

# CISCO

*Revised 4/28/2008*

## **/training/etc**

*The Art of Knowledge.*

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**Course Description:** ICND1 v1.0 focuses on providing the skills and knowledge necessary to implement and support a small switched and routed network. For the purpose of this course, a small network is defined as 1-20 hosts connected to a single switch with the switch running a single VLAN. The switch is also connected to a router that is providing a routed link (RIP & default) to a simulated Internet and corporate office.

ICND1 v1.0 works from the bottom up providing knowledge and skills as they are needed. The course starts with an introduction to networking. It then introduces host-to-host communications using TCP/IP. Next Layer 2 devices (switches, etc.) are introduced into the network. Next Layer 3 devices (routers) are introduced into the network. The introduction of Layer 3 devices leads to the use of WANs and routing to connect the site to the Internet and corporate sites. Finally, device management skills (CDP, TFTP, etc.) are introduced.

**Who Should Attend:** The primary audience for this course includes Network Administrators, Network Engineers, Network Managers, and Systems Engineers.

**Prerequisites:** Students should have basic computer literacy, basic Windows navigation skills, basic Internet usage skills, and basic e-mail usage skills.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Describe how networks function, identifying major components, function of network components and the Open System Interconnection (OSI) reference model.
- Using the host-to-host packet delivery process, describe issues related to increasing traffic on an Ethernet LAN and identify switched LAN technology solutions to Ethernet networking issues.
- Describe the reasons for extending the reach of a LAN and the methods that can be used with a focus on RF wireless access.
- Describe the reasons for connecting networks with routers and how routed networks transmit data through networks using TCP/IP.

## Course Outline:

### Course Introduction

#### Module 1: Building a Simple Network

Exploring the Functions of Networking  
 Securing the Network  
 Understanding the Host-to-Host Communication Model  
 Understanding TCP/IP's Internet Layer  
 Understanding TCP/IP's Transport Layer  
 Exploring the Packet Delivery Process  
 Understanding Ethernet  
 Connecting to an Ethernet LAN  
 Lab 1-1: Using Windows Applications as Network Tools  
 Lab 1-2: Observing the TCP Three-Way Handshake  
 Lab 1-3: Observing Extended PC Network Information

#### Module 2: Ethernet Local Area Networks (LAN's)

Understanding the Challenges of Shared LANs  
 Solving Network Challenges with Switched LAN Technology  
 Exploring the Packet Delivery Process  
 Operating Cisco IOS Software  
 Starting a Switch  
 Understanding Switch Security  
 Maximizing the Benefits of Switching  
 Troubleshooting Switch Issues  
 Lab 2-1: Connecting to Remote Lab Equipment  
 Lab 2-2: Switch Startup and Initial Configuration  
 Lab 2-3: Enhancing Security of Switch Configuration  
 Lab 2-4: Operating and Configuring a Cisco IOS Device

#### Module 3: Wireless Local Area Networks (WLAN's)

Exploring Wireless Networking  
 Understanding WLAN Security  
 Implementing a WLAN

#### Module 4: Local Area Network Connections

Exploring the Functions of Routing  
 Understanding Binary Basics  
 Constructing a Network Addressing Scheme  
 Starting a Router  
 Configuring a Router  
 Exploring the Packet Delivery Process  
 Understanding Router Security  
 Using Cisco Router and Security Device Manager  
 Using a Router as a DHCP Server  
 Accessing Remote Devices

Lab 4-1: Converting Decimal to Binary and Binary to Decimal  
 Lab 4-2: Classifying Network Addressing  
 Lab 4-3: Computing Usable Sub-networks and Hosts  
 Lab 4-4: Calculating Subnet Masks  
 Lab 4-5: Initial Router Startup  
 Lab 4-6: Initial Router Configuration  
 Lab 4-7: Enhancing Security of Initial Router Configuration  
 Lab 4-8: Using SDM to Configure DHCP Server Function  
 Lab 4-9: Managing Remote Access Sessions

#### Module 5: Wide Area Networks (WANs)

Understanding WAN Technologies  
 Enabling the Internet Connection  
 Enabling Static Routing  
 Configuring Serial Encapsulation  
 Enabling Routing Information Protocol (RIP)  
 Lab 5-1: Connecting to the Internet  
 Lab 5-2: Connecting to the Main Office  
 Lab 5-3: Enable Dynamic Routing to Main Office

#### Module 6: Network Environment Management

Managing Cisco Devices  
 Lab 6-1: Using CDP  
 Lab 6-2: Managing Router Startup Options  
 Lab 6-3: Managing Cisco Devices  
 Lab 6-4: Confirming the Re-Configuration of the Branch Network

**Course Description:** Interconnecting Cisco Networking Devices Part 2 (ICND2) v1.0 is an instructor-led course presented by Cisco training partners to their end-user customers. This five-day course focuses on using Cisco Catalyst switches and Cisco routers connected in LANs and WANs typically found at medium-sized network sites. The course helps to provide the skills and knowledge necessary to install, operate, and troubleshoot a small to medium-size branch office Enterprise network, including configuring several switches and routers, connecting to a WAN and implementing network security.

**Who Should Attend:** The primary audience for this course include Network Administrators, Network Engineers, Network Managers, and Systems Engineers. The secondary audience for this course includes Network Designers and Project Managers.

**Prerequisites:** The knowledge and skills that a learner must have before attending this course include skills and knowledge equivalent to those learned in Interconnecting Cisco Networking Devices Part 1 (ICND1) and the ability to install, configure, and troubleshoot a small network.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Review how to configure and troubleshoot a small network
- Expand the switched network from a small LAN to a medium-sized LAN with multiple switches, supporting VLANs, Trunking, and Spanning Tree
- Describe routing concepts as they apply to a medium-sized network and discuss considerations when implementing routing on the network
- Configure, verify, and troubleshoot OSPF
- Configure, verify, and troubleshoot EIGRP
- Determine how to apply ACLs based on network requirements, and to configure, verify, and troubleshoot ACLs on a medium-sized network
- Describe when to use NAT or PAT on a medium-sized network, and configure NAT or PAT on routers

## Course Outline:

### Course Introduction

Lab 8-1: Establishing a Frame Relay WAN  
Lab 8-2: Troubleshooting Frame Relay WANs

### Module 1: Small Network Implementation

Introducing the Review Lab  
Lab 1-1: Implementing a Small Network (Review Lab)

### Module 2: Medium-Sized Switched Network Construction

Implementing VLANs and Trunks  
Improving Performance with Spanning Tree  
Routing Between VLANs  
Securing the Expanded Network  
Trouble shooting Switched Networks  
Lab 2-1: Configuring Expanded Switched Networks  
Lab 2-2: Troubleshooting Switched Networks

### Module 3: Medium-Sized Routed Network Construction

Reviewing Routing Operations  
Implementing VLSM

### Module 4: Single Area OSPF Implementation

Implementing OSPF  
Troubleshooting OSPF  
Lab 4-1: Implementing OSPF  
Lab 4-2: Troubleshooting OSPF

### Module 5: EIGRP Implementation

Implementing EIGRP  
Troubleshooting EIGRP  
Lab 5-1: Implementing EIGRP  
Lab 5-2: Troubleshooting EIGRP

### Module 6: Access Control Lists

Introducing ACL Operation  
Configuring and Troubleshooting ACLs  
Lab 6-1: Implementing and Troubleshooting ACLs

### Module 7: Address Space Management

Scaling the Network with NAT and PAT  
Transitioning to IPv6  
Lab 7-1: Configuring NAT and PAT  
Lab 7-2: Implementing IPv6

### Module 8: LAN Extension into a WAN

Introducing VPN Solutions  
Establishing a Point-to-Point WAN Connection with PPP  
Establishing a WAN Connection with Frame Relay  
Troubleshooting Frame Relay WANs

**Course Description:** The CCNA Bootcamp (CCNA v1.0) is an instructor-led five-day course focusing on learning job tasks, skills and knowledge expected of a CCNA. CCNA v1.0 combines the course curriculum of the, new for mid-2007, ICND1 and ICND2 instructor-led courses into one, intense, week-long course.

The ideal candidate would be someone who has worked in a data network environment (PC support/helpdesk or network operations/monitoring), and has had hands-on experience, though no formal training, with Cisco IOS devices. This Bootcamp will serve to review and expand on what the candidate already knows and add to it, the detailed configuration and implementation of Cisco IOS devices.

Prospective CCNA v1.0 students should prepare themselves for course days consisting of at least 10 hours and as long as 12 hours. Homework will be assigned and reviewed daily.

Those new to networking and to Cisco IOS should consider taking the ICND1 and ICND2 classes instead of CCNA v1.0.

For those wanting to make the most of this bootcamp, we recommended you prepare for this course by accessing the Network Fundamentals content available within the Cisco Learning Connection at Cisco's website.

**Who Should Attend:** The primary audience for this course includes Network Administrators, Network Engineers, Network Managers, and Systems Engineers. The secondary audience for this course includes Network Designers and Project Managers.

