- There are two sub-interfaces (fa0/0.1 & fa0/0.2) in ROUTER-1 for inter-VLAN routing.

- There are two VLANs in SWITCH-1

- VLAN 2 (Faculty) ports: fa0/9 to 16 & VLAN 3 (Account) ports: fa0/1 to 8

- Fa0/17 is in trunk mode because we used inter-VLAN routing between VLAN2 & VLAN3

- User mode password : hdm123

- Privilege mode password : hdm456

SWITCH-1

Port	PC-Name	PC-IP address	Subnet Mask	Gateway	DNS Server	PC-MAC address
Fa0/1	Acc-2	192.168.40.2	255.255.255.0	192.168.40.1	192.168.100.162	0001.C774.42B2
Fa0/2	Acc-3	192.168.40.3	255.255.255.0	192.168.40.1	192.168.100.162	0060.3E0E.A72B
Fa0/3	Acc-4	192.168.40.4	255.255.255.0	192.168.40.1	192.168.100.162	0001.427E.D23E
Fa0/4	Acc-5	192.168.40.5	255.255.255.0	192.168.40.1	192.168.100.162	00D0.BABB.E093
Fa0/5	Acc-6	192.168.40.6	255.255.255.0	192.168.40.1	192.168.100.162	0090.0CAC.4E1C
Fa0/6	Acc-7	192.168.40.7	255.255.255.0	192.168.40.1	192.168.100.162	0050.0F02.8786
Fa0/7	Acc-8	192.168.40.8	255.255.255.0	192.168.40.1	192.168.100.162	00D0.BC9C.0A8D
Fa0/8	account.edu.in	192.168.40.254	255.255.255.0	192.168.40.1	192.168.100.162	0090.0CA6.A9E5
Fa0/9	Fac-2	192.168.20.2	255.255.255.0	192.168.20.1	192.168.100.162	00D0.97D0.E016
Fa0/10	Fac-3	192.168.20.3	255.255.255.0	192.168.20.1	192.168.100.162	00D0.5838.C5A3
Fa0/11	Fac-4	192.168.20.4	255.255.255.0	192.168.20.1	192.168.100.162	0009.7C10.9BA4
Fa0/12	Fac-5	192.168.20.5	255.255.255.0	192.168.20.1	192.168.100.162	0003.E456.8A87
Fa0/13	Fac-6	192.168.20.6	255.255.255.0	192.168.20.1	192.168.100.162	0001.648C.194D
Fa0/14	Fac-7	192.168.20.7	255.255.255.0	192.168.20.1	192.168.100.162	0004.9A51.3454
Fa0/15	cms.edu.in	192.168.20.253	255.255.255.0	192.168.20.1	192.168.100.162	0060.3E8A.5AA7
Fa0/16	faculty.edu.in	192.168.20.254	255.255.255.0	192.168.20.1	192.168.100.162	0001.4283.B869
Fa0/17						
Fa0/18						
Fa0/19						
Fa0/20						
Fa0/21						
Fa0/22						
Fa0/23						
Fa0/24		**TRUNK PORT (Connected to Router-1 in Fa0/0)**				

SWITCH-2

Port	PC-Name	PC-IP address	Subnet Mask	Gateway	DNS Server	PC-MAC address
Fa0/1	Stu-2	192.168.10.2	255.255.255.0	192.168.10.1	192.168.100.162	0030.F2D5.0289
Fa0/2	Stu-3	192.168.10.3	255.255.255.0	192.168.10.1	192.168.100.162	0060.702E.5B83
Fa0/3	Stu-4	192.168.10.4	255.255.255.0	192.168.10.1	192.168.100.162	0007.ECA9.C013
Fa0/4	Stu-5	192.168.10.5	255.255.255.0	192.168.10.1	192.168.100.162	00E0.A3C2.B701
Fa0/5	Stu-6	192.168.10.6	255.255.255.0	192.168.10.1	192.168.100.162	0050.0F32.C0A3
Fa0/6	Stu-7	192.168.10.7	255.255.255.0	192.168.10.1	192.168.100.162	0090.2138.B7E5
Fa0/7	Stu-8	192.168.10.8	255.255.255.0	192.168.10.1	192.168.100.162	0090.21BE.C89B
Fa0/8	Stu-9	192.168.10.9	255.255.255.0	192.168.10.1	192.168.100.162	0006.2A8A.2E0D
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		**Connected to Router-2 in Fa0/0**				

