UNDERSTANDING CISCO CYBERSECURITY FUNDAMENTALS (SECFND) V1.0

Course Code: 4997

Gain the basic knowledge required to perform role of an entry-level cybersecurity analyst in a threat-centric security operations center.

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Learn more

The Understanding Cisco Cybersecurity Fundamentals (SECFND) v1.0 course provides you with an understanding of network infrastructure devices, operations and vulnerabilities of the TCP/IP protocol suite, basic information security concepts, common network application operations and attacks, the Windows and Linux operating systems, and the types of data that are used to investigate security incidents.

After completing this course, you will have basic knowledge that is required to perform the job role of an entry-level cybersecurity analyst in a threat-centric security operations center.

What You’ll Learn

- Describe, compare and identify various network concepts
- Fundamentals of TCP/IP
- Describe and compare fundamental security concepts
- Describe network applications and the security challenges
- Understand basic cryptography principles.
- Understand endpoint attacks, including interpreting log data to identify events in Windows and Linux
• Develop knowledge in security monitoring, including identifying sources and types of data and events
• Know various attack methods, security weaknesses, evasion methods, and remote versus local exploits

Who Needs to Attend
• Security Operations Center – Security Analyst
• Computer/Network Defense Analysts
• Computer Network Defense Infrastructure Support Personnel
• Future Incident Responders and Security Operations Center (SOC) personnel
• Students beginning a career, entering the cybersecurity field
• Cisco Channel Partners

Prerequisites

Basic technical competency (must possess one or more of the following):
• Cisco certification (Cisco CCENT certification or higher)
• Relevant industry certification [(ISC)2, CompTIA Security+, EC-Council, GIAC, ISACA]
• Cisco Networking Academy letter of completion (CCNA 1 and CCNA 2)
• Windows expertise: Microsoft (Microsoft Specialist, MCSA, MCSE), CompTIA (A+, Network+, Server+)
• Linux expertise: CompTIA (Linux+), Linux Professional Institute (LPI) certification, Linux Foundation (LFCS, LFCE), Red Hat (RHCSA, RHCE, RHCA), Oracle Linux (OCA, OCP)

It is strongly recommended, but not required, students have the following knowledge and skills:

Skills and knowledge equivalent to those learned in ICND1 - Interconnecting Cisco Networking Devices, Part 1.
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CLASSROOM LIVE

$4,295 USD
5 days

Classroom Live Outline
This course allows learners to understand common security concepts, and start to learn the basic security techniques used in a Security Operations Center (SOC) to find threats on a network using a variety of popular security tools within a “real-life” network infrastructure.

Module 1: TCP/IP and Cryptography Concepts
Objective: Describe the concepts and usage of the TCP/IP protocol suite, network infrastructure, TCP/IP attacks, and cryptography.

Lesson 1: Understanding the TCP/IP Protocol Suite
Objective: Describe the TCP/IP protocol suite and its functions.

This lesson includes these topics:
OSI Model
Objective: Describe the OSI model and its function.
TCP/IP Model
Objective: Explain the TCP/IP protocol suite.
Introduction to the Internet Protocol
Objective: Explain Internet Protocol characteristics.
IP Addressing
Objective: Explain IPv4 addressing concepts.
IP Address Classes
Objective: Explain IPv4 address classes.
Reserved IP Addresses
Objective: Describe IPv4 reserved addressing space.
Public and Private IP Addresses
Objective: Describe the difference between public and private IP address space.
IPv6 Addresses
Objective: Describe IPv6 addressing.

Introduction to the Transmission Control Protocol
Objective: Describe TCP protocol characteristics.

TCP Three-Way Handshake
Objective: Explain the TCP three-way handshake process.

Introduction to the User Datagram Protocol
Objective: Describe the UDP protocol and how it differs from TCP.

TCP and UDP Ports
Objective: Explain the use of TCP and UDP ports in network communications. List some of the well-known ports.

Address Resolution Protocol
Objective: Explain how ARP provides the essential service of mapping IP addresses to physical addresses on a network.

Host-to-Host Packet Delivery Using TCP
Objective: Describe the steps required for host-to-host packet delivery using TCP.

Dynamic Host Configuration Protocol
Objective: Describe how the DHCP protocol functions.

Domain Name System
Objective: Describe basic DNS function and operation.

Internet Control Message Protocol
Objective: Describe the use and role of ICMP.

Packet Capture Using tcpdump
Objective: This topic analyzes packet captures using tools such as tcpdump.

Wireshark
Objective: Describe how Wireshark is used to capture packets live and to open PCAP files.

Lesson 2: Understanding the Network Infrastructure

Objective: Describe network devices and the protocols running inside the network infrastructure and investigate the logs that network devices generate.

This lesson includes these topics:

Analyzing DHCP Operations
Objective: Describe attacks that target the Dynamic Host Configuration Protocol and how to monitor DHCP exchanges.

IP Subnetting
Objective: Describe how to scale IP networks with IP subnetting.

Hubs, Bridges, and Layer 2 Switches
Objective: Describe hub, bridge, and layer 2 switch operation and concepts.

VLANs and Trunks
Objective: Describe the function of VLANs and trunks at layer 2.

Spanning Tree Protocols
Objective: Describe layer 2 spanning-tree protocol.
Standalone (Autonomous) and Lightweight Access Points
Objective: Describe Standalone (Autonomous) and Lightweight Access Points, and their security vulnerabilities.

Routers
Objective: Describe the use of routers and the routing process used in network communications.

Routing Protocols
Objective: Describe routing protocols and attacks that can be used against them.

Multilayer Switches
Objective: Describe how multilayer switches operate and how frame and packet forwarding take place on the switch.

NAT Fundamentals
Objective: Describe Network Address Translation (NAT) fundamental concepts.

Packet Filtering with ACLs
Objective: Describe the purpose of Access List Control lists.

ACLs with the Established Option
Objective: Describe ACL operation when using the established option.

Lesson 3: Understanding Common TCP/IP Attacks
Objective: Describe security flaws in the TCP/IP protocol and how they can be used to attack networks and hosts.

This lesson includes these topics:

Legacy TCP/IP Vulnerabilities
Objective: Describe legacy TCP/IP vulnerabilities.

IP Vulnerabilities
Objective: Describe vulnerabilities related to the IP protocol.

ICMP Vulnerabilities
Objective: Describe vulnerabilities related to the ICMP protocol.

TCP Vulnerabilities
Objective: Describe vulnerabilities related to the TCP protocol.

UDP Vulnerabilities
Objective: Describe vulnerabilities related to the UDP protocol.

Attack Surface and Attack Vectors
Objective: Describe the attack surface and its relation to an organizations vulnerability.

Reconnaissance Attacks
Objective: Describe how network data is collected through a reconnaissance attack.

Access Attacks
Objective: Describe how an access attack is used to gain unauthorized access.

Man-in-the-Middle (MITM) Attacks
Objective: Describe MITM attacks.

Denial of Service and Distributed Denial of Service
Objective: Describe how DoS and DDoS attacks are used against networks.

Reflection and Amplification Attacks
Objective: Describe how a reflection attack is used against IP hosts.

Spoofing Attacks
Objective: Describe the concepts and uses of spoofing attacks.

DHCP Attacks
Objective: Describe the concepts and use of DHCP attacks.

Lesson 4: Understanding Basic Cryptography Concepts
Objective: Describe the basic concepts and uses of cryptography.

This lesson includes these topics:

Impact of Cryptography on Security Investigations
Objective: Describe the impact of cryptography on security investigations.

Cryptography Overview
Objective: Describe cryptography concepts.

Hash Algorithms
Objective: Describe hashing mechanisms and algorithms.

Encryption Overview
Objective: Describe encryption usage and features.

Cryptanalysis
Objective: Describe the use of cryptanalysis to break codes to decipher encrypted data.

Symmetric Encryption Algorithms
Objective: Describe the use of symmetric encryption algorithms.

Asymmetric Encryption Algorithms
Objective: Describe the use of asymmetric cryptographic algorithms.

Diffie-Hellman Key Agreement
Objective: Describe the Diffie-Hellman key agreement and Diffie-Hellman groups.

Use Case: SSH
Objective: Describe uses of the SSH protocol.

Digital Signatures
Objective: Describe the basic security services offered with the use of digital signatures.

PKI Overview
Objective: Describe PKI components and use.

PKI Operations
Objective: Describe PKI operations.

Use Case: SSL/TLS
Objective: Describe a use case for SSL/TLS.

Cipher Suite
Objective: Describe cipher suite concepts.

Key Management
Objective: Describe key management for the secure generation, verification, exchange, storage, and destruction of keys.

NSA Suite B
Objective: Describe NSA Suite B cryptographic algorithms.
Module 2: Network Applications and Endpoint Security

Lesson 1: Describing Information Security Concepts

Objective: Describe information security concepts and strategies within the network.

This lesson includes these topics:

Information Security Confidentiality, Integrity, and Availability
Objective: Describe the Information Security CIA triad.

Personally Identifiable Information
Objective: Describe PII as it relates to information security.

Risk
Objective: Describe risk as a function of the likelihood of a given threat source’s exercising a particular potential vulnerability.

Vulnerability Assessment
Objective: Describe vulnerability assessment in the context of information security.

CVSS v3.0
Objective: Describe the CVSS.

Access Control Models
Objective: Describe basic models for implementing access controls over network resources.

Regulatory Compliance
Objective: Describe compliance regulations and their effects on an organization.

Information Security Management
Objective: Describe frameworks for information security management.

Security Operations Center
Objective: Describe the SOC components of people, processes, and technologies, and the reason for the SOC.

Challenge

Lesson 2: Understanding Network Applications

Objective: This lesson describes the use of network applications and how the security analyst can use this knowledge to detect malicious behavior.

This lesson includes these topics:

DNS Operations
Objective: Explain DNS terminology and operations.

Recursive DNS Query
Objective: Describe the process of recursive DNS queries.

Dynamic DNS
Objective: Describe the automated discovery and registration process of the client public IP addresses via DDNS.