**Prerequisites:** Students should have basic computer literacy, Windows navigation skills, internet usage skills and e-mail usage skills. They should also have hands-on experience with Cisco IOS devices and basic skills with connectivity configuration of routers and switches.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Describe how networks function, identifying major components function of network components and the Open System Interconnection (OSI) reference model
- Describe issues related to increasing traffic on an Ethernet LAN and identify switched LAN technology solutions to Ethernet networking issues
- Describe the reasons for extending the reach of a LAN and the methods that can be used with a focus on RF wireless access
- Describe the reasons for connecting networks with routers and how routed networks transmit data through networks using TCP/IP
- Describe the function of Wide Area Networks (WANs), the major devices of WANs, and configure PPP encapsulation, static and dynamic routing, PAT and RIP routing
- Use the command-line interface to discover neighbors on the network and managing the router's startup and configuration

## Course Outline:

### Course Introduction

### Building a Simple Network

### Ethernet Local Area Networks (LANs)

### Wireless LANs

### LAN Connections

### WANs

### Network Environment Management

### Small Network Implementation

### Medium-Sized Switched Network Construction

### Medium-Sized Routed Network Construction

### Single Area OSPF Implementation

### EIGRP Implementation

### Access Control Lists

### Address Space Management

### LAN Extensions into a WAN

### Lab Guide

**Course Description:** CCNP Training for advance skills in building Enterprise level switched networks and applications. Integrate Advance Technologies such as VoIP and Wireless.

In this course, students will learn how to create an efficient and expandable enterprise network by installing, configuring, monitoring, and troubleshooting network infrastructure equipment (especially Catalyst Multilayer Switches) according to the Campus Infrastructure module in the Enterprise Composite Network model. The campus switched network includes converged IP data, IPC (voice), and Airspace WLAN (Wireless) connectivity.

**Who Should Attend:** This course is for Channel Partners / Resellers, customers, and employees.

**Prerequisites:** Students should have taken CCNA (INTRO and ICNDv2.2 or newer).

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Create an efficient and expandable enterprise network.

**Course Outline:**

Introduction to Campus Networks

Defining Virtual Networks (VLANs)

Implementing Spanning Tree

Implementing InterVLAN Routing

Implement High Availability in a Campus Environment

Wireless Client Access

Minimizing Service Loss and Data Theft in a Campus Network

Configuring Campus Switches to Support Voice

**Course Description:** CCNP routing protocol training for professional-level skills in building Enterprise level router networks and applications. Integrates Advanced Technologies.

In this course, students will learn how to create an efficient and expandable enterprise network by installing, configuring, monitoring, and troubleshooting network infrastructure equipment (especially routers such as Cisco ISRs) according to the Campus Infrastructure module in the Enterprise Composite Network model. The routed network includes the most commonly used and emerging IP routing protocols.

**Who Should Attend:** The primary audiences for this course are as follows: \* Candidates for Cisco CCNP®, CCDP®, and CCIP® certifications, \* Candidates for Cisco CCIE® Routing and Switching and CCIE Communications and Services certifications, \* Network administrators and technicians responsible for implementing and troubleshooting complex routed network environments, \* Customers or channel resellers who are experienced with Cisco products or have a broad knowledge of the internetworking industry, \* Network technicians who are experienced with Cisco products and services, \* Network administrators responsible for implementing and managing medium-to-large business networks, \* Senior network support staff performing a help-desk role in a medium or enterprise-sized company that has internal network support escalation staff, and \* Network support staff who design, implement, and troubleshoot Layer 3 connectivity issues.

**Prerequisites:** The knowledge and skills that a learner must have before attending this course include the following: \* Networking terms, numbering schemes, and topologies, \* Open Systems Interconnection (OSI) reference model, \* Operating and configuring a Cisco router, \* TCP/IP stack and configuration of IP addresses, \* IP subnetting, to include complex subnetting and variable-length subnet masking (VLSM), \* Routing protocol operation and configuration for Routing Information Protocol (RIP), EIGRP, and OSPF single-area networks, \* Using, implementing, and configuring static and default routes, \* Interpreting the contents, entries, and indicators from a Cisco routing table, \* Filtering traffic with standard and extended access lists, \* Verifying basic router configurations using show and debug command output, \* Verifying basic switch configurations using show command output, \* Configuring a WAN serial interface using High-Level Data Link Control (HDLC) and PPP, and \* Configuring a WAN serial interface using Frame Relay permanent virtual circuits (PVCs) and subinterfaces. The course assumes that the learner has achieved CCNA certification; practical experience with deploying and operating networks based on Cisco network devices and Cisco IOS software is strongly recommended.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Describe the converged network requirements of various network and networked applications within the Cisco network architectures.
- Implement and verify Enhanced Interior Gateway Routing Protocol (EIGRP) operations.
- Build a scalable multiarea network with Open Shortest Path First Protocol (OSPF).
- Configure Integrated Intermediate System-to-Intermediate System Protocol (IS-IS) in a single area.
- Manipulate routing and packet flow.
- Implement and verify Border Gateway Protocol (BGP) for enterprise Internet service provider (ISP) connectivity.
- Implement and verify multicast forwarding using Protocol Independent Multicast (PIM) and related protocols.

## Course Outline:

### Course Introduction

Overview  
Course Goal and Objectives  
Course Flow  
Additional References  
Your Training Curriculum

### Module 1: Network Requirements

Describing Network Requirements

### Module 2: Configuring EIGRP

Introducing EIGRP  
Implementing and Verifying EIGRP  
Configuring Advanced EIGRP Options  
Configuring EIGRP Authentication  
Using EIGRP in an Enterprise Network  
Lab 2-0: Basic Configuration  
Lab 2-Configuring and Tuning EIGRP

### Module 3: Configuring OSPF

Introducing the OSPF Protocol  
OSPF Packet Types  
Configuring OSPF Routing  
OSPF Network Types  
Link-State Advertisements  
Configuring OSPF Route Summarization  
Configuring OSPF Special Area Types  
Configuring OSPF Authentication  
Lab 3-Configuring Single-Area OSPF  
Lab 3-Configuring OSPF for Multiple Areas and Frame Relay

Nonbroadcast  
Lab 3-Configuring OSPF for Multiple Areas and Frame Relay  
Point-to-Multipoint and Point-to-Point  
Lab 3-Tuning OSPF

### Module 4: The IS-IS Protocol

Introducing IS-IS and Integrated IS-IS Routing  
Performing IS-IS Routing Operations  
Configuring Basic Integrated IS-IS  
Lab 4-Configuring Integrated IS-IS

### Module 5: Manipulating Routing Updates

Operating a Network Using Multiple IP Routing Protocols  
Configuring and Verifying Route Redistribution  
Controlling Routing Update Traffic  
Implementing Advanced Cisco IOS Features: Configuring DHCP  
Lab 5-Configuring Basic Redistribution  
Lab 5-Tuning Basic Redistribution with Cisco IOS Tools

### Module 6: Implementing BGP

Explaining BGP Concepts and Terminology  
Explaining EBGP and IBGP  
Configuring Basic BGP Operations  
Selecting a BGP Path  
Using Route Maps to Manipulate Basic BGP Paths  
Lab 6-Configuring Multihomed BGP  
Lab 6-Manipulating BGP Path Selection with Route Maps

### Module 7: Implementing Multicast

Explaining Multicast  
IGMP and Layer 2 Issues  
Explaining Multicast Routing Protocols  
Multicast Configuration and Verification  
Lab 7-Configuring Multicast Routing

### Module 8: Implementing IPv6

Introducing IPv6  
Defining IPv6 Addressing  
Implementing Dynamic IPv6 Addresses  
Using IPv6 with OSPF and Other Routing Protocols  
Using IPv6 with IPv4  
Lab 8-Configuring IPv6 Addresses  
Lab 8-Enabling IPv6 OSPF Routing  
Lab 8-Configuring IPv6 Tunnels

**Course Description:** The IPv6 Fundamentals, Design and Deployment v2.0 course is a five-day, instructor led training course that combines the IPVSF v1.1 and IPVSD with no overlap. IP6FD v2.0 provides baseline through advanced technical information and training on the next-generation Internet protocol, IPv6. The goal of this course is to prepare the learner for transitioning to IPv6 based networks. IP6FD encompasses design considerations, security considerations, configuration principles, configuring IOS devices for IPv6 and IPv6 transition mechanisms. Throughout the course students will be presented justification for the principles, concepts and practices contained in each lesson. This course will help network engineers understand, configure, and support Cisco devices running IOS software and covers the IPv6 routing protocols such as RIPng, OSPF, BGP, and IS-IS; IPv6 transition mechanisms including tunnels, ISATAP, NAT-PT, and 6to4; and other features. The design and deployment components present in depth coverage of IPv6 design and deployment for DNS, DHCP, integrating IPv6 in an IPv4 network, Multicast, and much more.

**Who Should Attend:** This course is for channel partners / resellers and customers.

**Prerequisites:** There are no prerequisites for this course.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Recite the factors that drove the creation of a new IP structure and its possible usages.
- Fundamentally explain the operation of IPv6.
- Demonstrate theoretical and practical knowledge of IPv6 advanced concepts and uses respectively.
- Identify all the updates to IPv4 routing protocols needed to support IPv6 topologies.
- Implement IPv6 services and applications
- Evaluate a given scenario and desired outcome and identify the best transition mechanism for the situation.

