Oxygen Forensics v8.3.1.105

Test Results for Mobile Device Acquisition Tool

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Homeland Security

Science and Technology

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Contents

Introduction

The Computer Forensics Tool Testing (CFTT) program is a joint project of the Department of Homeland Security (DHS), the National Institute of Justice (NIJ), and the National Institute of Standards and Technology Special Program Office (SPO) and Information Technology Laboratory (ITL). CFTT is supported by other organizations, including the Federal Bureau of Investigation, the U.S. Department of Defense Cyber Crime Center, U.S. Internal Revenue Service Criminal Investigation Division Electronic Crimes Program, and the U.S. Department of Homeland Security's Bureau of Immigration and Customs Enforcement, U.S. Customs and Border Protection and U.S. Secret Service. The objective of the CFTT program is to provide measurable assurance to practitioners, researchers, and other applicable users that the tools used in computer forensics investigations provide accurate results. Accomplishing this requires the development of specifications and test methods for computer forensics tools and subsequent testing of specific tools against those specifications.

Test results provide the information necessary for developers to improve tools, users to make informed choices, and the legal community and others to understand the tools' capabilities. The CFTT approach to testing computer forensics tools is based on well-recognized methodologies for conformance and quality testing. Interested parties in the computer forensics community can review and comment on the specifications and test methods posted on the CFTT Web site (http://www.cftt.nist.gov/).

This document reports the results from testing Oxygen Forensics v8.3.1.105 across supported mobile devices e.g., smart phones, feature phones.

Test results from other tools can be found on the DHS S&T-sponsored digital forensics web page, http://www.dhs.gov/science-and-technology/nist-cftt-reports.

How to Read This Report

This report is divided into four sections. Section 1 identifies and provides a summary of any significant anomalies observed in the test runs. This section is sufficient for most readers to assess the suitability of the tool for the intended use. Section 2 identifies the mobile devices used for testing. Section 3 lists testing environment, the internal memory data objects used to populate the mobile devices. Section 4 provides an overview of the test case results reported by the tool. The full test data is available at http://www.cftt.nist.gov/mobile_devices.htm.

Test Results for Mobile Device Acquisition Tool

Tool Tested:	Oxygen Forensics
Software Version:	8.3.1.105
Supplier:	Oxygen Forensics, Inc.
Address:	901 N. Pitt St, Suite 170 Alexandria, VA 22314
Tel:	(844) 53-SALES
WWW:	http://www.oxygen-forensics.com

1 Results Summary

Oxygen Forensics v8.3.1.105 provides the ability to extract common device information, contacts with all the fields and contact photos, calls logs, facetime calls, organizer data, SMS and MMS messages, e-mails with attachments, photos, videos, audio files, Geo coordinates, data from Android and iOS backup files and various application user data. The Oxygen Analyst provides an integrated SQLite viewer allowing examiners to explore sqlite files and Property List (Plist) XML files.

The tool was tested for its ability to acquire active data from the internal memory of supported mobile devices and associated media (i.e., smart phones, feature phones). Except for the following anomalies, the tool acquired all supported data objects completely and accurately for all mobile devices tested.

***Connectivity*:**
- Connectivity was not established. (Devices: *BlackBerry Q10, BlackBerry Z30*)

***Equipment / Subscriber related data*:**
- Subscriber and equipment related data (i.e., IMEI/IMSI, MSISDN) was not reported. (Devices: *Ellipsis 8, HTC Win 8x, Samsung Rugby III*)
- Subscriber related data (i.e., MSISDN) was not reported. (Devices: *Motorola Droid Turbo 2, Galaxy S6, Galaxy S6 Edge Plus, LG G4*)
- Equipment related data (i.e., IMEI) was not reported. (Device: *Nokia Lumia 735*)

***Personal Information Management (PIM) data*:**
- Contacts and associated metadata (i.e., graphics, email, URLs, Addresses) were not reported. (Devices: *HTC Win 8x, Samsung Rugby III*)
- Calendar entries were not acquired. (Devices: *Motorola Droid Turbo 2, HTC Win 8x, Samsung Rugby III*)
- Memos were not acquired. (Devices: *Galaxy S6, Galaxy S6 Edge Plus, LG G4, Ellipsis 8, Galaxy Tab E, Galaxy Tab S2, iPad Mini, HTC Win 8x, Samsung Rugby III*)
- Call log data was not reported. (Devices: *Motorola Droid Turbo 2, Ellipsis 8, Galaxy Tab E, Galaxy Tab S2, HTC Win 8x, Samsung Rugby III*)

