

September 2023

Test Results for Mobile Device Acquisition Tool:
XRY Office v10.5.0 – XAMN v7.5.0 Build 1113

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Introduction

The Computer Forensics Tool Testing (CFTT) program is a joint project of the Department of Homeland Security's (DHS) Science and Technology Directorate (S&T), the National Institute of Justice, and the National Institute of Standards and Technology's (NIST) Special Programs Office and Information Technology Laboratory. 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's Criminal Investigation Division Electronic Crimes Program, and U.S. 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 website (<https://www.cfft.nist.gov/>).

This document reports the results from testing XRY Office v10.5.0 – XAMN v7.5.0 Build 1113 across supported mobile devices e.g., smart phones, tablets.

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: XRY Office v10.5.0 – XAMN v7.5.0 Build 1113

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1 Results Summary

XRY Office v10.5.0 – XAMN v7.5.0 Build 1113 was tested for its ability to acquire active data from the internal memory of supported mobile devices (i.e., smart phones, tablets).

The data reported for the devices below varies based upon the data extraction technique supported. For instance, a physical and/or file system extraction will provide the user with more data than a logical extraction. Each supported data extraction technique was performed. Except for the following anomalies, the tool acquired all supported data objects completely and accurately for all mobile devices tested.

Acquisition:

Connectivity disruption doesn't report an error message for the user. (Devices: *all Android devices, all iOS*)

Equipment/User Data:

IMEI was not reported. (Device: *Samsung Galaxy Z Fold 3 5G*)

PIM Data:

Contacts and calendar entries are not reported. (Device: *One Plus 10 Pro*)

SMS Messages:

- SMS partially reported. (Devices: *Google Pixel 6, Google Pixel 6 Pro*)
- SMS are not reported. (Device: *One Plus 10 Pro*)

MMS Messages:

- Incoming audio MMS is partially reported. (Devices: *Samsung Galaxy Note 8, Huawei*)
- Incoming and Outgoing audio MMS are partially reported. (Devices: *Samsung Galaxy Note 10, Google Pixel 4*)
- MMS not reported (i.e., text message with graphic, audio, video attachments). (Device: *One Plus 10 Pro*)

Stand-alone files:

Graphic, Audio and Video files are not reported. (Devices: *Samsung Galaxy S10, Samsung Galaxy Note 10, Samsung Galaxy Z Fold 3 5G*)

Application Data:

Pdf files are not reported. (Devices: *Samsung Galaxy S10, iPhone 13, iPhone 13 Mini*)

Social Media Data:

- Social media related data (Facebook, Twitter, LinkedIn, Instagram, Pinterest) is not reported. (Device: *Samsung Galaxy S22*)
- Social media related data (Facebook, Twitter, LinkedIn, Instagram, Pinterest, Snapchat, WhatsApp) is not reported. (Devices: *Samsung Galaxy S10, Samsung Galaxy Note 8, Samsung Galaxy Note 10*)
- Social media related data (Facebook, Twitter, LinkedIn, Instagram, Pinterest, Snapchat) is not reported. (Device: *iPhone 8*)
- Social media related data (Facebook, LinkedIn, Instagram, Pinterest, Snapchat, WhatsApp) is not reported. (Device: *Google Pixel 4*)
- Social media related data (Twitter) is partially reported. (Device: *Google Pixel 4*)
- Social media related data (Facebook, Twitter, LinkedIn, Instagram, Pinterest, Snapchat, WhatsApp, Tiktok) is not reported. (Devices: *Google Pixel 6, One Plus 9, Samsung Galaxy Tab S8, Samsung Galaxy Z Fold 3 5G*)
- Social media related data (Facebook, Twitter, LinkedIn, Instagram, Pinterest, Snapchat, Tiktok) is not reported. (Device: *Google Pixel 6 Pro*)
- Social media related data (WhatsApp) is partially reported. (Device: *Google Pixel 6 Pro*)
- Social media related data (Facebook, Twitter, LinkedIn, Pinterest, Snapchat) is not reported. (Devices: *iPhone SE, iPhone XR, iPhone 11*)
- Social media related data (TikTok) is partially reported. (Device: *iPhone11*)
- Social media related data (Facebook) is partially reported. (Devices: *iPhone13, iPhone 13 Mini, iPhone 13 Pro, iPhone 13 Pro Max*)
- Social media related data (Twitter, LinkedIn, Pinterest, Snapchat) is not reported. (Devices: *iPhone13, iPhone 13 Mini, iPhone 13 Pro, iPhone 13 Pro Max*)