### Course Outline:

Module 1 - Introduction to IPv6

Module 2 - IPv6 Operation

Module 3 - Advanced IPv6 Topics

Module 4 - Describing IPv6-Enabled Routing Protocols

Module 5 - Using IPv6 Services

Module 6 - IPv6 Transition Mechanisms

Module 7 - Discussing Security Issues in IPv6

Module 8 - Mobile IP Model

Module 9 - Deploying IPv6

**Course Description:** Cisco Communications Manager System Administration v6.0 (CCMSAv6.0) course focuses on the basic administration of the Cisco Communications Manager product and the devices that register to the Cisco Communications Manager. The course is 40% hands-on laboratory exercises that challenge the student to configure IP Phones, voice gateways, media resources such as Music on Hold, conference and transcoders as well as Call Admission Control.

**Who Should Attend:** The target audience for this course combination would be first and second level customer support personnel. The course will teach basic function and programming for Cisco Communications Manager 6.0. This course is equally beneficial to personnel with either data or voice backgrounds.

**Prerequisites:** The knowledge and skills a learner must have before attending this course include basic networking and telephony knowledge.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Identify and describe the UC architecture, hardware, and software.
- Access the online administration guide to perform Moves, Adds, and Changes to IP phones, voice gateways, and Call Admission Control components of a Unified Communications solution.

## Course Outline:

### Cisco Unified Communications Manager

Communications Manager Functions  
 Operating System, Database and Supporting Applications  
 Cluster Definition  
 Intra-cluster Communication  
 Clustering Options  
 Cisco Communications Manager Components  
 Deployment Models  
 Backing up the Communications Manager  
 Lab 1-1: Performing General Administration  
 Lab 1-2: Configuring Cisco Unified Communications Manager 6.0 Basic Settings

### System Configuration

Access to Communications Manager Administration  
 MLA - Multi Level Administration  
 System Parameter  
 Auto-registration  
 Cisco IP Phones  
 IP Phone Models  
 Phone Button Templates  
 Softkey Templates  
 Registration Process  
 Basic Phone and Directory Number Configuration  
 Lab 2-1: Configuring Cisco Unified Communications Manager to Support Cisco IP Phones

### Route Plan Basics

External Call Routing  
 Route Pattern Wildcards  
 Digit Analysis  
 Route Plan Configuration  
 Lab 3-1: Configuring Basic Dial Plan Elements

### Advanced Route Plan

Route Filters  
 Discard Digits Instructions  
 Transformation Masks  
 Translation Patterns  
 Transformation Patterns  
 Route Plan Report  
 Lab 4-1: Configuring Complex Dial Plan Elements

### Telephony Class of Service

Partitions  
 Calling Search Spaces  
 Problems Addressed  
 Time of Day Routing  
 Lab 5-1: Implementing Calling Privileges and Restrictions

### Call Admission Control (CAC) and Survivable Remote Site Telephony (SRST)

Why Call Admission Control?  
 Distributed Call Processing CAC - Gatekeeper  
 Centralized Call Processing CAC - Locations  
 Survivable Remote Site Telephony (SRST)  
 Automated Alternate Routing (AAR)

### Media Resources

Media Resource Overview  
 Conferencing Resources  
 Media Termination Points  
 Music On Hold Resources  
 Annunciator Resources  
 Media Resource Management  
 Lab 7-1: Configuring Media Resources

### Communications Manager Features

Call Park  
 Call Pickup  
 Callback  
 Barge and Privacy  
 Hunt List  
 Cisco IP Phone Services  
 Mobile Connect and Mobile Voice Access  
 Lab 8-1: Configuring User Features  
 Lab 8-2: Configuring Hunt Groups and Call Coverage

### LDAP Users

Adding a User  
 User Logon and Device Selection  
 Call Forward  
 Speed Dials  
 Cisco IP Phone Services Subscription  
 Personal Address Book  
 Message Waiting Lamp Policy  
 Personal Device Locale  
 User Options Web Pages Locale  
 Lab 9-1: Create/Associate Users

### Adding Individual Phone Profiles

Phone Configuration Screens  
 Directory Number Configuration Screens

### Bulk Administration Tool (BAT)

Installation and Features  
 Templates  
 Creating .csv Files  
 Adding and Updating  
 Lab 10-1: Using the Cisco Unified Communications Manager Bulk Administration Tool

**Course Description:** The aim of the Administering Unified Messaging (AUM) v5.0 course is to produce competent administrators of the Cisco Unity product, up to and including Release 5.0. By the end of this course, learners will be able to perform system setup and customization; add, delete, and modify subscribers; and monitor and maintain the Cisco Unity system. It is the initial course in a two-course series; the other is Implementing Unified Messaging (IUM). As such, it lays a successful foundation for participation in the engineering-level course because a learner must understand the product features and how to use them before being able to install, configure, maintain, and troubleshoot the features. The class partially prepares a learner to take the Unified Communication for System Engineers exam (642-104).

**Who Should Attend:** The primary audiences for this course are End-user system administrators, IP telephony specialized Channel Partners (Field Engineer 2 role), and Professional Services partners. The secondary audiences for this course are Channel Partner systems engineers and Cisco systems engineers.

**Prerequisites:** Students should have a working knowledge of Microsoft Windows 2000, Microsoft Exchange 2000 or the IBM Lotus Domino messaging environment, and the features, benefits, and programming of at least one manufacturer's PBX (Cisco Unified CallManager or Cisco Unified Communications Manager preferred).

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Identify the components of the Cisco Unity system, describe their standard and optional features, and explain and how they integrate into a unified messaging system
- Identify the components of the Cisco Unity Connection system, describe their standard and optional features, and explain how they integrate with telephone systems

## Course Outline:

### Course Introduction

Lab Topology  
Hardware and Software Requirements

### Module 1: Cisco Unified Messaging Overview

Introducing Cisco Unity  
Understanding Unified Messaging Integrations  
Understanding Cisco Unity Standard System Features  
Understanding Cisco Unity Standard User Features  
Understanding Cisco Unity Optional Features

### Module 2: Cisco Unity Connection Overview

Introducing Cisco Unity Connection  
Positioning Cisco Unity Connection  
Understanding Cisco Unity Connection Integrations  
Understanding Unity Connection Standard Features  
Understanding Cisco Unity Connection Optional Features

### Module 3: Cisco Unified Messaging General Setup

Using Cisco Unity  
Using the Cisco Unity Administrator  
Setting Up Cisco Unity  
Lab Exercise 3-1: Setting up Cisco Unity

### Module 4: Cisco Unified Messaging Subscriber Configuration

Configuring Global Subscriber Settings  
Configuring Subscriber Accounts and Settings  
Using Call Handlers and Interview Handlers  
Lab Exercise 4-1: Preparing to Add Subscribers  
Lab Exercise 4-2: Working with Subscribers  
Lab Exercise 4-3: Creating an Audiotext Application  
Lab Exercise 4-4: Configuring Emergency Dial-Outs

### Module 5: Cisco Unified Messaging System Monitoring and Maintenance

Monitoring a Cisco Unified Messaging System  
Maintaining a Cisco Unified Messaging System  
Managing Unified Messaging System Reporting  
Lab Exercise 5-1: Performing Unity System Monitoring and Maintenance

**Course Description:** The Cisco Certified Voice Professional certification is a new certification focusing on Voice over IP technologies. The CCVP consists of 5 examinations and a current CCNA certification. CCVP Boot Camp course is split into three - one week classes. Each class runs at an accelerated pace, with extended hours, 8:00 AM to 8:00 PM each day. Each class covers two of the six courses needed to pass the CCVP examinations. The three weeks combined focus on presenting the core competencies associated with Cisco IP Telephony converged networks. The purpose of these courses is to provide the student with adequate knowledge needed to pass five key certification tests required to attain the advanced Cisco Certified Voice Professional (CCVP) certification.

**Who Should Attend:** This course is for Network Engineers who will be designing IP Telephony solutions that include the deployment of Cisco Call Manager software and associated VoIP equipment.

**Prerequisites:** Students need to have a working knowledge of LANs, WANs, and IP switching and routing, basic internetworking skills taught in the Interconnecting Cisco Network Devices (ICND) course, or its equivalent, and knowledge of traditional public switched telephone network (PSTN) operations and voice fundamentals.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Describe the similarities and differences between traditional PSTN voice networks and IP telephony solutions
- Explain the processes and standards for voice digitization, compression, digital signaling, and fax transport as they relate to VoIP networks
- Configure voice interfaces on Cisco voice-enabled equipment for connection to traditional, nonpacketized telephony equipment
- Configure the call flows for POTS, VoIP, and default dial peers
- Describe the fundamentals of VoIP and identify challenges and solutions regarding its implementation
- Compare centralized and decentralized call control and signaling protocols
- Describe specific voice quality issues and the QoS solutions used to solve them
- Explain the need to implement QoS and methods for implementing and managing QoS
- Identify and describe different models used for ensuring QoS in a network and explain key IP QoS mechanisms used to implement the models

**Course Outline:****Introducing Voice Over IP****Voip Network Technologies****VoIP Network Architectures****Building Scalable Dial Plans****Calculating Bandwidth Requirements****Allocating Bandwidth for Voice and Data Traffic****Considering Security in VoIP Networks****Configuring Voice Networks****Configuring Voice Ports****Adjusting Voice Interface Settings****Configuring Dial Peers****Configuring Voice Port Connections****VoIP Signaling and Call Control****Introducing Signaling and Call Control****Introducing H.323****Deploying and Configuring H.323****Configuring SIP****Configuring MGCP****Comparing Call Control Models****Improving and Maintaining Voice Quality****Designing for Optimal Voice Quality****Implementing CAC****Introduction to IP QoS****The Building Blocks of IP QoS****Introduction to Modular QoS CLI and Auto-QoS****Classification and MarkingModule****Congestion Management****Congestion Avoidance****Traffic Policing and Shaping****Link Efficiency Mechanisms****QoS Best Practices**

**Course Description:** CCVP2 Boot Camp course runs at an accelerated pace, with extended hours, 8:00 AM to 8:00 PM each day, covering material from the CIPT1 v5.0 course and the CIPT2 v5.0 course.

