COMMSCOPE®
RUCKUS CERTIFICATION PROGRAM

Exam Study Guide

# RCNA

# RUCKUS Certified Networking Associate Exam

## HIGHLIGHTS

### How to Register

Register online at the RUCKUS Certifications Store

### Passing Score

63% or better

### Questions

60

### Exam Duration

2 Hours

### Proctoring

This exam is remote proctored using a secure browser.

See the What to Expect document for details.

### Validity Period

The RCNA Certification is valid for a period of three (3) years

### Retake Policy

Once passed, you may not retake the exam except to recertify.

If failed, you may retake the exam immediately, however, after a second attempt you must wait 14 days. After a third or fourth attempt, you must wait 30 days. No more than 5 retakes are allowed within one year.

## Exam Description

As a RUCKUS Certified Networking Associate, you must be able to design, deploy and manage RUCKUS ICX routing and switching hardware and software in a production environment. This exam assesses your ability to administer, troubleshoot and optimize RUCKUS ICX solutions.

### Ideal Candidate

Before attempting the exam, you should have these critical competencies and experience:

- Understanding of advanced network Layer 2/3 protocols
- 5+ years of network experience/exposure
- Advanced network troubleshooting skills and experience

### Preparatory Course

RUCKUS offers a paid, virtual instructor-led **RUCKUS ICX 200 Administrator** course which covers the material tested on this exam. Please contact andrew.voss@commscope.com for more information.

### Target Audience

This certification is designed for network administrators, architects and security engineers tasked with management, administration and troubleshooting RUCKUS ICX networking deployments.

## Exam Blueprint

The exam blueprint outlines the range of content that may be included in the exam. Not all objectives have associated questions. The weight indicates approximately how much of the exam content focuses on a section.

| Weight | Section Name & Objectives |
|---|---|
| 10% | Foundational IP technologies and concepts<br><br>• IP discovery concepts<br>• IP addressing concepts<br>• IPv6 concepts<br>• Basic LAN and enterprise network concepts |
| 10% | IP products and solutions<br><br>• Mulit-VRF<br>• RUCKUS implementation of IP solutions such as MCT, VRRP-E, PVST and topology groups<br>• Aggregate VLANs (Q-in-Q)<br>• VxLANs<br>• MACSEC and IPSEC |
| 24% | Implement an IP solution (install, configure, setup)<br><br>Routing configuration and verification<br>• IP addressing on interfaces (loopback, VE, physical)<br>• Static and default routes<br>• OSPF<br>• BGP and BGP4+ neighboring and route advertisement<br>• Dynamic routing protocol redistribution<br>• Router redundancy with VRRP / VRRP-E / VRRP-Ev3<br>• PBR and route filtering<br>• Multi-VRF and customize Management VRF<br>• DHCP relay and server<br><br>Switching configuration and verification<br>• Static and dynamic LAGs<br>• Spanning Tree (PVST, RSTP, MSTP)<br>• Adjust STP parameters for root bridge selection and traffic flow control<br>• VLANs<br>• Campus fabrics<br>• MCT and toplogy groups<br>• DHCP pools<br><br>General configuration<br>• PoE / PoE+ budgets and priorities<br>• CoS / QoS (basic setup, mapping, trust DSCP)<br>• Zero-touch and manual stacking<br>• Port-level settings (MTU, auth, speed, protocol priorities)<br><br>Multicast configuration and verification<br>• PIM sparse and dense modes and SSM<br>• Candidate rendezvous points and bootstrap routers<br>• IGMP and IGMP snooping |

24%

## Enhance an IP solution

Network Optimization
- Gather information with SNMP and sFlow
- Optimize CoS and QoS
- Modify STP / RSTP to reduce convergence flow
- OSPF route summarization
- Port Flap Dampening
- BFD to minimize routing protocol failover time
- Packet-inerror-detect
- Device upgrade and downgrade

Security
- Access control using various tools (ACLs, 802.1X, AAA, RADIUS, TACACS+, certificate management)
- SSH
- Dynamic ARP inspection
- DHCP snooping
- Device hardening
- Password recovery
- Permissions and flexible authentication

17%

## Troubleshoot an IP solution

Data Gathering
- Show command
- Analyze command output from variety of tools (ping, traceroute, term mon, debug destination)
- Use show techsupport and log data
- Port mirroring / RSPAN
- Packet capture
- sFlow

