Introduction

Mobile devices are the most common computing platform in the world. They are also the most commonly used device for accessing the Internet. As we know from personal use, smartphones provide a variety of different features and allow users to perform almost every task previously done with computers. The capabilities provided by smartphones expand often, therefore the process for investigating mobile devices is constantly evolving.

Smartphones can (and do) substitute for desktop computers in almost every way because they are portable, always connected, and more convenient to use for most applications. As a result, smartphones carry immensely valuable information in many forensic investigations. They often provide recent chats, call logs, location data, pictures, and much more. In most cases, they carry more personal information than a traditional PC, which is why smartphones and other mobile devices often become the focus of modern forensic investigations.

In this lab, you will use Paraben’s E3 to analyze data from iOS and Android smartphones.

Lab Overview

SECTION 1 of this lab has two parts, which should be completed in the order specified.

1. In the first part of the lab, you will analyze an iOS data case, document evidence, and generate an investigative report using Paraben's E3.

2. In the second part of the lab, you will use E3’s Mobile Evidence Comparer to compare two iOS data cases generated from the same device.

SECTION 2 of this lab allows you to apply what you learned in **SECTION 1** with less guidance and different deliverables, as well as some expanded tasks and alternative methods. You will continue your investigation and analyze an Android data case.

Finally, you will explore the virtual environment on your own in **SECTION 3** of this lab to answer a set of questions and challenges that allow you to use the skills you learned in the lab to conduct independent, unguided work - similar to what you will encounter in a real-world situation.

Learning Objectives

Upon completing this lab, you will be able to:

1. Identify evidence within iOS data cases.
2. Identify evidence within Android data cases.
3. Compare different data cases from the same mobile device.
4. Document evidence and generate a formal investigative report.
5. Draft a Case Summary and Conclusion as part of a formal investigative report.

Topology

This lab contains the following virtual machines. Please refer to the network topology diagram below.

- vWorkstation (Windows: Server 2019)

Tools and Software

The following software and/or utilities are required to complete this lab. Students are encouraged to explore the Internet to learn more about the products and tools used in this lab.

- Paraben's E3

Deliverables

Upon completion of this lab, you are required to provide the following deliverables to your instructor:

SECTION 1

1. Lab Report file, including screen captures of the following:

- Contents of the Properties pane
- Contents of the Contacts grid
- Contents of the Calendar grid
- Contents of the Messages grid
- Contents of the Notes grid
- At least three car pictures in the Thumbnail View
- Table of contents in the investigative report
- Difference in data case properties
- Additional note in the newer data case

2. Any additional information as directed by the lab:

- None

SECTION 2

1. Lab Report file, including screen captures of the following:

- Device Information
- ICE Contacts
- Contact Email Accounts
- Installed Applications
- Recovered contact information from the Android phone
- User Activity Timeline between 9:17:47 AM and 9:24:51 AM on 6/2/2021
- Contents of the Own Whispers grid
- Contents of the History grid
- Contents of the list_item 1-5 table
- Keep Notes account owner
- Investigative Report's Table of Contents

2. Any additional information as directed by the lab:

- None

SECTION 3

1. Lab Report file, including screen captures of the following:

- None

2. Any additional information as directed by the lab:

- Prepare a brief summary of the appropriate structure and best practices for preparing a digital forensics report.

- Case Summary
- Findings and Analysis
- Conclusion

Section 1: Hands-On Demonstration

Note: In this section of the lab, you will follow a step-by-step walk-through of the objectives for this lab to produce the expected deliverables.

1. **Review** the **Tutorial**.

   Frequently performed tasks, such as making screen captures and downloading your Lab Report, are explained in the Cloud Lab Tutorial. The Cloud Lab Tutorial is available from the User menu in the upper-right corner of the Student Dashboard. You should review these tasks before starting the lab.

2. **Proceed** with **Part 1**.

Part 1: Identify Forensic Evidence in an iOS Data Case

Note: In this lab, you will assume the role of a digital forensics specialist working with the Madison Police Department. Detectives have recently retrieved two smartphones (iOS and Android) that belong to the suspects in an organized car theft operation. The suspects refer to themselves using the codenames Bonnie and Clyde. You have been tasked with identifying evidence related to the car thefts from the confiscated smartphones.

In this part of the lab, you will analyze evidence acquired from the seized iPhone. In E3, mobile evidence is acquired through the use of development debugging calls from the E3 software to the mobile device. Drivers must be loaded for the operating system running E3 to be able to understand the device and the debugging calls that are used to create the connection. Once the connection is made, E3 will determine what level of data transfer should occur, based on the acquisition options the user has selected. Because a live acquisition is not possible in the virtual lab environment, you will use an existing E3 data case containing previously acquired iPhone data.

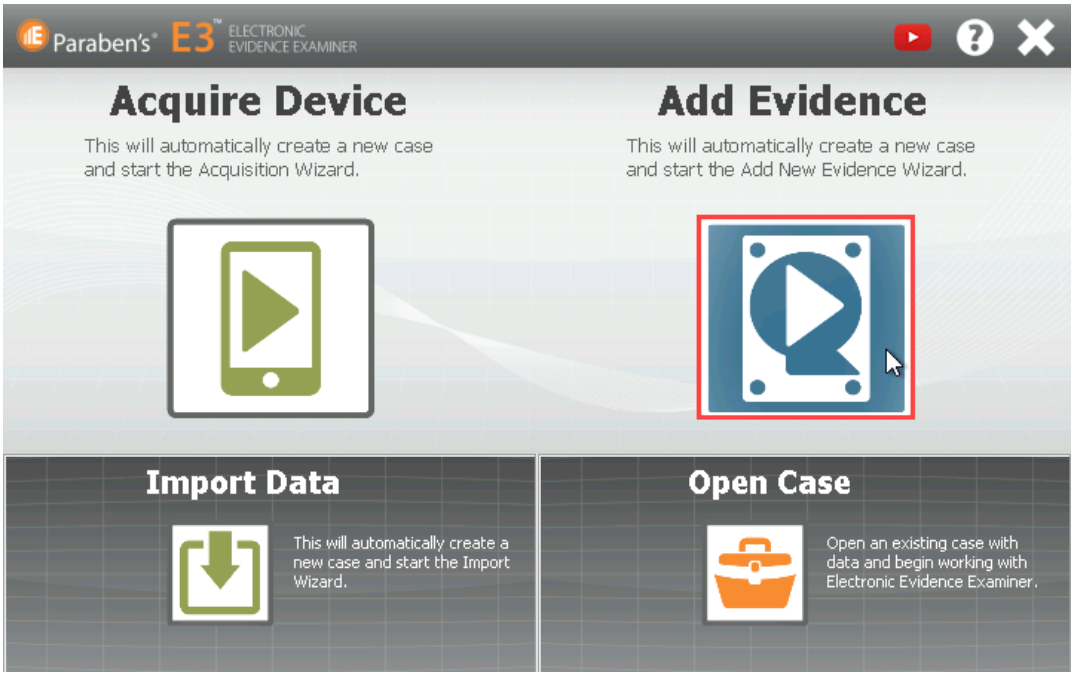
In the next steps, you import an E3 data case for the iPhone and review the parsed data for relevant evidence.

1. On the vWorkstation desktop, **double-click** the **Electronic Evidence Examiner icon** to open the E3 application.

E3 icon

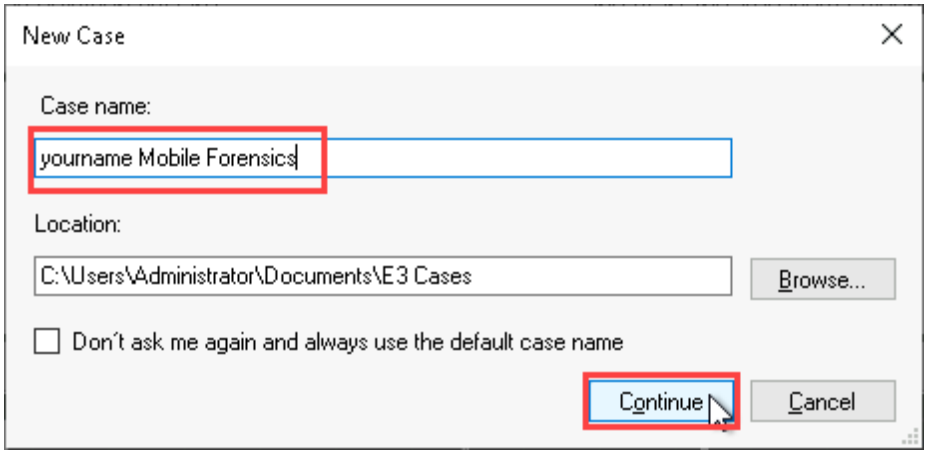
Note: E3 may take several minutes to load. The E3 welcome screen opens with shortcuts to the most common activities that forensic investigators will perform within the tool.

2. At the Welcome screen, **click** the **Add Evidence button** to open the New Case dialog box.



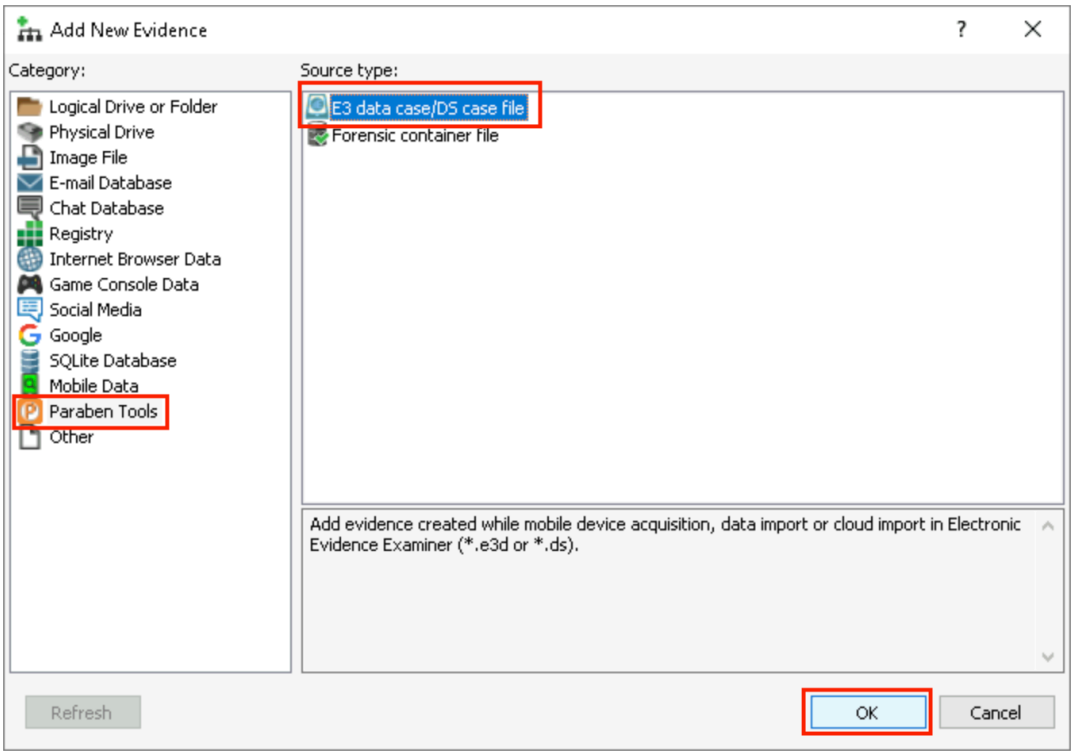
Welcome page - Add Evidence

3. In the New Case dialog box, **type** ***yourname*** **`Mobile Forensics`** in the Case name field, replacing *yourname* with your own name, then **click Continue** to create your new case file and open the Add New Evidence dialog box.



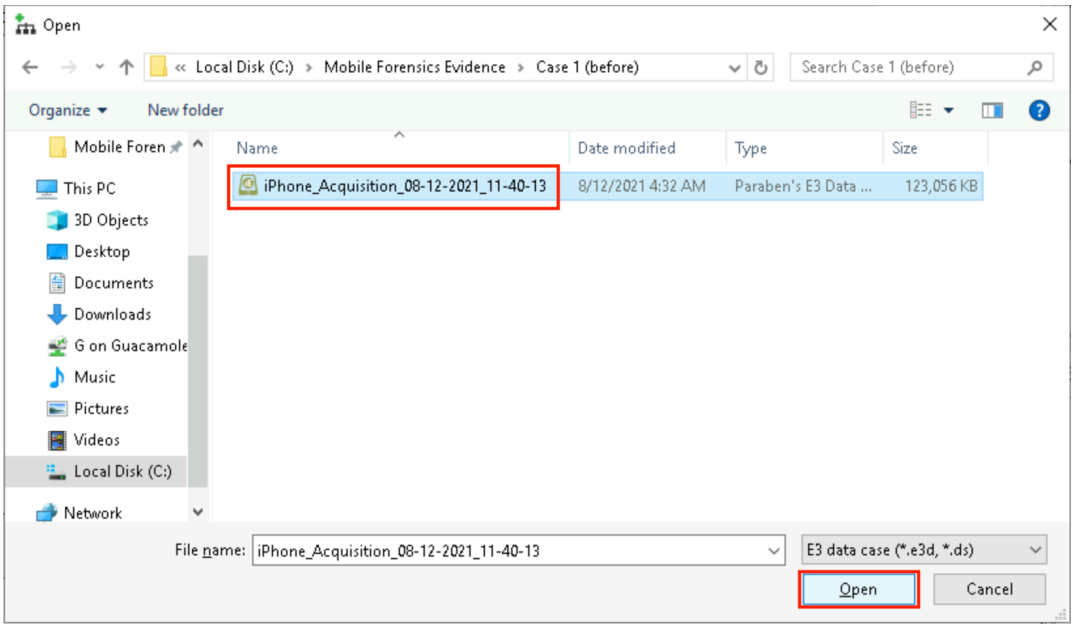
New Case

4. In the Add New Evidence dialog box, **click** the **Paraben Tools category**, then **select** the **E3 data case/DS case file source type** and **click OK** to continue.



