FOR508: **Advanced Incident Response, Threat Hunting, and Digital Forensics**

GCFA
Forensic Analyst
www.giac.org/gcfa

6 Day Program	36 CPEs	Laptop Required

You Will Be Able To

- Learn and master the tools, techniques, and procedures necessary to effectively hunt, detect, and contain a variety of adversaries and to remediate incidents
- Detect and hunt unknown live, dormant, and custom malware in memory across multiple Windows systems in an enterprise environment
- Hunt through and perform incident response across hundreds of unique systems simultaneously using F-Response Enterprise and the SIFT Workstation
- Identify and track malware beaconing outbound to its command and control (C2) channel via memory forensics, registry analysis, and network connection residue
- Determine how the breach occurred by identifying the beachhead and spear phishing attack mechanisms
- Target advanced adversary anti-forensics techniques like hidden and time-stomped malware, along with utility-ware used to move in the network and maintain an attacker's presence
- Use memory analysis, incident response, and threat hunting tools in the SIFT Workstation to detect hidden processes, malware, attacker command lines, rootkits, network connections, and more
- Track user and attacker activity second-by-second on the system you are analyzing through in-depth timeline and super-timeline analysis
- Recover data cleared using anti-forensics techniques via Volume Shadow Copy and Restore Point analysis
- Identify lateral movement and pivots within your enterprise, showing how attackers transition from system to system without detection

FOR508: Advanced Incident Response, Threat Hunting, and Digital Forensics will help you to:

- Detect how and when a breach occurred
- Identify compromised and affected systems
- Perform damage assessments and determine what was stolen or changed
- Contain and remediate incidents
- Develop key sources of threat intelligence
- Hunt down additional breaches using knowledge of the adversary

DAY 0: A 3-letter government agency contacts you to say an advanced threat group is targeting organizations like yours, and that your organization is likely a target. They won't tell how they know, but they suspect that there are already several breached systems within your enterprise. An advanced persistent threat, aka an APT, is likely involved. This is the most sophisticated threat that you are likely to face in your efforts to defend your systems and data, and these adversaries may have been actively rummaging through your network undetected for months or even years.

This is a hypothetical situation, but the chances are very high that hidden threats already exist inside your organization's networks. Organizations can't afford to believe that their security measures are perfect and impenetrable, no matter how thorough their security precautions might be. Prevention systems alone are insufficient to counter focused human adversaries who know how to get around most security and monitoring tools.

The key is to constantly look for attacks that get past security systems, and to catch intrusions in progress, rather than after attackers have completed their objectives and done significant damage to the organization. For the incident responder, this process is known as "threat hunting". Threat hunting uses known adversary behaviors to proactively examine the network and endpoints in order to identify new data breaches.

Threat hunting and Incident response tactics and procedures have evolved rapidly over the past several years. Your team can no longer afford to use antiquated incident response and threat hunting techniques that fail to properly identify compromised systems, provide ineffective containment of the breach, and ultimately fail to rapidly remediate the incident. Incident response and threat hunting teams are the keys to identifying and observing malware indicators and patterns of activity in order to generate accurate threat intelligence that can be used to detect current and future intrusions.

This in-depth incident response and threat hunting course provides responders and threat hunting teams with advanced skills to hunt down, identify, counter, and recover from a wide range of threats within enterprise networks, including APT nation-state adversaries, organized crime syndicates, and hactivists. Constantly updated, FOR508: Advanced Incident Response and Threat Hunting addresses today's incidents by providing hands-on incident response and threat hunting tactics and techniques that elite responders and hunters are successfully using to detect, counter, and respond to real-world breach cases.

ADVANCED THREATS ARE IN YOUR NETWORK – IT'S TIME TO GO HUNTING!

> **"This course provides an awesome view of philosophies of incident handlers – it helped me re-frame and refocus on the important parts of my job!"**
>
> -John Kay, **TD Bank**

Course Day Descriptions

DAY 1: Advanced Incident Response and Threat Hunting

Incident responders and threat hunters should be armed with the latest tools, memory analysis techniques, and enterprise methodologies to identify, track, and contain advanced adversaries and to remediate incidents. Incident response and threat hunting analysts must be able to scale their analysis across thousands of systems in their enterprise. This section examines the six-step incident response methodology as it applies to incident response for advanced threat groups. We will show the importance of developing cyber threat intelligence to impact the adversaries' "kill chain" and demonstrate live response techniques and tactics that can be applied to a single system and across the entire enterprise.

