

# AD Enterprise 7.1 Release Notes

Document Date: 5/22/2019

©2019 AccessData Group, Inc. All rights reserved

# Introduction

This document lists the new features, fixed issues, and known issues for this version of AD Enterprise. All known issues published under previous release notes still apply until they are listed under "Fixed Issues."

- What is New in 7.1 on page 2
- Important Information on page 16

## What is New in 7.1

The following items are new and improved for this release:

## System and Architecture

#### Microsoft SQL Server support

- Added support for using Enterprise with SQL Server 2016 and 2017 (SQL Server 2012 and 2014 are still supported)
- SQL Server 2008 is no longer supported

## **Updated Postgres Database**

The Postgres database has been updated to version 11.2.

## Cloud Based Relational Database Services (RDS) Support

The AccessData Suite can now be run on Amazon Web Services (AWS) using the new Cloud Based option. Users will log in using a link to the web service and all services and processing will be located online. Users have the option to use the AWS™ provided PostgreSQL engine or the AWS Aurora™ service. AWS PostgreSQL RDS is wire-compatible with PostgreSQL 9.6.x.

See Cloud Based Relational Database Services (RDS) Support on page 17.

## **Product Virtualization Support**

AccessData will support its products in a virtual environment running on supported operating systems and environments by both the Vendor/manufacturer and AccessData.

See AD Product Virtualization and Cloud Guidelines on page 18.

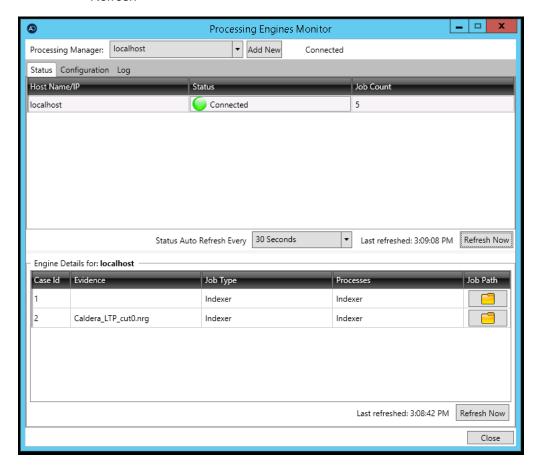
## Job Management

#### DPE monitoring and administration application

This enhancement allows users to manage the distributed processing engines more dynamically; allowing for instant clarity on what each engine is working on. (15120)

The following actions can be made:

- Select the desired processing manager, if multiple managers exist
- View a list of all processing engines at a single glance
- Select an individual engine to make changes to the settings and to see what it's working on;
   including Case, Evidence, Job Type, and Processes
- Dynamically configure individual engines, including Add, Remove, Enable/Disable, and Refresh



#### Dynamically add and remove distributed processing engines

It is now possible to add and remove distributed processing engines with the touch of a button.

## **Processing**

#### **Additional Expansion Options**

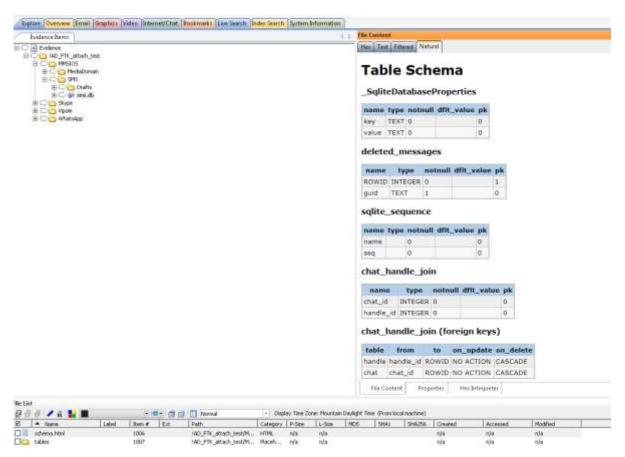
The following parsers have been added:

- Firewall Log
- McAfee Log
- Registry Policy
- OpenSSH Known Hosts

#### **SQLite Schema Output**

#### Updated SQLite Schema information, useful information

There is an enhanced SQL databases expansion option. When applied, this option will display the schema HTML file. When viewed in the File Content panel, tables showing which data is contained within the selected database will be visible. This provides insight into whether a particular Python script should be applied in order to locate more specific data of interest.