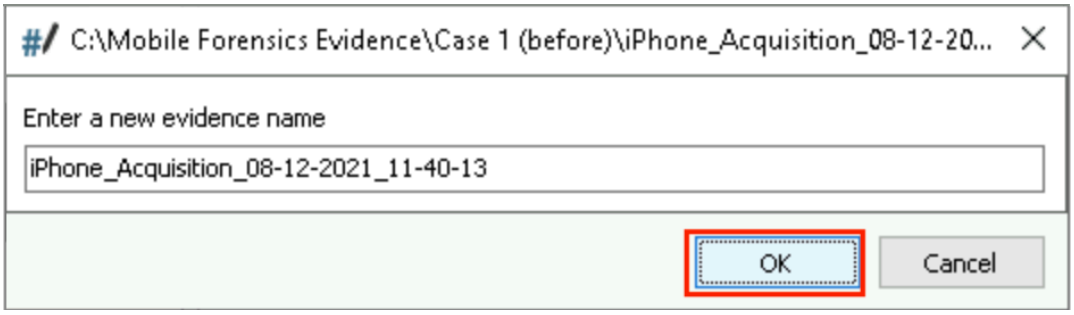
Add New Evidence

5. In the Open dialog box, **navigate** to C**:\Mobile Forensics Evidence\Case 1 (before)**, then **select** the **iPhone_Acquisition_08-12-2021_11-40-13.e3d file** and **click Open** to import the Paraben evidence file containing the acquired iOS data.



Open dialog box

6. When prompted, **click OK** to accept the default name for the drive image and add the data from the drive image to your case file.

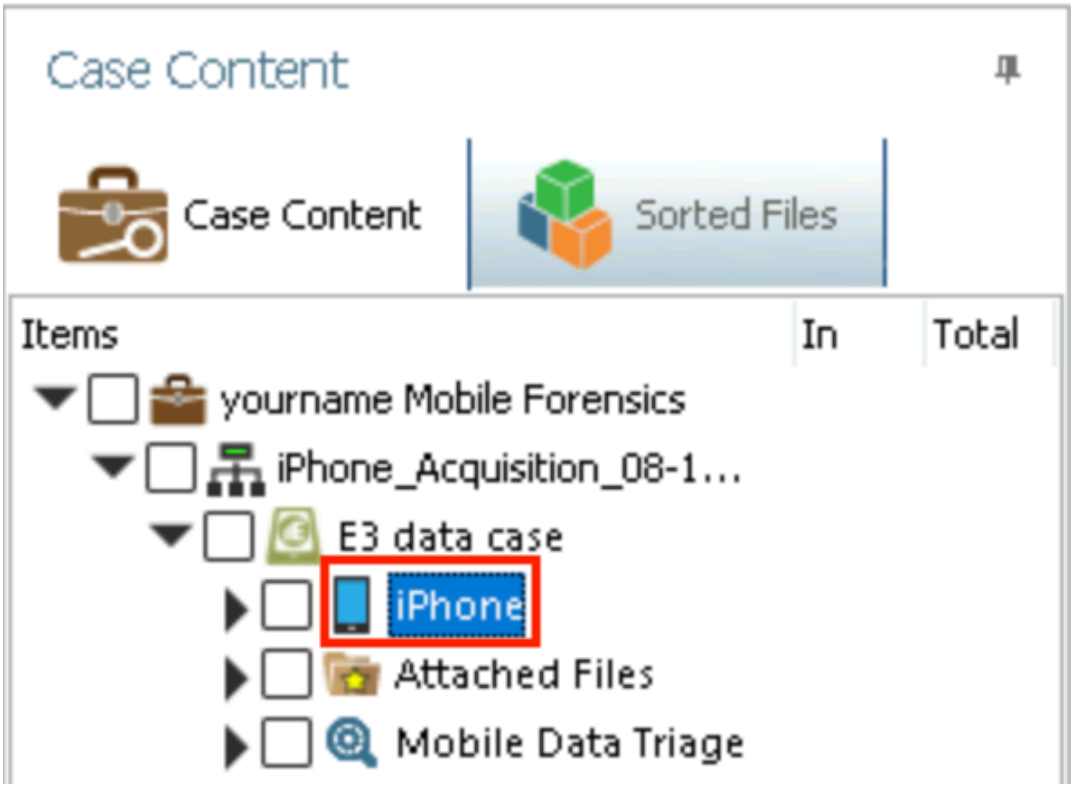


Evidence name

Note: The *yourname* Mobile Forensics case will appear in the Case Content pane. The Case Content pane is the primary display and navigation area for all evidence in the open case file. Within the Case Content pane's tree-view structure, you can access case nodes, evidence nodes, evidence type nodes, folder nodes, and data grids/streams. Technically, the Case Content pane does not store the actual evidence, but provides a series of links to elements within the physical evidence.

When you select a specific node or grid within the Case Content pane, the contents of the enclosing folder or database will be displayed in the Data Viewer in the center pane. Within the Data Viewer, you can select individual files, folders, and records. Additional information about the currently selected node, grid, file, folder, or record will be displayed in the Viewers pane on the right, which provides multiple ways to view your current selection.

7. In the Case Content pane, **navigate** to ***yourname* Mobile Forensics / iPhone_Acquisition_08-12-2021_11-40-13 / E3 data case / iPhone** to display information about the iPhone in the Properties pane on the right.

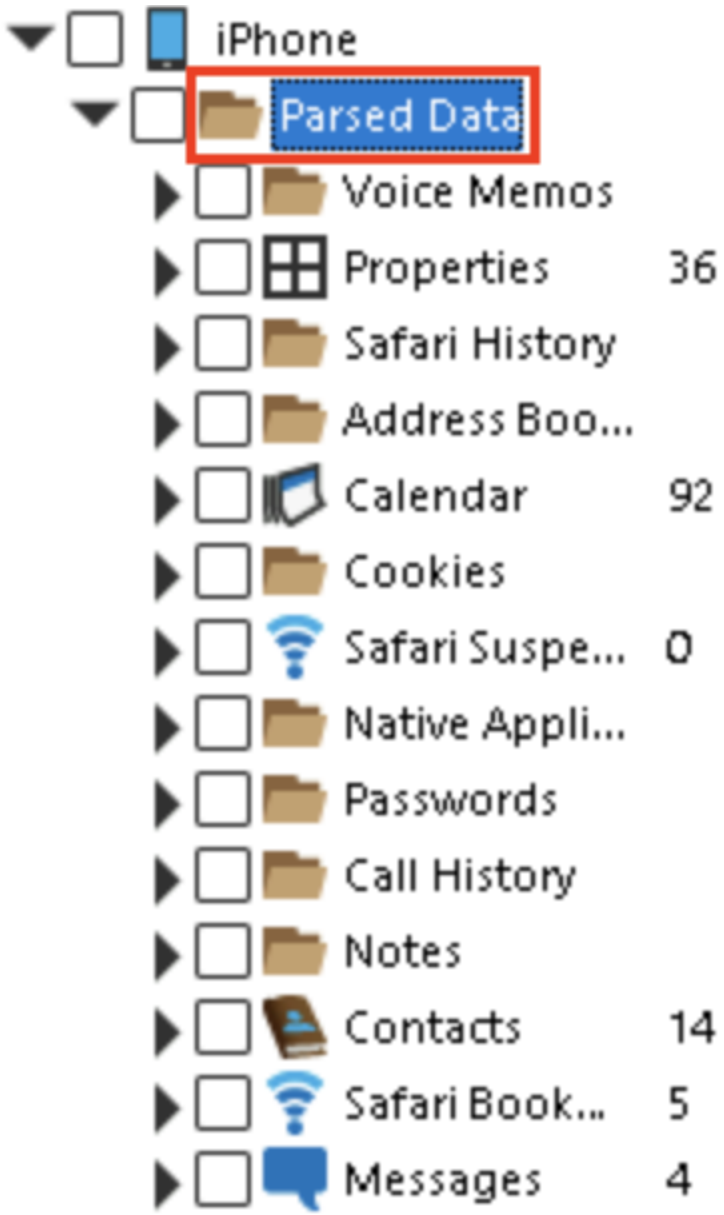


iPhone Properties

Note: The Properties pane contains several details about the iPhone this data was acquired from, including Device model, Device name, Model number, Modem Firmware number, IOS Version, Serial Number, Wi-Fi address, and more. When correlating evidence from an iPhone with other sources of evidence – for example, packet captures or cloud backups – many of these details can be indispensable to building a comprehensive case.

8. **Make a screen capture** showing the **contents of the Properties pane**.

9. In the Case Content pane, **expand** the **iPhone node**, then **expand** the **Parsed Data folder**.

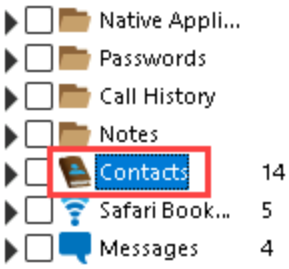


Parsed Data

Note: Parsed Data is an artificial folder that E3 builds while acquiring data from an iOS device. During acquisition, the data is parsed to allow the raw structure of the mobile data to be displayed in a tree

form. However, most of the firmware variants associated with mobile data do not maintain a typical tree structure, so the data is broken into groups. These groups refer back to the apps associated with the data (Messages, Calendars, Contacts, etc.). Some of these apps will exist in the file system and others will be separated. The firmware and location of the app data will ultimately determine how the data is displayed.

10. In the Case Content pane, **click** the **Contacts folder** to open the Contacts grid in the Data Viewer.

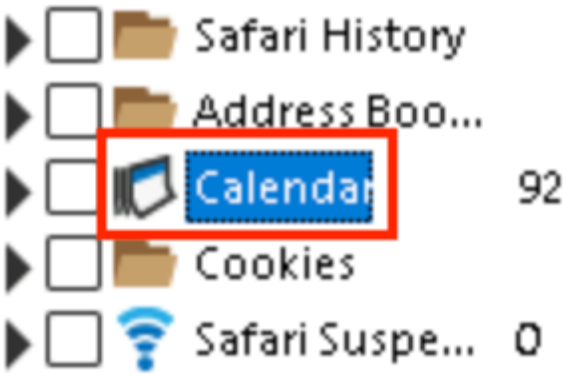


Contacts

Note: The Contacts grid contains the full names, phone numbers, and email addresses of contacts stored in the iPhone, as well as timestamps for creation and modification dates. When dealing with iPhone evidence with tens or hundreds of contacts, you can easily sort the data in ascending or descending order by clicking the column header. You can also change the column order and remove specific columns by right-clicking any column and selecting Columns from the context menu.

11. **Make a screen capture** showing the **contents of the Contacts grid**.

12. In the Case Content pane, **click** the **Calendar folder** to open the Calendar grid in the Data Viewer.



Calendar

Note: The Calendar grid contains the summary and description for calendar events stored in the iPhone, as well as start date, end date, timezone, location, and a value called CalendarID. The CalendarID value can be especially useful for forensic investigators, as it distinguishes system-generated events from user-generated events. Events with a CalendarID value of 9 refer to events created on the device automatically, such as holidays. Events with a CalendarID value of 14 refer to events created on the device by the user.

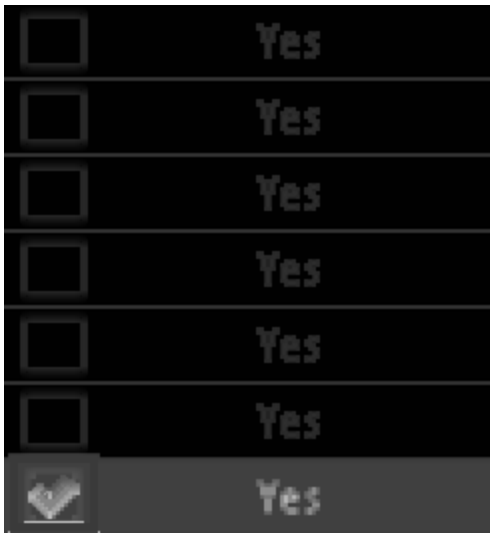
13. In the Calendar grid, **review** the **summary details** for events that were created by the device user.

Note: You should notice that one of the events has a car icon in the summary field. Given the context of the investigation, this could be evidence of a car theft that was planned for this day.

14. **Make a screen capture** showing the **contents of the Calendar grid**.

