AccessData Legal and Contact Information

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<table>
<thead>
<tr>
<th>AccessData®</th>
<th>MPE+ Velocitor™</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccessData Certified Examiner® (ACE®)</td>
<td>Password Recovery Toolkit®</td>
</tr>
<tr>
<td>AD Summation®</td>
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</tr>
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</tr>
<tr>
<td>DNA®</td>
<td>SilentRunner®</td>
</tr>
<tr>
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<td>Summation®</td>
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<td>Mobile Phone Examiner Plus®</td>
<td>ThreatBridge™</td>
</tr>
</tbody>
</table>

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<th>AccessData Group, Inc.</th>
</tr>
</thead>
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</tbody>
</table>

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>AccessData is closed on US Federal Holidays</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Federal Sales:</th>
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</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Corporate Sales:</th>
<th>Voice: 801.377.5410, option 3; Fax: 801.765.4370</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Training:</th>
<th>Voice: 801.377.5410, option 6; Fax: 801.765.4370</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>Voice: 801.377.5410, option 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email:</td>
<td></td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th></th>
<th>Americas/Asia-Pacific:</th>
</tr>
</thead>
<tbody>
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The AccessData Professional Services staff comes with a varied and extensive background in digital investigations including law enforcement, counter-intelligence, and corporate security. Their collective experience in working with both government and commercial entities, as well as in providing expert testimony, enables them to provide a full range of computer forensic and eDiscovery services.
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</tr>
</tbody>
</table>
Table of Contents

AccessData Legal and Contact Information ............................................ 2

Table of Contents ................................................................. 8

Part 1: Introducing Forensic Toolkit® (FTK®) ........................................... 25

Chapter 1: Introducing AccessData® Forensic Toolkit® (FTK®) ..................... 26
  Overview of Investigating Digital Evidence ......................................... 26
  About Acquiring Digital Evidence ................................................. 27
    Types of Digital Evidence ....................................................... 27
    Acquiring Evidence ........................................................... 27
  About Examining Digital Evidence .............................................. 28
  About Managing Cases and Evidence ............................................ 29
  What You Can Do With the Examiner ............................................ 30
    About Indexing and Hashing .................................................... 30
    About the Known File Filter Database ..................................... 30
    About Searching .............................................................. 31
    About Bookmarking ........................................................... 31
    About Presenting Evidence ................................................... 31

Chapter 2: Getting Started with the User Interface ..................................... 32

Part 2: Administrating Forensic Toolkit® (FTK®) ....................................... 34

Chapter 3: Application Administration ................................................. 35
  Initializing the Database and Creating an Application Administrator Account . 36
  Changing Your Password ......................................................... 37
  Recovering a Password .......................................................... 37
    Creating a Password Reset File ............................................. 37
    Resetting your Password ..................................................... 38
  Setting Database Preferences .................................................... 39
  Managing Database Sessions ..................................................... 39
  Optimizing the Database for Large Cases ....................................... 39
  Managing KFF Settings .......................................................... 40
  Recovering and Deleting Processing Jobs ....................................... 40
  Restoring an Image to a Disk .................................................... 41
  Database Integration with other AccessData Products .......................... 41
### Adding New Users to a Database

- About Assigning Roles to Users
  - About Additional Roles
  - About Predefined Roles
  - Assigning Initial Database-level Roles to Users
  - Assigning Additional Case-level Roles to Users
- Assigning Users Shared Label Visibility
- Setting Additional Preferences
  - Choosing a Temporary File Path
  - Providing a Network Security Device Location
  - Setting Theme Preferences for the Visualization Add on
- Optimizing the Case Database
- Managing Global Features
  - Managing Shared Custom Carvers
  - Managing Custom Identifiers
  - Managing Columns
  - Managing File Extension Maps
  - Managing Filters

### Part 3: Case Management

- Chapter 4: Introducing Case Management
  - About Case Management
  - The User Interfaces
  - About the Cases List
  - Menus of the Case Manager
  - Menus of the Examiner

- Chapter 5: Creating and Configuring New Cases
  - Opening an Existing Case
  - Creating a Case
  - Configuring Detailed Options for a Case
    - About Processing Options
    - Configuring Default Processing Options for a Case
    - Using Processing Profiles
    - Manually Customizing a set of Detailed Options
  - Evidence Processing Options
    - Expanding Compound Files
    - Using dtSearch Text Indexing
    - Configuring Case Indexing Options
    - Data Carving
    - Running Optical Character Recognition (OCR)
    - Using Explicit Image Detection
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Including Registry Reports</td>
<td>97</td>
</tr>
<tr>
<td>Send Email Alert on Job Completion</td>
<td>97</td>
</tr>
<tr>
<td>Custom File Identification Options</td>
<td>97</td>
</tr>
<tr>
<td>Creating Custom File Identifiers</td>
<td>97</td>
</tr>
<tr>
<td>Configuring Evidence Refinement (Advanced) Options</td>
<td>99</td>
</tr>
<tr>
<td>Refining Evidence by File Status/Type</td>
<td>100</td>
</tr>
<tr>
<td>Selecting Index Refinement (Advanced) Options</td>
<td>101</td>
</tr>
<tr>
<td>Selecting Lab/eDiscovery Options</td>
<td>103</td>
</tr>
<tr>
<td>Adding Evidence to a New Case</td>
<td>106</td>
</tr>
<tr>
<td>Working with Volume Shadow Copies</td>
<td>106</td>
</tr>
<tr>
<td>Converting a Case from Version 2.2 or Newer</td>
<td>106</td>
</tr>
<tr>
<td>Chapter 6: Managing Case Data</td>
<td>107</td>
</tr>
<tr>
<td>Backing Up a Case</td>
<td>108</td>
</tr>
<tr>
<td>About Performing a Backup and Restore on a Multi-Box Installation</td>
<td>108</td>
</tr>
<tr>
<td>Performing a Backup of a Case</td>
<td>108</td>
</tr>
<tr>
<td>Archiving a Case</td>
<td>110</td>
</tr>
<tr>
<td>Archiving and Detaching a Case</td>
<td>111</td>
</tr>
<tr>
<td>Attaching a Case</td>
<td>112</td>
</tr>
<tr>
<td>Restoring a Case</td>
<td>113</td>
</tr>
<tr>
<td>Deleting a Case</td>
<td>114</td>
</tr>
<tr>
<td>Storing Case Files</td>
<td>114</td>
</tr>
<tr>
<td>Migrating Cases Between Database Types</td>
<td>114</td>
</tr>
<tr>
<td>Chapter 7: Working with Evidence Image Files</td>
<td>115</td>
</tr>
<tr>
<td>Verifying Drive Image Integrity</td>
<td>115</td>
</tr>
<tr>
<td>Mounting an Image to a Drive</td>
<td>116</td>
</tr>
<tr>
<td>Benefits of Image Mounting</td>
<td>116</td>
</tr>
<tr>
<td>Characteristics of a Logically Mounted Image</td>
<td>117</td>
</tr>
<tr>
<td>Characteristics of a Physically Mounted Image</td>
<td>117</td>
</tr>
<tr>
<td>Mounting an Image as Read-Only</td>
<td>117</td>
</tr>
<tr>
<td>Mounting a Drive Image as Writable</td>
<td>118</td>
</tr>
<tr>
<td>Unmounting an Image</td>
<td>119</td>
</tr>
<tr>
<td>Restoring an Image to a Disk</td>
<td>119</td>
</tr>
<tr>
<td>Performing Final Carve Processing</td>
<td>119</td>
</tr>
<tr>
<td>Recovering Processing Jobs</td>
<td>120</td>
</tr>
<tr>
<td>Chapter 8: Working with Static Evidence</td>
<td>121</td>
</tr>
<tr>
<td>Static Evidence Compared to Remote Evidence</td>
<td>121</td>
</tr>
<tr>
<td>Acquiring and Preserving Static Evidence</td>
<td>122</td>
</tr>
<tr>
<td>Adding Evidence</td>
<td>122</td>
</tr>
</tbody>
</table>
## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working with Evidence Groups</td>
<td>126</td>
</tr>
<tr>
<td>Selecting Evidence Processing Options</td>
<td>127</td>
</tr>
<tr>
<td>Selecting a Language</td>
<td>128</td>
</tr>
<tr>
<td>Examining Data in Volume Shadow Copies</td>
<td>129</td>
</tr>
<tr>
<td>About Restore Point Processing Options</td>
<td>130</td>
</tr>
<tr>
<td>Managing Restore Points</td>
<td>131</td>
</tr>
<tr>
<td>Viewing Restore Point Data</td>
<td>131</td>
</tr>
<tr>
<td>Using Additional Analysis</td>
<td>133</td>
</tr>
<tr>
<td>Hashing</td>
<td>138</td>
</tr>
<tr>
<td>Data Carving</td>
<td>138</td>
</tr>
<tr>
<td>Viewing the Status and Progress of Data Processing and Analysis</td>
<td>140</td>
</tr>
<tr>
<td>Viewing Processed Items</td>
<td>141</td>
</tr>
<tr>
<td>Chapter 9: Working with Live Evidence</td>
<td>142</td>
</tr>
<tr>
<td>About Live Evidence</td>
<td>142</td>
</tr>
<tr>
<td>Types of Live Evidence</td>
<td>143</td>
</tr>
<tr>
<td>Adding Local Live Evidence</td>
<td>143</td>
</tr>
<tr>
<td>Methods of Adding Remote Live Evidence</td>
<td>144</td>
</tr>
<tr>
<td>Requirements for Adding Remote Live Evidence</td>
<td>144</td>
</tr>
<tr>
<td>Adding Evidence with the Temporary Agent</td>
<td>145</td>
</tr>
<tr>
<td>Pushing the Temporary Agent</td>
<td>145</td>
</tr>
<tr>
<td>Manually Deploying the Temporary Agent</td>
<td>146</td>
</tr>
<tr>
<td>Adding Data with the Enterprise Agent</td>
<td>147</td>
</tr>
<tr>
<td>Methods of Deploying the Enterprise Agent</td>
<td>147</td>
</tr>
<tr>
<td>Creating Self-signed Certificates for Agent Deployment</td>
<td>147</td>
</tr>
<tr>
<td>Configuring Communication Settings for the Enterprise Agent Push</td>
<td>148</td>
</tr>
<tr>
<td>Pushing the Enterprise Agent</td>
<td>149</td>
</tr>
<tr>
<td>Removing the Enterprise Agent</td>
<td>150</td>
</tr>
<tr>
<td>Connecting to an Enterprise Agent</td>
<td>150</td>
</tr>
<tr>
<td>Adding Remote Data with the Enterprise Agent</td>
<td>150</td>
</tr>
<tr>
<td>Acquiring Drive Data</td>
<td>153</td>
</tr>
<tr>
<td>Acquiring RAM Data</td>
<td>154</td>
</tr>
<tr>
<td>Importing Memory Dumps</td>
<td>155</td>
</tr>
<tr>
<td>Unmounting an Agent Drive or Device</td>
<td>155</td>
</tr>
<tr>
<td>Chapter 10: Filtering Data to Locate Evidence</td>
<td>156</td>
</tr>
<tr>
<td>About Filtering</td>
<td>156</td>
</tr>
<tr>
<td>Types of Filters</td>
<td>157</td>
</tr>
<tr>
<td>What You Can Do with Filters</td>
<td>157</td>
</tr>
<tr>
<td>Understanding How Filters Work</td>
<td>159</td>
</tr>
<tr>
<td>Viewing the Components of Filters</td>
<td>159</td>
</tr>
<tr>
<td>Viewing Details about Attributes that Filters use</td>
<td>159</td>
</tr>
<tr>
<td>Using Simple Filtering</td>
<td>160</td>
</tr>
</tbody>
</table>
### Table of Contents

Using Global Filters .................................................. 160  
Using Tab Filters ...................................................... 160  
How Global Filters and Tab Filters can work Together .......... 161  
Using Filters with Category Containers .......................... 161  
Using Filters with Reports ........................................... 161  
Viewing the Filters that you have Applied ......................... 162  

Using Filtering with Searches ......................................... 163  
Adding a Search Filter to a Live Searches ......................... 163  
Adding a Search Filter to an Index Searches ...................... 163  

Using Compound Filters ............................................... 164  
Applying Compound Filters .......................................... 164  

Using Custom Filters .................................................. 165  
About Nested Filters ................................................. 165  
Creating a Custom Filter ............................................ 165  
Copyng Filters ......................................................... 166  
Editing a Custom Filter .............................................. 166  

Sharing, Importing, and Exporting Filters ........................ 167  
Sharing Custom Filters Between Cases ................................ 167  
Importing Filters ....................................................... 167  
Exporting Filters ....................................................... 167  

Types of Predefined Filters ............................................ 169

**Chapter 11: Working with Labels** .......................................... 173  
What You Can Do With Labels ........................................ 173  
Creating a Label ....................................................... 174  
Applying a Label ....................................................... 174  
Managing Labels ....................................................... 175  
Managing Label Groups ................................................ 176

**Chapter 12: Decrypting Files** ........................................... 177  
About Decrypting Files ................................................ 177  
About the Encrypted File Passwords List .......................... 179  
Identifying the Encrypted Files in a Case ......................... 181  
Using PRTK/DNA Integration ........................................... 182  
Decrypted Files Using the Automatic Decryption Processing Option .... 182  
Decrypted Files Using Right-Click Auto Decryption ............... 183  
Recovering Unknown Passwords of Encrypted Files ................ 184  
About Recovering Passwords using the PRTK/DNA Integrated Tool with Examiner 184  
Recovering Passwords using the PRTK/DNA Integrated Tool ........ 184  
Decrypted Other Encryption Types ................................... 186  
Decrypted EFS .......................................................... 186  
Decrypted Microsoft Office Digital Rights Management (DRM) Protected Files 187
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrypting Lotus Notes Files</td>
<td>188</td>
</tr>
<tr>
<td>Decrypting S/MIME Files</td>
<td>188</td>
</tr>
<tr>
<td>Decrypting Credant Files</td>
<td>189</td>
</tr>
<tr>
<td>Decrypting Bitlocker Partitions</td>
<td>191</td>
</tr>
<tr>
<td>Decrypting Safeguard Utimaco Files</td>
<td>192</td>
</tr>
<tr>
<td>Decrypting SafeBoot Files</td>
<td>194</td>
</tr>
<tr>
<td>Decrypting Guardian Edge Files</td>
<td>194</td>
</tr>
<tr>
<td>Decrypting an Image Encrypted With PGP® WDE</td>
<td>194</td>
</tr>
<tr>
<td>Viewing Decrypted Files</td>
<td>196</td>
</tr>
<tr>
<td>Chapter 13: Exporting Data from the Examiner</td>
<td>197</td>
</tr>
<tr>
<td>Copying Information from the Examiner</td>
<td>197</td>
</tr>
<tr>
<td>Exporting Files to a Native Format</td>
<td>199</td>
</tr>
<tr>
<td>Exporting Files to an AD1 Image</td>
<td>201</td>
</tr>
<tr>
<td>Exporting an Image to an Image</td>
<td>203</td>
</tr>
<tr>
<td>Exporting File List Information</td>
<td>205</td>
</tr>
<tr>
<td>Exporting a Word List</td>
<td>206</td>
</tr>
<tr>
<td>Exporting Recycle Bin Index Contents</td>
<td>206</td>
</tr>
<tr>
<td>Exporting Hashes from a Case</td>
<td>207</td>
</tr>
<tr>
<td>Exporting KFF Data</td>
<td>207</td>
</tr>
<tr>
<td>Exporting All Hits in a Search to a CSV file</td>
<td>208</td>
</tr>
<tr>
<td>Exporting Emails to PST</td>
<td>209</td>
</tr>
<tr>
<td>Chapter 14: About Cerberus Malware Analysis</td>
<td>210</td>
</tr>
<tr>
<td>About Cerberus Malware Analysis</td>
<td>210</td>
</tr>
<tr>
<td>About Cerberus Stage 1 Threat Analysis</td>
<td>211</td>
</tr>
<tr>
<td>About Cerberus Score Weighting</td>
<td>211</td>
</tr>
<tr>
<td>About Cerberus Override Scores</td>
<td>211</td>
</tr>
<tr>
<td>About Cerberus Threat Score Reports</td>
<td>212</td>
</tr>
<tr>
<td>Cerberus Stage 1 Threat Scores</td>
<td>214</td>
</tr>
<tr>
<td>Cerberus Stage 1 File Information</td>
<td>216</td>
</tr>
<tr>
<td>About Cerberus Stage 2 Static Analysis</td>
<td>217</td>
</tr>
<tr>
<td>About Cerberus Stage 2 Report Data</td>
<td>217</td>
</tr>
<tr>
<td>Cerberus Stage 2 Function Call Data</td>
<td>218</td>
</tr>
<tr>
<td>File Access Call Categories</td>
<td>219</td>
</tr>
<tr>
<td>Networking Functionality Call Categories</td>
<td>221</td>
</tr>
<tr>
<td>Process Manipulation Call Categories</td>
<td>223</td>
</tr>
<tr>
<td>Security Access Call Categories</td>
<td>224</td>
</tr>
<tr>
<td>Windows Registry Call Categories</td>
<td>224</td>
</tr>
<tr>
<td>Surveillance Call Categories</td>
<td>225</td>
</tr>
<tr>
<td>Uses Cryptography Call Categories</td>
<td>225</td>
</tr>
<tr>
<td>Low-level Access Call Categories</td>
<td>226</td>
</tr>
</tbody>
</table>
Chapter 15: Running Cerberus Malware Analysis ............................................... 228
  Running Cerberus Analysis ................................................................. 228
  About Reviewing Results of Cerberus .................................................. 230
    Cerberus Columns ............................................................................. 230
  Reviewing Results of Cerberus ............................................................ 232
  Using Index Search with Cerberus ......................................................... 233
  Exporting a Cerberus Report ................................................................. 233

Chapter 16: Getting Started with KFF (Known File Filter) .................................. 234
  About KFF .............................................................................................. 234
    Introduction to the KFF Architecture ................................................. 235
    Components of KFF Data .................................................................... 235
    How KFF Works .................................................................................. 237
  About the KFF Server and Geolocation ................................................ 239
  Installing the KFF Server ...................................................................... 240
    About Installing the KFF Server ....................................................... 240
    About KFF Server Versions ............................................................... 240
    Installing the KFF Server Service ..................................................... 240
  Configuring the Location of the KFF Server .......................................... 241
    Configuring the KFF Server Location on FTK-based Computers ......... 241
    Configuring the KFF Server Location on Resolution1 and Summation Applications .......................................................................... 241
  Migrating Legacy KFF Data ................................................................. 242
  Importing KFF Data ............................................................................... 244
    About Importing KFF Data ............................................................... 244
    Using the KFF Import Utility ............................................................. 245
    Importing Pre-defined KFF Data Libraries ........................................... 247
    Installing the Geolocation (GeoIP) Data ............................................. 250
  About CSV and Binary Formats .......................................................... 252
  Uninstalling KFF ................................................................................... 255
  Installing KFF Updates ......................................................................... 256
  KFF Library Reference Information ..................................................... 257
    About KFF Pre-Defined Hash Libraries .............................................. 257
  What has Changed in Version 5.6 ......................................................... 262

Chapter 17: Using the Known File Filter (KFF) ...................................................... 263
  Process for Using KFF ........................................................................... 263
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>About the KFF Admin page</td>
<td>264</td>
</tr>
<tr>
<td>Adding Hashes to the KFF Server</td>
<td>266</td>
</tr>
<tr>
<td>Importing KFF Data</td>
<td>266</td>
</tr>
<tr>
<td>Manually Managing Hashes in a Hash Set</td>
<td>268</td>
</tr>
<tr>
<td>Adding Hashes From Files in Cases</td>
<td>269</td>
</tr>
<tr>
<td>Using KFF Groups to Organize Hash Sets</td>
<td>270</td>
</tr>
<tr>
<td>About KFF Groups</td>
<td>270</td>
</tr>
<tr>
<td>Creating a KFF Group</td>
<td>271</td>
</tr>
<tr>
<td>Viewing the Contents of a KFF Group</td>
<td>271</td>
</tr>
<tr>
<td>Managing KFF Groups</td>
<td>271</td>
</tr>
<tr>
<td>Enabling a Case to Use KFF</td>
<td>273</td>
</tr>
<tr>
<td>About Enabling and Configuring KFF</td>
<td>273</td>
</tr>
<tr>
<td>Enabling and Configuring KFF</td>
<td>273</td>
</tr>
<tr>
<td>Reviewing KFF Results in the Examiner</td>
<td>275</td>
</tr>
<tr>
<td>About KFF Data Shown in the Item List</td>
<td>275</td>
</tr>
<tr>
<td>Using the KFF Information Columns</td>
<td>275</td>
</tr>
<tr>
<td>Using KFF Filters</td>
<td>276</td>
</tr>
<tr>
<td>Using the Overview Tab</td>
<td>276</td>
</tr>
<tr>
<td>Re-Processing KFF Using Additional Analysis</td>
<td>277</td>
</tr>
<tr>
<td>Exporting KFF Data</td>
<td>278</td>
</tr>
<tr>
<td>About Exporting KFF Data</td>
<td>278</td>
</tr>
<tr>
<td>Exporting KFF Groups</td>
<td>278</td>
</tr>
<tr>
<td>Archiving the KFF Server’s Data</td>
<td>278</td>
</tr>
</tbody>
</table>

**Part 4: Reviewing Cases** .......................................................... 279

**Chapter 18: Using the Examiner Interface** .................................... 280

About the Examiner ................................................................. 280
Creating Screen Captures in the Examiner ...................................... 281

**Chapter 19: Exploring Evidence** .................................................. 282

Explorer Tree Pane ................................................................. 282
File List Pane ................................................................................. 283
Using the File List’s Columns ...................................................... 283
Icons of the File List Tool Bar ..................................................... 285
File List View Right-Click Menu .................................................... 287
The File Content Viewer Pane ....................................................... 289
The Filter Toolbar ............................................................................. 297
Using QuickPicks ............................................................................. 298

**Chapter 20: Examining Evidence in the Overview Tab** .......................... 299

Using the Overview Tab ................................................................. 299
Evidence Groups Container .............................................................. 299
Chapter 21: Examining Email .................................................. 303
  Using the Email Tab ......................................................... 303
  Email Status Tree .......................................................... 303
  Email Archives Tree ....................................................... 304
  Email Tree ................................................................. 304

Chapter 22: Examining Graphics ............................................. 305
  Using the Graphics Tab .................................................... 305
  The Thumbnails Size Setting .......................................... 306
  Moving the Thumbnails Pane .......................................... 307
  Evaluating Explicit Material .......................................... 308
    Filtering EID Material ................................................ 308
    EID Scoring ............................................................. 309
  Using PhotoDNA to Compare Images ................................ 311
    About Using PhotoDNA .............................................. 311
    About the PhotoDNA Library Management Page ............... 311
    About the PhotoDNA Processing Option ......................... 311
    About viewing the PhotoDNA results ............................ 312
    Configuring a PhotoDNA Library ................................. 312
    Comparing Images to the PhotoDNA Library ................... 313

Chapter 23: Examining Videos ............................................... 315
  Generating Thumbnails for Video Files ............................ 316
    Generating Video Thumbnails from the Natural Viewer ....... 316
  Creating Common Video Files ....................................... 317
  Using the Video Tree Pane ............................................ 318
  Using the Video Thumbnails Pane ................................... 319
  Playing a Video from a Video Thumbnail ......................... 319
  The Thumbnail Size Setting .......................................... 320
  Moving the Thumbnails Pane ........................................ 320

Chapter 24: Examining Miscellaneous Evidence ........................ 321
  Identifying Processing-Generated Data ............................. 322
  Relating Generated Files to Original Files ..................... 322
  Viewing Windows Prefetch Data ...................................... 323
  Viewing Data in Windows XML Event Log (EVTX) Files ....... 323
<table>
<thead>
<tr>
<th>Chapter 25: Bookmarking Evidence</th>
<th>342</th>
</tr>
</thead>
<tbody>
<tr>
<td>About Bookmarks</td>
<td>342</td>
</tr>
<tr>
<td>About Timeline Bookmarks</td>
<td>342</td>
</tr>
<tr>
<td>Creating a Bookmark</td>
<td>343</td>
</tr>
<tr>
<td>About Empty Bookmarks</td>
<td>344</td>
</tr>
<tr>
<td>Bookmarks Dialog Options</td>
<td>345</td>
</tr>
<tr>
<td>Bookmark Comments HTML Editor</td>
<td>347</td>
</tr>
<tr>
<td>Viewing Bookmark Information</td>
<td>349</td>
</tr>
<tr>
<td>Creating a Timeline Bookmark Report</td>
<td>349</td>
</tr>
<tr>
<td>Using the Bookmarks Tab</td>
<td>349</td>
</tr>
<tr>
<td>Bookmarking Selected Text</td>
<td>350</td>
</tr>
<tr>
<td>Bookmarking Video Thumbnails</td>
<td>350</td>
</tr>
<tr>
<td>Adding a Video Thumbnail to a New or Existing Bookmark</td>
<td>350</td>
</tr>
<tr>
<td>Adding to an Existing Bookmark</td>
<td>351</td>
</tr>
<tr>
<td>Creating Email or Email Attachment Bookmarks</td>
<td>352</td>
</tr>
<tr>
<td>Adding Email and Email Attachments to Existing Bookmarks</td>
<td>352</td>
</tr>
<tr>
<td>Moving a Bookmark</td>
<td>353</td>
</tr>
<tr>
<td>Copying a Bookmark</td>
<td>353</td>
</tr>
<tr>
<td>Deleting a Bookmark</td>
<td>353</td>
</tr>
<tr>
<td>Deleting Files from a Bookmark</td>
<td>353</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 26: Searching Evidence with Live Search</th>
<th>354</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducting a Live Search</td>
<td>354</td>
</tr>
<tr>
<td>Live Text Search</td>
<td>355</td>
</tr>
<tr>
<td>Live Hex Search</td>
<td>357</td>
</tr>
<tr>
<td>Live Pattern Search</td>
<td>358</td>
</tr>
<tr>
<td>Using Pattern Searches</td>
<td>358</td>
</tr>
<tr>
<td>Predefined Regular Expressions</td>
<td>361</td>
</tr>
<tr>
<td>Social Security Number</td>
<td>361</td>
</tr>
</tbody>
</table>
# Table of Contents

<table>
<thead>
<tr>
<th>Chapter 27: Searching Evidence with Index Search</th>
<th>365</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducting an Index Search</td>
<td>366</td>
</tr>
<tr>
<td>Using Search Terms</td>
<td>366</td>
</tr>
<tr>
<td>Using Unicode Characters in Search Terms</td>
<td>367</td>
</tr>
<tr>
<td>Expanding Search Terms</td>
<td>367</td>
</tr>
<tr>
<td>Defining Search Criteria</td>
<td>369</td>
</tr>
<tr>
<td>Exporting and Importing Index Search Terms</td>
<td>369</td>
</tr>
<tr>
<td>Selecting Index Search Options</td>
<td>370</td>
</tr>
<tr>
<td>Viewing Index Search Results</td>
<td>370</td>
</tr>
<tr>
<td>Using dtSearch Regular Expressions</td>
<td>371</td>
</tr>
<tr>
<td>TR1 Regular Expressions For Text Patterns</td>
<td>371</td>
</tr>
<tr>
<td>TR1 Regular Expressions For Number Patterns</td>
<td>371</td>
</tr>
<tr>
<td>Documenting Search Results</td>
<td>372</td>
</tr>
<tr>
<td>Using Copy Special to Document Search Results</td>
<td>378</td>
</tr>
<tr>
<td>Bookmarking Search Results</td>
<td>379</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 28: Viewing System Information</th>
<th>381</th>
</tr>
</thead>
<tbody>
<tr>
<td>About Viewing System Information</td>
<td>381</td>
</tr>
<tr>
<td>Populating the Data in the System Information Tab</td>
<td>382</td>
</tr>
<tr>
<td>Viewing System Information</td>
<td>382</td>
</tr>
<tr>
<td>Available System Information Data</td>
<td>383</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 29: Examining Volatile Data</th>
<th>388</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using the Volatile Tab</td>
<td>389</td>
</tr>
<tr>
<td>Understanding Memory</td>
<td>391</td>
</tr>
<tr>
<td>Viewing Memory Dump Data</td>
<td>392</td>
</tr>
<tr>
<td>Viewing Hidden Processes</td>
<td>392</td>
</tr>
<tr>
<td>Viewing Input/Output Request Packet Data</td>
<td>392</td>
</tr>
<tr>
<td>Viewing Virtual Address Descriptor (VAD) Data</td>
<td>392</td>
</tr>
<tr>
<td>Performing File Remediation from the Volatile Tab</td>
<td>394</td>
</tr>
<tr>
<td>Killing a Process</td>
<td>394</td>
</tr>
<tr>
<td>Wiping a File</td>
<td>395</td>
</tr>
<tr>
<td>Adding Hashes to KFF Library from the Volatile Tab</td>
<td>395</td>
</tr>
<tr>
<td>Adding Hashes to Fuzzy Hash Library from the Volatile Tab</td>
<td>396</td>
</tr>
<tr>
<td>Creating a Memory Dump File</td>
<td>396</td>
</tr>
</tbody>
</table>
Chapter 30: Analyzing Document Content .................................................. 397
   Using Entity Extraction .............................................................................. 397
      About Entity Extraction .......................................................................... 397
      Enabling Entity Extraction .................................................................... 400
      Viewing Entity Extraction Data ............................................................. 400
   Using Document Content Analysis .......................................................... 401
      Filtering Documents by Document Content Analysis .............................. 401
      Prerequisites for Cluster Topic .............................................................. 402
      How Document Content Analysis Works .............................................. 402
      Filtering with Cluster Topic .................................................................. 402
      Considerations of Cluster Topic ............................................................ 402
   Performing Cluster Analysis .................................................................... 403
      Words Excluded from Cluster Analysis Processing ............................... 404

Chapter 31: Using Visualization ................................................................. 405
   About Visualization .................................................................................... 405
   Launching Visualization ............................................................................ 406
   About the Visualization page ..................................................................... 407
   About Visualization Time Line Views ...................................................... 408
      About the Base Time Line ...................................................................... 408
         Setting the Base Time Line .................................................................. 410
      Changing the View of Visualization ...................................................... 411
         Modifying the Bar Chart Displays ........................................................ 411
         Changing the Theme of Visualization .................................................. 411
   Visualizing File Data .................................................................................. 412
      Configuring Visualization File Dates .................................................... 412
      Visualizing File Extension Distribution ................................................. 413
      Visualizing File Category Distribution ................................................. 415
      Using the File Data List .......................................................................... 416
   Visualizing Email Data .............................................................................. 419
      Narrowing the Scope with the Email Time Line ..................................... 419
      Viewing Mail Statistics .......................................................................... 421
      Using the Email Details List .................................................................... 421
   About the Detailed Visualization Time Line ............................................. 425
   Using the Detailed Visualization Time Line ............................................. 426
      Understanding How Data is Represented in the Detailed Time Line ......... 426
      About Time Bands ................................................................................ 427
      Modifying the Time Line Using Time Bands and Zoom ....................... 429
      Understanding How Grouping Works in the Detailed Visualization Time Line 429
   Visualizing Internet Browser History Data ............................................... 431
   Visualizing Other Data ............................................................................. 431
Chapter 40: Installing the Mac Agent

Configuring the AccessData Agent installer
Bundling a Certificate
Configuring the Port.
Additional Configuration Options
Installing the Agent
Uninstalling the Agent

Chapter 41: Working with Windows Registry Evidence

Understanding the Windows Registry
Windows 9x Registry Files
Windows NT and Windows 2000 Registry Files
Windows XP Registry Files
Possible Data Types
Additional Considerations
Windows XP Registry Quick Find Chart
System Information
Networking.
User Data
User Application Data

Chapter 42: Supported File Systems and Drive Image Formats

File Systems
Whole Disk Encrypted Products
Hard Disk Image Formats
CD and DVD Image Formats

Chapter 43: Recovering Deleted Material

FAT 12, 16, and 32
NTFS
Ext2.
Ext3.
HFS.

Chapter 44: Managing Security Devices and Licenses

Installing and Managing Security Devices
Installing LicenseManager .................................................. 516
Starting LicenseManager ................................................... 517
Using LicenseManager ....................................................... 518
Updating Products ............................................................ 523
Sending a Dongle Packet File to Support ............................... 524
Virtual CodeMeter Activation Guide ....................................... 525
Introduction ........................................................................ 525
Preparation Notes ............................................................... 530
Setup Overview .................................................................... 530
Network Dongle Notes .......................................................... 531
NLS Server System Notes ...................................................... 531
NLS Client System Notes ...................................................... 531

Chapter 45: Configuring a Multi-box Setup .............................. 533
Configuration for a Multi-box Setup ....................................... 533
Configuration Overview ....................................................... 533
Create a Service Account ...................................................... 533
Share the Case Folder ......................................................... 534
Configure Database Services ............................................... 535
Share the Backup Destination Folder ..................................... 535
Test the New Configuration .................................................. 535

Chapter 46: AccessData Distributed Processing ....................... 537
Distributed Processing Prerequisites ....................................... 537
Using PostgreSQL with Distributed Processing ....................... 538
Installing Distributed Processing ......................................... 539
Configuring Distributed Processing ...................................... 541
Using Distributed Processing .............................................. 543
Checking the Installation ..................................................... 543

Chapter 47: AccessData Oradjuster ........................................ 544
Oradjuster System Requirements .......................................... 544
Introduction .......................................................... 544
The First Invocation ......................................................... 545
Subsequent Invocations ....................................................... 545
Part 1

Introducing Forensic Toolkit® (FTK®)

This part contains introductory information about AccessData® Forensic Toolkit® (FTK®) and contains the following chapters:

- Introducing AccessData® Forensic Toolkit® (FTK®) (page 26)
- Getting Started with the User Interface (page 32)
Chapter 1
Introducing AccessData® Forensic Toolkit® (FTK®)

AccessData® Forensic Toolkit® (FTK®) lets you do thorough computer forensic examinations. It includes powerful file filtering and search functionality, and access to remote systems on your network.

AccessData forensic investigation software tools help law enforcement officials, corporate security, and IT professionals access and evaluate the evidentiary value of files, folders, and computers.

This chapter includes the following topics

- Overview of Investigating Digital Evidence (page 26)
- About Acquiring Digital Evidence (page 27)
- About Examining Digital Evidence (page 28)
- About Managing Cases and Evidence (page 29)
- What You Can Do With the Examiner (page 30)

Overview of Investigating Digital Evidence

This section describes acquiring, preserving, analyzing, presenting, and managing digital evidence and cases.

Forensic digital investigations include the following process

- Acquisition
  Acquisition involves identifying relevant evidence, securing the evidence, and creating and storing a forensic image of it.
  About Acquiring Digital Evidence (page 27)
- Analysis
  Analysis involves creating a case and processing the evidence with tools to properly investigate the evidence.
  About Examining Digital Evidence (page 28)
- Presentation
  Presentation involves creating a case report that documents and synthesizes the investigation.
  About Presenting Evidence (page 31)
- Management
  Management involves maintenance tasks such as backing up, archiving, detaching, attaching, restoring, and deleting cases and evidence.
  About Managing Cases and Evidence (page 29)
About Acquiring Digital Evidence

The admissibility of digital evidence in a court of law, can be dependent on preserving the integrity of the source data when it is acquired.

When digital evidence is acquired, forensic examiners create clones of the digital evidence to prevent any possibility of the digital evidence being changed or modified in any way. This acquired duplication is called a forensic image. If there is question to the authenticity of the evidence, the image can be compared to the original source data to prove or to disprove its reliability.

To create a forensic image, the data must be acquired in such a way that ensures that no changes are made to the original data or to the cloned data. The acquired data must be an exact “bit-by-bit” duplication of the source data. You can use AccessData’s Imager tool to acquire exact duplicates of digital evidence.

Preserving the evidence is accomplished both in the method of acquisition and the storage of the acquired data. Creating an exact replica of the original source is critical in forensic investigations. Keeping that replica safe from any source of corruption or unauthorized access involves both physical and electronic security. Once a case is created and the evidence is added to it, the case becomes just as critical. Acquired 001, E01, S01, and AD1 images can be encrypted using AD Encryption.

Types of Digital Evidence

Digital evidence is data such as documents and emails that can be transmitted and stored on electronic media, such as computer hard drives, mobile phones, and USB devices.

The following are types of digital evidence:

- **Static evidence**
  The data that is imaged before it is added to a case is known as static evidence because it stays the same. Images can be stored and remain available to the case at all times because the image is an exact replica of evidence data in a file format.

- **Live evidence**
  Live evidence can be data that is acquired from a machine while it is running. It is often saved to an image as it is acquired. Sometimes, this is necessary in a field acquisition. Other times, it can be an original drive or other electronic data source that is attached to the investigation computer. All connections to the evidence should be made through a hardware write-blocking device. Live evidence that is attached to the investigation computer must remain connected throughout the entire investigation. It is best to create an image of any evidence source outside of your network, rather than risk having the source removed during the course of the investigation.

- **Remote evidence**
  Another type of live evidence is data acquired directly from machines that are connected to your corporate network. This live evidence is referred to as remote evidence. The process of adding it to your case for investigation is known as Remote Data Acquisition.

Acquiring Evidence

Some aspects of acquiring evidence are dependent on local or federal law. Be aware of those requirements before you acquire the evidence. You can utilize static evidence as well as acquire and use live and remote evidence from computers on your network.
About Acquiring Static Evidence

For digital evidence to be valid, it must be preserved in its original form. The evidence image must be forensically sound, in other words, identical in every way to the original. The data cannot be modified by the acquisition method used.

The following tools can do such an acquisition

- **Hardware Acquisition Tools**
  
  Duplicate, or clone, disk drives and allow read-only access to the hard drive. They do not necessarily use a CPU, are self-contained, and are often hand-held.

- **Software Acquisition Tools**
  
  Create a software duplication of the evidence called a disk image. Imager lets you choose the image file format, the compression level, and the size of the data segments to use.

Imager is a software acquisition tool. It can quickly preview evidence. If the evidence warrants further investigation, you can create a forensically sound disk image of the evidence drive or source. It makes a bit-by-bit duplicate of the media, rendering a forensic disk image identical in every way to the original, including file slack and allocated or free space.

You should use a write-blocking device when using software acquisition tools. Some operating systems, such as Windows, make changes to the drive data as it reads the data to be imaged.

You can process static evidence, and acquire live data from local network machines for processing. You can also view and preview evidence on remote drives, including CDs and DVDs.

About Acquiring Live Evidence

You can collect evidence from a live machine when you must. For criminal investigations, it is especially important to be aware of the data compromises you will face in such a situation, however sometimes there is no other choice. One such example is when the suspect drive is encrypted and you must acquire the image in-place while the machine is running. Another example is when imaging a RAID array; it must be live to be properly acquired.

About Acquiring Remote Evidence

You can acquire live evidence from your active networked computers, including information in RAM, and drive data. In addition, using Remote Drive Management System (RDMS), you can mount any drive through a mapping and browse its contents, then make a custom image of what you find. This type of evidence is known as remote evidence because it is not stored on the examiner computer but is within your network.

About Examining Digital Evidence

Analyzing evidence is a process to locate and identify meaningful data to make it available to the appropriate parties in an easy-to-understand medium.
After you have completed installation and created a case, you can add evidence for analysis. Evidence can include images of hard drives, floppy drives, CDs and DVDs, portable media such as USB drives, and/or live (un-imaged) data from any common electronic source.

The data can be hashed and indexed. You can run searches in the index for specific words like names and email addresses, or you can run live searches.

You can use the Known File Filter (KFF) library to categorize specific information during evidence analysis. The KFF lets you automatically assign files a status of Alert, Ignore, or Disregard.

**About Managing Cases and Evidence**

As you work with cases, it is a best practice to back up the cases and the evidence. Back up of evidence files is as easy as copying them to a secure location on a secure media. Back up of cases can be more complicated, but is equally important in the event of a crash or other catastrophic data loss.

Back up of a case requires the same amount of drive space as the case itself. This is an important consideration when planning your network resources for investigations.

Some of the case management features include: Archive, Archive and Detach, and Attach. These features give you control over your cases.

See *Managing Global Features* (page 49).
What You Can Do With the Examiner

You can use tab views to locate data such as the following

- The **Overview** tab lets you narrow your search to look through specific document types, or to look for items by status or file extension.
- The **Graphics** tab lets you quickly scan through thumbnails of the graphics in the case.
- The **Email** tab lets you view emails and attachments.

As you find items of interest, you can do the following

- Create, assign, and view labels in a sorted file list view.
- Use searches and filters to find relevant evidence.
- Create bookmarks to easily group the items by topic or keyword, find those items again, and make the bookmarked items easy to add to reports.
- Export files as necessary for password cracking or decryption, then add the decrypted files back as evidence.
- Add external, supplemental files to bookmarks that are not otherwise part of the case.

About Indexing and Hashing

During case creation and evidence import, you have the option to create an index of the data and to create hash numbers of all the files contained in the data.

Indexing is the process of creating an index with a searchable list of the words or strings of characters in a case. The index instantaneously provides results. However, it is sometimes necessary to use a live search to find things not contained in the index.

Hashing a file or files refers to the process of using an algorithm to generate a unique value based on a file's contents. Hash values are used to verify file integrity and identify duplicate and known files. Known files can be standard system files that can be ignored in the investigation or they can be files known to contain illicit or dangerous materials. Ignore and alert statuses provide the investigator with valuable information at a glance.

Three hash functions are available: Message Digest 5 (MD5), Secure Hash Algorithms 1 (SHA-1), and Secure Hash Algorithms 256 (SHA-256).

Typically, individual file hashes (each file is hashed as it is indexed and added to a case) compare the results with a known database of hashes, such as the KFF. However, you can also hash multiple files or a disk image to verify that the working copy is identical to the original.

About the Known File Filter Database

The Known File Filter (KFF) is an AccessData utility used to compare file hashes in a case against a database of hashes from files known to be ignorable (such as known system and program files) or with alert status (such as known contraband or illicit material), or those designated as disregard status (such as when a search warrant does not allow inspection of certain files within the image that have been previously identified). The KFF allows quick elimination or pinpointing of these files during an investigation.
Files which contain other files, such as ZIP, CAB, and email files with attachments are called container files. When KFF identifies a container file as either ignorable or alert, the component files are not extracted. If extraction is desired, the files must be manually extracted and added to the case. See Using the Known File Filter (KFF) on page 263.

**About Searching**

You can conduct live searches or index searches of acquired images.

A live search is a bit-by-bit comparison of the entire evidence set with the search term and takes slightly more time than an Index search. Live searches allow you to search non-alphanumeric characters and to perform pattern searches, such as regular expressions and hex values.

See Searching Evidence with Live Search (page 354)

The Index search compares search terms to an index file containing discrete words or number strings found in both the allocated and unallocated space in the case evidence. The investigator can choose to generate an index file during preprocessing.

See Searching Evidence with Index Search (page 365)

AccessData products use dtSearch, one of the leading search tools available, in the index search engine. dtSearch can quickly search gigabytes of text.

**About Bookmarking**

As important data is identified from the evidence in the case, bookmarking that data enables you to quickly find and refer to it, add to it, and attach related files, even files that are not processed into the case. These files are called “supplementary files.” Bookmarks can be included in reports at any stage of the investigation and analysis.

See Bookmarking Evidence (page 342)

**About Presenting Evidence**

You can present digital evidence by creating a case report containing the evidence and investigation results in a readable, accessible format.

Use the report wizard to create and modify reports. A report can include bookmarks (information selected during the examination), customized graphic references, and selected file listings. Selected files, such as bookmarked files and graphics, can be exported to make them available with the report. The report can be generated in several file formats, including HTML and PDF and can be generated in multiple formats simultaneously.

See Working with Evidence Reports (page 465).
You can use two primary interfaces to work with cases and evidence:

- **Case Manager**
- **Examiner**

## The Case Manager

You can use the *Case Manager* to manage application settings that apply to multiple cases.

The following is an example of the *Case Manager*:

![Case Manager Example](image)

See [Introducing Case Management](#) on page 53.
The Examiner

You can use the Examiner to locate and interpret case data.

The following is an example of the Examiner:

For more information, see the following

- See Introducing Case Management (page 53)
- See Using the Examiner Interface (page 280)
Part 2

Administrating Forensic Toolkit® (FTK®)

This part contains information about administrating and configuring Forensic Toolkit® (FTK®) and contains the following chapters:

- Application Administration (page 35)
Chapter 3
Application Administration

This chapter includes topics that discuss administration tasks that you can do within the Case Manager interface.

See the following

- See Initializing the Database and Creating an Application Administrator Account on page 36.
- See Changing Your Password on page 37.
- See Recovering a Password on page 37.
- See Setting Database Preferences on page 39.
- See Managing Database Sessions on page 39.
- See Optimizing the Database for Large Cases on page 39.
- See Managing KFF Settings on page 40.
- See Recovering and Deleting Processing Jobs on page 40.
- See Restoring an Image to a Disk on page 41.
- See Database Integration with other AccessData Products on page 41.
- See Adding New Users to a Database on page 42.
- See About Assigning Roles to Users on page 43.
- See Assigning Users Shared Label Visibility on page 47.
- See Setting Additional Preferences on page 48.
- See Managing Global Features on page 49.

**Important:** It is strongly recommended to configure antivirus to exclude the database (PostgreSQL, Oracle database, MS SQL) AD temp, source images/loose files, and case folders for performance and data integrity.
Initializing the Database and Creating an Application Administrator Account

The database and application must already be installed prior to this step.

The first time you launch the application, you specify the database to use. The application then creates the database schema which is required before any case data can be loaded into the database. You will be prompted to give the location of the database. This option allows a non-local database to be specified even if a local database is present.

After initializing the database, you are prompted to create an Application Administrator account. This account lets you create other user accounts and perform other administrative tasks.

To initialize the database and create an Application Administrator account

1. Click the shortcut icon to open the application
2. If it does not detect a configured database connection for this version, you will be prompted to Add Database.
3. In the RDBMS drop-down menu, select the brand of database that you are connecting to.
4. Specify the server hosting the database in the Host field.
   If the database is on the same computer as FTK, you can leave this field empty.
5. (Optional) Give the database connection a nickname in the Display name field.
6. Specify the database name by doing one of the following:
   - If you are using Oracle, you must configure the Oracle SID to be FTK2.
   - If you are using PostgreSQL or MS SQL Server, for the PostgreSQL dbname or mssql sa, you can use the default values or enter your own value. If you enter your own value, make sure that you record it so that you know the database name.
7. Do not change the Port number fields unless you have a custom database configuration.
8. If you are using MS SQL Server, you can check Use Integrated Security to use your Windows authentication credentials.
9. Click OK.
   If the connection attempt to the database was successful, the database will be initialized.
10. In the Please Authenticate dialog, log into the database using you database administrator account credentials.
   - If you used the default installation, enter the following credentials:
     Username: postgres
     Password: AD@Password
   - If you used the advanced installation or installed a different database, enter your credentials.
     A successful login initializes the database and opens the Case Manager window.
11. In the Add New User dialog, create an Application Administrator account for this version of the database schema.
   - Enter a name and password.
   - Record this information in a secure place.
12. Click OK.
Changing Your Password

Once logged into the system, you can change your password.

To change your password

1. In Case Manager, click Database > Change Password.
2. In the Change Password dialog box, enter your current password.
3. Enter your new password in the New Password text box.
4. Verify your new password by entering it again in the Re-enter text box.
5. Click OK.

Recovering a Password

You can recover an Administrator database password using a Password Reset File. Only the Administrator logged into the program can create the reset file and only the Administrator that created the reset file can use the file to reset the password. Before recovering your Administrator password, you will create a Password Reset File. Once you reset a password, the Password Reset File you used is no longer valid.

There are two main components to recover an Administrator’s password:

- See Creating a Password Reset File on page 37.
- See Resetting your Password on page 38.

Creating a Password Reset File

You can use one of the following methods to create a Password Reset file:

- When creating a user with the Application Administration role and assigning a new password
- When changing the password for a user with the Application Administration role
- Accessing the Create Password Reset File option in the Administer Users dialog.

When creating/changing a password

1. After entering the new password, click OK.
2. A prompt appears that asks you to create a Password Reset File. Click Yes.
3. Navigate to a secure location and enter the name of the Password Reset File.
   **Important:** Choose a location for the Password Reset File that only you know and to which others do not have immediate access. Keep its location confidential.
4. Click OK.

From the Administer Users dialog

1. In Case Manager, click Database > Administer Users.
2. Highlight your User Name (that is, the User Name under which you are logged in).
3. Click Create Password Reset File.
4. Navigate to a secure location and enter the name of the Password Reset File.
Important: Choose a location for the Password Reset File that only you know and to which others do not have immediate access. Keep its location confidential.

5. Click OK.

Resetting your Password

To reset your password, enter the Password Reset File you created previously.

Note: Any Password Reset Files that have already been used to reset passwords are no longer valid and will not work. Password Reset Files from other users or other databases also will not work. Only the Password Reset File that you created previously with your User Name and Password will work.

To enter the Password Reset File

1. When prompted for your password, enter your User Name.
2. Click OK.
   The Reset Password button appears in the Please Authenticate dialog.
3. Click Reset Password.
4. Locate the Password Reset File, highlight it, and click OK.
5. Enter a new password, verify the new password, and click OK.
Setting Database Preferences

The *Preferences* dialog lets you specify where to store the temporary file, the location of a network license and whether you want to optimize the database after you process evidence.

**To set database preferences**

1. In the *Case Manager*, click **Tools > Preferences**. Type in or browse to the folder you want temporary files to be written to.
2. Select a location for the temporary file folder.
   - The Temporary File Folder stores temporary files, including files extracted from ZIP and email archives. The folder is also used as scratch space during text filtering and indexing. The Temporary File Folder is used frequently and should be on a drive with plenty of free space, and should not be subject to drive space allocation limits.
3. If your network uses AccessData Network License Service (NLS), you must provide the IP address and port for accessing the License Server.
4. Specify if you want to optimize the case database.
   - This is set to optimize by default. Unmark the check box to turn off automatic optimization. This causes the option to be available in Additional Analysis for those cases that were processed with Optimize Database turned off initially. The Restore Optimization option in Additional Analysis does not appear if Database Optimization is set in the New Case Wizard to be performed following processing, or if it has been performed already on the current case from either place.
5. In the *Preferences* dialog, click **OK**.

Managing Database Sessions

You can use the *Sessions Management* dialog to manage and track database sessions from within the *Case Manager*. You can also use the *Manage DB Sessions* dialog to terminate cases that are open and consuming sessions, but are inactive. This lets open file handles close so that processing can be restarted.

To open the *Manage DB Sessions* dialog, in the *Case Manager*, click **Database > Session Management**.

Optimizing the Database for Large Cases

*Note:* This feature currently only supports installations using PostgreSQL. If you are using Oracle, this feature is disabled.

The database can be configured to optimize the handling of large cases. Specifically it may decrease the processing time for large cases. However, if you choose to optimize the database, it will require additional disk resources on the database host computer.

**To optimize the database for large cases**

1. In the *Case Manager*, click **Database > Configure**.
2. Click **Optimized for large cases**.
3. Click **Apply**.
Managing KFF Settings

The AccessData Known File Filter can be managed from the Case Manager > Database menu. Click Manage KFF to open the KFF Admin dialog box.

This functionality is also found in the Examiner main window under Manage > KFF.

The functionality is the same regardless of how you launch KFF Admin.

See Using the Known File Filter (KFF) on page 263.

Recovering and Deleting Processing Jobs

Jobs that are started but unable to finish can be restarted or deleted.

To recover and delete processing jobs

1. Click Tools > Recover Processing Jobs. If no jobs remain unfinished, an error message pops up. Click Continue to see the Recover Processing Jobs dialog. It is be empty. Click Close. If there are jobs in the list, you can choose whether to Restart or Delete those jobs.

2. Click Select All, Unselect All, or mark the check box for each job to be recovered.

3. Do one of the following:
   - Click Restart. In the Recovery Type dialog, choose the recovery type that suits your needs.
   - Click Delete. Click Yes to confirm that you want to delete the job permanently.

4. Click Close.
Restoring an Image to a Disk

You can restore a disk image (001 (RAW/dd), E01, or S01) to a physical disk. The target disk must be the same size or larger than the original, uncompressed disk.

To restore an image to a disk

1. In the Case Manager or in the Examiner, click Tools > Restore Image to Disk. The Restore Image to Disk dialog opens.
2. Browse to and select the source image (must be RAW-dd/001, E01, or S01).
3. Click the Destination drive drop-down to choose the drive to restore the image to.
   If you have connected an additional target drive and it does not appear in the list, click Refresh to update the list.
4. If the target (destination) drive is larger than the original, uncompressed data, and you don’t want the image data to share the drive space with old data, mark the Zero-fill remainder of destination drive check box.
5. If you need the operating system to see the target drive by drive letter, mark the Notify operating system to rescan partition table when complete check box.
6. Click Restore Image.

Database Integration with other AccessData Products

You can use FTK® 5.0 or higher with the following products:

- Resolution1 applications 5.x or higher
- AccessData Summation 5.x or higher
- AccessData CIRT 2.2 or higher

If you are using these products, you can share the same database. When you install FTK®, you can specify the same database that you are using for the other product. This lets you open and perform tasks on projects from those cases in FTK®. You can do the following tasks with projects:

- Open a case
- Backup and restore a case
- Add and remove evidence
- Perform Additional Analysis
- Search and index data
- Export data
Adding New Users to a Database

The Application Administrator can add new users to a database. The Add New User dialog lets you add users, disable users, change a user’s password, set roles, and show disabled users.

To add a new user
1. Click Database > Administer Users > Create User.
2. In the Add New User dialog, enter information for the following:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Name</td>
<td>Enter the name that the user is known as in program logs and other system information.</td>
</tr>
<tr>
<td>Full Name</td>
<td>Enter the full name of the user as it is to appear on case reports.</td>
</tr>
<tr>
<td>Password</td>
<td>Enter and verify a password for this user.</td>
</tr>
<tr>
<td>Role</td>
<td>Assign rights to the selected user name using roles. The default roles are:</td>
</tr>
<tr>
<td></td>
<td>Application Administrator: Can perform all types of tasks, including adding and managing users.</td>
</tr>
<tr>
<td></td>
<td>Case/Project Administrator: Can perform all of the tasks an Application Administrator can perform, with the exception of creating and managing users.</td>
</tr>
<tr>
<td></td>
<td>Case Reviewer: Cannot create cases; can only process cases.</td>
</tr>
</tbody>
</table>

3. Click OK to apply the selected role to the new user.
4. Click OK to exit the Add New User dialog.
About Assigning Roles to Users

A user can have two levels of roles assigned to him or her. A user can have initial roles granted that apply globally across all cases in a database, and a user can also have specific roles granted for a specific case.

Roles can be granted as follows

- Roles that apply to all cases in a database are granted from the Database > Administer Users dialog.
- Roles that apply to a specific case are granted from the Case > Assign Users dialog.

The permissions that are applied through roles are cumulative, meaning that if you apply more than one, the greatest amount of rights and permissions become available.

When you assign roles that apply globally across the database, you cannot reduce the rights on a case-by-case basis.

AccessData recommends that when you first create a user account, save the account and close the dialog without setting a role. Then click Case > Assign Users to assign roles on a case-by-case basis. You can also assign all new users the Case Reviewer role for the database and, then selectively add additional roles as needed on a case-by-case basis.

There are pre-defined roles and you can create your own.

Tips for Assigning Permissions to Users

- It is important to understand that when you create user accounts (Database > Administer Users) and assign roles to users from that dialog, the roles you assign are global for this database; you cannot reduce their rights on a case-by-case basis.
- If you decide to limit a user’s rights by assigning a different role, you must return to the Database > Administer Users dialog, select a user and choose Set Roles. Unmark the current role and click OK with no role assigned here, or choose a different role that limits access, then click OK to save the new setting.
- AccessData recommends that you first create the user account, save the account and close the dialog without setting a role. Then, click Case > Assign Users to assign roles on a case-by-case basis.
- Or you could assign all new users the global Case Reviewer role, then selectively add the Case/Project Administrator or Application Administrator role as needed. The permissions that are applied through roles are cumulative, meaning that if you apply more than one, the greatest amount of rights and permissions become available.

About Additional Roles

You can use the Case Manager to assign specific roles to users on a case-by-case basis. You can do this by using the Additional Roles feature.

For example, you may have a user who has a general role of Case Reviewer. However, you may want to give that user additional rights to a specific case. You can assign that user an Additional Role for that specific case. You could assign them a Project/Case Administrator role to grant some management rights, or you could assign them the Application Administrator role to grant them all rights for the case.

It is important to note that the rights granted through an Additional Role only apply once the user has opened the case in the Examiner. It does not grant them rights to the case using the Case or Management menus in the Case Manager. For example, this user cannot backup the case. To grant them rights at the Case Manager level, you would need assign them the regular Project/Case Administrator role, not as an Additional Role.
About Predefined Roles

The following roles are predefined and can easily be used:

- Application Administrator - has all rights
- Project/Case Administrator - has most rights to manage assigned cases and to create and manage new cases. (This role can only manage cases that the user is assigned to or has created themselves.)
- Case Reviewer - has rights to view data in assigned cases.

You can manage the rights that any role has.

The following tables display the default rights that the roles have or don’t have.

Restrictions to the Case Reviewer Role

The case reviewer role does not have all of the permissions as the application administrator and the database administrator.

Permissions Denied to Case Reviewer Users

<table>
<thead>
<tr>
<th>Permission</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create, Add, or Delete cases</td>
<td>Use Imager</td>
</tr>
<tr>
<td>Administer Users</td>
<td>Use Registry Viewer</td>
</tr>
<tr>
<td>Data Carve</td>
<td>Use PRTK</td>
</tr>
<tr>
<td>Manually Data Carve</td>
<td>Use Find on Disk</td>
</tr>
<tr>
<td>Assign Users to Cases</td>
<td>Use the Disk Viewer</td>
</tr>
<tr>
<td>Add Evidence</td>
<td>View File Sectors</td>
</tr>
<tr>
<td>Access Credant Decryption from the Tools Menu</td>
<td>Define, Edit, Delete, Copy, Export, or Import Filters</td>
</tr>
<tr>
<td>Decrypt Files from the Tools Menu</td>
<td>Export Files or Folders</td>
</tr>
<tr>
<td>Mark or View Items Flagged as “Ignorable” or “Privileged”</td>
<td>Access the Additional Analysis Menu</td>
</tr>
<tr>
<td>Manage the KFF</td>
<td>Backup or Restore Cases</td>
</tr>
<tr>
<td>Enter Session Management</td>
<td>Create Custom Data Views</td>
</tr>
</tbody>
</table>

Differences Between the Case Administrator and Application Administrator Roles in the Examiner

Default Case Administrator and Application Administrator Role Comparison (In the Examiner)

<table>
<thead>
<tr>
<th>Examiner Menu</th>
<th>Feature</th>
<th>Project/Case Administrator</th>
<th>Application Administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>Export</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Export to Image</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Export Word List</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Reports</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>
## Default Case Administrator and Application Administrator Role Comparison (In the Examiner)

<table>
<thead>
<tr>
<th>Examiner Menu</th>
<th>Feature</th>
<th>Project/Case Administrator</th>
<th>Application Administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Timeline Report</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Job Summary Report</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Export Event Audit Log</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Evidence</td>
<td>Add/Remove</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Add Remote Data</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Additional Analysis</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Process Manually Carved Items</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Manage Evidence Group</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Import Memory Dump</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Import Custom Column File</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Import Custom Column Data</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Delete Custom Column Data</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Merge Case Index</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Filter</td>
<td>New</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>On</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Import</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Tab Filter</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Tools</td>
<td>Decrypt Files</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Verify Image Integrity</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Restore Image to Drive</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Mount Image to Drive</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Disk Viewer</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Other Applications &gt; Imager, PRTK, Registry Viewer</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Custom Data Views</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Configure Agent Push</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Push Agents</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Manage Remote Acquisition</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Unmount Agent Drive</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Disconnect Agents</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Recover Processing Jobs</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Assigning Initial Database-level Roles to Users

You can use the case manager to assign roles to users. Although the default roles can all be selected concurrently, AccessData recommends that only one of these be selected for any user to avoid granting either redundant or excessive permissions.

To assign initial database-level roles to users

1. In the Case Manager, click Database > Administer Users.
2. Do one of the following:
   - If the user does not yet exist in the system click Create User to create the user.
   - If the user does exist in the system, select the user’s name and click Set Roles.
3. Click Set Roles to assign a role that limits or increases database and administrative access.
4. To assign a default role, mark the check box next to that role. The default roles are as follows:
   - Application Administrator: Can perform all types of tasks, including adding and managing users.
   - Case/Project Administrator: Can perform all of the tasks an Application Administrator can perform, with the exception of creating and managing users.
   - Case Reviewer: Cannot create cases; can only process cases.
5. Click OK to apply the selected role to the new user, save the settings, and return to the Add New User dialog.

### Default Case Administrator and Application Administrator Role Comparison (In the Examiner)

<table>
<thead>
<tr>
<th>Examiner Menu</th>
<th>Feature</th>
<th>Project/Case Administrator</th>
<th>Application Administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage</td>
<td>Execute SQL</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select Audit Events</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>KFF</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>PhotoDNA</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Labels &gt; Manage Shared Labels</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Carvers &gt; Manage Carvers</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Carvers &gt; Manage Shared Carvers</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Filters &gt; Manage Filters</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Filters &gt; Manage Shared Filters</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Columns &gt; Manage Columns</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Columns &gt; Manage Shared Columns</td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>
Assigning Additional Case-level Roles to Users

You can use the Case Manager to assign specific roles to users on a case-by-case basis. You can do this by using the Additional Roles feature.

To assign additional case-level roles to users

1. In the Case Manager, select the case for which you want to grant additional roles to a user.
2. Click Case > Assign Users.
3. In the Assigned Users pane, select the user that you want to grant additional roles to.
4. Click Additional Roles.
5. In the Additional Roles dialog, under Additional Roles for this Case, select the roles that you want to grant.
6. Click OK.
7. Click Done.

Assigning Users Shared Label Visibility

Shared Labels give Application Administrators the added benefit of assigning visibility to only specific users on a case-by-case basis.

To assign Label Visibility

1. In Case Manager, click Case > Assign Users. The Assign Users for Case dialog opens, and a list of users that have permissions in the currently selected case appears.
2. Highlight a User.
3. Click Label Visibility to open the Manage Label Visibility dialog.

To show or hide Labels

1. Select a user in the User List pane. The Shared Labels dialog opens. Initially all are set as Visible.
2. Move labels as needed, based on the following:
   - Select a label you want that user not to see in any case, and click the > button.
   - To move a hidden label into the Visible Labels pane, select it, and click the < button.
Setting Additional Preferences

Choosing a Temporary File Path

The Temporary File Folder stores temporary files, including files extracted from ZIP and email archives. The folder is also used as scratch space during text filtering and indexing. The Temporary File Folder is used frequently and should be on a drive with plenty of free space, and should not be subject to drive space allocation limits.

To specify a location for the Temporary File Folder

1. In the Case Manager, click Tools > Preferences. Type in or browse to the folder you want temporary files to be written to.
2. Select the folder, then click OK.
3. In the Preferences dialog, verify the path is what you wanted.
4. In the Theme to use for Visualization section, you can also choose a color scheme to apply to the visualization windows.
5. Click OK.

Providing a Network Security Device Location

If your network uses AccessData Network License Service (NLS), provide the IP address and port for accessing the License Server.

Setting Theme Preferences for the Visualization Add on

To change the appearance of the Visualization window

1. In the Case Manager, click Tools > Preferences.
2. In the Theme to use for Visualization section, select a color scheme to apply to the Visualization windows.
3. Click OK.

Optimizing the Case Database

This is set to optimize by default. Unmark the check box to turn off automatic optimization. This causes the option to be available in Additional Analysis for those cases that were processed with Optimize Database turned off initially.

Note: The Restore Optimization option in Additional Analysis will not appear if Database Optimization was set in the New Case Wizard to be performed following processing, or if it has been performed already on the current case from either place.
Managing Global Features

Several features that were previously available only in a case are now fully implemented for global application, and are known as “Shared.” Since they are available globally, they are managed from the Case Manager interface, under the Tools menu.

The Application Administrators manage all Shared features. It is a good practice to set these up to the extent you are able, before you create your first case. Of course, new ones can be added at any time and copied to existing cases. Shared features can be created within cases by both Application and Case Administrators, and Shared (added to the global list).

Since each Shared feature has been documented to some extent in other chapters of the User Guide, only the parts of the features that apply specifically to Application Administrators are explained here. Cross-references are added to provide quick access to more complete information.

Managing Shared Custom Carvers

Carvers provide a comprehensive tool that allows you to customize the carving process to access hidden data exactly the way you need it. You can create new, and edit or delete existing shared carvers. In addition, you can import and export carvers, and copy carvers to cases that were previously processed without a particular custom carver.

There are no default carvers listed in the Manage Shared Custom Carvers dialog. It contains only custom-designed carvers that are shared.

See also Data Carving (page 90)

To create a Shared Custom Carver
1. In the Case Manager, click Manage > Carvers.
2. From the Manage Shared Custom Carvers dialog, click New.
3. Set the data carving options that you want to use.
4. Click Save when the new carver has been defined to meet your needs. You will see the new carver in this list and when you mark the Carving option in the New Case Wizard.
5. In the Manage Shared Carvers dialog, click the appropriate button to:
   a. Create New shared custom carvers
   b. Edit existing shared custom carvers
   c. Delete shared custom carvers
   d. Import shared custom carvers that have been exported from cases
   e. Export shared custom carvers
   f. Copy shared custom carvers to a case
6. Click OK to close the Carving Options dialog.
Managing Custom Identifiers

Custom File Identifiers let you specify which file category or extension should be assigned to files with a certain signature. While Custom Identifiers can be created and/or selected by a Case Administrator in the New Case Wizard, Shared Custom Identifiers are created and managed from a separate menu. See also Creating Custom File Identifiers (page 97).

To Create a Shared Custom Identifier

1. In the Case Manager, click Manage > Custom Identifiers. Initially, the Custom Identifiers List pane is empty, and the rest of the window is grayed-out.
2. Click Create New. The window activates.
3. Enter a name for the new Custom Identifier. The name you enter is added into the Custom Identifiers List.
4. Enter a description to help define the identifier’s purpose.
5. Create the Custom Identifier by defining Operations and using the AND and OR buttons.
6. When you are done defining this Custom Identifier, click Apply.

You can also do the following

- Click Delete to delete an unwanted or outdated identifier.
- Click Export to save the selected identifier as a TXT file.
- Click Import to add an external identifier file.
- Click Close to close the Custom Identifiers dialog.

Managing Columns

Shared Columns use the same windows and dialogs that Local Columns use.

To create a Shared Column Template

1. In Case Manager, click Manage > Columns. The Manage Shared Column Settings dialog opens.
2. Highlight a default Column Template to use as a basis for a Custom Column Template.
3. Click New.
4. Enter a new name in the Column Template Name field.
5. Select the Columns to add from the Available Columns pane, and click Add >> to move them to the Selected Columns pane.
6. Select from the Selected Columns pane and click Remove to clear an unwanted column from the Selected Columns.
7. When you have the new column template defined, click OK.

See also Customizing File List Columns (page 460).

Managing File Extension Maps

Extension Maps can be used to define or change the category associated to any file with a certain file extension. For example, files with BAG extension which would normally be categorized as “Unknown Type” can be
categorized as an AOL Bag File, or a files with a MOV extension that would normally be categorized as Apple QuickTime video files can be changed to show up under a more appropriate category since they can sometimes contain still images.

To create a Shared Custom Extension Mapping

1. In the Case Manager, click Manage > File Extension Maps.
2. In the Custom Extension Mapping dialog, click Create New.
3. Enter a name for the new mapping.
4. Enter a description for easier identification.
5. In the Category pane, select a file type you want to map an extension to.
6. Click Add Extension.
   The Add New Extension dialog box opens.
7. Enter the new extension to add.
8. Click OK.

You can also do the following:

- Click Delete to remove an unwanted or outdated mapping.
- Click Import to add an external Custom Extension Mapping file for Shared use.
- Click Export to save a Custom Extension Mapping file.
- Click Close to close the Custom Extension Mapping dialog.

See also Custom Case Extension Maps (page 98).

Managing Filters

Filters consist of a name, a description, and as many rules as you need. A filter rule consists of a property, an operator, and one or two criteria. (You may have two criteria in a date range.)

To create a new Shared filter

1. From Case Manager, click Manage > Filters.
   The Manage Shared Filters dialog opens.
2. Do one of the following:
   - If there is an existing filter in the Filters list that you want to use as a pattern, or template, highlight that filter and click Copy.
   - If there is no filter that will work as a pattern, Click New.
3. Enter a name and a short description of the new filter.
4. Select a property from the drop-down menu.
5. Select an operator from the Properties drop-down menu.
6. Select the applicable criteria from the Properties drop-down menu.
7. Each property has its own set of operators, and each operator has its own set of criteria. The possible combinations are vast.
8. Select the Match Any operator to filter out data that satisfies any one of the filter rules or the Match All operator to filter out data that satisfies all rules of the filter.
   You can test the filter without having to save it first. Check the Live Preview box to test the filter as you create it.
Part 3

Case Management

This part contains information about managing cases. It contains the following chapters:

- Introducing Case Management (page 53)
- Creating and Configuring New Cases (page 73)
- Managing Case Data (page 107)
- Working with Evidence Image Files (page 115)
- Working with Static Evidence (page 121)
- Working with Live Evidence (page 142)
- Filtering Data to Locate Evidence (page 156)
- Working with Labels (page 173)
- Decrypting Files (page 177)
- Exporting Data from the Examiner (page 197)
- Getting Started with KFF (Known File Filter) (page 234)
- Using the Known File Filter (KFF) (page 263)
- About Cerberus Malware Analysis (page 210)
- Running Cerberus Malware Analysis (page 228)
Chapter 4
Introducing Case Management

This chapter includes the following topics

- About Case Management (page 53)
- The User Interfaces (page 53)
- About the Cases List (page 54)
- Menus of the Case Manager (page 55)
- Menus of the Examiner (page 61)

About Case Management

Case management includes creating new cases, as well as backing up, archiving, detaching, restoring, attaching, deleting cases from the database, and managing case and evidence files.

Case management tasks are performed from the Case Manager.

Note: Multiple user names in a case are automatically assigned to Original User Names when a case is Archived, or Archived and Detached, and then restored. They can also be reassigned if necessary.

See Creating a Case (page 74)
See Managing Case Data (page 107)

The User Interfaces

The Case Manager lets you add and manage cases, users, roles and permissions, and do other management tasks. You can use the Case Manager to apply settings globally to all cases in the system.

Menus of the Case Manager (page 55)
You can use the Examiner to locate, bookmark, and report on evidence.
Menus of the Examiner (page 61)
About the Cases List

The *Cases List* shows all of the cases that are available to the currently logged in user. The right pane displays information about the cases. The information that is shown for *Case File*, *Description File*, and *Description* are determined by the either the Application Administrator or the Case Administrator.

**Case Manager Cases List**

![Case Manager Cases List](image-url)
Menus of the Case Manager

Case Manager Menus

<table>
<thead>
<tr>
<th>Menu</th>
<th>More Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>File</strong></td>
<td>The File menu lets you exit the Case Manager.</td>
</tr>
<tr>
<td></td>
<td>See Options of the Case Manager File Menu (page 55)</td>
</tr>
<tr>
<td><strong>Database</strong></td>
<td>The Database menu lets you administer users and roles.</td>
</tr>
<tr>
<td></td>
<td>See Options of the Case Manager Database Menu (page 56)</td>
</tr>
<tr>
<td><strong>Case</strong></td>
<td>The Case menu lets you create, backup, and delete cases. You can also assign users to roles.</td>
</tr>
<tr>
<td></td>
<td>See Options of the Case Manager Case Menu (page 56)</td>
</tr>
<tr>
<td><strong>Tools</strong></td>
<td>The Tools menu lets you configure the processing engine, recover interrupted jobs and restore images to a disk.</td>
</tr>
<tr>
<td></td>
<td>See Options of the Case Manager Tools Menu (page 58)</td>
</tr>
<tr>
<td><strong>Manage</strong></td>
<td>The Manage menu lets you administrate shared objects such as columns, labels and carvers.</td>
</tr>
<tr>
<td></td>
<td>See Options of the Case Manager Manage Menu (page 59)</td>
</tr>
<tr>
<td><strong>Help</strong></td>
<td>The Help menu lets you access the user guide as well as view version and copyright information.</td>
</tr>
<tr>
<td></td>
<td>See Options of the Case Manager Help Menu (page 60)</td>
</tr>
</tbody>
</table>

Options of the Case Manager File Menu

Options of the Case Manager's File Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exit</td>
<td>Exits and closes the program.</td>
</tr>
</tbody>
</table>
Options of the Case Manager Database Menu

Case Manager Database Menu

Options of the Case Manager Database Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log In/ Log Out</td>
<td>Opens the authentication dialog for users to log into the database. You can log out the currently authenticated user without closing the program.</td>
</tr>
<tr>
<td>Change password</td>
<td>Opens the Change Password dialog. The currently authenticated user can change their own password by providing the current password, then typing and re-typing the new password.</td>
</tr>
<tr>
<td></td>
<td>See Changing Your Password on page 37.</td>
</tr>
<tr>
<td>Administer Users</td>
<td>Lets you manage user accounts. The Application Administrator can change users’ roles.</td>
</tr>
<tr>
<td></td>
<td>See Adding New Users to a Database on page 42.</td>
</tr>
<tr>
<td>Session Management</td>
<td>Opens the Manage Database Sessions dialog. Click Refresh to update the view of current sessions. Click Terminate to end sessions that are no longer active.</td>
</tr>
<tr>
<td></td>
<td>See Managing Database Sessions on page 39.</td>
</tr>
<tr>
<td>Configure</td>
<td>Opens the Configure Database dialog.</td>
</tr>
<tr>
<td></td>
<td>See Optimizing the Database for Large Cases on page 39.</td>
</tr>
</tbody>
</table>
### Options of the Case Manager Case Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New</strong></td>
<td>Start a new case with the currently authenticated user as the Case Administrator. Case Reviewers cannot create a new case.</td>
</tr>
<tr>
<td></td>
<td>See Creating a Case (page 74)</td>
</tr>
<tr>
<td><strong>Open</strong></td>
<td>Opens the highlighted case with its included evidence.</td>
</tr>
<tr>
<td><strong>Assign Users</strong></td>
<td>Allows the Application Administrator or the Case Administrator to adjust or control the rights of other users to access a particular case. Also allows the Administrator to control which users can see which of the Shared Labels that are available.</td>
</tr>
<tr>
<td></td>
<td>See What You Can Do With Labels (page 173)</td>
</tr>
<tr>
<td><strong>Backup</strong></td>
<td>Opens a dialog for specifying names and locations for backup of selected cases. You can select multiple cases in the Case Manager to backup.</td>
</tr>
<tr>
<td></td>
<td>Options are:</td>
</tr>
<tr>
<td></td>
<td>• Backup</td>
</tr>
<tr>
<td></td>
<td>• Archive</td>
</tr>
<tr>
<td></td>
<td>• Archive and Detach</td>
</tr>
<tr>
<td></td>
<td>See Managing Case Data on page 107.</td>
</tr>
<tr>
<td><strong>Restore</strong></td>
<td>Opens a Windows Explorer instance for locating and restoring a selected, saved case. Options are:</td>
</tr>
<tr>
<td></td>
<td>• Restore an archived case</td>
</tr>
<tr>
<td></td>
<td>• Attach an archived and detached case</td>
</tr>
<tr>
<td></td>
<td>See Managing Case Data on page 107.</td>
</tr>
<tr>
<td><strong>Delete</strong></td>
<td>Deletes the selected case. Pop-up appears to confirm deletion.</td>
</tr>
<tr>
<td></td>
<td>See Deleting a Case on page 114.</td>
</tr>
<tr>
<td><strong>Copy Previous Case</strong></td>
<td>Copy a case from a previous version (4.2 or later) into the database. The use of a UNC folder path is no longer required beginning with version 4.2 and newer.</td>
</tr>
<tr>
<td></td>
<td>To use copy from previous case you don't backup the case in the previous version, you simply use the “Copy Previous Case” feature. If you want to use Backup, you can backup the case in a previous version, such as 4.2 then restore it to the new version. Copy Previous Case doesn't recognize backed-up cases.</td>
</tr>
</tbody>
</table>
Options of the Case Manager Case Menu (Continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove Generated Index</td>
<td>This option lets you select a case and delete its index. If you remove a case’s index, you cannot use index searches until you create a new index. To create a new index, in the Examiner, click Evidence &gt; Additional Analysis. Select dtSearch® Text Index and click OK.</td>
</tr>
<tr>
<td>Refresh Case List</td>
<td>Right-click in the Case List area and select Refresh Case List, or click F5 to refresh the case list with any new information.</td>
</tr>
</tbody>
</table>

Options of the Case Manager Tools Menu

Case Manager Tools Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recover Processing Jobs</td>
<td>Allows you to recover jobs that were interrupted during processing so the processing can be completed.</td>
</tr>
<tr>
<td>Show Progress Window</td>
<td>Opens the Progress window so you can check the Processing Status.</td>
</tr>
<tr>
<td>Restore Image to Disk</td>
<td>Copies a disk image to a disk other than the original.</td>
</tr>
<tr>
<td>Credant Server Settings</td>
<td>Lets you configure Credant server settings. See Decrypting Credant Files on page 189.</td>
</tr>
<tr>
<td>Preferences</td>
<td>Opens Preferences dialog. See Setting Additional Preferences on page 48.</td>
</tr>
</tbody>
</table>
## Options of the Case Manager Manage Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carvers</td>
<td>Manage Shared Custom Carvers. Custom Carvers created here can be copied to cases.</td>
</tr>
<tr>
<td></td>
<td>See <a href="#">Managing Shared Custom Carvers</a> on page 49.</td>
</tr>
<tr>
<td>Custom Identiifiers</td>
<td>Manage Shared Custom Identifiers. Custom Identifiers created here are automatically made available to all new cases, but cannot be copied directly to earlier cases. They must be exported and then imported into such cases.</td>
</tr>
<tr>
<td></td>
<td>See <a href="#">Managing Custom Identifiers</a> on page 50.</td>
</tr>
<tr>
<td>Columns</td>
<td>Manage Shared Column Settings. Custom Columns created here can be copied to cases.</td>
</tr>
<tr>
<td></td>
<td>See <a href="#">Managing Columns</a> on page 50.</td>
</tr>
<tr>
<td>File Extension Maps</td>
<td>Manage Shared File Extension Mappings. File Extension Maps created here are automatically made available to all new cases, but cannot be copied directly to earlier cases. They must be exported and then imported into such cases.</td>
</tr>
<tr>
<td></td>
<td>See <a href="#">Managing File Extension Maps</a> on page 50.</td>
</tr>
<tr>
<td>Filters</td>
<td>Manage Shared Filters. Custom Filters created here can be copied to cases.</td>
</tr>
<tr>
<td></td>
<td>See <a href="#">Managing Filters</a> on page 51.</td>
</tr>
<tr>
<td>Labels</td>
<td>Manage Shared Labels. Custom Labels created here can be copied to cases.</td>
</tr>
<tr>
<td></td>
<td>See <a href="#">Working with Labels</a> on page 173.</td>
</tr>
<tr>
<td>KFF</td>
<td>Lets you access advanced KFF management options such as creating groups and sets.</td>
</tr>
<tr>
<td></td>
<td>See <a href="#">Getting Started with KFF (Known File Filter)</a> on page 234.</td>
</tr>
<tr>
<td>PhotoDNA</td>
<td>Lets you configure a PhotoDNA Hash Library.</td>
</tr>
<tr>
<td></td>
<td>See <a href="#">Using PhotoDNA to Compare Images</a> on page 311.</td>
</tr>
</tbody>
</table>
Options of the Case Manager Manage Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence Processing Profiles</td>
<td>Lets you configure Evidence Processing Profiles.</td>
</tr>
<tr>
<td></td>
<td>See Using Processing Profiles on page 77.</td>
</tr>
</tbody>
</table>

Options of the Case Manager Help Menu

Case Manager Help Menu

Options of the Case Manager Help Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Guide</td>
<td>Opens the user guide in PDF format.</td>
</tr>
<tr>
<td>About</td>
<td>Provides version and build information, copyright and trademark information, and other copyright and trade acknowledgements.</td>
</tr>
</tbody>
</table>
Menus of the Examiner

When a case is created and assigned a user, the Examiner window opens with the following menus:

Examiner Menus

<table>
<thead>
<tr>
<th>Menu</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>See Options of the Examiner File Menu (page 61)</td>
</tr>
<tr>
<td>Edit</td>
<td>See Options of the Examiner Edit Menu (page 63)</td>
</tr>
<tr>
<td>View</td>
<td>See Options of the Examiner View Menu (page 64)</td>
</tr>
<tr>
<td>Evidence</td>
<td>See Options of the Examiner Evidence Menu (page 66)</td>
</tr>
<tr>
<td>Filter</td>
<td>See Options of the Examiner Filter Menu (page 68)</td>
</tr>
<tr>
<td>Tools</td>
<td>See Options of the Examiner Tools Menu (page 69)</td>
</tr>
<tr>
<td>Manage</td>
<td>See Options of the Examiner Manage Menu (page 71)</td>
</tr>
<tr>
<td>Help</td>
<td>See Options of the Examiner Help Menu (page 72)</td>
</tr>
</tbody>
</table>

Options of the Examiner File Menu

Examiner File Menu

Options of the Examiner File Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export</td>
<td>Exports selected files and associated evidence to a designated folder.</td>
</tr>
</tbody>
</table>
## Options of the Examiner File Menu (Continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export to Image</td>
<td>Exports one or more files as an AD1 image to a storage destination. When exporting to AD1 the image's file path is added under a root directory. This speeds the process of gathering data for the AD1, and for shortening the path to AD1 content.</td>
</tr>
<tr>
<td>Export File List Info</td>
<td>Exports selected file information to files formatted as the Column List in CSV, TSV, and TXT formats.</td>
</tr>
<tr>
<td>Export Word List</td>
<td>Exports the words from the cases index as a text file. You can use this word list to create a dictionary in the AccessData PRTK and DNA products. See <a href="#">Exporting a Word List</a> (page 206)</td>
</tr>
<tr>
<td>Report</td>
<td>Opens the Report Options dialog for creating a case report. See <a href="#">Creating a Case Report</a> (page 466)</td>
</tr>
<tr>
<td>Volatile Data Report</td>
<td>Opens a Volatile Data Report created from live data collected remotely and added to this case. This option is grayed out unless Volatile Data has been added to the case.</td>
</tr>
<tr>
<td>Close</td>
<td>Closes the Examiner and returns to the Case Manager window.</td>
</tr>
<tr>
<td>Exit</td>
<td>Closes both the Examiner and Case Manager windows.</td>
</tr>
</tbody>
</table>
### Options of the Examiner Edit Menu

**Examiner Edit Menu**

![Examiner Edit Menu](image)

#### Options of the *Examiner Edit Menu*

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy Special</td>
<td>Duplicates information about the object copied as well as the object itself, and places the copy in the clipboard. See <a href="#">Copying Information from the Examiner</a> (page 197)</td>
</tr>
</tbody>
</table>
Options of the Examiner View Menu

Examiner View Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refresh</td>
<td>Reloads the current view with the latest information.</td>
</tr>
<tr>
<td>Filter Bar</td>
<td>Inserts the filter toolbar into the current tab. These features are also available from the Filter menu.</td>
</tr>
<tr>
<td>Time Zone Display</td>
<td>Opens the <em>Time Zone Display</em> dialog.</td>
</tr>
<tr>
<td>Thumbnail Size</td>
<td>Selects the size of the thumbnails displayed from the Graphics tab. Select from the following:</td>
</tr>
<tr>
<td></td>
<td>• Large-default</td>
</tr>
<tr>
<td></td>
<td>• Medium</td>
</tr>
<tr>
<td></td>
<td>• Small</td>
</tr>
<tr>
<td></td>
<td>• Tiny</td>
</tr>
<tr>
<td>Tab Layout</td>
<td>Manages tab settings. The user can lock an existing setting, add and remove settings, and save settings one tab at a time or all at once. The user can also restore previous settings or reset them to the default settings. These options are in the following list:</td>
</tr>
<tr>
<td></td>
<td>• Save</td>
</tr>
<tr>
<td></td>
<td>• Restore</td>
</tr>
<tr>
<td></td>
<td>• Reset to Default</td>
</tr>
<tr>
<td></td>
<td>• Remove</td>
</tr>
<tr>
<td></td>
<td>• Save All Tab Layouts</td>
</tr>
<tr>
<td></td>
<td>• Lock Panes</td>
</tr>
<tr>
<td></td>
<td>• Add New Tab Layout</td>
</tr>
</tbody>
</table>
**Options of the Examiner View Menu (Continued)**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File List Columns</td>
<td>Specifies how to treat the current File List. Options are:</td>
</tr>
<tr>
<td></td>
<td>- Save As Default</td>
</tr>
<tr>
<td></td>
<td>- Save All as Default</td>
</tr>
<tr>
<td></td>
<td>- Reset to Factory Default</td>
</tr>
<tr>
<td></td>
<td>- Reset All To Factory Default</td>
</tr>
<tr>
<td>File Content Tabs</td>
<td>Specifies the behavior of file content when a different tab is selected. Options are:</td>
</tr>
<tr>
<td>Switching</td>
<td>- Auto</td>
</tr>
<tr>
<td></td>
<td>- Manual</td>
</tr>
<tr>
<td>Explore Tree</td>
<td>Displays the Explore Tree in the upper-left pane.</td>
</tr>
<tr>
<td>Graphics Tree</td>
<td>Displays the Graphics Tree in the upper-left pane.</td>
</tr>
<tr>
<td>Overview Tree</td>
<td>Displays the Overview Tree in the upper-left pane.</td>
</tr>
<tr>
<td>Email Tree</td>
<td>Displays the Email Tree in the upper-left pane.</td>
</tr>
<tr>
<td>Bookmark Tree</td>
<td>Displays the Bookmark Tree in the upper-left pane.</td>
</tr>
<tr>
<td>Index Searches</td>
<td>Displays the Index Search Results pane in the upper-left pane.</td>
</tr>
<tr>
<td>Live Searches</td>
<td>Displays the Live Search Results pane in the upper-left pane.</td>
</tr>
<tr>
<td>Bookmark Information</td>
<td>Adds the Bookmark Information pane into the current tab.</td>
</tr>
<tr>
<td>File List</td>
<td>Adds the File List pane into the current tab.</td>
</tr>
<tr>
<td>File Content</td>
<td>Adds the File Content pane into the current tab.</td>
</tr>
<tr>
<td>Email Attachments</td>
<td>Displays the attachments to email objects found in the case. Available only in the Email and Overview tabs.</td>
</tr>
<tr>
<td>Properties</td>
<td>Inserts the Object Properties pane into the current tab view.</td>
</tr>
<tr>
<td>Hex Value Interpreter</td>
<td>Displays a pane that provides an interpretation of Hex values selected from the Hex View pane.</td>
</tr>
<tr>
<td>Thumbnails</td>
<td>Displays a pane containing thumbnails of all graphics found in the case.</td>
</tr>
<tr>
<td>Progress Window</td>
<td>Opens the Progress dialog, from which you can monitor tasks and/or cancel them.</td>
</tr>
</tbody>
</table>
Options of the Examiner Evidence Menu

Examiner Evidence Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add/Remove</td>
<td>Opens the <em>Manage Evidence</em> dialog, used to add and remove evidence. From Manage Evidence, choose from the following:</td>
</tr>
<tr>
<td></td>
<td>Time Zone — Choose Time Zone for evidence item</td>
</tr>
<tr>
<td></td>
<td>Refinement Options — Select Evidence Refinement Options</td>
</tr>
<tr>
<td></td>
<td>Language Setting — Choose the language of the evidence item</td>
</tr>
<tr>
<td></td>
<td>Define and Manage Evidence Groups</td>
</tr>
<tr>
<td></td>
<td>Select Case KFF Options</td>
</tr>
<tr>
<td>Add Remote Data</td>
<td>Opens the <em>Add Remote Data</em> dialog from which you can remotely access volatile, memory, and/or drive data and add it to the case. To Collect</td>
</tr>
<tr>
<td></td>
<td>remote data from another computer on the network, provide the following:</td>
</tr>
<tr>
<td></td>
<td>Remote IP Address</td>
</tr>
<tr>
<td></td>
<td>Remote Port</td>
</tr>
<tr>
<td></td>
<td>Select any or all of the following:</td>
</tr>
<tr>
<td></td>
<td>Physical Drives (Can be mapped using RDMS)</td>
</tr>
<tr>
<td></td>
<td>Logical Drives (Can be mapped using RDMS)</td>
</tr>
<tr>
<td></td>
<td>Memory Analysis</td>
</tr>
<tr>
<td></td>
<td>Click <strong>OK</strong> or <strong>Cancel</strong>.</td>
</tr>
</tbody>
</table>
## Options of the *Examiner Evidence Menu* (Continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Analysis</td>
<td>Opens the <em>Additional Analysis</em> dialog with many of the same processing options available when the evidence was added. Allows the user to reprocess using available options not selected previously.</td>
</tr>
<tr>
<td></td>
<td>See <a href="#">Using Additional Analysis</a> (page 133).</td>
</tr>
<tr>
<td>Process Manually Carved Items</td>
<td>Initiates the processing of items that have been manually carved, using the selected options.</td>
</tr>
<tr>
<td>Manage Evidence Groups</td>
<td>Opens the dialog where you can create and manage Evidence Groups.</td>
</tr>
<tr>
<td>Import Memory Dump</td>
<td>Opens the <em>Import Memory Dump File</em> dialog which allows you to select memory dumps from other case files or remote data acquisitions, and import them into the current case. The memory dump file must have been previously created.</td>
</tr>
<tr>
<td></td>
<td>See <a href="#">Working with Live Evidence</a> (page 142).</td>
</tr>
<tr>
<td>Import Custom Column File</td>
<td>When a Custom Column Settings file has been created, import it into your case using this tool.</td>
</tr>
<tr>
<td>Delete Custom Column Data</td>
<td>If you have imported or created a Custom Column Settings file, use this tool to delete the associated column and its data from the view.</td>
</tr>
<tr>
<td>Merge Case Index</td>
<td>This option has been removed. The processing engine does this automatically and no longer needs user interaction to select the merge.</td>
</tr>
</tbody>
</table>
Options of the Examiner Filter Menu

### Examiner Filter Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>Opens the Filter Definition dialog to define a temporary filter.</td>
</tr>
<tr>
<td>Duplicate</td>
<td>Duplicates a selected filter. A duplicated filter serves as a starting point for customizing a new filter.</td>
</tr>
<tr>
<td>Delete</td>
<td>Deletes a selected filter.</td>
</tr>
<tr>
<td>On</td>
<td>Applies the selected filter globally in the application. The File List changes color to indicate that the filter is applied.</td>
</tr>
<tr>
<td>Import</td>
<td>Opens the Windows file manager allowing the user to import a pre-existing filter.</td>
</tr>
<tr>
<td>Export</td>
<td>Opens the Windows File Manager allowing the user to save a filter.</td>
</tr>
<tr>
<td></td>
<td>The name of the filter cannot have any special or invalid characters or the export will not work.</td>
</tr>
<tr>
<td>Tab Filter</td>
<td>Allows the selection of a filter to apply in the current tab.</td>
</tr>
</tbody>
</table>
## Options of the Examiner Tools Menu

### Examiner Tools Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrypt Files</td>
<td>Decrypts EFS and Office files using passwords you enter. See <a href="#">Decrypting Files</a> (page 177)</td>
</tr>
<tr>
<td>Credant Decryption</td>
<td>Opens the <em>Credant Decryption</em> dialog where you enter the decryption information. See <a href="#">Decrypting Credant Files</a> (page 189)</td>
</tr>
<tr>
<td>Verify Image Integrity</td>
<td>Generates hash values of the disk image file for comparison. See <a href="#">Verifying Drive Image Integrity</a> (page 115)</td>
</tr>
<tr>
<td>Restore Image to Disk</td>
<td>Restores a physical image to a disk. If the original drive was on a bootable partition, the restored image may also be bootable. This feature is disabled for Case Reviewers.</td>
</tr>
<tr>
<td>Mount Image to Drive</td>
<td>Allows the mounting of a physical or logical image for read-only viewing. Logically mounting images allows them to be viewed as a drive-letter in Windows Explorer. Mounted logical drives now show the user the correct file, even when a deleted file with the same name exists in the same directory. See <a href="#">Mounting an Image to a Drive</a> (page 116)</td>
</tr>
<tr>
<td>Disk Viewer</td>
<td>Opens a hex viewer that allows you to see and search contents of evidence items. Search Text for a term using Match Case, ANSI, Unicode, Regular Expression or Search Up instead of down; Search Hex using Search Up. Specify a logical sector or a cluster.</td>
</tr>
<tr>
<td>Other Applications</td>
<td>Opens other AccessData tools to complement the investigational analysis.</td>
</tr>
<tr>
<td>Configure Agent Push</td>
<td>Opens configuration dialog for pushing the agent to remote machines for data acquisition.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Push Agents</td>
<td>Push, or install, an Agent to a remote machine. You can Add, Remove, Import, or Export a single machine or a list of machines here.</td>
</tr>
<tr>
<td>Manage Remote Acquisition</td>
<td>Opens the <em>Remote Acquisition</em> dialog. Set the drive acquisition retry options here to set compression levels, balance speed of transfers with the amount of bandwidth usage, and set compression levels for remote data transfers.</td>
</tr>
<tr>
<td>Unmount Agent Drive</td>
<td>Unmount a remote drive that is mounted through RDMS.</td>
</tr>
<tr>
<td>Disconnect Agent</td>
<td>Disconnect a remote agent.</td>
</tr>
<tr>
<td>Recover Processing Jobs</td>
<td>Restarts processing so jobs that were interrupted can be completed.</td>
</tr>
<tr>
<td>Visualization</td>
<td>Lets you launch the Visualization add on module for the data that you currently have displayed in the File List Pane. Visualization is only available from the Explore, Overview, and Email Tabs. See <a href="#"><em>Using Visualization</em></a> on page 405.</td>
</tr>
<tr>
<td>Execute SQL</td>
<td>Executes a user-defined SQL script from within the interface.</td>
</tr>
<tr>
<td>Launch ‘oradjuster.EXE’</td>
<td>Runs Oradjuster.EXE to temporarily optimize the available memory on the Examiner &amp; database machine for those using an Oracle database. This utility does not work on a two-box configuration. See (page 544)</td>
</tr>
</tbody>
</table>
Options of the Examiner Manage Menu

Examiner Manager Menu

<table>
<thead>
<tr>
<th>Tool Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KFF</td>
<td>Manage Known File Filter (KFF) Library, sets, and groups. See Using the Known File Filter (KFF) (page 263).</td>
</tr>
<tr>
<td>Labels</td>
<td>Manage Local and Shared Labels as well as Label Groups. See What You Can Do With Labels (page 173).</td>
</tr>
<tr>
<td>Carvers</td>
<td>Manage Local and Shared Custom Carvers. See Data Carving (page 90).</td>
</tr>
<tr>
<td>Filters</td>
<td>Manage Local and Shared Filters. See Filtering Data to Locate Evidence (page 156).</td>
</tr>
<tr>
<td>Columns</td>
<td>Manage Local and Shared Columns. See Customizing File List Columns (page 460).</td>
</tr>
</tbody>
</table>
Options of the Examiner Help Menu

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Guide</td>
<td>Opens the user guide in PDF format.</td>
</tr>
<tr>
<td>Case Folder</td>
<td>Opens the folder that contains the case data.</td>
</tr>
<tr>
<td>About</td>
<td>Provides version and build information, copyright and trademark information, and other copyright and trade acknowledgements.</td>
</tr>
</tbody>
</table>
Chapter 5
Creating and Configuring New Cases

This chapter explains how to create a new case and configure the case options. If you have cases that were created in version 2.2 or later, you can convert them to the latest version.

This chapter includes the following topics

- Opening an Existing Case (page 73)
- Creating a Case (page 74)
- Configuring Detailed Options for a Case (page 75)
- Evidence Processing Options (page 81)
- Adding Evidence to a New Case (page 106)
- Converting a Case from Version 2.2 or Newer (page 106)

Opening an Existing Case

You can open a case that has previously been created and closed.

To open an existing case

1. Open the Case Manager.
2. In the Case Manager, highlight and double-click a case to open it.

Note: If you attempt to open a case you have not been assigned to, you will receive a message saying, “You have not been assigned to work on this case.” This is because you must be authenticated to open the case.
Creating a Case

Case information is stored in a database, and allows case administration as each new case is created.

To start a new case

1. Open the Case Manager.
2. Click Case > New. The New Case Options dialog opens.
3. Enter a name for the case in the Case Name field.
4. (Optional) Enter any specific reference information in the Reference field.
5. (Optional) Enter a short description of the case in the Description field.
6. You can use the Description File option to attach a file to the case. For example you can use this field to attach a work request document or a warrant to the case.
7. In the Case Folder Directory field specify where to store the case files. If you wish to specify a different location for the case, click the Browse button.

   **Note:** If the case folder directory is not shared, an error occurs during case creation.

8. (Optional) In the Database Directory field you can specify a location for where to store database directory files. You can check the In the case folder option to save the database directory in the case folder. If you do not specify these options, the database directory is saved to the default location of the database.

   **Note:** The location that you specify for Database Directory is relative to your database computer. If you intend to specify a location that is on a different computer than your database, for example in a multi-box scenario, then you must enter a network path.

**Important:** If using a UNC path for the case folder, and selecting the In the case folder option for the database directory, and if the database process isn't running as a network user, it will not be able to access the UNC path and will therefore fail to create the database files.

9. Configure the default processing options for the case by either using a processing profile or using custom settings.
   See Configuring Detailed Options for a Case on page 75.
10. If you wish to open the case as soon as it is created, mark Open the case.
11. Click OK to create the new case.
Configuring Detailed Options for a Case

When you configure Detailed Options for a case, there are options for doing the following:

- Configuring Default Processing Options for a Case (page 76)
- Configuring Evidence Refinement (Advanced) Options (page 99)
- Selecting Index Refinement (Advanced) Options (page 101)
- Managing Custom Identifiers (page 50)

About Processing Options

To help you in investigating the evidence in a case, the evidence data is processed. When evidence is processed, data about the evidence is created and stored in the database. You can view the processed data in the Examiner.

Evidence is processed at the following times:

- When adding evidence to a case
- After the initial processing, when performing an additional analysis

There are many different types of processing options. You can choose which processing options are relevant to your case.

The following are some examples of how your data can be processed:

- Generate hash values for all of the files in the evidence.
- Categorize the types of files in your evidence, such as graphics, office documents, encrypted files, and so on.
- Expand the contents of compound files, such as ZIP or TAR files.
- Create an index of the words that are in the evidence files for quick searches and retrieval.
- Create thumbnails for the graphics and videos in the evidence.
- Decrypt encrypted files.
- Compare files in your evidence against a list of known files that you may want to be alerted about (such as contraband images) or files that you want to ignore (such as Windows system files).

You can select processing options at the following times:

- When you create a case (Detailed Options) -- these become the default options for the case.
  See Evidence Processing Options (page 81)
- When you add evidence to an existing case (Refinement Options) -- you can either use or override the case defaults.
  See Configuring Evidence Refinement (Advanced) Options (page 99)
- When you perform an Additional Analysis on a case.
  See Using Additional Analysis (page 133)

Each processing option that you enable increases the time that it take to process the evidence. Depending on your situation, you may want to select more or fewer options.

For example, in one scenario, you may want to process the evidence as quickly as possible. In this case, you can use a pre-defined “Field Mode” that deselects almost all processing options and therefore takes the shortest amount of time. After the initial processing, you can perform an Additional Analysis and enable additional processing options.
In another scenario, you may want to take the time to categorize and index files during the initial processing, so you can enable those options. This will take a significant amount of time for a large evidence set.

**Configuring Default Processing Options for a Case**

When you create a case, you define the default processing options that are used whenever evidence is added to that case. By specifying default processing options for a case, you do not have to manually configure the processing options each time you add new evidence. The case-level defaults can be overridden and customized when you add new evidence or when you perform an additional analysis.

