



# Autopsy and iPhone Forensics

Cybersecurity  
Digital Forensics Day 2



# Class Objectives

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By the end of class, you will be able to:




Identify the methods used in smartphone forensics investigations.



Navigate the database and file structure of an iPhone's flash drive.



Locate identifiable evidence on an iPhone in order to establish ownership.



Use Autopsy to view and tag evidence in an iPhone image.




Extract image content for offline viewing in other applications.

In the previous class, we covered the basic principles of digital forensic methodologies and used Autopsy to preserve and document evidence.



Today, we will hone in on mobile forensics and continue the National Gallery investigation, using Autopsy to view and tag evidence from an iPhone image.





# Where's the Data?

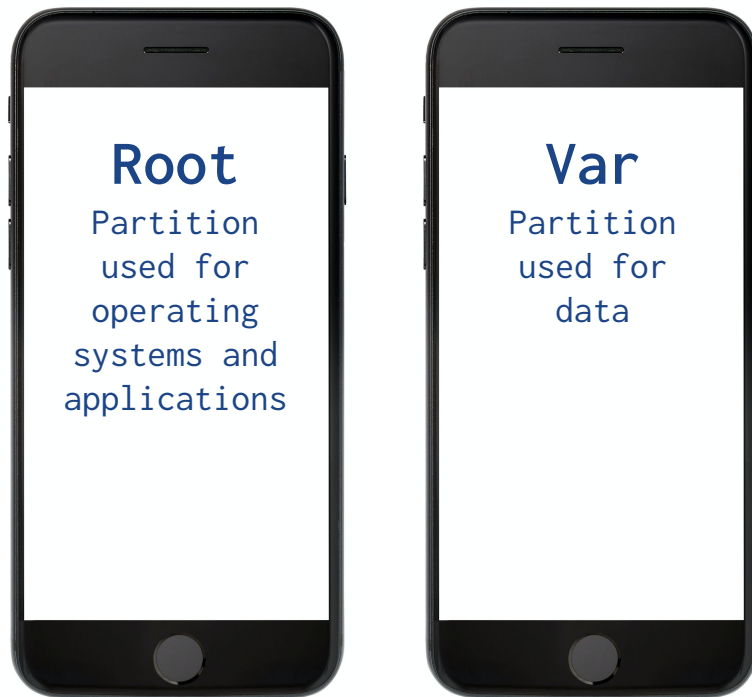
## File Systems and Data Storage

# Where's the Data? File Systems and Data Storage

It's important to know where data is stored, how to access it, and how to recover it.

iPhones use **flash memory**.

Flash memory contains two disk partitions:



## REMEMBER

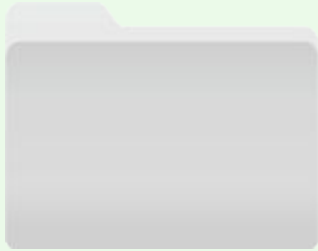
Data is first imaged using a **bit-level copy**.

iPhone texts, GPS coordinates, and cell tower locations can all be recovered.

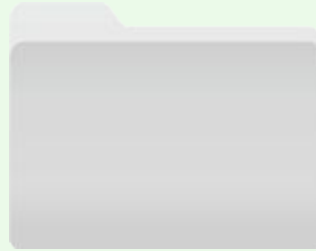
# Important Directories, Databases, and Files

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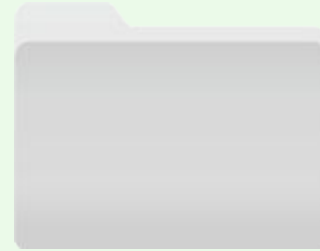
The following directories are worth investigating for evidence:



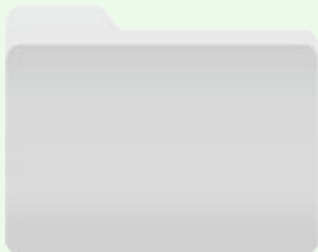
`/mobile`



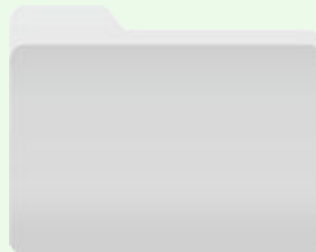
`/Applications`



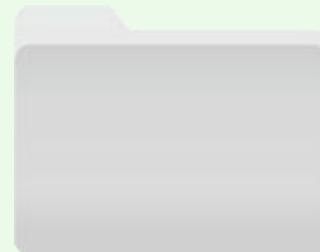
`/Library`



`/root`



`/Logs`



`/logs`



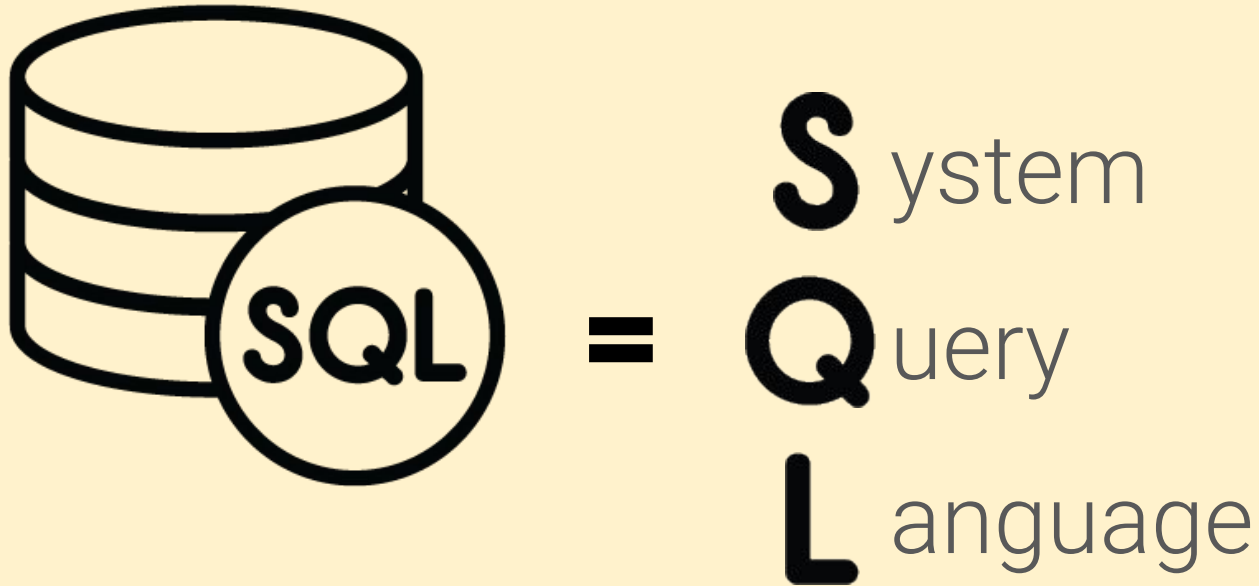
iPhone users store data in  
SQL databases and other files.



# Important Directories, Databases, and Files

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SQL (System Query Language) is a programming language used to read, write, and update database files.



# Important Directories, Databases, and Files

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NAME	CONTENTS
AddressBook.sqlitedb	Contact info, personal data like name, email address, etc.
AddressBookImages.sqlitedb	Images associated with saved contacts.
Calendar.sqlitedb	Calendar details and events information.
CallHistory.db	Call logs including phone numbers and timestamps.
sms.db	Text and multimedia messages along with timestamps.
voicemail.db	Voicemail messages.
Safari/Bookmarks	Saved URL addresses.
Envelope Index	Email addresses on phone.
consolidated.db	GPS tracking data.
locationd	Google coordinates of locations.

# Important Directories, Databases, and Files

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iPhone also has data stored in Property Lists (`plist`s).



`plist`s store configuration information, call history, and cache information.



`Maps/History.plist` tracks location searches.



`Map/Bookmarks.plist` contains bookmarks.

