SUPERIOR UNIVERSITY

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Subject: Computer Networks Lab

Lab 11

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Section: 5D

Task 1:

What is "DHCP, VLAN & DNS", explain with Example (draw structure in cisco)

DHCP:

VLAN:

DNS:

1. DHCP (Dynamic Host Configuration Protocol)

Explanation

DHCP automatically assigns IP addresses and network configuration (subnet mask, default gateway, DNS server) to devices in a network. This eliminates the need for manual IP configuration.

Example in a Network

- A DHCP server assigns IP addresses from a pool (e.g., 192.168.1.100-192.168.1.200) to devices like PCs, phones, or printers.

Steps to Configure DHCP in Cisco Packet Tracer

1. Add a **Router** or a **Dedicated DHCP Server**.

2. Configure the router as a DHCP server or connect to a separate DHCP server.

3. Define the IP address pool.

Configuration Example (On Router)

ip dhcp pool LAN

 network 192.168.1.0 255.255.255.0

 default-router 192.168.1.1

 dns-server 8.8.8.8

2. VLAN (Virtual Local Area Network)

Explanation

A VLAN logically segments a network into smaller, isolated parts to improve performance and security. Devices in one VLAN cannot communicate with devices in another VLAN without a router.

Example in a Network

- VLAN 10 for **HR Department** (192.168.10.0/24)

- VLAN 20 for **IT Department** (192.168.20.0/24)

Steps to Configure VLAN in Cisco Packet Tracer

1. Add a **Switch** and configure VLANs.

2. Assign switch ports to specific VLANs.

3. Add a **Router or Layer-3 Switch** for inter-VLAN routing.

Configuration Example (On Switch)

vlan 10

 name HR

vlan 20

 name IT

interface FastEthernet 0/1

 switchport mode access

 switchport access vlan 10

interface FastEthernet 0/2

 switchport mode access

switchport access vlan 20

Configuration Example (On Router or Layer-3 Switch for Routing)

interface GigabitEthernet 0/0.10

 encapsulation dot1Q 10

 ip address 192.168.10.1 255.255.255.0

interface GigabitEthernet 0/0.20

 encapsulation dot1Q 20

 ip address 192.168.20.1 255.255.255.0

3. DNS (Domain Name System)

Explanation

DNS resolves domain names (e.g., www.example.com) to IP addresses (e.g., 192.168.1.100), allowing users to access websites or services using friendly names.

Example in a Network

- A DNS server resolves www.company.com to its IP address (192.168.10.100).

Steps to Configure DNS in Cisco Packet Tracer

1. Add a **DNS Server**.

2. Configure the server with domain names and corresponding IPs.

3. Ensure devices use the DNS server IP for name resolution.

Configuration Example (On DNS Server)

- On the DNS server in Packet Tracer, add entries:

    o **Name**: www.company.com

- **Address**: 192.168.10.100

PC Configuration

- Configure the PC to use the DNS server (192.168.10.1) in its network settings.