

Appendix A

Routing

Review Questions and Answers

Unit 1: Lesson 1-1: The OSI Model Review

Part A

1. Define the following terms:
 - a. Name:
 - b. Address:
 - c. Route:

Part B

1. Differentiate between physical and logical addressing in networking. Include in your discussion examples of each type of address.
2. Explain how to convert a 48-bit address into a hexadecimal number.

Part C

Match the term with its definition:

Terms		Definitions	
1.__	Promiscuity	A.	Using group addressing to send packets to all stations on the LAN.
2.__	Broadcast addressing	B.	The service device transmits packets to the client, who listens for the packet and discovers the address of the service device.
3.__	Solicitation	C.	All network devices accept all packets regardless of the destination address.
4.__	Multicast addressing	D.	All service devices within a single group can be detected when the client station transmits a packet to the service group. The service group in turn listens for the transmission and responds to the packets addressed to them.
5.__	Advertisement	E.	Used to discover other stations on the network by sending packets to more than one station simultaneously using group addressing.

Part D

1. Compare connection-oriented and connectionless network services.

Part E

Identify the connectivity interfaces or protocols supported by the ARN by placing an “X” next to the choices supported.

1.	IP
2.	POTS
3.	Frame Relay
4.	Repeating
5.	AppleTalk Phase I
6.	X.25
7.	Ethernet
8.	V.34 Modem
9.	EGB
10.	PPP

Unit 1: Lesson 1-2: LANs, WANs, and Routers

Part A

1. Name a TCP/IP protocol that corresponds to the OSI network layer.
2. Name two TCP/IP protocols that correspond to the OSI transport layer.
3. Name five TCP/IP protocols that correspond to the OSI's upper three layers.

Part B

1. Which LAN transmission protocol has a collision domain?
2. Which LAN transmission protocol runs at 100 Mbps over optical fiber?
3. Which LAN transmission protocol requires hosts to wait to transmit until they have a special string of bits?

Part C

1. Match the router with its description.

1.	Interior	A.	All data from outside the network passes through this type of router.
2.	Exterior	B.	This type of router is used to segment large LANs.
3.	Border	C.	This type of router is not concerned with host addresses.

2. Diagram the relationship of the three types of routers. Include labels in your diagram.

Part D

1. Briefly describe the following WAN interfaces:
 - a. Leased Lines
 - b. Circuit Switched Connections
 - c. Packet Switched Connections
 - d. Cell Switched Connections

2. Describe the five basic WAN protocols.

Unit 2: Lesson 2-1: Bridge Algorithms

Part A

1. A transparent learning bridge builds a forwarding table by:
 - a. reading the source MAC address of every received frame and noting which port the frame was received on.
 - b. reading the destination MAC address of every received frame and noting which port the frame was transmitted on.
 - c. reading the source logical network address of every received frame and noting which port the frame was received on.
 - d. reading the destination logical network address of every received frame and noting which interface the frame was transmitted on.
2. When a transparent learning bridge receives a frame, it compares the frame's destination address with addresses in the forwarding table. What will happen if there is no match?
 - a. The frame will be dropped.
 - b. The frame will be flooded.
 - c. The frame will be broadcast out all ports.
 - d. The frame's destination address will be added to the forwarding table and then the frame will be flooded.
3. In the Spanning Tree algorithm, a designated bridge is:
 - a. the bridge with the highest path cost to the root bridge.
 - b. the bridge with the lowest path cost to the root bridge.
 - c. the bridge with the root port.
 - d. the bridge with the lowest priority and MAC address.
4. The type of bridge used only to connect two or more token rings is:
 - a. transparent bridge
 - b. learning bridge

- c. source route bridge
 - d. translating bridge
 - e. SRT bridge
5. The type of bridge that provides a network connection between LANs that use different protocols at the physical and data link layers is called:
- a. transparent bridge
 - b. learning bridge
 - c. source route bridge
 - d. translating bridge
 - e. SRT bridge
6. The bridge that links FDDI networks to networks using different protocols is called:
- a. transparent bridge
 - b. learning bridge
 - c. source route bridge
 - d. translating bridge
 - e. SRT bridge
7. Source-route bridges use what process to determine the path of a frame?
- a. Spanning Tree algorithm
 - b. Address Resolution Protocol
 - c. Route Discovery
 - d. Encapsulation
8. Bridges operate at what level of the OSI model?
- a. Physical layer

- b. Network layer
 - c. Data link layer
 - d. Application layer
 - e. Transport layer
9. As a discovery frame travels from ring to ring and crosses bridges, it records the path in the:
- a. Routing table
 - b. Routing information field
 - c. MAC frame
 - d. Logical network address
10. Which of the following is responsible for determining the path that a SRB frame will use in order to reach a destination?
- a. Source route bridge
 - b. destination station
 - c. source station
 - d. repeater

Part B

Diagram each of the following types of bridges, including descriptive labels.

