



Mobilyze v2018.1

Test Results for Mobile Device Acquisition Tool

November 1, 2018



**Homeland
Security**

Science and Technology

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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 (<http://www.cftt.nist.gov/>).

This document reports the results from testing BlackBag Tech's Mobilyze v2018.1 across supported mobile devices i.e., Android and iOS.

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.

Test Results for Mobile Device Acquisition Tool

Tool Tested:	Mobilyze
Software Version:	v2018.1
Supplier:	Blackbag Technologies
Address:	300 Piercy Road San Jose, CA 95138
Tel:	(408) 844-8890
WWW:	http://www.blackbagtech.com

1 Results Summary

Blackbag Tech's Mobilyze allows investigators to acquire, view and preserve the data held on any iOS or Android device. Mobilyze was tested for its ability to acquire active data from the internal memory of Android and iOS devices. Except for the following anomalies, the tool acquired all supported data objects completely and accurately for all mobile devices tested.

Connectivity:

- Connectivity was not successfully established. (Device: *LG G4*)
- An error message was not returned when connectivity is disrupted during data extraction. (Devices: *iOS*)

Personal Information Management (PIM) data:

- Long contacts/address book entries are truncated within the preview-pane. (Devices: *Android, iOS*)
- Calendar entries are not reported. (Devices: *Android*)
- Memo entries are not reported. (Devices: *Android, iOS*)
- Call logs are not reported. (Devices: *Ellipsis 8, Galaxy Tab-E, Galaxy Tab S2*)
- SMS and MMS (i.e., audio, graphic, video) are not reported. (Devices: *Ellipsis 8, Galaxy Tab-E, Galaxy Tab S2*)
- Group SMS messages are not reported. (Devices: *LG G5, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Google Pixel XL, Galaxy GS7/GS7 Edge, Motorola D Force, HTC 10, Samsung J3*)
- MMS message attachments (i.e., audio, video) are not reported. (Devices: *Galaxy S3, Galaxy S5, LG G5, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Samsung J3, Google Pixel XL, Galaxy GS7/GS7 Edge, Motorola D Force, HTC 10, Galaxy Note 3, iOS*)

Stand-alone Files:

- Audio files (e.g., mp3, wav) are not reported. (Devices: *Android, iOS*)
- Document files (i.e., .txt, .pdf) are not reported. (Devices: *Android*)

Social media Data:

- Facebook and LinkedIn is partially reported (i.e., account information) (Devices: *Galaxy S3, Galaxy S5, Galaxy Note 3*)
 - Facebook, Twitter, LinkedIn and Instagram is partially reported (i.e., account information). (Devices: *LG G5, Motorola Droid Turbo 2, Samsung J3, Samsung GS7/GS7 Edge, HTC 10, Ellipsis 8, Galaxy Tab S2, iPhone 6S Plus, iPhone 7 Plus, iPad Pro*)
 - Facebook data is not reported. (Device: *Galaxy S6 Edge Plus*)
 - Twitter, LinkedIn and Instagram is partially reported (i.e., account information). (Devices: *Galaxy S6 Edge Plus, Galaxy Tab-E*)
 - Facebook, Twitter, LinkedIn and Instagram is not reported. (Devices: *Google Pixel XL, Motorola D Force*)
 - Facebook and Twitter is partially reported (i.e., account information) (Device: *iPhone 5S*)
 - Facebook, Twitter and LinkedIn is partially reported (i.e., account information) (Device: *iPad Mini, iPad Air*)
 - Instagram is not reported. (Device: *iPad Mini*)
- **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.*

Internet Related Data:

- Internet related data (i.e., bookmarks, history) are not reported. (Devices: *LG G5, Galaxy S6 Edge Plus, Samsung J3, Google Pixel XL, Samsung GS7/GS7 Edge, Motorola D Force, HTC 10, Galaxy Note 3, Galaxy Tab-E, Galaxy Tab S2*)
- Internet related data (i.e., history) is not reported. (Device: *Galaxy S5*)
- Email related data is not reported. (Devices: *Android*)

GPS Related Data:

- No GPS (i.e., Maps application) longitude/latitude – location data is reported. (Devices: *Android, iPhone 5S*)

For more test result details see section 4.

2 Mobile Devices

The following table lists the mobile devices used for testing Mobilyze v2018.1.

