LAB 4.1 VLAN

UNDERSTANDING, CREATING, AND SIMULATING MULTIPLE VLANS IN A SINGLE SWITCH

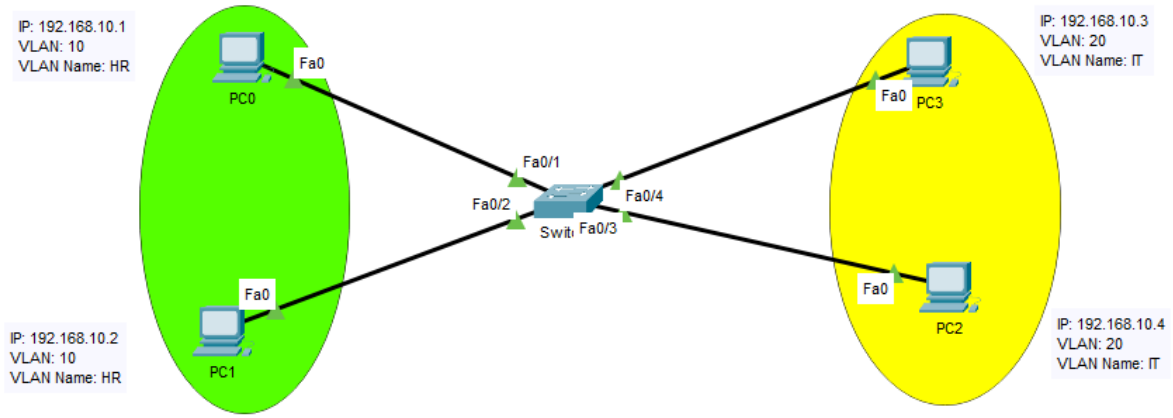
OBJECTIVE: To understand and create multiple VLANS in a switch

TOOLS USED: Packet Tracer

BACKGROUND

VLAN is a custom network which is created from one or more local area networks in order to limit access to a specified group of users by dividing workstations into different isolated VLAN.