- SMS and MMS messages were not acquired. (Devices: *HTC Win 8x, Samsung Rugby III*).
- SMS and MMS messages and associated data (i.e., audio, graphics, video) were not reported. (Devices: *Galaxy Tab E, Galaxy Tab S2*)
- Group message recipients for outgoing SMS messages were partially reported. All message contacts are not included. (Devices: *Motorola Droid Turbo 2, Galaxy S6, Galaxy S6 Edge Plus, LG G4*)

Application Data:
- Application related data (i.e., txt, pdf files) was not acquired. (Devices: *iOS, HTC Win 8x, Nokia Lumia 735*)

Stand-alone Files:
- Stand-alone audio/music files were not reported. (Devices: *iOS, HTC Win 8x, Nokia Lumia 735*)
- Stand-alone videos were not reported. (Device: *iPad Mini, HTC Win 8x, Nokia Lumia 735*)
- Stand-alone pictures were not reported. (Devices: *iPad Mini, HTC Win 8x, Nokia Lumia 735*)

Social media Data:
- Social media (Facebook, Twitter, LinkedIn) related data was not acquired. (Devices: *Motorola Droid Turbo 2, Galaxy S6, Galaxy S6 Edge Plus, LG G4*)
- Social media (Facebook, Instagram, LinkedIn) related data was not acquired. (Devices: *Galaxy Tab E, Galaxy Tab S2*)
- Social media (Facebook, Twitter, LinkedIn, Instagram) related data was not acquired. (Devices: *Ellipsis 8*)
- Social media (Facebook, Twitter, Instagram) related data was not acquired. (Devices: *iOS*)
- Partial social media related data for Instagram (i.e., one picture) was reported. (Devices: *Motorola Droid Turbo 2, Galaxy S6, Galaxy S6 Edge Plus, LG G4*)
- Partial social media related data for Twitter (i.e., pictures) was reported. (Devices: *Galaxy Tab E, Galaxy Tab S2*)

Internet Related Data:
- Browser history, bookmarks and email related data were not acquired. (Devices: *Android, HTC Win 8x, Samsung Rugby III*)

GPS Related Data:
- GPS related – waypoints, routes, longitude and latitude coordinates were not acquired. (Devices: *Android, HTC Win 8x, Samsung Rugby III*)

NOTES:
- ➢ If case files i.e., ofb files, are not password protected they can be uncompressed and modified without warning the contents of the case file have changed when re-opening the case file.
- ➢ If auto device connection is selected and iTunes is not installed – the mobile device is identified but only the contents within the DCIM folder (i.e., graphics, video) are acquired. If manual extraction is selected and iTunes is not installed –

the user is prompted to install iTunes. The user should be prompted to install iTunes if not present for auto device connectivity.

For more test result details see section 4.

2 Mobile Devices

The following table lists the mobile devices used for testing Oxygen Forensics v8.3.1.105.

Make	Model	OS	Firmware	Network
Apple iPhone	6	iOS 9.2.1 (13C75)	4.52.00	CDMA
Apple iPhone	6S	iOS 9.2.1 (13C75)	1.23.00	CDMA
Apple iPhone	6S Plus	iOS 9.2.1 (13C75)	1.23.00	CDMA
Apple iPad	Mini	iOS 9.2.1 (13B143)	4.32.00	CDMA
Apple iPad	Pro	iOS 9.2.1 (13C75)	4.52.00	CDMA
Motorola Droid	Turbo 2	Android 5.1.1	LCK23.130-23	CDMA
Samsung Galaxy	S6	Android 5.1.1	LMY47.G920VVRU4BOK7	CDMA
Samsung Galaxy	S6 Edge Plus	Android 5.1.1	LMY47X.G928VVRU2AOJ2	CDMA
LG	G4	Android 5.1.1	LMY47D	CDMA
Ellipsis	8	Android 4.4.2	QZ3_PE3X	CDMA
Samsung Galaxy	Tab E	Android 5.1.1	LMY47X.T567VVRU1AOH1	CDMA
Samsung Galaxy	Tab S2	Android 5.1.1	LMY47X.T817BVRU2AOJ2	CDMA
Blackberry Q10	SQN100-2	10 OS - 10.2.1.2122	672849	CDMA
Blackberry Z30	STA100-3	10 OS - 10.3.2.858	85718	CDMA
HTC Win 8x	HTC PM23300	Win 8.0	3030.0.34101.502	GSM
Samsung Rugby III	SGH-A997	A997UCMG1	REV0.2	GSM

