

102-2 Midterm

A. Multi-selection (30%)

1. Which three are roles of the core layer in a **LAN** design? (Choose 3)
 - a. Provides high-speed data transport (O)
 - b. Performs packet filtering
 - c. Serves as a fast convergent infrastructure with a high level of redundancy (O)
 - d. Avoids data manipulation (O)
 - e. Performs mainly policy-based decisions
 - f. Provides access to the network

2. Which statements are correct description of **NSF**? (Choose 2)
 - a. It allows the standby RP to take control of the device after a hardware or software fault on the active RP.
 - b. It is a Layer 3 function that works with **SSO** (Stateful Switchover) to minimize the amount of time a network is unavailable to its user following a switchover. (O)
 - c. It is supported by the Cisco implementation of **EIGRP**, **OSPF**, **RIP**, and **BGP** protocols.
 - d. It synchronizes startup configuration, startup variable, and running configuration.
 - e. The main objective of NSF is to continue forwarding IP packets following an RP switchover. (O)

3. Which are the advantages of **GLBP** in the distribution layer? (Choose 2)
 - a. GLBP provides all the benefits of **HSRP** and includes load balancing when VLANs do not span the access switches. (O)
 - b. A convergence event on the uplink affects only half as many hosts as compared to **HSRP** when VLANs do not span the access switches. (O)
 - c. A convergence event on the uplink affects is processed in half the times as compared to **HSRP** when VLANs do not span the access switches.
 - d. **STP** can block one of the access layer uplinks, and there is at most a two-hop Layer 2 path for upstream traffic when VLANs span access switches.
 - e. **STP** can block one of the access layer uplinks, and there is at most a two-hop Layer 3 path for upstream traffic when VLANs span access switches.

4. Select the best statement concerning **EIGRP** and **OSPF** routing design. (Choose 1)
- a. Routing design needs to be done most carefully for small networks.
 - b. **OSPF** should not be used for small networks.
 - c. Routing design needs to be done most carefully for large networks. (O)
 - d. Route summarization must be used in all network designs.
 - e. **OSPF** works best with a full mesh.
5. Which three factors are the biggest influences on **OSPF** scalability? (Choose 3)
- a. Flooding paths and redundancy (O)
 - b. Amount of routing information in the **OSPF** area or routing domain (O)
 - c. Number of routers capable of **Cisco Express Forwarding**
 - d. Number of adjacent neighbors (O)
 - e. Other routing protocols in use
6. What are the characteristics of a **Layer 3 access** design model? (Choose 3)
- a. **VLANs** do not expand to the aggregation layer. (O)
 - b. **VLANs** are extended to the aggregation layer.
 - c. All uplinks are active, and none are blocking. (O)
 - d. **Layer 2** server adjacency is supported across a single pair of access switches. (O)
 - e. **Layer 2** server adjacency is not supported across access switches.

B. Explanation of Terms (25%)

1. Stateful Switchover (SSO) (CH3 p.22 NSF/SSO)

Ans. SSO allows the standby Route Processor (RP) to take control of the device after a hardware or software fault on the Active RP.

SSO synchronizes startup configuration, startup variables, and running configuration as well as dynamic runtime data including Layer 2 protocol state for trunks and ports, hardware Layer 2 and Layer 3 tables (MAC, FIB (forwarding information base), adjacency table) as well as ACL and QoS tables.

2. RootGuard (CH3 p.47 CISCO STP Instructions)

Ans. Secures root on a specific switch by preventing external switches from becoming root.

3. EtherChannel (CH3 p.57 EtherChannel)

Ans. EtherChannel is a port link aggregation technology or port-channel architecture used primarily on Cisco switches.

Grouping of several physical Ethernet links to create one logical Ethernet link for the purpose of providing fault-tolerance and high-speed links between switches, routers and servers.

4. Autonomous Systems (CH4 p.62 Autonomous Systems)

Ans. An autonomous system is a region of the Internet that is administered by a single entity.