L 1 / L2 / L3 Troubleshooting
- Physical layer (optical, cabling, link states)
- MAC address aging issues and stale ARP entries
- VLAN issues
- Spanning Tree issues
- Proprietary L2 issues (MCT, PVST, topology groups)
- LAG and LACP issues
- FDP, CDP and LLDP issues
- Routing table interpretation
- VRRP-E configurations
- OSPF configurations
- BGP configurations

Performance Issues
- High CPU, broadcast storms, loops
- Interface errors

15%

## Manage an IP solution

- IP Management tools (CLI, GUI)
- Standard and extended ACLs
- Data gathering (SPAN, mirror ports, analyzers, sFlow)
- License management
- Interpret and clear port statistics
- Identify unusual traffic conditions (attacks, DDOS, mis-configured devices or nodes, policy-based routing, etc.)
- Configuration backup and restore
- Manage PoE budget and priorities
- Change management and firmware updates

## Study Materials

| | |
|---|---|
| Preparatory Course Name and Description | RUCKUS ICX Administrator Instructor-led Training Course (ICX 200)<br><br>This training course concentrates on the duties performed by a network administrator within typical to complex network environment and focuses on the RUCKUS ICX series of switches running FastIron 8.0.90.<br><br>NOTE: This course is only available as paid, classroom or virtual instructor-led training. |
| Additional Supporting Online Courses and Product Documentation | These free resources are also provided as materials to assist in your exam preparation.<br><br>Online Courses and Resources<br>• RSP 100 Routing and Switching Protocols REV 0619<br>• ICX 150 RUCKUS ICX Implementer REV 0419<br>• ICX Management Using SmartZone (YouTube playlist)<br><br>Product Manuals<br>• FastIron 08.0.90 (GA) Command Reference Guide (53-1005565-01)<br>• FastIron 08.0.90 (GA) DHCP Configuration Guide (53-1005566-01)<br>• FastIron 08.0.90 (GA) Features and Standards Support Matrix (53-1005560-01)<br>• FastIron 08.0.90 (GA) Layer 2 Switching Configuration Guide (53-1005 562-01)<br>• FastIron 08.0.90 (GA) Layer 3 Routing Configuration Guide (53-1005567-01)<br>• FastIron 08.0.90 (GA) Management Configuration Guide (53-1005563-01)<br>• FastIron 08.0.90 (GA) Monitoring Configuration Guide (53-1005578-01)<br>• FastIron 08.0.90 (GA) Security Configuration Guide (53-1005573-01)<br>• FastIron 08.0.90 (GA) Software Upgrade Guide (53-1005568-01) |
| Online Resources: | • CommScope RUCKUS Training Portal<br>• CommScope RUCKUS Support Website |

## Practice Questions

The following questions are provided as examples of the type and breadth of questions you will encounter in the exam. An answer key I provided at the end.

1. An administrator is troubleshooting DHCP issues for clients within the 10.240.10.0/24 subnet. Their DHCP server exists within Server Farm A.

   Review the output:

```
!
interface ethernet 1/1/21
port-name "Server Farm A"
route-only
ip address 10.254.20.254 255.255.255.0
ip ospf area 0
!
interface ethernet 1/1/24
port-name To "Server Farm B"
route-only
ip address 10.254.10.254 255.255.255.0
ip ospf area 0
!
interface ve 240
ip address 10.240.10.1 255.255.255.0
ip helper-address 1 10.254.20.50
ip ospf area 240
!
interface ve 241
ip address 10.241.10.1 255.255.255.0
ip helper-address 1 10.254.10.50
ip ospf area 241
!
```

   Which source IP address would be seen by the DHCP server 10.254.20.50 for clients trying to obtain an IP address?

   A. 10.240.10.1

   B. 10.241.10.1

   C. 10.254.10.254

   D. 10.254.20.254

2. Review the output:

```
interface ethernet 1/1/15
 loop-detection
 inline power power-by-class 1
!
interface ethernet 1/1/16
 loop-detection
 inline power power-by-class 4
!
interface ethernet 1/1/17
 loop-detection
 inline power power-by-class 3
!
interface ethernet 1/1/18
 loop-detection
 inline power power-by-class 2
```

Which interface will provide 25 watts of power to a PoE+ capable device?

A. interface ethernet 1/1/15

B. interface ethernet 1/1/16

C. interface ethernet 1/1/17

D. interface ethernet 1/1/18

3. 172.16.0.0/23 is not being advertised by BGP.