CCVP2 v5.0 prepares you for installing, configuring, and maintaining a Cisco IP telephony solution. The course includes lab activities in which you will perform post installation tasks and configure Cisco Unified CallManager; configure gateways, gatekeepers, and switches; and build route plans to place intracluster and intercluster Cisco IP phone calls. You will also configure telephony class of service (calling restrictions) and numerous user telephone features, services, media resources, and applications.

CCVP2 v5.0 is also designed to provide learners with the necessary knowledge and skills to enable video calls and to secure, monitor, and manage a Cisco Unified Communications solution based on Cisco Unified CallManager, the call-routing and signaling component of the Cisco Unified Communications solution.

**Who Should Attend:** This course is for Channel Partners/Resellers, Customers, and Employees.

**Prerequisites:** Students should have experience with the following: Interconnecting Cisco Network Devices (ICND1 & ICND2); Cisco CCNA® certification recommended; Building Cisco Multilayer Switched Networks (BCMSN); working knowledge of fundamental terms and concepts of computer networking to include LANs, WANs, and IP switching and routing; ability to configure and operate Cisco routers and switches and to enable VLANs and DHCP; Cisco Voice over IP (CVOICE); Fundamental knowledge of converged voice and data networks; and the ability to configure voice interfaces on Cisco voice-enabled equipment for connection to traditional, non-packetized telephony equipment and to configure the call flows for POTS and VoIP dial peers.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Deploy a Cisco CallManager 5.0 server in a cluster using a supported IP telephony deployment model.
- Perform platform and general administration, and implement disaster recovery.
- Deploy SCCP and SIP endpoints in a Cisco CallManager 5.0 cluster.
- Deploy a dial plan consisting of gateways, trunks, route plan elements, hunt groups, partitions, and calling search spaces.
- Implement multiple site deployments with fallback telephony services in the remote branches, call admission control over the WAN bandwidth, and automated call rerouting through the PSTN when the WAN bandwidth is insufficient.
- Configure Cisco CallManager to enable end-user features and services.
- Harden Cisco IP telephony devices, prevent toll fraud, understand cryptographic concepts, and apply cryptography to a Cisco Unified CallManager cluster.

## Course Outline:

### Course Introduction

Overview  
Course Goal and Objectives  
Course Flow  
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Your Training Curriculum

### Module 1: Get Started with CiscUnified CallManager Release 5.0

Introducing CiscUnified CallManager Release 5.0  
Evaluating CiscUnified CallManager Release 5.0 Deployment Options  
Installing CiscUnified CallManager Release 5.0

### Module 2: Administration of CiscUnified CallManager Release 5.0

Administering the CiscIP Telephony Platform  
Performing General Administration  
Configuring CiscUnified CallManager Release 5.0 Basic Settings  
Implementing Disaster Recovery

### Module 3: Deployment of CiscUnified CallManager Release 5.0 Endpoints

Configuring CiscCatalyst Switches  
Evaluating CiscIP Telephony Endpoints  
Configuring CiscUnified CallManager tSupport CiscIP Phones  
Configuring SIP Endpoints  
Managing Endpoints with CiscUnified CallManager BAT

### Module 4: Deployment of a Dial Plan on CiscUnified CallManager Release 5.0

Understanding Dial Plans  
Configuring CiscUnified CallManager Trunks  
Configuring Voice Gateways  
Configuring Basic Dial Plan Elements  
Configuring Hunt Groups and Call Coverage  
Configuring Complex Dial Plan Elements  
Implementing Calling Privileges and Restrictions

### Module 5: Implementation of Multiple Site Deployment

Understanding Call Admission Control in CiscUnified CallManager Release 5.0  
Configuring Call Admission Control in CiscUnified CallManager Release 5.0  
Configuring CiscUnified SRST

### Module 6: CiscUnified CallManager Features and Services

Configuring Media Resources  
Configuring User Features - Part 1  
Configuring User Features - Part 2  
Configuring CiscUnified CallManager Attendant Console

### Module 7: Secure IP Telephony

Preventing Toll Fraud  
Hardening the IP Phone  
Understanding Cryptographic Fundamentals  
Understanding PKI  
Understanding CiscIP Telephony Authentication and Encryption Fundamentals  
Configuring CiscIP Telephony Authentication and Encryption

### Module 8: Enable IP VideTelephony

Introducing IP VideTelephony  
Configuring CiscUnified VideAdvantage

### Module 9: Monitor and Manage IP Telephony

Introducing CiscUnified CallManager Serviceability  
Monitoring Performance  
Configuring Alarms and Traces  
Managing Call Accounting  
Using Additional Management and Monitoring Tools

### Lab Outline

Lab 2-1: Performing Platform Administration  
Lab 2-2: Performing General Administration  
Lab 2-3: Configuring CiscUnified CallManager 5.0 Basic Settings  
Lab 2-4: Backing Up and Restoring CiscUnified CallManager 5.0  
Lab 3-1: Configuring Auxiliary or Voice VLANs  
Lab 3-2: Configuring CiscUnified CallManager tSupport CiscIP Phones  
Lab 3-3: Configuring SIP Endpoints  
Lab 3-4: Using the Bulk Administration Tool  
Lab 4-1: Configuring CiscUnified CallManager Trunks  
Lab 4-2: Configuring Voice Gateways  
Lab 4-3: Configuring Basic Dial Plan Elements  
Lab 4-4: Configuring Hunt Groups and Call Coverage  
Lab 4-5: Configuring Complex Dial Plan Elements  
Lab 4-6: Implementing Calling Privileges and Restrictions  
Lab 5-1: Configuring Call Admission Control  
Lab 5-2: Configuring SRST

Lab 6-1: Configuring Media Resources  
Lab 6-2: Configuring User Features  
Lab 6-3: Configuring CiscUnified CallManager Extension Mobility  
Lab 6-4: Configuring Presence and BLF Functionality  
Lab 6-5: Configuring Additional Features  
Lab 6-6: Configuring CiscUnified CallManager Attendant Console  
Lab 7-1: Preventing Toll Fraud  
Lab 7-2: Hardening the IP Phone  
Lab 7-3: Configuring CiscIP Telephony Authentication and Encryption  
Lab 8-1: Enabling CiscUnified VideAdvantage  
Lab 9-1: Monitoring Performance  
Lab 9-2: Configuring Alarms and Traces  
Lab 9-3: Configuring CiscUnified CallManager CAR  
Lab 9-4: Enabling Dependency Records, Configuring CiscUnified CallManager Dialed Number Analyzer, and Using QRT

**Course Description:** The Cisco Certified Voice Professional certification is a new certification focusing on Voice over IP technologies. The CCVP consists of 5 examinations and a current CCNA certification. CCVP Boot Camp course is split into three - one week classes. Each class runs at an accelerated pace, with extended hours, 8:00 AM to 8:00 PM each day. Each class covers two of the six courses needed to pass the CCVP examinations. The three weeks combined focus on presenting the core competencies associated with Cisco IP Telephony converged networks. The purpose of these courses is to provide the student with adequate knowledge needed to pass five key certification tests required to attain the advanced Cisco Certified Voice Professional (CCVP) certification.

**Who Should Attend:** This course is for Network Engineers who will be designing IP Telephony solutions that include the deployment of Cisco Call Manager software and associated VoIP equipment.

**Prerequisites:** Prior to attending this week of the BootCamp, the student should have: \* Interconnecting Cisco Network Devices (ICND); \* Cisco CCNA® certification recommended prerequisite; \* Building Cisco Multilayer Switched Networks (BCMSN); and \* Cisco Voice over IP (CVOICE).

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Deploy a Cisco CallManager server in a cluster by using a supported IP telephony deployment model
- Configure Cisco CallManager and the Cisco Catalyst switch to enable on-cluster calls and add users, phones, and Cisco IP Communicator to the Cisco CallManager database using manual configuration, auto-registration, or BAT
- Configure Cisco gateways and intercluster trunks, create hunt groups, and create a route plan in Cisco CallManager to enable calling to remote clusters so that the WAN is not oversubscribed, calls are preserved if the WAN fails, and user calling restrictions are in place
- Configure Cisco CallManager to enable features and services, including conferencing, music on hold (MOH), speed dials, Call Park, Call Pickup, Cisco Call Back, Barge, Privacy, Cisco IP Phone Services, Cisco CallManager Extension Mobility, Cisco CallManager Attendant Console, and Cisco IP Manager Assistant (IPMA) and also use these features on Cisco IP Phones
- Configure Cisco CallManager and the client PC to enable Cisco CallManager Attendant Console and Cisco IPMA

**Course Description:** CCVP3 Boot Camp v2.0 runs at an accelerated pace, with extended hours, 8:00 AM to 8:00 PM each day, covering material from the GWGK v2.0 course and the TUC v1.0 course.

