Sri Lanka Institute of Information Technology

Computer Networks
2nd Year, 1st Semester

Tutorial 6

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1. Show how you can go to the global configuration mode of the switch from the user EXEC mode.
    - enable
    - configure terminal

2. Why a switch needs an IP address?
    - A switch needs an IP address primarily for management purposes – to uniquely identify it in the network and allow remote access for configuration, monitoring, and troubleshooting.

3. What is the command to examine the addresses that a switch has learned?
    - show mac-address-table

4. What can the 'port security' feature do?
    - Port security provides an additional layer of control over network access by restricting which devices can connect to specific switch ports based on their MAC addresses, thereby helping to prevent unauthorized access and mitigate security risks.
        - Specify a maximum number of MAC addresses that are allowed to connect to a particular switch port.
        - Define actions to take when a security violation occurs, such as shutting down the port, generating an alert, or simply logging the event.

5. Out of these devices what is more likely to act as a multi-port bridge?
    - Router
    - Switch
    - Hub
    - Repeater
    - Transceiver

6. Explain the Frame Transmission Modes. What is the fastest mode? What is the most accurate?

Switching Method	Description
Store-and-forward	The switch fully receives all bits in the frame (store) before forwarding the frame (forward). This allows the switch to check the FCS before forwarding the frame.
Cut-through	The switch forwards the frame as soon as it can. This reduces latency but does not allow the switch to discard frames that fail the FCS check.
Fragment-free	The switch forwards the frame after receiving the first 64 bytes of the frame, thereby avoiding forwarding frames that were errored due to a collision.

- Fastest mode → Cut-through
- Most accurate mode → Store-and-forward

7. Briefly describe the functions of switches.

- MAC address learning - Switches learn the MAC addresses of devices connected to their ports by examining the source MAC address of incoming frames. They maintain a table, known as the MAC address table or CAM table, which maps MAC addresses to the corresponding switch ports. This learning process allows switches to make forwarding decisions based on MAC addresses.
- Forwarding / filtering decisions - Switches use their MAC address tables to filter and forward frames only to the ports where the destination devices are located. This helps reduce unnecessary network traffic and improves network efficiency.
- Loop avoidance – uses Spanning Tree Protocol

8. State 5 factors to be considered when purchasing switches.
   - Cost
   - Port density
   - Power
   - Reliability
   - Port speed
   - Scalability

9. Describe about Stackable Configuration Switches.

- Stackable configuration switches are network switches designed to be interconnected and operated as a single, unified system, known as a stack. This stacking capability allows multiple switches to function as a single logical unit, providing several benefits in terms of management, scalability, and performance.

10. State the best practices of applying security for switches.

- Setting passwords
- Enabling physical security
- Configure port security by
    a. Disabling unused ports
    b. Enabling port security
    c. Maximum number of devices
    d. Address violation