Internet Related Data:

- Internet related data (Bookmarks, History, Email) is not reported. (Devices: *Samsung Galaxy S10, Samsung Galaxy S22, Samsung Galaxy Note 8, Samsung Galaxy Note 10, Google Pixel 4, Google Pixel 6, Google Pixel 6 Pro, Samsung Galaxy Tab S8, Samsung Galaxy Z Fold 3 5G*)
- Internet related data (Bookmarks, History) is not reported. (Devices: *One Plus 9, One Plus 10 Pro*)
- Internet related data (Email) is not reported. (Devices: *iPhone 8, iPhone 13 Mini, iPhone 13 Pro, iPhone 13 Pro Max*)
- Internet related data (Email) is partially reported. (Device: *iPhone 13*)

GPS:

GPS data (Latitude, longitude coordinates) is not reported. (Devices: *Samsung Galaxy S10, Samsung Galaxy S22, Samsung Galaxy Note 8, Samsung Galaxy Note 10, Google Pixel 4, Google Pixel 6, Google Pixel 6 Pro, One Plus 9, One Plus 10 Pro, Samsung Galaxy Tab S8, Samsung Galaxy Z Fold 3 5G*)

For more test result details see section 4.

2 Mobile Devices

The following table lists the mobile devices used for testing XRY Office v10.5.0 – XAMN v7.5.0 Build 1113.

Make	Model	OS	Firmware or Serial Number	Network
Apple iPhone	8	iOS 11.3.1 (15E302)	1.89.00	CDMA
Apple iPhone	SE	iOS 15.1 (MX9N2LL/A)	1.06.00	CDMA
Apple iPhone	XR	iOS 15.1	7.02.00	CDMA
Apple iPhone	11	iOS 15.1 (15E302)	3.0.00	CDMA
Apple iPhone	13	iOS 15.6	MM9V61W17K	CDMA
Apple iPhone	13 Mini	iOS 15.6	M2NJF9FKVN	CDMA
Apple iPhone	13 Pro	iOS 15.6	FQ9K7W024F	CDMA
Apple iPhone	13 Pro Max	iOS 15.6	LR6H5XW3RP	CDMA
Samsung Galaxy	S10	Android 9	RF8MA1NVT7X	CDMA
Samsung Galaxy	S22	Android 12	R5CT515ZJRR	CDMA
Samsung Galaxy	Tab S8	Android 12	R52T50AYAOP	CDMA
Samsung Galaxy	Note 8	Android 7.1.1	G960U1UEU1ARB7	CDMA
Samsung Galaxy	Note 10	Android 9	R58M83KGESH	CDMA
Samsung Galaxy	Z Fold 3 5G	Android 12	RFCT419QYEF	CDMA
Google	Pixel 4	Android 10	Not available	CDMA
Google	Pixel 6	Android 12	Build SP2A.220305.013.A3	CDMA
Google	Pixel 6 Pro	Android 12	Build SQ1D.220105.007	CDMA
Huawei	P20 Pro	Android 8.1.0	CLTL29810106 (C636)	CDMA
One Plus	9	Android 11	Build 11.2.9.9.LE25AA	CDMA
One Plus	10 Pro	Android 12	Build NE2215_11_A.15	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 Office v10.5.0 – XAMN v7.5.0 Build 1113 was installed on Windows 10 Pro for Workstation version 10.0.19042.

