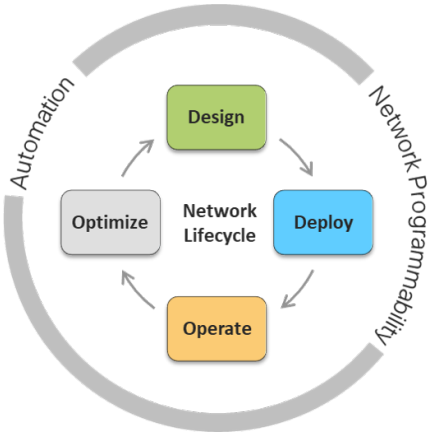
CCIE Collaboration (v3.0) Exam Topics - Practical Exam



Exam Description: The Cisco CCIE Collaboration (v3.0) Practical Exam is an eight-hour, hands-on exam that requires a candidate to plan, design, implement, operate, and optimize complex enterprise Collaboration solutions.

The following topics are general guidelines for the content likely to be included on the exam. Your knowledge, skills and abilities on these topics will tested throughout the entire network lifecycle, unless explicitly specified otherwise within this document.

The exam is closed book and no outside reference materials are allowed.

1. Protocols and APIs (10%)

1.1 IP collaboration signaling protocols
- 1.1.a SIP
- 1.1.b MGCP

1.2 Media Negotiation
- 1.2.a SDP Offer/Answer model
- 1.2.b SDP Early offer, delayed offer, early media
- 1.2.c SDP Payload type interworking

1.3 Media Path Optimization
- 1.3.a Interactive Connectivity Establishment (ICE)
- 1.3.b TURN and STUN

1.4 SIP headers
- 1.4.a Identity headers (Name, number, URI, Privacy)
- 1.4.b Route headers
- 1.4.c Diversion headers
- 1.4.d CallID, SessionID, and CiscoGUID

1.5 Media protocols
- 1.5.a RTP/RTCP, SRTP/SRTCP
- 1.5.b Binary Floor Control Protocol (BFCP)
- 1.5.c ActiveControl (iX)

1.6 DTMF relay
- 1.6.a In-band vs out-of-band
- 1.6.b RFC 2833
- 1.6.c Key Pad Markup Language (KPML)
- 1.6.d Unsolicited NOTIFY
- 1.6.e Interworking

1.7 Messaging protocols
- 1.7.a XMPP
- 1.7.b SIP/SIMPLE

1.8 Collaboration APIs
- 1.8.a Unified CM Administrative XML (AXL) API
- 1.8.b Webex REST API
- 1.8.c Cisco Meeting Server
- 1.8.d Unified CM User Data Service API
- 1.8.e Java Telephony Application Programming Interface (JTAPI)

2. Infrastructure and Quality of Services (10%)

2.1 Network services
- 2.1.a DHCP
- 2.1.b NTP
- 2.1.c DNS
- 2.1.d CDP/LLDP

2.2 Troubleshoot layer 2 and layer 3 network connectivity issues

2.3 Quality of Service for Collaboration applications and endpoints on LAN/WAN/WLAN (Cisco IOS-XE and AireOS)
- 2.3.a Identification
- 2.3.b Classification and marking
- 2.3.c Queuing and scheduling
- 2.3.d Congestion management

2.4 Troubleshoot voice and video quality issues
- 2.4.a Media stream packet loss, jitter, and latency
- 2.4.b Endpoint media quality metrics
- 2.4.c One-way or no-way media

2.5 Call Admission Control
- 2.5.a CUBE
- 2.5.b UCM

2.5.c Cisco Expressway Series

2.6 Certificate management
- 2.6.a CUBE
- 2.6.b UCM and IM&P
- 2.6.c Cisco Expressway Series
- 2.6.d Cisco Meeting Server

3. Call Control and Dial plan (20%)

3.1 Global dial plans
- 3.1.a Localization and globalization
- 3.1.b Numbering schemes
- 3.1.c Dialing habits
- 3.1.d Interdigit timeouts
- 3.1.e Calling privileges
- 3.1.f Number presentation

3.2 Fundamental dial plan features on Unified CM
- 3.2.a Partitions and calling search spaces
- 3.2.b Translation and transformation patterns
- 3.2.c Urgent priority
- 3.2.d Path selection

3.3 Advanced dial plan features on Unified CM
- 3.3.a Global dial plan replication
- 3.3.b Local route groups
- 3.3.c Emergency Location Groups

3.4 URI and domain-based routing

3.5 Unified CM telephony features
- 3.5.a Call Pickup
- 3.5.b Barge/privacy
- 3.5.c Native call queuing
- 3.5.d Busy Lamp Field (BLF)

3.6 Audio and video codec selection

3.7 SIP trunking
- 3.7.a SIP profiles
- 3.7.b SIP trunk security profiles
- 3.7.c Resiliency
- 3.7.d Mid-call signaling

3.7.e Session refresh

3.8 Securing SIP trunks on UCM

3.9 UDS in a multi-cluster environment
- 3.9.a Service discovery
- 3.9.b ILS
- 3.9.c User search
- 3.9.d LDAP proxy

3.10 Unified CM database replication

3.11 Dial plans on CUBE
- 3.11.a Inbound and outbound dial-peers
- 3.11.b Voice translation rules and profiles
- 3.11.c Dial-peer provisioning policy
- 3.11.d Destination server groups
- 3.11.e Destination dial-peer groups
- 3.11.f E.164 pattern maps
- 3.11.g URI-based dialing
- 3.11.h VRF-aware call routing

