XRY v7.8.0

Test Results for Mobile Device Acquisition Tool

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Homeland Security
Science and Technology

Test Results for Mobile Device Acquisition Tool:
XRY v7.8.0

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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.

This document reports the results from testing MSAB XRY v7.8.0 across supported mobile devices and associated media e.g., smart phones, tablets, feature phones and UICCs.

Test results from other tools can be found on the DHS S&T-sponsored digital forensics web page.

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.

Test Results for Mobile Device Acquisition Tool

Tool Tested: XRY

Software Version: v7.8.0

Supplier: MSAB Inc.

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WWW: http://www.msab.com

1   Results Summary

MSAB's XRY Logical software enables investigators to perform 'logical' data and file system acquisitions from mobile devices. XRY Logical will allow you to recover most of the live and file system data from the device. It is an automated equivalent of manually examining each screen on the device and recording what is displayed. XRY Physical provides the ability for physical recovery of data from mobile devices providing access to system and deleted data.

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

Connectivity:
  - Physical data extraction resulted in the following error: no connections were found for the selected device. (Device: *LG G4*)
  - Connectivity was not established to the BlackBerry Z10. Development mode was successfully enabled. The device was recognized by Windows. No data was recovered. Processing ended with errors, could not connect to host. (Device: *BlackBerry Z10*)

*Personal Information Management (PIM) data***:**
  - Address book entries/Contacts are not reported. (Devices: *LG Revere 3, Extravert 2*)
  - Long Address book entries/Contacts are truncated. (Device: *BlackBerry Z30*)
  - Graphic files associated with Address book entries/Contacts are not reported. (Device: *BlackBerry Z30*)
  - Address, City, State and Zip are not reported with Address book entries/Contacts. (Device: *BlackBerry Z30*)
  - Calendar related data is not reported. (Device: *Google Pixel XL*)
  - Memos/Notes are not reported. (Device: *BlackBerry Z30*)

- Call log data (i.e., incoming, outgoing, missed) is not reported. (Devices: *Galaxy Tab-E, Galaxy Tab S2*)
- SMS and MMS related data via FireChat are not reported. (Devices: *Ellipsis 8, Galaxy Tab-E, Galaxy Tab S2*)
- MMS messages (i.e., audio, graphic, video) are not reported. (Devices: *LG Revere 3, Extravert 2*)

Social media Data:
- Social media related data (i.e., Facebook, LinkedIn) is partially reported (account, profile related information). (Device: *Galaxy S3*)
- Social media related data (i.e., Facebook) is partially reported (account, profile related information). (Devices: *Galaxy S5, Galaxy Note 3*)
- Social media related data (i.e., Facebook, Twitter, LinkedIn) is not reported. (Device: *Motorola Droid Turbo 2*)
- Social media related data (i.e., Instagram) is partially reported (pictures). (Device: *Motorola Droid Turbo 2*)
- Social media related data (i.e., Twitter) is partially reported (pictures). (Device: *Google Pixel XL*)
- Social media related data (i.e., Facebook, LinkedIn, Instagram) is not reported. (Device: *Google Pixel XL*)
- Social media related data (i.e., Facebook, Twitter, LinkedIn, Instagram) is not reported. (Devices: *Motorola Z Force, HTC 10*)
- Social media related data (i.e., Facebook, LinkedIn) is partially reported (account, profile related information). (Device: *iPhone 5S*)
- Social media related data (i.e., Facebook) is partially reported (account, profile related information). (Devices: *iPhone 6S Plus, iPhone 7 Plus*)
- Social media related data (i.e., Instagram) are not reported. (Devices: *iPhone 6S Plus, iPhone 7 Plus*)
- Social media related data (i.e., Facebook, Twitter, LinkedIn) is partially reported (account, profile related information). (Device: *iPad Air*)
- Social media related data (i.e., Facebook, Instagram) are not reported. (Devices: *iPad Mini, iPad Pro*)
- Social media related data for Facebook, Twitter and LinkedIn is not reported. (Device: *BlackBerry Z30*)

➢ ***Note:*** *The acquisition and reporting of social media related data extracted from a mobile device is dependent upon various factors - the state of the device (e.g., jailbroken, rooted), the data extraction method (e.g., logical, physical), the version of the app and how the data is stored.*
➢ ***Note for Android Devices:***
Non-system Android apps can choose to opt-out of the backup (e.g. WhatsApp). If the app manufacturer selects, then no app data is stored in the backup; a method commonly used for logical data recovery from mobile devices.