CCVP3 v2.0 provides students with information and practice activities to prepare them to install, configure, monitor and troubleshoot Cisco voice gateways and gatekeepers in Enterprise installations, in accord with the recommendations of Cisco's Solution Reference Network Design for IP Telephony guides.

CCVP3 v2.0 is also designed to equip network professionals with the knowledge and skills required to troubleshoot Unified Communications systems & solutions in Enterprise, Mid-Market, and Commercial deployments. The course teaches troubleshooting methodology, triage, resources, tools and fixes at the integrated system or solution level, and for components such as Cisco Unified Call Manager, Cisco Unity, videoconferencing, and infrastructure.

**Who Should Attend:** This course is for Network administrators, Network engineers, System engineers, and Network managers.

**Prerequisites:** Students must have CCNA certification status or equivalent knowledge working with Cisco IOS routers, CVOICE 5.0 or equivalent knowledge working with voice technologies in routers, Call Agent (Cisco Unified CallManager) skills and knowledge: Cisco IP Telephony Part 1 and Part 2 (CIPT1 and CIPT2), and an understanding of factors that affect voice and video quality: Implementing Cisco Quality of Service (QOS).

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Implement the appropriate interconnections.
- Implement a dial plan.
- Implement media resources, call applications and fax on gateways.
- Implement basic and advanced gatekeeper functionality and gatekeeper redundancy on IOS routers.
- Identify and describe the different IP-IP Gateway deployment models and explain the features supported for enterprise customers.
- Use a systematic methodology to troubleshoot Cisco Unified Communication systems by using knowledge of tools and reports that help isolate Cisco Unified Communication system problems.
- Isolate the specific problem, propose a solution, and, where appropriate, implement the solution
- Diagnose a call setup issue and resolve the issues.
- Troubleshoot the quality of both voice and video streams.

### Course Outline:

#### Gateway Deployments

Introducing Gateways  
Implementing H.323 Gateways  
Implementing MGCP Gateways  
Implementing SIP Gateways  
Implementing SRST Gateways

#### Cisco IP Communications

PSTN and PBX Integrations  
Introducing PSTN and PBX Trunks  
Implementing Analog Trunks  
Implementing CAS Trunks  
Implementing BRI and PRI Trunks  
Implementing QSIG Trunks

#### Dial Plans on IOS Gateways

Dial Plan Overview  
Implementing PSTN Dial Plans on IOS Gateways  
Implementing Multi Site Dial Plans on IOS Gateways  
Implementing Calling Privileges on IOS Gateways  
Implementing RSVP Based CAC

#### Advanced Gateway Features

Implementing Media Resources using IOS Gateway DSPs  
Implementing FAX Support on IOS Gateways  
Call Applications on IOS Gateways

#### Gatekeeper Deployments

Introducing Deployments  
Implementing Basic Gatekeeper Functionality  
Implementing Gatekeeper Call Admission Control  
Implementing Advanced Gatekeeper Functionality  
Implementing Gatekeeper Redundancy

#### IP-IP Gateway

IP-IP Gateway Overview  
Implementing IP-IP Gateways

#### A Methodology and Tools for Troubleshooting Cisco Unified Communications Systems

Introducing Cisco Unified Communications Systems Troubleshooting  
Understanding Troubleshooting Methodology in Cisco Unified Communications Systems

Gathering Information for Troubleshooting

#### Troubleshoot Cisco Unified CallManager-Related Issues

Troubleshooting Common Endpoint Registration Issues  
Troubleshooting Cisco Unified CallManager Availability Issues  
Troubleshooting Cisco Unified CallManager Security Issues  
Troubleshooting Database Replication Issues  
Troubleshooting LDAP Replication Issues  
Troubleshooting Common Gateway Registration Issues

#### Troubleshoot Call Setup Issues

Introducing Call Setup Issues and Causes  
Troubleshooting On-Premises Single-Site Calling Issues  
Troubleshooting Offsite Call Issues  
Troubleshooting Intercluster Dial Plan Issues  
Troubleshooting Gatekeepers in a Cisco Unified Communications System

#### Troubleshoot Voice and Video Quality Issues

Defining Common Voice and Video Quality Issues  
Troubleshooting VoIP Quality Problems  
Troubleshooting Echo  
Troubleshooting Quality Problems of Cisco Unified Video Advantage

#### Application Integration and Media Resource Issues

Troubleshooting Common Cisco Unity Integration Issues  
Troubleshooting CTI Issues  
Troubleshooting Media Resources

**Course Description:** Implementing Cisco Unified Communications IP Telephony Part 1 (CIPT1) v6.0 prepares you for installing and configuring a Cisco Unified Communications Manager solution in a single site. This course focuses primarily on Cisco Unified Communications Manager Release 6.0, the call routing and signaling component for the Cisco Unified Communications solution.

This course includes lab activities in which you will perform post-installation tasks, configure Cisco Unified Communications Manager and switches, implement Media Gateway Control Protocol (MGCP) gateways, and build dial plans to place on-net and off-net phone calls. You will also implement media resources, Lightweight Directory Access Protocol (LDAP), voice-mail integration, and numerous user telephone features.

**Who Should Attend:** The primary audiences for this course are Network designers, Network administrators, Network engineers, Network managers, and Systems engineers.

**Prerequisites:** The knowledge and skills that a learner must have before attending this course include working knowledge of fundamental terms and concepts of computer networking, to include LANs, WANs, and IP switching and routing, ability to configure and operate Cisco routers and switches and to enable VLANs and DHCP, fundamental knowledge of converged voice and data networks, and working knowledge of the MGCP and its implementation on Cisco IOS gateways.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Describe Cisco Unified Communications Manager including its functions, architecture, deployment and redundancy options, and how to install or upgrade
- Perform Cisco Unified Communications Manager platform and general administration, initial configuration, and user management
- Configure Cisco Unified Communications Manager to support on-cluster calling in a single-site deployment
- Implement a dial plan in Cisco Unified Communications Manager to make internal calls and place calls within the public switched telephone network (PSTN)

## Course Outline:

### Course Introduction

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Configuring Presence-Enabled Speed Dials and Lists  
Integrating Cisco Unified Communications Manager with Voice-Mail Systems  
Implementing Cisco Unified Video Advantage  
Lab 5-1: Implementing Media Resources  
Lab 5-2: Configuring Cisco Unified Communications Manager User Features  
Lab 5-3: Configuring Presence-Enabled Speed Dials and Lists  
Lab 5-4: Integrating Cisco Unified Communications Manager to Voice-Mail Systems  
Lab 5-5: Enabling Cisco Unified Video Advantage

### Module 1: Introduction to Cisco Unified Communications Manager

Understanding Cisco Unified Communications Manager Architecture  
Understanding Cisco Unified Communications Manager Deployment and Redundancy Options  
Installing and Upgrading Cisco Unified Communications Manager  
Lab 1-1: Cisco Unified Communications Manager Installation and Upgrade Discovery

### Module 2: Administration of Cisco Unified Communications Manager

Understanding Cisco Unified Communications Manager Administration Options  
Managing Services and Initial Configuration of Cisco Unified Communications Manager  
Managing User Accounts in Cisco Unified Communications Manager  
Lab 2-1: Exploring Cisco Unified Communications Manager Administration Options  
Lab 2-2: Configuring Cisco Unified Communications Manager Initial Settings  
Lab 2-3: Managing User Accounts in Cisco Unified Communications Manager

### Module 3: Single-Site On-Net Calling

Understanding Endpoints in Cisco Unified Communications Manager  
Configuring Cisco Catalyst Switches for Endpoints  
Implementing and Hardening IP Phones  
Lab 3-1: Configuring Voice VLANs  
Lab 3-2: Implementing IP Phones  
Lab 3-3: Hardening IP Phones

### Module 4: Single-Site, Off-Net Calling

Implementing MGCP Gateways in Cisco Unified Communications Manager  
Configuring Cisco Unified Communications Manager Call-Routing Components  
Implementing Cisco Unified Communications Manager Digit Manipulation  
Implementing Calling Privileges in Cisco Unified Communications Manager  
Implementing Call Coverage in Cisco Unified Communications Manager  
Lab 4-1: Implementing MGCP Gateways  
Lab 4-2: Configuring Cisco Unified Communications Manager Call-Routing Components  
Lab 4-3: Implementing Digit Manipulation  
Lab 4-4: Implementing Calling Privileges in Cisco Unified Communications Manager  
Lab 4-5: Implementing Call Coverage in Cisco Unified Communications Manager

### Module 5: Implementation of Media Resources, Features, and Applications

Implementing Media Resources  
Configuring Cisco Unified Communications Manager User Features

**Course Description:** Implementing Cisco Unified Communications IP Telephony Part 2 (CIPT2) v6.0 prepares you for installing and configuring, a Cisco Unified Communications Manager solution in a multisite environment. This course focuses on Cisco Unified CallManager Release 6.0, the call routing and signaling component for the Cisco Unified Communications solution. It also includes H.323 and Media Gateway Control Protocol (MGCP) gateway implementation, the use of a Cisco Unified Border Element, and configuration of Survivable Remote Site Telephony (SRST), different mobility features, and voice security.

