Layer 2 Switching Concepts

Identify the concepts, operations, and functionalities of Layer 2 switching in Junos OS:

- Bridging components
- Frame processing

VLAN Concepts

Describe the concepts, benefits, and functionalities of VLANs:

- Access and trunk ports
- VLAN tagging (IEEE 802.1Q)
- Native VLANs
- Voice VLANs
- Inter-VLAN routing

Layer 2 Switching and VLAN Configuration

Demonstrate knowledge of how to configure, monitor, and troubleshoot Layer 2 switching and VLANs:

- Interfaces and switch ports
- VLAN configuration
- Inter-VLAN routing

Spanning Tree

Spanning Tree Concepts

Describe the concepts, benefits, operations, and functionalities of Spanning Tree Protocol:

- Spanning Tree Protocol (STP)
- Rapid Spanning Tree Protocol (RSTP)
- Port roles and port states
- Bridge Protocol Data Units (BPDUs)
- Convergence and reconvergence processes

Spanning Tree Configuration

Demonstrate knowledge of how to configure, monitor, and troubleshoot Spanning Tree:

- STP configuration and operation

- RSTP configuration and operation

Layer 2 Security

Layer 2 Protection and Security Features

Identify the concepts, benefits, and operations of Layer 2 security mechanisms:

- BPDU protection, loop protection, and root protection

- Port security mechanisms:

  o MAC address limiting

  o DHCP snooping

  o Dynamic ARP Inspection (DAI)

  o IP Source Guard

- MACsec

- Storm control

Layer 2 Firewall Filters

Identify the concepts, benefits, and operations of Layer 2 firewall filters:

- Filter types

- Packet processing order

- Match criteria and actions

Layer 2 Security Configuration

Demonstrate knowledge of how to configure, monitor, and troubleshoot Layer 2 security:

- Protection mechanisms

- Port security

- Storm control

- Firewall filter configuration and application

Protocol-Independent Routing

Protocol-Independent Routing Concepts

Identify the concepts, operations, and functionalities of protocol-independent routing:

- Static routes

- Aggregate routes

- Generated routes

- Martian addresses

- Routing instances and RIB groups

- Load balancing

- Filter-based forwarding

Protocol-Independent Routing Configuration

Demonstrate knowledge of how to configure, monitor, and troubleshoot protocol-independent routing:

- Static, aggregate, and generated routes

- Load balancing

- Filter-based forwarding

OSPF (Open Shortest Path First)

OSPF Concepts

Describe the concepts, operations, and functionalities of OSPF:

- Link-state database

- OSPF packet types

- Router ID

- Neighbor and adjacency formation

- Designated Router (DR) and Backup Designated Router (BDR)

- OSPF areas and router types

- OSPF realms

- Link-State Advertisement (LSA) types

OSPF Configuration and Troubleshooting

Demonstrate knowledge of how to configure, monitor, and troubleshoot OSPF:

- Area and interface configuration

- Neighbor relationships

- Additional basic OSPF options

- Routing policy application

- Troubleshooting tools:

    o ping

    o traceroute

    o traceoptions

    o show commands

    o logging

IS-IS (Intermediate System to Intermediate System)

IS-IS Concepts

Describe the concepts, operations, and functionalities of IS-IS:

- Link-state database

- IS-IS Protocol Data Units (PDUs)

- Type, Length, and Value (TLV) elements

- Adjacencies and neighbors

- Levels and areas

- Designated Intermediate System (DIS)

- Metrics

IS-IS Configuration and Troubleshooting

Demonstrate knowledge of how to configure, monitor, and troubleshoot IS-IS:

- Levels, interfaces, and adjacencies

- Additional basic IS-IS options

- Routing policy application

- Troubleshooting tools:

  - ping

  - traceroute

  - traceoptions

  - show commands

  - logging

BGP (Border Gateway Protocol)

BGP Concepts

Describe the concepts, operations, and functionalities of BGP:

- BGP basic operation

- BGP message types

- BGP attributes

- Route and path selection process

- Internal BGP (IBGP) and External BGP (EBGP) behavior and interaction

BGP Configuration and Troubleshooting

Demonstrate knowledge of how to configure, monitor, and troubleshoot BGP:

- BGP groups and peers

- Additional basic BGP options

- Routing policy application

- Troubleshooting tools:

  - ping

  - traceroute

  - traceoptions

  - show commands

  - logging

IP Tunnels

IP Tunneling Concepts

Identify the concepts, requirements, and functionalities of IP tunneling:

- Tunneling applications and design considerations

- Generic Routing Encapsulation (GRE)

- IP-in-IP tunneling

IP Tunnel Configuration and Troubleshooting

Demonstrate knowledge of how to configure, monitor, and troubleshoot IP tunnels:

- GRE tunnel configuration

- IP-in-IP tunnel configuration

- Troubleshooting tools:

  o ping

  o traceroute

  o traceoptions

  o show commands

  o logging

High Availability (HA)

High Availability Concepts

Identify the concepts, benefits, applications, and requirements of high availability in Junos OS:

- Link Aggregation Groups (LAG)

- Redundant Trunk Groups (RTG)

- Virtual Chassis

- Graceful Restart

- Graceful Routing Engine Switchover (GRES)

- Nonstop Active Routing (NSR)

- Nonstop Bridging (NSB)

- Bidirectional Forwarding Detection (BFD)

- Virtual Router Redundancy Protocol (VRRP)

- Unified In-Service Software Upgrade (ISSU)

High Availability Configuration and Troubleshooting

Demonstrate knowledge of how to configure, monitor, and troubleshoot high availability components:

- LAG and RTG

- Virtual Chassis

- Graceful Restart, GRES, NSB, and NSR

- VRRP

- ISSU

- Troubleshooting tools:

  - traceoptions

  - show commands

  - logging