



HCIE-Routing & Switching V3.0 Exam Outline

HCIE-Routing & Switching V3.0 Certification Exam

Exam Name	HCIE-Routing & Switching (Written)	HCIE-Routing & Switching (LAB)
Exam Code	H12-261	H12-266
Language	ENU/CHS	ENU/CHS
Exam Format	True-false Question, Single Answer, Multiple Answer, Fill in the bank answers, Drag and drop item	Operation, Essay Question
Exam Cost	300USD	1200 USD
Exam Duration	90min	480min
Pass Score/ Total Score	600/1000	80/100

Exam Content

HCIE-Routing & Switching V3.0 exam covers Network Planning, Design, Implementation, Maintenance, Trouble-Shooting, Optimization, Cut-over ,etc.

Knowledge Points

Key Points		Written	Lab
Layer 2 Technologies	STP	12%	7%
	VLAN		
	Transparent bridge		
	Link Aggregation, Eth-Trunk and IP-Trunk, Load-balance, LACP		
	Ethernet technologies		
	Smart link		
	DLDP		
	Switched Port Analyzer (port-mirroring)		
	CSS/iStack		
	HDLC/IP-Trunk and PPP/MP		
	PPPoE		
IPv4/v6 Unicast	IPv4 addressing, subnetting, and VLSM	52%	32%
	IPv4 tunneling and GRE		
	IPv6 addressing		

	ICMPv6		
	IPv6 functionality protocols		
	Migration techniques		
	IPv4/v6 OSPF		
	IPv4/v6 IS-IS		
	IPv4/v6 BGP		
	Route Control		
MPLS VPN	MPLS	10%	13%
	MPLS Layer 3 VPN		
	Inter-AS MPLS VPN		
IPv4/v6 Multicast	IPv4/v6 Multicast	6%	4%
Network Security	Access lists	5%	2%
	uRPF		
	IP Source Guard		
	AAA		
	802.1x / NAC		
	NAT		
	Device access control		
	IPsec		
	Traffic Suppression		
	Local Attack Defense		
	IP Address Anti-spoofing		
	ARP Security		
	DHCP Security		
QoS	--	5%	3%
Network Management	--	2%	1%
Feature	--	3%	1%
SDN	--	5%	--
Planning/Troubleshoot a Network	--	--	37%

Written Exam Knowledge Points

I . Layer 2 Technologies

STP

1.STP

2.RSTP

3.MSTP

- 4. Loop guard
- 5. Root guard
- 6. BPDU guard
- 7. TC-BPDU attack guard

VLAN

- 1. Access port
- 2. Trunk port
- 3. Hybrid port
- 4. QinQ
- 5. Vlan Aggregation
- 6. Mux VLAN
- 7. Voice VLAN

Transparent bridge

- 1. Local Bridging
- 2. Remote Bridging
- 3. Integrated Bridging and Routing
- 4. VLAN ID Transparent Transmission

Link Aggregation, Eth-Trunk and IP-Trunk, Load-balance, LACP

- 1. Link Aggregation
- 2. LACP

Ethernet technologies

- 1. Speed and duplex
- 2. Ethernet, Fast Ethernet, Gigabit Ethernet, 10GE, 40GE, 100GE
- 3. Auto MDI/MDIX
- 4. Auto negotiation
- 5. Storm control
- 6. Unicast flooding control

Smart link

DLDP

Switched Port Analyzer (port-mirroring)

