Router infotech
Beyond Certification

STUDENT LAB GUIDE

CCNA (640-802)

CCNA
CISCO

Developed By,

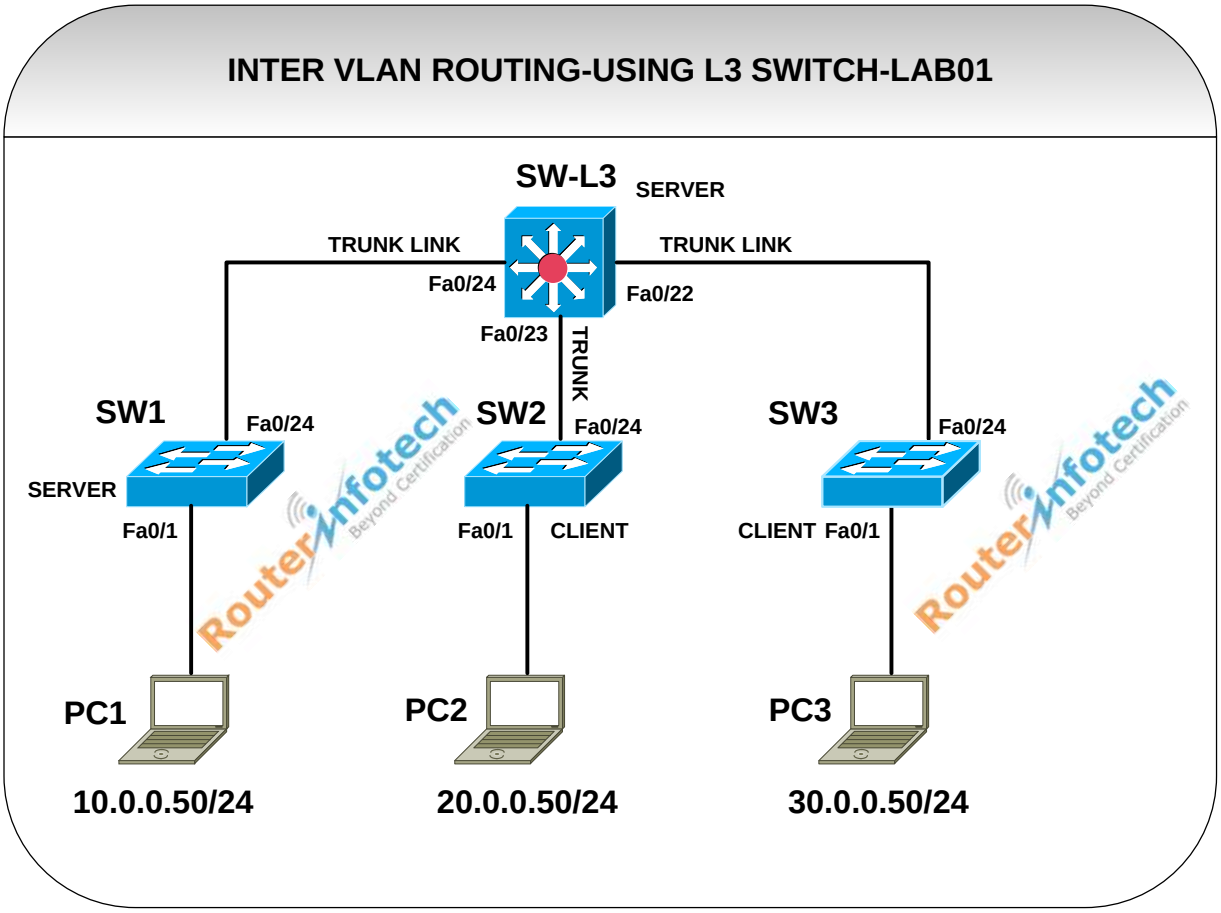
Router Infotech Career Academy

LAB: 07
INTER VLAN ROUTING – USING L3 SWITCH

Objective:

To configure L3 switch in order to obtain Inter VLAN Routing (also called as **Switched Virtual Interface -SVI**) & test its all functionalities practically.

TOPOLOGY: Setup your lab topology as below.