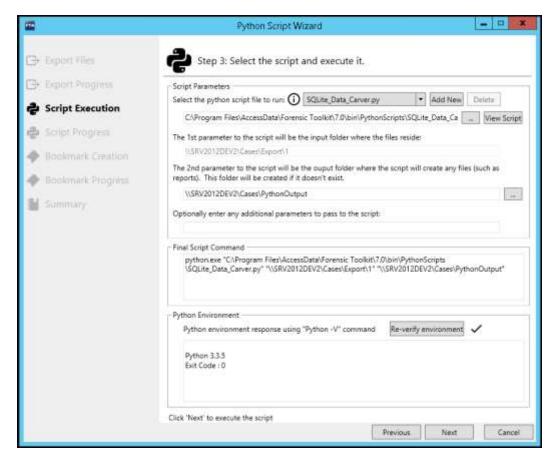


## **Python Scripting**

#### Python scripting user interface

This feature allows users to run any Python script on selected evidence files within a case. Users are able to parse SQLite databases not yet supported by AD Enterprise. Users can run their own custom Python scripts to produce any kind of desired results. The wizard allows results to be attached to case reports by using bookmarks. Multiple scripts can be run consecutively within the wizard. Use of Python 3.0 and newer is recommended for full functionality.

**Important:** The Python scripts that come with the application need Python 3.0; however, users can add their own Python 2 scripts and still use a Python environment for those scripts.



## **Decryption**

#### **Dell Encryption Decryption**

Credant Decryption is now Dell Encryption Decryption.

The following are now supported:

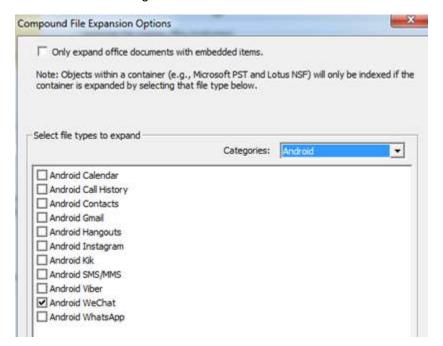
- Dell Encryption Full Disk Encryption (data at rest)
- Dell Encryption File Folder Encryption (data at rest)

## Mobile Phone Support

#### **Mobile Parsers**

The following parsers have been added:

- Android SMS/MMS
- Android Gmail
- Android Calendar
- Android Call Log
- Android Kik
- Android Google Hangouts
- Android Viber
- Android Instagram



#### Redesigned Chat Conversations

The following conversations are now shown in a standard messaging format. This makes it easier to view and to export information to third parties without having to append an explanation for the data.

- Android SMS/MMS
- Celebrite Chat
- FB Messenger (Android)

- Hangouts
- Instagram (Android)
- Kik (Android)
- Pidgin
- Skype
- Viber (Android)
- WeChat (Android)
- WeChat (iOS)
- What's App (Android)
- Whats App (iOS)
- XRY Chat

You can apply the Chat Conversations column setting in the File List to see the most relevant data for these files. The type of chat will be listed in the Src (Source) column.

**Important:** If a non-text item from a chat was not captured in the evidence file, the unavailable item will be listed along with any relevant information. These could include items such as images, videos, voice recordings, locations, stickers, emojis, or other attachments.

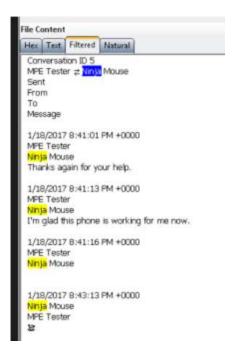
Note: In some cases the Standard Messaging Format will not be available. This includes reporting and Viber chat. Workaround: For reporting purposes, use the export feature.



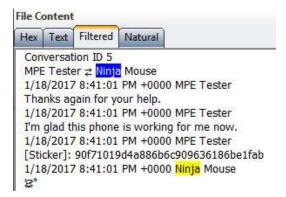
#### **Chat Filtered View**

The chat Filtered view has changed.

