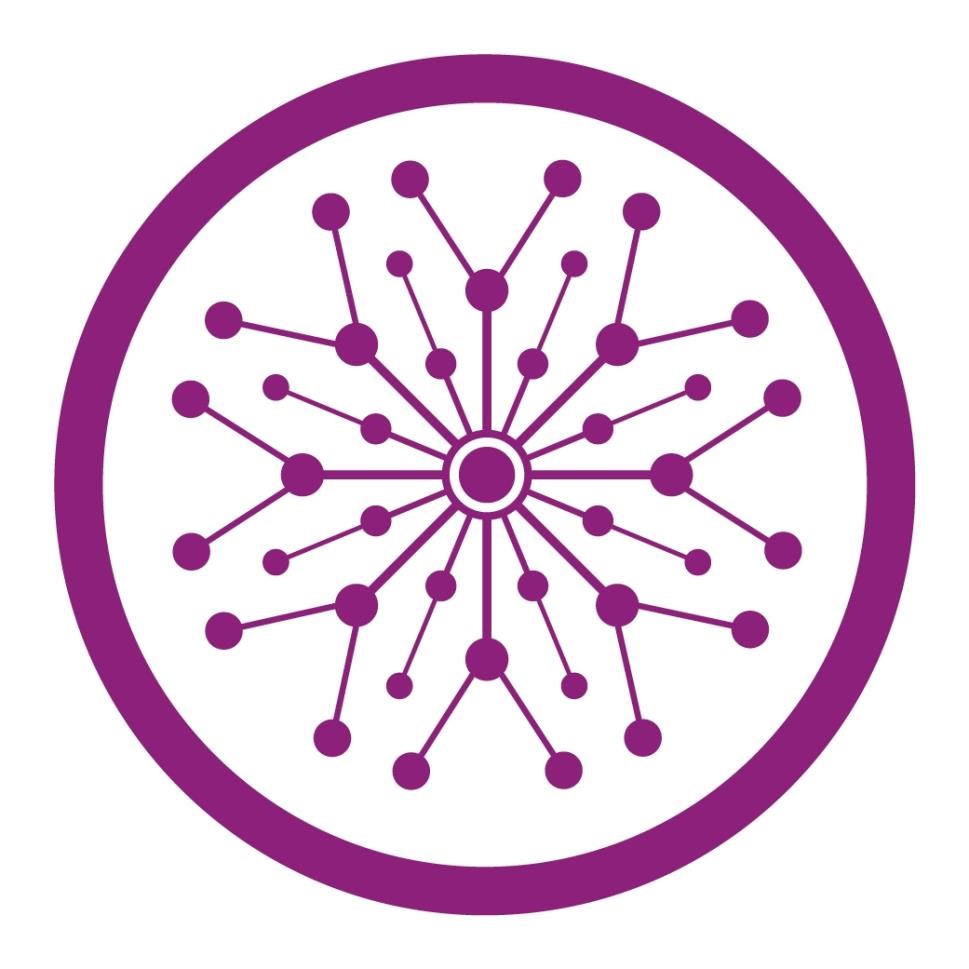
**Task-14**

**Computer Networks (Lab)**



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**Section:** SE-5B

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**DEPARTMENT OF SOFTWARE ENGINEERING**

## Network Configuration Documentation

### Project Title: Three-Floor Building Network with VLAN Segmentation and Inter-VLAN Routing

### Objective

To create a secure and efficient network infrastructure for a three-floor building, segmenting the network into VLANs to isolate traffic and improve security.

### Network Topology

[Insert a diagram of the network topology, including devices, connections, and VLAN assignments]

### Device Configuration

#### Router 1 Configuration

**Interface Configuration:**

* Configure serial interfaces for router-to-router connections.
* Configure Gigabit Ethernet interface as a trunk port to connect to the switch.
* Create sub-interfaces on the Gigabit Ethernet interface for each VLAN.
* Assign IP addresses to each sub-interface.

**VLAN Configuration:**

* Create VLANs for each floor and department.
* Assign VLANs to the appropriate sub-interfaces.

**DHCP Server Configuration:**

* Create DHCP pools for each VLAN.
* Configure DHCP options, including IP address range, default gateway, and DNS server.

#### Switch Configuration

**Port Configuration:**

* Configure ports connected to devices in the same VLAN as access ports.
* Configure the port connecting to the router as a trunk port.