Procedure:

1. Configure all the switches hostnames & Trunking Ports as shown in above topology.
2. Configure VTP domain name as **routerinfotech** on SW1.
3. Change the default VTP mode on SW2 & SW3 as **client** .
4. Create VLAN 10 having name **'QC'**, VLAN 20 having name **'QA'** and VLAN 30 having name **'TESTING'** on SW1.
5. Verify your VTP configuration (operating mode, domain name, rivision number & VLAN's etc.) on SW1, SW2, SW3 and SW-L3 .
6. Apply VLAN 10 to interface fastEthernet 0/1 of SW1,
   Apply VLAN 20 to interface fastEthernet 0/1 of SW2 and also
   Apply VLAN 30 to interface fastEthernet 0/1 of SW3
7. Verify VLAN configuration on SW1, SW2 & SW3.
8. Configure SW-L3 to obtain Inter VLAN Routing & verify VLAN configuration on it.
9. Verify the connectivity between PC1, PC2 & PC3 **(VLAN 10, VLAN 20 & VLAN 30)**.

Configuration:

Step 1:

1.1 : Configure the Trunking Ports on SW-L3 as shown in above topology .

```
SW-L3(config)#interface fastEthernet 0/22
SW-L3(config-if)#switchport mode trunk

SW-L3(config)#interface fastEthernet 0/23
SW-L3(config-if)#switchport mode trunk

SW-L3(config)#interface fastEthernet 0/24
SW-L3(config-if)#switchport mode trunk
```

1.2 : Configure the Trunking Port on SW1 as shown in above topology .

```
SW1(config)#interface fastEthernet 0/24
SW1(config-if)#switchport mode trunk
```

1.3 : Configure the Trunking Port on SW2 as shown in above topology .

```
SW2(config)#interface fastEthernet 0/24
SW2(config-if)#switchport mode trunk
```

1.4 : Configure the Trunking Port on SW3 as shown in above topology .

```
SW3(config)#interface fastEthernet 0/24
SW3(config-if)#switchport mode trunk
```

NOTE : You can use show interfaces trunk command to verify on which interfaces trunking is enabled on switches SW-L3, SW1, SW2 and SW3.

E.g SW1#show interfaces trunk

Step 2:

2.1 : Configure VTP domain name as **routerinfotech** on SW1**.**

```
SW1(config)#vtp domain routerinfotech
Changing VTP domain name from NULL to routerinfotech
```

Step 3:

3.1 : Change the default VTP mode on SW2 as **client.**

```
SW2(config)#vtp mode client
Setting device to VTP CLIENT mode.
```

3.2 : Change the default VTP mode on SW3 as **client.**

```
SW3(config)#vtp mode client
Setting device to VTP CLIENT mode.
```

Step 4:

4.1: Create VLAN 10 having name '**QC**', VLAN 20 having name **'QA'** and VLAN 30 having name **'TESTING'** on SW1.

```
SW1(config)#vlan 10
SW1(config-vlan)#name QC
SW1(config-vlan)#vlan 20
SW1(config-vlan)#name QA
SW1(config-vlan)#vlan 30
SW1(config-vlan)#name TESTING
```

Step 5:

5.1: Verify your VTP configuration (operating mode, domain name, rivision number & VLAN's etc.) on SW1.

```
SW1#show vtp status
VTP Version                     : 2
Configuration Revision          : 6
Maximum VLANs supported locally : 255
Number of existing VLANs        : 8
VTP Operating Mode              : Server
```

```
VTP Domain Name                 : routerinfotech
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x11 0xC7 0xD9 0x86 0x10 0x99 0xF8
0xD4
Configuration last modified by 0.0.0.0 at 3-1-93 00:16:55
Local updater ID is 0.0.0.0 (no valid interface found)
```

5.2: Verify your VTP configuration (operating mode, domain name, rivision number & VLAN's etc.) on SW2.

```
SW2#show vtp status
VTP Version                     : 2
Configuration Revision          : 6
Maximum VLANs supported locally : 255
Number of existing VLANs        : 8
VTP Operating Mode              : Client
VTP Domain Name                 : routerinfotech
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x11 0xC7 0xD9 0x86 0x10 0x99 0xF8
0xD4
Configuration last modified by 0.0.0.0 at 3-1-93 00:16:55
Local updater ID is 0.0.0.0 (no valid interface found)
```

5.3: Verify your VTP configuration (operating mode, domain name, rivision number & VLAN's etc.) on SW3.

```
SW3#show vtp status
VTP Version                     : 2
Configuration Revision          : 6
Maximum VLANs supported locally : 255
Number of existing VLANs        : 8
VTP Operating Mode              : Client
VTP Domain Name                 : routerinfotech
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x11 0xC7 0xD9 0x86 0x10 0x99 0xF8
0xD4
Configuration last modified by 0.0.0.0 at 3-1-93 00:16:55
Local updater ID is 0.0.0.0 (no valid interface found)
```

