Juniper Networks Certified Internet Professional (JNCIP-SP) Certification

Course Details

Course Outline

1. **OSPF**
   - OSPFv2 Review
   - Link-State Advertisements
   - Protocol Operations
   - OSPF Authentication
   - Lab: OSPF Multiarea Networks
2. **OSPF Areas**
   - Review of OSPF Areas
   - Stub Area Operation
   - Stub Area Configuration
   - NSSA Operation
   - NSSA Configuration
   - Route Summarization
   - Lab: OSPF Route Summarization
3. **OSPF Case Studies and Solutions**
   - Virtual Links
   - OSPF Multiarea Adjacencies
   - External Reachability
   - Lab: Advanced OSPF Options and Routing Policy
4. **IS-IS**
   - Overview of IS-IS
   - IS-IS PDUs
   - Neighbors and Adjacencies
   - Configuring and Monitoring IS-IS
   - Lab: IS-IS Configuration and Monitoring
5. **Advanced IS-IS Operations and Configuration Options**
   - IS-IS Operations
   - IS-IS Configuration Options

- IS-IS Routing Policy
- Lab: Advanced IS-IS Configuration Options and Routing Policy

6. **Multilevel IS-IS Networks**
   - Level 1 and Level 2 Operations
   - Multilevel Configuration
   - Lab: Configuring a Multilevel IS-IS Network
7. **BGP**
   - Review of BGP
   - BGP Operations
   - BGP Path Selection and Options
   - Configuration Options
   - Lab: BGP and BGP Attributes
8. **BGP Attributes and Policy- Part 1**
   - BGP Policy
   - Next Hop
   - Origin and MED
   - AS Path
   - Lab: BGP Attributes: Next Hop, Origin, MED, and AS Path
9. **BGP Attributes and Policy- Part 2**
   - Local Preference
   - Communities
   - Lab: BGP Attributes: Local Preference and Communities
10. **Route Reflection and Confederations**
    - Route Reflection Operation
    - Configuration and Routing Knowledge
    - BGP Confederations
    - Lab: Scaling BGP
11. **BGP Route Damping**
    - Route Flap and Damping Overview
    - Route Damping Parameters
    - Configuring and Monitoring Route Damping
    - Lab: BGP Route Damping
12. **CoS Overview**
    - CoS History and Evolution

- CoS and DiffServe
- CoS Fields in Packet Headers
- CoS Processing

13. **Packet Classification**
    - Classification Overview
    - Forwarding Classes and Packet Loss Priority
    - Fixed Classification
    - Multifield Classification
    - Behavior Aggregate Classification
    - Lab 1: Configuring Packet Classification
14. **Policing**
    - Policing Overview
    - Single-Rate Two-Color Policer
    - Tricolor Marking Policers
    - Hierarchical Policers
    - Application Directly on an Interface
    - Application Within a Firewall Filter
    - Lab 2: Configuring Policers
15. **Scheduling**
    - Scheduling Overview
    - Transmission Rate
    - Queue Priority
    - Delay Buffers
    - Drop Profiles and Drop Profile Maps
    - Scheduling Configuration
    - Lab 3: Configuring Schedulers
16. **Hierarchical Scheduling**
    - Hierarchical Scheduling Overview
    - Scheduler Modes
    - Hierarchical Scheduling Levels
    - Throughput Example
    - Remaining Traffic
    - Queue Properties in a Hierarchical Scheduling Context
    - Putting It All Together

- Lab 4: Configuring Hierarchical Schedulers

17. **Rewrite Rules**
    - Packet Header Rewrite Overview
    - Rewrite Rules and Tables
    - Rewrite Combinations
    - Lab 5: Configuring Rewrite Rules
18. **CoS-Based Forwarding**
    - CBF Overview
    - CBF Configuration
    - Lab 6: Configuring CBF
19. **Case Study**
    - VOIP Case Study Overview
    - VOIP Case Study: Ingress Node
    - VOIP Case Study: Transit and Egress Nodes
20. **Introduction to Multicast**
    - Overview of Multicast
    - Multicast Addresses
    - Reverse Path Forwarding
    - Internet Group Management Protocol
    - Lab 1: Implementing a Baseline Network
21. **Multicast Routing Protocols**
    - Overview of Multicast Routing Protocols
    - PIM Dense Mode Operation
    - Lab 2: PIM Dense Mode
    - PIM Sparse Mode Operation
    - Lab 3: PIM Sparse Mode and RP Discovery
22. **MSDP**
    - MSDP
    - Anycast-RP
    - Lab 4: Implementing MSDP and Anycast-RP
23. **Source-Specific Multicast**
    - Overview of SSM Operation
    - SSM Addresses
    - IGMPv3 and SSM

