

Case Study 3 - Physical Analyzer (Android Investigation)

Aloysius Egbo Ike

Mobile Forensic

May 7, 2024

#### **Executive Summary**

The use of smart phones as a tool for communication and most especially, the iPhone, is growing at a rapid rate globally. As at 2023, Apple's IPhone which exclusively runs the iOS rated as the best selling smartphone of 2023.

While phones generally are handy for fast communication, some people use them for bad things like illegal activities through calls, texts, or online actions. Social media sites like Facebook, Instagram, Twitter, and WhatsApp are also sometimes used for these kinds of activities. This makes it a vital evidentiary exhibit during investigations.

The case study aims to teach about forensic analysis of mobile devices, focusing on locating important data for investigations. The extraction summary content is reviewed to understand what information is available from the mobile device, although not all data may be fully decoded or supported.

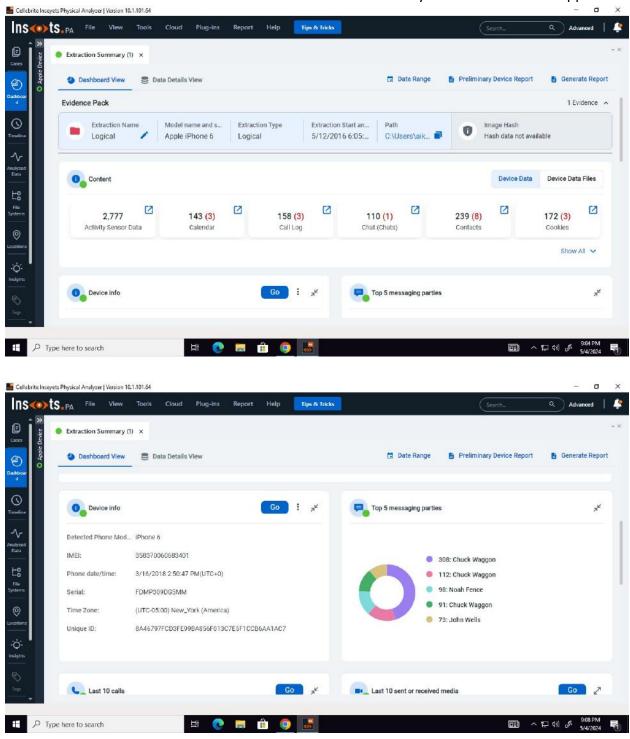
Various aspects of the mobile device are examined, including deleted calendar events, user accounts, drone activity, and cloud data sources. Specific questions are answered, such as the number of deleted calendar events, the phone model, and the presence of drone flights.

Furthermore, the investigation explores in details email addresses associated with Apple ID, cloud data sources detected on the device, and decoded chat applications. Additionally, multimedia files and images are analyzed to determine if any photos were taken with a drone and if location information can provide insights into the user's activities.

This case study provides hands-on experience in mobile forensics using Cellerbrite, teaching how to extract and analyze data from mobile devices to gather evidence for investigations. By answering specific questions and examining various data points, students learn the techniques and tools used in mobile forensic analysis.

#### Part 1.

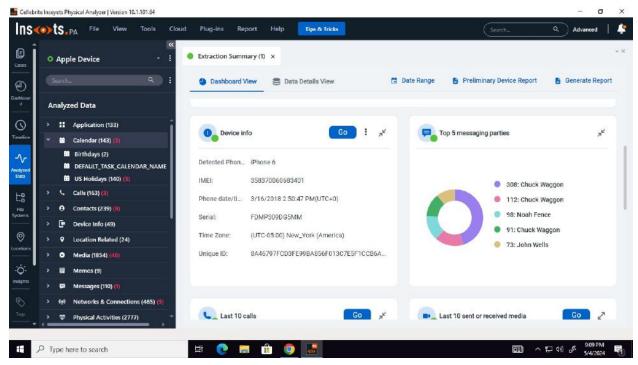
- 1. Review the Extraction Summary Content.
  - a. NOTE: All information from the mobile device may not be decoded or supported.



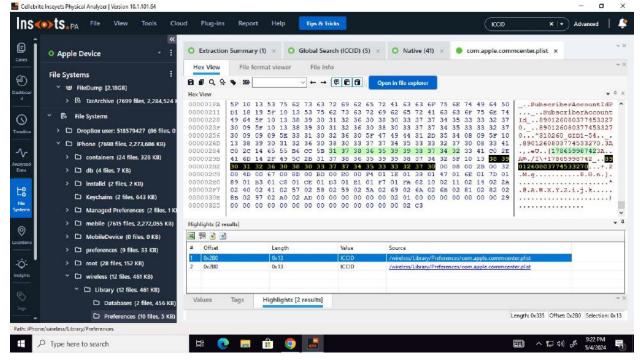
Part 2.

1. How many deleted calendar events are located on the device?

Answer: There are three calendar events that have been deleted and are currently stored on the device.