Table 1: Mobile Devices

3 Testing Environment

The tests were run in the NIST CFTT lab. This section describes the selected test execution environment, and the data objects populated onto the internal memory of mobile devices.

3.1 Execution Environment

Oxygen Forensics v8.3.1.105 was installed on Windows 7 v6.1.7601.

3.2 Internal Memory Data Objects

Oxygen Forensics v8.3.1.105 was measured by analyzing acquired data from the internal memory of pre-populated mobile devices. Table 2 defines the data objects and elements used for populating mobile devices provided the mobile device supports the data element.

Data Objects	Data Elements
Address Book Entries	
	Regular Length
	Maximum Length
	Special Character
	Blank Name
	Regular Length, email
	Regular Length, graphic
	Regular Length, Address
	Deleted Entry
	Non-Latin Entry
	Contact Groups
PIM Data	
Datebook/Calendar	*Regular Length*
Memos	*Maximum Length*
	Deleted Entry
	Special Character
	Blank Entry
Call Logs	
	Incoming
	Outgoing
	Missed
	Incoming – Deleted
	Outgoing – Deleted
	Missed - Deleted

Data Objects	Data Elements
Text Messages	
	Incoming SMS – Read
	Incoming SMS – Unread
	Outgoing SMS
	Incoming EMS – Read
	Incoming EMS – Unread
	Outgoing EMS
	Incoming SMS – Deleted
	Outgoing SMS – Deleted
	Incoming EMS – Deleted
	Outgoing EMS – Deleted
	Non-Latin SMS/EMS
MMS Messages	
	Incoming Audio
	Incoming Graphic
	Incoming Video
	Outgoing Audio
	Outgoing Graphic
	Outgoing Video
Application Data	
	Device Specific App Data
Stand-alone data files	
	Audio
	Graphic
	Video
	Audio – Deleted
	Graphic - Deleted
	Video - Deleted
Internet Data	
	Visited Sites
	Bookmarks
	E-mail
Location Data	
	GPS Coordinates
	Geo-tagged Data
Social Media Data	
	Facebook
	Twitter
	LinkedIn
	Instagram

Table 2: Internal Memory Data Objects

4 Test Results

This section provides the test cases results reported by the tool. Sections 4.1 – 4.3 identify the mobile device operating system type (e.g., Android, iOS) and the make and model of mobile devices used for testing Oxygen Forensics v8.3.1.105.

The *Test Cases* column (internal memory acquisition) in sections 4.1 - 4.3 are comprised of two sub-columns that define a particular test category and individual sub-categories that are verified when acquiring the internal memory for supported mobile devices and UICCs within each test case. Each individual sub-category row results for each mobile device/UICC tested. The results are as follows:

As Expected: the mobile forensic application returned expected test results – the tool acquired and reported data from the mobile device/UICC successfully.

Partial: the mobile forensic application returned some of data from the mobile device/UICC.

Not As Expected: the mobile forensic application failed to return expected test results – the tool did not acquire or report supported data from the mobile device/UICC successfully.

NA: Not Applicable – the mobile forensic application is unable to perform the test or the tool does not provide support for the acquisition for a particular data element.

4.1 Android Mobile Devices

The internal memory contents for Android devices were acquired and analyzed with Oxygen Forensics v8.3.1.105.

All test cases pertaining to the acquisition of supported Android devices were successful with the exception of the following.

