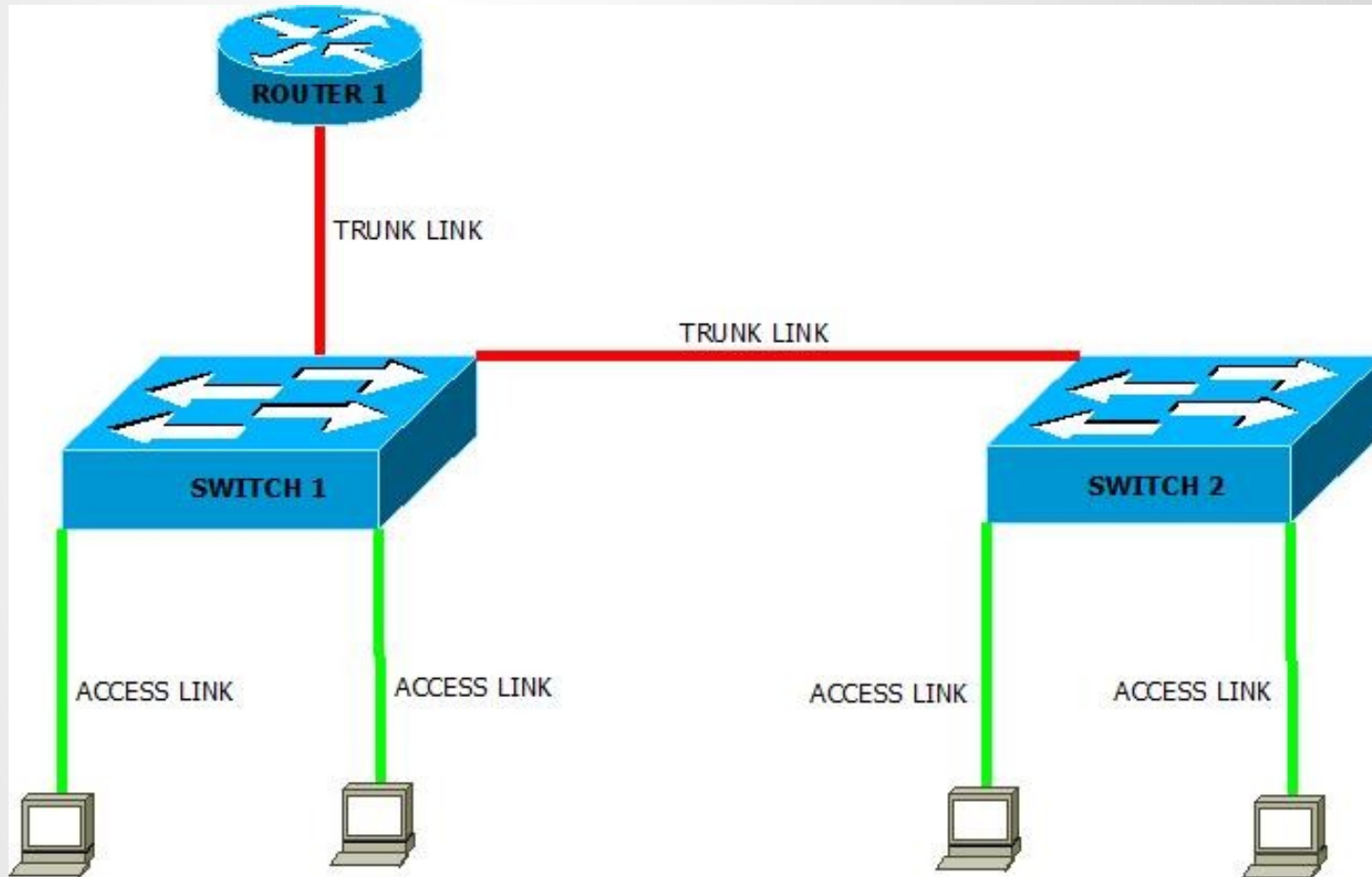


VLAN LAB

Chess

BASIC VLAN CONFIGURATION

- LAB NETWORK TOPOLOGY



OBJECTIVE

The objectives of the LAB are as follows.

1. Configure the network elements shown in the topology found in the previous slide so as to allow PC in the same VLAN to communicate with one another
2. Configure basic layer 3 routing on the router so as to allow interVLAN routing.

NOTES

To configure the devices telnet into maabara:20XX where XX refers to the node numbers in your group. Only telnet into the nodes that you have been assigned and not any other Node.

The tasks will be done in groups of four or five

Scripts printed in blue are actual configurations that should be configured on the switches, router or the PC. The PC is actually a router but is used here to represent a node.

Configuring the switches

Configure the RED links on SWITCH 1 and 2 as trunk links and only allow VLAN 100 and VLAN 200 to pass through the Trunk Link.