3.2 Internal Memory Data Objects

XRY Office v10.5.0 – XAMN v7.5.0 Build 1113 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>
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>

Data Objects	Data Elements
Application Data	<i>Device Specific App Data</i>
Stand-alone data files	<i>Audio Graphic Video Audio – Deleted Graphic - Deleted Video - Deleted</i>
Internet Data	<i>Visited Sites Bookmarks E-mail</i>
Location Data	<i>GPS Coordinates Geo-tagged Data</i>
Social Media Data	<i>Facebook Twitter LinkedIn Instagram Pinterest SnapChat WhatsApp</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 (Android, iOS) and the make and model of mobile devices used for testing XRY Office v10.5.0 – XAMN v7.5.0 Build 1113.

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 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 Office v10.5.0 – XAMN v7.5.0 Build 1113. All test cases pertaining to the acquisition of supported Android devices were successful with the exception of the following.

- Connectivity disruption doesn't report an error message to the user. Tool keeps trying to acquire the device for all Android devices.
- Equipment related data (IMEI) was not reported for the Samsung Galaxy Z Fold 3 5G.
- Contacts and calendar entries are not reported for the One Plus 10 Pro.
- Emojis within an SMS are not reported for the Google Pixel 6.
- Emojis within an incoming SMS are not reported for the Google Pixel 6 Pro.
- SMS messages are not reported for the One Plus 10 Pro.
- Incoming audio MMS attachments are not playable for Samsung Galaxy Note 8 and Huawei.
- Incoming and Outgoing audio MMS attachments are not playable for Samsung Galaxy Note 10 and Google Pixel 4.
- MMS messages are not reported for the One Plus 10 Pro.
- Stand-alone graphic, audio and video files are not reported for the Samsung Galaxy S10, Samsung Galaxy Note 10 and Samsung Galaxy Z Fold 3 5G.
- Application data (pdf files) is not reported for the Samsung Galaxy S10.
- Social media related data (Facebook, Twitter, LinkedIn, Instagram, Pinterest) is not reported for the Samsung Galaxy S22.
- Social media related data (Facebook, Twitter, LinkedIn, Instagram, Pinterest, Snapchat, WhatsApp) is not reported for the Samsung Galaxy S10, Samsung Galaxy Note 8 and Samsung Galaxy Note 10.
- Social media related data (Facebook, LinkedIn, Instagram, Pinterest, Snapchat, WhatsApp) is not reported for the Google Pixel 4.
- Social media related data (Twitter) is partially reported; only pictures are reported for the Google Pixel 4.
- Social media related data (Facebook, Twitter, LinkedIn, Instagram, Pinterest, Snapchat, WhatsApp, TikTok) is not reported for the Google Pixel 6, One Plus 9 and Samsung Galaxy Tab S8.
- Social media related data (Facebook, Twitter, LinkedIn, Instagram, Pinterest, Snapchat, TikTok) is not reported for the Google Pixel 6 Pro.
- Social media related data (WhatsApp) is partially reported, only the profile picture was reported for the Google Pixel 6 Pro.
- Internet related data (Bookmarks, History, Email) is not reported for the Samsung Galaxy S10, Samsung Galaxy S22, Samsung Galaxy Note 8, Samsung Galaxy Note 10, Google Pixel 4, Google Pixel 6, Google Pixel 6 Pro and Samsung Galaxy Tab S8.
- Internet related data (Bookmarks, History) is not reported for the One Plus 9 and One Plus 10 Pro.
- GPS coordinated are not reported for the Samsung Galaxy S10, Samsung Galaxy S22, Samsung Galaxy Note 8, Samsung Galaxy Note 10, Google Pixel 4, Google Pixel 6, Google Pixel 6 Pro, One Plus 9, One Plus 10 Pro and Samsung Galaxy Tab S8.

