

7. Program to simulate VLAN for an organization with 3 departments using 1900 Switch

/* Use the 1900 switch, connect 6 nodes A,B,C,D,E,F through ports 1 to 6 with ip address 10.0.0.1 to 10.0.0.6, Mask 255.0.0.0

/* check the connectivity between each node from A to F
Ping 10.0.0.2, 3,4,5,6

/* Observe the vlans if any
Switch1900#sh vlan

/* Define vlans in switch 1900

```
CISCO#config terminal
CISCO(config)#vlan 10 name HR
CISCO(config)#vlan 20 name Sales
CISCO(config)#vlan 30 name IT
```

/* Observe the vlans
Switch1900#sh vlan

/* Assign membership to vlan

```
CISCO(config)#int e0/1
CISCO(config-if)#vlan-membership static 10
CISCO(config)#int e0/2
CISCO(config-if)#vlan-membership static 10
CISCO(config)#int e0/3
CISCO(config-if)#vlan-membership static 20
CISCO(config)#int e0/4
CISCO(config-if)#vlan-membership static 20
CISCO(config)#int e0/5
CISCO(config-if)#vlan-membership static 30
CISCO(config)#int e0/6
CISCO(config-if)#vlan-membership static 30
```

CISCO#sh vlan

/* check the connectivity between each node from A to F
Ping 10.0.0.2, 3,4,5,6

8. Program to simulate VLAN for an organization with 3 departments using 1900 Switch fabric

Use the same procedure.

Add one more 1900 switch

Define same vlans & add membership

Add nodes to each of the port

Assign IP 10.0.0.7,8,9,10,11,12 with mask 255.0.0.0

Check the connectivity within same vlan and across the vlan spread over switch fabric.

9. Program to simulate VLAN for a organization with 3 departments using 2950 Switch

```
CISCO#config terminal
CISCO(config)#vlan 10
CISCO(config-vlan)#name HR
CISCO(config-vlan)#exit
CISCO(config)#vlan 20
CISCO(config-vlan)#name Sales
CISCO(config-vlan)#exit
CISCO(config)#vlan 30
CISCO(config-vlan)#name IT
CISCO(config-vlan)#exit
```

Verify VLANs

```
CISCO#show vlan brief
VLAN Name Status Ports
```

```
-----
1 default          active          Fa0/1, Fa0/2, Fa0/3, Fa0/4
                  Fa0/5, Fa0/6, Fa0/7, Fa0/8
                  Fa0/9, Fa0/10, Fa0/11, Fa0/12
                  Fa0/13, Fa0/14, Fa0/15, Fa0/16
                  Fa0/17, Fa0/18, Fa0/19, Fa0/20
                  Fa0/21, Fa0/22, Fa0/23, Fa0/24
                  Gi0/1, Gi0/2
```

10 HR active

20 Sales active

30 IT Active

```
1002 fddi-default act/unsup
1003 token-ring-default act/unsup
1004 fddinet-default act/unsup
1005 trnet-default act/unsup
```

Note: All ports of the switch are member of VLAN 1 by default.

To Assign Ports to Different VLANs:

```
CISCO(config)#interface fa0/1
CISCO(config-if)#switchport mode access
CISCO(config-if)#switchport access vlan 10
CISCO(config-if)#exit
CISCO(config)#interface fa0/3
CISCO(config-if)#switchport mode access
CISCO(config-if)#switchport access vlan 20
CISCO(config)#interface fa0/5
CISCO(config-if)#switchport mode access
CISCO(config-if)#switchport access vlan 30
```

Verify Ports in VLANS

```
CISCO#show vlan brief
VLAN Name Status Ports
```

```
-----
1 default          active          Fa0/3, Fa0/4, Fa0/5, Fa0/6
                  Fa0/7, Fa0/8, Fa0/9, Fa0/10
```

Fa0/11, Fa0/12, Fa0/13, Fa0/14
Fa0/15, Fa0/16, Fa0/17, Fa0/18
Fa0/19, Fa0/20, Fa0/21, Fa0/22
Fa0/23, Fa0/24, Gi0/1, Gi0/2

10 HR	activeFa0/1
20 Sales	active Fa0/3
30 IT	active Fa0/5

10. Program to simulate VLAN for a organization with 3 departments using 2950 Switch fabric

Using same procedure of above and use additional switch and link both switches using any ethernet ports.