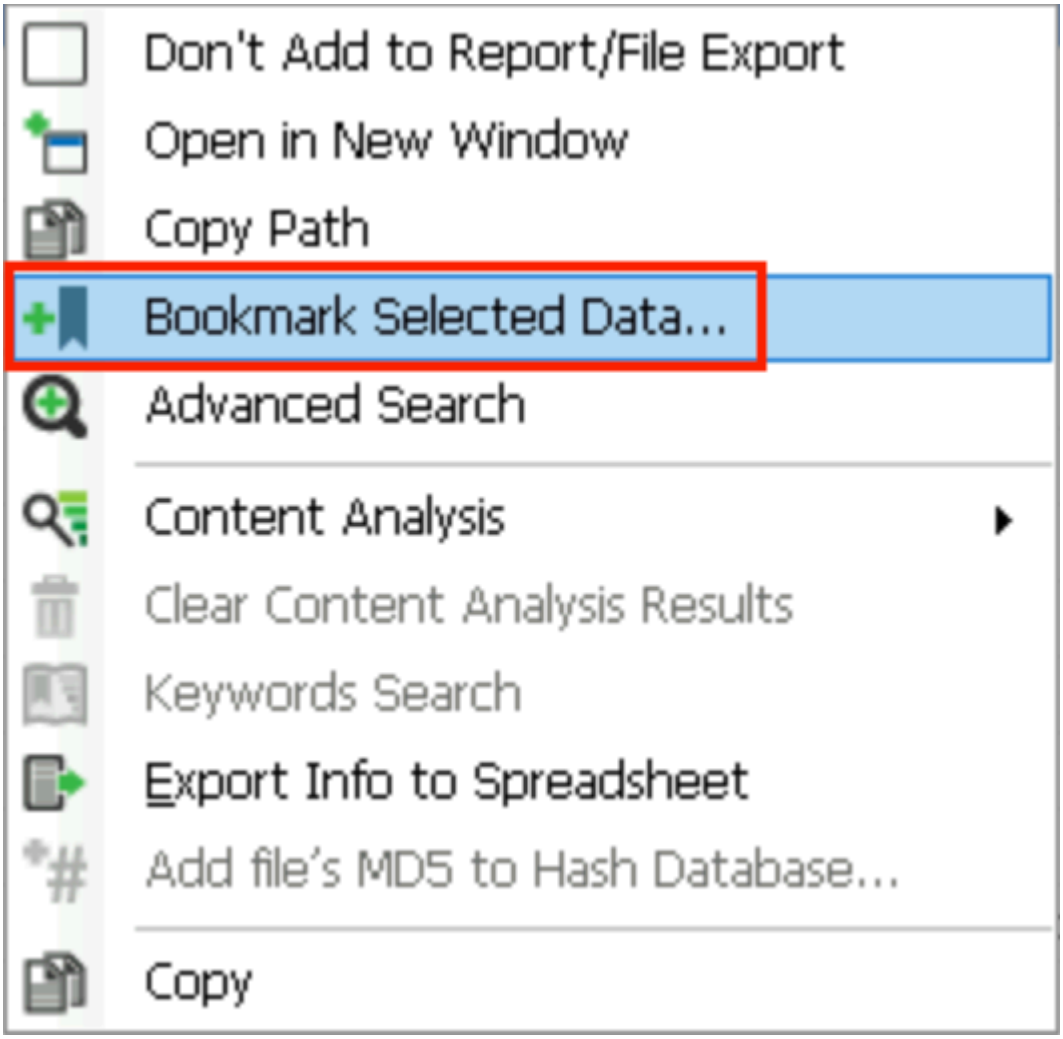
Note: In the next steps, you will bookmark the potentially incriminating Calendar event so you can later include it in a formal evidence report.

15. In the Data Viewer, **click** the **checkbox** for the **Calendar event containing potential evidence** to select it.



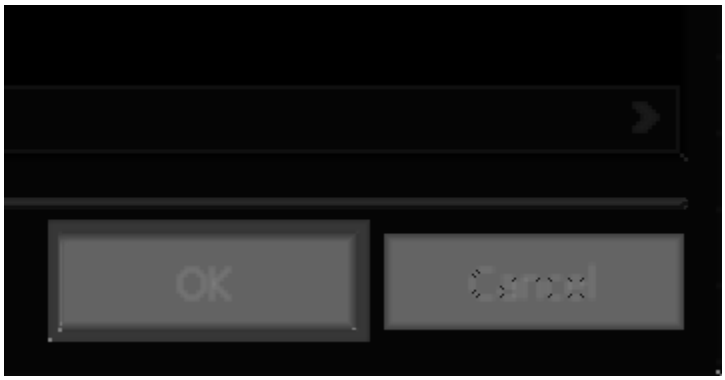
Checkbox

16. **Right-click** the **selected event**, then **select Bookmark Selected Data** to open the Bookmark Selected Data dialog box.



Bookmark Selected Files

17. In the Bookmark Selected Files dialog box, **click OK** to save the bookmark and close the dialog box.



Bookmark Selected Files dialog box

18. In the Case Content pane, **click** the **Messages folder** to open the Messages grid in the Data Viewer.

Messages

Note: The Messages grid contains data related to text messages stored in the iPhone, including the sender, recipient, text content, date received, date sent, read receipts, service, and more. Service refers to the message type, namely SMS or iMessage. iOS supports both the standard SMS messages that are compatible with all mobile devices and Apple's proprietary iMessage system, which functions exclusively on Apple devices.

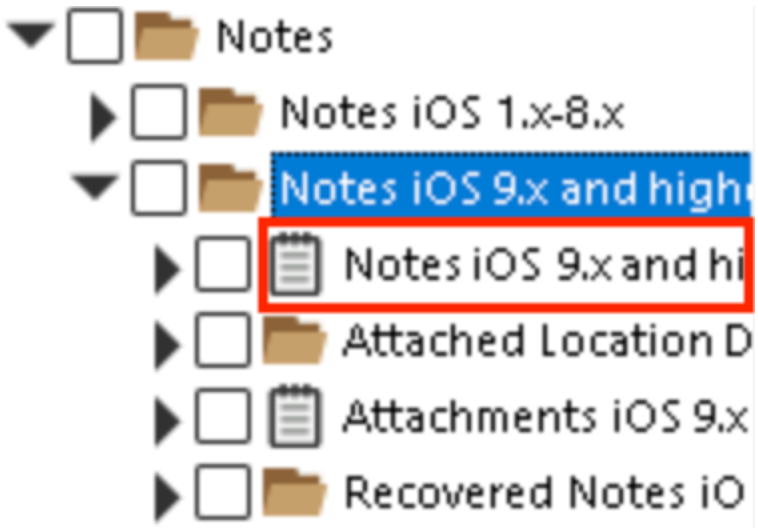
19. In the Messages grid, **review** the **text message data** for messages containing evidence associated with the car thefts.

Note: Upon reviewing the outgoing text messages on the suspect's phone, you should locate two messages that could be associated with the car thefts. The first is a message to Stinky asking about a specific car. The second is a message to ICE Mylady that indicates a car is located in Windy City.

20. **Make a screen capture** showing the **contents of the Messages grid**.

21. **Repeat steps 15-17** to save bookmarks for the two text messages.

22. In the Case Content pane, **navigate** to **Notes** / **Notes iOS 9.x and higher**, then **select** the **Notes iOS 9.x and higher grid** to open it in the Data Viewer.



Notes iOS 9.x and higher

Note: Notes are often valuable sources of information in a forensic investigation, as users will often use this quick and easy word-processing tool to capture or save important, text-based information, such as instructions, to-do lists, and even journals.

23. In the Notes grid, **review** the **notes data** for notes containing evidence associated with the car thefts.

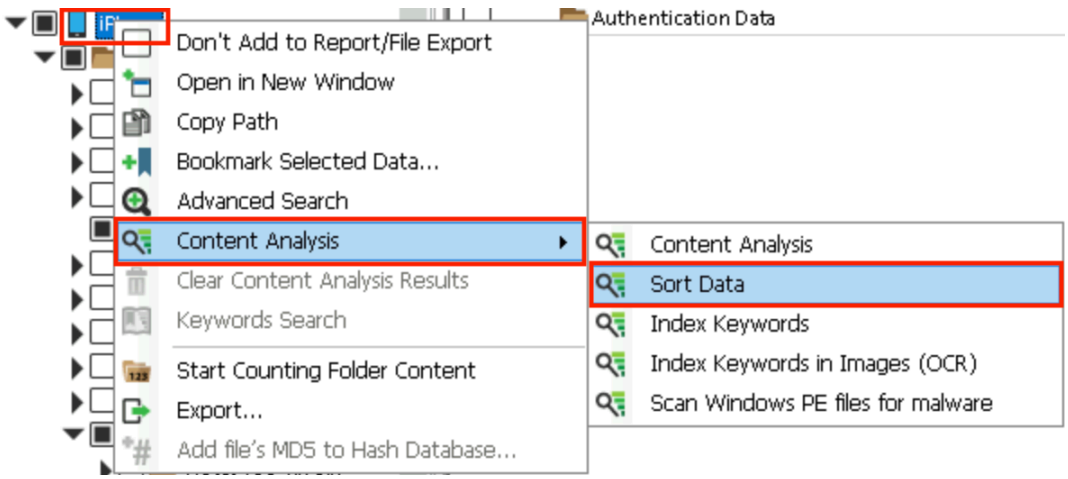
Note: As you review the contents of the notes on the suspect's phone, you should find additional evidence related car thefts in the notes data. Specifically, you should see a note confirming that the suspect knew a specific license plate number was known to police. You also see three notes relating to license plates being replaced.

24. **Make a screen capture** showing the **contents of the Notes grid**.

25. **Repeat steps 15-17** to save bookmarks for the four notes.

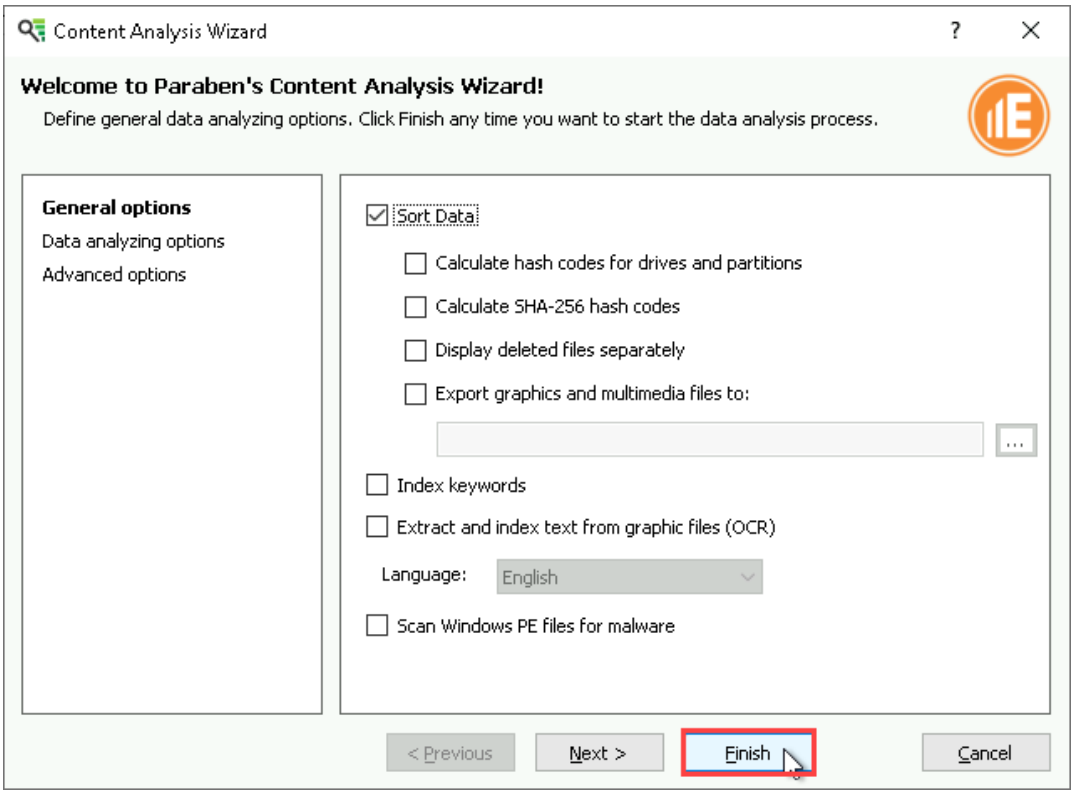
Note: So far, your investigation has been limited to the parsed data for specific native iPhone apps. In the next steps, you will use E3's Content Analysis function to search for photos and image files stored in the acquired iPhone data, including unparsed data.

26. In the Case Content pane, **right-click** the **iPhone node** and **select Content Analysis > Sort Data** to open the Content Analysis Wizard.