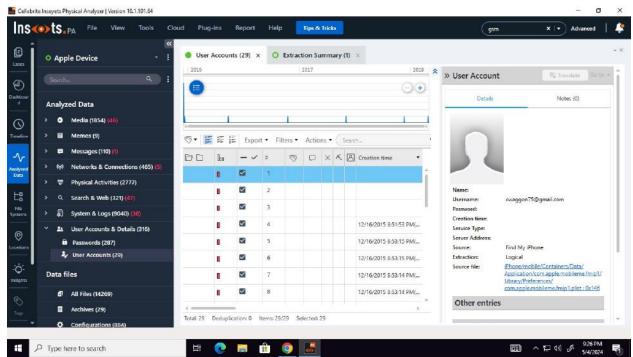


2. What is the source file or location for the ICCID? Is the phone GSM or CDMA? Answer: The last known ICCID is 8901260803774533270 and The Source file or location is com.apple.commcenter.plist



3. How many user accounts are listed?

Answer: There are 29 accounts listed.



4. Was a drone flown on this device?

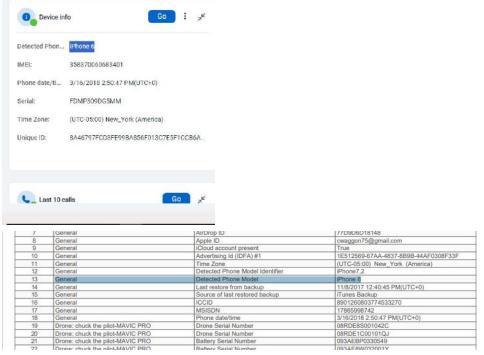
Answer: yes, by looking at the preliminary report, a drone was flown on this device.

17	General	IMPIPDIA	1/000990/42
18	General	Phone date/time	3/16/2018 2:50:47 PM(UTC+0)
19	Drone: chuck the pilot-MAVIC PRO	Drone Serial Number	08RDE8S001042C
20	Drone: chuck the pilot-MAVIC PRO	Drone Serial Number	08RDE1C00101QJ
21	Drone: chuck the pilot-MAVIC PRO	Battery Serial Number	093AEBP0330549
22	Drone: chuck the pilot-MAVIC PRO	Battery Serial Number	093AE8W032001Y
23	Drone: Phantom3	Drone Serial Number	03Z1075127
24	Drone: Phantom3	Battery Serial Number	6171162703315
25	iPhone	ICCID	8901260803774533270
26	iPhone Detected Phone Model Identifier		iPhone7.2

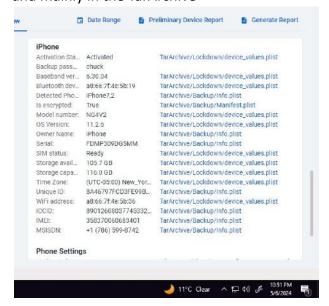
5. If a device was flown with this device, can we determine how many drone serial numbers were recorded?

Answer: Three drones serial numbers that was recorded are 08RDE8S001042C, 08RDE1C00101QJ and O3Z1075127 from the above screenshot.

6. What model of phone was the source for the data extractions? Answer: The Phone model was iPhone 6.



7. Where in the file system is the phone information located? Answer: The phone information is located in the logical section of the extraction summary and mainly in the TarArchive



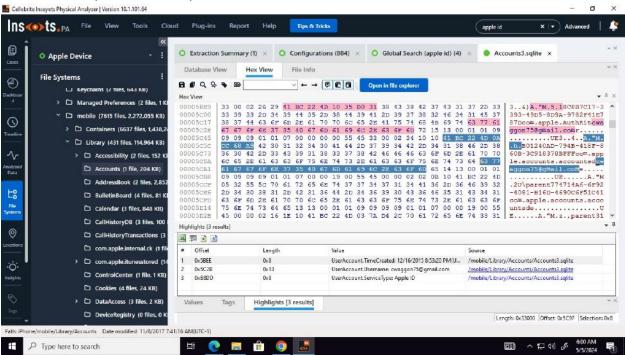
8. What email address was associated with the device Apple ID?

Answer: Email address associated with the device Apple ID is cwaggon75@gmail.com

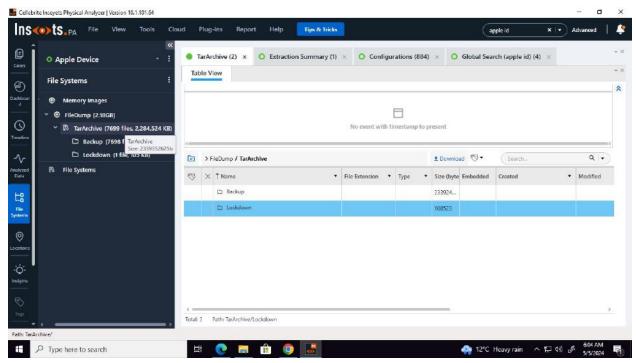


9. What is the source file link, and location of the Apple ID (email address) information in the File System?

Answer: The Apple ID information File System revealed the source file link to be /mobile/Library/Accounts3.sqlite



10. What is the file extension for the Memory Image extraction, for the File Dump? Answer: The TAR file extension used, when extracting memory images for file dump. This extension format is used for compressing and archiving files using the Tape Archive (TAR) format. The TAR format is frequently used in Unix and Linux systems to bundle multiple files and directories into a single file, making it easier for storage and transfer.