This course includes lab activities in which you will apply a dial plan for a multisite environment, configure survivability for remote sites during WAN failure and implement solutions to reduce bandwidth requirements in the IP WAN. You will also enable call admission control (CAC) and automated alternate routing (AAR), a feature that allows rerouting of calls over the public switched telephone network (PSTN) in case of no available bandwidth. There are labs for implementing Cisco Unified Communications Manager Device Mobility, Cisco Unified Communications Manager Extension Mobility, Cisco Unified Mobility, and voice security.

**Who Should Attend:** This course is primarily for Network designers, Network administrators, Network engineers, Network managers, and Systems engineers.

**Prerequisites:** The knowledge and skills that a learner must have before attending this course are as follows: \* Working knowledge of converged voice and data networks, \* Working knowledge of MGCP, session initiation protocol (SIP), and H.323, as well as their implementation on Cisco IOS gateways, \* Ability to configure and operate Cisco routers and switches, and \* Ability to configure and operate Cisco Unified Communications Manager in a single-site environment.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Describe the issues in multisite deployments and their solutions, and describe and configure required dial plan elements.
- Implement call-processing resiliency in remote sites using SRST, MGCP fallback, and Cisco Unified Communications Manager Express.
- Implement CAC to prevent oversubscription of the IP WAN.
- Implement Cisco IOS Tcl and VoiceXML applications, along with mobility features such as Cisco Unified Communications Manager Device Mobility, Cisco Unified Communications Manager Extension Mobility, and Cisco Unified Mobility, so that users are reachable via their office phone numbers, regardless of their physical location and the various devices they may use.

### Course Outline:

#### Course Introduction

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CiscUnified Communications Manager PKI  
Implementing Security in CiscUnified Communications Manager  
Lab 5-1: Implementing Security in CiscUnified Communications Manager

#### Module 1: Multisite Deployments

Identifying Issues in a Multisite Deployment  
Identifying Solutions for a Multisite Deployment  
Implementing Multisite Connections  
Implementing a Dial Plan for Multisite Deployments  
Lab 1-1: Implementing Basic Multisite Connections  
Lab 1-2: Implementing Multisite Dial Plans

#### Module 2: Centralized Call-Processing Redundancy

Examining Remote Site Redundancy Options  
Implementing SRST and MGCP Fallback  
Implementing CiscUnified Communications Manager Express in SRST Mode  
Lab 2-1: Implementing CiscUnified SRST and MGCP Fallback  
Lab 2-2: Implementing CiscUnified Communications Manager Express as SRST Fallback

#### Module 3: Bandwidth Management and Call Admission Control

Implementing Bandwidth Management  
Implementing Call Admission Control  
Lab 3-1: Implementing Bandwidth Management  
Lab 3-2: Implementing CAC

#### Module 4: Features and Applications for Multisite Deployments

Implementing Call Applications on CiscIOS Gateways  
Implementing Device Mobility  
Implementing Extension Mobility  
Implementing CiscUnified Mobility  
Lab 4-1: Enabling the Device Mobility Feature  
Lab 4-2: Implementing CiscUnified Communications Manager Extension Mobility  
Lab 4-3: Implementing CiscUnified Mobility

#### Module 5: IP Telephony Security

Understanding Cryptographic Fundamentals and PKI  
Understanding Native CiscUnified Communications Manager Security Features and

**Course Description:** Cisco Voice over IP (CVOICE) v6.0 provides an understanding of converged voice and data networks and also the challenges faced by the various network technologies. The course also provides network administrators and network engineers with the knowledge and skills required to integrate gateways and gatekeepers into an enterprise VoIP network. This course is one of several courses in the Cisco CCVP™ track that addresses design, planning, and deployment practices and provides comprehensive hands-on experience in configuration and deployment of VoIP networks.

**Who Should Attend:** The course is for students completing the CCVP certification track and Network engineers, architects, and support staff.

**Prerequisites:** The knowledge and skills that a learner must have before attending this course are as follows: \* Working knowledge of fundamental terms and concepts of computer networking to include LANs, WANs, and IP switching and routing, \* Basic internetworking skills taught in Interconnecting Cisco Network Devices (ICND), or equivalent knowledge, \* Ability to configure and operate Cisco routers and switches and to enable VLANs and DHCP, and \* Knowledge of traditional public switched telephone network (PSTN) operations and technologies.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Describe VoIP, voice gateways, special requirements for VoIP calls, codecs and codec complexity, and how DSPs are used as media resources on a voice gateway
- Configure gateway interconnections to support VoIP and PSTN calls and to integrate with a PSTN and PBX
- Describe the basic signaling protocols that are used on voice gateways and configure a gateway to support calls using the various signaling protocols

## Course Outline:

### \* Course Introduction

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Course Goal and Objectives  
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### Module 1: Introduction to VoIP

Introducing VoIP  
Introducing Voice Gateways  
Specifying Requirements for VoIP Calls  
Understanding Codecs, Codec Complexity, and DSP Functionality

### Module 2: Voice Port Configuration

Understanding Call Types  
Configuring Analog Voice Ports  
Understanding Dial Peers  
Configuring Digital Voice Ports  
Understanding QSIG  
Lab 2-1: Configuring Analog Voice Ports  
Lab 2-2: Configuring POTS Dial Peers  
Lab 2-3: Configuring VoIP Dial Peers  
Lab 2-4: Configuring Digital Voice Ports

### Module 3: VoIP Gateway Implementation

Implementing H.323 Gateways  
Implementing MGCP Gateways  
Implementing SIP Gateways  
Lab 3-1: Implementing H.323 Gateways  
Lab 3-2: Implementing SIP Gateways

### Module 4: Dial Plan Implementation on Voice Gateways

Understanding Dial Plans  
Implementing Numbering Plans  
Configuring Digit Manipulation  
Configuring Path Selection  
Implementing Calling Privileges on Cisco Gateways  
Lab 4-1: Implementing Numbering Plans  
Lab 4-2: Implementing PSTN Dial Plans on Cisco Gateways  
Lab 4-3: Configuring Path Selection  
Lab 4-4: Implementing Calling Privileges on Cisco Gateways

### Module 5: H.323 Gatekeepers

Introducing Gatekeepers  
Configuring Basic Gatekeeper Functionality  
Implementing Gatekeeper-Based CAC  
Lab 5-1: Configuring Basic Gatekeeper Functionality  
Lab 5-2: Implementing Gatekeeper-Based CAC

### Module 6: ITSP Connectivity

Understanding Special Requirements for External VoIP Connections  
Implementing a Cisco UBE  
Lab 6-1: Configuring a Cisco UBE

**Course Description:** Troubleshooting Cisco Unified Communications Systems (TUC) v1.0 equips network professionals with the knowledge and skills required to troubleshoot Unified Communications systems & solutions in Enterprise, Mid-Market, and Commercial deployments. TUC teaches troubleshooting methodology, triage, resources, tools and fixes at the integrated system or solution level, and for components such as Cisco Unified Call Manager, Cisco Unity, videoconferencing, and infrastructure. This is a troubleshooting course and the learners should spend 60-70 percent of their time in the lab.

**Who Should Attend:** This course is for Network administrators, Network engineers, System engineers, and Network managers.

**Prerequisites:** The knowledge and skills that a learner must have before attending this course are as follows: \* Sound fundamental networking knowledge (CCNA), \* Voice fundamentals: Cisco Voice over IP (CVOICE), \* Call Agent (Cisco Unified CallManager) skills and knowledge: Cisco IP Telephony Part 1 and Part 2 (CIPT1 and CIPT2), \* Voice Infrastructure: Implementing Gateways and Gatekeepers (GWGK), and \* an understanding of factors that affect voice and video quality: Implementing Cisco Quality of Service (QoS).

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Use a systematic methodology to troubleshoot Cisco Unified Communication systems by using knowledge of tools and reports that help isolate Cisco Unified Communication system problems.
- Isolate the specific problem, propose a solution, and, where appropriate, implement the solution when given a trouble call that has been categorized as a Cisco Unified CallManager-related issue.
- Diagnose a call setup issue and resolve the issues.
- Troubleshoot the quality of both voice and video streams.

