FOR585: **Smartphone Forensic Analysis In-Depth**

GASF
Advanced Smartphone Forensics
www.giac.org/gasf

6 Day Program	36 CPEs	Laptop Required

You Will Be Able To

- Select the most effective forensic tools, techniques, and procedures for critical analysis of smartphone data
- Reconstruct events surrounding a crime using information from smartphones, including manual timeline development and link analysis (e.g., who communicated with whom, where, and when) without relying on a tool
- Understand how smartphone file systems store data, how they differ, and how the evidence will be stored on each device
- Interpret file systems on smartphones and locate information that is not generally accessible to users
- Identify how the evidence got onto the mobile device – we'll teach you how to know if the user created the data, which will help you avoid the critical mistake of reporting false evidence obtained from tools
- Incorporate manual decoding techniques to recover deleted data stored on smartphones and mobile devices
- Tie a user to a smartphone at a specific date/time and at various locations
- Recover hidden or obfuscated communication from applications on smartphones
- Decrypt or decode application data that are not parsed by your forensic tools
- Detect smartphones compromised by malware and spyware using forensic methods
- Decompile and analyze mobile malware using open-source tools
- Handle encryption on smartphones and bypass, crack, and/or decode lock codes manually recovered from smartphones, including cracking iOS backup files that were encrypted with iTunes

FOR585: Smartphone Forensic Analysis In-Depth will help you understand:

- Where key evidence is located on a smartphone
- How the data got onto the smartphone
- How to recover deleted mobile device data that forensic tools miss
- How to decode evidence stored in third-party applications
- How to detect, decompile, and analyze mobile malware and spyware
- Advanced acquisition terminology and free techniques to gain access to data on smartphones
- How to handle locked or encrypted devices, applications, and containers

SMARTPHONES HAVE MINDS OF THEIR OWN. DON'T MAKE THE MISTAKE OF REPORTING SYSTEM EVIDENCE, SUGGESTIONS, OR APPLICATION ASSOCIATIONS AS USER ACTIVITY.
IT'S TIME TO GET SMARTER!

A smartphone lands on your desk and you are tasked with determining if the user was at a specific location at a specific date and time. You rely on your forensic tools to dump and parse the data. The tools show location information tying the device to the place of interest. Are you ready to prove the user was at that location? Do you know how to take this further to place the subject at the location of interest at that specific date and time? Tread carefully, because the user may not have done what the tools are showing!

Mobile devices are often a key factor in criminal cases, intrusions, IP theft, security threats, accident reconstruction, and more. Understanding how to leverage the data from the device in a correct manner can make or break your case and your future as an expert. FOR585: Smartphone Forensic Analysis In-Depth will teach you those skills.

Every time the smartphone thinks or makes a suggestion, the data are saved. It's easy to get mixed up in what the forensic tools are reporting. Smartphone forensics is more than pressing the find evidence button and getting answers. Your team cannot afford to rely solely on the tools in your lab. You have to understand how to use them correctly to guide your investigation, instead of just letting the tool report what it believes happened on the device. It is impossible for commercial tools to parse everything from smartphones and understand how the data were put on the device. Examination and interpretation of the data is your job and this course will provide you and your organization with the capability to find and extract the correct evidence from smartphones with confidence.

This in-depth smartphone forensic course provides examiners and investigators with advanced skills to detect, decode, decrypt, and correctly interpret evidence recovered from mobile devices. The course features 27 hands-on labs, a forensic challenge, and a bonus take-home case that allow students to analyze different datasets from smart devices and leverage the best forensic tools, methods, and custom scripts to learn how smartphone data hide and can be easily misinterpreted by forensic tools. Each lab is designed to teach you a lesson that can be applied to other smartphones. You will gain experience with the different data formats on multiple platforms and learn how the data are stored and encoded on each type of smart device. The labs will open your eyes to what you are missing by relying 100% on your forensic tools.

Smartphone technologies are constantly changing, and most forensic professionals are unfamiliar with the data formats for each technology. Take your skills to the next level: it's time for the good guys to get smarter and for the bad guys to know that their smartphone activity can and will be used against them!

SMARTPHONE DATA CAN'T HIDE FOREVER – IT'S TIME TO OUTSMART THE MOBILE DEVICE!

> **"With so many security measures put in place by O/S devs and app devs, the analysis techniques taught in this course are an absolute necessity. If the good guys want to stay ahead of the bad guys, this course is a must."**
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> -Luis Martinez, **Westchester District Attorney's Office**

Course Day Descriptions

DAY 1: Smartphone Overview, Misfit Devices, SQLite Introduction, and Android Forensics Overview

Although smartphone forensic concepts are similar to those of digital forensics, smartphone file system structures differ and require specialized decoding skills to correctly interpret the data acquired from the device. On this first course day, students will apply what they know to smartphone forensic handling, device capabilities, acquisition methods, misfit devices, SQLite database examination, and query development. They'll also gain an overview of Android devices and manually crack locked Androids. Students will become familiar with the forensic tools required to complete comprehensive examinations of smartphone data structures. We realize that not everyone examines BlackBerry and knock-off devices, which is why we offer "choose your own adventure" labs, meaning that students can select the labs most relevant to them. BlackBerry 10 smartphones are designed to protect user privacy, but techniques taught on this course day will enable the investigator to go beyond what the tools decode and manually recover data residing in database files of BlackBerry 10 device file systems. Knock-off devices are another outlier than can be parsed and decoded once you become familiar with the file system structures.

