

# CISC-9 - CCNA - IMPLEMENTING AND ADMINISTERING CISCO SOLUTIONS

## V2.1

Categoria: **Cisco**

### INFORMAZIONI SUL CORSO



Durata:  
5 Giorni



Categoria:  
Cisco



Qualifica Istruttore:  
Cisco Certified  
Instructor



Dedicato a:  
Professionista IT



Produttore:  
Cisco

### OBIETTIVI

After completing this course you should be able to:

- Identify the components of a computer network and describe their basic characteristics
- Understand the model of host-to-host communication
- Describe the features and functions of the Cisco Internetwork Operating System (IOS®) software
- Describe LANs and the role of switches within LANs
- Describe Ethernet as the network access layer of TCP/IP and describe the operation of switches
- Install a switch and perform the initial configuration
- Describe the TCP/IP Internet layer, IPv4, its addressing scheme, and subnetting
- Describe the TCP/IP Transport layer and Application layer
- Explore functions of routing
- Implement basic configuration on a Cisco router
- Explain host-to-host communications across switches and routers
- Identify and resolve common switched network issues and common problems associated with IPv4 addressing
- Describe IPv6 main features and addresses, and configure and verify basic IPv6 connectivity
- Describe the operation, benefits, and limitations of static routing
- Describe, implement, and verify virtual local area networks (VLANs) and trunks
- Describe the application and configuration of inter-VLAN routing
- Explain the basics of dynamic routing protocols and describe components and terms of Open Shortest Path First (OSPF)
- Explain how Spanning Tree Protocol (STP) and Rapid Spanning Tree Protocol (RSTP) work
- Configure link aggregation using EtherChannel
- Describe the purpose of Layer 3 redundancy protocols
- Describe basic WAN and VPN concepts
- Describe the operation of access control lists (ACLs) and their applications in the network
- Configure Internet access using Dynamic Host Configuration Protocol (DHCP) clients and explain and configure network address translation (NAT) on Cisco routers
- Describe basic quality of service (QoS) concepts
- Describe the concepts of wireless networks, which types of wireless networks can be built, and how to use Wireless LAN Controllers (WLCs)
- Describe network and device architectures and introduce virtualization
- Introduce the concept of network programmability and Software-Defined Networking (SDN) and describe smart

network management solutions such as Cisco DNA Center™, Software-Defined Access (SD-Access), and Software-Defined Wide Area Network (SD-WAN)

- Configure basic IOS system monitoring tools
- Describe the management of Cisco devices
- Describe the current security threat landscape
- Describe threat defense technologies
- Implement a basic security configuration of the device management plane
- Implement basic steps to harden network devices

## PREREQUISITI

Attendees should meet the following prerequisites:

- Basic computer literacy
- Basic PC operating system navigation skills
- Basic internet usage skills
- Basic IP address knowledge

## CONTENUTI

### Exploring the Functions of Networking

- What is a Computer Network?
- Common Usage of a Computer Network
- Components of a Network
- Characteristics of a Network
- Physical vs. Logical Topologies
- Interpreting a Network Diagram
- Impact of User Applications on the Network

### Introducing the Host-To-Host Communications Model

- Host-To-Host Communications Overview
- ISO OSI Reference Model
- TCP/IP Protocol Suite
- Peer-To-Peer Communications
- Encapsulation and De-Encapsulation
- TCP/IP Stack vs OSI Reference Model

### Operating Cisco IOS Software

- Cisco IOS Software Features and Functions
- Cisco IOS Software CLO Functions
- Cisco IOS Software Modes
- Get Started with Cisco CLI

### Introducing LANs

- Local Area Networks
- LAN Components
- Need for Switches
- Characteristics and Features of Switches

-Activity: Datasheet exploration

### **Exploring the TCP/IP Link Layer**

- Ethernet LAN Connection Media
- Ethernet Frame Structure
- LAN Communication Types
- MAC Addresses
- Frame Switching
- Observe How a Switch Operates
- Duplex Communication

### **Starting a Switch**

- Switch Installation
- Connecting to a Console Port
- Switch Components
- Switch LED Indicators
- Basic show Commands and Information
- Perform Basic Switch Configuration
- Implement the Initial Switch Configuration