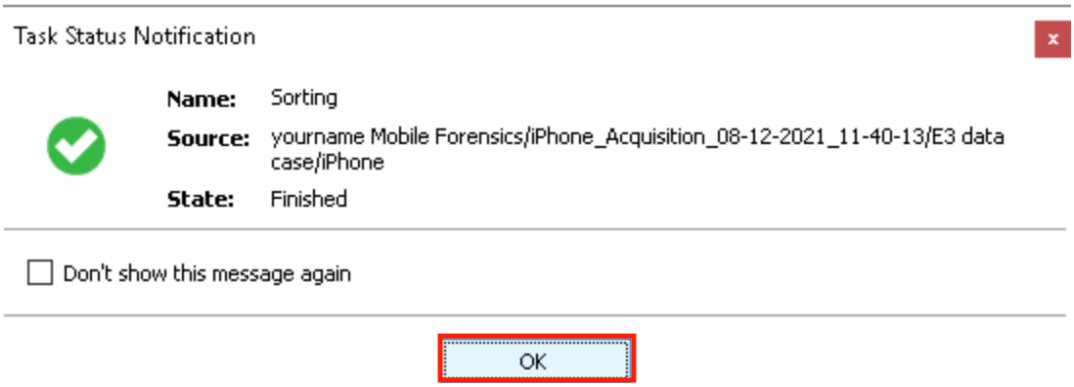
Content Analysis > Sort Data

27. In the Content Analysis Wizard, **confirm** the Sort Data option is selected, then **click Finish** to launch the content analysis process.



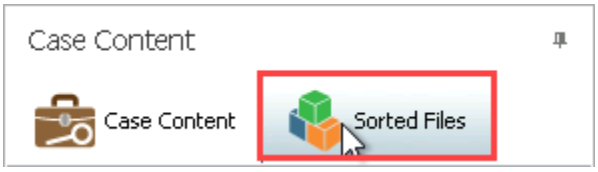
Content Analysis Wizard

28. When prompted, **click OK** to close the Task Status Notification dialog box.



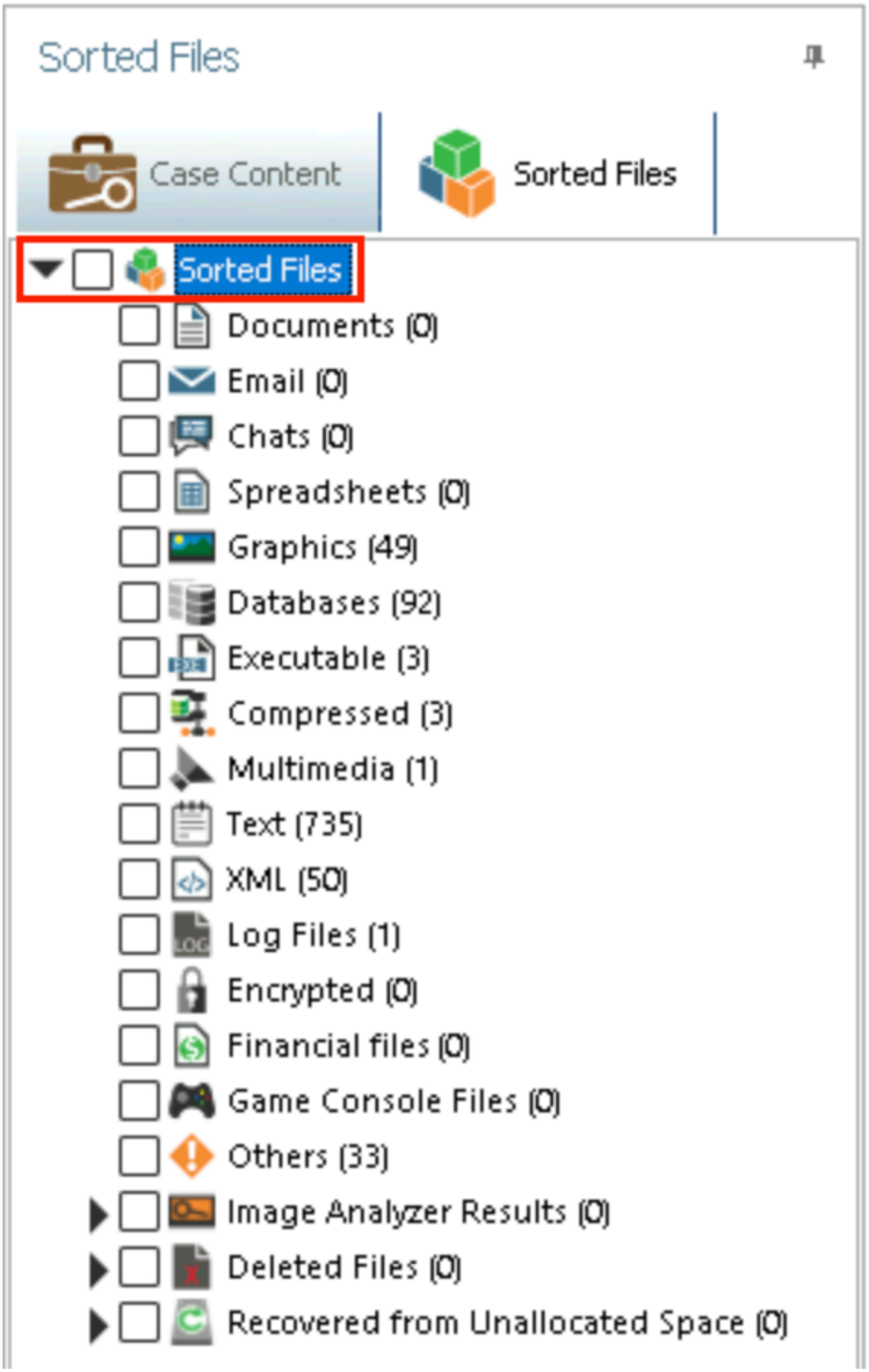
Task Status Notification

29. In the Case Content pane, **click** the **Sorted Files tab** to switch to the Sorted Files view.



Sorted Files tab

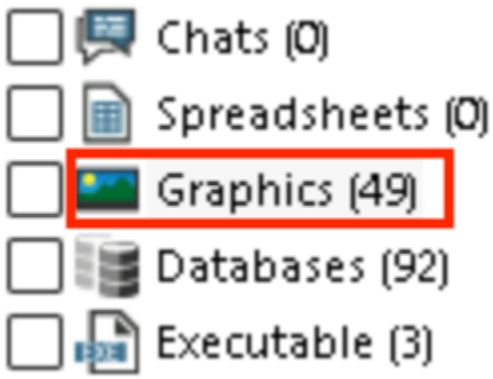
30. In the Sorted Files pane, **expand** the **Sorted Files node** to view the file types available in the case.



Sorted Files expanded

Note: You should see the following file types on the suspect's smartphone: graphic files, databases, executables, compressed files, multimedia, text, XML, log files, and others.

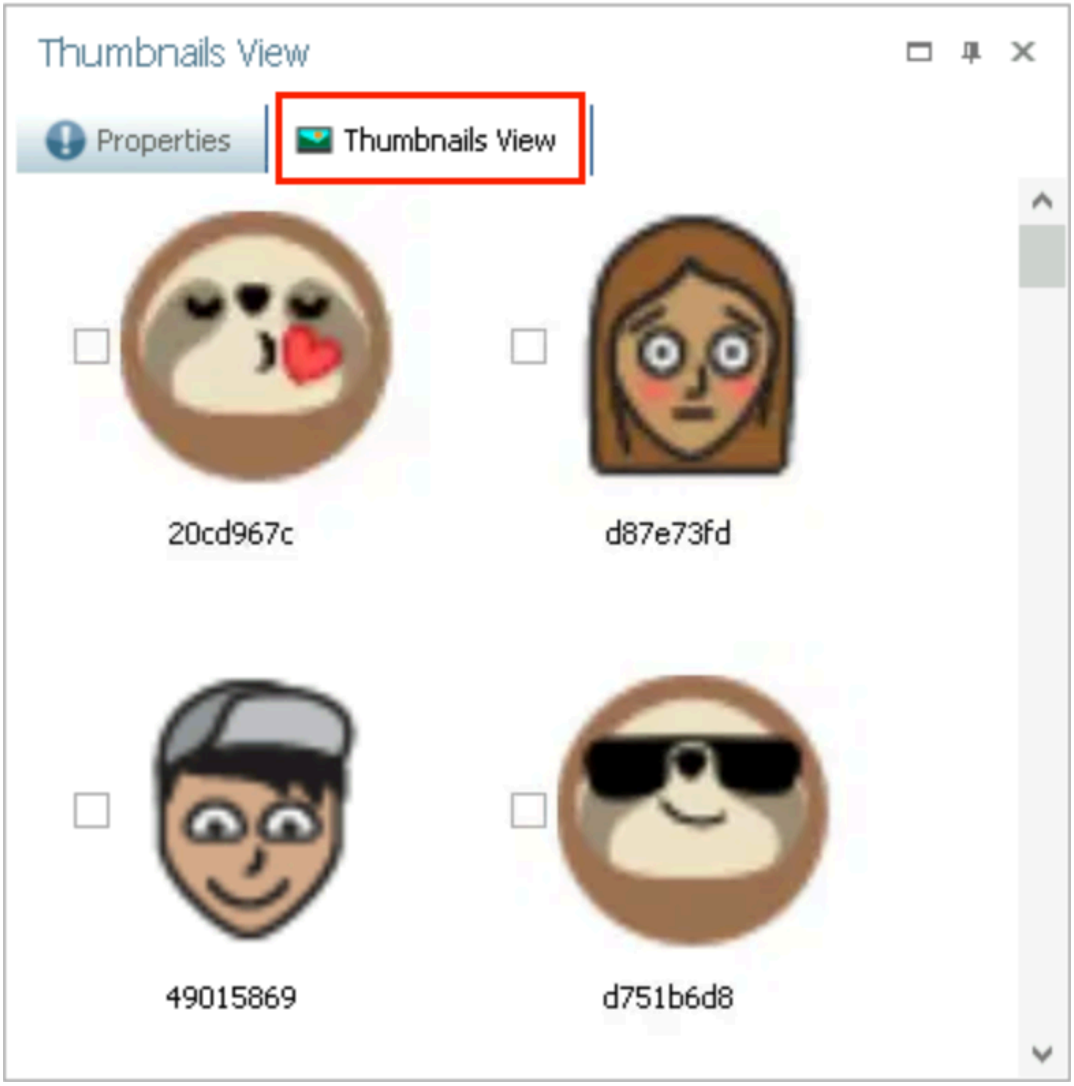
31. In the Sorted Files pane, **click** the **Graphics category** to display a list of images identified on the iPhone in the center pane.



Graphics

32. In the Properties Pane, **select** the **Thumbnails View tab** to display the images as thumbnails.

    If necessary, expand the right pane to display more images in the Thumbnails View.



Thumbnails View

33. In the Thumbnails View, **review** the **images** for evidence associated with the car thefts.

Note: As you review the thumbnails, you should discover 13 pictures of cars. Many of these images include the license plates of the vehicles. You suspect these may be the new license plates added to the cars after they were stolen.

34. **Make a screen capture** showing **at least two car pictures in the Thumbnail View**.

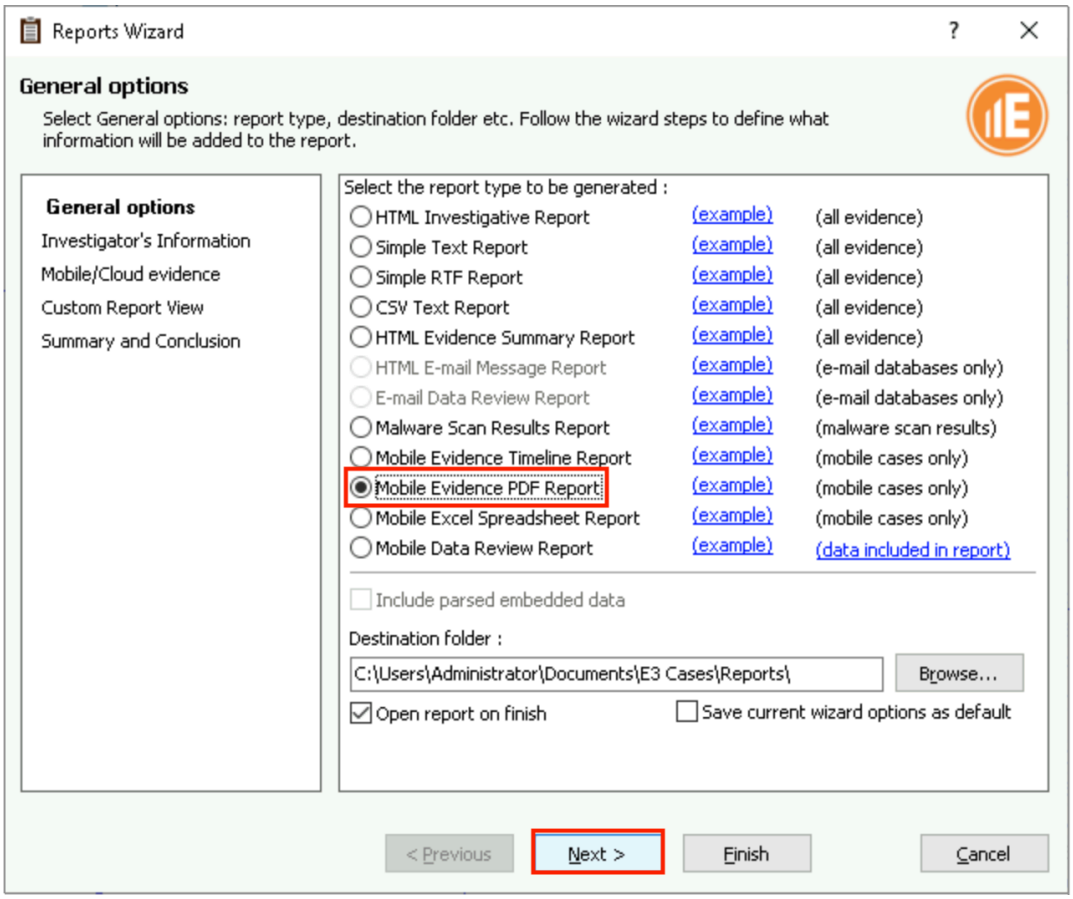
35. **Repeat steps 15-17** to save bookmarks for the images.

