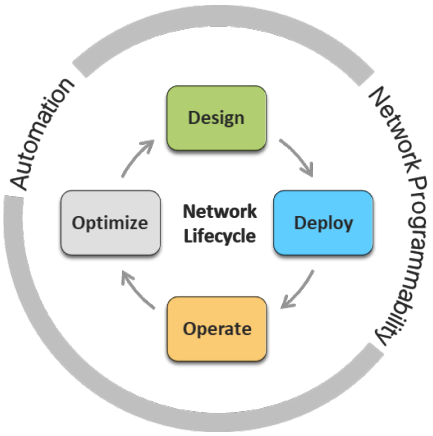
CCIE Enterprise Wireless (v1.0) Exam Topics – Practical Exam



Exam Description: The Cisco CCIE Enterprise Wireless v1.0 Practical Exam is an eight-hour, hands-on exam that requires a candidate to plan, design, implement, operate, and optimize complex Enterprise Wireless networks.

Candidates are expected to program and automate the network within their exam, as per exam topics below.

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 be 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. Radio Frequency and Standards (15%)

1.1 IEEE 802.11 standards and protocols

1.2 RF Design / Site survey
- 1.2.a Define the tasks/goals for a preliminary site survey
- 1.2.b Conduct the site survey
- 1.2.c Determine AP quantity, placement and antenna type

1.3 Indoor and outdoor RF deployments
- 1.3.a Coverage
- 1.3.b Throughput
- 1.3.c Voice
- 1.3.d Location
- 1.3.e High Density / Very High Density

1.4 RF operational models
- 1.4.a Radio resource management (Auto-RF, manual, hybrid, Flexible Radio Assignment, TPC and DCA, CHD)
- 1.4.b Channel use (Co-channel, radar, non-WiFi interference, Dynamic Bandwidth Selection)

- 1.4.c Power level, overlap
- 1.4.d RF profiles
- 1.4.e Data rates
- 1.4.f RX-SOP
- 1.4.g CleanAir and EDRRM
- 1.4.h Air Time Fairness (ATF)

2. Enterprise Wired Campus (10%)

2.1 Layer 2 technologies to support wireless deployments
- 2.1.a VLANs
- 2.1.b STP
- 2.1.c Etherchannel
- 2.1.d CDP, LLDP

2.2 Data/Control plane technologies to support a SD-Access wireless deployment
- 2.2.a VXLAN and LISP
- 2.2.b VRFs

2.3 AP powering options

2.4 IPv4 and IPv6 connectivity
- 2.4.a Subnetting
- 2.4.b Static and inter-VLAN routing

2.5 Multicast on the switching infrastructure
- 2.5.a PIM
- 2.5.b Basic IGMP (including IGMP snooping)
- 2.5.c MLD

2.6 QoS on the switching infrastructure
- 2.6.a MQC
- 2.6.b MLS QoS

2.7 Services to support a wireless deployment
- 2.7.a DNS
- 2.7.b DHCPv4 / DHCPv6
- 2.7.c NTP, SNTP
- 2.7.d SYSLOG
- 2.7.e SNMP

3. Enterprise Wireless Network (25%)

3.1 WLC interfaces and ports

3.2 Lightweight APs
- 3.2.a AP modes
- 3.2.b AP Logging
- 3.2.c AP CLI troubleshooting
- 3.2.d AP level configuration settings
- 3.2.e WLC discovery and AP join process
- 3.2.f AP join profile

3.3 High availability, redundancy, and resilience
- 3.3.a SSO
- 3.3.b N+1, N+N
- 3.3.c Patching and rolling upgrades for IOS-XE
- 3.3.d ISSU

3.4 Wireless segmentation with profiles and groups
- 3.4.a RF profiles
- 3.4.b AP groups
- 3.4.c Flex groups
- 3.4.d Site tag
- 3.4.e RF tag
- 3.4.f Policy tag

3.5 FlexConnect and Office Extend

3.6 All controller deployment models

3.7 Mesh

3.8 WGB on IOS and on COS APs

3.9 Controller Mobility
- 3.9.a L2/L3 roaming
- 3.9.b Multicast optimization
- 3.9.c Mobility group scaling
- 3.9.d Inter-OS controller mobility
- 3.9.e Mobility anchoring
- 3.9.f Mobility encryption