TOPOLOGY

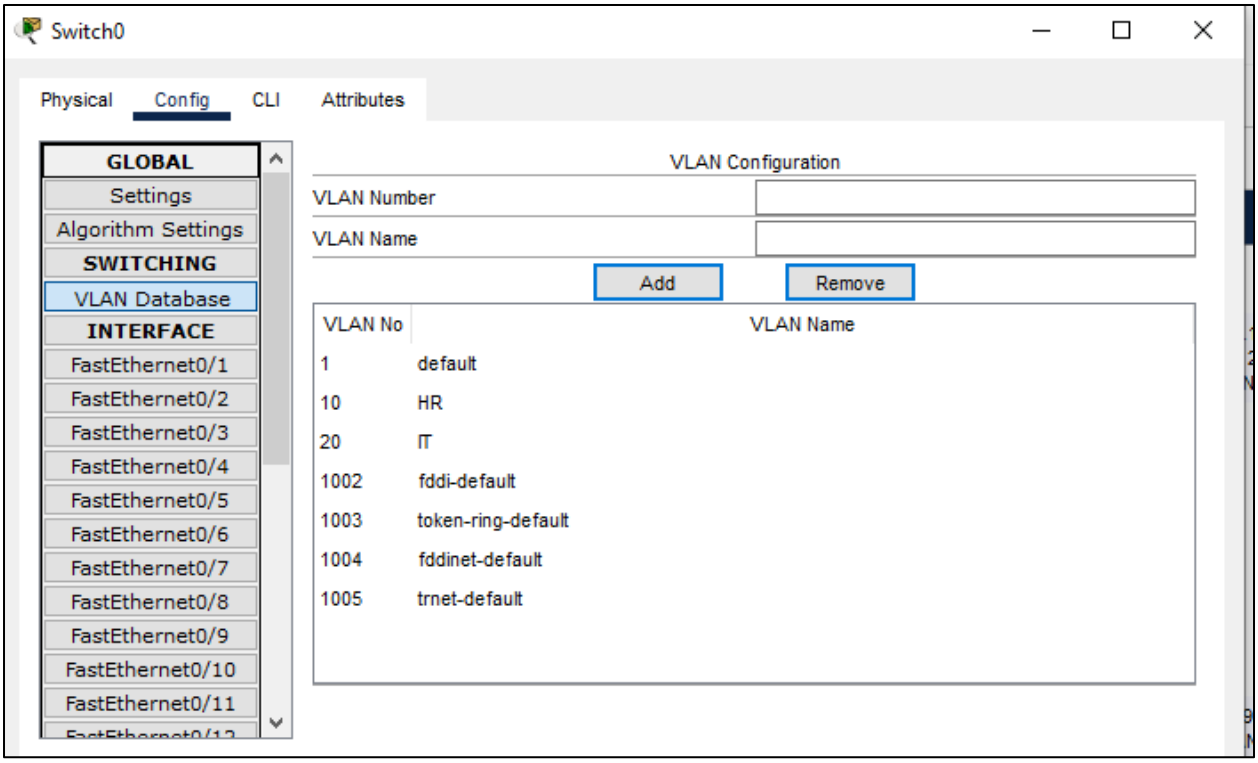


IP ADDRESSING PLAN

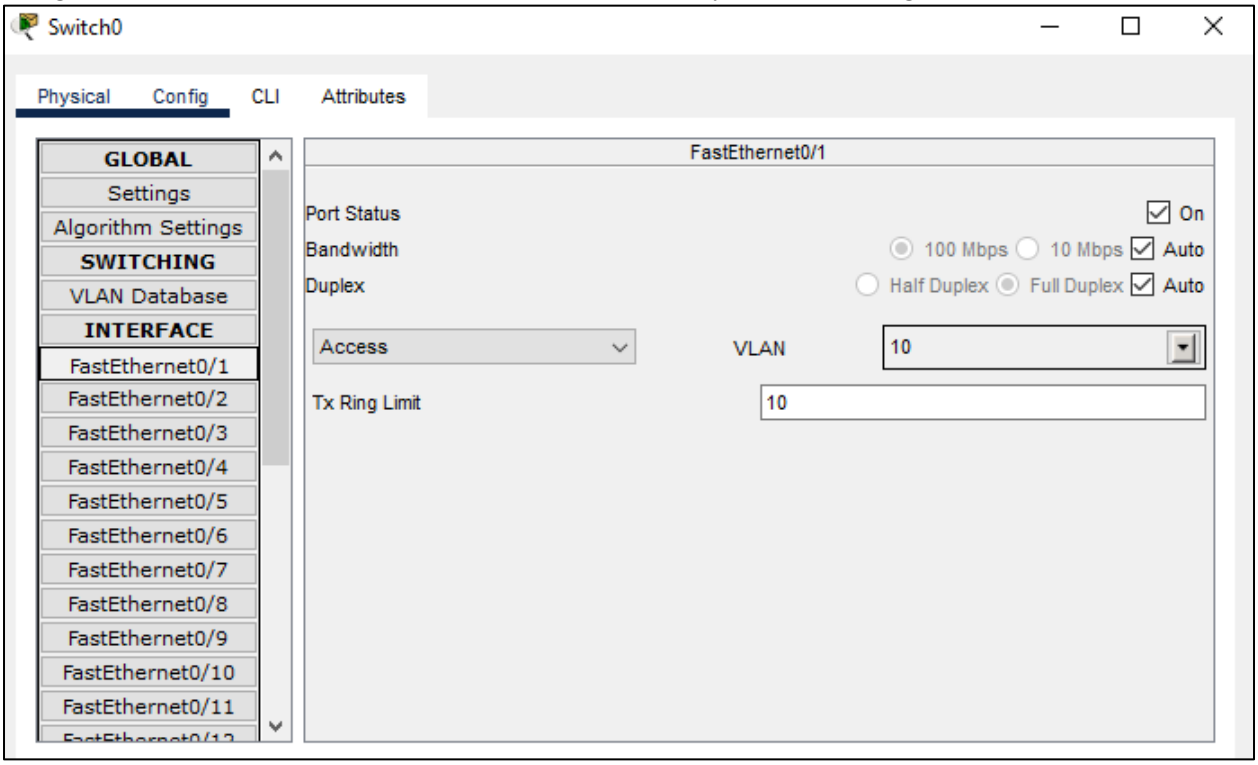
Device	Interface	IP Address	Subnet Mask	VLAN	Gateway
PC0	NIC	192.168.10.1	255.255.255.0	10/HR	
PC1	NIC	192.168.10.2	255.255.255.0	10/HR	
PC2	NIC	192.168.10.3	255.255.255.0	20/IT	
PC3	NIC	192.168.10.4	255.255.255.0	20/IT	

PROCEDURE

1. Create the topology as shown above
2. Assign the IP address to each PC as shown in IP addressing plan
3. Create two VLANs in a switch as



4. Assign the PC connected interface of switch into the VLAN you want to assign



VERIFICATION

1. Ping the PC as

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC0	PC1	ICMP		0.000	N	0	(ed
	Successful	PC3	PC2	ICMP		0.000	N	1	(ed
	Failed	PC0	PC2	ICMP		0.000	N	2	(ed

PC with in a VLAN gets communicated but PC present in different VLAN can not communicate.