### **Introducing the TCP/IP Internet Layer, IPv4 Addressing, and Subnets**

- Internet Protocol
- Decimal and Binary Number Systems
- Binary-to-Decimal Conversion
- Decimal-to-Binary Conversion
- IPv4 Address Representation
- IPv4 Header Fields
- IPv4 Address Classes
- Subnet Masks
- Subnets
- Implementing Subnetting: Borrowing Bits
- Implementing Subnetting: Determining the Addressing Scheme
- Benefits of VLSM and Implementing VLSM
- Private vs. Public IPv4 Addresses
- Reserved IPv4 Addresses
- Verifying IPv4 Address of a Host

### **Explaining the TCP/IP Transport Layer and Application Layer**

- TCP/IP Transport Layer Functions
- Reliable vs. Best-Effort Transport
- TCP Characteristics
- UDP Characteristics
- TCP/IP Application Layer
- Introducing HTTP
- Domain Name System
- Explaining DHCP for IPv4
- Inspect TCP/IP Applications

### **Exploring the Functions of Routing**

- Role of a Router
- Router Components
- Router Functions
- Routing Table
- Path Determination
- Cisco Router Models
- Routing Hierarchy on Internet

### **Configuring a Cisco Router**

- Initial Router Setup
- Configuring Router Interfaces
- Configuring IPv4 Addresses on Router Interfaces
- Checking Interface Configuration and Status
- Configure an Interface on a Cisco Router
- Exploring Connected Devices
- Using Cisco Discovery Protocol
- Configure and Verify LLDP
- Configure and Verify Layer 2 Discovery Protocols
- Implement an Initial Router Configuration

### **Exploring the Packet Delivery Process**

- Layer 2 Addressing
- Layer 3 Addressing
- Default Gateways
- Address Resolution Protocol
- Configure Default Gateway
- Host-To-Host Packet Delivery
- Explore Packet Forwarding

### **Troubleshooting a Simple Network**

- Troubleshooting Methods
- Troubleshooting Common Switch Media Issues
- Troubleshooting Common Switch Port Issues
- Troubleshoot Switch Media and Port Issues
- Troubleshoot Port Duplex Issues
- Troubleshooting Common Problems Associated with IPv4 Addressing

### **Introducing Basic IPv6**

- IPv4 Address Exhaustion Workarounds
- IPv6 Features
- IPv6 Addresses and Address Types
- Comparison of IPv4 and IPv6 Headers
- Neighbor Discovery
- IPv6 Address Allocation
- Configure Basic IPv6 Connectivity
- Verification of End-To-End IPv6 Connectivity

### **Configuring Static Routing**

- Routing Operation

- Static and Dynamic Routing Comparison
- When to Use Static Routing
- IPv4 Static Route Configuration
- Default Routes
- Verifying Static and Default Route Configuration
- Configure and Verify IPv4 Static Routes
- IPv6 Static Route Configuration
- Configure IPv6 Static Routes
- Implement IPv4 Static Routing
- Implement IPv6 Static Routing

### **Implementing VLANs and Trunks**

- VLAN Introduction
- Creating a VLAN
- Assigning a Port to a VLAN
- Trunking with 802.1Q
- Configuring an 802.1Q Trunk
- Configure VLANs and Trunks
- VLAN Design Considerations
- Troubleshoot VLANs and Trunks

### **Routing Between VLANs**

- Purpose of Inter-VLAN Routing
- Options for Inter-VLAN Routing
- Configure Inter-VLAN Routing
- Implement Multiple VLANs and Basic Routing Between the VLANs

### **Introducing OSPF**

- Dynamic Routing Protocols
- Path Selection
- Link-State Routing Protocol Overview
- Link-State Routing Protocol Data Structures
- Introducing OSPF
- Establishing OSPF Neighbor Adjacencies
- OSPF Neighbor States
- SPF Algorithm
- Building a Link-State Database
- Configure and Verify Single-Area OSPF
- Routing for IPv6