Router-1

Fa0/0.1 = 192.168.20.1

Fa0/0.2 = 192.168.40.1

Fa0/1 = 192.168.30.2

Se0/0/0 = 192.168.50.2

Router-2

Fa0/1 = 192.168.30.1

Fa0/0 = 192.168.10.1

ISP router

Se0/0/0 = 192.168.100.130

Se0/0/1 = 192.168.50.1

WAN-1 Router

Se0/0/0 = 192.168.100.33

Fa0/0 = 192.168.100.1

WAN-2 Router

Se0/0/0 = 192.168.100.34

Se0/0/1 = 192.168.100.97

Fa0/0 = 192.168.100.65

WAN-3 Router

Se0/0/0 = 192.168.100.98

Se0/0/1 = 192.168.100.129

ROUTER-1

Router>en

Router#conf t

Router(config)#hostname Router-1

Router-1(config)#int fa0/1

Router-1(config-if)#ip add 192.168.30.2 255.255.255.0

Router-1(config-if)#no sh

Router-1(config-router)#int se0/0/0

Router-1(config-if)#ip add 192.168.50.2 255.255.255.0

Router-1(config-if)#no sh

Router-1(config-subif)#int fa0/0

Router-1(config-if)#no sh

Router-1(config-if)#int fa0/0.1

Router-1(config-subif)#encapsulation dot1Q 2

Router-1(config-subif)#ip add 192.168.20.1 255.255.255.0

Router-1(config-subif)#int fa0/0.2

Router-1(config-subif)#encapsulation dot1Q 3

Router-1(config-subif)#ip add 192.168.40.1 255.255.255.0

Router-1(config-subif)#int Ethernet0/1/0

Router-1(config-if)#ip add 192.168.60.2 255.255.255.0

Router-1(config-if)#no sh

Router-1(config)#router ospf 1

Router-1(config-router)#net 192.168.20.0 0.0.0.255 area 0

Router-1(config-router)#net 192.168.30.0 0.0.0.255 area 0

Router-1(config-router)#net 192.168.40.0 0.0.0.255 area 0

Router-1(config-router)#net 192.168.50.0 0.0.0.255 area 0

Router-1(config-router)#net 192.168.60.0 0.0.0.255 area 0

ROUTER-1(ACL)

Created named acl = ACL2

Applied at FA0/0.1 - inside

Router-1(config)#IP access-list extended ACL2

Router-1(config-ext-nacl)#10 deny tcp 192.168.20.0 0.0.0.255 host 192.168.40.254 eq www

Router-1(config-ext-nacl)#20 deny tcp 192.168.20.0 0.0.0.255 host 192.168.40.254 eq 443

Router-1(config-ext-nacl)#30 permit ip any any

ROUTER-1(SSH)

Router-1(config)#ip domain-name mehta

Router-1(config)#crypto key generate rsa

How many bits in the modulus [512]: 1024

ROUTER-2

Router>en

Router#conf t

Router(config)#hostname Router-2

Router-2(config)#int fa0/0

Router-2(config-if)#ip add 192.168.10.1 255.255.255.0

Router-2(config-if)#no sh

Router-2(config-if)#int fa0/1

Router-2(config-if)#ip add 192.168.30.1 255.255.255.0

Router-2(config-if)#no sh

Router-2(config)#router ospf 1

Router-2(config-router)#net 192.168.10.0 0.0.0.255 area 0

Router-2(config-router)#net 192.168.30.0 0.0.0.255 area 0

ROUTER-2(ACL)

Created named acl = ACL1

Applied at FA0/0 – inside

Router-2(config)#IP access-list extended ACL1

Router-2(config-ext-nacl)#10 deny tcp 192.168.10.0 0.0.0.255 192.168.40.0 0.0.0.255 eq www

Router-2(config-ext-nacl)#20 deny tcp 192.168.10.0 0.0.0.255 192.168.40.0 0.0.0.255 eq 443

Router-2(config-ext-nacl)#30 deny tcp 192.168.10.0 0.0.0.255 192.168.20.0 0.0.0.254 eq www

Router-2(config-ext-nacl)#40 deny tcp 192.168.10.0 0.0.0.255 192.168.20.0 0.0.0.254 eq 443

Router-2(config-ext-nacl)#50 deny tcp 192.168.10.0 0.0.0.255 host 192.168.100.66 eq www

Router-2(config-ext-nacl)#60 deny tcp 192.168.10.0 0.0.0.255 host 192.168.100.66 eq 443

Router-2(config-ext-nacl)#70 deny icmp any 192.168.40.0 0.0.0.255

Router-2(config-ext-nacl)#80 deny icmp any 192.168.20.0 0.0.0.254

Router-2(config-ext-nacl)#90 deny icmp any host 192.168.100.66

Router-2(config-ext-nacl)#100 permit ip any any

ROUTER-2(SSH)