HTTP Operations
Objective: Describe HTTP operations and traffic analysis to identify anomalies in the HTTP traffic.
HTTPS Operations
Objective: Describe the use of and operation of HTTPS traffic.

Web Scripting
Objective: Describe how web scripting can be used to deliver malware.

SQL Operations
Objective: Describe how SQL is used to query, operate, and administer relational database management systems as well as how to recognize SQL based attacks.

SMTP Operations
Objective: Describe how the mail delivery process works, and SMTP conversations.

Lesson 3: Understanding Common Network Application Attacks

Objective: This lesson discusses several network application-based attacks. The security analyst needs to be aware of and able to detect these types of attacks.

This lesson includes these topics:

Password Attacks
Objective: Describe password attacks such as brute force and dictionary attacks.

Pass-the-Hash Attacks
Objective: Describe pass-the-hash attacks.

DNS-Based Attacks
Objective: Describe DNS-based attacks.

DNS Tunneling
Objective: Describe DNS tunneling and its use to exfiltrate data out of their networks.

Web-Based Attacks
Objective: Describe web-based attacks and their risk to businesses.

Malicious iFrames
Objective: Describe malicious scripts that are hidden inside inline frames.

HTTP 302 Cushioning
Objective: Describe web site redirection with HTTP 302 cushioning.

Domain Shadowing
Objective: Describe the domain shadowing process used to hijack users’ domain registration logins to create subdomains.

Command Injections
Objective: Describe command injection used to execute arbitrary commands on vulnerable web applications.

SQL Injections
Objective: Describe how SQL injections are used against databases.

Cross-Site Scripting and Request Forgery
Objective: Describe how cross-site scripting and request forgery are used to threaten the security of web applications.

Email-Based Attacks
Objective: Describe how email-based attacks are used against enterprises.

Lesson 4: Understanding Windows Operating System Basics
Objective: This lesson focuses on the Windows operating system feature and functionality.

This lesson includes these topics:

Windows Operating System History
Objective: Describe the history on the Windows operating systems and vulnerabilities.
Windows Operating System Architecture
Objective: Describe the Windows OS architecture and components.
Windows Processes, Threads, and Handles
Objective: Describe Windows processes, threads, and handles.
Windows Virtual Memory Address Space
Objective: Describe virtual memory allocation in the Windows OS.
Windows Services
Objective: Describe Windows services and how they are used.
Windows File System Overview
Objective: Describe the functionality of Windows NTFS.
Windows File System Structure
Objective: Describe the Windows NTFS structure.
Windows Domains and Local User Accounts
Objective: Describe Windows domains and local user accounts.
Windows Graphical User Interface
Objective: Describe the Windows graphical user interface and its use.
Run as Administrator
Objective: Describe how to perform tasks in Windows which may require administrator privileges.
Windows Command Line Interface
Windows PowerShell
Objective: Describe the features of the Windows PowerShell.
Windows net Command
Objective: Describe how the net command is used for Windows administration and maintenance.
Controlling Startup Services and Executing System Shutdown
Objective: Describe how to control Windows startup services, and execute a system shutdown.
Controlling Services and Processes
Objective: Describe how to control Windows services and processes that are operating on a host.
Monitoring System Resources
Objective: Describe how to monitor Windows system resources with the use of Windows Task Manager.
Windows Boot Process
Objective: Describe the Windows boot process, starting services, and registry entries.
Windows Networking
Objective: Describe how to configure Windows networking properties.

Windows netstat Command
Objective: Describe how to use the netstat command to view running networking functions.

Accessing Network Resources with Windows
Objective: Describe how access Windows network resources and perform remote functions.

Windows Registry
Objective: Describe the use of the Windows registry.

Windows Event Logs
Objective: Describe how the Windows Event Viewer is used to browse and manage event logs.

Windows Management Instrumentation
Objective: Describe how the Windows Management Instrumentation is used for management of data and operations on Windows-based operating systems.

Common Windows Server Functions
Objective: Describe common Windows server functions and features.

Common Third-Party Tools
Objective: Describe commonly used third-party tools to manage Windows operating systems.

Lesson 5: Understanding Linux Operating System Basics

Objective: Provide an overview of the Linux Operating System.

This lesson includes these topics:

History and Benefits of Linux
Objective: Provide brief history and benefits of Linux operating system

Linux Architecture
Objective: Describe Linux architecture.

Linux File System Overview
Objective: Provide an overview of the Linux file system.

Basic File System Navigation and Management Commands
Objective: Describe basic file system navigation and management commands in Linux.

File Properties and Permissions
Objective: Describe Linux file properties and permissions.

Editing File Properties
Objective: Describe Linux commands that you can use to manage file permissions and ownership.

Root and Sudo
Objective: Describe Root and Sudo commands in Linux.

Disks and File Systems
Objective: Describe Linux storage disks and file systems.

System Initialization
Objective: Describe the Linux boot process.
Emergency/Alternate Startup Options
Objective: Describe alternate startup options in case Linux is experiencing problems or has been compromised.

Shutting Down the System
Objective: Describe properly procedure to shut down a Linux-based system when you need to bring the system down for maintenance or troubleshooting.

System Processes
Objective: Describe Linux system processes.

Interacting with Linux
Objective: Describe mechanisms for interacting with the Linux operating system.

Linux Command Shell Concepts
Objective: Explore important concepts about the Linux shell and its usage.

Piping Command Output
Objective: Explore Linus Piping command output.

Other Useful Command Line Tools
Objective: Describe other useful Linux command line tools.

Overview of Secure Shell Protocol
Objective: Provide an overview of Secure Shell Protocol.

Networking
Objective: Describe Linux f tools and features for managing virtually every aspect of networking and connectivity configuration.

Managing Services in SysV Environments
Objective: Describe the process of managing services in SysV environments.

Viewing Running Network Services
Objective: Describe tools to track the services running in your Linux installation.

Name Resolution: DNS
Objective: Provide an overview of the Domain Name System.

Testing Name Resolution
Objective: Explore the Linux operating system tools to test name resolution.

Viewing Network Traffic
Objective: Explore Linux tools to viewing network traffic.

System Logs
Objective: Explore logging functionality in context to Linux systems.

Configuring Remote syslog
Objective: Configure remote syslog in context to Linux systems.

Running Software on Linux
Objective: Describe requirements to run software in a Linux installation.

Executables vs. Interpreters
Objective: Explore Linux executable files and interpreters that can execute code.

Using Package Managers to Install Software in Linux
Objective: Describe package managers to install software in Linux.

System Applications
Objective: Describe system applications used to serve clients in context to Linux.

Lightweight Directory Access Protocol
Lesson 6: Understanding Common Endpoint Attacks

Objective: Describe various attack techniques against the endpoints.

This lesson includes these topics:

Classify Attacks, Exploits, and Vulnerabilities
Objective: Classify attacks, exploits, and vulnerabilities in context to endpoint attacks.
Buffer Overflow
Objective: Describe buffer overflow vulnerability.
Malware
Objective: Describe malware in context to endpoint attacks.
Reconnaissance
Objective: Describe reconnaissance in context to endpoint attacks.
Gaining Access and Control
Objective: Describe gaining access and control in context to endpoint attacks.
Gaining Access via Social Engineering
Objective: Describe how social engineering is used to gain access to endpoints.
Social Engineering Example: Phishing
Objective: Describe phishing as an example of social engineering.
Gaining Access Via Web-Based Attacks
Objective: Describe how attacker can gain access via web-based attacks.
Exploit Kits
Objective: Describe how attackers can use exploit kit to discover and exploit vulnerabilities in an endpoint.
Rootkits
Objective: Describe rootkit as an attacker tool.
Privilege Escalation
Objective: Describe mechanisms that attackers can use to escalate privileges.
Pivoting
Objective: Describe how attackers use pivoting technique to expand their access in a network.
Post-Exploitation Tools Example
Objective: Provide example of tools used in the post-exploitation phase of an attack.
Exploit Kit Example: Angler
Objective: Describe Angler exploit kit chain of events.

Lesson 7: Understanding Network Security Technologies

Objective: Describe how various network security technologies work together to guard against attacks.

This lesson includes these topics:

Defense-in-Depth Strategy
Objective: Describe the traditional Defense-in-Depth approach to provide a layered security by using multiple security mechanisms.
Defend Across the Attack Continuum
Objective: Describe the security model that works across the attack continuum.
Authentication, Authorization, and Accounting
Objective: Describe AAA.
Identity and Access Management
Objective: Describe Identity and Access Management solutions.
Stateful Firewall
Objective: Describe stateful firewalls.
Network Taps
Objective: This topic describes network taps.
Switched Port Analyzer
Objective: This topic describes switched port analyzer.
Remote Switched Port Analyzer
Objective: This topic describes remote switched port analyzer.
Intrusion Prevention System
Objective: Describe Intrusion Prevention Systems.
IPS Evasion Techniques
Objective: Describe Intrusion Prevention Systems Evasion Techniques.
Snort Rules
Objective: Describe Intrusion Prevention Systems.
VPNs
Objective: Describe VPNs.
Email Content Security
Objective: Describe email content security.
Web Content Security
Objective: Describe web content security.
DNS Security
Objective: Describe DNS security.
Network-Based Malware Protection
Objective: Describe network-based malware protection.
Next Generation Firewall
Objective: Describe Next Generation Firewall.
Security Intelligence
Objective: Describe the use of security intelligence feed.
Threat Analytic Systems
Objective: Describe threat analytics systems
Network Security Device Form Factors
Objective: Describe the three network security device form factors: physical, virtual, and cloud.
Security Onion Overview
Objective: Describe the Security Onion open source security monitoring tool.
Security Tools Reference
Objective: Describe online security research tools.

Lesson 8: Understanding Endpoint Security Technologies
Objective: Provides basic understanding of endpoint security and be familiar with common endpoint security technologies.