- Equipment related data i.e., IMEI was not reported for the Ellipsis 8.
- Subscriber related data i.e., MSISDN was not reported for the Motorola Droid Turbo 2, Galaxy S6, Galaxy S6 Edge Plus, LG G4 and the Ellipsis 8.
- Calendar entries were not acquired/reported for the Motorola Droid Turbo 2.
- Memos were not acquired/reported for the Galaxy S6, Galaxy S6 Edge Plus, LG G4, Ellipsis 8, Galaxy Tab E and the Galaxy Tab S2.
- Call log data was not reported for the Motorola Droid Turbo 2 and the Ellipsis 8, Galaxy Tab E and the Galaxy Tab S2 via Hangouts dialer.
- SMS and MMS messages using the application FireChat were not reported for the Galaxy Tab E and the Galaxy Tab S2.
- All recipients included for outgoing group messages were not reported for the Motorola Droid Turbo 2, Galaxy S6, Galaxy S6 Edge Plus and the LG G4.
- Social media related data i.e., Facebook, Twitter, LinkedIn were not acquired or the Motorola Droid Turbo 2, Galaxy S6, Galaxy S6 Edge Plus and the LG G4.
- Social media related data i.e., Facebook, Instagram, LinkedIn were not acquired for the Galaxy Tab E or the Galaxy Tab S2.
- Social media related data was not reported for the Ellipsis 8.
- Partial social media related data for Instagram was reported for the Motorola Droid Turbo 2, Galaxy S6, Galaxy S6 Edge Plus and the LG G4. Only one picture is reported.
- Partial social media related data for Twitter for the Galaxy Tab E or the Galaxy Tab S2 was reported. Only pictures related to the social media account were reported.
- Internet related data (Bookmarks, History, Email) was not acquired for all Android devices.
- GPS (longitude / latitude coordinates) for map routes were not reported for all Android devices..

NOTES:
- ➢ Memos were not reported under "Organizer" for the Motorola Droid Turbo 2, but can be extracted beneath "File Browser" from notepad.db.
- ➢ Geo-tagged photos were reported beneath "File Browser" under Geo files for the Galaxy S6, Galaxy S6 Edge Plus, LG G4, Galaxy Tab E and the Galaxy Tab S2.

See Table 3 below for more details.

Oxygen Forensics v8.3.1.105							
Test Cases – Internal Memory Acquisition		*Mobile Device Platform: Android*					
		Moto Droid Turbo 2	Galaxy S6	Galaxy S6 Edge Plus	LG G4	Ellipsis 8	Galaxy Tab-E	Galaxy Tab S2
Acquisition	Acquire All	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Disrupted	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Reporting	Preview-Pane	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Generated Reports	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Equipment/ User Data	IMEI	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*
	MEID/ESN	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	MSISDN	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*NA*	*NA*
PIM Data	Contacts	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*
	Calendar	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*
	Memos/Notes	*As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
Call Logs	Incoming	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	Outgoing	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	Missed	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
SMS Messages	Incoming	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	Outgoing	*Partial*	*Partial*	*Partial*	*Partial*	*Not As Expected*	*Not As Expected*	*Not As Expected*
MMS Messages	Graphic	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	Audio	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	Video	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
Stand-alone Files	Graphic	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Audio	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Video	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Application Data	Documents (txt, pdf files)	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Facebook	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*

Oxygen Forensics v8.3.1.105							
Test Cases – Internal Memory Acquisition		*Mobile Device Platform: Android*					
		Moto Droid Turbo 2	Galaxy S6	Galaxy S6 Edge Plus	LG G4	Ellipsis 8	Galaxy Tab-E	Galaxy Tab S2
Social Media Data	Twitter	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Partial*	*Partial*
	LinkedIn	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	Instagram	*Partial*	*Partial*	*Partial*	*Partial*	*Not As Expected*	*Not As Expected*	*Not As Expected*
Internet Data	Bookmarks	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	History	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	Email	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
GPS Data	Coordinates/ Geo-tagged	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
Non-Latin Character	Reported in native format	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*	*As Expected*	*As Expected*
Hashing	Case File/ Individual Files	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Case File Data Protection	Modify Case Data	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*

Table 3: Android Mobile Devices

4.2 iOS Mobile Devices

The internal memory contents for iOS devices were acquired and analyzed with Oxygen Forensics v8.3.1.105.

All test cases pertaining to the acquisition of supported iOS devices were successful with the exception of the following across all iOS devices.