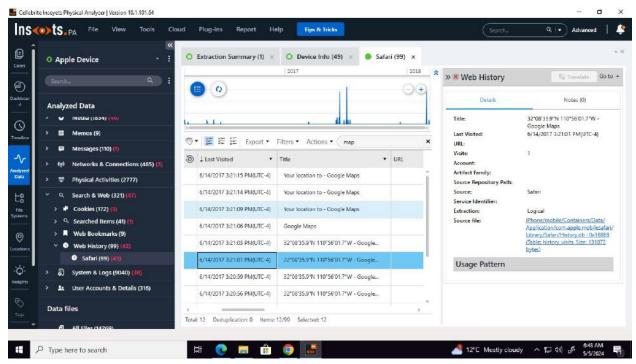
11. How many Cloud Data Sources were detected on the device with supported access? Answer: There are two (2) Cloud Data Sources detected on the device. GoogleDrive and Dropbox.



12. Based on the Chats tab, how many chat applications were decoded? Answer: 15 Chat Applications were decoded

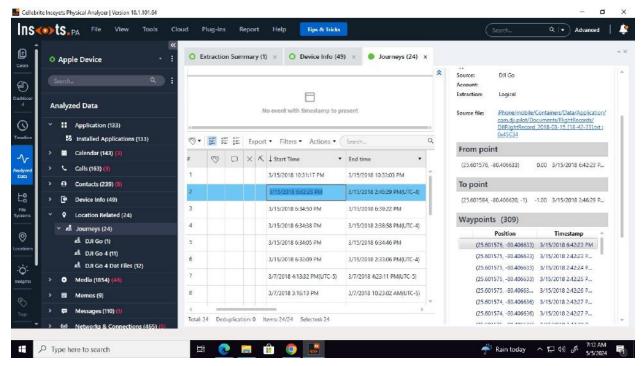


13. What was the title of the Journeys entry associated with a web history? Answer: 32°08'35.9"N 110°56'01.7"W-Google Maps was the title of the journey entry associated with a web history.

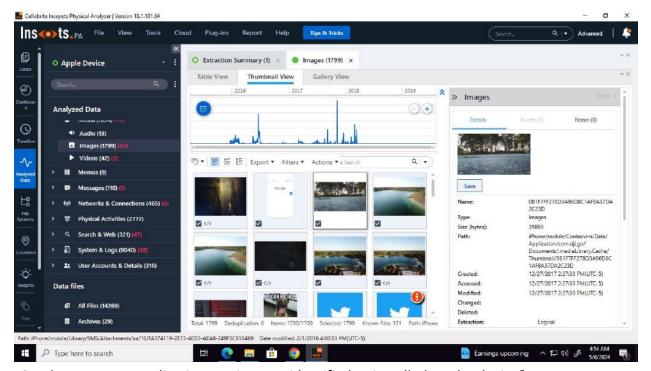


14. How many Waypoints were recorded during the drone flight ending on 3/15/2018 at 18:46?

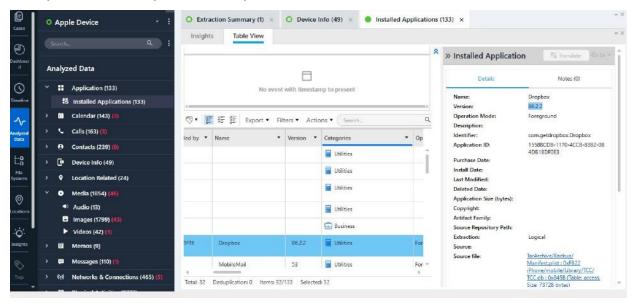
Answer: The drone flight recorded 309 waypoints, on 3/15/2018 at 18:46. These waypoints are specific locations or coordinates that are pre-programmed into the drone's flight path, serving as a guide for the drone to follow along a designated route during its flight.



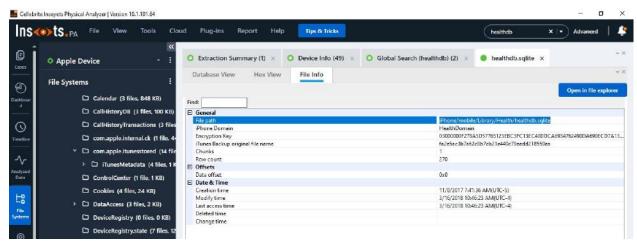
15. How many known images were identified on the device? Answer: There are 121 known images identified on the device.



16. What DropBox application version was identified as installed on the device? Answer: The DropBox application version identified as installed on the device is 86.2.2

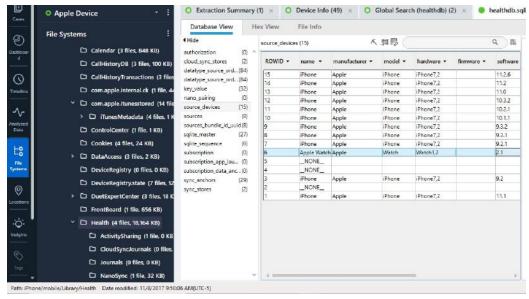


17. What is the path to the healthdb.sqlite file in the file system? Answer: iphone/mobile/Library/health/healthdb.sqlite

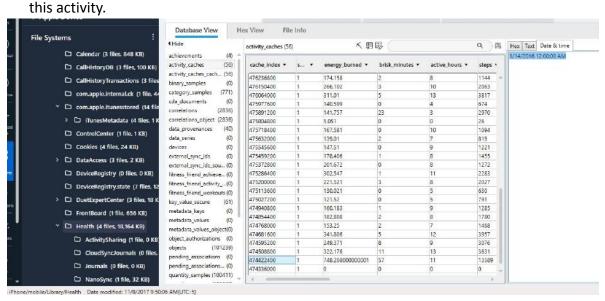


18. Whithin the healthdb.sqlite database, which table(s) reveals the name of an additional device being used by Chuck?

Answer: From the Database View, the source\_devices table reveals that he has an Apple Watch