8. Program to simulate Inter VLAN Routing among 2 Vlan in 1900 Switch, using Router Interfaces

Using the same procedure of prg. 8, create 2 vlans in 1900 switch

Add 2 nodes in each vlan,

Assign IP address 10.0.0.1 & 10.0.0.2, with Mask 255.0.0.0 for 1st vlan

Assign IP address 20.0.0.1 & 20.0.0.2 with Mask 255.0.0.0 for 2nd vlan

Check connectivity

Add a 2621 Router.

Through its F0/0 connect to fa interface of switch.

Through its F0/1 connect to fa interface of switch.

Assign the proper ip address to Router interface

/* For F0/0,

10.0.0.10 with mask 255.0.0.0

For F0/1, 20.0.0.10 with mask 255.0.0.0

2621(config-if) ip address 10.0.0.10 255.0.0.0

2621(config-if) ip address 20.0.0.10 255.0.0.0

For nodes of 1st vlan, add gateway address 10.0.0.10

For nodes of 2nd vlan, add gateway address 20.0.0.10

Try connectivity from one vlan to another for success

9. Program to simulate Inter VLAN Routing in 2950 Switch, using Router Interfaces

10. Program to simulate Inter VLAN Routing in 2950 Switch, using ISL

Routing

Configuring Switch:

```
Switch(config)#vlan 10
Switch(config-vlan)#name HR
Switch(config-vlan)#vlan 20
Switch(config-vlan)#name Sales
Switch(config-vlan)#exit
Switch(config)#interface fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#exit
Switch(config)#interface fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#exit
Switch(config)#interface fa0/3
Switch(config-if)#switchport mode trunk
```

Configuring Router:

```
Router(config)#interface fa0/0
Router(config-if)#no shutdown
Router(config-if)#exit
```

Creating sub-interface for VLAN 10 on router:

```
Router(config)#interface fa0/0.10
Router(config-subif)#encapsulation dot1Q 10
Router(config-subif)#ip address 10.0.0.10 255.0.0.0
Router(config-subif)#exit
```

Creating sub-interface for VLAN 20 on router:

```
Router(config)#interface fa0/0.20
Router(config-subif)#encapsulation dot1Q 20
Router(config-subif)#ip address 20.0.0.10 255.0.0.0
Router(config-subif)#exit
```

Configuring IP on PC:

Host A

```
IP Address 10.0.0.1
Subnet Mask 255.0.0.0
Default Gateway 10.0.0.10
```

Host B

```
IP Address 20.0.0.1
Subnet Mask 255.0.0.0
Default Gateway 20.0.0.10
```

check the connectivity between vlans for success

10. Program to simulate static Routing in a simple network with 2 networks connected to same Router and demonstrate Direct Delivery

Configuring R1:

```
R1(config)#interface fa0/0
R1(config-if)#ip address 10.0.0.10 255.0.0.0
R1(config-if)#no shutdown
R1(config-if)#exit
```

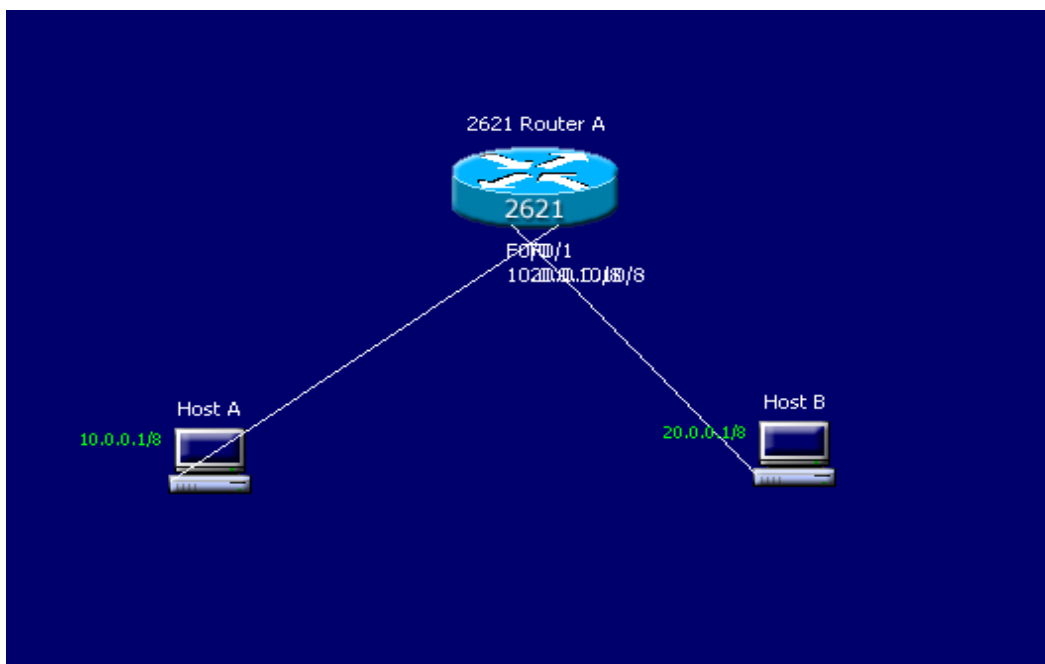
```
R1(config)#interface fa0/1
R1(config-if)#ip address 20.0.0.10 255.0.0.0
R1(config-if)#no shutdown
R1(config-if)#exit
```

