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Test Results for Mobile Device Acquisition Tool:
UFED4PC v7.60.0.222 – Physical Analyzer v7.58.0.66

Contents

| | |
|---------------------------------------|----|
| Introduction..... | 1 |
| How to Read This Report | 1 |
| 1 Results Summary | 3 |
| 2 Mobile Devices | 4 |
| 3 Testing Environment..... | 5 |
| 3.1 Execution Environment | 5 |
| 3.2 Internal Memory Data Objects..... | 5 |
| 4 Test Results..... | 7 |
| 4.1 Android Mobile Devices..... | 8 |
| 4.2 iOS Mobile Devices..... | 13 |

Introduction

The Computer Forensics Tool Testing (CFTT) program is a joint project of the Department of Homeland Security's (DHS) Science and Technology Directorate, 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.cftt.nist.gov/>).

This document reports the results from testing Cellebrite UFED4PC v7.60.0.222 and Physical Analyzer v7.58.0.66 across supported mobile devices.

Test results from other tools can be found on DHS's computer forensics webpage at <https://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: UFED4PC, Physical Analyzer

Software Version: v7.60.0.222 (UFED4PC), v7.58.0.66 (PA)

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1 Results Summary

Cellebrite UFED4PC v7.60.0.222 and Physical Analyzer v7.58.0.66 was tested for its ability to acquire active data from the internal memory of supported mobile devices.

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.

Subscriber related data:

Subscriber information (IMEI) is not reported. (Devices: *Samsung Galaxy Z Fold, Google Pixel 6 Pro, Google Pixel 6, Samsung Galaxy Tab S8, Samsung Galaxy Tab S7*)

Personal Information Management (PIM) data:

- Graphic files associated with an Address book entry are not reported. (Devices: *One Plus 10 Pro, Huawei P20 Pro, Galaxy S9, Galaxy Note 8*)

MMS Messages:

- MMS attachments (audio, video) are not playable. (Device: *One Plus 10 Pro*)
- MMS attachments (audio, graphic, video) are not playable/viewable. (Device: *One Plus 9*)
- MMS attachments (outgoing audio) are not playable. (Device: *Samsung Galaxy S9*)

For more test result details see section 4.

2 Mobile Devices

The following table lists the mobile devices used for testing Cellebrite UFED4PC v7.60.0.222 and Physical Analyzer v7.58.0.66.

| Make | Model Name | OS | Extraction Type | Model # | Network |
|--------------|-------------------|---------------|--|-----------------------|---------|
| Apple iPhone | 13 Pro Max | iOS 15.6 | Advanced Logical | MNCP34LL/A | CDMA |
| Apple iPhone | 13 Pro | iOS 15.6 | Advanced Logical | MNNDT3LL/A | CDMA |
| Apple iPhone | 13 | iOS 15.6 | Advanced Logical | MNGD3LL/A | CDMA |
| Apple iPhone | 13 mini | iOS 15.6 | Advanced Logical | MNF83LL/A | CDMA |
| Apple iPhone | 11 | iOS 15.1 | Advanced Logical | MWL72LL/A | CDMA |
| Apple iPhone | XR | iOS 15.1 | Advanced Logical | NQCK2LL/A | CDMA |
| Apple iPhone | SE | iOS 15.1 | Advanced Logical | MX9N2LL/A | CDMA |
| Apple iPhone | X | iOS 11.3.1 | Advanced Logical | MQCK2LL/A | CDMA |
| Apple iPad | Pro | iOS 15.6 | Advanced Logical | MHQR3LL/A | CDMA |
| Apple iPhone | 8 | iOS 11.3.1 | Advanced Logical | 15E203 | CDMA |
| Samsung | Galaxy S22 | Android 12 | Advanced Logical, Full File System (FFS) | SM-S901U1 | CDMA |
| Samsung | Galaxy Z Fold3 5G | Android 12 | Advanced Logical, FFS | SM-F926U1 | CDMA |
| One Plus | 10 Pro | Android 12 | Advanced Logical | NE2215 | CDMA |
| One Plus | 9 | Android 11 | Advanced Logical, FFS | LE2115 | CDMA |
| Google Pixel | 6 Pro | Android 12 | Advanced Logical, FFS | GF5KQ | CDMA |
| Google Pixel | 6 | Android 12 | Advanced Logical, FFS | GR1YH | CDMA |
| Samsung | Galaxy Tab S8 | Android 12 | Advanced Logical, FFS | SM-X700 | CDMA |
| Samsung | Galaxy Tab S7 FE | Android 12 | Advanced Logical, FFS | SM-T733 | CDMA |
| Google | Pixel 4 | Android 10 | Advanced Logical, FFS | G0201 | CDMA |
| Samsung | Galaxy Note 10 | Android 9 | Advanced Logical, FFS | SM-N97OU1 | CDMA |
| Samsung | Galaxy S10 | Android 9 | Advanced Logical, FFS | SM-G973U1 | CDMA |
| Samsung | Galaxy Note 8 | Android 7.1.1 | Advanced Logical | NMF26XN950 U1UEU1AQ1f | CDMA |
| Samsung | Galaxy S9 | Android 8.0.0 | Advanced Logical | G960U1UEU1 ARB7 | CDMA |
| Huawei | P20 Pro | Android 8.1.0 | Advanced Logical | CLTL2981010 6 (C636) | 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