You configure the default processing options for a case in one of the following ways:

- **Using Processing Profiles** (page 77)
- **Manually Customizing a set of Detailed Options** (page 80)

**Note:** One factor that may influence which processing options to select is your schedule. If you disable indexing, it shortens case processing time. The case administrator can return at a later time and index the case if needed. The fastest way to create a case and add evidence is to use Field Mode.
Using Processing Profiles

About Processing Profiles

As an investigator, you may want to be able to save a set of processing options as a profile so that they can be easily reused. Processing profiles are a saved list of processing options that are stored in the database. Processing profiles are created at the global level and are available anytime you create a case.

For example, you may need to focus on certain types of data in a case, such as images and videos. In this example, you can create a processing profile that enables the following processing options:

- KFF
- Expand Compound Files
- Flag Bad Extensions
- Create Thumbnails for Graphics
- Create Thumbnails for Video
- Generate Common Video File
- Explicit Image Detection
- PhotoDNA

Each time you create this kind of case, you can use a profile with these options set as default and you won't need to manually specify them again.

Processing profiles are used at the case level. Specifically, when you create a case, you can select a processing profile from a drop-down list as the default processing options for that case. Any time that you add evidence to that case, the profile's setting will be the default "Refinement Options". This saves you time by not having to reconfigure processing options each time you add evidence to the case. However, when you add evidence to a case, you can modify the processing options for that evidence set. The profile is simply a set of default settings for the case.

Processing profiles are stored in the database. It is important to note that the profile itself does not get saved with the case but only the processing options that are in the profile.

There are two pre-configured processing profiles:

- AD Standard (these were the Factory Defaults in version 4.x and earlier)
- AD Field Mode
  See About Pre-configured Processing Profiles on page 78.

When you create a case, you can use one of the pre-configured profiles or create/select a custom profile. If you create a custom profile, you can save it with a unique name so that you can re-use it in a different case.

See Creating a Custom Processing Profile (page 78)

Important: When you create a custom profile, the settings for Custom File Identification or Event Audit Log options are not stored in the processing profile. The Send Email Alert and Decrypt Credant Files settings on the Evidence Processing tab are also not stored in the processing profile.

You can also edit, delete, import, or export processing profiles.

See Managing Processing Profiles (page 79)

You can also set custom processing options for a case without saving them to a profile.
There are two pre-configured processing profiles. You cannot edit these profiles. However, you can use them as a template for a new custom profile.

The following are the pre-configured profiles.

<table>
<thead>
<tr>
<th>AD Standard</th>
<th>AD Standard includes the following processing options:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• MD5 Hash</td>
</tr>
<tr>
<td></td>
<td>• SHA-1 Hash</td>
</tr>
<tr>
<td></td>
<td>• SHA-256 Hash</td>
</tr>
<tr>
<td></td>
<td>• Expand common compound files</td>
</tr>
<tr>
<td></td>
<td>This will expand many types of compound files.</td>
</tr>
<tr>
<td></td>
<td>See Expanding Compound Files (page 84)</td>
</tr>
<tr>
<td></td>
<td>• File Signature Analysis</td>
</tr>
<tr>
<td></td>
<td>• dtSearch Test Index</td>
</tr>
<tr>
<td></td>
<td>• Create Thumbnails for Graphics</td>
</tr>
<tr>
<td></td>
<td>• Include Deleted Files</td>
</tr>
</tbody>
</table>

This list of processing options is the same as the Factory Defaults in version 4.x.

For a description of processing options, see Evidence Processing Options (page 81)

<table>
<thead>
<tr>
<th>Field Mode</th>
<th>Field Mode disables the standard processing options when processing evidence. This speeds up processing. You can then re-enable processing options through Additional Analysis.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>See Using Additional Analysis (page 133)</td>
</tr>
<tr>
<td></td>
<td>The Job Processing screen always shows 0 for Queued when Field Mode is enabled, because items move directly from Active Tasks to Completed.</td>
</tr>
</tbody>
</table>

Creating a Custom Processing Profile

You can create a processing profile by selecting a set of processing options and then saving them as a profile.

You can create a processing profile at one of the following times:

• Before creating a case
• While configuring processing options for a new case

To create a custom processing profile

1. From the Case Manager do one of the following:
   • To create a profile before creating a case, do the following:
     1a. Click Manage > Evidence Processing Profiles.
     1b. Click New Profile.
   • To create a profile while creating a new case, do the following:
     1a. Click Case > New.
     1b. Next to the Processing Profile field, click Custom.
2. You can use the Profile dropdown to select an existing profile as a template.
3. Do the following:
   3a. Click the Evidence Processing icon in the left pane, and select the processing options to be the default options for the case. For more information, see Evidence Processing Options (page 81).
   3b. Click the Evidence Refinement (Advanced) icon to select the evidence refinement options to use on this case. For more information, see Configuring Evidence Refinement (Advanced) Options (page 99).
   3c. Click the Index Refinement (Advanced) icon to select the index refinement options to use on this case. For more information, see Selecting Index Refinement (Advanced) Options (page 101).
   3d. Click the Evidence Lab/eDiscovery icon to select the advanced options to use on this case. For more information, see Selecting Lab/eDiscovery Options (page 103).

Important: When you create a custom profile, the settings for Custom File Identification or Event Audit Log options are not stored in the processing profile. When you configure these options, the Save As... profile button is grayed out to signify that they are not saved as part of a profile.

See Managing Custom Identifiers (page 50) Viewing Exported Event Audit Logs (page 36).

4. When you are satisfied with your options, click Save to Profile... to create the profile.
5. Enter a name for the profile.
   • To create a new profile, enter a unique name.
     You cannot use AD Standard, AD Field Mode, or Custom.
   • To update an existing custom profile, enter the profile name.
6. (Optional) Enter a description of the profile.
7. Click Save.

Managing Processing Profiles

You can do the following to manage processing profiles.

<table>
<thead>
<tr>
<th>Edit</th>
<th>You can edit an existing custom profile. You cannot edit the AD Standard or AD Field Mode pre-configured profiles.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To edit a profile, you select an existing profile, make the desired changes, save the profile, and confirm that you want to replace the existing profile.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Set as Default</th>
<th>You can set a processing profile as the global default. Whenever you create a new case, the default profile is listed.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The default profile is denoted by a green check mark.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delete</th>
<th>You can delete an existing custom profile. You cannot delete the AD Standard or AD Field Mode pre-configured profiles.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If you delete a custom profile that has been selected as the default, the profile is deleted and the AD Standard profile becomes the default.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Export</th>
<th>You can export a profile so that you can archive it or use it on a different computer. The exported settings are saved in xml format.</th>
</tr>
</thead>
</table>

| Import | You can import a profile that has been previously exported. |

To manage processing profiles

1. In the Case Manager, click Manage > Evidence Processing Profiles.
2. In the Manage Evidence Processing Profiles dialog, select a profile to manage.
3. Select an action to perform on the profile.
4. Click Close.
**Manually Customizing a set of Detailed Options**

You can configure default processing options for a case without saving it as a profile.

**To manually customize the evidence processing options**

1. From the *New Case Options* dialog, click **Custom**.
   1a. Click the *Evidence Processing* icon in the left pane, and select the processing options to be the default options for the case. For more information, see *Evidence Processing Options* (page 81).
   1b. Click the *Evidence Refinement (Advanced)* icon to select the evidence refinement options to use on this case. For more information, see *Configuring Evidence Refinement (Advanced) Options* (page 99).
   1c. Click the *Index Refinement (Advanced)* icon to select the index refinement options to use on this case. For more information, see *Selecting Index Refinement (Advanced) Options* (page 101).
   1d. Click Custom File Identification to configure Custom Identifiers. For more information, see *Managing Custom Identifiers* (page 50).

2. Click **OK**.
   In the Processing Profile field, it will display *Custom* to show that you did not save the options as a profile.

3. When you are satisfied with your evidence refinement options, click **OK** to create the case and continue to the Evidence Processing screen.
Evidence Processing Options

The following table outlines the Evidence Processing options.

<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD5 Hash</td>
<td>Creates a digital fingerprint using the Message Digest 5 algorithm, based on the contents of the file. This fingerprint can be used to verify file integrity and to identify duplicate files.</td>
</tr>
<tr>
<td>SHA-1 Hash</td>
<td>Creates a digital fingerprint using the Secure Hash Algorithm-1, based on the contents of the file. This fingerprint can be used to verify file integrity and to identify duplicate files.</td>
</tr>
<tr>
<td>SHA-256 Hash</td>
<td>Creates a digital fingerprint using the Secure Hash Algorithm-256, based on the contents of the file. This fingerprint can be used to verify file integrity and to identify duplicate files. SHA-256 is a hash function computed with 32-bit words, giving it a longer digest than SHA-1.</td>
</tr>
<tr>
<td>Flag Duplicate Files</td>
<td>Identifies files that are found more than once in the evidence. This is done by comparing file hashes.</td>
</tr>
<tr>
<td>KFF</td>
<td>Enables the Known File Filter (KFF) that lets you identify either known insignificant files that you can ignore or known illicit or dangerous files that you want to be alerted to.</td>
</tr>
<tr>
<td></td>
<td>When you enable KFF, you must select a KFF Template to use. You can select an existing KFF Template from the drop-down menu or click ... to create a new one.</td>
</tr>
<tr>
<td></td>
<td>See Using the Known File Filter (KFF) on page 263.</td>
</tr>
<tr>
<td>PhotoDNA</td>
<td>Enables PhotoDNA which lets you compare images in your evidence against known images in a library.</td>
</tr>
<tr>
<td></td>
<td>See Using PhotoDNA to Compare Images on page 311.</td>
</tr>
<tr>
<td>Expand Compound Files</td>
<td>Automatically opens and processes the contents of compound files such as ZIP, email, and OLE files.</td>
</tr>
<tr>
<td></td>
<td>See Expanding Compound Files on page 84.</td>
</tr>
<tr>
<td></td>
<td>The option File Signature Analysis is not forced to be selected. This lets you initially see the contents of compound files without necessarily having to process them. Processing can be done later, if it is deemed necessary or beneficial to the case by selecting File Signature Analysis.</td>
</tr>
<tr>
<td>Include Deleted Files</td>
<td>Checked by default. Un-check to exclude deleted files from the case.</td>
</tr>
<tr>
<td>File Signature Analysis</td>
<td>Analyzes files to indicate whether their headers or signatures match their extensions. This option must be selected if you choose Registry Summary Reports.</td>
</tr>
<tr>
<td>Flag Bad Extensions</td>
<td>Identifies files whose types do not match their extensions, based on the file header information. This option forces the File Signature Analysis option to be checked.</td>
</tr>
</tbody>
</table>
### Evidence Processing Options (Continued)

<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entropy Test</td>
<td>Identifies files that are compressed or encrypted. Compressed and encrypted files identified in the entropy test are not indexed.</td>
</tr>
<tr>
<td>dtsSearch® Text Index</td>
<td>Stores the words from evidence in an index for quick retrieval. Additional space requirement is approximately 25% of the space required for all evidence in the case. Click <strong>Indexing Options</strong> for extensive options for indexing the contents of the case. Generated text that is the result of a formula in a document or spreadsheet is indexed, and can be filtered.</td>
</tr>
<tr>
<td>Create Thumbnails for Graphics</td>
<td>Creates thumbnails for all graphics in a case. Thumbnails are always created in JPG format, regardless of the original graphic file type.</td>
</tr>
<tr>
<td>Create Thumbnails for Videos</td>
<td>Creates thumbnails for all videos in a case. You can also set the frequency for which video thumbnails are created, either by a percent (1 thumbnail every &quot;n&quot;% of the video) or by interval (1 thumbnail every &quot;n&quot; seconds).</td>
</tr>
<tr>
<td>Generate Common Video File</td>
<td>When you process the evidence in your case, you can choose to create a common video type for videos in your case. These common video types are not the actual video files from the evidence, but a copied conversion of the media that is generated and saved as an MP4 file that can be previewed on the video tab.</td>
</tr>
<tr>
<td>HTML File Listing</td>
<td>Creates an HTML version of the File Listing in the case folder.</td>
</tr>
<tr>
<td>CSV File Listing</td>
<td>The File Listing Database is now created in CSV format instead of an MDB file and can be added to Microsoft Access.</td>
</tr>
<tr>
<td>Data Carve</td>
<td>Carves data immediately after pre-processing. Click <strong>Carving Options</strong>, then select the file types to carve. Uses file signatures to identify deleted files contained in the evidence. All available file types are selected by default. For more information on Data Carving, see <strong>Data Carving</strong> (page 90).</td>
</tr>
<tr>
<td>Meta Carve</td>
<td>Carves deleted directory entries and other metadata. The deleted directory entries often lead to data and file fragments that can prove useful to the case, that could not be found otherwise.</td>
</tr>
<tr>
<td>Optical Character Recognition (OCR)</td>
<td>Scans graphics files for text and converts graphics-text into actual text. That text can then be indexed, searched and treated as any other text in the case. For more detailed information regarding OCR settings and options, see <strong>Running Optical Character Recognition (OCR)</strong> (page 95).</td>
</tr>
<tr>
<td>Process</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Explicit Image Detection      | Click **EID Options** to specify the EID threshold for suspected explicit material found in the case.  
See [Evaluating Explicit Material](#) on page 308.  
EID is an add-on feature. Contact your sales representative for more information.                                                                                                                                                                                                                                                                                                                                               |
| Registry Reports              | Creates Registry Summary Reports (RSR) from case content automatically. Click RSR Directory to specify the location of the RSR Templates. When creating a report, click the RSR option in the Report Wizard to include the RSR reports requested here. RSR requires that File Signature Analysis also be selected. If you try to select RSR first, an error will pop up to remind you to mark File Signature Analysis before selecting RSR.                                                                                       |
| Include Deleted Files         | Enabled by default; to force exclusion of deleted files, unmark this check box.                                                                                                                                                                                                                                                                                                                                                     |
| Cerberus Analysis             | Lets you run the add on module for Cerberus Malware Triage. You can click **Cerberus Options** to access additional options.  
For more information see [About Cerberus Malware Analysis](#) (page 210)                                                                                                                                                                                                                                                                                              |
| Send Email Alert on Job Completion | Opens a text box that allows you to specify an email address where job completion alerts will be sent.  
Outgoing TCP traffic must be allowed on port 25.                                                                                                                                                                                                                                                                                                                                                                             |
| Decrypt Credant Files         | See [Decrypting Credant Files](#) on page 189.  
If you select to decrypt Credant files, the **File Signature Analysis** option will automatically be selected as well.                                                                                                                                                                                                                                                                                                        |
| Process Internet Browser History for Visualization | Processes internet browser history files so that you can see them in the detailed visualization timeline.  
See [Visualizing Browser History Data](#) on page 294.                                                                                                                                                                                                                                                                                                                    |
| Perform Automatic Decryption  | Disabled by default. Attempts to decrypt files using a list of passwords that you provide  
See [About Decrypting Files](#) on page 177.                                                                                                                                                                                                                                                                                                                             |
| Language Identification       | Disabled by default. Analyzes the first two pages of every document to identify the languages contained within. The user will be able to filter by a Language field within review and determine who needs to review which documents based on the language contained within the document.  
See [Identifying Document Languages](#) on page 332.                                                                                                                                                                                                                                                                                                |
| Document Content Analysis     | Disabled by default. Analyzes the content and groups it according to topic in the **Overview** tab. When selected, the DCA Options button is also activated and opens the Document Content Analysis Options.  
See [Using Document Content Analysis](#) on page 401.                                                                                                                                                                                                                                                                                                          |
### Expanding Compound Files

You can expand individual compound file types. This lets you see child files that are contained within a container such as ZIP files. You can access this feature from the Case Manager's new case wizard, or from the Add Evidence or Additional Analysis dialogs.

See Evidence Processing Options on page 81.

Unless noted, the following file types are expanded by default.

If you expand data, you will have files that are generated when the data was processed and were not part of the original data. There are tools to help you identify generated data.

See Identifying Processing-Generated Data on page 322.

See Relating Generated Files to Original Files on page 322.

You can expand the following compound files:

<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
</tr>
</thead>
</table>
| Entity Extraction (Document Content) | Disabled by default. Identifies and extracts specific types of data in your evidence. You can select to process one or all of the following types of entity data:  
  - Credit Card Numbers  
  - Phone Numbers  
  - Social Security Numbers  
  In the Examiner, under the Document Content node in the Overview tab, you can view the extracted data.  
  See Using Entity Extraction on page 397. |
<table>
<thead>
<tr>
<th>Evidence Processing Options</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chrome SQLite</td>
<td>Not expanded by default. See About Expanding Google Chrome, Firefox, and IE 9 Data on page 336.</td>
</tr>
<tr>
<td>DBX</td>
<td></td>
</tr>
<tr>
<td>ESE DB</td>
<td>Expands ESE (Extensible Storage Engine) databases. See About Extensible Storage Engine (ESE) Databases on page 335.</td>
</tr>
<tr>
<td>EMFSPOOL</td>
<td></td>
</tr>
<tr>
<td>EVTX</td>
<td>Not expanded by default. See Viewing Data in Windows XML Event Log (EVTX) Files on page 323.</td>
</tr>
<tr>
<td>EXIF</td>
<td></td>
</tr>
<tr>
<td>GZIP</td>
<td></td>
</tr>
<tr>
<td>IE Recovery</td>
<td>Not expanded by default. Expands IE Recovery data that was stored when access to a Web site was lost. See Expanding Internet Artifact Data on page 339.</td>
</tr>
<tr>
<td>IE WebCache</td>
<td>Not expanded by default. Expands the Web cache data for IE 10 and later IE versions. See About Expanding Data from Internet Explorer (IE) Version 10 or Later on page 337.</td>
</tr>
<tr>
<td>IIS log files</td>
<td>Not expanded by default. See Viewing IIS Log File Data on page 325.</td>
</tr>
<tr>
<td>Internet Explorer Files</td>
<td>Expands Internet Explorer internet artifact data. See Expanding Internet Artifact Data on page 339.</td>
</tr>
<tr>
<td>Log2t CSV</td>
<td>Not expanded by default. This processing option will recognize CSV files that are in the Log2timeline format and parses the data within the single CSV into individual records within the case. The individual records from the CSV will be interspersed with other data, giving you the ability to perform more advanced timeline analysis across a very broad set of data. In addition you can leverage the visualization engine to perform more advanced timeline based visual analysis. See Viewing Log2Timeline CSV File Data on page 329.</td>
</tr>
<tr>
<td>Lotus Notes (NSF)</td>
<td></td>
</tr>
<tr>
<td>MBOX</td>
<td></td>
</tr>
<tr>
<td>Mail.ru Chat</td>
<td>Parses Mail.RU Agent chat history files and email (mra.dbs). Examining Internet Artifact Data (page 334)</td>
</tr>
<tr>
<td>Microsoft Exchange</td>
<td></td>
</tr>
<tr>
<td>MS Office, OLE and OPC documents</td>
<td></td>
</tr>
<tr>
<td>MSG</td>
<td></td>
</tr>
<tr>
<td>PDF</td>
<td></td>
</tr>
<tr>
<td>PKCS7 and S/MIME Files</td>
<td></td>
</tr>
<tr>
<td>PST</td>
<td></td>
</tr>
<tr>
<td>RAR</td>
<td></td>
</tr>
<tr>
<td>Registry</td>
<td>Not expanded by default. See Viewing Registry Timeline Data on page 327.</td>
</tr>
<tr>
<td>RFC822 Internet Email</td>
<td></td>
</tr>
<tr>
<td>SQLite Databases</td>
<td></td>
</tr>
<tr>
<td>TAR</td>
<td></td>
</tr>
<tr>
<td>Windows Thumbnails</td>
<td></td>
</tr>
<tr>
<td>ZIP, including ZIPX</td>
<td></td>
</tr>
</tbody>
</table>
Be aware of the following before you expand compound files:

- If you have labeled or hashed a family of files, then later choose to expand a compound file type that is contained within that label or family, the newly expanded files do not inherit the labeling from the parent, and the family hashes are not automatically regenerated.

- Many Lotus Notes emails, *.NSF, are being placed in the wrong folders in the Examiner. This is a known issue wherein Lotus Notes routinely deletes the collection indexes. Lotus Notes client has the ability to rebuild the collections from the formulas, but Examiner cannot. So if Lotus Notes data is acquired shortly after the collections have been cleared, then the Examiner does not know where to put the emails. These emails are all placed in a folder named "[other1]."

To work around: Open the NSF file in the Lotus Notes client, and then close (you may need to save), then acquire the data and process it. The emails will all be in the right folder because the view collections are recreated.

- Compound file types such as AOL, Blackberry IPD Backup, EMFSpool, EXIF, MSG, PST, RAR, and ZIP can be selected individually for expansion. This feature is available from the Case Manager new case wizard, or from the Add Evidence or Additional Analysis dialogs.

- Only the file types selected are expanded. For example, if you select ZIP, and a RAR file is found within the ZIP file, the RAR is not expanded.

To expand compound files
1. Do one of the following:
   - For new cases, in the New Case Options dialog click Detailed Options.
   - For existing cases, in the Examiner, click Evidence > Additional Analysis.

2. Select Expand Compound Files.

   The option File Signature Analysis is no longer forced to be checked when you select Expand Compound Files. This lets you see the contents of compound files without necessarily having to process them. You can choose to process them later, if it is deemed necessary or beneficial to the case.

3. Select Include Deleted Files if you also want to expand deleted compound files.

4. Click Expansion Options.

5. In the Compound File Expansions Options dialog do the following:
   - If you do not want to expand office documents that do not have embedded items, select Only expand office documents with embedded items.
   - Select the types of compound files that you want expand.

   Only the file types that you select are expanded. For example, if you select ZIP, and a RAR file is contained within the ZIP file, then the RAR is not expanded.

   **Note:** The option File Signature Analysis is not forced to be selected. This lets you initially see the contents of compound files without necessarily having to process them. Processing can be done later, if it is deemed necessary or beneficial to the case by selecting File Signature Analysis.

6. In the Compound File Expansions Options dialog, click OK.

7. Click OK.
Using dtSearch Text Indexing

You can use the following indexing options to choose from when creating a new case.

Indexing a Case

All evidence should be indexed to aid in searches. Index evidence when it is added to the case by checking the dtSearch Text Index box on the Evidence Processing Options dialog, or index after the fact by clicking and specifying indexing options.

Scheduling is another factor in determining which process to select. Time restraints may not allow for all tasks to be performed initially. For example, if you disable indexing, it shortens the time needed to process a case. You can return at a later time and index the case if needed.

dtSearch Indexing Space Requirements

To estimate the space required for a dtSearch Text index, plan on approximately 25% of the space needed for each case’s evidence.

Configuring Case Indexing Options

Case Indexing gives you almost complete control over what goes in your case index. These options can be applied globally from Case Manager.

Note: Search terms for pre-processing options support only ASCII characters.
These options must be set prior to case creation.

To set Indexing Options as the global default
1. In Case Manager, click Case > New > Detailed Options.
2. In the Evidence Processing window, mark the dtSearch Text Index check box.
3. Click Indexing Options to bring up the Indexing Options dialog box.
4. Set the options using the information in the following table:

### dtSearch Indexing Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letters</td>
<td>Specifies the letters and numbers to index. Specifies Original, Lowercase,</td>
</tr>
<tr>
<td></td>
<td>Uppercase, and Unaccented. Choose Add or Remove to customize the list.</td>
</tr>
<tr>
<td></td>
<td>You may need to add characters to this list for specific index searches to</td>
</tr>
<tr>
<td></td>
<td>function properly. For example, you may want to do an index search for</td>
</tr>
<tr>
<td></td>
<td>‘<a href="mailto:name@domain.com">name@domain.com</a>’. By default, the @ symbol is treated as a space and is not</td>
</tr>
<tr>
<td></td>
<td>indexed.</td>
</tr>
<tr>
<td></td>
<td>See Spaces on page 89.</td>
</tr>
<tr>
<td></td>
<td>To have the @ symbol included in the index, you would need to do two things:</td>
</tr>
<tr>
<td></td>
<td>● Remove the @ from the Spaces list.</td>
</tr>
<tr>
<td></td>
<td>● Add the @ to the Letters list.</td>
</tr>
<tr>
<td>Noise Words</td>
<td>A list of words to be considered “noise” and ignored during indexing.</td>
</tr>
<tr>
<td></td>
<td>Choose Add or Remove to customize the list.</td>
</tr>
<tr>
<td>Hyphens</td>
<td>Specifies which characters are to be treated as hyphens. You can add</td>
</tr>
<tr>
<td></td>
<td>standard keyboard characters, or control characters. You can remove items</td>
</tr>
<tr>
<td></td>
<td>as well.</td>
</tr>
<tr>
<td>Hyphen</td>
<td>Treatment</td>
</tr>
<tr>
<td></td>
<td>Specifies how hyphens are to be treated in the index. Options are:</td>
</tr>
<tr>
<td></td>
<td>● Ignore</td>
</tr>
<tr>
<td></td>
<td>Hyphens will be treated as if they never existed. For example, the term</td>
</tr>
<tr>
<td></td>
<td>“counter-culture” would be indexed as “counterculture.”</td>
</tr>
<tr>
<td></td>
<td>● Hyphen</td>
</tr>
<tr>
<td></td>
<td>Hyphens will be treated literally. For example, the term “counter-culture”</td>
</tr>
<tr>
<td></td>
<td>would be indexed as “counter-culture.”</td>
</tr>
<tr>
<td></td>
<td>● Space</td>
</tr>
<tr>
<td></td>
<td>Hyphens will be replaced by a non-breaking space. For example the term</td>
</tr>
<tr>
<td></td>
<td>“counter-culture” would be indexed as two separate entries in the index</td>
</tr>
<tr>
<td></td>
<td>being “counter” and “culture.”</td>
</tr>
<tr>
<td></td>
<td>● All</td>
</tr>
<tr>
<td></td>
<td>Terms with hyphens will be indexed using all three hyphen treatments.</td>
</tr>
<tr>
<td></td>
<td>For example the term “counter-culture” will be indexed as “counterculture”,</td>
</tr>
<tr>
<td></td>
<td>“counter-culture”, and as two separate entries in the index being “counter”</td>
</tr>
<tr>
<td></td>
<td>and “culture.”</td>
</tr>
</tbody>
</table>
dtSearch Indexing Options (Continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| Spaces                  | Specifies which special characters should be treated as spaces. Remove characters from this list to have them indexed as any other text. Choose **Add** or **Remove** to customize the list.  
You may need to remove characters from this list for specific index searches to function properly. For example, you may want to do an index search for ‘name@domain.com’. By default, the @ symbol is treated as a space and is not indexed.  
To have the @ symbol included in the index, you would need to do two things:  
• Remove the @ from the Spaces list.  
• Add the @ to the Letters list. |
| Ignore                  | Specifies which control characters or other characters to ignore. Choose **Add** or **Remove** to customize the list.                                                                                      |
| Max Word Length         | Allows you to set a maximum word length to be indexed.                                                                                                                                                  |
| Index Binary Files      | Specify how binary files will be indexed. Options are:  
• Index all  
• Skip  
• Index all (Unicode)                                                                                                                                                                                   |
| Enable Date Recognition | Choose to enable or disable this option.                                                                                                                                                                |
| Presumed Date Format    | If date recognition is enabled, specify how ambiguous dates should be formatted when encountered during indexing. Options are:  
• MM/DD/YY  
• DD/MM/YY  
• YY/MM/DD                                                                                                                                                                                                 |
| Set Max Memory          | Allows you to set a maximum size for the index.                                                                                                                                                         |
| Auto-Commit Interval    | Allows you to specify an Auto-Commit Interval while indexing the case. When the index reaches the specified size, the indexed data is saved to the index. The size resets, and indexing continues until it reaches the maximum size, and saves again, and so forth. |

**Note:** The **Indexing Options** dialog does not support some Turkish characters.

5. When finished setting Indexing Options, click **OK** to close the dialog.  
6. Complete the **Detailed Options** dialog.  
7. Click **OK** to close the **Detailed Options** dialog.  
8. Specify the path and filename for the **Default Options** settings file.  
9. Click **Save**.  
10. In the **Case Manager**, click **Case > New**.  
11. Proceed with case creation as usual. There is no need to click **Detailed Options** again in creating the case to select options, unless you wish to use different settings for this case.

In addition to performing searches within the case, you can also use the Index to export a word list to use as a source file for custom dictionaries to improve the likelihood and speed of password recovery related to case files.
when using the Password Recovery Toolkit (PRTK). You can export the index by selecting File > Export Word List. See also Searching Evidence with Index Search (page 365)

**Data Carving**

Data carving is the process of looking for data on media that was deleted or lost from the file system. Often this is done by identifying file headers and/or footers, and then “carving out” the blocks between these two boundaries.

AccessData provides several specific pre-defined carvers that you can select when adding evidence to a case. In addition, Custom Carvers allow you to create specific carvers to meet your exact needs.

Data carving can be selected in the New Case Wizard as explained below, or from within the Examiner. In addition, because Custom Carvers are now a Shared feature, they can be accessed through the Manage menu. These are explained below.

**Pre-defined Carvers**

The following pre-defined carvers are available. Some carvers are enabled by default.

<table>
<thead>
<tr>
<th>Carver</th>
<th>Enabled by default?</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOL bag files</td>
<td>Yes</td>
</tr>
<tr>
<td>BMP files</td>
<td>Yes</td>
</tr>
<tr>
<td>EMF files</td>
<td>Yes</td>
</tr>
<tr>
<td>GIF files</td>
<td>Yes</td>
</tr>
<tr>
<td>HTML files</td>
<td>Yes</td>
</tr>
<tr>
<td>JPEG files</td>
<td>Yes</td>
</tr>
<tr>
<td>LNK files</td>
<td>Yes</td>
</tr>
<tr>
<td>OLE files (MS Office)</td>
<td>Yes</td>
</tr>
<tr>
<td>PDF files</td>
<td>Yes</td>
</tr>
<tr>
<td>PNG files</td>
<td>Yes</td>
</tr>
<tr>
<td>TIFF files</td>
<td>Yes</td>
</tr>
<tr>
<td>ZIP files</td>
<td>Yes</td>
</tr>
<tr>
<td>AIM Chat Logs</td>
<td>No</td>
</tr>
<tr>
<td>Facebook Status Updates</td>
<td>No</td>
</tr>
<tr>
<td>Facebook Chat</td>
<td>No</td>
</tr>
<tr>
<td>Facebook Email Artifact</td>
<td>No</td>
</tr>
<tr>
<td>Facebook Mail Snippets</td>
<td>No</td>
</tr>
<tr>
<td>Facebook Fragment</td>
<td>No</td>
</tr>
<tr>
<td>Gmail Email Message</td>
<td>No</td>
</tr>
<tr>
<td>Gmail Parsed Email</td>
<td>No</td>
</tr>
<tr>
<td>Google Talk Chats</td>
<td>No</td>
</tr>
<tr>
<td>Hotmail Email Artifact</td>
<td>No</td>
</tr>
</tbody>
</table>
### Pre-defined Carvers (Continued)

<table>
<thead>
<tr>
<th>Carver</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bebo Chat</td>
<td>No</td>
</tr>
<tr>
<td>Firefox Form History</td>
<td>No</td>
</tr>
<tr>
<td>Firefox Places</td>
<td>No</td>
</tr>
<tr>
<td>Firefox Session Store</td>
<td>No</td>
</tr>
<tr>
<td>Frostwire Props Files</td>
<td>No</td>
</tr>
<tr>
<td>GigaTribe Chat</td>
<td>No</td>
</tr>
<tr>
<td>IE8 Recovery URL</td>
<td>No</td>
</tr>
<tr>
<td>Limewire Props</td>
<td>No</td>
</tr>
<tr>
<td>Limewire/Frostwire Keyword Search</td>
<td>No</td>
</tr>
<tr>
<td>mIRC Chat Log</td>
<td>No</td>
</tr>
<tr>
<td>MySpace Chat</td>
<td>No</td>
</tr>
<tr>
<td>Twitter Status</td>
<td>No</td>
</tr>
<tr>
<td>Windows Messenger Plus w/chat logging</td>
<td>No</td>
</tr>
<tr>
<td>MSN/WLM Chat</td>
<td>No</td>
</tr>
<tr>
<td>Yahoo Diagnostic</td>
<td>No</td>
</tr>
<tr>
<td>Yahoo Webmail Chat</td>
<td>No</td>
</tr>
<tr>
<td>Yahoo Mail</td>
<td>No</td>
</tr>
<tr>
<td>Yahoo Group Chat Recvd</td>
<td>No</td>
</tr>
<tr>
<td>Yahoo Group Chat Sent</td>
<td>No</td>
</tr>
<tr>
<td>Yahoo Chat</td>
<td>No</td>
</tr>
<tr>
<td>Yahoo Chat UnAllocated</td>
<td>No</td>
</tr>
<tr>
<td>Yahoo Unencrypted Active</td>
<td>No</td>
</tr>
<tr>
<td>Ares P2P</td>
<td>No</td>
</tr>
<tr>
<td>Chrome History</td>
<td>No</td>
</tr>
<tr>
<td>Dropbox</td>
<td>No</td>
</tr>
<tr>
<td>eMule</td>
<td>No</td>
</tr>
<tr>
<td>Facebook</td>
<td>No</td>
</tr>
<tr>
<td>Flickr</td>
<td>No</td>
</tr>
<tr>
<td>Google Docs</td>
<td>No</td>
</tr>
<tr>
<td>Google Drive</td>
<td>No</td>
</tr>
<tr>
<td>Google Plus</td>
<td>No</td>
</tr>
<tr>
<td>Google Plus Chat</td>
<td>No</td>
</tr>
<tr>
<td>Hotmail</td>
<td>No</td>
</tr>
<tr>
<td>ICQ 7M Chat History</td>
<td>No</td>
</tr>
<tr>
<td>Internet Explorer 10</td>
<td>No</td>
</tr>
<tr>
<td>Safari</td>
<td>No</td>
</tr>
<tr>
<td>Shareaza</td>
<td>No</td>
</tr>
<tr>
<td>SkyDrive</td>
<td>No</td>
</tr>
<tr>
<td>Skype, Skype 3</td>
<td>No</td>
</tr>
<tr>
<td>Torrent</td>
<td>No</td>
</tr>
<tr>
<td>Twitter</td>
<td>No</td>
</tr>
</tbody>
</table>
Selecting Data Carving Options

If you are unfamiliar, please review Creating a Case (page 74) and Configuring Detailed Options for a Case (page 75) before beginning this section.

When you are in the New Case Wizard in Detailed Options > Evidence Processing, click Data Carve > Carving Options to open the dialog shown below.

If you already have a case open with evidence added and processed, click the following:

- Evidence > Additional Analysis > Data Carve > Carving Options

Standard Data Carving gives you a limited choice of which file types to carve.

Choose which types of data to carve according to the information below.

To set Data Carving options

1. Select Data Carve.
2. Click Carving Options.
3. Select the types of files you want carved.
   - Click Select All to select all file types to be carved.
   - Click Clear All to unselect all file types.
   - Click on individual file types to toggle either selected or unselected.

   **Note:** It may help to be aware of the duplicate files and the number of times they appear in an evidence set to determine intent.

4. Depending on the file type highlighted, the Selected Carver Options may change. Define the optional limiting factors to be applied to each file:
   - Define the minimum byte file size for the selected type.
   - Define the minimum pixel height for graphic files.
   - Define the minimum pixel width for graphic files
5. Mark the box, Exclude KFF Ignorable files if needed.
6. If you want to define Custom Carvers, click Custom Carvers. (Custom Carvers are explained in the next section.) When you are done with Custom Carvers, click Close.
7. In the Carving Options dialog, click OK.

Custom Carvers

The Custom Carvers dialog allows you to create your own data carvers in addition to the built-in carvers. Custom Carvers can be created and shared from within a case, or from the Case Manager.

Application Administrators have the necessary permissions to access the Manage Shared Carvers dialog. Case Administrators can manage the Custom Carvers in the cases they administer. Case Reviewers are not allowed to manage Custom Carvers.
Shared Custom Carvers are automatically available globally; but can be copied to a case when needed. Carvers created within a case are automatically available to the case, but can be shared and thus made available globally.

To access Manage Custom Carvers dialogs, click Manage > Carvers > Manage Custom Carvers (or Manage Shared Carvers if you are an Application Administrator).

The Manage Shared Custom Carvers and Manage Custom Carvers dialogs are very similar. The difference is whether you can copy the carvers to a case or make the carvers shared.

The Custom Carvers dialog allows you to define carving options for specific file types or information beyond what is built-in. Once defined, these carving options files can be Shared with the database as well as exported and imported for use in other cases. The original, local copy, remains in the case where it was created, for local management.

To create a Custom Data Carver

1. Click New.
2. Complete the data fields for the Custom Carver you are creating. Options are as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Name of the Carver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author</td>
<td>Name of the Creator</td>
</tr>
<tr>
<td>Description</td>
<td>Summarizes the intended use of the carver</td>
</tr>
<tr>
<td>Minimum File Size in bytes</td>
<td>(Optional)</td>
</tr>
<tr>
<td>Maximum File Size in bytes</td>
<td>(Optional) The default Custom Carver Maximum File Size is 2147483647 bytes. The carver Max File Size in bytes must be populated with any size larger than the defined Minimum File Size in bytes (default is 0). A Maximum File Size equal to or less than the minimum size, or &lt;no entry&gt;, results in an error prompting for a valid number to be entered.</td>
</tr>
<tr>
<td>File extension</td>
<td>Defining the extension of the carved file helps with categorization, sorting, and filtering carved files along with other files in the case.</td>
</tr>
<tr>
<td>Key Signatures(s) and Other Signatures(s)</td>
<td>Enter the ASCII text interpretation of the file signature as seen in a hex viewer. Many can be defined, but at least one key signature must be present in the file in order to be carved. Click the + icon to begin defining a new Key Signature or Other Signature. Click the - icon to remove a defined Key Signature or Other Signature.</td>
</tr>
<tr>
<td>File Category</td>
<td>The File Category the carved item will belong to once it is carved. The specified category must be a leaf node in the Overview tab.</td>
</tr>
<tr>
<td>Offset</td>
<td>Use decimal value.</td>
</tr>
<tr>
<td>Length</td>
<td>The length in bytes.</td>
</tr>
<tr>
<td>Little Endian</td>
<td>If not marked, indicates Big Endian.</td>
</tr>
<tr>
<td>Signature</td>
<td>Enter the ASCII text interpretation of the file signature as seen in a hex viewer.</td>
</tr>
<tr>
<td>Case Insensitive</td>
<td>Default is case sensitive. Mark to make the end File Tag Signature not case sensitive.</td>
</tr>
</tbody>
</table>

3. When done defining the Custom Carver, click Close.

Note: When adding signatures to a carver, the Signature is case sensitive check box is used when carving for signatures that can be both upper or lower case. For example, <HTML> and <html>
are both acceptable headers for HTML files, but each of these would have a different signature in hex, so therefore they are case sensitive.

- The objects and files carved from default file types are automatically added to the case, and can be searched, bookmarked, and organized along with the existing files.
  However, custom carved data items are not added to the case until they are processed, and they may not sort properly in the File List view. They are added to the bottom of the list, or at the top for a Z-to-A search, regardless of the filename.
Running Optical Character Recognition (OCR)

The Optical Character Recognition (OCR) process lets you extract text that is contained in graphics files. The text is then indexed so that it can be, searched, and bookmarked.

Running OCR against a file type creates a new child file item. The graphic files are processed normally, and another file with the parsed text from the graphic is created. The new OCR file is named the same as the parent graphic, [graphickname.ext], but with the extension OCR, for example, graphickname.ext.ocr.

You can view the graphic files in the File Content View when it is selected in the File List View. The Natural tab shows the graphic in its original form. The Filtered tab shows the OCR text that was added to the index.

Before running OCR, be aware of the following:

- OCR is only a helpful tool for the investigator to locate images from index searches. OCR results should not be considered evidence without further review.
- OCR can have inconsistent results. OCR engines by nature have error rates. This means that it is possible to have results that differ between processing jobs on the same machine with the same piece of evidence.
- Some large images can cause OCR to take a very long time to complete. Under some circumstances, they may not generate any output.
- Graphical images that have no text or pictures with unaligned text can generate bad output.
- OCR is best on typewritten text that is cleanly scanned or similarly generated. All other picture files can generate unreliable output that can vary from run to run.

To run Optical Character Recognition

1. Do one of the following:
   - For new cases, in the New Case Options dialog click Detailed Options.
   - For existing cases, in the Examiner, click Evidence > Additional Analysis.

2. Select Optical Character Recognition. OCR requires File Signature Analysis and dtSearch Indexing to be selected. When Optical Character Recognition is marked, the other two options are automatically marked and grayed-out to prevent inadvertent mistakes, and ensure successful processing.

3. Click OCR Options.

4. In the OCR Options dialog, select from the following options:

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Types</td>
<td>Lets you specify which file types to include in the OCR process during case processing. For PDF files, you can also control the maximum filtered text size for which to run OCR against.</td>
</tr>
<tr>
<td>Filtering Options</td>
<td>Lets you specify a range in file size to include in the OCR process. You can also specify whether or not to only run OCR against black and white, and grayscale. The Restrict File Size option is selected by default. By default, OCR file generation is restricted to files larger than 5K. If you do not want to limit the size of OCR files, you must disable this option.</td>
</tr>
<tr>
<td>Engine</td>
<td>Lets you choose the OCR engine to use.</td>
</tr>
</tbody>
</table>

5. In the OCR Options dialog, click OK.
6. In the *Evidence Processing* dialog, click **OK**.

**Using Explicit Image Detection**

**About Explicit Image Detection**

Explicit Image Detection (EID) is an add-on feature. Contact your sales representative for more information. EID reads all graphics in a case and assigns both the files and the folders they are contained within a score according to what it interprets as being possibly illicit content. The score ranges are explained later in this section.

**To add EID evidence to a case**

1. Click **Evidence > Add/Remove**.
2. In the **Detailed Options > Evidence Processing** dialog, ensure that **File Signature Analysis** is marked.
3. Select **Explicit Image Detection**
4. Click **EID Options**. The three EID options are profiles that indicate the type of filtering that each one does. You can choose between any combination of the following profiles depending on your needs:

<table>
<thead>
<tr>
<th>Profile Name</th>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-DFT</td>
<td>Default (XS1)</td>
<td>This is the most generally accurate. It is always selected.</td>
</tr>
<tr>
<td>X-FST</td>
<td>Fast (XTB)</td>
<td>This is the fastest. It scores a folder by the number of files it contains that meet the criteria for a high likelihood of explicit material. It is built on a different technology than X-DFT and does not use “regular” DNAs. It is designed for very high volumes, or real-time page scoring. Its purpose is to quickly reduce, or filter, the volume of data to a meaningful set.</td>
</tr>
<tr>
<td>X-ZFN</td>
<td>Less False Negatives (XT2)</td>
<td>This is a profile similar to X-FST but with more features and with fewer false negatives than X-DFT. You can apply this filter after initial processing to all evidence, or to only the folders that score highly using the X-FST option. Check-mark or highlight those folders to isolate them for Additional Analysis. In Additional Analysis, File Signature Analysis must be selected for EID options to work correctly.</td>
</tr>
</tbody>
</table>

5. When the profile is selected, click **OK** to return to the *Evidence Processing* dialog and complete your selections.

AccessData recommends that you run **Fast (X-FST)** for folder scoring, and then follow with **Less False Negatives (X-ZFN)** on high-scoring folders to achieve the fastest, most accurate results.

After you select **EID** in *Evidence Processing or Additional Analysis*, and the processing is complete, you must select or modify a filter to include the EID related columns in the *File List View*. 

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**Including Registry Reports**

The Registry Viewer supports Registry Summary Report (RSR) generation as part of case processing.

**To generate Registry Summary Reports and make them available for the case report**

1. Ensure that **File Signature Analysis** is marked.
2. Mark **Registry Reports**.
3. Click **RSR Directory**.
4. Browse to the location where your RSR templates are stored.
5. Click **OK**.

**Send Email Alert on Job Completion**

You can select to send an email notification when a job completes.

This option is also available from **Evidence > Additional Analysis**. Enter the email address of the recipient in the **Job Completion Alert Address** box, then click **OK**.

**Note:** Outgoing TCP traffic must be allowed on port 25.

**Custom File Identification Options**

Custom File Identification provides the examiner a way to specify which file category or extension should be assigned to files with a certain signature. These dialogs are used to manage custom identifiers and extension maps specific to the case.

In **Detailed Options**, the **Custom File Identification** dialog lets you select the Custom Identifier file to apply to the new case. This file is stored on the system in a user-specifed location. The location can be browsed to, by clicking **Browse**, or reset to the root drive folder by clicking **Reset**.

**Creating Custom File Identifiers**

Custom File Identifiers are used to assign categories to files that may or may not already be automatically categorized in a way that is appropriate for the case. For example, a file that is discovered, but not categorized, will be found under the “Unknown Types” category. You can prevent this categorization before the evidence is processed by selecting a different category and sub-category.

Custom Identifiers provide a way for you to create and manage identifiers, and categorize the resulting files into any part of the category tree on the Overview tab. You can select from an existing category, or create a new one to fit your needs.

You can define identifiers using header information expected at a specific offset inside a file, as is now the case, but in addition, you can categorize files based on extension.

**Note:** PDF files are now identified through the PDF file system and will no longer be identified through Custom File Identification.
To create a Custom Identifier file

1. In the Case Manager, click Case > New > Detailed Options.
2. Click Custom File Identification.
4. Fill in the fields with the appropriate values. The following table describes the parameters for Custom File Identifiers:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The value of this field defines the name of the sub-category that will appear below the selected Overview Tree category and the category column.</td>
</tr>
<tr>
<td>Description</td>
<td>Accompanies the Overview Container’s tree branch name.</td>
</tr>
<tr>
<td>Category</td>
<td>The general file category to which all files with a matching file signature should be associated.</td>
</tr>
<tr>
<td>Offset</td>
<td>The decimal offset of where the unique signature (see Value) can be found within the file given that the beginning of the file is offset 0.</td>
</tr>
<tr>
<td>Value</td>
<td>Any unique signature of the file expressed in hexadecimal bytes.</td>
</tr>
</tbody>
</table>

**Note:** The Offset must be in decimal format. The Value must be in hexadecimal bytes. Otherwise, you will see the following error: Hex strings in the Offset field cause an exception error.

“Exception: string_to_int: conversion failed was thrown.”

**Important:** After creating a Case Custom File Identifier, you must apply it, or it will not be saved.
5. When you are done defining the Custom File Identifier, click Make Shared to share it to the database. This action saves it so the Application Administrator can manage it.
6. Click OK to close the dialog. Select the identifier you just created and apply it to the case you are creating. Otherwise it will not be available locally in the future.

Custom Case Extension Maps

Extension Maps can be used to define or change the category associated to any file with a certain file extension. For example, files with BAG extension, which would normally be categorized as “Unknown Type,” can be categorized as an AOL BAG file, or files with a MOV extension, that would normally be categorized as Apple QuickTime video files, can be changed to show up under a more appropriate category since they can sometimes contain still images.

**To create a Case Custom Extension Mapping**

1. Within the Detailed Options dialog of the New Case wizard, select Custom File Identification on the left hand side.
2. Under the Extension Maps column, click New.
3. Fill in the fields with the appropriate values.
4. Mark **Make Shared** to share this Custom Extension Mapping with the database. Shared features such as Custom Extension Mappings are managed by the Application Administrator. Your copy remains in the case for you to manage as needed.

The following table describes the parameters for Custom Extension Mappings:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The value of this field defines the name of the sub-category that will appear below the selected Overview Tree category and the category column.</td>
</tr>
<tr>
<td>Category</td>
<td>The general file category to which all files with a matching file signature should be associated.</td>
</tr>
<tr>
<td>Description</td>
<td>Accompanies the Overview Container’s tree branch name.</td>
</tr>
<tr>
<td>Extensions:</td>
<td>Any file extension that should be associated to the selected Category.</td>
</tr>
</tbody>
</table>

**Note:** You must use at least one offset:value pair (hence the [...]+), and use zero or more OR-ed offset:value pairs (the [...]*). All of the offset:value conditions in an OR-ed group are OR-ed together, then all of those groups are AND-ed together.

---

**Configuring Evidence Refinement (Advanced) Options**

The Evidence Refinement Options dialogs allow you to specify how the evidence is sorted and displayed. The Evidence Refinement (Advanced) option allows you to exclude specific data from being added to the case when found in an individual evidence item type.

Many factors can affect which processes to select. For example, if you have specific information otherwise available, you may not need to perform a full text index. Or, if it is known that compression or encryption are not used, an entropy test may not be needed.

**Important:** After data is excluded from an evidence item in a case, the same evidence cannot be added back into the case to include the previously excluded evidence. If data that was previously excluded is found necessary, the user must remove the related evidence item from the case, and then add the evidence again, using options that will include the desired data.

**To set case evidence refining options**

1. Click the *Evidence Refinement (Advanced)* icon in the left pane.
2. Click the corresponding tab to access each dialog.
3. Set the needed refinements for the current evidence item.
4. To reset the menu to the default settings, click **Reset**.
5. To accept the refinement options you have selected and specified, click **OK**.
# Refining Evidence by File Status/Type

Refining evidence by file status and type allows you to focus on specific files needed for a case.

## Refine by File Status/Type Options

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include File Slack</td>
<td>Mark to include file slack space in which evidence may be found.</td>
</tr>
<tr>
<td>Include Free Space</td>
<td>Mark to include unallocated space in which evidence may be found.</td>
</tr>
<tr>
<td>Include KFF Ignorable Files</td>
<td><em>(Recommended)</em> Mark to include files flagged as ignorable in the KFF for analysis.</td>
</tr>
<tr>
<td>Include OLE Streams and Office 2007 package contents</td>
<td>Mark to include Object Linked and Embedded (OLE) data streams, and Office 2007 (DOCX, and XLSX) file contents that are layered, linked, or embedded.</td>
</tr>
<tr>
<td>Deleted</td>
<td>Specifies the way to treat deleted files. Options are:</td>
</tr>
<tr>
<td></td>
<td>• Ignore Status</td>
</tr>
<tr>
<td></td>
<td>• Include Only</td>
</tr>
<tr>
<td></td>
<td>• Exclude</td>
</tr>
<tr>
<td></td>
<td>Defaults to “Ignore Status.”</td>
</tr>
<tr>
<td>Encrypted</td>
<td>Specifies the way to treat encrypted files. Options are:</td>
</tr>
<tr>
<td></td>
<td>• Ignore Status</td>
</tr>
<tr>
<td></td>
<td>• Include Only</td>
</tr>
<tr>
<td></td>
<td>• Exclude</td>
</tr>
<tr>
<td></td>
<td>Defaults to “Ignore Status.”</td>
</tr>
<tr>
<td>From Email</td>
<td>Specifies the way to treat email files. Options are:</td>
</tr>
<tr>
<td></td>
<td>• Ignore Status</td>
</tr>
<tr>
<td></td>
<td>• Include Only</td>
</tr>
<tr>
<td></td>
<td>• Exclude</td>
</tr>
<tr>
<td></td>
<td>Defaults to “Ignore Status.”</td>
</tr>
<tr>
<td>File Types</td>
<td>Specifies which types of files to include and exclude.</td>
</tr>
</tbody>
</table>

**Only add items to the case that match both File Status and File Type criteria**

Applies selected criteria from both File Status and File Types tabs to the refinement. Will not add items that do not meet all criteria from both pages. If this option is not checked, and if you set a File Status, such as From Email > Include Only, then only the File Status value will be used and the File Type will be ignored.
Refining Evidence by File Date/Size

Refine evidence further by making the addition of evidence items dependent on a date range or file size that you specify. However, once in the case, filters can also be applied to accomplish this.

**Refine by File Date/Size Options**

<table>
<thead>
<tr>
<th>Exclusion</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refine Evidence by File Date</td>
<td>To refine evidence by file date:</td>
</tr>
<tr>
<td></td>
<td>1. Check <em>Created</em>, <em>Last Modified</em>, and/or <em>Last Accessed</em>.</td>
</tr>
<tr>
<td></td>
<td>2. In the two date fields for each date type selected, enter beginning and ending date ranges.</td>
</tr>
<tr>
<td>Refine Evidence by File Size</td>
<td>To refine evidence by file size:</td>
</tr>
<tr>
<td></td>
<td>1. Check <em>At Least</em> and/or <em>At Most</em> (these are optional settings).</td>
</tr>
<tr>
<td></td>
<td>2. In the corresponding size boxes, specify the applicable file size.</td>
</tr>
<tr>
<td></td>
<td>3. In the drop-down lists, to the right of each, select <em>Bytes</em>, <em>KB</em>, or <em>MB</em>.</td>
</tr>
</tbody>
</table>

**Selecting Index Refinement (Advanced) Options**

The Index Refinement (Advanced) feature allows you to specify types of data that you do not want to index. You may choose to exclude data to save time and resources, or to increase searching efficiency.

**Note:** AccessData strongly recommends that you use the default index settings.

**To refine an index**

1. Within the *Detailed Options* dialog of the *New Case* wizard, click *Index Refinement (Advanced)* in the left pane.
   The Index Refinement (Advanced) menu is organized into two dialog tabs:
   - *Refine Index by File Status/Type*
   - *Refine Index by File Date/Size*
2. Click the corresponding tab to access each dialog.
3. Define the refinements you want for the current evidence item.
4. Click *Reset* to reset the menu to the default settings.
5. Click *OK* when you are satisfied with the selections you have made.

**Refining an Index by File Status/Type**

Refining an index by file status and type allows the investigator to focus attention on specific files needed for a case through a refined index defined in a dialog.
At the bottom of the two Index Refinement tabs you can choose to mark the box for **Only index items that match both File Status AND File Types criteria**, if that suits your needs.

**Refine Index by File Status/Type Options**

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include File Slack</td>
<td>Mark to include free space between the end of the file footer, and the end of a sector, in which evidence may be found.</td>
</tr>
<tr>
<td>Include Free Space</td>
<td>Mark to include both allocated (partitioned) and unallocated (unpartitioned) space in which evidence may be found.</td>
</tr>
<tr>
<td>Include KFF Ignorable Files</td>
<td>Mark to include files flagged as ignorable in the KFF for analysis.</td>
</tr>
<tr>
<td>Include Message Headers</td>
<td>Marked by default. Includes the headers of messages in filtered text. Unmark this option to exclude message headers from filtered text.</td>
</tr>
<tr>
<td>Do not include document metadata in filtered text</td>
<td>Not marked by default. This option lets you turn off the collection of internal metadata properties for the indexed filtered text. The fields for these metadata properties are still populated to allow for field level review, but the you will no longer see information such as Author, Title, Keywords, Comments, etc in the Filtered text panel of the review screen. If you use an export utility such as ECA or eDiscovery and include the filtered text file with the export, you will also not see this metadata in the exported file.</td>
</tr>
<tr>
<td>Include OLE Streams</td>
<td>Includes Object Linked or Embedded (OLE) data streams that are part of files that meet the other criteria.</td>
</tr>
<tr>
<td>Deleted</td>
<td>Specifies the way to treat deleted files. Options are:</td>
</tr>
<tr>
<td></td>
<td>- Ignore status</td>
</tr>
<tr>
<td></td>
<td>- Include only</td>
</tr>
<tr>
<td></td>
<td>- Exclude</td>
</tr>
<tr>
<td>Encrypted</td>
<td>Specifies the way to treat encrypted files. Options are:</td>
</tr>
<tr>
<td></td>
<td>- Ignore status</td>
</tr>
<tr>
<td></td>
<td>- Include only</td>
</tr>
<tr>
<td></td>
<td>- Exclude</td>
</tr>
<tr>
<td>From Email</td>
<td>Specifies the way to treat email files. Options are:</td>
</tr>
<tr>
<td></td>
<td>- Ignore status</td>
</tr>
<tr>
<td></td>
<td>- Include only</td>
</tr>
<tr>
<td></td>
<td>- Exclude</td>
</tr>
<tr>
<td>Include OLE Streams</td>
<td>Includes Object Linked or Embedded (OLE) files found within the evidence.</td>
</tr>
<tr>
<td>File Types</td>
<td>Specifies types of files to include and exclude.</td>
</tr>
<tr>
<td>Only add items to the Index that match both File Status and File Type criteria</td>
<td>Applies selected criteria from both File Status and File Types tabs to the refinement. Will not add items that do not meet all criteria from both pages.</td>
</tr>
</tbody>
</table>
Refining an Index by File Date/Size

Refine index items dependent on a date range or file size you specify.

**Refine Index by File Date/Size Options**

<table>
<thead>
<tr>
<th>Exclusion</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refine Index by File Date</td>
<td>To refine index content by file date:</td>
</tr>
<tr>
<td></td>
<td>1. Select <strong>Created</strong>, <strong>Last Modified</strong>, or <strong>Last Accessed</strong>.</td>
</tr>
<tr>
<td></td>
<td>2. In the date fields, enter beginning and ending dates within which to include files.</td>
</tr>
<tr>
<td>Refine Index by File Size</td>
<td>To refine evidence by file size:</td>
</tr>
<tr>
<td></td>
<td>1. Click in either or both of the size selection boxes.</td>
</tr>
<tr>
<td></td>
<td>2. In the two size fields for each selection, enter minimum and maximum file sizes to include.</td>
</tr>
<tr>
<td></td>
<td>3. In the drop-down lists, select whether the specified minimum and maximum file sizes refer to <strong>Bytes</strong>, <strong>KB</strong>, or <strong>MB</strong>.</td>
</tr>
</tbody>
</table>

**Selecting Lab/eDiscovery Options**

This option is available for those with AD Lab and Summation licenses.

AD Lab and eDiscovery have additional options available for advanced de-duplication analysis.

De-duplication is separated by email items and non-email items. Within each group, the available options can be applied by case or by Custodian.

The following table provides more information regarding each option and its description.

**AD Lab/eDiscovery Detailed Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable Advanced De-duplication Analysis</td>
<td></td>
</tr>
<tr>
<td>Email Items De-duplication Scope</td>
<td></td>
</tr>
<tr>
<td>Choose whether you want this de-duplication process to be applied at the Case level, or at the Custodian level.</td>
<td></td>
</tr>
<tr>
<td>● Case Level</td>
<td></td>
</tr>
<tr>
<td>● People (Custodian) Level</td>
<td></td>
</tr>
</tbody>
</table>
De-duplication Options
For each item type you check, AD Lab eliminates duplicates from the case as it processes through the collected evidence. Uncheck an item type to keep all duplicate instances in your case.

*Available item types*
- Email To
- Email From
- Email CC
- Email BCC
- Email Subject
- Email Submit Time
- Email Delivery Time
- Email Attachment Time
- Email Attachment Count
- Email Hash
  - Body Only
  - Body and Attachments

**Non-email Items De-duplication Scope**
Choose whether you want this de-duplication process to be applied to the entire case or at the custodian level.
- Case Level
- People (Custodian) Level

**De-duplication Option**
There is only one option available for non-email items; either you are going to de-duplicate just the actual files, or if unmarked, you will de-duplicate actual files only, or all files, including children, zipped, OLE, and carved files.
- Actual Files Only

**Propagate Email Attributes**
When an email has attachments or OLE items, marking this option causes the email’s attributes to be copied and applied to all “child” files of the email “parent.”

**Cluster Analysis**
Invokes the extended analysis of documents to determine related, near duplicates, and email threads.
See [Viewing Data in Volume Shadow Copies](#) on page 341.
Configure the details by clicking **NDA Options**.

**Cluster Analysis Options**
This lets you specify the options for Cluster Analysis.
You can specify which document types to process:
- Documents
- Presentations
- Spreadsheets
- Email
You can also specify the similarity threshold, which determines the level of similarity required for documents to be considered related or near duplicates.
AD Lab/eDiscovery Detailed Options (Continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include Extended Information in the Index</td>
<td>If you create a case in FTK and are going to review it in Summation or eDiscovery, select this option to make the index data fully compatible with Summation/eDiscovery.</td>
</tr>
<tr>
<td>Create Email Threads</td>
<td>Sorts and groups emails by conversation threads.</td>
</tr>
</tbody>
</table>
Adding Evidence to a New Case

If you marked Open the Case before clicking OK in the New Case Options dialog, when case creation is complete, the Examiner opens. Evidence items added here will be processed using the options you selected in pre-processing, unless you click Refinement Options to make changes to the original settings.

Working with Volume Shadow Copies

You can examine data that is contained in NTFS Volume Shadow Copies. See Examining Data in Volume Shadow Copies on page 129.

Converting a Case from Version 2.2 or Newer

If you have cases that were created in version 2.2 or later, you can convert them to the latest version. Refer to the following guidelines for migrating 2.x cases.

Important: Consider the following information:

- Any case created with a version prior to 2.2 must be re-processed completely in the latest version.
- AccessData recommends reprocessing active cases instead of attempting to convert them, to maximize the features and capabilities of the new release.
- AccessData recommends that no new evidence be added to any case that has been converted from an earlier version. This is because newer versions of processing gathers more information than was done in versions prior to 2.x.
  Therefore, if evidence is added to a converted 2.2 case, the new evidence will have all the info gathered by the newest version; however, the data from the converted 2.2 case will not have this additional information. This may cause confusion and bring forensic integrity into question in a court of law.

For more information, see the webinar that explains Case Portability in detail. This webinar can be found under the Core Forensic Analysis portion of the webpage: http://www.accessdata.com/Webinars.

The AccessData website works best using Microsoft Windows Explorer. You will be required to create a username and password if you have not done so in the past. If you have used this website previously, you will need to verify your email address. The website normally remembers the rest of the information you enter.

For instructions on converting cases, see the Migrating Cases document located at http://www.accessdata.com/support/product-downloads/ftk-download-page
Chapter 6
Managing Case Data

This chapter includes the following topics

- Backing Up a Case (page 108)
- Archiving and Detaching a Case (page 111)
- Attaching a Case (page 112)
- Restoring a Case (page 113)
- Migrating Cases Between Database Types (page 114)
Backing Up a Case

About Performing a Backup and Restore on a Multi-Box Installation

If you have installed the Examiner and the database on separate boxes, or if you have case folders on a different box than the application, there are special considerations you must take into account. For instructions on how to back up and restore in this environment, see Configuring a Multi-box Setup in the User Guide.

Performing a Backup of a Case

At certain milestones of an investigation, you should back up your case to mitigate the risk of an irreversible processing mistake or perhaps case corruption.

Case backup can also be used when migrating or moving cases from one database type to another. For example, if you have created cases using 4.1 in an Oracle database and you want to upgrade to 5.0.x and migrate the case(s) to a PostgreSQL database. Another example is if you have created cases using 5.0.x in an Oracle database and you want to move the case(s) to the same version that is running a PostgreSQL database.

When you back up a case, the case information and database files (but not evidence) are copied to the selected destination folder. AccessData recommends that you store copies of your drive images and other evidence separate from the backed-up case.

Important: Case Administrators back up cases and must maintain and protect the library of backups against unauthorized restoration, because the user who restores an archive becomes that case’s administrator.

Note: Backup files are not compressed. A backed-up case requires the same amount of space as that case’s database table space and the case folder together.

Starting in 4.2, all backups are performed using the database independent format rather than a native format. The database independent format facilitates migrating and moving cases to a different database application or version. You can perform a backup using a native format using the dbcontrol utility. For more information, contact AccessData Technical Support.

Important: Do not perform a backup of a case while any data in that case is being processed.

To back up a case

1. In the Case Manager window, select the case to back up. You can use Shift + Click, or Ctrl + Click to select multiple cases to backup.
2. Do one of the following:
   - Click Case > Backup > Backup.
   - Right-click on the case in the Cases list, and click Backup.
3. In the field labeled Backup folder, enter a destination path for the backup files.
   Important: Choose a folder that does not already exist. The backup will be saved as a folder, and when restoring a backup, point to this folder (not the files it contains) in order to restore the case.
4. If you are using 4.1 to backup a case in order to migrate it to 4.2, make sure that you select Use database independent format.
   In 4.2, all backups are performed using the database independent format.
5. (Optional) Back up the Summation or Resolution1 application database.
   If you have a licence for Summation or Resolution1, when you back up a case, you can also select to
   backup the Summation or Resolution1 application database by doing the following:
   
   5a. Click **App DB..**
   
   5b. Specify the App DB properties and credentials.

6. Click **OK**.

**Note:** The following information may be useful:

- Each case you back up should have its own backup folder to ensure all data is kept together and
cannot be overwritten by another case backup. In addition, AccessData recommends that backups
be stored on a separate drive or system from the case, to reduce space consumption and to reduce
the risk of total loss in the case of catastrophic failure (drive crash, etc.).

- The absolute path of the case folder is recorded. When restoring a case, the default path is the
original path. You can choose the default path, or enter a different path for the case restore.
Archiving a Case

When work on a case is completed and immediate access to it is no longer necessary, that case can be archived.

The Archive and Detach function copies that case’s database table space file to the case folder, then deletes it from the database. This prevents two people from making changes to the same case at the same time, preserving the integrity of the case, and the work that has been done on it. Look for filename DB fn. Archive keeps up to four backups, DB f0, DB f1, DB f2, and DB f3.

To archive a case
1. In the Case Manager, select the case to archive.
2. Click Case > Backup > Archive.
3. A prompt asks if you want to use an intermediate folder.
   The processing status dialog appears, showing the progress of the archive. When the archive completes, close the dialog.

To view the resulting list of backup files
1. Open the cases folder.
   Note: The cases folder is no longer placed in a default path; instead it is user-defined.
2. Find and open the sub-folder for the archived case.
3. Find and open the sub-folder for the archive (DB fn).
4. You may view the file names as well as Date modified, Type, and Size.
Archiving and Detaching a Case

When work on a case is not complete, but it must be accessible from a different computer, archive and detach that case.

The Archive and Detach function copies that case’s database table space file to the case folder, then deletes it from the database. This prevents two people from making changes to the same case at the same time, preserving the integrity of the case, and the work that has been done on it.

To archive and detach a case
1. In the Case Manager, click Case > Backup > Archive and Detach. The case is archived.
2. You will see a notice informing you that the specified case will be removed from the database. Click OK to continue, or Cancel to abandon the removal and close the message box.
3. A prompt asks if you want to use an intermediate folder. The processing status dialog appears, showing the progress of the archive. When the archive completes, close the dialog.

To view the resulting list of files
1. Open the folder for the archived and detached cases.
2. Find and open the sub-folder for the archived case.

   **Note:** The cases folder is no longer placed in a default path; instead it is user-defined.

3. Find and open the sub-folder for the archive (DB fn). You may view the file names as well as Date Modified, Type, and Size.
Attaching a Case

Attaching a case is different from restoring a case. You would restore a case from a backup to its original location in the event of corruption or other data loss. You would attach a case to the same or a different machine/database than the one where it was archived and detached from.

The Attach feature copies that case's database table space file into the database on the local machine.

**Note:** The database must be compatible and must contain the AccessData schema.

To attach a detached case

1. Click **Case > Restore > Attach**.
   
   **Important:** Do NOT use “Restore” to re-attach a case that was detached with “Archive.” Instead, use “Attach.” Otherwise, your case folder may be deleted.

2. Browse to and select the case folder to be attached.

3. (Optional) Select **Specify the location of the DB files** and browse to the path to store the database files for this case.
   
   3a. Select **In the case folder** to place the database files in subfolder of the case folder.

4. Click **OK**.
Restoring a Case

When your case was backed up, it was saved as a folder. The folder selected for the backup is the folder you must select when restoring the backup.

Note: Do not use the Restore... function to attach an archive (instead use Attach...).

To restore a case

1. Open the Case Manager window.
2. Do either of these:
   - Click Case > Restore > Restore.
   - Right-click on the Case Manager case list, and click Restore > Restore.
3. Browse to and select the backup folder to be restored.
4. (Optional) Select Specify the location of the DB files and browse to the path to store the database files for this case.
   4a. Select In the case folder to place the database files in subfolder of the case folder.
5. You are prompted if you would like to specify a different location for the case folder. The processing status dialog appears, showing the progress of the archive. When the archive completes, close the dialog.
Deleting a Case

To delete a case from the database

1. In the Case Manager window, highlight the name of the case to be deleted from the database.
2. Do either of these:
   - Click Case > Delete.
   - Right-click on the name of the case to deleted, and click Delete
3. Click Yes to confirm deletion.

**WARNING:** This procedure also deletes the case folder. It is recommended that you make sure you have a backup of your case before you delete the case or else the case is not recoverable.

Storing Case Files

Storing case files and evidence on the same drive substantially taxes the processors’ throughput. The system slows as it saves and reads huge files. For desktop systems in laboratories, you can increase the processing speed by saving evidence files to a separate server. For more information, see the separate installation guide.

If taking the case off-site, you can choose to compromise some processor speed for the convenience of having your evidence and case on the same drive, such as a laptop.

Migrating Cases Between Database Types

You can migrate or move cases from one database to another. For more information, see the *Quick Install Guide* and the *Upgrading Cases* guide.
Chapter 7
Working with Evidence Image Files

This chapter contains the following topics

- Verifying Drive Image Integrity (page 115)
- Mounting an Image to a Drive (page 116)
- Benefits of Image Mounting (page 116)
- Characteristics of a Logically Mounted Image (page 117)
- Characteristics of a Physically Mounted Image (page 117)
- Mounting an Image as Read-Only (page 117)
- Mounting a Drive Image as Writable (page 118)
- Unmounting an Image (page 119)
- Restoring an Image to a Disk (page 119)
- Performing Final Carve Processing (page 119)
- Recovering Processing Jobs (page 120)

Verifying Drive Image Integrity

A drive image can be altered or corrupted due to bad media, bad connectivity during image creation, or by deliberate tampering. This feature works with file types that store the hash within the drive image itself, such as EnCase (E01) and SMART (S01) images.

To verify an evidence image’s integrity, a hash of the current file is generated and allows you to compare that to the hash of the originally acquired drive image.

To verify that a drive image has not changed

1. Select Tools > Verify Image Integrity.

   In case the image file does not contain a stored hash, one can be calculated. The Verify Image Integrity dialog provides the following information:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image Name</td>
<td>Displays the filename of the evidence image to be verified.</td>
</tr>
<tr>
<td>Path</td>
<td>Displays the path to the location of the evidence image file.</td>
</tr>
<tr>
<td>Command</td>
<td>Click <strong>Verify</strong> or <strong>Calculate</strong> to begin hashing the evidence image file.</td>
</tr>
</tbody>
</table>
2. Click either **Calculate**, or **Verify** according to what displays in the Command column, to begin hashing the evidence file. The **Progress** dialog appears and displays the status of the verification. If the image file has a stored hash, when the verification is complete, the dialog shows and compares both hashes. Completing these processes may take some time, depending on the size of the evidence, the processor type, and the amount of available RAM.

### Mounting an Image to a Drive

Image Mounting allows forensic images to be mounted as a drive or physical device, for read-only viewing. This action opens the image as a drive and allows you to browse the content in Windows and other applications. Supported types are RAW/dd images, E01, S01, AD1, and L01.

Full disk images RAW/dd, E01, and S01 can be mounted Physically. Partitions contained within full disk images, as well as Custom Content Images of AD1 and L01 formats can be mounted Logically. The differences are explained in this section.

**Note:** Encrypted images cannot be mounted as either a drive or physical device.

### Benefits of Image Mounting

The ability to mount an image with AccessData forensic products provides the following benefits:

- **Mount a full disk image with its partitions all at once; the disk is assigned a Physical Drive name and the partitions are automatically assigned a drive letter beginning with either the first available, or any available drive letter of your choice.**
- **A full disk image mounted physically, and assigned a Physical Drive name that can be read using Imager or with any Windows application that performs Physical Name Querying.**
- **Mount images of multiple drives and/or partitions. The mounted images remain mounted until unmounted or until Imager is closed.**
- **Mounted images can be easily unmounted in any order, individually, or all at once.**
- **A logically mounted image may be viewed in Windows Explorer as though it were a drive attached to the computer, providing the following benefits:**
  - File types with Windows associations can be viewed in their native or associated application, when that application is installed locally.
  - Anti-virus applications can be run on the mounted image.
  - Because the logically mounted image is seen as a drive in Windows Explorer, it can be shared, and viewed from remote computers when Remote Access has been configured correctly.
  - Files can be copied from the mounted image to another location.
- **Mount NTFS / FAT partitions contained within images as writable block devices. This feature caches sections of a read-only image to a temporary location allowing the user to “write” to the image without compromising the integrity of the original image.** Once mounted via the write cache mount method, the data can then be leveraged by any 3rd party tools which require write access.
Characteristics of a Logically Mounted Image

AD1 and L01 are both custom content images, and contain full file structure, but do not contain any drive geometry or other physical drive data. Thus, these images do not have the option of being mounted Physically.

**Note:** When Logically mounting an image, the drive or partition size displays incorrectly in the Windows **Start > Computer** view. However, when you open the “drive” from there, the folders and files contained within the mounted image do display correctly.

Characteristics of a Physically Mounted Image

When you mount an image physically, while it cannot be viewed by Windows Explorer, it can be viewed outside of Imager using any Windows application that performs Physical Name Querying.

E01, S01, and RAW/dd images are drive images that have the disk, partition, and file structure as well as drive data. A physical disk image can be mounted Physically; the disk image partitions can be mounted Logically.

Mounting an Image as Read-Only

To mount an image

1. If you already have the desired image added as evidence in the case, select that item, then do Step 2 to auto-populate the Source box with the image file to be mounted, as shown in Step 3.
   
   If you do not already have the desired image added as evidence, begin with Step 2.

2. Do one of the following:
   
   - Right-click and choose **Mount Image to Drive**.
   - Select the image from the Evidience tree. Right-click and choose **Mount Image to Drive**.
   - Click **Tools > Mount Image to Drive**, then browse to the image on your local drive or on a network drive you have access to.

3. Enter the path and filename, or click **Browse** to populate the Source box with the path and filename of the image to be mounted.

   After selecting an image, the Mount Type will default to the supported mapping based on the image type selected. Click the drop-down to display other available mount types.

4. Select the Mount Type to use for mounting.

   Available Mount Types are Physical & Logical, Physical Only, and Logical Only.

   If the Mount Type selected includes Logical, you can select the Drive Letter to assign as the mount point.

5. Click the **Drive Letter** drop-down to see all drive letters that are available for assignment to the mounted image.

6. Click the **Mount Method** drop-down to select **Block Device / Read Only** or **File System / Read Only**.
7. Click **Mount**.
   
   All the related mount information will be displayed in the Mapped Image List.
   
   To mount another image, repeat the process. You can continue to mount images as needed, until you run out of evidence to add, or mount points to use. Mounted images remain available until unmounted, or until the program is closed.

8. Click **Close** to return to the main window.

## Mounting a Drive Image as Writable

When mounting an image as writable, you must be working with a physical image, and the mount type you select must be Physical & Logical. This is the only option that provides the **Block Device / Writable** Mount Method.

**To mount a drive image as writable**

1. In the **Examiner**, click **Tools > Mount Image to Drive**.
2. Select a full disk image such as 001/Raw dd, E01, or S01 file type.
3. In the **Mount Type** drop-down, select **Physical & Logical**.
4. In the **Drive Letter** drop-down, select **Next Available** (default), or select a different drive letter.
   
   **Note:** Check your existing mappings. If you map to a drive letter that is already in use, the original will prevail and you will not be able to see the mapped image contents.

5. In the **Mount Method** drop-down, select **Block Device / Writable**.
6. In the **Write Cache Folder** text box, type or click **Browse** to navigate to the folder where you want the Write Cache files to be created and saved.
7. Click **Mount**.
   
   You will see the mapped images in the Mapped Image List.

**To view or add to the writable mapped drive image**

1. On your Windows desktop, click **Start > Computer** (or **My Computer**).
2. Find the mapped drive letter in your Hard Disk Drives list. It should be listed by the name of the Image that was mounted, then the drive letter.
3. Double-click on it as you would any other drive.
4. As a test, right-click and choose **New > Folder**.
5. Enter a name for the folder and press **Enter**.
6. The folder you created is displayed in the Folder view.
7. Mapped images remain mapped until unmapped, or until the application is shut down.
Unmounting an Image

To unmount a mounted image
1. Click File > Image Mounting. The Map Image to Drive dialog opens.
2. Highlight the images to unmount, click Unmount. To unmount multiple mappings, click the first, then Shift-click the last to select a block of contiguous mappings. Click a file, then Ctrl-click individual files to select multiple non-contiguous mappings.)
3. Click Done to close the Map Image to Drive dialog.

Restoring an Image to a Disk

A physical image such as 001 (RAW/dd), E01, or S01, can be restored to a drive of equal or greater size to the original, un-compressed drive.

To restore an image to a disk
1. Connect a target drive to your computer.
2. In the Examiner, click Tools > Restore Image to Disk.
3. Click Browse to locate and select the source image. It must be a full-disk image such as 001 (Raw/dd), E01, or S01.
   The source image must be a disk image. A custom content image such as AD1 will not work for this feature.
4. Click the Destination Drive drop-down, select the target drive you connected in Step 1. If you do not see that drive in the list, click Refresh.
5. Mark the Zero-fill remainder of destination drive check box if the drive is larger than the original un-compressed drive.
6. Mark the Notify operating system to rescan partition table when complete check box to allow the new drive to be seen by the OS. If you plan to connect the drive in a different computer there is no need to do this step.
   When you are finished selecting options, click Restore Image to continue.

Performing Final Carve Processing

When you have selections saved as carved files from any file in the Hex viewer, performing Final Carve Processing carves the files, saves them, adds them to the case, and even creates or assigns them to bookmarks you specified when the data was selected.

Final Carve Processing jobs can be monitored in the Progress Window as Additional Analysis Jobs.
Recovering Processing Jobs

Jobs that are started but unable to finish for whatever reason can be deleted or restarted. Click Tools > Recover Processing Jobs. If no jobs remain unfinished, the Recover Processing Jobs dialog box is empty. Click Close. If there are jobs in the list, you can choose whether to Restart or Delete those jobs.

To recover incomplete processing jobs
1. Click Select All, Unselect All, or mark the check box for each job to be recovered.
2. Click Restart.
3. In the Recovery Type dialog, choose the recovery type that suits your needs:
   - Continue processing from where the job ended.
   - Restart the job from the beginning.
4. Click Close.
5. To verify the progress of a restarted or continued job, click Tools > Show Progress Window.

To remove incomplete processing jobs
1. Click Select All, Unselect All, or mark the check box for each job to discard.
2. Click Delete.
3. Click Yes to confirm that you want to delete the job permanently.
4. Click Close.
Chapter 8
Working with Static Evidence

This chapter includes the following topics

- Static Evidence Compared to Remote Evidence (page 121)
- Acquiring and Preserving Static Evidence (page 122)
- Adding Evidence (page 122)
- Working with Evidence Groups (page 126)
- Selecting Evidence Processing Options (page 127)
- Selecting a Language (page 128)
- Examining Data in Volume Shadow Copies (page 129)
- Using Additional Analysis (page 133)
- Data Carving (page 138)
- Hashing (page 138)
- Viewing the Status and Progress of Data Processing and Analysis (page 140)
- Viewing Processed Items (page 141)

Static Evidence Compared to Remote Evidence

Static evidence describes evidence that has been captured to an image before being added to the case.

Live evidence describes any data that is not saved to an image prior to being added to a case. Such evidence is always subject to change, and presents risk of data loss or corruption during examination. For example, a suspect's computer, whether because a password is not known, or to avoid the suspect's knowing that he or she is under suspicion, may be imaged live if the computer has not yet been or will not be confiscated.

Remote evidence describes data that is acquired from remote live computers in the network after the case has been created.

This chapter covers working with static evidence. For more information regarding acquisition and utilization of remote evidence, see Working with Live Evidence (page 142).
Acquiring and Preserving Static Evidence

For digital evidence to be valid, it must be preserved in its original form. The evidence image must be forensically sound, in other words, identical in every way to the original.

See also About Acquiring Digital Evidence (page 27)

Adding Evidence

When case creation is complete, the Manage Evidence dialog appears. Evidence items added here will be processed using the options you selected in pre-processing. Please note the following information as you add evidence to your case:

- You can now drag and drop evidence files from a Windows Explorer view into the Manage Evidence dialog.
- You can repeat this process as many times as you need to, for the number of evidence items and types you want to add.
- DMG (Mac) images are sometimes displayed as “Unrecognized File System.” This happens only when the files are not “Read/Write” enabled.
- If the DMG is a full disk image or an image that is created with the read/write option, then it is identified properly. Otherwise the contents will not be recognized properly.
- After processing, the Evidence Processing selected options can be found in the case log. You can also view them by clicking Evidence > Add/Remove. Double-click on any of the evidence items to open the Refinement Options dialog.
- Popular mobile phone formats (found in many MPE images) such as M4A, MP4, AMR, and 3GP can be recognized. These file types will play inside the Media tab as long as the proper codecs are installed that would also allow those files to play in Windows Media Player.

To add static evidence (an exact image, or “snapshot” of electronic data found on a hard disk or other data storage device) to an existing case, select Evidence > Add/Remove from the menu bar and continue.

Note: Use Universal Naming Convention (UNC) syntax in your evidence path for best results.

Click Refinement Options to override settings that were previously selected for evidence added to this case. If you do not click Refinement Options here, the options that were specified when you created the case will be used.

Configuring Default Processing Options for a Case (page 76)
After evidence has been added, you can perform many processing tasks that were not performed initially. Additional evidence files and images can be added and processed later, if needed.

### Manage Evidence Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add</td>
<td>Opens the <em>Select Evidence Type</em> dialog. Click to select the evidence type, and a Windows Explorer instance will open, allowing you to navigate to and select the evidence you choose.</td>
</tr>
<tr>
<td>Remove</td>
<td>Displays a caution box and asks if you are sure you want to remove the selected evidence item from the case. Removing evidence items that are referenced in bookmarks and reports will remove references to that evidence and they will no longer be available. Click Yes to remove the evidence, or click No to cancel the operation.</td>
</tr>
<tr>
<td>Display Name</td>
<td>The filename of the evidence being added.</td>
</tr>
</tbody>
</table>
| State        | The State of the evidence item:  
  - " " (empty) Indicates that processing is complete.  
  - "+" Indicates the item is to be added to the case  
  - "−" Indicates the item is to be removed from the case.  
  - "**" Indicates the item is processing.  
  - "!" Indicates there was a failure in processing the item.  
  If you click Cancel from the *Add Evidence* dialog, the state is ignored and the requested processing will not take place.  
  **Note:** If the State field is blank and you think the item is still processing, from any tab view, click View > Progress Window to verify. |
| Path         | The full pathname of the evidence file.                                                                                                       |
| ID/Name      | The optional ID/Name of the evidence being added.                                                                                              |
| Description  | The options description of the evidence being added. This can be the source of the data, or other description that may prove helpful later.        |
| Evidence Group| Click the drop-down to assign this evidence item to an Evidence Group. For more information regarding Evidence Groups, see Working with Evidence Groups (page 126). |
| Time Zone    | The time zone of the original evidence. Select a time zone from the drop-down list.                                                          |
| **Merge Case Index** | Merges fragmented index segments to improve performance of index-related commands, such as Index Searching.   
  **Note:** The application automatically merges the case index when system resources allow whether or not Merge Case Index is selected. Selecting this option forces the merge to execute regardless of system resources. |
| Language Setting | Select the code page for the language to view the case in. The *Language Selection* dialog contains a drop-down list of available code pages. Select a code page and click OK. |
| Case KFF Options | Opens the KFF Admin box for managing KFF libraries, groups, and sets for this case.                                                      |
When you are satisfied with the evidence options selected, click **OK**.

**Note:** To remove evidence from the list either before processing, or after it has been added to the case, select the evidence item in the list, then click **Remove**.

**Note:** When you export data from a case as an image, and then add that image as evidence in either the same case or a different case, the name of the image is renamed using a generic term. This prevents a user generated image name from being indexed with evidence.

### To add new evidence to the case

1. Do one of the following:
   - Drag and drop the evidence file into the **Manage Evidence > Evidence Name** list field.
   - Click **Add** to choose the type of evidence items to add into a new case.

   **Important:** Consider the following:
   - Evidence taken from any physical source that is removable, whether it is a “live” drive or an image, will become inaccessible to the case if the drive letters change or the evidence-bearing source is moved. Instead, create a disk image of this drive, save it either locally, or to the drive you specified during installation, then add the disk image to the case. Otherwise, be sure the drive will be available whenever working on the case.
   - To add physical or logical drives as evidence on any 64-bit Windows system you must run the application as an Administrator. Otherwise, an empty drive list displays. If you encounter this problem on a 64-bit system, log out, then run again as Administrator.
   - While it is possible to add a CUE file as a valid image type, when adding a CUE file as “All images in a directory”, although adding the BIN and the CUE are actually the same thing the user gets double of everything.

   **Workaround:** Remove duplicates before processing.

2. Mark the type of evidence to add, and then click **OK**.

3. Click the **Browse** button at the end of the **Path** field to browse to the evidence folder. Select the evidence item from the stored location.

4. Click **OK**.

   **Note:** Folders and files not already contained in an image when added to the case will be imaged in the AD1 format and stored in the case folder. If you select AD1 as the image type, you can add these without creating an image from the data.

5. Fill in the ID/Name field with any specific ID or Name data applied to this evidence for this case.

6. Use the Description field to enter an optional description of the evidence being added.

7. Select the **Evidence Group** that this evidence item belongs to. Click **Manage** to create and manage evidence groups.
8. Select the **Time Zone** of the evidence where it was seized from the drop-down list in the **Time Zone** field. This is required to save the added evidence.

After selecting an Evidence Type, and browsing to and selecting the evidence item, the selected evidence displays under Display Name. The Status column shows a plus (+) symbol to indicate that the file is being added to the case.
Working with Evidence Groups

Evidence Groups let you create and modify groups of evidence. You can share groups of evidence with other cases, or make them specific to a single case.

To create an evidence group
1. In Examiner, click Evidence > Add/Remove.
2. With an evidence item selected in the Display Name box, click Manage to the right of Evidence Group.
3. In the Manage Evidence Group dialog, click Create New to create a new Evidence Group.
4. Provide a name for the new evidence group, and mark the Share With Other Cases box to make this group available to other cases you may be working on.
5. Click Create to create and save this new group.
6. Click Close.

To modify an evidence group
1. In Examiner, click Evidence > Add/Remove.
2. With an evidence item selected in the Display Name box, click Manage to the right of Evidence Group.
3. To modify a group, highlight it in the list, and click Modify.
4. Make the changes to the group, then click Update.
5. Click Close.

To delete an evidence group
1. In Examiner, click Evidence > Add/Remove.
2. With an evidence item selected in the Display Name box, click Manage to the right of Evidence Group.
3. To delete a group, highlight it in the list, and click Delete.
4. Click Close.
Selecting Evidence Processing Options

The Evidence Processing options allow selection of processing tasks to perform on the current evidence. Select only those tasks that are relevant to the evidence being added to the case.

See Configuring Default Processing Options for a Case on page 76.

After processing, the Evidence Processing options selected for this case can be found in the case log. You can also view them by clicking Evidence > Add/Remove. Double-click on any of the evidence items to open the Refinement Options dialog.

Some pre-processing options require others to be selected. For example:

- Data Carving depends on Expand
- KFF depends on MD5 hashing
- Flag Duplicates depends on MD5 hashing
- Indexing depends on Identification
- Flag bad extension depends on File Signature Analysis.

Different processing options can be selected and unselected depending on the specific requirements of the case.

At the bottom of every Refinement Options selection screen are the following options:

- OK: accepts current settings without saving for future use.
- Cancel: cancels the entire Detailed Options dialog without saving settings or changes, and returns to the New Case Options dialog.

If you choose not to index in the Processing Options page, but later find a need to index the case, click Evidence > Additional Analysis. Choose All Items, and check dtSearch Index.

To set Evidence Refinement Options for this case

1. Click Refinement Options to open the Refinement Options dialog. Refinement Options are much the same as Detailed Options.
   
   The sections available are:
   - Evidence Processing: For more information on Evidence Processing options, see Selecting Evidence Processing Options (page 127).
   - Evidence Refinement (Advanced): For more information on Evidence Refinement (Advanced) options, see Configuring Evidence Refinement (Advanced) Options (page 99).
   - Index Refinement (Advanced): For more information on Index Refinement (Advanced), see Selecting Index Refinement (Advanced) Options (page 101).

2. Click OK to accept the settings and to exit the Manage Evidence dialog.

3. Select the KFF Options button to display the KFF Admin dialog.

   Note: The AD Alert and the AD Ignore Groups are selected by default.

4. Click Done to accept settings and return to the Manage Evidence dialog.

5. Click Language Settings to select the code page for the language to be used for viewing the evidence. More detail is given in the following section.

6. Click OK to add and process the evidence.
Selecting a Language

If you are working with a case including evidence in another language, or you are working with a different language Operating System, click Language Settings from the Manage Evidence dialog.

The Language Setting dialog appears, allowing you to select a code page from a drop-down list. When the setting is made, click OK.
Examining Data in Volume Shadow Copies

You can examine data that is contained in NTFS Volume Shadow Copies. In NTFS partitions, the Volume Shadow Copy Service (VSS) maintains a copy of every 16 KB block that is changed. These blocks are packaged up at predetermined times (which differ depending on the operating system being run) as a Volume Shadow Copy (VSC) or restore point. These restore points can contain data that has been renamed or deleted. They can also contain hidden malware, especially persistent code.

Encrypted drives are supported.

You can mount and process restore points as a separate evidence items within a case. When restore points are processed, a unique file system image for each restore point is created under the source NTFS partition.

You can view the files in the different file system images to analyze the difference between each restore point and the files that are unique to each one. This helps you see how a system has changed over a period of time. You can identify and parse files within the restore points and can search for evidence or malware hidden there.

You configure the processing of restore points when you add new evidence to a case. You can do this for a new case or an existing case. If the evidence that you are adding contains an NTFS partition with Volume Shadow Copy restore points, a Select Restore Points option is available. You can view all of the available restore points and select the ones that you want to process.

When viewing the restore point data, you can use the following VSC-related columns the provides details about the data.

**VSC-related Columns**

<table>
<thead>
<tr>
<th>VSC-Delta Restore Point End</th>
<th>Date of second restore point of a delta file</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSC-Delta Restore Point Start</td>
<td>Date of first restore point of a delta file</td>
</tr>
<tr>
<td>VSC-Delta State</td>
<td>The state of a delta file as compared in two restore points</td>
</tr>
<tr>
<td>VSC-Renamed From</td>
<td>The name this file was renamed from</td>
</tr>
<tr>
<td>VSC-Renamed To</td>
<td>The name this file was renamed to</td>
</tr>
<tr>
<td>VSC- Restore Point Date</td>
<td>Date of restore point this file came from</td>
</tr>
</tbody>
</table>

See Managing Columns on page 460.
About Restore Point Processing Options

When you select restore points to process, you select the following options:

- Which restore points to include
- The restore point expansion options (Delta/Full)

Restore Points Selection

If an NTFS partition has restore points, you can select which restore points to expand as file system images. Each restore point that you select is represented by a unique file system. You can select the Current files as well as any previous restore points.

Important: You can select to process one or more restore point. If you do not select a restore point, you cannot add it later within the same evidence item. You must re-add the NTFS partition as a new evidence item and then select the desired restore points.

Restore Point Expansion Options

You choose from the following expansion options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full</td>
<td>All restore points are added as full file systems. The benefit of this option is that you can view all of the files in all of the restore points. However, you will potentially have duplicate files, making the data set large. It can also make it more difficult to find the files that have been deleted or modified. If &quot;Full&quot; restore option is selected, you are warned if more than one restore point is checked. You can add the evidence item again if you don’t choose to add it as a restore point image originally. You can then choose restore points.</td>
</tr>
</tbody>
</table>
Managing Restore Points

To process restore point file systems
1. In either a new or an existing case, add new evidence, and select evidence that has an NTFS partition.
2. On the Manage Evidence page, click Choose Restore Points.
   If the button is active, then the evidence has an NTFS partition.
   If the button is grayed out, the evidence does not have an NTFS partition.
   When you click the button, if the NTFS partition does not have any restore points, a message is displayed.
3. Select the restore points that you want to process as file systems.
   See About Restore Point Processing Options on page 130.
4. Select the expansion option.
5. Click OK.

Viewing Restore Point Data

After the evidence with the restore points has been processed, you can view the data. You can view the created file systems for the restore points that you selected.

You can also add columns to the File List to display

To view restore point file systems
1. In the Examiner, click the Explore tab.
2. Select the evidence item and the the NTFS partition.
3. You can view a file system image for each restore point.
4. You can view the content of each restore point to compare folders and files.
5. You can use VSC-related columns to view detailed data. See VSC-related Columns on page 129.

6. You can also use searches, filters, and so on to find and analyze the files in the share points.

**Note:** If you selected “Latest to Oldest”, the tree will show *Current* first, but then the deltas are sorted by the oldest to the newest. If you selected “Oldest to Latest” the folders are sorted in the correct order.
Using Additional Analysis

After evidence has been added to a case and processed, you may wish to perform other analysis tasks. To further analyze selected evidence, click **Evidence > Additional Analysis**.

Most of the tasks available during the initial evidence processing remain available with Additional Analysis. See **Evidence Processing Options** on page 81.

Specific items can also be targeted. Multiple processing tasks can be performed at the same time.

Make your selections based on the information in the table below. Click **OK** when you are ready to continue.

**Additional Analysis Options**

<table>
<thead>
<tr>
<th>Field Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hashing / Job Options Tab</strong></td>
<td></td>
</tr>
<tr>
<td>File Hashes</td>
<td>These options create file hashes for the evidence. The Options are:</td>
</tr>
<tr>
<td><strong>MD5 Hash:</strong></td>
<td>This hash option creates a digital fingerprint based on the contents of the file. This fingerprint can be used to verify file integrity and to identify duplicate files.</td>
</tr>
<tr>
<td><strong>SHA-1 Hash:</strong></td>
<td>This hash option creates a digital fingerprint based on the contents of the file. This fingerprint can be used to verify file integrity and to identify duplicate files.</td>
</tr>
<tr>
<td><strong>SHA-256:</strong></td>
<td>This hash option creates a digital fingerprint based on the contents of the file. This fingerprint can be used to verify file integrity and to identify duplicate files.</td>
</tr>
<tr>
<td><strong>Flag Duplicates:</strong></td>
<td>Mark to flag duplicate files. This applies to all files in the case, regardless of the Target Items selected.</td>
</tr>
</tbody>
</table>

**Note:** A blank hash field appears for unallocated space files, the same as if the files had not been hashed at all. To notate in the hash field the reason for it being blank would slow the processing of the evidence into the case.

<table>
<thead>
<tr>
<th>KFF</th>
<th>Enables the Known File Filter (KFF) that lets you identify either known insignificant files that you can ignore or known illicit or dangerous files that you want to be alerted to. When you enable KFF, you must select a KFF Template to use. You can select an existing KFF Template from the drop-down menu or click ... to create a new one. See <strong>Using the Known File Filter (KFF)</strong> on page 263. You can select to <strong>Recheck previously processed items</strong> when searching for new information, or when a KFF group is added or changed. Mark <strong>Recheck previously processed items</strong> if changes have been made to the KFF since the last check.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Items</strong></td>
<td>Select the items on which to perform the additional analysis. Highlighted, and Checked items will be unavailable if no items in the case are highlighted or checked. The following list shows the available options:</td>
</tr>
<tr>
<td><strong>Highlighted Items:</strong></td>
<td>Performs the additional analysis on the items highlighted in the File List pane when you select Additional Analysis.</td>
</tr>
</tbody>
</table>
### Additional Analysis Options (Continued)

<table>
<thead>
<tr>
<th>Field Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Checked Items:</strong></td>
<td>Performs the additional analysis on the checked evidence items in the File List pane when you select Additional Analysis.</td>
</tr>
<tr>
<td><strong>Currently Listed Items:</strong></td>
<td>Performs the additional analysis on all the evidence items currently listed in the File List pane when you select Additional Analysis.</td>
</tr>
<tr>
<td><strong>All Items:</strong></td>
<td>Performs the additional analysis on all evidence items in the case.</td>
</tr>
<tr>
<td><strong>PhotoDNA</strong></td>
<td>Enables PhotoDNA which lets you compare images in your evidence against known images in a library. See Using PhotoDNA to Compare Images on page 311.</td>
</tr>
<tr>
<td><strong>Refinement</strong></td>
<td>Include OLE Streams: Includes Object Linked or Embedded (OLE) items that are part of files that meet the other criteria.</td>
</tr>
<tr>
<td><strong>Job Options</strong></td>
<td>Send Email Alert on Job Completion: Opens a text box for the entry of an email address destination for a notification email when these jobs complete. Note: Outgoing TCP traffic must be allowed on port 25.</td>
</tr>
</tbody>
</table>

### Indexing / Tools tab

**Indexed Search**

**dtSearch® Index**

Choose **dtSearch® Index** to create a dtSearch index that enables instantaneous index searches. Marking **dtSearch Index** activates the Entropy Test check box.

**Entropy Test**

Select **Entropy Test** to exclude compressed or encrypted items from the indexing process.

**Decryption**

**Decrypt Credant Files:**

See Decrypting Credant Files on page 189. If you select to decrypt Credant files, the **File Signature Analysis** option will automatically be selected as well.

**Perform Automatic Decryption:**

Attempts to decrypt files using a list of passwords that you provide. See Decrypting Files Using Right-Click Auto Decryption on page 183.

**Other Tools:**

**Optical Character Recognition:**

 Parses text from graphics images and adds them to the Index. Creates an additional file with the OCR extension. Click **OCR Options** to select specific graphics files to run the OCR process on, or to set limiting factors such as size, or grayscale. For more detailed information regarding OCR settings and options, see Running Optical Character Recognition (OCR) (page 95).
**Additional Analysis Options (Continued)**

<table>
<thead>
<tr>
<th>Field Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explicit Image Detection:</strong></td>
<td>Enables EID Options button. The EID license is purchased separately. This item will be disabled unless the license is detected on your CmStick. Click <strong>EID Options</strong> to select the processes to run. Choose default, speed, or accuracy settings. See <strong>Evaluating Explicit Material</strong> on page 308.</td>
</tr>
<tr>
<td><strong>Registry Reports:</strong></td>
<td>Enables Registry Summary Reports (RSRs) to be used directly from Registry Viewer if it is installed. Click RSR Directory to specify the location of any RSR templates you have saved or downloaded from the AccessData web site.</td>
</tr>
<tr>
<td><strong>Cerberus Analysis</strong></td>
<td>Performs a malware analysis on executable binaries. See <strong>About Cerberus Malware Analysis</strong> on page 210. See <strong>Running Cerberus Malware Analysis</strong> on page 228.</td>
</tr>
<tr>
<td><strong>Cerberus Analysis:</strong></td>
<td>Lets you run the add on module for Cerberus Malware Triage. You can click <strong>Cerberus Options</strong> to access additional options. For more information see <strong>About Cerberus Malware Analysis</strong> (page 210)</td>
</tr>
<tr>
<td><strong>Language Identification</strong></td>
<td>Analyzes the first two pages of every document to identify the languages contained within. The user will be able to filter by a Language field within review and determine who needs to review which documents based on the language contained within the document. See <strong>Identifying Document Languages</strong> on page 332.</td>
</tr>
<tr>
<td><strong>Document Content Analysis</strong></td>
<td>Analyzes the content and groups it according to topic in the Overview tab. When selected, the DCA Options button is also activated and opens the Document Content Analysis Options. See <strong>Using Document Content Analysis</strong> on page 401.</td>
</tr>
</tbody>
</table>
| **Entity Extraction (Document Content)** | Identifies and extracts specific types of data in your evidence. You can select to process one or all of the following types of entity data:  
  - Credit Card Numbers  
  - Phone Numbers  
  - Social Security Numbers  
In the Examiner, under the Document Content node in the Overview tab, you can view the extracted data. See **Using Entity Extraction** on page 397. |
| **Cluster Analysis** | (AD Lab and Summation license only) Invokes the extended analysis of documents to determine related, near duplicates, and email threads. See **Performing Cluster Analysis** on page 403. Configure the details by clicking **Analysis Options**. |
### Additional Analysis Options (Continued)

<table>
<thead>
<tr>
<th>Field Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Cluster Analysis Options**        | (AD Lab and Summation license only) This lets you specify the options for Cluster Analysis. You can specify which document types to process:  
  - Documents  
  - Presentations  
  - Spreadsheets  
  - Email  
  You can also specify the similarity threshold, which determines the level of similarity required for documents to be considered related or near duplicates. |
| **Generate System Information**      | Extracts data and populates the System Information tab. See Viewing System Information on page 381. |

### Miscellaneous tab

**File Type Identification**  
*File Signature Analysis:* Analyzes files to indicate whether their headers or signatures match their extensions.  
Before version 5.1, when performing additional analysis, if you selected certain processing options, such as *Flag Bad Extensions*, dtSearch Text Index, Data Carve, OCR, Explicit Image Detection, or Decrypt Credant Files, the *File Signature Analysis* option was automatically selected and the option was disabled so that you could not un-select it. Stating in version 5.1, if you select one of those options, the *File Signature Analysis* option is still automatically selected, but the option is not disabled and you can manually un-select it. Disable this option with care.  
This does not apply to the initial processing options.