This lesson includes these topics:

Host-Based Personal Firewall
Objective: Describe host-based personal firewall.
Host-Based Anti-Virus
Objective: Describe host-based anti-virus.
Host-Based Intrusion Prevention System
Objective: Describe host-based Intrusion Prevention System.
Application Whitelists and Blacklists
Objective: Describe application whitelists and blacklists.
Host-Based Malware Protection
Objective: Describe host-based malware protection.
Sandboxing
Objective: Describe sandboxing in context to network security.
File Integrity Checking
Objective: Describe how security analysts use file integrity checking tools.

Module 3: Security Monitoring and Analysis
Objective: This module discusses network security monitoring, data collection, and data analysis.

Lesson 1: Describing Security Data Collection
Objective: This lesson discusses security monitoring and analysis of logs and data collected from multiple sources.

This lesson includes these topics:

Network Security Monitoring Placement
Objective: Describe placement of network security monitoring devices on the network.
Network Security Monitoring Data Types
Objective: Describe the various types of data used in monitoring network security.
Intrusion Prevention System Alerts
Objective: Describe the importance and use of IPS alerts in network security monitoring.
True/False, Positive/Negative IPS Alerts
Objective: Describe true and false positive IPS alerts and their effects on security monitoring.
IPS Alerts Analysis Process
Objective: Describe the process of IPS alert analysis.
Firewall Log
Objective: Describe the context of a security incident in firewall syslog messages.
DNS Log
Objective: Describe the need for network DNS activity log analysis.
Web Proxy Log
Objective: Describe web proxy log analysis for investigating web-based attacks.

Email Proxy Log
Objective: Describe email proxy log analysis for investigating email-based attacks.

AAA Server Log
Objective: Describe AAA server log analysis.

Next Generation Firewall Log
Objective: Describe NGFW log analysis for incident investigation.

Applications Log
Objective: Describe application log analysis for detecting application misuse.

Packet Captures
Objective: Describe packet capture usage and benefits for investigating security incidents.

NetFlow
Objective: Describe the use of NetFlow for collection and monitoring of network traffic flow data.

Network Behavior Anomaly Detection
Objective: Describe network behavior anomaly monitoring for detecting deviations from the normal patterns.

Data Loss Detection Using Netflow Example
Objective: Describe using NetFlow for data loss detection.

Security Information and Event Management Systems
Objective: Describe the deployment and use of SIEMs to collect, sort, process, prioritize, store, and report the alarms.

Lesson 2: Describing Security Event Analysis

Objective: Explore the different threat models that security operations organizations can reference when performing cybersecurity analysis.

This lesson includes these topics:

Cyber Kill Chain
Objective: Provide overview of the cyber kill chain model that describes the structure of an attack.

Advanced Persistent Threats
Objective: Describe advanced persistence threats characteristics.

Diamond Model for Intrusion Analysis
Objective: Describe the Diamond model for intrusion analysis.

Cybersecurity Threat Models Summary
Objective: Summarize cybersecurity threat models.

SOC Runbook Automation
Objective: Provide an overview of the SOC runbook automation.

Malware Reverse Engineering
Objective: Describe how malware reverse engineering can help protect or defend against future attacks.

Chain of Custody
Objective: Describe chain of custody for all evidence and interacting with law enforcement.

Challenge

Classroom Live Labs

Guided Lab 1: Explore the TCP/IP Protocol Suite
- Topology
- Task 1: Examine the Network Configuration on Inside-Win
- Task 2: Examine the Network Configuration on Inside-Kali
- Task 3: Verify That Peers Are Not Yet in ARP Cache
- Task 4: Initialize the Packet Capture Process
- Task 5: Generate and Capture Local LAN Traffic
- Task 6: Examine Packet Summaries
- Task 7: Examine Ethernet Headers
- Task 8: Examine an IP Header
- Task 9: Examine an ICMP Header and Data
- Task 10: Capture Communication with a Remote LAN
- Task 11: Examine How the Communication Started
- Task 12: Examine a TCP Connection
- Task 13: Examine the First HTTP Transactions
- Task 14: Examine TCP Connections
- Task 15: Compare and Contrast TCP and UDP

Challenge

Guided Lab 2: Explore the Network Infrastructure
- Topology
- Task 1: Explore Network Switch Operation
- Task 2: Explore VLANs
- Task 3: Explore Trunking
- Task 4: Explore Routing
- Task 5: Explore NAT
- Task 6: Explore Firewalling
- Task 7: Explore DHCP Operation

Challenge

Guided Lab 3: Explore TCP/IP Attacks
- Topology
- Task 1: Footprinting
- Task 2: Fingerprinting
- Task 3: Discrete OS Scanning
- Task 4: Malicious Route Injection
- Task 5: ARP Cache Poisoning

Challenge
Guided Lab 4: Explore Cryptographic Technologies

- Topology
- Task 1: Demonstrate Hash Algorithms
- Task 2: Examine Hash Collisions
- Task 3: Explore MD5 and Enable Secret
- Task 4: Demonstrate Symmetric Encryption
- Task 5: Demonstrate Asymmetric Encryption
- Task 6: Create a Key Pair and Digital Signature
- Task 7: Explore Public-Key Infrastructure
- Task 8: Capture Packets from an SSL/TLS Connection
- Task 9: Analyze SSL/TLS Negotiation

Challenge

Guided Lab 5: Explore Network Applications

- Topology
- Task 1: Prepare to Send an Email Manually
- Task 2: Send an Email Manually
- Task 3: Follow the Email Path
- Task 4: Examine the Email
- Task 5: Send One Email the Normal Way
- Task 6: Examine Hypertext Markup Language
- Task 7: Examine Cascading Style Sheets
- Task 8: Examine JavaScript
- Task 9: Examine PHP
- Task 10: Examine Structured Query Language
- Task 11: Examine URLs
- Task 12: Capture HTTP Traffic for Analysis
- Task 13: HTTP Requests: GET and POST

Challenge

Guided Lab 6: Explore Network Application Attacks

Objective: This lab will explore several different classes of attacks against a targeted web server.

- Topology
- Task 1: Explore Vulnerability Scanning
- Task 2: Examine the Footprints of a Vulnerability Scan
- Task 3: Leverage the Vulnerability Scan Results
- Task 4: Perform an Offline Password Attack
- Task 5: Perform an Online Password Attack
- Task 6: Perform a Command Injection
- Task 7: Perform an SQL Injection
- Task 8: Account Access Via Cookie Manipulation
- Task 9: Explore Reflected Cross-Site Scripting
- Task 10: Explore Persistent Cross-Site Scripting
Challenge

Guided Lab 7: Explore the Windows Operating System

Objective: This lab will focus on exploring the Windows operating system and services discussed in the lesson.

- Topology
- Task 1: Prepare the Inside-Win VM
- Task 2: Explore Processes
- Task 3: Explore Threads
- Task 4: Explore the Registry Database
- Task 5: Explore Handles
- Task 6: Explore Windows Services
- Task 7: Explore Windows Users, Groups, and Permissions
- Task 8: Explore Windows Network Activity from the CLI
- Task 9: Explore Windows Network Activity from the GUI

Challenge

Guided Lab 8: Explore the Linux Operating System

Objective: This lab exercise provides you a structured experience with the Linux operating system basics.

- Topology
- Task 1: Bash Shell
- Task 2: Navigate Linux Directories
- Task 3: Basic File and Directory Operations
- Task 4: File System Permissions
- Task 5: Modify Permissions
- Task 6: I/O Piping and Redirection
- Task 7: grep Command
- Task 8: Linux Processes
- Task 9: netstat Command

Challenge

Guided Lab 9: Explore Endpoint Attacks

- Topology
- Task 1: Perform Reconnaissance
- Task 2: Exploit a Misconfiguration
- Task 3: Exploit a Back Door
- Task 4: Escalate a Privilege Escalation
- Task 5: Exploit an Operating System Flaw
- Task 6: Use a Pivot
- Task 7: Employ Social Engineering/Phishing
- Task 8: Establish Persistence
- Task 9: Tunnel Exfiltrated Data

Challenge
Guided Lab 10: Explore Network Security Technologies

- Topology
  - Task 1: Examine Interface Access Policy on the ABC-ASA
  - Task 2: Demonstrate Stateful Inspection of TCP
  - Task 3: Examine Application Policy on the ABC-ASA
  - Task 4: Examine Remote Access VPNs
  - Task 5: Examine Network IDS
  - Task 6: Examine the Squid Web Proxy

Challenge

Guided Lab 11: Explore Endpoint Security

Objective: Explore the behavior of two endpoint security applications that are part of the base Windows operating system distribution: Windows Defender and Windows Firewall.

- Topology
  - Task 1: Explore Windows Defender
  - Task 2: Explore Windows Firewall
  - Task 3: Explore IPtables and TCP wrappers

Challenge

Guided Lab 12: Explore Security Data for Analysis

Objective: This lab focuses on the analysis of event data for investigation of a security event.

- Topology
  - Task 1: Explore Alert Data
  - Task 2: Extracted Content
  - Task 3: Sandbox Analysis
  - Task 4: Transaction Data
  - Task 5: Session Data
  - Task 6: Full Packet Capture

Challenge
Virtual Classroom Live Outline

This course allows learners to understand common security concepts, and start to learn the basic security techniques used in a Security Operations Center (SOC) to find threats on a network using a variety of popular security tools within a “real-life” network infrastructure.

Module 1: TCP/IP and Cryptography Concepts

Objective: Describe the concepts and usage of the TCP/IP protocol suite, network infrastructure, TCP/IP attacks, and cryptography.

Lesson 1: Understanding the TCP/IP Protocol Suite

Objective: Describe the TCP/IP protocol suite and its functions.