Note: In the next steps, you will use E3's reporting functionality to generate an investigative report containing the evidence you found. Good reports are a critical part of an investigation. The report allows the investigator to effectively and concisely present the distilled evidence and create a non-technical summary for decision makers, executives, and attorneys. A well-constructed report can also be crucial in ongoing investigations where months or years will pass before new evidence is introduced. Good reporting ensures that no critical evidence or information is forgotten or overlooked.

36. On the E3 toolbar, **click** the **Reports tab**, then **click** the **Generate Report button** to open the Reports Wizard.

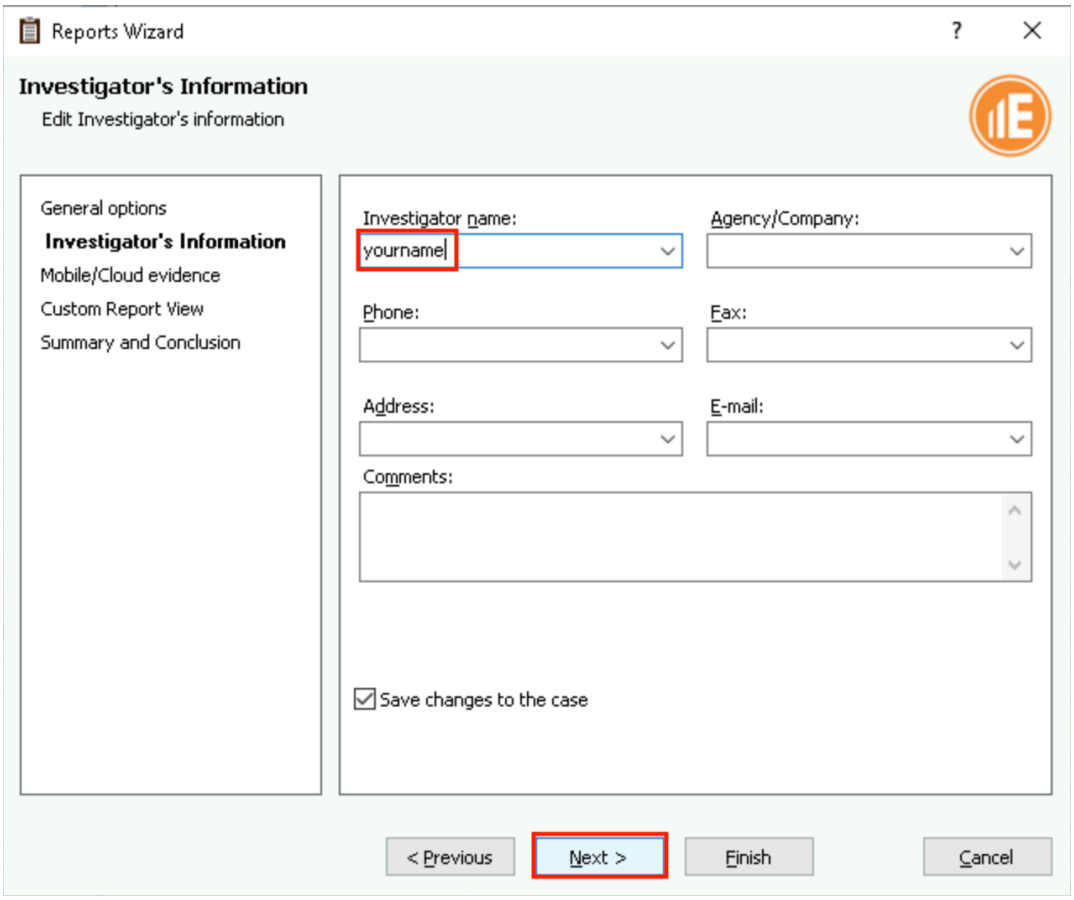
Generate Report

37. On the General Options page, **select** the **Mobile Evidence PDF Report radio button**, then **click Next** to continue.



General Options

38. On the Investigator's Information page, **type *yourname*** in the Investigator name field, replacing *yourname* with your own name, then **click Next** to continue.

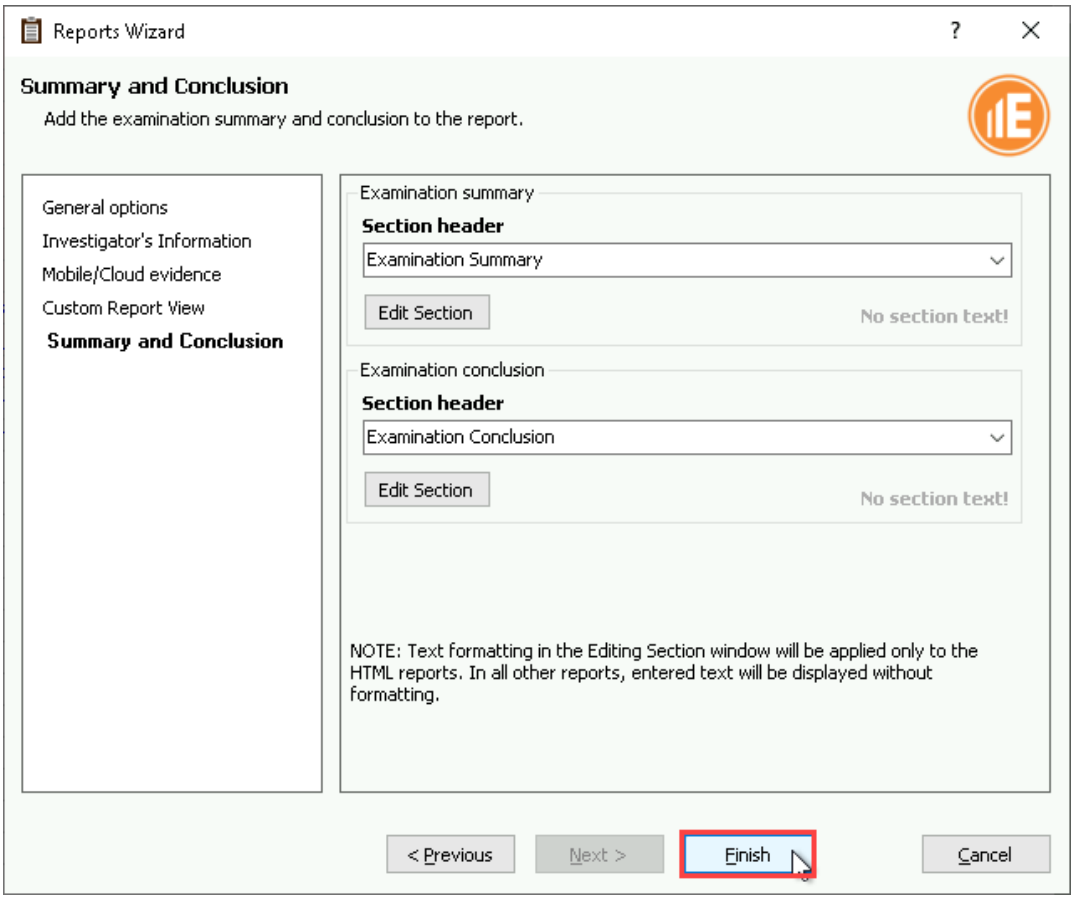


Investigator's Information

39. On the Mobile/Cloud evidence page, **click Next** to accept the default settings and continue.

40. On the Custom Report View page, **click Next** to accept the default settings and continue.

41. On the Summary and Conclusion page, **click Finish** to generate the report.



Summary and Conclusion

Note: After about 30 seconds, the report will automatically open in Adobe Reader.

43. **Review** the **report**, then **navigate** to the **Table of contents page**.

44. **Make a screen capture** showing the **Table of contents in the investigative report**.

45. **Close** the **Adobe Reader window**.

46. **Click OK** to close the Task Status Notification dialog box.

47. **Close** the **E3 window**.

Part 2: Compare iOS Data Cases

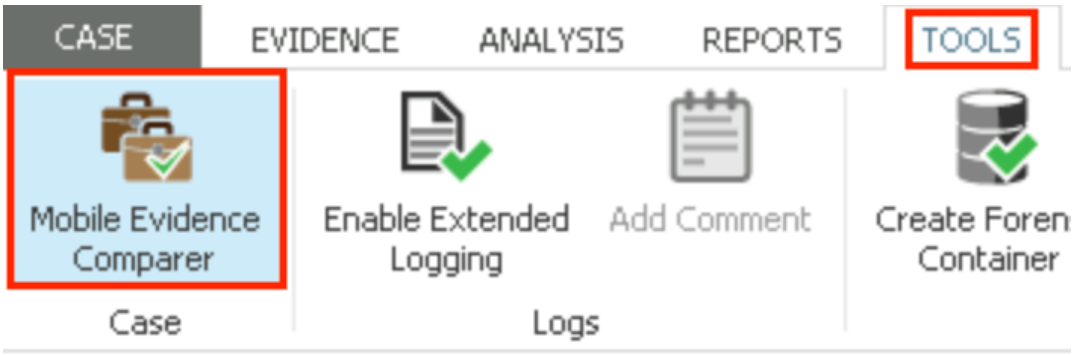
Note: In this part the lab, you will compare the same iOS data case you reviewed in Part 1 with a second iOS data case that was generated from the same device one day later. Rather than manually comparing the data from the two cases, you will use E3's Mobile Evidence Comparer. For investigators, this unique feature can be a tremendous time-saver. In real-world investigations, the Mobile Evidence Comparer can be used to quickly determine if a mobile device has been compromised or has been used improperly. It is often used in corporate or government environments where the mobile device is issued to a user and is easily accessible for data acquisition.

In the next steps, you will re-open E3 and add the data cases to the Mobile Evidence Comparer.

1. On the vWorkstation desktop, **double-click** the **Electronic Evidence Examiner icon** to re-open the E3 application.

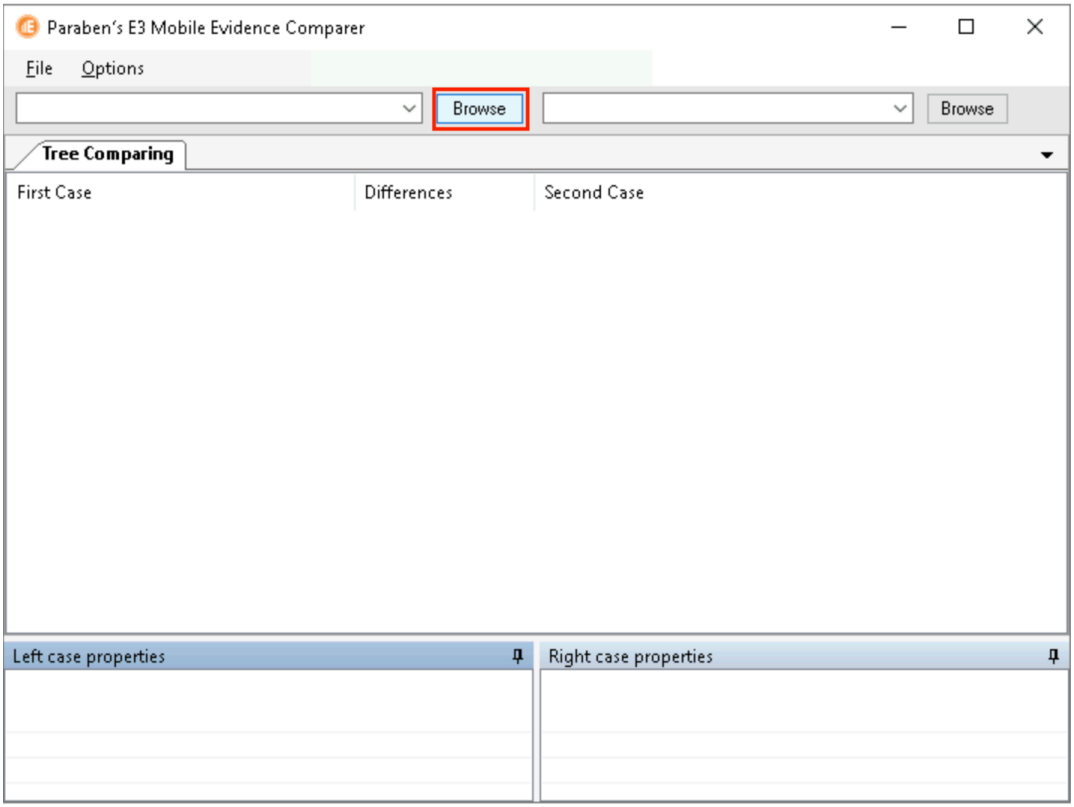
2. **Close** the **Welcome screen**.