**VLAN Configuration:**

* Create VLANs for each floor and department.
* Assign VLANs to the appropriate ports.

### Verification

* Verify the VLAN configuration on the switch and router.
* Verify the IP addressing and routing between VLANs.
* Verify DHCP server configuration and client IP address assignment.
* Test connectivity between devices in different VLANs.

### Security Considerations

* **VLAN Segmentation:** Isolates traffic between different departments and floors, reducing the risk of unauthorized access.
* **Strong Password Policies:** Implement strong password policies for all devices.
* **Firewall Configuration:** Configure firewalls to restrict traffic between VLANs as needed.
* **Regular Security Audits:** Conduct regular security audits to identify and address vulnerabilities.

### Future Considerations

* **Quality of Service (QoS):** Implement QoS to prioritize critical traffic.
* **Network Monitoring:** Deploy network monitoring tools to monitor network performance and identify potential issues.
* **Network Redundancy:** Consider adding redundancy to critical network components to improve reliability.

By following these guidelines and the configuration provided, you can effectively implement a secure and efficient network infrastructure for your three-floor building.

**Code**

**ROUTER NO 1 : COMMANDS**

**Router>en**

**Router#config t**

**Enter configuration commands, one per line. End with CNTL/Z.**

**Router(config)#int se0/2/0 router to router**

**Router(config-if)#no shut**

**%LINK-5-CHANGED: Interface Serial0/2/0, changed state to down**

**Router(config-if)#int gig0/0 for witch enable**

**Router(config-if)#no shutdown**

**Router(config-if)#**

**%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up**

**Router(config-if)#int se0/2/0**

**Router(config-if)#clock rat**

**% Incomplete command.**

**Router(config-if)#clock rate**

**% Incomplete command.**

**Router(config-if)#clock rate 64000**

**Router(config-if)#int se0/2/1**

**Router(config-if)#no shutdown**

**%LINK-5-CHANGED: Interface Serial0/2/1, changed state to down**

**Router(config-if)#int se0/2/1**

**Router(config-if)#clo**

**% Incomplete command.**

**Router(config-if)#clock rate 64000**

**Router(config-if)#do wr**

**Building configuration...**

**[OK]**

**Router(config-if)#**

**ASSIGNING VLAN OF RECEPTION , STORE OR LOGISTICS (FIRST FLOOR)**

**Switch>**

**Switch>en**

**Switch#]config t**

**^**

**% Invalid input detected at '^' marker.**

**Switch#config ter**

**Enter configuration commands, one per line. End with CNTL/Z.**

**Switch(config)#int range fa0/2-3**

**Switch(config-if-range)#switchport mode access**

**Switch(config-if-range)#switchport access vlan 80**

**% Access VLAN does not exist. Creating vlan 80**

**Switch(config-if-range)#int range fa0/4-5**

**Switch(config-if-range)#switchport mode access**

**Switch(config-if-range)#switchport access vlan 70**

**% Access VLAN does not exist. Creating vlan 70**

**Switch(config-if-range)#int range fa0/6-8**

**Switch(config-if-range)#switchport mode access**

**Switch(config-if-range)#switchport access vlan 60**

**% Access VLAN does not exist. Creating vlan 60**

**TO SEND MSG FROM ONE VLAN PORTION TO OTHER PORTION**

**Switch(config-if)#switvhport mode trun**

**^**

**% Invalid input detected at '^' marker.**

**Switch(config-if)#switvhport mode trunk**

**^**

**% Invalid input detected at '^' marker.**

**Switch(config-if)#switchport mode trunk**

**Switch(config-if)#**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up**

**2nd floor VLAN assignening**

**Switch(config)#int range fa0/2-3**

**Switch(config-if-range)#switch mode access**

**Switch(config-if-range)#switchport mode access**

**Switch(config-if-range)#switchport access vlan 50**

**% Access VLAN does not exist. Creating vlan 50**

**Switch(config-if-range)#int range fa0/4-5**

**Switch(config-if-range)#switchport mode access**

**Switch(config-if-range)#switchport access vlan 40**

**% Access VLAN does not exist. Creating vlan 40**

**Switch(config-if-range)#int range fa0/6-8**

**Switch(config-if-range)#switchport access vlan 30**

**% Access VLAN does not exist. Creating vlan 30**

**Switch(config-if-range)#do wr**

**Building configuration...