



CCNA Security v1.0 Scope and Sequence

Last updated April 7, 2011

Target Audience

The Cisco® CCNA® Security course is designed for Cisco Networking Academy® students seeking career-oriented, entry-level security specialist skills. Target students include IT professionals who want to enhance their core routing and switching skills and students enrolled in technology degree programs at institutions of higher education.

CCNA Security provides a next step for CCNA Discovery or CCNA Exploration students who want to expand their CCNA-level skill set to prepare for a career in network security.

Prerequisites

CCNA Security has no Networking Academy course prerequisites.

Students should have the following skills and knowledge:

- Basic PC skills such as typing, mouse, and desktop navigation skills
- Basic Internet navigation skills
- CCNA-level networking concepts and skills

While there are no *required* course prerequisites, students are encouraged to complete the CCNA Discovery or CCNA Exploration curricula to acquire the fundamental CCNA-level routing and switching skills needed for success in this course.

Target Certifications

The CCNA Security curriculum prepares students for the Implementing Cisco IOS® Network Security (IINS) certification exam (640-553), leading to the CCNA Security certification.

Curriculum Description

CCNA Security equips students with the knowledge and skills needed to prepare for entry-level security specialist careers. This course is a hands-on, career-oriented e-learning solution that emphasizes practical experience. CCNA Security is a blended curriculum with both online and classroom learning.

CCNA Security aims to develop an in-depth understanding of network security principles as well as the tools and configurations available. The following tools are covered:

- Protocol sniffers/analyzers
- TCP/IP and common desktop utilities
- Cisco IOS Software
- Cisco VPN client
- Packet Tracer (PT)

- Web-based resources

The predominant lab types are procedural, skills integration challenges, troubleshooting, and model building.

Most chapters include Packet Tracer-based skills integration challenges that are cumulative throughout the course, allowing for an “exam-like” culminating activity at the end of the course. All hands-on labs in the course can be completed on actual physical equipment or in conjunction with the NDG NETLAB solution.

CCNA Security has the following features:

- Designed for students with CCNA-level knowledge and skills
- Can be delivered as an independent curriculum or integrated into broader courses of study
- Offers a hands-on, career-oriented approach to learning networking that emphasizes practical experience
- Can be delivered in-person or in a blended distance learning (BDL) environment
- Includes activities that emphasize networking implementation

Curriculum Objectives

CCNA Security helps students develop the skills needed to succeed in IT-related degree programs and prepare for the CCNA Security certification. It provides a theoretically rich, hands-on introduction to network security, in a logical sequence driven by technologies.

The goals of CCNA Security are as follows:

- Provide an in-depth, theoretical understanding of network security
- Provide students with the knowledge and skills necessary to design and support network security
- Provide an experience-oriented course that employs industry-relevant instructional approaches to prepare students for associate-level jobs in the industry
- Enable students to have significant hands-on interaction with IT equipment to prepare them for certification exams and career opportunities

Upon completion of the CCNA Security course, students will be able to perform the following tasks:

- Describe the security threats facing modern network infrastructures
- Secure network device access
- Implement AAA on network devices
- Mitigate threats to networks using ACLs
- Implement secure network management and reporting
- Mitigate common Layer 2 attacks
- Implement the Cisco IOS firewall feature set
- Implement the Cisco IOS IPS feature set
- Implement site-to-site IPSec VPNs
- Administer effective security policies

Minimum System Requirements

CCNA Security curriculum requirements:

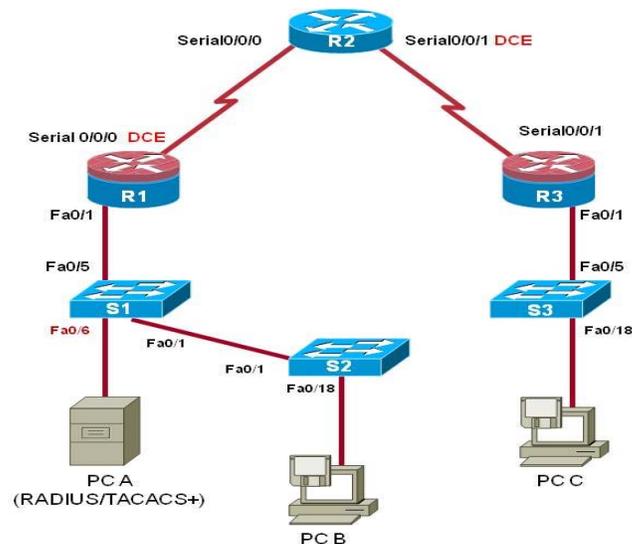
- 1 Student PC per student; 1 local curriculum server

Lab bundle requirements for CCNA Security:

Detailed equipment information, including descriptions and part numbers, is available in the official CCNA Security Equipment List on Academy Connection. Please refer to that document for the latest information, which includes specifications for the following minimum equipment required:

- 3 Cisco routers, 2 with the Security Technology Package License
- 3 Two-Port Serial WAN Interface Cards
- 3 Cisco switches
- Assorted Ethernet and Serial cables and hubs

The equipment should be set up in the following configuration:



CCNA Security Outline

This course teaches students the skills needed to obtain entry-level security specialist jobs. It provides a hands-on introduction to network security. Instructors are encouraged to provide outside-the-classroom learning experiences.