## Course Outline:

### Course Introduction

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### Module 1: A Methodology and Tools for Troubleshooting Cisco Unified Communications Systems

Introducing Cisco Unified Communications Systems Troubleshooting  
Understanding Troubleshooting Methodology in Cisco Unified Communications Systems  
Gathering Information for Troubleshooting  
Lab 1-1: Lab Discovery and Phone Configuration  
Lab 1-2 Using TUC Tools

### Module 2: Troubleshoot Cisco Unified CallManager-Related Issues

Troubleshooting Common Endpoint Registration Issues  
Troubleshooting Cisco Unified CallManager Availability Issues  
Troubleshooting Cisco Unified CallManager Security Issues  
Troubleshooting Database Replication Issues  
Troubleshooting LDAP Replication Issues  
Troubleshooting Common Gateway Registration Issues  
Lab 2-1: Trouble Ticket 1  
Lab 2-2: Trouble Ticket 2  
Lab 2-3: Trouble Ticket 3  
Lab 2-4: Trouble Ticket 4  
Case Study 2-5: Troubleshoot LDAP Synchronization Issues for Cisco Unified CallManager Release 4.1(3)  
Lab 2-6: Trouble Ticket 6  
Case Study 2-7: Troubleshoot Database Replication Issues for Cisco Unified CallManager Release 4.x  
Lab 2-8: Trouble Ticket 8

### Module 3: Troubleshoot Call Setup Issues

Introducing Call Setup Issues and Causes  
Troubleshooting On-Premises Single-Site Calling Issues  
Troubleshooting Offsite Call Issues  
Troubleshooting Intercluster Dial Plan Issues  
Troubleshooting Gatekeepers in a Cisco Unified Communications System  
Lab 3-1: Trouble Ticket 1  
Lab 3-2: Trouble Ticket 2  
Lab 3-3: Trouble Ticket 3  
Lab 3-4: Trouble Ticket 4  
Lab 3-5: Trouble Ticket 5  
Lab 3-6: Trouble Ticket 6  
Lab 3-7: Trouble Ticket 7  
Lab 3-8: Trouble Ticket 8  
Lab 3-9: Trouble Ticket 9

Lab 3-10, Trouble Ticket 10

### Module 4: Troubleshoot Voice and Video Quality Issues

Defining Common Voice and Video Quality Issues  
Troubleshooting VoIP Quality Problems  
Troubleshooting Echo  
Troubleshooting Quality Problems of Cisco Unified Video Advantage  
Lab 4-1: Trouble Ticket 1  
Lab 4-2: Trouble Ticket 2  
Lab 4-3: Trouble Ticket 3  
Lab 4-4: Trouble Ticket 4

### Module 5: Application Integration and Media Resource Issues

Troubleshooting Common Cisco Unity Integration Issues  
Troubleshooting CTI Issues  
Troubleshooting Media Resources  
Lab 5-1: Trouble Ticket 1  
Lab 5-2: Trouble Ticket 2  
Lab 5-3: Trouble Ticket 3  
Lab 5-4: Trouble Ticket 4  
Lab 5-5: Trouble Ticket 5  
Lab 5-6: Trouble Ticket 6

**Course Description:** The Intelligent Contact Manager Boot Camp v7.0 (ICMBC) is an accelerated class combining the complete Cisco classes for Cisco Intelligent Contact Management Product Training Part 1(ICMPT1), and Cisco Intelligent Contact Management Product Training Part 2(ICMPT2). The classes are condensed by having longer days (8:00 AM to 6:00 PM) and reducing the overlap. This allows those students who attend only to be away from their work for one week instead of the two weeks for the normal ICMPT1, and ICMPT2, classes.

The two and a half day ICMPT1 portion covers an overview of the ICM, configuration, basic scripting, WebView reporting, as well as Pre-Routing, Post-Routing, and Translation Routing.

The two and a half day ICMPT2 portion provides the knowledge and experience necessary to install, set-up, support and troubleshoot the Cisco ICM system. Students will install and configure Cisco ICM software as it was used in ICMPT1. A pre-configured IPCC Express will be used for the second Contact Center and will be connected by the student installing an IPCC Express Gateway PG. Installation will also include a WebView Server, a Historical Data Server (HDS), and the optional products for Application Gateway and Database Routing. The Cisco Support Tools v2.0 is introduced and will be installed in class. Through the use of Support Tools Dashboard utility, and various monitoring and testing utilities, (the process Log files, command line reference) students will be able to identify, analyze, and diagnose various system alarms and events.

**Who Should Attend:** This course is intense and fast paced and is intended for personnel who will implement, configure and support the Cisco ICM/IPCC Product.

System Engineers, Channel Partner/Resellers, Cisco Employees, Customers, Deployment Engineers, and other personnel wanting to meet the pre-requisite of completing the ICMPT1 course prior to attending the IP Contact Center Enterprise (IPCCE) v1.0 class will want to attend.

**Prerequisites:** Students should have strong knowledge of MS Windows Server 2003 and TCP/IP networking and familiarity with your call center operations (ACD, Network, and any IVR implementations).

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Configure a generic ICM system using the Configure ICM utility (ICMPT1).
- Create several call routing and administrative scripts using the Script Editor utility.
- Generate real time and historical ICM reports using standard templates from the Webview utility.
- Describe ICM system components, their functions, and processes that run on the System Components.
- Install the needed third party software for proper WebView operation.
- Install the ICM System Software in a duplexed Enterprise environment.
- Use the Cisco Support Tools Dashboard utility and ICM tools for basic System Administration and Troubleshooting.
- Identify solution models and their issues.
- Build an ICM Enterprise (ICMPT2) solution.

## Course Outline:

### ICMPT1 v7.0

#### Module 1: Call Routing Concepts

Call Routing Options  
ICM Components  
ICM Call Routing

#### Module 2: Boston Contact Center

Configure Boston Contact Center  
Script Editor

#### Module 3: Basic Administration

Additional Boston Configuration  
Advanced Script Editor  
Administration Labs

#### Module 4: Extended Functions

External Database Lookup  
Call Variables  
Multiple Skill Groups

#### Module 5: Administrative Scripts

Administrative Scripts

#### Module 6: Translation Routing

Translation Routing

#### Module 7: Virtual Contact Center

Adding A Contact Center  
Enterprise Services and Skill Groups

#### Module 8: WebView

### WebView

### ICMPT2 v7.0

#### Module 1: ICM Topology

ICM Deployment Models

#### Module 2: Processes

Functional Description  
Fault Tolerance

#### Module 3: Classroom Lab Setup

Before you begin

#### Module 4: Central Controller

Domain Manager  
Router  
Logger

#### Module 5: Admin Workstation and Historical Data Server

Admin Workstation

#### Module 6: Device Management Protocol Devices

Network Interface Controller (NIC)  
Peripheral Gateway (PG)

#### Module 7: Routing Options

External SQL Database  
Application Gateway

#### Module 8: IPCC Express Gateway PG

IPCC Express Gateway PG

### Module 9: Administration Tools

WebView Server  
Support Tools

**Course Description:** The new release Cisco IP Contact Center Enterprise v1.0 is based on updated Call Manager, IP IVR and ICM software. All labs have been rewritten and tested. New call flows have been created and are used as the basis to help students understand how to configure IP Contact Center and understand how it operates. The new course also includes coverage of CAD, the Cisco Agent Desktop, and expanded reporting.

**Who Should Attend:** This course is intended for personnel who will implement, configure and support the Cisco IPCC Product and have already attended training on the ICM Product.

**Prerequisites:** Students should have attended and completed ICMPT (ICM Product Training) and Call Manager courses and it is recommended that they have attended and completed CRSD.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Accurately explain the IPCC solution concept.
- Identify solution models and their issues.
- Build a "clean order" for an IPCC solution.
- Design an ipcc solution using all applicable components.
- Install, configure, test, and maintain IPCC components for the single-site environment.
- Formulate and implement IPCC call flows and routing.
- Use cisco's standard IPCC deployment tools.

### Course Outline:

#### Volume 1

##### Introduction

##### Overview

Lesson 1: IPCC Pre Routing Call Flow  
Lesson 2: IPCC Post Route from CallManager Call Flow  
Lesson 3 and LAB Module 3: Configure CallManager for IPCC  
Lesson 4: CRS Script Editor  
Lesson 5 and LAB Module 5: Create a CRS Script  
Lesson 6 and LAB Module 6: Configure IPIVR for IPCC  
Lesson 7 and LAB Module 7: ICM Configuration  
Lesson 8 and LAB Module 8: ICM Component Installation  
Lesson 9 and LAB Module 9: CTIOS and CTIOS Desktop  
Lesson 10 and LAB Module 10: Translation Route Wizard  
Lesson 11 and LAB Module 11: ICM Script and Call Tracer

#### Volume 2

Lesson 1 and LAB Module 1: System IPCC Installation  
Lesson 2 and LAB Module 2: Deployment Wizard  
Lesson 3 and LAB Module 3: Post Installation Configuration  
Lesson 4: Cisco Agent Desktop (CAD)  
Lesson 5 and LAB Module 5: Cisco Desktop Applications Installation  
Lesson 6 and LAB Module 6: System IPCC Script  
Lesson 7 and LAB Module 7: CAD Workflow  
Lesson 8: Cisco Outbound Option  
Lesson 9 and LAB Module 9: Cisco Outbound Option Installation  
Lesson 10 and Lab Module 10: Parent/Child

**Course Description:** This course provides knowledge and hands-on deployment experience for Unified Contact Center Express and Unified IP IVR. Deployment tasks include planning, installation, configuration, administration, script development, agent and supervisor deployments, and troubleshooting.

**Who Should Attend:** This course is for Channel Partners / Resellers, Customers, and Employees.

**Prerequisites:** Students should have experience with internetworking fundamentals, basic IP telephony fundamentals, Cisco Unified Communications Manager deployments, Cisco IP Phones and Cisco IP Communicator, Contact Center Operations, Microsoft Windows Server 2000, 2003, XP, and MS SQL 2000, MSDE databases.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Design and plan a Unified Contact Center Express and a Unified IP IVR implementation
- Install or discuss all CRS components, servers and clients
- Configure all CRS components
- Build workflow applications to exploit Unified IP IVR features and capabilities
- Build contact center workflows to exploit Unified Contact Center Express features and capabilities
- Deploy and use Agent and Supervisor Desktop software

### Course Outline:

CRS Product Overview

CRS Design and Ordering

Installation & Configuration

Script Editor

Creating Scripts and Applications

Configuring UCCX ACD

Creating Scripts for Contact Centers

Using Cisco Desktop Admin (CDA)

Supervisor Remote Monitoring

Using ASR and TTS

Outbound Preview Dialing

Reporting

Troubleshooting

**Course Description:** Implementing Cisco Storage Networking Solutions (ICSNS) v3.0 is a 5-day lecture/lab course that provides learners with fundamental skills in implementing and troubleshooting Cisco storage networks. Course topics include installing and bringing up the switch, configuring Virtual SANs (VSANs), domains, interfaces, and zones, implementing PortChannels, configuring management security, and basic troubleshooting. You will also learn how to configure highly available FCIP tunnels and tune the performance of your FCIP links.

