CSCGW - Cisco SIP, Cisco Unified Border Element, and Gateways v2.0 Training

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Duration: **5 Day**

The **CSCGW - Cisco SIP, Cisco Unified Border Element, and Gateways v2.0** course is designed for networking and collaboration professionals who want to develop deeper skills in Cisco voice gateways, SIP, and Cisco Unified Border Element technologies.

The programme begins with the core building blocks of Cisco Unified Communications networks. Participants explore gateway call routing, call legs, voice port configuration, DSP functionality, and codec behaviour before progressing into SIP and Cisco Unified Border Element.

The course examines SIP call flows, SIP messaging, SDP and media negotiation, dial-peer logic, SIP normalization, and advanced CUBE dial-peer strategies in detail.

Later sections focus on the more advanced capabilities of Cisco Unified Border Element, including secure SIP trunk integration, signaling and media bindings, toll fraud prevention, tenant-based multiple trunk support, hybrid cloud calling, and call recording.

Hands-on labs give participants practical experience configuring and troubleshooting Cisco IOS gateways and CUBE environments using realistic voice scenarios.

Prerequisites

Participants should have networking knowledge at approximately **CCNA level** or equivalent practical experience.

Familiarity with the following areas will be useful:

- TCP/IP
- Routing and switching
- IP addressing
- Network device configuration
- Basic Cisco IOS
- Fundamental voice networking concepts

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Who Should Attend

This course is particularly suitable for:

- Network Engineers
- Network Architects
- Collaboration Engineers
- Voice Engineers
- Unified Communications specialists
- Network support professionals
- Technical staff responsible for voice and data network devices
- Professionals evaluating or implementing VoIP solutions
- Enterprise and service provider staff who need a working understanding of packet telephony technologies

What You Will Learn

By the end of the course, participants will be able to:

- Explain the Cisco Collaboration Solutions Architecture
- Describe the role of Cisco Voice Gateways
- Identify common gateway protocols
- Build a basic dial plan
- Understand Cisco Unified Communications Manager media resources
- Configure gateway voice ports
- Explain the role of DSPs
- Understand call signaling over IP networks
- Evaluate codecs and codec complexity
- Identify key requirements for VoIP call legs
- Configure VoIP call legs
- Explain dial-peer behaviour
- Describe the relationship between call legs and dial peers
- Apply digit manipulation on Cisco IOS Gateways
- Control calling privileges
- Work with MGCP gateways
- Explain the fundamentals of H.323
- Analyse signaling and media protocols
- Describe call signaling for call setup and teardown
- Explain the role of Cisco Unified Border Element
- Use advanced CUBE dial-peer features
- Apply SIP normalization
- Understand signaling and media bindings
- Apply toll fraud prevention controls
- Support multiple trunks using tenants
- Evaluate Hybrid Local Gateway scenarios
- Implement call recording and monitoring approaches

Training Outline

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Module 1: Introduction to Voice Gateways

This module introduces the role and behaviour of gateways within Cisco Unified Communications networks.

Topics include:

- Cisco Unified Communications Networks
- The role of gateways
- Gateway call routing
- Call legs
- Gateway voice ports
- Voice port configuration
- DSP functionality
- Codecs
- Codec complexity

Participants examine how voice traffic is routed through gateways and how DSP resources support media processing.

Module 2: VoIP Call Legs

This module focuses on the characteristics and requirements of VoIP call legs.

Topics include:

- VoIP call leg characteristics
- VoIP media transmission
- Requirements for VoIP call legs
- Configuring VoIP call legs
- Call signaling
- Media paths

Participants learn how individual call legs combine to form an end-to-end IP voice call.

Module 3: Dial Plan Implementation

This module examines dial plan design and call routing within Cisco voice environments.

Topics include:

- Digit manipulation
- Path selection
- Calling privileges
- Dial-peer logic
- Inbound and outbound call routing
- Number transformations

Participants learn how to build and control dial plans across different numbering and routing scenarios.

Module 4: VoIP Signaling Protocols

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This module compares several major VoIP signaling protocols.

MGCP

Topics include:

- MGCP operation
- MGCP gateway behaviour
- Integration with Cisco Unified Communications Manager

H.323

Topics include:

- H.323 fundamentals
- Call signaling
- Media protocols

SIP

Topics include:

- SIP overview
- SIP messages
- SIP servers
- SDP
- Media negotiation
- SIP call setup types
- SIP call setup and teardown

Participants analyse how signaling and media protocols work together during a voice session.

Module 5: Cisco Unified Border Element

This module focuses on the role of Cisco Unified Border Element in modern voice environments.

Topics include:

- Introduction to Cisco Unified Border Element
- CUBE architecture
- CUBE call processing
- Advanced CUBE dial-peer features
- SIP normalization
- Signaling bindings
- Media bindings
- Toll Fraud Prevention
- Tenant configuration
- Supporting multiple trunks with tenants

Participants examine how CUBE provides secure and controlled interworking between different SIP environments.

Module 6: Cisco Unified Border Element Applications

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This module explores advanced CUBE deployment scenarios.

Topics include:

- Cloud Calling Hybrid Local Gateway
- Hybrid cloud connectivity
- SIP trunk integration
- Call Recording
- Call Monitoring
- SPAN-based recording approaches

Participants evaluate how CUBE can be used in hybrid calling, cloud connectivity, and recording architectures.

Labs

The course includes practical labs covering:

- Using certificates
- Configuring IP network protocols
- Creating a basic dial plan
- Exploring Partitions and Calling Search Spaces
- Configuring VoIP Dial Peers
- Configuring and troubleshooting collaboration endpoints
- Troubleshooting calling issues
- Configuring Regions and Locations
- Configuring VoIP Call Legs
- Configuring and troubleshooting ISDN PRI
- Examining Cisco IOS Gateway inbound and outbound dial-peer behaviour
- Implementing and troubleshooting digit manipulation on a Cisco IOS Gateway
- Implementing PSTN calling using MGCP Gateways
- Analysing SIP, H.323, and media protocols
- Troubleshooting SIP and media protocols
- Implementing Cisco Unified Border Element
- Configuring CUBE
- Troubleshooting Cisco Unified Border Element
- Implementing call recording and monitoring using a SPAN-based solution