**Carving**  
Carves data immediately after pre-processing. Click *Carving Options*, then select the file types to carve. Uses file signatures to identify deleted files contained in the evidence. All available file types are selected by default.  
For more information on Data Carving, see Data Carving (page 90).  
Selecting this will also enable the *Expand Compound Files* option.

**Miscellany**  
*Expand Compound Files (Email, OLE, ZIP, etc.)*:  
Expands and indexes files that contain other files.  
*Include Deleted Files.* Checked by default. Uncheck to exclude deleted files from the case.  
See Expanding Compound Files on page 84.

*Create Thumbnails for Graphics:*  
Generates thumbnails for graphic files found in the evidence. Thumbnails are always .JPG format, regardless of the original graphic format.  
See Examining Graphics on page 305.
### Additional Analysis Options (Continued)

<table>
<thead>
<tr>
<th>Field Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create Thumbnails for Videos</td>
<td>Creates thumbnails for all videos in a case. You can also set the frequency for which video thumbnails are created, either by a percent (1 thumbnail every “n”% of the video) or by interval (1 thumbnail every “n” seconds. See Examining Videos on page 315.</td>
</tr>
<tr>
<td>Generate Common Video File</td>
<td>When you process the evidence in your case, you can choose to create a common video type for videos in your case. These common video types are not the actual video files from the evidence, but a copied conversion of the media that is generated and saved as an MP4 file that can be previewed on the video tab. See Examining Videos on page 315.</td>
</tr>
<tr>
<td><strong>Flag Bad Extensions:</strong></td>
<td>Flags files that have extensions that do not match the file headers.</td>
</tr>
<tr>
<td><strong>HTML File Listing:</strong></td>
<td>Generate a list of files contained in the case, in HTML format.</td>
</tr>
<tr>
<td><strong>CSV File Listing:</strong></td>
<td>Generate a list of files contained in the case, in CSV format. This list can be used in any CSV supported spreadsheet application.</td>
</tr>
<tr>
<td>Don’t Expand Embedded Graphics.</td>
<td>This option lets you not process embedded graphics from email items. The default behavior has not changed. This option only applies if you select it in the processing options.</td>
</tr>
<tr>
<td>Process Internet Browser History for Visualization</td>
<td>Processes internet browser history files so that you can see them in the detailed visualization timeline. See Visualizing Browser History Data on page 294.</td>
</tr>
</tbody>
</table>
Hashing

When the MD5 Hash option is chosen for evidence processing, the MD5 hash value for every file item discovered within the evidence is computed. The same is true for SHA-1 Hash and SHA-256 options. In general, a hash value can be used (in most situations) to uniquely identify a digital file - much like a finger print can uniquely identify the person to whom it belongs.

Several specific purposes are served by enabling hashing during processing. First and foremost, when the MD5 Hash and/or SHA-1 Hash options are chosen along with the KFF option, each file item’s MD5 (and/or SHA-1) value can be found within the KFF Library. The KFF Library does not contain any SHA-256 values. All of the file items within the evidence that have been encountered and reliably cataloged by other investigators or US Federal Government archivists can be identified. This feature lets you find the “known” files within the evidence, which brings some intriguing advantages to the investigator.

These are described in Using the Known File Filter (KFF) (page 263).

Data Carving

Data carving is the process of locating files and objects that have been deleted or that are embedded in other files.

You can recover and add embedded items and deleted files that contain information that may be helpful in forensic investigations.

The data carving feature allows the recovery of previously deleted files located in unallocated space. Users can also carve directory entries to find information about data or metadata.

**Note:** You can create custom carvers. In addition, you can manually carve for any file type for which you have the correct header/footer/file length information, then save that file and add it to the case. In addition, you can carve any data from any file, and save the selected data as a separate file and add it to the case.

See also Custom Carvers (page 92).

To recover embedded or deleted files, the case evidence is searched for specific file headers. Using the data from a file header for a recognized file type the length of that file is determined, or the file footer is found, and “carves” the associated data, then saves it as a distinct file. A child object is created with a name reflecting the type of object carved and its offset into the parent object’s data stream. Embedded or deleted items can be found as long as the file header still exists.

Data carving can be done when adding evidence to a case, or by clicking Evidence > Additional Analysis > Data Carve from within a case.

**Recognized File Types for Data Carving**

- AOL Bag Files
- BMP Files
- EMF Files
- GIF Files
- HTML Files
- LNK Files
- OLE Archive Files (Office Documents)
- PDF Files
- PNG Files
- TIFF Files
Recognized File Types for Data Carving (Continued)

- JPEG Files
- Zip Files

You can set additional options to refine the data carving process for the selected file types.

Data Carving Files When Processing a New Case

Data Carving can be done during initial case creation by setting preprocessing options, or later, as an Additional Analysis task.
Viewing the Status and Progress of Data Processing and Analysis

The Data Processing Status screen lets you view the status of any processing, analysis, or searching that is being done on evidence in a case. This screen is also called the Progress Window.

To view the status and progress of data processing and analysis

1. In the Examiner, click View > Progress Window to open the Data Processing Status screen. Processing is categorized according to the following job types:
   - Add Evidence
   - Additional Analysis
   - Live Search
   - Other

2. Click on a job type in the left pane, to view aggregate progress statistics for all of the items in a job type.

3. Click the expand icon to the left of a job type and then select an individual job or task to view the status of jobs and tasks. Details about each task in a job are displayed in the right hand pane under Messages.

You can also view the following status information about job processing:

<table>
<thead>
<tr>
<th>Information</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>The percentage complete as each task progresses.</td>
</tr>
<tr>
<td>Discovered</td>
<td>The number of items that have been discovered.</td>
</tr>
<tr>
<td>Processed</td>
<td>The number of items that have been processed. If you compare the numbers in the Data Processing Status screen with the numbers shown in Overview tab &gt; Case Overview &gt; File Category, for example, you may notice that the numbers are not the same. If there is a difference, the numbers in the case are accurate; the numbers in the Data Processing screen on the progress bar items are not.</td>
</tr>
<tr>
<td>Indexed</td>
<td>The number of items that have been indexed.</td>
</tr>
<tr>
<td>Process State</td>
<td>The current status of a job's processing. When the job is complete, this displays Finished, and the Message box in the right pane also displays Job Finished.</td>
</tr>
<tr>
<td>Name</td>
<td>The file name of the evidence item that is processing in a task.</td>
</tr>
<tr>
<td>Path</td>
<td>The path to where the evidence item is stored.</td>
</tr>
<tr>
<td>Process Manager</td>
<td>The Process Manager computer is listed by its name or by its IP Address. If your Evidence Processing Engine runs on the same computer as the Examiner and the database, then &quot;localhost&quot; is the default Process Manager. If you are using Distributed Processing, the Process Manager or the Remote Processing computer is listed.</td>
</tr>
</tbody>
</table>
4. You can select from the following options:
   - **Job Folder** lets you open the location where the JobInformation.log for this job is stored. You can view detailed information about the processing tasks and any errors or failures in the JobInformation.log file.
   - **Remove when finished** lets you remove a task or job from the job list when it has completed processing.
   - **Cancel** lets you stop the current task from running.

5. Click **Close** to close the display but not cancel any current tasks.

**Viewing Processed Items**

It is not necessary to wait for the program to finish processing the case to begin viewing data. The metadata—the information about the evidence—can be viewed in several modes before the evidence image has completed processing.

**Important:** Do not attempt to do any search prior to processing completion. You can view processed items from the tabbed views, but searching during indexing may corrupt the index and render the case useless.
Chapter 9
Working with Live Evidence

You can acquire live evidence from local and remote network computers. Adding and using both local and remote live evidence is covered in this chapter.

See also About Acquiring Digital Evidence (page 27) for details on the ways that evidence can be acquired, and precautions to take before acquiring evidence.

This chapter includes the following topics

- About Live Evidence (page 142)
- Adding Local Live Evidence (page 143)
- Methods of Adding Remote Live Evidence (page 144)
- Requirements for Adding Remote Live Evidence (page 144)
- Adding Evidence with the Temporary Agent (page 145)
- Adding Data with the Enterprise Agent (page 147)

About Live Evidence

Data that you gather and process from an active data source is called live evidence. You can gather this data from either local or remote sources.

Types of Remote Data to Acquire

<table>
<thead>
<tr>
<th>Data Types found in RAM</th>
<th>Memory Data</th>
<th>Drive Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Info</td>
<td>RAM</td>
<td>Physical Drives</td>
</tr>
<tr>
<td>DLL Info</td>
<td>Memory Search</td>
<td>Logical Drives</td>
</tr>
<tr>
<td>Sockets</td>
<td></td>
<td>Mounted Devices</td>
</tr>
<tr>
<td>Driver List</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open Handles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Descriptor Tables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Devices</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Some live evidence like processes and services information may fluctuate and change frequently. This evidence is called volatile data. Volatile data is different than memory data and does not contain the same information as a
Memory Data (RAM) acquisition. A RAM acquisition downloads all the RAM data into a memory dump, and then it is read and processed when you add it to a case.

Drive data includes physical drives and devices, logical drives and devices, and mounted devices on a remote computer.

Administrative rights and permissions are required on the remote computer to collect remote live evidence. See Requirements for Adding Remote Live Evidence on page 144.

Types of Live Evidence

Live evidence is data that you gather and process from an active data source. It is important to understand any implications of acquiring data live. See About Acquiring Digital Evidence on page 27.

You can acquire and investigate the following types of live evidence:

- Local live evidence.
  An example of local live evidence is an original drive or other electronic data source that is attached to the investigation computer. It can also be data acquired from a device on a remote computer while the device is mounted to the system as Read/Write.
  See Adding Local Live Evidence on page 143.
- Remote live evidence.
  You can acquire data directly from computers on your network. This data is called remote live evidence. The process of adding the data into a case is called remote data acquisition.

Adding Local Live Evidence

You can add live evidence and then create a static image of that data. You can also add the data without creating an image, but realize that as the files are read, the operating system makes changes to the file statuses, the Read date and time stamps, and the Accessed time and date stamps. You can add the entire contents of a folder or a single file from a device that is attached to the Examiner machine.

To add live evidence to a case

1. In Examiner, click Evidence > Add/Remove.
2. In the Manage Evidence dialog box, click Add.
3. Do one of the following:
   - Click Contents of a Directory, then click OK. Browse to and select the directory. Read the warning. To continue click Yes.
   - Click Individual Files, then click OK. Browse to the location, select one or more files. You can use Shift-Click or use Ctrl-Click to select multiple files. Read the warning. To continue click Yes.
   - Click Physical Drive, then click OK. Read the warning. To continue, click Yes. Select a drive. The drives are listed in UNC format and are pre-pended with the string: PHYSICALDRIVE. Click OK.
   - Click Logical Drive, then click OK. Read the warning. To continue, click Yes. Select a drive. The drives are listed by drive letter. Click OK.
4. A job is created and the Data Processing Status window opens. Live Evidence Jobs are displayed under Other Jobs.
5. Click Close.
Methods of Adding Remote Live Evidence

There are two agent applications that you can install on networked computers to add remote live evidence. The following agents are included:

- **Temporary Agent.**
  
  The Temporary Agent is an application for short-term use on client computers to access and acquire specific remote live evidence. It is set to expire after a period of inactivity and then it automatically uninstalls itself.

- **Enterprise Agent.**
  
  The Enterprise Agent is a persistent agent application for client computers that lets you remotely perform administrative tasks such as memory searches, memory dumps, memory analysis, remote device mounting and device acquisition.

Requirements for Adding Remote Live Evidence

To use *Add Remote Data* the following requirements must be met:

- Your user account must have the Application Administrator or the Case Administrator role. Case Reviewers cannot access the *Add Remote Evidence* dialog.
- Your Windows user account must have local administrator rights on the computer from which you want to acquire the data.
- An Agent must be installed on the target remote computer.

*Note:* On Windows Vista, Windows 7, and Windows Server 2008 systems, the application must be run as an administrator in order to push agents to remote computers. To run as administrator, you can right-click on the desktop icon and click, run as administrator.

Simple File Sharing must be disabled on Windows XP targets. The default setting is enabled.
Adding Evidence with the Temporary Agent

The Temporary Agent can acquire forensic images of the physical and logical drives, acquire non-proprietary images of memory, and forensically mount physical devices or logical volumes to the Examiner computer. You can remotely mount up to three devices simultaneously.

When you deploy the Temporary Agent, it automatically creates and uses a temporary certificate for secure communications. This certificate automatically expires and is only valid for a limited scope.

Pushing the Temporary Agent

You can push the Temporary Agent to a remote computer to acquire data. The temporary agent remains active until it has not had any activity for a short period of time. After the period of time is over, the Temporary Agent automatically uninstalls itself. You can also manually disconnect the agent from the Tools menu in Examiner.

Certain requirements must be met in order to deploy the temporary agent. See Requirements for Adding Remote Live Evidence on page 144.

To push the Temporary Agent

1. In the Examiner, click Evidence > Add Remote Data.
2. Enter either the IP Address or the DNS hostname of the target computer.
3. Make sure that a Remote Port is designated to use. The default port is 3999.
4. Choose Install a Temporary Agent.
5. Click OK.

Note: In Windows, if the user has defined a TEMP\TMP path different from the system default TEMP\TMP path, the agent will push successfully to the machine, but will not run properly.

To workaround, make sure that the TEMP / TMP environment variables are set to:

%USERPROFILE%\AppData\Local\Temp

6. Enter the credentials of a user who is a member of the local administrators group on the target computer.

Note: The authentication domain is required for both domain accounts and local accounts. If using a local account, enter the IP address or the DNS hostname of a local administrator account.

7. Click Add to add the set of credentials to the list.
8. Click OK.
9. In the Remote Data dialog, select from the following options to acquire and click OK.
   - Image Drives: Lets you create an image of a drive or device on the remote system. You can store the image on the remote computer or on the Examiner computer. You can also automatically add the image into a case.
   - Acquire RAM: Lets you acquire the data currently held in memory on the target machine. You can also capture and automatically import a memory dump, or save the memory dump to a location. See also Importing Memory Dumps (page 155).
   - Mount Device: lets you mount a remote drive or device and view it in Windows Explorer as if it were attached to your drive. It can be a CD or DVD, a USB storage device, or a drive or partition. See also Unmounting an Agent Drive or Device (page 155).
**Note:** The *Preview Information Only* option is not available for the Temporary Agent.

The job begins and the *Data Processing Status* window opens. *Acquire Remote Data* jobs are displayed under *Other Jobs*. Click **Close** to close the *Data Processing Status* window.

## Manually Deploying the Temporary Agent

You can manually install the agent and the required certificate key.

### Requirements for Manually Deploying the Temporary Agent

- Either a self-signed certificate, or a CA-signed certificate to run the manual deployment from a thumb drive.
- Administrator privileges on the target computer.
- Network connectivity to the target computer.

### To manually deploy the Temporary Agent

1. Copy the appropriate **Agent.EXE** (32-bit, or 64-bit) from
   
   ```
   C:\Program Files\AccessData\Forensic Toolkit\<version>\bin\Agent\x32 (or x64)
   ```
   
   to a thumb drive or a shared network resource that is available to both the host and the target machines.

2. Copy the public key certificate file to the same thumb drive or a shared network resource. If you used the *Examiner* to create a certificate, the file is stored by default at:
   
   ```
   C:\Program Files\AccessData\Forensic Toolkit\<version>\bin\
   ```

3. Create a new folder on the target machine.

4. Copy the CRT and agent files from the thumb drive or shared resource to the new folder.

5. Open a command line and navigate to the path of the **Agent2** folder.

6. Run one of the following command lines, depending on if the agent is 32-bit or 64-bit.

   ```
   ftkagent.EXE -cert [certname.crt] -port [portnumber]
   ftkagentx64.EXE -cert [certname.crt] -port [portnumber]
   ```

7. Depending on which agent file you deployed, you will see either **FTKAgent.EXE** or **FTKAgentx64.EXE** in the Task Manager. *Do not* close the command line, or the agent uninstalls.
Adding Data with the Enterprise Agent

The Enterprise Agent lets you acquire data from remote systems in your network. You can map to a remote drive and preview the contents before adding it to the case.

Methods of Deploying the Enterprise Agent

You can use the following methods to deploy the Enterprise Agent to remote computers:

- **Push agent**: You can use Examiner to deploy the Enterprise Agent from the server to remote computers.
- **Manual installation**: You can manually install the agent executable and the required public certificate key on the target machine.
- **Network deployment**: The Enterprise Agent can be also deployed with other means. For example with Active Directory, or with third-party software management utilities.

Creating Self-signed Certificates for Agent Deployment

Communication between the Enterprise Agents and the Examiner computer are transmitted on a Secure Socket Layer (SSL) encrypted channel. The SSL certificates can be either self-signed within the Examiner, or signed by a Certificate Authority (CA).

You must have three types of communications certificates to use the Enterprise Agent. These include a private key, a corresponding public key, and trusted certificate that AccessData provides when you install.

Once you have the certificates, you must configure the communications settings before you can push the agent to remote computers.

For more information see Configuring Communication Settings for the Enterprise Agent Push (page 148)

You can use the Examiner to create self-signed certificates.

Creating Self-Signed Certificates with Certman

Certman is a utility, bundled with several AccessData products, that can be used to generate self-signed certificates. These certificates can be used with the Enterprise Agent and other AccessData products. The steps below will demonstrate how to use Certman.

Prerequisites:

- Copies of certman.exe, libeay32.dll, and boost_thread-vc100-mt-1_49.dll, all in the same folder (typically found in [Drive]:\Program Files\AccessData\Forensic Toolkit\[version]\bin\certman.exe)

To Create Self-Signed Certificates with Certman

1. Open a Command Prompt (as Administrator)
2. Navigate to the folder containing certman.exe
3. Run the following command to generate a self-signed public/private key pair:
   `certman.exe -e -n <issuer> <certificate_name>`
   Where `<issuer>` is the name of the local PC where Certman is being run (including domain, if applicable), and `<certificate_name>` is what you’d like to name the certificate.
   Certman will generate a P12 key package, KEY private key, and CRT public certificate in the same folder as certman.exe
   Example:
   If my PC were named "ADPC", on the "adlocal.com" domain, and I wanted my certificates to be named "MyCert", I'd run the following command:
   `certman.exe -e -n ADPC.adlocal.com MyCert`
   This would produce a key package named MyCert.p12, a private key named MyCert.key, and a public certificate named MyCert.crt.

   **Note:** The resulting P12 key package will be unencrypted, allowing it to be imported into IIS (without a password).

---

### Configuring Communication Settings for the Enterprise Agent Push

You must set up the Enterprise Agent communications settings before you can push the agent to target computers.

To use the Enterprise Agent, you must provide certificates for a public and private key.

For more information see Creating Self-signed Certificates for Agent Deployment (page 147).

**To configure communications settings for the Enterprise Agent push**

1. In the *Examiner*, click **Tools > Configure Agent Push**.
2. In the *Configure Agent Push* dialog, configure the following options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Path to UNC share</strong></td>
<td>The network path to the share formatted as a UNC. Do not include the server name portion of the path. For example, if the path is \TARGETSYSTEM\SHARE, then enter \SHARE. It is recommended to use a path that is ubiquitous across all target systems. For example, the ADMIN$ share.</td>
</tr>
<tr>
<td><strong>Local path to shared folder</strong></td>
<td>The same directory specified in the <strong>Path to UNC Share</strong> field, but written in a local folder syntax. The agent requires a local path in order to execute its tasks.</td>
</tr>
<tr>
<td><strong>Path to trusted modules certificate</strong></td>
<td>This is an AccessData supplied certificate that is automatically added when you install. You should not normally need to modify this location.</td>
</tr>
<tr>
<td><strong>Path to agent modules</strong></td>
<td>This is the location on the <em>Examiner</em> computer where the agent modules files are stored. You should not normally need to modify this location.</td>
</tr>
</tbody>
</table>
3. Click **OK**.

### Pushing the Enterprise Agent

You can push the Enterprise Agent from the server to remote computers.

Before you can do this task, you must first configure your Enterprise Agent settings.


#### To push the Enterprise Agent

1. In the **Examiner**, click **Tools > Push Agents**.
2. Do one of the following:
   - In the **Machines to install** field, enter an IP address, or a DNS hostname for target computer and click **Add**.
   - Click **Import** to add a list computers from a file.
3. Choose from the following options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Path to public key</strong></td>
<td>The public key that is to be used by the agent. The public key can be either a CERT or a P7B. A P7B file is a container of certificates with a chain of public keys up to the Certificate Authority.</td>
</tr>
<tr>
<td><strong>Path to private key</strong></td>
<td>This is the location of the private key certificate. For example this can be PXCS12, PFX, PEM, P12, PEM.ADP12, or P12.ADP12. ADP12 is an AccessData protected and encrypted P12 certificate. The <strong>Examiner</strong> automatically creates and uses ADP12 private keys when you supply it with a PEM or P12 private key.</td>
</tr>
<tr>
<td><strong>Agent port</strong></td>
<td>By default the agent is configured to listen on port 3999. You can use this field to configure the agent to use a different port.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Option</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Uninstall Agent</td>
<td>Lets you uninstall the agent from a computer that already has it installed. See also Removing the Enterprise Agent (page 150)</td>
</tr>
<tr>
<td>Use custom agent name</td>
<td>Lets you rename the agent process. For example you can use the field to rename the process to something more descriptive, or less descriptive. You can change the following names: Service name, Executable name</td>
</tr>
</tbody>
</table>
Removing the Enterprise Agent

You can use Examiner to remotely uninstall the Enterprise Agent from target computers.

To remove the Enterprise Agent
1. In the Examiner, click Tools > Push Agents.
2. Do one of the following:
   - In the Machines to install field, enter an IP address, or a DNS hostname of the target computer and click Add.
   - Click Import to add a list of computers from a file.
3. Select Uninstall Agent.
4. Click OK.

Connecting to an Enterprise Agent

To connect to the Enterprise Agent
1. In the Examiner, Click Evidence > Add Remote Data.
2. Enter the IP Address of hostname or target machine where Agent is deployed.
3. Enter the port to connect to the agent. By default, the agent uses port 3999.
4. Select Use Existing Agent.
5. Click OK.
6. Browse to the Agent folder and choose the certificate file and click OK.
7. Choose from the list of options the ones to use during this session.

Adding Remote Data with the Enterprise Agent

To add remote data, in the Examiner, click Evidence > Add Remote Data. Once the remote data is added to the case, you can view it in the Volatile tab.

The Enterprise Agent can add the following types of remote data:
- Volatile Data
- Memory Data
- Drive Data

---

### TABLE 9-2

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update the agent if it is present</td>
<td>Checks if an existing agent is already installed and upgrades it to the most current version on your server.</td>
</tr>
<tr>
<td>Allow manual uninstall</td>
<td>Lets the user on the target computer remove the agent from the Windows Add or Remove programs window.</td>
</tr>
</tbody>
</table>

4. Click OK.
• Mounted Device Data

You can make these selections each time you do an acquisition, or you can set defaults that are applied automatically. Default preferences still let you change your final selections before you submit the job.

You can dump processes and DLLs into a file. You can acquire and add RAM data immediately, or save it to a memory dump file to import later. Page files and swap files are also supported.

To add remote data with the Enterprise Agent

1. Connect to an Enterprise Agent. See Connecting to an Enterprise Agent on page 150.
2. In the Add Remote Data dialog, in the Selection Information pane, choose from the following remote data options to acquire:
**Note:** It is recommended to do RAM acquisitions separately from Volatile Data acquisitions. A volatile acquisition pulls may override the RAM acquisition settings, and prevent the proper acquisition of data such as the system descriptor tables.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Include Volatile Data</strong></td>
<td>Lets you select to include from the following volatile data types:</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>Process Info</strong> - Shows details of all processes. For example the process name, time, and hash.</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>Service Info</strong> - Returns details about which services are available according to the operating system. For example this includes the status such as stopped and running, and the startup type such as manual and automatic.</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>DLL Info</strong> - Returns details about load-time specific DLLs for a process. This does not return run-time DLLs.</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>Driver Info</strong> - Returns the drivers on the target computer.</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>User Info</strong> - Returns details about the users that have a local account on the computer. This option also returns the shares that each user has mounted at the time of log-on.</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>Open Handles</strong> - Returns the open handles of a specific process. For example: registry, files, sockets, and other items that can be associated by a handle.</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>Network Sockets</strong> - Returns the open sockets for a process.</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>Network Devices</strong> - Returns devices from the target such as NICs, Gateways, and routing.</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>Registry Info</strong> - Lets you discover if specific keys are present. This opens the Acquire Registry Keys dialog where you can select from predefined options or create your own customer path to retrieve.</td>
</tr>
<tr>
<td><strong>Include Memory Data</strong></td>
<td>Lets you select from the following memory information:</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>RAM</strong> – lets you either run a memory analysis, or capture a memory dump. A memory analysis instructs the agent to analyze live memory and returns a volatile snapshot of it. A memory dump lets you capture the live memory into a file. You can specify a path to store the file or to automatically add and analyze the dump in your case.</td>
</tr>
<tr>
<td>0x0</td>
<td><strong>Memory Search</strong> – Lets you search for items in memory such as specific processes, DLLs, text, or even Hexadecimal values.</td>
</tr>
<tr>
<td><strong>Include Drive Data</strong></td>
<td>Lets you capture or preview either a logical or physical view of the drive. Some drive configurations require viewing them from a logical perspective or from a physical perspective. For example, drives configured in software RAID array versus drives configured in a hardware RAID array.</td>
</tr>
<tr>
<td></td>
<td>You can either create an image of the drive or a preview of the drive. The Image option creates a forensic image of the drives. You can automatically add it or you can store it in a location.</td>
</tr>
<tr>
<td></td>
<td>The preview option adds the metadata of the drive as an evidence item. You can use this to quickly view the file system within the interface to determine if more action is required.</td>
</tr>
<tr>
<td></td>
<td><strong>Physical Drive Info</strong> – This option includes the drives as they are determined by the BIOS.</td>
</tr>
<tr>
<td></td>
<td><strong>Logical Drive Info</strong> - This option includes the drive information as it is determined by the operating System.</td>
</tr>
<tr>
<td></td>
<td>See also Acquiring Drive Data (page 153)</td>
</tr>
</tbody>
</table>
3. In the Acquisition Options pane, choose from the following options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mount a Device</td>
<td>Lets you mount a disk or device onto the Examiner computer that represents the targeted disk of the remote computer.</td>
</tr>
</tbody>
</table>

4. In the Resource Usage pane, select the resource usage option that you want to use. For certain operations like memory capture and drive imaging, this setting restricts the amount of CPU usage on the target computer. For example, you can use this option to lower the CPU usage and avoid performance impacts to the target computer.

5. (Optional) Click Preferences to create a set of options to be automatically selected when you open the Add Remote Data dialog.

6. Click OK.

**Note:** Depending on the options that you select in the Selection Information pane, you may need to provide additional details. For example, Registry Info has a dialog that opens to define specific keys to check for.

7. The Data Processing Status screen opens and the Other Jobs group is open, showing progress on each of the tasks you have requested.

You can close the Data Processing Status window at any time. Click View > Progress Window to check job processing status. When the status indicates that all data has been collected, click the Evidence tab to view acquired physical and logical drives or drive images. Click the Volatile tab in the Enterprise Examiner UI to view the Volatile information.

For more information, see Using the Overview Tab (page 299) and see Using the Volatile Tab (page 389).

### Acquiring Drive Data

When examining drive data, you can choose to acquire information for previewing only, or you can acquire a complete disk image. A separate job is created for each selected data source associated with the machine, but does not include memory. These jobs can be monitored in the View > Progress Window > Data Processing Status > Other Jobs list.
To include drive data in an acquisition

This task is accomplished as part of a procedure for adding remote data. For more information, see Adding Remote Data with the Enterprise Agent on page 150.

1. Drive Data requires you to make drive selections. In the Select Drives pane, expand the drive list for that Agent machine and select a drive to view that drive's information in the Details pane.

   Click OK.

2. In the Drive Data group box, select the type of drive data to be examined.

   **Preview Information Only:** Provides a list of the files in the drives, not the actual files themselves.

   2a. Select **Include Slack** to detect fragments of files that have not been completely overwritten and/or **Recover Deleted Files** to recover deleted files that have not been overwritten.

   2b. **Complete Disc Image:** Creates an image of the drives. This process may take a long time and can impact the CPU usage of the remote computer.

   2c. Specify the Disk Image Path information relative to This (local) machine or Remote source machine.

   2d. Enter or browse to locate the File Path for the disk image.

   2e. If you chose Remote source machine, enter a user name and password for a location where you have permissions to write the image.

   2f. Mark **Add image to case when complete** to begin investigating the data as soon as the acquisition is complete. The evidence processor uses the default analysis options.

3. Click OK to start the acquisition.

**Acquiring RAM Data**

1. In the Add Remote Data > Browse and Select Nodes pane, select the Agent to acquire RAM data from.

2. In the Selection Information pane, click **Include Memory Data** if you want to acquire the RAM data and perform a memory search at the same time. If not, choose the option that suits your needs.

3. Make other selections for Acquisition Options, Update Agent, and Resource Usage, then click OK.

4. Do one of the following:
   - Choose either Memory Analysis to add the RAM data directly to the case you are working on.
   - Choose Memory dump to save the dump file to a destination folder and name of your choosing.

5. Click OK.

   If you chose Memory Analysis, the Data Processing Status dialog opens to display the memory acquisition jobs you requested. If you chose Memory dump, the Memory Dump dialog opens and you can continue to specify the options for the memory dump file.

5a. **Specify a Memory Dump Location.** This can be a destination local to your Examiner machine, or on the remote Agent machine, but must be a location where you have full access permissions.

5b. Choose a file type for the memory dump file. Options are RAW and AD1.

5c. Select the box labeled Add memory analysis to case if you wish to do so.

5d. Select the box labeled Get memory page file to make the memory page file available to the case.

5e. Click OK to save settings and continue.

   The processing requests are added, the memory is acquired, and the search is performed as three separate jobs in the Data Processing Status window.
Importing Memory Dumps

The Import Memory Dump feature allows you to import memory dump files from this or other case files in to the current case.

Note: If importing a memory dump from a 64-bit target machine with more than 4 GB of RAM, it is strongly recommended that you use a 64-bit Examiner. The analysis may fail on a 32-bit Examiner.

To import a memory dump

1. In the Examiner, click Evidence > Import Memory Dump.
2. Select the system from the dropdown list. If the system is not listed, select the <Add new Agent> item from the list, and enter a hostname or an IP Address.
3. Click the Browse button to locate the memory dump file you want to add to your case and click Open.
4. Click OK to add the memory dump to your case.
5. The memory dump data appears in the Volatile tab in the Examiner window under the Agent name and acquisitions date and time. Each acquisition is displayed separately under its data and time stamp, grouped by Agent, Acquisition Time, or Operation Type.
See also Using the Volatile Tab (page 389).

Unmounting an Agent Drive or Device

To Unmount a drive or device

1. Click Tools > Unmount Agent Drive.
2. In the Unmount Agent Drive dialog, do one of the following:
   - Select a drive to unmount.
   - Select All Agents to unmount all drives from all agents at the same time.
3. Click OK.
Chapter 10
Filtering Data to Locate Evidence

About Filtering

Filters let you leverage item attributes to locate specific data very quickly. They reduce the amount of time that you must examine data because they can narrow a large data set down to a very specific focus.

The Examiner includes a Filter toolbar, and a Filter Manager utility to help you work with filters. When you apply a filter it limits the files that are displayed in the Examiner match the criteria of the filter.

See also Types of Filters (page 157)
See also What You Can Do with Filters (page 157)

Examiner’s Filter Dropdown Menu
Types of Filters

The *Examiner* includes several different types of filters to help you to locate and to exclude specific data.

### Types of Filters

<table>
<thead>
<tr>
<th>Filter Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predefined Filters</td>
<td>Predefined filters are filters that AccessData has created. For example, there is a predefined filter called <em>Graphic Files</em> that limits the displayed data to graphics files only. You cannot delete or modify a predefined filter, however you can copy them to use as templates when you create your own custom filters. See also <em>Types of Predefined Filters</em> (page 169)</td>
</tr>
<tr>
<td>Global Filters</td>
<td>Global filters apply across the entire <em>Examiner</em> interface. For example, if you globally apply the filter <em>Checked Files</em>, only checked files are displayed, regardless of the tab, pane, or window that you are viewing. See also <em>Using Global Filters</em> (page 160)</td>
</tr>
<tr>
<td>Tab Filters</td>
<td>Tab filters apply only to a specific tab. For example if you apply the <em>Checked Files</em> filter as a tab filter specific to the <em>Overview</em> tab, when you switch to the <em>Explore</em> tab files that are not checked are still displayed. See also <em>Using Tab Filters</em> (page 160)</td>
</tr>
<tr>
<td>Custom Filters</td>
<td>Custom filters are filters that you create. For example if an AccessData predefined does not meet your exact needs, you can use the <em>Filter Manager</em> utility to create your own custom filter. See also <em>Creating a Custom Filter</em> (page 165)</td>
</tr>
<tr>
<td>Nested Filters</td>
<td>A nested filter is a filter that contains filters within it. Nested filters let you leverage several filters together to accomplish a specific goal. Nested filters prevent you from having to create a complicated custom filter each time you need to use multiple filters together. For example, a simple nested filter could include both <em>Graphic Files</em> and <em>KFF Alert Files</em> as filters. See also <em>About Nested Filters</em> (page 165)</td>
</tr>
<tr>
<td>Compound Filters</td>
<td>Compound filters are created in the <em>Filter Manager</em> utility. In the <em>Filter Manager</em> you can add many filters together. You choose to include and exclude a files that meet criteria. Compound filters let you apply boolean logic to your compound filter. See also <em>Using Compound Filters</em> (page 164)</td>
</tr>
<tr>
<td>Search Filters</td>
<td>Search filters are added to a live search or an index search. They limit a search to only display results that match the criteria contained within the search. You can use static search filters in conjunction with global filters to very quickly apply two levels of filtering to your search results. See also <em>Using Filtering with Searches</em> (page 163)</td>
</tr>
</tbody>
</table>

### What You Can Do with Filters

You can use filters to quickly locate specific item types. You can also use filters to exclude data that you do not want displayed. For example, if you only want to see encrypted items, you can apply a filter to show you those. If
you do not want to see files that were created after a certain date, you can also use a filter to exclude those files from being displayed.

See also About Filtering (page 156)

**What You Can Do with Filters**

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply filters globally</td>
<td>Using Global Filters (page 160)</td>
</tr>
<tr>
<td>Apply filters to specific tabs</td>
<td>Using Tab Filters (page 160)</td>
</tr>
<tr>
<td>Apply filters in categories</td>
<td>Using Filters with Category Containers (page 161)</td>
</tr>
<tr>
<td>Add filters to live searches</td>
<td>Adding a Search Filter to a Live Searches (page 163)</td>
</tr>
<tr>
<td>Add filters to index searches</td>
<td>Adding a Search Filter to an Index Searches (page 163)</td>
</tr>
<tr>
<td>Use filters when you create reports</td>
<td>Using Filters with Reports (page 161)</td>
</tr>
<tr>
<td>Create, copy, and customize your own filters</td>
<td>Creating a Custom Filter (page 165)</td>
</tr>
<tr>
<td>Share filters between cases</td>
<td>Sharing Custom Filters Between Cases (page 167)</td>
</tr>
<tr>
<td>Export filters</td>
<td>Exporting Filters (page 167)</td>
</tr>
<tr>
<td>Import filters</td>
<td>Importing Filters (page 167)</td>
</tr>
</tbody>
</table>
Understanding How Filters Work

Filters are composed of various components that are stored in your database.

**Filter Component**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Filter names help you to locate a filter that you want to use.</td>
</tr>
<tr>
<td>Description</td>
<td>Filter descriptions help you to understand what a filter is designed to accomplish.</td>
</tr>
<tr>
<td>Rule</td>
<td>Filter rules instruct filters of the goal that you want to accomplish. Filters can have a single rule or filters can also have multiple rules. Filter rules are the logic that help you make your filters accomplish a specific task. Filter rules are comprised of the following components:</td>
</tr>
<tr>
<td>Property</td>
<td>Filter properties are the attributes that are associated with a data record. An example of a property is File Type.</td>
</tr>
<tr>
<td>Operator</td>
<td>Filter operators are the decision that you want to run against a property. Each property has specific operators that are applicable to it. An example of an operator that applies to the property &quot;File Type&quot; is the operator &quot;Is Not&quot;</td>
</tr>
<tr>
<td>Criteria</td>
<td>Filter criteria let you define the conditions of the operator. Each operator has specific criteria that are applicable to it. An example of criteria that applies to the property Is Not is the criteria Word Template 2010.</td>
</tr>
</tbody>
</table>

**Note:** When working with time-based filters, the case time zone is used for date and times offsets.

**Viewing the Components of Filters**

You can use the Filter Manager to see how any filter is constructed.

**To view the definitions of a filter**

1. In the Examiner, click Filter Manager.
2. In the Filter Manager, under the Filters list, select a filter.
3. Click Define. In the Filter Definition dialog, you can see the Name, Description, and any of the Rules that the filter uses.

**Viewing Details about Attributes that Filters use**

Each filter uses rules that leverage various attributes that are stored in the database. If you are unsure of what a particular filter attribute is, you can you can view descriptions about each of these attributes. To view these descriptions you must use the Column Settings utility.

**To view details about attributes that are used by filters**

1. In the Examiner, in the File List pane, click the column settings icon.
2. In the Manage Column Settings dialog, click New.
3. In the Column Settings dialog, under Available Columns, expand All Features.
4. Locate and select the attribute that you want to view details about.
5. Click Add >>.
6. In the Selected Column pane, the Name, Short Name, and Description are provided for the attribute.
7. When you are done viewing attribute descriptions, click Cancel.

### Using Simple Filtering

You can accomplish the following simple tasks with filtering:

- Using Global Filters (page 160)
- Using Tab Filters (page 160)
- Using Filters with Category Containers (page 161)
- Using Filters with Reports (page 161)

### Using Global Filters

You can apply filters globally across the files in the Examiner. Each filter limits which files are displayed in the Examiner pane according to the rules of the filter.

In the Examiner, you can keep a filter selected, and still turn it on and off.

See also Types of Filters (page 157)

#### To use a global filter

1. In the Examiner, in the upper-left menu bar, select the Filter drop-down menu.
2. In the Filter drop-down menu, locate the filter that you want to apply.
3. Click the filter.

   The results that are displayed in the Examiner, are limited to show only the files that are applicable to the filter that you select.

#### To turn global filters on and off

1. In the Examiner, do one of the following:

   - To turn a filter on or off, click the icon: that is next to the Filter drop-down menu. This leaves the filter that you have currently selected in place but activates or deactivates it.
   - If you no longer want to use any global filter, in the Filter drop-down menu, click -unfiltered-.

### Using Tab Filters

You can create filters that are only applicable to a specific tab. These filters only apply to the tab that you create them in. If you have applied a tab filter its name is displayed at the bottom of the Examiner window.

See also Types of Filters (page 157)
To use a tab filter

1. In the Examiner, click Filter > Tab Filter.
2. In the Tab Filter Selection dialog, use the drop-down menu to select the filter that you want to apply.
3. Click OK.

If you have a tab filter applied, and no longer want to use it you can turn it off.

To remove a tab filter

1. In the Examiner, click Filter > Tab Filter.
2. In the Tab Filter Selection dialog, use the drop-down menu, select the empty field in the drop-down list.
   It is the first field in the drop-down menu.
3. Click OK.

How Global Filters and Tab Filters can work Together

Global filters and tab filters can be used together to further narrow down the data set that you are viewing. Using Global filters and Tab filters together is a quick way of apply two levels of filtering without creating or defining either a nested filter or a compound filter. For example, you can apply a global filter across all items in the case, and then create a specific tab filter to again further refine the data set to meet a criteria.

See also Using Global Filters (page 160)
See also Using Tab Filters (page 160)

Using Filters with Category Containers

The Examiner includes a tab called the Overview tab. The Overview tab groups items into categories. There are several different categories such as Documents, Executable files, Folders, and Graphics. You can use the Overview tab to first select a category, and then also apply a filter.

See also What You Can Do with Filters (page 157)

To use filters with category containers

1. In the Examiner, click the Overview tab.
2. In the Case Overview pane, locate and then click the category that you want to focus on.
   For example you could select, File Category > Documents. The File List pane would only display document files.
3. In the Filter drop-down select a filter that you want to apply.
   For example, you could select the filter Encrypted Items. The File List pane would then display only document files that are also encrypted.

Using Filters with Reports

You can apply filters when you create your reports.

See also What You Can Do with Filters (page 157)
To use filters with reports

1. In the Examiner, click File > Report.
2. In the Report Options dialog, select one of the following options:
   - Bookmarks
   - Graphics
   - File Paths
   - File Properties
3. In the upper portion of the Report Options dialog, click the Filter drop-down menu and select the filter that you want to apply.
   You can apply specific filter for each of the report options.
4. After you have finished defining the report, click OK.

Viewing the Filters that you have Applied

If you see results in the File List pane that don’t match what you expect to see, it may because you inadvertently have filters applied that you didn’t expect.

Check the following:

- To see if you have a global filter applied, in the upper-left portion of the Examiner, check the Filter field to see if a filter is applied. You can also check the filter icon to see if perhaps the filter is turned on or off.

  ![Filter: Bookmarked]

- To see if you have a tab filter applied, in the lower bar of the Examiner, check to see if a tab filter is applied.

  ![Email Tab Filter: Bad Extension Files]
Using Filtering with Searches

You can apply global filters to modify the search results window. When you apply a global filter to a search, the search results window is modified to match the criteria of the global filter. Using global filters with searches lets you do filter against a single search, without having to create a special search criteria for each filter type.

You can add search specific filters to a live search or to an index search. They limit a search to only display results that match the criteria contained within the search. When you add a search specific filter to a search, the search results window continues to limit the search results to apply to the filter.

You can use search filters in conjunction with global filters to very quickly apply two levels of filtering to your search results.

See Adding a Search Filter to a Live Searches (page 163)
See Adding a Search Filter to an Index Searches (page 163)

Adding a Search Filter to a Live Searches

You can define a live search query, and add filter to limit the search results to meet your criteria.

See also What You Can Do with Filters (page 157)

To use a filter with a Live Search
1. In the Examiner, click the Live Search tab.
2. Use the tools in the Live Search tab to create and define your search query.
   Searching Evidence with Live Search (page 354)
3. In the Search Filter drop-down menu, select the filter that you want to apply to the search. The Search Filter drop-down menu is located in lower portion of the search pane. This operation limits the search results to only files that both meet the criteria of your search and the criteria of the filter.
4. In the lower-right portion of the search window, click Search.
   The search query is displayed in the Live Search Results pane.

Adding a Search Filter to an Index Searches

You can define an index search query, and add filter to limit the search results to meet your criteria. If you have applied a filter, the filter’s name is displayed in the Search Results pane.

See also What You Can Do with Filters (page 157)

To use a filter with an Index Search
1. In the Examiner, click the Index Search tab.
2. Use the tools in the Index Search tab to create and define your search query.
   Searching Evidence with Index Search (page 365)
3. Click Search Now.
4. In the Indexed Search Filter Option dialog, select Apply filter.
5. In the filter drop-down menu, select the filter that you want to use.
6. Click **OK**.
   The search query is displayed in the *Index Search Results* pane. If you have added a filter to the search, the search displays the follow string: 
   
   \[ \text{dtSearch® Indexed Search (Prefilter: (The Filter’s Name) Query: (The Search’s Syntax))} \]

**Using Compound Filters**

Filters can be combined to more easily locate data. You can select and apply multiple filters at the same time. Such filters are called compound filters. The *Filter Manager* dialog provides a display of your compound filter to help you to visualize the resulting *Include* filter, or *Exclude* filter. You can choose **AND/OR** options to make your compound filters more effective.

Compound filters are not saved. They are only combined and applied as needed. As they are applied, the *File List* pane automatically displays the results of the applied filter. The filter remains applied until it is changed.

See also [Applying Compound Filters](#) (page 164)

**Applying Compound Filters**

Compound filters are applied in the Filter Manager.

See also [Using Compound Filters](#) (page 164)

**To apply a compound filter**

1. On the *Filter* toolbar, click **Filter Manager**.
2. Select a filter from the list of predefined filters to use as a template.
3. Choose from the following as needed:
   - Click the >> button, or drag and drop into the Include or Exclude box.
   - Click the << button to remove an individual item from either the Include or Exclude box.
   - Click **Clear** in either the Include or Exclude box to clear all items from that box and start over.
4. Click **Apply** at the bottom of the dialog. The results are displayed in the *File List* pane.
Using Custom Filters

You can create your own customized filters to meet your exact needs.

To save you the time and effort of creating filters, AccessData has created many predefined filters that you can leverage to accomplish the majority of your filtering tasks.

For more information see Types of Predefined Filters (page 169)

Before you create a new filter, you may be able to save time by copying a preexisting filter and modifying it to meet your specific criteria.

See also Copying Filters (page 166)

About Nested Filters

You can use the Filter Manager to create nested filters. A nested filter is a filter that contains multiple filters within it. You can add rules to a filter that check against other filters.

See also Types of Filters (page 157)

For example, the following illustrates the logic of a nested filter:

**An Example of Rules for a Nested Filter**

<table>
<thead>
<tr>
<th>Filter</th>
<th>Matches</th>
<th>Graphics Files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter</td>
<td>Does Not Match</td>
<td>Flagged Ignorable</td>
</tr>
<tr>
<td>Filter</td>
<td>Does Not Match</td>
<td>KFF Ignore Files</td>
</tr>
</tbody>
</table>

Creating a Custom Filter

You can create your own custom filters. Filters are created from either the Filter Definition dialog or the Filter Manager.

**To create a custom filter**

1. In the Examiner, click **Filter > New**.
2. In the Filter Definition dialog, enter **Name** for the filter.
3. Enter a **Description** that explains what the filter does.
4. In the Rules section do the following to create a rule:
   4a. Select a **Property** from the drop-down menu.
   4b. Select an **Operator** from the drop-down menu.
   4c. Select a Criteria from the drop-down menu.
5. To add additional rules to the filter, click the + icon. To remove a rule, click the - icon.
6. If you want to turn a rule on, or turn a rule off, select the check box next to the rule.
7. In the lower portion of the *Filter Definition* dialog, do one of the following:
   - Select *Match Any* to force the filter to include or exclude files if they match any of the rules that you have defined in the filter.
   - Select *Match All* to force the filter to include or exclude files only if they match all of the rules that you have defined in the filter.

8. After you define the filter, click *Live Preview* to test that the filter is working as you expect. When you click *Live Preview* the contents in the *File List* pane adjusts to match the definition of the filter.

9. Click *Save*.

10. Click *Close*.

**Copying Filters**

You can copy any existing filter to use as a basis to create a new filter.

See also *Types of Predefined Filters* (page 169)

To copy a filter

1. In the *Examiner*, click *Filter Manager*.
2. In the *Filter Manager*, under the *Filters* list, select a filter.
3. In the lower portion of the *Filter Manager*, click the icon: *Create a copy of the selected filter*. 
4. In the *Filter Definition* dialog, modify the filter according to your requirements.
5. Click *Save*.

**Editing a Custom Filter**

You can edit your own custom filters. You can edit the description and rules of a custom filter.

You cannot rename a custom filter. However, you can copy a filter, give the copy a new name, and then delete the original filter, if desired.

To edit a custom filter

1. In the *Examiner*, click *Manage > Filters > Manage Filters*.
2. In the *Manage Filters* dialog, select the filter that you want to edit.
3. Click *Edit*.
4. After editing the filter, click *Save*. 
Sharing, Importing, and Exporting Filters

You can share filters between cases. You can import filters that have been created from other systems. You can also export custom filters that you have created to use in other systems.

See the following:

- Sharing Custom Filters Between Cases (page 167)
- Importing Filters (page 167)
- Exporting Filters (page 167)

**Sharing Custom Filters Between Cases**

After you create a custom filter for a case, you can share that filter to make it available to other cases. You can also copy filters from other cases to use in your case.

**To share a filter with other cases**

1. In the *Examiner*, click Manage > Filters > Manage Filters.
2. In the *Manage Filters* dialog, select the custom filter that you want to share with other cases.
3. Click *Copy to Shared*.
4. Click *Close*.

**To copy a Shared filter into your Case**

1. In the *Examiner*, click Manage > Filters > Manager Shared Filters.
2. In the *Manage Shared Filters* dialog, select the custom filter that you want to copy to your case.
3. Click *Copy to Case*.
4. Click *Close*.

**Importing Filters**

You can import filters that have been saved as XML files into your system.

See also Exporting Filters (page 167)

**To import filters**

1. In the *Examiner*, click *Filter Manager*.
2. In the *Filter Manager* dialog, click the *Import a filter from a xml file* icon.
3. In the *Open* dialog, browse to the location where the filter XML file is stored. Select the filter and click *Open*.
4. In the *Filter Import* dialog, click *OK*.

**Exporting Filters**

You can export filters into XML files to use in other systems.

See also Importing Filters (page 167)
To export filters

1. In the *Examiner*, click **Filter Manager**.
2. In the *Filter Manager* dialog, select the filter that you want to export.
3. Click the **Export selected filter to a xml file** icon.
4. In the *Save As* dialog, browse to the destination location where you want to save the exported filter file.
5. Click **Save**.
6. In the *Export Filter* dialog, click **OK**.
Types of Predefined Filters

The Examiner includes several predefined filters that you can use for common filtering tasks. If these filters do not quite meet the criteria that you require, you can create a copy of these to create your own custom filters.

See also Copying Filters (page 166)

Predefined Filters

<table>
<thead>
<tr>
<th>Predefined Filter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Files</td>
<td>Shows the actual files, as opposed to All Files. All Files is the default and includes metadata, OLE files, and alternate data stream files.</td>
</tr>
<tr>
<td>Alternate Data Streams</td>
<td>Shows files with alternate data streams (additional data associated with a file object).</td>
</tr>
<tr>
<td>Archive Files</td>
<td>Shows only archive-type file items, such as ZIP and THUMBS.DB.</td>
</tr>
<tr>
<td>Bad Extension Files</td>
<td>Shows only the files with extensions that don’t match the file header.</td>
</tr>
<tr>
<td>Bookmarked</td>
<td>Shows only the items that are contained in a bookmark.</td>
</tr>
<tr>
<td>Carved Files</td>
<td>Shows only the items that have been carved.</td>
</tr>
<tr>
<td>Cerberus Score</td>
<td>Shows only the items that have a Cerberus Score</td>
</tr>
<tr>
<td>Cerberus Static Analysis</td>
<td>Shows only the items that have had Cerberus Static Analysis run against them.</td>
</tr>
<tr>
<td>Checked Files</td>
<td>Shows only the items that you have selected with a check mark.</td>
</tr>
<tr>
<td>Decrypted Files</td>
<td>Shows only the items that have been decrypted by AccessData tools within the case. This indicates that AccessData decryption tools have had control of this file and its decryption since it was added to the case in its original encrypted form.</td>
</tr>
<tr>
<td>Deleted Files</td>
<td>Shows only those items that have the deleted status.</td>
</tr>
<tr>
<td>Duplicate Files</td>
<td>Shows only files that have duplicates in the case. This filter requires that you select the Flag Duplicate Files processing option.</td>
</tr>
<tr>
<td>eDiscovery Duplicates</td>
<td>A filter for eDiscovery duplicates.</td>
</tr>
<tr>
<td>eDiscovery Refinement</td>
<td>Includes files and folders that are not useful for most eDiscovery cases.</td>
</tr>
<tr>
<td>Email Attachments</td>
<td>Shows all email items that are not email messages.</td>
</tr>
<tr>
<td>Email Delivery Time</td>
<td>Allows definition of specific date/time range of email deliveries.</td>
</tr>
<tr>
<td>Email Files</td>
<td>Shows only those items that have the email status.</td>
</tr>
<tr>
<td>Email Files and</td>
<td>Shows all email items, both messages and attachments.</td>
</tr>
<tr>
<td>Attachments</td>
<td></td>
</tr>
<tr>
<td>Encrypted Files</td>
<td>Shows only those items flagged as EFS files or other encrypted files.</td>
</tr>
<tr>
<td>Evidence Items</td>
<td>Shows all evidence items added to the case.</td>
</tr>
</tbody>
</table>
## Predefined Filters (Continued)

<table>
<thead>
<tr>
<th>Predefined Filter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excluded eDiscovery Refinement</td>
<td>Excludes files and folders that are not useful for most eDiscovery cases.</td>
</tr>
<tr>
<td>Explicit Images Folder (High Score)</td>
<td>Shows folders with EID scores of 60 or higher using FST or ZFN (high) criteria.</td>
</tr>
<tr>
<td>Explicit Images Folder (Medium Score)</td>
<td>Shows folders with EID scores of 40 or higher using FST or ZFN (medium) criteria.</td>
</tr>
<tr>
<td>File Category</td>
<td>Allows user to set a filter by file category (is a member of). Relates to File Category tree under Overview tab.</td>
</tr>
<tr>
<td>File Created Time</td>
<td>Allows definition of specific date/time range of file creation.</td>
</tr>
<tr>
<td>File Extension</td>
<td>Allows filtering of files by a defined extension or set of extensions.</td>
</tr>
<tr>
<td>File Modified Time</td>
<td>Allows definition of specific date/time range of file modification.</td>
</tr>
<tr>
<td>Files with Alternate Data Streams</td>
<td>Shows files that contain Alternate Data Streams (additional data associated with a file system object).</td>
</tr>
<tr>
<td>Flagged Ignorable</td>
<td>Shows only those items you have identified as Ignorable.</td>
</tr>
<tr>
<td>Flagged Privileged</td>
<td>Shows only those items you have identified as Privileged.</td>
</tr>
<tr>
<td>Folders</td>
<td>Shows only folder items.</td>
</tr>
<tr>
<td>From Free Space</td>
<td>Shows only those items found in (carved from) free space.</td>
</tr>
<tr>
<td>From Recycle Bin</td>
<td>Shows only those items taken from the recycle bin.</td>
</tr>
<tr>
<td>Graphic Files</td>
<td>Shows only those items that have been identified as graphics.</td>
</tr>
<tr>
<td>Indexed</td>
<td>Shows items that have been indexed.</td>
</tr>
<tr>
<td>Is Forwarded</td>
<td>Shows any email item that has been forwarded.</td>
</tr>
<tr>
<td>Is Reply</td>
<td>Shows any email item that is a reply to another email.</td>
</tr>
<tr>
<td>KFF Alert Files</td>
<td>Shows all files with KFF Alert status that are in a case.</td>
</tr>
<tr>
<td>KFF Ignore Files</td>
<td>Shows all files with KFF Ignore status that are in a case.</td>
</tr>
<tr>
<td>Labeled Files</td>
<td>Shows files that have a Label assigned to them.</td>
</tr>
<tr>
<td>Microsoft Office Files</td>
<td>Shows Word, Access, PowerPoint, and Excel files.</td>
</tr>
<tr>
<td>Mobile Phone: Calendar</td>
<td>Shows calendar information acquired from a mobile phone.</td>
</tr>
<tr>
<td>Mobile Phone: Call History</td>
<td>Shows call information acquired from a mobile phone.</td>
</tr>
<tr>
<td>Mobile Phone: Messages</td>
<td>Shows message information acquired from a mobile phone.</td>
</tr>
<tr>
<td>Mobile Phone: Phonebook</td>
<td>Shows contact information acquired from a mobile phone.</td>
</tr>
</tbody>
</table>
## Predefined Filters (Continued)

<table>
<thead>
<tr>
<th>Predefined Filter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Phone Files</td>
<td>Shows files and data from mobile devices added to the case using AccessData Mobile Phone Examiner.</td>
</tr>
<tr>
<td>No Deleted</td>
<td>Shows all except deleted items.</td>
</tr>
<tr>
<td>No Duplicate</td>
<td>Shows only one instance of every item in the case.</td>
</tr>
<tr>
<td>No Email Related Files or Attachments</td>
<td>Shows files that are not Email related files.</td>
</tr>
<tr>
<td>No File Slack</td>
<td>Shows all except files found in (carved from) file slack.</td>
</tr>
<tr>
<td>No Files with Duplicates</td>
<td>Shows only files that have no duplicates in the case.</td>
</tr>
<tr>
<td>No KFF Ignore Files</td>
<td>Shows all items except KFF ignore files.</td>
</tr>
<tr>
<td>No KFF Ignore or OLE Subitems</td>
<td>Shows all items except KFF ignore files or OLE subitems.</td>
</tr>
<tr>
<td>No KFF Ignore or OLE Subitems or Duplicates</td>
<td>Shows all items except KFF ignore files, OLE subitems, or duplicate items.</td>
</tr>
<tr>
<td>No MS Office 2007/2010 Unimportant Subitems</td>
<td>Excludes unimportant files and folders contained in MS Office 2007/2010 OPC files (DOCX, XLSX PPTX etc)</td>
</tr>
<tr>
<td>No OLE Subitems</td>
<td>Shows all items except OLE subitems.</td>
</tr>
<tr>
<td>No Unimportant OLE Data Streams</td>
<td>Shows all items including OLE subitems, except that unimportant OLE data streams are not shown.</td>
</tr>
<tr>
<td>Not Flagged Ignorable</td>
<td>Shows all items except those you indicated Ignorable.</td>
</tr>
<tr>
<td>Not Flagged Privileged</td>
<td>Shows all items except those you flagged Privileged.</td>
</tr>
<tr>
<td>NSF Notes</td>
<td>Shows Emails, views, and other notes from Lotus Notes NSF databases.</td>
</tr>
<tr>
<td>OCR Extractions</td>
<td>Shows files that were extracted from graphics with OCR.</td>
</tr>
<tr>
<td>OCR Graphics</td>
<td>Graphic files that have been parsed by the OCR engine.</td>
</tr>
<tr>
<td>OLE Subitems</td>
<td>Shows only OLE archive items and archive contents.</td>
</tr>
<tr>
<td>Reclassified Files</td>
<td>Shows only those items whose classification you have changed.</td>
</tr>
<tr>
<td>Registry Files</td>
<td>Shows Windows 9x, NT, and NTFS registry files.</td>
</tr>
<tr>
<td>Subfilter for EID FST OR ZFN (high)</td>
<td>This is a subfilter that is used by the explicit images folder (high score) filter.</td>
</tr>
<tr>
<td>Subfilter for EID FST OR ZFN (medium)</td>
<td>This is a subfilter that is used by the explicit images folder (medium score) filter.</td>
</tr>
</tbody>
</table>
## Predefined Filters (Continued)

<table>
<thead>
<tr>
<th>Predefined Filter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thumbs.db Files</td>
<td>Shows Thumbs.db files.</td>
</tr>
<tr>
<td>Unchecked Files</td>
<td>Shows only those items that you have not checked.</td>
</tr>
<tr>
<td>Unimportant OLE Stream Categories</td>
<td>Shows only Unimportant OLE Stream Categories.</td>
</tr>
<tr>
<td>Unimportant OLE Streams</td>
<td>Shows only Unimportant OLE Streams.</td>
</tr>
<tr>
<td>User-decrypted Files</td>
<td>Shows only those items that you have decrypted and added to the case. Decrypted by User status is always applied to files added using the Add Decrypted Files feature. The Examiner cannot confirm validity, content, or origin of such files.</td>
</tr>
<tr>
<td>Video Conversion or Thumbnails</td>
<td>Shows only generated video thumbnails or common video files.</td>
</tr>
<tr>
<td></td>
<td>See Examining Videos on page 315.</td>
</tr>
<tr>
<td>Video Thumbnails</td>
<td>Shows only generated video thumbnails.</td>
</tr>
<tr>
<td></td>
<td>See Generating Thumbnails for Video Files on page 316.</td>
</tr>
<tr>
<td>Video Conversion</td>
<td>Shows only generated video common video files.</td>
</tr>
<tr>
<td></td>
<td>See Creating Common Video Files on page 317.</td>
</tr>
<tr>
<td>Web Artifacts</td>
<td>Shows HTML, Index.dat, and empty Index.dat files.</td>
</tr>
</tbody>
</table>
Chapter 11
Working with Labels

Labels let you group files in the way that makes the most sense to you. Initially, there are no default labels. All are customized. Labels you create are saved locally and you have complete control over them within your case. However, labels can be created and shared to the database for use by all who have been granted access to do so.

This chapter includes the following topics

- What You Can Do With Labels (page 173)
- Creating a Label (page 174)
- Applying a Label (page 174)
- Managing Labels (page 175)
- Managing Label Groups (page 176)

What You Can Do With Labels

You can use labels to do the following

- Create bookmarks that contain only files with the labels that you specify.
- Apply labels according to common criteria, such as the following:
  - All Highlighted
  - All Checked
  - All Listed
  - Extend labels to associated (family) files; i.e., a label applied to a child file can also be easily applied to its parent. Thus, labels applied to a parent file can easily be applied to all of its children.
- Customize a column template to contain a labels column and sort on that column to view all of your case files according to the labels that are applied to them.
- Apply multiple labels to a single file.
- Multiple local labels can be selected and shared in one operation.
- Create group labels according to specific criteria.
- View labels in the Overview tab by the labels category and see all files with labels applied in the File List view.
- Share labels you create with the database to make them available for other cases, according to user permissions.
  - Shared labels do not affect existing local labels.
Once a label is shared, it is managed by either the Application Administrator, or the Case Administrator.

Shared labels can be pushed to cases, and can be saved (exported) and then added (imported) into other databases.

Only Application Administrators can delete, import, or export Shared labels.

Shared labels, once pushed to a case, become local, and are fully managed by the Case Administrator.

Administrators can specify which shared labels are visible to which users.

Case Administrators can change local labels and re-share them. If there is a duplicate name, you are given the choice to rename or cancel the operation.

Case Administrators can update Shared labels from the database to their cases.

Case Reviewers do not have permissions to Share local labels.

### Creating a Label

You can use the File List view to create a new label.

**To create a label**

1. In the *File List* view, click **Create Labels**.
2. Click **Manage Local**. The *Manage Labels* dialog opens.
3. Click **New**. A text entry box opens on the first available line.
4. Enter a name for the label, and press enter. The label is saved with the default color; black.
5. Click **Change Color**. The *Color* dialog opens. You can use any color from the default palette, or click **Define Custom Colors** to create a unique color for this label. Use the cross-hairs and the slide to create the color you want, then click **Add to Custom Colors**, then select the custom color from the Custom colors palette.
6. Click **OK**. The *Manage Labels* dialog reopens. You can see your new label listed with the color you defined or selected.
7. Click **Close**.
8. Click **OK**.

### Applying a Label

You can apply a label to a file or group of files to make them easy to locate.

**To apply a label**

1. In the *File List* view, highlight, check, or select the files you want to apply a label to.
2. Click the **Apply Label To** drop-down.
3. Choose whether to apply the label that you will select to **Highlighted**, **Checked**, or **Listed** files.
4. Click the **Apply This Label** drop-down and click on the label to apply to the selected files. The name of the label is displayed in that label’s color.
Managing Labels

When you click the Labels button on the File List toolbar, and the Labels dialog opens, you see four buttons across the bottom.

The two buttons open separate dialogs that appear very much alike.

Aside from the different list of labels you may see, the only other difference you will see is the button that in Manage (Local) Labels says Make Shared, and in the Manage Shared Labels says Copy to Case.

**Managing (Local) Labels and Managing Shared Labels Dialog Options**

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>Click <strong>New</strong> to create another label.</td>
</tr>
<tr>
<td>Rename</td>
<td>Click <strong>Rename</strong> to change the name of any label you select.</td>
</tr>
<tr>
<td>Change Color</td>
<td>Click <strong>Change Color</strong> to select a different color for any label you select.</td>
</tr>
<tr>
<td>Delete</td>
<td>Click <strong>Delete</strong> to remove a label from the case. Deleting a label removes all instances of the label's application. The files remain, but the label itself is gone.</td>
</tr>
<tr>
<td>Import</td>
<td>Click <strong>Import</strong> to bring a label definition into your list from another source.</td>
</tr>
<tr>
<td>Export</td>
<td>Click <strong>Export</strong> to save a selected label definition for use in a different case.</td>
</tr>
<tr>
<td>Make Shared</td>
<td>Click <strong>Make Shared</strong> (from Manage (Local) labels) to Share a label definition to the database for others to use.</td>
</tr>
<tr>
<td>Copy to Case</td>
<td>Click <strong>Copy to Case</strong> (from Manage Shared labels) to copy a global label to a case that was created before that label was available.</td>
</tr>
<tr>
<td>Group</td>
<td>Click <strong>Group</strong> to create a labels Group that can be used locally or Shared to the database for others to use according to their permissions.</td>
</tr>
</tbody>
</table>
Managing Label Groups

Label groups are created by selecting labels that are shown in the Label Groups pane. Selection is done by a toggle method: click once to select, click again to deselect.

To create a new label Group

1. In the Manage Label Groups dialog, click New.
2. Provide a name for the new group.
3. Click OK.

Select any or all of the Groups to create new Groups. However, to add individual labels to groups, work in the Group Definition area, where there are two windows. On the left is Labels Available to Add to Group, and on the right is Labels in Current Group.

You must create a label before you can add it to the group. If the label you need is not listed in the Group Definition area, click Close. In the Manage Labels dialog, click New and create a label.

To add a label to a group

1. In the Label Groups window, select the group you want to add labels to.
2. Select a label in the left window and click the >> button to move it into the right window.
3. Repeat until the labels in the Current Group list are how you want.
4. Changes are saved as they are made. When you are finished adding labels to the group, click Close.

To remove a label from a Group

1. In the Manage Label Groups dialog, from the Labels in Current Group pane, highlight the label to be removed.
2. Click the << button to move the label back to the Labels Available to Add pane.
Chapter 12
Decrypting Files

About Decrypting Files

If you have the correct credentials, you can decrypt many types of encrypted files in your cases.

Note: If you do not know the passwords for encrypted files, you can use tools to try to recover the password.

See Recovering Unknown Passwords of Encrypted Files on page 184.

When files are decrypted, the original encrypted files are maintained and a child object is created for the decrypted file. This results in two files that affects your file counts: one for the original file and one for the decrypted file.

The following tables list the methods you can use to decrypt files and the type of encrypted files that are supported.

**Decryption Methods**

<table>
<thead>
<tr>
<th>Encryption Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic Decryption</td>
<td>AccessData Password Recovery Toolkit has been integrated so that you can decrypt several types of encrypted files. This integration is included and you do not need to have PRTK or DNA installed. For more information, see Decrypting Files Using the Automatic Decryption Processing Option (page 182)</td>
</tr>
<tr>
<td>Tools &gt; Decrypt Files</td>
<td>From the Examiner interface, you can use the Decrypt Files option to decrypt one or more files. See Decrypting Files Using the Automatic Decryption Processing Option on page 182. See Decrypting EFS on page 186. See Decrypting Lotus Notes Files on page 188. See Decrypting S/MIME Files on page 188.</td>
</tr>
<tr>
<td>Decrypting Credant files</td>
<td>You can configure Credant decryption either at the global application level or at the case level. See Decrypting Credant Files (page 189)</td>
</tr>
<tr>
<td>When adding an encrypted image as evidence</td>
<td>When you add an image as evidence, if the image is encrypted with one of the supported types of encryption, it is automatically detected and you are prompted to enter the credentials.</td>
</tr>
</tbody>
</table>
The following table provides a list of the supported types that can be decrypted and the method used:

### Files that can be Decrypted

<table>
<thead>
<tr>
<th>Encryption Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABICoder</td>
<td>Use the Automatic Decryption feature to decrypt these types of files. See Decrypting Files Using the Automatic Decryption Processing Option on page 182.</td>
</tr>
<tr>
<td>AdvancedFileLock</td>
<td>If you do not know the passwords for these encrypted files, you can use tools to try to recover passwords. See Recovering Unknown Passwords of Encrypted Files on page 184.</td>
</tr>
<tr>
<td>Apple DMG</td>
<td>Note: When decrypting TrueCrypt files, it is decrypted as a filesystem image. You are not able to drill down into the image. As a workaround, export the decrypted file and re-add it as additional evidence.</td>
</tr>
<tr>
<td>AShampoo</td>
<td></td>
</tr>
<tr>
<td>BCArchive</td>
<td></td>
</tr>
<tr>
<td>BCTextEncoder</td>
<td></td>
</tr>
<tr>
<td>BestCrypt</td>
<td></td>
</tr>
<tr>
<td>CryptoForge</td>
<td></td>
</tr>
<tr>
<td>Cypherus</td>
<td></td>
</tr>
<tr>
<td>iOS backup files</td>
<td></td>
</tr>
<tr>
<td>Microsoft Office files</td>
<td></td>
</tr>
<tr>
<td>OpenOffice</td>
<td></td>
</tr>
<tr>
<td>PDF</td>
<td></td>
</tr>
<tr>
<td>PGP password file</td>
<td></td>
</tr>
<tr>
<td>RAR</td>
<td></td>
</tr>
<tr>
<td>StuffIt</td>
<td></td>
</tr>
<tr>
<td>TrueCrypt</td>
<td></td>
</tr>
<tr>
<td>WinZip adv.encryption</td>
<td></td>
</tr>
<tr>
<td>YAFFS (1 and 2)</td>
<td></td>
</tr>
<tr>
<td>ZIP</td>
<td></td>
</tr>
<tr>
<td>7-Zip</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** While BestCrypt BCArchive and BCTextEncoder are supported, BestCrypt encrypted volumes are not supported.

<table>
<thead>
<tr>
<th>Windows Rights Management (RMS) for Microsoft Office files and Outlook email files</th>
<th>You can decrypt DRM files at the case level. See Decrypting Microsoft Office Digital Rights Management (DRM) Protected Files on page 187.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credant</td>
<td>You can configure Credant decryption either at the global application level or at the case level. See Decrypting Credant Files on page 189.</td>
</tr>
<tr>
<td>Lotus Notes (whole NSF)</td>
<td>After initial evidence processing, you can use the Decrypt Files tool. See Decrypting Other Encryption Types on page 186. See Decrypting Lotus Notes Files on page 188.</td>
</tr>
<tr>
<td>Lotus Notes (notes/email)</td>
<td></td>
</tr>
<tr>
<td>Microsoft EFS, Office</td>
<td></td>
</tr>
<tr>
<td>S/MIME PKCS7</td>
<td></td>
</tr>
</tbody>
</table>

Decryption Files
About Decrypting Files

When you encrypt individual files, you create a list of passwords to use to try to decrypt the files. You configure a password list for each case.

When you enter passwords into the list, you can type them or paste them from a text file. Each password must be on its own line.

You can add passwords to the list at any time. The password list is saved with the case. The passwords are present any other time that you access the list in that case.

When compiling a list of passwords, you can use the following sources:

- Passwords that were recovered using AccessData PRTK or DNA
  See Recovering Unknown Passwords of Encrypted Files on page 184.
- Passwords that you have learned about as part of an investigation
- Lists of known commonly used passwords

### Files that can be Decrypted

<table>
<thead>
<tr>
<th>Encryption Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bitlocker (Windows Vista, 7, 8)</td>
<td>When you add an image as evidence, if the image is encrypted with one of these types of encryption, it is automatically detected and you are prompted to enter the credentials.</td>
</tr>
<tr>
<td>Checkpoint/PointSec R73 7.4.5</td>
<td>See the following for more information:</td>
</tr>
<tr>
<td>Checkpoint 7.6.150 with token challenge</td>
<td>- Decrypting Bitlocker Partitions (page 191)</td>
</tr>
<tr>
<td>McAfee Endpoint Encryption (formerly Safeboot) 5.x and 6.0</td>
<td>- Decrypting Safeguard Utimaco Files (page 192)</td>
</tr>
<tr>
<td>Safeguard Easy 4.40.9 and Enterprise 5.40 and 5.50</td>
<td>- Decrypting SafeBoot Files (page 194)</td>
</tr>
<tr>
<td>Symantec Endpoint Encryption (formerly Guardian Edge) 8.1.1, 9.1.6, 9.3.0, 9.4.1, 9.5.3, SEE version 8.0.1</td>
<td>- Decrypting Guardian Edge Files (page 194)</td>
</tr>
<tr>
<td>Symantec Drive Encryption (PGP WDE) 10.0 (only)</td>
<td>- Decrypting an Image Encrypted With PGP® WDE (page 194)</td>
</tr>
<tr>
<td>CheckPoint</td>
<td></td>
</tr>
</tbody>
</table>
Identifying the Encrypted Files in a Case

After you have added evidence to a case, you can identify which files are encrypted. In the Examiner interface, you can use the Overview tab or apply the Encrypted Files filter.

To view the encrypted files in a case

1. Open the Examiner.
2. Do one of the following:
   - To use the Overview tab, do the following:
     2a. Click the Overview tab.
     2b. Expand File Status.
     2c. Click Encrypted Files
   - To use a filter, do the following:
     2a. Click the QuickPick icon for Evidence to view all or some of the evidence in the case.
     2b. Using the Filters drop-down menu, select Encrypted Files.
     In the File List, all decrypted files will be displayed.

After decrypting files, you can see which files have been decrypted.

See Recovering Unknown Passwords of Encrypted Files on page 184.

Note: In the File List, all decrypted files will be displayed in text. Several decryption key files are identified and categorized for ease of use. Find them in the Overview tab under File Category > Other Encryption Files > Certificates. Having these files identified and available makes it easier to quickly access files that may have been unavailable before.
Using PRTK/DNA Integration

Decrypting Files Using the Automatic Decryption Processing Option

You can decrypt many types of encrypted files using Automatic Decryption, which uses code from AccessData Password Recovery Toolkit (PRTK).

See About Decrypting Files on page 177.

To decrypt files, you supply a list of passwords. When the decrypted files are processed, those passwords are used to try to decrypt the files. If the passwords match, the files are decrypted.

You can configure and use this feature at any of the following times:

- As a processing option when doing one of the following:
  - Creating a case and configuring the default processing options for the case
    
    You can enable Automatic Decryption to be a default processing option for a case. As a default option, every time that you add evidence to the case, the default setting will be to try to decrypt files using the passwords that you provide. You can add passwords to the list at any time. This option is not enabled by default and will add time to the evidence processing.
  
  - Adding evidence to a case and configuring the refinement options for processing
    
    Any time that you add evidence to a case, you can configure the refinement options to enable file decryption using Automatic Description. Each time you enable decryption, you can modify that password list as needed.

  - After the evidence has been processed and using Additional Analysis
    
    Any time that you perform Additional Analysis, you can configure the refinement options to enable file decryption using Automatic Decryption. Each time you enable decryption, you can modify that password list as needed.

- After the evidence has been processed, from the Examiner interface using Tools > Decrypt files

The following encrypted file types cannot be decrypted using the Perform Automatic Decryption option during processing:

- EFS, Lotus Notes (whole), Lotus Notes/emails, SMIME, and Credant

Instead, you must use the Tools > Decrypt Files option in the Examiner.

To configure Automatic Decryption as a processing option

1. Access the Processing Options for either a new case, new evidence or for performing Additional Analysis.

2. On the options page, check Perform Automatic Decryption.

   See Evidence Processing Options on page 81.

3. Click Passwords.

4. Enter the passwords that you want to use.

   See About the Encrypted File Passwords List on page 179.

5. Click OK.

To perform Automatic Decryption from the Decrypt Files page

1. In a case, click Tools > Decrypt Files.

2. In the Decrypt Files dialog, check Perform Automatic Decryption.

3. Click Passwords.
4. Enter the passwords that you want to use. See About the Encrypted File Passwords List on page 179.

5. Select **Attempt Blank Password** to decrypt files with no password, or whose password is blank.

6. Click **OK**.

7. Click **Decrypt**.
   A processing job is started to decrypt files.
   When using PRTK/DNA integration or recover a password, a dialog is displayed showing the progress of the recovery job. When a password has been recovered, the status in the dialog will turn green and it will display “A password has been recovered. Attempting to decrypt the file.”

   **Note:** You may briefly see a progress dialog appear. The dialog is not applicable to this data and will disappear quickly.

8. If needed, you can cancel the decryption process.

After decrypting files, you can see which files have been decrypted.

See Recovering Unknown Passwords of Encrypted Files on page 184.

---

**Decrypting Files Using Right-Click Auto Decryption**

The integration with PRTK/DNA includes an Auto Decrypt option. You can use a right-click option one an encrypted file in the File List and it will send the file to PRTK/DNA for password recovery. If the password is found, it will be returned automatically to the FTK interface, which will begin the FTK decryption process.

To perform auto-decryption, you must have PRTK or DNA 7.3 or higher installed on the same computer as the Examiner.

**To auto decrypt files**

1. In the **Examiner**, use the **Quick Filters** to select **Encrypted Files**.

2. Right-click an encrypted file and select **Auto Decrypt**.
   A password recovery job is then started in PRTK/DNA.
   The **Data Processing Status** dialog shows the process of the job.
   You can view the status in the PRTK/DNA UI as well.
   When the job is completed, the status displays the following message:
   “The password has been recovered; attempting to decrypt the file.”

3. In the **Examiner**, use the **Quick Filters** to select **Decrypted Files**.
   If the file was decrypted, it will show in the File List.
Recovering Unknown Passwords of Encrypted Files

You may find encrypted files with unknown passwords in your case.

See Identifying the Encrypted Files in a Case on page 181.

If you have a license, you can use AccessData Password Recovery Toolkit (PRTK) or Distributed Network Attack (DNA) to attempt to recover passwords for encrypted files. You can use PRTK or DNA in the following ways:

- As a stand-alone product
- As an integrated tool with the Examiner

About Recovering Passwords using the PRTK/DNA Integrated Tool with Examiner

Using PRTK/DNA integration, you can easily send encrypted files to PRTK/DNA to attempt to recover unknown passwords. These passwords can then be used with the decryption tools to decrypt the encrypted files.

See About Decrypting Files on page 177.

In order to use this PRTK/DNA integrated tool to recover passwords, you must install version 7.2 or higher of PRTK or the DNA host on the same computer as the Examiner. (You cannot install both PRTK and DNA on the same computer.

Important: When an item is sent to PRTK/DNA for automatic decryption, a dictionary is automatically generated based on the case’s wordlist in FTK. This dictionary is used “As Is” in conjunction with the English dictionaries and “PRTK” profile to attempt password recovery on the selected item.

For details about PRTK/DNA, see the PRTK/DNA User Guide.

As a workflow, you can do the following:

- Identify encrypted files in your case.
  See Identifying the Encrypted Files in a Case on page 181.
- Using the Examiner, select and send encrypted files to PRTK/DNA.
- A password recovery job is started in PRTK/DNA for each file that you send.
  Important: PRTK is a resource-intensive application. If you send more than 3 files at a time, you may significantly reduce the resources available to the Examiner. Because DNA uses distributed jobs, you can send more files without impacting the Examiner.
- You view the PRTK/DNA interface to view the status and results of the password recovery jobs.
- After jobs have been run in PRTK/DNA, you can use PRTK/DNA to copy all of the recovered passwords to the clipboard.
  See Copying Recovered Passwords From PRTK/DNA to the Windows Clipboard on page 185.
- You can then use the list of passwords with the decryption tools to decrypt the encrypted files.
  See About Decrypting Files on page 177.

Recovering Passwords using the PRTK/DNA Integrated Tool

You can attempt to recovery unknown passwords for encrypted files in your case.
To Recover Passwords using the PRTK/DNA Integrated Tool with Examiner

1. Use the Examiner to identify encrypted files.
   See Identifying the Encrypted Files in a Case on page 181.
2. In the File List, select the files that you want to sent to PRTK/DNA.
3. Click Tools > Send to PRTK/DNA for password recovery...
   If this option is not active, then PRTK or DNA is not installed on the same computer as the Examiner.
4. In the Send Files to PRTK/DNA dialog, confirm the file or files that you want to send.
   The dialog will display if PRTK or DNA is installed on the computer and will be used.
5. Click OK.
6. Use the PRTK/DNA interface to view job status and results.
7. Copy the list of recovered passwords to use to decrypt files.

Copying Recovered Passwords From PRTK/DNA to the Windows Clipboard

You can copy the list of recovered passwords to the Windows clipboard. This can be useful is creating a list of known passwords for other uses. For example, if you are using AccessData Forensics Toolkit (FTK), you can use this list to decrypt files in your FTK cases.

The passwords are copied in text format, one password per line.

To copy recovered passwords to the clipboard

1. Complete at least one password recovery job.

2. In the toolbar, click the icon.
   The passwords are copied to the Windows clipboard.

3. Open a text editor and paste the list in the file.
4. Copy the list into the Passwords list.
Decrypting Other Encryption Types

Decrypting EFS

Understanding EFS

Versions of Windows developed for business environments from Windows 2000 onwards include the ability to encrypt files and folders. This feature is known as Encrypting File System (EFS). It is not supported in Windows XP Home Edition.

EFS files, as well as Microsoft® Office, and Lotus® Notes (NSF) files and folders can be decrypted. To do so, the password must already be known.

In Windows, EFS-encrypted files or folders can be viewed only by the user who encrypted them or by the user who is the authorized Recovery Agent. When the user logs in, encrypted files and folders are decrypted and the files are automatically displayed.

Note: There are certain files that cannot be encrypted, including system files; NTFS compressed files, and files in the [drive]\[Windows_System_Root] and its subdirectories.

Important: When a user marks an encrypted file as privileged and that file is later decrypted, all associated data with the newly decrypted file are able to be found in an index search as hits. When a user attempts to view the hits in a different list, an error is displayed that the path is invalid.

Decrypting EFS Files and Folders

To find EFS passwords, export encrypted files and add them as jobs in PRTK or DNA. When passwords are found, you are ready to decrypt the encrypted files.

Requirements

Different versions of Windows OS have different requirements for decrypting EFS.

Windows 2000 and XP Systems Prior to SP1

EFS files on Windows 2000 prior to Service Pack 4 and Windows XP systems prior to Service Pack 1 are automatically decrypted. Simply select the Decrypt EFS Files option when adding evidence to a case and PRTK technology decrypts the EFS files.

Windows XP SP1 or Later

For systems running Windows XP Service Pack 1 or later, or Windows 2000 Service Pack 4 or later, the user’s or the Recovery Agent’s password is needed before the EFS files can be decrypted.
Decryption of EFS

To decrypt EFS

1. In a case, click **Tools > Decrypt Files**.
2. In the **Decrypt Files** dialog, if EFS had been detected in your evidence, the EFS option will be active.
3. Select the EFS.
4. In the **Decrypt Files** dialog, click **Set Passwords**.
5. Enter the password.
   - See **About the Encrypted File Passwords List** on page 179.
6. Select **Attempt Blank Password** to decrypt files with no password, or whose password is blank.

**Note:** EFS encrypted files in the case are automatically detected. Decrypt File Types will automatically be marked according to the file types found. Unselect any file types that you do not want to decrypt.

7. Choose one of the following:
   - Click **Decrypt** to begin the decryption process.
   - Click **Cancel** to abandon the decryption and return to the case.

**Note:** The **Decrypt** button is disabled until at least one password is entered, or until **Attempt Blank Password** is marked.

8. When decryption is complete, click **Cancel** to return to the case.

**Decrypting Microsoft Office Digital Rights Management (DRM) Protected Files**

If your organization uses Windows Rights Management (RMS) to protect your Microsoft Office files, you can use the Examiner to decrypt them. If you are investigating Microsoft Office files from within your organization, this saves you time by decrypting and indexing DRM protected files in batch. By using this feature you no longer have to first export each document and then decrypt them individually with the RMS server.

**Important:** This feature only applies to files that are DRM protected from within your Domain. You cannot use this feature to decrypt files that are protected by other organization's RMS systems.

To decrypt DRM protected files, the following prerequisites must exist:

- Your **Examiner** computer and the Microsoft RMS server must be in the same domain.
- The **Examiner** computer must be able to authenticate with the RMS server. The machine activation happen when you first attempt to open or to protect a document for the first time.
- You must be logged into the **Examiner** computer with a Domain account that has Super User access to the Microsoft RMS server.

**To Decrypt DRM Protected Office Files**

1. In the **Examiner**, click **Tools > Decrypt Files**.
2. Click **Decrypt**.
3. Enter your RMS credentials.
**Decrypting Lotus Notes Files**

Lotus Notes stores files in a container called an NSF file. Both the NSF container file and the individual files and emails within the NSF file can be encrypted. To decrypt Lotus Notes files, you may need to first decrypt the NSF container file, and then decrypt its contents.

When an NSF file is created, Lotus Notes also creates a user.id file. Lotus Notes uses the user.id file to identify the user. You must have the user.id file to decrypt the NSF container file and to decrypt its contents.

Lotus Notes versions 7 through 8.5, including NSF and ODS formats 48 and 51 are supported.

**To decrypt a Lotus Notes NSF file**

1. Process the encrypted NSF file and its corresponding user.id file as evidence in the same case. When an NSF file is created, the user.id file is created at the same time. You need both files.
2. When processing is complete, click **Tools > Decrypt Files**.
3. Enter the password to the user.id file.

   **Note:** Some files do not have a password applied. In these cases, you should click **Attempt Blank Password**.

4. Click **Save Password**.
5. Enable **Lotus Notes (whole NSF)**.
6. Click **Decrypt**.

**To decrypt Lotus Notes and emails**

1. Process the encrypted notes and emails and the corresponding user.id file as evidence in the same case.
2. When processing is complete, click **Tools > Decrypt Files**.
3. Enter the password to the user.id file

   **Note:** Some files do not have a password applied. In these cases, you should click **Attempt Blank Password**.

4. Click **Save Password**.
5. Enable **Lotus Notes (notes/emails)**.
6. Click **Decrypt**.

**Decrypting S/MIME Files**

You can decrypt RSA standard PKCS7 S/MIME email items. This includes MBOX, DBX, RFC822, and some PST/EDB archives. You cannot decrypt PGP encrypted emails, Lotus Notes proprietary encryption, and items with S/MIME signatures — only the S/MIME encryption.

The Key files are PFX and PEM. The Key files are flagged and kept track of during processing in the same way as EFS and NSF key files.

**To decrypt S/MIME**

1. In a case, click **Tools > Decrypt Files**.
2. In the **Decrypt Files** dialog, click **Set Passwords**.
3. Enter the password.  
   See About the Encrypted File Passwords List on page 179.

4. Mark **Attempt Blank Password** to decrypt files with no password, or whose password is blank.

   **Note:** S/MIME encrypted files in the case are automatically detected. Decrypt File Types will automatically be marked according to the file types found. Unselect any file types you wish not to decrypt.

5. Click **Decrypt** to begin the decryption process,

   **Note:** The **Decrypt** button is disabled until at least one password is entered, or until **Attempt Blank Password** is marked.

6. When decryption is complete, click **OK** to return to the case.

---

### Decrypting Credant Files

Credant encryption is file-based and works much like EFS. The Credant Decryption option in the tools menu is unavailable unless the image contains Credant encryption.

Credant version 7.7 is supported in both online and offline key bundle modes.

The integration allows two options for decryption: offline, and online. For a key bundle located on the user’s local machine or network, use the offline option. For a key bundle located on a remote server within your network, use the online option.

The first time a user decrypts Credant files and provides the Credant server credentials, that information is encrypted and stored in the database. Later, if that user needs to decrypt Credant files in that or another case, the credentials field populates automatically.

The credentials are stored separately for each user, so while one user may have the credentials stored, others may not until the others have processed a case with Credant files that need to be decrypted.

Both the Online and Offline Credant Decryption dialog boxes have a Decryption Threads drop-down box. This dictates the total number of threads assigned to decryption, not the number of decryption threads per core. If you have a high-end system, you may benefit from a higher setting. At this time, it is not possible to cancel the processing once it has begun.

**Important:** If you click **Cancel** to process the evidence without decrypting, you will **not** be able to decrypt at a later time. Also, the evidence cannot be added to the same case a second time. You will have to create a new case to decrypt and process this evidence.

You can configure Credant server settings in the following ways:

- Globally, for all cases, in the **Case Manager** interface under the Tools menu.
- For a specific case. You can configure Credant decryption in one of the following ways:
  - When configuring Processing Options.
  - On the **Additional Analysis** page
  - On **Tools > Decrypt Files**

   **Important:** This option uses an offline key bundle only. This method does not create any parent-child relationships, and as a result, produces fewer counts than the other methods of doing Credant decryption.  
   See Using an Offline Key Bundle on page 190.
Note: From the Processing Options or the Additional Analysis page, you can select to decrypt Credant files. If you select to decrypt Credant files, the File Signature Analysis option will automatically be selected as well.

See Using Additional Analysis on page 133.

You can now do a Live Search on Credant files on the fly after performing a drive preview.

Using an Offline Key Bundle

Offline decryption is a quicker and more convenient option if the key bundle can be placed on the investigator’s local computer. To decrypt an encrypted image offline, select the key bundle file and enter the password used to decrypt it.

Important: This method does not create any parent-child relationships, and as a result, produces fewer counts than the other methods of doing Credant decryption.

To decrypt Credant files using an offline key bundle

1. Click Tools > Credant Decryption to open the Credant Decryption Options dialog.
2. Select the key bundle file by entering its location or browsing to it.
3. Enter the password.
4. Re-enter the password.
5. Click OK.

Using an Online Key Bundle

Online decryption can occur only when the computer processing the image can directly access the server over the network.

Usually the Machine ID and Shield ID fields are automatically populated. The Machine ID can be found on the server as the Unique ID on the Properties tab. The Shield ID can be found as the “Recovery ID” on the “Shield” tab. It looks similar to this: “ZE3HM8WW”.

The Server Data group box contains information on how to contact the server. It includes the Credant Server user name, password, and IP address. The port should be 8081, and is auto-populated.

Offline decryption requires you to get a key bundle file from the server. Then, select the key bundle file and enter the password used to decrypt it. Get the key bundle file by executing the CFGetBundle.EXE file with a command like that looks like this:

CFGetBundle -Xhttps://10.1.1.131:8081/xapi -asuperadmin -Achangeit -dxp1.accessdata.lab -sZE3HM8WW -oKeyBundle.bin -ipassword

-X for the server address
-a for administrator name
-A for the administrator password
-d for the Machine ID
-s for the Shield ID
-o for the output file

-i for the password used to encrypt the key bundle

**Note:** All command line switches are case sensitive. Also, as in the example above, there is no space between the switch and the accompanying data.

Once you have used either the online or the offline method, the files will be decrypted immediately and the decrypted file will become a child of the encrypted file. After decryption, the files will be processed with the same settings last used to process a file.

Once the key has been added and the appropriate partitions selected, click **OK** to return to the *Manage Evidence* dialog. Select a time zone from the Time Zone drop-down, then click **OK** to begin processing.

**Important:** If you click **Cancel** to process the evidence without decrypting, you will *not* be able to decrypt at a later time. Also, the evidence cannot be added to the same case a second time. You will have to create a new case to decrypt and process this evidence.

---

**Decrypting Bitlocker Partitions**

If you have the proper credentials, you can decrypt Bitlocker encrypted partitions. You can decrypt the Bitlocker partitions from Windows Vista and Windows 7 computers. You can provide the unique credentials for multiple encrypted partitions. After you provide Bitlocker credentials, files in the encrypted partitions are decrypted while the evidence is processed.

**To decrypt Bitlocker partitions**

1. Add evidence that has Bitlocker encryption to a case.
   
   If Bitlocker encryption is detected, you are prompted to enter credentials in the following dialog:

   ![Bitlocker Encryption Credentials]

   - Choose the Boot Key File or Recovery Password:
     - **Boot Key File**
     - **Recovery Password**

2. Enter one of the following credentials:
   - Boot Key File
   - Recovery Password.
3. If there are multiple partitions, a dialog will be displayed saying that the password for the first partition is valid, and that additional partitions remain encrypted.

![Bitlocker Password]

Password is valid for partition 0.
1 partition remains encrypted.

4. Click OK and the credential dialog is again displayed for the next partition. This sequence continues until you have entered the credentials for all encrypted partitions.

**Decrypting Safeguard Utimaco Files**

You can use either Imager or the Examiner interface to decrypt boot drives that were encrypted with SafeGuard by Utimaco.

**Safeguard Easy**

Safeguard Easy works only with an image of a complete drive or a live drive. Imaged partitions cannot be decrypted because the information needed to decrypt the partition exists in the boot record of the drive.

When a live drive or drive image is added as evidence, it is checked to determine if SafeGuard Easy encryption is used on the drive. If it is used, a dialog will appear asking for the user name and password required to access the drive. If the correct user name and password are entered, the drive will be decrypted transparently during processing and the user can access information on the drive as though the drive were not encrypted. Incorrect passwords will result in long waits between attempts -- waits that grow exponentially for each failure. Hitting the cancel button on the dialog will allow the drive to be added as evidence, but the encrypted portions will not be processed.

Secondary hard drives and removable media that has been encrypted with SafeGuard Easy are not currently supported. The problem with secondary drives and removable media is that they contain NO information that indicates how they are encrypted. The encryption information for secondary drives and removable media is contained on the boot drive of the computer that encrypted them.

Versions 2.x and later, and all Imager versions since then support SafeGuard Easy drives encrypted with the following algorithms: AES128, AES256 (the default), DES, 3DES, and IDEA.

The Safeguard dialog box appears only when a valid Utimaco-encrypted image is read.

The username and password used to create the encrypted image are required for decryption. Once the credentials have been added, click OK to return to the Manage Evidence dialog. Select a time zone from the Time Zone drop-down, then click OK to begin processing.

**Important:** The following important information applies when using SafeGuard Decryption:

- Enter the User Name and Password carefully and verify both before clicking OK. If this information is entered incorrectly, the entire image is checked for matching information before returning with an error message. Each wrong entry results in a longer wait.
- If you click *Cancel* to process the evidence without decrypting, you will *not* be able to decrypt at a later time. Also, the evidence cannot be added to the same case a second time. You will have to create a new case to decrypt and process this evidence.

**SafeGuard Enterprise**

SafeGuard Enterprise (SGN) is supported. Utimaco supplied libraries to access the decryption keys for SGN via their recovery mechanism. This involves a somewhat cumbersome challenge/response system with the server to access the decryption keys. Each partition may be decrypted with a different key. The challenge/response process needs to be done for each encrypted partition. In order to enable the challenge/response system, a file called *recoverytoken.tok* needs to be retrieved from the server and selected in the decryption dialog. A recoverytoken.tok file is automatically selected if it is in the same directory as the evidence file.

SafeGuard Enterprise decryption was developed using version 5.x.

AccessData uses SafeGuard-provided *BE_Sgn_Api.DLL* and *BE_KBRDLLn.DLL*. These libraries are 32-bit libraries. The 32-bit process is used to retrieve keys in 64-bit. The actual decryption of the drive is done in the *Examiner*, but the SafeGuard libraries are needed to generate the key from the username/password.

To recognize that a drive is encrypted with SafeGuard Enterprise, “UTICRYPT” is searched for at the beginning of the first sector of each partition.

**Retrieving the Recovery Token**

Before the decryption process can occur, the *recoverytoken.tok* file must be retrieved from the server.

**To retrieve the Recovery Token**

1. From the server, you must create a virtual client.
2. Then you must export the virtual client. This is where the *recoverytoken.tok* file is created.
3. This file must be copied to a place where the *Examiner* can access the file.
4. Click the *Recovery* button next to each partition to retrieve that partition’s key. A dialog will open, telling you which key to retrieve:
   4a. On the server, select **Tools > Recovery** from the menu.
   4b. Select the virtual client you exported (the *recoverytoken.tok* file)
5. Select **Key requested**.
6. Find the requested key (in this case 0x1C3A799F48FB4B199903FB5730314ABF). You can use **Find > Key IDs** from the drop-down, and enter a partial key into **Search Name** to help find the correct key.
7. A challenge code of 6 segments of 5 characters each is offered.
8. Enter the characters from the challenge portion of the dialog into the server’s dialog.
9. Click **Next**.
10. The server then offers a response code consisting of 12 segments of 5 characters each.
11. Enter these into the corresponding dialog that provides the decryption key.
12. Click **OK**. The drive is decrypted and added as evidence to the case.
Decrementing SafeBoot Files

SafeBoot is a program that encrypts drives and/or partitions. The encryption key must be available to enter into the Key field. All recognized partitions are selected by default, up to a maximum of eight. You can unselect any partition that you do not want to add to the case.

**Important:** The following important information applies when using SafeBoot Decryption:

- If you click **Cancel** to process the evidence without decrypting, you will **not** be able to decrypt at a later time. Also, the evidence cannot be added to the same case a second time. You will have to create a new case to decrypt and process this evidence.
- You must add all partitions and decrypt the encrypted partitions when first adding the evidence to the case or you will be unable to see them. Encrypted partitions do not display in the Evidence list.

Once the key has been added and the appropriate partitions selected, click **OK** to return to the Manage Evidence dialog. Select a time zone from the Time Zone drop-down, then click **OK** to begin processing.

Decrementing Guardian Edge Files

When a Guardian Edge-encrypted image is added to a case, it is automatically detected as a Guardian Edge image and a dialog will appear asking for credentials. The dialog has a drop-down list box with the user names that have been found to be associated with the image. Select the user name for which you have a password and enter that password. Enter the password in one of two ways:

- Enter it twice with dots appearing for each character (to keep it hidden from on-lookers).
- Check the **Show in plain text** box and enter it once.

Click **OK** to proceed with the decryption process.

**Important:** If you click **Cancel** to process the evidence without decrypting, you will **not** be able to decrypt at a later time. Also, the evidence cannot be added to the same case a second time. You will have to create a new case to decrypt and process this evidence.

Decrementing an Image Encrypted With PGP® WDE

You can acquire images from disks that have been protected with PGP® Whole Disk Encryption (WDE). This section describes the support for, and the process of specifying the credentials necessary to decrypt the image.

**Note:** Decryption is only possible if an existing credential, such as a user passphrase or a previously-configured Whole Disk Recovery Token, is available.

PGP® WDE Decryption

Individuals and organizations typically use PGP® Whole Disk Encryption (PGP® WDE) to protect the information on their laptop computers in case of loss or theft. Encrypted disks prompt for a user’s passphrase before Windows loads, allowing data to be decrypted on the fly as it is read into memory or encrypted just before being written to disk. Disks remain encrypted at all times.
Administrators can instruct PGP® WDE devices that are managed by a PGP® Universal™ Server to automatically secure an encrypted disk to additional credentials based on a company’s central policy. These could include a WDE Administrator key (for IT support purposes), an Additional Decryption Key (also called a corporate recovery key) and/or a Whole Disk Recovery Token (“WDRT”). WDRTs are commonly used to reset a forgotten passphrase and, can also be used by authorized administrators or examiners to decrypt an acquired image of a PGP® WDE encrypted drive.

**To decrypt a PGP®WDE Image and add it to a case**

1. After creating a case, click **Evidence > Add / Remove Evidence > Add > Acquired Images > OK**.
2. Browse to the location of the image files and select the first of the set to add to this case.
3. You may enter any user’s boot password or passphrase, or use the Whole Disk Recovery Token (WDRT) to decrypt a drive or image. Use one of the following methods:
   - *Boot passwords*: The users for the drive are displayed in the drop-down list in the PGP® Encryption Credentials box. Select the user and enter that user’s boot password.
   - *Whole Disk Recovery Token (WDRT)*: Obtain the WDRT by doing the following:
     3a. Log into the PGP® Universal™ Server.
     3b. Select the **Users** tab.
     3c. Click on the User Name having a recovery icon for the system being examined.
     3d. In the popup dialog in the far right column click the WDRT link to display information about the WDRT. The WDRT will look similar to this:
         
         ULB53-UD7A7-1C4QC-GPDZJ-CRNPA-X5A
         
         3e. You can enter the key, with or without the dashes, in the Passphrase/WDRT text field as the credential to decrypt a drive or image. The WDRT can be copied and pasted into the text field to avoid errors.
     3f. Click **OK**.

**Important**: If you click **Cancel** to process the evidence without decrypting, you will **not** be able to decrypt at a later time. Also, the evidence cannot be added to the same case a second time. You will have to create a new case to decrypt and process this evidence.

4. Verify that the PGP® WDE encrypted image is added to the case Manage Evidence list.
Viewing Decrypted Files

After you have decrypted files, you can view which files have been decrypted.

You can also view the *File Properties* of the original encrypted file to see the password that was used to decrypt that file.