- Documents (txt, pdf) were not acquired for the iPhone 6, iPhone 6S, iPhone 6S Plus and the iPad Pro.
- Audio files were not reported for the iPhone 6, iPhone 6S, iPhone 6S Plus and the iPad Pro.
- Social media related data i.e., profile information, status updates, personal messages, graphics were not reported for Facebook, Twitter or Instagram for the iPhone 6, iPhone 6S, iPhone 6S Plus and the iPad Pro. Username, application files and application information are reported.
- Partial social medial related data i.e., personal messages, graphics, Username, application files and application information for LinkedIn were reported for the iPhone 6, iPhone 6S, iPhone 6S Plus and the iPad Pro.
- The following data elements were not acquired for the iPad Mini: Memos, stand-alone files (i.e., audio, graphic, videos), documents (txt, pdf), email related data and social media related data (i.e., Facebook, Twitter, Instagram).
- Partial social media related data (i.e., personal messages for LinkedIn) was reported for the iPad Mini.

NOTES:
- ➢ If auto device connection is selected and iTunes is not installed – the mobile device is identified but only the contents within the DCIM folder (i.e., graphics, video) are acquired. If manual extraction is selected and iTunes is not installed – the user is prompted to install iTunes. The user should be prompted to install iTunes if not present for auto device connectivity.
- ➢ Memo entries are not reported in "Notes" within the preview pane. Data can be extracted from the file browser from NoteStore.sqlite.
- ➢ Connectivity to the iPad Mini is identified as an Apple Generic Device.
- ➢ All acquired data for the iPad Mini is categorized beneath the "Timeline" sub-directory. The data is not parsed out to the associated sub-directories. The following directories are missing beneath "common sections" – Phonebook, Event Log, Messages, File Browser, Organizer, Dictionary, Web Connections and the Application Folder (Messengers, Navigation, Social Networks, Web Browsers).

See Table 4 below for more details.

	Oxygen Forensics v8.3.1.105					
Test Cases – Internal Memory Acquisition		*Mobile Device Platform: iOS*				
		iPhone 6	iPhone 6S	iPhone 6S Plus	iPad Mini	iPad Pro
Acquisition	Acquire All	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Disrupted	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Reporting	Preview-Pane	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Generated Reports	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Equipment/ User Data	IMEI	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	MEID/ESN	*NA*	*NA*	*NA*	*NA*	*NA*
	MSISDN	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
PIM Data	Contacts	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Calendar	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Memos/Notes	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*
Call Logs	Incoming	*As Expected*	*As Expected*	*As Expected*	*NA*	*NA*
	Outgoing	*As Expected*	*As Expected*	*As Expected*	*NA*	*NA*
	Missed	*As Expected*	*As Expected*	*As Expected*	*NA*	*NA*
SMS Messages	Incoming	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Outgoing	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
MMS Messages	Graphic	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Audio	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Video	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Stand-alone Files	Graphic	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*
	Audio	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	Video	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*
Application Data	Documents (txt, pdf files)	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	Facebook	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*

Oxygen Forensics v8.3.1.105					
Test Cases – Internal Memory Acquisition	*Mobile Device Platform: iOS*				
	iPhone 6	iPhone 6S	iPhone 6S Plus	iPad Mini	iPad Pro
Social Media Data — Twitter	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
Social Media Data — LinkedIn	*Partial*	*Partial*	*Partial*	*Partial*	*Partial*
Social Media Data — Instagram	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*
Internet Data — Bookmarks	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Internet Data — History	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Internet Data — Email	*NA*	*NA*	*NA*	*NA*	*NA*
GPS Data — Coordinates/ Geo-tagged	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Non-Latin Character — Reported in native format	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Hashing — Case File/ Individual Files	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Case File Data Protection — Modify Case Data	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*

Table 4: iOS Mobile Devices

4.3 Blackberry / Windows / Feature Phones

The internal memory contents for the feature phone was acquired and analyzed with Oxygen Forensics v8.3.1.105.

All test cases pertaining to the acquisition of supported mobile devices were successful with the exception of the following.