Topics: The SIFT Workstation; Malware and Spyware Forensics; Introduction to Smartphones; Smartphone Handling; Forensic Acquisition Concepts of Smartphones; Smartphone Forensics Tool Overview; JTAG Forensics; Smartphone Components; Introduction to SQLite

DAY 2: Core Protocols & Log Aggregation/Analysis

There are countless network protocols that may be in use in a production network environment. We will cover those that are most likely to benefit the forensicator in typical casework, as well as several that help demonstrate analysis methods useful when facing new, undocumented, or proprietary protocols. By learning the "typical" behaviors of these protocols, we can more readily identify anomalies that may suggest misuse of the protocol for nefarious purposes. These protocol artifacts and anomalies can be profiled through direct traffic analysis as well as through the log evidence created by systems that have control or visibility of that traffic. While this affords the investigator with vast opportunities to analyze the network traffic, efficient analysis of large quantities of source data generally requires tools and methods designed to scale.

Topics: Hypertext Transfer Protocol (HTTP): Protocol and Logs; Domain Name Service (DNS): Protocol and Logs; Firewall, Intrusion Detection System, and Network Security Monitoring Logs; Logging Protocol and Aggregation; ELK Stack and the SOF-ELK Platform

Who Should Attend

- Experienced digital forensic analysts
- Media exploitation analysts
- Information security professionals
- Incident response teams
- Law enforcement officers, federal agents, and detectives
- Accident reconstruction investigators
- IT auditors
- Graduates of SANS SEC575, SEC563, FOR500, FOR508, FOR572, FOR526, FOR610, or FOR518 who want to take their skills to the next level

DAY 3: iOS Device Forensics

Apple iOS devices contain substantial amounts of data (including deleted records) that can be decoded and interpreted into useful information. Proper handling and parsing skills are needed for bypassing locked iOS devices and correctly interpreting the data. Without iOS instruction, you will be unprepared to deal with the iOS device that will likely be a major component in a forensic investigation.

Topics: iOS Forensic Overview and Acquisition; iOS File System Structures; iOS Evidentiary Locations; Handling Locked iOS Devices; Traces of User Activity on iOS Devices

DAY 5: Third-Party Application Analysis

This day starts with third-party applications across all smartphones and is designed to teach students how to leverage third-party application data and preference files to support an investigation. The rest of the day focuses heavily on secure chat applications, recovery of deleted application data and attachments, mobile browser artifacts, and knock-off phone forensics. The skills learned in this section will provide you with advanced methods for decoding data stored in third-party applications across all smartphones. We will show you what the commercial tools miss and teach you how to recover these artifacts yourself.

Topics: Third-Party Applications Overview; Third-Party Application Artifacts; Messaging Applications and Recovering Attachments; Mobile Browsers; Secure Chat Applications

DAY 4: iOS Backups, Malware and Spyware Forensics, and Detecting Evidence Destruction

iOS backups are extremely common and are found in the cloud and on hard drives. Users create backups, and we often find that our best data can be derived from creating an iOS backup for forensic investigation. This section will cover methodologies to extract backups and cloud data and analyze the artifacts for each. Malware affects a plethora of smartphone devices. We will examine various types of malware, how it exists on smartphones, and how to identify and analyze it. Most commercial smartphone tools help you identify malware, but none of them will allow you to tear down the malware to the level we cover in class. Up to five labs will be conducted on this day alone! The day ends with the students challenging themselves using tools and methods learned throughout the week to recover user data from a wiped smartphone.

Topics: iOS Backup File Forensics; Locked iOS Backup Files; iCloud Data Extraction and Analysis; Malware and Spyware Forensics; Detecting Evidence Destruction

DAY 6: Smartphone Forensics Capstone Exercise

This final course day will test all that you have learned during the course. Working in small groups, students will examine three smartphone devices and solve a scenario relating to a real-world smartphone forensic investigation. Each group will independently analyze the three smartphones, manually decode data, answer specific questions, form an investigation hypothesis, develop a report, and present findings.

Topics: Identification and Scoping; Forensic Examination; Forensic Reconstruction

FOR585 Training Formats

Live Training

Live Events
sans.org/information-security-training/by-location/all

Summit Events
sans.org/cyber-security-summit

Private Training
sans.org/private-training

Online Training

OnDemand
sans.org/ondemand

Simulcast
sans.org/simulcast