To view decrypted files

1. Open the Examiner.
2. Do one of the following:
   - To use the Overview tab, do the following:
     2a. Click the **Overview** tab.
     2b. Expand **File Status**.
     2c. Click **Decrypted Files**
   - To use a filter, do the following:
     2a. Click the QuickPick icon for *Evidence* to view all or some of the evidence in the case.
     2b. Using the Filters drop-down menu, select **Decrypted Files**.
     In the *File List*, all decrypted files will be displayed.
3. Click on an individual file in the File List to view the file in the File Content pane.
Chapter 13
Exporting Data from the Examiner

This section discusses how to export data from the Examiner interface.

Copying Information from the Examiner

You can use the Copy Special dialog to copy information about the files in a case to the computer clipboard. The file information can include any or all column items, such as Filename, File Path, File Category etc. The data is copied in a tab-delimited format.

To copy file information

1. Select the files for the Copy Special task by doing either of the following:
   - In the File List on any tab, select the files that you want to copy information about.
   - Right-click the file in the file list.
2. Open the Copy Special dialog in any of these ways:
   - Select Edit > Copy Special.
   - Click the Copy Special button on the file list pane.
   - Click Copy Special.
3. In the Copy Special dialog, select from the following:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose Columns</td>
<td>Choose the column template definition that you want to use for the exported data.</td>
</tr>
<tr>
<td>Include Header Row</td>
<td>Includes a header row that uses the column headings you selected.</td>
</tr>
<tr>
<td>All Highlighted</td>
<td>Copies all items highlighted in the current file list.</td>
</tr>
<tr>
<td>All Checked</td>
<td>Copies all items checked in all file lists. You can check files in multiple lists. Checked items remain checked until you uncheck them.</td>
</tr>
<tr>
<td>Currently Listed</td>
<td>Copies all items in the current file list.</td>
</tr>
<tr>
<td>All</td>
<td>Copies all items in the case. Selecting this option can create a very large TSV or CSV file, and may exceed the 10,000 item capacity of the clipboard.</td>
</tr>
</tbody>
</table>

4. In the Choose Columns drop-down list, select the column template that contains the file information that you want to copy.
5. To define a new column settings template click *Column Settings* to open the *Column Settings Manager*.
6. Click **OK** to copy the data to the clipboard.
Exporting Files to a Native Format

You can export files that you find in an investigation to process and distribute to other parties. For example, you can export encrypted files that you need to decrypt with Password Recovery Toolkit (PRTK). You can also export Registry files to analyze in the Registry Viewer.

To export items from a case

1. Do either of the following:
   - In the Examiner, click File > Export
   - Right-click on a file in the File List pane and click Export

2. In the Export dialog, select from the following export options:

### Export Options

<table>
<thead>
<tr>
<th>File Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Append Item number to Filename</td>
<td>Adds the case’s unique File ID to the filename of the exported item.</td>
</tr>
<tr>
<td>Append extension to filename if bad/absent</td>
<td>Uses the file’s header information to add missing file extensions.</td>
</tr>
<tr>
<td>Export Children</td>
<td>Expands container-type files and exports their contents.</td>
</tr>
<tr>
<td>Exclude Slack Space Children Files</td>
<td>Excludes all slack files from the export.</td>
</tr>
<tr>
<td>Save HTML view (if available)</td>
<td>Saves applicable files in HTML format.</td>
</tr>
<tr>
<td>Export emails using Item number for name</td>
<td>Substitutes the Item number in the case instead of the email title to shorten the file paths.</td>
</tr>
<tr>
<td>Export directory as file</td>
<td>Creates a file that contains the binary data of a directory that you export.</td>
</tr>
<tr>
<td></td>
<td>If you select a folder to export, the Examiner does not export the parent folder or empty sub-folders.</td>
</tr>
<tr>
<td></td>
<td>You can export folders as files, but any empty folders that are not selected to be exported as files are not created during the export. To work around this issue, export a folder structure with its children, move up one folder level and mark Export directory as file and Export children.</td>
</tr>
<tr>
<td>Limit Path Length</td>
<td>The Limit Path Length option is now off by default. This prevents getting only partial paths in the export.</td>
</tr>
<tr>
<td>Create Manifest files</td>
<td>Generates manifest files that contain the details and options that are selected for the exported data, including headers. The Export Summary File is commonly called a Manifest file. If you select this option the export creates the manifest file CSV format. The export saves the file in the same destination folder as the exported files.</td>
</tr>
</tbody>
</table>
Export Options (Continued)

<table>
<thead>
<tr>
<th>File Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include original path</td>
<td>Includes the full path from the root to the file. The export maintains the folder structure for the exported files.</td>
</tr>
<tr>
<td>Export emails as MSG</td>
<td>Exports email files into the MSG format for broader compatibility.</td>
</tr>
<tr>
<td>Export emails to PST</td>
<td>Exports email files to a PST file.</td>
</tr>
<tr>
<td></td>
<td>See Exporting Emails to PST on page 209.</td>
</tr>
<tr>
<td>Export messages from email to PST</td>
<td>You can export email messages to a PST file, even if they didn't come from a PST file originally. This lets you accomplish the following:</td>
</tr>
<tr>
<td></td>
<td>• Export messages from RFC822, NSF, PST, Exchange, and so on to a PST.</td>
</tr>
<tr>
<td></td>
<td>• As the opposite of reduction, you can create a new PST file with responsive messages in it.</td>
</tr>
<tr>
<td></td>
<td>This creates a new PST rather than exporting the whole source PST and running reduction to remove anything non-responsive.</td>
</tr>
<tr>
<td></td>
<td>• Convert email archives, such as NSF, to a PST with the same folder and message structure.</td>
</tr>
<tr>
<td></td>
<td>The Exporting Emails to PST feature requires that you have either Microsoft Outlook or the Microsoft Collaboration Data Objects (CDO) installed on the same computer as the processing engine.</td>
</tr>
<tr>
<td></td>
<td>See the Important Information in the Release Notes.</td>
</tr>
<tr>
<td>Include thumbnails of video files</td>
<td>Includes the thumbnails of the video files that were created during evidence processing or during additional analysis.</td>
</tr>
<tr>
<td>Include common video format</td>
<td>Includes the common video format (MP4) files that were created during evidence processing or during additional analysis.</td>
</tr>
</tbody>
</table>

3. Select the items that you want to export from the following options:

<table>
<thead>
<tr>
<th>Target Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Checked</td>
<td>Selects all items checked in all file lists. You can check files in multiple lists.</td>
</tr>
<tr>
<td>All Listed</td>
<td>Selects all items in the current file list.</td>
</tr>
<tr>
<td>All Highlighted</td>
<td>Selects all items highlighted in the current file list. Items remain highlighted only as long as the same tab is displayed.</td>
</tr>
<tr>
<td>All</td>
<td>Selects all items in the case.</td>
</tr>
</tbody>
</table>

4. In the Destination Base Path field, enter or browse to and select the location to export the file. The default path is [Drive]\case_folder\Report\Export\.

5. Click OK.
Exporting Files to an AD1 Image

You can export files to an Image. However, you can only export files to the AD1 format, or to their native format. To export files to their native type see Exporting Files to a Native Format (page 199).
To export images into an image file Exporting an Image to an Image (page 203).

**To export a file to an image**

1. In the **Examiner**, do one of the following:
   - Highlight the items that you want to export.
   - Check the items that you want to export.
   - Make the **File List** pane display the items that you want to export.
2. Click **File > Export to Image**.
3. In the **Create Custom Content Image** dialog, select the appropriate option based on your decision in step one of this procedure Click **OK**.
4. In the **Create Image** dialog, under **Image Destinations(s)**, click **Add**.
5. In the **Select Image Destination** dialog, specify the following information:

<table>
<thead>
<tr>
<th><strong>Option</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case Number</strong></td>
<td>(Optional) Lets you enter a case number for the data that is to be exported.</td>
</tr>
<tr>
<td><strong>Evidence Number</strong></td>
<td>(Optional) Lets you enter an evidence number for the data that is to be exported.</td>
</tr>
<tr>
<td><strong>Unique Description</strong></td>
<td>(Optional) Lets you add a description to the data that is to be exported.</td>
</tr>
<tr>
<td><strong>Examiner</strong></td>
<td>(Optional) Lets you add the name of the evidence examiner to the data that is to be exported.</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td>(Optional) Lets you add notes to the data that is to be exported.</td>
</tr>
<tr>
<td><strong>Image Destination Type</strong></td>
<td>Only AD1 is supported for unique file(s).</td>
</tr>
<tr>
<td><strong>Relative to</strong></td>
<td>The image can be saved locally (<strong>Relative to This machine</strong>), or remotely (<strong>Relative to Remote source machine</strong>).</td>
</tr>
<tr>
<td><strong>Folder</strong></td>
<td>Specify the path and the destination folder for the image on the target computer.</td>
</tr>
<tr>
<td><strong>Username</strong></td>
<td>Specify the domain and the user name to access the target computer.</td>
</tr>
<tr>
<td><strong>Password</strong></td>
<td>Specify the password of the user on the target computer.</td>
</tr>
<tr>
<td><strong>Image Filename (Excluding Extensions)</strong></td>
<td>Specify a filename for the image, but do not include an extension.</td>
</tr>
<tr>
<td><strong>Image Fragment Size</strong></td>
<td>Specify the image fragment size in MB. You can save RAW and E01 file types in a single segment by specifying 0 MB.</td>
</tr>
</tbody>
</table>
6. Click **OK**.

### Image Options (Continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compression</strong></td>
<td>Specify the compression level to use. 0 represents no compression, 9 represents the highest compression. Compression level 1 is the fastest to create. Compression level 9 is the slowest to create.</td>
</tr>
<tr>
<td><strong>Use AD Encryption</strong></td>
<td>Select this option if you want to encrypt the image as it is created.</td>
</tr>
<tr>
<td></td>
<td>When exporting data to an image from an encrypted drive, create the image physically, not logically. A physical image is often required for decrypting full disk encryption.</td>
</tr>
<tr>
<td></td>
<td>AD Encryption supports the following:</td>
</tr>
<tr>
<td></td>
<td>● Hash algorithm SHA-512.</td>
</tr>
<tr>
<td></td>
<td>● Crypto algorithms AES 128, 192, and 256.</td>
</tr>
<tr>
<td></td>
<td>● Key materials (for encrypting the AES key): pass phrases, raw key files, and certificates.</td>
</tr>
<tr>
<td></td>
<td>A raw key file is any arbitrary file whose raw data is treated as the key material.</td>
</tr>
<tr>
<td></td>
<td>Certificates use public keys for encryption and corresponding private keys for decryption.</td>
</tr>
</tbody>
</table>
Exporting an Image to an Image

You can export images into the following types:

- AD1 (AD Custom Content)
- E01 (EnCase Compatible)
- S01 (Smart)
- 001 (RAW/DD)

To export case data to an image

1. In the Examiner, in the Evidence Items tree pane, select an image to export.
2. Click File > Export to Image.
3. In the Create Custom Content Image dialog, specify if you want to export the selected, highlighted, or checked items and then click OK.
4. In the Create Image dialog, under Image Destination(s), click Add.
5. In the Select Image Destination dialog, specify the following information:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Number</td>
<td>(Optional) Lets you enter a case number for the data that is to be exported.</td>
</tr>
<tr>
<td>Evidence Number</td>
<td>(Optional) Lets you enter an evidence number for the data that is to be exported.</td>
</tr>
<tr>
<td>Unique Description</td>
<td>(Optional) Lets you add a description to the data that is to be exported.</td>
</tr>
<tr>
<td>Examiner</td>
<td>(Optional) Lets you add the name of the evidence examiner to the data that is to be exported.</td>
</tr>
<tr>
<td>Notes</td>
<td>(Optional) Lets you add notes to the data that is to be exported.</td>
</tr>
<tr>
<td>Image Destination Type</td>
<td>By default, the image type is AD1. When exporting to an AD1, the image’s file path is added under a root directory. This behavior speeds the process of gathering data for the AD1, and shortens the path to the AD1 content.</td>
</tr>
<tr>
<td>Relative to</td>
<td>The image can be saved locally (Relative to This machine), or remotely (Relative to Remote source machine).</td>
</tr>
<tr>
<td>Folder</td>
<td>Specify the path and the destination folder for the image on the target computer.</td>
</tr>
<tr>
<td>Username</td>
<td>Specify the domain and the user name to access the target computer.</td>
</tr>
<tr>
<td>Password</td>
<td>Specify the password of the user on the target computer.</td>
</tr>
<tr>
<td>Image Filename (Excluding Extensions)</td>
<td>Specify a filename for the image, but do not include an extension.</td>
</tr>
</tbody>
</table>
6. Click **OK**.

7. In the *Create Image* dialog, choose if you want to **Verify Images after they are created**.

8. Choose if you want to **Precalculate progress statistics**. This feature estimates the progress of the task as it is running.

9. Choose if you want to **Add image to case when completed**.

10. Specify the **Time Zone** of the evidence.

11. Click **OK**.

12. Click **Start**.

---

**Image Destination Options (Continued)**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Image Fragment Size</strong></td>
<td>Specify the image fragment size in MB. You can save RAW and E01 file types in a single segment by specifying 0 MB.</td>
</tr>
<tr>
<td><strong>Compression</strong></td>
<td>Specify the compression level to use. 0 represents no compression, 9 represents the highest compression. Compression level 1 is the fastest to create. Compression level 9 is the slowest to create.</td>
</tr>
</tbody>
</table>
| **Use AD Encryption** | Select this option if you want to encrypt the image as it is created. When exporting data to an image from an encrypted drive, create the image physically, not logically. A physical image is often required for decrypting full disk encryption. AD Encryption supports the following:  
  * Hash algorithm SHA-512.  
  * Crypto algorithms AES 128, 192, and 256.  
  * Key materials (for encrypting the AES key): pass phrases, raw key files, and certificates. A raw key file is any arbitrary file whose raw data is treated as the key material. Certificates use public keys for encryption and corresponding private keys for decryption. |
Exporting File List Information

You can use Copy Special functionality to save file list information into a file. You can save this file in TSV, TXT, or CSV format. TXT files display in a text editor program like Notepad. Files saved in TSV or CSV can be opened in a spreadsheet program.

To export file list information to a network/folder/etc you must have rights to access and save information to the location.

To export File List Information

1. Do one of the following:
   - In the Examiner, select File > Export File List Info.
   - Right-click on a file in the File List pane and select Export File List Info.
2. Select the items to export.
   Choose from:
   - All Highlighted (in the File List View)
   - All Checked (in the case)
   - All Listed (in the File List View)
   - All (in the case)
3. Specify if you want to include a header row in the exported file.
4. From the Choose Columns drop-down, select the column template to use. You can click Column Settings to create a column template to use for the export.
5. Specify the filename for the exported information.
6. Choose a file type for the exported file.
7. Browse to and select the destination folder for the exported file.
8. Click Save.
Exporting a Word List

You can export the contents of the case index or registry into a word list. You can use this word list as the basis for a custom dictionary to aid in the password recovery process.

You must have indexed the case to export the word list. If you have not indexed the case, you can click **Evidence > Additional Analysis**. In the **Additional Analysis** dialog, under **Search Indexes**, select **dtSearch Index**, and then click **OK**.

You can only export Registry Viewer contents into a word list if the Registry Viewer is installed on the computer where you are running the **Examiner**.

**To export a word list**

1. In the **Examiner**, select **File > Export Word List**.
2. Select the Registry keys that you want to include in the word list.
3. Click **Export**.
4. Click **Browse Folders** and select the filename and location for the exported word list.
5. Click **Save**.

Exporting Recycle Bin Index Contents

You can export the indexed data from INFO2 files into **TXT**, **TSV**, or **CSV** format.

**To export INFO2 files**

1. Locate an INFO2 file. In the **Examiner** you can find them in the **Overview** tab under **OS/File System Files > Recycle Bin Index**.
2. In the **File List**, highlight the INFO2 files that you want to export.
3. Right-click on the selected files and choose **Export Recycle Bin Index Contents**.
4. Browse to and select the desired destination folder.
5. Type a filename for the exported data file.
6. In the **Save as type** drop-down, select the file type to use.
7. Mark **Include header row** if you want the column headings included in the exported file.
8. Click **Save**.
Exporting Hashes from a Case

You can export hashes from a case. You can add the hash list into the Known File Filter in the same case to identify and set the KFF status on files of interest (Alert) or files of no interest (Ignore). You can use the Disregard status to make it easier to use existing groups, ignoring certain sets in the group that may have Alert status assigned.

To export hashes from the case

1. In the *Examiner*, in the *File List* view, select the files that you want to export the hashes for.
2. Right-click in the list and choose *Export File List Info*.
3. In the *Save As* dialog box, in the *File name* field, enter the name for the exported list.
4. In the *Save as type* drop-down, select either TSV or CSV.
5. Under *File List items to export*, select from the following:
   - All highlighted
   - All checked
   - Currently listed
   - All (In case)
6. Click *Choose Columns* and select the column settings to use.
   If you do not find the correct column setting for this export, click *Column Settings* to customize a column setting to include the file properties you want in this export.
   You should include MD5 Hash, and it is recommended that you also include SHA1 Hash. It is optional to include SHA 256 Hash.
7. In the *Selected Columns* list, double-click on each item to add and remove the columns.
8. Click *OK*.
9. Click *Save*.

Exporting KFF Data

You can use the KFF Admin interface to export KFF Data.

See *Exporting KFF Data* on page 278.
Exporting All Hits in a Search to a CSV file

After you run a search for terms, words, or predefined patterns, you can export your results to a comma delimited text file (CSV).

**To Export All Hits in a Search to a CSV file**

1. Run either a **Live Search** or an **Index Search**.
2. From either the **Index Search Results** window or the **Live Search Results** window, right click the search result and click **Set Context Data Width**.
3. Set the width value. For example, 32.
4. Right-click the search result and click **Export to File > All Hits in Search**.
5. In the **Save As** dialog, browse to the destination where you want to save the file.
6. In the **File Name** field, enter a name for the file.
7. In the **Save as type** field select **Comma Delimited Text File (*.CSV)**.
8. You can then import the CSV file into a program that supports CSV files such as Microsoft Excel.
Exporting Emails to PST

You can export email messages to a PST file, even if they didn’t come from a PST file originally. This lets you accomplish the following:

- Export messages from RFC822, NSF, PST, Exchange, and so on to a PST.
- As the opposite of reduction, you can create a new PST file with responsive messages in it. This creates a new PST rather than exporting the whole source PST and running reduction to remove anything non-responsive.
- Convert email archives, such as NSF, to a PST with the same folder and message structure.

To export emails to PST

1. In the Export dialog, select Export emails to PST.
2. (Optional) If you want to preserve the folder structure, select Preserve folder structure.

Note: When preserving the folder structure, the export creates a root directory for the email, followed by the user name associated with that email. The folder and message structure then mirror that of the emails being exported.

3. Select how you want to organize the exported emails.
   Choose from the following export options:
   - Separate PST per evidence.
   - Separate PST per custodian
   - Single PST
   - PST per mail archive
4. Configure other export options and click OK.

To convert email archives with the same folder and message structure

1. In the Export dialog, select Export messages from email archives to PST.
2. Configure other export options and click OK.
Chapter 14

About Cerberus Malware Analysis

About Cerberus Malware Analysis

Cerberus lets you do a malware analysis on executable binaries. You can use Cerberus to analyze executable binaries that are on a disk, on a network share, or that are unpacked in system memory.

Cerberus consists of the following stages of analysis:

- **Stage 1: Threat Analysis**
  Cerberus stage 1 is a general file and metadata analysis that quickly examines an executable binary file for common attributes it may possess. It identifies potentially malicious code and generates and assigns a threat score to the executable binary.
  See About Cerberus Stage 1 Threat Analysis on page 211.

- **Stage 2: Static Analysis**
  Cerberus stage 2 is a disassembly analysis that takes more time to examine the details of the code within the file. It learns the capabilities of the binary without running the actual executable.
  See About Cerberus Stage 2 Static Analysis on page 217.

Cerberus first runs the Stage 1 threat analysis. After it completes Stage 1 analysis, it will then automatically run a static analysis against binaries that have a threat score that is higher than the designated threshold.

Cerberus analysis may slow down the speed of your overall processing.

**Note:** This feature is available depending on your license. Please contact your sales representative for more information.

**Important:** Cerberus writes binaries to the AD Temp folder momentarily in order to perform the malware analysis. Upon completion it will quickly delete the binary. It is important to ensure that your antivirus is not scanning the AD Temp folder. If antivirus deletes/Quarantines the binary from the temp Cerberus analysis will not be performed.

Cerberus analyzes the following types of files:

<table>
<thead>
<tr>
<th>acm</th>
<th>com</th>
<th>dll</th>
<th>exe</th>
<th>lex</th>
<th>ocx</th>
<th>scr</th>
<th>tlb</th>
</tr>
</thead>
<tbody>
<tr>
<td>ax</td>
<td>cpl</td>
<td>dll~</td>
<td>iec</td>
<td>mui</td>
<td>pyd</td>
<td>so</td>
<td>tmp</td>
</tr>
<tr>
<td>cnv</td>
<td>dat</td>
<td>drv</td>
<td>ime</td>
<td>new</td>
<td>rll</td>
<td>sys</td>
<td>tsp</td>
</tr>
</tbody>
</table>

wpc
About Cerberus Stage 1 Threat Analysis

Cerberus stage 1 analysis is a general analysis for executable binaries. The Stage 1 analysis engine scans through the binary looking for malicious artifacts. It examines several attributes from the file's metadata and file information to determine its potential to contain malicious code within it. For each attribute, if the condition exists, Cerberus assigns a score to the file. The sum of all of the file’s scores is the file’s total threat score.

More serious attributes have higher positive scores, such as +20 or +30. Safer attributes have smaller or even negative numbers such as +5, -10 or -20.

The existence of any particular attribute does not necessarily indicate a threat. However, if a file contains several attributes, then the file will have a higher sum score which may indicate that the executable binary may warrant further investigation. The higher the threat score, the more likely a file may be to contain malicious code.

For example, you may have a file that had four attributes discovered. Those attributes may have scores of +10, +20, +20, and +30 for a sum of +80. You may have another file with four attributes of scores of +5, +10, -10, -20 for a sum of -15. The first file has a much higher risk than the second file.

Cerberus stage 1 analysis also examines each file's properties and provides information such as its size, version information, signature etc.

About Cerberus Score Weighting

There are default scores for each attribute of Cerberus Stage 1 threat scoring. However, you can modify the scoring so that you can weigh the threat score attributes with your own values.

For example, the Bad Signed attribute as a default value of +20. You can give it a different weight of +30.

You must configure these scores before the files are analyzed.

About Cerberus Override Scores

Some threat attributes have override scores. If a file has one of these attributes, instead of the score being the sum of the other attributes, the score is overridden with a set value of 100 or -100. This is useful in quickly identifying files that are automatically considered either as a threat or safe. If a bad artifact is found that requires immediate attention, the file is given the maximum score. If an artifact is found that is considered safe, the file is automatically given the minimum score.

Score ranges have maximum and minimum values of -100 to 100.

- High threat signatures will result in a final score of 100.
- Low threat signatures will result in a final score of -100.

Cerberus attributes that that have maximum override scores include:

- Bad signatures
- Revoked signatures
- Expired signatures
- Packed with known signature

If any of these attributes are found, the score is overridden with a score of +100.
Cerberus Minimum override score includes:

- Valid digital signature

If this attribute is found, the score is overridden with a score of -100.

**Important:** If a file that is malware has a valid digital signature, the override will score the file as -100 (low threat), even though the file is really malware.

### About Cerberus Threat Score Reports

After you have processed evidence with Cerberus enabled, you can view a threat score report for each executable file in a threat score reports. This report shows the Cerberus score that were calculated during processing. There are two columns of scores: the weighted score assigned to each attribute (the potential score) and the actual score given if the attribute was found in the file.

**Cerberus Threat Score Report**

![Cerberus Threat Score Report](image)
The report also shows general file properties.

**File Information Threat Score Report**

<table>
<thead>
<tr>
<th>File Size</th>
<th>1705120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import Count</td>
<td>83</td>
</tr>
<tr>
<td>Entropy Score</td>
<td>7.99275</td>
</tr>
<tr>
<td>Entropy may be packed</td>
<td>true</td>
</tr>
<tr>
<td>Interesting Functions:</td>
<td></td>
</tr>
<tr>
<td>KERNEL32.DLL!CREATEPROCESS</td>
<td>process</td>
</tr>
<tr>
<td>ADVAPI32.DLL!ADJUSTTOKENPRIVILEGES</td>
<td>security</td>
</tr>
<tr>
<td>ADVAPI32.DLL!LOOKUPPRIVILEGEVALUEA</td>
<td>security</td>
</tr>
<tr>
<td>ADVAPI32.DLL!OPENPROCESSTOKEN</td>
<td>security</td>
</tr>
<tr>
<td>No packer signature matched.</td>
<td>True</td>
</tr>
<tr>
<td>Has Version</td>
<td>True</td>
</tr>
<tr>
<td>Version info:</td>
<td></td>
</tr>
<tr>
<td>Comments</td>
<td>This installation was built with Inno Setup: <a href="http://www.innosetup.com">http://www.innosetup.com</a></td>
</tr>
<tr>
<td>CompanyName</td>
<td>goodcomms Inc.</td>
</tr>
<tr>
<td>FileDescription</td>
<td>App1s(앱매즈) Setup</td>
</tr>
<tr>
<td>FileVersion</td>
<td>1.0.0.1</td>
</tr>
<tr>
<td>LegalCopyright</td>
<td></td>
</tr>
<tr>
<td>Is Signed</td>
<td>True</td>
</tr>
<tr>
<td>Is Signature Valid</td>
<td>True</td>
</tr>
<tr>
<td>Signature data:</td>
<td></td>
</tr>
<tr>
<td>SignerName</td>
<td>Thawte Code Signing CA - G2</td>
</tr>
<tr>
<td>ProductName</td>
<td>n/a</td>
</tr>
<tr>
<td>SignatureTime</td>
<td>9:44 PM 12/1/2011</td>
</tr>
<tr>
<td>SignatureResult</td>
<td>Signed</td>
</tr>
</tbody>
</table>
### Cerberus Stage 1 Threat Scores

The following table lists the threat scores that are provided in a Stage 1 analysis:

#### Cerberus Stage 1 Threat Score Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default Threat Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network</td>
<td>+5</td>
<td>The Network category is triggered when a program contains the functionality to access a network. This could involve any kind of protocol from high-level HTTP to a custom protocol written using low-level raw sockets.</td>
</tr>
<tr>
<td>Persistence</td>
<td>+20</td>
<td>Persistence indicates that the application may try to persist permanently on the host. For example, the application would resume operation automatically even if the machine were rebooted.</td>
</tr>
<tr>
<td>Process</td>
<td>+5</td>
<td>Process indicates the application may start a new process or attempt to gain access to inspect or modify other processes. Malicious applications attempt to gain access to other processes to obfuscate their functionality or attack vector or for many other reasons. For example, reading or writing into a process’s memory, or injecting code into another process.</td>
</tr>
<tr>
<td>Crypto</td>
<td>+6</td>
<td>Crypto is triggered when an application appears to use cryptographic functionality. Malicious software uses cryptography to hide data or activity from network monitors, anti-virus products, and investigators.</td>
</tr>
<tr>
<td>Protected Storage</td>
<td>+10</td>
<td>ProtectedStorage indicates that the application may make use of the Windows &quot;pstore&quot; functionality. This is used on some versions of Windows to store encrypted data on the system. For example, Internet Explorer stores a database for form-filling in protected storage.</td>
</tr>
<tr>
<td>Registry</td>
<td>+5</td>
<td>Registry is triggered when a target application attempts to use the registry to store data. The registry is commonly used to store application settings, auto-run keys, and other data that the application wants to store permanently but not in its own file.</td>
</tr>
<tr>
<td>Security</td>
<td>+5</td>
<td>Imports functions used to modify user tokens. For example, attempting to clone a security token to impersonate another logged on user.</td>
</tr>
<tr>
<td>Obfuscation</td>
<td>+30</td>
<td>Stage 1 searches for signs that the application is 'packed', or obfuscated in a way that hinders quick inspection. The Obfuscation category is triggered when the application appears to be packed, encrypted, or otherwise obfuscated. This represents a deliberate decision on behalf of the developer to hinder analysis.</td>
</tr>
<tr>
<td>Process Execution Space</td>
<td>+2</td>
<td>Unusual activity in the Process Execution Space header. For example, a zero length raw section, unrealistic linker time, or the file size doesn't match the Process Execution Space header.</td>
</tr>
</tbody>
</table>
### Bad Signed

This category is triggered when a binary is cryptographically signed, but the signature is invalid. A signature is generally used to demonstrate that some entity you trust (like a government or legitimate company, called a 'signing authority') has verified the authorship and good intentions of the signed application. However, signatures can be revoked and they can expire, meaning that the signature no longer represents that the signing authority has trust in the application.

### Embedded Data

This category is triggered when an application contains embedded executable code. While all programs contain some program code, this category indicates that the application has an embedded 'resource', which contains code separate from the code which runs normally as part of the application.

### Bad / Bit-Bad

This category is triggered when the application contains signatures indicating it uses the IRC protocol or shellcode signature. Many malware networks use IRC to communicate between the infected hosts and the command-and-control servers.

### Signed / Bit Signed

This category is triggered when a program is signed. A program that is signed is verified as 'trusted' by a third party, usually a legitimate entity like a government or trusted company. The signature may be expired or invalid though; check the 'BadSigned' category for this information.

### PE Good

Scores for good artifacts in PE headers.

### PE Malware

Scores for known malware artifacts in PE headers.

---

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default Threat Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad Signed</td>
<td>+20</td>
<td>This category is triggered when a binary is cryptographically signed, but the signature is invalid. A signature is generally used to demonstrate that some entity you trust (like a government or legitimate company, called a 'signing authority') has verified the authorship and good intentions of the signed application. However, signatures can be revoked and they can expire, meaning that the signature no longer represents that the signing authority has trust in the application.</td>
</tr>
<tr>
<td>Embedded Data</td>
<td>+10</td>
<td>This category is triggered when an application contains embedded executable code. While all programs contain some program code, this category indicates that the application has an embedded 'resource', which contains code separate from the code which runs normally as part of the application.</td>
</tr>
<tr>
<td>Bad / Bit-Bad</td>
<td>+20</td>
<td>This category is triggered when the application contains signatures indicating it uses the IRC protocol or shellcode signature. Many malware networks use IRC to communicate between the infected hosts and the command-and-control servers.</td>
</tr>
<tr>
<td>Signed / Bit Signed</td>
<td>-20</td>
<td>This category is triggered when a program is signed. A program that is signed is verified as 'trusted' by a third party, usually a legitimate entity like a government or trusted company. The signature may be expired or invalid though; check the 'BadSigned' category for this information.</td>
</tr>
<tr>
<td>PE Good</td>
<td>-10</td>
<td>Scores for good artifacts in PE headers.</td>
</tr>
<tr>
<td>PE Malware</td>
<td>+30</td>
<td>Scores for known malware artifacts in PE headers.</td>
</tr>
</tbody>
</table>
**Cerberus Stage 1 File Information**

The following table lists the threat scores that are provided in a Stage 1 analysis:

**File Information from Cerberus Stage 1 Analysis**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Size</td>
<td>Displays the size of the file in bytes.</td>
</tr>
<tr>
<td>Import Count</td>
<td>Displays the number of functions that Cerberus examined.</td>
</tr>
<tr>
<td>Entropy Score</td>
<td>Displays a score of the binaries entropy used for suspected packing or encrypting.</td>
</tr>
<tr>
<td>Entropy may be packed</td>
<td>New:</td>
</tr>
<tr>
<td>Interesting Functions</td>
<td>Displays the name of functions from the process execution space that contributed to the file’s threat score.</td>
</tr>
<tr>
<td>Suspected Packer List</td>
<td>Attempts to display a list of suspected packers whose signature matches known malware packers.</td>
</tr>
<tr>
<td>Modules</td>
<td>Displays the DLL files included in the binary.</td>
</tr>
<tr>
<td>Has Version</td>
<td>Displays whether or not the file has a version number.</td>
</tr>
<tr>
<td>Version Info</td>
<td>Displays information about the file that is gathered from the Windows API including the following:</td>
</tr>
<tr>
<td></td>
<td>● CompanyName</td>
</tr>
<tr>
<td></td>
<td>● FileDescription</td>
</tr>
<tr>
<td></td>
<td>● FileVersion</td>
</tr>
<tr>
<td></td>
<td>● InternalName</td>
</tr>
<tr>
<td></td>
<td>● LegalCopyright</td>
</tr>
<tr>
<td></td>
<td>● LegalTrademarks</td>
</tr>
<tr>
<td></td>
<td>● OriginalFilename</td>
</tr>
<tr>
<td></td>
<td>● ProductName</td>
</tr>
<tr>
<td></td>
<td>● ProductVersion</td>
</tr>
<tr>
<td>Is Signed</td>
<td>Displays whether or not the file is signed. If the file is signed the following information is also provided:</td>
</tr>
<tr>
<td></td>
<td>● IsValid</td>
</tr>
<tr>
<td></td>
<td>● SignerName</td>
</tr>
<tr>
<td></td>
<td>● ProductName</td>
</tr>
<tr>
<td></td>
<td>● SignatureTime</td>
</tr>
<tr>
<td></td>
<td>● SignatureResult</td>
</tr>
<tr>
<td>Unpacker results</td>
<td>Attempts to show if and which packers were used in the binary.</td>
</tr>
</tbody>
</table>
About Cerberus Stage 2 Static Analysis

When you run a stage 1 analysis, you configure a score that will launch a Cerberus stage 2 analysis. If an executable receives a score that is equal or higher than the configured score, Cerberus stage 2 is performed. Cerberus stage 2 disassembles the code of an executable binary without running the actual executable.

About Cerberus Stage 2 Report Data

When a stage 2 analysis runs, it returns its results of the file’s functions in the Functional Call Summary section of the threat score report.

Cerberus Stage 2 Report Data in Threat Scan Report
Cerberus Stage 2 Function Call Data

Stage 2 analysis data is generated for the following function call categories:

- File Access
- Networking functionality
- Process Manipulation
- Security Access
- Windows Registry
- Surveillance
- Uses Cryptography
- Low-level Access
- Loads a driver
- Subverts API
- Misc
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Access</td>
<td>Functions that manipulate (read, write, delete, modify) files on the local file system.</td>
</tr>
<tr>
<td>Filesystem.File.Read.</td>
<td>This is triggered by functionality which reads executable files from disk. The executable code can then be executed, obfuscated, stored elsewhere, transmitted, or otherwise manipulated.</td>
</tr>
<tr>
<td>Filesystem.File.Read.</td>
<td>This application may attempt to read data directly from disk, bypassing the filesystem layer. This is very uncommon in normal applications, and may indicate subversive activity.</td>
</tr>
<tr>
<td>Filesystem.Physical.</td>
<td>This application may attempt to write data directly to disk, bypassing the filesystem layer in the operating system. This is very uncommon in normal applications, and may indicate subversive activity. It is also easy to do incorrectly, so this may help explain any system instability seen on the host.</td>
</tr>
<tr>
<td>FileSystem.Directory.</td>
<td>This indicates the application may attempt to create directory. Modifications to the file system are useful for diagnosing how an application persists, where its code and data are stored, and other useful information.</td>
</tr>
<tr>
<td>FileSystem.Directory.</td>
<td>This indicates an application may try to create a directory in the \Windows directory. This directory contains important operating system files, and legitimate applications rarely need to access it.</td>
</tr>
<tr>
<td>FileSystem.Directory.</td>
<td>This indicates the application may attempt to recurse through the file system, perhaps as part of a search functionality.</td>
</tr>
<tr>
<td>FileSystem.Delete:</td>
<td>This indicates the application may delete files. With sufficient permissions, the application may be able to delete files which it did not write or even system files which could affect system stability.</td>
</tr>
<tr>
<td>FileSystem.File.Delete</td>
<td>This indicates the application may try to delete files in the \Windows directory, where important system files are stored. This is rarely necessary for legitimate applications, so this is a strong indicator of suspicious activity.</td>
</tr>
<tr>
<td>FileSystem.File.Delete</td>
<td>This indicates the application may try to delete files in the \Windows\System32 directory, where important system files are stored. This is rarely necessary for legitimate applications, so this is a strong indicator of suspicious activity.</td>
</tr>
<tr>
<td>FileSystem.File.Read.</td>
<td>This indicates the application may attempt to read from the \Windows directory, which is very uncommon for legitimate applications. \Windows is where many important system files are stored.</td>
</tr>
<tr>
<td>FileSystem.File.Write.</td>
<td>This indicates the application may attempt to write to the \Windows directory, which is very uncommon for legitimate applications. \Windows is where many important system files are stored.</td>
</tr>
</tbody>
</table>
### Cerberus Stage 2 File Access Function Call Categories (Continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FileSystem.File.Read. System32:</td>
<td>This indicates the application may attempt to read from the \Windows\System32 directory, which is very uncommon for legitimate applications. \Windows\System32 is where many important system files are stored.</td>
</tr>
<tr>
<td>FileSystem.File.Write. System32:</td>
<td>This indicates the application may attempt to write to the \Windows\System32 directory, which is very uncommon for legitimate applications. \Windows\System32 is where many important system files are stored.</td>
</tr>
<tr>
<td>FileSystem.File.Write. ExecutableExtension:</td>
<td>This indicates the application may attempt to write an executable file to disk. This could indicate malicious software that has multiple ‘stages’, or it could indicate a persistence mechanism used by malware (i.e. write an executable file into the startup folder so it is run when the system starts up).</td>
</tr>
<tr>
<td>FileSystem.File. Filename.Compression:</td>
<td>This indicates the program may write compressed files to disk. Compression can be useful to obfuscate strings or other data from quick, automated searches of every file on a filesystem.</td>
</tr>
<tr>
<td>FileSystem.File. Filename.Autorun:</td>
<td>This indicates the application may write a program to a directory so that it will run every time the system starts up. This is a useful persistence mechanism.</td>
</tr>
</tbody>
</table>
# Networking Functionality Call Categories

## Cerberus Stage 2 Networking Functionality Function Call Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Networking functionality</td>
<td>Functions that enable sending and receiving data over the or other networks.</td>
</tr>
<tr>
<td><strong>Network.FTP.Get:</strong></td>
<td>Describes the use of FTP to retrieve files. This could indicate the vector a malware application uses to retrieve data from a C&amp;C server.</td>
</tr>
<tr>
<td><strong>Network.Raw:</strong></td>
<td>Functions in this category indicate use of the basic networking commands used to establish TCP, UDP, or other types of connections to other machines. Programmers who use these build their own communication protocol over TCP (or UDP or other protocol below the application layer) rather than using an application-layer protocol such as HTTP or FTP.</td>
</tr>
<tr>
<td><strong>Network.Raw.Listen:</strong></td>
<td>Functionality in this category indicates the application accepts incoming connections over tcp, udp, or other lower-level protocol.</td>
</tr>
<tr>
<td><strong>Network.Raw.Receive:</strong></td>
<td>Functionality in this bucket indicates that the application receives data using a socket communicating over a lower-level protocol such as TCP, UDP, or a custom protocol.</td>
</tr>
<tr>
<td><strong>Network.DNS.Lookup.Country.XX:</strong></td>
<td>This indicates the application may attempt to resolve the address of machines in one of several countries. “XX” will be replaced by the ‘top level domain’, or TLD associated with the lookup, indicating the application may attempt to establish contact with a host in one of these countries.</td>
</tr>
<tr>
<td><strong>Network.HTTP.Read:</strong></td>
<td>The application may attempt to read data over the network using the HTTP protocol. This protocol is commonly used by malware so that its malicious traffic appears to ‘blend in’ with legitimate web traffic.</td>
</tr>
<tr>
<td><strong>Network.HTTP.Connect.Nonstandard.Request:</strong></td>
<td>This indicates the application may make an HTTP request which is not a head, get, or post request. The vast majority of web applications use one or more of these 3 kinds of requests, so this category indicates anomalous behavior.</td>
</tr>
<tr>
<td><strong>Network.HTTP.Connect.Nonstandard.Port:</strong></td>
<td>Port: Most HTTP connections occur over either port 80 or 443. This indicates the application is communicating with the server over a non-standard port, which may be a sign that the server is not a normal, legitimate web server.</td>
</tr>
<tr>
<td><strong>Network.HTTP.Connect.Nonstandard.Header:</strong></td>
<td>HTTP messages are partially composed of key-value pairs of strings which the receiver will need to properly handle the message. This indicates the application includes non-standard or very unusual header key-value pairs.</td>
</tr>
<tr>
<td><strong>Network.HTTP.Post:</strong></td>
<td>This indicates the application makes a ‘post’ http request. ‘post’ messages are normally used to push data to a server, but malware may not honor this convention.</td>
</tr>
</tbody>
</table>
### Cerberus Stage 2 Networking Functionality Function Call Categories (Continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network.HTTP.Head:</td>
<td>This indicates the application makes a ‘head http request. ‘head’ messages are normally used to determine information about a server’s state before sending a huge amount of data across the network, but malware may not honor this convention.</td>
</tr>
<tr>
<td>Network.Connect. Country.XX:</td>
<td>This indicates the application may attempt to connect to a machines in one of several countries. “XX” will be replaced by the ‘top level domain’, or TLD associated with the lookup.</td>
</tr>
<tr>
<td>FTP.Put:</td>
<td>The application may attempt to send files over the network using FTP. This may indicate an exfiltration mechanism used by malware.</td>
</tr>
</tbody>
</table>
## Process Manipulation Call Categories

### Cerberus Stage 2 Process Manipulation Function Call Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Manipulation</td>
<td>May contain functions to manipulate processes.</td>
</tr>
<tr>
<td>ProcessManagement.n Enumeration:</td>
<td>This functionality indicates the application enumerates all processes. This could be part of a system survey or other attempt to contain information about the host.</td>
</tr>
<tr>
<td>ProcessManagement.n Thread.Create:</td>
<td>This indicates the target application may create multiple threads of execution. This can give insight into how the application operates, operating multiple pieces of functionality in parallel.</td>
</tr>
<tr>
<td>ProcessManagement.n Thread.Create. Suspended:</td>
<td>This indicates the application may create threads in a suspended state. Similar to suspended processes, this may indicate that the threads are only executed some time after they're created or that some properties are modified after they are created.</td>
</tr>
<tr>
<td>ProcessManagement.n Thread.Create: Remote:</td>
<td>This indicates the application may attempt to create a thread in another process. This is a common malware mechanism for ‘hijacking’ other legitimate processes, disguising the fact that malware is on the machine.</td>
</tr>
<tr>
<td>ProcessManagement.n Thread.Open:</td>
<td>The application may try to gain access to observe or modify a thread. This behavior can give insight into how threads interact to affect the host.</td>
</tr>
<tr>
<td>ProcessManagement.n Process.Open:</td>
<td>This application may attempt to gain access to observe or modify other processes. This can give strong insight into how the application interacts with system and what other processes it may try to subvert.</td>
</tr>
<tr>
<td>ProcessManagement.n Process.Create:</td>
<td>This application may attempt to create one or more other processes. Similar to threads, multiple processes can be used to parallelize an application’s functionality. Understanding that processes are used rather than threads can shed insight on how an application accomplishes its goals.</td>
</tr>
<tr>
<td>ProcessManagement.n Process.Create. Suspended:</td>
<td>Describes functionality to create new processes in a suspended state. Processes can be created in a ‘suspended’ state so that none of the threads execute until it is resumed. While a process is suspended, the creating process may be able to substantially modify its behavior or other properties.</td>
</tr>
</tbody>
</table>
**Security Access Call Categories**

**Cerberus Stage 2 Security Access Function Call Categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security Access</td>
<td>Functions that allow the program to change its security settings or impersonate other logged on users.</td>
</tr>
<tr>
<td>Security:</td>
<td>This category indicates use of any of a large number of security-related functions, including those manipulating security tokens, Access Control Entries, and other items. Even without using an exploit, modification of security settings can enable a malicious application to gain more privileges on a system than it would otherwise have.</td>
</tr>
</tbody>
</table>

**Windows Registry Call Categories**

**Cerberus Stage 2 Windows Registry Function Call Categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Registry</td>
<td>Functions that manipulate (read, write, delete, modify) the local Windows registry. This also includes the ability to modify autoruns to persist a binary across boots.</td>
</tr>
<tr>
<td>Registry.Key.Create:</td>
<td>The application may attempt to create a new key in the registry. Keys are commonly used to persist settings and other configuration information, but other data can be stored as well.</td>
</tr>
<tr>
<td>Registry.Key.Delete:</td>
<td>Registry.Key.Delete: This application may attempt to delete a key from the registry. While it is common to delete only keys that the application itself created, with sufficient permissions, Windows may not prevent an application from deleting other applications’ keys as well.</td>
</tr>
<tr>
<td>Registry.Key.Autorun:</td>
<td>This indicates the application may use the registry to try to ensure it or another application is run automatically on system startup. This is a common way to ensure that a program continues to run even after a machine is restarted.</td>
</tr>
<tr>
<td>Registry.Value.Delete:</td>
<td>This indicates the application may attempt to delete the value associated with a particular key. As with the deletion of a key, this may not represent malicious activity so long as the application only deletes its own keys’ values.</td>
</tr>
<tr>
<td>Registry.Value.Set:</td>
<td>The application may attempt to set a value in the registry. This may represent malicious behavior if the value is set in a system key or the key of another application.</td>
</tr>
<tr>
<td>Registry.Value.Set.Binary:</td>
<td>This indicates the application may store binary data in the registry. This data could be encrypted, compressed, or otherwise is not plain text.</td>
</tr>
</tbody>
</table>
**Surveillance Call Categories**

**Cerberus Stage 2 Surveillance Function Call Categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveillance</td>
<td>Usage of functions that provide audio/video monitoring, keylogging, etc.</td>
</tr>
<tr>
<td>Driver.Setup:</td>
<td>Functionality in this category involves manipulation of INF files, logging, and other driver-related tasks. Drivers are used to gain complete control over a system, potentially even gaining control of other security products.</td>
</tr>
<tr>
<td>Driver.DirectLoad:</td>
<td>Functionality in this category involves loading drivers. As noted in 'driver.setup', drivers represent ultimate control over a host system and should be extremely trustworthy.</td>
</tr>
</tbody>
</table>

**Uses Cryptography Call Categories**

**Cerberus Stage 2 Uses Cryptography Function Call Categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uses Cryptography</td>
<td>Usage of the Microsoft CryptoAPI functions.</td>
</tr>
<tr>
<td>Crypto.Hash.Compute:</td>
<td>This indicates a hash function may be used by the target application. Hash functions are used to verify the integrity of communications or files to ensure they were not tampered with.</td>
</tr>
<tr>
<td>Crypto.Algorithm.XX:</td>
<td>The “XX” could be any of several values, including ‘md5’, ‘sha-1’, or ‘sha-256’. These represent particular kinds of hashes which the target application may use.</td>
</tr>
<tr>
<td>Crypto.MagicValue:</td>
<td>This indicates that the target contains strings associated with cryptographic functionality. Even if the application does not use Windows OS functionality to use cryptography, the ‘magic values’ will exist so long as the target uses standard cryptographic algorithms.</td>
</tr>
</tbody>
</table>
**Low-level Access Call Categories**

### Cerberus Stage 2 Low-level Access Function Call Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-level Access</td>
<td>Functions that access low-level operating system resources, for example reading sectors directly from disk.</td>
</tr>
<tr>
<td>Driver.Setup:</td>
<td>Functionality in this category involves manipulation of INF files, logging, and other driver-related tasks. Drivers are used to gain complete control over a system, potentially even gaining control of other security products.</td>
</tr>
<tr>
<td>Driver.DirectLoad:</td>
<td>Functionality in this category involves loading drivers. As noted in 'driver.setup', drivers represent ultimate control over a host system and should be extremely trustworthy.</td>
</tr>
<tr>
<td>Debugging.dbghelp:</td>
<td>This indicates use of functionality included in the dbghelp.dll module from the &quot;Debugging Tools for Windows&quot; package from Microsoft. With the proper permissions, the functionality in this library represents a power mechanism for disguising activity from investigators or for gaining control of other processes.</td>
</tr>
<tr>
<td>Misc.SystemRestore:</td>
<td>Describes functionality involved in the System Restore feature, including removing and adding restore points. Restore points are often used as part of a malware-removal strategy, so removal of arbitrary restore points, especially without user interaction, may represent malicious activity.</td>
</tr>
<tr>
<td>Debugging.</td>
<td>This is triggered if the application tries to determine whether it is being debugged. Malicious applications commonly try to determine whether they’re being analyzed so that they can modify the behavior seen by analysts, making it difficult to discover their true functionality.</td>
</tr>
<tr>
<td>ChecksForDebugger:</td>
<td></td>
</tr>
</tbody>
</table>

**Loads a driver Call Categories**

### Cerberus Stage 2 Loads a driver Function Call Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loads a driver</td>
<td>Functions that load drivers into a running system.</td>
</tr>
</tbody>
</table>
### Subverts API Call Categories

**Cerberus Stage 2 Subverts API Function Call Categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subverts API</td>
<td>Undocumented API functions, or unsanctioned usage of Windows APIs (for example, using native API calls).</td>
</tr>
</tbody>
</table>
Chapter 15
Running Cerberus Malware Analysis

This chapter includes the following topics about running Cerberus in FTK-based products.

- About Reviewing Results of Cerberus (page 230)
- Using Index Search with Cerberus (page 233)
- Exporting a Cerberus Report (page 233)

Running Cerberus Analysis

Cerberus Analysis consists of two stages of analysis that help you to locate potentially malicious files. You can enable this analysis when creating a case or using Additional Analysis.

See About Cerberus Malware Analysis on page 210.

Stage 1 is called a threat analysis and quickly examines an executable binary file for common attributes it may possess. Stage 2 is called static analysis. Static analysis is a disassembly analysis that takes more time to examine the details of the code within the file.

For more information see About Cerberus Malware Analysis (page 210)

Cerberus first runs a threat analysis. After it completes Stage 1 analysis, it can then automatically run a static analysis against binaries with a threat score that is higher than a certain threshold.

Cerberus analysis may slow down the speed of your overall processing. Depending on the size of your data set and the amount of executable binaries that you must examine, it may be advisable to run Cerberus analysis in two steps after you complete initial case processing. In this case, you can first only run Cerberus analysis stage 1 and then after stage 1 is completed, you can then choose to run Cerberus Analysis stage 2.

By default, you must be a Case Manager to run Cerberus analysis.
To run a Cerberus Analysis

1. Do one of the following:

   - When creating a new case: In the Case Manager, in the New Case Options dialog, click Detailed Options. Select Evidence Processing, then click Cerberus Analysis.
   - If working an existing case: In the Examiner, go to Evidence > Additional Analysis. In the Additional Analysis dialog, under the section Indexing / Tools, click Cerberus Analysis.

2. Next to Cerberus Analysis, click Cerberus Options.

3. In the Cerberus Analysis dialog, you can define the weight assigned to each Cerberus stage 1 score. These Stage 1 scores are designed to identify and score specific malware properties and traits. The user-defined weights can be saved per case as well as globally in the Evidence Processing templates.

4. In the Cerberus Analysis dialog, you can choose the option Perform Cerberus Analysis stage 2 if stage 1 threshold is greater than n. This option lets you choose to automatically run stage 2 analysis after stage 1 analysis completes. Do one of the following:

   - To run stage 1 analysis only: Deselect the option to Perform Cerberus Analysis stage 2 if stage 1 threshold is greater than, then only Cerberus Analysis stage 1 is run.
   - To run both stage 1 and stage 2 analysis: Select the option to Perform Cerberus Analysis stage 2 if stage 1 threshold is greater than n. Specify a threshold for a minimum threat score against which you want to run the stage 2 analysis.

     If a file’s threat score is higher than the threshold value that you set, then stage 2 is run. If a file’s threat score is lower than the threshold value, then stage 2 analysis is not run. By default, the threshold automatically runs stage 2 analysis against files with a threat score greater than +20.

5. Click OK.

6. In the Additional Analysis dialog, click OK.
About Reviewing Results of Cerberus

You can use the Examiner to locate executable binaries that have had Cerberus analysis run against them. For executable binaries to have a Cerberus Score, a Case Administrator must first run a Cerberus Analysis.

The Examiner includes the following Cerberus filters that let you display only files that have had Cerberus run against them.

- **Cerberus Score**: Lets you limit the results that are displayed in the File List pane to only files that have had Cerberus Stage 1 analysis run against them.
- **Cerberus Static Analysis**: Lets you limit the results that are displayed in the File List pane to only files that have had both Cerberus Stage 1 analysis and Cerberus Stage 2 analysis.

Cerberus Filter View

In the File List pane, there are Cerberus columns that display Cerberus results data.

See About Cerberus Stage 1 Threat Analysis on page 211.

The data that the Cerberus filter uses to render the information is also available in columns in the Item List. These columns can be sorted and filtered.

There is a Column template that is pre-configured with columns for each of the Cerberus Threat Score Attributes.

You can sort the list of files to see if they have had Cerberus Stage two Static Analysis run, see their threat score, or to see if they have attributes from a Cerberus stage 1 analysis.

**Cerberus Columns**

<table>
<thead>
<tr>
<th>Name</th>
<th>Item #</th>
<th>Path</th>
<th>Category</th>
<th>Cerberus Static Analysis</th>
<th>Cerberus Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dd1.exe</td>
<td>3666</td>
<td>precious.001/... Exe</td>
<td>Y</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Dd5.exe</td>
<td>3668</td>
<td>precious.001/... Exe</td>
<td>Y</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>femengr-ens.dll</td>
<td>3711</td>
<td>precious.001/... Exe</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>HEX32.DLL</td>
<td>3531</td>
<td>precious.001/... Exe</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>MsnMessengerSetu...</td>
<td>3713</td>
<td>precious.001/... Exe</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>sshare95.dll</td>
<td>3532</td>
<td>precious.001/... Exe</td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Ssharent.dll</td>
<td>3533</td>
<td>precious.001/... Exe</td>
<td></td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>
Reviewing Results of Cerberus

To view files with a Cerberus score
1. In the Examiner, open the Explore tab.
2. In the Evidence Items pane, use Quick Picks to select the evidence.
3. In the Filter drop-down menu, select one of the following:
   - Cerberus Score: Lets you limit the results that are displayed in the File List pane to only files that have had Cerberus Stage 1 analysis run against them.
   - Cerberus Static Analysis: Lets you limit the results that are displayed in the File List pane to only files that have had both Cerberus Stage 1 analysis and Cerberus Stage 2 analysis.
4. In the File List pane, in the Column Setting drop-down, select Cerberus Results.
   The File List pane shows all files that have been analyzed by Cerberus. It displays columns for each attribute that Cerberus 1 analyzes. If a file contained an attribute, the column cell displays a Y. If the file did not contain an attribute, the column cell displays an N. You can sort the files by clicking on a column heading. You can sort the displayed results by clicking a column header.
5. To view more details about the file, select it in the File List pane.
   Additional details about the Cerberus analysis are displayed in the File Content viewer in the Natural tab.
Using Index Search with Cerberus

The results of Cerberus analysis can be indexed so that you can run a search for them. The indexed information is an un-tagged version of the Cerberus HTML report. It is appended to the end of the content that is displayed in the File Content Pane’s Filtered view.

See also Searching Evidence with Index Search (page 365).

To search for a Cerberus result

1. In the Examiner, click Evidence > Additional Analysis.
2. In the Search Indexes section, select k® Text Index.
3. In the Miscellaneous section, select Cerberus Analysis.
4. Click Cerberus Options.
5. Enter a Cerberus stage 2 Threshold and click OK.
6. In the Additional Analysis dialog, click OK.
7. In the Examiner click the Index Search tab.
8. In the Terms field, enter a value from the Cerberus report to search for and click Add. For example “Uses Cryptography.”
9. Click Search Now.
10. (Optional) In the Indexed Search Filter Option dialog, you can apply a filter. For example Cerberus Score.
11. Click OK.
12. In the Indexed Results pane, you can select a search result. The search hit is highlighted and displayed in the File Content pane.

Exporting a Cerberus Report

You can export Cerberus results to an HTML file.

To export a Cerberus Report

1. In the File List pane, right click a file that has Cerberus results.
2. Click Export.
3. In the Export dialog, under File Options, select Save HTML view (if available).
4. In the Destination base path field, browse to the location where you want to save the export.
5. Click OK.
Chapter 16
Getting Started with KFF (Known File Filter)

This document contains the following information about understanding and getting started using KFF (Known File Filter).

- About KFF (page 234)
- About the KFF Server and Geolocation (page 239)
- Installing the KFF Server (page 240)
- Configuring the Location of the KFF Server (page 241)
- Migrating Legacy KFF Data (page 242)
- Importing KFF Data (page 244)
- About CSV and Binary Formats (page 252)
- Installing KFF Updates (page 256)
- Uninstalling KFF (page 255)
- KFF Library Reference Information (page 257)
- What has Changed in Version 5.6 (page 262)

Important: AccessData applications versions 5.6 and later use a new KFF architecture. If you are using one of the following applications version 5.6 or later, you must install and implement the new KFF architecture:

- Resolution1 (Resolution1 Platform, Resolution1 CyberSecurity, Resolution1 eDiscovery)
- Summation
- FTK-based products (FTK, FTK Pro, AD Lab, AD Enterprise)

See What has Changed in Version 5.6 on page 262.

About KFF

KFF (Known File Filter) is a utility that compares the file hash values of known files against the files in your project. The known files that you compare against may be the following:

- Files that you want to ignore, such as operating system files
- Files that you want to be alerted about, such as malware or other contraband files

The hash values of files, such as MD5, SHA-1, etc., are based on the file's content, not on the file name or extension. The helps you identify files even if they are renamed.
Using KFF during your analysis can provide the following benefits:

- Immediately identify and ignore 40-70% of files irrelevant to the project.
- Immediately identify known contraband files.

**Introduction to the KFF Architecture**

There are two distinct components of the KFF architecture:

- **KFF Data** - The KFF data are the hashes of the known files that are compared against the files in your project. The KFF data is organized in KFF Hash Sets and KFF Groups. The KFF data can be comprised of hashes obtained from pre-configured libraries (such as NSRL) or custom hashes that you configure yourself.
  
  See [Components of KFF Data](#) on page 235.

- **KFF Server** - The KFF Server is the component that is used to store and process the KFF data against your evidence. The KFF Server uses the AccessData Elasticsearch Windows Service. After you install the KFF Server, you import your KFF data into it.

**Note:** The KFF database is no longer stored in the shared evidence database or on the file system in EDB format.

**Components of KFF Data**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hash</strong></td>
<td>The unique MD5 or SHA-1 hash value of a file. This is the value that is compared between known files and the files in your project.</td>
</tr>
<tr>
<td><strong>Hash Set</strong></td>
<td>A collection of hashes that are related somehow. The hash set has an ID, status, name, vendor, package, and version. In most cases, a set corresponds to a collection of hashes from a single source that have the same status.</td>
</tr>
<tr>
<td><strong>Group</strong></td>
<td>KFF Groups are containers that are used for managing the Hash Sets that are used in a project. KFF Groups can contain Hash Sets as well as other groups. Projects can only use a single KFF Group. However, when configuring your project you can select a single KFF Group which can contains nested groups.</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>The specified status of a hash set of the known files which can be either Ignore or Alert. When a file in a project matches a known file, this is the reported status of the file in the project.</td>
</tr>
</tbody>
</table>
| **Library** | A pre-defined collection of hashes that you can import into the KFF Serve. There are three pre-defined libraries:  
  - NSRL  
  - NDIC HashKeeper  
  - DHS  
  See [About Pre-defined KFF Hash Libraries](#) on page 237. |
About the Organization of Hashes, Hash Sets, and KFF Groups

Hashes, such as MD5, SHA-1, etc., are based on the file’s content, not on the file name or extension.

You can also import hashes into the KFF Server in .CSV format.

For FTK-based products, you can also import hashes into the KFF Server that are contained in .TSV, .HKE, .HKE.TXT, .HDI, .HDB, .hash, .NSRL, or .KFF file formats.

You can also manually add hashes.

Hashes are organized into Hash Sets. Hash Sets usually include hashes that have a common status, such as Alert or Ignore.

Hash Sets must be organized into to KFF Groups before they can be utilized in a project.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index/Indices</td>
<td>When data is stored internally in the KFF Library, it is stored in multiple indexes or indices. The following indices can exist:</td>
</tr>
<tr>
<td>NSRL index</td>
<td>A dedicated index for the hashes imported from the NSRL library.</td>
</tr>
<tr>
<td>NDIC index</td>
<td>A dedicated index for the hashes imported from the NDIC library.</td>
</tr>
<tr>
<td>DHC index</td>
<td>A dedicated index for the hashes imported from the DHC library.</td>
</tr>
<tr>
<td>KFF index</td>
<td>A dedicated index for the hashes that you manually create or import from other sources, such as CSV.</td>
</tr>
<tr>
<td>NSRL index</td>
<td>A dedicated index for the hashes imported from the NSRL library.</td>
</tr>
<tr>
<td>NDIC index</td>
<td>A dedicated index for the hashes imported from the NDIC library.</td>
</tr>
<tr>
<td>DHC index</td>
<td>A dedicated index for the hashes imported from the DHC library.</td>
</tr>
<tr>
<td>KFF index</td>
<td>A dedicated index for the hashes that you manually create or import from other sources, such as CSV.</td>
</tr>
</tbody>
</table>

These indices are internal and you do not see them in the main application. The only place that you see some of them are in the KFF Import Tool.

See Using the KFF Import Utility on page 245.

The only time you need to be mindful of the indices is when you use the KFF binary format when you either export or import data.

See About CSV and Binary Formats on page 252.
About Pre-defined KFF Hash Libraries

All of the pre-configured hash sets currently available for KFF come from three federal government agencies and are available in KFF libraries.

See About KFF Pre-Defined Hash Libraries on page 257.

You can use the following KFF libraries:

* NIST NSRL  
  See About Importing the NIST NSRL Library on page 248.
* NDIC HashKeeper (Sept 2008)  
  See Importing the NDIC Hashkeeper Library on page 249.
* DHS (Jan 2008)  
  See Importing the DHS Library on page 250.

It is not required to use a pre-configured KFF library in order to use KFF. You can configure or import custom hash sets. See your application's Admin Guide for more information.

How KFF Works

The Known File Filter (KFF) is a body of MD5 and SHA1 hash values computed from electronic files. Some pre-defined data is gathered and cataloged by several US federal government agencies or you can configure your own. KFF is used to locate files residing within project evidence that have been previously encountered by other investigators or archivists. Identifying previously cataloged (known) files within a project can expedite its investigation.

When evidence is processed with the MD5 Hash (and/or SHA-1 Hash) and KFF options, a hash value for each file item within the evidence is computed, and that newly computed hash value is searched for within the KFF data. Every file item whose hash value is found in the KFF is considered to be a known file.

Note: If two hash sets in the same group have the same MD5 hash value, they must have the same metadata.  
If you change the metadata of one hash set, all hash sets in the group with the same MD5 hash file will be updated to the same metadata.

The KFF data is organized into Groups and stored in the KFF Server. The KFF Server service performs lookup functions.

Status Values

In order to accelerate an investigation, each known file can labeled as either Alert or Ignore, meaning that the file is likely to be forensically interesting (Alert) or uninteresting (Ignore). Other files have a status of Unknown.

The Alert/Ignore designation can assist the investigator to hone in on files that are relevant, and avoid spending inordinate time on files that are not relevant. Known files are presented in the Overview Tab’s File Status Container, under “KFF Alert files” and “KFF Ignorable.”
Hash Sets

The hash values comprising the KFF are organized into hash sets. Each hash set has a name, a status, and a listing of hash values. Consider two examples. The hash set “ZZ00001 Suspected child porn” has a status of Alert and contains 12 hash values. The hash set “BitDefender Total Security 2008 9843” has a status of Ignore and contains 69 hash values. If, during the course of evidence processing, a file item’s hash value were found to belong to the “ZZ00001 Suspected child porn” set, then that file item would be presented in the KFF Alert files list. Likewise, if another file item’s hash value were found to belong to the “BitDefender Total Security 2008 9843” set, then that file would be presented in the KFF Ignorable list.

In order to determine whether any Alert file is truly relevant to a given project, and whether any Ignore file is truly irrelevant to a project, the investigator must understand the origins of the KFF’s hash sets, and the methods used to determine their Alert and Ignore status assignments.

You can install libraries of pre-defined hash sets or you can import custom hash sets. The pre-defined hash sets contain a body of MD5 and SHA1 hash values computed from electronic files that are gathered and cataloged by several US federal government agencies.

See About KFF Pre-Defined Hash Libraries on page 257.

Higher Level Structure and Usage

Because hash set groups have the properties just described, and because custom hash sets and groups can be defined by the investigator, the KFF mechanism can be leveraged in creative ways. For example, the investigator may define a group of hash sets created from encryption software and another group of hash sets created from child pornography files and then apply only those groups while processing.
About the KFF Server and Geolocation

In order to use the Geolocation Visualization feature in various AccessData products, you must use the KFF architecture and do the following:

- Install the KFF Server.
  
  See Installing the KFF Server on page 240.

- Install the Geolocation (GeoIP) Data (this data provide location data for evidence)
  
  See Installing the Geolocation (GeoIP) Data on page 250.
  
  From time to time, there will be updates available for the GeoIP data.
  
  See Installing KFF Updates on page 256.

If you are upgrading to 5.6 or later from an application 5.5 or earlier, you must install the new KFF Server and the updated Geolocation data.
Installing the KFF Server

About Installing the KFF Server

In order to use KFF, you must first configure an KFF Server.

For product versions 5.6 and later, you install a KFF Server by installing the AccessData Elasticsearch Windows Service.

Where you install the KFF Server depends on the product you are using with KFF:

- For FTK and FTK Pro applications, the KFF Server must be installed on the same computer that runs the FTK Examiner application.
- For all other applications, such as AD Lab, Resolution1, or Summation, the KFF Server can be installed on either the same computer as the application or on a remote computer. For large environments, it is recommended that the KFF Server be installed on a dedicated computer.

After installing the KFF Server, you configure the application with the location of the KFF Server.

See Configuring the Location of the KFF Server on page 241.

About KFF Server Versions

The KFF Server (AccessData Elasticsearch Windows Service) may be updated from time to time. It is best to use the latest version.

<table>
<thead>
<tr>
<th>AccessData Elasticsearch Windows Service</th>
<th>Released</th>
<th>Installation Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version 1.3.2</td>
<td>November 2014 with 5.6 versions of Resolution1, Summation, FTK-based products</td>
<td>See Installing the KFF Server Service on page 240.</td>
</tr>
</tbody>
</table>

For applications 5.5 and earlier, the KFF Server component was version 1.2.7 and earlier.

About Upgrading from Earlier Versions

If you have used KFF with applications versions 5.5 and earlier, you can migrate your legacy KFF data to the new architecture.

See Migrating Legacy KFF Data on page 242.

Installing the KFF Server Service

For instructions on installing the AccessData Elasticsearch Windows Service, see Installing the Elasticsearch Service (page 483).
Configuring the Location of the KFF Server

After installing the KFF Server, on the computer running the application, such as FTK, Lab, Summation, or Resolution1, you configure the location of the KFF Server.

Do one of the following:

- Configuring the KFF Server Location on FTK-based Computers (page 241)
- Configuring the KFF Server Location on Resolution1 and Summation Applications (page 241)

Configuring the KFF Server Location on FTK-based Computers

Before using KFF with FTK, FTK Pro, Lab, or Enterprise, with KFF, you must configure the location of the KFF Server.

Important: To configure KFF, you must be logged in with Admin privileges.

To view or edit KFF configuration settings
1. In the Case Manager, click Tools > Preferences > Configure KFF.
2. You can set or view the address of the KFF Server.
   - If you installed the KFF Server on the same computer as the application, this value will be localhost.
   - If you installed the KFF Server on a different computer, identify the KFF server.
3. Click Test to validate communication with the KFF Server.
4. Click Save.
5. Click OK.

Configuring the KFF Server Location on Resolution1 and Summation Applications

When using the KFF Server with Summation or Resolution1 applications, two configuration files must point to the KFF Server location.

These setting are configured automatically during the KFF Server installation. If needed, you can verify the settings.

However, if you change the location of the KFF Server, do the following to specify the location of the KFF Server.

1. Configure AdgWindowsServiceHost.exe.config:
   1a. On the computer running the application (for example, the server running Summation), go to C:\Program Files\AccessData\Common\FTK Business Services.
   1b. Open AdgWindowsServiceHost.exe.config.
1d. Change localhost to be the location of your KFF server (you can use hostname or IP).
1e. Save and close file.
1f. Restart the business services common service.

2. Configure AsyncProcessingServices web.config:
   2a. On the computer running the application (for example, the server running Summation), go to C:\Program Files\AccessData\AsyncProcessingServices.
   2b. Open web.config.
   2d. Change localhost to be the location of your KFF server (you can use hostname or IP).
   2e. Save and close file.
   2f. Restart the AsyncProcessing service.

**Migrating Legacy KFF Data**

If you have used KFF with applications versions 5.5 and earlier, you can migrate that data from the legacy KFF Server to the new KFF Server architecture.

**Important:** Applications version 5.6 and later can only use the new KFF architecture that was introduced in 5.6. If you want to use KFF data from previous versions, you must migrate the data.

**Important:** If you have NSRL, NDIC, or DHS data in your legacy data, those sets will not be migrated. You must re-import them using the 5.6 versions or later of those libraries. Only legacy custom KFF data will be migrated.

Legacy KFF data is migrated to KFF Groups and Hash Sets on the new KFF Server.
Because KFF Templates are no longer used, they will be migrated as KFF Groups, and the groups that were under the template will be added as sub-groups.

You migrate data using the KFF Migration Tool. To use the KFF Migration Tool, you identify the following:

- The Storage Directory folder where the legacy KFF data is located.
  This was folder was configured using the KFF Server Configuration utility when you installed the legacy KFF Server. If needed, you can use this utility to view the KFF Storage Directory. The default location of the KFF_Config.exe file is Program Files\AccessData\KFF.

- The URL of the new KFF Server (the computer running the AccessData Elastic Search Windows Service)
  This is populated automatically if the new KFF Server has been installed.

**To install the KFF Migration Tool**
1. On the computer where you have installed the KFF Server, access the KFF Installation disc, and run the autorun.exe.
2. Click the 64 bit or 32 bit Install KFF Migration Utility.
3. Complete the installation wizard.

**To migrate legacy KFF data**
1. On the legacy KFF Server, you must stop the KFF Service.
   You can stop the service manually or use the legacy KFF Config.exe utility.
2. On the new KFF Server, launch the KFF Migration Tool.
3. Enter the directory of the legacy KFF data.
4. The URL of Elasticsearch should be listed.
5. Click **Start**.
6. When completed, review the summary data.
Importing KFF Data

**About Importing KFF Data**

You can import hashes and KFF Groups that have been previous configured.

You can import KFF data in one of the following formats:

**KFF Data sources that you can import**

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
</table>
| Pre-configured KFF libraries | You can import KFF data from the following pre-configured libraries  
  - NIST NSRL  
  - NDIC HashKeeper  
  - DHS  
  To import KFF libraries, it is recommended that you use the KFF Import Utility.  
  See Using the KFF Import Utility on page 245.  
  See Importing Pre-defined KFF Data Libraries on page 247.  
  See KFF Library Reference Information on page 257. |
| Custom Hash Sets and KFF Groups | You can import custom hashes from CSV files.  
  See About the CSV Format on page 252.  
  For FTK-based products, you can also import custom hashes from the following file types:  
  - Delimited files (CSV or TSV)  
  - Hash Database files (HDB)  
  - Hashkeeper files (HKE)  
  - FTK Exported KFF files (KFF)  
  - FTK Supported XML files (XML)  
  - FTK Exported Hash files (HASH)  
  To import these kinds of files, use the KFF Import feature in your application.  
  See Using the Known File Feature chapter. |
| KFF binary files             | You can import KFF data that was exported in a KFF binary format, such as an archive of a KFF Server.  
  See About CSV and Binary Formats on page 252.  
  When you import a KFF binary snapshot, you must be running the same version of the KFF Server as was used to create the binary export.  
  To import KFF binary files, it is recommend that you use the KFF Import Utility.  
  See Using the KFF Import Utility on page 245. |
About KFF Data Import Tools

When you import KFF data, you can use one of two tools:

<table>
<thead>
<tr>
<th>KFF Data Import Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>The application’s Import feature</td>
</tr>
<tr>
<td>The KFF management feature in the application lets you import both .CSV and KFF Binary formats. Use the application to import .CSV files.</td>
</tr>
<tr>
<td>See Using the Known File Feature chapter.</td>
</tr>
<tr>
<td>Even though you can import KFF binary files using the application, it is recommend that you use the KFF Import Utility.</td>
</tr>
<tr>
<td>KFF Import Utility</td>
</tr>
<tr>
<td>It is recommended that you use the KFF Import Utility to import KFF binary files.</td>
</tr>
<tr>
<td>See Using the KFF Import Utility on page 245.</td>
</tr>
</tbody>
</table>

About Default Status Values

When you import KFF data, you configure a default status value of Alert or Ignore. When adding Hash Sets to KFF Groups, you can configure the KFF Groups to use the default status values of the Hash Set or you can configure the KFF Group with a status that will override the default Hash Set values.

See Components of KFF Data on page 235.

About Duplicate Hashes

If multiple Hash Set files containing the same Hash identifier are imported into a single KFF Group, the group keeps the last Hash Set’s metadata information, overwriting the previous Hash Sets’ metadata. This only happens within an individual group and not across multiple groups.

Using the KFF Import Utility

About the KFF Import Utility

Due to the large size of of some KFF data, a stand-alone KFF Import utility is available to use to import the data. This KFF Import utility can import large amounts of data faster then using the import feature in the application.

It is recommend that you install and use the KFF Import utility to import the following:

- NSRL, DHC, and NIST libraries
- An archive of a KFF Server that was exported in the binary format

After importing NSRL, NDIC, or DHS libraries, these indexes are displayed in the Currently Installed Sets list.

See Components of KFF Data on page 235.

You can also use the KFF Import Utility to remove the NSRL, NDIC, or DHS indexes that you have imported.

An archive of a KFF Server, which is the exported KFF Index, is not shown in the list.
Installing the KFF Import Utility

You should use the KFF Import Utility to import some kinds of KFF data.

To install the KFF Import Utility

1. On the computer where you have installed the KFF Server, access the KFF Installation disc, and run the autorun.exe.
2. Click the 64 bit or 32 bit Install KFF Import Utility.
3. Complete the installation wizard.

Importing a KFF Server Archive Using the KFF Import Utility

You can import an archive of a KFF Server that you have exported using the binary format.

If you are importing a pre-defined KFF Library, see Importing Pre-defined KFF Data Libraries (page 247).

To import using the KFF Import Utility

1. On the KFF Server, open the KFF Import Utility.
2. To test the connection to the KFF Server’s Elasticsearch service at the displayed URL, click Connect.
   If it connects correctly, no error is shown.
   If it is not able to connect, you will get the following error: Failed after retrying 10 times: ‘HEAD accessdata_threat_indices’.
3. To import, click Import.
4. Click Browse.
5. Browse to the folder that contains the KFF binary files.
   Specifically, select the folder that contains the Export.xml file.
6. Click Start.
7. Close the dialog.

Removing Pre-defined KFF Libraries Using the KFF Import Utility

You can remove a pre-defined KFF Library that you have previously imported.

You cannot see or remove existing custom KFF data (the KFF Index).

To remove pre-defined KFF Libraries

1. On the KFF Server, open the KFF Import Utility.
2. Select the library that you want to remove.
3. Click Remove.
Importing Pre-defined KFF Data Libraries

About Importing Pre-defined KFF Data Libraries

After you install the KFF Server, you can import pre-defined NIST NSRL, NDIC HashKeeper, and DHS data libraries.

See About Pre-defined KFF Hash Libraries on page 237.

In versions 5.5 and earlier, you installed these using an executable file. In versions 5.6 and later, you must import them. It is recommend that you use the KFF Import Utility.

After importing pre-defined KFF Libraries, you can remove them from the KFF Server.

See Removing Pre-defined KFF Libraries Using the KFF Import Utility on page 246.

See the following sections:

- About Importing the NIST NSRL Library (page 248)
- Importing the NDIC Hashkeeper Library (page 249)
- Importing the DHS Library (page 250)
About Importing the NIST NSRL Library

You can import the NSRL library into your KFF Server. During the import, two KFF Groups are created: NSRL_Alert and NSRL_Ignore. In FTK-based products, these two groups are automatically added to the Default KFF Group.

The NSRL libraries are updated from time to time. To import and maintain the NSRL data, you do the following:

Process for Importing and Maintaining the NIST NSRL Library

1. Import the complete NSRL library. You must first install the most current complete NSRL library. You can later add updates to it.
   To access and import the complete NSRL library, see Importing the Complete NSRL Library (page 249)

2. Import updates to the library. When updates are made available, import the updates to bring the data up-to-date.
   See Installing KFF Updates on page 256.
   Important: In order to use the NSRL updates, you must first import the complete library. When you install an NSRL update, you must keep the previous NSRL versions installed in order to maintain the complete set of NSRL data.

Available NSRL library files (new format)

<table>
<thead>
<tr>
<th>NSRL Library Release</th>
<th>Released</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete library version 2.45 (source .ZIP file)</td>
<td>Nov 2014</td>
<td>For use only with applications version 5.6 and later. Contains the full NSRL library up through update 2.45. See Importing the Complete NSRL Library on page 249.</td>
</tr>
</tbody>
</table>

Available Legacy NSRL library files

<table>
<thead>
<tr>
<th>Legacy NSRL Library Release</th>
<th>Released</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>version 2.44 (.EXE file)</td>
<td>Nov 2013</td>
<td>For use with the legacy KFF Server that was used with applications versions 5.5 and earlier. Contains the full NSRL library up through update 2.44. Install this library first. Note: NSRL updates for the legacy KFF format will end in the 2nd quarter of 2015. From that time, NSRL updates will only be provided in the new format.</td>
</tr>
</tbody>
</table>
Importing the Complete NSRL Library

To add the NSRL library to your KFF Library, you import the data. You start by importing the full NSRL library. You can then import any updates as they are available.

See About Importing the NIST NSRL Library on page 248.

See Installing KFF Updates on page 256.

Important: The complete NSRL library data is contained in a large (3.4 GB) .ZIP file. When expanded, the data is about 18 GB. Make sure that your file system can support files of this size.

Important: Due to the large amount of NSRL data, it will take 3-4 hours to import the NSRL data using the KFF Import Utility. If you import from within an application, it will take even longer.

To install the NSRL complete library

1. Extract the NSRLSOURCE_2.45.ZIP file from the KFF Installation disc.
2. On the KFF Server, launch the KFF Import Utility. See Installing the KFF Import Utility on page 246.
3. Click Import.
4. Click Browse.
5. Browse to and select the NSRLSource_2.45 folder that contains the NSRLFile.txt file. (Make sure you are selecting the folder and not drilling into the folder to select an individual file. The import process will drill into the folder to get the proper files for you.)
6. Click Select Folder.
7. Click Start.
8. When the import is complete, click OK.
9. Close the Import Utility dialog and the NSRL library will be listed in the Currently Installed Sets.

Importing the NDIC Hashkeeper Library

You can import the Hashkeeper 9.08 library.

For application versions 5.6 and later, these files are stored in the KFF binary format.

To import the Hashkeeper library

1. Have access the NDIC source files by download the ZIP file from the web:
   1b. Click Known File Filter (KFF).
   1c. For KFF Hash Sets, click Download Page.
   1d. Click the KFF NDIC library that you want to download.
2. Extract the ZIP file.
3. On the KFF Server, launch the KFF Import Utility. See Installing the KFF Import Utility on page 246.
4. Click Import.
5. Click Browse.
6. Browse to and select the NDIC source folder that contains the Export.xml file.
   (Make sure you are selecting the folder and not drilling into the folder to select an individual file. The import process will drill into the folder to get the proper files for you.)

7. Click Select Folder.
8. Click Start.
9. When the import is complete, click OK.
10. Close the Import Utility dialog and the NDIC library will be listed in the Currently Installed Sets.

Importing the DHS Library

You can import the DHS 1.08 library.

For application versions 5.6 and later, these files are stored in the KFF binary format.

To import the DHS library
1. Have access to the NDIC source files by download the ZIP file from the web:
   1b. Click Known File Filter (KFF).
   1c. For KFF Hash Sets, click Download Page.
   1d. Click the KFF DHS library that you want to download.
2. Extract the ZIP file.
3. On the KFF Server, launch the KFF Import Utility.
   See Installing the KFF Import Utility on page 246.
4. Click Import.
5. Click Browse.
6. Browse to and select the DHS source folder that contains the Export.xml file.
   (Make sure you are selecting the folder and not drilling into the folder to select an individual file. The import process will drill into the folder to get the proper files for you.)
7. Click Select Folder.
8. Click Start.
9. When the import is complete, click OK.
10. Close the Import Utility dialog and the DHS library will be listed in the Currently Installed Sets.

Installing the Geolocation (GeoIP) Data

Geolocation (GeoIP) data is used for the Geolocation Visualization feature of several AccessData products.

See About the KFF Server and Geolocation on page 239.

You can also check for and install GeoIP data updates.

If you are upgrading to 5.6 or later from an application 5.5 or earlier, you must install the new KFF Server and the updated Geolocation data.

The Geolocation data that was used with versions 5.5 and earlier is version 1.0.1 or earlier.

The Geolocation data that is used with versions 5.6 and later is version 2014.10 or later.
To install the Geolocation IP Data

1. On the computer where you have installed the KFF Server, access the KFF Installation disc, and run the autorun.exe.
2. Click the 64 bit or 32 bit Install Geolocation Data.
3. Complete the installation wizard.
About CSV and Binary Formats

When you export and import KFF data, you can use one of two formats:

- CSV
- KFF Binary

About the CSV Format

When you use the .CSV format, you use a single .CSV file. The .CSV file contains the hashes that you import or export.

When you export to a CSV file, it contains the hashes as well as all of the information about any associated Hash Sets and KFF Groups. You can only use the CSV format when exporting individual Hash Sets and KFF Groups.

When you import using a CSV file, it can be a simple file containing only the hashes of files, or it can contain additional information about Hash Sets and KFF Groups.

However, CSV files will usually take a little longer to export and import.

To view the sample of a .CSV file that contains binaries and Hash Sets and KFF Groups, perform a CSV export and view the file in Excel.

You can also use the format of CSV files that were exported in previous versions.

To import .CSV files, use the application's KFF Import feature.

About the KFF Binary Format

When you use the KFF binary format, you use a set of files that are in an internal KFF Server (Elasticsearch) format that is referred to as a Snapshot. The binary format is essentially a snapshot of one of the indices contained in the KFF Server. You can only have one binary format snapshot for each index.

See Components of KFF Data on page 235.

The benefit of the binary format is that it is able to support larger amounts of data than the CSV format. For large data sets, the binary format will export and import faster than the CSV format.

For example, when you import the DHC or NDIC Hashkeeper libraries, they are imported from a KFF binary format.

If you export your custom Hash Sets or KFF Groups using the KFF binary format, everything in the KFF Index is included.

See About Choosing to Export in CSV or KFF Binary Format on page 253.

When exporting in a Binary format, you specify an existing parent folder and then the name of a new sub-folder for the binary data. The new sub-folder must not previously exist and will be created by the export process.

After export, the binary export folder contains the following:

- Indices sub-folder - The folder contains the exported KFF data
- Export.xml - This file is the only file that is not an Elasticsearch file and is created by the export feature and contains the KFF Group and Hash Set definitions for the index.
About Choosing to Export in CSV or KFF Binary Format

When you export your own KFF data, you have the option of using either the CSV or the binary format. The results are different based on the format that you use:

**CSV format**

<table>
<thead>
<tr>
<th>Exporting in CSV format</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you export KFF data using the CSV format, you can export specific specific pieces of KFF data, such as one or more Hash Sets or one or more KFF Groups. The exported data is contained in one .CSV file. The benefits of the CSV format are that CSV files can be easily viewed and can be manually edited. They are also less dependent on the version of the KFF Server.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Importing from CSV format</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you import a CSV file, the data in the file is data is added to your existing KFF data that is in the KFF Index. See Components of KFF Data on page 235. For example, suppose you started by manually created four Hash Sets and one KFF Group. That would be the only contents in your KFF Index. Suppose you import a .CSV file that contains five hash sets and two KFF Groups. They will be added together for a total of nine Hash Sets and three KFF Groups. To import .CSV files, use the KFF Import feature in your application. See Using the Known File Feature chapter.</td>
</tr>
</tbody>
</table>

**KFF binary format**

<table>
<thead>
<tr>
<th>Exporting in KFF binary format</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you export your KFF data using the KFF binary format, all of the data that you have in the KFF Index will be exported together. You cannot use this format to export individual Hash Sets or KFF Groups. See Components of KFF Data on page 235. You will only want to use this format if you intend to export all of the data in the KFF Index and import it as a whole. This can be useful in making an archive of your KFF data or copying KFF data from one KFF Server to another. Because NSRL, NIST, and DHC data is contained in their own indexes, when you do an export using this format, those sets are not included. Only the data in the KFF Index is exported.</td>
</tr>
</tbody>
</table>
When you import a KFF binary format, it will import the complete index and will replace any data that is currently in that index on the KFF Server. For example, if you import the DHC library, and then later you import the DHC library again, the DHC index will be replaced with the new import.

If you have a KFF binary format snapshot of custom KFF data (which would have come from a binary format export) it will replace all KFF data that already exists in your KFF Index.

For example, suppose you manually created four Hash Sets and one KFF Group. Suppose you then import a binary format that has five hash sets and two KFF Groups. The binary format will be imported as a complete index and will replace the existing data. The result will be only be the imported five Hash Sets and two KFF libraries.

When importing KFF binary files, it is recommend that you use the KFF Import Utility.

See Installing the KFF Import Utility on page 246.
## Uninstalling KFF

You can uninstall KFF application components independently of the KFF Data.

<table>
<thead>
<tr>
<th>Main version</th>
<th>Description</th>
</tr>
</thead>
</table>
| Applications 5.6 and later | For applications version 5.6 and later, you uninstall the following components:  
  - *AccessData Elasticsearch Windows Service* (KFF Server) v1.2.7 and later  
    Note: Elasticsearch is used by multiple features in various applications, use caution when uninstalling this service or the related data.  
  - *AccessData KFF Import Utility* (v5.6 and later)  
  - *AccessData KFF Migration Tool* (v1.0 and later)  
  - *AccessData Geo Location Data* (v2014.10 and later)  
    Note: This component is not used by the KFF feature, but with the KFF Server for the geolocation visualization feature.  
  
  The location of the KFF data is configured when the *AccessData Elasticsearch Windows Service* was installed. By default, it is lactated at C:\Program Files\AccessData\Elasticsearch\Data. |
| Applications 5.5 and earlier | For applications version 5.5 and earlier, you can uninstall the following components:  
  - KFF Server (v1.2.7 and earlier)  
    Note: The KFF Server is also used by the geolocation visualization feature.  
  - AccessData Geo Location Data (1.0.1 and earlier)  
    This component is not used by the KFF feature, but with the KFF Server for the geolocation visualization feature.  
  
  The location of the KFF data was configured when the *KFF Server* was installed. You can view the location of the data by running the *KFF.Config.exe* on the KFF Server.  
  
  If you are upgrading from 5.5 to 5.6, you can migrate your KFF data before uninstalling the KFF Server. |
Installing KFF Updates

From time to time, AccessData will release updates to the KFF Server and the KFF data libraries.

Some of the KFF data updates may require you to update the version of the KFF Server.

To check for updates, do the following:

2. On the Product Downloads page, click Known File Filter (KFF).
3. Open the Download page.
4. Check for updates.
   - See About KFF Server Versions on page 240.
   - See About Importing the NIST NSRL Library on page 248.
5. If there are updates, download them.
6. Install or import the updates.
KFF Library Reference Information

About KFF Pre-Defined Hash Libraries

This section includes a description of pre-defined hash collections that can be added as AccessData KFF data. The following pre-defined libraries are currently available for KFF and come from one of three federal government agencies:

- NIST NSRL (The default library installed with KFF)
- NDIC HashKeeper (An optional library that can be downloaded from the AccessData Downloads page)
- DHS (An optional library that can be downloaded from the AccessData Downloads page)

**Note:** Because KFF is now multi-sourced, it is no longer maintained in HashKeeper format. Therefore, you cannot modify KFF data in the HashKeeper program. However, the HashKeeper format continues to be compatible with the AccessData KFF data.

Use the following information to help identify the origin of any hash set within the KFF:

- The NSRL hash sets do not begin with “ZZN” or “ZN”. In addition, in the AD Lab KFF, all the NSRL hash set names are appended (post-fixed) with multi-digit numeric identifier. For example: “Password Manager & Form Filler 9722.”
- All HashKeeper Alert sets begin with “ZZ”, and all HashKeeper Ignore sets begin with “Z”. (There are a few exceptions. See below.) These prefixes are often followed by numeric characters (“ZZN” or “ZN” where N is any single digit, or group of digits, 0-9), and then the rest of the hash set name. Two examples of HashKeeper Alert sets are:
  - “ZZ00001 Suspected child porn”
  - “ZZ14W”
  - An example of a HashKeeper Ignore set is:
  - “Z00048 Corel Draw 6”
- The DHS collection is broken down as follows:
  - In 1.8.1.4 and later there are two sets named “DHS-ICE Child Exploitation JAN-1-08 CSV” and “DHS-ICE Child Exploitation JAN-1-08 HASH”.
  - In AD Lab there is just one such set, and it is named “DHS-ICE Child Exploitation JAN-1-08”.

Once an investigator has identified the vendor from which a hash set has come, he/she may need to consider the vendor’s philosophy on collecting and categorizing hash sets, and the methods used by the vendor to gather hash values into sets, in order to determine the relevance of Alert (and Ignore) hits to his/her project. The following descriptions may be useful in assessing hits.
NIST NSRL

The NIST NSRL collection is described at: http://www.nsrl.nist.gov/index.html. This collection is much larger than HashKeeper in terms of the number of sets and the total number of hashes. It is composed entirely of hash sets being generated from application software. So, all of its hash sets are given Ignore status by AccessData staff except for those whose names make them sound as though they could be used for illicit purposes.

The NSRL collection divides itself into many sub-collections of hash sets with similar names. In addition, many of these hash sets are “empty”, that is, they are not accompanied by any hash values. The size of the NSRL collection, combined with the similarity in set naming and the problem of empty sets, allows AccessData to modify (or selectively alter) NSRL’s own set names to remove ambiguity and redundancy.


NDIC HashKeeper

NDIC’s HashKeeper collection uses the Alert/Ignore designation. The Alert sets are hash values contributed by law enforcement agents working in various jurisdictions within the US - and a few that apparently come from Luxemburg. All of the Alert sets were contributed because they were believed by the contributor to be connected to child pornography. The Ignore sets within HashKeeper are computed from files belonging to application software.

During the creation of KFF, AccessData staff retains the Alert and Ignore designations given by the NDIC, with the following exceptions. AccessData labels the following sets Alert even though HashKeeper had assigned them as Ignore: “Z00045 PGP files”, “Z00046 Steganos”, “Z00065 Cyber Lock”, “Z00136 PGP Shareware”, “Z00186 Misc Steganography Programs”, “Z00188 Wiping Programs”. The names of these sets may suggest the intent to conceal data on the part of the suspect, and AccessData marks them Alert with the assumption that investigators would want to be “alerted” to the presence of data obfuscation or elimination software that had been installed by the suspect.

The following table lists actual HashKeeper Alert Set origins:

A Sample of HashKeeper KFF Contributions

<table>
<thead>
<tr>
<th>Hash</th>
<th>Contributor</th>
<th>Location</th>
<th>Contact Information</th>
<th>Case/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZZ00001</td>
<td>Suspected child porn</td>
<td>Det. Mike McNown &amp; Randy Stone</td>
<td>Wichita PD</td>
<td></td>
</tr>
<tr>
<td>ZZ00002</td>
<td>Identified Child Porn</td>
<td>Det. Banks</td>
<td>Union County (NJ) Prosecutor's Office</td>
<td>(908) 527-4508</td>
</tr>
<tr>
<td>ZZ00003</td>
<td>Suspected child porn</td>
<td>Illinois State Police</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZZ00004</td>
<td>Identified Child Porn</td>
<td>SA Brad Kropp, AFOSI, Det 307</td>
<td>(609) 754-3354</td>
<td>Case # 00307D7-S934831</td>
</tr>
</tbody>
</table>
## A Sample of HashKeeper KFF Contributions (Continued)

<table>
<thead>
<tr>
<th>Hash</th>
<th>Contributor</th>
<th>Location</th>
<th>Contact Information</th>
<th>Case/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZZ000000</td>
<td>NDIC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZZ000005</td>
<td>Rene Moes, Luxembourg Police</td>
<td></td>
<td><a href="mailto:rene.moes@police.eta.t.lu">rene.moes@police.eta.t.lu</a></td>
<td></td>
</tr>
<tr>
<td>ZZ000006</td>
<td>Illinois State Police</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZZ00007b</td>
<td>Rene Moes, Luxembourg Police</td>
<td></td>
<td><a href="mailto:rene.moes@police.eta.t.lu">rene.moes@police.eta.t.lu</a></td>
<td></td>
</tr>
<tr>
<td>ZZ00007a</td>
<td>Illinois State Police</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZZ000008</td>
<td>Sergeant Purcell</td>
<td>Seminole County Sheriff's Office</td>
<td>(407) 665-6948, <a href="mailto:dpurcell@seminolesheriff.org">dpurcell@seminolesheriff.org</a></td>
<td>suspected child pornography from 20010000850</td>
</tr>
<tr>
<td>ZZ000009</td>
<td>Sergeant Purcell</td>
<td>Seminole County Sheriff's Office</td>
<td>(407) 665-6948, <a href="mailto:dpurcell@seminolesheriff.org">dpurcell@seminolesheriff.org</a></td>
<td>200100004750</td>
</tr>
<tr>
<td>ZZ000011</td>
<td>Detective Richard Voce CFCE</td>
<td>Tacoma Police Department</td>
<td>(253)594-7906, <a href="mailto:rvoce@ci.tacoma.wa.us">rvoce@ci.tacoma.wa.us</a></td>
<td></td>
</tr>
<tr>
<td>ZZ000012</td>
<td>Detective Michael Forsyth</td>
<td>Baltimore County Police Department</td>
<td>(410)887-1866, <a href="mailto:mick410@hotmail.com">mick410@hotmail.com</a></td>
<td></td>
</tr>
<tr>
<td>ZZ000013</td>
<td>Sergeant Purcell</td>
<td>Seminole County Sheriff's Office</td>
<td>(407) 665-6948, <a href="mailto:dpurcell@seminolesheriff.org">dpurcell@seminolesheriff.org</a></td>
<td></td>
</tr>
<tr>
<td>ZZ000014</td>
<td>Det. J. Hohl</td>
<td>Yuma Police Department</td>
<td>928-373-4694</td>
<td>YPD02-70707</td>
</tr>
</tbody>
</table>
The basic rule is to always consider the source when using KFF in your investigations. You should consider the origin of the hash set to which the hit belongs. In addition, you should consider the underlying nature of hash values in order to evaluate a hit's authenticity.

### A Sample of HashKeeper KFF Contributions (Continued)

<table>
<thead>
<tr>
<th>Hash</th>
<th>Contributor</th>
<th>Location</th>
<th>Contact Information</th>
<th>Case/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZZ14W</td>
<td>Sgt Stephen May</td>
<td><a href="mailto:Tamara.Chandler@oga.state.tx.us">Tamara.Chandler@oga.state.tx.us</a>, (512)936-2898</td>
<td>TXOAG 41929134</td>
<td></td>
</tr>
<tr>
<td>ZZ14U</td>
<td>Sgt Chris Walling</td>
<td><a href="mailto:Tamara.Chandler@oga.state.tx.us">Tamara.Chandler@oga.state.tx.us</a>, (512)936-2898</td>
<td>TXOAG 41919887</td>
<td></td>
</tr>
<tr>
<td>ZZ14X</td>
<td>Sgt Jeff Eckert</td>
<td><a href="mailto:Tamara.Chandler@oga.state.tx.us">Tamara.Chandler@oga.state.tx.us</a>, (512)936-2898</td>
<td>TXOAG Internal</td>
<td></td>
</tr>
<tr>
<td>ZZ14I</td>
<td>Sgt Stephen May</td>
<td><a href="mailto:Tamara.Chandler@oga.state.tx.us">Tamara.Chandler@oga.state.tx.us</a>, (512)936-2898</td>
<td>TXOAG 041908476</td>
<td></td>
</tr>
<tr>
<td>ZZ14B</td>
<td>Robert Britt, SA, FBI</td>
<td><a href="mailto:Tamara.Chandler@oga.state.tx.us">Tamara.Chandler@oga.state.tx.us</a>, (512)936-2898</td>
<td>TXOAG 031870678</td>
<td></td>
</tr>
<tr>
<td>ZZ14S</td>
<td>Sgt Stephen May</td>
<td><a href="mailto:Tamara.Chandler@oga.state.tx.us">Tamara.Chandler@oga.state.tx.us</a>, (512)936-2898</td>
<td>TXOAG 041962689</td>
<td></td>
</tr>
<tr>
<td>ZZ14Q</td>
<td>Sgt Cody Smirl</td>
<td><a href="mailto:Tamara.Chandler@oga.state.tx.us">Tamara.Chandler@oga.state.tx.us</a>, (512)936-2898</td>
<td>TXOAG 041952839</td>
<td></td>
</tr>
<tr>
<td>ZZ14V</td>
<td>Sgt Karen McKay</td>
<td><a href="mailto:Tamara.Chandler@oga.state.tx.us">Tamara.Chandler@oga.state.tx.us</a>, (512)936-2898</td>
<td>TXOAG 41924143</td>
<td></td>
</tr>
<tr>
<td>ZZ00015 Known CP Images</td>
<td>Det. J. Hohl</td>
<td>Yuma Police Department</td>
<td>928-373-4694</td>
<td>YPD04-38144</td>
</tr>
<tr>
<td>ZZ00016</td>
<td>Marion County Sheriff's Department</td>
<td>(317) 231-8506</td>
<td>MP04-0216808</td>
<td></td>
</tr>
</tbody>
</table>
Higher Level KFF Structure and Usage

Since hash set groups have the properties just described (and because custom hash sets and groups can be defined by the investigator) the KFF mechanism can be leveraged in creative ways. For example:

- You could define a group of hash sets created from encryption software and another group of hash sets created from child pornography files. Then, you would apply only those groups while processing.
- You could also use the Ignore status. You are about to process a hard drive image, but your search warrant does not allow inspection of certain files within the image that have been previously identified. You could do the following and still observe the warrant:
  6a. Open the image in Imager, navigate to each of the prohibited files, and cause an MD5 hash value to be computed for each.
  6b. Import these hash values into custom hash sets (one or more), add those sets to a custom group, and give the group Ignore status.
  6c. Process the image with the MD5 and KFF options, and with AD_Alert, AD_Ignore, and the new, custom group selected.
  6d. During post-processing analysis, filter file lists to eliminate rows representing files with Ignore status.

Hash Set Categories

The highest level of the KFF’s logical structure is the categorizing of hash sets by owner and scope. The categories are AccessData, Project Specific, and Shared.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccessData</td>
<td>The sets shipped with as the Library. Custom groups can be created from these sets, but the sets and their status values are read only.</td>
</tr>
<tr>
<td>Project Specific</td>
<td>Sets and groups created by the investigator to be applied only within an individual project.</td>
</tr>
<tr>
<td>Shared</td>
<td>Sets and groups created by the investigator for use within multiple projects all stored in the same database, and within the same application schema.</td>
</tr>
</tbody>
</table>

**Important:** Coordination among other investigators is essential when altering Shared groups in a lab deployment. Each investigator must consider how other investigators will be affected when Shared groups are modified.
What has Changed in Version 5.6

With the 5.6 release of Resolution1, Summation, and FTK-based products, the KFF feature has been updated.

If you used KFF with applications version 5.5 or earlier, you will want to be aware of the following changes in the KFF functionality.