SWITCH 1

Configure the interfaces between the switches and to the router as Trunks links and encapsulate them as 802.1Q links

```
Switch>enable
```

```
Switch#config t
```

```
Switch(config)#
```

```
Switch(config)#interface ethernet 2/1
```

```
Switch(config-if)#switchport trunk encapsulation dot1q
```

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

Configure (Create) two VLANS from the VLAN database; VLAN 100 and VLAN 200 and give them descriptive names e.g. Teaching-staff-VLAN and Student-VLAN

```
Switch(config)#vlan 100
```

```
Switch(config-vlan)#name Teaching-staff-VLAN
```

```
Switch(config)#vlan 200
```

```
Switch(config-vlan)#name
```

```
Switch(config-vlan)#name student-vlan
```

Configuring the switches

Cont.

Confirm that the VLANS have been created and that they are active.

```
Switch#show vlan
```

| <i>VLAN Name</i> | <i>Status</i> | <i>Ports</i> |
|---------------------|---------------|-----------------------------|
| ----- | | |
| ----- | | |
| <i>1 default</i> | <i>active</i> | <i>Et0/0, Et0/2,</i> |
| <i>Et0/3, Et1/0</i> | | <i>Et1/1, Et1/2, Et1/3,</i> |
| <i>Et2/0</i> | | <i>Et2/1, Et2/2, Et2/3,</i> |
| <i>Et3/0</i> | | <i>Et3/1, Et3/2, Et3/3</i> |

Configuring the switches

Cont.

Configure the trunk ports between the Switches to allow only VLAN 100 and 200.

```
Switch(config-if)#switchport trunk allowed vlan  
100,200
```

You can remove or add a vlan into the allowed list by use the commands below.

```
Switch(config-if)#switchport trunk allowed vlan add  
3000
```

```
Switch(config-if)#switchport trunk allowed vlan  
remove 3000
```

Configuring the switches

Cont.

Configure the The ports connecting the PC as Access ports with their respective vlans. PC1 and PC 3 should be configured to access vlan 100 and PC 2 and PC 4 to access VLAN 200.

```
Switch(config-if)#switchport mode access
```

```
Switch(config-if)#switchport access vlan 100
```

Repeat the process above for VLAN200

Configuring the switches

Cont.

Confirm that the access or trunk ports have been configured as access or trunk respectively as shown below.

```
Switch#show interfaces ethernet 3/2 switchport
```

```
Name: Et3/2
```

```
Switchport: Enabled
```

```
Administrative Mode: static access
```

```
Operational Mode: down
```

```
Administrative Trunking Encapsulation: negotiate
```

```
Negotiation of Trunking: Off
```

```
Access Mode VLAN: 100 (VLAN0100)
```

```
Trunking Native Mode VLAN: 1 (default)
```

```
Administrative Native VLAN tagging: enabled
```

```
Voice VLAN: none
```

```
Administrative private-vlan host-association: none
```

```
Administrative private-vlan mapping: none
```

```
Administrative private-vlan trunk native VLAN: none
```

```
Administrative private-vlan trunk Native VLAN tagging: enabled
```

```
Administrative private-vlan trunk encapsulation: dot1q
```

```
Administrative private-vlan trunk normal VLANs: none
```

```
Administrative private-vlan trunk associations: none
```

```
Administrative private-vlan trunk mappings: none
```

```
Operational private-vlan: none
```

```
Trunking VLANs Enabled: ALL
```


Configuring the switches

Cont.

Configure the Router interface to be a “Router on a Stick”. This means you configure two VLANS on that particular interface.

```
Router(config)#interface ethernet 1/1
```

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

```
Router(config-if)#exit
```

```
Router(config)#interface ethernet 1/1.100
```

```
Router(config-subif)#encapsulation dot1Q 100
```

```
Router(config-subif)#ip address 192.168.1.1 255.255.255.0
```

```
Router(config-subif)#exit
```

```
Router(config)#interface ethernet 1/1.200
```

```
Router(config-subif)#encapsulation dot1Q 200
```

```
Router(config-subif)#ip address 172.16.1.1 255.255.255.0
```

Configuring the switches

Cont.

Configure the PCs with Ip address in the respective VLANs. PC 1 should be configured with 192.168.1.3 255.255.255.0 PC 3 192.168.1.4 255.255.255.0. PC 2 should be 172.16.1.3/24 and PC 4 should be 172.16.1.5/24.

Please note that routers have been used to represent PCs in the demonstration.

```
Router(config)#interface ethernet 2/2
```

```
Router(config-if)#ip address 192.168.1.3  
255.255.255.0
```

```
Router(config-if)#exit
```

Configure a default route on the PCS to their respective vlans. This is similar to configuring a Gateway on a normal PC.

```
Router(config)#ip route 0 0 0 0 0 0 0 0 192 168 1 1
```

Inter-Vlan Communications

Configure a basic OSPF routing on the routers so as to ensure communication between VLANs. This depends on your requirements on the ground. This just demonstrates how you can allow subnets in different VLANs to communicate with one another. You should be able to ping across VLANs once this is done

```
Router(config)#router ospf 1
```

```
Router(config-router)#exit
```

```
Router(config)#interface ethernet x/x.100
```

```
Router(config-subif)#ip ospf 1 area 0
```

```
Router(config)#interface ethernet y/y.100
```

```
Router(config-subif)#ip ospf 1 area 0
```

Test the links to see that you can ping across VLANs by pinging PCs in the other VLAN