



Oxygen Forensics v10.0.0.81

Test Results for Mobile Device Acquisition Tool

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Homeland
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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.cfft.nist.gov/>).

This document reports the results from testing Oxygen Forensics v10.0.0.81 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-cfft-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: Oxygen Forensics
Software Version: 10.0.0.81

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 version 10.0.0.81 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:

- The following errors were reported after attempting data extraction. (Device: HTC Win 8x):
 - Phonebook: Error code 254
 - Event Log: Error Code 127 – EAccessViolation: Access violation at address 01445F28 in module 'ExtractionWizard.exe'. Read of address 00000000
 - Calendar: Error Code 127 – EAccessViolation: Access violation at address 0140F4CC in module 'ExtractionWizard.exe'. Read of address 00000000
 - Dictionaries: Error code 127
 - Applications: Error code 127

Subscriber related data:

- The MSISDN/MDN was not reported. (Devices: *LG G4, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Ellipsis 8, Galaxy Tab-E, Galaxy Tab S2*)

Personal Information Management (PIM) data:

- Calendar entries are not reported. (Devices: *Google Pixel XL, Motorola Z Force*)
- Memo entries are not reported. (Device: *Ellipsis 8*)

- Deleted Note/Memo entries are incorrectly reported with a status of Active. (Devices: *iPhone 7 Plus, iPad Air*)
- Call logs are incorrectly categorized as facetime instead of voice. (Device: *iPhone 5S*)
- Call log data via Hangouts Dialer are not reported. (Devices: *Ellipsis 8, 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*)
- Contacts associated with group SMS messages are not reported completely, i.e., the only last contact within the group is reported. (Devices: *LG G4, LG G5, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Samsung J3, Google Pixel XL, Samsung GS7, Samsung GS7 Edge, Motorola Z Force, HTC 10*)

Stand-alone Files:

- Stand-alone files (i.e., audio, graphic, video, documents) are not reported. (Devices: *Ellipsis 8, Galaxy Tab-E, Galaxy Tab S2*)
- Stand-alone audio data (i.e., mp3, wav) files accessed within the iPod/iTunes player are not reported. (Devices: *iOS*)
- Stand-alone video files are not reported. (Device: *iPhone 4*)
- Deleted stand-alone video files are incorrectly reported with a status of active. (Device: *iPhone 7 Plus*)
- Stand-alone document files (e.g., .txt, .pdf) are not reported. (Devices: *iOS*)

Internet Related Data:

- Internet related data (i.e., bookmarks, history, email) is not reported. (Devices: *Galaxy S5, LG G4, LG G5, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Samsung J3, Google Pixel XL, Samsung GS7, Samsung GS7 Edge, Motorola Z Force, HTC 10, Galaxy Note 3, Ellipsis 8, Galaxy Tab-E, Galaxy Tab S2*)

GPS Related Data:

- No Maps GPS related data (i.e., longitude, latitude) coordinates are reported. (Devices: *Galaxy S5, LG G4, LG G5, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Samsung J3, Google Pixel XL, Samsung GS7, Samsung GS7 Edge, Motorola Z Force, HTC 10, Galaxy Note 3, Ellipsis 8, Galaxy Tab-E, Galaxy Tab S2*)

UICCs:

- Non-Latin characters were not displayed in their native format. Aurélien is displayed as: Aur□lien. (Media: *UICCs*)

For more test result details see section 4.

2 Mobile Devices

The following table lists the mobile devices used for testing Oxygen Forensics v10.0.0.81.

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
Samsung	GS7 Edge SM-G935V	Android 6.0.1	MMB29M.G935VVRS4APH1	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	

Make	Model	OS	Firmware	Network
Ellipsis 8	QTAQZ3	Android 4.4.2	KOT49H	CDMA
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

Oxygen Forensics v10.0.0.81 was installed on Windows version 10.0.14393.

3.2 Internal Memory Data Objects

Oxygen Forensics v10.0.0.81 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>
	<i>Contact Groups</i>
PIM Data: Datebook/Calendar; Memos	<i>Regular Length</i>
	<i>Maximum Length</i>
	<i>Deleted Entry</i>
	<i>Special Character</i>
	<i>Blank Entry</i>
Call Logs	<i>Incoming</i>
	<i>Outgoing</i>
	<i>Missed</i>
	<i>Incoming – Deleted</i>
	<i>Outgoing – Deleted</i>
	<i>Missed - Deleted</i>

Data Objects	Data Elements
Text Messages	<i>Incoming SMS – Read</i>
	<i>Incoming SMS – Unread</i>
	<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 – 4.3 identify the mobile device operating system type, media (e.g., Android, iOS, UICC) and the make and model of mobile devices used for testing Oxygen Forensics v10.0.0.81.

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 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 Oxygen Forensics v10.0.0.81.