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 – SM-J320V	Android 6.0.1	MMB29M.J320VVRU2AP12	CDMA
Google	Pixel XL	Android 7.1.1	NMF26U	CDMA
Samsung	GS7 – SM-G930V	Android 6.0.1	MMB29M.G930VVRU4AP13	CDMA
Motorola	D 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	GS7 Edge SM-G935V	Android 6.0.1	MMB29M.G935VVRU4APH1	CDMA
Samsung	Galaxy Note3	Android 4.4.2	KOT49H.N900VVRUCNC4	CDMA
Ellipsis 8	QTAQZ3	Android 4.4.2	KOT49H	CDMA

Make	Model	OS	Firmware	Network
Samsung	Galaxy Tab-E	Android 5.1.1	LMY47X.T567VVRU1AOH1	CDMA
Samsung	Galaxy Tab S2	Android 5.1.1	LMY47X.T817BVRU2AOJ2	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

Mobilyze v2018.1 Build 20180306.204241-8fcd9cb was installed on Mac OS X v10.12.6.

3.2 Internal Memory Data Objects

Mobilyze v2018.1 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	<i>Regular Length</i>
	<i>Maximum Length</i>
	<i>Special Character</i>
	<i>Blank Name</i>
	<i>Regular Length, email</i>
	<i>Regular Length, graphic</i>
	<i>Regular Length, Address</i>
	<i>Deleted Entry</i>
	<i>Non-Latin Entry</i>
PIM Data: Datebook/Calendar; Memos	<i>Contact Groups</i>
	<i>Regular Length</i>
	<i>Maximum Length</i>
	<i>Deleted Entry</i>
	<i>Special Character</i>
Call Logs	<i>Blank Entry</i>
	<i>Incoming</i>
	<i>Outgoing</i>
	<i>Missed</i>
	<i>Incoming – Deleted</i>
	<i>Outgoing – Deleted</i>
Text Messages	<i>Missed - Deleted</i>
	<i>Incoming SMS – Read</i>
	<i>Incoming SMS – Unread</i>

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

Table 2: Internal Memory Data Objects

4 Test Results

This section provides the test cases results reported by the tool. Sections 4.1 – 4.2 identify the mobile device operating system type, media (e.g., Android, iOS) and the make and model of mobile devices used for testing Mobilyze v2018.1.

The *Test Cases* column (internal memory acquisition) in sections 4.1 - 4.2 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 within each test case. Each individual sub-category row results for each mobile device 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 successfully.

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

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 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 Mobilyze v2018.1.

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

- Connectivity was not successfully established to the LG G4.
- Long contact/address book entries are truncated within the preview-pane view for all Android devices.
- Calendar entries are not reported for all Android devices.
- Memo entries are not reported for all Android devices.
- Call logs (i.e., incoming, outgoing, missed) are not reported for the Ellipsis 8, Galaxy Tab-E and Galaxy Tab S2.
- SMS and MMS messages are not reported for the Ellipsis 8, Galaxy Tab-E and Galaxy Tab S2.
- Group SMS messages are not reported for the LG G5, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Google Pixel XL, Galaxy GS7/GS7 Edge, Motorola D Force, HTC 10 and Samsung J3.
- MMS message attachments (i.e., audio, video) are not reported for the Galaxy S3, Galaxy S5, LG G5, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Samsung J3, Google Pixel XL, Galaxy GS7/GS7 Edge, Motorola D Force, HTC 10 and Galaxy Note 3.
- Stand-alone audio files are not reported for all Android devices.
- Stand-alone document files (e.g., .txt, .pdf) are not reported for all Android devices.
- Social media related data for Facebook and LinkedIn is partially reported (i.e., account information) for the Galaxy S3, Galaxy S5 and Galaxy Note 3.
- Social media related data for Facebook, Twitter, LinkedIn and Instagram is partially reported (i.e., account information) for the LG G5, Motorola Droid Turbo 2, Samsung J3, Samsung GS7/GS7 Edge, HTC 10, Ellipsis 8 and Galaxy Tab S2.
- Social media related data for Facebook is not reported for the Galaxy S6 Edge Plus.
- Social media related data for Twitter, LinkedIn and Instagram is partially reported (i.e., account information) for the Galaxy S6 Edge Plus and Galaxy Tab-E.
- Social media related data for Facebook, Twitter, LinkedIn and Instagram is not reported for the Google Pixel XL and Motorola D Force.
- Internet related data (i.e., bookmarks, history) are not reported for the LG G5, Galaxy S6 Edge Plus, Samsung J3, Google Pixel XL, Samsung GS7/GS7 Edge, Motorola D Force, HTC 10, Galaxy Note 3, Galaxy Tab-E and Galaxy Tab S2.
- Internet related data (i.e., history) is not reported for the Galaxy S5.
- Email related data is not reported for all Android devices.
- No Maps GPS related data (i.e., longitude, latitude) coordinates are reported for all Android devices.