This lesson includes these topics:

OSI Model
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Public and Private IP Addresses
Objective: Describe the difference between public and private IP address space.  
IPv6 Addresses  
Objective: Describe IPv6 addressing.  
Introduction to the Transmission Control Protocol  
Objective: Describe TCP protocol characteristics.  
TCP Three-Way Handshake  
Objective: Explain the TCP three-way handshake process.  
Introduction to the User Datagram Protocol  
Objective: Describe the UDP protocol and how it differs from TCP.  
TCP and UDP Ports  
Objective: Explain the use of TCP and UDP ports in network communications. List some of the well-known ports.  
Address Resolution Protocol  
Objective: Explain how ARP provides the essential service of mapping IP addresses to physical addresses on a network.  
Host-to-Host Packet Delivery Using TCP  
Objective: Describe the steps required for host-to-host packet delivery using TCP.  
Dynamic Host Configuration Protocol  
Objective: Describe how the DHCP protocol functions.  
Domain Name System  
Objective: Describe basic DNS function and operation.  
Internet Control Message Protocol  
Objective: Describe the use and role of ICMP.  
Packet Capture Using tcpdump  
Objective: This topic analyzes packet captures using tools such as tcpdump.  
Wireshark  
Objective: Describe how Wireshark is used to capture packets live and to open PCAP files.  

Lesson 2: Understanding the Network Infrastructure  
Objective: Describe network devices and the protocols running inside the network infrastructure and investigate the logs that network devices generate.  

This lesson includes these topics:  
Analyzing DHCP Operations  
Objective: Describe attacks that target the Dynamic Host Configuration Protocol and how to monitor DHCP exchanges.  
IP Subnetting  
Objective: Describe how to scale IP networks with IP subnetting.  
Hubs, Bridges, and Layer 2 Switches  
Objective: Describe hub, bridge, and layer 2 switch operation and concepts.  
VLANs and Trunks  
Objective: Describe the function of VLANs and trunks at layer 2.  
Spanning Tree Protocols  
Objective: Describe layer 2 spanning-tree protocol.
Standalone (Autonomous) and Lightweight Access Points
Objective: Describe Standalone (Autonomous) and Lightweight Access Points, and their security vulnerabilities.

Routers
Objective: Describe the use of routers and the routing process used in network communications.

Routing Protocols
Objective: Describe routing protocols and attacks that can be used against them.

Multilayer Switches
Objective: Describe how multilayer switches operate and how frame and packet forwarding take place on the switch.

NAT Fundamentals
Objective: Describe Network Address Translation (NAT) fundamental concepts.

Packet Filtering with ACLs
Objective: Describe the purpose of Access List Control lists.

ACLs with the Established Option
Objective: Describe ACL operation when using the established option.

Lesson 3: Understanding Common TCP/IP Attacks
Objective: Describe security flaws in the TCP/IP protocol and how they can be used to attack networks and hosts.

This lesson includes these topics:

Legacy TCP/IP Vulnerabilities
Objective: Describe legacy TCP/IP vulnerabilities.

IP Vulnerabilities
Objective: Describe vulnerabilities related to the IP protocol.

ICMP Vulnerabilities
Objective: Describe vulnerabilities related to the ICMP protocol.

TCP Vulnerabilities
Objective: Describe vulnerabilities related to the TCP protocol.

UDP Vulnerabilities
Objective: Describe vulnerabilities related to the UDP protocol.

Attack Surface and Attack Vectors
Objective: Describe the attack surface and its relation to an organizations vulnerability.

Reconnaissance Attacks
Objective: Describe how network data is collected through a reconnaissance attack.

Access Attacks
Objective: Describe how an access attack is used to gain unauthorized access.

Man-in-the-Middle (MITM) Attacks
Objective: Describe MITM attacks.

Denial of Service and Distributed Denial of Service
Objective: Describe how DoS and DDoS attacks are used against networks.

Reflection and Amplification Attacks
Objective: Describe how a reflection attack is used against IP hosts.
Spoofing Attacks
Objective: Describe the concepts and uses of spoofing attacks.
DHCP Attacks
Objective: Describe the concepts and use of DHCP attacks.

Lesson 4: Understanding Basic Cryptography Concepts
Objective: Describe the basic concepts and uses of cryptography.

This lesson includes these topics:

Impact of Cryptography on Security Investigations
Objective: Describe the impact of cryptography on security investigations.
Cryptography Overview
Objective: Describe cryptography concepts.
Hash Algorithms
Objective: Describe hashing mechanisms and algorithms.
Encryption Overview
Objective: Describe encryption usage and features.
Cryptanalysis
Objective: Describe the use of cryptanalysis to break codes to decipher encrypted data.
Symmetric Encryption Algorithms
Objective: Describe the use of symmetric encryption algorithms.
Asymmetric Encryption Algorithms
Objective: Describe the use of asymmetric cryptographic algorithms.
Diffie-Hellman Key Agreement
Objective: Describe the Diffie-Hellman key agreement and Diffie-Hellman groups.
Use Case: SSH
Objective: Describe uses of the SSH protocol.
Digital Signatures
Objective: Describe the basic security services offered with the use of digital signatures.
PKI Overview
Objective: Describe PKI components and use.
PKI Operations
Objective: Describe PKI operations.
Use Case: SSL/TLS
Objective: Describe a use case for SSL/TLS.
Cipher Suite
Objective: Describe cipher suite concepts.
Key Management
Objective: Describe key management for the secure generation, verification, exchange, storage, and destruction of keys.
NSA Suite B
Objective: Describe NSA Suite B cryptographic algorithms.
Module 2: Network Applications and Endpoint Security

Lesson 1: Describing Information Security Concepts

Objective: Describe information security concepts and strategies within the network.

This lesson includes these topics:

Information Security Confidentiality, Integrity, and Availability
Objective: Describe the Information Security CIA triad.

Personally Identifiable Information
Objective: Describe PII as it relates to information security.

Risk
Objective: Describe risk as a function of the likelihood of a given threat source's exercising a particular potential vulnerability.

Vulnerability Assessment
Objective: Describe vulnerability assessment in the context of information security.

CVSS v3.0
Objective: Describe the CVSS.

Access Control Models
Objective: Describe basic models for implementing access controls over network resources.

Regulatory Compliance
Objective: Describe compliance regulations and their effects on an organization.

Information Security Management
Objective: Describe frameworks for information security management.

Security Operations Center
Objective: Describe the SOC components of people, processes, and technologies, and the reason for the SOC.

Challenge

Lesson 2: Understanding Network Applications

Objective: This lesson describes the use of network applications and how the security analyst can use this knowledge to detect malicious behavior.

This lesson includes these topics:

DNS Operations
Objective: Explain DNS terminology and operations.

Recursive DNS Query
Objective: Describe the process of recursive DNS queries.

Dynamic DNS
Objective: Describe the automated discovery and registration process of the client public IP addresses via DDNS.

HTTP Operations
Objective: Describe HTTP operations and traffic analysis to identify anomalies in the HTTP traffic.
HTTPS Operations
Objective: Describe the use of and operation of HTTPS traffic.
Web Scripting
Objective: Describe how web scripting can be used to deliver malware.
SQL Operations
Objective: Describe how SQL is used to query, operate, and administer relational database management systems as well as how to recognize SQL based attacks.
SMTP Operations
Objective: Describe how the mail delivery process works, and SMTP conversations.

Lesson 3: Understanding Common Network Application Attacks

Objective: This lesson discusses several network application-based attacks. The security analyst needs to be aware of and able to detect these types of attacks.

This lesson includes these topics:

Password Attacks
Objective: Describe password attacks such as brute force and dictionary attacks.
Pass-the-Hash Attacks
Objective: Describe pass-the-hash attacks.
DNS-Based Attacks
Objective: Describe DNS-based attacks.
DNS Tunneling
Objective: Describe DNS tunneling and its use to exfiltrate data out of their networks.
Web-Based Attacks
Objective: Describe web-based attacks and their risk to businesses.
Malicious iFrames
Objective: Describe malicious scripts that are hidden inside inline frames.
HTTP 302 Cushioning
Objective: Describe web site redirection with HTTP 302 cushioning.
Domain Shadowing
Objective: Describe the domain shadowing process used to hijack users’ domain registration logins to create subdomains.
Command Injections
Objective: Describe command injection used to execute arbitrary commands on vulnerable web applications.
SQL Injections
Objective: Describe how SQL injections are used against databases.
Cross-Site Scripting and Request Forgery
Objective: Describe how cross-site scripting and request forgery are used to threaten the security of web applications.
Email-Based Attacks
Objective: Describe how email-based attacks are used against enterprises.

Lesson 4: Understanding Windows Operating System Basics
Objective: This lesson focuses on the Windows operating system feature and functionality.

This lesson includes these topics:

Windows Operating System History
Objective: Describe the history on the Windows operating systems and vulnerabilities.

Windows Operating System Architecture
Objective: Describe the Windows OS architecture and components.

Windows Processes, Threads, and Handles
Objective: Describe Windows processes, threads, and handles.

Windows Virtual Memory Address Space
Objective: Describe virtual memory allocation in the Windows OS.

Windows Services
Objective: Describe Windows services and how they are used.

Windows File System Overview
Objective: Describe the functionality of Windows NTFS.

Windows File System Structure
Objective: Describe the Windows NTFS structure.

Windows Domains and Local User Accounts
Objective: Describe Windows domains and local user accounts.

Windows Graphical User Interface
Objective: Describe the Windows graphical user interface and its use.

Run as Administrator
Objective: Describe how to perform tasks in Windows which may require administrator privileges.

Windows Command Line Interface

Windows PowerShell
Objective: Describe the features of the Windows PowerShell.

Windows net Command
Objective: Describe how the net command is used for Windows administration and maintenance.

Controlling Startup Services and Executing System Shutdown
Objective: Describe how to control Windows startup services, and execute a system shutdown.

Controlling Services and Processes
Objective: Describe how to control Windows services and processes that are operating on a host.

Monitoring System Resources
Objective: Describe how to monitor Windows system resources with the use of Windows Task Manager.

Windows Boot Process
Objective: Describe the Windows boot process, starting services, and registry entries.

Windows Networking
Objective: Describe how to configure Windows networking properties.

Windows netstat Command
Objective: Describe how to use the netstat command to view running networking functions.

Accessing Network Resources with Windows
Objective: Describe how access Windows network resources and perform remote functions.

Windows Registry
Objective: Describe the use of the Windows registry.

Windows Event Logs
Objective: Describe how the Windows Event Viewer is used to browse and manage event logs.