Previously, the name of the recipient was displayed for each comment in the conversation. In the following example, when performing an index search on the name Ninja, this conversation would have resulted in five search hits.



In 7.x, the name of the recipient is not shown for each comment in the conversation. This not only changes the view, but also reduces the count of index search hits for the name Ninja, in this example, from five to two.



## Image and Video Review Optimization

#### Thumbnail large case review optimization

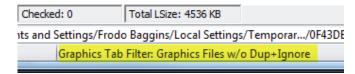
Users can now load over 10 million images for review.

#### Easily Remove Duplicate and Non-Relevant Graphics

#### New Filter: Graphics Files w/o Dup+Ignore

There is a new filter named Graphics Files w/o Dup+Ignore. When applied as the Tab Filter for the Graphics tab, this filter will hide any graphics files flagged as the following:

- Duplicate Items
- Flagged Ignore
- KFF Ignorable



For example, when processing graphics data, you can enable the Flag Duplicate Files processing option. In the Graphics tab, when this filter is applied, it will automatically hide any graphic files that were flagged as Duplicate Items. You can review the files that are flagged as duplicates by viewing Overview > Files Status > Duplicate Items.

On a new installation, this new filter is the default Tab Filter for the Graphics tab. In an upgrade environment, you can apply this new filter as the default Graphics Tab Filter.

#### New Button: Ignore Highlighted

In conjunction with the Graphics Files w/o Dup+Ignore filter, a new Ignore Highlighted button has been added to the Thumbnails pane on the Graphics tab. You can select one or more files and click Ignore Highlighted. This then gives the files a Flagged Ignore status, and with the Graphics Files w/o Dup+Ignore filter applied, the files are no longer shown. This allows users to quickly filter out graphics files that are not applicable to their case. You can review the files that you have ignored by viewing Overview > Files Status > Flagged Ignore.



## **Export**

#### **Exporting Native Emails to PST**

When exporting native email messages, you have the option to "Output message in a PST/NSF". However, for that option to work, Outlook must be installed on the computer running the Evidence Processing Engine.

The following enhancements have been made when using that option and especially when creating a new PST:

- You can now have Outlook version 2016 installed. Outlook 2013 is still supported.
  - Previously, to determine if Outlook was installed, the "MAPIX" value under the following registry key was queried:
    - HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows Messaging Subsystem
  - To support "Click To Run" installers for Outlook, the following keys are now also queried for the MAPIX value:
    - "HKEY\_LOCAL\_MACHINE\SOFTWARE\\Microsoft\\Office\\ClickToRun\\REGIST RY\\MACHINE\\Software\\Microsoft\\Windows Messaging Subsystem
    - "HKEY\_LOCAL\_MACHINE\SOFTWARE\\Microsoft\\Office\\ClickToRun\\REGIST RY\\MACHINE\\Software\\Wow6432Node\\Microsoft\\Windows Messaging Subsystem.
- Emails contained in OST files are now automatically exported to a new PST archive.

## Upgrade Script for Previous OST Files to Export to PST

As additional support for exporting OST to PST, if you have OST email data that was processed in a previous release, you have the option to run an upgrade script against those OST files.

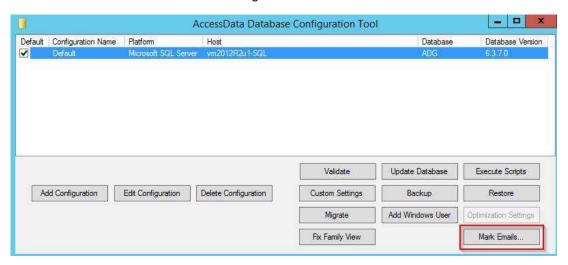
This script marks the emails within OST files so that when you export emails, it will behave the same as data that was processed with 7.0—they will get exported to PST. Otherwise, when you generate an export, the legacy OST will get exported as individual items.

You do not need to run this script for any data that is processed after installing 7.0.

#### To run the upgrade script

- 1. Install 7.0.
- Run the AccessData Database Configuration Tool by doing the following:
  - a. Browse to the path of DBConfig.exe.
     The default path is C:\Program Files\AccessData\DBConfigTool.
  - b. Right-click DBConfig.exe and click Run as Administrator.
- 3. Select your database and click Mark Emails.