### **Improving Redundant Switched Topologies with EtherChannel**

- EtherChannel Overview
- EtherChannel Configuration Options
- Configuring and Verifying EtherChannel
- Configure and Verify EtherChannel
- Improve Redundant Switched Topologies with EtherChannel

### **Explaining the Basics of ACL**

- ACL Overview

- ACL Operation
- ACL Wildcard Masking
- Wildcard Mask Abbreviations
- Types of Basic ACLs
- Configuring Standard IPv4 ACLs
- Configuring Extended IPv4 ACLs
- Verifying and Modifying IPv4 ACLs
- Applying IPv4 ACLs to Filter Network Traffic
- Configure and Verify IPv4 ACLs
- Implement Numbered and Named IPv4 ACLs

### **Enabling Internet Connectivity**

- Configure a Provider-Assigned IPv4 Address
- Introducing Network Address Translation
- NAT Terminology and Translation Mechanisms
- Benefits and Drawbacks of NAT
- Static NAT and Port Forwarding
- Dynamic NAT
- Port Address Translation
- Configuring and Verifying Inside IPv4 NAT
- Configure Static NAT
- Configure Dynamic NAT and PAT
- Implement PAT

### **Explaining the Evolution of Intelligent Networks**

- Overview of Network Programmability in Enterprise Networks
- Software-Defined Networking
- Common Programmability Protocols and Methods
- Configuration Management Tools
- Introducing Cisco DNA Center
- Explore the Cisco DNA Center
- Downloadable Asset: Using Cisco Meraki Dashboard API
- Introducing Cisco SD-Access
- Introducing Cisco SD-WAN

### **Introducing System Monitoring**

- Introducing Syslog
- Syslog Message Format
- SNMP Overview
- Enabling Network Time Protocol
- Configure and Verify NTP
- Configure System Message Logging

### **Managing Cisco Devices**

- Cisco IOS Integrated File System and Devices
- Stages of the Router Power-On Boot Sequence
- Loading and Managing System Images Files
- Loading Cisco IOS Configuration Files

- Validating Cisco IOS Images Using MD5/SHA512
- Managing Cisco IOS Images and Device Configuration Files
- Create the Cisco IOS Image Backup
- Upgrade Cisco IOS Image

### **Securing Administrative Access**

- Network Device Security Overview
- Securing Access to Privileged EXEC Mode
- Securing Console Access
- Securing Remote Access
- Secure Console and Remote Access
- Configuring the Login Banner
- Limiting Remote Access with ACLs
- Enable and Limit Remote Access Connectivity
- External Authentication Options
- Secure Device Administrative Access

### **Implementing Device Hardening**

- Securing Unused Ports
- Infrastructure ACL
- Disabling Unused Services
- Port Security
- Configure and Verify Port Security
- Mitigating VLAN Attacks
- Dynamic ARP Inspection
- Mitigating STP Attacks
- Implement Device Hardening

### **Building Redundant Switched Topologies (Self-Study)**

- Physical Redundancy in a LAN
- Issues in Redundant Topologies
- Spanning Tree Operation
- Types of Spanning Tree Protocols
- PortFast and BPDU Guard
- Rapid Spanning Tree Protocol

### **Exploring Layer 3 Redundancy (Self-Study)**

- Need for Default Gateway Redundancy
- Understanding FHRP
- Understanding HSRP

### **Introducing WAN Technologies (Self-Study)**

- Introduction to WAN Technologies
- WAN Devices and Demarcation Point
- WAN Topology Options
- WAN Connectivity Options
- Virtual Private Networks
- Enterprise-Managed VPNs

**Introducing QoS (Self-Study)**

- Converged Networks
- QoS Defined
- QoS Policy
- QoS Mechanisms
- QoS Models
- Deploying End-to-End QoS

**Explaining Wireless Fundamentals (Self-Study)**

- Wireless Technologies
- Wireless Radio Communication
- WLAN Architectures
- Wi-Fi Channels
- AP and WLC Management
- Log in to and Monitor the WLC
- Configure an Open Wireless Network
- Define a RADIUS Server and Enable SNMP and Syslog