2. View the details of VLANs created in switch as

```
Switch#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    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
                                                Gig0/1, Gig0/2
10   HR                               active    Fa0/1, Fa0/2
20   IT                               active    Fa0/3, Fa0/4
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
Switch#
```

CONCLUSION

In this way we can create multiple VLANs within a LAN (in a Switch) so that broadcast domain can be divided and gets minimized in a LAN.

LAB 4.2 VLAN

UNDERSTANDING, CREATING, AND SIMULATING MULTIPLE VLANS DISTRIBUTED IN MULTIPLE SWITCH

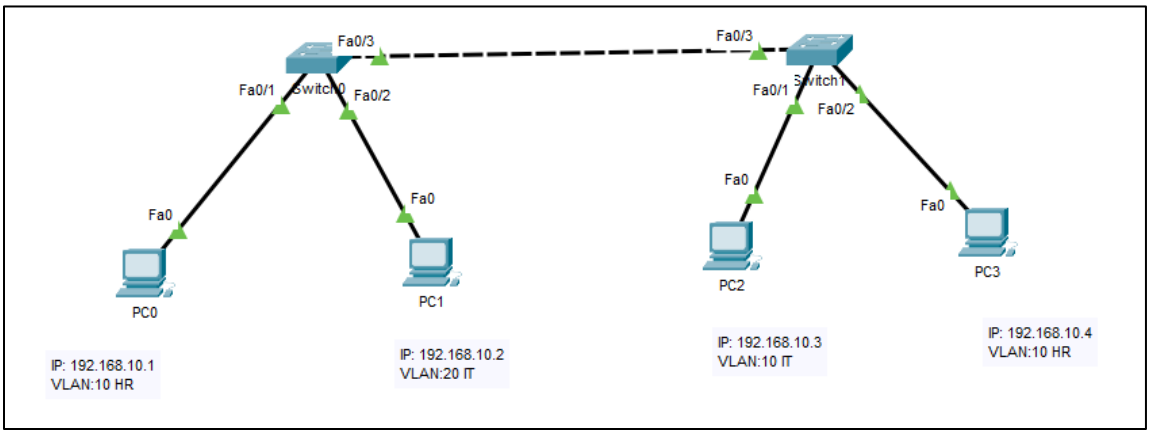
OBJECTIVE: To understand and create multiple VLANS distributed in multiple switch.

TOOLS USED: Packet Tracer

BACKGROUND

[write concept of VLAN Native, Trunk and Access VLAN]