Changes from version 5.5 to 5.6

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KFF Server</td>
<td>KFF Server now runs a different service.</td>
</tr>
<tr>
<td></td>
<td>• In 5.5 and earlier, the KFF Server ran as the KFF Server service.</td>
</tr>
<tr>
<td></td>
<td>• In 5.6 and later, the KFF Server uses the AccessData Elasticsearch Windows Service.</td>
</tr>
<tr>
<td></td>
<td>For applications version 5.6 and later, all KFF data must be created in or imported into the new KFF Server.</td>
</tr>
<tr>
<td>KFF Migration Tool</td>
<td>This is a new tool that lets you migrate custom KFF data from 5.5 and earlier to the new KFF Server.</td>
</tr>
<tr>
<td></td>
<td>NIST NSRL, NDIC HashKeeper, or DHS library data from 5.5 will not be migrated. You must re-import it.</td>
</tr>
<tr>
<td></td>
<td>See Migrating Legacy KFF Data on page 242.</td>
</tr>
<tr>
<td>KFF Import Utility</td>
<td>This is a new utility that lets you import large amounts of KFF data quicker than using the import feature in the application.</td>
</tr>
<tr>
<td></td>
<td>See Using the KFF Import Utility on page 245.</td>
</tr>
<tr>
<td>KFF Libraries, Templates, and Groups</td>
<td>In 5.5, all Hash Sets were configured within KFF Libraries. KFF Libraries could then contain KFF Groups and KFF Templates.</td>
</tr>
<tr>
<td></td>
<td>KFF Libraries and Templates have been eliminated. You now simply create or import KFF Groups and add Hash Sets to the groups.</td>
</tr>
<tr>
<td></td>
<td>You can now nest KFF Groups.</td>
</tr>
<tr>
<td>NIST NSRL, NDIC HashKeeper, or DHS libraries</td>
<td>In 5.5 and earlier, to use these libraries, you ran an installation wizard for each library. You now import these libraries using the KFF Import Utility.</td>
</tr>
<tr>
<td></td>
<td>See About Importing Pre-defined KFF Data Libraries on page 247.</td>
</tr>
<tr>
<td>Import Log</td>
<td>FTK-based products no longer include the Import Log.</td>
</tr>
<tr>
<td></td>
<td>Resolution1 and Summation products did not have it previously.</td>
</tr>
<tr>
<td>Export</td>
<td>When you export KFF data you can now choose two formats:</td>
</tr>
<tr>
<td></td>
<td>• CSV format which replaced XML format</td>
</tr>
<tr>
<td></td>
<td>• A new binary format</td>
</tr>
<tr>
<td></td>
<td>See About CSV and Binary Formats on page 252.</td>
</tr>
</tbody>
</table>
Chapter 17
Using the Known File Filter (KFF)

This chapter explains how to configure and use KFF and has the following sections:

- See Process for Using KFF on page 263.
- See About the KFF Admin page on page 264.
- See Adding Hashes to the KFF Server on page 266.
- See Using KFF Groups to Organize Hash Sets on page 270.
- See Enabling a Case to Use KFF on page 273.
- See Reviewing KFF Results in the Examiner on page 275.
- See Exporting KFF Data on page 278.

Process for Using KFF

To use the KFF feature, you perform the following steps:

Process for using KFF

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Install and configure the KFF Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>See Installing the KFF Server on page 240.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Add and manage KFF hashes on the KFF Server.</td>
</tr>
<tr>
<td></td>
<td>See Adding Hashes to the KFF Server on page 266.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Add and manage KFF Groups to organize KFF Hash Sets.</td>
</tr>
<tr>
<td></td>
<td>Using KFF Groups to Organize Hash Sets (page 270)</td>
</tr>
<tr>
<td>Step 4</td>
<td>Enable KFF for a case.</td>
</tr>
<tr>
<td></td>
<td>See Enabling a Case to Use KFF on page 273.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Review KFF results in the Examiner.</td>
</tr>
<tr>
<td></td>
<td>See Reviewing KFF Results in the Examiner on page 275.</td>
</tr>
<tr>
<td>Step 6</td>
<td>(Optional) Re-process the KFF data using different hashes.</td>
</tr>
<tr>
<td></td>
<td>See Re-Processing KFF Using Additional Analysis on page 277.</td>
</tr>
<tr>
<td>Step 7</td>
<td>(Optional) Archive or export KFF data to share with other KFF Servers.</td>
</tr>
<tr>
<td></td>
<td>See Exporting KFF Data on page 278.</td>
</tr>
</tbody>
</table>
About the KFF Admin page

You use the KFF Admin page to configure KFF Data by doing the following:

- Import Hashes
- Manually manage Hash Sets
- Create and manage KFF Groups
- Export KFF data

To open the KFF Admin page

- From the Case Manager or the Examiner, click Manage > KFF...
  The KFF Admin page opens.

If the Configure KFF dialog appears instead, check the following:

- The KFF Server is installed.
  See Installing the KFF Server on page 240.
- The application has been configured for the KFF Server.
  See Configuring the Location of the KFF Server on page 241.
- The KFF Service is running.
  In the Windows Services manager, make sure that the AccessData Elasticsearch service is started.

Elements of the KFF Admin page

<table>
<thead>
<tr>
<th>Pane</th>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups pane</td>
<td><strong>New</strong></td>
<td>Lets you create a KFF Group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Creating a KFF Group on page 271.</td>
</tr>
<tr>
<td></td>
<td><strong>Edit</strong></td>
<td>Lets you edit a KFF Group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Managing KFF Groups on page 271.</td>
</tr>
<tr>
<td></td>
<td><strong>Delete</strong></td>
<td>Lets you delete a KFF Group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Managing KFF Groups on page 271.</td>
</tr>
<tr>
<td></td>
<td><strong>Export</strong></td>
<td>You can share KFF hashes by exporting KFF groups.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Exporting KFF Data on page 278.</td>
</tr>
<tr>
<td>Hash Sets Pane</td>
<td></td>
<td>Displays the sets that you have imported or created.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, if you import the NSRL KFF library, those sets are displayed here.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Once you select a KFF Group in the Groups pane, only the Hash Sets and Groups that are in that selected group are listed.</td>
</tr>
</tbody>
</table>
### Elements of the KFF Admin page

<table>
<thead>
<tr>
<th>Pane</th>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edit</td>
<td></td>
<td>Lets you edit the hashes in a custom Hash Set. See <a href="#">Using KFF Groups to Organize Hash Sets</a> on page 270.</td>
</tr>
<tr>
<td>Import</td>
<td></td>
<td>Lets you import KFF data. See <a href="#">Importing KFF Data</a> on page 266.</td>
</tr>
<tr>
<td>Archive Server</td>
<td></td>
<td>Lets you archive all of the custom KFF Groups and Hash Sets stored in this KFF Server. See <a href="#">Enabling a Case to Use KFF</a> on page 273.</td>
</tr>
</tbody>
</table>
Adding Hashes to the KFF Server

You must add the hashes of the files that you want to compare against your evidence data. When adding hashes to the KFF Server, you add them in KFF Hash Sets.

You can use the following methods to add hashes to the KFF Library:

| Migrate legacy KFF Server data | You can migrate legacy KFF data that is in a KFF Server in applications versions 5.5 and earlier.  
See Migrating Legacy KFF Data on page 242. |
|--------------------------------|--------------------------------------------------------------------------------------------------|
| Import hashes                  | You can import previously configured KFF hashes, for example, from .CSV, .HDB, .HKE, or .HASH files.  
See Importing KFF Data on page 266. |
| Manually create and manage Hash Sets | You can manually add hashes to a Hash Set.  
See Manually Managing Hashes in a Hash Set on page 268. |
| Add hashes from files in your case | You can add hashes from files in your case.  
See Adding Hashes From Files in Cases on page 269. |

Importing KFF Data

Before Importing KFF Data

To understand the methods and formats for importing KFF data, first see About Importing KFF Data (page 244). This chapter explains how to import KFF data using the KFF Admin page.

Importing KFF Hashes

You can import KFF data from the following:

- KFF export files, such as CSV, TSV, HDB, HKE, KFF, HASH
- KFF binary files
  Warning: Importing KFF binary files will replace your existing KFF data.  
See About CSV and Binary Formats on page 252.  
It is recommended that you use the external KFF Import Utility to import KFF binary files.  
See Using the KFF Import Utility on page 245.

When importing KFF data, you must enter values for the following fields:

- Name
- Source Vendor
- Version
- Package

While the values are required, you can enter whatever values you may want to use to help you organize your hashes.
To import KFF hashes from files

1. Open the Case Manager or the Examiner.
2. Click Manage > KFF.
3. In KFF Admin, click Import.
4. Click Add File.
5. Set the Status: Alert or Ignore.
6. To browse to a file, for the Path, click ...
7. Browse to the path of the file.
8. Use the file type selector to view the types of files that you are looking for (.CSV, HKE, KFF, etc.)
10. Click Open.
11. Enter information for the hash set:
12. Click OK.
13. (Optional) Add other files that you want to import.
14. Click Import.

To import KFF binary files

Warning: This process may replace your existing KFF data.

See About the KFF Binary Format on page 252.

1. Open the Case Manager or the Examiner.
2. Click Manage > KFF.
3. Click Import.
4. Click Add File.
5. Set the Status: Alert or Ignore.
7. To browse to a folder, for the Path, click ...
8. Browse to the path of the source folder of the binary files (specifically the Export.xml file).
9. Click Open.
10. Enter information for the hash set:
11. After you have selected a file and added the information, click OK.
12. (Optional) Modify the import list by adding or removing files.
13. Click Import.
Manually Managing Hashes in a Hash Set

You can manually add, edit, and delete hash values within a custom hash set.

Note: You cannot manually add, edit, and delete hash values that were imported from NSRL, NDIC HashKeeper, and DHS libraries.

Searching For, Viewing, and Managing Hashes in a Hash Set

Due to the large number of hashes that may be in a Hash Set, a list of hashes is not displayed. (However, you can export a KFF Group that contains the Hash Set and view the hashes in the export file.)

You can use the KFF Hash Finder to search for hash values within a hash set. You search by entering a complete hash value. You can only search for one hash within one hash set at a time.

To search for and manage hashes in a hash set

1. Click Manage > KFF.
2. Select a Hash Set.
3. Click Edit.
4. To search for a hash, do the following:
   4a. In the Hash field, enter the complete hash value that you want to search for.
   4b. Click Search.
5. To manually add a hash to a hash set, do the following:
   5a. In the Hash field, enter the complete hash value that you want to add.
   5b. Click Search to verify if the hash already exists.
   5c. If the hash was not found, click Add.
   5d. Select the status of the hash:
      - Alert
      - Ignore
      - None
   5e. Enter the File Name of the file for the hash.
   5f. (Optional) Enter other information about the hash.
   5g. Click Save.
6. To manually edit a hash in a hash set, do the following:
   6a. In the Hash field, enter the complete hash value that you want to edit.
   6b. Click Search to verify that the hash already exists.
   6c. If the hash was found, click Edit.
   6d. Edit any settings and click Save.
7. To manually delete a hash from a hash set, do the following:
   7a. In the Hash field, enter the complete hash value that you want to delete.
   7b. Click Search to verify that the hash already exists.
   7c. If the hash was found, click Delete.
8. Click Done.
Adding Hashes From Files in Cases

You may identify files that in exist in a case as files that you want to add to your KFF hashes. For example, you may find a graphics file that you want to either alert for or ignore in this or other cases. Using Examiner, you can select files, export their file information to CSV, and then Import them as new KFF Hash Sets.

To add hashes from files in a case

1. Open a case in the Examiner.
2. Check one or more files that you want to have an Alert status for. (Only do similar statuses at a time.)
3. Export the file information you want to add hashes for by doing the following:
   3a. Click File > Export File List Info.
   3b. Browse to a folder and provide a name, such Files_for_KFF_Alerts.
   3c. Select a CSV format.
   3d. Choose All checked.
   3e. Click Save.
   3f. (Optional) Repeat the export for files that you want to have an Ignore status for.
4. Import one or more exported File List Info CSV files by doing the following:
   4a. Click Manage > KFF.
   4b. Click Import.
   4c. On the KFF Import Tool, click Add File.
   4d. Select the status: Alert or Ignore for the hashes.
   4e. Click ... to browse to the file that you exported with the File List Info.
   4f. Enter the Source Vendor, Version, and Package.
   4g. Click OK.
   4h. (Optional) Click Add file and repeat for other files.
   4i. Click Import.
5. Add the new Hash Sets to one or more KFF Groups.
Using KFF Groups to Organize Hash Sets

About KFF Groups

KFF groups are containers for one or more Hash Sets. When you create a group, you then add Hash Sets to the group. KFF Groups can also contain other KFF Groups.

When you enable KFF for a case, you select which KFF Group to use during processing.

Within a KFF group, you can manually edit custom Hash Sets.

About KFF Groups Status Override Settings

When you create a KFF Group, you can choose to use the default status of the Hash Set (Alert or Ignore) or override it. You do this by setting one of the following Status Override settings:

- **Alert** - All Hash Sets within the KFF Group will be set to Alert regardless of the status of the individual Hash Sets.
- **Ignore** - All Hash Sets within the KFF Group will be set to Ignore regardless of the status of the individual Hash Sets.
- **No Override** - All Hash Sets will maintain their default status.

For example, if you have a Hash Set with a status of Alert, if you set the KFF Group to No Override, then the default status of Alert is used. If you set the KFF Group with a status of Ignore, the Hash Set Alert status is overridden and Ignore is used.

As a result, use caution when setting the Status Override for a KFF Group.

About Nesting KFF Groups

KFF Groups can contain Hash Sets or they can contain other KFF Groups. When one KFF Group includes another KFF Group, it is called nesting.

The reason that you may want to nest KFF Groups is that you can use multiple KFF Groups when processing your data. When you enable KFF for a case, you can only select one KFF Group. By nesting, you can use multiple KFF Groups.

For example, you may have one KFF Group that contains Hash Sets with an Alert status. You may have a second KFF Group that contains Hash Sets with an Ignore status. When processing a case, you may want to use both of those KFF Groups. To accomplish this, you can create another KFF Group as a parent and then add the other two KFF Groups to it. When processing, you would select the parent KFF Group.

When nesting KFF Groups you must be mindful of the Status Override of the parent KFF Group. When nesting KFF Groups, the Status Override the highest KFF Group in the hierarchy is used. In most cases, you will want to set the parent KFF Group with a status of None. That way, the status of each child KFF Group (or their Hash Sets) is used. If you select an Alert or Ignore status for the parent KFF Group, then all child KFF Groups and their Hash Sets will use that status.
About the Default KFF Group

A Default KFF Group is automatically created, but by default, has no Hash Sets in it. You cannot rename or delete the Default KFF Group however, you can add and remove Hash Sets.

The purpose of the Default KFF Group is that you can add the Hash Sets that you most regularly use, and when you enable the processing of KFF data for a case, you can simply select the Default KFF Group.

See Enabling a Case to Use KFF on page 273.

If you install NSRL, NDIC HashKeeper, and DHS libraries, they are automatically added to the Default KFF Group. You can remove them from the Default KFF Group if you wish.

Creating a KFF Group

You create KFF groups to organize your Hash Sets. When you create a KFF Group, you add one or more Hash Sets to it. You can later edit the KFF Group to add or remove Hash Sets.

To create and configure a KFF group

1. Open the Case Manager or the Examiner.
2. Click Manage > KFF.
3. In the Groups pane, click New.
4. Enter a Name.
5. Set the Status Override.
   See About KFF Groups Status Override Settings on page 270.
6. In the Available Hash Sets pane, select any hash sets to include in the KFF Group and click "<< .
7. To nest another KFF Group within it, in the Available Groups pane, select any child KFF Groups and click "<< .
8. Click OK.

Viewing the Contents of a KFF Group

In KFF Admin, you can select a KFF Group and in the right Hash Sets pane, view the Hash Sets and child KFF Groups that are contained in that KFF Group.

Managing KFF Groups

You can edit KFF Groups and do the following:

- Rename the group
- Change the Override Status
- Add or remove Hash Sets and KFF Groups

You can also do the following:

- Delete the group
- Export the group
  See Exporting KFF Data on page 278.
To manage a KFF Group

1. Open the Case Manager or the Examiner.
2. Click Manage > KFF.
3. Select a group or right-click a KFF Group.
4. Do one of the following:
   - Click Edit.
   - Click Delete.
   - Click Export.
Enabling a Case to Use KFF

About Enabling and Configuring KFF

To use KFF in a case, you do the following when you either create a case, add evidence to a case, or run Additional Analysis:

Process for enabling and configuring KFF

1. (Optional) Create a new case or add evidence to a case.
   You can enable KFF when you create a case or add evidence to a case. You can also enable KFF for an existing case using Additional Analysis. See Re-Processing KFF Using Additional Analysis on page 277.

2. Configure how to process KFF Ignorable files
   When you create a case or add evidence to a case, you can choose how to process KFF Ignorable files:
   - Exclude KFF Ignorable Files - By default, KFF will not include Ignorable files in the processed evidence. They will not be visible in the Examiner nor will they be in any file counts.
   - Enable Include KFF Ignorable Files - You can enable a processing option to include KFF Ignorable files. Any files that are KFF Ignorable will be included and visible in the project. However, Ignorable files can be hidden using filters. See Enabling and Configuring KFF on page 273.
   See Using KFF Filters on page 276.
   When you process KFF using Additional Analysis, KFF Ignorable files are still included in the case’s evidence files.

3. Enable KFF
   Enable the KFF processing option. See Enabling and Configuring KFF on page 273.

4. Select a KFF Group
   When you enable KFF, you select one KFF group to use. You can select an existing group or create a new group.
   A KFF Group can include other KFF Groups. You can select a parent KFF Group that contains other groups with the sets that you want to use.
   See Using KFF Groups to Organize Hash Sets on page 270.

Enabling and Configuring KFF

To enable and configure KFF for a new case or new evidence

1. Create a new case or add evidence to a case and open the Evidence Processing options.
   See Evidence Processing Options on page 81.
   (In an existing case, open the Additional Analysis page.)
   See Using Additional Analysis on page 133.
   See Re-Processing KFF Using Additional Analysis on page 277.

2. Choose whether or not to include KFF Ignorable files.
   By default, KFF Ignorable files will not be included.
   To include KFF Ignorable files, do the following:
   2a. In the Detailed Options dialog, click the Evidence Refinement (Advanced) tab.
   2b. Select Include KFF Ignorable Files.
2c. Click the **Evidence Processing** tab.

3. In the *Evidence Processing* options, select *KFF*.

4. Do one of the following to select a KFF Group:
   - In the *KFF* drop-down menu, select an existing KFF Group that you want to use.
   - Click ... to open KFF Admin and configure a KFF Group to use and then select it.
     See [About KFF Groups](#) on page 270.

   You can use a KFF Group that you created or use the Default group.
   See [About the Default KFF Group](#) on page 271.

5. Configure any other processing options.

6. Click **OK**.
Reviewing KFF Results in the Examiner

You can view the KFF results in the Examiner. You can use the following tools to view KFF results:

- KFF Information in Columns
- KFF Filters
- KFF file status in the Overview tab.

**About KFF Data Shown in the Item List**

Depending on the KFF configuration options, you can identify and view files based on their KFF status and group.

**Note:** KFF Ignorable files will not be displayed in the File List unless you enabled the Include KFF Ignorable Files processing option. See Enabling a Case to Use KFF on page 273.

There are three possible KFF statuses in the Examiner:

- **Alert** - Files that matched hashes in the template with an Alert status
- **Ignore** - Files that matched hashes in the template with an Ignore status (not shown in the Item List by default)  
  See About Enabling and Configuring KFF on page 273.
- **Unknown** - Files that did not match hashes in the template (designated by a blank KFF Status)

**Using the KFF Information Columns**

You can add the following columns to display KFF data about each file in the File List.

**KFF Columns**

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KFF Status</td>
<td>Displays the status of the file as it pertains to KFF. The three status options are Alert, Ignore, or Unknown (blank).</td>
</tr>
<tr>
<td>KFF Group</td>
<td>Displays the name of the KFF Group that has the matched hash.</td>
</tr>
<tr>
<td>Not KFF Ignore...</td>
<td>Displays a True status if is not a KFF Ignorable file or a False status if it is a KFF Ignorable file.</td>
</tr>
</tbody>
</table>
Using KFF Filters

You can use filters to filter your evidence based on KFF data. You can use the Filter Manager to build a Compound filters.

To use the KFF Filters
1. In the Examiner, click the Filter drop-down menu.
2. Select one of the KFF Filters:
   - KFF Alert Files - Shows all files with an Alert status.
   - KFF Ignore Files - Shows all files with a KFF Ignore status.
     KFF Ignorable files will not be displayed unless you enabled the Include KFF Ignorable Files processing option.
     See Enabling a Case to Use KFF on page 273.
   - No KFF Ignore Files - Shows all files except those with a KFF Ignore status.

Using the Overview Tab

You can use the File Status nodes in the Overview tab to filter your evidence based on KFF data.

To use the Overview tab to filter KFF status
1. In the Examiner, click the Overview tab.
2. Expand File Status.
3. Click one of the following KFF nodes:
   - KFF Alert Files - Shows all files with an Alert status.
   - KFF Ignore Files - Shows all files with a KFF Ignore status.
     KFF Ignorable files will not be displayed unless you enabled the Include KFF Ignorable Files processing option.
     See Enabling a Case to Use KFF on page 273.
Re-Processing KFF Using Additional Analysis

You can process an existing case with KFF using Additional Analysis in the following situations:

- After you have processed a case with KFF enabled, you can re-process your data using an updated or different KFF Group. This is useful in re-examining a project after adding or editing hash sets.
  
  See Adding Hashes From Files in Cases on page 269.

- Enabling KFF for a case that was not previously processed using KFF.

To re-process a case using KFF

1. In the Examiner, click Evidence > Additional Analysis.
2. Enable KFF.
3. Do one of the following:
   - In the the drop-down menu, select a KFF Group.
   - Configure a KFF Group by clicking the ...
4. You can either process files new files in the case or process files that have been processed previously against KFF.
   
   Mark Recheck previously processed items if you want to processes all existing files with the KFF Group that you have selected.
5. Click OK.
6. Review the KFF results.
   
   See Reviewing KFF Results in the Examiner on page 275.
Exporting KFF Data

About Exporting KFF Data

You can share KFF Hash Sets and KFF Groups with other KFF Servers by exporting KFF data on one KFF Server and importing it on another. You can also use export as a way of archiving your KFF data.

You can export data in one of the following ways:

- **Exporting KFF Groups** - This exports the selected KFF Groups with any included sub-groups and any included Hash Sets and hashes to a CSV file.
- **Archiving the KFF Server’s Data** - This exports all the KFF data except NSRL, NIST, and DHC data in a binary format.

See About CSV and Binary Formats on page 252.

Exporting KFF Groups

You can share KFF hashes by exporting one or more KFF Groups. Exports are saved in a CSV file.

To export a KFF group

1. Open the Case Manager or the Examiner.
2. Click Manage > KFF.
3. Select one or more groups.
4. Click Export.
5. Select the location to which you want to save the exported CSV file.
6. Enter a name for the exported file.
7. Click Save.

Archiving the KFF Server’s Data

You can archive all of the KFF Groups and custom Hash Sets stored in a KFF Server. This can be useful in backing up your KFF data or sharing data across other KFF Servers.

This archive does not include data that was imported from NSRL, NDIC HashKeeper, and DHS libraries.

The data is saved in either a CSV file or a binary format.

To archive a KFF Server

1. Open the Case Manager or the Examiner.
2. Click Manage > KFF.
3. In the Archive Server section, select CSV file or Binary.
4. Click Archive Server...
5. Select the location to which you want to save the export.
6. (CSV format only) Enter a name for the export.
7. Click Save.
Part 4

Reviewing Cases

This part contains information about reviewing cases and contains the following chapters:

- Using the Examiner Interface (page 280)
- Exploring Evidence (page 282)
- Examining Evidence in the Overview Tab (page 299)
- Examining Email (page 303)
- Examining Graphics (page 305)
- Examining Miscellaneous Evidence (page 321)
- Bookmarking Evidence (page 342)
- Searching Evidence with Live Search (page 354)
- Searching Evidence with Index Search (page 365)
- Using Visualization (page 405)
- Examining Volatile Data (page 388)
- Customizing the Examiner Interface (page 455)
- Working with Evidence Reports (page 465)
Chapter 18
Using the Examiner Interface

About the Examiner

You can use the examiner to locate, organize, and export data. The Examiner interface contains tabs, each with a specific focus. Most tabs also contain a common toolbar and file list with customizable columns. Additional tabs can be user-defined.

For example, you can use the following tabs to perform a specific task:

- The Overview tab lets you narrow your search to look through specific document types, or to look for items by status or file extension.
- The Graphics tab lets you quickly scan through thumbnails of the graphics in the case.
- The Email tab lets you view emails and attachments.

As you find items of interest, you can do the following:

- Create, assign, and view labels in a sorted file list view.
- Use searches and filters to find relevant evidence.
- Create bookmarks to easily group the items by topic or keyword, find those items again, and make the bookmarked items easy to add to reports.
- Export files as necessary for password cracking or decryption, then add the decrypted files back as evidence.
- Add external, supplemental files to bookmarks that are not otherwise part of the case.

Tabs of the Examiner
Creating Screen Captures in the Examiner

You can capture screen shots within the Examiner interface. You can include the screen captures when creating reports. You can use screen captures to include information that is not easy to export or include in reports.

See Adding Screen Captures from Examiner on page 475.
Chapter 19
Exploring Evidence

The Explore tab displays all the contents of the case evidence files and drives as the original user would have seen them.

This chapter includes the following topics
- Explorer Tree Pane (page 282)
- File List Pane (page 283)
- The File Content Viewer Pane (page 289)
- The Filter Toolbar (page 297)
- Using QuickPicks (page 298)

Explorer Tree Pane

Lists directory structure of each evidence item, similar to the way one would view directory structure in Windows Explorer. An evidence item is a physical drive, a logical drive or partition, or drive space not included in any partitioned drive, as well as any file, folder, or image of a drive, or mounted image.

The Explorer Tree Pane
File List Pane

Displays case files and pertinent information about files, such as filename, file path, file type and many more properties as defined in the current filter. The files here may display in a variety of colors.

They are as follows:

- Black = Default
- Grey = Deleted
- Pink = Bookmarked
- Red = Encrypted

The File List view reflects the files available for the current tabbed view and the properties that meet selected Column templates, limited by any filters that may be applied. In this pane, you can choose which columns to display, as well as the order of those columns, create Bookmarks, create Labels, Copy or Export File Lists. The File List pane is included in all default tab views.

The File List Pane

Using the File List’s Columns

For each evidence item, you can display multiple columns of information about that item.
You can hover over a column’s short name to display a tooltip that shows a more descriptive column long name.

You can sort the list using any column. Click on a column heading in the File List view to sort on that column. Hold down the Shift key while clicking a different column header to make the newly selected column the primary-sorted column, while the previous primary-sorted column becomes the secondary-sorted column. There are only two levels of column sorting, primary and secondary.

To undo a secondary sort, click on a different column header to make it the primary-sorted column.

Column widths in most view panes can be adjusted by hovering the cursor over the column heading borders, and dragging the column borders wider or narrower.

See Customizing File List Columns (page 460).

A data box displays in the lower-right of the File List View that indicates the total logical size of the currently listed files.

**Using the File List’s Type-Down Control Feature**

When you view data in the File List, use can use a type-down control feature to locate information. To use the type-down control feature, select any file in the file list and then type the first letters of a file. As you continue to type, the file selector moves to the file list to the closest match to what you type.
## Icons of the File List Tool Bar

**File List Tool Bar**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Check All" /></td>
<td>Checks all of the files in the current list.</td>
</tr>
<tr>
<td><img src="image" alt="Uncheck All" /></td>
<td>Unchecks all of the files in the current list.</td>
</tr>
<tr>
<td><img src="image" alt="Uncheck Case" /></td>
<td>Unchecks all of the files in the current case.</td>
</tr>
<tr>
<td><img src="image" alt="Create New Bookmark" /></td>
<td>Opens the <em>Create New Bookmark</em> dialog.</td>
</tr>
<tr>
<td><img src="image" alt="Manage Labels" /></td>
<td>Opens the <em>Manage Labels</em> dialog.</td>
</tr>
<tr>
<td><img src="image" alt="Apply Label" /></td>
<td>Apply Label drop-down allows you to select from the list of defined labels and apply it to a single selected file or a group of files as selected in the <em>Apply Label To</em> drop-down.</td>
</tr>
<tr>
<td><img src="image" alt="Select Label Target" /></td>
<td>Select Label Target drop-down allows you to specify currently Highlighted, Checked, or Listed files for the Label you choose from the Apply Label drop-down.</td>
</tr>
<tr>
<td><img src="image" alt="Export File List" /></td>
<td>Export File List lets you save selected files to another folder.</td>
</tr>
<tr>
<td><img src="image" alt="Copy Special" /></td>
<td>Opens the <em>Copy Special</em> dialog.</td>
</tr>
<tr>
<td><img src="image" alt="Column Settings" /></td>
<td>Opens the <em>Column Settings</em> dialog.</td>
</tr>
</tbody>
</table>
### Component | Description
--- | ---
Column Templates | Sets the columns to a specific selection from the list of defined column sets. See [Managing Columns](#) on page 460.
- Cerberus Results  
  - See [Cerberus Columns](#) on page 230.
- eDiscovery
- eDiscovery Mail
- Email
- Explicit Image Detection (EID)
- File Listing
- GeoEXIF, GeoIP, Geolocation - Shows Geolocation-related columns  
  - See [Using Geolocation Columns in the Item List](#) on page 447.
- Internet History  
  - See [Examining Internet Artifact Data](#) on page 334.
- Normal (default)
- Reports: File Path Section
- Reports: Standard

| ![Display Time Zone: Pacific Daylight Time (from local machine)](#) | Displays the selected Time Zone from the local machine. |
| ![Heatmap](#) | Opens the Heatmap page.  
  - See [Using Visualization Heatmap](#) on page 432. |
| ![Geolocation](#) | Opens the Geolocation page.  
  - See [Using Visualization Geolocation](#) on page 440. |
| ![Visualization](#) | Opens the Visualization page.  
  - See [Using Visualization](#) on page 405. |
| ![Cancel](#) | Leave query running when switching tabs (this may affect the performance of other tabs). |
| ![Active spinner](#) | Cancel retrieving row data. This is not a pause button. To retrieve row data after clicking **Cancel**, you must begin again. There is no way to pause and restart the retrieval of row data.  
  - Active spinner indicates Processing activity. |

**Note:** When checking files in a case, these two rules apply:

- Checked files are persistent and remain checked until the user unchecks them.
- Checked files are per-user; another user or an Administrator will not see your checked files as checked when viewing the same case.
**File List View Right-Click Menu**

When you right-click on any item in the File List view, a menu with the following options appears. Some options are enabled or disabled, depending on the tab you are in, the evidence that exists in the case, the item you have selected, or whether bookmarks have been created.

**File List View Right-Click Menu Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>Opens the selected file.</td>
</tr>
<tr>
<td>Launch in Content Viewer</td>
<td>Launches the file in the Content Viewer, formerly known as Detached Viewer.</td>
</tr>
<tr>
<td>Open With</td>
<td>Opens the file. Choose either Internet Explorer or an External Program.</td>
</tr>
<tr>
<td>Create Bookmark</td>
<td>Opens the <em>Create New Bookmark</em> dialog for creating a new bookmark.</td>
</tr>
<tr>
<td>Add to Bookmark</td>
<td>Opens the <em>Add to Bookmark</em> dialog for adding selected files to an existing bookmark.</td>
</tr>
<tr>
<td>Remove from Bookmark</td>
<td>Removes a file from a bookmark. From the Bookmarks tab, open the bookmark containing the file to be removed, then select the file. Right-click and select <em>Remove from Bookmark</em>.</td>
</tr>
<tr>
<td>Labels</td>
<td>Opens the <em>Labels</em> dialog. View assigned Labels, create or delete a Label, Apply a Labels to file, or Manage Local or Manage Global Labels.</td>
</tr>
<tr>
<td>Review Labels</td>
<td>Opens the <em>Label Information</em> dialog to display all labels assigned to the selected file or files.</td>
</tr>
<tr>
<td>Mount Image to Drive</td>
<td>Allows you to mount an image logically to see it in Windows Explorer, or physically to view.</td>
</tr>
<tr>
<td>Add Decrypted File</td>
<td>Right-click and select <em>Add Decrypted File</em>. Opens the <em>Add Decrypted File</em> dialog. Browse to and select the file to add to the case, click <em>Add</em>.</td>
</tr>
<tr>
<td>View File Sectors</td>
<td>Opens a hex view of the selected file. Type in the file sector to view and click <em>Go To</em>.</td>
</tr>
<tr>
<td>Find on Disk</td>
<td>Opens the Disk Viewer and shows where the file is found in the disk/file structure. <strong>Note:</strong> Find on disk feature won't find anything under 512 B physical size. Files smaller than 1500 bytes may reside in the MFT and do not have a start cluster. Find on disk depends on that to work.</td>
</tr>
<tr>
<td>Find Similar Files</td>
<td>Opens the <em>Search for Similar Files</em> dialog. The selected file's hash value is displayed. Click <em>From File</em> to see the filename the hash is from. The Evidence Items to Search box shows all evidence items in the case. Mark which ones to include in the search. Select the Minimum Match Similarity you prefer, and click <em>Search</em> or <em>Cancel</em>.</td>
</tr>
<tr>
<td>Open in Registry Viewer</td>
<td>Opens a registry file in AccessData’s Registry Viewer. Choose <em>SAM</em>, <em>SOFTWARE</em>, <em>SYSTEM</em>, <em>SECURITY</em>, or <em>NTUSER.dat</em>.</td>
</tr>
<tr>
<td>Export</td>
<td>Opens the <em>Export</em> dialog with all options for file export, and a destination path selection.</td>
</tr>
<tr>
<td>Export to Image</td>
<td>Opens the <em>Create Custom Content Image</em> dialog.</td>
</tr>
</tbody>
</table>
## File List View Right-Click Menu Options (Continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquire to Disk Image</td>
<td>Allows you to create a new disk image (001, AFF, E01, or S01) from a disk image in the case.</td>
</tr>
<tr>
<td>Export File List Info</td>
<td>Opens the Save As dialog. Choose TXT, TSV, or CSV. The default name is FileList.TXT.</td>
</tr>
<tr>
<td>Copy Special</td>
<td>Opens the Copy Special dialog.</td>
</tr>
<tr>
<td>Check All Files in Current List</td>
<td>Check-marks all files in the current list.</td>
</tr>
<tr>
<td>Uncheck all Files in Current List</td>
<td>Unchecks all files in the current list.</td>
</tr>
<tr>
<td>Uncheck All Files in Case</td>
<td>Unchecks all files in the case.</td>
</tr>
<tr>
<td>Check/Uncheck All Highlighted</td>
<td>Checks or unchecks all files that are currently highlighted in the list. (Pressing the space bar does the same thing.)</td>
</tr>
<tr>
<td>Change “Flag as Ignorable” Status</td>
<td>Change Flag Status of all files as either Ignorable or Not Ignorable according to Selection Options.</td>
</tr>
<tr>
<td>Change “Flag as Privileged” Status</td>
<td>Change Flag Status of all files as either Privileged or Not Privileged according to Selection Options.</td>
</tr>
<tr>
<td>Re-assign File Category</td>
<td>Change File Category assignment.</td>
</tr>
<tr>
<td>View This Item In a Different List</td>
<td>Changes the File List view from the current tab to that of the selected tab from the pop-out.</td>
</tr>
</tbody>
</table>
The File Content Viewer Pane

Displays the contents of the currently selected file from the File List. The Viewer toolbar allows the choice of different view formats.

You can use CTRL+F to search within the File Content pane.

The File Content pane tab has a Default tab and a Web tab for each of the following tabbed views:

- Hex Tab
- Text Tab
- Filtered Tab
- Natural Tab
- Properties Tab
- Hex Interpreter Tab

Tabs of the File Content Pane

Note: The Find on Disk feature (in File List view, right-click an item) won’t find anything under 512 Bytes physical size. Also, files smaller than 1500 bytes may reside in the MFT and thus do not have a start cluster. Find on Disk depends on the start cluster information to work.
Note: In the File List view of any tab, a much-greater-than symbol (>>>) denotes that the path is not an actual path, but that the file came from another file or source, such as a zipped, compressed, or linked (OLE) file, or that it was carved.

The File Content pane title changes depending on which tab is selected at the bottom of the window. The available tabs are File Content, Properties, and Hex Interpreter. These three tabs default to the bottom left of the File Content pane in any program tab where it is used.

The three tabs can be re-ordered by clicking on a tab and dragging-and-dropping it to the position in the linear list where you want it. Click any of these tabs to switch between them. The information displayed applies to the currently selected file in the Viewer pane.

**The Natural Tab**

The Natural tab displays a file’s contents as it would appear normally. This viewer uses INSO filters for viewing hundreds of file formats without the native application being installed.

**File Content Pane: Natural Tab**

![File Content Pane: Natural Tab](image)

Note: When highlighting terms in Natural View, each term throughout the document is highlighted, one term at a time. When it reaches the limit of highlighting in that window, regardless of which term it is on (first, second, third, etc.) it stops highlighting. There is no workaround.

Note: Viewing large items in their native applications may be faster than waiting for them to be rendered in the Examiner viewer.

The Natural View top tab is the only one of the four that has additional tabs that provide for the viewing of Text, Media, and Web files, in their native application environment.

**File Content Pane: Default, Media, and Web Tabs**
• Natural Tab: Default
  The Default tab displays documents or files in a viewer that uses INSO (Inside-Out) Technology, according to their file type.

• Natural Tab: Media
  Case audio and video files play using an embedded Windows Media Player.
  The Examiner has the functionality to recognize popular mobile phone formats (found in many MPE images) such as M4A, MP4, AMR, and 3GP. These file types play inside the Media tab as long as the proper codecs are installed that would also allow those files to play in Windows Media Player.

• Natural Tab: Web
  The Web view uses an embedded Internet Explorer instance to display the contents of the selected file in a contained field.
  In the Web view, the top-left border of the pane holds two toggle buttons for enabling or disabling HTML content.

**Natural Tab: Web Tab Toggle Buttons**

<table>
<thead>
<tr>
<th>Enable or Disable CSS Formatting. CSS formatting displays any fonts, colors, and layout from cascading style sheets. HTML formatting not part of a cascading style sheet might remain. Enabled feature is indicated by a blue background; disabled feature is indicated by a gray background.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable or Disable External Hyperlinks. Enabled hyperlinks in the file will link to active internet pages. This may not accurately provide data that was available using that link at the time the image was made, or the evidence was acquired. Enabled feature is indicated by a blue background; disabled feature is indicated by a gray background.</td>
</tr>
</tbody>
</table>

**The Properties Tab**

The Properties tab is found in the File Content View, and displays a pane, or window of information about a selected file. The following figure displays the information contained in the Properties pane. This information corresponds to the file selected in the *File List* pane.
### Properties Pane Components

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The filename of the selected file.</td>
</tr>
<tr>
<td>Item Number</td>
<td>A number assigned to the item during evidence processing.</td>
</tr>
<tr>
<td>File Type</td>
<td>The type of a file, such as an HTML file or a Microsoft Word 98 document. The file header is used to identify each item’s file type.</td>
</tr>
<tr>
<td>Path</td>
<td>The path from the evidence source down to the selected file.</td>
</tr>
<tr>
<td>General Info</td>
<td>General information about the selected file:</td>
</tr>
<tr>
<td></td>
<td><em>File Size:</em> Lists the size attributes of the selected file as follows:</td>
</tr>
<tr>
<td></td>
<td>- Physical size of the file, including file slack</td>
</tr>
<tr>
<td></td>
<td>- Logical size of the file, excluding file slack</td>
</tr>
<tr>
<td></td>
<td><em>File Dates:</em> Lists the Dates and Times of the following activities for that file on the imaged source:</td>
</tr>
<tr>
<td></td>
<td>- Created</td>
</tr>
<tr>
<td></td>
<td>- Last accessed</td>
</tr>
<tr>
<td></td>
<td>- Last modified</td>
</tr>
<tr>
<td></td>
<td>All dates with times are listed in UTC and local times.</td>
</tr>
<tr>
<td>File Attributes</td>
<td>The attributes of the file:</td>
</tr>
<tr>
<td></td>
<td><em>From Recycle Bin:</em> True if the file was found in the Recycle Bin. False otherwise.</td>
</tr>
<tr>
<td></td>
<td><em>Start Cluster:</em> Start cluster of the file on the disk.</td>
</tr>
<tr>
<td></td>
<td><em>Compressed:</em> True if compressed. False otherwise.</td>
</tr>
<tr>
<td></td>
<td><em>Original Name:</em> Path and filename of the original file.</td>
</tr>
<tr>
<td></td>
<td><em>Start Sector:</em> Start sector of the file on the disk.</td>
</tr>
<tr>
<td></td>
<td><em>File has been examined for slack:</em> True if the file has been examined for slack. False otherwise.</td>
</tr>
<tr>
<td>DOS Attributes:</td>
<td><em>Hidden:</em> True if Hidden attribute was set on the file. False otherwise.</td>
</tr>
<tr>
<td></td>
<td><em>System:</em> True if this is a DOS system file. False otherwise.</td>
</tr>
<tr>
<td></td>
<td><em>Read Only:</em> True or False value.</td>
</tr>
<tr>
<td></td>
<td><em>Archive:</em> True if Read Only attribute was set on the file. False otherwise.</td>
</tr>
<tr>
<td></td>
<td><em>8.3 Name:</em> Name of the file in the DOS 8.3 naming convention, such as [filename.ext].</td>
</tr>
</tbody>
</table>
Exploring Evidence

The information displayed in the Properties tab is file-type-dependent, so the selected file determines what displays.

### The Hex Tab

The Hex tab shows the file content in hexadecimal. It is different from the Hex Interpreter tab at the bottom of the screen.

### The Hex Tab

![Hex Tab Image]
The bar symbol indicates that the character font is not available, or that an unassigned space is not filled.

**File Content Hex View Right-click Menu Options**

<table>
<thead>
<tr>
<th>Selection</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select all</td>
<td>Show decimal offsets</td>
</tr>
<tr>
<td>Copy text</td>
<td>Show text only</td>
</tr>
<tr>
<td>Copy hex</td>
<td>Fit to window</td>
</tr>
<tr>
<td>Copy Unicode</td>
<td>Save current settings</td>
</tr>
<tr>
<td>Copy raw data</td>
<td>Go to Offset takes you to a desired offset. You can select the Hex data to save as a separate file.</td>
</tr>
<tr>
<td>Save selection</td>
<td>Save selection as carved file lets you manually carve data from files.</td>
</tr>
</tbody>
</table>

**The Hex Interpreter Tab**

The Hex Interpreter tab shows interpreted hexadecimal values selected in the Hex tab viewer on the File Content tab in the Viewer pane into decimal integers and possible time and date values as well as Unicode strings.

**The Hex Interpreter Tab**

The Hex Value Interpreter reads date/time stamp values, including AOL date/time, GPS date/time, Mac date/time, BCD, BCD Hex, and BitDate.

The Hex tab displays file contents in hexadecimal format. Use this view together with the Hex Interpreter pane. The Hex View tab is also found in the File Content View. This feature helps if you are familiar with the internal code structure of different file types, and know where to look for specific data patterns or for time and date information.

**To convert hexadecimal values**

1. Highlight one to eight continuous bytes of hexadecimal code in the **File Content pane > File Content tab viewer > Hex tab**. (Select two or more bytes for the Unicode string, depending on the type of data you want to interpret and view.)
2. Switch to the Hex Interpreter tab at the bottom of the **File Content Viewer > Hex tab**, or open it next to, or below the **File Content tab > Hex tab** view to see both concurrently.
3. The possible valid representations, or interpretations, of the selected code automatically display in the Hex Value Interpreter.
Little-endian and big-endian refers to which bits are most significant in multi-byte data types, and describes the order in which a sequence of bytes is stored in a computer’s memory. Microsoft Windows generally runs as Little Endian, because it was developed on and mostly runs on Intel-based, or Intel-compatible machines.

In a big-endian system, the most significant bit value in the sequence is stored first (at the lowest storage address). In a little-endian system, the least significant value in the sequence is stored first. These rules apply when reading from left to right, as we do in the English language.

As a rule, Intel based computers store data in a little-endian fashion, where RISC-based systems such as Macintosh, store data in a big-endian fashion. This would be fine, except that a) AccessData’s products image and process data from both types of machines, and b) there are many applications that were developed on one type of system, and are now “ported” to the other system type. You can’t necessarily apply one rule and automatically know which it is.

Little-endian is used as the default setting. If you view a data selection in the Hex Interpreter and it does not seem correct, you can try choosing the big-endian setting to see if the data displayed makes more sense.

The Text Tab

The Text tab displays the file’s content as text using the code page selected from the View Text As drop-down menu.

The File Content pane currently provides many code pages from which to choose. When the desired code page is selected, the Text tab will present the view of the selected file in text using the selected code page language.

The Filtered Tab

The Filtered tab shows the file’s text created during indexing. The following figure represents content displayed in the filtered tab. The text is taken from an index created for the current session if indexing was not previously selected.
The Filter Toolbar

The interface provides a tool bar for applying QuickPicks and Filters to the case.

See also Filtering Data to Locate Evidence (page 156)

The Filter Toolbar

![Filter Toolbar Image]

Filter Toolbar Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Filter On/Off Icon]</td>
<td>Turns the filter on or off. Filtered data is shown in a colored pane to indicate that it is filtered. In addition, if no filter is applied, the icon is grayed out. When active, or ON, the Filter button has a light blue background. When inactive, or OFF, the background is gray.</td>
</tr>
<tr>
<td>![Drop-Down Menu]</td>
<td>Opens the drop-down menu listing defined filters. Applies the selected filter.</td>
</tr>
<tr>
<td>![Filter Manager]</td>
<td>Opens the Filter Manager. The Filter Manager allow multiple filters to be selected and applied concurrently. These are known as Compound filters.</td>
</tr>
<tr>
<td>![QuickPicks On/Off Icon]</td>
<td>Turns the QuickPicks filter on or off. The QuickPicks filter is used in the Explore tab to populate the file list with only items the investigator wishes to analyze. When active, or ON, the QuickPicks button is light blue. When inactive, or OFF, the background is gray.</td>
</tr>
<tr>
<td>![Lock Icon]</td>
<td>Locks or unlocks the movable panes in the application. When the lock is applied, the box turns grey, and the panes are locked. When unlocked, the box has a light blue background and blue outline, indicating the panes can be moved.</td>
</tr>
</tbody>
</table>
Using QuickPicks

QuickPicks is a type of filter that allows the selection of multiple folders and files in order to focus analysis on specific content. The following figure represents the Explore Evidence Items tree with a partially selected set of folders and sub-folders using the QuickPicks feature.

The QuickPicks filter simultaneously displays open and unopened descendent containers of all selected tree branches in the File List at once. The colors of the compound icons indicate whether descendants are selected.

The icons are a combination of an arrow, representing the current tree level, and a folder, representing any descendants.

### QuickPicks Icons

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Dark Green Arrow Behind Bright Green Folder" /></td>
<td>A dark green arrow behind a bright green folder means all descendants are selected.</td>
</tr>
<tr>
<td><img src="image" alt="Dark Green Arrow Behind Yellow Folder" /></td>
<td>A dark green arrow behind a yellow folder means that although the folder itself is not selected, some of its descendents are selected.</td>
</tr>
<tr>
<td><img src="image" alt="White Arrow With No Folder" /></td>
<td>A white arrow with no folder means neither that folder, nor any of its descendents is selected.</td>
</tr>
<tr>
<td><img src="image" alt="White Arrow Behind Bright Green Folder" /></td>
<td>A white arrow behind a bright green folder means that all descendants are selected, but the folder is not.</td>
</tr>
</tbody>
</table>

The File List view reflects the current QuickPicks selections. When QuickPicks is active, or on, if no folders are selected, the File List view shows the currently selected item in the Tree view, including first-level child objects. When any item is selected, that selection is reflected in the File List view. When QuickPicks is not active, or off, the File List view displays only items at the selected level in the tree view, with no children.
Chapter 20
Examining Evidence in the Overview Tab

This chapter includes the following topics

- Using the Overview Tab (page 299)

Using the Overview Tab

The Overview tab provides a general view of a case. You can find the number of items in various categories, view lists of items and lists of individual files by category, status, and extension. Evidence categories are represented by trees in the upper-left Case Overview pane of the application.

The Overview Tab

Evidence Groups Container

Evidence items can be assigned to a group when they are added to a case. The Evidence Groups Container shows at-a-glance which Evidence Groups are in use in a case, and the number of items associated with each.

File Items Container

The File Items container itemizes files by whether they have been checked and lists in an expandable tree view the evidence files added to the case.
**File Extension Container**

The File Extension container itemizes files by their extensions, such as TXT, MAPIMAIL, and DOC and lists them in a tree view.

The File Extension Container content numbers do not synchronize or match up with the overall number of case items. This is because case items, such as file folders, do not have extensions and, therefore, are not listed in the File Extension Container.

**File Category Container**

File Category container itemizes files by type, such as a word processing document, graphic, email, executable (program file), or folder, and lists them in a tree view.

The statistics for each category are automatically listed. Expand the category tree view to see the file list associated with it.

BlackBerry IPD files (the files created on your PC when you back up your BlackBerry device) are recognized and categorized. Not every BlackBerry device has the same features as all the others, and everyone uses their device differently so there is no guarantee that every type of data will be available from every set of backup IPD files. You will most likely see HTML and XML files, Messages, and Pictures/Photos. Address Books, Tasks, and Calendars will be extracted if available.

### File Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archives</td>
<td>Archive files include email archive files, ZIP, STUFFIT, THUMBS.DB thumbnail graphics, and other archive formats.</td>
</tr>
<tr>
<td>Databases</td>
<td>Database files such as those from MS Access, Lotus Notes NSF, and other database programs.</td>
</tr>
<tr>
<td>Documents</td>
<td>Includes recognized word processing, HTML, WML, XML, TXT, or other document-type files.</td>
</tr>
<tr>
<td>Email</td>
<td>Includes email messages from Outlook, Outlook Express, AOL, Endoscope, Yahoo, Rethink, Udder, Hotmail, Lotus Notes, and MSN.</td>
</tr>
<tr>
<td>Executables</td>
<td>Includes Win32 executable files and DLLs, OS/2, Windows VxD, Windows NT, Java Script, and other executable formats.</td>
</tr>
<tr>
<td>Folders</td>
<td>Folders or directories that are located in the evidence.</td>
</tr>
<tr>
<td>Graphics</td>
<td>Lists files having the standard recognized graphic formats such as TIF, GIF, JPEG, and BMP, as found in the evidence.</td>
</tr>
<tr>
<td>Internet/Chat Files</td>
<td>Lists Microsoft Internet Explorer cache and history indexes.</td>
</tr>
<tr>
<td>Mobile Phone Data</td>
<td>Lists data acquired from recognized mobile phone devices.</td>
</tr>
<tr>
<td>Multimedia</td>
<td>Lists AIF, WAV, ASF, and other audio and video files as found in the evidence.</td>
</tr>
<tr>
<td>OS/File System Files</td>
<td>Lists partitions, file systems, registry files, and so forth.</td>
</tr>
<tr>
<td>Other Encryption Files</td>
<td>Lists found encrypted files, as well as files needed for decryption such as EFS search strings, Public Keys, Private Keys, and other RSA Keys.</td>
</tr>
</tbody>
</table>

For more information on Decrypting Encrypted Files, See [Decrypting Files](#) (page 177).
File Status Container

File Status covers a number of file categories that can alert the investigator to problem files or help narrow down a search.

The statistics for each category are automatically listed. Click the category button to see the file list associated with it. The following table displays the file status categories.

### File Status Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bad Extensions</strong></td>
<td>Files with an extension that does not match the file type identified in the file header, for example, a GIF image renamed as [graphic].txt.</td>
</tr>
<tr>
<td><strong>Data Carved Files</strong></td>
<td>The results of data carving when the option was chosen for preprocessing.</td>
</tr>
<tr>
<td><strong>Decrypted Files</strong></td>
<td>The files decrypted by applying the option in the Tools menu.</td>
</tr>
<tr>
<td><strong>Note:</strong> Decrypted status means the file was decrypted from evidence added to the case in its original form. The software has had control of the file and knows it was originally encrypted, that it was contained in the original evidence, and thus, is relevant to the case.</td>
<td></td>
</tr>
<tr>
<td><strong>Deleted Files</strong></td>
<td>Complete files or folders recovered from slack or free space that were deleted by the owner of the image, but not yet written over by new data.</td>
</tr>
<tr>
<td><strong>Duplicate Items</strong></td>
<td>Any items that have an identical hash.</td>
</tr>
<tr>
<td><strong>Email Attachments</strong></td>
<td>Files attached to the email in the evidence.</td>
</tr>
<tr>
<td><strong>Email Related Items</strong></td>
<td>All email-related files including email messages, archives, and attachments.</td>
</tr>
</tbody>
</table>
Cluster Topic Container

Cluster Topic are groups of files created through Document Content Analysis. This feature allows you to group Email Threaded data and Near Duplicate data together for quicker review. After the application completes the analysis, the content appears in the Cluster Topic container. The content is organized by the keywords in which the documents were analyzed and grouped. Documents that do not fit into a Content Topic category are placed in the UNCLUSTERED category.

Using Document Content Analysis (page 401)
Chapter 21
Examining Email

This chapter includes the following topics

- **Using the Email Tab** (page 303)

## Using the Email Tab

The Email tab displays email mailboxes and their associated messages and attachments. The display is a coded HTML format.

### The Email Tab

![Image of Email Tab]

### Email Status Tree

The Email Status tree lists information such as the sender of the email, and whether an email has attachments. They are listed according to the groups they belong to.
**Email Archives Tree**

The *Email Archives* tree lists Email related files that are considered containers. Item types include DBX, MBX, PST/OST, Saved Mail, Sent Mail, Trash, and so forth. The tree is limited to archive types found within the evidence during processing.

**Email Tree**

The *Email* tree lists message counts, AOL DBX counts, PST counts, NSF counts, MBOX counts, and other such counts.

Exchange and PST Emails can be exported to MSG format. In addition, MSG files resulting from an export of internet email look the way they should.

The *Email Tab > Email* Items tree view contains two new groups: Email By Date (organized by Year, then by Month, then by Date, for both Submitted and Delivered); and Email Addresses (organized by Senders and Recipients, and subcategorized by Email Domain, Display Name, and Email Addresses).

You can also export Tasks, Contacts, Appointments, Sticky Notes, and Journal Entries to MSG files.

**Important:** If the Mozilla Firefox directory is added as evidence while in use, history, downloads, etc. are identified as zero-length files.

When an email-related item is selected in the File List, right-click and choose **View this item in a different list > Email** to see the file in Email context.

**Note:** Email data parsed into the new nodes in the Email tree view will only be populated in new cases. Converted cases will not have this data. To make this data available in older cases, re-process the case in the new version.
Chapter 22
Examining Graphics

This chapter includes the following topics

- Using the Graphics Tab (page 305)
- Evaluating Explicit Material (page 308)
- Using PhotoDNA to Compare Images (page 311)

Using the Graphics Tab

The Graphics tab displays the graphics in a case like a photo-album.

The Graphics Tab

![Image of the Graphics Tab]

Each graphic file is shown in a thumbnail view. A graphic displays in the Thumbnail view when its thumbnail is checked in the File Contents pane.
Graphics tab Thumbnails

In the thumbnail viewer, if a graphic is not fully loaded, the following icon is displayed:

![Loading Icon]

In the thumbnail viewer, if a graphic cannot be displayed, the following icon is displayed:

![Error Icon]

Beneath each thumbnail image is a check box. When creating a report, choose to include all of the graphics in the case or only those graphics that are checked.

The Evidence Items pane shows the Overview tree by default. Use the View menu to change what displays here. Only graphic files appear in the File List when the tab filter is applied. Turn off the tab filter to view additional files.

The Thumbnails Size Setting

The thumbnail settings allow large amounts of graphic data to be displayed for evidence investigation, or larger thumbnails to show more detail quickly. The investigator does not always need to see details to pick out evidence; scan the thumbnails for flesh tones, photographic-type graphics, and perhaps particular shapes. Once found, the graphics can be inspected more closely in the Content Viewer. There are two ways to change the thumbnails size setting, in the Examiner View menu or with the Thumbnail Size Selector ( ).

- To change the Thumbnail Size in the View menu, click View > Thumbnail Size and select a size.
- To change the Thumbnail Size with the Thumbnail Size Selector, click and select a size.
Changing the Thumbnail Size

The detachable pane feature is especially useful when you undock the thumbnails graphics pane and move it to a second monitor, thus freeing your first monitor to display the entire data set for the graphics files being analyzed. You can undock the Thumbnails pane, and expand it across the screen. Then you can open the Thumbnails Settings sub-menu, and scale the thumbnails down to fit as many as possible in the pane.

Moving the Thumbnails Pane
Evaluating Explicit Material

When explicit material is suspected in a case, the Explicit Image Detection (AID) feature allows for easier location and identification of those files. When creating the case, there are options for identifying explicit material.

See Using Explicit Image Detection (page 96) for more information on setting the EID pre-processing options prior to case creation.

When the pre-processing options are set and applied to evidence as it is processed, in the case you can easily identify files that fit the criteria you set.

Filtering EID Material

The following tasks can help you use the EID feature.

Create an EID Tab Filter

A Tab Filter must be used here to filter the folders from the Explore tab, but not filter out the Folders’ content from the Graphics Tab. However, the filter itself must be created first, then the filter must be applied as a Tab Filter.

To create a filter for the EID folders in your case

1. Click the Explore tab.
2. Ensure that Filters are turned off, and the Filter drop-down displays “-unfiltered-”.
4. Create a Filter to include EID Folders that have high scores.
   4a. Give the Filter a name that reflects its purpose.
   4b. Provide a description with enough information to be helpful at a glance.
   4c. Set up rules. Check each rule to include it in the filter.
   4d. Mark Live Preview to see the effects of the filter on the current File List.
   4e. Choose Match Any, or Match All, to fit your needs, according to the preview.
   4f. Click Save > Close.
      If you choose to, repeat Steps 3 and 4 for Medium folders with a criteria of 40, then move to Step 5.
5. From the Filter Manager, copy the new filters to the Include list on the top-right side of the view.
6. At the bottom of the dialog, click Apply and Close.

To apply the new filter as a Tab filter

1. Click the Explore tab.
2. Ensure that Filters are turned off, and the Filter drop-down displays “-unfiltered-”.
3. Click Filter >Tab Filter.
4. In the Tab Filter Selection dialog, click the drop-down to select Explicit images folder (high score) as created earlier.
5. Click OK.
Change the Column List Settings

To view the Explicit Image Detection (EID) statistics for your case in the File List, do the following:

1. Click the Graphics tab.

2. In the File List, select the default EID column template from the drop-down list, or add the EID columns to the column template you choose. To customize a Columns Template for EID content, do the following:
   2a. Click Column Settings in the File List toolbar.
   2b. In the Manage Column Settings dialog, click New, or highlight an existing template and click Copy Selected.
   2c. In the Column Settings dialog, select the EID-related column headings to add to the template, and click Add.
   2d. Make your selections.
   2e. Move the selected columns up in the list to make them display closer to the left-most column in the view, as it best works for you.

3. Click OK

4. From the Manage Column Settings, select the New Column template, and click Apply.
   Later, to re-apply this column template, select it from the Column Setting drop-down.

The resulting columns are displayed in the File List view.

5. In the File List view, arrange the column headings so you can see the EID data.

6. Click any column heading to sort on that column, to more easily see and evaluate the relevant data.

EID Scoring

Each folder is given a score that indicates the percentage of files within the folder that have an EID score above 50. For example, if the folder contains 8 files and three of them score over 50, the folder score will be 38 (3 is 37.5% of 8). Now, a folder score of 38 does not mean there is no objectionable material in that folder, it only means that there is not a high concentration of objectionable material found there.

Explicit Image Detection filtering rates pictures according to the presence or absence of skin tones in graphic files. In addition, it not only looks for flesh tone colors, but it has been trained on a library of approximately 30,000 pornographic images. It assesses actual visual content. This capability increases the speed with which investigators can handle cases that involve pornography.

Successfully filtered pictures are issued a score between 0 and 100 (0 being complete absence of skin tones, and 100 being heavy presence of skin tones). A score above 100 indicates that no detection could be made.

When you set filters for analyzing the scored data, you specify your own acceptance threshold limit for images you may consider inappropriate. Negative scores indicate a black and white, or grayscale image where no determination can be made, or that some error occurred in processing the file.

Descriptions of EID Scoring Values

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 100</td>
<td>The amount of skin tones detected. 0 = few skin tones detected, 100 heavy skin tones detected</td>
</tr>
<tr>
<td>-1</td>
<td>File not found</td>
</tr>
<tr>
<td>-2</td>
<td>License error</td>
</tr>
</tbody>
</table>
### Descriptions of EID Scoring Values

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>Wrong file format</td>
</tr>
<tr>
<td>-4</td>
<td>No match found</td>
</tr>
<tr>
<td>-5</td>
<td>Folder not found</td>
</tr>
<tr>
<td>-6</td>
<td>Unknown error</td>
</tr>
<tr>
<td>-7</td>
<td>Cannot load image (e.g., corrupt image)</td>
</tr>
<tr>
<td>-8</td>
<td>Not enough information</td>
</tr>
<tr>
<td>-9</td>
<td>Face detection profile path is null</td>
</tr>
<tr>
<td>-10</td>
<td>Can’t open face detection directory</td>
</tr>
<tr>
<td>-11</td>
<td>Face detection file not found</td>
</tr>
<tr>
<td>-12</td>
<td>Input classifier not initialized</td>
</tr>
<tr>
<td>-13</td>
<td>Init profile failed</td>
</tr>
<tr>
<td>-14</td>
<td>File path is empty</td>
</tr>
<tr>
<td>-16</td>
<td>Image data is empty</td>
</tr>
<tr>
<td>-17</td>
<td>Null matching handle</td>
</tr>
<tr>
<td>-18</td>
<td>Missing retrieval result</td>
</tr>
<tr>
<td>-100</td>
<td>An unsupported file format</td>
</tr>
<tr>
<td>-101</td>
<td>An unsupported black &amp; white image</td>
</tr>
<tr>
<td>-102</td>
<td>An unsupported grayscale image</td>
</tr>
<tr>
<td>-103</td>
<td>An unsupported monochrome image</td>
</tr>
<tr>
<td>-1000</td>
<td>An unknown error</td>
</tr>
<tr>
<td>-1001</td>
<td>The EID score function threw an exception</td>
</tr>
<tr>
<td>-1002</td>
<td>The EID score function threw an exception</td>
</tr>
</tbody>
</table>
Using PhotoDNA to Compare Images

About Using PhotoDNA

You can use PhotoDNA to compare digital images against known contraband images so that you can quickly identify any contraband images in your evidence.

About the PhotoDNA Library Management Page

The PhotoDNA Library Management page is where you manage PhotoDNA libraries. From the PhotoDNA Management page, you can do the following:

- Specify the folder to be used for the library
- Add to or remove images from the library
- Edit the description of the photo in the library
- Import or export the library in order to share with others.

When an image file is added, PhotoDNA is run to analyze the file. A new row is created and an ID number is given to each photo. A description field displays the name of the photo. This description is an editable text field. You can add additional information to the description.

When you export, you can export all of the photos in a library or only one or more.

About the PhotoDNA Processing Option

You enable PhotoDNA for a case as a processing option. You can enable it at one of the following situations:

- When you create a new case
- When you add evidence to a case
When you perform Additional Analysis

Enabling PhotoDNA will add time to processing. You can choose when to spend the extra time.

In the processing options, there is a PhotoDNA check box that is disabled by default. When you select the PhotoDNA check box, the PhotoDNA Library Management page is opened. You can select the location for an existing library or configure a new one.

When you enable PhotoDNA, the following occurs during evidence processing:

- A PhotoDNA value is generated for each image in the library.
- A PhotoDNA value is generated for each image in the evidence.
- The values for the images in the evidence is compared to the values in the library.
- A PhotoDNA score is generated for each image in the evidence.

You can view the score to see how similar images are to your library.

**About viewing the PhotoDNA results**

During processing, discovered images are analyzed by PhotoDNA and are given a DNA value. That image's DNA value is then compared to the DNA value in the PhotoDNA Library. A *PhotoDNA Distance* value is generated that represents how closely it matches any of the files in the library. (If the image matches more than one item in the library, the closest score is used).

The *PhotoDNA Distance* value can range from 0 to 49,000. A value of 0 means that there is no distance and the photo is a perfect match. Any score higher than the range means that there is no match and therefore no value is given.

After you have processed your evidence with PhotoDNA enabled, you can use the following three columns in the File List to display PhotoDNA information:

- PhotoDNA Data - Displays the description of the file in the library that the image most closely resembles. (By default, this is the path and filename of the photo in the library, but because the description is editable in the PhotoDNA Library Management interface, this will display whatever is in the description field.)
- PhotoDNA Difference - Displays the number indicating how closely the image matches a PhotoDNA library file (0 is a perfect match)
- PhotoDNA File ID - Displays the ID number of the file in the library as represented in the PhotoDNA Library Management interface.
- PhotoDNA Hash - The value of the PhotoDNA hash for the image.

See [Comparing Images to the PhotoDNA Library](#) on page 313.

**Configuring a PhotoDNA Library**

You configure a PhotoDNA library from the PhotoDNA Library Management page. You can do this at one of the following times:

- Outside of a case, from the Case Manager > Manage menu.
- Within a case when configuring Processing Options.

**To configure a PhotoDNA Library**

1. Open the PhotoDNA Library Management page by doing one of the following:
   - From the Case Manager, click Manage > PhotoDNA.
   - From within a case access the Processing Options.
2. Select a PhotoDNA Library by browsing to a folder location.
   If you have not previously created a library, specify a new folder location.
   If you have previously created a library, you can use it or create a new one.
   If you are in the Processing Options and it displays an existing library and you want to use a different
   one, clear the PhotoDNA option and re-select it.

3. To add photos to the library, do the following:
   3a. Click Add.
   3b. Browse to the photos that you want to add to the library.
   3c. Select the files that you want to add.
   3d. Click Open.

4. To remove photos from the library, select an item and click Remove.

5. Edit the description of an item, do the following:
   5a. Double-click an item.
   5b. Edit the description.
   5c. Click OK.

6. To export the library, do the following:
   6a. Select the photos that you want to export.
   6a. Click Export.
   6b. Specify a location to save the exported file.
   6c. Click Save.

7. To import a library, do the following:
   7a. Click Import.
   7b. Browse to an exported file.
   7c. Click Import.
   7d. Click Save.

Comparing Images to the PhotoDNA Library

You can compare the images in your case to the files in the PhotoDNA Library. The comparison is done during
evidence processing. A PhotoDNA score is generated. You can view the score to see how similar images are to
you library.

If you have an image in your evidence that you want to add to the PhotoDNA Library, you can do so with a right-
click option.

You can perform a processing job at one of the following situations:

- When you add evidence to a case
- When you perform Additional Analysis

To compare images to the PhotoDNA Library

1. Either add evidence to a case or perform an Additional Analysis.
2. In the processing options, select the PhotoDNA check box.
3. Configure the PhotoDNA Library.
4. Click **OK**.
   Any images that are in the evidence will be processed, given a DNA value, and then compared against the files in the library.

**To view the PhotoDNA scores**

1. In the Examiner, use the **Overview** tab or the **Graphics** tab to view the graphics in your case.  
   See *Using the Graphics Tab* on page 305.

2. Add columns to the File List that display the PhotoDNA score by doing the following:
   2a. Click the **Column Settings** icon.
   2b. Either create or edit a column settings template.
   2c. In the Available Columns list, expand **All Features**.
   2d. Select and **Add** the following columns:
      - **PhotoDNA Distance** - The value that shows how closely it matches a file in your library. For convenience, have this higher in the list than the other two.
      - **PhotoDNA Data** - The name of the file in the library that the image was compared to.
      - **PhotoDNA File ID** - The file ID of the file in the library that the image was compared to. (This ID is shown in the Photo ID Library Manager.  
        See *About viewing the PhotoDNA results* on page 312.
   2e. Click **OK**.
   2f. Select the desired settings and click **Apply**.
   2g. You can sort by the PhotoDNA Distance value to see the photos that have the lowest scores and are the most likely matches.

**To add images in the File List to the PhotoDNA library**

- You can right-click a image file in the **File List** and click **Add to PhotoDNA library**.  
The file is automatically added to the library. You can either remove it or click **Close**.
Chapter 23
Examining Videos

The Video tab lets you view detailed information about the video files in your cases.

You can generate thumbnails from video files and display them in the Video Thumbnail pane. This functionality lets you quickly examine a portion of the contents within video files without having to watch each media file individually.

See Generating Thumbnails for Video Files (page 316)

The Video tab also includes an embedded media player that lets you view the contents of video files. When you process the evidence in your case, you can choose to create a common video type for each of the various videos in your case. These common video types are not the actual video files from the evidence, but a copied conversion of the media that is generated by AccessData. These features let you view the contents of multiple video types, in a common resolution, and sampling rate, from within the Examiner’s embedded media player.

See Creating Common Video Files (page 317)

When you process evidence, video thumbnails are created by default. To disable the creation of video thumbnails, turn off the Create Thumbnails for Videos option in the Evidence Processing options.

See Evidence Processing Options on page 81.
Generating Thumbnails for Video Files

You can generate thumbnail graphics based on the content that exists within video files in your case. Video thumbnail generation is accomplished during processing. You can either set up video thumbnail generation when you create a new case, or you can run the processing against an existing case by using the Additional Analysis dialog.

To generate thumbnails for video files
1. Do one of the following:
   - In the Case Manager, click Case > New. Then, click Detailed Options.
   - In the Examiner, click Evidence > Additional Analysis > Hashing/Job Options.
2. Check Create Thumbnails for Videos.
3. Click Thumbnail Options.
4. In the Video Thumbnail Options dialog, set from the following:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>This option generates thumbnails against videos based on the percentage of a video's total content. For example, if you set this value to 5, then at every 5% of the video a thumbnail is generated.</td>
</tr>
<tr>
<td>Interval</td>
<td>This option generates thumbnails against videos based on seconds. For example, if you set this value to 5, then at every 5 seconds within a video, a thumbnail is generated.</td>
</tr>
</tbody>
</table>

5. Click OK.

Generating Video Thumbnails from the Natural Viewer

You can also capture video thumbnails directly from a video viewed in the Natural Viewer. This feature allows you to find and capture specific information from video you are reviewing. After capturing a video thumbnail, you can then bookmark that thumbnail for future review.

To capture a video thumbnail from the Natural Viewer
1. From Evidence Explorer, click the Video tab.
2. Highlight the video and click the Natural tab in the File Content pane.
3. Click the Play button ( ).
4. Click the Pause button when you are ready to capture a video thumbnail.

Note: You can navigate through the video using the Rewind and Fast Forward

5. Click Add in the bottom right corner of the Video Thumbnails pane.
   The application creates a video thumbnail of the paused frame and places that thumbnail in the Video Thumbnail pane.
Creating Common Video Files

When you process the evidence in your case or during Additional Analysis, you can choose to create a common video type for videos in your case. These common video types are not the actual video files from the evidence, but a copied conversion of the media that is generated and saved as an MP4 file that can be previewed on the video tab.

Common video files are not created by default.

See Evidence Processing Options on page 81.

To create common video files

1. Do one of the following:
   - In the Case Manager, Click Case > New. Then, click Detailed Options.
   - In the Examiner, click Evidence > Additional Analysis.
2. Check Create Common Video Files.
3. Process or analyze evidence.

Video Formatting Options

4. In the Video Formatting Options dialog, set the following:
   - **Lines of Resolution**: Sets the number of vertical lines in the video. The higher it is, the better the resolution.
   - **Bit Rate**: Sets the rate of bits in Kbps measurements. The higher it is, the better the resolution.
5. Click OK.
Using the Video Tree Pane

The Video tree pane lets you see the multimedia content in a tree view. The content that is displayed in the Video tab is dependent on a default Tab Filter called Video Tab Filter: Video Thumbnails.

The contents in the Video tree displays the multimedia contents in your case and information about the content that applies to the requirements of the Tab filter.

For example, in the graphic below, you can see that the case has 46 total multimedia files. 12 of those multimedia files meet the requirements of the Tab filter and therefore have had video thumbnails generated for them.

**Video Tab: Video Tree Pane**

You can use the Video tree pane to navigate and drill down to specific multimedia containers and files. If you select a file in the tree pane, The Video Thumbnails pane and the File List pane display the content that is contained in your selection.
Using the Video Thumbnails Pane

The Video Thumbnails pane displays any video thumbnails that you have generated based on your selection in either the Video tree view or in the File List Pane.

**Video Tab: Video Thumbnail Pane**

You can use the Video Thumbnail pane to rapidly scan through the visual contents in a video file, without having to launch and watch the entire video.

In the Video Thumbnails pane, if a thumbnail could not be generated the following icon is displayed:

In the Video Thumbnails pane, beneath the first thumbnail image for a set of videos is a check box. You can select this check box to check the video file in the Examiner.

Playing a Video from a Video Thumbnail

You can play a video in the File Content Viewer starting from a selection in the Video Thumbnail pane.

For example, if you visually scan the contents of the video thumbnails pane and discover something you need to investigate in the File Content viewer, rather than watching the entirety of the video, you can select the location you want to start the video by selecting that thumbnail.

**To Play a Video from the Location of a Video Thumbnail**

1. In the Video Thumbnails pane, click the thumbnail from which you want to start the video.

2. In the File Content Pane, in the Natural tab, click the Play icon. The video begins to play from the location that you selected in the Video Thumbnails pane.
The Thumbnail Size Setting

You can change the size of the thumbnails that are displayed in the Video tab of the Examiner.
See The Thumbnails Size Setting (page 306) for information on how to do this.

Moving the Thumbnails Pane

You can move, float, and dock the thumbnails pane in the Video tab of the Examiner.
See Moving the Thumbnails Pane (page 307) for information on how to do this.
Chapter 24
Examining Miscellaneous Evidence

This chapter contains information on the following ways to view evidence:

- Identifying Processing-Generated Data (page 322)
- Relating Generated Files to Original Files (page 322)
- Viewing Windows Prefetch Data (page 323)
- Viewing Data in Windows XML Event Log (EVTX) Files (page 323)
- Viewing IIS Log File Data (page 325)
- Viewing Registry Timeline Data (page 327)
- Viewing Log2Timeline CSV File Data (page 329)
- Identifying Document Languages (page 332)
- Examining Internet Artifact Data (page 334)
- Viewing Data in Volume Shadow Copies (page 341)
- Viewing Data in Volume Shadow Copies (page 341)
Identifying Processing-Generated Data

There are some files that get generated during processing. Examples of these files include data broken out from compound files, EXIF data from images, file metadata, and so on. There is a column called Actual File which can be used in the File List to designate if the file was in the original data (True) or if it was generated during processing (False).

See Managing Columns on page 460.

Also, when looking at the file name at the bottom of the File List, if the file was generated by FTK, there is an >> after the parent file name and before the generated file name.

For example, photo.jpg>>photo.exif.html, or mystuff.zip>>pass.doc

See File List Pane on page 283.

You can also use bookmarks to relate generated files with the actual source file in the evidence.

See Identifying Processing-Generated Data on page 322.

Relating Generated Files to Original Files

Some files in your evidence may not be original files but may have been generated during processing. Examples of these files include data broken out from compound files, EXIF data from images, file metadata, and so on.

You can use bookmarks to quickly relate generated files with the actual source file in the evidence. By selecting the Actual Source File option, the source file will be listed and bookmarked as well. All parent items are recursively related within the bookmark from the generated item to the actual source file and not just a parent folder.

See Creating a Bookmark on page 343.

For example, during processing, a DOC file may be generated from a ZIP file. If you bookmark the DOC file and select the Actual Source File option, the original ZIP file is included in the bookmark as well.

The related items are also shown in the bookmark section of reports.

You can also view information in the File List to identify processing-generated files.

See Identifying Processing-Generated Data on page 322.

To relate generated files to the original files in bookmarks

1. Right-click a file that was generated during processing.
2. Click either Create Bookmark or Add to Bookmark.
3. On the bookmark dialog, select Actual Source File.
Viewing Windows Prefetch Data

You can easily view data about Windows prefetch (PF) files. When you select a prefetch file in the File List, the following application data is displayed in HTML format in the Natural tab of the File Content pane:

- The file path of the application executable file
- The number of times the application has been run
- The last time the application was run

Viewing Data in Windows XML Event Log (EVTX) Files

About Viewing EVTX Log Files

You can view Microsoft Windows XML event log data. You can view event data in HTML format in the Natural tab of the File Content pane.

You can view event data in one of two ways:

<table>
<thead>
<tr>
<th>View event data that is contained in Microsoft Windows XML event log (EVTX) files</th>
<th>In the File List, you can see a list of all of the EVTX files. When you view an EVTX log file, in the File Content pane, you can view the information about all of the events that are contained in that one file. There can be a lot of data contained in one file.</th>
</tr>
</thead>
</table>
| Expand EVTX log files into separate objects for every event record | When you expand EVTX log files, each event is extracted as its own record. As a result, in the File List, each event is shown as its own item. Each item has a small amount of data in it but there can be many individual event records. For example, you may have 100 EVTX log files, and if you expand them, you can have over 100,000 individual event records. When you process evidence, you have the option of expanding EVTX log files. The options is turned off by default. See Evidence Processing Options on page 81. See Using Additional Analysis on page 133. If you expand EVTX files into separate event objects, you can also use the following columns in the File List:  
  - EVTX Event Channel  
  - EVTX Event Computer  
  - EVTX Event Data  
  - EVTX Event ID  
  - EVTX Event Level  
  - EVTX Event Source  
  - EVTX Event Source Name  
  - EVTX Event User ID |

If you expand data, you will have files are are generated when the data was processed and was not part of the original data. There are tools to help you identify generated data. See Identifying Processing-Generated Data on page 322.
To view EVTX log files

1. In the Examiner, click **Overview**.
2. In **Case Overview**, do one of the following:
   - **View by file extension**:
     - Click **File Extension**.
     - If present, click **evtx**.
   - **View by file category**:
     - Click **File Category**.
     - If present, click **Windows EVTX Event Log**.
3. If your case has any EVTX files, they are displayed in the **File List**.
4. Click an EVTX file to view the data in the **Natural** tab.
   Some log files may not contain any events and you will only see the heading **EVTX Events**.

To expand EVTX log files into individual event records

1. In the Examiner, click **Evidence > Additional Analysis**.
   See **Using Additional Analysis** on page 133.
2. Under **Miscellany**, select **Expand Compound Files**.
3. Click **Expansion Options**.
4. Select **EVTX**.
5. Click **OK** to save the expansion settings.
6. Click **OK** to process the evidence to expand EVTX files.

To view individual event records

1. In the Examiner, click **Overview**.
2. In **Case Overview**, Click **File Category**.
3. If present, click **Windows EVTX Event**.
4. If your case has any event records, they are displayed in the **File List**.
5. Click an event record to view the data in the **Natural** tab.

To add EVTX-related columns in the File List

- To add EVTX-related columns in the **File List**, add the EVTX-related columns to a new or existing column template.
  See **Managing Columns** on page 460.
  These columns will display data only for the expanded individual events, not for the EVTX log files.
Viewing IIS Log File Data

You can view data that is contained in IIS log files in HTML format in the *Natural* tab of the File Contents Pane.

You can also process IIS log files so that they are broken into individual records and interspersed with other items to support timeline analysis. To process IIS log files, there is a new *IIS LOG* check box in *Evidence Processing Options* > *Expansion Options*. This option is not enabled by default.

You can view IIS log data in one of two ways:

<table>
<thead>
<tr>
<th>View the log file data</th>
<th>In the <em>File List</em>, you can see a list of IIS log files. When you view a log file, in the <em>File Content</em> pane, you can view the information that are contained in that one file. There can be a lot of data contained in one file.</th>
</tr>
</thead>
</table>
| Expand log file data out as individual records | When you expand IIS log files, each record is extracted. As a result, in the *File List*, each record is shown as its own item. When you process evidence, you have the option of expanding IIS log files. The options is turned off by default. See *Evidence Processing Options* on page 81. See *Using Additional Analysis* on page 133. If you expand IIS log files into separate records, you can also use the following columns in the *File List*:  
  - c-ip  
  - cs(Cookie)  
  - cs(Referer)  
  - cs(User-Agent)  
  - cs-bytes  
  - cs-host  
  - cs-method  
  - cs-uri-query  
  - cs-uri-stem  
  - cs-username  
  - s-computename  
  - s-ip  
  - s-port  
  - s-sitename  
  - sc-bytes  
  - sc-status |

If you expand data, you will have files are are generated when the data was processed and was not part of the original data. There are tools to help you identify generated data.

See *Identifying Processing-Generated Data* on page 322. See *Relating Generated Files to Original Files* on page 322.
To expand IIS log files into individual records

1. In the Examiner, click **Evidence > Additional Analysis**.
   See **Using Additional Analysis** on page 133.
2. Under **Miscellany**, select **Expand Compound Files**.
3. Click **Expansion Options**.
4. Select **IIS Log**.
5. Click **OK** to save the expansion settings.
6. Click **OK** to process the evidence to expand the files.

To add IIS log-related columns in the File List

- To add IIS log-related columns in the File List, add the IIS log-related columns to a new or existing column template.
  See **Managing Columns** on page 460.
  These columns will display data only for the expanded individual records, not for the IIS log files.
Viewing Registry Timeline Data

You can view registry additional data in HTML format in the *Natural* tab of the *File Contents Pane* to support timeline analysis.

You can process Registry data files so that they are broken into individual records so they are interspersed with other items to support timeline analysis. To process Registry data, there is a new *Registry* check box in *Evidence Processing Options > Expansion Options*. This option is not enabled by default.

The following registry areas are supported:

- **SAM:**
  - SAM\Domains\Account\Users

- **NTUSER.DAT:**
  - Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist\{75048700-EF1F-11D0-9888-006097DEACF9}\Count
  - Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist\{5E6AB780-7743-11CF-A12B-00AA04AE837}\Count
  - Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist\{CEBFF5CD-ACE2-4F4F-9178-9926F41749EA}\Count
  - Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist\{F4E57C4B-2036-45F0-A9AB-443BCFE33D9F}\Count
  - Software\Microsoft\Windows\CurrentVersion\Explorer\ComDlg32\CIDSizeMRU
  - Software\Microsoft\Windows\CurrentVersion\Explorer\ComDlg32\FirstFolder
  - Software\Microsoft\Windows\CurrentVersion\Explorer\ComDlg32\LastVisitedPidlMRU
  - Software\Microsoft\Windows\CurrentVersion\Explorer\ComDlg32\LastVisitedPidlMRULegacy
  - Software\Microsoft\Windows\CurrentVersion\Explorer\ComDlg32\OpenSavePidlMRU

You can view Registry data in one of two ways:

<table>
<thead>
<tr>
<th>View the Registry data</th>
<th>In the <em>File List</em>, you can view Registry files.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand Registry data out as individual records</td>
<td>When you expand Registry data, each record is extracted. As a result, in the <em>File List</em>, each record is shown as its own item.</td>
</tr>
<tr>
<td></td>
<td>When you process evidence, you have the option of expanding Registry data. The options is turned off by default.</td>
</tr>
<tr>
<td></td>
<td>See <em>Evidence Processing Options</em> on page 81.</td>
</tr>
<tr>
<td></td>
<td>See <em>Using Additional Analysis</em> on page 133.</td>
</tr>
<tr>
<td></td>
<td>If you expand Registry data into separate records, you can also use the following columns in the <em>File List</em>:</td>
</tr>
<tr>
<td></td>
<td>● Registry Action Description</td>
</tr>
<tr>
<td></td>
<td>● Registry Action Name</td>
</tr>
<tr>
<td></td>
<td>● Registry Action Type</td>
</tr>
<tr>
<td></td>
<td>● Registry File</td>
</tr>
</tbody>
</table>

If you expand data, you will have files are are generated when the data was processed and was not part of the original data. There are tools to help you identify generated data.

See *Identifying Processing-Generated Data* on page 322.
To expand Registry data into individual records

1. In the Examiner, click **Evidence > Additional Analysis**.
   See Using Additional Analysis on page 133.
2. Under Miscellany, select **Expand Compound Files**.
3. Click **Expansion Options**.
4. Select **Registry**.
5. Click **OK** to save the expansion settings.
6. Click **OK** to process the evidence to expand the files.

To add Registry-related columns in the File List

- To add Registry-related columns in the File List, add the Registry-related columns to a new or existing column template.
  See Managing Columns on page 460.

These columns will display data only for the expanded individual records.
Viewing Log2Timeline CSV File Data

You can view data that is contained in CSV files that are in the Log2timeline format. You can view the data in the Natural view of the File Content pane.

The individual records from the CSV will be interspersed with other data, giving you the ability to perform more advanced timeline analysis across a very broad set of data. In addition you can leverage the visualization engine to perform more advanced timeline based visual analysis.

To process CSV files, there is a new Log2tCSV check box in Evidence Processing Options > Expansion Options. This option is not enabled by default.

You can view CSV data in one of two ways:

<table>
<thead>
<tr>
<th>View the original CSV files</th>
<th>In the File List, you can see a list CSV files. When you select a file, you can view the information that is contained in each file in the File Content pane.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand log file data out as individual records</td>
<td>When you expand CSV files, each record is extracted. As a result, in the File List, each record is shown as its own item. When you process evidence, you have the option of expanding CSV files. The options is turned off by default. See Evidence Processing Options on page 81. See Using Additional Analysis on page 133. If you expand CSV files into separate records, you can also use columns to view each CSV field. See the table Log2timeline CSV fields (page 331)</td>
</tr>
</tbody>
</table>

If you expand data, you will have files are are generated when the data was processed and was not part of the original data. There are tools to help you identify generated data.

See Identifying Processing-Generated Data on page 322.

See Relating Generated Files to Original Files on page 322.

**To view the un-expanded CSV files**

1. In the Examiner, click the Overview tab.
2. Expand File Category.
3. If CSV files exist in your evidence, you can expand Other Known Types > Log2t CSV logs. A list of Log2t CSV files is displayed in the File List.
4. Click a file to view the un-expanded data.

**To expand CSV files into individual records**

1. In the Examiner, click Evidence > Additional Analysis. See Using Additional Analysis on page 133.
2. Click Miscellaneous
3. Under Miscellany, select Expand Compound Files.
4. Select Expand Compound Files.
5. Click **Expansion Options**.
6. Select **Log2t CSV**.
7. Click **OK** to save the expansion settings.
8. Click **OK** to process the evidence to expand the files.

**To add CSV-related columns in the File List**

1. In the Examiner, click the Column Settings icon. See **Managing Columns** on page 460.
2. Either create a new column template or edit an existing one.
3. In the **Available Columns** list, expand **Log2T**.
4. Add the desired columns to the template.
5. Click **OK**.
6. Select the template name you just configured.
7. Click **Apply**. This applies the template to the File List.
8. Click **Close**.
9. In the Overview tab, expand **File Category > Other Known Types > Log2t CSV log entry**.
   A list of Log2t entries is displayed in the **File List**.
   You will see the data in the columns for each record.
   These columns will display data only for the expanded individual records, not for the original CSV files.
## Log2timeline CSV fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log2t Desc</td>
<td>A description field, this is where most of the information is stored. This field is the full description of the field, the interpreted results or the content of the actual log line.</td>
</tr>
<tr>
<td>Log2t Extra</td>
<td>Additional information parsed is joined together and put here. This 'extra' field may contain various information that further describe the event. Some input modules contain additional information about events, such as further divide the event into source IP's, etc. These fields may not fit directly into any other field in the CSV file and are thus combined into this 'extra' field.</td>
</tr>
<tr>
<td>Log2t Filename</td>
<td>The full path of the filename that contained the entry. In most input modules this is the name of the logfile or file being parsed, but in some cases it is a value extracted from it, in the instance of $MFT this field is populated as the name of the file in question, not the $MFT itself.</td>
</tr>
<tr>
<td>Log2t Format</td>
<td>The name of the input module that was used to parse the file. If this is a log2timeline input module that produced the output it should be of the format Log2t::input::NAME where name is the name of the module. However other tools that produce l2t_csv output may put their name here.</td>
</tr>
<tr>
<td>Log2t Host</td>
<td>The hostname associated with the entry, if one is available.</td>
</tr>
<tr>
<td>Log2t Inode</td>
<td>The inode number of the file being parsed, or in the case of $MFT parsing and possibly some other input modules the inode number of each file inside the $MFT file.</td>
</tr>
<tr>
<td>Log2t MACB</td>
<td>The MACB or legacy meaning of the fields, mostly for compatibility with the mactime format.</td>
</tr>
<tr>
<td>Log2t Notes</td>
<td>Some input modules insert additional information in the form of a note, which comes here. This might be some hints on analysis, indications that might be useful, etc. This field might also contain URL's that point to additional information, such as information about the meaning of events inside the EventLog, etc.</td>
</tr>
<tr>
<td>Log2t Short</td>
<td>The short description of the entry, usually contains less text than the full description field. This is created to assist with tools that try to visualize the event. In those output the short description is used as the default text, and further information or the full description can be seen by either hovering over the text or clicking on further details about the event.</td>
</tr>
<tr>
<td>Log2t Source</td>
<td>The short name for the source. This may be something like LOG, WEBHIST, REG, etc. This field name should correspond to the type field in the TLN output format and describes the nature of the log format on a high level (all log files are marked as LOG, all registry as REG, etc.)</td>
</tr>
<tr>
<td>Log2t SourceType</td>
<td>A more comprehensive description of the source. This field further describes the format, such as &quot;Syslog&quot; instead of simply &quot;LOG&quot;, &quot;NTUSER.DAT Registry&quot; instead of &quot;REG&quot;, etc.</td>
</tr>
<tr>
<td>Log2t User</td>
<td>The username associated with the entry, if one is available.</td>
</tr>
<tr>
<td>Log2t Version</td>
<td>The version number of the timestamp object.</td>
</tr>
</tbody>
</table>
Identifying Document Languages

When processing evidence, you can perform automatic language identification. This will analyze the first two pages of every document to identify the language that is contained within.

To identify languages, you enable the Language Identification processing option.

See Evidence Processing Options on page 81.
See Using Additional Analysis on page 133.

After processing is complete, you can add the Language column in the File List in the Examiner.

See Managing Columns on page 460.

You can filter by the Language field within review and determine who needs to review which documents based on the language contained within the document.

If there are multiple languages in a document, the first language will be identified.

This feature is enabled by selecting a new Language Identification processing option. When you enable Language Identification, you have the following options:

- Document Types to process - You can select to process the following file types:
  - Documents
  - Presentation
  - Spreadsheets
  - Email
- The languages to identify - You can select to identify the following:
  - Basic languages that include English, Chinese, Spanish, Japanese, Portuguese, Arabic, French, Russian, and Korean.
  - Extended languages. Performs language identification for 67 different languages. This is the slowest processing option.

Note: The Language Identification processing option is disabled by default. If you enable it, the basic language setting and all four document types are enabled by default.

Basic Languages

The system will perform language identification for the following languages:

- Arabic
- Chinese
- English
- French
- German
- Japanese
- Korean
- Portuguese
- Russian
• Spanish

If the language to identify is one of the ten basic languages (except for English), select Basic when choosing Language Identification. The Extended option also identifies the basic ten languages, but the processing time is significantly greater.

**Extended Languages**

The system will perform language identification for 67 different languages. This is the slowest processing option. The following languages can be identified:

<table>
<thead>
<tr>
<th>Afrikaans</th>
<th>Esperanto</th>
<th>Latin</th>
<th>Scottish Gaelic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albanian</td>
<td>Estonian</td>
<td>Latvian</td>
<td>Serbian</td>
</tr>
<tr>
<td>Amharic</td>
<td>Finnish</td>
<td>Lithuanian</td>
<td>Slovak</td>
</tr>
<tr>
<td>Arabic</td>
<td>French</td>
<td>Malay</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Armenian</td>
<td>Georgian</td>
<td>Manx</td>
<td>Spanish</td>
</tr>
<tr>
<td>Basque</td>
<td>German</td>
<td>Marathi</td>
<td>Spanish</td>
</tr>
<tr>
<td>Belarusian</td>
<td>Greek</td>
<td>Nepali</td>
<td>Swahili</td>
</tr>
<tr>
<td>Bosnian</td>
<td>Hawaiian</td>
<td>Norwegian</td>
<td>Swedish</td>
</tr>
<tr>
<td>Breton</td>
<td>Hebrew</td>
<td>Persian</td>
<td>Tagalog</td>
</tr>
<tr>
<td>Bulgarian</td>
<td>Hindi</td>
<td>Polish</td>
<td>Tamil</td>
</tr>
<tr>
<td>Catalan</td>
<td>Hungarian</td>
<td>Portuguese</td>
<td>Thai</td>
</tr>
<tr>
<td>Chinese</td>
<td>Icelandic</td>
<td>Quechua</td>
<td>Turkish</td>
</tr>
<tr>
<td>Croatian</td>
<td>Indonesian</td>
<td>Romanian</td>
<td>Ukrainian</td>
</tr>
<tr>
<td>Czech</td>
<td>Irish</td>
<td>Rumantsch</td>
<td>Vietnamese</td>
</tr>
<tr>
<td>Danish</td>
<td>Italian</td>
<td>Russian</td>
<td>Welsh</td>
</tr>
<tr>
<td>Dutch</td>
<td>Japanese</td>
<td>Sanskrit</td>
<td>Yiddish</td>
</tr>
<tr>
<td>English</td>
<td>Korean</td>
<td>Scots</td>
<td>West Frisian</td>
</tr>
</tbody>
</table>
Examining Internet Artifact Data

You can examine detailed information about the internet artifact data in your case.

At a basic level, when evidence is processed, internet artifact files are categorized and organized so that you can easily see them. You can use either of the following to quickly see internet artifact files:

- The Overview tab > File Category > Internet/Chat Files
- The Internet/Chat tab

Both tabs display the same data.

For example, using these views, you can quickly see the following files:

- **AOL:**
  - AOL ABY files
  - AOL Buddy List
  - AOL User History
- **Chrome Browser:**
  - Bookmark files
  - Cookies files
  - History files
- **Internet Explorer:**
  - MSIE Cookie Index files
  - MSIE History files
- **Microsoft Live Messenger Log files**
- **Mozilla**
  - Address Book files
  - Cookie Index files
  - History files
  - Mozilla Thunderbird email files
- **Yahoo IM conversation files**
- **mail.ru agent history files (Mra.dbs):**
  - User account information and encrypted account password
    From the registry at HKCU\Software\Mail.Ru\Agent\magent_logins3\*
  - Parsed contacts and messages from mra.dbs files
    Each message contains a plain-text and an RTF version, both UTF16LE.
  - Contact list from the inbox.ru.xml.

For many of these files, you can view information from the files in the Natural view. For example, you can see an AOL Buddy List or the contents of a Yahoo IM conversation.

Some internet artifact information is stored in SQLite tables. Most of these tables are viewable in the Natural view.
About Extensible Storage Engine (ESE) Databases

Extensible Storage Engine (ESE) databases are used by many Microsoft components as well as other programs to store and retrieve data. Some of these components include:

- MS Exchange Server (2007)
- MS Exchange Server (2010)
- Active Directory
- Windows Live Server
- Desktop Search (Vista and Windows 7)
- IE 10 Web Data (for example, history, cookies, cache, and so forth)
- SRS (Site Replication Service) Template
- Windows Help Center
- Windows Update
- Windows System Update
- Windows Server Security
- Windows Server WINS
- Windows Server DHCP
- NT File Replication Service

These ESE databases are expanded when processing evidence (if selected in the Expansion Options) and displayed in Evidence Groups. Most of the ESE databases appear in File Category > Databases. The exception is Exchange ESE databases, which appear in File Category > Email.

Internet Explorer version 10 or later also use ESE databases to store data like the internet history, cookies, cache, and so forth. (See About Expanding Data from Internet Explorer (IE) Version 10 or Later on page 337.)

To expand the ESE Databases into individual records

1. In the Examiner, click Evidence > Additional Analysis. See Using Additional Analysis on page 133.
2. Click Miscellaneous
3. Under Miscellany, select Expand Compound Files.
4. Select Expand Compound Files.
5. Click Expansion Options.
6. Verify that ESE DB is selected.
7. Click OK to save the expansion settings.
8. Click OK to process the evidence to expand the files.
About Expanding Google Chrome, Firefox, and IE 9 Data

There are advanced processing options that will expand the basic Google Chrome, Mozilla Firefox, and Internet Explorer data. You can do the following:

- Expand Google Chrome and Mozilla Firefox SQLite tables and IE 9 IE .DAT files to create individual records.
  This provides investigators the ability to bookmark specific records from within the tables. For example, if you are looking for a specific Top Site record, you can more easily find and bookmark the record you need.
- Reconstruct web pages.
  When viewing either Cache or History entries, if enough data is stored in the cache, you can see the reconstructed web page that was cached when the user was browsing the respective web site.

The following table lists the expanded data that you can view:

<table>
<thead>
<tr>
<th>Internet Artifact Expanded Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chrome</strong></td>
</tr>
<tr>
<td>● Cache Index Data</td>
</tr>
<tr>
<td>● Cookies</td>
</tr>
<tr>
<td>● Downloads</td>
</tr>
<tr>
<td>● History</td>
</tr>
<tr>
<td>● Top Sites</td>
</tr>
<tr>
<td>● Key Words</td>
</tr>
<tr>
<td>● Web Autofill Data</td>
</tr>
<tr>
<td><strong>Firefox</strong></td>
</tr>
<tr>
<td>● Bookmarks</td>
</tr>
<tr>
<td>● Cache Index Data</td>
</tr>
<tr>
<td>● Cookies</td>
</tr>
<tr>
<td>● Favorites</td>
</tr>
<tr>
<td>● Form History</td>
</tr>
<tr>
<td>● History</td>
</tr>
<tr>
<td><strong>Internet Explorer 9</strong></td>
</tr>
<tr>
<td>● IE Cache Entries</td>
</tr>
<tr>
<td>● IE Cookies Entries</td>
</tr>
<tr>
<td>● IE History Entries</td>
</tr>
<tr>
<td>● IE Download Entries</td>
</tr>
<tr>
<td>● MSIE Recovery.dat Entries</td>
</tr>
</tbody>
</table>
When viewing the expanded data, you can use the following columns in the File List to display detailed data.

### Internet History Columns

<table>
<thead>
<tr>
<th>Column</th>
<th>Column</th>
<th>Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action URL</td>
<td>Google Profile Address</td>
<td>Opened</td>
</tr>
<tr>
<td>Autofill Name</td>
<td>Google Profile City</td>
<td>Origin URL</td>
</tr>
<tr>
<td>Autofill Value</td>
<td>Google Profile Company Name</td>
<td>Password Element</td>
</tr>
<tr>
<td>Bytes Downloaded</td>
<td>Google Profile Country</td>
<td>Password Value</td>
</tr>
<tr>
<td>Cookie Name</td>
<td>Google Profile Country Code</td>
<td>Rank</td>
</tr>
<tr>
<td>Cookie Path</td>
<td>Google Profile Email Address</td>
<td>Redirects to</td>
</tr>
<tr>
<td>Cookie Value</td>
<td>Google Profile First Name</td>
<td>Start Time</td>
</tr>
<tr>
<td>Count</td>
<td>Google Profile Last Name</td>
<td>Terms</td>
</tr>
<tr>
<td>Duration</td>
<td>Google Profile Middle Name</td>
<td>This Visit Time</td>
</tr>
<tr>
<td>Encrypted Card Number</td>
<td>Google Profile Phone Number</td>
<td>Types Times</td>
</tr>
<tr>
<td>End Time</td>
<td>Google Profile State</td>
<td>URL</td>
</tr>
<tr>
<td>Expiration Month</td>
<td>Host Key</td>
<td>URL has HTML</td>
</tr>
<tr>
<td>Expiration Time</td>
<td>Last Updated Time</td>
<td>Username Element</td>
</tr>
<tr>
<td>Expiration Year</td>
<td>Last Visit Time</td>
<td>Username Value</td>
</tr>
<tr>
<td>File Path</td>
<td>Name on Card</td>
<td>Visit Times</td>
</tr>
<tr>
<td></td>
<td>Offline User Email</td>
<td>Zip Code</td>
</tr>
</tbody>
</table>

See [Managing Columns](#) on page 460.

See [Icons of the File List Tool Bar](#) on page 285.

If you expand internet artifact data, you will have files are generated when the data was processed and was not part of the original data. There are tools to help you identify generated data.

See [Identifying Processing-Generated Data](#) on page 322.

See [Relating Generated Files to Original Files](#) on page 322.