3.12 SIP-SRST and E-SRST

3.13 Dial plans on Expressway Series
- 3.13.a Transforms
- 3.13.b Search rules
- 3.13.c Zones

4. Endpoints and User Management (10%)

4.1 Hardware and software endpoint registration in a multi-cluster environment
- 4.1.a On-premise (local or proxy TFTP)
- 4.1.b Mobile and Remote Access (Service Discovery)
- 4.1.c Cloud

4.2 Mixed mode and Security By Default (SBD) on Unified CM
- 4.2.a Certificate Trust List (CTL) and Identity Trust List (ITL)
- 4.2.b Token-less
- 4.2.c Trust Verification Service (TVS)

4.3 Securing endpoints

4.4 Collaboration endpoints and infrastructure using IPv6

- 4.5 Endpoint features
  - 4.5.a Directory integration and search
  - 4.5.b Product specific configuration
  - 4.5.c Multistream
- 4.6 User authentication and authorization
  - 4.6.a Directory synchronization On-premise
  - 4.6.b Directory synchronization Cloud
  - 4.6.c Single-Sign-On (SSO)
  - 4.6.d OAuth
- 4.7 Self-provisioning

5. Edge Services (20%)

- 5.1 ISDN PRI gateways
- 5.2 SIP trunks using CUBE
- 5.3 SIP normalization and SDP normalization
  - 5.3.a Normalization and transparency scripts (Lua)
  - 5.3.b Cisco IOS-XE SIP profiles
- 5.4 Securing SIP trunks on CUBE
  - 5.4.a SRTP to RTP interworking
  - 5.4.b SRTP pass-through
  - 5.4.c SRTP to SRTP interworking
- 5.5 Stateful box-to-box redundancy on CUBE (Cisco IOS-XE)
- 5.6 Network and application level security on Cisco IOS-XE
  - 5.6.a IP Trust List
  - 5.6.b Call spike protection
  - 5.6.c Media policing
  - 5.6.d Call thresholds
  - 5.6.e RTP port ranges
  - 5.6.f Telephony denial of service attacks
- 5.7 Firewall traversal in a Collaboration solution
  - 5.7.a Port numbers and transport
  - 5.7.b NAT
  - 5.7.c Web proxy servers
  - 5.7.d Deep Packet Inspection considerations

5.8 Expressway Series traversal communications
- 5.8.a Traversal zones
- 5.8.b SSH tunnels
- 5.8.c Encryption interworking

5.9 Mobile and Remote Access (MRA)

5.10 Network and application level security on Expressway Series
- 5.10.a Toll fraud prevention (CPL)
- 5.10.b Zone authentication
- 5.10.c Automated intrusion protection
- 5.10.d Mutual TLS

5.11 Webex Edge and Webex Hybrid Services
- 5.11.a Extending cloud services using on premise resources
- 5.11.b Cloud service management

5.12 Third-party interoperability and federation
- 5.12.a Voice and video calling
- 5.12.b IM&P

6. Media Resources and Meetings (15%)

6.1 Media resources
- 6.1.a Transcoding and transrating
- 6.1.b MTP
- 6.1.c Music on hold (unicast and multicast)

6.2 Rendezvous conferencing
- 6.2.a Unified CM Conference Now
- 6.2.b Cisco Meeting Server Spaces

6.3 Ad-hoc conferencing
- 6.3.a Cisco IOS-XE conferencing
- 6.3.b Cisco Meeting Server

6.4 Scheduled meetings
- 6.4.a On-premise
- 6.4.b Cloud

6.5 CallBridge and WebBridge on Cisco Meeting Server
- 6.5.a Internal user access
- 6.5.b External user access

6.6 High availability on Cisco Meeting Server

6.7 Secure conferencing on Cisco Meeting Server

7. Collaboration Applications and Services (15%)

7.1 On premise IM&P servers and clients

7.2 Presence
- 7.2.a Busy Lamp Field (BLF)
- 7.2.b Soft client

7.3 IM&P server integration with external database for Persistent Chat and Group Chat

7.4 Cisco Unity Connection voicemail integration

7.5 Cisco Unity Connection voicemail features
- 7.5.a Call and directory handlers
- 7.5.b Voicemail access from soft clients
- 7.5.c Video greetings and messaging

7.6 Cisco Unity Connection voicemail dial plan
- 7.6.a Partitions and search spaces
- 7.6.b Routing rules

7.7 Mobility features
- 7.7.a Mobile Connect (Single Number Reach)
- 7.7.b Device Mobility
- 7.7.c Mobile Identity
- 7.7.d Extend and Connect
- 7.7.e Extension Mobility

7.8 Extension Mobility Cross Cluster (EMCC)
- 7.8.a Emergency dialing considerations
- 7.8.b Certificate exchange

7.9 Audio and video call recording architectures
- 7.9.a SIP-based Media Recording (SIPREC)
- 7.9.b Network-Based Recording
- 7.9.c Built-in bridge
- 7.9.d CUBE Media Proxy
- 7.9.e Cisco Meeting Server

7.10 Secure call recording

7.11 Cisco Unified Contact Center Express (UCCX)
- 7.11.a Integration
- 7.11.b Scripting

7.12 Contact Center agent desktop (Finesse)