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

- Subscriber related data (i.e., MSISDN) was not reported for the LG G4, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Ellipsis 8, Galaxy Tab-E and Galaxy Tab S2.
- Calendar entries are not reported for the Google Pixel XL and Motorola Z Force.
- Memo entries are not reported for the Ellipsis 8.
- Call log data via Hangouts Dialer are not reported for the Ellipsis 8, Galaxy Tab-E and Galaxy Tab S2.
- SMS and MMS related data via FireChat are not reported for the Ellipsis 8, Galaxy Tab-E and Galaxy Tab S2.
- Contacts associated with group SMS messages are not reported completely, i.e., the only last contact within the group is reported for the LG G4, LG G5, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Samsung J3, Google Pixel XL, Samsung GS7, Samsung GS7 Edge, Motorola Z Force and HTC 10.
- Stand-alone files (i.e., audio, graphic, video, documents) are not reported for the Ellipsis 8, Galaxy Tab-E and Galaxy Tab S2.
- Internet related data (i.e., bookmarks, history, email) is not reported for the Galaxy S5, LG G4, LG G5, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Samsung J3, Google Pixel XL, Samsung GS7, Samsung GS7 Edge, Motorola Z Force, HTC 10, Galaxy Note 3, Ellipsis 8, Galaxy Tab-E and Galaxy Tab S2.
- No Maps GPS related data (i.e., longitude, latitude) coordinates are reported for the Galaxy S5, LG G4, LG G5, Motorola Droid Turbo 2, Galaxy S6 Edge Plus, Samsung J3, Google Pixel XL, Samsung GS7, Samsung GS7 Edge, Motorola Z Force, HTC 10, Galaxy Note 3, Ellipsis 8, Galaxy Tab-E and Galaxy Tab S2.

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

Oxygen Forensics v10.0.0.81

Oxygen Forensics v10.0.0.81									
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	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	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	Not As Expected	Not As Expected	As Expected	As Expected
PIM Data	Contacts	As Expected	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	Not As Expected
	Memos/ Notes	As Expected	NA	NA	NA	NA	NA	NA	As Expected
Call Logs	Incoming	As Expected	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	As Expected
	Missed	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
SMS Messages	Incoming	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	Outgoing	As Expected	As Expected	Partial	Partial	Partial	Partial	Partial	Partial
MMS Messages	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
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

Oxygen Forensics v10.0.0.81									
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
Application Data	Documents (txt, pdf files)	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
Social Media Data	Facebook	As Expected	NA	NA	NA	NA	NA	NA	NA
	Twitter	As Expected	As Expected	As Expected	As Expected	NA	As Expected	As Expected	As Expected
	LinkedIn	NA	Partial	NA	NA	NA	NA	NA	NA
	Instagram	NA	NA	As Expected	Not As Expected	NA	As Expected	NA	NA
Internet Data	Bookmarks	As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected
	History	As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected
	Email	As Expected	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	As Expected	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	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

Oxygen Forensics v10.0.0.81								
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	Not As Expected	Not As Expected	Not As Expected
PIM Data	Contacts	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	Calendar	As Expected	Not As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	Memos/ Notes	NA	NA	NA	NA	Not As Expected	NA	NA
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	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	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

Oxygen Forensics v10.0.0.81								
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
Application Data	Documents (txt, pdf files)	As Expected	As Expected	As Expected	As Expected	Not As Expected	Not As Expected	Not As Expected
Social Media Data	Facebook	NA	NA	NA	NA	NA	NA	NA
	Twitter	As Expected	NA	As Expected	As Expected	NA	As Expected	As Expected
	LinkedIn	NA	NA	NA	NA	NA	NA	NA
	Instagram	NA	NA	NA	NA	NA	As Expected	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	Coordinate s/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	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 Oxygen Forensics v10.0.0.81.

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

- Deleted Notes/Memos are not reported with a status of deleted for the iPhone 7 Plus and iPad Air.
- Call logs are incorrectly categorized as facetime instead of voice for the iPhone 5S.
- Stand-alone audio data (i.e., mp3, wav) files accessed within the iPod/iTunes player are not reported for all iOS devices.
- Stand-alone video files are not reported for the iPhone 4.
- Deleted stand-alone video files are not reported with a status of deleted for the iPhone 7 Plus.
- Stand-alone document files (e.g., .txt, .pdf) are not reported for all iOS devices.

See Table 4 below for more details.

Oxygen Forensics v10.0.0.81

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
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	Partial	As Expected	Partial	As Expected
Call Logs	Incoming	As Expected	Partial	As Expected	As Expected	NA	NA	NA
	Outgoing	As Expected	Partial	As Expected	As Expected	NA	NA	NA
	Missed	As Expected	Partial	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	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected
	Video	Not As Expected	As Expected	As Expected	Partial	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

Oxygen Forensics v10.0.0.81								
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	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	Twitter	NA	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	LinkedIn	NA	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	Instagram	NA	NA	As Expected	As Expected	As Expected	NA	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	NA	NA
GPS Data	Coordinates/Geo-tagged	As Expected	Not As Expected	As Expected	Not 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 Universal Integrated Circuit Cards (UICCs)

The internal memory contents for Universal Integrated Circuit Cards (UICCs) were acquired and analyzed with Oxygen Forensics v10.0.0.81.

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

- Non-Latin characters were not displayed in their native format. Aurélien is displayed as: Aur□lien.

See Table 5 below for more details.

UFED4PC v6.2.1 / Physical Analyzer v6.3.0.284		
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	Partial

UFED4PC v6.2.1 / Physical Analyzer v6.3.0.284		
Test Cases – UICC Acquisition		<i>Universal Integrated Circuit Card</i>
Hashing	Hashes reported for acquired data objects	<i>As Expected</i>

Table 5: Universal Integrated Circuit Cards