**

**[OK]**

**Switch(config-if-range)#int fa0/1**

**Switch(config-if)#switchport mode trunk**

**Switch(config-if)#**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up**

**Switch(config-if)#do wr**

**Building configuration...**

**[OK]**

**Switch(config-if)#**

**Switch#**

**%SYS-5-CONFIG\_I: Configured from console by console**

**3rd floor VLAN assigning**

**Switch>en**

**Switch#config terminal**

**Enter configuration commands, one per line. End with CNTL/Z.**

**Switch(config)# int range fa0/2-3**

**Switch(config-if-range)#switchport mode access**

**Switch(config-if-range)#switchport access vlan 10**

**% Access VLAN does not exist. Creating vlan 10**

**Switch(config-if-range)# int range fa0/4-6**

**Switch(config-if-range)#switchport mode access**

**Switch(config-if-range)#switchport access vlan 20**

**% Access VLAN does not exist. Creating vlan 20**

**Switch(config-if-range)#do wr**

**Building configuration...**

**[OK]**

**Switch(config-if-range)#int fa0/1**

**Switch(config-if)#switchport mode trunk**

**Switch(config-if)#**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up**

**Switch(config-if)#do wr**

**Building configuration...**

**[OK]**

**IP ASSIGNING FOR 1ST FLOOR (SUBNETTING)**

**Router>en**

**Router#config t**

**Enter configuration commands, one per line. End with CNTL/Z.**

**Router(config)#int se0/2/0**

**Router(config-if)#ip address 10.10.10.5 255.255.255.252**

**Router(config-if)#int se0/2/1**

**Router(config-if)#ip address 10.10.10.9 255.255.255.252**

**Router(config-if)#do wr**

**Building configuration...**

**[OK]**

**Router(config-if)#**

**2nd floor ip assigning**

**Router>EN**

**Router#config t**

**Enter configuration commands, one per line. End with CNTL/Z.**

**Router(config)#int se0/1/0**

**Router(config-if)#ip address 10.10.10.1 255.255.255.252**

**Router(config-if)#int se0/1/1**

**Router(config-if)#ip address 10.10.10.10 255.255.255.252**

**Router(config-if)#do wr**

**Building configuration...**

**[OK]**

**Router(config-if)#**

**3rd floor ip assigning**

**Router>en**

**Router#config terminal**

**Enter configuration commands, one per line. End with CNTL/Z.**

**Router(config)#int se0/1/0**

**%Invalid interface type and number**

**Router(config)#int se0/2/0**

**Router(config-if)#ip address 10.10.10.2 255.255.255.252**

**Router(config-if)#int se0/2/1**

**Router(config-if)#ip address 10.10.10.6 255.255.255.252**

**Router(config-if)#do wr**

**Building configuration...**

**[OK]**

**Router(config-if)#**

**INTER VLAN FOR COMMUNICATION FLOOR 1ST**

**Router>en**

**Router#config t**

**Enter configuration commands, one per line. End with CNTL/Z.**

**Router(config)#int gig0/0.80**

**Router(config-subif)#**

**%LINK-5-CHANGED: Interface GigabitEthernet0/0.80, changed state to up**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.80, changed state to up**

**Router(config-subif)#encapsulation dot1/0 80**

**^**

**% Invalid input detected at '^' marker.**

**Router(config-subif)#encapsulation dot1q 80**

**Router(config-subif)#ip address 192.168.8.1 255.255.255.0**

**Router(config-subif)#ex**

**Router(config)#int gig0/0.70**

**Router(config-subif)#**

**%LINK-5-CHANGED: Interface GigabitEthernet0/0.70, changed state to up**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.70, changed state to up**

**Router(config-subif)#encapsulation dot1q 70**

**Router(config-subif)#ip address 192.168.7.1 255.255.255.0**

**Router(config-subif)#exe**

**^**

**% Invalid input detected at '^' marker.**

**Router(config-subif)#ex**

**Router(config)#int gig0/0.60**

**Router(config-subif)#**

**%LINK-5-CHANGED: Interface GigabitEthernet0/0.60, changed state to up**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.60, changed state to up**