4. Click OK in the confirmation dialog.



# **Enterprise API for Existing Agents**

It is now possible to connect to an existing agent using Enterprise. This can be performed using a command line prompt.

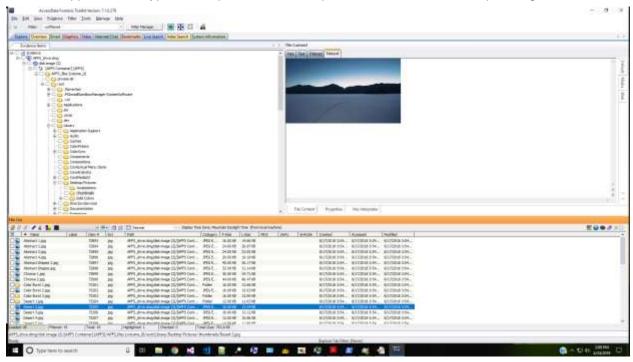
Note: A separate Enterprise license is needed to use this feature.

## Support for Apple File System (APFS)

Enterprise offers support for live files and folders within the Apple File System.

Notes: Testing was conducted using macOS High Sierra 10.14.4.

Support for encryption, compression and Snapshot will be addressed in upcoming releases.



## **Quin-C Engine Integration**

Quin-C Engine integration within Enterprise provides the ability to create cases and run processing jobs from within a command line, providing the ability to automate repetitive processes.

Additional integration enhancements include:

#### **Image Recognition**

The Image Recognition feature trains Enterprise to recognize a specific face or item by leveraging the power of TensorFlow and the Quin-C Server.

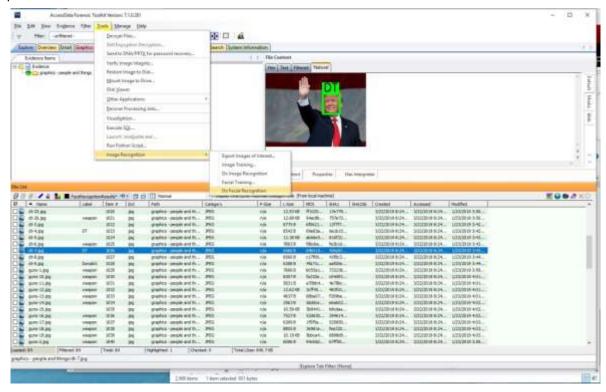


Image Recognition training is performed by using a bounding box on either a single image or set of images. Once trained, users can search the case data for similar images. Filters for each set of results are created based on the training data file name. These filters are automatically applied to responsive images, allowing investigators to use a single filter to quickly view results.

Responsive image sets can also be exported.

The Image Recognition option is available in the Tools menu and contains the following options:

- · Export Images of Interest
- Image Training
- Do Image Recognition
- Facial Training
- Do Facial Recognition

## **EP support for Custom Yara Rules**

Custom Yara Rules are now supported in the Enterprise Evidence Processing Engine. This allows for improved malware detection capabilities within Enterprise.

When analyzing executable code (DLL's and EXE's), the Evidence Processing Engine evaluates a given set of Yara rules to determine if executable code is malicious. It will then report that information in an HTML file in the UI. This enhanced functionality allows the EP to evaluate additional Yara rules as part of the process mentioned above. By setting the value of the following registry key to a directory with custom rules files (\*.rule) in it.

```
"SOFTWARE\\AccessData\\Products\\Common\\CustomYaraRules"
```

The custom rules in the directory listed above are evaluated during the process and reported in the HTML file.

To use this feature, the rules need to be in stringlist category, as shown below:

```
rule autorun_0 {
meta: category = "stringlist"
name = "HKLM\\System\\CurrentControlSet\\Control\\Terminal
Server\\Wds\\rdpwd\\StartupPrograms"
strings:
$a = "System" wide ascii nocase
$b = "CurrentControlSet" wide ascii nocase
$c = "Control" wide ascii nocase
$d = "Terminal Server" wide ascii nocase
$e = "Wds" wide ascii nocase
$f = "rdpwd" wide ascii nocase
$g = "StartupPrograms" wide ascii nocase
condition:
5 of ( $a, $b, $c, $d, $e, $f, $g )
}
```