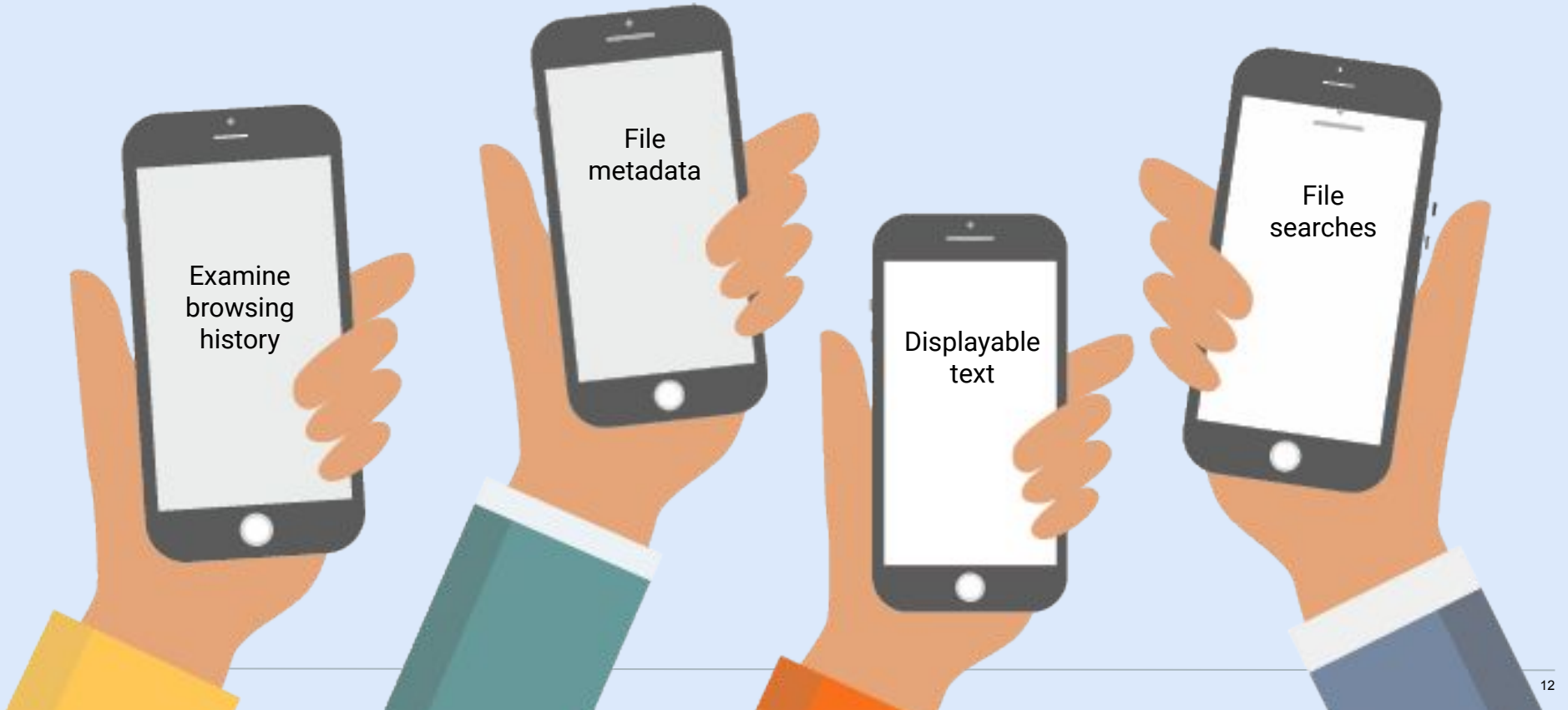


`Safari/History` contains internet browsing history.

# Demo Introduction

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In this demonstration, we will walk through various ways to obtain evidence.





# Instructor Demonstration

## Evidence Analysis with Autopsy



## **Activity:** Mobile Evidence Analysis

In this activity, you will analyze evidence and document the details of Tracy's iPhone.

**Suggested Time:**  
50 Minutes





**Time's Up!** Let's Review.

A close-up, high-angle shot of a computer keyboard. The central focus is a large, white, rectangular key with rounded corners. On this key, there is a dark blue icon of a coffee cup with three wavy lines above it representing steam. Below the icon, the word "Break" is printed in a dark blue, serif font. The key is set against a light-colored, textured keyboard surface. Other keys are visible in the background, including one with a double quote symbol and another with a dash/slash symbol, but they are out of focus.

Break



# Tagging Evidence

# Tagging Evidence

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We can use Autopsy to tag evidence.



**Evidence tagging** is the process of bookmarking evidence to keep critical details organized and easily accessible.



Autopsy includes an evidence-tagging feature that allows investigators to easily locate evidence contained in the program.