**Router(config-subif)#encapsulation dot1q 60**

**Router(config-subif)#ip address 192.168.6.1 255.255.255.0**

**Router(config-subif)#ex**

**Router(config)#**

**ASSIGNING DHCP TO ROUTER 1 (1ST FLOOR RECEPTION)**

**Router(config)#**

**Router(config)#SERVICE DHCP**

**Router(config)#IP DHCP POOL RECEPTION**

**Router(dhcp-config)#NETWORK 192.168.8.0 255.255.255.0**

**Router(dhcp-config)#DEFAULT-GETWAY 192.168.8.1**

**^**

**% Invalid input detected at '^' marker.**

**Router(dhcp-config)#DEFAULT-ROUTER 192.168.8.1**

**Router(dhcp-config)#DNS-SERVER 192.168.8.1**

**Router(dhcp-config)#EX**

**Router(config)#**

**ASSIGNING DHCP TO ROUTER 1 (1ST FLOOR STORE)**

**Router(config)#SERVICE DHCP**

**Router(config)#IP DHCP POOL STORE**

**Router(dhcp-config)#NETWORK 192.168.7.0 255.255.255.0**

**Router(dhcp-config)#DEFAULT-ROUTER 192.168.7.1**

**Router(dhcp-config)#DNS-SERVER 192.168.7.1**

**Router(dhcp-config)#EX**

**ASSIGNING DHCP TO ROUTER 1 (1ST FLOOR LOGISTIC)**

**Router(config)#SERVICE DHCP**

**Router(config)#IP DHCP POOL LOGISTIC**

**Router(dhcp-config)#NETWORK 192.168.6.0 255.255.255.0**

**Router(dhcp-config)#DEFAULT-ROUTER 192.168.6.1**

**Router(dhcp-config)#DNS-SERVER 192.168.6.1**

**Router(dhcp-config)#EX**

**Router(config)#**

**inter VLAN ROUTER 2 (FLOOR 2)**

**Router>en**

**Router#config t**

**Enter configuration commands, one per line. End with CNTL/Z.**

**Router(config)#int gig0/0.30**

**Router(config-subif)#**

**%LINK-5-CHANGED: Interface GigabitEthernet0/0.30, changed state to up**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.30, changed state to up**

**Router(config-subif)#encapsulation dot1q 30**

**Router(config-subif)#ip address 192.168.3.1 255.255.255.0**

**Router(config-subif)#ex**

**Router(config)#int gig0/0.40**

**Router(config-subif)#**

**%LINK-5-CHANGED: Interface GigabitEthernet0/0.40, changed state to up**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.40, changed state to up**

**Router(config-subif)#encapsulation dot1q 40**

**Router(config-subif)#ip address 192.168.4.1 255.255.255.0**

**Router(config-subif)#ex**

**Router(config)#int gig0/0.50**

**Router(config-subif)#**

**%LINK-5-CHANGED: Interface GigabitEthernet0/0.50, changed state to up**

**%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.50, changed state to up**

**Router(config-subif)#encapsulation dot1q 50**

**Router(config-subif)#ip address 192.168.5.1 255.255.255.0**

**Router(config-subif)#do wr**

**Building configuration...**

**[OK]**

**Router(config-subif)#ex**

**Router(config)#**

**DHCP AT ROUTER FLOOR 2 (SALES)**

**Router(config)#SERVICE DHCP**

**Router(config)#ip dhcp pool sales**

**Router(dhcp-config)#network 192.168.3.0 255.255.255.0**

**Router(dhcp-config)#default-router 192.168.3.1**

**Router(dhcp-config)#dns-server 192.168.3.1**

**Router(dhcp-config)#**

**DHCP AT ROUTER FLOOR 2 (HR)**

**Router(config)#SERVICE DHCP**

**Router(config)#ip dhcp pool HR**

**Router(dhcp-config)#network 192.168.4.0 255.255.255.0**

**Router(dhcp-config)#default-router 192.168.4.1**

**Router(dhcp-config)#dns-server 192.168.4.1**

**Router(dhcp-config)#ex**

**DHCP AT ROUTER FLOOR 2 (FINANCE)**

**Router(config)#SERVICE DHCP**

**Router(config)#ip dhcp pool finance**

**Router(dhcp-config)#network 192.168.5.0 255.255.255.0**

**Router(dhcp-config)#default-router 192.168.5.1**

**Router(dhcp-config)#dns-server 192.168.5.1**

**Router(dhcp-config)#do wr**

**Router(dhcp-config)#ex**

**Router(config)#do wr**

**Building configuration...**

**[OK]**