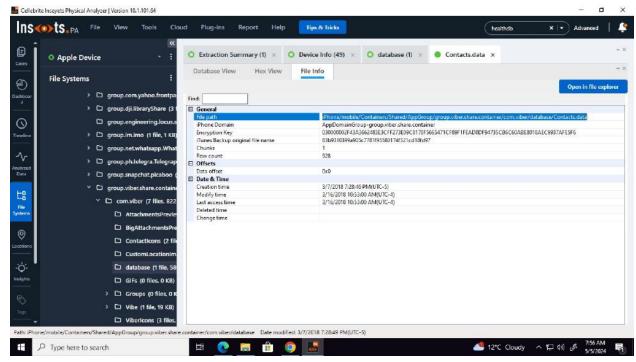
19. Open the healthdb\_secure.sqlite and select the activity\_chart table. In the steps column, filter to the 13589 steps record. Using the value provided in the cache\_index column, what is the date that Chuck Waggon completed this activity? Answer: 1/14/2016 12:00:00 AM appears to be the date that Chuck Waggon completed



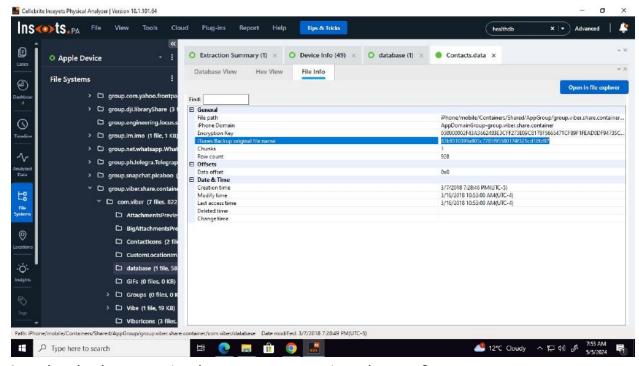
20. What is the path and Viber contacts file name?

Answer: The path is

IPhone/mobile/Containers/Shared/AppGroup/group.viber.share.container/com.viver/database/Contacts.data

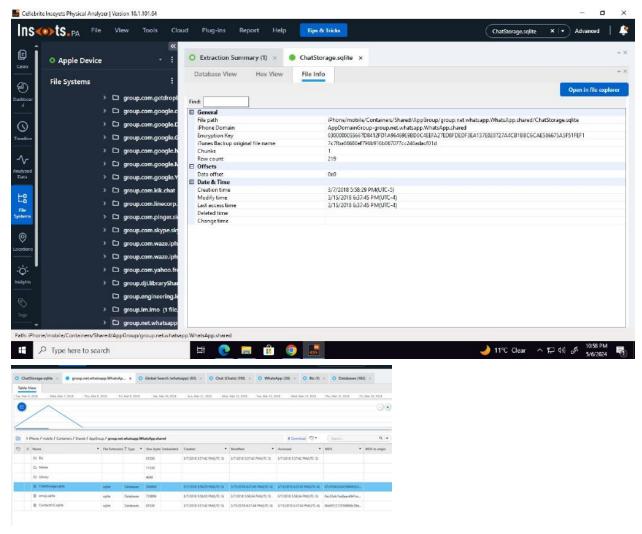


And the file name is: 83b9310399a905c7781f95580174f321cd18fd97



21. What database contains the messages sent using WhatsApp?

Answer: The database that contains the messages sent using Whatsapp is ChatStorage.sqlite

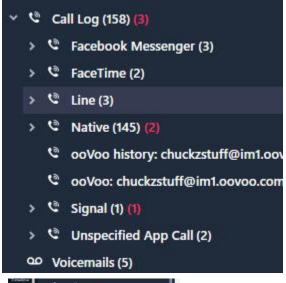


22. With whom did Chuck speak using the Viber application?

Answer: 12138673854 incoming call and Outgoing call 12675784074 but cannot tell who the contact is. This is as shown in the Figure below.

	$\sim$	5		Ford Parker	PhoneBook	_\$! <mobile>!\$_ 12167032945</mobile>
		6		Incoming Sideline Call	PhoneBook	12138673854
		7	×	Joe -John Wells Friend		
		8		Joe -John Wells Friend	PhoneBook	_\$! <mobile>!\$_ 16164251781</mobile>
0	$\checkmark$	9		John Freeman	PhoneBook	_\$! <mobile>!\$_ 14783657186</mobile>
8	<b>☑</b>	10		John Wells	PhoneBook	_\$! <mobile>!\$_ 16142095096 Old number 16142861412</mobile>
0	$\checkmark$	11		Les Cheatum	PhoneBook	_\$! <mobile>!\$_ 14043982128</mobile>
		12		Manual Trabajo	PhoneBook	_\$! <mobile>!\$_ 15092166844</mobile>
	<b>V</b>	13		Noah Fence	PhoneBook	_\$! <other>!\$_ 14075303868 _\$!<other>!\$_ 14752091229 _\$!<mobile>!\$_ 16468817687</mobile></other></other>
		14		Outgoing Sideline Call	PhoneBook	12675784074

