

ARQUITECTURA DE REDES

AUXILIAR GUIDE

ACCESS AND DISTRIBUTION NETWORKS

Objectives

- VLAN definition
- Inter-VLAN routing
- Usage of L2 and L3 Switches
- Access and distribution network design and interconnection

Access Network (VLAN) Deployment

1. Assemble the depicted network. Configure 3 VLAN at the switches:

- Ports 1-2: VLAN1 (sub-network 10.1.1.0/24)
- Ports 3-4: VLAN2 (sub-network 10.2.2.0/24)
- Ports 5-6: VLAN3 (sub-network 10.3.3.0/24)
- Ports 7-8: Inter-switch/Tagged/802.1Q (native VLAN 1)

Place terminals at the different VLAN and test connectivity.

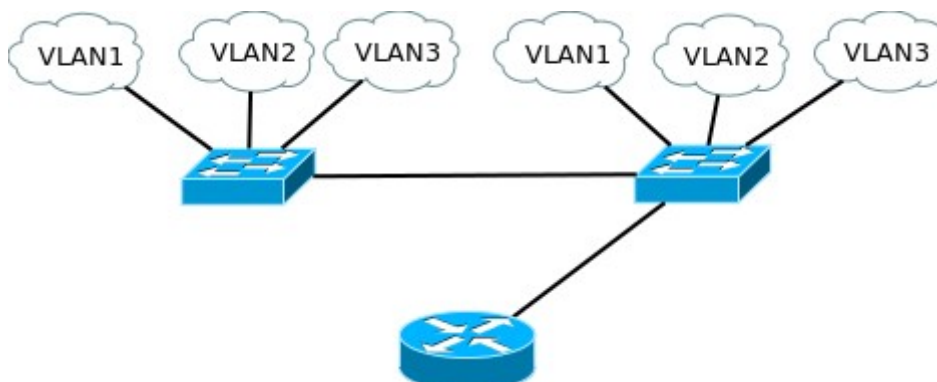


Inter-VLAN Routing with Router

2. Assemble the depicted network by adding a router. Configure the router to support sub-interfaces and Inter-VLAN (802.1Q) routing:

```
Router(config)# interface FastEthernet0/0
Router(config-if)# no shutdown
Router(config-if)# interface FastEthernet0/0.1
Router(config-if)# encapsulation dot1Q 1 native           !VLAN1
Router(config-if)# ip address 10.1.1.1 255.255.255.0
!
Router(config-if)# interface FastEthernet0/0.2
Router(config-if)# encapsulation dot1Q 2                 !VLAN2
Router(config-if)# ip address 10.2.2.1 255.255.255.0
!
Router(config-if)# interface FastEthernet0/0.3
Router(config-if)# encapsulation dot1Q 3                 !VLAN3
Router(config-if)# ip address 10.3.3.1 255.255.255.0
```

Verify the routing table. Place terminals at the different VLAN, configure the respective gateways (router sub-interfaces) and test connectivity. Capture the packets being exchanged between the Router and (right) Switch.



Inter-VLAN Routing with a L3 Switch (and redundant links)

3. Configure 3 VLAN at the L3 Switch (VLAN1 ,2 and 3):

```
RouterSW# vlan database
RouterSW(vlan)# vlan 1
RouterSW(vlan)# vlan 2
RouterSW(vlan)# vlan 3
RouterSW(vlan)# exit
```

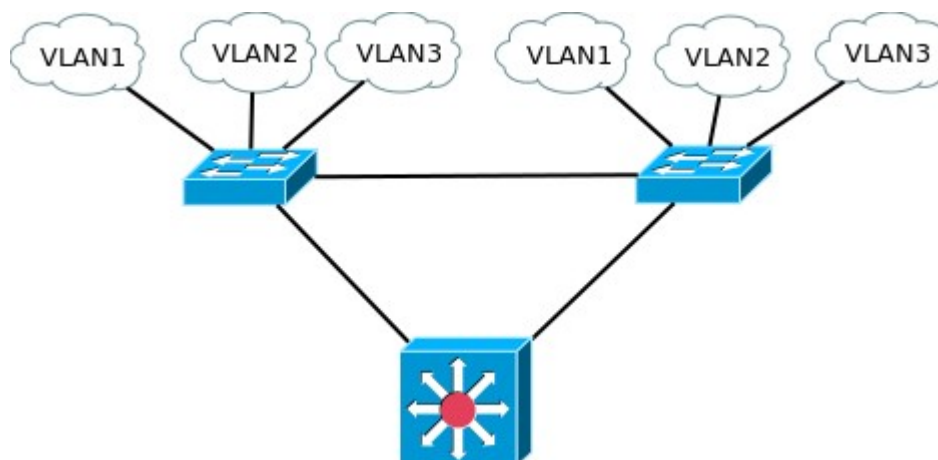
Configure the L3 Switch's L2 ports (fastEthernet slot 1), port 0: VLAN1, ports 1-8: VLAN2, ports 9-12: VLAN3 and ports 13-15: Inter-switch/Tagged/802.1Q:

```
RouterSW(config)# interface f1/0
RouterSW(config-if)# switchport mode access
RouterSW(config-if)# switchport access vlan 1
RouterSW(config-if)# interface range fastEthernet 1/1 - 8
RouterSW(config-if-range)# switchport mode access
RouterSW(config-if-range)# switchport access vlan 2
RouterSW(config-if-range)# interface range fastEthernet 1/9 - 12
RouterSW(config-if-range)# switchport mode access
RouterSW(config-if-range)# switchport access vlan 3
RouterSW(config-if-range)# interface range fastEthernet 1/13 - 15
RouterSW(config-if-range)# switchport mode trunk
RouterSW(config-if-range)# switchport trunk encapsulation dot1q
```

Configure the Switch L3 virtual (Vlan) interfaces:

```
RouterSW(config)# interface Vlan 1
RouterSW(config-if)# ip address 10.1.1.1 255.255.255.0
RouterSW(config)# interface Vlan 2
RouterSW(config-if)# ip address 10.2.2.1 255.255.255.0
RouterSW(config)# interface Vlan 3
RouterSW(config-if)# ip address 10.3.3.1 255.255.255.0
```

Verify the routing table. Place terminals at the different VLAN, configure the respective gateways (Vlan virtual interfaces) and test connectivity. Capture the packets being exchanged between the Router and L3 Switch.



Inter-VLAN Routing with Redundancy (Distribution Network Deployment)

4. Add a second L3 Switch for equipment redundancy. Verify the routing tables. Place terminals at the different VLAN, configure the respective (dual) gateways (Vlan virtual interfaces) and test connectivity. Capture the packets being exchanged between the Router and L3 Switch.