ICSNS v3.0 enables the student to describe and configure the hardware and software components of the Cisco MDS 9000 product family, focusing on key technologies and features that apply to departmental, mid-range, and enterprise SANs. ICSNS v3.0 replaces MDS 9000 Configuration and Troubleshooting (MDSCT) v2.2. It also contains the Fibre Channel over IP (FCIP) content formerly found in Cisco Multiprotocol Storage Essentials (CMSE) v2.0.

**Who Should Attend:** This course is for Customers, Employees, and Channel Partners/Resellers.

**Prerequisites:** Students must have a basic understanding of data storage hardware components and protocols, including SCSI and Fibre Channel and IP networking concepts. CCNA certification is recommended.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Given a SAN environment, identify the components, services, and features of the MDS 9000 platform that can be used to improve the availability, scalability, performance, and manageability of the SAN.
- Given an MDS 9000 switch, safely install the switch hardware and perform the initial software configuration process.
- Given a SAN design, implement the logical topology specified by a SAN design, so that connectivity between end devices can be verified.
- Given a SAN design, describe the traffic management features associated with Intelligent Network Services for the MDS 9000 series in order to configure basic traffic management services for the SAN.
- Given a SAN environment, describe how to use FCIP to implement appropriate solutions for SAN extension.

### Course Outline:

#### Course Introduction

#### MDS 9000 Platform Overview

Introducing MDS 9000 Platform Components  
Using Intelligent Network Services  
Implementing Integrated Management  
Introducing the MDS 9000 System Architecture

#### System Installation and Initial Configuration

Installing Switch Hardware  
Performing the Initial Switch Configuration  
Installing and Licensing SAN-OS  
Using Call Home

#### Building VSANs

Configuring VSANs  
Managing Domains  
Configuring Interfaces  
Configuring Dynamic VSANs  
Using Intelligent Addressing  
Implementing Zones  
Improving Management Security

#### Managing SAN Traffic

Configuring PortChannels  
Configuring Routing and Load Balancing  
Configuring Traffic Priority

#### Implementing FCIP

FCIP Protocol Overview  
Configuring FCIP  
Configuring FCIP High-Availability  
Implementing IVR for SAN Extension  
Tuning FCIP Performance

#### Troubleshooting Tools and Scenarios

Diagnostic Tools and Methodologies  
Capture and Analyze SAN Traffic  
Basic Troubleshooting Scenarios

#### Appendix A: The Fibre Channel Protocol

The SCSI Protocol  
FC Protocol Concepts

#### FC Layers

FC Flow Control  
FC Login

FC Error Recovery  
FC Switched Fabric

#### Appendix B: Installation and Configuration Reference

Switch Hardware Installation Reference

#### Labs

Lab 2-1: Quickstart Switch Configuration  
Lab 2-2: Configuring Call Home  
Lab 3-1: Creating VSANs  
Lab 3-2: Configuring Interfaces  
Lab 3-3: Configuring Zones  
Lab 4-1: Configuring PortChannels  
Lab 5-1: Implementing an FCIP Tunnel  
Lab 5-2: Configuring FCIP High Availability  
Lab 5-3: Implementing IVR for SAN Extension  
Lab 5-4: Tuning FCIP Performance  
Lab 6-1: Using SPAN and the CiscPort Analyzer Adapter  
Lab 6-2: Challenge Lab  
Lab 6-3: Upgrading Switch Software

**Course Description:** Implementing Cisco Storage Networking Solutions (ICSNS) v3.2.3 is a 5-day lecture/lab course that provides learners with fundamental skills in implementing and troubleshooting Cisco storage networks.

Course topics include installing and bringing up the switch, configuring Virtual SANs (VSANs), domains, interfaces, and zones, implementing PortChannels, configuring management security, and basic troubleshooting. You will also learn how to configure highly available FCIP tunnels and tune the performance of your FCIP links.

ICSNS v3.2.3 enables the student to describe and configure the hardware and software components of the Cisco MDS 9000 product family, focusing on key technologies and features that apply to departmental, mid-range, and enterprise SANs.

ICSNS v3.2.3 replaces MDS 9000 Configuration and Troubleshooting (MDSCT) v2.2. It also contains the Fibre Channel over IP (FCIP) content formerly found in Cisco Multiprotocol Storage Essentials (CMSE) v2.0.

**Who Should Attend:** This course is for Customers, Employees, and Channel Partners/Resellers.

**Prerequisites:** Students must have a basic understanding of data storage hardware components and protocols, including SCSI and Fibre Channel and a basic understanding of IP networking concepts. CCNA certification is recommended.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Given a SAN environment, identify the components, services, and features of the MDS 9000 platform that can be used to improve the availability, scalability, performance, and manageability of the SAN.
- Given an MDS 9000 switch, safely install the switch hardware and perform the initial software configuration process.
- Given a SAN design, implement the logical topology specified by a SAN design, so that connectivity between end devices can be verified.
- Given a SAN design, describe the traffic management features associated with Intelligent Network Services for the MDS 9000 series in order to configure basic traffic management services for the SAN.
- Given a SAN environment, describe how to use FCIP to implement appropriate solutions for SAN extension.

## Course Outline:

### Course Introduction

**MDS 9000 Platform Overview**  
Introducing MDS 9000 Platform Components  
Using Intelligent Network Services  
Implementing Integrated Management  
Introducing the MDS 9000 System Architecture

**System Installation and Initial Configuration**  
Installing Switch Hardware  
Performing the Initial Switch Configuration  
Installing and Licensing SAN-OS  
Using Call Home

**Building VSANs**  
Configuring VSANs  
Managing Domains  
Configuring Interfaces  
Configuring Dynamic VSANs  
Using Intelligent Addressing  
Implementing Zones  
Improving Management Security

**Managing SAN Traffic**  
Configuring PortChannels  
Configuring Routing and Load Balancing  
Configuring Traffic Priority

**Implementing FCIP**  
FCIP Protocol Overview  
Configuring FCIP  
Configuring FCIP High-Availability  
Implementing IVR for SAN Extension  
Tuning FCIP Performance

**Troubleshooting Tools and Scenarios**  
Diagnostic Tools and Methodologies  
Capture and Analyze SAN Traffic  
Basic Troubleshooting Scenarios

**Appendix A: The Fibre Channel Protocol**  
The SCSI Protocol

FC Protocol Concepts  
FC Layers  
FC Flow Control  
FC Login  
FC Error Recovery  
FC Switched Fabric

**Appendix B: Installation and Configuration Reference**  
Switch Hardware Installation Reference

**Lab Outline**  
Lab 2-1: Quickstart Switch Configuration  
Lab 2-2: Configuring Call Home  
Lab 3-1: Creating VSANs  
Lab 3-2: Configuring Interfaces  
Lab 3-3: Configuring Zones  
Lab 4-1: Configuring PortChannels  
Lab 5-1: Implementing an FCIP Tunnel  
Lab 5-2: Configuring FCIP High Availability  
Lab 5-3: Implementing IVR for SAN Extension  
Lab 5-4: Tuning FCIP Performance  
Lab 6-1: Using SPAN and the CiscPort Analyzer Adapter  
Lab 6-2: Challenge Lab  
Lab 6-3: Upgrading Switch Software

**Course Description:** This is a draft copy of the course information, subject to revisions & changes.

Securing Networks with ASA Advanced (SNA v1.0) is a new course to replace the Cisco Secure Virtual Private Networks (CSVPN) course & portions of the Securing Networks with PIX and ASA (SNPA) course.

In order to cover new features in ASA software v8.0 and to fully cover the VPN features of the ASA, the content of SNPA was split into two courses, one that covers the fundamentals, SNAF, and one that covers more advanced topics, SNA v1.0.

SNA v1.0 also utilizes the graphical user interface instead of the command line interface for explanation and discussions of configuring the ASA.

**Who Should Attend:** This course is for Employees, Channel Partners/Resellers, and Customers.

**Prerequisites:**

**Course Description:** This is a draft copy of the course information, subject to revisions & changes.

SNAF course is a five-day, leader-led, lab-intensive course which takes a task-oriented approach in teaching the skills to configure, operate, and manage products from the Cisco Adaptive Security Appliance family.

SNAF replaces the SNPA 5.0 course. In order to cover new features in ASA software v8.0 and to fully cover the VPN features of the ASA, the content of SNPA was split into two courses, one that covers the fundamentals, SNAF, and one that covers more advanced topics, SNAA.

**Who Should Attend:** This course is for Employees, Channel Partners/Resellers, and Customers.

**Prerequisites:**