TOPOLOGY

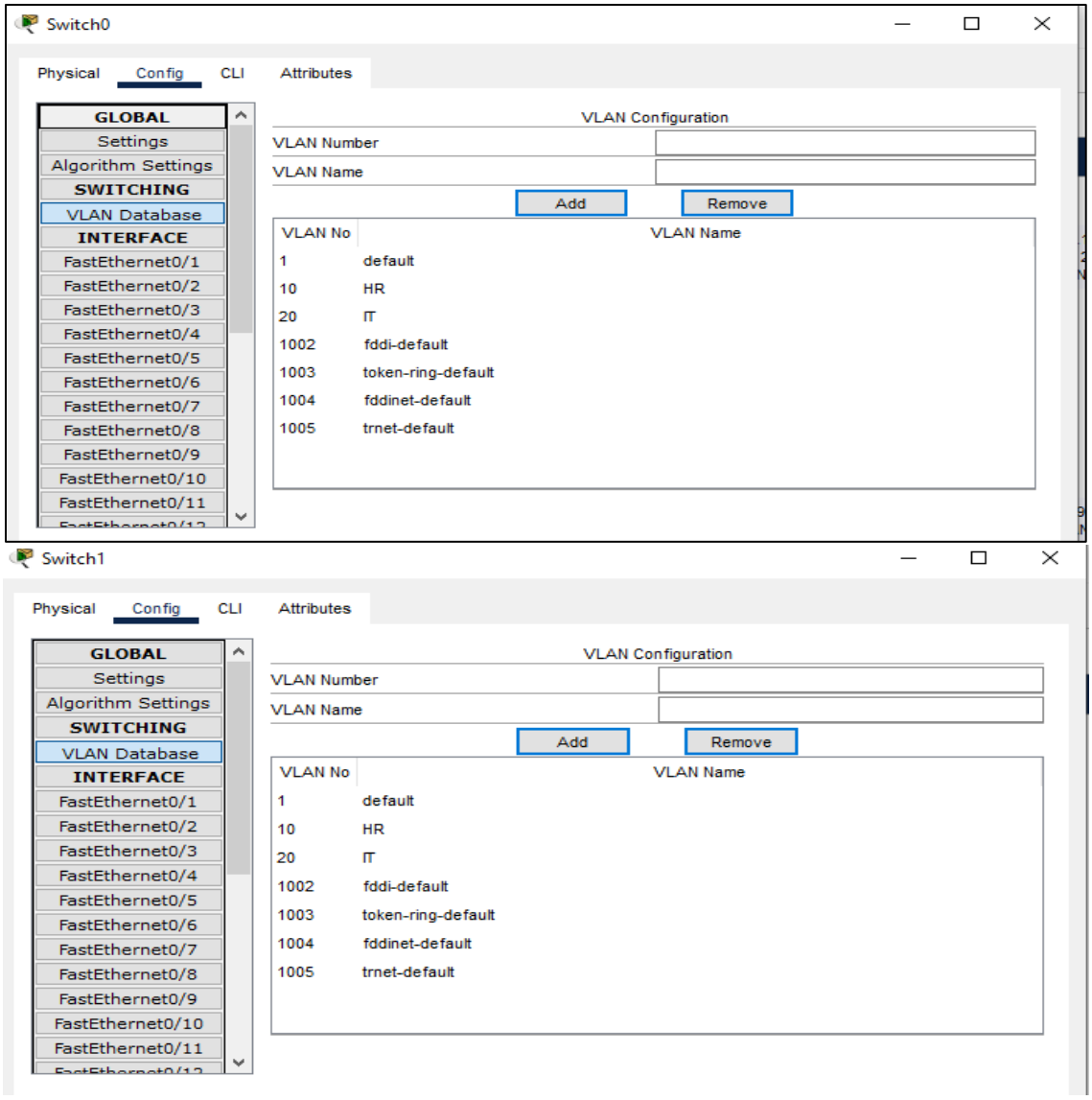


IP ADDRESSING PLAN

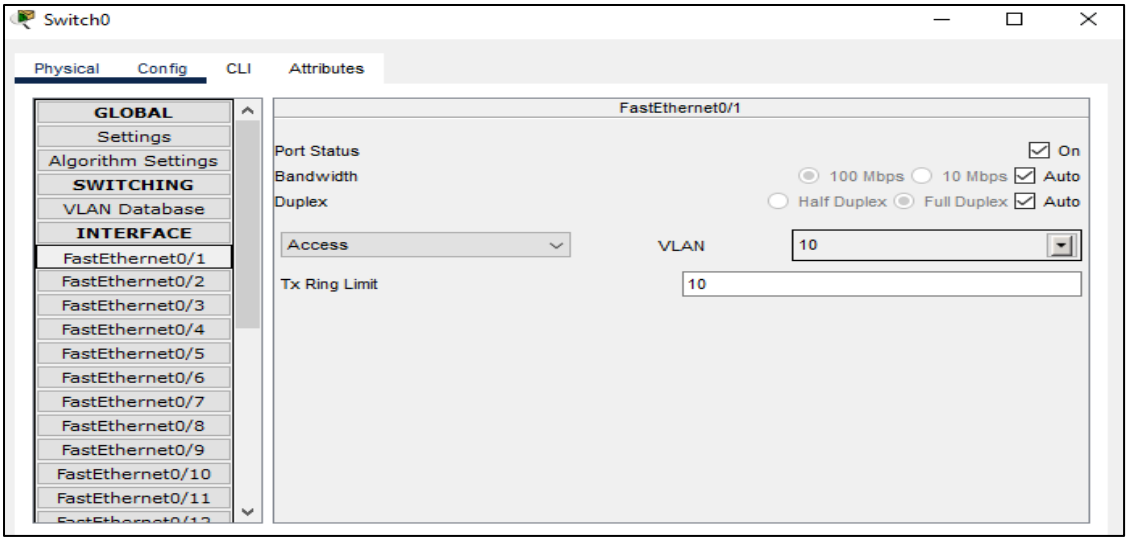
Device	Interface	IP Address	Subnet Mask	VLAN	Gateway
PC0	NIC	192.168.10.1	255.255.255.0	10/HR	
PC1	NIC	192.168.10.2	255.255.255.0	20/IT	
PC2	NIC	192.168.10.3	255.255.255.0	20/IT	
PC3	NIC	192.168.10.4	255.255.255.0	10/HR	