5.4: Verify your VTP configuration (operating mode, domain name, rivision number & VLAN's etc.) on SW-L3.

```
SW-L3#show vtp status
VTP Version                     : 2
Configuration Revision          : 6
Maximum VLANs supported locally : 1005
Number of existing VLANs        : 8
VTP Operating Mode              : Server
VTP Domain Name                 : routerinfotech
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x11 0xC7 0xD9 0x86 0x10 0x99 0xF8
0xD4
Configuration last modified by 0.0.0.0 at 3-1-93 00:16:55
Local updater ID is 0.0.0.0 (no valid interface found)
```

Step 6:

6.1: Apply VLAN 10 to interface fastEthernet 0/1 of SW1

```
SW1(config)#interface fastEthernet 0/1
SW1(config-if)#switchport mode access
SW1(config-if)#switchport access vlan 10
```

6.2: Apply VLAN 20 to interface fastEthernet 0/1 of SW2

```
SW2(config)#interface fastEthernet 0/1
SW2(config-if)#switchport mode access
SW2(config-if)#switchport access vlan 20
```

6.3: Apply VLAN 30 to interface fastEthernet 0/1 of SW3

```
SW3(config)#interface fastEthernet 0/1
SW3(config-if)#switchport mode access
SW3(config-if)#switchport access vlan 30
```

Step 7:

7.1: Verify VLAN configuration on SW1, SW2 & SW3.

```
SW1#show vlan

VLAN  Name                             Status    Ports
----  -------------------------------- --------- -------------------------------
1     default                          active    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
10    QC                               active    Fa0/1
20    QA                               active
30    TESTING                          active
1002  fddi-default                     act/unsup
1003  token-ring-default               act/unsup
1004  fddinet-default                  act/unsup
1005  trnet-default                    act/unsup

SW2#show vlan

VLAN  Name                             Status    Ports
----  -------------------------------- --------- -------------------------------
1     default                          active    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
10    QC                               active
20    QA                               active    Fa0/1
30    TESTING                          active
1002  fddi-default                     act/unsup
1003  token-ring-default               act/unsup
1004  fddinet-default                  act/unsup
1005  trnet-default                    act/unsup

SW3#show vlan

VLAN  Name                             Status    Ports
----  -------------------------------- --------- -------------------------------
1     default                          active    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
10    QC                                active
20    QA                                active
30    TESTING                           active     Fa0/1

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

Step 8:

8.1: Configure VLAN interfaces on SW-L3 to obtain Inter VLAN Routing.

```
SW-L3(config)#interface vlan 10

%LINK-5-CHANGED: Interface Vlan10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan10, changed state
to upSW-L3(config-if)#ip address 10.0.0.1 255.255.255.0
SW-L3(config-if)#no shutdown


SW-L3(config)#interface vlan 20

%LINK-5-CHANGED: Interface Vlan20, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan20, changed state
to upSW-L3(config-if)#ip address 20.0.0.1 255.255.255.0
SW-L3(config-if)#no shutdown



SW-L3(config)#interface vlan 30

%LINK-5-CHANGED: Interface Vlan30, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state
to upSW-L3(config-if)#ip address 30.0.0.1 255.255.255.0
SW-L3(config-if)#no shutdown
```

8.2: Verify VLAN configuration on SW-L3.

```
SW-L3#show vlan

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, Gig0/1, Gig0/2
10   QC                               active
20   QA                               active
30   TESTING                          active
1002 fddi-default                     act/unsup
1003 token-ring-default               act/unsup
1004 fddinet-default                  act/unsup
1005 trnet-default                    act/unsup
```

Step 9:

9.1 : Verify the connectivity between PC1, PC2 & PC3 (VLAN 10, VLAN 20 & VLAN 30)

```
PC1>ping 20.0.0.50
Pinging 20.0.0.50 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.50: bytes=32 time=125ms TTL=127
Reply from 20.0.0.50: bytes=32 time=110ms TTL=127
Ping statistics for 20.0.0.50:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 110ms, Maximum = 125ms, Average = 115ms
PC1>ping 30.0.0.50
Pinging 30.0.0.50 with 32 bytes of data:
Request timed out.
Reply from 30.0.0.50: bytes=32 time=109ms TTL=127
Reply from 30.0.0.50: bytes=32 time=125ms TTL=127
Reply from 30.0.0.50: bytes=32 time=125ms TTL=127
Ping statistics for 30.0.0.50:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 109ms, Maximum = 125ms, Average = 119ms
```