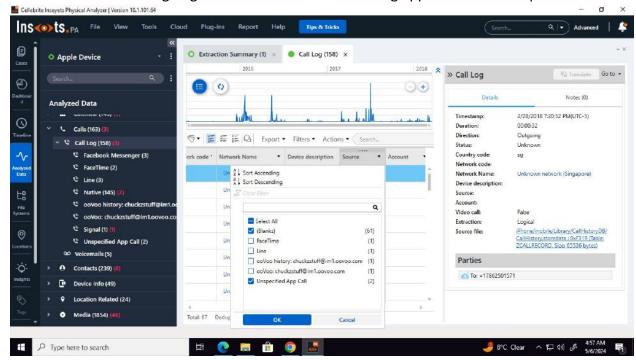
23. How many sources were used to compile the total Calls Log number? Answer: Seven different sources were used to compile the total calls log number



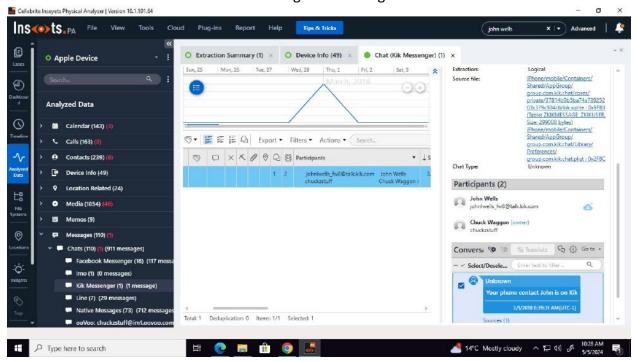


24. How many outgoing calls were made without using applications on the phone?

Answer: Total of 63 outgoing calls were made without using applications on the phone

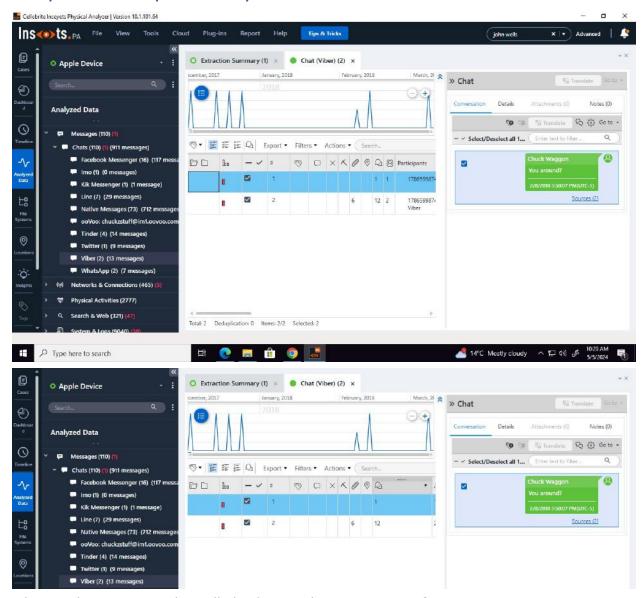


25. With whom did Chuck chat with using Kik Messenger? Answer: Chuck chatted with John Wells using Kik Messenger.



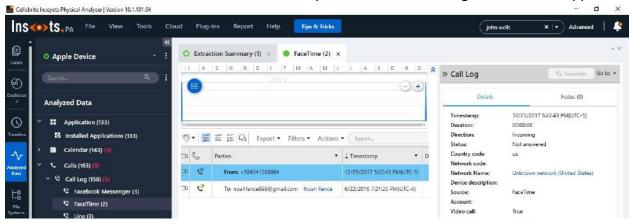
26. How many Viber chat sessions are recorded? How many messages are contained in the Viber sessions?

Answer: Two Viber chats sessions were recorded and 13 messages are contained as seen in the second screenshot of No 26 below.



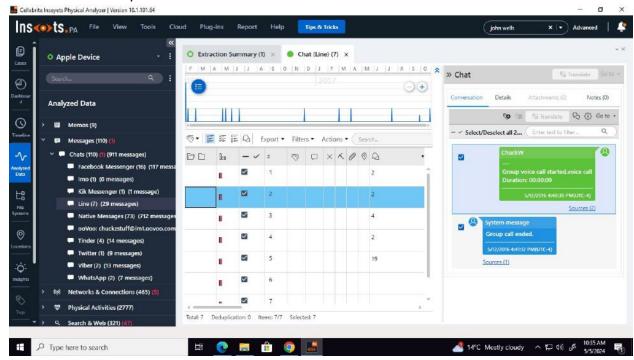
27. Who or Whom attempted to call Chuck using the FaceTime App?

Answer: +584241288864 and Noah Fence attempted to call Chuck using the FaceTime App.



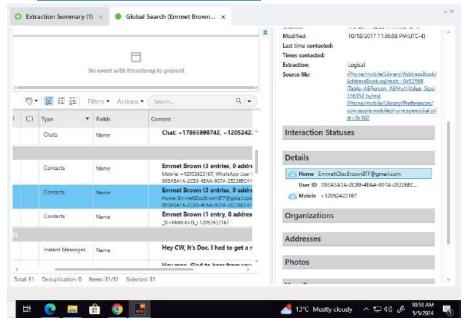
28. Within Chats, determine the name of the Group call Chuck made on 12 May 2016?