   Review the output:

   ICX Configuration:

```
local-as 65110
address-family ipv4 unicast
neighbor 10.255.10.254 remote-as 65106
neighbor 10.255.10.254 soft-reconfiguration inbound
exit-address-family
```

   ICX Routing Table:

```
 Destination        Gateway           Port      Cost     Type      Uptime


1 0.0.0.0/0         10.117.255.1     ve 119     0/0      S         134d
2 10.117.255.0/24   DIRECT           ve 119     0/0      D         95d18h
3 10.255.81.0/24    DIRECT           ve 2558    0/0      D         39d3h
4 10.255.82.0/24    DIRECT           ve 2558    0/0      D         39d3h
5 10.255.83.0/24    DIRECT           ve 2558    0/0      D         39d3h
6 10.255.84.0/24    DIRECT           ve 2558    0/0      D         39d3h
7 172.16.0.0/23     10.117.255.5     ve 199     1/1      S         134d
```

   Which command applied to the configuration will correct this?

   A. `redistribute static`

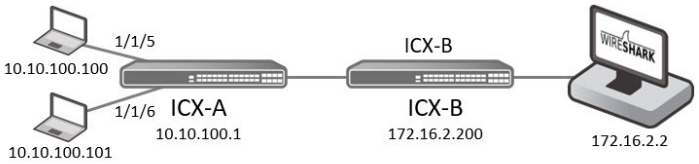
   B. `redistribute connected`

   C. `network 172.16.0.0 255.255.255.0`

   D. `ip route 172.16.0.0 255.255.254.0 10.255.10.254 distance 20`

4. An administrator is trying to configure ERSPAN to capture traffic from hosts and send it to a network analyzer for review.

   Review the exhibit:




```
ICX-A(config)# monitor-profile 1 type erspan
ICX-A(config-monitor-profile 1)# source-ip 10.1.100.100
ICX-A(config-monitor-profile 1)# destination-ip 172.16.2.2
ICX-A(config-monitor-profile 1)# interface e 1/1/5
ICX-A(config-if-e1000-1/1/5)# monitor profile 1 both
ICX-A(config-if-e1000-1/1/5)# interface e 1/1/6
ICX-A(config-if-e1000-1/1/6)# monitor profile 1 in
```

   Why is the traffic not reaching the analyzer?

   A. source-ip must be 10.10.100.1

   B. destination-ip must be 172.16.2.200

   C. RSPAN VLAN must be added to ICX-B

   D. monitor profile on port 1/1/6 must be both

5. A customer requires a single point of management, large scalability, the ability to utilize Layer 2 and Layer 3 devices, and the ability to scale as they grow.

   Which Ruckus ICX solution meets the customer requirements?

   A. Campus Fabric

   B. VxLAN gateway

   C. Metro Ring Protocol

   D. Multi-Chassis Trunking

6. Which three services are enabled by default on the ICX? (Choose three)

   A. AAA console
   B. FTP server
   C. HTTPS server
   D. SNMPv3
   E. SSHv2
   F. Telnet server

7. What type of tunnel encapsulation do VxLANs use on ICX devices?

   A. GRE

   B. L2TP

   C. IPSEC

   D. MAC in UDP

8. Which statement is true regarding IGMP on the ICX?

   A. IGMP snooping is enabled by default.

   B. Version 3 is the default IGMP version.

   C. Multiple active queriers are strongly recommended.

   D. Version 3 uses only address 224.0.0.22 for group messages.

9. Which two statements are true when configuring VRFs in an ICX switch. (choose two)

   A. VRFs only support IPv4 IP addressing.

   B. PE routers have to be directly connected.

   C. PE routers have to be directly connected at Layer 3.

   D. Only one VRF instance can be applied to a physical port.

   E. Route Distinguisher must match on all VRF instances configured.

10. A new Ruckus ICX 7450 with the 4x10G SFP module has been installed. The uplink from this switch will be using a 1G SFP.

    Which command is needed on the interface for the link to come up?

    A. `bandwidth 1000`

    B. `speed-duplex auto`

    C. `gig-default neg-off`

    D. `speed-duplex 1000-full`

Answer key: 1: D, 2: B, 3: A, 4: A, 5: A, 6: ACE, 7: D, 8: D, 9: CD, 10: D