# Important Information

## Supported Platforms

#### Windows Operating Systems Support

You can install AccessData® AD Enterprise on the following operating systems:

- Windows 10 Version 1709 (OS Build 16299.309) and 1809 (OS Build 17763.437)
- Windows Server 2012
- Windows Server 2016

See the AD Enterprise System Implementation Guide at

https://support.accessdata.com/hc/en-us/sections/200667399-System-Specification-Guides

#### Microsoft SQL Server Support

The following SQL databases are supported:

- SQL Server 2012
- SQL Server 2014
- SQL Server 2016

#### PostgreSQL Support

The following versions of PostgreSQL are supported:

- 9.6.3.5
- 11.2 (this is the version provided with the installation files)

## For Additional Information

#### **Latest Documentation**

The documentation is sometimes updated. For the latest documentation, see the product download page:

http://accessdata.com/product-download

or download the zip file from

www.accessdata.com/productdocs/adenterprise/adenterprise.zip.

## Installation and Upgrade

- If you install AD Enterprise on a Windows 2003 64-bit computer, you must configure the ASP .NET service extension. To configure this, do the following:
  - Open the Microsoft Internet Information Services (IIS) Manager.

- o In the left pane, click Web Service Extensions.
- In the extensions list, click ASP.NET v4.x.
- Click Allow.
- The FTK Suite (FTK, AD Lab, AD Enterprise) no longer supports multiple products of the same version running on the same machine at the same time. The user can only install one of the three products of a specific version on a single machine. (29786, 30927)
- AD Enterprise supports Distributed Processing Engines (DPEs).

## Cloud Based Relational Database Services (RDS) Support

The AccessData Suite can now utilize the power and scale of Amazon Web Services™ managed relational database service (AWS RDS).

Users have the option to use the AWS™ provided PostgreSQL engine or the AWS Aurora™ service. AWS PostgreSQL RDS is wire-compatible with PostgreSQL 9.6.x.

AWS Aurora is an Amazon proprietary service that is PostgreSQL compatible offering up to 3x faster than a traditional PostgreSQL 9.6.x instance.

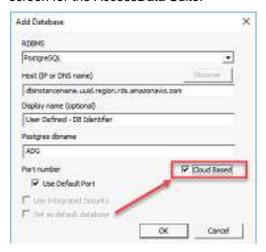
To use the amazon RDS Instance, you will need to set up your instance in your AWS console prior to installing the AccessData Suite. When selecting your RDS instance, make sure that the DB engine version for both Aurora and RDS is 9.6.x or higher. AccessData does not support PostgreSQL version 10 in this release.

You will also need to specify a "master" user. This is to work around the limitation that the RDS and Aurora PostgreSQL engine(s) will not allow users to have access to the "postgres" user within the DB engine. Please discuss this and all security implications with your network or database administrator(s).

Once you have selected and set up your database instance, you will use the "endpoint" on the status screen to connect your database.



Once this endpoint is available, you will be able to select "Cloud Based" on the UI of the "Add Database" screen for the AccessData Suite.



When prompted, enter both the Username and Password you provided during the RDS set up in your AWS console. Once complete, the database(s) for your products will be in the AWS cloud, alleviating the need for an on-premises Database server and instance.

**Important:** AccessData recommends not making the Database "Publically accessible" for security reasons. If using a VPN to connect to your cloud provider, you will need to update the rules for your security group to allow connections over your VPN.

### AD Product Virtualization and Cloud Guidelines

#### Overview

This document outlines the support boundaries and procedures for supporting virtualized environments with AccessData software.

#### Introduction

While virtual machines have not traditionally been supported with AD Products; the fact is that most customers – small/medium business as well as large enterprise have rapidly moved away from a 1:1 server configuration for their workloads. Running virtual machines and sharing the resources have long been a way to maximize the investment of computing resources.

A virtual machine / virtualized environment that is properly configured will work as reliably, and perform essentially the same as a physical server with dedicated resources.