Answer: Line Group call



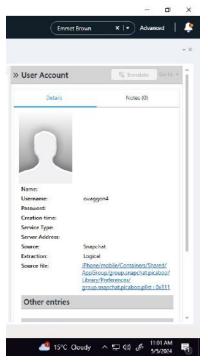
29. What is Emmet Brown's email address?

Answer: EmmettDocBrownBTF@gmail.com

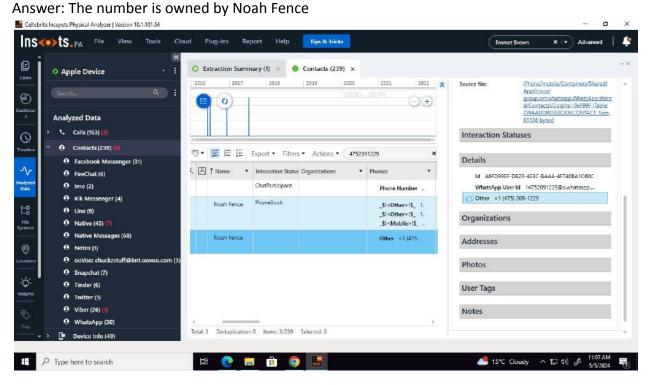


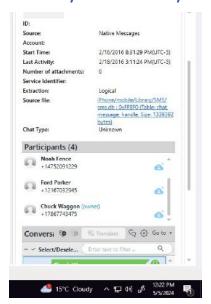
30. What is Chuck's Snapchat username?

Answer: Chuck's Snapchat username is Cwaggon4

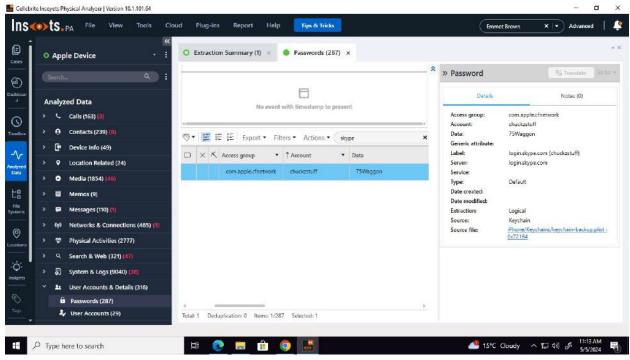


31. Who owns the following phone number: 475-209-1229?

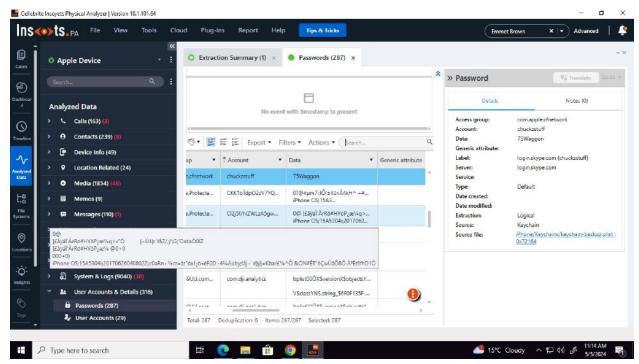




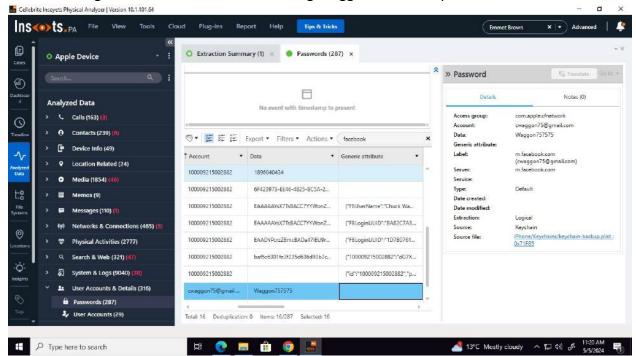
32. What is Chuck's Skype password? (does he use one password for everything?) Answer: Chuck's Skype password is 75Waggon.



No, he doesn't use it for everything as different accounts have different data.

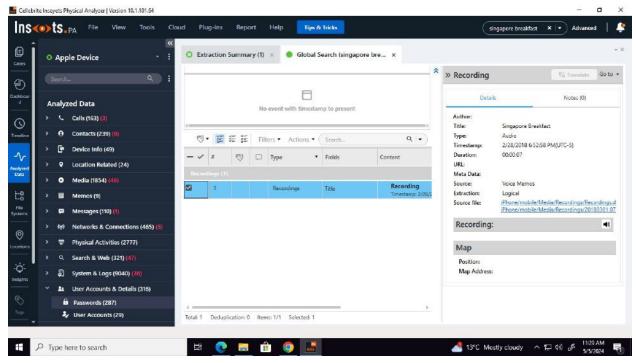


33. The identity Chuck Waggon signed into a Facebook account. What password was used? Answer: He signed into Facebook account using Waggon757575 as password

