

This Document explains the configurations made in
<https://youtu.be/hANCSUi3sk4>

layer 2 switch and router

1) create vlans - Vlans allow networks to be segmented into several broadcast domains. Creating vlans will increase performance in a network because when users are divided into separate broadcast domains, the need for traffic to be sent to unwanted locations is reduced. A vlan can be created by:

```
Switch(config)# vlan <#>
```

2) assign ports to vlans - To separate end users through vlans, ports must be assigned to one. By default all ports are assigned to vlan 1. A ports assigned vlan can be changed by:

```
Switch(config)#interface port type <#>
```

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

```
Switch(config-if)#switchport access vlan <#>
```

3) create a trunking port - A trunking port is needed for the switch to send data from more than 1 vlan. The trunk will connect the switch to the router. Trunk ports can be made by:

```
Switch(config)#interface port type <#>
```

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

4) create subinterfaces with ip addresses (the default gateways) on the router - A subinterface is

what allows a router to split one physical interface into a multiple logical ones. This allows for multiple vlans to be connected through one physical port on the router, and one trunking port on the switch. For the router to deliver data on the trunk port it must use an encapsulation method called IEEE 802.1Q. This method puts a tag into the frame header which contains information about which vlan the data is going to.

```
Router(config)#interface g 0/1. <vlan#>
```

```
Router(config-subif)#encapsulation dot1Q <vlan #>
```

```
Router(config-subif)#ip address ip address subnet mask
```

(note the . in g 0/1.)

5) turn on the port - By default, ports on a router are shut down. To turn them on, enter the interface of desired port and enter:

```
Router(config)# interface port type <#>
```

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

6) ping test

multilayer switch

1) create vlans and give them ip addresses (the default gateways) - Vlans serve the same purpose here, however on a Cisco multilayer switch, individual ports cannot be assigned an IP address. Therefore an IP address must be given to a vlan, which will then be assigned to a port connecting to end users and (in this scenario) acting as the default gateway. This is done by:

```
Switch(config)#vlan <#>
```

```
Switch(config-vlan)#interface vlan <vlan #>
```

Switch(config-if)#ip address *ip address subnet mask*

2) assign ports to vlans - In order for a port to access a specific vlan it must be configured. This can be done by:

Switch(config)#interface *port type* <#>

Switch(config-if)#switchport mode access

Switch(config-if)#switchport access vlan <#>

3) 1st ping test

4) enable ip routing - By default IP routing is not enabled by the multilayer switch so it must be turned on manually by:

Switch(config)#ip routing

5) 2nd ping test

connect the 2 tiers (with static routes)

1) on the multilayer switch, create a 3rd vlan and give it an ip address - Because we need a bridge network to connect the two tiers, a 3rd vlan must be created to assign to the connecting port. Follow the directions from step 1 in "multilayer switch" section to create this.

2) assign it to the port connecting to the router

3) on the router, give the port connecting to the multilayer switch an ip address and turn it on

4) create routes on router and multilayer

switch - Finally, routes need to be established for the neighboring networks to connect with each other. Because this is a small topology, a simple static route can be easily set up by:

Router(config)#ip route *<destination network address> <destination network subnet mask> <next hop address>*

5) ping test