**Introducing Architectures and Virtualization (Self-Study)**

- Introduction to Network Design
- Enterprise Three-Tier Hierarchical Network Design
- Spine - Leaf Network Design
- Cisco Enterprise Architecture Model
- Underlay and Overlay Network Concepts
- Cloud Computing Overview
- Network Device Architecture
- Virtualization Fundamentals

**Examining the Security Threat Landscape (Self-Study)**

- Security Threat Landscape Overview
- Malware
- Hacking Tools
- DoS and DDoS
- Spoofing
- Reflection and Amplification Attacks
- Social Engineering
- Evolution of Phishing
- Password Attacks
- Reconnaissance Attacks
- Buffer Overflow Attacks
- Man-in-the-Middle Attacks
- Vectors of Data Loss and Exfiltration
- Other Considerations

**Implementing Threat Defense Technologies (Self-Study)**

- Information Security Overview
- Firewalls
- Intrusion Prevention Systems
- Protection Against Data Loss and Phishing Attacks



- Defending against DoS and DDoS Attacks
- Introduction to Cryptographic Technologies
- IPsec Security Services
- Secure Sockets Layer and Transport Layer Security
- Wireless Security Protocols
- Configure a WLAN to Use WPA2 PSK

#### **Labs:**

- Discovery 1: Get Started with Cisco Command-Line Interface (CLI)
- Discovery 2: Observe How a Switch Operates
- Discovery 3: Perform Basic Switch Configuration
- FAST Lab 1: Implement the Initial Switch Configuration
- Discovery 4: Inspect TCP/IP Applications
- Discovery 5: Configure an Interface on a Cisco Router
- Discovery 6: Configure and Verify Layer 2 Discovery Protocols
- FAST Lab 2: Implement an Initial Router Configuration
- Discovery 7: Configure Default Gateway
- Discovery 8: Explore Packet Forwarding
- Discovery 9: Troubleshoot Switch Media and Port Issues
- Discovery 10: Troubleshoot Port Duplex Issues
- Discovery 11: Configure Basic IPv6 Connectivity
- Discovery 12: Configure and Verify IPv4 Static Routes
- Discovery 13: Configure IPv6 Static Routes
- FAST Lab 3: Implement IPv4 Static Routing
- FAST Lab 4: Implement IPv6 Static Routing
- Discovery 14: Configure VLANs and Trunk
- FAST Lab 5: Troubleshoot VLANs and Trunk
- Discovery 15: Configure Inter-VLAN Routing
- FAST Lab 6: Implement Multiple VLANs and Basic Routing Between the VLANs
- Discovery 16: Configure and Verify Single-Area OSPF
- Discovery 17: Configure and Verify EtherChannel
- FAST Lab 7: Improve Redundant Switched Topologies with EtherChannel
- Discovery 18: Configure and Verify IPv4 ACLs
- FAST Lab 8: Implement Numbered and Named IPv4 ACLs
- Discovery 19: Configure a Provider-Assigned IPv4 Address
- Discovery 20: Configure Static NAT
- Discovery 21: Configure Dynamic NAT and Port Address Translation (PAT)
- FAST Lab 9: Implement PAT
- Discovery 22: Explore the Cisco DNA™ Center
- Discovery 23: Configure and Verify NTP
- FAST Lab 10: Configure System Message Logging
- Discovery 24: Create the Cisco IOS Image Backup
- Discovery 25: Upgrade Cisco IOS Image
- Discovery 26: Secure Console and Remote Access
- Discovery 27: Enable and Limit Remote Access Connectivity
- FAST Lab 11: Secure Device Administrative Access
- Discovery 28: Configure and Verify Port Security
- FAST Lab 12: Implement Device Hardening

- Discovery 29: Log into and Monitor the WLC
- Discovery 30: Configure an Open Wireless Network
- Discovery 31: Define a RADIUS Server and Enable SNMP and Syslog
- Discovery 32: Configure a WLAN to Use WPA2 PSK

## INFO

**Esame:** 200-301 - Cisco Certified Network Associate

**Materiale didattico:** Materiale didattico ufficiale Cisco in formato digitale

**Costo materiale didattico:** incluso nel prezzo del corso a Calendario

**Natura del corso:** Operativo (previsti lab su PC)