3. From the E3 toolbar, **click** the **Tools tab**, then **click** the **Mobile Evidence Comparer button** to open the Mobile Evidence Comparer in a new window.



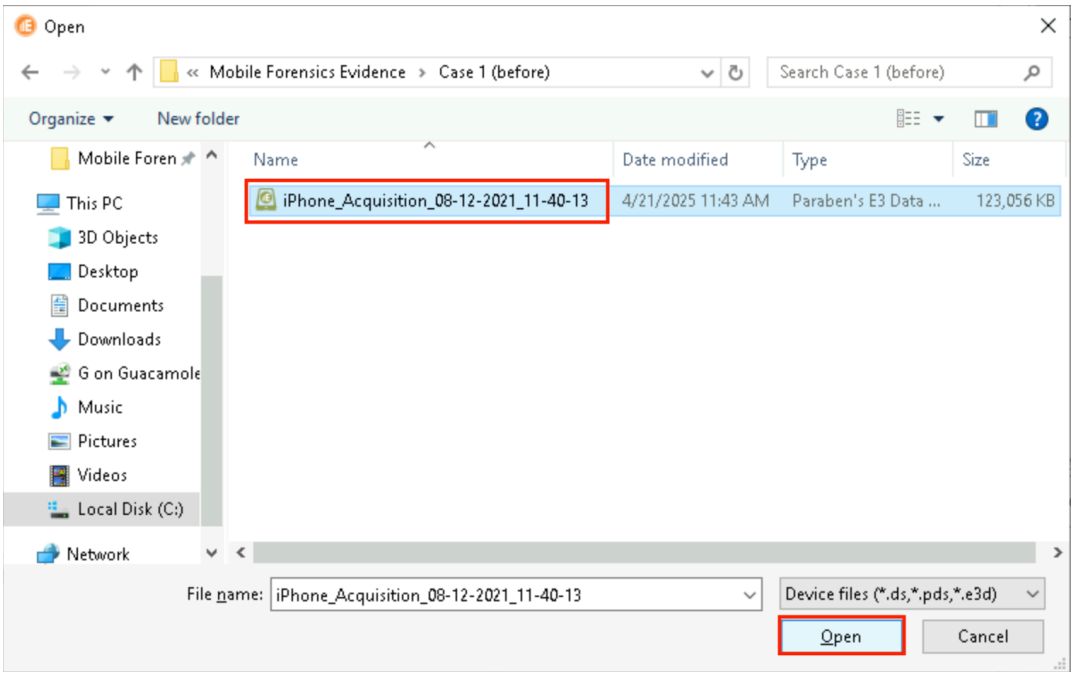
Mobile Evidence Comparer

4. In the Mobile Evidence Comparer, **click** the **left Browse button** to open the Open dialog box.



Left Browse Button

5. In the Open dialog box, **navigate** to **This PC > Local Disk (C:) > Mobile Forensics Evidence > Case 1 (before)**, **select** the **iPhone_Acquisition_08-12-2021_11-40-13.e3d case** and **click Open** to import the first Paraben data case for the iPhone.



Open dialog box

6. In the Mobile Evidence Comparer, **click** the **right Browse button** to open the Open dialog box.

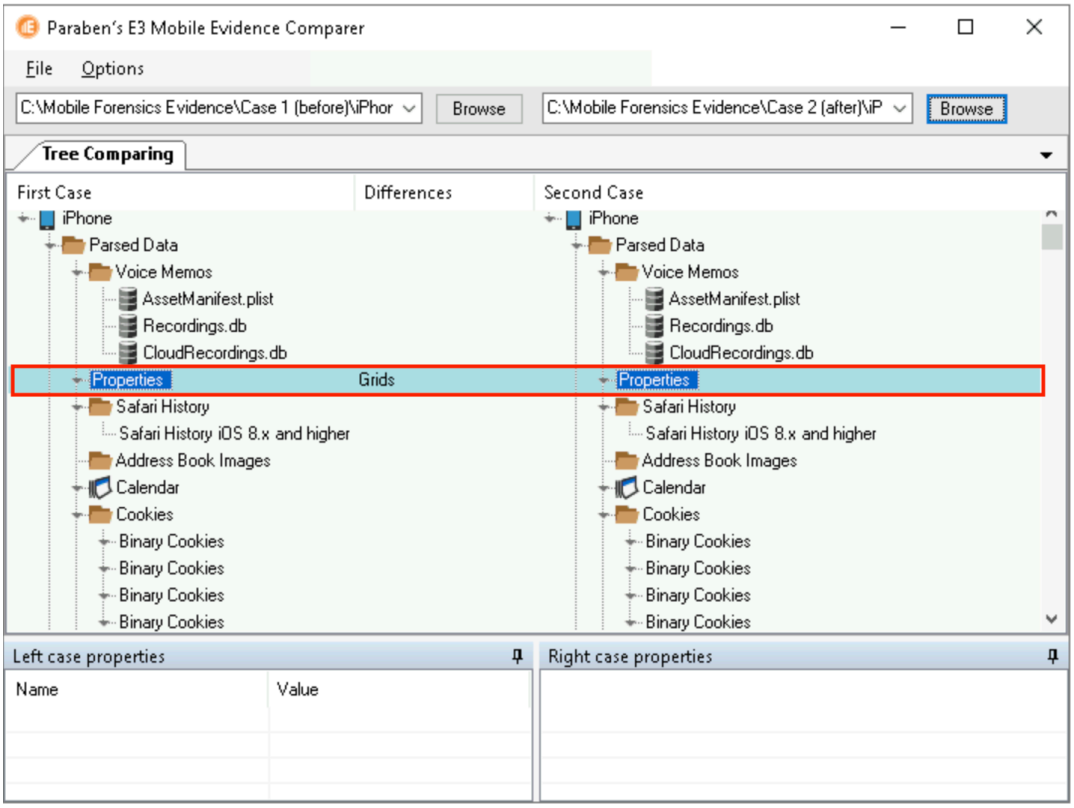
7. In the Open Evidence dialog box, **navigate** to **This PC > Local Disk (C:) > Mobile Forensics > Case 2 (after)**, then **select** the **iPhone_Acquisition_08-12-2021_11-55-18.e3d case** and **click Open** to import the second Paraben data case for the iPhone.

Note: The differences in the two cases are highlighted in blue and green by default. Blue indicates that the file was modified in some way, with the exact differences specified in the Differences column. Green indicates that the file is not available in one of the cases.

In the next steps, you will examine the first blue row in greater detail.

8. In the Mobile Evidence Comparer, **double-click** the **blue Properties row** to open the

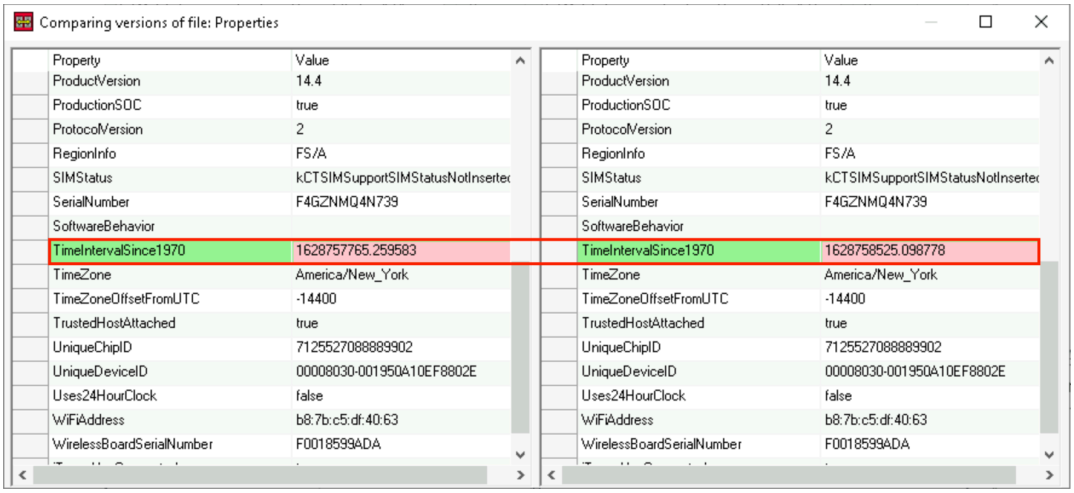
Comparing versions of file: Properties window.



Properties

Note: The contents of the *Comparing versions of file* window will depend on the nature of the difference. In this case, the difference resides in the grid, so the Mobile Evidence Comparer will display the grid view of the Properties file. When the difference exists in the size or content of a file, the Mobile Evidence Comparer will display a byte-level view of the difference.

9. In the Comparing window, **scroll down** to the **TimeintervalSince1970 row**.



Comparing window

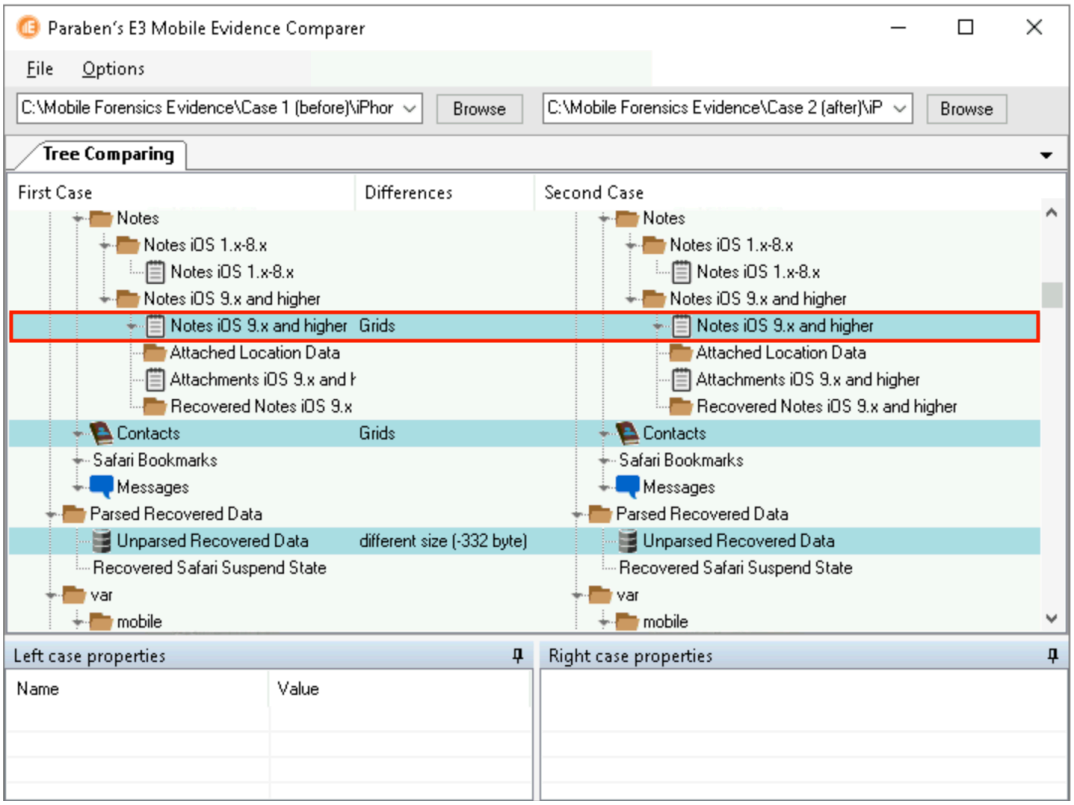
Note: When displaying differences in a grid, the Mobile Evidence Comparer will highlight the row where the differences occur in green. The specific value that differs will be highlighted in pink.

In this case, the difference resides in the timestamp for the phone's data case, which makes sense, given that the data cases were generated a full day apart.

10. **Make a screen capture** showing the **difference in data case properties**.

11. **Close** the **Comparing window**.

12. In the Mobile Evidence Comparer window, **scroll down** to locate the **Notes iOS 9.x and higher row**.



Notes iOS 9.x and higher row

13. **Double-click** the **Notes iOS 9.x and higher row** to open the Comparing window.

14. **Maximize** the **Comparing window** to display the full contents of the grid.

Note: You should see that several Notes have been deleted in the newer data case.

15. **Make a screen capture** showing the **additional note in the newer data case**.

16. **Close** any **open windows**.

Note: This concludes Section 1 of the lab.

Section 2: Applied Learning

Note: SECTION 2 of this lab allows you to apply what you learned in **SECTION 1** with less guidance and different deliverables, as well as some expanded tasks and alternative methods. You will continue your investigation and analyze an Android data case.

Part 1: Identify Forensic Evidence in Android User Data

Note: In Section 1, you completed your analysis of the recovered iOS phone and prepared a formal investigative report on your findings. Next, you will need to analyze the data on the Android phone that was also seized from the suspects. You have yet to determine which phone belongs to Bonnie and which phone belongs to Clyde, so as a first step, you will focus your investigation on the user data, including contacts and browsing history.