Router-2(config)#ip domain-name mehta

Router-2(config)#crypto key generate rsa

How many bits in the modulus [512]: 1024

ISP Router

Router>en

Router#conf t

Router(config)#hostname ISP

ISP(config-if)#int se0/0/1

ISP(config-if)#ip add 192.168.50.1 255.255.255.0

ISP(config-if)#no sh

ISP(config-if)#clock rate 64000

ISP(config-if)#int se0/0/0

ISP(config-if)#ip add 192.168.100.130 255.255.255.224

ISP(config-if)#clock rate 64000

ISP(config-if)#no sh

ISP(config)#router ospf 1

ISP(config-router)#net 192.168.50.0 0.0.0.255 area 0

ISP(config-router)#net 192.168.100.128 0.0.0.31 area 0

NAT in ISP Router

ISP>en

ISP#conf t

ISP(config)#access-list 10 deny 192.168.10.0 0.0.0.255

ISP(config)#access-list 10 deny 192.168.20.0 0.0.0.255

ISP(config)#access-list 10 deny 192.168.30.0 0.0.0.255

```
ISP(config)#access-list 10 deny 192.168.40.0 0.0.0.255

ISP(config)#access-list 10 deny 192.168.50.0 0.0.0.255

ISP(config)#access-list 10 permit any

ISP(config)#int se0/0/0

ISP(config-if)#ip access-group 10 out

ISP(config)#int se0/0/1

ISP(config-if)#ip nat inside

ISP(config-if)#int se0/0/0

ISP(config-if)#ip nat outside

ISP(config-if)#ex

ISP(config)#access-list 1 permit 192.168.10.0 0.0.0.255

ISP(config)#access-list 1 permit 192.168.20.0 0.0.0.255

ISP(config)#access-list 1 permit 192.168.30.0 0.0.0.255

ISP(config)#access-list 1 permit 192.168.40.0 0.0.0.255

ISP(config)#access-list 1 permit 192.168.50.0 0.0.0.255

ISP(config)#ip nat inside source list 1 interface se0/0/0 overload
```