Cellebrite UFED4PC v7.60.0.222 and Physical Analyzer v7.58.0.66 was installed on Windows 10 Pro version 10.0.19042.1586.

3.2 Internal Memory Data Objects

Cellebrite UFED4PC v7.60.0.222 and Physical Analyzer v7.58.0.66 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 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</i> |
| MMS Messages | <i>Incoming Audio Incoming Graphic Incoming Video Outgoing Audio Outgoing Graphic Outgoing Video</i> |
| 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, media (e.g., Android, iOS) and the make and model of mobile devices used for testing Cellebrite UFED4PC v7.60.0.222 and Physical Analyzer v7.58.0.66.

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 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 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 Cellebrite Physical Analyzer v7.58.0.66. All test cases pertaining to the acquisition of supported Android devices were successful with the exception of the following across all Android devices.

- Subscriber information (IMEI) is not reported for the Samsung Galaxy Z Fold, Google Pixel 6 Pro, Google Pixel 6, Samsung Galaxy Tab S8 and Samsung Galaxy Tab S7.
- Graphic files associated with an Address book entry are not reported for the Samsung Galaxy Z-Fold, One Plus 10 Pro, Huawei P20 Pro, Galaxy S9 and Galaxy Note 8.
- MMS attachments (audio, video) are not playable for the One Plus 10 Pro.
- MMS attachments (audio, graphic, video) are not playable/viewable for the One Plus 9.
- MMS attachments (outgoing audio) are not playable for the Samsung Galaxy S9.

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

Internal Memory Acquisition
Cellebrite UFED4PC v7.60.0.222 – Physical Analyzer v7.58.0.66
Mobile Device Platform: Android

| Test Cases: | Samsung Galaxy S22 | Samsung Galaxy Z Fold 3 5G | One Plus 10 Pro | One Plus 9 | Google Pixel 6 Pro | Google Pixel 6 | Samsung Galaxy Tab S8 |
|---|---------------------------|-----------------------------------|------------------------|-----------------------|---------------------------|---------------------------|------------------------------|
| Acquisition: Acquire All | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Acquisition: Disrupted | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | 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> | 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> | 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> | Not As <i>Expected</i> | Not As <i>Expected</i> | Not As <i>Expected</i> |
| PIM Data: Contacts | As <i>Expected</i> | As <i>Expected</i> | Partial | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| PIM Data: Calendar | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| PIM Data: Memos/Notes | As <i>Expected</i> | As <i>Expected</i> | NA | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Incoming | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Outgoing | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Missed | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| SMS Messages: Incoming | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | NA |
| SMS Messages: Outgoing | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | NA |
| MMS Messages: Graphic | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | Partial | As <i>Expected</i> | As <i>Expected</i> | NA |
| MMS Messages: Audio | As <i>Expected</i> | NA | Partial | Partial | As <i>Expected</i> | As <i>Expected</i> | NA |
| MMS Messages: Video | As <i>Expected</i> | NA | Partial | Partial | As <i>Expected</i> | As <i>Expected</i> | NA |
| Stand-alone Files: Graphic | As <i>Expected</i> | As <i>Expected</i> | 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> | 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> | 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> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Social Media Data: Facebook | As <i>Expected</i> | As <i>Expected</i> | NA | NA | NA | NA | As <i>Expected</i> |