Topics: Real Incident Response Tactics; Threat Hunting; Threat Hunting in the Enterprise; Incident Response and Hunting across Endpoints; Malware Defense Evasion and Identification; Malware Persistence Identification; Investigating WMI-Based Attacks

DAY 2: Intrusion Analysis

Cyber defenders have a wide variety of tools and artifacts available to identify, hunt, and track adversary activity in a network. Each attacker action leaves a corresponding artifact, and understanding what is left behind as footprints can be critical to both red and blue team members. Attacks follow a predictable pattern, and we focus our detective efforts on immutable portions of that pattern. As an example, at some point an attacker will need to run code to accomplish its objectives. We can identify this activity via application execution artifacts. The attacker will also need one or more accounts to run code. Consequently, account auditing is a powerful means of identifying malicious actions. An attacker also needs a means to move throughout the network, so we look for artifacts left by the relatively small number of ways there are to accomplish this part of their mission. In this section, we cover common attacker tradecraft and discuss the various data sources and forensic tools you can use to identify malicious activity in the enterprise.

Topics: Stealing and Utilization of Legitimate Credentials; Advanced Evidence of Execution Detection; Lateral Movement Adversary Tactics, Techniques, and Procedures (TTPs); Log Analysis for Incident Responders and Hunters

Who Should Attend

- Incident response team members
- Threat hunters
- SOC analyst
- Experienced digital forensic analysts
- Information security professionals
- Federal agents and law enforcement personnel
- Red team members, penetration testers, and exploit developers
- SANS FOR500 and SEC504 graduates

DAY 3: Memory Forensics in Incident Response and Threat Hunting

Now a critical component of many incident response and threat hunting teams who regularly detect advanced adversaries in their organization, memory forensics has come a long way in just a few years. Memory forensics can be extraordinarily effective at finding evidence of worms, rootkits, PowerShell, and advanced malware used by APT attackers. In fact, some attacks may be nearly impossible to unravel without memory analysis. Memory analysis was traditionally the domain of Windows internals experts, but the recent development of new tools and techniques makes it accessible today to all investigators, incident responders, and threat hunters. Better tools, interfaces and detection heuristics have greatly leveled the playing field. Understanding attack patterns in memory is a core analyst skill applicable across a wide range of endpoint detection and response (EDR) products. This extremely popular section will cover many of the most powerful memory analysis capabilities available and give you a solid foundation of advanced memory forensic skills to super-charge investigations, regardless of the toolset employed.

Topics: Remote and Enterprise Incident Response; Triage and Enpoint Detection and Reponse (EDR); Memory Acquisition; Memory Forensics Analysis Process for Response and Hunting; Memory Forensics Examinations; Memory Analysis Tools

DAY 5: Incident Response & Hunting Across the Enterprise – Advanced Adversary and Anti-Forensics Detection

Over the years, we have observed that many incident responders and threat hunters have a challenging time finding threats without pre-built indicators of compromise or threat intelligence gathered before a breach. This is especially true in APT adversary intrusions. This advanced session will demonstrate techniques used by first responders to identify malware or forensic artifacts when very little information exists about their capabilities or hidden locations. We will discuss techniques to help funnel possibilities down to the candidates most likely to be evil malware trying to hide on the system.

Topics: Cyber Threat Intelligence; Malware and Anti-Forensic Detection; Anti-Forensic Detection Methodologies; Identifying Compromised Hosts without Active Malware

DAY 4: Timeline Analysis

Learn advanced incident response and hunting techniques uncovered via timeline analysis directly from the authors who pioneered timeline analysis tradecraft. Temporal data are located everywhere on a computer system. Filesystem modified/access/creation/change times, log files, network data, registry data, and Internet history files all contain time data that can be correlated into critical analysis to successfully solve cases. Pioneered by Rob Lee in 2001, timeline analysis has become a critical incident response, hunting, and forensics technique. New timeline analysis frameworks provide the means to conduct simultaneous examinations of a multitude of time-based artifacts. The analysis that once took days now takes minutes. This section will step you through the two primary methods of building and analyzing timelines created during advanced incident response, threat hunting, and forensic cases. Exercises will show analysts how to create a timeline and also how to introduce the key methods to help you use those timelines effectively in your cases.

Topics: Timeline Analysis Overview; Memory Analysis Timeline Creation; Filesystem Timeline Creation and Analysis; Super Timeline Creation and Analysis

DAY 6: The APT Threat Group Incident Response Challenge

This incredibly rich and realistic enterprise intrusion exercise is based on a real-world advanced persistent threat (APT) group. It brings together techniques learned earlier in the week and tests your newly acquired skills in a case that simulates an attack by an advanced adversary. The challenge brings it all together using a real intrusion into a complete Windows enterprise environment. You will be asked to uncover how the systems were compromised in the initial intrusion, find other systems the adversary moved to laterally, and identify intellectual property stolen via data exfiltration. You will walk out of the course with hands-on experience investigating realistic attacks, curated by a cadre of instructors with decades of experience fighting advanced threats from attackers ranging from nation-states to financial crime syndicates and hactivist groups.

Topics: Identification and Scoping; Containment and Threat Intelligence Gathering; Remediation and Recovery

FOR508 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