WAN-1 Router

Router>en

Router#conf t

Router(config)#hostname WAN-1

WAN-1(config)#int fa0/0

WAN-1(config-if)#ip add 192.168.100.1 255.255.255.224

WAN-1(config-if)#no sh

WAN-1(config-if)#int se0/0/0

WAN-1(config-if)#ip add 192.168.100.33 255.255.255.224

WAN-1(config-if)#no sh

WAN-1(config-if)#clock rate 64000

WAN-1(config)#router ospf 1

WAN-1(config-router)#net 192.168.100.0 0.0.0.31 area 0

WAN-1(config-router)#net 192.168.100.32 0.0.0.31 area 0

WAN-2 Router

Router>en

Router#conf t

Router(config)#hostname WAN-2

WAN-2(config)#int se0/0/0

WAN-2(config-if)#ip add 192.168.100.34 255.255.255.224

WAN-2(config-if)#no sh

WAN-2(config-if)#int fa0/0

WAN-2(config-if)#ip add 192.168.100.65 255.255.255.224

WAN-2(config-if)#no sh

WAN-2(config-if)#int se0/0/1

WAN-2(config-if)#ip add 192.168.100.97 255.255.255.224

WAN-2(config-if)#clock rate 64000

WAN-2(config-if)#no sh

WAN-2(config)#router ospf 1

WAN-2(config-router)#net 192.168.100.32 0.0.0.31 area 0

WAN-2(config-router)#net 192.168.100.64 0.0.0.31 area 0

WAN-2(config-router)#net 192.168.100.96 0.0.0.31 area 0

WAN-3 Router

Router>en

Router#conf t

Router(config)#hostname WAN-3

WAN-3(config)#int se0/0/0

WAN-3(config-if)#ip add 192.168.100.98 255.255.255.224

WAN-3(config-if)#no sh

WAN-3(config-if)#int se0/0/1

WAN-3(config-if)#ip add 192.168.100.129 255.255.255.224

WAN-3(config-if)#no sh

WAN-3(config)#router ospf 1

WAN-3(config-router)#net 192.168.100.96 0.0.0.31 area 0

WAN-3(config-router)#net 192.168.100.128 0.0.0.31 area 0

SWITCH-1

Switch>en

Switch#conf t

Switch-1(config)#hostname Switch-1

Switch-1(config)#vlan 2

Switch-1(config-vlan)#name Faculty

Switch-1(config-vlan)#vlan 3

Switch-1(config-vlan)#name Account

Switch-1(config-vlan)#exit

Switch-1(config)#int range fa0/1-8

Switch-1(config-if-range)#switchport access vlan 3

Switch-1(config-if-range)#int range fa0/9-16

Switch-1(config-if-range)#switchport access vlan 2

Switch-1(config-if-range)#int fa0/24

Switch-1(config-if)#switchport mode trunk

Switch-1#copy run start

SWITCH-1 (Port-security) – Account and Faculty Department

Switch-1(config)#interface range fa0/17-23

Switch-1(config-if-range)#shutdown

Switch-1(config)#int fa0/1

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0001.C774.42B2

Switch-1(config-if)#int fa0/2

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0060.3E0E.A72B

Switch-1(config-if)#int fa0/3

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0001.427E.D23E

Switch-1(config-if)#int fa0/4

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 00D0.BABB.E093

Switch-1(config-if)#int fa0/5

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0090.0CAC.4E1C

Switch-1(config-if)#int fa0/6

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0050.0F02.8786

Switch-1(config-if)#int fa0/7

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 00D0.BC9C.0A8D

Switch-1(config-if)#int fa0/8

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0090.0CA6.A9E5

Switch-1(config-if)#int fa0/9

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 00D0.97D0.E016

Switch-1(config-if)#int fa0/10

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 00D0.5838.C5A3

Switch-1(config-if)#int fa0/11

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0009.7C10.9BA4

Switch-1(config-if)#int fa0/12

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0003.E456.8A87

Switch-1(config-if)#int fa0/13

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0001.648C.194D

Switch-1(config-if)#int fa0/14

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0004.9A51.3454

Switch-1(config-if)#int fa0/15

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0060.3E8A.5AA7

Switch-1(config-if)#int fa0/16

Switch-1(config-if)#switchport mode access

Switch-1(config-if)#switchport port-security

Switch-1(config-if)#switchport port-security mac-address 0001.4283.B869

Switch-1#copy run start

How to check security violation in port-security

Switch-1#show port-security interface fa0/1

SWITCH-1(SSH)

Switch-1(config)#ip default-gateway 192.168.20.1

Switch-1(config)#ip domain-name mehta

Switch-1(config)#crypto key generate rsa

Switch-1(config)#int vlan 2

Switch-1(config-if)#ip add 192.168.20.250 255.255.255.0

Switch-1(config-if)#no sh

SWITCH-2 (Port-security) – Student LAB

Switch>en

Switch#conf t

Switch-2(config)#hostname Switch-2

Switch-2(config)#interface range fa0/9-23

Switch-2(config-if-range)#shutdown

Switch-2(config)#int fa0/1

Switch-2(config-if)#switchport mode access

Switch-2(config-if)#switchport port-security

Switch-2(config-if)#switchport port-security mac-address 0030.F2D5.0289

Switch-2(config-if)#int fa0/2

Switch-2(config-if)#switchport mode access

Switch-2(config-if)#switchport port-security

Switch-2(config-if)#switchport port-security mac-address 0060.702E.5B83

Switch-2(config-if)#int fa0/3

Switch-2(config-if)#switchport mode access

Switch-2(config-if)#switchport port-security

Switch-2(config-if)#switchport port-security mac-address 0007.ECA9.C013

Switch-2(config-if)#int fa0/4

Switch-2(config-if)#switchport mode access

Switch-2(config-if)#switchport port-security

Switch-2(config-if)#switchport port-security mac-address 00E0.A3C2.B701

Switch-2(config-if)#int fa0/5

Switch-2(config-if)#switchport mode access

Switch-2(config-if)#switchport port-security

Switch-2(config-if)#switchport port-security mac-address 0050.0F32.C0A3

Switch-2(config-if)#int fa0/6

Switch-2(config-if)#switchport mode access

Switch-2(config-if)#switchport port-security

Switch-2(config-if)#switchport port-security mac-address 0090.2138.B7E5

Switch-2(config-if)#int fa0/7

Switch-2(config-if)#switchport mode access

Switch-2(config-if)#switchport port-security

Switch-2(config-if)#switchport port-security mac-address 0090.21BE.C89B

Switch-2(config-if)#int fa0/8

Switch-2(config-if)#switchport mode access

Switch-2(config-if)#switchport port-security

Switch-2(config-if)#switchport port-security mac-address 0006.2A8A.2E0D

Switch-2#copy run start

SWITCH-2(SSH)

Switch-2(config)#ip default-gateway 192.168.10.1

Switch-2(config)#ip domain-name mehta

Switch-2(config)#crypto key generate rsa

How many bits in the modulus [512]: 1024

Switch-2(config)#int vlan 1

Switch-2(config-if)#ip add 192.168.10.250 255.255.255.0

Switch-2(config-if)#no sh

SWITCH-3(SSH)

Switch>en

Switch#conf t

Switch-3(config)#ip default-gateway 192.168.30.2

Switch-3(config)#ip domain-name mehta

Switch-3(config)#crypto key generate rsa

How many bits in the modulus [512]: 1024

Switch-3(config)#int vlan 1

Switch-3(config-if)#ip add 192.168.30.250 255.255.255.0

Switch-3(config-if)#no sh

How to connect to SSH from Network Admin Laptop

PC> ssh -l mehta 192.168.60.1