| Test Cases: | Samsung Galaxy S22 | Samsung Galaxy Z Fold 3 5G | One Plus 10 Pro | One Plus 9 | Google Pixel 6 Pro | Google Pixel 6 | Samsung Galaxy Tab S8 |
|--|---------------------------|-----------------------------------|------------------------|--------------------|---------------------------|-----------------------|------------------------------|
| Social Media Data: Facebook Messenger | <i>As Expected</i> | <i>As Expected</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>As Expected</i> |
| Social Media Data: Twitter | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> |
| Social Media Data: LinkedIn | <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> |
| Social Media Data: Instagram | <i>As Expected</i> | <i>As Expected</i> | <i>NA</i> | <i>NA</i> | <i>As Expected</i> | <i>As Expected</i> | <i>As Expected</i> |
| Social Media Data: Pinterest | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> |
| Social Media Data: SnapChat | <i>As Expected</i> | <i>As Expected</i> | <i>NA</i> | <i>As Expected</i> | <i>As Expected</i> | <i>As Expected</i> | <i>NA</i> |
| Social Media Data: WhatsApp | <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> |
| Social Media Data: TikTok | <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> |
| Internet Data: Bookmarks | <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> |
| Internet Data: History | <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> |
| Internet Data: Email | <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> |
| GPS Data: Coordinates/Geo-tagged | <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> |
| 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
Cellebrite UFED4PC v7.60.0.222 – Physical Analyzer v7.58.0.66
Mobile Device Platform: Android

| Test Cases: | Samsung Galaxy Tab S7 FE | Google Pixel 4 | Samsung Galaxy Note 10 | Samsung Galaxy S10 | Samsung Galaxy Note 8 | Samsung Galaxy S9 | Huawei P20 Pro |
|---|---------------------------------|---------------------------|-------------------------------|---------------------------|------------------------------|---------------------------|---------------------------|
| Acquisition: Acquire All | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Acquisition: Disrupted | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | 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> | 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> | As <i>Expected</i> | As <i>Expected</i> |
| Equipment/User Data: IMEI/MEID/ESN | Not As <i>Expected</i> | As <i>Expected</i> | 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> | Partial | Partial | Partial |
| PIM Data: Calendar | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| PIM Data: Memos/Notes | As <i>Expected</i> | Not As <i>Expected</i> | NA | As <i>Expected</i> | Not As <i>Expected</i> | Not As <i>Expected</i> | Not As <i>Expected</i> |
| Call Logs: Incoming | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Outgoing | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Missed | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| SMS Messages: Incoming | NA | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| SMS Messages: Outgoing | NA | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| MMS Messages: Graphic | NA | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| MMS Messages: Audio | NA | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | Partial | As <i>Expected</i> |
| MMS Messages: Video | NA | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | 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> | 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> | 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> | 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> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Social Media Data: Facebook | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | NA | NA | NA |

| Test Cases: | Samsung Galaxy Tab S7 FE | Google Pixel 4 | Samsung Galaxy Note 10 | Samsung Galaxy S10 | Samsung Galaxy Note 8 | Samsung Galaxy S9 | Huawei P20 Pro |
|--|--------------------------|----------------|------------------------|--------------------|-----------------------|-------------------|----------------|
| Social Media Data: Facebook Messenger | As Expected | As Expected | As Expected | As Expected | NA | NA | NA |
| Social Media Data: Twitter | NA | NA | NA | As Expected | NA | NA | NA |
| Social Media Data: LinkedIn | As Expected | As Expected | As Expected | As Expected | NA | NA | NA |
| Social Media Data: Instagram | As Expected | As Expected | As Expected | As Expected | NA | NA | NA |
| Social Media Data: Pinterest | NA | NA | NA | Partial | NA | NA | NA |
| Social Media Data: SnapChat | As Expected | As Expected | As Expected | As Expected | NA | NA | NA |
| Social Media Data: WhatsApp | As Expected | As Expected | As Expected | As Expected | NA | NA | NA |
| Social Media Data: TikTok | As Expected | As Expected | NA | As Expected | NA | NA | NA |
| Internet Data: Bookmarks | As Expected | As Expected | As Expected | As Expected | NA | NA | NA |
| Internet Data: History | As Expected | As Expected | As Expected | As Expected | NA | NA | NA |
| Internet Data: Email | As Expected | As Expected | As Expected | As Expected | NA | NA | NA |
| GPS Data: Coordinates/Geo-tagged | As Expected | As Expected | As Expected | As Expected | NA | NA | NA |
| 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 |
| SQLite Data: Report Active Data | As Expected | As Expected | As Expected | As Expected | As Expected | As Expected | As Expected |
| SQLite Data: Run SQLite Commands | 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 Cellebrite Physical Analyzer v7.58.0.66.