PROCEDURE

5. Create the topology as shown above
6. Assign the IP address to each PC as shown in IP addressing plan
7. Create two VLANs in each switch as



8. Assign the PC connected interface of switch into the VLAN you want to assign



Similarly for other interfaces in switch 0 and go to into switch1 and assign interface to each VLAN as shown above. During assignment fa 0/3 interface in each switch must make trunk other should be access.

VERIFICATION

3. Ping the PC as

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC0	PC3	ICMP		0.000	N	0	(ed
	Successful	PC1	PC2	ICMP		0.000	N	1	(ed
	Failed	PC0	PC1	ICMP		0.000	N	2	(ed

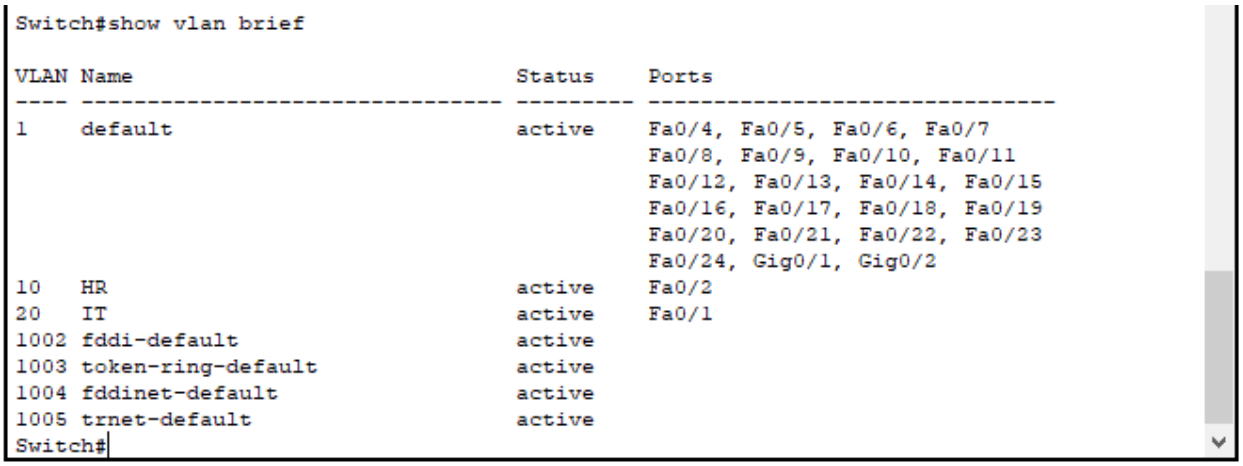
PC present in Same VLAN gets communicated irrespective of their location and connection switch however, PC present in different VLAN can not communicate.

4. View the details of VLANs created in switch as
   In switch 0

```
Switch#show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    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, Gig0/1, Gig0/2
10   HR                                active    Fa0/1
20   IT                                active    Fa0/2
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
Switch#
```

   In switch 1



```
Switch#show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    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, Gig0/1, Gig0/2
10   HR                                active    Fa0/2
20   IT                                active    Fa0/1
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
Switch#
```

CONCLUSION

In this way we can create multiple VLANs distributed in multiple switches so that broadcast domain can be distributed in multiple locations.