Windows Management Instrumentation
Objective: Describe how the Windows Management Instrumentation is used for management of data and operations on Windows-based operating systems.

Common Windows Server Functions
Objective: Describe common Windows server functions and features.

Common Third-Party Tools
Objective: Describe commonly used third-party tools to manage Windows operating systems.

Lesson 5: Understanding Linux Operating System Basics

Objective: Provide an overview of the Linux Operating System.

This lesson includes these topics:

History and Benefits of Linux
Objective: Provide brief history and benefits of Linux operating system

Linux Architecture
Objective: Describe Linux architecture.

Linux File System Overview
Objective: Provide an overview of the Linux file system.

Basic File System Navigation and Management Commands
Objective: Describe basic file system navigation and management commands in Linux.

File Properties and Permissions
Objective: Describe Linux file properties and permissions.

Editing File Properties
Objective: Describe Linux commands that you can use to manage file permissions and ownership.

Root and Sudo
Objective: Describe Root and Sudo commands in Linux.

Disks and File Systems
Objective: Describe Linux storage disks and file systems.

System Initialization
Objective: Describe the Linux boot process.
Emergency/Alternate Startup Options
Objective: Describe alternate startup options in case Linux is experiencing problems or has been compromised.

Shutting Down the System
Objective: Describe properly procedure to shut down a Linux-based system when you need to bring the system down for maintenance or troubleshooting.

System Processes
Objective: Describe Linux system processes.

Interacting with Linux
Objective: Describe mechanisms for interacting with the Linux operating system.

Linux Command Shell Concepts
Objective: Explore important concepts about the Linux shell and its usage.

Piping Command Output
Objective: Explore Linus Piping command output.

Other Useful Command Line Tools
Objective: Describe other useful Linux command line tools.

Overview of Secure Shell Protocol
Objective: Provide an overview of Secure Shell Protocol.

Networking
Objective: Describe Linux f tools and features for managing virtually every aspect of networking and connectivity configuration.

Managing Services in SysV Environments
Objective: Describe the process of managing services in SysV environments.

Viewing Running Network Services
Objective: Describe tools to track the services running in your Linux installation.

Name Resolution: DNS
Objective: Provide an overview of the Domain Name System.

Testing Name Resolution
Objective: Explore the Linux operating system tools to test name resolution.

Viewing Network Traffic
Objective: Explore Linux tools to viewing network traffic.

System Logs
Objective: Explore logging functionality in context to Linux systems.

Configuring Remote syslog
Objective: Configure remote syslog in context to Linux systems.

Running Software on Linux
Objective: Describe requirements to run software in a Linux installation.

Executables vs. Interpreters
Objective: Explore Linux executable files and interpreters that can execute code.

Using Package Managers to Install Software in Linux
Objective: Describe package managers to install software in Linux.

System Applications
Objective: Describe system applications used to serve clients in context to Linux.

Lightweight Directory Access Protocol
Lesson 6: Understanding Common Endpoint Attacks

Objective: Describe various attack techniques against the endpoints.

This lesson includes these topics:

Classify Attacks, Exploits, and Vulnerabilities
Objective: Classify attacks, exploits, and vulnerabilities in context to endpoint attacks.
Buffer Overflow
Objective: Describe buffer overflow vulnerability.
Malware
Objective: Describe malware in context to endpoint attacks.
Reconnaissance
Objective: Describe reconnaissance in context to endpoint attacks.
Gaining Access and Control
Objective: Describe gaining access and control in context to endpoint attacks.
Gaining Access via Social Engineering
Objective: Describe how social engineering is used to gain access to endpoints.
Social Engineering Example: Phishing
Objective: Describe phishing as an example of social engineering.
Gaining Access Via Web-Based Attacks
Objective: Describe how attacker can gain access via web-based attacks.
Exploit Kits
Objective: Describe how attackers can use exploit kit to discover and exploit vulnerabilities in an endpoint.
Rootkits
Objective: Describe rootkit as an attacker tool.
Privilege Escalation
Objective: Describe mechanisms that attackers can use to escalate privileges.
Pivoting
Objective: Describe how attackers use pivoting technique to expand their access in a network.
Post-Exploitation Tools Example
Objective: Provide example of tools used in the post-exploitation phase of an attack.
Exploit Kit Example: Angler
Objective: Describe Angler exploit kit chain of events.

Lesson 7: Understanding Network Security Technologies

Objective: Describe how various network security technologies work together to guard against attacks.

This lesson includes these topics:

Defense-in-Depth Strategy
Objective: Describe the traditional Defense-in-Depth approach to provide a layered security by using multiple security mechanisms.
Defend Across the Attack Continuum  
Objective: Describe the security model that works across the attack continuum. 
Authentication, Authorization, and Accounting  
Objective: Describe AAA. 
Identity and Access Management  
Objective: Describe Identity and Access Management solutions. 
Stateful Firewall  
Objective: Describe stateful firewalls. 
Network Taps  
Objective: This topic describes network taps. 
Switched Port Analyzer  
Objective: This topic describes switched port analyzer. 
Remote Switched Port Analyzer  
Objective: This topic describes remote switched port analyzer. 
Intrusion Prevention System  
Objective: Describe Intrusion Prevention Systems. 
IPS Evasion Techniques  
Objective: Describe Intrusion Prevention Systems Evasion Techniques. 
Snort Rules  
Objective: Describe Intrusion Prevention Systems. 
VPNs  
Objective: Describe VPNs. 
Email Content Security  
Objective: Describe email content security. 
Web Content Security  
Objective: Describe web content security. 
DNS Security  
Objective: Describe DNS security. 
Network-Based Malware Protection  
Objective: Describe network-based malware protection. 
Next Generation Firewall  
Objective: Describe Next Generation Firewall. 
Security Intelligence  
Objective: Describe the use of security intelligence feed. 
Threat Analytic Systems  
Objective: Describe threat analytics systems 
Network Security Device Form Factors  
Objective: Describe the three network security device form factors: physical, virtual, and cloud. 
Security Onion Overview  
Objective: Describe the Security Onion open source security monitoring tool. 
Security Tools Reference  
Objective: Describe online security research tools. 

Lesson 8: Understanding Endpoint Security Technologies
Objective: Provides basic understanding of endpoint security and be familiar with common endpoint security technologies.

This lesson includes these topics:

Host-Based Personal Firewall
Objective: Describe host-based personal firewall.

Host-Based Anti-Virus
Objective: Describe host-based anti-virus.

Host-Based Intrusion Prevention System
Objective: Describe host-based Intrusion Prevention System.

Application Whitelists and Blacklists
Objective: Describe application whitelists and blacklists.

Host-Based Malware Protection
Objective: Describe host-based malware protection.

Sandboxing
Objective: Describe sandboxing in context to network security.

File Integrity Checking
Objective: Describe how security analysts use file integrity checking tools.

Module 3: Security Monitoring and Analysis

Objective: This module discusses network security monitoring, data collection, and data analysis.

Lesson 1: Describing Security Data Collection

Objective: This lesson discusses security monitoring and analysis of logs and data collected from multiple sources.

This lesson includes these topics:

Network Security Monitoring Placement
Objective: Describe placement of network security monitoring devices on the network.

Network Security Monitoring Data Types
Objective: Describe the various types of data used in monitoring network security.

Intrusion Prevention System Alerts
Objective: Describe the importance and use of IPS alerts in network security monitoring.

True/False, Positive/Negative IPS Alerts
Objective: Describe true and false positive IPS alerts and their effects on security monitoring.

IPS Alerts Analysis Process
Objective: Describe the process of IPS alert analysis.

Firewall Log
Objective: Describe the context of a security incident in firewall syslog messages.

DNS Log
Objective: Describe the need for network DNS activity log analysis.
Web Proxy Log
Objective: Describe web proxy log analysis for investigating web-based attacks.

Email Proxy Log
Objective: Describe email proxy log analysis for investigating email-based attacks.

AAA Server Log
Objective: Describe AAA server log analysis.

Next Generation Firewall Log
Objective: Describe NGFW log analysis for incident investigation.

Applications Log
Objective: Describe application log analysis for detecting application misuse.

Packet Captures
Objective: Describe packet capture usage and benefits for investigating security incidents.

NetFlow
Objective: Describe the use of NetFlow for collection and monitoring of network traffic flow data.

Network Behavior Anomaly Detection
Objective: Describe network behavior anomaly monitoring for detecting deviations from the normal patterns.

Data Loss Detection Using Netflow Example
Objective: Describe using NetFlow for data loss detection.

Security Information and Event Management Systems
Objective: Describe the deployment and use of SIEMs to collect, sort, process, prioritize, store, and report the alarms.

Lesson 2: Describing Security Event Analysis

Objective: Explore the different threat models that security operations organizations can reference when performing cybersecurity analysis.

This lesson includes these topics:

Cyber Kill Chain
Objective: Provide overview of the cyber kill chain model that describes the structure of an attack.

Advanced Persistent Threats
Objective: Describe advanced persistence threats characteristics.

Diamond Model for Intrusion Analysis
Objective: Describe the Diamond model for intrusion analysis.

Cybersecurity Threat Models Summary
Objective: Summarize cybersecurity threat models.

SOC Runbook Automation
Objective: Provide an overview of the SOC runbook automation.

Malware Reverse Engineering
Objective: Describe how malware reverse engineering can help protect or defend against future attacks.

Chain of Custody
Objective: Describe chain of custody for all evidence and interacting with law enforcement.