NOTES:

- Deleted data recovered: stand-alone graphic, audio and video files for the Google Pixel 6.
- *Android Generic* profile was used to acquire data from the Samsung Galaxy ZFold 3 5G.
- Social media apps were not downgraded for any of the devices.

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

Test Cases:	Samsung Galaxy S10	Samsung Galaxy S22	Samsung Galaxy Tab S8	Samsung Galaxy Note 8	Samsung Galaxy Note 10	Samsung Galaxy Z Fold 3 5G	Google Pixel 4
Social Media Data: Twitter	<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>Partial</i>
Social Media Data: LinkedIn	<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>
Social Media Data: Instagram	<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>
Social Media Data: Pinterest	<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>
Social Media Data: SnapChat	<i>Not As Expected</i>	<i>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>
Social Media Data: WhatsApp	<i>Not As Expected</i>	<i>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>
Social Media Data: TikTok	<i>N/A</i>	<i>As Expected</i>	<i>Not As Expected</i>	<i>N/A</i>	<i>N/A</i>	<i>Not As Expected</i>	<i>N/A</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>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
Internet Data: History	<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>
Internet Data: 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>
SQLite Data: Report Active 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>
SQLite Data: Run SQLite Commands	<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 3a: Android Devices

Internal Memory Acquisition
XRY Office v10.5.0 – XAMN v7.5.0 Build 1113

Mobile Device Platform: Android

Test Cases:	Google Pixel 6	Google Pixel 6 Pro	Huawei P20 Pro	One Plus 9	One Plus 10 Pro
Acquisition: Acquire All	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>
Acquisition: Disrupted	Not As <i>Expected</i>	Not As <i>Expected</i>	Not As <i>Expected</i>	Not As <i>Expected</i>	Not As <i>Expected</i>
Reporting: Preview-Pane	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>
Reporting: Generated Reports	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>
Equipment/User Data: IMEI/ MEID/ESN	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>
Equipment/User Data: MSISDN	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>
PIM Data: Contacts	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	Not As <i>Expected</i>
PIM Data: Calendar	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	Not As <i>Expected</i>
PIM Data: Memos/Notes	N/A	N/A	N/A	N/A	N/A
Call Logs: Incoming	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	N/A	As <i>Expected</i>
Call Logs: Outgoing	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	N/A	As <i>Expected</i>
Call Logs: Missed	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	N/A	As <i>Expected</i>
SMS Messages: Incoming	Partial	Partial	As <i>Expected</i>	As <i>Expected</i>	Not As <i>Expected</i>
SMS Messages: Outgoing	Partial	Partial	As <i>Expected</i>	As <i>Expected</i>	Not As <i>Expected</i>
MMS Messages: Graphic	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	Not As <i>Expected</i>
MMS Messages: Audio	As <i>Expected</i>	As <i>Expected</i>	Partial	As <i>Expected</i>	Not As <i>Expected</i>
MMS Messages: Video	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	Not As <i>Expected</i>
Stand-alone Files: Graphic	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>
Stand-alone Files: Audio	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>
Stand-alone Files: Video	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>
Application Data: Documents (txt, pdf files)	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	As <i>Expected</i>	N/A
Social Media Data: Facebook	Not As <i>Expected</i>	Not As <i>Expected</i>	N/A	Not As <i>Expected</i>	N/A

Test Cases:	Google Pixel 6	Google Pixel 6 Pro	Huawei P20 Pro	One Plus 9	One Plus 10 Pro
Social Media Data: Twitter	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>N/A</i>	<i>Not As Expected</i>	<i>N/A</i>
Social Media Data: LinkedIn	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>N/A</i>	<i>Not As Expected</i>	<i>N/A</i>
Social Media Data: Instagram	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>N/A</i>	<i>Not As Expected</i>	<i>N/A</i>
Social Media Data: Pinterest	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>N/A</i>	<i>Not As Expected</i>	<i>N/A</i>
Social Media Data: SnapChat	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>N/A</i>	<i>Not As Expected</i>	<i>N/A</i>
Social Media Data: WhatsApp	<i>Not As Expected</i>	<i>Partial</i>	<i>N/A</i>	<i>Not As Expected</i>	<i>N/A</i>
Internet Data: Bookmarks	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>N/A</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
Internet Data: History	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>N/A</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
Internet Data: Email	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
GPS Data: Coordinates/Geo-tagged	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>N/A</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>
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>
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>
SQLite Data: Report Active Data	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
SQLite Data: Run SQLite Commands	<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 XRY Office v10.5.0 – XAMN v7.5.0 Build 1113.