Chapter Outline

Chapter/Section	Goals/Objectives
Chapter 1. Modern Network Security Threats	Explain network threats, mitigation techniques, and the basics of securing a network
1.1 Fundamental Principles of a Secure Network	Describe the fundamental principles of securing a network
1.2 Worms, Viruses and Trojan Horses	Describe the characteristics of worms, viruses, and Trojan horses and mitigation methods
1.3 Attack Methodologies	Describe common network attack methodologies and mitigation techniques such as Reconnaissance, Access, Denial of Service, and DDoS
Chapter 2. Securing Network Devices	Secure administrative access on Cisco routers
2.1 Securing Device Access and Files	Configure secure administrative access and router resiliency
2.2 Privilege Levels and Role-Based CLI	Configure command authorization using privilege levels and role-based CLI
2.3 Monitoring Devices	Configure network devices for monitoring
2.4 Using Automated Features	Secure IOS-based routers using automated features
Chapter 3. Authentication, Authorization and Accounting	Secure administrative access with AAA
3.1 Purpose of AAA	Describe the purpose of AAA and the various implementation techniques
3.2 Configuring Local AAA	Implementing AAA using the local database
3.3 Configure Server-Based AAA	Implementing AAA using TACACS+ and RADIUS protocols
Chapter 4. Implementing Firewall Technologies	Implement firewall technologies to secure the network perimeter
4.1 Access Control Lists	Implement ACLs
4.2 Firewall Technologies	Describe the purpose and operation of firewall technologies
4.3 Context-Based Access Control	Implement CBAC
4.4 Zone-Based Policy Firewall	Implement Zone-based policy Firewall using SDM and CLI
Chapter 5. Implementing Intrusion Prevention	Configure IPS to mitigate attacks on the network
5.1 IPS Technologies	Describe the purpose and operation of network-based and host-based Intrusion Prevention

	Systems
5.2 Implementing IPS	Implement Cisco IOS IPS operations using SDM and CLI
Chapter 6. Securing the Local Area Network	Describe LAN security considerations and implement endpoint and Layer 2 security features
6.1 Endpoint Security Considerations	Describe endpoint vulnerabilities and protection methods
6.2 Layer 2 Security Considerations	Describe basic Catalyst switch vulnerabilities such as VLAN attacks, STP manipulation, CAM table overflow attacks, and MAC address spoofing attacks
6.3 Wireless, VoIP and SAN Security Considerations	Describe the fundamentals of Wireless, VoIP and SANs, and the associated security considerations
6.4 Configuring Switch Security	Configure and verify switch security features, including port security and storm control
6.5 SPAN and RSPAN	Describe Switched Port Analyzer (SPAN) and Remote SPAN (RSPAN)
Chapter 7. Cryptography	Describe methods for implementing data confidentiality and integrity
7.1 Cryptographic Services	Describe how different types of encryption, hashes, and digital signatures work together to provide confidentiality, integrity, and non-repudiation
7.2 Hashes and Digital Signatures and authentication	Describe the mechanisms to ensure data integrity
7.3 Symmetric and Asymmetric Encryption	Describe the mechanisms used to ensure data confidentiality
Chapter 8. Implementing Virtual Private Networks	Implement secure virtual private networks
8.1 VPNs	Describe the purpose and operation of VPN types
8.2 IPSec VPN Components and Operation	Describe the components and operations of IPSec VPNs
8.3 Implementing Site-to-Site IPSec VPNs	Configure and verify a site-to-site IPSec VPN with pre-shared key authentication using SDM and CLI
8.4 Implementing a Remote Access VPN	Configure and verify a remote access VPN
8.5 Implementing SSL VPNs	Configure and verify SSL VPNs
Chapter 9. Managing a Secure Network	Given the security needs of an enterprise, create and implement a comprehensive security policy
9.1 Secure Network Lifecycle	Describe the secure network lifecycle
9.2 Self-Defending Network	Describe the components of a self-defending network and business continuity plans
9.3 Building a Comprehensive Security Policy	Establish a comprehensive security policy to meet the security needs of a given enterprise