Challenge

Virtual Classroom Live Labs

Guided Lab 1: Explore the TCP/IP Protocol Suite

- Topology
- Task 1: Examine the Network Configuration on Inside-Win
- Task 2: Examine the Network Configuration on Inside-Kali
- Task 3: Verify That Peers Are Not Yet in ARP Cache
- Task 4: Initialize the Packet Capture Process
- Task 5: Generate and Capture Local LAN Traffic
- Task 6: Examine Packet Summaries
- Task 7: Examine Ethernet Headers
- Task 8: Examine an IP Header
- Task 9: Examine an ICMP Header and Data
- Task 10: Capture Communication with a Remote LAN
- Task 11: Examine How the Communication Started
- Task 12: Examine a TCP Connection
- Task 13: Examine the First HTTP Transactions
- Task 14: Examine TCP Connections
- Task 15: Compare and Contrast TCP and UDP

Challenge

Guided Lab 2: Explore the Network Infrastructure

- Topology
- Task 1: Explore Network Switch Operation
- Task 2: Explore VLANs
- Task 3: Explore Trunking
- Task 4: Explore Routing
- Task 5: Explore NAT
- Task 6: Explore Firewalling
- Task 7: Explore DHCP Operation

Challenge

Guided Lab 3: Explore TCP/IP Attacks

- Topology
- Task 1: Footprinting
- Task 2: Fingerprinting
- Task 3: Discrete OS Scanning
- Task 4: Malicious Route Injection
- Task 5: ARP Cache Poisoning

Challenge
Guided Lab 4: Explore Cryptographic Technologies

- Topology
- Task 1: Demonstrate Hash Algorithms
- Task 2: Examine Hash Collisions
- Task 3: Explore MD5 and Enable Secret
- Task 4: Demonstrate Symmetric Encryption
- Task 5: Demonstrate Asymmetric Encryption
- Task 6: Create a Key Pair and Digital Signature
- Task 7: Explore Public-Key Infrastructure
- Task 8: Capture Packets from an SSL/TLS Connection
- Task 9: Analyze SSL/TLS Negotiation

Challenge

Guided Lab 5: Explore Network Applications

- Topology
- Task 1: Prepare to Send an Email Manually
- Task 2: Send an Email Manually
- Task 3: Follow the Email Path
- Task 4: Examine the Email
- Task 5: Send One Email the Normal Way
- Task 6: Examine Hypertext Markup Language
- Task 7: Examine Cascading Style Sheets
- Task 8: Examine JavaScript
- Task 9: Examine PHP
- Task 10: Examine Structured Query Language
- Task 11: Examine URLs
- Task 12: Capture HTTP Traffic for Analysis
- Task 13: HTTP Requests: GET and POST

Challenge

Guided Lab 6: Explore Network Application Attacks

Objective: This lab will explore several different classes of attacks against a targeted web server.

- Topology
- Task 1: Explore Vulnerability Scanning
- Task 2: Examine the Footprints of a Vulnerability Scan
- Task 3: Leverage the Vulnerability Scan Results
- Task 4: Perform an Offline Password Attack
- Task 5: Perform an Online Password Attack
- Task 6: Perform a Command Injection
- Task 7: Perform an SQL Injection
- Task 8: Account Access Via Cookie Manipulation
- Task 9: Explore Reflected Cross-Site Scripting
- Task 10: Explore Persistent Cross-Site Scripting
Challenge

Guided Lab 7: Explore the Windows Operating System

Objective: This lab will focus on exploring the Windows operating system and services discussed in the lesson.

- Topology
- Task 1: Prepare the Inside-Win VM
- Task 2: Explore Processes
- Task 3: Explore Threads
- Task 4: Explore the Registry Database
- Task 5: Explore Handles
- Task 6: Explore Windows Services
- Task 7: Explore Windows Users, Groups, and Permissions
- Task 8: Explore Windows Network Activity from the CLI
- Task 9: Explore Windows Network Activity from the GUI

Challenge

Guided Lab 8: Explore the Linux Operating System

Objective: This lab exercise provides you a structured experience with the Linux operating system basics.

- Topology
- Task 1: Bash Shell
- Task 2: Navigate Linux Directories
- Task 3: Basic File and Directory Operations
- Task 4: File System Permissions
- Task 5: Modify Permissions
- Task 6: I/O Piping and Redirection
- Task 7: grep Command
- Task 8: Linux Processes
- Task 9: netstat Command

Challenge

Guided Lab 9: Explore Endpoint Attacks

- Topology
- Task 1: Perform Reconnaissance
- Task 2: Exploit a Misconfiguration
- Task 3: Exploit a Back Door
- Task 4: Escalate a Privilege Escalation
- Task 5: Exploit an Operating System Flaw
- Task 6: Use a Pivot
- Task 7: Employ Social Engineering/Phishing
- Task 8: Establish Persistence
- Task 9: Tunnel Exfiltrated Data

Challenge
Guided Lab 10: Explore Network Security Technologies

- Topology
  Task 1: Examine Interface Access Policy on the ABC-ASA
  Task 2: Demonstrate Stateful Inspection of TCP
  Task 3: Examine Application Policy on the ABC-ASA
  Task 4: Examine Remote Access VPNs
  Task 5: Examine Network IDS
  Task 6: Examine the Squid Web Proxy

Challenge

Guided Lab 11: Explore Endpoint Security

Objective: Explore the behavior of two endpoint security applications that are part of the base Windows operating system distribution: Windows Defender and Windows Firewall.

- Topology
  Task 1: Explore Windows Defender
  Task 2: Explore Windows Firewall
  Task 3: Explore IPtables and TCP wrappers

Challenge

Guided Lab 12: Explore Security Data for Analysis

Objective: This lab focuses on the analysis of event data for investigation of a security event.

- Topology
  Task 1: Explore Alert Data
  Task 2: Extracted Content
  Task 3: Sandbox Analysis
  Task 4: Transaction Data
  Task 5: Session Data
  Task 6: Full Packet Capture

Challenge

Jul 8 - 12, 2019 | 11:30 AM - 7:30 PM EST
Jul 29 - Aug 2, 2019 | 8:30 AM - 4:30 PM EST
Sep 9 - 13, 2019 | 8:30 AM - 4:30 PM EST
Sep 16 - 20, 2019 | 9:30 AM - 5:30 PM EST
Oct 14 - 18, 2019 | 8:30 AM - 4:30 PM EST
Nov 4 - 8, 2019 | 9:30 AM - 5:30 PM EST
Dec 2 - 6, 2019 | 8:30 AM - 4:30 PM EST
On-Demand Outline

This course allows learners to understand common security concepts, and start to learn the basic security techniques used in a Security Operations Center (SOC) to find threats on a network using a variety of popular security tools within a “real-life” network infrastructure.

Module 1: TCP/IP and Cryptography Concepts

Objective: Describe the concepts and usage of the TCP/IP protocol suite, network infrastructure, TCP/IP attacks, and cryptography.

Lesson 1: Understanding the TCP/IP Protocol Suite

Objective: Describe the TCP/IP protocol suite and its functions.

This lesson includes these topics:

OSI Model
Objective: Describe the OSI model and its function.
TCP/IP Model
Objective: Explain the TCP/IP protocol suite.
Introduction to the Internet Protocol
Objective: Explain Internet Protocol characteristics.
IP Addressing
Objective: Explain IPv4 addressing concepts.
IP Address Classes
Objective: Explain IPv4 address classes.
Reserved IP Addresses
Objective: Describe IPv4 reserved addressing space.
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Objective: Describe how Wireshark is used to capture packets live and to open PCAP files.

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IP Vulnerabilities
Objective: Describe vulnerabilities related to the IP protocol.

ICMP Vulnerabilities
Objective: Describe vulnerabilities related to the ICMP protocol.

TCP Vulnerabilities
Objective: Describe vulnerabilities related to the TCP protocol.

UDP Vulnerabilities
Objective: Describe vulnerabilities related to the UDP protocol.

Attack Surface and Attack Vectors
Objective: Describe the attack surface and its relation to an organizations vulnerability.

Reconnaissance Attacks
Objective: Describe how network data is collected through a reconnaissance attack.

Access Attacks
Objective: Describe how an access attack is used to gain unauthorized access.

Man-in-the-Middle (MITM) Attacks
Objective: Describe MITM attacks.

Denial of Service and Distributed Denial of Service
Objective: Describe how DoS and DDoS attacks are used against networks.

Reflection and Amplification Attacks
Objective: Describe how a reflection attack is used against IP hosts.

Spoofing Attacks
Objective: Describe the concepts and uses of spoofing attacks.

DHCP Attacks
Objective: Describe the concepts and use of DHCP attacks.

Lesson 4: Understanding Basic Cryptography Concepts
Objective: Describe the basic concepts and uses of cryptography.

This lesson includes these topics:

Impact of Cryptography on Security Investigations
Objective: Describe the impact of cryptography on security investigations.

Cryptography Overview
Objective: Describe cryptography concepts.

Hash Algorithms
Objective: Describe hashing mechanisms and algorithms.

Encryption Overview
Objective: Describe encryption usage and features.

Cryptanalysis
Objective: Describe the use of cryptanalysis to break codes to decipher encrypted data.

Symmetric Encryption Algorithms
Objective: Describe the use of symmetric encryption algorithms.

Asymmetric Encryption Algorithms
Objective: Describe the use of asymmetric cryptographic algorithms.

Diffie-Hellman Key Agreement
Objective: Describe the Diffie-Hellman key agreement and Diffie-Hellman groups.

Use Case: SSH
Objective: Describe uses of the SSH protocol.

Digital Signatures
Objective: Describe the basic security services offered with the use of digital signatures.

PKI Overview
Objective: Describe PKI components and use.

PKI Operations
Objective: Describe PKI operations.

Use Case: SSL/TLS
Objective: Describe a use case for SSL/TLS.

Cipher Suite
Objective: Describe cipher suite concepts.

Key Management
Objective: Describe key management for the secure generation, verification, exchange, storage, and destruction of keys.

NSA Suite B
Objective: Describe NSA Suite B cryptographic algorithms.
Module 2: Network Applications and Endpoint Security

Lesson 1: Describing Information Security Concepts

Objective: Describe information security concepts and strategies within the network.

This lesson includes these topics:

Information Security Confidentiality, Integrity, and Availability
Objective: Describe the Information Security CIA triad.

Personally Identifiable Information
Objective: Describe PII as it relates to information security.

Risk
Objective: Describe risk as a function of the likelihood of a given threat source’s exercising a particular potential vulnerability.

Vulnerability Assessment
Objective: Describe vulnerability assessment in the context of information security.