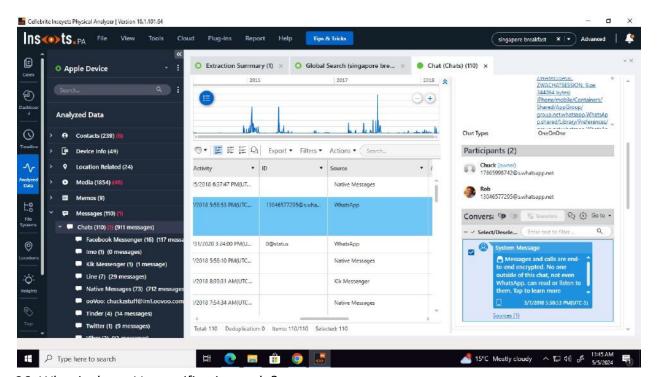


34. Do any audio recordings exist with an association to breakfast in Singapore, if one exists, what is its duration?

Answer: Yes, an audio recording exists with an association to breakfast in Singapore. The duration is 00:00:07

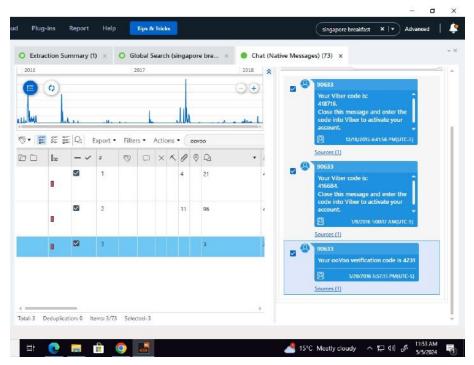


35. What contact received an invitation to WhatsApp, sent from the Chuck Waggon phone. Answer: Rob was the contact that received an invitation to WhatsApp, sent from the Chuck Waggon phone.

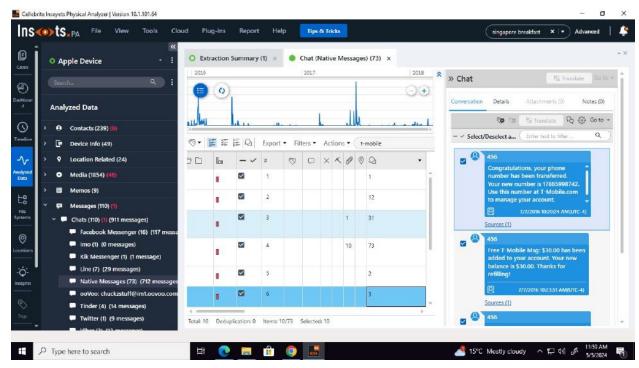


36. What is the ooVoo verification code?

Answer: The ooVoo verification code is 4231

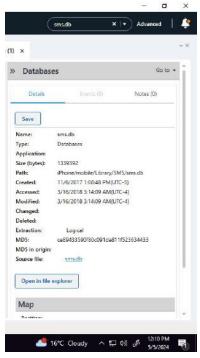


37. Which cellphone provider(s) are used to provide cellular services for the phone? Answer: T-mobile



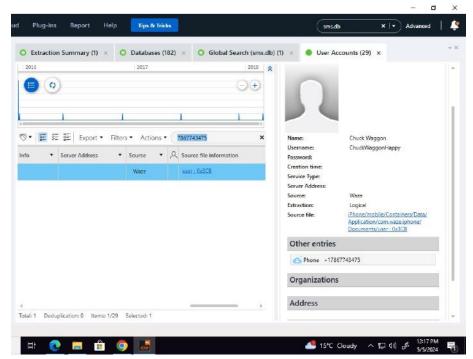
38. In which database are the SMS's located?

Answer: The location of the SMS is in the SMS.db.



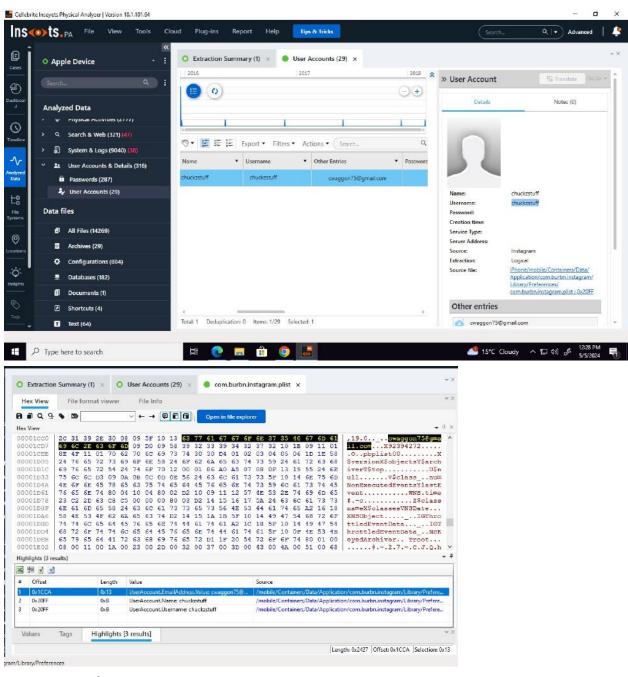
39. The phone number +1 786-774-3475 is associated with applications on the device. By reviewing the User Accounts and names, with which application is the number associated?

Answer: Waze is the application which the number is associated with.