Internet Related Data:

- Internet related data (i.e., email) is not reported. (Device: *Motorola Droid Turbo 2*)
- Internet related data (i.e., bookmarks, history, email) is not reported. (Devices: *Google Pixel XL, Motorola Z Force, HTC 10*)
- Internet related data (i.e., Bookmarks, History) is not reported. (Device: *BlackBerry Z30*)

GPS Related Data:

- GPS related data (i.e., longitude, latitude coordinates) are not reported for associated Maps navigational apps. (Device: *Motorola Droid Turbo 2*)

For more test result details see section 4.

2 Mobile Devices

The following table lists the mobile devices used for testing XRY v7.8.0.

Make	Model	OS	Firmware	Network
Apple iPhone	4	iOS v4.3.3 (8J2)	04.10.01	GSM
Apple iPhone	5S	iOS 7.1 (11D167)	2.18.02	CDMA
Apple iPhone	6S Plus	iOS 9.2.1 (13C75)	1.23.00	CDMA
Apple iPhone	7 Plus	iOS 10.2 (14C92)	1.33.00	CDMA
Apple iPad	Mini	iOS 9.2.1 (13B143)	4.32.00	CDMA
Apple iPad	Air	iOS 7.1 (11D167)	2.18.02	CDMA
Apple iPad	Pro	iOS 9.2.1 (13C75)	4.52.00	CDMA
Samsung Galaxy	S3 SGH-1747	Android 4.1.2	1747UCDMG2	GSM
Samsung Galaxy	S5 SM-G900V	Android 4.2.2	G900V.05	CDMA
LG	G4	Android 5.1.1	LMY47D	CDMA
LG	G5	Android 6.0.1	MMB29M	CDMA
Motorola Droid	Turbo2	Android 5.1.1	LCK23.130-23	CDMA
Samsung Galaxy	S6 Edge Plus – SM-G928V	Android 5.1.1	LMY47X.G928VVRU2AOJ2	CDMA
Samsung J3	J3 – SM-J320V	Android 6.0.1	MMB29M.J320VVRU2AP12	CDMA
Google Pixel XL	XL	Android 7.1.1	NMF26U	CDMA
Samsung GS7	GS7 – SM-G930V	Android 6.0.1	MMB29M.G930VVRU4AP13	CDMA
Samsung GS7 Edge	GS7 Edge SM-G935V	Android 6.0.1	MMB29M.G935VVRS4APH 1	CDMA
Motorola	Z Force XT1650	Android 7.0	NCLS25.86-11-4	CDMA
HTC 10	HTC6545LVW	Android 6.0.1	1.85.605.8.8.0_g CL774095	CDMA
Samsung	Galaxy Note3	Android 4.4.2	KOT49H.N900VVRUCNC4	CDMA
Ellipsis 8	QTAQZ3	Android 4.4.2	KOT49H	CDMA
Samsung	Tab-E	Android	LMY47X.T567VVRU1AOH1	CDMA

Make	Model	OS	Firmware	Network
Galaxy		5.1.1		
Samsung Galaxy	Tab S2	Android 5.1.1	LMY47X.T817BVRU2AOJ2	CDMA
BlackBerry	Z10	10.2.1.2174	672849	CDMA
BlackBerry	Z30	10.3.2.556	85718	CDMA
LG Cosmos 3	Cosmos 3	BREW 1.0.2	VN251ZV6	CDMA
LG Revere	Revere 3	BREW 1.0.2	VN17011A	CDMA
LG Extravert	Extravert 2	REV1.0	REV1.0	CDMA

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

XRY v7.8.0 was installed on Windows 10 Pro version 10.0.14393.

3.2 Internal Memory Data Objects

XRY v7.8.0 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, grahic
	Regular Length, Address
	Deleted Entry
	Non-Latin Entry
	Contact Groups
PIM Data: Datebook/Calendar; Memos	*Regular Length*
	Maximum Length
	Deleted Entry
	Special Character
	Blank Entry
Call Logs	*Incoming*
	Outgoing

Data Objects	Data Elements
	Missed
	Incoming – Deleted
	Outgoing – Deleted
	Missed - Deleted
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 – 4.4 identify the mobile device operating system type, media (e.g., Android, iOS, BlackBerry, Feature phones, UICC) and the make and model of mobile devices used for testing XRY v7.8.0.

The *Test Cases* column (internal memory acquisition) in sections 4.1 - 4.4 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 XRY v7.8.0.