LAB 4.3 VLAN

UNDERSTANDING, CREATING, AND SIMULATING MULTIPLE VLANS DISTRIBUTED IN MULTIPLE SWITCH AND ROUTING AMONG VLANS

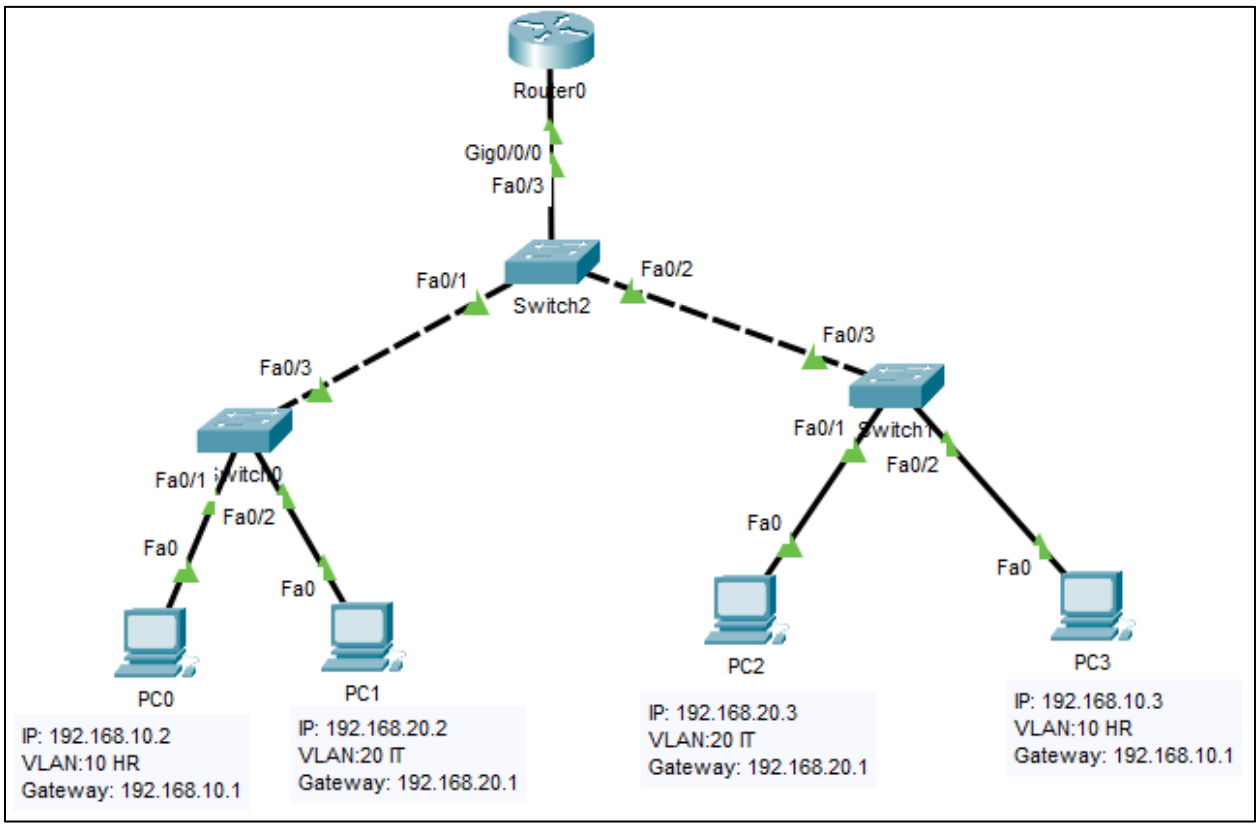
OBJECTIVE: To understand and create multiple VLANS distributed in multiple switch and routing among them

TOOLS USED: Packet Tracer

BACKGROUND

[write concept of inter VLAN routing]