CSS/iStack

HDLC/IP-Trunk and PPP/MP

PPPoE

II. IPv4/v6 Unicast

IPv4 addressing, subnetting, and VLSM

IPv4 tunneling and GRE

IPv6 addressing

ICMPv6

IPv6 functionality protocols

Migration techniques

1. Tunneling techniques

2. Translation techniques

IPv4/v6 OSPF

1. Standard OSPF areas

2. Stub area

3. Totally stubby area

4. NSSA

5. Totally NSSA

6. LSA types

7. Adjacency on a point-to-point and on a multi-access network

8. Virtual-Link

9. LSA Filter

10. OSPF Fast Convergence

11. Stub Router

12. OSPF Authentication

IPv4/v6 IS-IS

1.NSAP

2.IS-IS Link-state packets

3.IS-IS area type

4.IS-IS circuit type

5.IS-IS TLV

6.IS-IS DIS and Pseudo node

7.IS-IS SPF

8.IS-IS LSP

9.IS-IS Metric

10.IS-IS Route Leaking

11.IS-IS MT

12.IS-IS Fast Convergence

13.IS-IS LDP Synchronization

14.IS-IS Authentication

IPv4/v6 BGP

1.IBGP and EBGP

2.BGP attributes

3.BGP synchronization

4.BGP routes Summarization

5.Route Dampening

6.BGP route reflector

7.BGP Community

8.BGP Peer Groups

9.BGP Security

10.Principles of Route Selection

Route Control

1.Filtering

2.IP Prefix list

- 3.Route Import(redistribution)
- 4.Route policy
- 5.Summarization
- 6.Preference
- 7.Other advanced features

III. MPLS VPN

MPLS

- 1.MPLS network component (P, PE, CE)
- 2.MPLS label format
- 3.MPLS label encapsulation
- 4.MPLS label stack
- 5.MPLS label operation
- 6.Forwarding Equivalence Class
- 7.LDP
- 8.Label advisement model
- 9.MPLS LDP—Local Label Allocation Filtering
- 10.MPLS LDP Inbound/outbound Label Binding Filtering

MPLS Layer 3 VPN

- 1.MP-IBGP VPNv4 peering
- 2.VPN-instance
- 3.Route Distinguisher
- 4.Route Target
- 5.Route Target import/export
- 6.PE-CE—Dynamic Routes
- 7.PE-CE—Static Routes
- 8.Redistributing PE-CE routes into VPNv4
- 9.Redistributing VPNv4 routes into PE-CE routing table
- 10.MCE

Inter-AS MPLS VPN

- 1.Option A
- 2.Option B
- 3.Option C

IV. IPv4/v6 Multicast

- 1.Multicast distribution tree
- 2.Multicast forwarding
- 3.Multicast RPF
- 4.PIM sparse mode
- 5.IGMP/MLD
- 6.IGMP Snooping/MLD Snooping
- 7.PIM RP, and BSR
- 8.Multicast tools, features, and source-specific multicast

V. Network Security

Access lists

uRPF

IP Source Guard

AAA

802.1x / NAC

NAT

- 1.Static NAT/NAPT
 - 2.Dynamic NAT/PAT
 - 3.Easy IP
 - 4.NAT Server
 - 5.Twice NAT
 - 6.ALG
 - 7.NAT Mapping
 - 8.NAT Filtering
- 2021-05-29

Device access control

IPsec

Traffic Suppression

Local Attack Defense

IP Address Anti-spoofing

ARP Security

DHCP Security

VI .QoS

- 1.Classification
- 2.Traffic Policing
- 3.Traffic Shaping
- 4.Congestion Avoidance
- 5.Congestion Management

VII. Network Management

- 1.Syslog
- 2.IP Service Level Agreement SLA
- 3.NetStream
- 4.NQA
- 5.SNMP
- 6.FTP
- 7.Telnet
- 8.SSH

VIII. Feature

- 1.VRRP
- 2.VGMP
- 3.Interface Backup
- 4.NTP

5.DHCP

6.BFD

7.NSF/GR

8.NSR

IX.SDN

1.Strategy of SDN/NFV

2.SDN architecture

3.VXLAN

4.EVPN

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5. SNMP
6. FTP
7. Telnet
8. SSH

VIII. Feature

1. VRRP
2. VGMP
3. Interface Backup
4. NTP
5. DHCP
6. BFD
7. NSF/GR
8. NSR

IX. Planning/Troubleshoot a Network

1. Planning/Troubleshoot complex Layer 2 network
2. Planning/Troubleshoot complex Layer 3 network
3. Planning/Troubleshoot a network in response to application
4. Planning/Troubleshoot network services
5. Planning/Troubleshoot network security

Note:

The content mentioned in this document is just a general exam guide; the exam may also contain



more related content that is not mentioned here.

Please don't hesitate to contact us if have any suggestions about HCIE-Routing & Switching certification, welcome to send Email to : Certification@huawei.com

Reference

HCIE-Routing & Switching Course V3.0

HCIE-Routing & Switching Lab Guide V3.0

Recommended Training

HCIE-Routing & Switching Training