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| Networking Infrastructure Diploma in CSF / IT  Year 2 (2020/21) Semester 3 | Week 7 |
| Tutorial |
| Virtual Local Area Networks (VLAN) | |

**OBJECTIVES**

After completing this session, you should have a better understanding of VLAN, its membership criteria as well as advantages and disadvantages.

**Part A**

1) What is the term used when a device is connected to a switch port, the VLAN membership is automatically assigned to the device?

A. Dynamic

B. Static

C. Port-centric

D. Default

2) Frame tagging places a unique identifier in the header of each frame as it is forwarded across the network \_\_\_\_\_\_\_\_\_\_.

A. microsegment

B. LAN

C. backbone

D. WAN

3) Frame tagging functions at what OSI layer?

A. 2 B. 3 C. 1 D. 4

4) The smaller the VLAN, the smaller the number of users that are affected by which of the following?

A. Packet filtering

B. Switch latency

C. Framing

D. Broadcasts

5) A VLAN makes up a switched network that is logically segmented by all of the following EXCEPT :

A. Collison domains

B. Functions

C. Applications

D. Project teams

6) Dynamic VLANs can be based on which of the following?

A. MAC addresses

B. Protocol type

C. Logical addressing

D. All of the above

7) How can access be controlled on a secured VLAN?

A. Station address

B. Protocol types

C. Application types

D. All of the above

8) When logically segmenting your network with VLANs, what type of device do you need to ensure proper communication between the VLANs that are created?

A. Switch

B. Bridge

C. Hub

D. Router

**Part B**

1. If Switch 2 in Figure 1 fails completely, the VLANs in Switch 1 and Switch 3 would be isolated. Explain how this problem could be overcome and what requirement would be needed of the switches.

**Figure 1 – VLAN Network**

Switch 1

Switch 2

Switch 3

Router

This problem can be solved by using a ring topology where router is connect to switch 1 than 1 connect to 2, 2 connect to 3 and 3 connect back to the router. All it need is an extra rj45 cable which is cheap. The switches must also need to support VLAN trunk.

2. InfoTech is an IT school located in a building in Anson Road. The offices of the teaching staff of the school are located on three different floors of the building.

The school groups teaching staff in different subnets based on the subjects they teach. However, the subject taught by a staff could be changed every semester.

Give a few reasons for recommending the school to make use of VLAN.

What could be a disadvantage of implementing VLAN?

With VLAN, it can speed up the need work as broadcast packet is limited to the VLAN network only, which reduce the bandwidth needed to send to all pc the whole network. This also increase the network security as admin can set which nodes can communicate with each other.

But admin need to do more job to setup this VLAN, as the admin will need to assign every user or port of the switch using MAC address, Protocol type or Application type to a VLAN first in the network.

3. List some criteria in which membership in a VLAN could be based on.

VLAN membership can be base on user function, department or application in use

1. When VLANs are spread across multiple physical switches, how can the VLAN membership of a device be passed on from one switch to another via the trunk?

The VLAN membership is pass with frame tagging, where a VLAN ID is assign to each frame before it is forwarded to the trunk

1. Explain how devices in one VLAN could communicate with another device in a different VLAN.

To allow device from one VLAN to communicate with another on different VLAN, a router is needed