In the next steps, you will add the Android evidence to E3 and review the information available within Mobile Data Triage.

1. From the vWorkstation desktop, **launch** the **E3 application**.

2. From the Welcome screen, **open** the ***yourname*** **Mobile Forensics case file** that you created in Section 1.

3. On the E3 toolbar, **click** the **Add Evidence button**, then **import** the **Lab_Android_Acquisition_06-02-2021_17-52-55 / E3 data case** from the C:\Mobile Forensics Evidence folder.

4. When prompted, **accept** the default name for the evidence.

5. In the Case Content pane, **navigate** to ***yourname*** **Mobile Forensics / Lab_Android_Acquisition_06-02-2021_17-52-55 / E3 data case**, then **expand** the **Mobile Data Triage node**.

Note: Similar to the Parsed Data folder that you reviewed in Section 1, Mobile Data Triage automatically surfaces and sorts files from some of the most commonly referenced sources of evidence. The Parsed Data folder is generated by E3 as a matter of necessity during the evidence acquisition process, while the Mobile Data Triage view is a curated collection of evidence derived from the parsed data that is presented in relevant categories for the benefit of the investigator.

6. In the Case Content pane, **select** the **Device Information category** and **review** its contents in the Data Viewer.

Note: Like the Properties tab for the iPhone, this category will show you basic information about the phone, including brand, manufacturer, model, and serial number. In this case, you can confirm that the suspect has an Honor smartphone from Huawei.

7. **Make a screen capture** showing the **Device Information**.

8. In the Case Content pane, **select** the **ICE Contacts category** and **review** its contents in the Data Viewer.

Note: ICE is a common acronym for "In Case of Emergency." When analyzing smartphone data, you can infer a close connection between the owner of the device and the ICE contacts, who are typically spouses, immediate family members, or close friends.

In this case, you should see two ICE contacts: Clyde and Daddy Dear. By process of elimination, you can reasonably infer that this device belongs to Bonnie and the iOS device belongs to Clyde.

9. **Make a screen capture** showing the **ICE Contacts**.

10. **Create a bookmark** for the Clyde ICE contact.

11. In the Case Content pane, **select** the **Contact Email Accounts category** and **review** its contents in the Data Viewer.

Note: You should see three contacts in the Contact Email Accounts folder for the suspect. They belong to Lucas Carter, Emma Chicago, and Tom Audi&BMW. Based on his name, it seems likely that Tom Audi&BMW could be a contact associated with the car thefts.

12. **Make a screen capture** showing the **Contact Email Accounts**.

13. **Create a bookmark** for the Tom Audi&BMW contact.

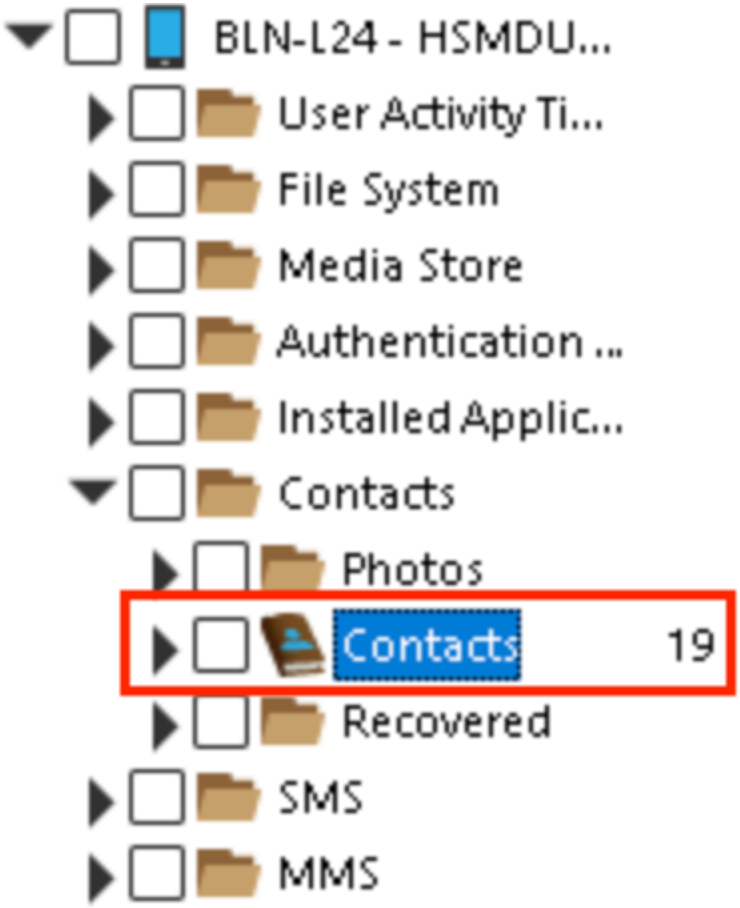
14. In the Case Content pane, **select** the **Installed Applications category** and **review** its contents in the Data Viewer.

Note: This category shows a list of the apps that the user installed on their phone. Within the installed applications, you should see that the suspect had installed the eBay Motors application. This could be where the suspect sells the vehicles after they are altered.

15. **Make a screen capture** showing the **Installed Applications**.

16. **Create a bookmark** for the eBay Motors app.

17. In the Case Content pane, **navigate** to **BLN-L24 – HSMDU17A21002751 / Contacts**, then **select** the **Contacts grid** to display the contents in the Data Viewer.

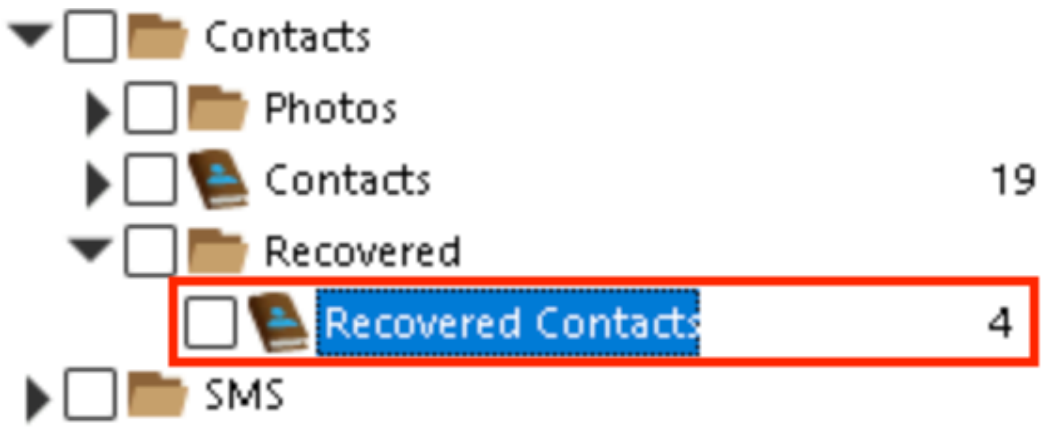


Contacts

Note: Like iOS, the contacts grid in Android contains the full names, phone numbers, and email addresses of contacts stored on the device, as well as timestamps for creation and modification dates. In the grid, you should see information for 19 contacts. However, it is not uncommon for criminals to delete contacts after they have completed a transaction in an effort to cover their tracks.

In the next steps, you will attempt to retrieve any deleted contact information on the Android smartphone.

18. In the Case Content pane, **expand** the **Recovered folder**, then **select** the **Recovered Contacts item** and review the contents in the Data Viewer.



Recovered Contacts

Note: Within the Recovered Contacts grid, you should see four contacts: the first only contains a Note with an eBay URL, the second only contains a phone number, the third is blank, and the fourth contains an email address. For the same reasons that criminals delete contacts, it is a best practice to initially save those contacts with as little identifying information as possible.

19. **Make a screen capture** showing the **recovered contact information from the Android phone**.

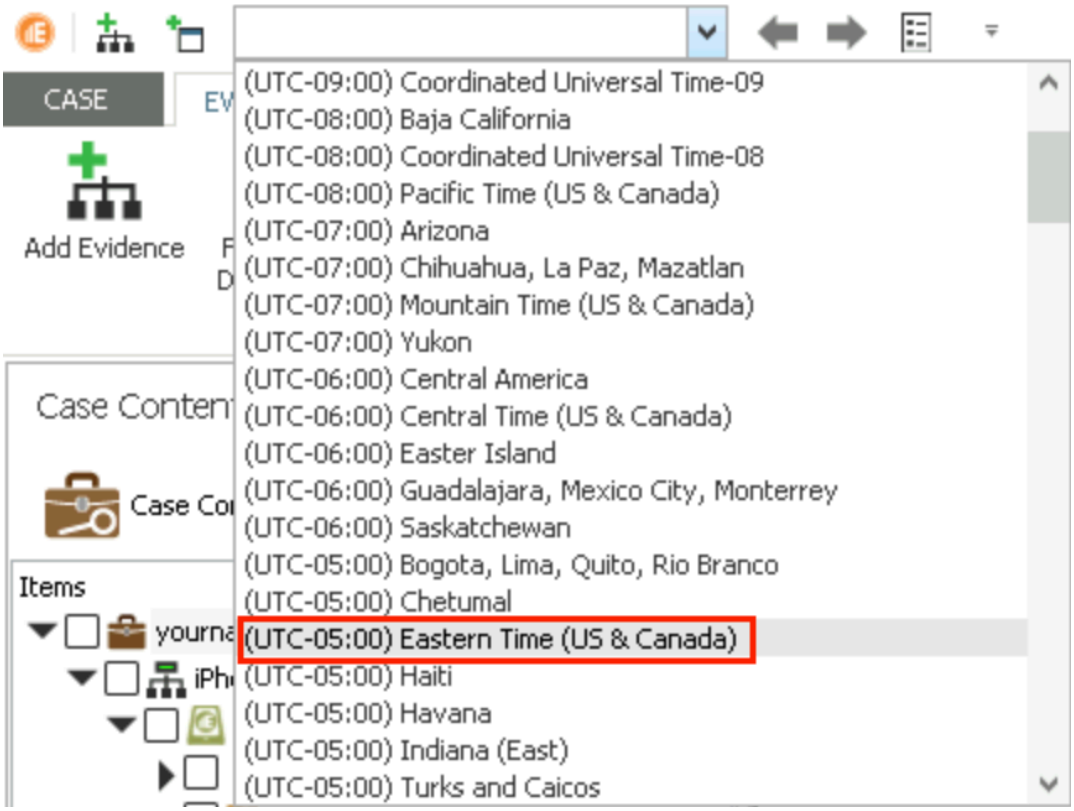
20. **Create a bookmark** for the second and fourth recovered contacts.

Part 2: Identify Forensic Evidence in Android Application Data

Note: In any forensic investigation, an investigator should attempt to re-create a timeline of the crime based on the evidence that's available to them. When working with Android devices, the User Activity Timeline feature makes this process immensely easier by providing a literal timeline of user activity on the device that shows exactly which apps were used and when.

For the next steps, assume that you have previously recovered evidence in the case that indicates that a crime occurred on 6/2/2021 between 9:17:47 AM and 9:24:51 AM (Eastern Standard Time). You will analyze the User Activity Timeline for this period and attempt to identify additional supporting evidence to guide your investigation further.

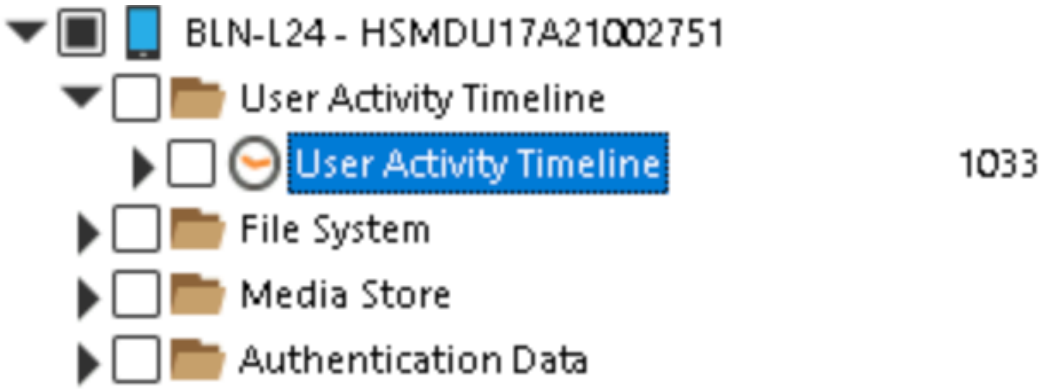
1. In the upper-left corner of the E3 window, **select (UTC-05:00) Eastern Time** to change the time zone.



Update the time zone

Note: Altering the time zone in E3 will automatically update timestamps within the case data to match the selected time zone. In this case, assume that you know that the crime occurred on the Eastern seaboard.

2. In the Case Content pane, **expand** the **User Activity Timeline folder**, then **select** the **User Activity Timeline grid** to open it in the Data Viewer.