### About Expanding Data from Internet Explorer (IE) Version 10 or Later

Data from Internet Explorer (IE) 10 is stored in a database called WebCacheV01.dat. This file is an ESE (Extensible Storage Engine) database that points to IE 10’s cached files. When expanded in Examiner, you can view the following data:

**Internet Artifact Expanded Data**

<table>
<thead>
<tr>
<th>Internet Explorer 10</th>
<th>IE Web Cache Compatibility Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IE Web Cache Content Entries</td>
</tr>
<tr>
<td></td>
<td>IE Web Cache Cookie Entries</td>
</tr>
<tr>
<td></td>
<td>IE Web Cache DOM Store Entries</td>
</tr>
<tr>
<td></td>
<td>IE Web Cache Download Entries</td>
</tr>
<tr>
<td></td>
<td>IE Web Cache RSS Feed Entries</td>
</tr>
<tr>
<td></td>
<td>IE Web Cache History Entries</td>
</tr>
<tr>
<td></td>
<td>Other Web Cache Entries</td>
</tr>
</tbody>
</table>

This data displays in the Overview tab under Internet/Chat Files or in the Internet/Chat tab.
IE 10 (and later) WebCache Data on a Live System

You cannot expand or display Internet Explorer 10 (or later) WebCache data from a live system. WebCache data is locked by the Windows operating system and does not display correctly in the Examiner.

About Internet Artifact Processing Options

To expand internet artifact data, you enable processing options either when you add the evidence or later by using Additional Analysis.

Note: The IE WebCache contains many files and can take additional time to expand. Therefore, IE WebCache is not selected by default.

Important: Expanding internet artifact data can add a significant amount of data to your evidence.

See Evidence Processing Options on page 81.
See Using Additional Analysis on page 133.

Internet Artifact Processing Options

<table>
<thead>
<tr>
<th>Browser Options</th>
<th>Chrome</th>
<th>Firefox</th>
<th>Internet Explorer 9 or earlier</th>
<th>Internet Explorer 10 or later</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand Compound Files &gt;</td>
<td>Expand Compound Files &gt; Chrome Bookmarks</td>
<td>unselected by default</td>
<td>Expand Compound Files &gt; Internet Explorer</td>
<td>Expand Compound Files &gt; IE WebCache</td>
</tr>
<tr>
<td>Chrome Bookmarks</td>
<td>Expand Compound Files &gt; Chrome Cache</td>
<td>unselected by default</td>
<td>Expand Compound Files &gt; Firefox Cache</td>
<td>unselected by default</td>
</tr>
<tr>
<td></td>
<td>Expand Compound Files &gt; Chrome SQLite</td>
<td>unselected by default</td>
<td>Expand Compound Files &gt; Firefox SQLite</td>
<td>unselected by default</td>
</tr>
<tr>
<td></td>
<td>Expand Compound Files &gt; Internet Explorer</td>
<td>selected by default</td>
<td>Expand Compound Files &gt; IE Recovery</td>
<td>unselected by default</td>
</tr>
<tr>
<td></td>
<td>This lets you expand IE Recovery data that was stored when access to a Web site was lost.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

About Viewing Internet Artifact Data

After you have expanded the artifact data, you can view the data in the Examiner. You can view expanded data in one of the following ways:

- Clicking an individual file and viewing the contents in the Natural view.
  For most items, you will see the data displayed in a table.
- Viewing Reconstructed web pages
  For history and cache entries, if enough data exists, the reconstructed web page appears. If enough data is not available, informational data appears instead.
  You can use the URL has HTML column to help you determine which files can be reconstructed.
• Adding columns to the File List that displays expanded data.
  You can add columns for all of the expanded items that is generated. A sample is listed in the Internet History Columns table above.
  You can view a list of all of the Internet History columns by looking at the Internet History column group in the column manager.
  See Managing Columns on page 460.

In the Internet/Chat files folder, the files are organized as follows:

• Chrome:
  ▪ Original Chrome artifact files are stored under the Chrome Browser Files folder
  ▪ The expanded data is stored under the Chrome Browser Data folder.
• Firefox:
  ▪ Original Firefox artifact files are stored under the Firefox Files folder
  ▪ The expanded data is stored under the Firefox Browser Data folder.
• IE:
  ▪ Original IE artifact files are stored under the Internet Explorer Browser Files folder
  ▪ The expanded data is stored under the Internet Explorer Browser Data folder.

**Expanding Internet Artifact Data**

**To expand internet artifact data**

1. When either adding evidence to a case or performing Additional Analysis, access the processing options.
   See Evidence Processing Options on page 81.
   See Using Additional Analysis on page 133.
2. Select the option to Expand Compound Files.
3. Click Expansion Options.
4. Select one or more of the following options:
   • Chrome:
     ▪ Chrome Bookmarks
     ▪ Chrome SQLite
   • Firefox:
     ▪ Firefox Bookmarks
     ▪ Firefox SQLite
   • IE:
     ▪ Internet Explorer Files
     ▪ IE Recovery
     See About Internet Artifact Processing Options on page 338.
5. Process your data.
Viewing Internet Artifact Data

To view expanded internet data in the Natural view

1. In the examiner, open one of the following: (Both tabs display the same data.)
   - The Overview tab > File Category > Internet/Chat Files

   **Note:** Chrome and Firefox SQLite files are also located in Internet/Chat Files.

   - The Internet/Chat tab
2. For Chrome files, expand Chrome Browser > Chrome Browser Data.
3. For Firefox files, expand Mozilla Files > Firefox Browser > Firefox Browser Data.
4. For IE files, expand Internet Explorer Browser > Internet Explorer Browser Data.
5. Select a folder, such as Cookies.
6. Click an item in the File List.
   The cookie’s data is displayed in the Natural view.
7. Click History.
8. Click an item in the File List.
   If possible, the reconstructed web page will be shown. If insufficient data exists, informational data will be shown instead.
9. You can perform a search for a specific value in the Natural view by clicking CTRL-F.

To view expanded internet data using columns

1. In the examiner, open one of the following: (Both tabs display the same data.)
   - The Overview tab > File Category > Internet/Chat Files
   - The Internet/Chat tab
2. Click the Column Settings icon.
   See Managing Columns on page 460.
3. Either create a new column template or edit an existing one.
4. In the Available Columns list, expand Data.
5. Add the desired columns to the template.
   For example, to add columns for Chrome or Firefox browser history data, use the following:
   - URL
   - Visit Times
   - Typed Times
   - Last Visit Time
   - This Visit Time
   - Duration
6. Click OK.
7. Select the template name you just configured and click Apply.
   This applies the template to the File List.
8. Click Close.
9. Expand Browser > Browser Data for either Chrome or Firefox.
10. Click History.
    In this example, you will see the history data in the columns for each record.
Viewing Data in Volume Shadow Copies

You can examine data that is contained in NTFS Volume Shadow Copies.

See Examining Data in Volume Shadow Copies on page 129.
Chapter 25

Bookmarking Evidence

This chapter includes the following topics

- About Bookmarks (page 342)
- About Timeline Bookmarks (page 342)
- Using the Bookmarks Tab (page 349)
- Creating a Bookmark (page 343)
- Viewing Bookmark Information (page 349)
- Bookmarking Selected Text (page 350)
- Adding to an Existing Bookmark (page 351)
- Creating Email or Email Attachment Bookmarks (page 352)
- Adding Email and Email Attachments to Existing Bookmarks (page 352)
- Moving a Bookmark (page 353)
- Copying a Bookmark (page 353)
- Deleting a Bookmark (page 353)
- Deleting Files from a Bookmark (page 353)

About Bookmarks

A bookmark is a group of files that you want to reference in your case. These are user-created and the list is stored for later reference, and for use in the report output. You can create as many bookmarks as needed in a case. Bookmarks can be nested within other bookmarks for convenience and categorization purposes.

Bookmarks help organize the case evidence by grouping related or similar files. For example, you can create a bookmark of graphics that contain similar or related graphic images. The Bookmarks tab lists all bookmarks that have been created in the current case.

Bookmarks only apply to the case they are created in.

About Timeline Bookmarks

When creating bookmarks, you can also create a Timeline type of bookmark. A Timeline bookmark lets you show the chronological relationships of the files in your case. When you create a Timeline bookmark, you can record the Create Date, Accessed Date, and Modified Date for files as individual items. You can then export that data to a CSV report file. Each action (create, accessed, modified) for each file is a separate item in the report.
When sorted by the date and time, the CSV report file presents a chronological timeline of the actions of the evidence files in your case.

For example, you can create a bookmark of files that were downloaded from the internet. The report shows when the files were downloaded (created) and the time interval between then and when they were last accessed. You can also see if and when the files were modified.

You can also add manual timeline data. Manual timeline data lets you add items to your timeline that may not be represented by the files in your case. For example, you may have phone logs that show when relevant phone calls were placed. You can add those phone calls as manual timeline items so that they appear in your report along with the file information in the case.

You can use the exported CSV file produce you own chronological timeline of the evidence in the case. This can present a clearer view of how certain events happened which can help investigators communicate to the jurors and judge on their case.

The CSV report file includes the following data as columns:

- The date/time stamp of the file action
- The type of file action (Modified, Accessed, Created, or Other)
- The Other category is used for manual timeline entries.
- The bookmark name
- The filename
- Any comments that you manually entered for each item

A bookmark can either be a timeline bookmark or a regular bookmark, but not both.

### Creating a Bookmark

**To create a bookmark**

1. In the File List view, select the files that you want to add to the bookmark.
   
   You can either highlight the files that you want to include, check the boxes of the files that you want to include, or do nothing to include all files.

2. Right-click on a selected file in the File List view and click Create Bookmark.

3. Enter the information about the bookmark.
   
   See Bookmarks Dialog Options on page 345.

4. Click OK.

---

**Note:** Applying filters to a group of listed files for bookmarking can speed the process. The All Highlighted setting does not work in this instance. Enabling this feature would significantly slow the response of the program. Instead, use either the Checked Files filter, or the All Files Listed filter.
About Empty Bookmarks

You can create bookmarks that contain only the name and location of the bookmark. These are called Empty Bookmarks. Empty Bookmarks allow you to add "placeholders" while investigating a case. This feature makes it easy to mark your place and come back to it later. For example, while investigating a fraud case, you notice an email that may or may not be pertinent to your investigation. Creating an Empty Bookmark allows you to quickly "save your place" and come back later when you have more time to delve into that evidence.

You can also use Empty Bookmarks to format your Bookmarks tree. This allows you to better organize your bookmarks. For example, you may be investigating documents, video, graphics, and emails. You could create an Empty Bookmark called Documents, under which you would place all of your document-related bookmarks. Then, you would create an Empty Bookmark called Video, under which you would place all of your video-related bookmarks. Continue creating Empty Bookmarks until you have a manageable Bookmark tree.

There are two ways to create Empty Bookmarks, creating the Empty Bookmark from the Bookmarks tab or in the Create New Bookmark dialog.

To create an Empty Bookmark from the Bookmarks tab

1. In Evidence Explorer, click the Bookmarks tab.
2. Right-click the bookmark under which to create the Empty Bookmark.
3. Click Create Empty Bookmark.
4. Enter a name for the Empty Bookmark and click OK.
   You add and save additional bookmark information to an Empty Bookmark at anytime by using the Bookmark Information pane.

To create an Empty Bookmark in the Create New Bookmark dialog

1. Create a bookmark. See Creating a Bookmark on page 343.
2. In Files to Include, select None.
3. Save the bookmark.
# Bookmarks Dialog Options

## Options of the Bookmark Information Pane

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bookmark Name</td>
<td>The name of the bookmark.</td>
</tr>
<tr>
<td>Bookmark Comment</td>
<td>Comments about the bookmark or its contents. Bookmark Comments are created in an HTML editor. HTML allows you to format your comments within the bookmark and for any subsequent reports. See Bookmark Comments HTML Editor on page 347.</td>
</tr>
<tr>
<td>Files to Include</td>
<td>Specify which files in the File List to include in this bookmark. You can select one of the following:</td>
</tr>
<tr>
<td></td>
<td>• All Highlighted - Includes only the highlighted items.</td>
</tr>
<tr>
<td></td>
<td>• All Checked - Includes only the checked items.</td>
</tr>
<tr>
<td></td>
<td>• All Listed - Includes all items in the File List.</td>
</tr>
<tr>
<td></td>
<td>• None - Creates an Empty Bookmark.</td>
</tr>
<tr>
<td>Timeline Bookmark</td>
<td>Select this option to make this a Timeline bookmark. If you select the Timeline tab, this options is selected automatically.</td>
</tr>
<tr>
<td></td>
<td>A bookmark can either be a Timeline Bookmark or a regular bookmark, but not both.</td>
</tr>
<tr>
<td>Select Existing Bookmark</td>
<td>Select the parent bookmark under which you would like to save the bookmark.</td>
</tr>
<tr>
<td></td>
<td>A default shared tree for bookmarks available to all investigators is created, and a bookmark tree specific to the case owner is created.</td>
</tr>
<tr>
<td></td>
<td>If the bookmark is related to an older bookmark it can be added under the older bookmark, with the older bookmark being the parent, or it can be saved as a peer.</td>
</tr>
<tr>
<td>Comments tab</td>
<td>This lets you configure elements of a standard bookmark.</td>
</tr>
<tr>
<td>File Comments</td>
<td>You can assign a comment to each file in the bookmark. Comments are created in an HTML editor. HTML allows you to format your comments within the bookmark and for any subsequent reports. See Bookmark Comments HTML Editor on page 347.</td>
</tr>
<tr>
<td>Supplementary Files</td>
<td>You can add external, supplementary files associated with the bookmark. Options are:</td>
</tr>
<tr>
<td></td>
<td>• Attach: Allows the investigator to add external supplementary files to the bookmark. The attached files appear in the Supplementary Files pane and are copied to the case folder.</td>
</tr>
<tr>
<td></td>
<td>• Remove: Removes a selected supplementary file from the bookmark.</td>
</tr>
</tbody>
</table>
### Also include

If applicable, you can include the following:

- Parent index.dat
  
  The option to include Parent index.dat is only available if you have selected to bookmark an index entry, for example a cookie. This option includes the entry’s parent index.DAT file in the bookmark.

- Email Attachments - If one of the items selected is an email with attachments, this will include all of the attachments that the email has.

- Parent Email - If one of the items selected is an email attachment object, selecting this option will include the parent email.

- Exclude Selected OCR Extractions
  
  The Exclude Selected OCR Extractions check box appears only when OCR-extracted files have been selected when creating a new or adding to an existing bookmark. If, instead, you have selected graphic files, and have not selected their OCR counterparts, the check box for OCR Extractions of selected Graphics will be active and available.

- Actual Source File
  
  This option lets you include the parent child of a processing-generated file.

  See Relating Generated Files to Original Files on page 322.

<table>
<thead>
<tr>
<th><strong>Field</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bookmark Selection in File</td>
<td>Check this item to have the highlighted text in a file automatically highlighted when the bookmark is re-opened. The highlighted text also prints in the report.</td>
</tr>
<tr>
<td></td>
<td>The selected text that will be included displays in the text box below the check box.</td>
</tr>
<tr>
<td><strong>Timeline tab</strong></td>
<td>This lets you configure elements of a Timeline bookmark.</td>
</tr>
<tr>
<td>Create Date</td>
<td>Select this option to record the date and time that the file was created.</td>
</tr>
<tr>
<td>Accessed Date</td>
<td>Select this option to record the date and time that the file was last accessed.</td>
</tr>
<tr>
<td>Modified Date</td>
<td>Select this option to record the date and time that the file was last modified.</td>
</tr>
<tr>
<td>Object Timeline Comments</td>
<td>You can assign a comment to each file timestamp in the bookmark. Comments are created in an HTML editor. HTML allows you to format your comments within the bookmark and for any subsequent reports. See Bookmark Comments HTML Editor on page 347.</td>
</tr>
<tr>
<td></td>
<td>The timeline comments are shown in the timeline report anchored to each date, and each date being used will create a new row in the text report.</td>
</tr>
<tr>
<td>Manual Timeline Data</td>
<td>In this section, you can add manual timeline entries that are not available as items in the File List. For example, you may have access to phone records and you can add call histories as individual manual entries. You enter the date and time of the items and then in the CSV, they are displayed chronologically with the other items in your bookmark. Note: Manual items are listed as Other in the report.</td>
</tr>
</tbody>
</table>

Table:<br><br>

<table>
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<th><strong>Field</strong></th>
<th><strong>Description</strong></th>
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<td>You can assign a comment to each file timestamp in the bookmark. Comments are created in an HTML editor. HTML allows you to format your comments within the bookmark and for any subsequent reports. See Bookmark Comments HTML Editor on page 347.</td>
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</tr>
</tbody>
</table>

See Relating Generated Files to Original Files on page 322.
The HTML Editor for Bookmark Comments allows you to format your comments within the bookmark and for any subsequent reports.

**Important:** You are required to use the HTML Editor when entering Bookmark Comments, with or without formatting.

**To enter Bookmark Comments**
1. In *Evidence Explorer*, click the **Bookmarks** tab.
2. Highlight (click) a bookmark from the **Bookmarks** pane.
3. Click the **Edit** button next to the Comment field. The HTML Editor appears.
4. Enter and/or format your comments using formatting options. You can also format your comments directly in HTML by clicking **Source**. For a brief description of each HTML formatting option, click **Help** in the HTML Editor.
5. Click **Done** in the HTML Editor when finished.
Note: ALWAYS click Done in the HTML Editor to exit the editor and keep your comments. You still need to save the Bookmark (Save Changes) to keep the comment in the Bookmark.
Viewing Bookmark Information

The Bookmark Information pane displays information about the selected bookmark and the selected bookmark file. The data in this pane is editable by anyone with sufficient rights.

Select a bookmark in the Bookmarks tree view of the Bookmarks tab, or in the Bookmarks node in the tree of the Overview tab to view information about a bookmark. The Overview tab view provides limited information about the bookmarks in the case. The Bookmark tab provides all information about all bookmarks in the case. In the Bookmark tab, the Bookmark Information pane displays the Bookmark Name, Creator Name, Bookmark Comment, and Supplementary files. When selected, a list of files contained in the bookmark displays in the File List. If you select a file from the File List, the comment and selection information pertaining to that file displays in the Bookmark Information pane.

Bookmarked files display in a different color in the File List pane than non-bookmarked files for easy identification.

Change any of the information displayed from this pane. Changes are automatically saved when you change the bookmark selection.

In the File List, bookmarked items display in a different color for easy identification. You may need to refresh the view to force a rewrite of the screen for the different color to display. Forcing a rewrite would impact the overall performance of the program.

Creating a Timeline Bookmark Report

After you have created Timeline Bookmarks, you can create Timeline Bookmark Reports. The reports are in CSV format. You can specify one or more Timeline Bookmarks for each report. You specify one or more Timeline Bookmarks for each report. You specify the location and name of the saved CSV report.

See About Timeline Bookmarks on page 342.

To create a timeline Bookmark Report

1. In the Examiner, click File > Timeline > Report.
2. Select one or more Timeline Bookmarks to use for the report.
3. (Optional) Select one of the following
   - Select All Children - This selects all of the children of the selected bookmarks in the bookmark tree.
   - Clear All Children - This clears all of the children of the selected bookmarks in the bookmark tree.
4. Click Select to select an output folder.
   4a. Select the folder to save the report in.
   4b. Specify the name of the report or use the default Timeline Report name.
5. Click Generate to save the report.

Using the Bookmarks Tab

You can use the Bookmark tab to view, create, and edit bookmarks.
Bookmarking Selected Text

Bookmarked selections are independent of the view in which they were made. Select hex data in the Hex view of a bookmarked file and save it; bookmark different text in the Filtered view of the same file and save that selection as well.

To add selected text in a bookmark

1. Open the file containing the text you want to select.
2. From the Natural, Text, Filtered or Hex views, make your selection.

   Note: If the file is a graphic file, you will not see, nor be able to make selections in the Text or the Natural views.

3. Click Create Bookmark in the File List toolbar to open the Create New Bookmark dialog.
4. When creating your bookmark, check Bookmark Selection in File.
5. To save selected content, choose the view that shows what you want to save, then highlight the content to save.
6. Right-click the selected content. Click Save As.
7. In the Save As dialog, provide a name for the selection and click Save.
   The selection remains in the bookmark.

Bookmarking Video Thumbnails

You can bookmark Video Thumbnails by creating a new bookmark or adding to an existing bookmark. By default, Video Thumbnails that are added to Bookmarks play from the location thumbnail to end of the video. You can update, change the start/end times, or remove the thumbnail from within the bookmark. You can also export your video thumbnails to your report.

See Using the Video Thumbnails Pane on page 319.
See About Bookmarks on page 342.
See Adding Bookmarks to a Report on page 468.

Adding a Video Thumbnail to a New or Existing Bookmark

To add a Video Thumbnail to a new or existing Bookmark

1. From the Evidence Explorer, click the Video tab.
2. Right-click the video thumbnail for the Bookmark.
3. Click either:
   - Create Bookmark. See Creating a Bookmark on page 343.
   - Add to Bookmark. See Adding to an Existing Bookmark on page 351.
4. Follow the instructions for creating and/or adding to a Bookmark.
About Updating/Removing Bookmarked Video Thumbnails

Once there are Video Thumbnails in a Bookmark, you can update (change) the Video Thumbnail or remove it.

**Note:** You cannot add a selection of a video from the Bookmark’s Natural Viewer using the **Add Selection** button. To add a video thumbnail to a bookmark, see Adding a Video Thumbnail to a New or Existing Bookmark (page 350).

To update a Video Thumbnail in a Bookmark

1. From the **Evidence Explorer**, click the **Bookmarks** tab.
2. In the **Bookmarks** pane, navigate to and highlight the Bookmark containing the Video Thumbnail(s).
3. In the **File List** pane, highlight the video from which the thumbnails were created.
4. In the **Bookmark Information > Selections** pane, click (highlight) the thumbnail (selection).
5. In the **File Content > Natural Viewer**, click Play ( ) and then Pause.
6. Click **Update Section**.
7. Enter a Start and/or End Time.
8. Click **OK**.

To remove a Video Thumbnail from a Bookmark

1. From the **Evidence Explorer**, click the **Bookmarks** tab.
2. In the **Bookmarks** pane, navigate to and highlight the Bookmark containing the Video Thumbnail(s).
3. In the **File List** pane, click (highlight) the video from which the thumbnails were created.
4. In the **Bookmark Information > Selections** pane, click (highlight) the thumbnail (selection).
5. Click **Remove Selection**.
6. Confirm the change.

Adding to an Existing Bookmark

Sometimes additional information or files are desired in a bookmark.

**To add to an existing bookmark**

1. Select the files to be added to the existing bookmark.
2. Right-click the new files.
3. Click **Add to Bookmark**.
4. When available (depending on the type of files you are adding), make selections for **Files to Add**, **Also Include**, **OCR Extractions of Selected Graphics**, and **Bookmark Selection in File**.
5. Open the parent bookmark tree.
6. Select the child bookmark to add the file or information to.
7. Click **OK**.
Creating Email or Email Attachment Bookmarks

When bookmarking an email, you can also add and bookmark any attachments. You can also include a parent email when you bookmark an email attachment.

To create a bookmark for an email, follow the steps for creating a bookmark. Select the email to include in the bookmark. Right-click and choose Create Bookmark. Note that by default, the Email Attachments box is active, but unmarked. If only the parent email is needed, the Email Attachments box should remain unselected.

Complete the bookmark creation normally by naming the bookmark, selecting the bookmark parent, then clicking OK.

If you need to bookmark only an attachment of the email, select and right-click on the attachment. Choose Create Bookmark. For more information on creating bookmarks, see, Creating a Bookmark (page 343).

Notice that the Parent Email box is automatically active, allowing you to include the parent email if it is not part of the selection you have already made. If the Parent Email box is checked, and there is more than one attachment, the Email Attachments box becomes active as well, allowing you to also include all attachments to the parent email. To add only the originally selected attachment to the bookmark, do not check the Parent Email box.

Adding Email and Email Attachments to Existing Bookmarks

To add an email to a bookmark, select the email to add, then right-click on the email and choose Add To Bookmark. Note that if emails are selected, but their attachments are not selected, the Email Attachments box is active, but not marked. If only the parent email is needed, the Email Attachments box can remain unselected. If you have selected only the attachment, include the attachment’s parent email by marking the Parent Email box.

One way to be sure to find the exact items you want is to highlight an interesting item in the File List view in one tab, then right-click on it and select View This Item in a Different List. Click on Email and you are taken to the Email tab with the selected email highlighted in the File List view, and displayed in the Natural tab in the File Content pane. In the Email Attachments pane on the right that file is displayed, along with its role; whether it is a parent email, part of the email thread, or an attachment.

If only an attachment of an email is needed to be added to the bookmark, select the attachment and follow the instructions for adding to a bookmark.
Moving a Bookmark

To move a bookmark
1. From either the Bookmark tab or the Overview tab, select the bookmark you want to move.
2. Drag the bookmark to the desired location and then release the mouse button.

Copying a Bookmark

To copy a bookmark
1. From either the Bookmark tab or the Overview tab, select the bookmark you want to copy.
2. Using the right mouse button, drag the bookmark to the desired location and release the mouse button.

Deleting a Bookmark

To delete a bookmark
1. In the Bookmark tab, expand the bookmark list and highlight the bookmark to be removed.
2. Do one of the following:
   - Press the Delete key.
   - Right-click on the bookmark to delete, and click Delete Bookmark.

Deleting Files from a Bookmark

To delete files from a bookmark
1. From either the Overview tab or the Bookmarks tab, open the bookmark containing the file you want to delete.
2. Right-click the file in the Bookmark File List pane.
3. Do one of the following:
   - Select Remove from Bookmark.
   - Press the Delete key on your keyboard. You will be prompted, “Are you sure you want to delete files from this bookmark?” Click Yes.
   - Deleting a file from a bookmark does not delete the file from the case.
Chapter 26
Searching Evidence with Live Search

Searching evidence for information pertaining to a case can be one of the most crucial steps in the examination. An index search gives rapid results, and a live search includes options such as text searching and hexadecimal searching. You can view search results from the File List and File Contents views of the Search tab.

The Live Search is a process involving a bit-by-bit comparison of the entire evidence set with the search term. This chapter includes the following topics

- Conducting a Live Search (page 354)
- Live Text Search (page 355)
- Live Hex Search (page 357)
- Live Pattern Search (page 358)
- Using Pattern Searches (page 358)
- Predefined Regular Expressions (page 361)
- Creating Custom Regular Expressions (page 363)

Conducting a Live Search

The live search takes slightly more time than an index search because it involves a bit-by-bit comparison of the search term to the evidence. A live search is flexible because it can find patterns of non-alphanumeric characters, including those that are not generally indexed. It is powerful because you can define those patterns to meet your needs in an investigation.
Live Text Search

A Text search finds all strings that match an exact entry, such as a specific phone number (801-377-5410). When conducting a Live Text Search, there are no arrows to click for operand selection.

A Live Text Search gives you options such as ANSI, Unicode with UTF-16 Little Endian, UTF-16 Big Endian, and UTF-8. The latter two are always case-sensitive. You can also choose from a list of other Code Pages to apply to the current search. In addition, you can select Case Sensitivity for any Live Text Search.

Note: When entering Chinese characters into search, you must have both ANSI and Unicode options selected.

The difference between a Pattern search and a Text search is that a text search searches for the exact typed text, there are no operands so the results return exactly as typed. For example, a simple Pattern search allows you to find all strings that match a certain pattern, such as for any 10-digit phone number (nnn-nnn-nnnn), or a nine-digit social security number (nnn-nnn-nnnn).

More complex Pattern searches ("regex") require specific syntax. See Live Pattern Search (page 358).

Search terms can be entered then exported as XML files, then imported at any time, or with any case. Text files can be imported and used in Live Search, however the Live Search Export feature supports only XML format.

Note: When importing TXT files that the search of those terms depend on the specific tab your in. (ie If I have a few hex terms and import the TXT list into Live Search in the Patterns tab), the search is run as a pattern search and not hex.

To Conduct a Live Text search

1. In the Live Search tab, click the Text tab.
   In the Text or Pattern tabs, you can check the character sets to include in the search.
2. If you want to include sets other than ANSI and Unicode, check Other Code Pages and click Select.
3. Select the needed sets.
4. Click to include EBCDIC, Mac, and Multibyte as needed.
5. Click OK to close the dialog.
6. Check Case Sensitive if you want to search specifically uppercase or lowercase letters as entered. Case is ignored if this box is not checked.
7. Enter the term in the Search Term field.
8. Click Add to add the term to the Search Terms window.
9. Click Clear to remove all terms from the Search Terms window.
10. Repeat Steps 7, 8, and 9 as needed until you have your search list complete.
    When you have added the search terms for this search, it is a good idea to export the search terms to a file that can be imported later, saving the time of re-entering every item, and the risk of errors. This is particularly helpful for customized pattern searches.
11. In the Max Hits Per File field, enter the maximum number of search hits you want listed per file. The default is 200. The range is 1 to 65,535. If you want to apply a filter, do so from the Filter drop-down list in the bar below the Search Terms list. Applying a filter speeds up searching by eliminating items that do not match the filter. The tab filter menu has no effect on filtering for searches.
12. Click Search.
13. Select the results to view from the Live Search Results pane. Click the plus icon (+) next to a search line to expand the branch. Individual search results are listed in the Live Search Results pane, and the
corresponding files are listed in the File List. To view a specific item, select the hit in the search results. Selected hits are highlighted in the Hex View tab.

14. When a search is running you can click View > Progress Window to see how the job is progressing.

**Note:** In the progress window, you can Pause, Resume, and Cancel jobs, in addition to closing the window. (Pause and Resume are the same button, but the label changes depending on processing activity.)

**Note:** Mark the Remove when finished check box to take completed jobs off the list for housekeeping purposes.

15. When processing is complete, return to the Live Search tab to review the results.

   Right-click on a search result in the Live Search Results pane to display more options. The available right-click options are as follows:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create Bookmark</td>
<td>Opens the Create New Bookmark dialog.</td>
</tr>
<tr>
<td>Copy to Clipboard</td>
<td>Opens a new context-sensitive menu. Options are:</td>
</tr>
<tr>
<td></td>
<td>• All Hits In Case</td>
</tr>
<tr>
<td></td>
<td>• All Hits In Search</td>
</tr>
<tr>
<td></td>
<td>• All Hits In Term</td>
</tr>
<tr>
<td></td>
<td>• All Hits In File</td>
</tr>
<tr>
<td>Export to File</td>
<td>Opens a new context-sensitive menu. Options are:</td>
</tr>
<tr>
<td></td>
<td>• All Hits In Case</td>
</tr>
<tr>
<td></td>
<td>• All Hits In Search</td>
</tr>
<tr>
<td></td>
<td>• All Hits In Term</td>
</tr>
<tr>
<td></td>
<td>• All Hits In File</td>
</tr>
<tr>
<td>Set Context Data Width</td>
<td>Opens the Data Export Options window. Allows you to set a context width from 32 to 2000 characters within which it can find and display the search hit.</td>
</tr>
<tr>
<td>Export Search Term</td>
<td>Select to export a search term list that can be imported into this or other cases.</td>
</tr>
<tr>
<td>Delete All Search Results</td>
<td>Deletes all search results from the Live Search Results pane.</td>
</tr>
<tr>
<td>Delete this Line</td>
<td>Deletes only the highlighted search results line from the Live Search Results pane.</td>
</tr>
</tbody>
</table>

Searching before the case has finished processing will return incomplete results. Wait to search until the case has finished processing and the entire body of data is available.

**Note:** Search terms for pre-processing options support only ASCII characters.
Live Hex Search

Hexadecimal (Hex) format includes pairs of characters in a base 16 numeric scheme, 0-9 and a-f. Hex searching allows you to search for repeating instances of data in Hex-format, and to save Hex-format data search strings to an XML file and re-use it in this or other cases.

Click the Hex (Hexadecimal) tab to enter a term by typing it directly into the search field, by clicking the Hexadecimal character buttons provided, or by copying hex content from the hex viewer of another file and pasting it into the search box. Click Add to add the hex string to the search terms list.

The instructions for conducting a live search on the hex tab are similar to conducting searches on the Pattern tab. Remember, when searching for hexadecimal values, a single alphabetic or numeric text character is represented by hex characters in pairs.

To do a Hex search
1. In the Live Search tab, click the Hex tab.
2. Add Hex search strings using the keyboard or using the Alpha-numeric bar above the Search Terms box.
3. Click Add to add the term to the Search Terms window.
4. Click Clear to remove all terms from the Search Terms window.
5. Repeat Steps 2, 3, and 4 as needed until you have your search list complete.
6. When you have added the search terms for this search, it is a good idea to export the search terms to a file that can be imported later, saving the time of re-entering every item, and reduces the risk of errors. This is particularly helpful for customized pattern searches.
7. In the Max Hits Per File field, enter the maximum number of search hits you want listed per file. The default is 200. The range is 1 to 65,535. If you want to apply a filter, do so from the Filter drop-down list in the bar below the Search Terms list. Applying a filter speeds up searching by eliminating items that do not match the filter. The tab filter menu has no effect on filtering for searches.
8. Click Search.
9. Select the results to view from the Live Search Results pane. Click the plus icon (+) next to a search line to expand the branch. Individual search results are listed in the Live Search Results pane, and the corresponding files are listed in the File List. To view a specific item, select the file in the search results. All search results are highlighted in the Hex View tab.
Live Pattern Search

The more complex Live Pattern "Regex" style search can be used to create pattern searches, allowing forensics analysts to search through large quantities of text information for repeating strings of data such as:

- Telephone Numbers
- Social Security Numbers
- Computer IP Addresses
- Credit Card Numbers

In the Live Search tab, click the Pattern tab. Each has different options.

The patterns consist of precise character strings formatted as mathematical-style statements that describe a data pattern such as a credit card or social security number. Pattern searches allow the discovery of data items that conform to the pattern described by the expression, rather than what a known and explicitly entered string looks for.

These pattern searches are similar to arithmetic expressions that have operands, operators, sub-expressions, and a value. For example, the following table identifies the mathematical components in the arithmetic expression, $\frac{5}{((1+2)^3)}$.

**Regex Pattern Search Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operands</td>
<td>5, 1, 2, 3</td>
</tr>
<tr>
<td>Operators</td>
<td>/, (, +, *</td>
</tr>
<tr>
<td>Sub-Expressions</td>
<td>(1+2), ((1+2)^3)</td>
</tr>
<tr>
<td>Value</td>
<td>Approximately 0.556</td>
</tr>
</tbody>
</table>

Like the arithmetic expression in this example, pattern searches have operands, operators, sub-expressions, and a value.

**Note:** Unlike arithmetic expressions, which can only have numeric operands, operands in pattern searches can be any characters that can be typed on a keyboard, such as alphabetic, numeric, and symbol characters.

**Using Pattern Searches**

A pattern search can consists of operands. The search engine searches left to right.

Operators let regular expressions search patterns of data rather than for specific values. For example, the operators in the following expression enable the search engine to find all Visa and MasterCard credit card numbers in case evidence files:

```plaintext
\<((\d\d\d\d)\[– \]){3}\d\d\d\d\>
```
Without the use of operators, the search engine could look for only one credit card number at a time.

### Visa and MasterCard Regular Expressions

<table>
<thead>
<tr>
<th><strong>Operands</strong></th>
<th>\–, spacebar space</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operators</strong></td>
<td>, &lt;, ( ), [ ], {3}, &gt;</td>
</tr>
<tr>
<td><strong>Sub-expressions</strong></td>
<td>(\d\d\d\d), ((\d\d\d\d)[\– \ ])</td>
</tr>
</tbody>
</table>
| **Value** | Any sequence of sixteen decimal digits that is delimited by three hyphens and bound on both sides by non-word characters \(xxxx–xxxx–xxxx–xxxx)\.

As the pattern search engine evaluates an expression in left-to-right order, the first operand it encounters is the backslash less-than combination (\<). This combination is also known as the begin-a-word operator. This operator tells the search engine that the first character in any search hit immediately follows a non-word character such as white space or other word delimiter.

### Note:
A precise definition of non-word characters and constituent-word characters in regular expressions is difficult to find. Consequently, experimentation may be the best way to determine if the forward slash less-than (\<) and forward slash greater-than (\>) operators help find the data patterns relevant to a specific searching task. The hyphen and the period are examples of valid delimiters or non-word characters.

The begin-a-word operator illustrates one of two uses of the backslash or escape character (\), used for the modification of operands and operators. On its own, the left angle bracket (<) would be evaluated as an operand, requiring the search engine to look next for a left angle bracket character. However, when the escape character immediately precedes the (<), the two characters are interpreted together as the begin-a-word operator by the search engine. When an escape character precedes a hyphen (-) character, which is normally considered to be an operator, the two characters (\-) require the search engine to look next for a hyphen character and not apply the hyphen operator (the meaning of the hyphen operator is discussed below).

The parentheses operator ( ) groups together a sub-expression, that is, a sequence of characters that must be treated as a group and not as individual operands.

The \d operator, which is another instance of an operand being modified by the escape character, is interpreted by the search engine to mean that the next character in search hits found may be any decimal digit character from 0-9.

The square brackets ([ ]) indicate that the next character in the sequence must be one of the characters listed between the brackets or escaped characters. In the case of the credit card expression, the backslash-hyphen-spacebar space (\[spacebar space\]) means that the four decimal digits must be followed by either a hyphen or a spacebar space.

The \{3\} means that the preceding sub-expression must repeat three times, back to back. The number in the curly brackets (\{ \}) can be any positive number.

Finally, the backslash greater-than combination (\>), also known as the end-a-word operator, means that the preceding expression must be followed by a non-word character.

Sometimes there are ways to search for the same data using different expressions. It should be noted that there is no one-to-one correspondence between the expression and the pattern it is supposed to find. Thus the preceding credit card pattern search is not the only way to search for Visa or MasterCard credit card numbers.
Because some pattern search operators have related meanings, there is more than one way to compose a pattern search to find a specific pattern of text. For instance, the following pattern search has the same meaning as the preceding credit card expression:

```regex
\<\((\d\d\d\d)(\–| )\)\{3\}\d\d\d\d\d\>
```

The difference here is the use of the pipe (|) or union operator. The union operator means that the next character to match is either the left operand (the hyphen) or the right operand (the spacebar space). The similar meaning of the pipe (|) and square bracket ([ ]) operators give both expressions equivalent functions.

In addition to the previous two examples, the credit card pattern search could be composed as follows:

```regex
\<\d\d\d\d\d\d\(\–\)\d\d\d\d\d\(\–\)\d\d\d\d\d\>
```

This expression explicitly states each element of the data pattern, whereas the {3} operator in the first two examples provides a type of mathematical shorthand for more succinct regular expressions.
Predefined Regular Expressions

Many predefined regular expressions are provided for pattern searching.

Examples of Predefined Regular Expressions

<table>
<thead>
<tr>
<th>Social Security Numbers</th>
<th>U.S. Phone Numbers</th>
<th>Visa and MasterCard Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Phone Numbers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.K. Phone Numbers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Hardware MAC Addresses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Social Security Number

The pattern search for Social Security numbers follows a relatively simple model:

\<\d\d\d\[\– \]\d\d\[\– \]\d\d\d\d\>

This expression reads as follows: find a sequence of text that begins with three decimal digits, followed by a hyphen or spacebar space. This sequence is followed by two more decimal digits and a hyphen or spacebar space, followed by four more decimal digits. This entire sequence must be bounded on both ends by non-word characters.

U.S. Phone Number

The pattern search for U.S. phone numbers is more complex:

\( (\(\<1\[\–\. \)\)?\(\(|\<\)\d\d\d\[\)\.\–/ \) ?)?\<\d\d\d\[\.\– \]\d\d\d\d\>\)

The first part of the above expression,

\( (\(\<1\[\–\. \)\)?\(\(|\<\)\d\d\d\[\)\.\–/ \) ?)?\)

means that an area code may or may not precede the seven digit phone number. This meaning is achieved through the use of the question mark (?) operator. This operator requires that the sub-expression immediately to its left appear exactly zero or one times in any search hits. This U.S. Phone Number expression finds telephone numbers with or without area codes.

This expression also indicates that if an area code is present, a number one (1) may or may not precede the area code. This meaning is achieved through the sub-expression \( (\<1\[\–\. \)\)?\), which says that if there is a “1” before the area code, it will follow a non-word character and be separated from the area code by a delimiter (period, hyphen, or spacebar space).

The next sub-expression, \( (\(|\<\)\d\d\d\[\)\.\–/ \) ?)\), specifies how the area code must appear in any search hits. The \( (\(|\<\)\)\) requires that the area code begin with a left parenthesis or other delimiter. The left parenthesis is, of necessity, escaped. The initial delimiter is followed by three decimal digits, then another delimiter, a right parenthesis, a period, a hyphen, a forward slash, or a spacebar space. Lastly, the question mark (?) means that there may or may not be one spacebar space after the final delimiter.

The latter portion of this expression, \( \<\d\d\d\[\.\– \]\d\d\d\d\>\), requests a seven-digit phone number with a delimiter (period, hyphen, or spacebar space) between the third and fourth decimal digit characters. Note that typically, the period is an operator. It means that the next character in the pattern can be any valid character. To specify an actual period (.), the character must be escaped (\_.). The backslash period combination is included in the expression to catch phone numbers delimited by a period character.
**IP Address**

An IP address is a 32-bit value that uniquely identifies a computer on a TCP/IP network, including the Internet. Currently, all IP addresses are represented by a numeric sequence of four fields separated by the period character. Each field can contain any number from 0 to 255. The following pattern search locates IP addresses:

```
\<[1-2]?[0-9]?[0-9]\.[1-2]?[0-9]?[0-9]\.[1-2]?[0-9]?[0-9]\.
```

The IP Address expression requires the search engine to find a sequence of data with four fields separated by periods (.). The data sequence must also be bound on both sides by non-word characters.

Note that the square brackets ([ ]) still behave as a set operator, meaning that the next character in the sequence can be any one of the values specified in the square brackets ([ ]). Also note that the hyphen (-) is not escaped; it is an operator that expresses ranges of characters.

Each field in an IP address can contain up to three characters. Reading the expression left to right, the first character, if present, must be a 1 or a 2. The second character, if present, can be any value 0–9. The square brackets ([ ]) indicate the possible range of characters and the question mark (?) indicates that the value is optional; that is, it may or may not be present. The third character is required; therefore, there is no question mark. However, the value can still be any number 0–9.

You can build your own regular expressions by experimenting with the default expressions. You can modify the default expressions to fine-tune your data searches or to create your own expressions.

Visit the AccessData website, www.accessdata.com, to find a technical document on Regular Expressions.
Creating Custom Regular Expressions

Create your own customized regular expressions using the following list of common operators

**Common Regular Expression Operators**

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.</td>
<td>A period matches any character.</td>
</tr>
<tr>
<td>+</td>
<td>Matches the preceding sub-expression one or more times. For example, “ba+” will find all instances of “ba,” “baa,” “baaa,” and so forth; but it will not find “b.”</td>
</tr>
<tr>
<td>$</td>
<td>Matches the end of a line.</td>
</tr>
<tr>
<td>*</td>
<td>Matches the preceding sub-expression zero or more times. For example, “ba*” will find all instances of “b,” “ba,” “baa,” “baaa,” and so forth.</td>
</tr>
<tr>
<td>?</td>
<td>Matches the preceding sub-expression zero or one times.</td>
</tr>
<tr>
<td>[ ]</td>
<td>Matches any single value within the square brackets. For example, “ab[xyz]” will find “abx,” “aby,” and “abz.”</td>
</tr>
<tr>
<td>-</td>
<td>A hyphen (-) specifies ranges of characters within the brackets. For example, “ab[0-3]” will find “ab0,” “ab1,” “ab2,” and “ab3.” You can also specify case specific ranges such as [a-r], or [B-M].</td>
</tr>
<tr>
<td>&quot;</td>
<td>(Back quote) Starts the search at the beginning of a file.</td>
</tr>
<tr>
<td>’</td>
<td>(Single quote or apostrophe) Starts the search at the end of a file.</td>
</tr>
<tr>
<td>&lt;</td>
<td>Matches the beginning of a word. In other words, the next character in any search hit must immediately follow a non-word character.</td>
</tr>
<tr>
<td>\&gt;</td>
<td>Matches the end of a word. In other words, the last character in any search hit must be immediately followed by a non-word character.</td>
</tr>
<tr>
<td></td>
<td>Matches the sub-expression on either the left or the right. For example, A</td>
</tr>
<tr>
<td>\b</td>
<td>Positions the cursor between characters and spaces.</td>
</tr>
<tr>
<td>\B</td>
<td>Matches anything not at a word boundary. For example, will find Bob in the name Bobby.</td>
</tr>
<tr>
<td>\d</td>
<td>Matches any single decimal digit.</td>
</tr>
<tr>
<td>\l</td>
<td>Matches any lowercase letter.</td>
</tr>
<tr>
<td>\n</td>
<td>Matches a new line.</td>
</tr>
<tr>
<td>\r</td>
<td>Matches a return.</td>
</tr>
<tr>
<td>\s</td>
<td>Matches any whitespace character such as a space or a tab.</td>
</tr>
<tr>
<td>\t</td>
<td>Matches a tab.</td>
</tr>
<tr>
<td>\u</td>
<td>Matches any uppercase letter.</td>
</tr>
<tr>
<td>\w</td>
<td>Matches any whole character [a-z A-Z 0-9].</td>
</tr>
<tr>
<td>^</td>
<td>Matches the start of a line.</td>
</tr>
</tbody>
</table>
Common Regular Expression Operators (Continued)

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:alpha:]</td>
<td>Matches any alpha character (short for the [a-z A-Z] operator).</td>
</tr>
<tr>
<td>[:alnum:]</td>
<td>Matches any alpha numerical character (short for the [a-z A-Z 0-9] operator).</td>
</tr>
<tr>
<td>[:blank:]</td>
<td>Matches any whitespace, except for line separators.</td>
</tr>
<tr>
<td>((n,m))</td>
<td>Matches the preceding sub-expression at least (n) (number) times, but no more than (m) (maximum) times.</td>
</tr>
</tbody>
</table>
Chapter 27
Searching Evidence with Index Search

Searching evidence for information pertaining to a case can be one of the most crucial steps in the examination. Index Search gives instantaneous results, and Live Search supports modes like text and hexadecimal. Search results are viewed from the File List and File Contents views in the Search tab.

This chapter details the use of the Index Search feature. It includes the following topics:

- Conducting an Index Search (page 366)
- Using Search Terms (page 367)
- Defining Search Criteria (page 369)
- Exporting and Importing Index Search Terms (page 369)
- Selecting Index Search Options (page 370)
- Viewing Index Search Results (page 371)
- Using dtSearch Regular Expressions (page 372)
- Documenting Search Results (page 378)
- Using Copy Special to Document Search Results (page 379)
- Bookmarking Search Results (page 380)
Conducting an Index Search

The Index Search uses the index to find the search term. Evidence items may be indexed when they are first added to the case or at a later time. Whenever possible, AccessData recommends indexing a case before beginning analysis.

Index searches are instantaneous. In addition, in the Index Search Results List, the offset of the data in the hit is no longer listed in the hit. You will see it when you look at the hit file in Hex view.

Running an Index search on large files or Index Searches resulting in a large number of hits may make the scroll bar appear not to work. However, it will return when the search is complete. For more information about indexing an evidence item, see Indexing a Case (page 87).

The Search Criteria pane shows a cumulative total of all listed or all selected terms, based on the And or the Or operator. The cumulative total displays at the bottom of the Search Terms list. This functionality has been added to match the way the Search Terms list functioned in previous versions.

Select none, one, several, or all search terms from the list, click either And or Or, then click either All or Selected to see cumulative results. You can see this feature at work in the figure below.

Important: If you start an index search and then refresh the interface before the search finishes, the search will cancel and restart. This will cause a sizeable delay when searching in large or very large cases.

The Index contains all discrete words or number strings found in both the allocated and unallocated space in the case evidence.

You can configure how special characters, spaces and symbols are indexed. This is not done by default, however. One benefit is that you can easily search on an exact email address using username@isp (the extension, such as COM or NET, is not included automatically because a period (.) is not indexed.

In addition to performing searches within the case, you can also use the index to export a word list to use as a source file for custom dictionaries to improve the likelihood of and speed of password recovery related to case files when using the Password Recovery Toolkit (PRTK). You can export the index by selecting File > Export Word List.

Note: Performing a search using Unicode only works with Live Search, not Index Search.

UTF encoded documents can be searched using dtSearch.

Note: dtSearch has been updated which changes some of the search functionality and results. The search is now filtering Windows and Linux executables (EXE, BIN, OCF, and ELF). This may reduce the number of search results and reduce certain items from being shown in the filtered text. For example, the text in a header of an application may include “This program cannot be run in DOS mode”. Because it is now filtered it will not longer show in Filtered text.
Using Search Terms

Type the word or term in the Search Term field. The term and terms like it appear in the Indexed Words column displaying the number of times that particular term was found in the data. Click Add or press Enter to place the term in the Search Terms list, or double-click the term in the indexed words column to add it to the Search Terms list.

Using Unicode Characters in Search Terms

You can search for Unicode characters when performing a search. For example, you can search for the ö character.

To add Unicode characters

1. Turn on your keyboard’s Num Lock.
2. In the Terms field, enter the Unicode.
   For example, do the following:
   2a. Press and hold down the ALT key.
   2b. Using the numeric keypad only, type 148.
   2c. Release the ALT key and the character is entered.

Note: For Windows 7 and earlier you can use a 3-digit unicode number. For Windows 8 and higher you must use a 4-digit number. See http://support.microsoft.com/kb/315684/en-us.

Expanding Search Terms

When performing an Index Search, you can use the Term Browser to build a search using terms that are related to one or more keywords. You then select which words you want to include in the search.

To expand terms, a third-party lexical database called WordNet ® is used. When you expand terms, you can use the following lists: Synonyms, Related, Specific, General.

For example, you may start with a keyword of “delete.” By using the Term Browser, it will suggest synonyms, such as “erase” and “cancel”. It will also suggest related terms, such as “cut,” “deletion,” and “excision”. It will also suggest general related terms, such as “censor,” “remove,” “take,” and “withdraw.” It will also suggest specific related terms, such as “strike,” “excise,” “scratch,” and “expunge”. You can select which of those words to include in your search.

The first time that you use this feature, the WordNet dictionary must be initialized. This is a one-time event and can take 5-15 minutes for it to complete. You are prompted before the initialization begins.

To search for terms using related words

1. In the Examiner, click Index Search.
2. Enter one or more keywords to the search terms.
3. Select one or more search terms that you want to expand.
4. Click **Expand Terms**.
   A list of synonyms is generated.
   To add other related words, select the **Include Related, Include Specific**, and **Include General** check boxes.

5. You can add terms to the term list, separated by a comma, and click **Expand**.

6. Select the words that you want to include in the search.

7. To build a search including the words that you selected, click **Add to Search**.
Defining Search Criteria

Refine a search even more by using the Boolean operators AND and OR. You can specify the terms to use in an index search by selecting specific entries, or by searching against all entries.

You can also use the NOT operator to force the search criteria to exclude terms. To do this, in the Index Search tab, in the Terms field, type NOT before the term that you want to exclude from the search criteria and then click Add.

For example, if you do not want to include files with the term “apple” in your search, enter NOT apple into the search criteria.

The Search Terms list now shows you a cumulative total for the search terms, individually, combined, or total. You can use the operators All and Selected to see more specific results. This is helpful when refining lists and terms to limit the results to a manageable number.

You can import a list of search terms to save having to type them multiple times. This is especially helpful when the list is long, or the terms are complex. When you create a search terms document, each term begins on a new line, and is followed immediately by a hard return. Save the file in TXT format in any text editor and save it for future use.

Important: When creating your search criteria, try to focus your search to bring up the smallest number of meaningful hits per search.

Exporting and Importing Index Search Terms

You can export a list of search terms you have added to the list of search terms to save for later use.

To export a set of search terms

1. Highlight the search terms to export to a file.
2. Click Export.
3. Provide a filename and location for the file (the TXT extension is added automatically).
4. Click Save.

To import a saved search terms file

1. Click Import to import a set of search terms.
2. Select the search terms file you previously saved.
3. Click Open.

Note: An imported term cannot be edited, except to delete a term and re-add it to your satisfaction.
Selecting Index Search Options

To refine an index search, from the Index Search tab, in the Search Criteria area click **Options**.

**Important:** The Search Options, *Stemming*, *Phonic*, and *Synonym* cannot be combined. You may choose only one at a time.

### Index Search Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stemming</td>
<td>Words that contain the same root, such as <em>raise</em> and <em>raising</em>.</td>
</tr>
<tr>
<td>Phonic</td>
<td>Words that sound the same, such as <em>raise</em> and <em>raze</em>.</td>
</tr>
<tr>
<td>Synonym</td>
<td>Words that have similar meanings, such as <em>raise</em> and <em>lift</em>.</td>
</tr>
</tbody>
</table>

### Index Result Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Files to List</td>
<td>Maximum number of files with hits that are to be listed in the results field. Searches limited in this way will be indicated by an asterisk (*) and the text &quot;(files may be limited by &quot;Max files to list&quot; option)&quot; which may be cut off if the file name exceeds the allowed line length. The maximum number of possible files with hits per search is 65,535. If you exceed this limit, the remaining hits will be truncated, and your search results will be unreliable. Narrow your search to limit the number of files with hits.</td>
</tr>
<tr>
<td>Max Hits per File</td>
<td>Maximum number of hits per file. You can change the maximum number in this field. Searches limited in this way will be indicated by an asterisk (*) and the text &quot;(files may be limited by &quot;Max hits per file&quot; option)&quot; which may be cut off if the file name and this text together exceed the allowed line length. The maximum number of possible hits per file is 10,000.</td>
</tr>
<tr>
<td>Max Words to Return</td>
<td>The maximum number of words to be returned by the search.</td>
</tr>
</tbody>
</table>

### Files to Search

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Files</td>
<td>Searches all the files in the case.</td>
</tr>
</tbody>
</table>
| File Name Pattern | Limits the search to files that match the filename pattern.  
Operand characters can be used to fill-in for unknown characters. The asterisk (*) and question-mark (?) operands are the only special characters allowed in an index search. The pattern can include "?" to match any single character or "***" to match an unknown number of continuous characters. 
For example, if you set the filename pattern to "d?ugl***", the search could return results from files named douglas, douglass, or druglord. 
To enter a filename pattern:  
- Check the **File Name Pattern** box.  
- In the field, enter the filename pattern. |

**Note:** Search by date range is now limited to be between Jan 1, 1970 and Dec 31, 3000.
Files to Search (Continued)

<table>
<thead>
<tr>
<th>Files Saved Between</th>
<th>Beginning and ending dates for the time frame of the last time a file was saved.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Check the <strong>Files Saved Between</strong> box.</td>
</tr>
<tr>
<td></td>
<td>• In the date fields, type the beginning and ending dates that you want to search</td>
</tr>
<tr>
<td></td>
<td>between.</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>Search by date range is limited to be between Jan 1, 1970 and Dec 31, 3000.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Files Created Between</th>
<th>Beginning and ending dates for the time frame of the creation of a file on the suspect's system.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Check the <strong>Files Created Between</strong> box.</td>
</tr>
<tr>
<td></td>
<td>• In the date fields, enter the beginning and ending dates that you want to search between.</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>Search by date range is now limited to be between Jan 1, 1970 and Dec 31, 3000.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>File Size Between</th>
<th>Minimum and maximum file sizes, specified in bytes.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Check the <strong>File Size Between</strong> box.</td>
</tr>
<tr>
<td></td>
<td>• In the size fields, enter the minimum and maximum file size in bytes that you want to search</td>
</tr>
<tr>
<td></td>
<td>between.</td>
</tr>
</tbody>
</table>

| Save as Default       | Check this box to make your settings apply to all index searches.                                 |

Click **Search Now** when search criteria are prepared and you are ready to perform the search.

**Viewing Index Search Results**

Index Search results are returned instantaneously. The Index Search Results pane displays the results of your query in a tree-type view. The tree expands to show whether the resulting items were found in allocated or unallocated space. Further, when found in allocated space, the results are separated by file category. They are then sorted by relevancy, a percentage of the hits found per search term.
Using dtSearch Regular Expressions

You can use regular expression searching capabilities in the dtSearch index search tab. This functionality does not use RegEx++ that is used in the Live Search tab. dtSearch utilizes the TR1 (Technical Report 1) regular expressions.

Regular expressions in dtSearch provide a powerful syntax for searching for complicated patterns in text, such as one of several possible sequences of letters followed by a sequence of numbers. Regular expressions can also be used to express spelling variations of individual words. Regular expression patterns are arbitrary (i.e., supplied by the user dynamically) and cannot be pre-indexed.

Regular expression searching in dtSearch is limited to a single whole word. A regular expression included in the dtSearch box must be quoted and must begin with ##. An example of this is:

Apple and "##199[0-9]" - will find Apple and 1990 through 1999
Apple and "##19[0-9]+" - will find Apple and 190 through 199

However, if you want to look for Apple Pie, you cannot use "##app.*ie" since this is two words. Only letters and numbers are searchable. You cannot search for any of the non-indexed characters as defined in the Index Search Settings in the Detailed Options section of a case creation. Also, dtSearch does not store information about line breaks so any searches that are made that include the beginning of a line or the end of a line will not work.

Search considerations using the wildcard character "*" in a regular expression does have an effect on search speed: the closer to the front of a word the expression is, the more it will slow searching. "Appl.*" will be nearly as fast as "Apple", while ".*pple" will be much slower.

Note: Advanced searching for Social Security Numbers and Credit Card Numbers and other number patterns can be achieved, however modifications to the dtSearch engine must be made before processing the case. For more details, see Advanced Searching on page 7 of this paper.

For more information, see:


TR1 Regular Expressions For Text Patterns

Element Terms

Characters and target sequences are referred to as an Element and can be one of the following:

- A literal character typed as the actual letter or number ( a or 1).
- A ‘.’ (period) is any single character.
- An ‘*’ (asterisk) is a wildcard character.
- (a) is a capture group.
- ‘d’ is a decimal character.
- For hex searches, \xhh matches a hex entry (ie - \x0f).
• `{2}` is a repetition character.
• A `,' (comma) is a minimum character.
• `(aa?)` is a target sequence.
• An alternation character search is 'this|that'.
• A concatenation sequence is `(a)(2,3)(b)(2,3)(c)'.
• A back reference is `((a+)(b+))(c+)`.
• `(?:subexpression)` matches the sequence of characters in the target sequence that is matched by the pattern between the delimiters.
• `(?!:subexpression)` matches any sequence of characters in the target sequence that does not match the pattern listed in the subexpression.
• A bracket or range expression of the form "[expr]", which matches a value or a range, similar to a "set" in the Live Pattern Search.

Examples:
• "##a" matches the target sequence "a" but does not match the target sequences "b", or "c", and so on.
• "##." matches a single character such as "a", "b", and "c", and so on.
• "##ab" matches the target sequence "ab."
• "##[b-z]" or range, matches the target sequences "b" and "c" but does not match the target sequences "a".
• "##tom|jerry" matches the target sequence of 'tom' or 'jerry'.
• "##d(4)" or repetition, matches the target sequence of four digits "1234".
• "##(?:aa)" or target sequence, matches the target sequence of "aa" and the target sequence of "aaa", and so on.

**Ordinary Character**

By entering actual ASCII characters, the search will return that set of characters after the element(s) are entered. By entering ordinary characters, "##nick", you would find said characters. However, if you wanted to look for Nick Davis, you could not use "##nick davis" since this is two words.

**Single "Any" Character and Wildcard**

The use of the any character element can be used if a letter or letters may be different, such as difference in spelling (example 'marijuana' and 'marihuana'). The wildcard is used to find any combination of characters after an element is entered.

Examples:
• "##(a*)" matches the target sequence "a", the target sequence "aa", and so on.
• "##a*" matches the target sequence "a", the target sequence "aa", and so on.
• "##(a.)" matches the target sequence "aa", the target sequence "ab", but will not find the target sequence the target sequence "aaa".
• "##a." matches the target sequence "aa", the target sequence "ab", but will not find the target sequence the target sequence "aaa".
• "##.ick" matches the target sequence "nick", the target sequence "click", and so on.
• "##mari.uana" matches the target sequence "marijuana" and the target sequence "marihuana".

Capture Group

A capture group marks its contents as a single unit in the regular expression and labels the target text that matches its contents. The label that is associated with each capture group is a number, which is determined by counting the opening parentheses that mark capture groups up to and including the opening parenthesis.

Examples:
• "##(ab)*" matches the target sequence "ab", the target sequence 'abab", and so on.
• "##(a+)(b+)*" matches the target sequence "ab", the target sequence "aab", the target sequence "abb", and so on.
• "##ab+" matches the target sequence "abb" but does not match the target sequence "abab."
• "##(ab)+" matches the target sequence "abab" but does not match the target sequence "abb."
• "##((a+)(b+))(c+)" matches the target sequence "aabbbc" and associates capture group 1 with the subsequence "aabbb", capture group 2 with the subsequence "aa", capture group 3 with "bbb", and capture group 4 with the subsequence "c".

Repetition

Any element can be followed by a repetition count.

Examples:
• "##(a{2})" matches the target sequence "aa" but not the target sequence "a" or the target sequence "aaa".
• "##(a{2,})" matches the target sequence "aa", the target sequence "aaa", and so on, but does not match the target sequence "a".

A repetition count can also take the following form:
• "?" - Equivalent to "{0,1}".

Examples:
• "#a?" matches the target sequence "" and the target sequence "a", but not the target sequence "aa".
• "##(aa?)(bbbb?)(c)" matches the target sequence "aabbbc" and the target sequence "abbbc".

Decimal Character

You can locate any set of decimals by using the "\d" character element in the expression.

Examples:
• "##d\d\d\d\d\d\d\d" matches the target sequence "1234".
• "##d\d[3]" matches the target sequence "123".
• "##\d{3}\d\d\d\d" matches the target sequence '1234567'.
• Visa and "##\d(4)" will match any files that contain the word 'visa' and any four digits.

Alternation

A concatenated regular expression can be followed by the character '|' and another concatenated regular expression. Any number of concatenated regular expressions can be combined in this manner. The resulting expression matches any target sequence that matches one or more of the concatenated regular expressions.

Example:
• "##(nick|houston)" matches the target sequence "nick", or the target sequence "houston".

Concatenation

Regular expression elements, with or without repetition counts, can be concatenated to form longer regular expressions. The resulting expression matches a target sequence that is a concatenation of the sequences that are matched by the individual elements.

Examples:
• "##(a){2,3}(b){2,3}(c)" matches the target sequence "aabbc", the target sequence "aaabbbbc".
• "##(\d{4})(4)" matches the target sequence of "1234123412341234" (16 digits - no spaces).

Back Reference

A back reference marks its contents as a single unit in the regular expression grammar and labels the target text that matches its contents. The label that is associated with each capture group is a number, which is determined by counting the opening parentheses that mark capture groups up to and including the opening parenthesis that marks the current capture group. A back reference is a backslash that is followed by a decimal value N. It matches the contents of the Nth capture group. The value of N must not be more than the number of capture groups that precede the back reference.

Example:
• "((a+)(b+))(c+))3" matches the target sequence "aabbcbbbb". The back reference "\3" matches the text in the third capture group, that is, the "(b+)". It does not match the target sequence "aabbcbbbb".
  - The first capture group is ((a+)(b+))
  - The second capture group is (a+)
  - The third capture group is (b+)
  - The fourth capture group is (c+)

Bracket or Character Range

A character range in a bracket expression adds all the characters in the range to the character set that is defined by the bracket expression. To create a character range, put the character '-' between the first and last characters in the range. Doing this puts into the set all characters that have a numeric value that is more than or equal to the numeric value of the first character, and less than or equal to the numeric value of the last character.
Examples:

- "[0-7]" represents the set of characters \{ '0', '1', '2', '3', '4', '5', '6', '7' \}. It matches the target sequences "0", "1", and so on, but not "a".
- "[h-k]" represents the set of characters \{ 'h', 'i', 'j', 'k' \}.
- "[0-24]" represents the set of characters \{ '0', '1', '2', '4' \}.
- "[0-2]" represents the set of characters \{ '0', '1', '2' \}.

An individual character in a bracket expression adds that character to the character set that is defined by the expression. If the bracket expression begins with a "^" then this defines that the expression will consider all characters except for those listed.

Examples:

- "[abc]" matches the target sequences "a", "b", or "c", but not the sequence "d".
- "[^abc]" matches the target sequence "d", but not the target sequences "a", "b", or "c".
- "[a^bc]" matches the target sequences "a", "b", "c", or "^", but not the target sequence "d".

**TR1 Regular Expressions For Number Patterns**

If order to achieve dtSearch capability in FTK for search strings such as Social Security Numbers, Credit Card Numbers, Employee Identification Numbers, Telephone Numbers, and so on, where a period or hyphen is present, certain steps must be done during the pre-processing phase of the case.

**Note:**  NOTE: Currently, you cannot include search patterns with spaces.

**Normal dtSearch strings for credit card numbers or social security numbers**

The normal dtSearch wildcard string can be utilized as long as the hyphen is set to be indexed as a space:

- Social Security Numbers - === == ====
  - Returns "123-45-6789"
  - Will not return "123 45 6789"
- Credit Card Numbers (16 digits) - ==== ==== ==== ====
  - Returns "1234-1234-1234-1234"
  - Will not return "1234 1234 1234 1234"

**Number Patterns**

You can use dtSearch TR1 Regular Expression to find number patterns as you can in Live Searches for such things as Credit Card Numbers, Social Security Numbers, xxxxxxxxx. Certain pre-processing options MUST be completed before this function will work.
Configuring Pre-Processing Options

If you to utilize the dtSearch TR1 Regular Expression functions for looking for number patterns, you must complete the following pre-processing options:

1. Start a new case.
2. Click Custom processing profile.
3. Click Indexing Options next to dtSearch Text Index.
4. On the Indexing Options dialog window set the following:
   - For Hyphen Treatments - set to Hyphen
   - In the Spaces section - remove the period
   - In the Spaces section - remove the left and right parenthesis
   - In the Letters section - click Add and in all 4 spaces, type a "." period and repeat for the left and right parenthesis, then click OK.
5. Process the case.

Examples of TR1 Regular Expressions for Number Patterns

- For Credit Card Numbers:
  - "##(\d{4}[\-\.])?(\d{4}[\-\.])?(\d{4}[\-\.])?(\d{4})"  
    The first three groups are composed of - (\d{4}[\-\.]). The expression is looking for four digits followed by a period, or hyphen. This group is repeated three times and followed by the group looking for the ending 4 digits. 
    We can shorten that expression by writing it "##((\d{4})[\-\.]){3}(\d{4})". This will find 1234-5678-1234-5678 or 1234.5678.1234.5678

- For Social Security Numbers -
  - "##(\d{3}[\-\.])?(\d{2}[\-\.])?(\d{4})".
  - This will find 123-45-6789 or 123.45.6789

- For U.S. Telephone Numbers -
  - "##(\d[\-\.])?(\d{2}[\-\.])?(\d{3}[\-\.])?(\d{4})" 
    This will find:
    567-8901
    234-567-8901
    1-234-567-8901
    (234)567-8901
    (234)-567-8901
    567.8901
    234.567.8901
    1.234.567.8901
    (234)567.8901
    (234).567.8901
Documenting Search Results

Once a search is refined and complete, it is often useful to document the results.

Right-click an item in the Search Results list to open the quick menu with the following options:

- **Create Bookmark:** Opens the Create Bookmark dialog. For more information on creating and using Bookmarks, see Using the Bookmarks Tab (page 349).
- **Copy to Clipboard:** Copies the selected data to the clipboard (buffer) where it can be copied to another Windows application, such as an Excel (2003 or earlier) spreadsheet.

  **Note:** The maximum number of lines of data that can be copied to the clipboard is 10,000.

- **Export to File:** Copies information to a file. Select the name and destination folder for the information file. Uses the same criteria as Copy to Clipboard.
- **Set Context Data Width:** Context data width is the number of characters that come before and after the search hit.
- **Delete All Search Results:** Use this to clear all search results from the Index Search Results pane.

### Copy or Export Search Results

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Hits in Case</td>
<td>Saves all the current search terms’ hits found from the entire case.</td>
</tr>
<tr>
<td>All Hits in Search</td>
<td>Saves all the search hits found in each search branch.</td>
</tr>
<tr>
<td>All Hits in Term</td>
<td>(Live search only) saves the instances of individual terms found from the list of search terms. For example, if a live search consisted of the list “black,” “hole,” “advent,” and “horizon,” this option would copy information on each of the terms individually.</td>
</tr>
<tr>
<td>All Hits in File</td>
<td>Records the instances of the search term in the selected file only.</td>
</tr>
<tr>
<td>All File Stats in Case</td>
<td>Creates a CSV file of all information requested in the case.</td>
</tr>
<tr>
<td>All File Stats in Search</td>
<td>Creates a CSV file of the information requested in the search.</td>
</tr>
<tr>
<td>All File Stats in Term</td>
<td>(Live search only) Creates a CSV file of the instances of individual terms found from the list of search terms.</td>
</tr>
</tbody>
</table>

After the information is copied to the clipboard, it can be pasted into a text editor or spreadsheet and saved. Choose **Export to File** to save the information directly to a file. Specify a filename and destination folder for the file, and then click **OK**

Search results can then be added to the case report as supplementary files.

**Important:** When exporting Index Search result hits to a spreadsheet file, the hits are exported as a CSV file in UTF-16LE data format. When opening in Excel, use the Text to Columns function to separate the Index Search hit values into columns.
Using Copy Special to Document Search Results

The Copy Special feature copies specific information about files to the clipboard.

Method 1 to copy information about the files in your search results
1. Click in the search results list.
2. From the menu bar, select Edit > Copy Special.

Method 2 to copy information about the files in your search results
1. Find that file highlighted in the File List view.
2. Right-click on the desired file.
3. Select Copy Special.
4. Choose the column settings template to use from the drop-down list. Click Column Settings to define a new column settings template.
   4a. Modify the column template in the Column Settings Manager. For more information on customizing column templates, see Customizing File List Columns (page 460).
   4b. Click Apply to return to the Copy Special dialog.
5. Select the customized column template if you created one.
6. Choose whether you want to include the header row in the file.
7. Under File List Items to Copy, select the option that best fits your needs:
   - All Highlighted to copy only the items currently highlighted in the list.
   - All Checked to copy all the checked files in the case.
   - Currently Listed to copy all currently listed items, but no others.
   - All to copy all items in the case.
8. The dialog states the number of files that your selection contains.
9. Click OK.
Bookmarking Search Results

To keep track of particular search results, add them to new or existing bookmarks. Search results in the file list can be selected and added to a newly-created bookmark, or added to an existing bookmark as with any other data.

To create a bookmark from the file list

1. Select the files you want to include in the bookmark.
2. Right-click any of the selected files and select Create Bookmark.
3. Complete the Create New Bookmark dialog.
4. Click OK.
   The bookmark appears in the Bookmark tab.
Chapter 28
Viewing System Information

About Viewing System Information

You can view system information that contains detailed information about disk images in an easy to read format. You can view several important pieces of information about the target computer and the users of that computer. You can view this information in the System Information tab.

Not all attributes are available for all disk images, however, the possible attributes that you can see are:

- Applications
  - Prefetch
  - User Assist
  - Installed
- Network Information
  - Network Shares
  - Network Connections
  - Wireless Profiles
- Owner Information
- Recent Files
  - LNK
  - NT User
  - Shortcuts
- SAM Users
- USB Devices

For details about the attributes, see Available System Information Data (page 383).
Populating the Data in the System Information Tab

The System Information tab is not populated with data by default. You must extract data during processing.

To extract data and have it populated in the System Information tab

- You must do one of the following:
  - When adding disk images to a case, select the Generate System Information processing option.
    See Evidence Processing Options on page 81.
  - For an existing case, use the Generate System Information option in Additional Analysis.
    See Using Additional Analysis on page 133.

Viewing System Information

After you have processed a disk image, you can view the system information.

To view system information data

1. Open the Examiner and click the System Information tab.
   You can choose one image at a time to review in further detail. On the left hand side, there is a dropdown list of all of the images that have been processed into the case.
2. Select the disk image that you want to view.
3. Select the nodes that you want to view.
   A tree of available attributes from the disk appears in the Categories panel.
   On the right side of the tab, there are two panels which display additional information about the node you select on the left. The upper panel is titled Items and the lower panel is titled Provenance.
   The Items panel displays lists of the attributes found within the selected node. For example, when looking at the Applications node, you may want to review a list of applications frequently used by the users of the target machine. You can select the node User Assist under the Applications node. Once you select this node from the tree on the left, in the Items panel you see a list of all of the applications frequently used by the users of the target machine along with the user that used that application, the number of times that application had been run, and the last time the application was run.
   The Item list allows you to sort any column in either ascending or descending order to assist you in finding the information you need quickly.
   In the Provenance panel, you can find the location of the data selected from the Items panel. Using the previous example of frequently used applications, you may want to review an application used by a specific user. From the Items list, you select the application you are interested in, and in the Provenance panel, you see the location from the target machine from which this information was obtained.
4. (Optional) In the Provenance panel, you can select the object, right-click, and set a bookmark.
Available System Information Data

This section contains information about the possible data available in the System Information tab. All of the data is collected from one or more sources, where a source can be a single file or a location within the file. Where possible, the complete source path is shown in the Provenance pane. Below are the details of the data available for each category and sub-category.

Possible data available in the System Information tab

<table>
<thead>
<tr>
<th>Category</th>
<th>Sub-Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Data</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|                   | **Prefetch** | Each time you turn on your computer, Windows keeps track of the way your computer starts and which programs you commonly open. Windows saves this information as a number of small files in the prefetch folder. The next time you turn on your computer, Windows refers to these files to help speed the start process.  
The prefetch folder is a subfolder of the Windows system folder. The prefetch folder is self-maintaining, and there's no need to delete it or empty its contents. If you empty the folder, Windows and your programs will take longer to open the next time you turn on your computer.  
For each prefetch (.PF) file, in the System Information tab displays the following information:  
- Complete path to the application executable  
- Number of times the application was run  
- Last time the application was run |
|                   | **User Assist** | UserAssist is a method used to populate a user's start menu with frequently used applications. This is achieved by maintaining a count of application use in each users NTUSER.DAT registry file at sub key:  
- Software\Microsoft\Windows\CurrentVersion\Explorer\UserAssist  
For each UserAssist entry in the registry, the System Information tab displays the following information:  
- Complete path to the application executable  
- Number of times the application was run  
- Last time the application was run |
Possible data available in the System Information tab (Continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Sub-Category</th>
<th>Description</th>
</tr>
</thead>
</table>
| Installed  |              | Applications installed on the Windows system are viewable via the Control Panel -> Programs and Features. By default the list doesn’t show updates or system components unless the user selects to see them. The information can come from various places in the registry but the feature uses the HKLM\SOFTWARE registry file under the sub keys:  
- Microsoft\Windows\CurrentVersion\Uninstall\  
- Wow6432Node\Microsoft\Windows\CurrentVersion\Uninstall\  
Service packs, hot fixes, updates, or system components are not reported. For each installed application, the System Information tab displays the following information:  
- Application name  
- Application publisher (if available)  
- Path to installed application (if available)  
- Date application was installed (if available)  
- Size of application install base (if available)  
- Application version (if available) |

Network Data

| Network Shares | A network share is a computer resource made available from one host to other hosts on a computer network. In this feature, it is specifically the networks that were accessed using the Universal Naming Convention (UNC). This information is stored in each user's NTUSER.DAT registry file at sub keys:  
- Software\Microsoft\Windows\CurrentVersion\Explorer\Map Network Drive MRU  
- Software\Microsoft\Windows\CurrentVersion\Explorer\RunMRU  
- Software\Microsoft\Windows\CurrentVersion\Explorer\MountPoints2  
For each installed application, the System Information tab displays the following information:  
- UNC Path  
- Last connection time |
### Possible data available in the System Information tab (Continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Sub-Category</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Network Connections**|                        | A network connection provides connectivity between one computer and the Internet, a network, or another computer. In every case the connected to network has an identifying name. Network connections managed by Windows are stored in the HKLM\SOFTWARE registry file under the sub key:  
- Microsoft\Windows NT\CurrentVersion\NetworkList  
For each network connection, the System Information tab displays the following information:  
- Profile name  
- First time connecting to the network  
- Most recent time connecting to the network  
- Network name  
- Network category (e.g. Domain, Private, Public)  
- Gateway MAC address  
- Whether it is a wireless network (This is only set if for sure it is a wireless network) |
| **Wireless Profiles**  |                        | A wireless profile is a set of configuration parameters that allow a system to connect to a wireless access point. The profiles managed by Windows are stored in the file C:\ProgramData\Microsoft\Wlansvc\Profiles\Interfaces  
For each wireless profile, the System Information tab displays the following information:  
- Profile name  
- SSID  
- Authentication (e.g. WPA2PSK, WPAPSK, etc.)  
- Encryption (e.g. TKIP, AES, none, etc.) |
| **Owner Information Data** |                   | This is basic data about the installed operating system and comes from the HKLM\SOFTWARE registry file under the sub key:  
- Microsoft\Windows NT\CurrentVersion  
For each registry value, the System Information tab displays the following information:  
- Name of the registry value  
- The contents of the registry value |
| **Recent Files Data**   |                        |                                                                                                                                           |
Many applications store recently used files in the user’s NTUSER.DAT registry file. The specific applications that are extracted are from Microsoft Office and Adobe Acrobat. The following sub keys are examined:

- Software\Microsoft\Office
- Software\Adobe
- Software\Microsoft\Windows\CurrentVersion\Explorer\Map Network Drive MRU
- Software\Microsoft\Windows\CurrentVersion\Explorer\RunMRU
- Software\Microsoft\Windows\CurrentVersion\Explorer\MountPoints2

For each recently used file, the System Information tab displays the following information:

- Application name (i.e. Acrobat, Excel, PowerPoint, Word)
- Absolute path to the recent file

**LNK Files**

LNK is a file extension for a shortcut file used by Microsoft Windows to point to an executable file. LNK stands for LiNK. Shortcut files are used as a direct link to an executable file, instead of having to navigate to the executable. LNK files are stored in each user’s AppData\Roaming\Microsoft\Windows\Recent or Recent directory.

For each LNK file, the System Information tab displays the following information:

- Absolute path to target file
- Date/Time the target file was created
- Date/Time the target file was last written to
- Date/Time the target file was last accessed

**Jump Lists**

Jump Lists, new in Windows 7, take you right to the documents, pictures, songs, or web sites you turn to each day. To open a Jump List, just right-click a program button on the Windows 7 taskbar. (You can also get to Jump Lists by clicking the arrow next to the program name on the Start menu.) The files that support this feature are located in each user’s AppData\Roaming\Microsoft\Windows\Recent\AutomaticDestinations folder.

For each LNK file inside each Jump List, the System Information tab displays the following information:

- Absolute path to target file
- Date/Time the target file was created
- Date/Time the target file was last written to
- Date/Time the target file was last accessed
Possible data available in the System Information tab (Continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Sub-Category</th>
<th>Description</th>
</tr>
</thead>
</table>
| SAM Users Data  |              | The Security Accounts Manager (SAM) HKLM\SAM registry file stores users' passwords in a hashed format either as a LAN hash or NT hash. To protect the file, Microsoft introduced the SYSKEY function so the on-disk copy of the SAM is partially encrypted with a key (usually referred to as the "SYSKEY"). For each user stored in the SAM registry, the System Information tab displays the following information:  
  - Name of the user  
  - SID  
  - Unencrypted current LAN hash  
  - Unencrypted previous LAN hash  
  - Unencrypted current NT hash  
  - Unencrypted previous NT hash |
| USB Devices     |              | When USB devices are plugged into a computer for the first time, the Windows operating installs an appropriate driver and stores information about the device in the registry and the setupapi log file. On subsequent device connections, various registry keys are updated to reflect the last connection time. Details about each USB device are stored in the following registry locations:  
  - HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\EMDMgmt  
  - HKLM\SYSTEM\CurrentControlSet\Enum\USBSTOR  
  - HKLM\SYSTEM\CurrentControlSet\Enum\USB  
  - HKLM\SYSTEM\CurrentControlSet\Control\DeviceClasses\{53f56307-b6bf-11d0-94f2-00a0c91efb8b}  
  - HKLM\SYSTEM\CurrentControlSet\Control\DeviceClasses\{53f56308-b6bf-11d0-94f2-00a0c91efb8b}  
  - HKLM\SYSTEM\MountedDevices  
  - HKU<user sid>\Software\Microsoft\Windows\CurrentVersion\Explorer\MountPoints2  
For each USB device, the System Information tab displays the following information:  
  - Vendor name  
  - Vendor id  
  - Product name  
  - Product id  
  - Instance id (very similar to serial number)  
  - Revision  
  - First time device was connected  
  - Last time device was connected  
  - Last time a user mounted the device  
  - Drives the device was mounted to  
  - Volume labels |
This chapter includes the following topics

- **Using the Volatile Tab** (page 389)
- **Understanding Memory** (page 391)
- **Viewing Memory Dump Data** (page 392)
- **Performing File Remediation from the Volatile Tab** (page 394)
- **Killing a Process** (page 394)
- **Wiping a File** (page 395)
- **Adding Hashes to KFF Library from the Volatile Tab** (page 395)
- **Adding Hashes to Fuzzy Hash Library from the Volatile Tab** (page 396)
- **Creating a Memory Dump File** (page 396)
Using the Volatile Tab

The Volatile tab provides tools for viewing, finding, and comparing data gathered from the memory of live agent systems in your network. Other data acquired remotely, such as from a Mounted Image Drive or a Mounted Device is viewable from other tabs. The Volatile tab is specifically for remote memory data acquired as a memory dump. It can be added directly to a case upon acquisition, or saved as a dump file to be added to any case at a later time.

See Working with Live Evidence (page 142).

When you have acquired volatile (Memory) data as a dump file the resulting acquisition data is displayed in the Volatile tab.

There are three main areas in the Volatile tab:

1. Tabbed Data View
2. Detail List View
3. Detailed Information View

It is important to remember that the views relate clockwise. When an item is selected in the Tabbed Data view, the related information is displayed in the Detail List view. An item selected in the Detail List view will display relevant information in the Detailed Information view, within the data tab that relates to the type of item that is selected.

The Tabbed Data view has three tabs:

- Snapshot
- Find
- Difference
Each *Tabbed Data View* displays a summary of acquired volatile data.

**Data View Sort Options**

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Operation Type" /></td>
<td>Sort acquired volatile data by <em>Operation Type</em>, such as those selectable from the <strong>Evidence &gt; Add Remote Evidence &gt; Selection Information</strong> dialog box. Found on Snapshot, Find, and Difference tabs.</td>
</tr>
<tr>
<td><img src="image" alt="Time of Acquisition" /></td>
<td>Sort acquired volatile data by the <em>Time of Acquisition</em>, displayed in the local machine's time. Found on Snapshot, Find, and Difference tabs.</td>
</tr>
<tr>
<td><img src="image" alt="Source Machine or Agent" /></td>
<td>Sort acquired volatile data by the <em>Source Machine or Agent</em>. Found on Snapshot, Find, and Difference tabs.</td>
</tr>
<tr>
<td><img src="image" alt="Display saved comparisons" /></td>
<td><em>Display saved comparisons</em>. When a comparison of found data is done, the results can be saved and viewed later. Found only on the Difference tab</td>
</tr>
<tr>
<td><img src="image" alt="Geolocation" /></td>
<td><strong>Geolocation</strong>. This button on the Volatile tab that will launch Geolocation for volatile data. See <strong>Viewing Geolocation IP Locations Data</strong> on page 451.</td>
</tr>
</tbody>
</table>

The *Detail List View* provides information specific to the item currently selected in the Data View. The content of the Detail List changes as different items are selected.

The *Detailed Information View* shows more specific information about the item in the Data View, and its selected component in the Detail List view.
Understanding Memory

Memory can include the physical “sticks” of memory that we put into the machine, commonly referred to as physical memory. However, video cards, network cards, and various other devices use memory that the Operating System (OS) must be able to access in order for the devices to work properly. Both physical memory and device memory are organized by the OS in a linear address map. For 32-bit operating systems, the linear address map is naturally 4GB. Traditionally the OS will put physical memory at the bottom of this map and the device memory at the top.

When a system has a full 4GB of physical memory, using all 4GB wouldn’t leave any room to address the device memory.

Since the OS can’t function without access to the device memory, it simply doesn’t use all 4GB of physical memory. Evidence of this fact can be seen on the main Properties window of My Computer. If you have a 32-bit Windows XP system with 4GB of physical memory, you may notice that the Properties window will show that you have only 3.25GB of physical RAM. That limitation allows for addressing of devices within the 4GB address space.

Most acquisition products check how much physical memory is available (4GB using our example above), open a handle to the OS’s memory map (referred to as \Device\PhysicalMemory) and start reading, one page at a time. Thus, in an attempt to read all of the physical memory, what they are actually reading is the OS’s linear address map of both physical and device memory. However, some device memory is not meant to be read and the simple act of reading it could cause system instability. In fact, if the OS is 64-bit, this algorithm would miss the physical memory that was placed beyond the 4GB range.

The approach AccessData takes is to query the OS’s memory map for the regions that correspond to physical memory and only acquire those regions - filling the other regions with zeros. This method not only avoids any issue with system instability but also guarantees that it acquires all the physical memory that the OS is able to use — the memory that anyone would normally be interested in.
Viewing Memory Dump Data

A Memory Dump file includes all the Processes, DLLs, Sockets, Drivers, Open Handles, Processors, System Descriptor Tables and Devices in use at the time of the acquisition. The Volatile tab provides a view of all this data by type.

Right-click on any dump file in the Snapshot view to choose View Memory or Search Memory.

Viewing Hidden Processes

Hidden processes are automatically detected. There is no way to disable or turn off this feature. The detection compares a list of processes in memory to the operating system's processes list to determine whether any running processes do not belong. These are the processes that are highlighted in yellow.

Hidden processes, when detected in a Memory Dump file, and found only in the Process List. Click on a dump file in the Process List, then scroll down the Detail List to locate any lines highlighted in yellow.

Click on a yellow-highlighted line in the Detail List to display related information in the Detailed Information list. Scroll across the columns list to see all the data.

Viewing Input/Output Request Packet Data

Input/Output Request Packet (IRP) data, also known as memory hooks, when detected in a memory dump file, are indicated in the Snapshot view by a yellow warning indicator. Memory hooks can be used for both legitimate and non-legitimate purposes.

In the Detail list, the items that contain memory hooks are highlighted in pink. Click on a pink-highlighted item to open that item in the Detailed Information view. The IRP tab shows the items and properties that are related to the IRP data that was detected. This data does not identify whether the IRP was bad or good, only that it was there, so you can determine its nature.

Tabs in the Detailed Information list provide additional related data for the selected data type. Some data types have several tabbed pages, and some have only a few. Each tabbed page contains different information related to the selected item, and each displays properties specific to the tabbed page for that information type. The property column headings are sortable to make it easier to locate critical information.

In addition to the IRP data view, access is provided to Service Descriptor Tables (SDT), and System Service Descriptor Tables (SSDT).

Up to four SSDT tables are available. The four tabs are placeholders only; their existence does not indicate nor guarantee they will be populated. Notice that the names of the populated tables' tabs are longer than those that are not populated. Only the data that is found in the evidence can be displayed.

Viewing Virtual Address Descriptor (VAD) Data

In the Windows operating system, every object opened by a program (example files, screens, sections of memory, etc.) is assigned a handle that the process in which the program is running can use. These handles are stored in a table that is managed by the process. This table is called the virtual address descriptor table (VAD).
A single process normally contains many VADs. Each VAD describes a range of virtual pages and tells the Memory Manager what those virtual pages represent. For example, a typical process will consist of an executable image (the program) and a set of dynamic link libraries (DLLs) that are used within that process, as well as data that is unique to the program. Each of these separate items exists somewhere within the address space of the program.

When each component is first loaded into the address space, the Memory Manager creates a new VAD entry for each such range of addresses. These VAD entries are in turn linked together in a binary tree that optimizes access to the most recently accessed VAD. This representation makes it easy to describe a sparse address space using a tree of VADs, it is fast to find entries within the VAD tree, and it is easy to reorganize VAD entries as necessary.

Investigating the VAD tree lets you view resources allocated by a program. The VAD tree constantly changes during execution of a program. Each time the VAD tree is read, the results are different.

To view Virtual Address Descriptor (VAD) Data

1. In the Examiner, select the Volatile tab.
2. In the Snapshot tab, expand Process List.
3. Expand the date of the snapshot.
4. Select the computer name.
5. In the upper-right pane, under Detail List, select a process.
6. In the lower-right pane, under Detailed Information, click the VAD tab.
7. The Virtual Address Descriptor (VAD) information is displayed in the Detailed Information pane.
Performing File Remediation from the Volatile Tab

Certain file remediation tasks are available for specific data types in the Volatile tab. After a remote volatile data acquisition is completed, click to expand the data type in the Snapshot tabbed view, then right-click on the item in the Detail List to choose from the available file remediation options.

### Volatile Tab File Remediation Options

<table>
<thead>
<tr>
<th>Volatile Data Type</th>
<th>Kill Process</th>
<th>Wipe File</th>
<th>Add Hashes to KFF Lib</th>
<th>Add Hashes to Fuzzy Lib</th>
<th>Dump</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process List</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DLL List</td>
<td>--</td>
<td>--</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sockets</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Driver List</td>
<td>--</td>
<td>--</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Open Handles</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Processors</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>System Descriptor Table</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Devices</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

### Killing a Process

Kill Process ends a process running on the remote computer the data was acquired from.

**To kill a process**

1. In the **Snapshot view**, click and expand the **Process List**.
2. In the **Detail List**, highlight or mark the check boxes of the processes to be killed.
3. Right-click in the Detail List and select **Kill Process**.
4. In the **Select Source** dialog box, select either **Highlighted Detail List items**, or **Checked items**.
5. Click **OK**.
Wiping a File

Wipe File completely removes a file from the remote computer the file was acquired from.

To wipe a file
1. In the Snapshot view, click and expand the Process List.
2. In the Detail List, highlight or mark the check boxes of the file to be wiped.
3. Right-click in the Detail List and select Wipe File.
4. In the Select Source dialog box, select either Highlighted Detail List items, or Checked items.
5. Click OK.

Adding Hashes to KFF Library from the Volatile Tab

Hashes can be added directly to the KFF Library directly from the Volatile tab.

To add hashes to the KFF Library
1. In the Detail List, highlight or mark the check boxes of the hashes to add to the KFF Library.
2. Right-click in the Detail List, and click Add Hashes to KFF.
3. Provide a name for the set.
4. Click Add all hashes to add the hashes of all displayed items, or Add only checked hashes in the current Detail List.
5. Select either Alert or Ignore.
6. Choose whether or not to Activate in [the current] case.
7. Click OK.
Adding Hashes to Fuzzy Hash Library from the Volatile Tab

Hashes can be added directly to the Fuzzy Hash Library directly from the Volatile tab.

To add hashes to the Fuzzy Hash Library
1. In the Detail List, highlight or mark the check boxes of the file(s) hashes to add to the Fuzzy Hash Library.
2. Right-click in the Detail List, and click Add Hashes to Fuzzy.
3. Provide a name for the set.
4. Click Add all hashes to add the hashes of all displayed items, or Add only checked hashes in the current Detail List.
5. Select either Alert or Ignore.
6. Assign a Threshold Value.
7. Choose whether or not to Activate in [the current] case.
8. Click OK.

Creating a Memory Dump File

A dump file can be created and added to the case directly from the Volatile tab.

To create a Dump file
1. In the Snapshot view, click and expand the Process List or the DLL List.
2. In the Detail List, highlight or mark the check boxes of the files to be dumped.
3. Right-click in the Detail List and select Dump to file.
4. In the Dump a file dialog box, mark Include DLLs with processes, and/or Include parent process with DLLs.
5. Browse to and select a destination path for the dump file.
6. Click OK.
Chapter 30
Analyzing Document Content

Depending on your license, you can analyze the content of documents in your evidence in the following ways:

- Using Document Content Analysis (page 401)
- Performing Cluster Analysis (page 403)
- Using Entity Extraction (page 397)

Using Entity Extraction

About Entity Extraction

You can extract entity data from the content of files in your evidence and then view those entities.

You can extract the following types of entity data:

- Credit Card Numbers
- Phone Numbers
- Social Security Numbers

The data that is extracted is from the body of documents, not the meta data.

Using entity extraction is a two-step process:

1. Process the data with the Entity Extraction processing options enabled. You can select which types of data to extract.
2. View the extracted entities in the Examiner.

The following table provides details of the type of data that is identified and extracted:

<table>
<thead>
<tr>
<th>Type</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Card Numbers</td>
<td>Numbers in the following formats will be extracted as credit card numbers:</td>
</tr>
</tbody>
</table>
### Entity Extraction Details

<table>
<thead>
<tr>
<th>Type</th>
<th>Examples</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>16-digit numbers</strong></td>
<td>For example,</td>
<td></td>
</tr>
<tr>
<td>used by VISA, MasterCard, and</td>
<td>● 1234-5678-9012-3456 (segmented by dashes)</td>
<td></td>
</tr>
<tr>
<td>Discover in the following</td>
<td>● 1234 5678 9012 3456 (segmented by spaces)</td>
<td></td>
</tr>
<tr>
<td>formats.</td>
<td>Not:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● 1234567890123456 (no segments)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● 12345678-90123456 (other segments)</td>
<td></td>
</tr>
<tr>
<td><strong>15-digit numbers</strong></td>
<td>For example,</td>
<td></td>
</tr>
<tr>
<td>used by American Express in</td>
<td>● 1234-5678-9012-345 (segmented by dashes)</td>
<td></td>
</tr>
<tr>
<td>the following formats.</td>
<td>● 1234 5678 9012 345 (segmented by spaces)</td>
<td></td>
</tr>
<tr>
<td><strong>Phone Numbers</strong></td>
<td>Numbers in the following formats will be extracted as phone numbers:</td>
<td></td>
</tr>
<tr>
<td>Standard 7-digit</td>
<td>For example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● 123-4567</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● 123.4567</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● 123 4567</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not: 1234567 (not segmented)</td>
<td></td>
</tr>
<tr>
<td>Standard 10-digit</td>
<td>For example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● (123)456-7890</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● (123)456 7890</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● (123) 456-7809</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● (123) 456.7809</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● +1 (123) 456.7809</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● 123 456 7809</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not 1234567890 (not segmented)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: A leading 1, for long-distance or 001 for international, is not included in the extraction, however, a +1 is.</td>
<td></td>
</tr>
</tbody>
</table>
## Entity Extraction Details

<table>
<thead>
<tr>
<th>Type</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>Some international formats are extracted, for example,</td>
</tr>
<tr>
<td></td>
<td>- +12-34-567-8901</td>
</tr>
<tr>
<td></td>
<td>- +12 34 567 8901</td>
</tr>
<tr>
<td></td>
<td>- +12-34-5678-9012</td>
</tr>
<tr>
<td></td>
<td>- +12 34 5678 9012</td>
</tr>
<tr>
<td></td>
<td>Not 12345678901 (not segmented)</td>
</tr>
<tr>
<td></td>
<td>Other international formats are not extracted, for example,</td>
</tr>
<tr>
<td></td>
<td>- 123-45678</td>
</tr>
<tr>
<td></td>
<td>- (10) 69445464</td>
</tr>
<tr>
<td></td>
<td>- 07700 954 321</td>
</tr>
<tr>
<td></td>
<td>- (0295) 416,72,16</td>
</tr>
<tr>
<td>Notes:</td>
<td>Be aware that you may get some false positives.</td>
</tr>
<tr>
<td></td>
<td>For example, a credit number 5105-1051-051-5100 may also be extracted as the phone number 510-5100.</td>
</tr>
</tbody>
</table>

### Social Security Numbers

Numbers in the following formats will be extracted as Social Security Numbers:

- 123-45-6789 (segmented by dashes)
- 123 45 6789 (segmented by spaces)

The following will not be extracted as Social Security Numbers:

- 123456789 (not segmented)
- 12345-6789 (other segments)
Enabling Entity Extraction

To enable entity extracting processing options:
1. You can enable entity extracting processing options at one of two times:
   - When creating a case or adding new evidence and configuring processing options. See Evidence Processing Options on page 81.
   - When running Additional Analysis on existing evidence. See Using Additional Analysis on page 133.

Viewing Entity Extraction Data

To view extracted entity data
1. In the Examiner, click the Overview tab.
2. Expand the Document Content node.
3. Expand a Document Content type, such as Credit Card Numbers or Phone Numbers.
4. Click an item to show the file in the File List that contains the extracted data.
Using Document Content Analysis

You can use Document Content Analysis to group document data together for quicker review.

**Note:** If you activated Document Content Analysis as an Evidence Processing option when you created the project, Document Content Analysis will automatically run after processing data and will not need to be run manually.

**To perform Document Content Analysis on a new case**

1. From *Case Manager*, click **Manage > Evidence Processing Profiles**.
2. In the **Manage Evidence Processing Profiles** dialog, create a new profile or edit an existing profile. See **Configuring Default Processing Options for a Case** on page 76. See **Using Processing Profiles** on page 77.
3. From the **Detailed Options** dialog, click the **Evidence Processing** tab from the left menu and select **Document Content Analysis**.
4. (Optional) Click **DCA Options** and change the **Analysis Threshold**, if needed, and click **OK**.
   - **Analysis Threshold** — Sets the level of similarity (in a percentage) that is required for documents to be considered related or near duplicates. The higher the percentage, the more similar the documents need to be in order to be considered similar.
5. Click **Save As** and follow the screens to save and/or replace the profile.

**To perform Document Content Analysis on an existing case**

1. In *Evidence Explorer*, click **Evidence > Add/Remove**.
2. From the **Manage Evidence** dialog, highlight the evidence you want to process using Document Content Analysis.
3. Click **Refinement Options**.
4. Select **Document Content Analysis** and change the DCA options, if needed. See **Evidence Processing Options** on page 81.

**Filtering Documents by Document Content Analysis**

Documents processed with Document Content Analysis can be filtered by the content of the documents in the evidence. The Cluster Topic container is created in Evidence Explorer in the **Overview > Case Overview** tab and is created from data processed with Document Content Analysis. Data included in the Cluster Topic container is taken from documents, including Word documents, text documents, and PDF documents.

In order for the application to filter the data and display the Cluster Topic container, the following must occur:

- Prerequisites for Cluster Topic (page 402)
- How Document Content Analysis Works (page 402)
- Filtering with Cluster Topic (page 402)
- Considerations of Cluster Topic (page 402)
**Prerequisites for Cluster Topic**

Before the Cluster Topic container can be created, the data in the project must be processed by Document Content Analysis. The data is processed automatically when Document Content Analysis is selected in the Evidence Processing options or you can process the data manually by selecting **Document Content Analysis** in the Refinement Options > Evidence Processing dialog.

Evidence Processing Options (page 81)
Configuring Evidence Refinement (Advanced) Options (page 99)

**How Document Content Analysis Works**

The application uses an algorithm to cluster the data. The algorithm accomplishes this by creating an initial set of cluster centers called pivots. The pivots are created by sampling documents that are dissimilar in content. For example, a pivot may be created by sampling one document that may contain information about children’s books and sampling another document that may contain information about an oil drilling operation in the Arctic. Once this initial set of pivots is created, the algorithm examines the entire data set to locate documents that contain content that might match the pivot’s perimeters. The algorithm continues to create pivots and clusters documents around the pivots. As more data is added to the project and processed, the algorithm uses the additional data to create more clusters.

Word frequency or occurrence count is used by the algorithm to determine the importance of content within the data set. Noise words that are excluded from Document Content Analysis are also not included in the Cluster Topic pivots or clusters.

**Filtering with Cluster Topic**

Once data has been processed by Document Content Analysis and categories are created under the Cluster Topic container, you can view the data in the Overview > File List.

Using the Overview Tab (page 299)
Cluster Topic Container (page 302)

The topics of the categories available are terms created during the Document Content Analysis. Documents containing these terms are included in the category and are displayed in the File List when selected. Categories are comprised of two word phrases that occur in the documents. This is to make the category more legible.

The UNCLUSTERED category contains any documents that are not included under a Cluster Topic Container.

**Considerations of Cluster Topic**

You need to aware the following considerations when examining the Cluster Topic categories:

- Not all data will be grouped into categories at once. The application creates categories in an incremental fashion in order to return results as quickly as possible. Since the application is continually creating categories, the Cluster Topic container is continually updated.
- Duplicate documents are grouped together as they match a specific category. However, if a category is particularly large, duplicate documents may not be included as part of any category. This is to avoid
performance issues. You can examine any duplicate documents or any documents not included in a category by highlighting the UNCLUSTERED category of the Cluster Topic container.