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

- Connectivity disruption doesn't report an error message to the user. Tool keeps trying to acquire the device for all iOS devices.
- Application data (pdf files) are not reported for the iPhone 13 and iPhone 13 Mini.
- Social media related data (Facebook, Twitter, LinkedIn, Instagram, Pinterest, Snapchat) is not reported for the iPhone 8.
- Social media related data (Facebook, Twitter, LinkedIn, Pinterest, Snapchat) is not reported the iPhone SE, iPhone XR and iPhone 11.
- Social media related data (TikTok) is partially reported for the iPhone 11, only stickers are reported.
- Social media related data (Facebook) is partially reported for the iPhone 13, iPhone 13 Mini, iPhone 13 Pro and iPhone 13 Pro Max. Tool only reports stickers and contacts within a chat conversation but does not show the messages exchanged.
- Social media related data (Twitter, LinkedIn, Pinterest, Snapchat) is not reported for the iPhone13, iPhone 13 Mini, iPhone 13 Pro and iPhone 13 Pro Max.
- Internet related data (Email) is not reported for the iPhone 8, iPhone 13 Mini, iPhone 13 Pro and iPhone 13 Pro Max.
- Internet related data (Email) is partially reported for the iPhone 13. Tool only reports .plist files but does not show contents of the email messages.

NOTES:

Deleted data recovered: Contacts, calls for the iPhone 8; MMS for the iPhone SE, iPhone 13 and iPhone 13 Mini; SMS for the iPhone 11 and Notes for the iPhone 13 Pro Max.

See Tables 4a, 4b below for more details.

Internal Memory Acquisition
XRY Office v10.5.0 – XAMN v7.5.0 Build 1113
Mobile Device Platform: iOS

Test Cases:	iPhone 8	iPhone SE	iPhone XR	iPhone 11	iPhone 13	iPhone 13 Mini
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>
Acquisition: 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>
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>
Reporting: 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>
Equipment/User Data: IMEI/MEID/ESN	<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: 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>
PIM Data: Contacts	<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: 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>
PIM Data: Memos/Notes	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Call Logs: Incoming	<i>As Expected</i>	<i>As Expected</i>	<i>N/A</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Call Logs: Outgoing	<i>As Expected</i>	<i>As Expected</i>	<i>N/A</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Call Logs: Missed	<i>As Expected</i>	<i>As Expected</i>	<i>N/A</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</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>
SMS Messages: 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>
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>
MMS Messages: Audio	<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: 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>
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>
Stand-alone Files: Audio	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Stand-alone Files: 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>
Application Data: Documents (txt, pdf files)	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
Social Media Data: Facebook	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Partial</i>	<i>Partial</i>

Test Cases:	iPhone 8	iPhone SE	iPhone XR	iPhone 11	iPhone 13	iPhone 13 Mini
Social Media Data: Twitter	<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>
Social Media Data: LinkedIn	<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>
Social Media Data: Instagram	<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>
Social Media Data: Pinterest	<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>
Social Media Data: SnapChat	<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>
Social Media Data: WhatsApp	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Social Media Data: TikTok	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>Partial</i>	<i>N/A</i>	<i>N/A</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>
Internet Data: 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>
Internet Data: Email	<i>Not As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>Partial</i>	<i>Not As Expected</i>
GPS Data: Coordinates/Geo-tagged	<i>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>
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>
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>
SQLite Data: Report Active 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>
SQLite Data: Run SQLite Commands	<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 4a: iOS Devices

