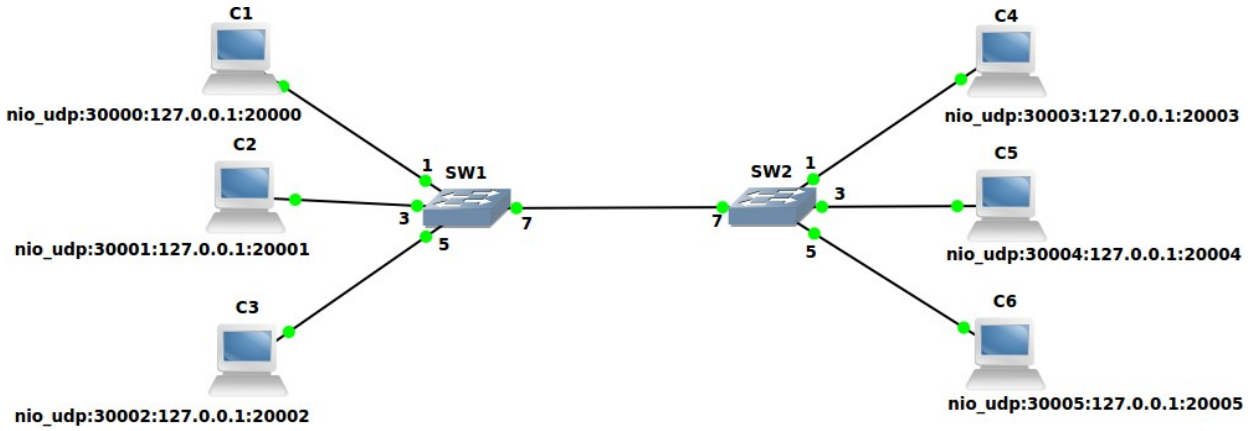
Redes e Serviços

Objectives

- VLAN Routing

VLAN Routing

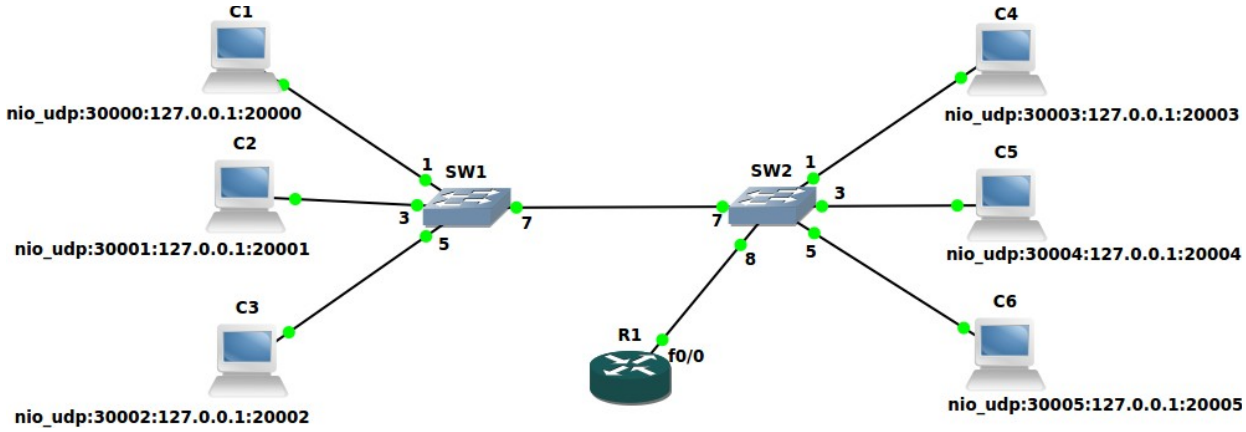
Access Network (VLAN) Deployment



1. Assemble the depicted network. Configure 3 VLAN at the switches:
- Ports 1-2: VLAN1 (sub-network 10.1.1.0/24, IPv4 C1:10.1.1.11, IPv4 C4: 10.1.1.14)
- Ports 3-4: VLAN2 (sub-network 10.2.2.0/24, IPv4 C2:10.2.2.12, IPv4 C5: 10.2.2.15)
- Ports 5-6: VLAN3 (sub-network 10.3.3.0/24, IPv4 C3:10.3.3.13, IPv4 C6: 10.3.3.16)
- Ports 7-8: Inter-switch/Tagged/802.1Q (dot1q, with native VLAN 1)

Place hosts in different VLAN and test connectivity.

Inter-VLAN Routing with Router

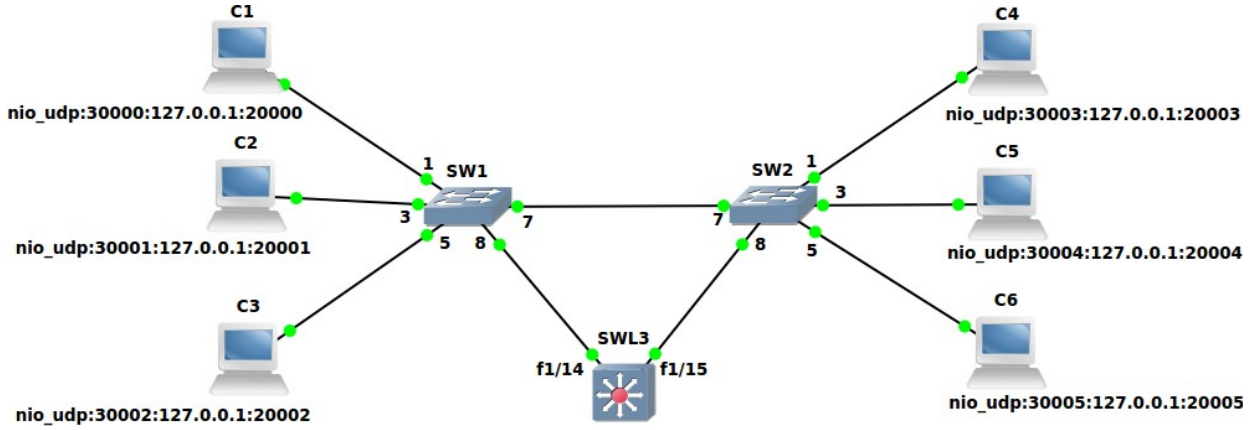


2. Assemble the depicted network by adding a router. Configure the router to support sub-interfaces and Inter-VLAN (802.1Q) routing:

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

3. Place hosts in 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)



4. 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
```

Verify the L3 Switch VLANs table: `show vlan-switch`.

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)# ip routing                              ! Activates IPv4 routing
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-if)# no shutdown
RouterSW(config-if)# no autostate
RouterSW(config)# interface Vlan 2
RouterSW(config-if)# ip address 10.2.2.1 255.255.255.0
RouterSW(config-if)# no shutdown
RouterSW(config-if)# no autostate
RouterSW(config)# interface Vlan 3
RouterSW(config-if)# ip address 10.3.3.1 255.255.255.0
RouterSW(config-if)# no shutdown
RouterSW(config-if)# no autostate
```

Verify the routing table (`sh ip route`). Place hosts in different VLAN, configure the respective gateways

(VLAN virtual interfaces) and test connectivity. Capture the packets being exchanged between the Router and L3 Switch. Analyze the switching module forwarding table (`show mac-address-table`) in L3 Switch.