4. Wireless Security and Identity Management (20%)

4.1 Secure management access and control plane
- 4.1.a Device administration with TACACS+/RADIUS
- 4.1.b CPU ACLs
- 4.1.c Management via wireless and dynamic interface
- 4.1.d Password policies
- 4.1.e AP authorization

4.2 Identity management
- 4.2.a Basic PKI for dot1X and WebAuth
- 4.2.b Internal and external identity sources
- 4.2.c Identity PSK

4.3 Wireless security and Network access policies
- 4.3.a Client authentication and authorization
- 4.3.b Client profiling and provisioning
- 4.3.c RADIUS attributes
- 4.3.d CoA
- 4.3.e ACLs
- 4.3.f L2/L3 security
- 4.3.g Certificates
- 4.3.h Local policies

4.4 Guest management
- 4.4.a Local web authentication
- 4.4.b Central web authentication
- 4.4.c Basic sponsor policy

4.5 Access Point switchport authentication
- 4.5.a MAB
- 4.5.b 802.1X
- 4.5.c NEAT
- 4.5.d Switchport macros

4.6 TrustSec for SD-Access Wireless
- 4.6.a SGTs
- 4.6.b SGACLs

4.7 Intrusion detection and prevention features
- 4.7.a Rogue policies
- 4.7.b MFP
- 4.7.c Standards and custom signatures

- 4.7.d Client exclusion policies
- 4.7.e Switchport tracing

5. Wireless business applications and services (20%)

- 5.1 QoS policies
  - 5.1.a QoS profiles
  - 5.1.b EDCA
  - 5.1.c WMM
  - 5.1.d Bi-Directional Rate Limitting
  - 5.1.e Admission control
  - 5.1.f QoS maps
  - 5.1.g FastLane
- 5.2 AVC and netflow
- 5.3 Client roaming optimization
  - 5.3.a Band Select
  - 5.3.b Load Balancing
  - 5.3.c 802.11r and Adaptive Fast Transition
  - 5.3.d 802.11k/v
- 5.4 Wireless Multicast
  - 5.4.a Multicast modes in the controllers
  - 5.4.b Multicast snooping
  - 5.4.c Multicast direct
  - 5.4.d Mulitcast VLAN
- 5.5 mDNS
  - 5.5.a mDNS proxy
  - 5.5.b Service discovery
  - 5.5.c Service filtering

6. Automation, Analytics, and Assurance (10%)

- 6.1 Prime Infrastructure
  - 6.1.a Basic operations
    - 6.1.a i Create and deploy templates
    - 6.1.a ii Operate maps
    - 6.1.a iii Import infrastructure devices
    - 6.1.a iv Audits
    - 6.1.a v Client troubleshooting
    - 6.1.a vi Notification receivers

- 6.1.a vii Reports
- 6.1.a viii Monitoring policies
- 6.1.a ix Prime Infrastructure jobs

6.1.b WLAN Security management

- 6.1.b i Configure rogue management
- 6.1.b ii Manage alarms and events

6.2 Cisco CMX/DNA Spaces

6.2.a Management access

6.2.b Network services

- 6.2.b i Analytics & Metrics
- 6.2.b ii Location
- 6.2.b iii Profiles
- 6.2.b iv Engage

6.2.c Operational Insights

6.2.d API calls using python scripts

6.3 Cisco DNA Center

6.3.a Wireless Automation

- 6.3.a i Day 0 - Provisioning
- 6.3.a ii SWIM
- 6.3.a iii Application policies
- 6.3.a iv Security policies
- 6.3.a v Operate Maps

6.3.b Assurance

- 6.3.b i Network health and WLC/AP 360
- 6.3.b ii Client health and client 360
- 6.3.b iii Application experience
- 6.3.b iv Sensors
- 6.3.b v iPCAP and on demand captures
- 6.3.b vi Network telemetry

6.3.c SD Access

- 6.3.c i Fabric enabled wireless
- 6.3.c ii SDA policy and segmentation