- Cluster Topic results can vary when performed on different databases and/or different computers. This is due to the analytic behavior of the Document Content Analysis process. Since limits have been set on the algorithm to allow for efficient collection of data, large amounts of content can thus produce varying results.

## Performing Cluster Analysis

Depending on the license you own (an AD Lab license or a AD Summation license), you can perform an analysis of files to determine related documents and email threads. If there are files that are similar, one document is identified as the pivot, and then the other related files are given a score that shows how closely they are related to the Pivot. If a score is 100, it is a perfect match.

**Note:** With an FTK, FTK PRO, or AD Enterprise license, you can perform Cluster Analysis on a documents only using the Document Content Analysis feature. See Using Document Content Analysis on page 401.

You perform the Cluster Analysis by enabling the Cluster Analysis processing option.

See Identifying Processing-Generated Data on page 322.

See Relating Generated Files to Original Files on page 322.

When you enable Cluster Analysis, you have the following options:

- Document Types to process - You can select to process the following file types:
  - Documents
  - Presentation
  - Spreadsheets
  - Email

- Similarity Threshold - Determines the level of similarity required for documents to be considered related or near duplicates.

After processing is complete, you can add the Review Set Pivot and the Distance to Pivot columns in the File List in the Examiner. You will also use the standard Item # column to identify the Pivot file.

See Managing Columns on page 460.

### To Perform Cluster Analysis

1. When either adding evidence to a case or performing Additional Analysis, access the processing options.
   - See Selecting Lab/eDiscovery Options on page 103.
   - See Using Additional Analysis on page 133.
2. Select the option for Cluster Analysis.
3. Click NDA Options.
4. Select the document types to process and the similarity threshold.
5. Process your data.
To view Cluster Analysis data using columns

1. In the examiner, view the file types that you selected.
2. Click the Column Settings icon.
   See Managing Columns on page 460.
3. Either create a new column template or edit an existing one.
4. Add the following columns to the template.
   - Item #
   - Review Set Pivot
   - Distance to Pivot
5. Click OK.
6. Select the template name you just configured.
7. Click Apply.
   This applies the template to the File List.
8. Click Close.
   The Review Set Pivot shows the Item # of the Pivot file, or the file that other files are compared to.
   If a file was identified as being a near duplicate, it will show a Distance to Pivot score. A perfect match has a score of 100.

Words Excluded from Cluster Analysis Processing

Noise words, such as if and or, are excluded from Cluster Analysis processing. The following words are excluded in the processing:

a, able, about, across, after, ain't, all, almost, also, am, among, an, and, any, are, aren't, as, at, be,
because, been, but, by, can, can't, cannot, could, could've, couldn't, dear, did, didn't, do, does, doesn't,
don't, either, else, ever, every, for, from, get, got, had, hadn't, has, hasn't, have, haven't, he, her, hers,
him, his, how, however, i, if, in, into, is, isn't, it, it's, its, just, least, let, like, likely, may, me, might, most,
must, my, neither, no, nor, not, of, off, often, on, only, or, other, our, own, rather, said, say, says, she,
should, shouldn't, since, so, some, than, that, the, their, them, then, there, these, they, they're, this, tis,
to, too, twas, us, wants, was, wasn't, we, we're, we've, were, weren't, what, when, where, which, while,
who, whom, why, will, with, would, would've, wouldn't, yet, you, you'd, you'll, you're, you've, your.
Chapter 31
Using Visualization

About Visualization

Visualization is a component that provides a graphical interface to enhance understanding and analysis of files and emails in a case. You view data based on file and email dates. Visualization provides dashboards with chats and lists that quickly show information about the data in the specified date range. Visualization helps you identify files and emails that you label and bookmark as part of your investigation.

Note: The Visualization feature is available as an add-on license. Please contact your AccessData sales representative for more information.

Visualization can only display data that has an associated date. If a file or an email does not contain a valid Created, Modified, Last Accessed, Sent or Received date, it is not displayed. For example, carved files do not have an associated date so they are not displayed in Visualization.

You can also take screen captures of the Visualization pages to have a record of the data.

Visualization supports the following data types:

- File Data: You can view file data from either the Explore tab or the Overview tab in the Examiner interface.
  For more information see Visualizing File Data (page 412).
- Email Data: You can view email data from the Email tab in the Examiner interface.
  For more information see Visualizing Email Data (page 419).
- Internet Browser History: You can view internet browser history data.
  For more information see Visualizing Internet Browser History Data (page 431).

Visualization also has the following components:

- Using Visualization Heatmap (page 432)
- Using Visualization Social Analyzer (page 434)
- Using Visualization Geolocation (page 440)
Launching Visualization

To launch visualization

1. Use the Explore, Overview, or Email tabs to specify a set of data.
   For example, in the Overview tab, you can view everything under File Extension or drill down to just DOC files.

2. When you have specified the data that you want to view in the Visualization pane, click the following pie chart icon:

   ![Pie Chart Icon]

   The data that you have displayed in the File List pane is the data that you can send to the visualization module.

   The visualization module opens in a separate window from the Examiner that you can minimize, maximize, and select in the Windows task bar.

3. On the time line, specify the date range for the base time line that you want to view data for.
   See Setting the Base Time Line on page 410.

   **Important**: The dashboard and data list displays information only for the data that exists in the base time line. If specified dates have no files, the dashboard displays the text "No Data Series." To properly use Visualization, you must specify the base time line that you want to view data for.
About the Visualization page

The Visualization page includes three main components:

- **Time line pane** - Provides a time line pane with graphics representing the available data. This is the top part of the page.
- **Dashboard** - Provides graphical chart panes about the data. This is the middle part of the page.
- **Data list pane** - Provides a list of the data items. This is the lower part of the page.

You can resize each pane.
About Visualization Time Line Views

You can use one of the following two time line views:

- **Basic** - The basic view lets you specify a base time line that you want to view data for. For example, you can select a specific year or month, or you can specify a custom date range. Any data that falls in that date range will be represented in the charts and data list.
  
  See About the Base Time Line on page 408.

- **Detailed** - The detailed time line view shows a graphical representation of each file or email message. If you have a lot of data in a given date range, you can narrow your view to days, hours, minutes, and milliseconds.
  
  See About the Detailed Visualization Time Line on page 425.

About the Base Time Line

The top portion of the visualization page is the time line. The time line displays a graph with a representation of that data that is visualized. The data is displayed from the oldest date on the left to the most current date on the right.

The span of the time line is automatically configured based on the dates of the data that you specified for visualization. For example, if the data that you specified has creation dates that range from 8/15/2003 to 9/11/2003, it will build a time line with those dates as the start and end.

The vertical gray bars represent where the data files are on the time line. The gold text in the lower left corner of the time line details the full timespan.

In the **Basic** time line view, you configure the base time line. The base time line is the specific range of dates that you want to work with. This may be a smaller date range than the full timespan (dates in yellow).

The base time line is represented by the blue selection box with sliding vertical bars. You can modify the base time line to be any range within the full timespan.

**Important:** The dashboard and data list displays information only for the data that exists in the base time line. If specified dates have no files, the dashboard displays the text "No Data Series." To properly use visualization, you must specify the base time line that you want to view data for.
When you first launch visualization, a limited default base time line is specified, starting with the oldest data that is in the data set. For example, if you are viewing files, the default base time line is the first month starting with the creation date of the oldest file.

In the example in the graphic shown above, there are four files in the default base time line of one month and those four files are shown in the list and represented in the dashboard.

In the email visualization, the time line is displayed in weeks, with vertical gray bars representing the emails.

**Time Line Selection Tools**
Setting the Base Time Line

You adjust the range and the location of the base time line by adjusting the blue selection box. The information in the visualization dashboard and data list change when you adjust the selection box.

See About the Base Time Line on page 408.

To adjust the full timespan

1. Below the time line, you can zoom in on the view of the total timespan (yellow full timespan bar) by clicking and dragging the end of the bar.
2. You can also slide the yellow bar left or right to adjust the range.

To adjust the base time line

1. You change the base time line of the data set by adjusting the blue selection box.
2. You can do one of the following options:
   - Select a period that is on the top of the time line, for example, a specific month like June.
   - Drag the sliders of the blue selection box to make it bigger or smaller.
   - Drag the selection box to a different position.
   - Use the mouse scroll wheel to move the selection box left or right.
Changing the View of Visualization

You can change the way that visualization looks. You can modify the way that bar charts in visualization appear. You can also change the color scheme of the visualization windows.

Modifying the Bar Chart Displays

You can use the radio buttons below the time line to change the appearance of bar charts in visualization.

<table>
<thead>
<tr>
<th>Description</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Log (logarithmic) view makes visualization adjust the bars or lines to raise the low points and lower the highs so that both are easier to view on a chart. This view smooths the peaks and valleys in the chart.</td>
<td>Log (default)</td>
</tr>
<tr>
<td>The Linear view returns the view from Log to an unadjusted representation of the data. Changing from the Log view to the Linear view shows more of the variance and spikes in the data.</td>
<td>Linear</td>
</tr>
<tr>
<td>The Bars option makes Visualization show evenly-spaced bars to represent the data.</td>
<td>Bars (default)</td>
</tr>
<tr>
<td>The Line view makes Visualization show the data as an unbroken line with peaks and valleys, representing increases and decreases in the amount of data over time.</td>
<td>Line</td>
</tr>
</tbody>
</table>

Changing the Theme of Visualization

You can modify the appearance of the Visualization windows. You can choose from nine different color schemes.

To change the theme of Visualization

1. In the Case Manager, click Tools > Preferences.
2. In the Preferences dialog, under Theme to use for Visualization, choose from the following:
   - Office Blue (default)
   - Metro
   - Office Black
   - Office Silver
   - Vista
   - Windows 7
   - Summer
   - Expression Dark
   - Transparent
Visualizing File Data

The file data dashboard lets you view bar graphs, pie charts, and details about the files in the data set.

When visualizing files data, you can do the following:

- Configuring Visualization File Dates (page 412)
- Visualizing File Extension Distribution (page 413)
- Visualizing File Category Distribution (page 415)
- Using the File Data List (page 416)

**Configuring Visualization File Dates**

When you view file data in the Visualization page, you can view data based on the following file data:

- Created date
- Modified date
- Last accessed date

If a file contains a Created date but not a Modified date, and you change the pane to display the file by Modified date, the file is no longer displayed in the visualization pane.

If a file’s Created date, Modified date, or Last Accessed date is prior to the year 1985, visualization displays a dialog box. The dialog box asks you if you want to include the files with these dates in the visualization display. If you select the option to *Do not ask me again*, Visualization will remember your preference the next time the dates precede 1985.
Configuring the file date type

1. On the Visualization page, click the file date type drop-down menu.
2. By default, it displays the Created setting.
3. Select Created, Modified, or Last Accessed.

Visualizing File Extension Distribution

The extension distribution chart lets you view the data for the selected date range.

You can view selected data by the following ways:

- File extension counts
- File sizes

File counts and sizes are rounded to two decimal places. You can select a bar in the extension distribution chart to further refine the data that is displayed in the file data list.

You can select an extension in the legend to select or un-select extensions.
File Extension Distribution Pane
Visualizing File Category Distribution

The category distribution chart displays a pie chart of the data set. It is organized according to the categories of the Overview tab and displays the percentages of each category in the data set. The percentages are displayed as the nearest whole number. For example: 10%. However, if a section in a category represents less than 1 whole percent, then the percentage is displayed to the hundredth percent. For example, 56%.

Visualization Category Distribution Chart

If several categories are displayed very closely together, they may overlap and it can be difficult to read the percentages. You can click the Show Connectors option to expand the percentages further from the pie chart and include a connecting line to the pie section that correlates to the percentage.

You can select a category in the pie chart to further refine that data that is displayed in the file data list.
Using the File Data List

The file data list displays detail about the files in the data set. The pane is similar to the File List pane in the Examiner interface. The information that is displayed in the file data list is generated based on the data that you refine through the use of the timeline pane, the file extension distribution chart, and the categories distribution chart.

Visualization File Data List

Within the file data list you can sort, group, and sub-group, items according to columns including; ID, Name, Category, Date, and Size. To sort, drag and drop the desired column heading onto the blue bar. Any column heading that includes a filter icon can be used to sort the file list data set.
**Important:** If you want to filter for a specific date, include the day of and the day after. The filter uses midnight as the time frame. So if you only want files with a date of January 27, 2013, include January 27 and Jan 28. That will include files from midnight on the 27th to midnight on the 28th.

You can perform several actions on selecting the files and then clicking the **Mark Selected Items** button.

You can do the following:

- Label the item
- Create a bookmark from the item
- Clear a check mark if you have checked it.
- Check the item.

You can use the Filter icon on any of the column headings to create custom filters in the file details list.

**Note:** You can filter and sort by file sizes such as bytes, KB, and MB. However, note that when you enter an operator to filter by size, you must enter the size according to its byte value. You cannot enter the value in KB or MB. For example, instead of entering 100 KB, you must enter 102400 for the filter to work properly.
File Data List Filtering Tool

- Frodbaggi.dm.rdf
- Frodbaggi.invite.rdf
- frodo baggins@2o7[2].txt
- frodo baggins@ads.monster[1].txt
- frodo baggins@ads.pointroll[2].txt
- frodo baggins@adserver.theonering[2].txt
- frodo baggins@advertising[1].txt
- frodo baggins@aim[1].txt
- frodo baggins@aimtoday.aol[1].txt
- frodo baggins@amazon[2].txt
- frodo baggins@aol[1].txt
- frodo_baggin@samshff1.txt

Show rows with value that

Is equal to

And

Is equal to

Filter  Clear Filter
Visualizing Email Data

The email visualization dashboard consists of the following items:

- **Email Time Line**
  See Narrowing the Scope with the Email Time Line on page 419.

- **Mail Statistics Graph**
  See Viewing Mail Statistics on page 421.

- **Email Details List**
  See Using the Email Details List on page 421.

- **Social Analyzer Chart**
  See Using Visualization Social Analyzer on page 434.

### Narrowing the Scope with the Email Time Line

The time line provides an aggregate view of email items sent and received in the data set. You can scale and refocus the scope of the time line to a specific data range. You can change the scope and scale of the data set by adjusting the gray slider tool. You can change the focus of the data set by adjusting the blue slider tool.

**Visualization Email Date Pane**
Using History Items in the Email Time Line

In the Email Visualization pane, when you alter the selection in the time line, a history item, also called a “bread crumb,” is added to the top of the time line. Each history item is labeled according to the date range that you have selected in the time line. You can use these history items to move forward or backward through different views that you have created.

Visualization History Items
**Viewing Mail Statistics**

The mail statistics graph displays the sent and received mail statistics in a bar chart. The data contained within the date range, in the email time line, determines the data that is displayed in the mail statistics graph.

You can select a bar in the statistics graph to further refine the data that is displayed below in the Email details list.

**Visualization Mail Statistics Chart**

![Email Visualization Chart]

**Using the Email Details List**

The email details list displays custodian-level sent and received statistics for email items. The list contains a column for the custodian's name, a column for the custodian's sent mail, and a column for the custodian's received mail.

You can sort group and subgroup the emails according to the columns including: *Sender, Address, Traffic Count, Sent Mail, and Received Mail*. To group the list of emails, you can drag and drop the column headers onto the table heading of the details list. The list sorts first by the first columns that you drop, and then in the order of any preceding columns that you drop into the table heading.

**Visualization Email Details List**

![Email Details List]

<table>
<thead>
<tr>
<th>Display Name</th>
<th>Email Address</th>
<th>Traffic Count</th>
<th>Sent</th>
<th>Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Outlook Express Team</td>
<td><a href="mailto:msw@microsoft.com">msw@microsoft.com</a></td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Natalie Davy</td>
<td><a href="mailto:natalie@mssdata.com">natalie@mssdata.com</a></td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Outlook 2007 Team</td>
<td><a href="mailto:alba@microsoft.com">alba@microsoft.com</a></td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Comcast Online Communications</td>
<td><a href="mailto:online.communications@comcast.net">online.communications@comcast.net</a></td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Sarnie Gargant</td>
<td><a href="mailto:sarniegargant@hotmail.com">sarniegargant@hotmail.com</a></td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Sarnie Gargant</td>
<td><a href="mailto:sarniegargant@yahoo.com">sarniegargant@yahoo.com</a></td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Sarnie Gargant</td>
<td><a href="mailto:sarniegargant@hotmail.com">sarniegargant@hotmail.com</a></td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>
You can use the Filter icon on any of the column headings to create filters in the Email Details List.

When you select the Filter icon, a filter dialog is displayed that lets you select items that apply to the column and add filtering expressions.

**Email Details List Filtering Tool**

In visualization, Email addresses that are similar but not exactly the same are displayed as two different addresses, even though they may be the same address. For example, the quotation marks for ‘John Doe’ and “John Doe” are not the same. These slight changes in text can happen from different email servers/software during email transit, and the program cannot discern duplicate email addresses.
If an email item is sent to multiple recipients, it is counted as a single item in the email details pane. In the Traffic Details chart, you can see when the same email was sent to multiple recipients. To view specific information about the recipients of that email item, you can click the Traffic Details button.

You can check specific emails in the examiner from the email details list by selecting the emails and then choosing one of the Check Selected Items options, Sent, Received, or Both.

When you expand a specific email item, you can run additional functionality. This functionality includes the Social Analyzer chart. The buttons to open the Social Analyzer chart are located on the right side of a custodian’s email item in the list.

For more information see the following:
Using Visualization Social Analyzer (page 434)

Analyzing Email Domains in Visualization

Once you have you opened the Social Analyzer pane, you can isolate and examine individual email domains.

**Note:** Social Analyzer is very graphics-intensive. In order to avoid server issues, you should cull the data with facets and other filters to isolate the information that you want to examine before viewing it in Social Analyzer.

To analyze email domains in Visualization mode

1. Open Social Analyzer.
2. Click the domain bubbles to select the domain(s) that you want to view.
3. (optional) If you want to view the top ten domains in terms of received emails. click . Each time you click this icon, the next top ten bubbles will be selected, and so forth.
4. (optional) You can zoom in and zoom out of the Social Analyzer panel. If you hover over a domain bubble, the full display name and address, as well as the count, is displayed in the tool tip.
5. You can expand selected email domains and examine individual emails in a domain. See Analyzing Individual Emails in Visualization on page 423.

Analyzing Individual Emails in Visualization

You can expand email domains to display individual emails and the traffic between those emails.

To analyze individual emails within selected email domains

1. Open Social Analyzer.
2. Click the domain bubbles to select the domain(s) that you want to view.
3. (optional) If you want to view the top ten domains in terms of received emails. click . Each time you click this icon, the next top ten bubbles will be selected, and so forth.
4. (optional) You can zoom in and zoom out of the Social Analyzer panel. If you hover over a domain bubble, the full DisplayName and address, as well as the count, will be displayed in the tool tip.

5. Click 🔍 to expand the domain names to display the individual emails.

Posting Email Results Back to the Examiner

After you have identified emails that are relevant to your investigation, you can post them back to the Examiner for further review. For example, you may drill down to an certain individual that had sent 25 emails to various domains. You can do the following:

- Add the 25 emails to a Label
- Add the 25 emails to a Bookmark
- Check the 25 emails in the File List
- Clear all other checked emails in the File List and check only these 25 emails.

To post email results

1. In the Social Analyzer, identify emails that you want to post.
2. Click Post Results Back.
3. Select the desired option.
About the Detailed Visualization Time Line

You can use the Detailed view of the visualization time line to get a more granular view of the files and emails in your data set. This helps you use the time line to identify the files and emails that are important in your investigation. The detailed view provides the following time bands that you can turn on or off to get a more or less granular view of the files:

- Years
- Months
- Days
- Hours
- Minutes
- Seconds
- Milliseconds

Different file types are represented by different colors to assist in identifying relevant files.
Using the Detailed Visualization Time Line

You can use the Detailed view of the time line to get a more granular view of the files and emails in your specified time line. You can change the Time Line View option to switch between the Basic view and the Detailed view.

**Important:** Before you launch the Detailed time line view, you must specify a base time line in the basic view that includes the data that you want to look at. Otherwise, you will only be able to see the files that are in the default base time line.

See About the Base Time Line on page 408.

**To use the detailed visualization time line**

1. Select a data set that you want to view.
2. Launch the visualization panel.
   See Launching Visualization on page 406.
3. Specify the base time line for the data that you want to view.
   See Setting the Base Time Line on page 410.
4. For the Time Line View, click Detailed.

**Understanding How Data is Represented in the Detailed Time Line**

In the detailed view, each file, or group of files, is represented with a flag with a circle. Each flag displays the file’s name, item number, category, size, and date. If you click a flag, the item it represents is selected in the file list pane at the bottom of the visualization interface.

The color of each flag and circle represents the type of data. For example, the color blue represents Graphics files. To the right of the time line, there is a Legend that displays what each color represents.

The span of the files depends on the base time line that you selected previously in the basic view.

See Setting the Base Time Line on page 410.
About Time Bands

If several items fall within a particular time frame, it can be difficult to see all of them. This is because their flags can overlap in the limited amount of interface space that is available.

You can manipulate the time line by giving the time line a greater or less granular view by using different time bands. You can use one or more of the following time bands to change your view:

- Years
- Months
- Days
- Hours
- Minutes
- Seconds
- Milliseconds

When you first open visualization, it will determine which time bands to enable based on the date range of the base time line.

You can choose to display or hide a time band. The bands are displayed at the bottom of the time line. The more time bands that you turn on, the more granular the data becomes.
For example, suppose you turn on the Year, Month, and Day time bands.

The Year time band is on the bottom, with the Month time band above that, and the Days time band (1-31) is above that. There are green dots in the bands. The green dots represent files or groups of files. Also in the example, there is a box in the center of the bands. That box is the view window. The view window is always in the center of the time line. You will only see the files that are in the view window. You can slide the time line to the left and right to place files into the view window.

If there are large clusters of files, you can turn on more time bands to get a more granular view of the files.
Modifying the Time Line Using Time Bands and Zoom

You can select different time bands to get a greater or less granular view of your data.

To change the time bands of the detailed time line

1. To display or hide a time band, in the top left corner, click a band to toggle it on or off.
   When a band is on, it is shadowed with a dark box.
   Be aware that when you change time bands, the focus box of that time band will be centered in the time line, and there may not be any files in the focus area. You will need to slide the time line to put the green dots back into the focus area.
2. Slide the time line to place the data in the view window.
   You can do one of the following options:
   • Click the right or left arrows in the upper-right corner.
   • Click the time line and drag it left or right.
   • Use the mouse scroll wheel to move it left or right.
3. You can also use the Zoom In and Zoom Out buttons (top-right corner) to modify the view.
   The zoom feature does not change the time bands or the selected date range. It simply displays more or less of the data.

Understanding How Grouping Works in the Detailed Visualization Time Line

If there are more than 500 items that all within a particular time period, the items are grouped together under a single grouped flag that represents all of the items. Grouping helps you to still use the detailed time line without having to view an overwhelming amount of data flags in a small amount of space.

You can have the data grouped by the following two methods:

• Selected Time - (Default) Items are grouped by a specific time period, for example Days. For example, you could have 25 items on the 5th, 200 items on the 6th, and 1100 items on the 7th. There would be a single group for each day.
• Fixed Number - Items are grouped into by a maximum group size of 500. Using the previous example, if there were 1325 total items, they would displayed in three groups of 441 files.

The group flag includes a Details button. Click the Details button to display a list of all of the items that are grouped under that flag.

You can also click a group to get a more granular view of the files in the group. When you click a group additional time bands are enabled to give you a more detailed view.

Be aware that multiple flags may be staked vertically. You may need to make the time line pane taller by dragging the bottom border of the pane down.
Example of grouping
Visualizing Internet Browser History Data

You can view internet browser history files in the detailed visualization timeline. You can view browser history from the following browsers:

- Internet Explorer
- Firefox
- Chrome
- Safari
- Opera

In order to view internet browsing history files in the detailed visualization timeline, you must first process the browser history files. By default, the option to process browser history files is disabled. You must enable the Process Internet Browser History for Visualization option in either the processing options or additional analysis options.

See Evidence Processing Options on page 81.

See Using Additional Analysis on page 133.

To view internet browser history files in the detailed visualization timeline

1. If you have browser history files, in the File List Overview tab, browse to File Category > Internet Chat Files > browser name > History.
2. Right-click one or more browser history files and select Visualize Browser History...

View browser history files from only one manufacturer at a time.

If the Visualize Browser History... option is grayed-out, then either the file has not been processed with the Process Internet Browser History for Visualization option enabled, or the file type is not supported.

If it is a supported file, the detailed visualization timeline is opened.

You may need to adjust the blue selection box to include the data that you want to see.

For information on viewing the visualization timeline, see About the Visualization page (page 407).

Visualizing Other Data

You can process specific file types so that they can be viewed in the visualization timeline.

- EVTX files - See Viewing Data in Windows XML Event Log (EVTX) Files (page 323)
- IIS Log files - See Viewing IIS Log File Data (page 325)
- Registry data files - See Viewing Registry Timeline Data (page 327)
- CSV files that are in the Log2Timeline format - See Viewing Log2Timeline CSV File Data (page 329)
Chapter 32
Using Visualization Heatmap

Heatmap allows you to view a visual representation of file categories and file volume within a project. Information displays in a grid comprised of squares of different colors and sizes. Each color represents a different file category, and the relative size of the square represents the file volume within the category. You can view each file category for more details about the files within that category (similar to a file tree) and navigate between file categories.

You can also switch between viewing the file volume by the physical size of each file and the file count. This allows you to see any discrepancies in the size of the files. For example, if someone were trying to hide a file by renaming the file extension, you could easily see the size discrepancy in the heatmap, and then investigate that particular file further.

To access Heatmap
1. In FTK, do the following:
   1a. Open the Examiner.
   1b. In the File List panel, click (Heatmap).
2. In Summation, Resolution1 eDiscovery, Resolution1 CyberSecurity, or Resolution1, do the following:
   2a. Click Project Review.
   2b. In the Item List panel, click Options > Visualization > Heatmap.

Heatmap Panel
Heatmap Options Panel

The following table defines the tasks from the **Heatmap** panel.

### Heatmap Panel Options

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![X Icon]</td>
<td>Cancels the heatmap filters and exits out of Visualization.</td>
</tr>
<tr>
<td>![Checkmark Icon]</td>
<td>Apply the visualization graph filters to the <em>Item List</em> grid. Once applied, only those items filtered with visualization appear in the <em>Item List</em> grid.</td>
</tr>
</tbody>
</table>

**Options**

**Category**
- Files - Allows you to view files by the file category. You can view the files in each category:
  - By double-clicking that particular file category’s square, or
  - By clicking the menu from the upper left side and choosing the file category that you want to view in the heatmap.
- Folders - Allows you to view files by the folders contained within the project. You can view the files in each folder:
  - By double-clicking that particular folder’s square.
  - By clicking the menu from the upper left side and choosing the folder that you want to view in the heatmap.
- Extensions - Allows you to view files by the file extension.

**Metric**
- By Size - Allows you to view file types by size of the files. The larger the files, the larger the represented square in the heatmap.
- By Count - Allows you to view file types by quantity. The more files of a particular type that are in the project, the larger the represented square in the heatmap.
Chapter 33
Using Visualization Social Analyzer

About Social Analyzer

The Social Analyzer shows a visual representation of email volume contained in the data set. Social Analyzer will display all of the email domains in a project, as well as individual email addresses within the email domains.

The Social Analyzer map displays emails in the data set group by domain name. These domain names appear on the map in circles called “bubbles.” The larger the bubble, the more emails are contained within that domain. The bubbles in the map are arranged in a larger sphere according to how many emails were sent to that domain. The center bubble in the sphere will have the most emails sent from this domain, while domains radiating clockwise from the center will have fewer and fewer emails in their domain bubble. If you want to examine email domains with the most sent emails, concentrate on examining the bubbles in the center of the map.

Email data in the Social Analyzer map can be examined on two different levels. On the first level, you can get an overall view of communications between domains. You can then select domains that you want to examine in a
more detailed view and expand those domains to view communications between specific email addresses from the domain. For example, if you search for high email traffic between two domains, you can see which two domains have the highest amount of traffic between them. Select the two domains, and expand them to view the email traffic between individual users from those two selected domains.

See Analyzing Email Domains in Visualization on page 438.
See Analyzing Individual Emails in Visualization on page 438.

Elements of the Social Analyzer Map

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Map Image]</td>
<td>This map presents the overall view of the social analyzer data. The orange rectangle indicates the area displayed in the main social analyzer map. Black dots in the overall view show domains that are either selected or communicating. You can either expand or collapse the overall view by clicking on the triangle in the upper right corner.</td>
</tr>
<tr>
<td>![Domain Bubble Image]</td>
<td>When you select a domain bubble, it is surrounded by a colored double ring. The ring may be colored blue, black, purple, or red. The different colors allow you to distinguish between different selected domains, but they do not have any significant meaning.</td>
</tr>
<tr>
<td>![Domain Bubble Image]</td>
<td>Domain bubbles that are not selected, but have sent emails to the selected domain bubble, are surrounded by a single colored ring that is the same color as the selected domain bubble. This allows you to easily tell which domains have been communicating with the selected domain bubble. Domain bubbles that do not connect to any selected domains are greyed out.</td>
</tr>
<tr>
<td>![Line Image]</td>
<td>Lines connect other domain bubbles to the selected domain bubble. These lines represent emails sent to the selected domain from other domains. The more emails that have been sent to the domain, the thicker the line between domain bubbles are. You can also see emails sent from the selected domain. Select Show Reversed Connections in the Social Analyzer panel to show visual representations of emails sent from the selected domain.</td>
</tr>
<tr>
<td>![Ring Image]</td>
<td>A domain bubble with an orange ring indicates that a domain has been connected to from another domain multiple times. This allows you to pinpoint domains that have heavy communication between them.</td>
</tr>
</tbody>
</table>
**Accessing Social Analyzer**

To navigate throughout the Social Analyzer pane, click and drag inside the pane. Hover over an email domain bubble to view the total number of emails that were sent from the domain.

**Note:** Expansion of large datasets may result in slow server speeds and slow rendering the Social Analyzer visualization data.

**To access Social Analyzer**

1. Click **Project Review**.
2. In the *Item List* panel, click **Options > Visualization > Social Analyzer**.

**Social Analyzer Options Panel**

![Social Analyzer Options Panel](image-url)
# Social Analyzer Options

The following table identifies the tasks that you can perform from the Social Analyzer panel.

## Social Analyzer Options

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Apply Visualization" /></td>
<td>Applies the visualization graph filters to the Item List grid. Once applied, only those items filtered with visualization will appear in the Item List grid.</td>
</tr>
<tr>
<td><img src="image" alt="Cancel Visualization" /></td>
<td>Cancels the visualization graph filters and exits out of Visualization.</td>
</tr>
<tr>
<td><img src="image" alt="Refresh" /></td>
<td>Refreshes the Social Analyzer pane.</td>
</tr>
<tr>
<td><img src="image" alt="Clear Selections" /></td>
<td>Clears the selected bubbles in the Social Analyzer pane.</td>
</tr>
<tr>
<td><img src="image" alt="Select Most Connected Items" /></td>
<td>Selects the ten bubbles that have been most connected to in the Social Analyzer pane. Each time you click this icon, the next top ten bubbles will be selected, and so forth.</td>
</tr>
<tr>
<td><img src="image" alt="Expand Selected Domains" /></td>
<td>Expands selected domains in the Social Analyzer pane. You can drill down to a second level to examine the email data. See Analyzing Individual Emails in Visualization on page 438.</td>
</tr>
<tr>
<td><img src="image" alt="Zoom In" /></td>
<td>Zooms into the Social Analyzer pane. If you are unable to view the social analyzer data, click Zoom In to locate the data. You can also zoom in by expanding the slider bar located at the bottom of the Social Analyzer pane, by using the + key on the keyboard, or by scrolling the mouse wheel up.</td>
</tr>
<tr>
<td><img src="image" alt="Zoom Out" /></td>
<td>Zooms out of the Social Analyzer pane. You can also zoom out by expanding the slider bar located at the bottom of the Social Analyzer pane, by using the - key on the keyboard, or by scrolling the mouse wheel down.</td>
</tr>
<tr>
<td><img src="image" alt="Map Expander" /></td>
<td>Expands and collapses the overall map of the data set. Dots that appear in black in the overall map are domains/emails that are connected to the selected domain/email. The orange rectangle on the map shows where the expanded location is on the map.</td>
</tr>
</tbody>
</table>
Analyzing Email Domains in Visualization

Once you have opened the Social Analyzer pane, you can isolate and examine individual email domains.

Note: Social Analyzer is very graphics-intensive. In order to avoid server issues, you should cull the data with facets and other filters to isolate the information that you want to examine before viewing it in Social Analyzer.

To analyze email domains in Visualization mode

1. Click Project Review.
2. In the Item List panel, click Options > Visualization > Social Analyzer.
3. Click the domain bubbles to select the domain(s) that you want to view.
4. (optional) If you want to view the top ten domains in terms of received emails, click . Each time you click this icon, the next top ten bubbles will be selected, and so forth.
5. (optional) You can zoom in and zoom out of the Social Analyzer panel. If you hover over a domain bubble, the full display name and address, as well as the count, is displayed in the tool tip.
6. You can expand selected email domains and examine individual emails in a domain. See Analyzing Individual Emails in Visualization on page 438.

Analyzing Individual Emails in Visualization

You can expand email domains to display individual emails and the traffic between those emails.
To analyze individual emails within selected email domains

1. Click **Project Review**.
2. In the *Item List* panel, select **Options > Visualization > Social Analyzer**.
3. Click the domain bubbles to select the domain(s) that you want to view.
4. (Optional) If you want to view the top ten domains in terms of received emails, click 🌟. Each time you click this icon, the next top ten bubbles will be selected, and so forth.
5. (Optional) You can zoom in and zoom out of the Social Analyzer panel. If you hover over a domain bubble, the full DisplayName and address, as well as the count, will be displayed in the tool tip.
6. Click ✉️ to expand the domain names to display the individual emails.
Chapter 34
Using Visualization Geolocation

About Geolocation Visualization

Geolocation allows you to view a map with real-world geographic location of evidence items that have geolocation information associated with them. This lets you understand where certain activities/actions took place.

See Using Visualization on page 482.

For example, if you have photos in the evidence that have GPS data in the EXIF data, you can see where those photos were taken. For volatile/RAM data, you can see the lines of communication (both sent and received) between addresses, showing the location of all parties involved.

Geolocation supports the following data types:

- Photos with GPS information in the EXIF data.
- Live email sender and receiver IP data gathered using a Volatile Job in AD Resolution1 CyberSecurity and AD Resolution1.
- Email sender and receiver IP data gathered using a Network Acquisition Job in AD Resolution1 CyberSecurity and AD Resolution1. Because the data is gathered from Sentinel, the data displayed shows a snapshot of the traffic at the time that Sentinel captured the data.

Note: Geolocation IP address data may take up to eight minutes to generate, depending upon other jobs currently running in the application.

Geolocation Components

Geolocation includes the following components:

- Maps
  When viewing geolocation data, you can use any of the three following maps:
  - MapQuest Streets
  - MapQuest Satellite
  - OpenStreetMaps

  You have the option to switch between the three map views while in the Geolocation filter.

- Geolocation Grid
  Below the map, you can view a grid that shows details about the items in the map.

See Using the Geolocation Grid on page 446.
• Geolocation Data in columns in the Item List
  You can view geolocation data for files in the Item List.
  See Using Geolocation Columns in the Item List on page 447.

• Geolocation Facets
  There are specific facets for filtering on Geolocation data.
  See Using Geolocation Facets on page 448.

**Geolocation Workflow**

When you launch Geolocation, it will display all relevant files currently in the item list. You can cull the data using filters and other tools in the item list to limit the data that is displayed in geolocation.

**General Geolocation Requirements**

As a prerequisite, you must have the following:

• Access to a KFF Service Server.
  - The KFF Server can be installed on the same computer as the AccessData software or on a separate computer.
  - KFF Geolocation Data. This must be installed on the KFF Server.
    See Getting Started with KFF in the Admin Guide.

• Internet access to view web-based maps.
  - You can download the offline maps for Geolocation. Use the link Geolocation Map for Offline Use and Geolocation Map for Offline ReadMe on the FTK Product download page:

• For AD Resolution1 Platform and AD Resolution1 CyberSecurity:
  - The Geolocation option selected when processing the evidence. This option allows the data to display properly in the Geolocation filter. Geolocation is selected by default when evidence is processed. Default Evidence Processing Options (page 80)

• For FTK, FTK Pro, Lab, and Enterprise:
  - The File Signature Analysis option selected when processing the evidence.

**Viewing Geolocation EXIF Data**

When your evidence has photos with GPS information in the EXIF data, you can view photo locations.

**To view EXIF data in FTK**

1. In FTK, open the Examiner.

2. In the File List panel, click 🛫 (Geolocation).

3. You can filter the items displayed and see item details..
   See Using the Geolocation Grid on page 446.
To view EXIF data in Summation or Resolution1 products

1. Click **Project Review**.

2. In the **Item List** panel, click **Options > Visualization > Geolocation**.

3. You can filter the items displayed and see item details.

   See [Using the Geolocation Grid on page 446](#).

![Geolocation Panel - EXIF data](image)

---

Using Visualization Geolocation

Viewing Geolocation EXIF Data | 442
Using Geolocation Tools

The Geolocation Map Panel

Points of data in a particular area on the map are represented by large dots called clusters. The number on each cluster show how many points of data (known as pins) are represented by the cluster. Clicking a particular cluster on the map zooms in on a group of pins.

The general location of the clusters are determined by a central point on the map. The clusters radiate from this central point. When you zoom in and out of the map, your central point on the map moves as well, and clusters will shift position on the map. However, as you zoom into a cluster, the cluster rendered will more closely align itself with the location of the individual pins.

When viewing IP data, the connections between two pins display on the map as lines between clusters/pins. The width of the lines represent the amount of traffic between two IP address. The thicker the lines, the more traffic has occurred. Green lines represent traffic originating from the pin and red lines represent traffic entering the pin.

When you select a cluster and zoom in on a particular pin, you can select one or more pins. When a pin is selected, the outline and shadow of the selected pin turns orange. If you zoom out of the map, the cluster with one or more selected pins has an orange ring.

Hovering over the cluster displays the following icons:

- ![Select All](image) Selects all of the pins in a cluster.
- ![Clear Selection](image) Clears all of the selected pins in a cluster.

The following table describes the Geolocation panel options.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Select All" /></td>
<td>After filtering data by selecting one or more pins, this applies the selected geolocations to the Item List grid. Once applied, only those geolocations filtered with visualization appear in the Item List grid. For network data, you will see any communication from those pins to any other location. This may include one or more items. If you enter the Geolocation view again, only those geolocation will be displayed in the map. To reset the items in the Item List, click the Project Explorer’s Reset and Apply icons.</td>
</tr>
</tbody>
</table>

The following table describes the Geolocation panel options.
Using Visualization Geolocation

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Checkmark icon" /></td>
<td>(Network Acquisition Job data from Resolution1 CyberSecurity or Resolution1 only) After filtering data by selecting one or more pins, this applies the selected geolocations to the Item List grid. Once applied, only those geolocations filtered with visualization appear in the Item List grid. This applies only the connections between the selected pins. As a result, it shows the communication between only the selected pins and not to other locations. This may include one or more items. If you enter the Geolocation view again, only those geolocations will be displayed in the map. To reset the items in the Item List, click the Project Explorer’s Reset and Apply icons.</td>
</tr>
<tr>
<td><img src="image" alt="Trash icon" /></td>
<td>Cancels the geolocation filters and exits out of Visualization.</td>
</tr>
<tr>
<td>Pins displayed</td>
<td>Shows the number of spins that are displayed and the number selected.</td>
</tr>
<tr>
<td>Clear</td>
<td>Clears and selected pins.</td>
</tr>
<tr>
<td>Options</td>
<td>Displays the number of pins selected in the map versus the number of pins available in the data.</td>
</tr>
<tr>
<td><img src="image" alt="Map tab icon" /></td>
<td>Choose which map to display in the Geolocation filter.</td>
</tr>
<tr>
<td><img src="image" alt="Expand collapse icon" /></td>
<td>Expands or collapses the overall view map.</td>
</tr>
<tr>
<td><img src="image" alt="Latitude longitude icon" /></td>
<td>Displays the latitude and longitude where the mouse pointer resides. To view the position of a particular pin, hover the mouse over the pin. To view the exact coordinates of the pin, select the pin and right-click.</td>
</tr>
<tr>
<td><img src="image" alt="Connections on/off icon" /></td>
<td>Turns the connections between the pins/clusters either on or off.</td>
</tr>
<tr>
<td><img src="image" alt="Display all pins icon" /></td>
<td>Displays all of the pins on the map.</td>
</tr>
<tr>
<td><img src="image" alt="Zoom in/out icon" /></td>
<td>Zooms in or out on the map. A slide bar displays, allowing you to control the zoom feature.</td>
</tr>
<tr>
<td>View All/View Selected</td>
<td>Displays either EXIF data or network connection data. You can also view both types of data at the same time.</td>
</tr>
</tbody>
</table>

Right-clicking a pin displays more information about the pin.
In the pin dialog, you can:

- Add any notes
- View the exact coordinates and status of the pin
- View the IP Address of the pin

**Note:** To save processing time and to ensure data accuracy, the host name does not populate in the Geolocation pin. However, the host name does populate in the Item List.

- Change the color and shape of the pin

If you make any changes to the pin, a warning icon 🔄 displays that notifies you that changes were made to the pin and need to be saved. You can do the following in the pin dialog:

- Click 🔄 to save the changes that you have made to the pin
- Click 🔄 to reset the pin. If changes have been saved previously to the pin, this action resets the pin to the saved version
- Click ✗ to close the dialog
Using the Geolocation Grid

When you open Geolocation, you can view a grid that shows details of the items on the map.

The Geolocation Grid has two tabs:

- **Network Communication:**
  
  In Resolution1 CyberSecurity and Resolution1, this shows network acquisition and volatile data from security jobs.
  
  In FTK, this show data from the **Volatile** tab.
  
  You can see the following:
  
  - Process Start Time column
  - Machine column
  - Process Name column
  - Path column
  - Host Name column
  - Bar chart (Resolution1 CyberSecurity and Resolution1 only)

  - Within the **Network Communication** tab, you can also view a bar chart that shows the count of items sorted by either Process Name or by Machine (computer IP address).

- **Exif:** This shows the following Exif data from photos
  
  - Capture Data column
  - File Name column
  - File Size Coordinate column

When you click an item in the grid, the map will be centered to reflect the location of the selected item.

You can minimize the grid so that the whole map is visible.

Filtering Items in the Geolocation Grid

When you first launch Geolocation, all of the items on the map are shown in the grid.

You can filter the contents of the grid in the following ways.

- In the map, if you select a pin, only that item is displayed. You can click (and select) multiple pins.

- In the map, if you right-click a cluster and click 🌟, that selects all of the pins in a cluster. This will filter the grid to those clustered pins. You can add multiple clusters to the grid.

- In the grid, the columns in the Geolocation Grid can be filtered to cull the items in the grid. For Network Communication data, the data in the bar chart is filtered as well when columns are filtered.
Using Geolocation Columns in the Item List

The data that the Geolocation filter uses to render the information is also available in columns in the Item List. You can find the following columns in the Item List, depending upon the data that has been collected. These columns can be sorted and filtered.

Data for geolocation columns require that the KFF Geolocation Data be installed.

See General Geolocation Requirements on page 441.

Geolocation EXIF Data Columns

When your evidence has photos with GPS information in the EXIF data, you can view data using the following columns.

Geolocation Columns: EXIF data

<table>
<thead>
<tr>
<th>Column</th>
<th>Display name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geotagged Area Code:</td>
<td>Area Code</td>
<td>Area code location of geotagged photo or object.</td>
</tr>
<tr>
<td>Geotagged City:</td>
<td>City</td>
<td>City location of geotagged photo or object.</td>
</tr>
<tr>
<td>Geotagged Country Code:</td>
<td>Country Code:</td>
<td>ISO country code location of geotagged photo or object, such as USA, FRA, MEX, HKG, and EST.</td>
</tr>
<tr>
<td>Geotagged Direction:</td>
<td>Direction</td>
<td>Direction geotagged photo or object.</td>
</tr>
<tr>
<td>Geotagged Latitude:</td>
<td>Latitude</td>
<td>Latitude of geotagged photo or object.</td>
</tr>
<tr>
<td>Geotagged Longitude:</td>
<td>Longitude</td>
<td>Longitude of geotagged photo or object.</td>
</tr>
<tr>
<td>Geotagged Postal Code:</td>
<td>Postal Code</td>
<td>Postal code of geotagged photo or object.</td>
</tr>
<tr>
<td>Geotagged Region:</td>
<td>Region</td>
<td>Regional or State location of geotagged photo or object, such as NY, DC, IL, FL, and UT.</td>
</tr>
<tr>
<td>Geotagged Source:</td>
<td>Source</td>
<td>Source used to resolve geotagged GPS location to locality information.</td>
</tr>
</tbody>
</table>
Using Geolocation Column Templates

When using AD Forensics products, you can use the following Column Templates to help you quickly display Geolocation-based columns in the File List:

- **Geolocation** - Displays all available Geolocation columns.
- **GeoEXIF** - Displays all columns that contain EXIF-related Geolocation data.
- **GeoIP** - Displays all columns that contain IP-related Geolocation data.

Using Geolocation Facets

When using Summation, or Resolution1 products, you can also use facets to cull data based on Geolocation data.

See Geolocation Facet Category on page 471.
Using Geolocation Visualization to View Security Data

You can use geolocation to view IP location data to discover where in the world a computer is communicating. You can view IP locations data when using one of the following products:

- AD Resolution1 CyberSecurity and AD Resolution1 Platform, after running either a Volatile Job or a Network Acquisition Job
- AD Forensics products, after gathering Volatile data

The Geolocation view will display lines that trace internet traffic sent and received between IP addresses, indicating the physical location of all parties involved. You can drill into geographic regions to see multiple evidence items. You can then select specific data to post back to the case, where they can view information in the examiner or include it in reports.

**Geolocation Panel - IP Locations To view IP data in Geolocation viewer**

Note: For data collected by Geolocation Visualization, the To Domain Name, To ISP, To Netspeed, and To Organization columns do not populate in the Item Grid. If you require this data, you need to purchase a MaxMind Premier database license.

### Prerequisites for Using Geolocation Visualization to View Security Data

- For FTK, Enterprise, AD Resolution1 Platform, and AD Resolution1 CyberSecurity:
  - For examining network acquisition and volatile data, enable the Geolocation option in the Web Config file. To enable this option, contact AccessData’s support.
  - Also for examining network acquisition and volatile data, you need to generate a text file of your IP locations and place the text file in the GeoData directory. Configuring the Geolocation Location Configuration File (page 449)

### Configuring the Geolocation Location Configuration File

When working with network acquisition and volatile data, some data may come from a private network where the physical location of the IP address is not known. For example, you may need to provide the location of your own network and any satellite offices that you interact with.

Normally you would start with block of IPs in your local network.
To set this information, you need to populate a configuration file for the KFF server.

The filename is iplocations.txt.

You can configure this file in one of two ways:

- Using the Management page > System Configuration > Geolocation page.
- Configuring the file manually

If you have already manually created this file, you will see the information in the configuration page interface.

### Using the Geolocation Configuration Page

1. In the console, click Management > System Configuration > Geolocation

2. Click + to add an item.

3. Fill in the location data.
   - See sample data below. You can get latitude longitude data for an area from Google maps.
   - Any data you save here is saved in the configuration file.

**Important:** Any time you save new data, the KFF Service is automatically restarted. This can affect running KFF jobs.

### Configuring the Location Configuration File Manually

You can manually create and edit the iplocations.txt text file for the KFF server. It has the following requirements:

- The text file needs to be saved with the filename iplocations.txt.
- The IP addresses must be written in CIDR format and need to be IPv4 addresses.
- Each comment line in the file must start with the character #. List only one address/network per line.
- The network line must contain the following information in the following order: address (in CIDR format), Id, CountryCode, CountryCode3, CountryName, Region, City, PostalCode, Latitude, Longitude, MetroCode, AreaCode, ContinentCode, Source.
- The iplocations.txt file must be placed in the Geodata folder of the kffdata folder on the server.

The following is an example of an iplocations.txt file:

```
#this file goes in the <kffdata>
#192.168.0.0/24,1,,USA,United States,Utah,Taylorsville,84129,40.6677,-111.9388,,801,,
#10.10.200.252/30,1,,USA,United States,Utah,Orem,84042,40.2969,-111.6946,,801,NA,
#10.10.200.48/32,1,,USA,United States,Utah,Orem,84042,40.2969,-111.6946,,801,NA,
```
Viewing Geolocation IP Locations Data

To view IP location data in FTK

1. Open the Examiner.
2. Click the Volatile tab.
3. In the Volatile tab, click (Geolocation).
4. You can filter the items displayed and see item details.
   See Using the Geolocation Grid on page 446.

To view IP location data in Resolution1 CyberSecurity or Resolution1

1. Open Project Review.
2. In the Item List panel, click Options > Visualization > Geolocation.
3. You can filter the items displayed and see item details.
   See Using the Geolocation Grid on page 446.
   For example, you can do the following:

   - You can click one or more pins and then click . This applies only the items you selected and displays them in the Item List. This displays any communication to or from those pins with any other location.

   - You can click one or more pins and then click . This applies only the items you selected and displays them in the Item List. This displays only the communication between the selected pins.

4. If you have both Network Communication and Exif pins in your data, you can select to turn on or off those pins in the map as well as items in the grid.
   Click the “eye” icon for Network Communication or Exif.
   If the icon is yellow, the data is displayed. If the icon is black, the data is not displayed.

Using the Geolocation Network Information Grid

- When viewing network acquisition and volatile data connection information, you can now view a grid that displays the following information:
  - Process Start Time
  - Machine
  - User Name
  - Process Name
  - Path
  - Host Name
  - IP Address
  - Coordinates
  - Ports

You can show the communication between multiple pins.
**Geolocation Filter**

You can filter your Geolocation data with filters in the Facets Panel. The following filters are available under the Geolocation filter categories for security jobs that contain geolocation data.

**Geolocation Filters in the Facets Panel**

<table>
<thead>
<tr>
<th>Geolocation Filters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Country Name</td>
<td>Filters evidence by the country from which the communication originated.</td>
</tr>
<tr>
<td>To Country Name</td>
<td>Filters evidence by the country to which the communication was sent.</td>
</tr>
<tr>
<td>From City Name</td>
<td>Filters evidence by the city from which the communication originated. Example: San Francisco, San Jose, Los Angeles.</td>
</tr>
<tr>
<td>To City Name</td>
<td>Filters evidence by the city that the communication to which was sent. Example: San Francisco, San Jose, Los Angeles.</td>
</tr>
<tr>
<td>From Continent</td>
<td>Filters evidence by the continent from which the communication originated.</td>
</tr>
<tr>
<td>To Continent</td>
<td>Filters evidence by the continent to which the communication was sent.</td>
</tr>
</tbody>
</table>
Geolocation IP Locations Columns

When using AD Resolution1 CyberSecurity and AD Resolution1, after running either a Volatile Job or a Network Acquisition Job, you can view IP location data using the following columns.

**Geolocation Columns: IP Data**

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GeolocationFromAreaCode</td>
<td>The area code that the communication originated from. This is usually related to phone communication. Example: 415 is the area code for San Francisco.</td>
</tr>
<tr>
<td>GeolocationFromCity</td>
<td>The city that the communication originated from. Example: San Francisco, San Jose, Los Angeles.</td>
</tr>
<tr>
<td>GeolocationFromCountryCode</td>
<td>The numerical code of the country that the communication originated from. This is usually related to phone communication. Example: The United States’s country code is 1, China’s code is 86, and Australia's code is 61.</td>
</tr>
<tr>
<td>GeolocationFromDomainName</td>
<td>The identification string of a origin point of communication on the Internet. This can be to a website or the domain of a company. Example: Accessdata.com.</td>
</tr>
<tr>
<td>GeolocationFromISP</td>
<td>The Internet Service Provider that the communication originated from. Example: Comcast, AT&amp;T, Time Warner Cable.</td>
</tr>
<tr>
<td>GeolocationFromLatitude</td>
<td>The exact numerical value of the North-South location on the globe that the communication originated from. Example: 37.783333 is the latitudinal value for San Francisco.</td>
</tr>
<tr>
<td>GeolocationFromLongitude</td>
<td>The exact numerical value of the East-West location on the globe that the communication originated from. Example: -122.416667 is the longitudinal value for San Francisco.</td>
</tr>
<tr>
<td>GeolocationFromMetroCode</td>
<td>The code assigned to a particular region. This code indicated the location in or near a large city where the communication originated from.</td>
</tr>
<tr>
<td>GeolocationFromNetspeed</td>
<td>The size of the connection, in bytes, that the communication originated from. Example: 5000 is 5000 bytes of data a second.</td>
</tr>
<tr>
<td>GeolocationFromOrganization</td>
<td>The place or group that the communication originated from. Example: AccessData.</td>
</tr>
<tr>
<td>GeolocationFromPostalCode</td>
<td>The code used for mailing identification of where the communication originated from. Example: 94127 is the postal code for San Francisco.</td>
</tr>
<tr>
<td>GeolocationFromRegion</td>
<td>The area from which the communication originated from. Example: Maidenhead’s region is England, Tokyo’s region is Tokyo.</td>
</tr>
<tr>
<td>GeolocationFromSource</td>
<td>The feed, or source from where the software obtained the information about the communication and the origin. Example: Sentinel or from a third-party source.</td>
</tr>
<tr>
<td>GeolocationToAreaCode</td>
<td>The area code that the communication is being sent to. This is usually related to phone communication. Example: 617 is the area code for Boston.</td>
</tr>
</tbody>
</table>
### Geolocation Columns: IP Data (Continued)

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GeolocationToCity</td>
<td>The city that the communication was sent to. Example: Boston, Philadelphia, New York City.</td>
</tr>
<tr>
<td>GeolocationToCountryCode</td>
<td>The numerical code of the country the communication is being sent to, usually related to phone communication. Example: The United States’s country code is 1, China’s code is 86, and Australia’s code is 61.</td>
</tr>
<tr>
<td>GeolocationToLatitude</td>
<td>The exact numerical value of the North-South location on the globe of the communication’s destination. Example: 42.358056 is the latitudinal value for Boston.</td>
</tr>
<tr>
<td>GeolocationToLongitude</td>
<td>The exact numerical value of the East-West location on the globe of the communication’s destination. Example: -71.063611 is the longitudinal value for Boston.</td>
</tr>
<tr>
<td>GeolocationToMetroCode</td>
<td>The code assigned to a particular region. This code indicated the location in or near a large city where the communication was destined for.</td>
</tr>
<tr>
<td>GeolocationToPostalCode</td>
<td>The code used for mailing identification of where the communication was destined for. Example: 94127 is the postal code for San Francisco.</td>
</tr>
<tr>
<td>GeolocationToRegion</td>
<td>The area from which the communication was destined for. Example: Maidenhead’s region is England, Tokyo’s region is Tokyo.</td>
</tr>
<tr>
<td>GeolocationToSource</td>
<td>The feed, or source from where the software obtained the information about the communication and the destination. Example: Sentinel or from a third-party source.</td>
</tr>
</tbody>
</table>
Chapter 35
Customizing the Examiner Interface

This chapter includes the following topics

- About Customizing the Examiner User Interface (page 455)
- The Tab Layout Menu (page 456)
- Moving View Panels (page 457)
- Creating Custom Tabs (page 459)
- Managing Columns (page 460)
- Customizing File List Columns (page 460)
- Creating User-Defined Custom Columns for the File List view (page 461)
- Deleting Custom Columns (page 463)
- Navigating the Available Column Groups (page 463)

About Customizing the Examiner User Interface

You can use the View menu to control the pane views displayed in each tab. There are several tabs by default, but you can create an interface view that best suits your needs.

Add or remove panes from the current tab using the View menu. Click View and click the unchecked pane to add it to the current view, or click a checked item on the list to remove that pane from the current view.

**To save the new arrangement**

- Click View > Tab Layout > Save.

*The View menu lets you do the following:*

- Refresh the current view’s data.
- View the Filter Bar
- Display the Time Zone for the evidence.
- Choose the display size for graphic thumbnails.
- Manage Tabs.
- Select Trees and viewing panes to include in various tabs.
- Open the Progress Window.
The Tab Layout Menu

Use the options in the Tab Layout menu to save changes to tabs, restore original settings, and lock settings to prevent changes.

The following table describes the options in the Tab Layout menu.

**Tab Layout Menu Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save</td>
<td>Saves the changes made to the current tab.</td>
</tr>
<tr>
<td>Restore</td>
<td>Restores the <em>Examiner</em> window to the settings from the last saved layout.</td>
</tr>
<tr>
<td></td>
<td>Custom settings can be restored.</td>
</tr>
<tr>
<td>Reset to Default</td>
<td>Sets the window to the setting that came with the program. Custom settings will be lost.</td>
</tr>
<tr>
<td>Remove</td>
<td>Removes the selected tab from the window.</td>
</tr>
<tr>
<td>Save All Layouts</td>
<td>Saves the changes made to all tabs.</td>
</tr>
<tr>
<td>Lock Panes</td>
<td>Locks the panes in place so that they cannot be moved until they are unlocked.</td>
</tr>
<tr>
<td>Add New Tab Layout</td>
<td>Adds a new tab to the window. The new tab will be like the one selected when this option is used. Customize the tab as needed and save it for future use.</td>
</tr>
</tbody>
</table>
Moving View Panels

Move view panes on the interface by placing the cursor on the title of the pane, clicking, dragging, and dropping the pane on the location desired. Holding down the mouse button undocks the pane. Use the guide icons to dock the pane in a pre-set location. The pane can be moved outside of the interface frame.

To place the view panel at a specific location on the application

1. Place the mouse (while dragging a view pane) onto a docking icon. The icon changes color.
2. Release the mouse button and the panel seats in its new position.

The following table indicates the docking options available:

<table>
<thead>
<tr>
<th>Docking Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Icon]</td>
<td>Docks the view panel to the top half of the tab.</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Docks the view panel to the right half of the tab.</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Docks the view panel to the left half of the tab.</td>
</tr>
</tbody>
</table>
## Docking Icons (Continued)

<table>
<thead>
<tr>
<th>Docking Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Dock Bottom" /></td>
<td>Docks the view panel to the bottom half of the tab.</td>
</tr>
<tr>
<td><img src="image" alt="Dock Center" /></td>
<td>Docks the view panel to the top, right, left, bottom, or center of the pane. When docked to the center, the new pane overlaps the original pane, and both are indicated by tabs on the perimeter of the pane.</td>
</tr>
<tr>
<td><img src="image" alt="Dock Tree" /></td>
<td>Docks the view panel to the top, right, left, or bottom of the tree pane. The tree panes cannot be overlapped.</td>
</tr>
<tr>
<td><img src="image" alt="Dock Lock" /></td>
<td>Locks the panels in place, making them immovable. When the lock is applied, the blue box turns grey. This button is found on the toolbar.</td>
</tr>
</tbody>
</table>
Creating Custom Tabs

Create a custom tab to specialize an aspect of an investigation, add desired features, and apply filters as needed to accommodate conditions specific to a case.

To create a custom tab
1. Click on the tab that is most like the tab you want to create.
2. Click View > Tab Layout > Add New Tab Layout.
3. Enter a name for the new tab and click OK. The resulting tab is a copy of the tab you were on when you created the new one.
4. From the View menu, select the features you need in your new tab.

**Note:** Features marked with diamonds are mutually exclusive; only one can exist on a tab at a time. Features with check marks can coexist in more than one instance on a tab.

5. Choose from the following:
   - Click Save to save this new tab’s settings
   - Click View > Tab Layout > Save.
   - Click View > Tab Layout > Save All to save all changes and added features on all tabs.

To remove tabs
1. Highlight the tab to be removed
2. Click View > Tab Layout > Remove.
Managing Columns

Shared Columns use the same familiar windows and dialogs that Local Columns use.

To create a Shared Column Template

1. In Case Manager, click Manage > Columns.
   
   The Manage Shared Column Settings dialog opens.

2. Highlight a default Column Template to use as a basis for a Custom Column Template.

3. Click New.

4. Enter a new name in the Column Template Name field.

5. Select the Columns to add from the Available Columns pane, and click Add >> to move them to the Selected Columns pane.

6. Select from the Selected Columns pane and click Remove to clear an unwanted column from the Selected Columns.

7. When you have the new column template defined, click OK.

Customizing File List Columns

The Column Settings dialog box allows the modification or creation of new definitions for the file properties and related information that display in the File List, and in what order. Columns display specific information about, or properties of, the displayed files.

Column settings are also used to define which file information appears in case reports. Use custom column settings in defining reports to narrow the File List Properties information provided in the Bookmark and File List sections.

Additional states have been added to keep track of users’ Label selections. For example, if the user has already checked a Label name, that filename and path will turn red, and it remains red as long as it remains different from the original status. Clicking it again will cycle it back to its original status and its color will return to black.

**Note:** Checking the Label name before choosing Apply Labels To, unchecks the Label name. Choose Apply Labels To first, then check or select the files to apply the Label to.

Column Settings can be customized and shared.

To define or customize Column Settings

1. From the File List, click Column Settings to open the Manage Column Settings dialog.

   From the Manage Column Settings dialog you can do any of the following tasks:

<table>
<thead>
<tr>
<th>Button</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>Create a new column template. This option opens a blank template you can use to create a new template from scratch.</td>
</tr>
<tr>
<td>Edit</td>
<td>Edit existing custom column templates. Use this option to make changes to an existing custom column template. You cannot edit default templates.</td>
</tr>
</tbody>
</table>
To define column settings using a new or copied template, click **New**, **Edit**, or **Copy Selected** to open the familiar Column Settings dialog.

3. In the Column Template Name field, type a name for the template.

4. In the Available Columns list, select a category from which you want to utilize a column heading.
   - You can add the entire contents of a category or expand the category to select individual headings.
   - You can move any item in the list up or down to position that column in the File List view. The top position is the first column from left to right.

5. When you are finished defining the column setting template, click **OK** to save the template and return to the Manage Column Settings dialog.

6. Highlight the template you just defined, and click **Apply** to apply those settings to the current File List view.

### Creating User-Defined Custom Columns for the File List view

You can define your own custom columns for use in the File List view. You must first export a file list to a TSV or a CSV file from a case, then populate the spreadsheet with custom column names and your own data as it relates to items that are listed by the ObjectID. To add the resulting custom columns to the File List view, you simply import the TSV or CSV file that you created, add the custom columns to the template, and apply the template.

If you import a custom column sheet that contains a column that you do not want to import, but you do not want to delete the column, you can type `IGNORE` in the first row of the column.

Files saved as TSV or CSV are encoded UTF-8.

### To define custom columns for the File List view

1. Open **CCExample.CSV** in a spreadsheet program. The default path to the file is `C:\Program Files\AccessData\Forensic Toolkit\[version_number]`
   Use this example file to help you create your own custom columns.
2. In the File List, select the files that you want to add to your custom columns settings template.

3. From the File List, click Export File List.

4. In the Save in text box, browse to and select the destination folder for the exported file.

5. In the File name text box, type the first name of the file, but do not specify the extension.

   **Note:** You can overwrite user created column setting files by giving the column template the same name as an existing user created template. Be sure you provide a file name that is unique if you don't want to overwrite the original or existing column template file.

6. In the Save As type text box, click the drop-down and choose CSV (Comma delimited) (*.CSV)

7. In the File List items to export group box, click All Highlighted.

8. Click Column Settings.

9. In the Column Settings dialog box, ensure that Item Number is in the Selected Columns list. If desired, you can move it to the top of the list, or remove all other columns headings that are listed in the Selected Columns list.

10. Click OK.

11. In the Choose Columns drop-down, select the Column Setting you just created or modified.

12. Click Save.

13. Open the CSV file that you just created with the Export File List.

14. Copy the item numbers in the Item Number column.

15. In the opened CCexample.CSV file, paste the item numbers in the OBJECTID column.

16. Edit the column headings the way you want them.
   - For example, the spreadsheet column, “MyCustomInt:INT” displays as the column heading “MyCustomInt” in the File List view.
   - Edit “MyCustomInt” to be whatever you want:
     - The INT portion allows integer values in the column
     - MyCustomBool:BOOL column allows true or false values
     - CustomStr:STRING heading allows text values.

17. Save the CCExample.CSV file with a new name, and in a place where you have rights to save and access the file as needed.

18. Close the FileList.CSV (or whatever name you gave the Export File List file).


20. Navigate to the CSV file that you just saved, then click Open.

21. In the Custom column data imported” dialog box, click OK.

22. On the Manage menu, click Column > Manage Columns, or click Column Settings on the File List toolbar.

23. Choose a column template to copy, or create a new one.

24. Add the custom column headings to a new or existing template.

25. In the Column Settings dialog box, click OK.

26. In the Manage Column Settings dialog box, select the template that contains the custom headings, and then click Apply.
Deleting Custom Columns

You can remove and delete custom columns that you have added to any column templates. You can delete custom columns even if the File List view is turned off.

Note: The data is not deleted; only the custom columns that allowed you to see that specific data are deleted.

To delete custom column data

1. On the Evidence menu, click **Delete Custom Column Data**.
2. Click **Yes** to confirm the deletion.

Navigating the Available Column Groups

The Column Settings dialog box groups column settings according to the following:

<table>
<thead>
<tr>
<th>Available Column Groups</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Features</td>
<td>Custom Columns (When a custom column template has been created or imported.)</td>
</tr>
<tr>
<td>Disk Image Features</td>
<td>Email Features</td>
</tr>
<tr>
<td>Stats</td>
<td>File Status Features</td>
</tr>
<tr>
<td>File System Features</td>
<td>Mobile Phone (When an MPE AD1 image has been processed.)</td>
</tr>
<tr>
<td>ZIP-specific Features</td>
<td>All Features</td>
</tr>
</tbody>
</table>

Within each grouping, you can choose from a list of various column headings that you want to add. You can also delete selected columns or arrange them in the order you want them to appear in the File List view.

To view the name, short name, and description of each available column

1. On the **Manage** menu, click **Columns > Managed Shared Columns**.
2. Do one of the following:
   - Select a category.
   - Open a category and select an individual column setting name.
3. Do either of the following:
   - Click **Add >>** to move your selection to the Selected Columns list.
   - Double-click your selection to add it to the Selected Columns list.
4. Do either of the following:
   - Use standard Windows column sizing methods to resize the column margins, thereby allowing you to read each description.
   - Click anywhere in the Select Columns list box, and then hover over a column description to see the entire description.
5. Click **OK**.

Note: The following information may be useful when navigating or viewing Available Columns and Groups.
• When you view data in the File List view, use the type-down control feature to locate the information you are looking for. Sort on the Filename column, then select the first item in the list. Type the first letter of the filename you are searching for. As you continue to type, next filename that matches the letters you have typed will be highlighted in the list. If at some point you see the file you are looking for displayed in the list, simply click on it. You may type the entire file name for the exact name to be fully highlighted in the list.

• A new column has been added, “Included by Filters” within the All Features group. This column tells you which filter caused a file to display in the File List pane. The Included by Filters column is not sortable.

• In the past, the “Processed” column was able to display only two states, Yes, and No. It has been changed to display different states, such as the following:

  P = Default (may be a null value)
  C = Complete

  **Note:** M = User's manually carved items
Chapter 36
Working with Evidence Reports

You can create a case report about the relevant information of a case any time during or after the investigation and analysis of a case. Reports can be generated in different formats, including HTML and PDF. The PDF report is designed specifically for printing hard copies with preserved formatting and correct organization. The HTML report is better for electronic distribution.

This chapter includes the following topics:

- Creating a Case Report (page 466)
- Adding Case Information to a Report (page 467)
- Adding Bookmarks to a Report (page 468)
- Adding Graphics Thumbnails and Files to a Report (page 470)
- Adding a File Path List to a Report (page 472)
- Adding a File Properties List to a Report (page 473)
- Adding Registry Selections to a Report (page 474)
- Adding Screen Captures from Examiner (page 475)
- Selecting the Report Output Options (page 476)
- Customizing the Report Graphic (page 477)
- Viewing and Distributing a Report (page 478)
- Modifying a Report (page 479)
- Exporting and Importing Report Settings (page 479)
- Writing a Report to CD or DVD (page 480)
**Creating a Case Report**

You can use the *Report Wizard* to create a report. The settings that you specify in the *Report Wizard* are persistent, and remain until they are changed by the user. You do not need to click **OK** until all the report creation information is entered or selected. If you inadvertently close the Report Wizard, you can re-open it by clicking *File > Report*.

**To Create a Case Report**

1. In the *Examiner*, click **File > Report** to run the *Report Wizard*.
2. Define your requirements for the following:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Information</td>
<td>See Adding Case Information to a Report (page 467)</td>
</tr>
<tr>
<td>Bookmarks</td>
<td>See Adding Bookmarks to a Report (page 468)</td>
</tr>
<tr>
<td>Graphics</td>
<td>See Adding Graphics Thumbnails and Files to a Report (page 470)</td>
</tr>
<tr>
<td>Videos</td>
<td>See Adding a Video to a Report (page 471)</td>
</tr>
<tr>
<td>File Path List</td>
<td>See Adding a File Path List to a Report (page 472)</td>
</tr>
<tr>
<td>File Properties</td>
<td>See Adding a File Properties List to a Report (page 473)</td>
</tr>
<tr>
<td>ListSelections</td>
<td>See Adding Registry Selections to a Report (page 474)</td>
</tr>
</tbody>
</table>

3. When you have completed defining the report, click **OK** to open the *Report Output* options dialog. See **Selecting the Report Output Options** (page 476)
Adding Case Information to a Report

The *Case Information* dialog lets you add basic case information to a report, such as the investigator and the organization that analyzed the case.

For information about other items you can define for a report, See *Creating a Case Report* (page 466).

**To Add Case Information to a Report**

1. In the *Examiner*, click **File > Report**.
2. In the left pane, under *Report Outline*, highlight **Case Information** to display the *Case Information* options in the right pane.
   
   You can select the **Case Information** check box to include a case information section in the report. You can deselect the **Case Information** check box to exclude a case information section from the report.
3. In the *Default Entries* pane, deselect any entries that you do not want to include in the report.
   
   If you inadvertently remove a default entry that you require, close and reopen the case to have the default entries displayed again.
4. Double-click the **Value** field to enter information.
5. Add and remove entries with the **Add** and **Remove** buttons under the *Default Entries* section.
6. Provide a label (Name) and a value (Information) for the included entries.
7. (Optional) Select the **Include File Extensions** option to include a file extensions list and count in the File Overview portion of the report.
   
   The list of file extensions appears in the report under *Case Information*, after *File Items* and *File Category*, and before *File Status*. The *File Extensions List* can be very long and may span many pages. If you intend to print the report, this may not be desirable.
Adding Bookmarks to a Report

The Bookmarks dialog lets you create a section in the report that lists the bookmarks that were created during the case investigation. Each bookmark can have a unique sorting option and a unique column setting.

For information about other items you can define for a report, see Creating a Case Report (page 466).

To add Bookmarks to a Report

1. In the Examiner, click File > Report.
2. In the left pane, under Report Outline, highlight Bookmarks to display the Bookmarks options in the right pane.
   You can select the Bookmarks check box to include bookmarks in the report. You can deselect the Bookmarks check box to exclude bookmarks from the report.
3. In the right pane, click Filter to open the filters list.
4. Select one the filters from the list. The empty line at the top of the list lets you apply no filter to the bookmarks.
5. Select the options to indicate which bookmarks you want to include. Choose Shared and/or User bookmarks by group, or individually.
6. For each bookmark you choose to include, you can choose options from the Bookmark section on the right. Options include:
   - Include email attachments
     - This setting applies to all email children, not only common attachments.
     - Selecting this setting activates the Export Options button.
   - Export files & include links
     - Selecting this setting activates the Export Options button.
   - Export Cerberus analysis html files
   - Include thumbnail for each object
7. Choose a Thumbnail Arrangement option for each bookmark or bookmark group as follows:
   - Number of thumbnails per row
   - Include all thumbnails at end of each bookmark section
   - Group all file paths at the end of thumbnails
8. Specify if you want to export the bookmarked files and include links to them in the report when it is generated.
9. Specify if you want to include graphic and video thumbnails that may be part of any bookmarks. If you want to create links to original files in the report, choose both to export the original files and to include graphic and video thumbnails when the report is generated.
10. In the Report Options dialog, click Bookmarks.
11. Click Sort Options and do the following:
    - Click the plus (+) to add a criterion, or click minus (-) to delete a criterion.
    - Click the down arrow button on the right side of each line to open the drop down of available sort columns.
    - Click OK to save the selected Sort Options and close the dialog.

Note: The sort options you see are determined by the Columns Template you have selected

For more information on customizing columns, see Customizing File List Columns (page 460).
12. Specify if you want to apply all settings for this bookmark to child files.

**Bookmark Export Options**

The *Bookmark Export Options* dialog contains the following three options:

- **Link to exported email attachments and filter out attachments in bookmark**
  - When selected, this option creates links to exported email attachments and filters out the attachments in the bookmark.

- **Include re-constructed web pages**
  - When selected, this option exports all of the files necessary to view re-constructed web pages. The files are stored in the *Report_Files* folder in a sub folder called *reconstructedpage*.

- **Export selections as their own file**
  - When selected, this option saves each bookmark selection as an individual file.
Adding Graphics Thumbnails and Files to a Report

The *Graphics* section in the Report Options dialog lets you define whether-or-not to create a section in the report that displays thumbnail images of the case graphics. You can also link the thumbnails to a full sized version of the original graphics if desired.

For information about other items you can define for a report, See *Creating a Case Report* (page 466).

**To add graphics thumbnails and files to a report**

1. In the *Examiner*, click **File > Report**.
2. In the left pane, under *Report Outline*, highlight **Graphics** to display the *Graphics* options in the right pane.
   You can select the **Graphics** check box to include graphics in the report. You can deselect the **Graphics** check box to exclude graphics from the report.
3. To apply a filter to any included graphics files in a report, click **Filter** and select a filter to apply to the graphics.
4. To export and link full-sized graphics in the report, click the **Export and link full-size graphics to thumbnails** option.
5. Select one of the following options
   - Include checked graphics only
   - Include all graphics in the case
6. To sort the graphics by name or by path, click **Sort Options**. In the *Sort Options* dialog, use the Plus (+) and Minus (-) buttons to add and remove sort options. Click the drop-down arrow on the right side of the line to select either **Name** or **Path**.
7. Specify the number of graphics thumbnails to display per row and choose whether-or-not to **Group all filenames at end of report**.
Adding a Video to a Report

The Video section in the Report Options dialog lets you define whether-or-not to create a section in the report that displays the thumbnail images and/or the rendered MP4 files of the case videos. You can also choose to include a link to the original full sized version of the video. These thumbnails and MP4 videos are created during evidence processing or during additional analysis.

See Generating Thumbnails for Video Files (page 316).
See Creating Common Video Files (page 317).

To add video thumbnails and files to a report

1. In the Examiner, click File > Report.
2. In the left pane, under Report Outline, highlight Videos to display the Video options in the right pane. You can select the Videos check box to include videos in the report. You can deselect the Videos check box to exclude videos from the report.
3. To apply a filter to any included video files in a report, click Filter and select a filter to apply to the videos.
4. To export and link the original videos in the report, click the Export and link original videos option.
5. To include a link to the rendered MP4 videos that were created during evidence processing or during additional analysis, check Export rendered videos.
6. To include the thumbnails of the videos in the report that were created during evidence processing or during additional analysis, check Export rendered thumbnails.
7. Select one of the following options
   - Include checked videos only
   - Include all videos in the case
8. To sort the videos by name or by path, click Sort Options. In the Sort Options dialog, use the Plus (+) and Minus (-) buttons to add and remove sort options. Click the drop-down arrow on the right side of the line to select either Name or Path.
9. Specify the number of video thumbnails to display per row in the Rendered Thumbnail Arrangement group box.
10. Click Columns. In the Manage Column Settings dialog, select the Settings Template to copy or edit. For detailed information on creating and modifying Columns Templates, see Customizing File List Columns (page 460).
Adding a File Path List to a Report

The *File Paths* dialog lets you create a section in the report that lists the file paths of files in selected categories. The *File Paths* section displays the files and their file paths; it does not contain any additional information.

For information about other items you can define for a report, See Creating a Case Report (page 466).

**To add a File Path List to a Report**

1. In the *Examiner*, click **File > Report**.
2. In the left pane, under *Report Outline*, highlight **File Path** to display the *File Path* options in the right pane.
   
   You can select the **File Path** check box to include a file path section in the report. You can deselect the **File Path** check box to exclude a file path section from the report.
3. Select a filter from the **Filter** drop-down, to apply a filter to the items you want to include a file path list. You can leave the filter option empty to not apply a filter.
4. Select from the **Available Categories** list to include the category or categories in the report by dragging the category to the **Selected Categories** list.
5. To also export and link to the selected files in the File Path list, select the check-boxes box next to the items in the **Selected Categories** box.
   
   If you do not select a check-box **Selected Categories** list, the File Path is included in the report, but the files themselves are not exported and linked to the *File Path* in the report.
Adding a File Properties List to a Report

The File Properties dialog lets you create a section in the report that lists the file properties of files in selected categories. Several options let you make the File Properties List in the report as specific or as general as you want it to be.

For information about other items you can define for a report, See Creating a Case Report (page 466).

To Add a File Properties List to a Report

1. In the Examiner, click File > Report.
   - In the left pane, under Report Outline, highlight File Properties to display the File Properties options in the right pane.
   - You can select the File Properties check box to include a file properties section in the report. You can deselect the File Properties check box to exclude a file properties section from the report.
2. Either click the Filter drop-down arrow and selecting the desired filter, or choose no filter by selecting the blank entry at the top of the filter drop-down list.
3. Drag and drop the categories that you want to include from the Available Categories window into the Selected Categories window.
4. Check a category in the Selected Categories window to export related files and link them to the File Properties list in the report.
   - Checking an item automatically selects the files and folders under it. If you do not want to include all sub-items, expand the list and select and deselect each item individually.
5. In the Report Options dialog, click File Properties.
6. In the File Properties options area, click Columns.
7. In the Manage Column Settings dialog, select the Settings Template to copy or edit.
   - For detailed information on creating and modifying Columns Templates, see Customizing File List Columns (page 460).
8. When you are done defining the columns settings, click OK.
   - You might want to define how the data is sorted, according to column heading. In the File List view you are limited to a primary and secondary search. In the Report wizard, you can define many levels of sorting.
10. In the File Properties options area, click Sort Options and do the following:
    - Click the plus (+) to add a criterion, or click minus (-) to delete a criterion.
    - Click the down arrow button on the right side of each line to open the drop down of available sort columns.
    - Click OK to save the selected Sort Options and close the dialog.

**Note:** The sort options you see are determined by the Columns Template you have selected

For more information on customizing columns, see Customizing File List Columns (page 460).
Adding Registry Selections to a Report

If your drive image contains Registry files, you can include them in your report.

When creating a Report that includes Registry files, a DAT extension is being added to the link. If the link does not open in the report, it can be exported and opened in Notepad.

For information about other items you can define for a report, See Creating a Case Report (page 466).

To Add Registry Selections to a Report

1. In the Examiner, click File > Report.
   In the left pane, under Report Outline, highlight Registry Selections to display the registry selections options in the right pane.
   You can select the Registry Selections check box to include a Registry Selections section in the report. You can deselect the Registry Selections check box to exclude a Registry Selections section from the report.
2. In the Registry File Types window, check the file types for which you want to include headings for in your report.
3. In the right window, check the registry file paths that you want included in your report.
4. Mark the box Include user generated reports (if any) if you have generated Registry Reports using Registry Viewer, and you want to include them in this report.

   Note: User-generated reports must exist in the case before generating the report, otherwise, this option is disabled. These reports are generated in Registry Viewer and can be collected from the Registry data found on the source drive.

5. Mark the box Select Auto Reports, to view and select which registry reports to include in the report from those that were generated automatically based on the registry reports selection in Case Manager > Case > New > Detailed Options > Evidence Refinement.

   Note: If you did not select this option during pre-processing, this option is disabled in the Report Options dialog.
Adding Screen Captures from Examiner

You can now capture screen shots within the Examiner interface. You can include the screen captures when creating reports. You can use screen captures to include information that is not easy to export or include in reports, such as:

- The contents of the Natural view (File Content pane)
- The contents and information in the File List
- The contents of visualization pages

These UI elements can include information that is useful as evidence, but there is no way to present it outside of the UI.

When you create a screen capture, the following occurs:

- The file is saved in the case folder under a Screenshot sub-folder. (Do not manually rename the captured files, otherwise the Report dialog will not find them.)
- The file is saved in the original size and in a smaller size that may be needed to fit in a report.
- The name and description of the file is saved in the database so that they can be displayed in the Report Options dialog.

To create a screen capture

1. In the Examiner, click the screen capture icon.
2. Click and drag the + cursor to select the area that you want to capture.
3. In the Screen Capture Info dialog, give the screen capture file a name.
4. Enter a description.
   This is recorded with the filename in the database.
5. Click Save.
6. To cancel a screen capture, click Esc.

To include a screen capture in a report

1. In the Examiner, click File > Report.
2. In the Report Options, click Screen Capture.
3. Select the screen captures that you want to include in the report.
4. (Optional) You can edit the description of the files, but not the filename.
5. Configure the other options for the report.
   When the report is created, the image files are copied to the report folder.
Selecting the Report Output Options

The Report Output dialog lets you select the location, language, report formats, and other details of the report. You can also recreate the directory structure of exported items.

For information about other items you can define for a report, See Creating a Case Report (page 466).

To select the report output options

1. When you have completed defining the report, from the Report Options dialog, click OK to open the Report Output options dialog.
2. Type the destination folder name for the saved report, or use the Browse button to locate and select a location.
3. Use the drop-down arrow to select the language for the written report. Available languages are as follows:

<table>
<thead>
<tr>
<th>Arabic (Saudi Arabia)</th>
<th>Chinese (Simplified, PRC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English (United States)</td>
<td>German (Germany)</td>
</tr>
<tr>
<td>Japanese (Japan)</td>
<td>Korean (Korea)</td>
</tr>
<tr>
<td>Portuguese (Brazil)</td>
<td>Russian (Russia)</td>
</tr>
<tr>
<td>Spanish (Spain, Traditional Sort)</td>
<td>Swedish (Sweden)</td>
</tr>
<tr>
<td>Turkish (Turkey)</td>
<td></td>
</tr>
</tbody>
</table>

4. Indicate the formats for publishing the report. You can choose any or all of the output formats.
To view a report made in any of the supported formats, you must have the appropriate application installed on your computer. Options are as follows:

<table>
<thead>
<tr>
<th>PDF (Adobe Reader)</th>
<th>HTML (Windows Web Browser)</th>
</tr>
</thead>
<tbody>
<tr>
<td>XML (Windows Web Browser)</td>
<td>RTF (Rich Text Format: Most Text Editors)</td>
</tr>
<tr>
<td>WML (Unix Web Browser)</td>
<td>DOCX (MS Office Word 2007)</td>
</tr>
<tr>
<td>ODT (Open Document Interchange: Sun Microsystems OpenOffice Documents)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Some report output formats require J#, either 1.1 or 2.0. If you select RTF format, for example, and J# is not installed, you will see an error.

5. Under Export Options do the following:
   - Check the Use object identification number for filename to shorten the paths to data in the report. Links are still created for proper viewing of the files.
   - The unique File ID numbers, when used in a report, keep the pathnames shorter. This makes burning the report to a CD or DVD more reliable.
   - Check the Append extension to filename if bad/absent box to add the correct extension where it is not correct, or is missing.

6. Under HTML Report Customization, choose from the following:
   - If you wish to use your own custom graphic or logo, mark the Use custom logo graphic box, then browse to the file and select it. Use GIF, JPG, JPEG, PNG, or BMP file types.
   - If you wish to use a custom CSS file, mark the Use custom CSS box. Select the folder where the custom CSS files have been saved. Click OK. The folder you selected displays in the “Use Custom CSS” text box.
7. Click **OK** to run the report.

   If the report folder you selected is not empty, you will see the following error message:
   Choose to **Delete** or **Archive** the contents of the folder, or to **Cancel** the report. Delete the contents of the current destination folder, or change to a different destination folder, then recreate the report or import it if you saved it during creation.

## Customizing the Report Graphic

When you select HTML as an output format, you can add your own graphic or logo to the report.

### To add your own graphic or logo

1. In the **Examiner**, click **File > Report** to open the Report wizard.
2. From the **Report Options** dialog, after you are done making selections for the Report Outline, click **OK**.
3. In the **Report Output** dialog, under Formats, mark **HTML**. This activates the HTML Report Customization options.
4. Under HTML Report Customization, mark **Use custom logo graphic**.
5. Click the **Browse** button to open the Windows Explorer view and browse to the graphic file to use for the report. The file format can be **JIF**, **JPG**, **JPEG**, **PNG**, or **BMP**.
6. Click **Open**.
7. When all Report options have been selected, click **OK**.

The progress bar dialog indicates the progress of the report.

**Note:** When selected, the finished HTML and/or PDF reports open automatically.

You can process only one set of reports at a time. If you select the options to create several different report formats before clicking **OK** to generate the report, all will process concurrently. However, if you start that process and then decide to create a new report, you will not be able to until the current report is finished generating.

If you start another report too soon, you will be prompted to wait, if you chose to create either HTML or PDF format for the report, it will automatically open when creation is complete. Otherwise, to view the report, click **Yes** when prompted.

## Using Cascading Style Sheets

The formatting of reports can be customized with Cascading Style Sheets (CSS). Reports stores a file path you select (default or custom) to the folder containing the custom **CSS** files. When **CSS** is not selected, Reports use the default settings.

For reports to utilize the cascading style sheets, three **CSS** files are necessary, and must all be located in the specified **CSS** folder:

- **Common.CSS**
- **Bookmarks.CSS**
- **Navigation.CSS**

The original **CSS** files are found in the following path if no changes were made to the default:

```csharp
C:\Program Files\AccessData\Forensic Toolkit\<version>\bin\ReportResources
```
Copy the *CSS files to a different directory before making changes to any of these files. Do not make changes to the original files.

To utilize the customized CSS files, click **Use custom CSS**, and select the path to the folder where the customized CSS files are stored.

When CSS is selected, Reports checks for those files in the specified directory. If any of the three files is missing you are notified and the report does not proceed.

---

**Note:** The UI option consists of a check box and a text path string. The path string points to the path directory that contains the three needed CSS files.

**Note:** The UI options settings are persistent per Windows login user. Thus, your selections will be persistent across the Case List for the currently authenticated user.

**Important:** In versions, the cascading style sheets have been updated for a better user experience. Updates include persistent highlighting on the navigation tree (so examiners know which item they are viewing) and better organization of data within the report.

However, if you have created personalized templates in previous versions, you will need to re-create them for 5.1.

---

**Viewing and Distributing a Report**

The report contains the information that you selected in the Report Wizard. When included in the report, files appear in both raw data and in the report format.

**To view the report outside of Examiner**

1. Browse to the report file
2. Click on the report file:
   - Click on `index.htm` to open an HTML document in your Web browser.
   - Click on the file `[report].PDF` to open the report in a PDF viewer.
Modifying a Report

Modify the report by changing the report settings, and recreating it. Add the new evidence or change report settings to modify the report to meet your needs.

Change the report settings for each report as needed.

All previously distributed reports should be retracted to keep all recipients current.

Note: If you want to keep a previous report, save the new report to a different folder that is empty.

Exporting and Importing Report Settings

Report settings are automatically saved whenever you generate a report. You can export the settings that you used as an XML file. You can then later import and reapply those same settings to use with new reports that you generate.

To export report settings
1. In the Examiner, click File > Report.
2. In the Report Options dialog box, click Export.
3. In the Export Sections dialog, select the sections that you want to export.
4. Click OK.
5. Click Browse to select a folder to save the settings.
6. You can accept the default name for the report settings file, or you can type a name for the settings file. An XML extension is automatically added when the report is created.
7. Click Save for each item you have selected in the Report Outline list.
8. Click OK.

To import saved settings for a new report
1. In the Examiner, click File > Report.
2. In the Report Options dialog, click Import.
3. Browse to a settings XML file that you want to apply, and select it.
4. Click Open to import and apply the settings file to your current report.
Writing a Report to CD or DVD

You can write a report to a CD or DVD, depending on the report’s size. It is recommended that you select **Use object identification number for filename**, in the Report Output options dialog. This option keeps paths shorter, so they do not exceed the limits of the media format.

After you create the report, write only the contents from the root of the report folder, and not the report folder itself. The autorun automatically launches the report’s main page (index.htm) using the default browser when the CD is read on a Windows computer.

**Note:** The following information pertains to burning reports to a CD or DVD.

- When burning some reports to a CD, some Registry Viewer Auto Reports links may be broken, where they work when viewing on the computer. To avoid this issue, make sure that longer Joliet filenames are enabled when burning report to a CD.
- To launch the report, the computer must be configured to automatically execute autorun files.
- If you burn the folder that contains the report to the CD or DVD, the autorun will not be at the root of the disk, and will not work properly.
- To prevent broken links to report files, use File Item numbers instead of names to keep paths short, and / or use the Joliet file naming to allow longer file paths.
Part 5

Reference

This part contains additional reference information and contains the following appendices

- Working with Windows Registry Evidence (page 500)
- Supported File Systems and Drive Image Formats (page 509)
- Recovering Deleted Material (page 512)
- Managing Security Devices and Licenses (page 514)
- Configuring a Multi-box Setup (page 533)
- AccessData Distributed Processing (page 537) AccessData Oradjuster (page 544)
Chapter 37
Installing the AccessData Elasticsearch Windows Service

About the Elasticsearch Service

The AccessData Elasticsearch Windows Service is used by multiple features in multiple applications, including the following:

- ThreatBridge in Resolution1
- Mobile Threat Monitoring in Resolution1
- KFF (Known File Filter) in all applications
- Visualization Geolocation in all applications

The AccessData Elasticsearch Windows Service uses the Elasticsearch open source search engine.

Prerequisites

- For best results with Resolution1 products and AD Lab and Enterprise, you should install the AccessData Elasticsearch Windows Service on a dedicated computer that is different from the computer running the application that uses it.
- For single-computer installations such as FTK, you can install the AccessData Elasticsearch Windows Service on the same computer as the application.
- A single instance of an AccessData Elasticsearch Windows Service is usually sufficient to support multiple features. However, if your network is extensive, you may want to install the service on multiple computers on the network. Consult with support for the best configuration for your organization’s network.
- You can install the AccessData Elasticsearch Windows Service on 32-bit or 64-bit computers.
- 16 GB of RAM or higher
- Microsoft .NET Framework 4
  To install the AccessData Elasticsearch Windows Service, Microsoft .NET Framework 4 is required. If you do not have .NET installed, it will be installed automatically.
- If you install the AccessData Elasticsearch Windows Service on a system that has not previously had an AccessData product installed upon it, you must add a registry key to the system in order for the service to install correctly.
Installing the Elasticsearch Service

Installing the Service

To install the AccessData Elasticsearch Windows Service

1. Click the the AccessData Elasticsearch Windows Service installer. It is available on the KFF Installation disc by clicking autorun.exe.
2. Accept the License Agreement and click **Next**.
3. On the *Destination Folder* dialog, click **Next** to install to the folder, or click **Change** to install to a different folder. This is where the Elasticsearch folder with the Elasticsearch service is installed.
4. On the *Data Folder* dialog, click **Next** to install to the folder, or click **Change** to install to a different folder. This is where the Elasticsearch data is stored.

**Note:** This folder may contain up to 10GB of data.

5. (For use with KFF) In the *User Credentials* dialog, you can configure credentials to access KFF Data files that you want to import if they exist on a different computer. This provides the credentials for the Elasticsearch service to use in order to access a network share with a user account that has permissions to the share.
   - Enter the user name, the domain name, and the password. If the user account is local, do not enter any domain value, such as localhost. Leave it blank instead.
6. In the *Allow Remote Communication* dialog, enter the IP address(es) of any machine(s) that will have ThreatBridge installed. If you plan on installing ThreatBridge on the same server as the AccessData Elasticsearch Windows Service, click **Next**.

**Select Enable Remote Communication.**

**Note:** If Enable Remote Communication is selected, a firewall rule will be created to allow communication to the AccessData Elasticsearch Windows Service service for every IP address added to the IP Address field. If no IP addresses are listed, then ANY IP address will be able to access the AccessData Elasticsearch Windows Service.

7. In the following *Allow Remote Communication* dialog, accept the default HTTP and Transport TCP Port values and click **Next**. However, if there are conflicts with these ports on the network, change the values to use other ports.

8. The *Configuration 1* dialog contains the following fields:
   - **Cluster name** - This field automatically populates with the system’s name.
   - **Node name** - This field automatically populates with the system’s name.

**Note:** If installing the AccessData Elasticsearch Windows Service on more than one system, allow the first system to install with the system’s name in the cluster and the node fields. In the sec-
ond and subsequent systems, enter the first system’s name in the cluster field, and in the node field, enter the name of the system to which you are installing.

- **Heap size** - This is the memory allocated for the AccessData Elasticsearch Windows Service. Normally you can accept the default value. For improved performance of the AccessData Elasticsearch Windows Service, increase the heap size.

10. The Configuration 2 dialog contains the following options:

- **Discovery** - Selecting the default of Multicast allows the AccessData Elasticsearch Windows Service search to communicate across the network to other Elasticsearch services. If the network does not give permissions for the service to communicate this way, select Unicast and enter the IP address(es) of the server(s) that the AccessData Elasticsearch Windows Service is installed on in the Unicast host names field. Separate multiple addresses with commas.

- **Node** - The Master node receives requests, and can pass requests to subsequent data nodes. Select both Master node and Data node if this is the primary system on which the AccessData Elasticsearch Windows Service is installed. Select only Data node if this is a secondary system on which the AccessData Elasticsearch Windows Service is installed. Click Next.

11. In the next dialog, click Install.

12. If the service installs properly, a command line window appears briefly, stating that the service has installed properly.

13. At the next dialog, click Finish.

**Troubleshooting the AccessData Elasticsearch Windows Service**

Once installed, the AccessData Elasticsearch Windows Service service should run without further assistance. If there are issues, go to C:\Program Files\Elasticsearch\logs to examine the logs for errors.
Chapter 38
Installing the Windows Agent

This chapter covers the manual installation of the agent in a Windows environment.

This appendix includes the following topics:

- See Manually Installing the Windows Agent on page 485.
- See Using Your Own Certificates on page 491.

Manually Installing the Windows Agent

Perform the following steps to manually install the Enterprise Agent in Windows:

- See Preparing the AD Enterprise Agent Certificate on page 485. (AD Enterprise only)
- See Installing the Agent on page 486.
- See Configuring Execname and Servicename Values on page 489.

Preparing the AD Enterprise Agent Certificate

About Enterprise Security Certificates:

When installing AccessData Enterprise Examiner, you need a security certificate. Enterprise Management Server creates Enterprise security certificates, the CRT public key and the PEM public and private key pair files. However, the Enterprise Configuration Management Tool now also accepts PKCS#12 certificates.

If you have a third-party certificate chain in the PKCS#12 format, the Enterprise Configuration Management Tool reads the PKCS#12 certificate and asks for the user password. The certificate is decrypted only long enough to gather the information necessary for the Enterprise installation, then re-encrypts the private key. The public key, regardless of source, must be in standard binary or base-64 encoding.

If the Agent is installed, or pushed, to the workstations using Enterprise, the certificate information will automatically be read from the Enterprise Configuration Management Tool. If the Agent is pushed out, the certificate information (paths and filenames) must be re-entered. The public certificate itself must be in an area of the network where it can be accessed by the Agent machine during installation, but does not need to be stored on the Agent machine.

In addition, the Agent uses only a public key. As long as that public key is in binary or base-64 format, it will automatically be read by the Agent. For more information, see Using Your Own Certificates (page 491).
To prepare the certificate

1. Prepare the Agent Certificate.
2. Copy the needed certificate from the Management Server to your deployment location.
   Management Server creates certificates during the setup in:
   \([\text{Drive}]\:\\Program Files\\AccessData\\AccessData Management Server\\certificates\).
   The certificate name is the \text{ManagementServer.crt}.
3. Copy \text{ManagementServer.crt} to a folder of your choice where it can be accessed while installing the Agent.

Installing the Agent

To install the Agent

1. Run \text{AccessDataAgent.msi} or \text{AccessDataAgent(64bit)} using \text{msiexec}.

   \textbf{Note:} These .msi files are located in the Program Files\AccessData\Forensic Toolkit\5.1\Bin\Agent\<x32 or x64> folder after installation.

There are several command line parameters available to use with this .msi as documented below. Here is an example command line that will install with the defaults:

If \text{AccessDataAgent.msi} resides in the folder C:\enterprise and ManagementServer.crt resides in \([\text{Drive}]\:\\certificates\), type the following command line to install the agent with defaults:

\text{msiexec /i [Drive]\:enterprise\AccessDataAgent.msi}
\text{CER=[Drive]\:certificates\ManagementServer.crt}.

The following table lists the command line options available for use with this \text{AccessDataAgent.msi}:

\begin{table}[h]
\centering
\begin{tabular}{|c|p{0.8\textwidth}|}
\hline
\textbf{Option} & \textbf{Action} \\
\hline
\text{/i} (i or x required) & Specifies install. \\
\hline
\text{/x} (i or x required) & Specifies un-install. \\
\hline
\text{/qn} (optional) & Allows you to install in quiet mode with no user interaction. \\
\hline
\text{<path and msi file name>} (required) & If running from the folder where the .msi is located you do not have to include path, only the filename. \\
\hline
\text{CER=<path and certificate file name>} (required) & Specifies the certificate the agent uses. \\
& \text{Always include the path, regardless of location.} \\
\hline
\text{ALLUSERS=<n>} & Configures the installer to be available to all users. The default option varies per operating system. The options are: \\
& \text{allusers=1} configures the installer to be available to all users. \\
& \text{allusers=0} configures the installer to be available to only the user who is installing the agent. \\
\hline
\text{INSTALLDIR=<custom install path>} (optional) & Allows you to change the install location from the default folder: (C:\Program Files\AccessData\Agent). \\
\hline
\text{PORT=<xxxx>} (optional) & Allows you to change the port from the default port (3999). \\
\hline
\end{tabular}
\end{table}
<table>
<thead>
<tr>
<th>Option</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIFETIME=&lt;d&gt;</td>
<td>Allows you to configure the life cycle of the agent. The “d” value equals the Time To Live (TTL) measured in days. Adding a number preceded by a dash measures the TTL in minutes. For example: &lt;-d&gt;.</td>
</tr>
<tr>
<td>CONNECTIONS=&lt;n&gt;</td>
<td>Allows you to configure the number of maximum connections for the agent.</td>
</tr>
<tr>
<td>STORESIZE=&lt;n&gt;</td>
<td>Allows you to configure the size of the data store.</td>
</tr>
<tr>
<td>TRANSIENT=1</td>
<td>Allows you to configure the agent as a <strong>Transient Agent</strong>. Transient Agents have no protected storage and remove themselves when the agent machine is restarted.</td>
</tr>
<tr>
<td>FOLDER_STORAGE=1</td>
<td>Allows you to configure the agent as a <strong>Persistent Agent</strong>. Persistent Agents use a “local” file system based storage and not protected storage. Persistent Agents also remain on the agent machine after the machine is restarted. This allows for local logical disc space to store the results of Public Site Server jobs operating while the Agent is not on the WAN or can get to the Public Site Server.</td>
</tr>
<tr>
<td>SERVICELESS=1</td>
<td>Allows you to configure the agent to install with no protected storage and no installed service. The agent removes itself when the agent machine restarts or when the lifetime option expires, whichever comes first.</td>
</tr>
<tr>
<td>PCD=&lt;x&gt;</td>
<td><strong>Enterprise Only</strong>: Allows you to configure the Proxy Cycle Delay (PCD). The PCD is the time interval at which the agent attempts to connect to proxy to check if any work has been assigned. The PCD “x” value is measured in seconds. The default is 1200 (20 minutes).</td>
</tr>
<tr>
<td>PROXY=</td>
<td><strong>Enterprise Only</strong>: Allows you to configure a proxy-able agent. PrimaryIP should refer to the IP address to which the agent should try to communicate. (Usually this will be the internal private network IP of the proxy server.) The “SecondaryIP” should refer to the IP address to which the agent should try to connect when the attempts to connect to the “PrimaryIP” have failed. (Often this IP will represent the public IP of the proxy server.) PrimaryIP2 and SecondaryIP2 should refer to an additional proxy server address and is delimited by a tilde (~). Additional proxy servers can be added by following this same pattern.</td>
</tr>
</tbody>
</table>

**Enterprise Only** refers to features that are only available in the Enterprise version of the software.
**Command Line Options (Continued)**

<table>
<thead>
<tr>
<th>Option</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAMA=&lt;Site Server IP address:port&gt;</td>
<td><strong>Resolution1, Resolution1 CyberSecurity, and Resolution1 eDiscovery Only:</strong> Allows you to configure the IP Address of the Site Server to which the agent reports. For example, 10.32.41.113:54545 This parameter is used so that the Agents know which Site Server to check into for the first time. Additionally, after that first check-in, the Agents will learn the Site Servers that has its CIDR and check there next time. It will update based on movement of the physical IP of the node.</td>
</tr>
<tr>
<td>PUBSS=&lt;public instance IP&gt;</td>
<td><strong>Resolution1, Resolution1 CyberSecurity, and Resolution1 eDiscovery Only:</strong> Allows you to configure the agent to connect to a Public Site Server (PUBSS). See About Site Servers on page 38. For example, pubss=192.192.192.192:5432 The Agent in Public Site Server (PUBSS) mode will check-in to the original PUBSS value that was part of the install. After that first check-in, it will receive a list of other Public Site Servers in the DMZ and then ping around to find the closest/fastest connection. For example, if the user is in New York and a job starts there, and then the user goes to Los Angeles, the user will go from the NYC PUBSS to the LA PUBSS and the collection should resume and support interruption. This is all completed based on the resolution of the IP address for the target and assignment in a proper CIDR range on Site Server config. See Site Server Configuration on page 41. This list will also get updated whenever it might change. This list comes from the Site Server configuration parameters you setup on your internal servers and not specifically some additional data entry. It comes from the virtue of having any Public Site Servers deployed. See MAMA=&lt;Site Server IP address:port&gt; on page 488.</td>
</tr>
<tr>
<td>PUBSS_DELAY=&lt;seconds&gt;</td>
<td><strong>Resolution1, Resolution1 CyberSecurity, and Resolution1 eDiscovery Only:</strong> This can be used to delay the default check-in interval (30 minutes). You may want to alter this value if you have a lot of Agents on the PUBSS system.</td>
</tr>
</tbody>
</table>

**Example Command Line Install**

msiexec /i "C:\AgentInstall\AccessData Agent (64-bit).msi" cer="C:\AgentInstall\AccessData E1.crt" mama=10.10.35.32:54545 TRANSIENT=1 Persistent=1 Serviceless=1 lifetime=1 or lifetime=-5 pubss=192.192.192.192 5432
Configuring Execname and Servicename Values

The Execname and Servicename values change the names of the agent executable and agent service respectively. These values are added to the MSI using an MSI editor (such as ORCA.exe — a free MSI editor).