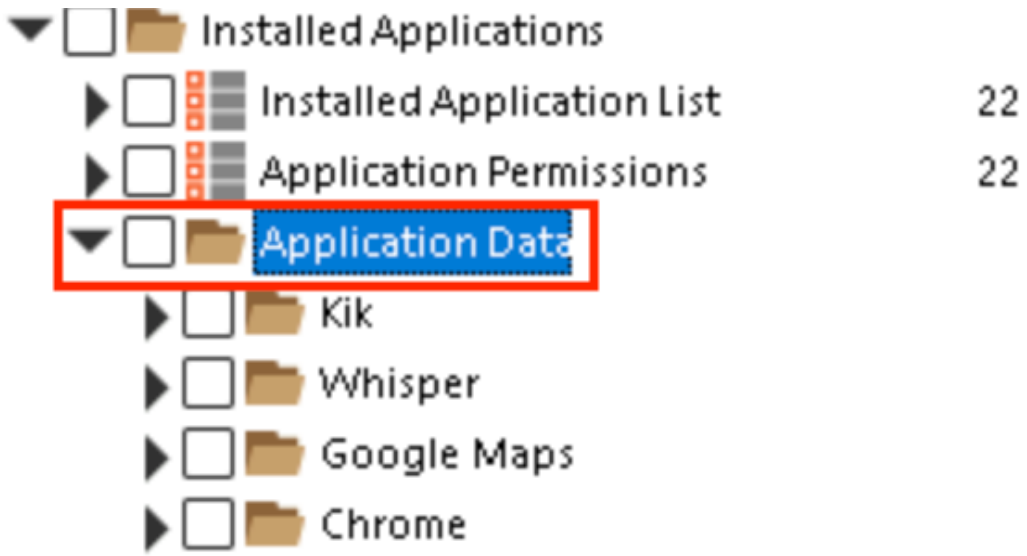
User Activity Timeline

3. **Review** the user activity that occurred between 9:17:47 AM and 9:24:51 AM on 6/2/2021.

Note: In this time period, you should see that the suspect accessed Whisper, Chrome, VPN Unlimited, Contacts, and Calendar (as well the System UI and Huawei Home). This information will allow you to focus your investigation to these specific applications in the next steps.

4. **Make a screen capture** showing the **User Activity Timeline between 9:17:47 AM and 9:24:51 AM on 6/2/2021**.

5. In the Case Content pane, **navigate** to **Installed Applications / Application Data**.



Application Data

Note: As the name implies, the Application Data folder contains application-specific data. You should recognize two of the applications that you found in the User Activity Timeline: Whisper and Chrome. You will begin by examining Whisper. Whisper is a chat application that allows users to connect anonymously online. Given the context of the investigation, it seems likely that the suspect may be using Whisper to contact others involved in the car theft operation or to identify buyers.

6. In the Case Content pane, **expand** the **Whisper folder**, then **select** the **Own Whispers grid** and **review** the contents in the Data Viewer.

Note: In the Own Whispers grid, you should see three texts that were sent from the suspect's device: one referencing a Porsche 911, one referencing the Windy City (the same location mentioned on Clyde's phone), and one mocking the cops.

7. **Make a screen capture** showing the **contents of the Own Whispers grid**.

8. **Create a bookmark** for the three Whisper texts.

9. In the Case Content pane, **expand** the **Chrome folder**, then **select** the **History grid** to display the contents in the Data Viewer.

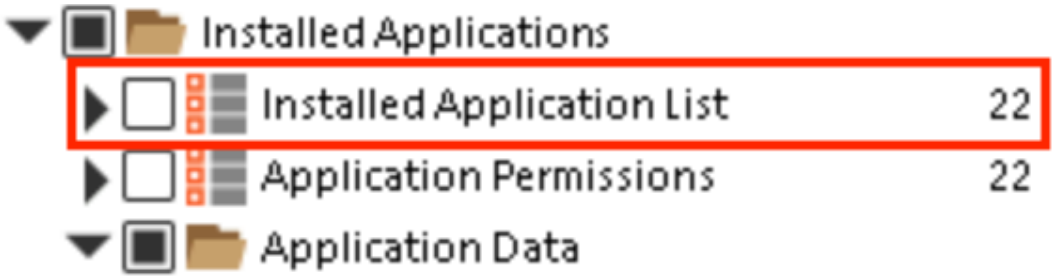
Note: In the Chrome History grid, you should see that the suspect visited websites several websites related to cars, including autonews.com, tesla.com, ebay.com/motors, and ran Google searches on the Porsche 911 and new Tesla models.

10. **Make a screen capture** showing the **contents of the History grid**.

11. **Create a bookmark** for the relevant browser history records.

Note: In the next steps, you will dig deeper into the application data by directly examining SQLite databases. SQLite databases are a popular option for data storage on mobile devices. Fortunately for forensic investigators, they are easily parsed by applications such as E3, which makes the information contained within much easier to retrieve and analyze.

12. In the Case Content pane, **select** the **Installed Application List grid** and **review** the contents in the Data Viewer.

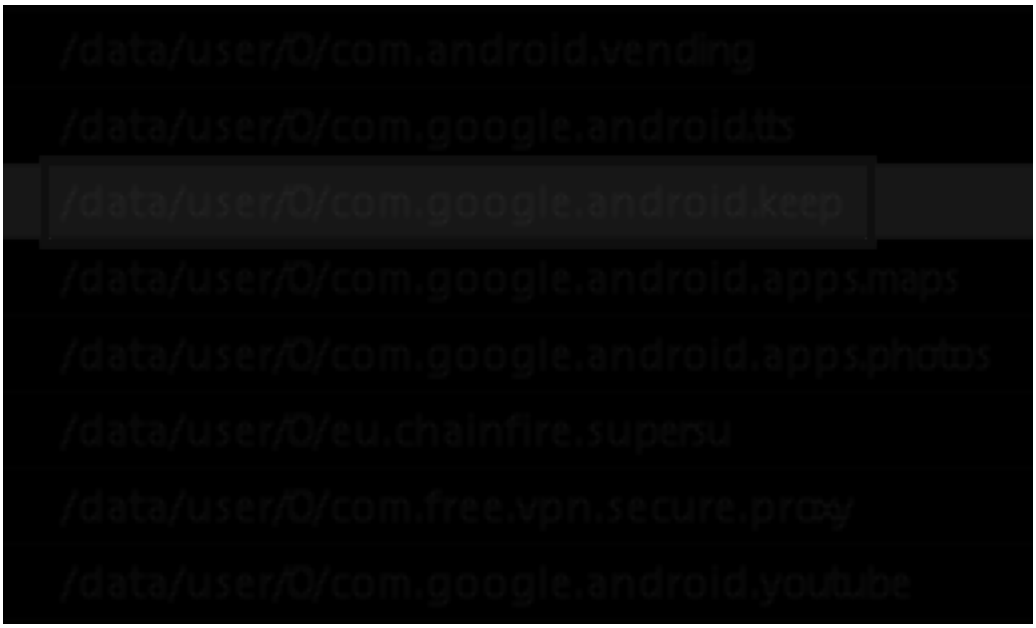


Installed Application List

13. In the Data Viewer, **select** the **Keep Notes app**, then **scroll to the right** to the **Raw Application Data column**, which contains the location of the raw application data within the filesystem.

Note: Similar to Notes on iOS, Keep Notes is a popular app for creating personal notes on Android.

14. Under the Raw Application Data column, **click** the **file path link** to open the folder's location within the file system in a new tab.



Raw Application Data file path

Note: You may notice that the Case Content pane now displays a location deep within the Android file system. This is where digital forensics tools like E3 really demonstrate their value, as you would otherwise need to be sufficiently familiar with the Android file system to manually drill down into this specific location.

15. In the Data Viewer, **navigate** to **databases / keep.db / SQLite Database / Tables** to display the contents of the database.

Note: SQLite databases are commonly used in mobile apps for storing an application's core data, including application data, permissions, and file locations. SQLite databases are composed of tables, which in turn contain the actual data organized into rows and columns. In this case, you should see 52 tables within the SQLite database for Keep Notes.

16. In the Case Content pane, **navigate** to **list_item / list_item 1-5** and **review** the contents of the table for potential evidence.

Note: Within the table, you should see five records containing the text contents of the suspect's notes. Of the five notes, two appear to make reference to license plate numbers.

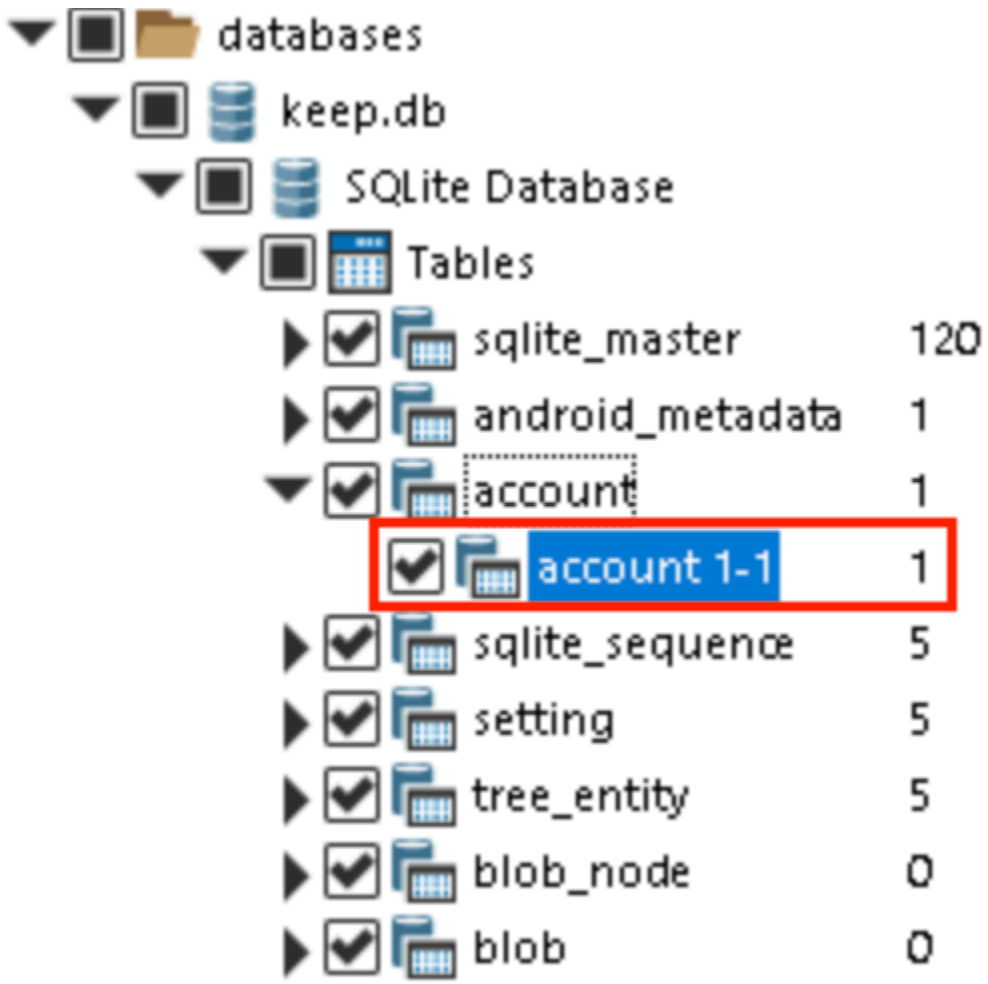
In a real-world investigation, you would more than likely need to spend time digging through different tables before finding relevant evidence.

17. **Make a screen capture** showing the **contents of the list_item 1-5 table**.

18. **Create a bookmark** for the two records containing references to license plates.

19. In the Case Content pane, **navigate** to **Tables / account / account 1-1** and **review** the contents of the table for potential evidence.

    You may need to expand the Items column header in the Case Content pane to see the full file tree.



Account 1-1

Note: The account table will provide the account name for the user that set up the Keep Notes account. In this case, you should see an email address – julriley1990@gmail.com. Given that you've already confirmed the phone belongs to Bonnie, and given that Bonnie and Clyde are almost certainly fake names, this email address may be a critical clue to Bonnie's actual identity.

20. **Make a screen capture** showing the **Keep Notes account owner**.

21. **Create a bookmark** for the account record containing the email address.

22. **Generate** a **Mobile Evidence PDF Report**.

23. **Make a screen capture** showing the **Investigative Report's Table of Contents**.

24. **Close** any **open windows**.

Note: This concludes Section 2 of the lab.

Section 3: Challenge and Analysis

Part 1: Research Report Writing for Digital Forensics

In Sections 1 and 2, you generated formal investigative reports that documented the evidence you located in both the iPhone and Android. However, you did not include a Case Summary or Conclusion.

Review the Introduction to Report Writing for Digital Forensics provided by the SANS Institute at https://web.archive.org/web/20210303184323/https://www.sans.org/blog/intro-to-report-writing-for-digital-forensics/ for guidance on report writing. You may also conduct additional research of your own.

Prepare a brief summary of the appropriate structure and best practices for preparing a digital forensics report.

Part 2: Draft a Forensic Report

Now that you have a better handle on the art and science of writing reports for digital forensic investigations, you will fill in the gaps that you left when you generated your investigative reports in Sections 1 and 2. Using the following template, prepare a simple report documenting the circumstances of the case, the evidence you found, and the conclusions you drew as a result.

Case Summary

Findings and Analysis

Conclusion

Note: This concludes Section 3 of the lab.