All test cases pertaining to the acquisition of supported iOS devices were successful.

See Table 4 below for more details.

Internal Memory Acquisition
Cellebrite UFED4PC v7.60.0.222 – Physical Analyzer v7.58.0.66
Mobile Device Platform: iOS

| Test Cases: | iPhone 13 Pro Max | iPhone 13 Pro | iPhone 13 | iPhone 13 mini | iPhone 11 | iPhone XR |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Acquisition: Acquire All | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Acquisition: Disrupted | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | 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> | 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> | 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> | As <i>Expected</i> |
| PIM Data: Contacts | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| PIM Data: Calendar | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| PIM Data: Memos/Notes | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Incoming | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Outgoing | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Missed | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| SMS Messages: Incoming | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| SMS Messages: Outgoing | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| MMS Messages: Graphic | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| MMS Messages: Audio | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| MMS Messages: Video | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | 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> | 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> | 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> | 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> | As <i>Expected</i> | As <i>Expected</i> |
| Social Media Data: Facebook | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |

| Test Cases: | iPhone 13 Pro Max | iPhone 13 Pro | iPhone 13 | iPhone 13 mini | iPhone 11 | iPhone XR |
|--|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Social Media Data: Facebook Messenger | <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: Twitter | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> |
| Social Media Data: LinkedIn | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> |
| Social Media Data: Instagram | <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: Pinterest | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> |
| Social Media Data: SnapChat | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</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>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</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>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>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> |
| Run 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 4: iOS Devices

Internal Memory Acquisition
Cellebrite UFED4PC v7.60.0.222 – Physical Analyzer v7.58.0.66
Mobile Device Platform: iOS

| Test Cases: | iPhone SE | iPhone X | iPad Pro | iPhone 8 |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| Acquisition: Acquire All | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Acquisition: Disrupted | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Reporting: Preview-Pane | 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> |
| Equipment/User Data: IMEI/MEID/ESN | 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> |
| PIM Data: Calendar | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| PIM Data: Memos/Notes | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Incoming | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Outgoing | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Call Logs: Missed | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| SMS Messages: Incoming | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| SMS Messages: Outgoing | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| MMS Messages: Graphic | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| MMS Messages: Audio | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| MMS Messages: Video | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> |
| Stand-alone Files: Graphic | 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> |
| Stand-alone Files: Video | 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> |
| Social Media Data: Facebook | As <i>Expected</i> | As <i>Expected</i> | As <i>Expected</i> | NA |

| Test Cases: | iPhone SE | iPhone X | iPad Pro | iPhone 8 |
|---|------------------------|------------------------|------------------------|------------------------|
| Social Media Data: Facebook Messenger | <i>As Expected</i> | <i>As Expected</i> | <i>As Expected</i> | <i>NA</i> |
| Social Media Data: Twitter | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> |
| Social Media Data: LinkedIn | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> |
| Social Media Data: Instagram | <i>As Expected</i> | <i>As Expected</i> | <i>As Expected</i> | <i>NA</i> |
| Social Media Data: Pinterest | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> |
| Social Media Data: SnapChat | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> |
| Social Media Data: WhatsApp | <i>As Expected</i> | <i>As Expected</i> | <i>NA</i> | <i>As Expected</i> |
| Social Media Data: TikTok | <i>NA</i> | <i>NA</i> | <i>As Expected</i> | <i>NA</i> |
| Internet Data: Bookmarks | <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> |
| Internet Data: Email | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> |
| GPS Data: Coordinates/Geo-tagged | <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> |
| Hashing: Case File/ Individual Files | <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> |
| SQLite Data: Report Active Data | <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> |