TOPOLOGY

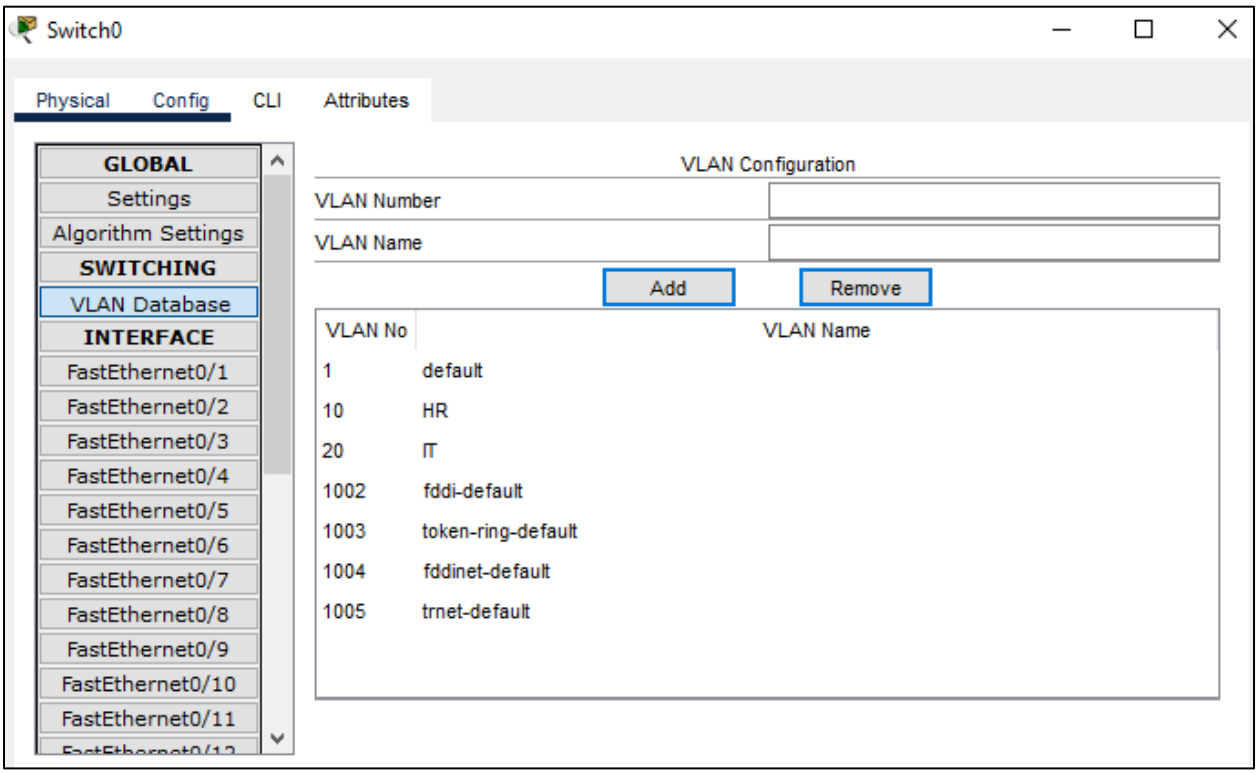


IP ADDRESSING PLAN

Device	Interface	IP Address	Subnet Mask	VLAN	Gateway
PC0	NIC	192.168.10.2	255.255.255.0	10/HR	192.168.10.1
PC1	NIC	192.168.20.2	255.255.255.0	20/IT	192.168.20.1
PC2	NIC	192.168.20.3	255.255.255.0	20/IT	192.168.20.1
PC3	NIC	192.168.10.3	255.255.255.0	20/HR	192.168.10.1
Router	GigibitEthernet 0/0/0.10	192.168.10.1	255.255.255.0	-	
Router	GigibitEthernet 0/0/0.20	192.168.20.1	255.255.255.0	-	

PROCEDURE

9. Create the topology as shown above
10. Assign the IP address to each PC as shown in IP addressing plan
11. Create two VLANs in each switch as



Do the same for switch 1 and switch 2 also.
And run the following additional command in switch 0 and switch 1