- PIM-SM and SSM
- SSM Case Study
- Lab 5: Source-Specific Multicast

24. **Multicast and Policy**
    - Multicast and Policy Overview
    - Controlling PIM Join and Register Messages
    - Controlling BSR Messages
    - Controlling MSDP SA Messages
    - Implementing Multicast Scoping
    - Lab 6: Multicast and Policy
25. **MPLS Fundamentals**
    - MPLS Foundation
    - Terminology
    - MPLS Configuration
    - MPLS Packet Forwarding
    - Lab: MPLS Fundamentals
26. **Label Distribution Protocols**
    - Label Distribution Protocols
    - RSVP
    - LDP
    - Lab: Label Distribution Protocols
27. **Constrained Shortest Path First**
    - RSVP Behavior Without CSPF
    - CSPF Algorithm
    - CSPF Tie Breaking
    - Administrative Groups
    - Interarea Traffic Engineered LSPs
    - Lab: CSPF
28. **Traffic Protection and LSP Optimization**
    - Default Traffic Protection Behavior
    - Primary and Secondary LSPs
    - Fast Reroute
    - Bypass LSPs
    - LSP Optimization

- Lab: Traffic Protection

29. **Fate Sharing**
    - Junos OS Fate Sharing
    - SRLG
    - Extended Admin Groups
    - Lab: Fate Sharing
30. **Miscellaneous MPLS Features**
    - Routing Table Integration
    - Forwarding Adjacencies
    - Policy Control over LSP Selection
    - LSP Metrics
    - Automatic Bandwidth
    - TTL Handling
    - Explicit Null Configuration
    - MPLS Pings
    - Lab: Miscellaneous MPLS Features
31. **VPN Review**
    - Overview of VPNs
    - CPE-Based VPNs
    - Provider-Provisioned
32. **Layer 3 VPNs**
    - Layer 3 VPN Terminology
    - VPN-IPv4 Address Structure
    - Operational Characteristics
    - Lab: VPN Baseline Configuration
33. **Basic Layer 3 VPN Configuration**
    - Preliminary Steps
    - PE Router Configuration
    - Lab: Layer 3 VPN with Static and BGP Routing
34. **Troubleshooting Layer 3 VPNs**
    - A Layered Approach
    - The Routing-Instance Switch
    - PE-Based and CE-Based Traceroutes
    - Viewing VRF Tables and PE-PE Signaling Flow

- Monitoring PE-CE Routing Protocols

35. **Layer 3 VPN Scaling and Internet Access**
    - Scaling Layer 3 VPNs
    - Public Internet Access Options
    - Lab: Route Reflection and Internet Access
36. **Layer 3 VPNs- Advanced Topics**
    - Exchanging Routes Between VRF Tables
    - Hub-and-Spoke Topologies
    - Layer 3 VPN CoS Options
    - Layer 3 VPN and GRE Tunneling Integration
    - Layer 3 VPN and IPsec Integration
    - Lab: GRE Tunnel Integration
37. **BGP Layer 2 VPNs**
    - Overview of Layer 2 Provider-Provisioned VPNs
    - BGP Layer 2 VPN Operational Model: Control Plane
    - BGP Layer 2 VPN Operational Model: Data Plane
    - Preliminary BGP Layer 2 VPN Configuration
    - BGP Layer 2 Configuration
    - Monitoring and Troubleshooting BGP Layer 2 VPNs
    - Lab: BGP Layer 2 VPNs
38. **Layer 2 VPN Scaling and CoS**
    - Review of VPN Scaling Mechanisms
    - Layer 2 VPNs and CoS
39. **LDP Layer 2 Circuits**
    - LDP Layer 2 Circuit Operation
    - LDP Layer 2 Circuit Configuration
    - LDP Layer 2 Circuit Monitoring and Troubleshooting
    - Circuit Cross-Connect
    - Lab: Circuit Cross-Connect and LDP Layer 2 Circuits
40. **Virtual Private LAN Services**
    - Layer 2 MPLS VPNs Versus VPLS
    - BGP VPLS Control Plane
    - BGP VPLS Data Plane
    - Learning and Forwarding Process

- Loops

41. VPLS Configuration

- VPLS Configuration
- VPLS Troubleshooting
- Lab: VPLS

42. Interprovider VPNs

- Hierarchical VPN Models
- Junos Support of Carrier-of-Carriers Model
- Junos Support of Carrier-of-Carrier VPN Applications
- Lab: Carrier-of-Carrier VPNs