- Connectivity to the BlackBerry Q10 or Z30 was not established.
- Subscriber and equipment related information (i.e., MSISDN, IMEI) was not reported for the HTC Win 8x or the Samsung Rugby III.
- Equipment related information i.e., IMEI was not reported for the Nokia Lumia 735.
- The only data reported for the HTC Win 8x was native sample photos, audio and video files. No other data elements defined below in Table 5 were acquired.
- The only data reported for the Samsung Rugby III was stand-alone photos, audio, video and documents. No other data elements defined below in Table 5 were acquired.
- Stand-alone graphic, audio, video or document files were not acquired for the Nokia Lumia 735.

NOTES:
- The Oxygen OFS2_Drivers_Pack was successfully installed. For the BlackBerry Q10 and Z30 neither Auto nor Manual device connections were successful in establishing a connection.

See Table 5 below for more details.

Oxygen Forensics v8.3.1.105					
Test Cases – Internal Memory Acquisition		*Mobile Device Platform: Blackberry, Windows, Feature phones*			
		Blackberry Q10	Blackberry Z30	HTC Win 8x	Nokia Lumia 735 (Bluetooth)	Samsung Rugby 3
Acquisition	Acquire All	*Not As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*
	Disrupted	*NA*	*NA*	*As Expected*	*NA*	*As Expected*
Reporting	Preview-Pane	*NA*	*NA*	*As Expected*	*As Expected*	*As Expected*
	Generated Reports	*NA*	*NA*	*As Expected*	*As Expected*	*As Expected*
Equipment/ User Data	IMEI/IMSI	*NA*	*NA*	*Not As Expected*	*Not As Expected*	*Not As Expected*
	MEID/ESN	*NA*	*NA*	*NA*	*NA*	*NA*

Oxygen Forensics v8.3.1.105						
Test Cases – Internal Memory Acquisition		*Mobile Device Platform: Blackberry, Windows, Feature phones*				
		Blackberry Q10	Blackberry Z30	HTC Win 8x	Nokia Lumia 735 (Bluetooth)	Samsung Rugby 3
	MSISDN	*NA*	*NA*	*Not As Expected*	*As Expected*	*Not As Expected*
PIM Data	Contacts	*NA*	*NA*	*Not As Expected*	*As Expected*	*Not As Expected*
	Calendar	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*
	Memos/Notes	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*
Call Logs	Incoming	*NA*	*NA*	*Not As Expected*	*As Expected*	*Not As Expected*
	Outgoing	*NA*	*NA*	*Not As Expected*	*As Expected*	*Not As Expected*
	Missed	*NA*	*NA*	*Not As Expected*	*As Expected*	*Not As Expected*
SMS Messages	Incoming	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*
	Outgoing	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*
MMS Messages	Graphic	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*
	Audio	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*
	Video	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*
Stand-alone Files	Graphic	*NA*	*NA*	*Not As Expected*	*Not As Expected*	*As Expected*
	Audio	*NA*	*NA*	*Not As Expected*	*Not As Expected*	*As Expected*
	Video	*NA*	*NA*	*Not As Expected*	*Not As Expected*	*As Expected*
Application Data	Documents (txt, pdf files)	*NA*	*NA*	*Not As Expected*	*Not As Expected*	*As Expected*
Social Media Data	Facebook	*NA*	*NA*	*Not As Expected*	*NA*	*NA*
	Twitter	*NA*	*NA*	*Not As Expected*	*NA*	*NA*
	LinkedIn	*NA*	*NA*	*Not As Expected*	*NA*	*NA*
	Instagram	*NA*	*NA*	*Not As Expected*	*NA*	*NA*
Internet Data	Bookmarks	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*
	History	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*

Oxygen Forensics v8.3.1.105					
Test Cases – Internal Memory Acquisition		Mobile Device Platform: Blackberry, Windows, Feature phones				
		Blackberry Q10	Blackberry Z30	HTC Win 8x	Nokia Lumia 735 (Bluetooth)	Samsung Rugby 3
	Email	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*
GPS Data	Coordinates/ Geo-tagged	*NA*	*NA*	*Not As Expected*	*NA*	*Not As Expected*
Non-Latin Character	Reported in native format	*NA*	*NA*	*NA*	*As Expected*	*NA*
Hashing	Case File/ Individual Files	*NA*	*NA*	*As Expected*	*As Expected*	*As Expected*
Case File Data Protection	Modify Case Data	*NA*	*NA*	*As Expected*	*As Expected*	*As Expected*

Table 5: Feature Phones