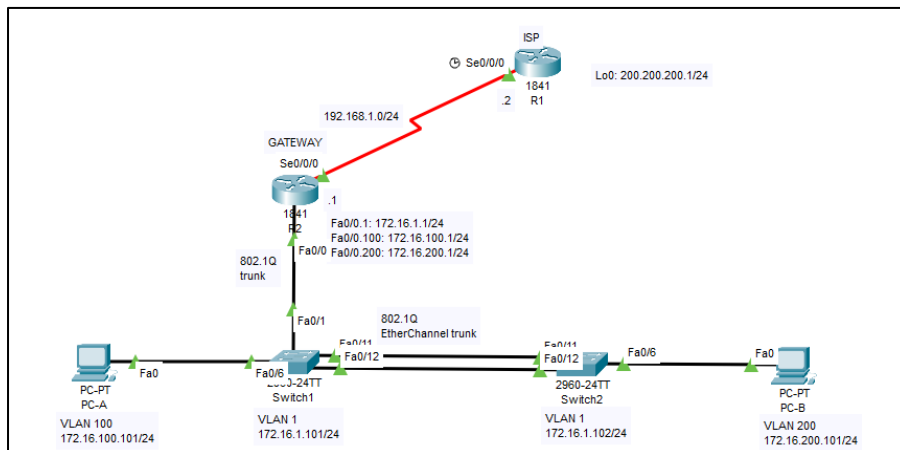
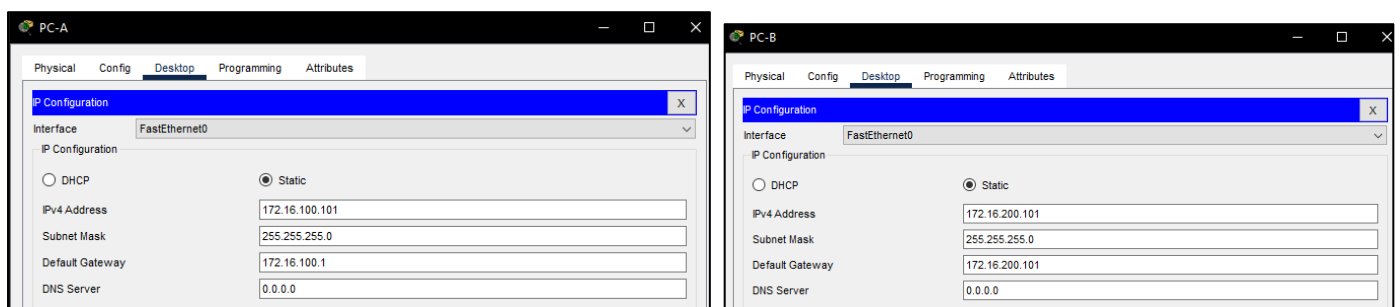


Practical 11→ Inter VLAN Routing with an External Router

TOPOLOGY→



STEP 1→ Configure the host.



STEP 2→ Configuring the routers.

```
ISP(config)#int lo0
ISP(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
ISP(config-if)#ip add 200.200.200.1 255.255.255.0
ISP(config-if)#int se0/0/0
ISP(config-if)#ip add 192.168.1.2 255.255.255.0
ISP(config-if)#no shut
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
ISP(config-if)#exit
```

```
ISP(config)#ip route 172.16.0.0 255.255.0.0 192.168.1.1
ISP(config)#
```

```

Router(config)#hostname Gateway
Gateway(config)#int se0/0/0
Gateway(config-if)#ip add 192.168.1.1 255.255.255.0
Gateway(config-if)#no shut

Gateway(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Gateway(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

Gateway(config-if)#ip route 0.0.0.0 0.0.0.0 192.168.1.2
Gateway(config)#^Z
Gateway#
%SYS-5-CONFIG_I: Configured from console by console

Gateway#ping 192.168.1.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.2, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/8/29 ms

```

STEP 3→ Configuring the switches.

```

ALS1(config)#int vlan 1
ALS1(config-if)#ip add 172.16.1.101 255.255.255.0
ALS1(config-if)#no shut

ALS1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

ALS1(config-if)#exit
ALS1(config)#ip default-gateway 172.16.1.2
ALS1(config)#ip default-gateway 172.16.1.1

ALS2(config)#int vlan 1
ALS2(config-if)#ip add 172.16.1.102 255.255.255.0
ALS2(config-if)#no shut

ALS2(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

ALS2(config-if)#exit
ALS2(config)#ip default-gateway 172.16.1.1

```

Step 4→ Confirm the VLANs

```

ALS1#sh 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, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

```

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Transl Trans2
1 enet 100001 1500 - - - - - 0 0
1002 fddi 101002 1500 - - - - - 0 0
1003 tr 101003 1500 - - - - - 0 0
1004 fdnet 101004 1500 - - - ieee - 0 0
1005 trnet 101005 1500 - - - ibm - 0 0
--More--

```

Step 5→ Configure trunk links and EtherChannels on Switches