1. Transparent Learning Bridge
2. Source Route Bridge
3. Translating Bridge
3. Translating Bridge
4. SRT Bridge

Part C

1. Diagram how the Spanning Tree algorithm functions to create a loop-free bridge topology. Include in your diagram descriptive labels.

2. Write an explanation of your Spanning Tree diagram.

Part D

Indicate each statement as either True (T) or False (F).

1.	All bridges use routing tables to select a path to a workstation.
2.	Bridges do not assign priority to the packets they transmit.
3.	The number of interconnected bridges is limited.
4.	Bridges break large packets into smaller segments to allow forwarding of the packet.
5.	Bridges provide error messages when there is a problem in the network.
6.	Transparent bridges use only a subset of the network topology.
7.	All packets are examined and treated differently when forwarded.
8.	Destination workstations maintain routing tables in source route bridging.
9.	The routing tables in source route bridging must be rebuild each time the system is shut down.
10.	The size of a network using bridges is unlimited.

Unit 3: Lesson 3-1: Network Layer Addressing

Part A

1. IP addresses are specified by a

- a. 28-bit number
 - b. subnet mask
 - c. 32-bit number
 - d. single octet
 - e. 8 octets
2. Which of the following is a valid IP address for a workstation?
- a. 204.141.255.0
 - b. 255.0.0.0
 - c. 140.235.10.4
 - d. 200.204.255.255
 - e. 0.0.0.0
3. Every computer that is connected to the Internet has
- a. The same IP address
 - b. At least 3 IP addresses
 - c. The same IP address as the main router on its local network
 - d. A unique IP address
 - e. A unique AppleTalk ID
4. Some portion of the left of an IP address indicates
- a. The workstation address within a network
 - b. The number of computers in the local network
 - c. The size of the network
 - d. The address of the network

Part B

1. A class A IP address has
 - a. 24 bits available for local addresses
 - b. 64 bits available for local addresses
 - c. 8 bits available for local addresses
 - d. 24 bits fixed for the network address

2. A class B address has
 - a. 24 bits available for local addresses
 - b. 16 bits fixed for the network address
 - c. 8 bits available for local addresses
 - d. 8 bits fixed for the network address

3. A class C address has
 - a. 8 bits fixed for the network address
 - b. 16 bits fixed for the network address
 - c. 24 bits available for the local addresses
 - d. 8 bits available for local addresses

Part C

1. Convert 220.131.45.7 into binary notation

2. Convert 11010101 11100010 00010111 00000010 to dotted decimal notation

Part D

1. Subnet the class B network 222.131.0.0 into 8 subnets

Part E

1. What are the host address ranges and subnet masks for each subnet in a class C network (200.110.100.0) that has been subnetted into 16 equal subnets?

Part F

1. Class-based IP addressing
 - a. Provides flexible network sizes
 - b. Only offers three sizes of network address spaces
 - c. Uses a variable length mask for each domain
 - d. Controls the suffix of each network's domain name
2. Classless Internet Domain Routing (CIDR) allows
 - a. Domains to choose one of three network sizes
 - b. Domains to have several names
 - c. Domains to have an address mask length appropriate to the desired network size
 - d. Have more than four octets in their dotted decimal address

Unit 3: Lesson 3-2: Routing

Part A

1. Describe the three basic operations a router performs on an IP packet.

Part B

1. Put the following steps in the IP routing sequence into order

- a. Receive frame
 - b. Check destination IP address against routing table
 - c. Switch packet to correct port
 - d. Put packet into frame
 - e. Unpack frame
 - f. Check MAC address
2. What does a router do with a packet when it can't find the destination address in its router table?
- a. Discard it
 - b. Send it to the default route
 - c. Store it until it's told the route
 - d. Send it to a static route
 - e. a or b
 - f. c or d

Part C

1. Describe the components of a Nortel Networks routing table.

Part D

1. Explain one advantage and one disadvantage to static routing.
2. Describe the difference between a dynamic and a static routing table.