40. What is Chuck's Instagram username? Where in the file system is this information located?

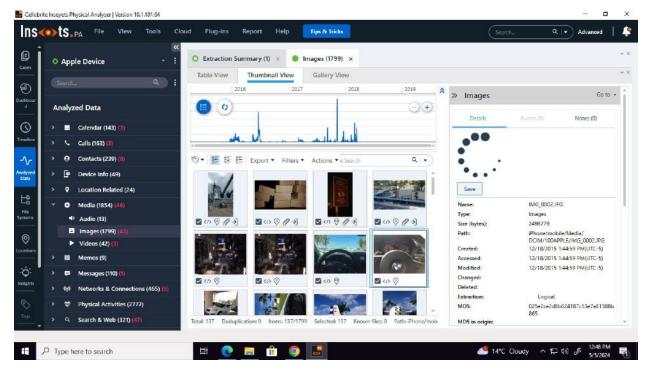
Answer: Username is chuckzstuff and it is located at /mobile/Containers/Data/Application/com.burbn.instagram/Library/Preferences/com.burbn.instagram.plist



**Image Analysis**: for the following questions, remain within the Images category only.

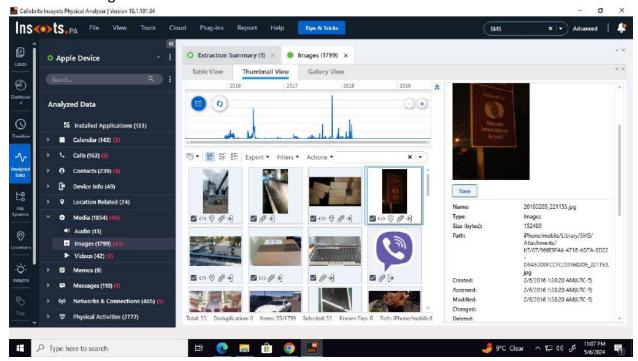
1. How many photos have location information?

Answer: There are 137 photos that have location information



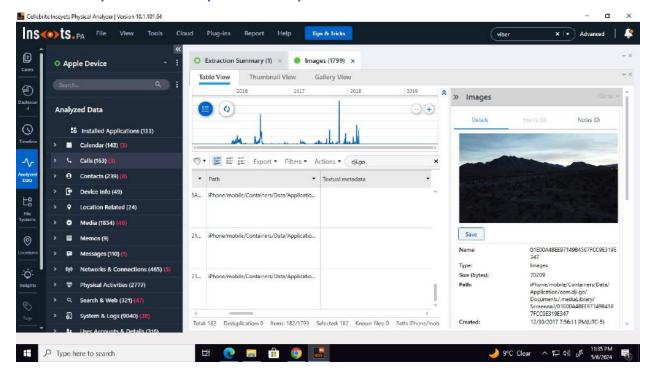
2. Using the Folder View tab, how many JPG images are saved in the SMS/Attachments folder?

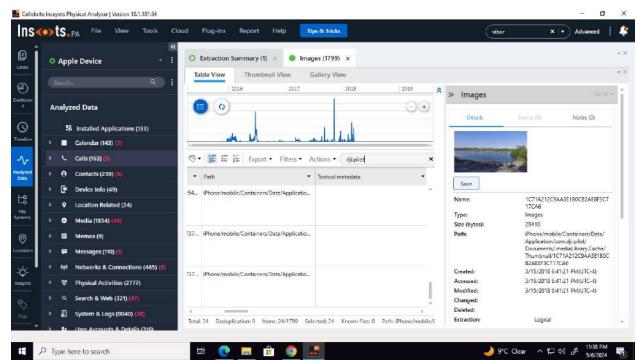
Answer: 55 Images



3. Were any pictures taken with a drone? If yes, how many?

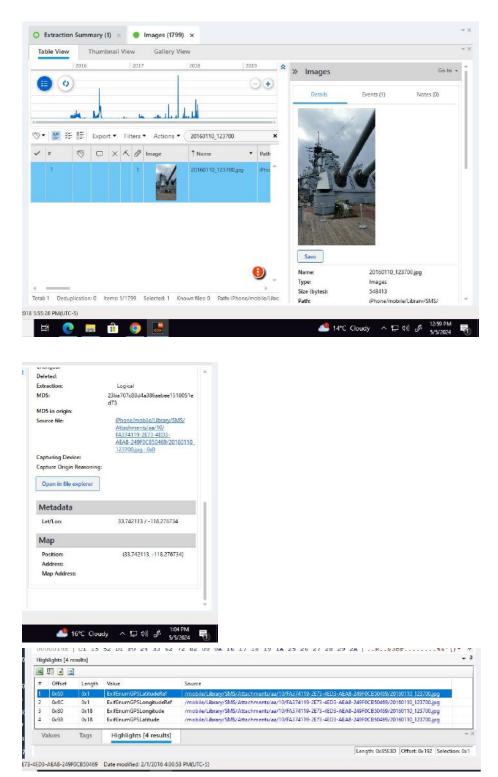
Answer: 206 pictures were taken with the use of a drone.





4. Where was the image 20160110\_123700.jpg taken? Was the image taken by the iPhone or sent to this phone?

Answer: Location is (33.742113, -118.276734) and it was sent via SMS to the phone.



5. Based only on the photos taken by the device on 25 January 2016, can we deduce where the phone operator may have eaten?

Answer: Based on the photos taken on January 25th, it seems likely that the phone operator dined at Shorty's Bar BQ.