Changing the Execname Value

To make changes to the execname value
1. Run Orca.EXE.
2. Click File > Open.
3. Browse to the folder containing the “AccessData Agent.msi” or “AccessData Agent (64-bit).msi” file and open the file. The default path is:
   \[Drive]\Program Files\AccessData\Forensic Toolkit\3.2\Bin\Agent\x32 (or x64)\n4. In the Tables list, select File...
5. In the FileName column, double-click “u4jwdcTh.exe|agentcore.exe”.
   5a. Enter the filename to use for the agent core executable.
   
   Note: Replace the entire string with the filename.
6. Press Enter.
7. Click File > Save.

Note: Do not close Orca if you are also changing the service name.

Changing the Servicename Value

To make changes to the Servicename value
If you closed Orca, begin with Step 1. Otherwise, skip to Step 4.
1. Run Orca.EXE.
2. Click File > Open.
3. Browse to the folder containing the “AccessData Agent.msi” or “AccessData Agent (64-bit).msi” file and open the file. The default path is:
   \[Drive]\Program Files\AccessData\Forensic Toolkit\3.2\Bin\Agent\x32 (or x64)\n4. In the Tables list, select “ServiceControl”.
5. In the Name column, double-click “AgentService”.
   5a. Enter the name to use for the AgentService and press Enter.
   
   Note: Use the same value in steps 5a, 7a and 8a.
6. In the Tables list, select “ServiceInstall”.
7. In the Name column, double-click “AgentService”.
   7a. Enter the name to use for the AgentService (use the same value entered in step 5a) and press Enter.
8. In the DisplayName column, double-click “AgentService”.

8a. Enter the name to use for the AgentService (use the same value entered in steps 5a and 7a) and press Enter.

9. Click File > Save.

10. Click File > Close.
Using Your Own Certificates

**Definitions:**

- **PKCS#12:** Standard certificate packaging to securely transfer public/private key pairs
- **PKCS#7:** Standard certificate package to store certificates for S/MIME encryption. We are using for storing sets of public key chains.

**To export the public certificate when using a PFX (PKCS#12) key**

1. Using the PKCS#12 provided by the Certificate Administrator, double-click PKCS#12 to open it.
2. Install the certificate into a local Microsoft certificate store by following the wizard supplied when you double-click the certificate file.
3. View the public certificate of the installed certificate by opening the local machine's certificate store. (This can be done with *Microsoft Management Console* or in *Internet Explorer* under **Tools > Internet Options > Content > Certificates**)
4. Find the bottom level certificate and double-click the certificate to view it.
5. Click the **Certification Path** tab to verify that the certificate has a full verification path, meaning that nothing is missing from the top of the chain to the bottom.
6. Click the **Details** tab and click **Copy to File**.
7. Click **Next** and click **Cryptographic Message Syntax Standard - PKCS #7 Certificates**.
8. Select **Include all certificates in the certificate path if possible**.
9. Click **Next** and enter a file export path.
10. Click **Finish**.
11. Click **Finish**.
12. Double-click the exported PKCS#7 and verify that all of the public certificates in the chain are in the PKCS#7.

The exported file you created will be used as the certificate for the agent installation.
Controlling Consumption of the CPU

You can edit a registry key that allows you to control what percentage of the CPU is used for the agent. This gives you the ability to throttle the CPU and insure that the agent does not consume all of the CPU available.

To add a throttling registry key

1. In the Registry Editor, expand the HKEY_LOCAL_MACHINE hive and locate the HKEY_LOCAL_MACHINE\SOFTWARE\AccessData\Shared folder.
2. Add a new DWORD (32-bit) value to the Shared folder (HKEY_LOCAL_MACHINE\SOFTWARE\AccessData\Shared\throttling)
3. The data value of the DWORD should be the maximum percentage of the CPU allowed to be used by the module. For example, if you want the maximum percentage of the CPU used to be 25 percent, modify the DWORD data value and enter 25 in the Edit DWORD dialog. The value should be from 0-100. If the data value is left at 0, the CPU will not be throttled when the agent is started.
4. In the Edit DWORD dialog, select the Decimal radio button and click OK.
5. After applying the registry key changes, restart the agent service.

For more information on adding and editing registry keys, see Microsoft's documentation.
Resolution1 eDiscovery Additional Instructions

1. Obtain the public key and private key pair (pfx and cer).

2. Copy the private certificates to the collection workers. The only certificates that need to be changed are the ones that talk with the agent (collectors).
   2a. (Optional) You can make the certificates available to the processing worker in the event you want to use it for collection testing in the interim.

3. Run CollectorCfgTool.EXE:
   
   ```
   [Drive]\[Program Files]\AccessData\eDiscovery\WorkManager\.
   ```
   3a. Select the new private key.
   3b. Provide the password.
   3c. (Optional) Delete the original private key.

4. Uninstall the agent:
   4a. Click Start > Control Panel -> Add or Remove Programs.
   4b. If the previous agent was installed using the “allusers” option, you must use the following to uninstall from the command prompt using msiexec
   ```
   msiexec /x [Path to Installer]Adagentinstaller.msi
   ```

5. Install the agent:
   5a. Assuming the Certificates are installed on the C: drive, in the Run Command box, type:
   ```
   msiexec /i [Path to Installer]Adagentinstaller.msi CER="[Full Path to Certificate File]"
   ```
Important Information

The following information is important to know about installing and executing an agent:

- The ADMON module does not run on low resource priority. The ADMON module must run on Normal priority or higher in order to maintain connection to the system drivers.
Chapter 39
Installing the Unix / Linux Agent

This chapter discusses the Unix Agent Installer. It includes the following topics:

- See Installing The Enterprise Agent on Unix/Linux on page 495.

Installing The Enterprise Agent on Unix/Linux

The AccessData Agent is available for Unix-, Linux-, and Mac-based operating systems as well as for Windows. This appendix discusses the specific installation files to use for supported Unix and Linux platforms.

Supported Platforms

The Unix Agent Installer supports the following platforms:

Unix Agent Supported Platforms

<table>
<thead>
<tr>
<th>Installer</th>
<th>OS</th>
</tr>
</thead>
</table>
| agent-rh5.sh or agent-rh5x64.sh | RedHat 5 (32- & 64-bit)  
SLED 11 (Suse Linux Enterprise Desktop) (32- & 64-bit)  
CentOS Enterprise 5 (32- & 64-bit)  
Ubuntu 9 (and newer) (64-bit) |
| agent-rh3.sh or agent-rh3x64.sh | RedHat 3 (32- & 64-bit)  
Novell Linux Desktop (NLD) 9 (32-bit)  
SLED 10 (Suse Linux Enterprise Desktop) (32- & 64-bit) |

Be sure to use the correct installer file for your 32- or 64-bit architecture/OS

To install the Unix Agent

Execute the following command as root, and provide the appropriate information:

agent-<os>.sh <certpath> [-installpath | -i <installpath>]

where <os> is the operating system agent that is being used, and where <certpath> is the location of the public certificate to be used for identification, and where [-i | -installpath] indicates the directory to install the agent in.
Uninstallation

To uninstall the Unix Agent, execute the following command as root:

```
# ./agent.sh -rf
```

Configuration

The configuration file is located in the install path and is named `ADAgent.conf`. It supports the following parameters:

- **Port**: Port on which to listen for activity.
- **MinThreadCount**: Minimum number of threads to have ready, waiting for connections.
- **MaxThreadCount**: Maximum number of threads servicing connections.
- **CertificatePath**: Fully qualified network path or local path to the certificate. The installer, by default, puts the certificate in the installation path.

Starting the Service

To start the Unix Agent service, execute the following command as root:

```
/etc/init.d/adagentd start
```

Stopping the Service

To stop the Unix Agent service, execute the following command as root:

```
/etc/init.d/adagentd stop
```
Chapter 40
Installing the Mac Agent

This chapter discusses the Agent Installer for Apple Macintosh. It includes the following topics:

- See Configuring the AccessData Agent installer on page 497.
- See Installing the Agent on page 499.
- See Uninstalling the Agent on page 499.

Configuring the AccessData Agent installer

The AccessData Agent requires an X.509 certificate in order to establish a secure network connection to the server or for AD Enterprise, the computer running Examiner. The package installer has been provided to aid in the distribution efforts of these certificates by allowing an Administrator to modify the AccessDataAgent package installer prior to installation of AccessData Agent software for Apple Macintosh. In addition to certificate distribution, the port used by the Agent can be configured.

The following instructions allow an Administrator to configure the AccessData Agent package installer.

**Bundling a Certificate**

The AccessData Agent installer requires that a certificate (or certificate tree) is bundled with the installer. The following is the sequence of steps that must be followed to bundle a certificate file into the installer.

1. Create a folder named Configure.
2. Create a single file, named adagent.cert that contains one or more X.509 certificates to be distributed to each installation of the Agent, and place it in the Configure folder.
3. Right-click the AccessDataAgent package installer file on the install disc, ([Drive]\Enterprise\Agents\agent-Mac.dmg).
4. Select Show Package Contents popup menu item.
5. Drag the Configure folder from the Package Contents into the folder opened in Step 4 (alongside the Contents folder).

**Configuring the Port**

The AccessDataAgent installer allows an Administrator to (optionally) configure the port the Agent will use to communicate with an Examiner when installed. This is done by adding a file containing the port number to the AccessDataAgent package installer. The following is a set of instructions an Administrator will use to configure
the AccessData Agent package installer. To do so, complete Steps 1-5 under Bundling a Certificate, then continue with Step 1 here. If you do not need to do a custom configuration of the port, skip to Step 6 below.

1. Create a text file named adagent.port that contains the port number the Agent is to use; this file is to be distributed to each installation of the Agent.
2. Place the adagent.port file into the Configure folder (previously created to contain the X.509 certificate).
3. Right-click the AccessDataAgent package installer file.
4. Select Show Package Contents popup menu item.
5. Ensure that the Configure folder is located in the same folder opened in Step 4 (alongside the Contents folder).
6. Close the window.

Note: The installer will not run successfully if all of the above steps are not already completed. The folder and file names must be exactly as documented

Additional Configuration Options

The Mac installer now supports the same settings as the Unix installer. Each setting should be added to the .mpkg file in a directory called Configure.

Enterprise Mac Agent Configuration Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>- adagent.cert</td>
<td>Specifies the certificate file used for communication</td>
</tr>
<tr>
<td>- adagent.port</td>
<td>Specifies the port the agent will listen on. The setting should contain nothing more than a number. The default port number is 3999</td>
</tr>
<tr>
<td>- adagent.lifetime</td>
<td>Specifies the amount of time before the agent dissolves. Again the file should contain nothing more than a number. Same rules as for the Linux agent about sign and value. The default is 0.</td>
</tr>
<tr>
<td>- adagent.connection</td>
<td>Sets the maximum number of concurrent connections allowed by the agent. The file should contain only a number. The default is 10.</td>
</tr>
<tr>
<td>- adagent.size</td>
<td>Sets the protected storage area size. The file should contain only the number. The default is 16777216. (16 MB).</td>
</tr>
</tbody>
</table>
Installing the Agent

When the certificate is bundled and the port configuration file is complete and saved, distribute the AccessDataAgent package installer to each target computer and run it locally.

Uninstalling the Agent

The AccessData Agent can be uninstalled by double-clicking the uninstall utility located in /Library/Application Support/AccessData. You will be required to enter your password; you must have administration rights for the uninstall to complete correctly.

Note: The account must have a password assigned to it.
Chapter 41
Working with Windows Registry Evidence

This appendix contains information about the Windows Registry and what information can be gathered from it for evidence. It includes the following topics:

- Understanding the Windows Registry (page 500)
- Windows XP Registry Quick Find Chart (page 505)

Understanding the Windows Registry

For forensic work, registry files are particularly useful because they can contain important information such as the following:

- Usernames and passwords for programs, email, and Internet sites
- A history of Internet sites accessed, including dates and times
- A record of Internet queries (i.e., searches performed on Internet search engines like Google, Yahoo, etc.)
- Lists of recently accessed files (e.g., documents, images, etc.)
- A list of all programs installed on the system

AccessData Registry Viewer allows you to view the contents of Windows operating system registries. Unlike the standard Windows Registry Editor, which only displays the current system’s registry, Registry Viewer lets you examine registry files from any Windows system or user. Registry Viewer also provides access to a registry’s protected storage, which contains passwords, usernames, and other information not accessible from within Windows Registry Editor.

The files that make up the registry differ depending on the version of Windows. The tables below list the registry files for each version of Windows, along with their locations and the information they contain.
### Windows 9x Registry Files

The following table describes each item on the Windows 9x registry files.

**Windows 9x Registry Files**

<table>
<thead>
<tr>
<th>Filename</th>
<th>Location</th>
<th>Contents</th>
</tr>
</thead>
</table>
| system.dat | \Windows   | - Protected storage for all users on the system. Protected Storage is an access-restricted area of the registry that stores confidential user information including usernames and passwords for Internet web sites, email Internet passwords for Microsoft Outlook or Outlook Express, and a record of queries (i.e., searches performed on Internet search engines like Google, Yahoo, etc.), including the time and date when they were performed.  
- Lists installed programs, their settings, and any usernames and passwords associated with them.  
- Contains the System settings. |
| user.dat   | \Windows   | - MRU (Most Recently Used) list of files. MRU Lists maintain a list of files so users can quickly re-access files. Registry Viewer allows you to examine these lists to see what files have been recently used and where they are located. Registry Viewer lists each program's MRU files in order from most recently accessed to least recently accessed.  
- User preference settings (desktop configuration, etc.). |

#### Windows NT and Windows 2000 Registry Files

The following table describes each item in the Windows NT and Windows 2000 registry files.

**Windows NT and Windows 2000 Registry Files**

<table>
<thead>
<tr>
<th>Filename</th>
<th>Location</th>
<th>Contents</th>
</tr>
</thead>
</table>
| NTUSER.DAT          | \Documents and Settings\[user account\] | - Protected storage for all users on the system. Protected Storage is an access-restricted area of the registry that stores confidential user information including usernames and passwords for Internet web sites, email passwords for Microsoft Outlook or Outlook Express, and a record of Internet queries (i.e., searches performed on Internet search engines like Google, Yahoo, etc.), including the time and date when they were performed.  
- All installed programs, their settings, and any usernames and passwords associated with them.  
- User preference settings (desktop configuration, etc.). |
| default             | \Winnt\system32\config        | System settings.                                                          |
| SAM                 | \Winnt\system32\config        | User account management and security settings.                           |
| SECURITY            | \Winnt\system32\config        | Security settings.                                                        |
| software            | \Winnt\system32\config        | All installed programs, their settings, and any usernames and passwords associated with them. |
| system              | \Winnt\system32\config        | System settings.                                                          |
**Windows XP Registry Files**

The following table describes each item in the Windows XP registry files.

### Windows XP Registry Files

<table>
<thead>
<tr>
<th>Filename</th>
<th>Location</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTUSER.DAT</td>
<td>\Documents and Settings{user account}</td>
<td>○ Protected storage for all users on the system. Protected Storage is an access-restricted area of the registry that stores confidential user information including usernames and passwords for Internet web sites, email passwords for Microsoft Outlook or Outlook Express, and a record of Internet queries (i.e., searches performed on Internet search engines like Google, Yahoo, etc.), including the time and date when they were performed.</td>
</tr>
<tr>
<td></td>
<td>If there are multiple user accounts on the system, each user has an ntuser.dat file.</td>
<td>○ All installed programs, their settings, and any usernames and passwords associated with them.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ User preference settings (desktop configuration, etc.)</td>
</tr>
<tr>
<td>default</td>
<td>\Winnt\system32\config</td>
<td>System settings.</td>
</tr>
<tr>
<td>SAM</td>
<td>\Winnt\system32\config</td>
<td>User account management and security settings.</td>
</tr>
<tr>
<td>SECURITY</td>
<td>\Winnt\system32\config</td>
<td>Security settings.</td>
</tr>
<tr>
<td>software</td>
<td>\Winnt\system32\config</td>
<td>All installed programs, their settings, and any usernames and passwords associated with them.</td>
</tr>
<tr>
<td>system</td>
<td>\Winnt\system32\config</td>
<td>System settings.</td>
</tr>
</tbody>
</table>

The logical registry is organized into the following tree structure:

The top level of the tree is divided into hives. A hive is a discrete body of keys, subkeys, and values that is rooted at the top of the registry hierarchy. On Windows XP systems, the registry hives are as follows:

- **HKEY_CLASSES_ROOT (HKCR)**
- **HKEY_CURRENT_USER (HKCU)**
- **HKEY_LOCAL_MACHINE (HKLM)**
- **HKEY_USERS (HKU)**
- **HKEY_CURRENT_CONFIG (HKCC)**
- **HKEY_DYN_DATA (HKDD)**

**HKEY_LOCAL_MACHINE** and **HKEY_USERS** are the root hives. They contain information that is used to create the **HKEY_CLASSES_ROOT**, **HKEY_CURRENT_USER**, and **HKEY_CURRENT_CONFIG** hives.

**HKEY_LOCAL_MACHINE** is generated at startup from the system.dat file and contains all the configuration information for the local machine. For example, it might have one configuration if the computer is docked, and another if the computer is not docked. Based on the computer state at startup, the information in **HKEY_LOCAL_MACHINE** is used to generate **HKEY_CURRENT_CONFIG** and **HKEY_CLASSES_ROOT**.

**HKEY_USERS** is generated at startup from the system User.dat files and contains information for every user on the system.

Based on who logs in to the system, the information in **HKEY_USERS** is used to generate **HKEY_CURRENT_USER**, **HKEY_CURRENT_CONFIG**, and **HKEY_CLASSES_ROOT**.

Keys and sub-keys are used to divide the registry tree into logical units off the root.
When you select a key, Registry Editor displays the key’s values; that is, the information associated with that key. Each value has a name and a data type, followed by a representation of the value’s data. The data type tells you what kind of data the value contains as well as how it is represented. For example, values of the REG_BINARY type contain raw binary data and are displayed in hexadecimal format.

**Possible Data Types**

The following table lists the Registry’s possible data types.

<table>
<thead>
<tr>
<th>Registry Data Types</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>REG_BINARY</td>
<td>Binary Value Raw binary data. Most hardware component information is stored as binary data and is displayed in hexadecimal format.</td>
</tr>
<tr>
<td>REG_DWORD</td>
<td>DWORD Value Data represented by a number that is 4 bytes long (a 32-bit integer). Many parameters for device drivers and services are this type and are displayed in binary, hexadecimal, or decimal format. Related values are REG_DWORD_LITTLE_ENDIAN (least significant byte is at the lowest address) and REG_DWORD_BIG_ENDIAN (least significant byte is at the highest address).</td>
</tr>
<tr>
<td>REG_EXPAND_SZ</td>
<td>Expandable String Value A variable-length data string. This data type includes variables that are resolved when a program or service uses the data.</td>
</tr>
<tr>
<td>REG_MULTI_SZ</td>
<td>Multi-String Value A multiple string. Values that contain lists or multiple values in a format that people can read are usually this type. Entries are separated by spaces, commas, or other marks.</td>
</tr>
<tr>
<td>REG_SZ</td>
<td>String Value A text string of any length.</td>
</tr>
<tr>
<td>REG_RESOURCE_LIST</td>
<td>Binary Value A series of nested arrays designed to store a resource list used by a hardware device driver or one of the physical devices it controls. This data is detected by the system and is displayed in hexadecimal format as a Binary Value.</td>
</tr>
<tr>
<td>REG_RESOURCE_REQUIREMENTS_LIST</td>
<td>Binary Value A series of nested arrays designed to store a device driver’s list of possible hardware resources that it, or one of the physical devices it controls, can use. This data is detected by the system and is displayed in hexadecimal format as a Binary Value.</td>
</tr>
<tr>
<td>REG_FULL_RESOURCE_DESCRIPTOR</td>
<td>Binary Value A series of nested arrays designed to store a resource list used by a physical hardware device. This data is displayed in hexadecimal format as a Binary Value.</td>
</tr>
<tr>
<td>REG_NONE</td>
<td>None Data with no particular type. This data is written to the registry by the system or applications and is displayed in hexadecimal format as a Binary Value.</td>
</tr>
<tr>
<td>REG_LINK</td>
<td>Link A Unicode string naming a symbolic link.</td>
</tr>
<tr>
<td>REG_QWORD</td>
<td>QWORD Value Data represented by a number that is a 64-bit integer.</td>
</tr>
</tbody>
</table>

**Additional Considerations**

If there are multiple users on a single machine, you must be aware of the following issues when conducting a forensic investigation:
If there are individual profiles for each user on the system, you need to locate the **USER.DAT** file for the suspects.

If all the users on the system are using the same profile, everyone’s information is stored in the same **USER.DAT** file. Therefore, you will have to find other corroborating evidence because you cannot associate evidence in the **USER.DAT** file with a specific user profile.

On Windows 9x systems, the **USER.DAT** file for the default user is used to create the **USER.DAT** files for new user profiles. Consequently, the **USER.DAT** files for new profiles can inherit a lot of junk.

To access the Windows registry from an image of the suspect’s drive, you can do any of the following:

- Load the suspect’s drive image and export his or her registry files to view them in Registry Editor.
- Mount a restored image as a drive, launch Registry Editor at the command line from your processing machine, export the registry files from the restored image, then view them in a third-party tool.

**Note:** The problem with this method is that you can only view the registry as text. Registry Editor displays everything in ASCII so you can’t see hex or binary values in the registry.

- Use Registry Viewer. Registry Viewer integrates seamlessly with the *Examiner* to display registry files within the image and create reports.

**Important:** Registry Viewer shows everything you normally see in live systems using the Windows Registry Editor. However, unlike Registry Editor and other tools that use the Windows API, Registry Viewer decrypts protected storage information so it displays values in the Protected Storage System Provider key (PSSP). Registry Viewer also shows information that is normally hidden in null-terminated keys.

### Seizing Windows Systems

Information stored in the registry— Internet Messenger sessions, Microsoft Office MRU lists, usernames and passwords for internet Web sites accessed through Internet Explorer, and so forth—are temporarily stored in **HKEY_CURRENT_USER**. When the user closes an application or logs out, the hive’s cached information is pulled out of memory and written to the user’s corresponding **USER.DAT**.

**Note:** Passwords and MRU lists are not saved unless these options are enabled.

**Important:** Because normal seizure procedures require that there be no alteration of the suspect’s computer in any way, you must be able to articulate why you closed any active applications before pulling the plug on the suspect’s computer. Sometimes it is better to simply pull the plug on the computer; other times, it makes more sense to image the computer in place while it is on. It may depend on what is the most important type of data expected to be found on the computer.

For example, Windows updates some program information in the registry when the changes are made. Other information is not updated until a program is closed. Also, if the computer’s drive is encrypted and you cannot decrypt it or don’t have the Key or password, you may have no choice except to image the live drive.

The Registry Quick Find Chart shown below gives more information.
# Windows XP Registry Quick Find Chart

The following charts describe common locations where you can find data of forensic interest in the Windows Registry.

## System Information

### Windows XP Registry System Information

<table>
<thead>
<tr>
<th>Description</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Owner</td>
<td>Software Microsoft\Windows NT\CurrentVersion</td>
<td>This information is entered during installation, but can be modified later.</td>
</tr>
<tr>
<td>Registered Organization</td>
<td>Software Microsoft\Windows NT\CurrentVersion</td>
<td>This information is entered during installation, but can be modified later.</td>
</tr>
<tr>
<td>Run</td>
<td>Software Microsoft\Windows\CurrentVersion\Run</td>
<td>Programs that appear in this key run automatically when the system boots.</td>
</tr>
<tr>
<td>Logon Banner Message</td>
<td>Software Microsoft\Windows\CurrentVersion\Policies\System\LegalNoticeText</td>
<td>This is a banner that users must click through to log on to a system.</td>
</tr>
<tr>
<td>Mounted Devices</td>
<td>System MountedDevices</td>
<td>Database of current and prior mounted devices that received a drive letter.</td>
</tr>
<tr>
<td>Current Control Set</td>
<td>System Select ControlSetXXX\Control\Windows</td>
<td>Identifies which control set is current.</td>
</tr>
<tr>
<td>Shutdown Time</td>
<td>System ControlSetXXX\Control\Windows</td>
<td>System shutdown time.</td>
</tr>
<tr>
<td>Event Logs</td>
<td>System ControlSetXXX\Services\EventLog</td>
<td>Location of Event logs.</td>
</tr>
<tr>
<td>Dynamic Disk</td>
<td>System ControlSetXXX\Services\DMIO\Boot Info\Primary Disk Group</td>
<td>Identifies the most recent dynamic disk mounted in the system.</td>
</tr>
<tr>
<td>Pagefile</td>
<td>System ControlSetXXX\Control\Session Manager\Memory Management</td>
<td>Location, size, set to wipe, etc.</td>
</tr>
<tr>
<td>Last User Logged In</td>
<td>Software Microsoft\Windows NT\CurrentVersion\Winlogon</td>
<td>Last user logged in - can be a local or domain account.</td>
</tr>
<tr>
<td>Product ID</td>
<td>Software Microsoft\Windows NT\CurrentVersion</td>
<td></td>
</tr>
<tr>
<td>O/S Version</td>
<td>Software Microsoft\Windows NT\CurrentVersion</td>
<td></td>
</tr>
<tr>
<td>Logon Banner Title</td>
<td>Software Microsoft\Windows\CurrentVersion\Policies\System\LegalNoticeCaption</td>
<td>User-defined data.</td>
</tr>
<tr>
<td>Logon Banner Message</td>
<td>Software Microsoft\Windows\CurrentVersion\Policies\System\LegalNoticeCaption</td>
<td>User-defined data.</td>
</tr>
<tr>
<td>Time Zone</td>
<td>System ControlSet001(or002)\Control\TimeZoneInformation\StandardName</td>
<td>This information is entered during installation, but can be modified later.</td>
</tr>
</tbody>
</table>
## Networking

### Windows XP Registry Networking Information

<table>
<thead>
<tr>
<th>Networking Information</th>
<th>Key Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map Network Drive MRU</td>
<td>NTUSER.DAT Software\Microsoft\Windows\CurrentVersion\Explorer\Map Network Drive MRU</td>
<td>Most recently used list of mapped network drives.</td>
</tr>
<tr>
<td>TCP\IP data</td>
<td>System ControlSet\XXX\Services\TCP\IP\Parameters</td>
<td>Domain, hostname data.</td>
</tr>
<tr>
<td>TCP\IP Settings of a Network Adapter</td>
<td>System ControlSet\XXX\Services\adapter\Parameters\TCP\IP</td>
<td>IP address, gateway information.</td>
</tr>
<tr>
<td>Default Printer</td>
<td>NTUSER.DAT Software\Microsoft\Windows NT\CurrentVersion\Windows</td>
<td>Current default printer.</td>
</tr>
<tr>
<td>Default Printer</td>
<td>NTUSER.DAT \printers</td>
<td>Current default printer.</td>
</tr>
<tr>
<td>Local Users</td>
<td>SAM Domains\Account\Users\Names</td>
<td>Local account security identifiers.</td>
</tr>
<tr>
<td>Local Groups</td>
<td>SAM Domains\Builtin\Aliases\Names</td>
<td>Local account security identifiers.</td>
</tr>
<tr>
<td>Profile list</td>
<td>Software Microsoft\Windows NT\CurrentVersion\ProfileList</td>
<td>Contains user security identifiers (only users with profile on the system).</td>
</tr>
<tr>
<td>Network Map</td>
<td>NTUSER.DAT Documents and Settings\username</td>
<td>Browser history and last-viewed lists attributed to the user.</td>
</tr>
</tbody>
</table>

## User Data

### Windows XP Registry User Data

<table>
<thead>
<tr>
<th>User Data</th>
<th>Key Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run</td>
<td>NTUSER.DAT Software\Microsoft\Windows\CurrentVersion\Run</td>
<td>Programs that appear in this key run automatically when the user logs on.</td>
</tr>
<tr>
<td>Media Player Recent List</td>
<td>NTUSER.DAT Software\Microsoft\Media Player\Player\RecentFileList</td>
<td>This key contains the user's most recently used list for Windows Media Player.</td>
</tr>
<tr>
<td>O\S Recent Docs</td>
<td>NTUSER.DAT Software\Microsoft\Windows\CurrentVersion\Explorer\RecentDocs</td>
<td>MRU list pointing to shortcuts located in the recent directory.</td>
</tr>
<tr>
<td>Run MRU</td>
<td>NTUSER.DAT \Software\Microsoft\Windows\CurrentVersion\Explorer\RunMRU</td>
<td>MRU list of commands entered in the “run” box.</td>
</tr>
<tr>
<td>Open And Save As Dialog Boxes MRU</td>
<td>NTUSER.DAT \Software\Microsoft\Windows\CurrentVersion\Explorer\ComDlg32</td>
<td>MRU lists of programs\files opened with or saved with the “open” or “save as” dialog boxes.</td>
</tr>
<tr>
<td>Current Theme</td>
<td>NTUSER.DAT Software\Microsoft\Windows\CurrentVersion\Themes</td>
<td>Desktop theme\wallpaper.</td>
</tr>
<tr>
<td>Last Theme</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\Windows\CurrentVersion\Themes\Last Theme</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>File Extensions\Program Association</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\Windows\CurrentVersion\Explorer\FileExts</td>
</tr>
</tbody>
</table>
### User Application Data

#### Windows XP Registry User Application Data

<table>
<thead>
<tr>
<th>Application</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word User Info</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\office\version\Common\UserInfo</td>
</tr>
<tr>
<td>Word Recent Docs</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\office\version\Common\Data</td>
</tr>
<tr>
<td>IE Typed URLs</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\Explorer\TypedURLs</td>
</tr>
<tr>
<td>IE Auto-Complete Passwords</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\Internet Explorer\IntelliForms</td>
</tr>
<tr>
<td>IE Auto-Complete Web Addresses</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\Protected Storage System Provider</td>
</tr>
<tr>
<td>IE Default Download Directory</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\Internet Explorer</td>
</tr>
<tr>
<td>Outlook Temporary Attachment Directory</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\office\version\Outlook\Security</td>
</tr>
<tr>
<td>AIM</td>
<td>NTUSER.DAT</td>
<td>Software\America Online\AOL Instant Messenger\CurrentVersion\Users\username</td>
</tr>
<tr>
<td>Word User Info</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\office\version\Common\UserInfo</td>
</tr>
<tr>
<td>ICQ</td>
<td>NTUSER.DAT</td>
<td>\Software\Mirabilis\ICQ*</td>
</tr>
<tr>
<td>MSN Messenger</td>
<td>NTUSER.DAT</td>
<td>Software\Microsoft\MSN Messenger\ListCache\NET MessengerService*</td>
</tr>
<tr>
<td>Kazaa</td>
<td>NTUSER.DAT</td>
<td>Software\Kazaa*</td>
</tr>
<tr>
<td>Yahoo</td>
<td>NTUSER.DAT</td>
<td>Software\Yahoo\Pager\Profiles*</td>
</tr>
<tr>
<td>Google Client History</td>
<td>NTUSER.DAT</td>
<td>Software\Google\NavClient\1.1\History</td>
</tr>
<tr>
<td>Adobe</td>
<td>NTUSER.DAT</td>
<td>Software\Adobe*</td>
</tr>
</tbody>
</table>
This appendix lists the file systems and image formats that are analyzed. It includes the following topics:

- File Systems (page 509)
- Whole Disk Encrypted Products (page 510)
- Hard Disk Image Formats (page 510)
- CD and DVD Image Formats (page 511)

## File Systems

The following table lists AccessData identified and analyzed file systems.

<table>
<thead>
<tr>
<th>Identified and Analyzed File Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAT 12, FAT 16, FAT 32</td>
</tr>
<tr>
<td>Ext2FS</td>
</tr>
<tr>
<td>Ext3FS</td>
</tr>
<tr>
<td>Ext4FS</td>
</tr>
<tr>
<td>ReiserFS 3</td>
</tr>
<tr>
<td>VxFS (Veritas File System)</td>
</tr>
</tbody>
</table>
**Whole Disk Encrypted Products**

The following table lists identified and analyzed Whole Disk Encryption (WDE) decryption products (these all require the investigator to enter the password, AccessData forensic products don’t “crack” these).

### Recognized and Analyzed Whole Disk Encryption Formats

<table>
<thead>
<tr>
<th>Format</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFF (Advanced Forensic Format)</td>
<td>Ultimaco Safeguard Easy</td>
</tr>
<tr>
<td>PGP®</td>
<td>Ultimaco SafeGuard Enterprise</td>
</tr>
<tr>
<td>Credant</td>
<td>Guardian Edge</td>
</tr>
<tr>
<td>SafeBoot</td>
<td>EFS</td>
</tr>
<tr>
<td>JFS</td>
<td>LVM</td>
</tr>
<tr>
<td>VMware</td>
<td>LVM2</td>
</tr>
<tr>
<td>UFS1</td>
<td>UFS2</td>
</tr>
<tr>
<td>Apple FileVault</td>
<td>Apple FileVault 2</td>
</tr>
</tbody>
</table>

### Hard Disk Image Formats

The following table lists identified and analyzed hard disk image formats.

### Supported Hard Disk Image Formats

<table>
<thead>
<tr>
<th>Format</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encase, including ‘incomplete’ Tableau-created files</td>
<td>SnapBack</td>
</tr>
<tr>
<td>Safeback 2.0 and under</td>
<td>Expert Witness</td>
</tr>
<tr>
<td>Linux DD</td>
<td>ICS</td>
</tr>
<tr>
<td>Ghost (forensic images only)</td>
<td>SMART</td>
</tr>
<tr>
<td>AccessData Logical Image (AD1)</td>
<td>MSVHD (MS Virtual Hard Disk)</td>
</tr>
<tr>
<td>DMG (Mac)</td>
<td>Lx0, Lx01</td>
</tr>
</tbody>
</table>
CD and DVD Image Formats

The following table lists identified and analyzed CD and DVD image formats.

<table>
<thead>
<tr>
<th>Identified and Analyzed CD and DVD File Systems and Formats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol (*.mds)</td>
</tr>
<tr>
<td>PlexTools (*.pxi)</td>
</tr>
<tr>
<td>Nero (*.nrg)</td>
</tr>
<tr>
<td>ISO</td>
</tr>
<tr>
<td>Virtual CD (*.vc4)</td>
</tr>
<tr>
<td>VCD</td>
</tr>
<tr>
<td>DVD+MRW</td>
</tr>
<tr>
<td>DVD-RW</td>
</tr>
<tr>
<td>DVD+RW Dual Layer</td>
</tr>
<tr>
<td>BD-R SRM-POW</td>
</tr>
<tr>
<td>BD-R SRM</td>
</tr>
<tr>
<td>HD DVD-R</td>
</tr>
<tr>
<td>SVCD</td>
</tr>
<tr>
<td>HD DVD-RW</td>
</tr>
<tr>
<td>CD-ROM XA</td>
</tr>
<tr>
<td>DVD+VR</td>
</tr>
<tr>
<td>DVD+R Dual Layer</td>
</tr>
<tr>
<td>DVD-VRW</td>
</tr>
<tr>
<td>HD DVD-R DL</td>
</tr>
<tr>
<td>BDAV</td>
</tr>
<tr>
<td>HD DVD-RAM</td>
</tr>
<tr>
<td>CD-R</td>
</tr>
<tr>
<td>SACD</td>
</tr>
<tr>
<td>DVD-ROM</td>
</tr>
<tr>
<td>DVD-VM</td>
</tr>
<tr>
<td>DVD+VRW</td>
</tr>
<tr>
<td>IsoBuster CUE</td>
</tr>
<tr>
<td>CloneCD (*.ccd)</td>
</tr>
<tr>
<td>Roxio (*.cif)</td>
</tr>
<tr>
<td>Pinnacle (*.pdi)</td>
</tr>
<tr>
<td>CD-RW,</td>
</tr>
<tr>
<td>CD-ROM</td>
</tr>
<tr>
<td>DVCD</td>
</tr>
<tr>
<td>DVD-VFR</td>
</tr>
<tr>
<td>DVD-VR</td>
</tr>
<tr>
<td>BD-R</td>
</tr>
<tr>
<td>BD-R DL</td>
</tr>
<tr>
<td>HD DVD-R DW DL</td>
</tr>
<tr>
<td>HD DVD</td>
</tr>
<tr>
<td>DVD-RAM,</td>
</tr>
<tr>
<td>CD-MRW,</td>
</tr>
<tr>
<td>DVD+R</td>
</tr>
<tr>
<td>BD-RE</td>
</tr>
<tr>
<td>BD-ROM</td>
</tr>
<tr>
<td>BD-R RRm</td>
</tr>
<tr>
<td>Virtual CD (*.vc4)</td>
</tr>
<tr>
<td>DVD+RW</td>
</tr>
<tr>
<td>VD-R</td>
</tr>
<tr>
<td>DVD-R Dual Layer</td>
</tr>
<tr>
<td>BD-R SRM+POW</td>
</tr>
<tr>
<td>BD-RE DL</td>
</tr>
</tbody>
</table>
You can find deleted files on supported file systems by their file header.

This appendix includes the following topics:

- FAT 12, 16, and 32 (page 512)
- NTFS (page 513)
- Ext2 (page 513)
- Ext3 (page 513)
- HFS (page 513)

FAT 12, 16, and 32

When parsing FAT directories, deleted files are identified by their names. In a deleted file, the first character of the 8.3 filename is replaced by the hex character 0xE5.

The file’s directory entry provides the file’s starting cluster (C) and size. From the size of the file and the starting cluster, the total number of clusters (N) occupied by the file are computed.

The File Allocation Table (FAT) is examined and the number of unallocated clusters are counted, starting at C (U). The recovered file [min (N, U)] clusters starting at C are then assigned.

If the deleted file was fragmented, the recovered file is likely to be incorrect and incomplete because the information that is needed to find subsequent fragments was wiped from the FAT system when the file was deleted.

If present, the long filename (LFN) entries are used to recover the first letter of the deleted file’s short filename. If the LFN entries are incomplete or absent, it uses an exclamation mark ("!") as the first letter of the filename.

The volume free space for deleted directories that have been orphaned are searched with a meta-carve process. An orphaned directory is a directory whose parent directory or whose entry in its parent directory has been overwritten.
NTFS

The Master File Table (MFT) is examined to find files that are marked deleted because the allocation byte in a record header indicates a deleted file or folder. It then recovers the file’s data using the MFT record’s data attribute extent list if the data is non-resident.

If the deleted file’s parent directory exists, the recovered file is shown in the directory where it originally existed. Deleted files whose parent directories were deleted are shown in their proper place as long as their parent directory’s MFT entry has not been recycled.

Ext2

Nodes that are marked deleted are searched for. The link count is zero and the deletion timestamp is nonzero.

For each deleted inode, the block pointers are processed and blocks are added to the deleted file. However, if an indirect block is marked allocated or references an invalid block number, the recovered file is truncated at that point because the block no longer contains a list of blocks for the file that the application is attempting to recover.

The filenames for files deleted on ext2 systems are not recovered. Instead, deleted files are identified by inode number because ext2 uses variable-length directory entries organized in a linked list structure. When a file is deleted, its directory entry is unlinked from the list, and the space it occupied becomes free to be partially or completely overwritten by new directory entries. There is no reliable way to identify and extract completely deleted directory entries.

Ext3

Deleted files from ext3 volumes are not recovered because ext3 zeroes out a file’s indirect block pointers when it is deleted.

HFS

Deleted files from HFS are not recovered.
Chapter 44
Managing Security Devices and Licenses

This appendix includes information about AccessData product licenses, Virtual CodeMeter activation, and Network License Server configurations.

Installing and Managing Security Devices

AccessData products require a licensing security device that communicates with the program to verify the existence of a current license.

You must install the security device software and drivers before you can manage licenses with LicenseManager. This section explains installing and using the CodeMeter Runtime software and the License Manager.

Installing the Security Device

AccessData products require a licensing security device that communicates with the program to verify the existence of a current license. The device is a WIBU-SYSTEMS (Wibu) CodeMeter (CmStick). This USB device requires specific software to be installed prior to connecting the devices and running your AccessData products. You will need the WIBU-SYSTEMS CodeMeter Runtime software with a WIBU-SYSTEMS CodeMeter (CmStick), either the physical USB device, or the Virtual device.

Note: Without a license security device and its related software, you can run applications in Demo mode only.

Store the CmStick or dongle in a secure location when it is not in use.

Installing the CodeMeter Runtime Software

When you purchase a product, AccessData provides a USB CmStick with the product package. To use the CmStick, you must first install the CodeMeter Runtime software, either from the shipping disc or from the setup file downloaded from the AccessData Web site.

Note: The CodeMeter software is automatically installed as part of the FTK suite.

To download the CodeMeter installer from the AccessData web site

1. Go to the AccessData download page at:
2. On the download page, click **CodeMeter**.
3. Click **Download Page**.
4. Click **Download Now**.
5. Save the installation file to your download directory or other temporary directory on your drive.

**To install CodeMeter**

1. Do one of the following:
   - Launch the installer from the FTK installer by doing the following:
     1a. Launch the FTK installer `Autorun.exe` file.
     1b. Click **Other Products**.
     1c. Click Install License Manager.
   - Launch the installer from the download by doing the following:
     1a. Navigate to, and double-click the installation file.
2. Wait for the **Preparing to Install** processes to complete.
3. In the Welcome dialog, click **Next**.
4. Read and accept the License Agreement
5. Enter User Information.
6. Click **Next**.
7. Select the features you want to install.
8. Click **Next**.
9. Click **Install**.
10. Click **Finish**.
11. Click **OK**.

**CodeMeter Error**

If you are not using NLS for your security device configuration, after clicking **No**, you will see the following additional message.

*Security Device Not Found*

To remedy, click **OK**, then install the correct CodeMeter Runtime software, and connect the CmStick or run License Manager to generate your Virtual CmStick. Then, restart FTK.
Installing LicenseManager

LicenseManager lets you manage product and license subscriptions using a security device or device packet file.

You can access the LicenseManager installer from the Web or from the FTK installer.

To download the LicenseManager installer from the AccessData web site
1. Go to the AccessData download page at:
2. On the download page, click LicenseManager.
3. Click Download Page.
4. Click Download Now.
5. Save the installation file to your download directory or other temporary directory on your drive.

To install LicenseManager
1. Do one of the following:
   - Launch the installer from the FTK installer by doing the following:
     1a. Launch the FTK installer Autorun.exe file.
     1b. Click Other Products.
     1c. Click Install License Manager.
   - Launch the installer from the download by doing the following:
     1a. Navigate to, and double-click the installation file.
2. Wait for the Preparing to Install processes to complete.
3. Click Next on the Welcome screen
4. Read and accept the License Agreement.
5. Click Next.
6. Accept the default destination folder, or select a different one.
7. Click Next.
8. In the Ready to Install the Program dialog, click Back to review or change any of the installation settings. When you are ready to continue, click Install.
9. Wait while the installation completes.
10. If you want to launch LicenseManager after completing the installation, mark the Launch AccessData LicenseManager check box.
11. Select the Launch AccessData LicenseManager check box to run the program upon finishing the setup. The next section describes how to run LicenseManager later.
12. Click Finish to finalize the installation and close the wizard.
Starting **LicenseManager**

To launch **LicenseManager**
1. Launch **LicenseManager** by clicking the **LicenseManager** icon on your desktop.
   When starting, **LicenseManager** reads licensing and subscription information from the installed and connected WIBU-SYSTEMS CodeMeter Stick, or Keylok dongle.

   **Note:** If using a Keylok dongle, and **LicenseManager** either does not open or displays the message, “Device Not Found”

2. Verify the correct dongle driver is installed on your computer.
3. With the dongle connected, check in Windows Device Manager to make sure the device is recognized.
   If it has an error indicator, right click on the device and choose Uninstall.
4. Remove the dongle after the device has been uninstalled.
5. Reboot your computer.
6. After the reboot is complete, and all startup processes have finished running, connect the dongle.
7. Wait for Windows to run the Add New Hardware wizard. If you already have the right dongle drivers installed, do not browse the internet, choose, “No, not this time.”
8. Click **Next** to continue.
9. On the next options screen, choose, “Install the software automatically (Recommended)
10. Click **Next** to continue.
11. When the installation of the dongle device is complete, click Finish to close the wizard.
12. You still need the CodeMeter software installed, but will not need a CodeMeter Stick to run **LicenseManager**.

   **Note:** If using a CodeMeter Stick, and **LicenseManager** either does not open or displays the message, “Device Not Found”

13. Make sure the CodeMeter Runtime 4.20b software is installed. It is available at [www.accessdata.com/support](http://www.accessdata.com/support). Click Downloads and browse to the product. Click on the download link. You can Run the product from the Website, or Save the file locally and run it from your PC. Once the CodeMeter Runtime software is installed and running, you will see a gray icon in your system tray.

14. Make sure the CodeMeter Stick is connected to the USB port.

   If the CodeMeter Stick is not connected, **LicenseManager** still lets you to manage licenses using a security device packet file if you have exported and saved the file previously.

**To open LicenseManager without a CodeMeter Stick installed**

1. Click **Tools > LicenseManager**.
   **LicenseManager** displays the message, “Device not Found”.
2. Click **OK**, then browse for a security device packet file to open.

   **Note:** Although you can run LicenseManager using a packet file, AccessData products will not run with a packet file alone. You must have the CmStick or dongle connected to the computer to run AccessData products that require a license.
**Using LicenseManager**

LicenseManager provides the tools necessary for managing AccessData product licenses on a WIBUSYSTEMS CodeMeter Stick security device, a Keylok dongle, a Virtual Dongle, or in a security device packet file.

LicenseManager displays license information, allows you to add licenses to or remove existing licenses from a dongle or CmStick. LicenseManager, and can also be used to export a security device packet file. Packet files can be saved and reloaded into LicenseManager, or sent via email to AccessData support.

In addition, you can use LicenseManager to check for product updates and in some cases download the latest product versions.

LicenseManager displays CodeMeter Stick information (including packet version and serial number) and licensing information for all AccessData products. The Purchase Licenses button connects directly to the AccessData website and allows you to browse the site for information about products you may wish to purchase. Contact AccessData by phone to speak with a Sales Representative for answers to product questions, and to purchase products and renew licenses and subscriptions.

**The LicenseManager Interface**

The LicenseManager interface consists of two tabs that organize the options in the LicenseManager window: the Installed Components tab and the Licenses tab.

**The Installed Components Tab**

The Installed Components tab lists the AccessData programs installed on the machine. The Installed Components tab is displayed in the following figure.

The following information is displayed on the Installed Components tab:

<table>
<thead>
<tr>
<th>LicenseManager Installed Components Tab Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program</td>
</tr>
<tr>
<td>Installed Version</td>
</tr>
<tr>
<td>Newest Version</td>
</tr>
<tr>
<td>Product Notes</td>
</tr>
<tr>
<td>AccessData Link</td>
</tr>
</tbody>
</table>

The following buttons provide additional functionality from the Installed Components tab:

**LicenseManager Installed Components Buttons**

<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help</td>
<td>Opens the LicenseManager Help web page.</td>
</tr>
</tbody>
</table>
Use the Installed Components tab to manage your AccessData products and stay up to date on new releases.

The Licenses Tab

The Licenses tab displays CodeMeter Stick information for the current security device packet file and licensing information for AccessData products available to the owner of the CodeMeter Stick, as displayed in the following figure.

The Licenses tab provides the following information:

LicenseManager Licenses Tab Features

<table>
<thead>
<tr>
<th>Program</th>
<th>Shows the owned licenses for AccessData products.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expiration Date</td>
<td>Shows the date on which your current license expires.</td>
</tr>
<tr>
<td>Status</td>
<td>Shows these status of that product's license:</td>
</tr>
<tr>
<td></td>
<td>• None: the product license is not currently owned</td>
</tr>
<tr>
<td></td>
<td>• Days Left: displays when less than 31 days remain on the license.</td>
</tr>
<tr>
<td></td>
<td>• Never: the license is permanently owned. This generally applies to Hash Tables and Portable Office Rainbow Tables.</td>
</tr>
<tr>
<td>Name</td>
<td>Shows the name of additional parameters or information a product requires for its license.</td>
</tr>
<tr>
<td>Value</td>
<td>Shows the values of additional parameters or information a product contained in or required for its license.</td>
</tr>
<tr>
<td>Show Unlicensed</td>
<td>When checked, the License window displays all products, whether licensed or not.</td>
</tr>
</tbody>
</table>

The following license management actions can be performed using buttons found on the License tab:

License Management Options

| Remove License | Removes a selected license from the Licenses window and from the CodeMeter Stick or dongle. Opens the AccessData License Server web page to confirm success. |
| Refresh Device | Connects to the AccessData License Server. Downloads and overwrites the info on the CodeMeter Stick or dongle with the latest information on the server. |
| Reload from Device | Begins or restarts the service to read the licenses stored on the CodeMeter Stick or dongle. |
Opening and Saving Dongle Packet Files

You can open or save dongle packet files using LicenseManager. When started, LicenseManager attempts to read licensing and subscription information from the dongle. If you do not have a dongle installed, LicenseManager lets you browse to open a dongle packet file. You must have already created and saved a dongle packet file to be able to browse to and open it.

To save a security device packet file

1. Click the Licenses tab, then under License Packets, click Save to File.
2. Browse to the desired folder and accept the default name of the .PKT file; then click Save.

Note: In general, the best place to save the .PKT files is in the AccessData LicenseManager folder. The default path is C:\Program Files\AccessData\Common Files\AccessData LicenseManager\.

To open a security device packet file

1. Select the Licenses tab.
2. Under License Packets, click Open Packet File.
3. Browse for a dongle packet file to open. Select the file and click Open.

Adding and Removing Product Licenses

On a computer with an Internet connection, LicenseManager lets you add available product licenses to, or remove them from, a dongle.
To move a product license from one dongle to another dongle, first remove the product license from the first dongle. You must release that dongle, and connect the second dongle before continuing. When the second dongle is connected and recognized by Windows and LicenseManager, click on the Licenses tab to add the product license to the second dongle.

Removing a License

**To remove (unassociate, or unbind) a product license**

1. From the Licenses tab, mark the program license to remove. This action activates the Remove License button below the Program list box.
2. Click Remove License to connect your machine to the AccessData License Server through the internet.
3. When you are prompted to confirm the removal of the selected licenses from the device, click Yes to continue, or No to cancel.
4. Several screens appear indicating the connection and activity on the License Server, and when the license removal is complete, the following screen appears.
5. Click OK to close the message box. Another internet browser screen appears from LicenseManager with a message that says, “The removal of your licenses from Security Device was successful!” You may close this box at any time.

Adding a License

**To add a new or released license**

1. From the Licenses tab, under Browser Options, click Add Existing License. The AccessData LicenseManager Web page opens, listing the licenses currently bound to the connected security device, and below that list, you will see the licenses that currently are not bound to any security device. Mark the box in the Bind column for the product you wish to add to the connected device, then click Submit.
2. An AccessData LicenseManager Web page will open, displaying the following message, "The AccessData products that you selected has been bound to the record for Security Device nnnnnnn within the Security Device Database.
   “Please run LicenseManager's “Refresh Device” feature in order to complete the process of binding these product licenses to this Security Device." You may close this window at any time.
3. Click Yes if LicenseManager prompts, “Were you able to associate a new product with this device?”
4. Click Refresh Device in the Licenses tab of LicenseManager. Click Yes when prompted.

You will see the newly added license in the License Options list.

Adding and Removing Product Licenses Remotely

While LicenseManager requires an Internet connection to use some features, you can add or remove licenses from a dongle packet file for a dongle that resides on a computer, such as a forensic lab computer, that does not have an Internet connection.

If you cannot connect to the Internet, the easiest way to move licenses from one dongle to another is to physically move the dongle to a computer with an Internet connection, add or remove product licenses as necessary using LicenseManager, and then physically move the dongle back to the original computer. However,
if you cannot move the dongle—due to organization policies or a need for forensic soundness—then transfer the packet files and update files remotely.

Adding a License Remotely

To remotely add (associate or bind) a product license
1. On the computer where the security device resides:
   1a. Run LicenseManager.
   1b. From the Licenses tab, click **Reload from Device** to read the dongle license information.
   1c. Click **Save to File** to save the dongle packet file to the local machine.
2. Copy the dongle packet file to a computer with an Internet connection.
3. On the computer with an Internet connection:
   3a. Remove any attached security device.
   3b. Launch LicenseManager. You will see a notification, “No security device found”.
   3c. Click OK.
   3d. An “Open” dialog box will display. Highlight the .PKT file, and click **Open**.
   3e. Click on the Licenses tab.
   3f. Click **Add Existing License**.
   3g. Complete the process to add a product license on the Website page.
   3h. Click **Yes** when the LicenseManager prompts, “Were you able to associate a new product with this dongle?”
   3i. When LicenseManager does not detect a dongle or the serial number of the dongle does not match the serial number in the dongle packet file, you are prompted to save the update file, [serial#].wibuCmRaU.
   3j. Save the update file to the local machine.
4. After the update file is downloaded, copy the update file to the computer where the dongle resides:
5. On the computer where the dongle resides:
   5a. Run the update file by double-clicking it. ([serial#].wibuCmRaU is an executable file.)
   5b. After an update file downloads and installs, click **OK**.
   5c. Run LicenseManager.
   5d. From the Licenses tab, click **Reload from Device** to verify the product license has been added to the dongle.

Removing a License Remotely

To remotely remove (unassociate, or unbind) a product license
1. On the computer where the dongle resides:
   1a. Run LicenseManager.
   1b. From the Licenses tab, click **Reload from Device** to read the dongle license information.
   1c. Click **Save to File** to save the dongle packet file to the local machine.
2. Copy the file to a computer with an Internet connection.
3. On the computer with an Internet connection:
   3a. Launch LicenseManager. You will see a notification, “No security device found”.

3b. Click **OK**.
3c. An “Open” dialog box will display. Highlight the .PKT file, and click **Open**.
3d. Click on the Licenses tab.
3e. Mark the box for the product license you want to unassociate; then click **Remove License**.
3f. When prompted to confirm the removal of the selected license from the dongle, click **Yes**.
3g. When LicenseManager does not detect a dongle or the serial number of the dongle does not match the serial number in the dongle packet file, you are prompted save the update file.
3h. Click **Yes** to save the update file to the local computer.
3i. The Step 1 of 2 dialog details how to use the dongle packet file to remove the license from a dongle on another computer.
3j. Save the update file to the local machine.

4. After the update file is downloaded, copy the update file to the computer where the dongle resides.

5. On the computer where the dongle resides:
5a. Run the update file by double-clicking it. This runs the executable update file and copies the new information to the security device.
5b. Run LicenseManager
5c. On the Licenses tab, click **Reload from Device** in LicenseManager to read the security device and allow you to verify the product license is removed from the dongle.
5d. Click **Save to File** to save the updated dongle packet file to the local machine.

6. Copy the file to a computer with an Internet connection.

**Updating Products**

You can use LicenseManager to check for product updates and download the latest product versions.

**Checking for Product Updates**

To check for product updates, on the Installed Components tab, click **Newest**. This refreshes the list to display what version you have installed, and the newest version available.

**Downloading Product Updates**

To install the newest version, mark the box next to the product to install, then click **Install Newest**.

**Note:** Some products are too large to download, and are not available. A notification displays if this is the case.

**To download a product update**

1. Ensure that LicenseManager displays the latest product information by clicking the Installed Components tab. Click **Newest** to refresh the list showing the latest releases, then compare your installed version to the latest release.
   - If the latest release is newer than your installed version, you may be able to install the latest release from our Website.
2. Ensure that the program you want to install is not running.
3. Mark the box next to the program you want to download; then click **Install Newest**.
4. When prompted, click Yes to download the latest install version of the product.
   4a. If installing the update on a remote computer, copy the product update file to another computer.
5. Install the product update. You may need to restart your computer after the update is installed.

**Purchasing Product Licenses**

Use LicenseManager to link to the AccessData Web site to find information about all our products.

Purchase product licenses through your AccessData Sales Representative. Call 801-377-5410 and follow the prompt for Sales, or send an email to sales@accessdata.com.

**Note:** Once a product has been purchased and appears in the AccessData License Server, add the product license to a CodeMeter Stick, dongle, or security device packet file by clicking Refresh Device.

**Sending a Dongle Packet File to Support**

Send a security device packet file only when specifically directed to do so by AccessData support.

**To create a dongle packet file**

1. Run LicenseManager
2. Click on the Licenses tab.
3. Click Load from Device.
4. Click Refresh Device if you need to get the latest info from AD’s license server.
5. Click Save to File, and note or specify the location for the saved file.
6. Attach the dongle packet file to an e-mail and send it to:
   support@accessdata.com.
Virtual CodeMeter Activation Guide

Introduction

A Virtual CodeMeter (VCM) allows the user to run licensed AccessData products without a physical CodeMeter device. A VCM can be created using AccessData License Manager, but requires the user to enter a Confirmation Code during the creation process.

The latest revision of this guide can be found at:


Preparation

- Contact your AccessData sales rep to order a VCM confirmation code.
- Install CodeMeter Runtime 4.10b or newer (available on the AccessData download page).
- Install the latest release of License Manager (available on the AccessData download page).
- The following steps are to be run on the system where you want to permanently attach the VCM.

Note: Once created, the VCM cannot be moved to any other system.

- AD Lab WebUI and eDiscovery administrators, please also follow steps outlined under in Additional Instructions for AD Lab WebUI and eDiscovery (page 527) in order to enable VCM licensing on the AccessData License Service.

Setup for Online Systems

To setup a Virtual CodeMeter

1. Unplug any AccessData dongles you currently have connected.
2. Launch License Manager.


3. Select Create A Local Virtual CMStick
4. Click OK.
   The Confirmation Code Required dialog appears.
5. Enter your confirmation code.
6. Click OK, AccessData License Manager will automatically synchronize with the License Server over the Internet.
7. Click OK when the update completes. License Manager will then create the VCM on your system.
8. At this point, AccessData License Manager now displays a serial number for the VCM on the Licenses tab and the VCM can now operate in a similar way to a hardware CodeMeter device.
**Setting up VCM for Offline Systems**

You can setup a Virtual CodeMeter on a system that is not connected to the internet (offline). You must also have one machine that connects to the internet to perform certain steps. This section details what to do on which machine.

**Perform these steps on the Online system**

1. Unplug any AccessData dongles you currently have connected.
2. Launch License Manager.


3. Select **Create Empty Virtual CMStick (offline)**.
4. Click **OK**.
5. The resulting dialog prompts you to save the *.wibucmravu* file. Enter a name and path for the file, then click **Save**.
6. Transfer the *.wibucmravu* to the Online system.

**Perform these steps on the Online system**

7. Unplug any AccessData dongles you currently have connected.
8. Launch License Manager.
9. Select **Create Activation File (online)**.
10. Click **OK**.
11. In the Confirmation Code Required dialog, enter your confirmation code and click **OK**.
12. AccessData License Manager will automatically synchronize with the License Server over the internet. Data synchronized from the server will be written to the *.wibucmravu* file. Click **OK** when the update completes.
13. Transfer *.wibucmravu* back to the offline system.

**Perform these steps on the Offline system**

14. Unplug any AccessData dongles you currently have connected.
15. Launch License Manager.
16. Select **Create Activate Virtual CMStick (offline)**.
17. Click **OK**.
18. The resulting dialog prompts you to browse to the location of the newly updated *.wibucmravu* file. Locate the file, then click **Open**. License Manager creates the VCM on your system.
19. At this point, AccessData License Manager should now display a serial number for the VCM on the “Licenses” tab and the VCM can now operate in a similar way to a hardware CodeMeter device.

**Creating a Virtual CM-Stick with Server 2003/2008 Enterprise Editions**

This section contains special instructions for using a VCM with Windows Server 2003 or 2008 Enterprise Editions. Complete each section in order.
To Create an Empty CodeMeter License Container

2. Open the CodeMeter Control Center. Make sure the window on the License tab is, empty indicating that no licenses are currently loaded.
3. Select File > Import License.
4. Browse to the License Manager program files directory.
   - 32 bit systems: C:\Program Files\AccessData\LicenseManager\ 
   - 64 bit systems: C:\Program Files (x86)\ AccessData\LicenseManager\ 
5. Highlight the TemplateDisc5010.wbb file, then click Import.
6. Click the Activate License button.
7. When the CmFAS Assistant opens, click Next.
8. Select Create license request, and click Next.
9. Confirm the desired directory and filename to save .WibuCmRaC. (Example: Test1.WibuCmRaC)
10. Click Commit.
11. Click Finish.

To Copy to another machine

1. Copy the new .WibuCmRaC to another machine that is not running Windows Server 2003/2008 Enterprise.

   Note: The destination system must have an active internet connection.

2. Unplug any AccessData dongles you currently have connected.
3. Launch License Manager.
4. Select Create Activation File (online).
5. Click OK.
6. In the Confirmation Code Required dialog enter your confirmation code and click OK.
7. AccessData License Manager will automatically synchronize with the License Server over the internet. Data synchronized from the server will be written to the *.wibucmrau file. Click OK when the update completes.

To Finish the activation on the Windows Server 2003/2008 Enterprise system

3. Open the CodeMeter Control Center. Make sure the window on the License tab empty indicating that no licenses are currently loaded.
4. Select File > Import License.
5. Browse to the location where the activated .WibuCmRaC is stored. Click Import.
6. AccessData License Manager now displays a serial number for the VCM on the Licenses tab and the VCM can now operate in a similar way to a hardware CodeMeter device.

Additional Instructions for AD Lab WebUI and eDiscovery

This section provides additional information for enabling the Web User Interface to recognize a VCM.
To enable AD Lab WebUI and eDiscovery to use VCM

1. Open Registry Editor.
2. Navigate to the following key:
   
   HKEY_LOCAL_MACHINE\SOFTWARE\AccessData\Products

   Add the following DWORD registry string to the key and set the value to 1:
   
   HKEY_LOCAL_MACHINE\SOFTWARE\AccessData\Products | EnableACTTest

   The AccessData License Service will know to expect a VCM when EnableACTTest is set to “1.”

Virtual CodeMeter FAQs

Q: How do I get a Virtual CodeMeter (VCM)?
A: Contact your AccessData product sales representative. They will provide you with a VCM confirmation code.

Q: How do VCMs work?
A: A VCM operates in almost exactly the same way as a hardware CodeMeter device, except that they exist as a file stored on the hard disk. During activation, the VCM file (named with a WBB extension) is tied to the hardware of the system using unique hardware identifiers. Those unique identifiers make VCMs non-portable. When AccessData License Manager is launched, it will automatically load the VCM and display its license information. From there, you can refresh, remove, add existing licenses, etc just the same you would with a hardware security device.

Q: Are VCMs supported on virtual machines (VM)?
A: No. Due to the fact that virtual machines are portable and VCMs are not, VCMs are not supported on virtual machines. Currently it is recommended to use AccessData Network License Service (NLS) to license systems running as virtual machines. CLICK HERE for more information.

Q: Does the AccessData Network License Service (NLS) support VCMs?
A: The current release of NLS does not support using VCM as a network dongle. AccessData is considering this support for a future release.

Q: How can I “unplug” a VCM?
A: If you want to prevent License Manager from automatically loading the VCM you can “unplug” it by stopping the CodeMeter Runtime Service server and then moving (cut and paste) the WBB file to a new location (renaming the file does not suffice). By default the WBB file is located at:

   32 bit systems:
   
   C:\Program Files\CodeMeter\CmAct\

   64 bit systems:

   C:\Program Files (x86)\CodeMeter\CmAct\

Q: I have activated a VCM on my system, but now I need to activate it on a different system. What should I do?
A: Since a VCM is uniquely tied to the system on which it is activated, it cannot be moved to any other system. If you need to activate a VCM on a different system, you need to contact your AccessData Sales Representative.

Q: What if I need to reinstall Windows, format my drive, change my system's hardware, or back up my VCM in case of a disaster? Will the VCM still work?

A: The VCM can be backed up by simply copying the WBB file to a safe location. It can be restored by copying the WBB file to the CmAct folder. The VCM cannot be restored without a WBB file. If you do not have a backup of your WBB file, you will need to get a new confirmation code from your AccessData Sales Representative.

Q: My AccessData product does not seem to recognize the license stored on a VCM. What am I doing wrong?

A: VCMs are supported by the following versions of AccessData products:

- FTK 1.81.6 and newer
- FTK 3.1.0 and newer
- PRTK 6.5.0 and newer
- DNA 3.5.0 and newer
- RV 1.6.0 and newer
- eDiscovery 3.1.2 and newer
- AD Lab 3.1.2 and newer
- AD Enterprise 3.1.0 and newer
- MPE+ 4.0.0.1 and newer

Ensure that the version of the product you are running support VCMs. If the version you are running is listed as supported, verify that according to License Manager, the release date of the version you are running falls before the expiration date of the license.
Network License Server (NLS) Setup Guide

Introduction

This section discusses the installation steps and configuration notes needed to successfully setup an AccessData Network License Server (NLS).

Note: Click on this link to access the latest version of this guide:

Network License Server (NLS) Setup Guide.

Preparation Notes

- CodeMeter Runtime 3.30a or newer must be installed on all Client and Server systems
- AccessData License Manager must be used to prepare the network dongle. The system running License Manager must have internet access and have CodeMeter Runtime installed.
- The current release of NLS supports the following versions of Windows:
  - Windows XP 32/64 bit
  - Windows Server 2003 32/64 bit
  - Windows Vista 32/64 bit
  - Windows Server 2008 R1 32/64 bit
  - Windows 7 32/64 bit
  - Windows Server 2008 R2 64 bit

Setup Overview

To setup NLS

1. Download the latest release of NLS located in the utilities section of the AccessData download page.
2. Extract contents of ZIP to a folder of your choice.
3. On the NLS server system, run through the NLS Installation MSI and accept all defaults.
4. Prepare network dongle:
   4a. Provide the serial number to AD Support and request to have the “Network Dongle Flag” applied.
   4b. Migrate any additional licenses to the network dongle
   4c. Refresh the network dongle device using AccessData License Manager.
5. Launch the AccessData product on the NLS client system.
6. Enter the NLS server configuration information:
   - IP address or hostname of NLS server system
   - Port 6921
7. Click, OK.

If you encounter any problems, please read the notes below for troubleshooting information.
**Network Dongle Notes**

- AccessData License Manager 2.2.6 or newer should be installed in order to manage licenses on the network dongle.
- Network dongles can hold up to 120 physical licenses. Each License has a capacity to hold thousands of sub licenses (i.e. Client count or worker count).
- Contact AccessData Technical Support to have your CodeMeter device flagged as a Network Dongle (required for NLS).

**NLS Server System Notes**

- Make sure the CodeMeter device is flagged as Network Dongle (i.e. License Manager will show the serial as “1181234N”. To have this flag set on your CodeMeter device, please contact AccessData Technical Support).
- Server system must be configured to allow incoming and outgoing traffic on TCP port 6921.
- A web interface to view and revoke licenses all licenses is accessible at http://localhost:5555
  - This page can be reached only from a web browser running locally on the NLS server system.
- A Network Dongle cannot be used to run AccessData products locally unless the NLS server is running locally.
- Some versions of Windows may not find a local NLS server when the DNS hostname of the server is provided. In those cases, it is recommended to use a static IP address.
- When using the NLS across domains, users must have permissions to access resources on both domains (either by dual-domain membership or cross-domain trust).
- When running NLS on Windows Server 2008, Terminal Services must be installed and accepting connections. If Terminal Services is not configured it will not open the port and share out the licenses correctly.
- The name of the service according to Windows is “AccessData Network License Service.”

**NLS Client System Notes**

- When launched, any NLS client application that needs to lease a license from the NLS server will automatically check for the following values within the Windows Registry.
  - **NetDonglePath**: The IP address or DNS hostname of the system hosting the Network License Server service which is found in the following registry key on the client system:
    ```
    HKEY_LOCAL_MACHINE\SOFTWARE\AccessData\Products\Common
    ```
  - **NetDonglePort**: The TCP port number through which the client and server systems have been configured to use. This value is located in the same key as NetDonglePath.
  - **uniqueId**: In order to lease a license from the server, the client system must first posses a unique identification value. This value is automatically generated by applications such as FTK, PRTK, or DNA. (Registry Viewer and FTK 1.x cannot be used setup initial client NLS configuration at this time.)
    - You can find the each client system’s uniqueId by inspecting the following registry key:
    ```
    HKEY_LOCAL_MACHINE\SOFTWARE\AccessData\Shared
    ```
  - The Client system must be configured to allow all incoming and outgoing traffic on TCP port 6921.
  - The following products support the ability to lease a license from a NLS server:
    - FTK 2.2.1 and newer
    - FTK 1.81.2 and newer
- FTK Pro 3.2 and newer
- PRTK 6.4.2 and newer
- DNA 3.4.2 and newer
- Registry Viewer 1.5.4 and newer
- AD Enterprise 3.0.3 and newer
- AD Lab 3.0.4 and newer
- AD Lab Lite 3.1.2 and previous
- Mobile Phone Examiner 3.0 and newer
- Explicit Image Detection (EID) Add-on
- Glyph Add-on
- Use AccessData License Manager (ver. 2.2.4 or newer) to migrate licenses off other devices and onto a network device.
- When running AccessData products on Windows Vista, 7, or Server 2008 you must choose Run as administrator at least once in order to lease a license from a NLS server.
- If the NLS client application is having trouble leasing a license either from the NLS server, AccessData recommends that you reset the licensing configuration to default.
- To reset the licensing configuration, delete and recreate the NLS registry key located at: `HKEY_LOCAL_MACHINEMACHINESOFTWAREAccessDataProductsCommon`
Chapter 45
Configuring a Multi-box Setup

Configuration for a Multi-box Setup

A multi-box setup is a configuration where all components are not installed or contained on the same computer. For example, you may have the database installed on a separate computer from the application, or the application and the database are installed on one computer and the case files are stored on a different computer.

By default, a multi-box installation is not configured to allow the user to back up and restore case information. Some configuration changes must be performed manually by the system administrator to properly configure a multi-box installation. Please note that the steps required to complete this configuration differ slightly for domain systems than for workgroup systems.

Configuration Overview

The following steps are required before you can perform multi-box case back ups and restoration.

- Create a service account common to all systems involved. See Create a Service Account on page 533.
- Share the case folder and assign appropriate permissions. See Share the Case Folder on page 534.
- Configure the database services to run under service account. See Configure Database Services on page 535.
- Share back up destination folder with appropriate permissions. See Share the Backup Destination Folder on page 535.

Note: When prompted to select the backup destination folder, always use the UNC path of that shared folder, even when the backup destination folder is local.

Each of these items is explained in detail later in this chapter.

Create a Service Account

To function in a distributed configuration, all reading and writing of case data should be performed under the authority of a single Windows user account. Throughout the rest of this document, this account is referred to as the “service account.” If all the systems involved are members of the same domain, choosing a domain user account is the recommended choice. If not all of the systems are members of the same domain, then you can configure “Mirrored Local Accounts” as detailed in the following steps:
To set up Mirrored Local Accounts

1. On the Examiner host system, create (or identify) a local user account.
2. Ensure that the chosen account is a member of the Local Administrators group.
3. On the database host system, create a user that has the exact same username and password as that on the Examiner host system.
4. Ensure that this account is also a member of the Local Administrators group on the database host system.

Instructions for Domain User Accounts

Choose (or create) a domain user account that will function as the service account. Verify that the chosen domain user has local administrator privilege on both the Examiner host system and the database host system.

To verify the domain user account privileges

1. Open the “Local Users and Groups” snap-in.
2. View the members of the Administrators group.
3. Ensure that the account selected earlier is a member of this group (either explicitly or by effective permissions).
4. Perform this verification for both the examination and the database host systems.

Share the Case Folder

On the system hosting the Examiner, create a network share to make the main case folder available to other users on the network. The case folder is no longer assigned by default. The user creating the case creates the case folder. It is that folder that needs to be shared.

For this example, it is located at the root of the Windows system volume, and the pathname is:

C:\FTK-Cases.

To share the case folder

1. Before you can effectively share a folder in Windows you must make sure that network file sharing is enabled. Windows XP users should disable Simple File Sharing before proceeding. Windows Vista/7 users will find the option in the Sharing and Discovery section of the Network and Sharing Center. If you encounter any issues while enabling file sharing, please contact your IT administrator.
2. Open the Properties dialog for the case folder.
3. Click the Sharing tab to share the folder.
4. Edit the permissions on both the Sharing and Security tabs to allow the one authoritative user Full Control permissions.
5. Test connectivity to this share from the database system:
   5a. Open a Windows Explorer window on the system hosting the database.
   5b. Type `\servername\sharename` in the address bar, where “servername” = the hostname of the Examiner host system, and “sharename” = the name of the share assigned in Step 1. For example: If the name of the system hosting the Examiner is ForensicTower1 and you named the share “FTK-Cases” in Step #1 above, the UNC path would be `\forensictower1\FTK-Cases`.
   5c. Click OK. Check to see if the contents of the share can be viewed, and test the ability to create files and folders there as well.
Configure Database Services

To ensure access to all the necessary resources, the services upon which the database relies must be configured to log on as a user with sufficient permissions to access those resources.

To configure the database service(s) to Run As [ service account ]

1. On the database server system, open the Windows Services Management console:
   1a. Click **Start > Run.**
   1b. Type **services.msc.**
   1c. Press **Enter.**
2. Locate the following services:
   - Oracle
     - Oracle TNS Listener service listed as **OracleFTK2TNSListener** or **OracleAccessDataDBTNSListener** (Found on Oracle System)
     - **OracleServiceFTK2** (Found on Oracle System)
   - PostgreSQL
     - **postgresql-x64-9.0**
     - or
     - **postgresql-x86-9.0**
3. Open the properties of the service and click the **Log On** tab.
4. Choose **This account.**
5. Click **Browse** to locate the service account username on the local system or domain. Ensure that “From this location” displays the appropriate setting for the user to be selected. Note that “Entire Directory” is used to search for a domain user account, while the name of your system will be listed for a workgroup system user.
6. In the object name box, type in the first few letters of the username and click **Check Names.** Highlight the desired username. Click **OK** when finished.
7. Enter the current password for this account and then enter it again in the **Confirm Password** box. Click **Apply** and then **OK.**
8. Repeat Steps #3-8 for each database service.
9. Restart database service(s) when finished.

Share the Backup Destination Folder

Using the same steps as when sharing the main case folder, share the backup destination folder. Use the UNC path to this share when performing backups. For a two-box backup to work correctly, you must use a single UNC path that both the examiner, and the database application have read/write access to.

Test the New Configuration

To test the new configuration

1. Launch the Case Manager and log in normally.
2. Select (highlight) the name of the case you want to backup.
   2a. Click **Case > Back up.**
2b. Select a back up destination folder.

**Note:** The path to the backup location must be formatted as a UNC path.

The *Data Processing* window opens, and when the progress bar turns green, the backup is complete. If the *Data Processing* window results in a red progress bar (sometimes accompanied by “Error 120”), the most likely cause is that the database service does not have permission to write to the backup location. Please double check all the steps listed in this document.
Chapter 46

AccessData Distributed Processing

Distributed Processing allows the installation of the Distributed Processing Engine (DPE) on additional computers in your network, allowing you to apply additional resources of up to three additional computers at a time to the processing of your cases.

Distributed Processing may not help reduce processing times unless the number of objects to be processed exceeds 1,000 times the number of cores. For example, on a system with eight cores, the additional distributed processing engine machines may not assist in the processing unless the evidence contains greater than 8,000 items.

This appendix includes the following topics

- See Distributed Processing Prerequisites on page 537.
- See Installing Distributed Processing on page 539.
- See Configuring Distributed Processing on page 541.
- See Using Distributed Processing on page 543.

Distributed Processing Prerequisites

Before installing the AccessData (AD) Distributed Processing Engine, the following prerequisites must be met (if you are not familiar with any one of these tasks, contact your IT administrator):

- The following software must be installed:
  - Evidence Processing Engine installed on the local examination machine.
  - CodeMeter Runtime software and either a USB or a Virtual CmStick.
    (For more information regarding the CmStick, see (page 514).)
  - Database either on the same computer, or on a second computer.
  - KFF Library.
  - McAfee Virus Scan must have an exception added for processes added to and run from the Temp Directory.
  - The Windows Temp directory must be set as default.

- A New user account that is a member of the Administrators group on the examiner machine. If you are installing on a Microsoft network with a Domain Controller, this is easily accomplished. If you are on a non-domain network or workgroup, create this same user account and password on each DPE machine, as well as on the machine holding the Case Folder and the machine holding the Evidence Folder.
  - Make a note of the user account, domain or workgroup, and the IP address of each machine.
- A familiarity with UNC paths. UNC paths are required whenever a path statement is needed during installation and configuration of the DPE, and when the path to the Case Folder, or the path to the Evidence Folder is required.
  - The UNC format is `\\[machine name or IP address]\[pathname]\[casefolder]`.
- Computers that are all on the same network, and in the same domain or workgroup.
- A familiarity with the Windows Services.msc to ensure appropriate Login rights for the DPE, and for restarting the service, if necessary.
- A familiarity with IP addresses and how to find them on a computer.
- A knowledge of the case folder path. The case folder must be shared for DPE to access it and write to it as it processes case data.

**Using PostgreSQL with Distributed Processing**

- When using PostgreSQL, please note the following:
  - If the computer has fewer than 16 cores (\(< 16\)), then in the PostgreSQL configuration file, set the `max_connections` to 60 per computer.
    For example, if there are 4 computers in the Distributed Processing Model in which every computer has fewer than 16 cores, then set `max_connections` to 240 (60*4).
  - If the computer has 16 or more cores (\(\geq 16\)), then in the PostgreSQL configuration file, set the `max_connections` to 125 per computer. For example, if there are 4 computers in the Distributed Processing Model in which 3 computers are 8 core (\(<16\)) and 1 computer is 16 core (\(\geq16\)), then set `max_connections` to 245 (60*3 + 125*1).
  - If there is just one computer in the Distributed Processing Model, the `max_connections` should be no less than 100.
Installing Distributed Processing

**Important:** Do not install the Distributed Processing Engine on the examiner machine. The install required the installation of the local Evidence Processing Engine on that machine.

Installing the Distributed Processing Engine on the examination machine disables both processing engines.

**Remedy:** If you have already installed both the Evidence Processing Engine and the Distributed Processing Engine on a single machine, you must:

a) stop the processes
b) uninstall from both the examination machine and the Evidence Processing Engine machines
c) restart your machine
d) install on the examination machine.
e) start the Evidence Processing Engine again

To install AccessData Distributed Processing

1. Install the Distributed Processing Engine (AccessData Distributed Processing Engine.EXE) on the computers that are to participate in case processing, (record the IP address of each one for use when configuring the DPE on the examination machine).

   The DPE install file can be found on the installation disc in the following path:
   
   `[Drive]:\FTK\AccessData Distributed Processing Engine.EXE`

   If you do not know the IP address of the machine you are installing on, do the following:

   1a. Click Start on the Windows Startbar.
   1b. Click Run.
   1c. Enter cmd.EXE in the Run text box.
   1d. If the prompt is not c:\>, type c: and press Enter.
      At the new prompt, type cd\ and press Enter.
      The resulting prompt should be c:\>.
   1e. At the c:\> prompt, type ipconfig /all.
   1f. From the resulting information, locate the Ethernet adapter Local Area Connection, and find the associated IP address. That is what you will need when you configure the Distributed Processing Engine.

   **Note:** AccessData recommends that you write down the IP addresses for all machines on which the DPE will be installed.

   1g. At the prompt, type exit and press Enter to close the cmd.EXE box.

   **Note:** The domain listed here is not necessarily the correct one to use in installation. To find the correct domain or workgroup name, right-click My Computer (On Vista or Server 2008, click Computer), click Properties > Computer Name. The Domain or Workgroup name is listed midway down the page. Please make a note of it for future use.

2. If a Security Warning appears, click Run to continue.
3. If you want to stop the install, click Cancel on the Preparing to Install screen.
4. Click Next on the Welcome screen to continue the install.
5. Read and accept the License Agreement.
6. Click **Next** to continue.

7. Accept the default destination folder (recommended), or click **Change** to specify a different destination folder.

8. Click **Next** to continue.

9. Enter the credentials to be used for running the service.
   
   - **User name**: This user account must be a member of the Administrators group on the DPE machine, and must also have access to both the case folder, and the evidence folder. If this user account is not a member of the Administrators group, or if you are not sure, check with your IT services department.
   
   - While it is not generally necessary on a domain, it is recommended that whether you are on a domain network, a non-domain network, or a workgroup network, you create this same user account with the same password as a member of the Administrators group on all machines involved. This acts as a fail-safe in case the domain server goes down.
   
   - **Domain**: The name of the domain all related computers are on. If a non-domain or workgroup network is in place, use the local DPE’s machine name or IP address in place of the domain name for this step in the installation.
   
   - **Password**: This user account’s password for authenticating to the domain, or to the machine on the non-domain network or workgroup. The password must be the same for this user account on each machine.

   The figure below illustrates the user name and password setup.
   
   The components on the top row of the figure can be all on one machine, all on separate machines, or on any combination of machines. The key is that the administrator account and password (or user account in the Administrators group—it can be any name as long as the correct permissions are assigned, and the same name/password combination is used on each machine) must exist on all the machines related to the DPE installation, including the examination and database machines, and on both the Case Folder machine and on the Evidence Folder machine. This means physically going to those machines and adding the correct user accounts manually.

10. When you have finished adding the User Credentials, click **Next** to continue.

11. Click **Install** when the Ready to Install the Program screen appears.

12. Wait while the AccessData Distributed Processing Engine files are copied into the selected path on the local machine.

13. The default path is:

   `[Drive]\Program Files\AccessData\Distributed Processing Engine\<Version>`.

14. Click **Finish** to complete the install and close the wizard.

### If the service fails to start

1. Leave the **Retry/Quit** dialog open and launch the Services (`services.msc`) dialog from the run command.

2. Open the **Properties** dialog for the AccessData Processing Engine Service.

3. Click the **Log On** tab.

4. Verify that the logon credentials used have full Administrative rights.

5. Save the settings and exit the **Properties** dialog.

6. Stop and start the service manually.

7. Click **Retry** on the installer screen.
Configuring Distributed Processing

Once the AccessData Distributed Processing Engine is installed on the non-examination machines, configure Distributed Processing to work with the local Processing Engine.

To configure Distributed Processing to work with the local Lab Processing Engine

1. In Case Manager, click Tools > Processing Engine Config.

2. Enter the appropriate information in each field, according to the following guidelines:

   - **Computer Name/IP**: Enter the IP address of the computers where the Distributed Processing Engine is installed. The computer name can also be used if the name can be resolved.
   - **Port**: The default port is 34097. This is the port the processing host will use to communicate with the remote processing engines.
   - **Add**: Adds the computer and port to the list. You can add up to three remote processing engines (for a total of 4 engines). When the maximum number of DPE machines is reached, the Add button will become inactive.
   - **Remove**: Removes a processing engine from the list of available engines. The localhost engine cannot be removed.
   - **Enable**: Enables the engine for use by the processing host. Until implemented, each engine you add will be set to enabled (Disabled = False) by default. When implemented, you will be able to change the selected computer’s status from Disabled to Enabled.
   - **Disable**: Makes the engine unavailable for use in processing. When implemented, you will be able to change the selected computer’s status from Enabled to Disabled. The disabled remote engine will remain on the list, but will not be used.
   - **Disabled = True**: Displays for that engine in the DPE list.
   - **Maintain UI performance while processing**: Allows you to decide whether processing speed or UI performance is more important.

   **Note**: This will slow processing, and when selected, applies to all Remote DPEs.

3. When all DPE machines have been added to the Processing Engine Configuration dialog, click **Close**.

If you have not yet configured the Distributed Processing Engine on the remote computers, or if you have, but it is not working properly, you will see the warning shown in the following figure.

To correct this

1. On the remote computer having the Distributed Processing Engine installed, click **Start**.
   1a. Right-click **My Computer**.
   1b. Click **Manage**.
   1c. Under **System Tools**, click **Local Users and Groups**.
   1d. Click **Groups**.
   1e. Double-click **Administrators**.
   1f. Verify that the user account name that was used in installation is in this group.
   1g. Click **OK** to close this dialog.

2. Under **Local Users and Groups**, click **Users**.
   2a. Find the user account name in the list, and double-click it.
   2b. Mark the box **User cannot change password**.
   2c. Mark the box **Password never expires**.
2d. Click **Apply**.
2e. Click **OK**.

3. Do one of the following:
   - Under Services and Applications, click **Services**.
   - If you already closed the Computer Management dialog, launch the Services (**services.msc**) dialog from the Run command on the Start menu.

3a. Open the Properties dialog for the AccessData Processing Engine Service.
3b. In the General tab, find Startup Type. If it says Automatic, proceed to the next step. If it says anything else, click the drop-down on the right side of the text box and select Automatic from the list. Click **Apply** and proceed to the next step.
3c. Open the **Log On** tab.
3d. Verify that the **Log On information** is set to the user name, domain or DPE machine name, and password that matches the user account you just verified (should be the one that was entered during installation).
3e. Click **OK**.

4. Right-click on the **AccessData Processing Engine Service**.
5. Click **Stop** to stop the service.
6. Click **Start** to re-start the service manually.
7. Click **Retry** on the installer screen.
8. Ensure that the user name provided during installation is a member of the Administrators account.
Using Distributed Processing

To utilize the Distributed Processing Engine when adding evidence to a case

1. Make sure the case folder is shared before trying to add and process evidence.
2. Enter the path to the case folder in the Create New Case dialog in UNC format.
3. Click Detailed Options, and select options as you normally would.
4. Click OK to return to the New Case Options dialog.
5. Mark Open the case and then click OK to create the new case and open it.
6. The new case is opened and the Manage Evidence dialog is automatically opened. Click Add. Select the evidence type to add. Select the evidence file to add and then click Open.
7. The path to the evidence is designated by drive letter by default. Change the path to UNC format by changing the drive letter to the machine name or IP address where the evidence file is located, according to the following syntax:
   \[computername_or_IP_address\][pathname][filename]
8. Leave the remaining path as is.
9. Click OK.

Checking the Installation

When you have completed the installation, open the Task Manager on the remote computer, and keep it open while you add the evidence and begin processing. This will allow you to watch the activity of the ProcessingEngine.EXE in the Processes tab.

The Distributed Processing Engine does not activate until a case exceeds approximately 30,000 items. When it does activate, you will see the CPU percentage and Memory usage increase for the ProcessingEngine.EXE in Task Manager.
Chapter 47
AccessData Oradjuster

AccessData Oradjuster.EXE optimizes certain settings within an AccessData Oracle database, and this allows peak performance during investigative analysis to be obtained. This utility is particularly useful for 64-bit systems with large amounts of RAM on board. It is included in the AD Lab Database install disc.

This document describes Oradjuster’s role in making maximum use of AD Oracle. To see a webinar that demonstrates Oradjuster, look under the Core Forensic Analysis portion of the web page: http://www.accessdata.com/Webinars.html.

This chapter includes the following topics

- See Oradjuster System Requirements on page 544.
- See Introduction on page 544.
- See The First Invitation on page 545.
- See Tuning for Large Memory Systems on page 548.

Oradjuster System Requirements

Oradjuster operates on all supported Windows platforms (both 32 and 64-bit) where and AD Oracle database has been installed.

Introduction

The Oracle database system's behavior is governed, in part, by its numerous Initialization Parameters, which define many internal database settings. Oradjuster is concerned with two small groups of these parameters. The first group regulates the memory usage of oracle.EXE, and the second group controls the number of client programs that can be connected simultaneously to the database.

Although Oradjuster is not mandatory, it is very helpful. For many investigators, it is ideal to run Oradjuster immediately following the AD Oracle install by clicking the Optimize the Database button on the Database installation autorun menu. Later on, Oradjuster can be invoked again (one or more times) in order to fluctuate database memory usage and derive even greater performance gains throughout the several phases of an investigation.
The First Invocation

When Oradjuster is invoked for the first time, it does the following

1. Detect AD Oracle.
2. Query Windows to discover the size of RAM.
3. If necessary, prompt for the database’s administrative password.
4. Display the current values of the parameters of interest.
5. Compute new values (based on the size of RAM) and modify the parameters with them.
6. Shut down and restart the database.
7. Display the updated parameter values.
8. Record the new values in a Windows Registry key.

Some of these steps will be treated in greater detail in what follows.

Note: When Oradjuster is invoked from the install autorun menu, it does not linger on screen. It disappears as soon as it has completed successfully, which is done in deference to those who may not take an interest in its esoteric display information.

Oradjuster’s first invocation brings great improvement to performance, and many investigators may find this satisfactory. However, as mentioned previously, subsequent use of Oradjuster can yield additional performance improvements.

Subsequent Invocations

The use case scenarios described in this section illustrate how to employ Oradjuster to greatest effect in configurations known as One-Box and Two-Box.

Note: Some of the instructions below describe the invocation of Oradjuster from the command prompt. Working from the command prompt may be a foreign experience for many, but any time/effort spent becoming familiar with the command prompt and command line programs is worthwhile because it facilitates advanced use of Oradjuster, and it opens a door to the large number of valuable and intriguing command line programs available (serving many diverse purposes, including digital forensics).

One-Box Deployment

Oradjuster’s default behavior is to assume that the Examiner and the database are installed on the same computer. The settings it applies on its first run strikes a balance between the memory needs of Examiner, AD Oracle, and the operating system. Additional performance gains can be won by reducing oracle.EXE memory consumption during evidence processing and then increasing oracle.EXE's memory consumption during investigative analysis after automatic processing has completed.
To accomplish this fluctuating of oracle.EXE memory usage

1. After creating a case, but before adding and processing evidence, launch Oradjuster from the Case Manager’s Tools menu.

2. Oradjuster will display its normal output and then prompt the user to make a temporary change to SGA_TARGET (one of the Oracle database parameters having direct impact on memory consumption). The value for SGA_TARGET is specified as a percentage of the size of physical memory, and the allowable range is typically between 10% and 50%. Enter a percentage in the lower half of the allowed range.

3. Add and process the case’s evidence.

4. After processing is complete, launch Oradjuster again from the Case Manager’s Tools menu.

5. Modify SGA_TARGET to a percentage in the upper half of the allowed range.

6. Complete the investigation of the case without modifying SGA_TARGET again unless more evidence is added and processed.

Some trial-and-error experimenting is required to find the most optimal percentages. For example, it may be desirable to set SGA_TARGET to the maximum allowable percentage in Step 5, rather than just some percentage in the upper half of the range, so that the case window is most responsive. Also, it may be good to reduce SGA_TARGET during Live searching (in spite of Step 6) as Live searching is similar in nature to evidence processing.

Two-Box Deployment

When Examiner is installed on computer A, and AD Oracle is installed on computer B, oracle.EXE should be even more aggressive in consuming memory on computer B since it does not need to share memory resources with the Examiner. The following procedure should be conducted.

To begin, log in to computer B.

Note: If Oradjuster has been run on this computer before (as part of AD Oracle install and setup), then its Registry key must be deleted before proceeding. Select Start Menu > Run. Enter “regedit” in the Run prompt and press Enter. Within the Registry Editor dialog, navigate to and delete the following key:

HKEY_LOCAL_MACHINE\Software\AccessData\Shared\Version Manager\sds\oradjuster

Important: Do not delete or modify any other Registry keys or your system may become unstable.

Open the command prompt (select Start Menu > All Programs > Accessories > Command Prompt). Then, issue the following commands (press the Enter key after each one):

Oradjuster Command Line Options

<table>
<thead>
<tr>
<th>Command</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C:&gt; cd &quot;Program Files\AccessData\Oracle\Oradjuster&quot;</td>
<td>Move to the directory containing Oradjuster.EXE. On a 64-bit version of Windows, the directory path should be &quot;Program Files(x86)\AccessData\Oracle\Oradjuster&quot;.</td>
</tr>
<tr>
<td>C:[path]&gt; Oradjuster.EXE -mem remoteworker</td>
<td>Assign parameter values appropriate for a dedicated AD Oracle database.</td>
</tr>
</tbody>
</table>
As with Step 6 in section The First Invocation, and the database will be restarted. Some of the Oracle parameters managed by Oradjuster cannot be modified “on the fly,” so the database must be restarted in order for their changes to take effect. Therefore, when invoking Oradjuster from the command prompt, first close the Examiner (by closing all case windows and the case management window).
Tuning for Large Memory Systems

When AD Oracle resides on a computer with a 64-bit Windows operating system, and with a large quantity of RAM (from 8 GB to 128 GB, or higher), additional considerations are in order. As was hinted in section One-Box Deployment, Oradjuster’s first run assigns oracle.EXE’s maximum memory consumption to roughly ½ the size of RAM. (That is why the upper limit for SGA_TARGET is typically 50%.) Instead of sharing memory proportionally between AD Oracle and the operating system, Oradjuster can be used to give oracle.EXE the lion’s share of memory, which would not be safe on a computer with a lesser quantity of RAM. This is best accomplished by editing Oradjuster’s key in the Registry and then running Oradjuster again, which causes Oradjuster to apply the new, manually-entered values in the Registry key to AD Oracle.

Consider an investigative computer with 64 GB of RAM that hosts AD Oracle and the Examiner. Suppose that the investigator ran Oradjuster in conjunction with the AD Oracle install, and has since conducted several large cases (containing millions of discovered items each). The investigator is generally content with the case window’s responsiveness in loading and sorting its File List pane, but wonders if that responsiveness could be improved. So, she prepares to edit the SGA_MAX_SIZE and SGA_TARGET values in the Oradjuster key in the Registry. When she opens Registry Editor and first navigates to the key, she sees that current values read:

**Example of Oradjuster Settings**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>sga_max_size</td>
<td>REG_SZ</td>
<td>37795712204</td>
</tr>
<tr>
<td>sga-target</td>
<td>REG_SZ</td>
<td>13743895347</td>
</tr>
</tbody>
</table>

These values represent quantities expressed in Bytes, and therefore the investigator can see that Oradjuster has set SGA_MAX_SIZE to about 37 GB, and SGA_TARGET value of roughly 13 GB. She knows that she can temporarily alter the value of SGA_TARGET using the technique shown in One-Box Deployment, but she can only increase it to the upper limit imposed by SGA_MAX_SIZE. So, she decides to make the following edits:

**Example of User-Modified Oradjuster Settings**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>sga_max_size</td>
<td>REG_SZ</td>
<td>48795712204</td>
</tr>
<tr>
<td>sga-target</td>
<td>REG_SZ</td>
<td>32743895347</td>
</tr>
</tbody>
</table>

By modifying only the first two digits of Data field for each value, the investigator has paved the way for Oradjuster to make the desired change to AD Oracle. (If she had wanted, the investigator could have edited the Data field to contain a number that would be easier to read, such as “48000000000,” but the net effect would be the same. And, the smaller the edit, the less chance of loosing a digit or inserting an extra one, both of which may require a troubleshooting effort to repair.) As soon as Oradjuster is again invoked, the new upper limit for
oracle.EXE memory usage will be approximately 48 GB (a jump from about ½ to about ¾ of RAM), and
SGA_TARGET will be set to about ½ of RAM by default.

The investigator closes the Examiner (knowing that her edit of SGA_MAX_SIZE in the Registry will cause
Oradjuster to restart AD Oracle) and runs Oradjuster again. (In this context, she can do so either by invoking it
from the command prompt, or by launching it with a double-click.) When Oradjuster completes its assignment
changes, and prompts the investigator to make a temporary change to SGA_TARGET if desired, she pauses to
review the before and after values in the Oradjuster output to confirm that the changes to SGA_MAX_SIZE and
SGA_TARGET are correct.

Note: When Oradjuster assigns a new value to SGA_MAX_SIZE, oracle.EXE will modify it rounding it up the
nearest multiple of 16 MB. Therefore, when inspecting Oradjuster output, remember to confirm that the
first (or left-most) digits of SGA_MAX_SIZE are correct. Do not be alarmed if trailing digits have been altered.

Finally, the investigator creates several more large cases with her new settings. She observes that the case
window is in fact more responsive and she pays attention to evidence processing times to see whether or not
oracle.EXE's increased claim on system memory appears to slow down evidence processing...

In conclusion, and although the vast majority of tuning needs have been addressed by the preceding
information, additional explanation will allow a curious investigator to go even further in using Oradjuster.

First, the list of supported command line arguments can be displayed with the command:
C:\[path]\> Oradjuster.exe -help

Second, the following table provides a listing of the values Oradjuster records in its Registry key.

**Oradjuster Values Found in its Registry Key**

<table>
<thead>
<tr>
<th>Value Name</th>
<th>Proves DB Restart</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>_pga_max_size</td>
<td>NO</td>
<td>Memory Usage</td>
</tr>
<tr>
<td>_smm_max_size</td>
<td>NO</td>
<td>Memory Usage</td>
</tr>
<tr>
<td>commit_write</td>
<td>NO</td>
<td>Memory Usage</td>
</tr>
<tr>
<td>open_cursors</td>
<td>NO</td>
<td>Memory Usage</td>
</tr>
<tr>
<td>pga_aggregate_target</td>
<td>NO</td>
<td>Memory Usage</td>
</tr>
<tr>
<td>processes</td>
<td>YES</td>
<td>Number of Concurrent Connections</td>
</tr>
<tr>
<td>session_cached_cursors</td>
<td>YES</td>
<td>Memory Usage</td>
</tr>
<tr>
<td>sessions</td>
<td>YES</td>
<td>Number of Concurrent Connections</td>
</tr>
<tr>
<td>sga_max_size</td>
<td>YES</td>
<td>Memory Usage</td>
</tr>
<tr>
<td>sga_target</td>
<td>NO</td>
<td>Memory Usage</td>
</tr>
<tr>
<td>Transactions</td>
<td>YES</td>
<td>Number of Concurrent Connections</td>
</tr>
<tr>
<td>VERSION</td>
<td>N/A</td>
<td>Oradjuster Version Information — Do not edit</td>
</tr>
</tbody>
</table>