#### Supported Virtual Environments

AccessData products are certified, and will work on the following Hypervisors and Cloud Based Environments:

Vendor/Service Provider	Version	Notes
VMware vSphere / ESXi	6.1 and higher	VMs must be Version 10 or higher
Microsoft Hyper-	V2012 R2 release and higher	VMs must be Generation 2
Amazon Web Services Elastic Compute Cloud (EC2)	AMIs running Windows Server 2016	AccessData recommends using c5/m5 compute fleets for AD Products.
Amazon Web Services Relational Database Services (RDS)	PostgreSQL Version 9.6.3 and higher. Aurora instances must not be version 10 or beyond.	AccessData recommends using db.m4 and db.r4 instances in your RDS deployment.
Microsoft Azure Compute Services	Azure Windows Virtual Machines running Windows Server 2016	AccessData recommends using Dsv2, Dsv3, Dv3 and Dv2 compute fleets for AD Products.

AccessData realizes there are other options for your cloud compute and virtualization infrastructure, however our products have not been tested on them for functionality and will not support providers and infrastructure outside of the guidance listed above.

#### **Support Boundaries**

AccessData will support its products in a virtual environment running on supported operating systems and environments by both the Vendor/manufacturer and AccessData.

Our software is designed and tested to work on various versions of Microsoft Windows, and our support strategy is based upon these being in compliance with vendor support and EOL Matrices.

AccessData does require that all of a customer(s) virtual resources are configured in alignment with our best practices and configuration work flow as outlined in our product documentation or as specified by our support team(s).

This includes ensuring that Virtual Machine resources are statically set and not dynamically set, nor controlled by the hypervisor – This applies specifically to the Processor Allocation, RAM, and Block Storage for a virtual machine to ensure they never go below a minimum threshold as outlined in our configuration guidelines.

#### **Support Exclusions**

- Underlying Network Performance problems on a Virtual switch
- Underlying disk performance problems on a virtual machine and/or host
- Connectivity to storage beyond ensuring AccessData's products can connect to their resource(s)
- Non AccessData software issues (e.g. Microsoft SQL Server)

- Clustering / High Availability / Resiliency software
- Protocol specific errors, including but not limited to
  - iSCSI Protocol Errors
  - VLAN Tagging
  - o Virtual Machine Queue(s) (VMQ) on 10 GB Networks
  - Attempting to mount volumes over Network File System(s) (NFS)
- Under provisioning/configuration errors on a virtual machine.

#### Links and Resources

Microsoft Windows Server Product Lifecycle:

https://support.microsoft.com/en-us/lifecycle/search/1163

VMware Lifecycle Product Matrix:

https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/support/product-lifecycle-matrix.pdf

Important: Not All products are guaranteed to work with all products from a specific vendor!

## Running PostgreSQL on a Virtual Machine

If you run PostgreSQL on a virtual machine with a dynamically allocated virtual hard drive, you must manually stop the PostgreSQL service before rebooting the virtual machine. Otherwise, PostgreSQL will become corrupted.

If you run PostgreSQL on a virtual machine with a fixed size virtual hard drive, then PostgreSQL will not become corrupted when rebooting.

This does not apply to PostgreSQL instances hosted in a managed database service such as AWS Relational Database Service™.

## **Agent Support**

Official Support for Red Hat Linux 6.x and 7.x
 The 6.2 Linux Agent requires GLIBC 2.17 or newer. Collection from a system running on an older GLIBC version can be attempted using the 6.1 version of the Agent, which can be obtained by contacting AccessData Support. A system's GLIBC version can be determined by running the following command: Idd -version.

## **MEMORY ANALYSIS**

• The memory analysis tool is only available for use up to Windows 7, 64 bit.

#### **KFF**

- The KFF Server uses the Apache Cassandra database. The version of Cassandra being used requires 64-bit Java 8. No other version of Java (7 or 9) is currently supported.
  - o To install Java, go to: <a href="https://java.com/en/download/windows-64bit.jsp">https://java.com/en/download/windows-64bit.jsp</a>
  - If you are using a 32-bit browser, your browser may automatically download the 32-bit version. You must use the 64-bit version.
- Make sure that you use the latest version of the KFF Server.
   See <a href="https://accessdata.com/product-download">https://accessdata.com/product-download</a> > Known File Filter 5.6 and up.
- When importing data using the KFF Import Utility, make sure that you get a confirmation that the import is complete before processing data using that KFF data. This is particularly important when importing NSRL data that takes several hours to import.
- Only the Project VIC and NSRL sets are locked/protected. All other sets in the KFF can be modified and archived.