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

- Calendar related data is not reported for the Google Pixel XL.
- Call log data (i.e., incoming, outgoing, missed) is not reported for the Galaxy Tab-E (Hangouts Dialer) and Galaxy Tab S2 (Hangouts Dialer).
- SMS and MMS related data via FireChat were not reported for the Ellipsis 8, Galaxy Tab-E and Galaxy Tab S2.
- Social media related data (i.e., Facebook, LinkedIn) is partially reported (account, profile related information) for the Galaxy S3.
- Social media related data (i.e., Facebook) is partially reported (account, profile related information) for the Galaxy S5 and Galaxy Note 3.
- Social media related data (i.e., Facebook, Twitter, LinkedIn) is not reported for the Motorola Droid Turbo 2.
- Social media related data (i.e., Instagram) is partially reported (i.e., pictures) for the Motorola Droid Turbo 2.
- Social media related data (i.e., Twitter) is partially reported (i.e., pictures) for the Google Pixel XL.
- Social media related data (i.e., Facebook, LinkedIn, Instagram) is not reported for the Google Pixel XL.
- Social media related data (i.e., Facebook, Twitter, LinkedIn, Instagram) is not reported for the Motorola Z Force and HTC 10.
- Internet related data (i.e., email) is not reported for the Motorola Droid Turbo 2.
- Internet related data (i.e., bookmarks, history, email) is not reported for the Google Pixel XL, Motorola Z Force and HTC 10.
- GPS related data (i.e., longitude, latitude coordinates) are not reported for associated Maps navigational apps for the Motorola Droid Turbo 2.

Notes:
- ➢ Address book entries/Contacts were not reported when performing a logical acquisition for the Galaxy S3. However, they were reported with the physical data extraction.
- ➢ When performing a logical acquisition for the Galaxy S5 no data was reported. However, data was reported with the physical data extraction.
- ➢ Physical data extraction for the LG G4 resulted in the following error: no connections were found for the selected device. The logical acquisition only returned: pictures, audio, video, documents and location related data.

See Table 3a, 3b below for more details.

XRY v7.8.0									
		Mobile Device Platform: Android							
Test Cases – Internal Memory Acquisition		Galaxy S3	Galaxy S5	LG G4	LG G5	Motorola Droid Turbo 2	Galaxy S6 Edge Plus	Samsung J3	Google Pixel XL
Acquisition	Acquire All	*As Expected*	*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*	*As Expected*
Reporting	Preview-Pane	*As Expected*	*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*	*As Expected*
Equipment/ User Data	IMEI	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	MEID/ESN	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	MSISDN	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
PIM Data	Contacts	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Calendar	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*Not As Expected*
	Memos/ Notes	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Call Logs	Incoming	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Outgoing	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Missed	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
SMS Messages	Incoming	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Outgoing	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
MMS Messages	Graphic	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Audio	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Video	*As Expected*	*As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Stand-alone Files	Graphic	*As Expected*	*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*	*As Expected*
	Video	*As Expected*	*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*	*As Expected*

Test Cases – Internal Memory Acquisition		Mobile Device Platform: Android							
		Galaxy S3	Galaxy S5	LG G4	LG G5	Motorola Droid Turbo 2	Galaxy S6 Edge Plus	Samsung J3	Google Pixel XL
Social Media Data	Facebook	Partial	Partial	Not As Expected	As Expected	Not As Expected	As Expected	As Expected	Not As Expected
	Twitter	As Expected	As Expected	Not As Expected	As Expected	Not As Expected	As Expected	As Expected	Partial
	LinkedIn	Partial	As Expected	Not As Expected	As Expected	Not As Expected	As Expected	As Expected	Not As Expected
	Instagram	NA	NA	Not As Expected	As Expected	Partial	As Expected	As Expected	Not As Expected
Internet Data	Bookmarks	As Expected	As Expected	Not As Expected	As Expected	As Expected	As Expected	As Expected	Not As Expected
	History	As Expected	As Expected	Not As Expected	As Expected	As Expected	As Expected	As Expected	Not As Expected
	Email	As Expected	As Expected	Not As Expected	As Expected	Not As Expected	As Expected	As Expected	Not As Expected
GPS Data	Coordinates /Geo-tagged	As Expected	As Expected	As Expected	As Expected	Not As Expected	As Expected	As Expected	As Expected
Non-Latin Character	Reported in native format	As Expected	As Expected	NA	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	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	As Expected