Examples of autonomous regions are:

- Campus network
- Backbone network
- Regional Internet Service Provider

5. Back-End Layer (CH2 p.24 Back-End Layer)

Ans. Provides connectivity to the database servers.

Primarily for the relational database systems that provide the mechanisms to access the enterprise's information, which makes them highly critical.

C. Questions (45%)

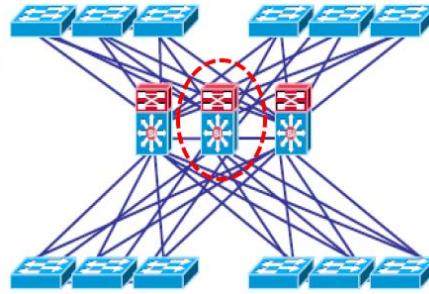
1. In too much redundancy case, it leads to which questions. (15%)

CH4 p.76 Too Much Redundancy

More redundancy is not necessarily better, and is a potential design issue.

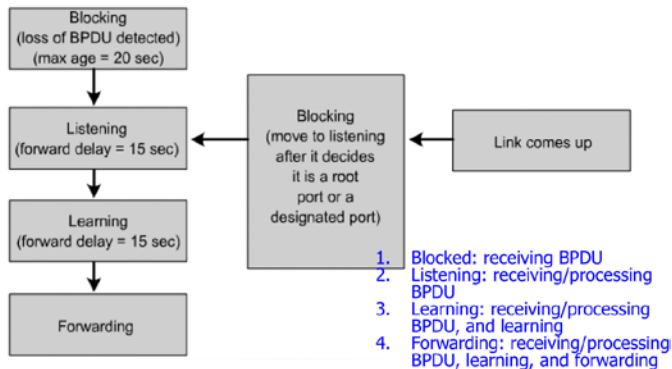
Too much redundancy can lead to design issues:

- Root placement
- Number of blocked links
- Convergence process
- Complex fault resolution



2. Please list and describe the detail of four stages of spanning-tree port states. (15%)

CH3 p.37-39 Four Stages of Spanning-Tree Port States



*•A port can also be in a **disabled state** which occurs when an administrator shuts down the port or the port fails.*

● Blocking State

- Ports can only receive BPDUs
- Data frames are discarded and no addresses can be learned
- It may take up to 20 seconds to change from this state

● Listening State

- Switches determine if there are any other paths to the root bridge
- The path that is not the least cost path to the root bridge goes back to the blocked state
- BPDUs are still processed.
- User data is not being forwarded and MAC addresses are not being learned
- The listening period is called the forward delay and lasts for 15 seconds

- Learning State
 - User data is not forwarded, but MAC addresses are learned from any traffic that is seen
 - The learning state lasts for 15 seconds and is also called the forward delay
 - BPDUs are still processed
- Forwarding state
 - User data is forwarded and MAC addresses continue to be learned
 - BPDUs are still processed
- **Disabled State (Fifth State)**
 - Can occur when an administrator shuts down the port or the port fails

3. Please list and describe the detail of three types of PVLAN ports. (15%)

Front-end Layer Functionality –PVLANs to segregate servers in the same subnet from each other.
(p.20)

Provide layer 2 isolation between ports within the same broadcast domain. (p.21)

- Promiscuous – can communicate with all interfaces, including the isolated and community ports within a PVLAN.
- Isolated – has complete layer 2 separation from the other ports within the same PVLAN, but not from the promiscuous ports.
 - PVLANs block all traffic to isolated ports except traffic from promiscuous ports.
 - Traffic from isolated port is forwarded only to promiscuous ports.
- Community – communicate among themselves and with their promiscuous ports.
 - These interfaces are separated at layer 2 from all other interfaces in other communities or isolated ports within their PVLAN.

Other important intelligent network services include (p.38)

- Private VLANs (PVLANs)
- Policy based routing (PBR).