Unit 4: Lesson 4-1: Address Resolution Protocol

Part A

1. Diagram how ARP creates an ARP Table. Summarize the steps.

Part B

1. Describe Gratuitous ARP and the primary reason this form of ARP is so important. Include an example in your description.

Part C

1. Describe Proxy ARP and the primary reason this form of ARP is so important. Include an example in your description.

Unit 5: Lesson 5-1: Routing Information Protocol

Part A

Number the steps of the Bellman-Ford algorithm in order of occurrence.

Step Numbers	Step Descriptions
	Find a row in the local routing table with the same destination.
	Add 1 to the distance field in the neighbor's row.
	If the neighbor's distance is less than the local distance replace the local row with the neighbor's row and record the neighbor who sent the information as the next hop. Go on to the next row.
	If no such row exists, add the neighbor's row and record the neighbor who sent the information as the next hop.
	If the neighbor's distance is greater or equal to the local distance, ignore it, and go to the next row.
	Get the next row from the table sent by the neighbor's router.
	If the row exists, compare the distance in the corresponding row in the local table to the distance from the row in the neighbor's table.

Part B

1. Diagram the count to infinity problem and write a short explanation of your diagram and how RIP solves the problem.

Part C

1. Describe how split horizon resolves the counting to infinity problem. Include a brief example in your description.
-

Unit 5: Lesson 5-2: Open Shortest Path First Protocol

Part A

Compare the basic features of distance-vector and link-state routing protocols.

Part B

1. Diagram the three OSPF phases in building a link-state routing table.

Part C

1. Describe the advantages of link-state routing.
-

Unit 5: Lesson 5-3: Border Gateway Protocol

Part A

1. Describe the Border Gateway Protocol and identify what types of networks use this protocol.

Part B

1. Diagram a BGP internetwork, including labels.

Part C

Define each of the terms.

Terms		Definitions
1.	Inter-autonomous Routing	
2.	Intra-autonomous Routing	
3.	Pass –Through Routing	

Part D

1. Compare the Border Gateway and Routing Information Protocols.

Unit 6: Lesson 6-1: Simple Network Management Protocol

Part A

1. Describe the Simple Network Management Protocol.
2. List five management areas defined by the ISO for which SNMP was developed to monitor and manage.

Part B

Match the definition with its SNMP component.

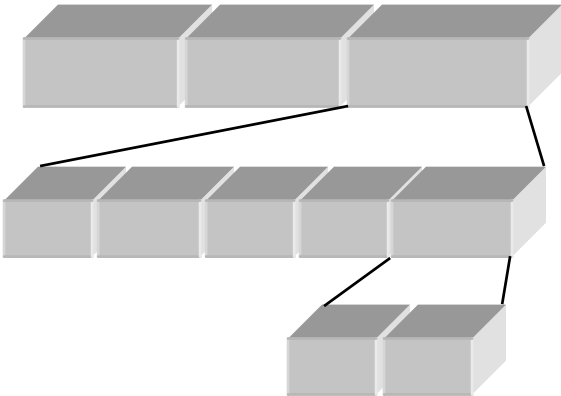
Componentd		Definitiond
1. _____ MIB	A.	A dedicated workstation that can configure and monitor and management network devices using SNMP.
2. _____ Agent	B.	The database of network performance information.
3. _____ NMS	C.	The network device that is being monitored and managed.
4. _____ Community	D.	An organized management group with the same name. Often thought of as a password used for security.

Define the purpose of each of the SNMP commands. Identify which are read-only and which are write commands.

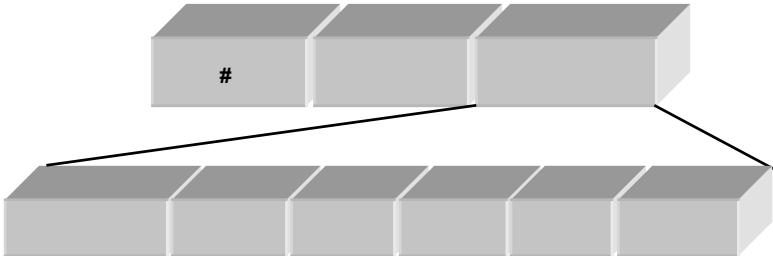
1. GetRequest-
2. GetResponse-
3. GetnextRequest-
4. Trap-
5. SetRequest-