Table 3a: Android Mobile Devices

XRY v7.8.0							
Test Cases – Internal Memory Acquisition		*Mobile Device Platform: Android*					
		Samsung GS7/GS7 Edge	Motorola Z Force	HTC 10	Galaxy Note3	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	As Expected	As Expected	As Expected
	MEID/ESN	NA	NA	NA	NA	NA	NA	NA
	MSISDN	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
PIM Data	Contacts	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	Calendar	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	Memos/ Notes	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
Call Logs	Incoming	As Expected	As Expected	As Expected	As Expected	NA	Not As Expected	Not As Expected
	Outgoing	As Expected	As Expected	As Expected	As Expected	NA	Not As Expected	Not As Expected
	Missed	As Expected	As Expected	As Expected	As Expected	NA	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	As Expected	As Expected	As Expected	As Expected	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

XRY v7.8.0							
Test Cases – Internal Memory Acquisition		*Mobile Device Platform: Android*						
		Samsung GS7/GS7 Edge	Motorola Z Force	HTC 10	Galaxy Note3	Ellipsis 8	Galaxy Tab-E	Galaxy Tab S2
Social Media Data	Facebook	*As Expected*	*Not As Expected*	*Not As Expected*	*Partial*	*As Expected*	*As Expected*	*As Expected*
	Twitter	*As Expected*	*Not As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	LinkedIn	*As Expected*	*Not As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Instagram	*As Expected*	*Not As Expected*	*Not As Expected*	*NA*	*As Expected*	*As Expected*	*As Expected*
Internet Data	Bookmarks	*As Expected*	*Not As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	History	*As Expected*	*Not As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Email	*As Expected*	*Not As Expected*	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
GPS Data	Coordinates/Geo-tagged	*As Expected*	*As Expected*	*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*	*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 3b: Android Devices

4.2 iOS Mobile Devices

The internal memory contents for iOS devices were acquired and analyzed with XRY v7.8.0.

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

- Social media related data (i.e., Facebook, LinkedIn) is partially reported (account, profile related information) for the iPhone 5S.
- Social media related data (i.e., Facebook) is partially reported (account, profile related information) for the iPhone 6S Plus and iPhone 7 Plus.
- Social media related data (i.e., Instagram) are not reported for the iPhone 6S Plus and iPhone 7 Plus.
- Social media related data (i.e., Facebook, Twitter, LinkedIn) is partially reported (account, profile related information) for the iPad Air.
- Social media related data (i.e., Facebook, Instagram) are not reported for the iPad Mini and iPad Pro.

See Table 4 below for more details.

Test Cases – Internal Memory Acquisition		Mobile Device Platform: iOS						
XRY v7.8.0								
		iPhone 4	iPhone 5S	iPhone 6S Plus	iPhone 7 Plus	iPad Mini	iPad Air	iPad Pro
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*	*As Expected*	*As Expected*	*As Expected*
	MEID/ESN	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	MSISDN	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
PIM Data	Contacts	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Calendar	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Memos/Notes	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Call Logs	Incoming	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*	*NA*	*NA*
	Outgoing	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*	*NA*	*NA*
	Missed	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*	*NA*	*NA*
SMS Messages	Incoming	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Outgoing	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
MMS Messages	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*
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*

XRY v7.8.0							
Test Cases – Internal Memory Acquisition		Mobile Device Platform: iOS					
		iPhone 4	iPhone 5S	iPhone 6S Plus	iPhone 7 Plus	iPad Mini	iPad Air	iPad Pro
Social Media Data	Facebook	*NA*	*Partial*	*Partial*	*Partial*	*Not As Expected*	*Partial*	*Not As Expected*
	Twitter	*NA*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*Partial*	*As Expected*
	LinkedIn	*NA*	*Partial*	*As Expected*	*As Expected*	*As Expected*	*Partial*	*As Expected*
	Instagram	*NA*	*NA*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*NA*	*Not As Expected*
Internet Data	Bookmarks	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	History	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Email	*As Expected*	*NA*	*NA*	*NA*	*NA*	*As Expected*	*NA*
GPS Data	Coordinates/ Geo-tagged	*As Expected*	*As Expected*	*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*	*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 4: iOS Mobile Devices

4.3 BlackBerry, Feature Devices

The internal memory contents for BlackBerry and Feature phones were acquired and analyzed with XRY v7.8.0.

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

- Address book entries/Contacts are not reported for the LG Revere 3 and Extravert 2.
- Long Address book entries/Contacts are truncated for the BlackBerry Z30. Only the first and last name are reported.
- Graphic files associated with Address book entries/Contacts are not reported for the BlackBerry Z30.
- Address, City, State and Zip are not reported with Address book entries/Contacts for the BlackBerry Z30.
- Memos/Notes are not reported for the BlackBerry Z30.
- MMS messages (i.e., audio, graphic, video) are not reported for the LG Revere 3 and Extravert 2.
- Social media related data for Facebook, Twitter and LinkedIn is not reported for the BlackBerry Z30.
- Internet related data (i.e., Bookmarks, History) is not reported for the BlackBerry Z30.