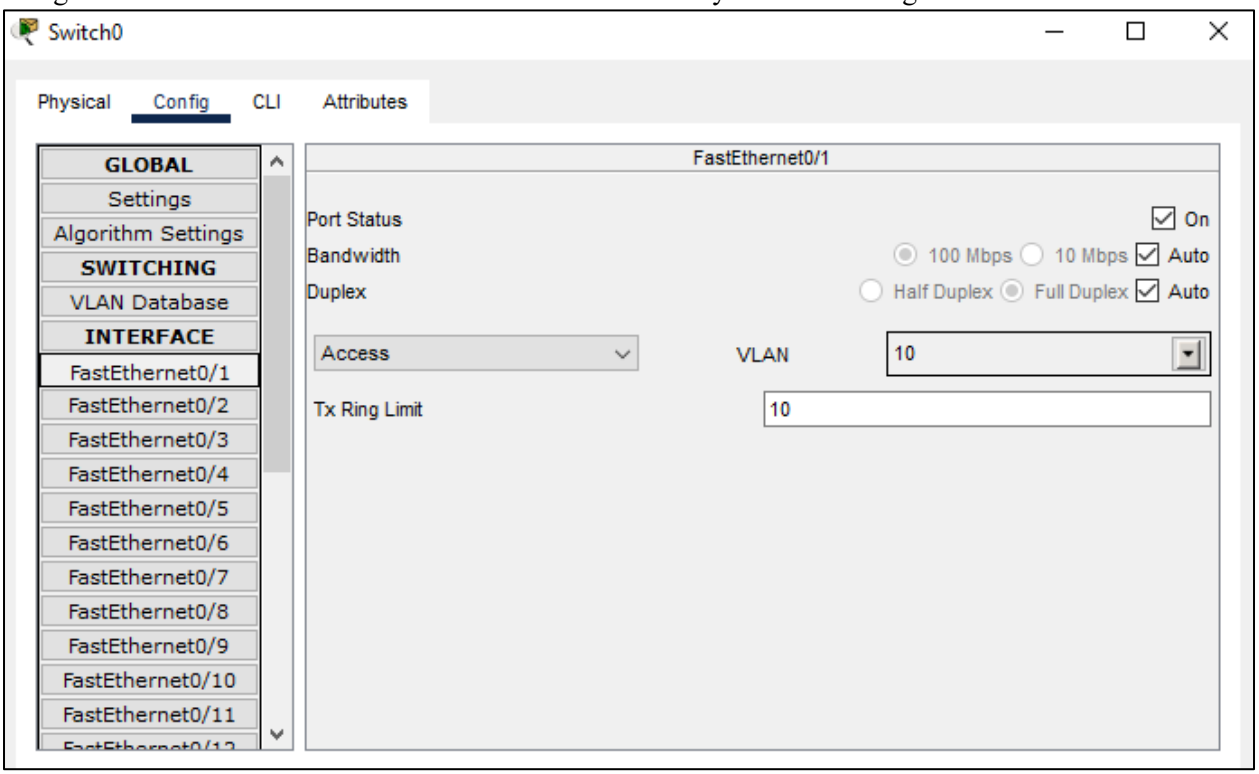
```
Switch>enable
Switch#config terminal
Switch(config)#vtp mode client
```

12. Perform the following configurations in router

```
Router>enable
Router#configure terminal
Router(config-if)#interface GigabitEthernet0/0/0.10
Router(config-subif)#encapsulation dot1Q 10
Router(config-subif)#ip address 192.168.10.1 255.255.255.0
Router(config-subif)#exit

Router(config)#interface gigabitEthernet 0/0/0.20
Router(config-subif)#encapsulation dot1Q 20
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#exit
```

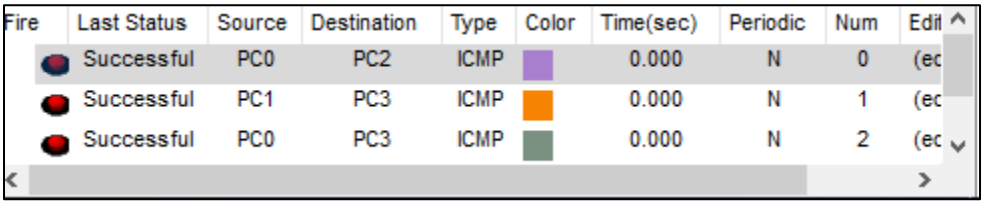
13. Assign the PC connected interface of switch into the VLAN you want to assign



Similarly for other interfaces in switch 0 and go to into switch1 and assign interface to each VLAN as shown above. During assignment fa 0/3 interface in switch 0 and switch 1 must make trunk other should be access. Similarly, all the interfaces 1 to 3 in switch 2 must be trunk.

VERIFICATION

5. Ping the PC as



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC0	PC2	ICMP		0.000	N	0	(ec
	Successful	PC1	PC3	ICMP		0.000	N	1	(ec
	Successful	PC0	PC3	ICMP		0.000	N	2	(ec

6. View the details of VLANs created in switch as
In switch 0

```
Switch#show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    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, Gig0/1, Gig0/2
10   HR                                active    Fa0/1
20   IT                                active    Fa0/2
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
Switch#
```

In switch 1

```
Switch#show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    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, Gig0/1, Gig0/2
10   HR                                active    Fa0/2
20   IT                                active    Fa0/1
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
Switch#
```

Switch 2

```
Switch#show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    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, Gig0/1, Gig0/2
10   HR                                active
20   IT                                active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
Switch#
```

CONCLUSION

In this way we can create multiple VLANs distributed in multiple switches and also perform the inter-VLAN routing in order to make communication possible among VLANs.