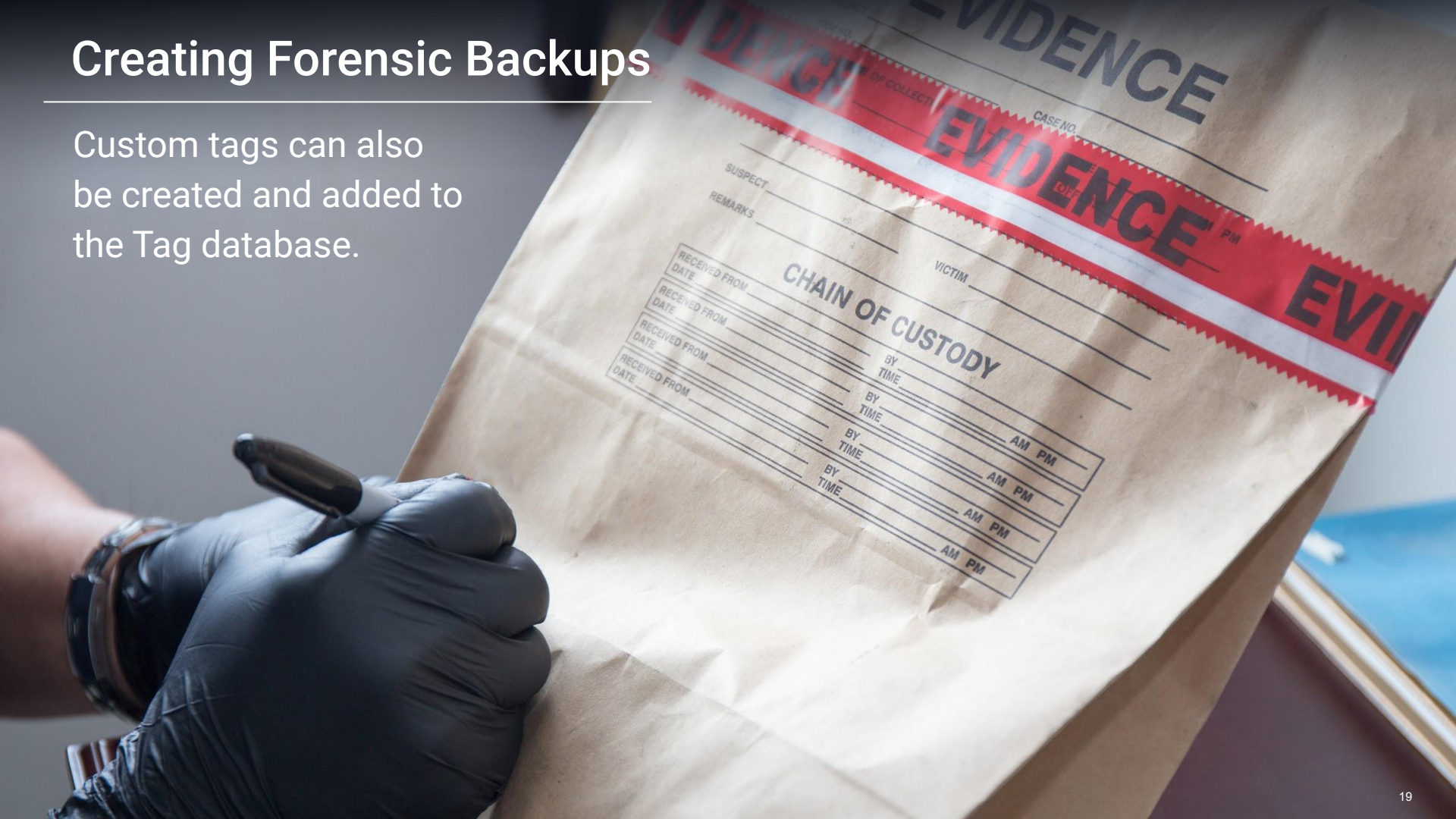


Pre-defined tags include:

- Follow Up
- Notable Item
- Child Exploitation
- Uncategorized
- Non-Pertinent

# Creating Forensic Backups

Custom tags can also be created and added to the Tag database.





In the following walkthrough, we'll tag and bookmark the SMS database, which contains sent and received iPhone messages.



## **Activity:** Tagging Evidence

In this activity, you will tag the major databases and files in the iPhone image file.

**Suggested Time:**  
50 Minutes





**Time's Up!** Let's Review.

# Extracting Data for Offline Analysis







Offline viewing refers to the process of viewing files outside of the main program, in this case, Autopsy.




Sometimes investigators use other applications for further offline analysis. This is because:



Not all data types can be rendered in Autopsy.



Other tools can analyze video, photo, and audio files in more depth. E.g., photos may need to be enlarged, audio may need voice recognition, and video may need to be enhanced for facial recognition.



Database information can easily be transferred to spreadsheets or word documents where it can be manipulated into reports.





In the following  
walkthrough, we'll extract  
files and directories for  
offline viewing.



# Instructor Demonstration

## Offline File Extraction



## **Activity:** Extracting Data for Offline Analysis

In this activity, you will export files for offline examination.

**Suggested Time:**  
20 Minutes





**Time's Up!** Let's Review.

# Wrap-Up

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As a forensic investigator, you will work with a team as part of a large collaborative effort.

It's critical to understand how to use tools such as Autopsy and how to export data, allowing other team members to perform offline analysis of evidence.



# Wrap-Up

Tagging helps categorize and label evidence that has already been screened.

This eliminates double work and helps other investigative team members continue your work if you become unavailable.

**EVIDENCE**

Agency \_\_\_\_\_

Item No. \_\_\_\_\_ Case No. \_\_\_\_\_

Date of Collection \_\_\_\_\_ Time of Collection \_\_\_\_\_

Collected By \_\_\_\_\_

Description of Evidence \_\_\_\_\_

Location of Collection \_\_\_\_\_

Type of Offense \_\_\_\_\_

Victim \_\_\_\_\_

Suspect \_\_\_\_\_

**CHAIN OF CUSTODY**

Received From \_\_\_\_\_ By \_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_

Received From \_\_\_\_\_ By \_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_

Received From \_\_\_\_\_ By \_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_

**EVIDENCE**





Next class, we will continue our investigation by analyzing email messages, SMS messages, and web history, in order to tie Tracy to the case.



Questions?

*The  
End*