#### Recommendations

- 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 the antivirus deletes/quarantines the binary from the temp, Cerberus analysis will not be performed.
- If you choose to have a case's database files placed in the case folder, do not move your case folder without first archiving and detaching the case.
- When creating a Custom Data View, the available filter list should not include: Checked Files, Unchecked Files (checked status is not available across users), Bookmarked Files, Labeled Files (too broad and will include all bookmarks or labels). These filters have been removed from the list. (6533)
- Difference in file handling when using Belkasoft parsing:
- If a SQLite database is encountered in the evidence that could have been handled by the Belkasoft parser but the Belkasoft All-in-One processing option was not checked, that SQLite database will get expanded using a generic SQLite expansion that shows tables and rows.
- Any evidence processed in this manner that is later re-processed (using Additional Analysis) with the Belkasoft All-in-One expansion option will NOT be expanded using Belkasoft technology but will remain with the original expanded items.
- To expand a SQLite database using Belkasoft technology that has already been expanded as a generic SQLite database, it must be added as a new, different piece of evidence, or a new case must be created.

## Known Issues in 7.1

#### **Distributed Processing Manager**

 When using a Distributed Processing Manager, and creating a project using a local path, you may receive an error that it cannot find ProcessingHost.exe. (9104)

Workaround: Manually change the case path and/or evidence path to UNC.

#### **Processing**

- When attempting to process a disk image with a partition that has more that 31 restore points, that partition is listed as "Unrecognized File System". (16723)
- A user with the Project/Case Administrator role can restore/attach any case, not just the cases that the user has rights to. However, if the user does not have rights to a case that is restored/attached, they still cannot see it in the Case List. (15804)

#### Decryption

 When adding an image encrypted with FileVault2 on Mac 10.11 or later, you are not prompted for a password and as a result, the image data is not recognized. (17440)

#### Chats

- The Belkasoft option is for parsing chat messages and using AccessData's parsing, and when available, will result in additional extracted data.
- If you use the All Communications processing profile and you have Belkasoft marked, Viber and Hangouts information is not parsed correctly. Only chat messages are returned. (17155)

#### Windows 10 Mail

• When viewing Windows 10 Mail (Unistore Database) evidence, Submit Date data is not available. (14165)

#### Viewers

• In Examiner and in the Web HTML 5 viewer, if you are viewing web content that has an Adobe SWF files in it, the SWF file will not be displayed. (17554)

#### Python Script Wizard

- If you open the Python Script Wizard, and you don't have a Python environment installed, in the Python Environment field, instead of a clear message, you will see a message the says "The system cannot find the specifiedExit Code: -98765". (17563)
- Python 2 environments will not have access to some features due to restrictions of the software.

#### File Systems

 Support for the Apple File System does not include APFS encryption or APFS compression, deleted files or archives.

#### Remote Data Acquistion

- Improved IP address checking for hostid 0 and hostid 255 in both the range and the singleton remote data acquisition. (16255)
- when entering a FQNM of Hostname, you can now enter a value longer than 24 characters and can start with a number. (16411)

## Comments?

We value all feedback from our customers. Please contact us at support@accessdata.com, or send documentation issues to documentation@accessdata.com.

# AccessData Legal Information

Document date: May 22, 2019

## **Legal Information**

©2019 AccessData Group, Inc. All rights reserved. No part of this publication may be reproduced, photocopied, stored on a retrieval system, or transmitted without the express written consent of the publisher.

AccessData Group, Inc. makes no representations or warranties with respect to the contents or use of this documentation, and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, AccessData Group, Inc. reserves the right to revise this publication and to make changes to its content, at any time, without obligation to notify any person or entity of such revisions or changes.

Further, AccessData Group, Inc. makes no representations or warranties with respect to any software, and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, AccessData Group, Inc. reserves the right to make changes to any and all parts of AccessData software, at any time, without any obligation to notify any person or entity of such changes.

You may not export or re-export this product in violation of any applicable laws or regulations including, without limitation, U.S. export regulations or the laws of the country in which you reside.

