

MODULES 2, 3 Review (on Reused Paper!)

MODULE 2 – SWITCHING CONCEPTS (logical answers or multiple choice!)

1. **MAC table:** Contains MAC address-to-Port associations

2. **Switch Operation:**

- Switches make decisions based on frame source and destination MAC addresses.
- Create/Update MAC-address table based on frame source MAC addresses.
- Forward traffic based on frame destination MAC addresses. **See Activity 2.1.8 !!!**

3. **Forwarding Methods – Just recognize the difference!**

- a. **Store-and-Forward:** Forward traffic after reading entire frame – best for interference environments
- b. **Cut-through:** Forward traffic after reading the frame header – faster but wastes BW w/ err-frames

4. **Collision Domains:**

Switches allow full-duplex operation, eliminating collisions - each interface has its own collision domain

5. **Broadcast Domains: Layer-2** All devices on a LAN. Use *routers* to divide networks to smaller broadcast domains – avoids heavy network traffic due to broadcasts

6. **Alleviate (undo) Network Congestion:**

- Fast port speeds
- **Fast internal switching - shared memory** (instead of each port keeps its own memory)
- Large frame buffers
- High port density (more ports per switch, reduce the number of switches, keeps traffic local)

MODULE 3 – VLANS

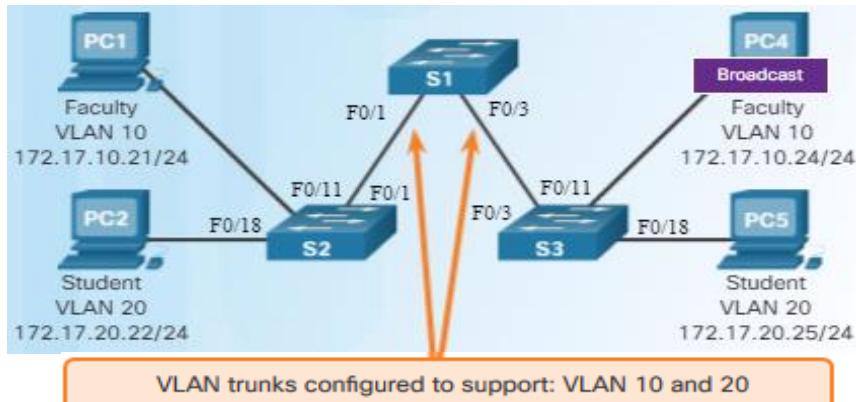
1. **Types of VLANs:** Data (access), Default (VLAN1), Management, Native

2. **Normal Range of VLANs:** 1 – 1005 (Just recognize!!)

3. **Default VLAN => VLAN1** – Cannot be deleted. ALL (switch)ports assigned to it by default.

7. **Native VLAN => For untagged traffic (legacy LANs).** It is assigned to an **IEEE802.1Q** Trunk Port so that any Untagged traffic on this port (802.1Q – which also carries “normal VLAN” traffic) to be directed to the Native VLAN.

8. In the figure below, VLAN trunks on both F0/1 (S1) and F0/3 (S1) support (allow) BOTH VLANs (10 and 20). This allows VLAN traffic from each VLAN to cross over S1 from S2 to S3 & vice versa.



This means that, in the figure above, PC1 on S1 (VLAN 10) can communicate with PC4 on S2 (VLAN 10), while PC2 on S1 (VLAN 20) can communicate with PC5 on S2 (VLAN 20)

9. The **Tag field** in the Ethernet Frame header contains **information about which VLAN the frame belongs to.** => **VLAN ID subfield.**

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10. Where is the IEEE 802.1Q tag inserted in the MAC frame? (AFTER the Address fields!!)

11. NORMAL VLAN configurations stored in the **vlan.dat** file, in flash memory.

The **show vlan brief** command displays the contents of the **vlan.dat** file.

12. Create a VLAN: (a) assign it a VLAN id and (b) give it a name (see figure below, to the left).

```
S1 (config)# vlan 20  
S1 (config-vlan)# name student
```

```
S1 (config)# interface F0/18  
S1 (config-if)# switchport mode access  
S1 (config-if)# switchport access vlan 20
```

13. Assign an interface to a VLAN:

Use the **switchport mode access** and **switchport access vlan <vlan-id>** commands, in the interface command mode (see figure above, to the right).

NOTE1: An interface (port) can ONLY belong to a SINGLE VLAN, EXCEPT in the case where it can also belong to a VOICE VLAN. (Multiple choice!)

NOTE2: When you remove VLAN assignment from a port (**no switchport access vlan N**) the port returns to the default VLAN (usually VLAN1).

14. To delete a VLAN: Issue the command: **no vlan <VLAN-ID>**

NOTE: Better RELEASE ALL ports assigned to that VLAN....

Interface *int-num*, then: **no switchport access vlan VLAN-D**

...otherwise these ports will become UNUSED until you assign them to another VLAN.

Need to perform shutdown, THEN no shutdown (!)

15. The command **switchport trunk allowed vlan 10, 20, 30, 40, 50, 99** allows all the VLAN IDs listed to send data over the trunk. A trunk needs to be configured for an INTERFACE, in the interface command mode, (config-if), with the command: **switchport mode trunk**

RECOGNIZE command **show interfaces trunk** => Reveals common trunking problems.

16. A common *trunking* problem is **Native VLAN mismatch** at the trunk "ends".

17. What is the effect of this sequence of commands??

- | | |
|--|--|
| 1. switchport trunk allowed vlan 50, 20, 70 | 3. switchport trunk allowed vlan 60, 10 |
| 2. switchport trunk allowed vlan 30, 80 | 4. switchport trunk allowed vlan 40, 99 |

18. DYNAMIC TRUNKING – BASICS ONLY

RECOGNIZE WHEN there is a TRUNK creation... (See Table in section 3.5.3)

????	Switch 1 Port	Switch 2 Port	Link State
	Trunk	Trunk	Trunk
	Trunk	Dynamic auto	Trunk
	Trunk	Dynamic desirable	Trunk
ENAAAΞ: Dynamic auto/desirable	Dynamic desirable/auto	Dynamic desirable	Trunk
	Dynamic auto	Dynamic auto	Access
	Dynamic desirable	Dynamic desirable	Trunk
ENAAAΞ: Access/Anything	Anything/Access	Access (or Limited connectivity with trunk)	