Connect Node A with 10.0.0.1 & mask 255.0.0.0 to FA0/0

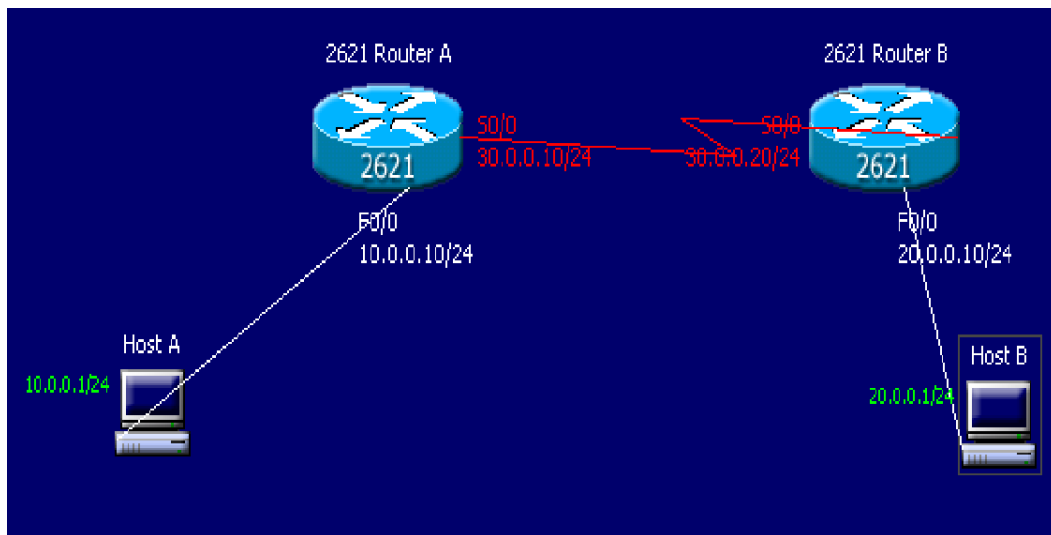
Connect Node B with 20.0.0.1 & mask 255.0.0.0 to FA0/1

```
/* verify the routing table
Router# Sh ip route
```

Check the connectivity between Node A & Node B for a success



11. Program to simulate static Routing in a network with 2 router connected through its serial interface



Configuring R1:

```

R1(config)#interface fa0/0
R1(config-if)#ip address 10.0.0.10 255.0.0.0
R1(config-if)#no shutdown
R1(config-if)#exit

```

```

R1(config)#interface s0/0
R1(config-if)#ip address 30.0.0.10 255.0.0.0
R1(config-if)#clock rate 64000
R1(config-if)#no shutdown
R1(config-if)#exit

```

Connect Node A with 10.0.0.1 & mask 255.0.0.0 to FA0/0

```

/* verify the routing table
R1# sh ip route

```

Note: Interface Serial0/0 of Router R1 is a DCE end, so clock rate must be given to this.