CVSS v3.0
Objective: Describe the CVSS.

Access Control Models
Objective: Describe basic models for implementing access controls over network resources.

Regulatory Compliance
Objective: Describe compliance regulations and their effects on an organization.

Information Security Management
Objective: Describe frameworks for information security management.

Security Operations Center
Objective: Describe the SOC components of people, processes, and technologies, and the reason for the SOC.

Challenge

Lesson 2: Understanding Network Applications

Objective: This lesson describes the use of network applications and how the security analyst can use this knowledge to detect malicious behavior.

This lesson includes these topics:

DNS Operations
Objective: Explain DNS terminology and operations.

Recursive DNS Query
Objective: Describe the process of recursive DNS queries.

Dynamic DNS
Objective: Describe the automated discovery and registration process of the client public IP addresses via DDNS.

HTTP Operations
Objective: Describe HTTP operations and traffic analysis to identify anomalies in the HTTP traffic.
HTTPS Operations
Objective: Describe the use of and operation of HTTPS traffic.

Web Scripting
Objective: Describe how web scripting can be used to deliver malware.

SQL Operations
Objective: Describe how SQL is used to query, operate, and administer relational database management systems as well as how to recognize SQL based attacks.

SMTP Operations
Objective: Describe how the mail delivery process works, and SMTP conversations.

Lesson 3: Understanding Common Network Application Attacks
Objective: This lesson discusses several network application-based attacks. The security analyst needs to be aware of and able to detect these types of attacks.

This lesson includes these topics:

Password Attacks
Objective: Describe password attacks such as brute force and dictionary attacks.

Pass-the-Hash Attacks
Objective: Describe pass-the-hash attacks.

DNS-Based Attacks
Objective: Describe DNS-based attacks.

DNS Tunneling
Objective: Describe DNS tunneling and its use to exfiltrate data out of their networks.

Web-Based Attacks
Objective: Describe web-based attacks and their risk to businesses.

Malicious iFrames
Objective: Describe malicious scripts that are hidden inside inline frames.

HTTP 302 Cushioning
Objective: Describe web site redirection with HTTP 302 cushioning.

Domain Shadowing
Objective: Describe the domain shadowing process used to hijack users’ domain registration logins to create subdomains.

Command Injections
Objective: Describe command injection used to execute arbitrary commands on vulnerable web applications.

SQL Injections
Objective: Describe how SQL injections are used against databases.

Cross-Site Scripting and Request Forgery
Objective: Describe how cross-site scripting and request forgery are used to threaten the security of web applications.

Email-Based Attacks
Objective: Describe how email-based attacks are used against enterprises.

Lesson 4: Understanding Windows Operating System Basics
Objective: This lesson focuses on the Windows operating system feature and functionality.

This lesson includes these topics:

Windows Operating System History
Objective: Describe the history on the Windows operating systems and vulnerabilities.

Windows Operating System Architecture
Objective: Describe the Windows OS architecture and components.

Windows Processes, Threads, and Handles
Objective: Describe Windows processes, threads, and handles.

Windows Virtual Memory Address Space
Objective: Describe virtual memory allocation in the Windows OS.

Windows Services
Objective: Describe Windows services and how they are used.

Windows File System Overview
Objective: Describe the functionality of Windows NTFS.

Windows File System Structure
Objective: Describe the Windows NTFS structure.

Windows Domains and Local User Accounts
Objective: Describe Windows domains and local user accounts.

Windows Graphical User Interface
Objective: Describe the Windows graphical user interface and its use.

Run as Administrator
Objective: Describe how to perform tasks in Windows which may require administrator privileges.

Windows Command Line Interface

Windows PowerShell
Objective: Describe the features of the Windows PowerShell.

Windows net Command
Objective: Describe how the net command is used for Windows administration and maintenance.

Controlling Startup Services and Executing System Shutdown
Objective: Describe how to control Windows startup services, and execute a system shutdown.

Controlling Services and Processes
Objective: Describe how to control Windows services and processes that are operating on a host.

Monitoring System Resources
Objective: Describe how to monitor Windows system resources with the use of Windows Task Manager.

Windows Boot Process
Objective: Describe the Windows boot process, starting services, and registry entries.

Windows Networking
Objective: Describe how to configure Windows networking properties.

Windows netstat Command
Objective: Describe how to use the netstat command to view running networking functions.

Accessing Network Resources with Windows
Objective: Describe how access Windows network resources and perform remote functions.

Windows Registry
Objective: Describe the use of the Windows registry.

Windows Event Logs
Objective: Describe how the Windows Event Viewer is used to browse and manage event logs.

Windows Management Instrumentation
Objective: Describe how the Windows Management Instrumentation is used for management of data and operations on Windows-based operating systems.

Common Windows Server Functions
Objective: Describe common Windows server functions and features.

Common Third-Party Tools
Objective: Describe commonly used third-party tools to manage Windows operating systems.

Lesson 5: Understanding Linux Operating System Basics
Objective: Provide an overview of the Linux Operating System.

This lesson includes these topics:

History and Benefits of Linux
Objective: Provide brief history and benefits of Linux operating system

Linux Architecture
Objective: Describe Linux architecture.

Linux File System Overview
Objective: Provide an overview of the Linux file system.

Basic File System Navigation and Management Commands
Objective: Describe basic file system navigation and management commands in Linux.

File Properties and Permissions
Objective: Describe Linux file properties and permissions.

Editing File Properties
Objective: Describe Linux commands that you can use to manage file permissions and ownership.

Root and Sudo
Objective: Describe Root and Sudo commands in Linux.

Disks and File Systems
Objective: Describe Linux storage disks and file systems.

System Initialization
Objective: Describe the Linux boot process.
Emergency/Alternate Startup Options
Objective: Describe alternate startup options in case Linux is experiencing problems or has been compromised.

Shutting Down the System
Objective: Describe properly procedure to shut down a Linux-based system when you need to bring the system down for maintenance or troubleshooting.

System Processes
Objective: Describe Linux system processes.

Interacting with Linux
Objective: Describe mechanisms for interacting with the Linux operating system.

Linux Command Shell Concepts
Objective: Explore important concepts about the Linux shell and its usage.

Piping Command Output
Objective: Explore Linus Piping command output.

Other Useful Command Line Tools
Objective: Describe other useful Linux command line tools.

Overview of Secure Shell Protocol
Objective: Provide an overview of Secure Shell Protocol.

Networking
Objective: Describe Linux f tools and features for managing virtually every aspect of networking and connectivity configuration.

Managing Services in SysV Environments
Objective: Describe the process of managing services in SysV environments.

Viewing Running Network Services
Objective: Describe tools to track the services running in your Linux installation.

Name Resolution: DNS
Objective: Provide an overview of the Domain Name System.

Testing Name Resolution
Objective: Explore the Linux operating system tools to test name resolution.

Viewing Network Traffic
Objective: Explore Linux tools to viewing network traffic.

System Logs
Objective: Explore logging functionality in context to Linux systems.

Configuring Remote syslog
Objective: Configure remote syslog in context to Linux systems.

Running Software on Linux
Objective: Describe requirements to run software in a Linux installation.

Executables vs. Interpreters
Objective: Explore Linux executable files and interpreters that can execute code.

Using Package Managers to Install Software in Linux
Objective: Describe package managers to install software in Linux.

System Applications
Objective: Describe system applications used to serve clients in context to Linux.

Lightweight Directory Access Protocol
Lesson 6: Understanding Common Endpoint Attacks

Objective: Describe various attack techniques against the endpoints.

This lesson includes these topics:

Classify Attacks, Exploits, and Vulnerabilities
Objective: Classify attacks, exploits, and vulnerabilities in context to endpoint attacks.

Buffer Overflow
Objective: Describe buffer overflow vulnerability.

Malware
Objective: Describe malware in context to endpoint attacks.

Reconnaissance
Objective: Describe reconnaissance in context to endpoint attacks.

Gaining Access and Control
Objective: Describe gaining access and control in context to endpoint attacks.

Gaining Access via Social Engineering
Objective: Describe how social engineering is used to gain access to endpoints.

Social Engineering Example: Phishing
Objective: Describe phishing as an example of social engineering.

Gaining Access Via Web-Based Attacks
Objective: Describe how attacker can gain access via web-based attacks.

Exploit Kits
Objective: Describe how attackers can use exploit kit to discover and exploit vulnerabilities in an endpoint.

Rootkits
Objective: Describe rootkit as an attacker tool.

Privilege Escalation
Objective: Describe mechanisms that attackers can use to escalate privileges.

Pivoting
Objective: Describe how attackers use pivoting technique to expand their access in a network.

Post-Exploitation Tools Example
Objective: Provide example of tools used in the post-exploitation phase of an attack.

Exploit Kit Example: Angler
Objective: Describe Angler exploit kit chain of events.

Lesson 7: Understanding Network Security Technologies

Objective: Describe how various network security technologies work together to guard against attacks.

This lesson includes these topics:

Defense-in-Depth Strategy
Objective: Describe the traditional Defense-in-Depth approach to provide a layered security by using multiple security mechanisms.
Defend Across the Attack Continuum
Objective: Describe the security model that works across the attack continuum.
Authentication, Authorization, and Accounting
Objective: Describe AAA.
Identity and Access Management
Objective: Describe Identity and Access Management solutions.
Stateful Firewall
Objective: Describe stateful firewalls.
Network Taps
Objective: This topic describes network taps.
Switched Port Analyzer
Objective: This topic describes switched port analyzer.
Remote Switched Port Analyzer
Objective: This topic describes remote switched port analyzer.
Intrusion Prevention System
Objective: Describe Intrusion Prevention Systems.
IPS Evasion Techniques
Objective: Describe Intrusion Prevention Systems Evasion Techniques.
Snort Rules
Objective: Describe Intrusion Prevention Systems.
VPNs
Objective: Describe VPNs.
Email Content Security
Objective: Describe email content security.
Web Content Security
Objective: Describe web content security.
DNS Security
Objective: Describe DNS security.
Network-Based Malware Protection
Objective: Describe network-based malware protection.
Next Generation Firewall
Objective: Describe Next Generation Firewall.
Security Intelligence
Objective: Describe the use of security intelligence feed.
Threat Analytic Systems
Objective: Describe threat analytics systems
Network Security Device Form Factors
Objective: Describe the three network security device form factors: physical, virtual, and cloud.
Security Onion Overview
Objective: Describe the Security Onion open source security monitoring tool.
Security Tools Reference
Objective: Describe online security research tools.