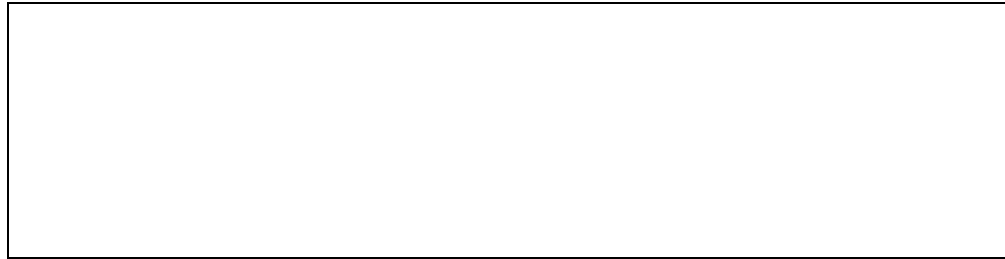
Part C

- 1. Identify the message format and label each section.
- 2. Define the purpose of each section.
 - a. Name of the message format:SNMP PDU



- 3. Identify the message format and label each section.
- 4. Define the purpose of each section.
 - a. Name of the message format: Trap PDU





Unit 6: Lesson 6-2: Management Information Base

Part A

1. Describe MIB structure and the name representation used to identify each object within the MIB.

Part B

1. Diagram the MIB represented by the dotted notation 1.3.6.1.4.1.18. Include in your diagram the object identifier namespace.

Part C

Place an X in the box next to an object group that is part of the top layer of the Nortel Networks MIB. Write a short definition for each of your choices.

MIB Objects		Definitions
1.	wfLine	
2.	wfHwModRev	
3.		
4.	wfHardwareConfig	
5.	wfEnterprise	
6.	wfSystem	
7.	wfApplication	
8.	wfHwSlot	
9.	wfSwSeries5	
10.	wfSoftwareConfig	

Unit 6: Lesson 6-3: Events and Traps

Part A

1. Define the meaning of the words “event” and “trap” in networking.
2. Define the term “trap-directed polling.” Include with your definition a diagram illustrating the term.

Part B

Place an “X” next to the generic traps. Write description of the event for each trap.

	Trap Names	Event Descriptions
1.	linkDown	
2.	enterprise Specific	
3.	authentication Failure	
4.	coldStart	
5.	warmStart	
6.	linkUp	
7.	egpNeighborloss	

Part C

1. Write a short essay identifying the types of events that a network manager would want trapped by SNMP to improve the network’s performance. Include a discussion as to how setting thresholds might improve monitoring.

Unit 7: Lesson 7-1: NetWare and AppleTalk Protocols

Part A

1. Diagram the relationship of the NetWare protocols to the OSI model.

Part B

1. Summarize the differences between the NetWare protocols, IPX RIP

Part C

1. Diagram the relationship of the AppleTalk protocols to the OSI model.

Part D

1. Diagram how an AppleTalk node acquires its network address.
2. Summarize the diagram in question #1 (Part D).

Part E

1. Describe AARP.
2. Describe RTMP.

Unit 8: Lesson 8-1: Switching

Part A

Indicate each statement as either True (T) or False (F).

1.	Switches are internetworking devices.
2.	Switches are passive devices that make no intelligent decisions.
3.	Cut-through switching performs error checking.

4.	Symmetric switches connect networks using the same bandwidth.
5.	Switches support full-duplex transmissions.
6.	Layer 2 switches build network layer address tables.
7.	Simultaneous transmissions are not supported by switches.
8.	Layer 2 switches refer to MAC address tables to forward packets across a network.
9.	Store and Forward switching discards erroneous frames.
10.	Asymmetric switches connect networks using different bandwidth.

Part B

1. Describe how Layer 3 switches have combined the roles of traditional switching (Layer 2) and routing.

Part C

Indicate each statement as either True (T) or False (F).

1.	Layer 3 switches simplify network design.
2.	Layer 3 increases the need to add more switches and servers to a network.
3.	Layer 3 switches are nothing more than routers.
4.	New protocols are needed to use layer 3 switches
5.	Layer 3 switches can operate either as a traditional switch or as a router.
6.	Layer 3 switches build network layer address tables.
7.	Simultaneous transmissions are not supported by layer 3 switches.
8.	Layer 3 switches refer only to MAC address tables to forward packets across a network.
9.	Layer 3 switches increase the quality of service by providing priority queuing.
10.	Layer 3 switches use both RIP and OSPF.