AccessData Group, Inc. 603 E. Timpanogos Circle Building H Orem, UT 84097 USA

## AccessData Trademarks and Copyright Information

The following are either registered trademarks or trademarks of AccessData Group, Inc. All other trademarks are the property of their respective owners

AccessData®

AD AccessData™

AD Summation® Mobile Phone Examiner Plus®

AccessData Certified Examiner® (ACE®) Discovery Cracker® MPE+ Velocitor™

Distributed Network Attack® Password Recovery Toolkit®

AD eDiscovery® DNA® PRTK®

AD RTK™ Forensic Toolkit® (FTK®) Registry Viewer®

LawDrop® Summation®

A trademark symbol (®, ™, etc.) denotes an AccessData Group, Inc. trademark. With few exceptions, and unless otherwise notated, all third-party product names are spelled and capitalized the same way the owner spells and capitalizes its product name. Third-party trademarks and copyrights are the property of the trademark and copyright holders. AccessData claims no responsibility for the function or performance of third-party products.

Third party acknowledgements:

- AFF® and AFFLIB® Copyright® 2005, 2006, 2007, 2008 Simson L. Garfinkel and Basis Technology Corp. All rights reserved.
   Copyright © 2005 - 2009 Ayende Rahien
- FreeBSD ® Copyright 1992-2011. The FreeBSD Project.
- BSD License:

Copyright (c) 2009-2011, Andriy Syrov. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer; Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution; Neither the name of Andriy Syrov nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission. THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

- WordNet License:
  - This license is available as the file LICENSE in any downloaded version of WordNet.
- WordNet 3.0 license: (Download)
  - WordNet Release 3.0 This software and database is being provided to you, the LICENSEE, by Princeton University under the following license. By obtaining, using and/or copying this software and database, you agree that you have read, understood, and will comply with these terms and conditions.: Permission to use, copy, modify and distribute this software and database and its documentation for any purpose and without fee or royalty is hereby granted, provided that you agree to comply with the following copyright notice and statements, including the disclaimer, and that the same appear on ALL copies of the software, database and documentation, including modifications that you make for internal use or for distribution. WordNet 3.0 Copyright 2006 by Princeton University. All rights reserved. THIS SOFTWARE AND DATABASE IS PROVIDED "AS IS" AND PRINCETON UNIVERSITY MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED. BY WAY OF EXAMPLE, BUT NOT LIMITATION, PRINCETON UNIVERSITY MAKES NO REPRESENTATIONS OR WARRANTIES OF MERCHANT- ABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR THAT THE USE OF THE LICENSED SOFTWARE, DATABASE OR DOCUMENTATION WILL NOT INFRINGE ANY THIRD PARTY PATENTS, COPYRIGHTS, TRADEMARKS OR OTHER RIGHTS. The name of Princeton

University or Princeton may not be used in advertising or publicity pertaining to distribution of the software and/or database.

Title to copyright in this software, database and any associated documentation shall at all times remain with Princeton University and LICENSEE agrees to preserve same.

 XMLmind XSL-FO Converter Professional Edition Developer License Agreement: Distribution

Licensee may not distribute with the Application any component of the Software other than the binary class library (xfc.jar) for the JavaTM version and the Dynamic Link Library file (xfc.dll) for the .NET version.

Licensee shall include the following copyright notice: "XMLmind XSL-FO Converter Copyright © 2002-2009 Pixware SARL", with every copy of the Application. This copyright notice may be placed together with Licensee's own copyright notices, or in any reasonably visible location in the packaging or documentation of the Application.

Licensee may use, distribute, license and sell the Application without additional fees due to Licensor, subject to all the conditions of this License Agreement.

- "Amazon Web Services", "AWS" "AWS Aurora" "AWS Relational Database Service" are trademarks of Amazon.com, Inc. or its affiliates in the United States and/or other countries and is used with permission <a href="https://aws.amazon.com/aispl/trademark-guidelines/">https://aws.amazon.com/aispl/trademark-guidelines/</a>.
- Apache(r), Apache Cassandra and the flame logo is a registered trademark of the Apache Software Foundation in the United States and/or other countries. No endorsement by the Apache Software Foundation is implied by the use of these marks.