Notes:
- ➢ Connectivity was not established to the BlackBerry Z10. Development mode was successfully enabled. The device was recognized by Windows. No data was recovered. Processing ended with errors, could not connect to host.

See Table 5 below for more details.

		Mobile Device Platform: Feature Phone			
Test Cases – Internal Memory Acquisition		BlackBerry Z30	LG Cosmos 3	LG Revere 3	LG Extravert 2
Acquisition	Acquire All	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Disrupted	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Reporting	Preview-Pane	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Generated Reports	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Equipment/ User Data	IMEI	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	MEID/ESN	*NA*	*NA*	*NA*	*NA*
	MSISDN	*As Expected*	*As Expected*	*As Expected*	*As Expected*
PIM Data	Contacts	*Partial*	*As Expected*	*Not As Expected*	*Not As Expected*
	Calendar	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Memos/Notes	*Not As Expected*	*As Expected*	*As Expected*	*As Expected*
Call Logs	Incoming	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Outgoing	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Missed	*As Expected*	*As Expected*	*As Expected*	*As Expected*
SMS Messages	Incoming	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Outgoing	*As Expected*	*As Expected*	*As Expected*	*As Expected*
MMS Messages	Graphic	*As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*
	Audio	*As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*
	Video	*As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*
Stand-alone Files	Graphic	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Audio	*As Expected*	*As Expected*	*As Expected*	*As Expected*
	Video	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Application Data	Documents (txt, pdf files)	*As Expected*	*As Expected*	*As Expected*	*As Expected*

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Test Cases – Internal Memory Acquisition		*Mobile Device Platform: Feature Phone*			
		BlackBerry Z30	LG Cosmos 3	LG Revere 3	LG Extravert 2
Social Media Data	Facebook	*Not As Expected*	*NA*	*NA*	*NA*
	Twitter	*Not As Expected*	*NA*	*NA*	*NA*
	LinkedIn	*Not As Expected*	*NA*	*NA*	*NA*
	Instagram	*NA*	*NA*	*NA*	*NA*
Internet Data	Bookmarks	*Not As Expected*	*NA*	*NA*	*NA*
	History	*Not As Expected*	*NA*	*NA*	*NA*
	Email	*NA*	*NA*	*NA*	*NA*
GPS Data	Coordinates/ Geo-tagged	*NA*	*NA*	*NA*	*NA*
Non-Latin Character	Reported in native format	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Hashing	Case File/ Individual Files	*As Expected*	*As Expected*	*As Expected*	*As Expected*
Case File Data Protection	Modify Case Data	*As Expected*	*As Expected*	*As Expected*	*As Expected*

Table 5: Feature Phones

4.4 Universal Integrated Circuit Cards (UICCs)

The internal memory contents for Universal Integrated Circuit Cards (UICCs) were acquired and analyzed with XRY v7.8.0.

All test cases pertaining to the acquisition of UICCs were successful.

See Table 6 below for more details.

XRY v7.8.0		
Test Cases – UICC Acquisition		*Universal Integrated Circuit Card*
Connectivity	Non Disrupted	*As Expected*
	Disrupted	*As Expected*
Equipment/ User Data	Service Provider Name (SPN)	*As Expected*
	ICCID	*As Expected*
	IMSI	*As Expected*
	MSISDN	*As Expected*
PIM Data	Abbreviated Dialing Numbers (ADNs)	*As Expected*
	Last Numbers Dialed (LNDs)	*As Expected*
	SMS Messages	*As Expected*
	EMS Messages	*As Expected*
Location Related Data	LOCI	*As Expected*
	GPRSLOCI	*As Expected*
Acquisition	Acquire All	*As Expected*
	Selected All	*As Expected*
	Select Individual	*As Expected*
Case File Data Protection	Modify Case Data	*As Expected*
Password Protected SIM Acquire	Acquisition of Protected SIM	*As Expected*
PIN/PUK Attempts	PIN attempts reported	*As Expected*
	PUK attempts reported	*As Expected*
Non-ASCII Character	Non-ASCII characters	*As Expected*
Hashing	Hashes reported for acquired data objects	*As Expected*

Table 6: Universal Integrated Circuit Cards