Lesson 8: Understanding Endpoint Security Technologies
Objective: Provides basic understanding of endpoint security and be familiar with common endpoint security technologies.

This lesson includes these topics:

Host-Based Personal Firewall  
Objective: Describe host-based personal firewall.

Host-Based Anti-Virus  
Objective: Describe host-based anti-virus.

Host-Based Intrusion Prevention System  
Objective: Describe host-based Intrusion Prevention System.

Application Whitelists and Blacklists  
Objective: Describe application whitelists and blacklists.

Host-Based Malware Protection  
Objective: Describe host-based malware protection.

Sandboxing  
Objective: Describe sandboxing in context to network security.

File Integrity Checking  
Objective: Describe how security analysts use file integrity checking tools.

Module 3: Security Monitoring and Analysis

Objective: This module discusses network security monitoring, data collection, and data analysis.

Lesson 1: Describing Security Data Collection

Objective: This lesson discusses security monitoring and analysis of logs and data collected from multiple sources.

This lesson includes these topics:

Network Security Monitoring Placement  
Objective: Describe placement of network security monitoring devices on the network.

Network Security Monitoring Data Types  
Objective: Describe the various types of data used in monitoring network security.

Intrusion Prevention System Alerts  
Objective: Describe the importance and use of IPS alerts in network security monitoring.

True/False, Positive/Negative IPS Alerts  
Objective: Describe true and false positive IPS alerts and their effects on security monitoring.

IPS Alerts Analysis Process  
Objective: Describe the process of IPS alert analysis.

Firewall Log  
Objective: Describe the context of a security incident in firewall syslog messages.

DNS Log  
Objective: Describe the need for network DNS activity log analysis.
Web Proxy Log
Objective: Describe web proxy log analysis for investigating web-based attacks.

Email Proxy Log
Objective: Describe email proxy log analysis for investigating email-based attacks.

AAA Server Log
Objective: Describe AAA server log analysis.

Next Generation Firewall Log
Objective: Describe NGFW log analysis for incident investigation.

Applications Log
Objective: Describe application log analysis for detecting application misuse.

Packet Captures
Objective: Describe packet capture usage and benefits for investigating security incidents.

NetFlow
Objective: Describe the use of NetFlow for collection and monitoring of network traffic flow data.

Network Behavior Anomaly Detection
Objective: Describe network behavior anomaly monitoring for detecting deviations from the normal patterns.

Data Loss Detection Using Netflow Example
Objective: Describe using NetFlow for data loss detection.

Security Information and Event Management Systems
Objective: Describe the deployment and use of SIEMs to collect, sort, process, prioritize, store, and report the alarms.

Lesson 2: Describing Security Event Analysis

Objective: Explore the different threat models that security operations organizations can reference when performing cybersecurity analysis.

This lesson includes these topics:

Cyber Kill Chain
Objective: Provide overview of the cyber kill chain model that describes the structure of an attack.

Advanced Persistent Threats
Objective: Describe advanced persistence threats characteristics.

Diamond Model for Intrusion Analysis
Objective: Describe the Diamond model for intrusion analysis.

Cybersecurity Threat Models Summary
Objective: Summarize cybersecurity threat models.

SOC Runbook Automation
Objective: Provide an overview of the SOC runbook automation.

Malware Reverse Engineering
Objective: Describe how malware reverse engineering can help protect or defend against future attacks.

Chain of Custody
Objective: Describe chain of custody for all evidence and interacting with law enforcement.

Challenge

On-Demand Labs

Guided Lab 1: Explore the TCP/IP Protocol Suite
- Topology
- Task 1: Examine the Network Configuration on Inside-Win
- Task 2: Examine the Network Configuration on Inside-Kali
- Task 3: Verify That Peers Are Not Yet in ARP Cache
- Task 4: Initialize the Packet Capture Process
- Task 5: Generate and Capture Local LAN Traffic
- Task 6: Examine Packet Summaries
- Task 7: Examine Ethernet Headers
- Task 8: Examine an IP Header
- Task 9: Examine an ICMP Header and Data
- Task 10: Capture Communication with a Remote LAN
- Task 11: Examine How the Communication Started
- Task 12: Examine a TCP Connection
- Task 13: Examine the First HTTP Transactions
- Task 14: Examine TCP Connections
- Task 15: Compare and Contrast TCP and UDP

Challenge

Guided Lab 2: Explore the Network Infrastructure
- Topology
- Task 1: Explore Network Switch Operation
- Task 2: Explore VLANs
- Task 3: Explore Trunking
- Task 4: Explore Routing
- Task 5: Explore NAT
- Task 6: Explore Firewalling
- Task 7: Explore DHCP Operation

Challenge

Guided Lab 3: Explore TCP/IP Attacks
- Topology
- Task 1: Footprinting
- Task 2: Fingerprinting
- Task 3: Discrete OS Scanning
- Task 4: Malicious Route Injection
- Task 5: ARP Cache Poisoning

Challenge
Guided Lab 4: Explore Cryptographic Technologies

- Topology
- Task 1: Demonstrate Hash Algorithms
- Task 2: Examine Hash Collisions
- Task 3: Explore MD5 and Enable Secret
- Task 4: Demonstrate Symmetric Encryption
- Task 5: Demonstrate Asymmetric Encryption
- Task 6: Create a Key Pair and Digital Signature
- Task 7: Explore Public-Key Infrastructure
- Task 8: Capture Packets from an SSL/TLS Connection
- Task 9: Analyze SSL/TLS Negotiation

Challenge

Guided Lab 5: Explore Network Applications

- Topology
- Task 1: Prepare to Send an Email Manually
- Task 2: Send an Email Manually
- Task 3: Follow the Email Path
- Task 4: Examine the Email
- Task 5: Send One Email the Normal Way
- Task 6: Examine Hypertext Markup Language
- Task 7: Examine Cascading Style Sheets
- Task 8: Examine JavaScript
- Task 9: Examine PHP
- Task 10: Examine Structured Query Language
- Task 11: Examine URLs
- Task 12: Capture HTTP Traffic for Analysis
- Task 13: HTTP Requests: GET and POST

Challenge

Guided Lab 6: Explore Network Application Attacks

Objective: This lab will explore several different classes of attacks against a targeted web server.

- Topology
- Task 1: Explore Vulnerability Scanning
- Task 2: Examine the Footprints of a Vulnerability Scan
- Task 3: Leverage the Vulnerability Scan Results
- Task 4: Perform an Offline Password Attack
- Task 5: Perform an Online Password Attack
- Task 6: Perform a Command Injection
- Task 7: Perform an SQL Injection
- Task 8: Account Access Via Cookie Manipulation
- Task 9: Explore Reflected Cross-Site Scripting
- Task 10: Explore Persistent Cross-Site Scripting
Challenge
Guided Lab 7: Explore the Windows Operating System

Objective: This lab will focus on exploring the Windows operating system and services discussed in the lesson.

- Topology
- Task 1: Prepare the Inside-Win VM
- Task 2: Explore Processes
- Task 3: Explore Threads
- Task 4: Explore the Registry Database
- Task 5: Explore Handles
- Task 6: Explore Windows Services
- Task 7: Explore Windows Users, Groups, and Permissions
- Task 8: Explore Windows Network Activity from the CLI
- Task 9: Explore Windows Network Activity from the GUI

Challenge
Guided Lab 8: Explore the Linux Operating System

Objective: This lab exercise provides you a structured experience with the Linux operating system basics.

- Topology
- Task 1: Bash Shell
- Task 2: Navigate Linux Directories
- Task 3: Basic File and Directory Operations
- Task 4: File System Permissions
- Task 5: Modify Permissions
- Task 6: I/O Piping and Redirection
- Task 7: grep Command
- Task 8: Linux Processes
- Task 9: netstat Command

Challenge
Guided Lab 9: Explore Endpoint Attacks

- Topology
- Task 1: Perform Reconnaissance
- Task 2: Exploit a Misconfiguration
- Task 3: Exploit a Back Door
- Task 4: Escalate a Privilege Escalation
- Task 5: Exploit an Operating System Flaw
- Task 6: Use a Pivot
- Task 7: Employ Social Engineering/Phishing
- Task 8: Establish Persistence
- Task 9: Tunnel Exfiltrated Data

Challenge
Guided Lab 10: Explore Network Security Technologies

- Topology
  - Task 1: Examine Interface Access Policy on the ABC-ASA
  - Task 2: Demonstrate Stateful Inspection of TCP
  - Task 3: Examine Application Policy on the ABC-ASA
  - Task 4: Examine Remote Access VPNs
  - Task 5: Examine Network IDS
  - Task 6: Examine the Squid Web Proxy

Challenge

Guided Lab 11: Explore Endpoint Security

Objective: Explore the behavior of two endpoint security applications that are part of the base Windows operating system distribution: Windows Defender and Windows Firewall.

- Topology
  - Task 1: Explore Windows Defender
  - Task 2: Explore Windows Firewall
  - Task 3: Explore IPtables and TCP wrappers

Challenge

Guided Lab 12: Explore Security Data for Analysis

Objective: This lab focuses on the analysis of event data for investigation of a security event.

- Topology
  - Task 1: Explore Alert Data
  - Task 2: Extracted Content
  - Task 3: Sandbox Analysis
  - Task 4: Transaction Data
  - Task 5: Session Data
  - Task 6: Full Packet Capture

Challenge
UNDERSTANDING CISCO CYBERSECURITY FUNDAMENTALS (SECFND) V1.0

Course Code: 4997

PRIVATE GROUP TRAINING
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