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

Mobilyze v2018.1

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
Acquisition	Acquire All	As Expected	As Expected	Not As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	Disrupted	As Expected	As Expected	NA	As Expected	As Expected	As Expected	As Expected	As Expected
Reporting	Preview-Pane	As Expected	As Expected	NA	As Expected	As Expected	As Expected	As Expected	As Expected
	Generated Reports	As Expected	As Expected	NA	As Expected	As Expected	As Expected	As Expected	As Expected
Equipment/ User Data	IMEI	As Expected	As Expected	NA	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	NA	As Expected	As Expected	As Expected	As Expected	As Expected
PIM Data	Contacts	Partial	Partial	NA	Partial	Partial	Partial	Partial	Partial
	Calendar	Not As Expected	Not As Expected	NA	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected
	Memos/ Notes	Not As Expected	Not As Expected	NA	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected
Call Logs	Incoming	As Expected	As Expected	NA	As Expected	As Expected	As Expected	As Expected	As Expected
	Outgoing	As Expected	As Expected	NA	As Expected	As Expected	As Expected	As Expected	As Expected
	Missed	As Expected	As Expected	NA	As Expected	As Expected	As Expected	As Expected	As Expected
SMS Messages	Incoming	As Expected	As Expected	NA	As Expected	As Expected	As Expected	As Expected	As Expected
	Outgoing	As Expected	As Expected	NA	Partial	Partial	Partial	Partial	Partial
MMS Messages	Graphic	As Expected	As Expected	NA	As Expected	As Expected	As Expected	As Expected	As Expected
	Audio	Partial	Partial	NA	Partial	Partial	Partial	Partial	Partial
	Video	Partial	Partial	NA	Partial	Partial	Partial	Partial	Partial
Stand-alone Files	Graphic	As Expected	As Expected	NA	As Expected	As Expected	As Expected	As Expected	As Expected
	Audio	Not As Expected	Not As Expected	NA	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected
	Video	As Expected	As Expected	NA	As Expected	As Expected	As Expected	As Expected	As Expected
Application Data	Documents (txt, pdf files)	Not As Expected	Not As Expected	NA	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected

Mobilyze v2018.1

Test Cases – Internal Memory Acquisition		<i>Mobile Device Platform: Android</i>							
		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	<i>Partial</i>	<i>Partial</i>	<i>NA</i>	<i>Partial</i>	<i>Partial</i>	<i>Not As Expected</i>	<i>Partial</i>	<i>Not As Expected</i>
	Twitter	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Not As Expected</i>
	LinkedIn	<i>Partial</i>	<i>Partial</i>	<i>NA</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Not As Expected</i>
	Instagram	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Not As Expected</i>
Internet Data	Bookmarks	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>Not As Expected</i>	<i>As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
	History	<i>As Expected</i>	<i>Not As Expected</i>	<i>NA</i>	<i>Not As Expected</i>	<i>As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
	Email	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>NA</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
GPS Data	Coordinates /Geo-tagged	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>NA</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
Non-Latin Character	Reported in native format	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Hashing	Case File/ Individual Files	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Case File Data Protection	Modify Case Data	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>

Table 3a: Android Mobile Devices

Mobilyze v2018.1

Test Cases – Internal Memory Acquisition		Mobile Device Platform: Android						
		Samsung GS7/GS7 Edge	Motorola D 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	Partial	Partial	Partial	Partial	Partial	Partial	Partial
	Calendar	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected
	Memos/ Notes	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected
Call Logs	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
	Missed	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	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	Partial	Partial	Partial	Partial	Not As Expected	Not As Expected	Not As Expected
	Video	Partial	Partial	Partial	Partial	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	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected
	Video	As Expected	As Expected	As Expected	As Expected	As Expected	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	Not As Expected	Not As Expected