Internal Memory Acquisition
XRY Office v10.5.0 – XAMN v7.5.0 Build 1113

Mobile Device Platform: iOS

Test Cases:	iPhone 13 Pro	iPhone 13 Pro Max
Acquisition: Acquire All	<i>As Expected</i>	<i>As Expected</i>
Acquisition: Disrupted	<i>Not As Expected</i>	<i>Not As Expected</i>
Reporting: Preview-Pane	<i>As Expected</i>	<i>As Expected</i>
Reporting: Generated Reports	<i>As Expected</i>	<i>As Expected</i>
Equipment/User Data: IMEI/MEID/ESN	<i>As Expected</i>	<i>As Expected</i>
Equipment/User Data: MSISDN	<i>As Expected</i>	<i>As Expected</i>
PIM Data: Contacts	<i>As Expected</i>	<i>As Expected</i>
PIM Data: Calendar	<i>As Expected</i>	<i>As Expected</i>
PIM Data: Memos/Notes	<i>As Expected</i>	<i>As Expected</i>
Call Logs: Incoming	<i>As Expected</i>	<i>As Expected</i>
Call Logs: Outgoing	<i>As Expected</i>	<i>As Expected</i>
Call Logs: Missed	<i>As Expected</i>	<i>As Expected</i>
SMS Messages: Incoming	<i>As Expected</i>	<i>As Expected</i>
SMS Messages: Outgoing	<i>As Expected</i>	<i>As Expected</i>
MMS Messages: Graphic	<i>As Expected</i>	<i>As Expected</i>
MMS Messages: Audio	<i>As Expected</i>	<i>As Expected</i>
MMS Messages: Video	<i>As Expected</i>	<i>As Expected</i>
Stand-alone Files: Graphic	<i>As Expected</i>	<i>As Expected</i>
Stand-alone Files: Audio	<i>As Expected</i>	<i>As Expected</i>
Stand-alone Files: Video	<i>As Expected</i>	<i>As Expected</i>
Application Data: Documents (txt, pdf files)	<i>As Expected</i>	<i>As Expected</i>
Social Media Data: Facebook	<i>Partial</i>	<i>Partial</i>

Test Cases:	iPhone 13 Pro	iPhone 13 Pro Max
Social Media Data: Twitter	<i>Not As Expected</i>	<i>Not As Expected</i>
Social Media Data: LinkedIn	<i>Not As Expected</i>	<i>Not As Expected</i>
Social Media Data: Instagram	<i>As Expected</i>	<i>As Expected</i>
Social Media Data: Pinterest	<i>Not As Expected</i>	<i>Not As Expected</i>
Social Media Data: SnapChat	<i>Not As Expected</i>	<i>Not As Expected</i>
Social Media Data: WhatsApp	<i>As Expected</i>	<i>As Expected</i>
Social Media Data: TikTok	<i>N/A</i>	<i>N/A</i>
Internet Data: Bookmarks	<i>As Expected</i>	<i>As Expected</i>
Internet Data: History	<i>As Expected</i>	<i>As Expected</i>
Internet Data: Email	<i>Not As Expected</i>	<i>Not As Expected</i>
GPS Data: Coordinates/Geo-tagged	<i>As Expected</i>	<i>As Expected</i>
Non-Latin Character: Reported in native format	<i>As Expected</i>	<i>As Expected</i>
Hashing: Case File/ Individual Files	<i>As Expected</i>	<i>As Expected</i>
Case File Data Protection: Modify Case Data	<i>As Expected</i>	<i>As Expected</i>
SQLite Data: Report Active Data	<i>As Expected</i>	<i>As Expected</i>
SQLite Data: Run SQLite Commands	<i>As Expected</i>	<i>As Expected</i>

Table 4b: iOS Devices