

EXAM IN NETWORKS 3

ANSWERS

Name :

Group :

Questions of understanding (7.5 points, -0.25 for the wrong answer): Choose the correct answer(s):

1. VLAN segmentation involves:

- Combining multiple networks into one Physically separating network devices
 Dividing a single physical network into multiple logical networks

2. What is the purpose of VLAN trunking?

- To encrypt VLAN data **To carry traffic for multiple VLANs over a single link.**
 To connect VLANs across different physical locations

3. When a router receives a packet, what information does it check in order to forward the packet to a remote destination?

- IP@ source Mac@ destination **IP@ destination** Mac@ Source

4. We use dynamic routing to :

- Update automatically the routing table**
 determine the best path to a destination in large topologies determine the best path to a destination in small topologies
 share dynamically information between routers
 all answers are correct

5. We use an algorithm in dynamic routing to :

- Determine the best path determination**
 discover neighbors and exchange the routing information
 specify the preference of a particular route

6. The metric used by routing protocols can be:

- Bandwidth** **Cost** **Delay** **Hop count** None of the answers are true

7. An autonomous system AS is:

- Group of routers managed by a single organization using a common routing policy**
 A public IP address A router operating without human intervention

8. Which of the following statements describe the RIP protocol?

- The maximum distance (number of jumps) is 15** **From 16 routers the packet is lost.**
 The maximum distance (number of jumps) is 255 **Update routing table every 30 seconds**
 Update routing table every 90 RIP is a link-state routing protocol

9. Which type of routing protocol typically exchanges routing information between routers within the same autonomous system (AS)?

- Interior Gateway Protocol (IGP)** Exterior Gateway Protocol (EGP)
 Border Gateway Protocol (BGP) Static Routing Protocol

10. What is the purpose of the Internet Assigned Numbers Authority (IANA) with respect to Autonomous Systems?

- To assign IP addresses to Autonomous Systems
 To regulate the use of routing protocols within Autonomous Systems

- To manage routing policies between Autonomous Systems
- To allocate Autonomous System Numbers (ASNs)**

Exercise 01 (5 points): Use the following information to answer:

Interface	IP of A	Interface	IP of B
Eth0	156.35.12.100	Eth0	203.178.79.78
Interface	IP of C	Interface	IP of D
Eth0	156.35.124.40	Eth0	38.146.213.179
Eth1	38.19.76.129	Eth1	213.39.16.151
Interface	IP of E	Interface	IP of F
Eth0	213.39.16.124	Eth0	14.250.37.65
Eth1	14.241.241.168	Eth1	203.178.79.148

1. For each network, indicate its network address and default mask (classful - addressing).

Net1: 156.35.0.0 /16

Net2: 38.0.0.0/8

Net3: 14.0.0.0/8

Net4: 213.39.16.0/24

Net5: 203.178.79.0/24



2. How many networks are there in the topology?

There are 5 networks in the topology

3. Give the routing table of node C.

Network destination/mask	Next Hop	Outgoing Interface
156.35.0.0 /16	Direct	Eth0 (C)
38.0.0.0/8	Direct	Eth1(C)
14.0.0.0/8	Eth0 (D)	Eth1(C)
213.39.16.0/24	Eth0 (D)	Eth1(C)
203.178.79.0/24	Eth0 (D)	Eth1(C)

Using the default route, the routing table becomes:

Network destination/mask	Next Hop	Outgoing Interface
156.35.0.0 /16	Direct	Eth0 (C)

38.0.0.0/8	Direct	Eth1(C)
0.0.0.0/0.0.0.0	Eth0 (D)	Eth1(C)

4. Device A sends a datagram to device B. Describe the successive steps of the routing process.

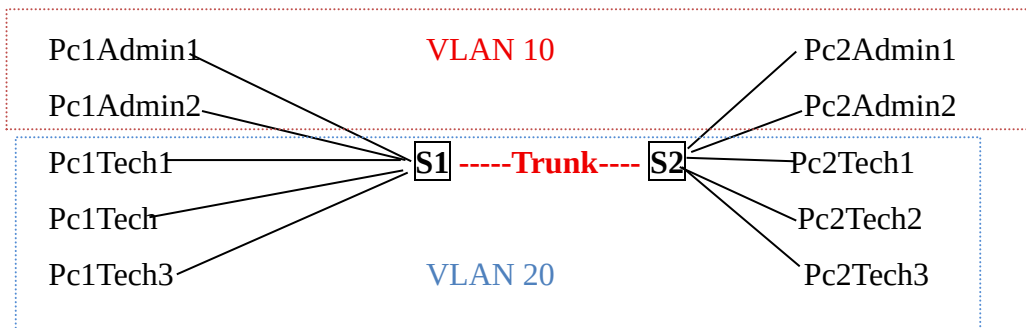
1. A looks for B (203.178.79.78) in its routing table: as B is not in the same network as A, it routes to its 1st hop gateway, C
2. C searches for B (203.178.79.78) in its routing table: the network correspondant to B may be reached via the default route / or / line 4 in its routing table. C routes to Eth0 (D), via its right interface
3. D searches for B (203.178.79.78) in its routing table: the network correspondant to B may be reached via Eth0 (E). D routes to Eth0 (E), via its right interface
4. E searches for B (203.178.79.78) in its routing table: the network correspondant to B may be reached via Eth0 (F). E routes to Eth0 (F), via its right interface
5. F searches for B (192.168.3.33) in its routing table: the network corresponding to B is directly connected so, F routes the packet to B.

5. Specify clearly which entry in the routing table is used at each decision point.

C	D	E	F
ETH0(D)	ETH0 (E)	ETH0 (F)	DIRECT

Exercise 02 (4 points): A company network contains two switches (S1 and S2) connected together. Each switch connects: 2 Administration PCs and 3 Technical PCs

1. Draw the network topology before using VLANs.



2. Propose a VLAN-based organization of the network.

Department	VLAN Name	VLAN ID
Administration	VLAN_ADMIN	10
Technical	VLAN_TECH	20

3. On the same diagram, label the VLANs, and indicate the type of link between S1 and S2.

The inter-switch link is labeled **TRUNK**

4. Why must the link between the two switches be of a special type?

- Multiple VLANs share the same physical link
- Access links support only one VLAN

5. Explain the role of a trunk link.

- Transports traffic from multiple VLANs
- Uses VLAN tagging (IEEE 802.1Q)
- Preserves VLAN separation between switches

6. Can Administration PCs communicate with each other if they are connected to different switches? Why?

Yes, communication is possible because we have the same VLAN (VLAN 10), even across different switches and the trunk link ensures VLAN continuity

Exercise 03 (3 points): complete the table below:

Protocol	RIP
Abbreviation of	R: Routing , I: Information P: Protocol
Administrative Distance	120
maximum routers in the network.	15
metric	Hop Count
Algorithm	RIP works on Bellman Ford algorithm.
Protocol type	Distance OR IGP vector