Configuring R2:

```

R2(config)#interface fa0/0
R2(config-if)#ip address 20.0.0.10 255.0.0.0
R2(config-if)#no shutdown
R2(config-if)#exit

```

```

R2(config)#interface s0/0
R2(config-if)#ip address 30.0.0.20 255.0.0.0
R2(config-if)#no shutdown
R2(config-if)#exit

```

Connect Node B with 20.0.0.1 & mask 255.0.0.0 to FA0/0

Check the connectivity between Node A & Node B

/*Adding static route on R1 for network 20.0.0.0

R1(config)#ip route 20.0.0.0 255.0.0.0 30.0.0.20

/* verify the routing table

R1# sh ip route

/*Adding static route on R2 for network 10.0.0.0

R2(config)#ip route 10.0.0.0 255.0.0.0 30.0.0.10

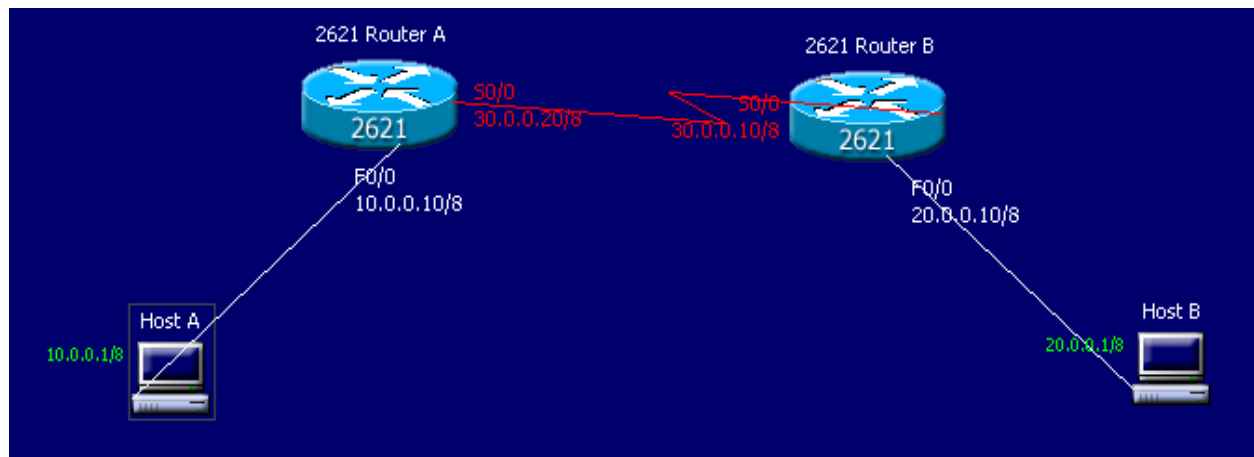
/* verify the routing table

R2# sh ip route

Check the connectivity between Node A & Node B for a success.

12. Program to simulate Static Routing among 5 different networks with 3 router interconnected using serial interfaces.

13. Program to simulate Dynamic Routing using RIP, among 2 different networks interconnected with 2 router through the serial interfaces.



Configuring R1:

R1(config)#interface fa0/0

R1(config-if)#ip address 10.0.0.10 255.0.0.0

R1(config-if)#no shutdown

R1(config-if)#exit

```
R1(config)#interface s0/0
R1(config-if)#ip address 30.0.0.10 255.0.0.0
R1(config-if)#clock rate 64000
R1(config-if)#no shutdown
R1(config-if)#exit
```

Connect Node A with 10.0.0.1 & mask 255.0.0.0 to FA0/0

```
/* verify the routing table
R1# sh ip route
```

Note: Interface Serial0/0 of Router R1 is a DCE end, so clock rate must be given to this.

Configuring R2:

```
R2(config)#interface fa0/0
R2(config-if)#ip address 20.0.0.10 255.0.0.0
R2(config-if)#no shutdown
R2(config-if)#exit
```

```
R2(config)#interface s0/0
R2(config-if)#ip address 30.0.0.20 255.0.0.0
R2(config-if)#no shutdown
R2(config-if)#exit
```

Connect Node B with 20.0.0.1 & mask 255.0.0.0 to FA0/0

Check the connectivity between Node A & Node B

/*Adding Dynamic route on R1

```
R1(config)#router rip
R1(config)#network 10.0.0.0
/* network to be advertised
/* verify the routing table
```

```
R1# sh ip route
```

/*Adding dynamic route on R2

```
R2(config)#router rip
R2(config)#network 20.0.0.0
/* network to be advertised
/* verify the routing table
```

```
R2# sh ip route
```

Check the connectivity between Node A & Node B for a success.

14. Program to simulate Dynamic Routing using RIP, among 5 different networks interconnected with 3 router through the serial interfaces.