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Test Cases – Internal Memory Acquisition		<i>Mobile Device Platform: Android</i>						
		Samsung GS7/GS7 Edge	Motorola D Force	HTC 10	Galaxy Note3	Ellipsis 8	Galaxy Tab-E	Galaxy Tab S2
Social Media Data	Facebook	<i>Partial</i>	<i>Not As Expected</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>As Expected</i>	<i>Partial</i>
	Twitter	<i>Partial</i>	<i>Not As Expected</i>	<i>Partial</i>	<i>As Expected</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>
	LinkedIn	<i>Partial</i>	<i>Not As Expected</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>
	Instagram	<i>Partial</i>	<i>Not As Expected</i>	<i>Partial</i>	<i>NA</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>
Internet Data	Bookmarks	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
	History	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
	Email	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
GPS Data	Coordinates/Geo-tagged	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
Non-Latin Character	Reported in native format	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Hashing	Case File/Individual Files	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Case File Data Protection	Modify Case Data	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>

Table 3b: Android Devices

4.2 iOS Mobile Devices

The internal memory contents for iOS devices were acquired and analyzed with Mobilyze v2018.1.

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

- An error message is not returned when interrupting connectivity during data extraction for all iOS devices.
- Long contact/address book entries are truncated within the preview-pane view for all iOS devices.
- Memo entries are not reported for all iOS devices.
- MMS message attachments (i.e., audio, video) are not reported for all iOS devices.
- Stand-alone audio files are not reported for all iOS devices.
- Social media related data for Facebook, Twitter, LinkedIn and Instagram is partially reported (i.e., account information) for the iPhone 6S Plus, iPhone 7 Plus and iPad Pro.
- Social media related data for Facebook and Twitter is partially reported (i.e., account information) for the iPhone 5S.
- Social media related data for Facebook, Twitter, and LinkedIn is partially reported for the iPad Mini and iPad Air.
- Social media related data (i.e., Instagram) is not reported for the iPad Mini.
- No Maps GPS related data (i.e., longitude, latitude) coordinates are reported for the iPhone 5S.

Notes:

- Contacts/address book entries are redundantly reported within the preview-pane and generated report for the iPhone 4.
- Calendar entries are redundantly reported within the preview-pane and generated report for the iPhone4.
- SMS and MMS messages are redundantly reported within the preview-pane and generated report for the iPhone4.

See Table 4 below for more details.

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Test Cases – Internal Memory Acquisition		<i>Mobile Device Platform: iOS</i>						
		<i>iPhone 4</i>	<i>iPhone 5S</i>	<i>iPhone 6S Plus</i>	<i>iPhone 7 Plus</i>	<i>iPad Mini</i>	<i>iPad Air</i>	<i>iPad Pro</i>
Acquisition	Acquire All	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Disrupted	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
Reporting	Preview-Pane	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Generated Reports	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Equipment/ User Data	IMEI	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	MEID/ESN	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	MSISDN	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
PIM Data	Contacts	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>
	Calendar	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Memos/Notes	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
Call Logs	Incoming	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Outgoing	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Missed	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
SMS Messages	Incoming	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Outgoing	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
MMS Messages	Graphic	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Audio	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>
	Video	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>
Stand-alone Files	Graphic	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Audio	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
	Video	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Application Data	Documents (txt, pdf files)	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Facebook	<i>NA</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>

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Test Cases – Internal Memory Acquisition		<i>Mobile Device Platform: iOS</i>						
		<i>iPhone 4</i>	<i>iPhone 5S</i>	<i>iPhone 6S Plus</i>	<i>iPhone 7 Plus</i>	<i>iPad Mini</i>	<i>iPad Air</i>	<i>iPad Pro</i>
Social Media Data	Twitter	<i>NA</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>
	LinkedIn	<i>NA</i>	<i>As Expected</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>	<i>Partial</i>
	Instagram	<i>NA</i>	<i>NA</i>	<i>Partial</i>	<i>Partial</i>	<i>Not As Expected</i>	<i>NA</i>	<i>Partial</i>
Internet Data	Bookmarks	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	History	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Email	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
GPS Data	Coordinates/Geo-tagged	<i>As Expected</i>	<i>Not As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Non-Latin Character	Reported in native format	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Hashing	Case File/Individual Files	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Case File Data Protection	Modify Case Data	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>

Table 4: iOS Mobile Devices