```

ALS1(config)#int range fa0/11-12
ALS1(config-if-range)#switchport mode trunk

ALS1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up

```

```

ALS1(config-if-range)#channel-group 1 mode desirable
ALS1(config-if-range)#
Creating a port-channel interface Port-channel 1

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up

```

```

ALS2(config)#int range fa0/11-12
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#channel-group 1 mode desirable
ALS2(config-if-range)#
Creating a port-channel interface Port-channel 1

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up

%LINK-5-CHANGED: Interface Port-channel1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel1, changed state to up

```

```

ALS1#sh etherchannel summary

Flags:  D - down          P - in port-channel
        I - stand-alone  s - suspended
        H - Hot-standby (LACP only)
        R - Layer3       S - Layer2
        U - in use       f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port

Number of channel-groups in use: 1
Number of aggregators:          1

Group  Port-channel  Protocol    Ports
-----+-----+-----+-----
1      Po1(SU)        PAgP       Fa0/11(P) Fa0/12(P)
ALS1#

```

Step 6→

Configure VTP(Virtual Transport Protocol)

```

Feature VLAN :
-----
VTP Operating Mode : Server
Maximum VLANs supported locally : 255
Number of existing VLANs : 5
Configuration Revision : 0
MD5 digest : 0x7D 0x5A 0xA6 0x0E 0x9A 0x72 0xA0 0x3A
             0xF0 0x58 0x10 0x6C 0x9C 0x0F 0xA0 0xF7

ALS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#vtp mode client
Setting device to VTP CLIENT mode.

```

```

ALS2#sh vtp status
VTP Version capable      : 1 to 2
VTP version running      : 1
VTP Domain Name          :
VTP Pruning Mode         : Disabled
VTP Traps Generation     : Disabled
Device ID                : 0001.4200.D520
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

Feature VLAN :
-----
VTP Operating Mode       : Client
Maximum VLANs supported locally : 255

```

```

ALS1(config)#vtp version 2

```

```

ALS1#sh vtp status
VTP Version capable      : 1 to 2
VTP version running      : 2
VTP Domain Name          :
VTP Pruning Mode         : Disabled
VTP Traps Generation     : Disabled
Device ID                : 0003.E499.7DD0
Configuration last modified by 172.16.1.101 at 3-1-93 00:41:05
Local updater ID is 172.16.1.101 on interface Vll (lowest numbered VLAN interface found)

```

Step 7→ Configure VLANs and Switch Access Ports

```

ALS1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#vtp domain SWLAB

```

```

ALS1(config-vlan)#vlan 100
ALS1(config-vlan)#name Payroll
ALS1(config-vlan)#vlan 200
ALS1(config-vlan)#name Engineering

```

```

ALS2#sh 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, Fa0/13, 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
100 Payroll	active	
200 Engineering	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

Step 8→ Statically assigning the Switch port mode to Access.

```

ALS1(config)#int fa0/6
ALS1(config-if)#switchport mode access
ALS1(config-if)#switchport access vlan 100
ALS1(config-if)#spanning-tree portfast

```

```

ALS2(config)#int fa0/6
ALS2(config-if)#switchport mode access
ALS2(config-if)#switchport access vlan 200
ALS2(config-if)#spanning-tree portfast

```

```

ALS1#sh vlan brief

```

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/7, Fa0/8, Fa0/9 Fa0/10, 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
100 Payroll	active	Fa0/6
200 Engineering	active	
1002 fddi-default	active	

```

ALS2#sh vlan brief
VLAN Name                Status    Ports
-----
1    default                active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                           Fa0/5, Fa0/7, Fa0/8, Fa0/9
                                           Fa0/10, 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
100  Payroll                 active
200  Engineering              active    Fa0/6
1002 fddi-default          active
1003 token-ring-default     active

```

Step 9→ Configuring ASL1 trunking to the gateway router

```

ALS1(config)#int fa0/1
ALS1(config-if)#switchport mode trunk
ALS1(config-if)#end
ALS1#
%SYS-5-CONFIG_I: Configured from console by console

```

Step 10→ Configure the gateway router Fast Ethernet interface for VLAN trunking.

Press RETURN to get started.

```

Gateway>en
Gateway#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Gateway(config)#int fa0/0
Gateway(config-if)#no shut

Gateway(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

```

Step 11→ Creating sub-interfaces for each VLAN.

```

Gateway(config-if)#int fa0/0.1
Gateway(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up

Gateway(config-subif)#description Management VLAN 1
Gateway(config-subif)#encapsulation dot1q 1 native
Gateway(config-subif)#ip add 172.16.1.1 255.255.255.0

```

```

Gateway(config-subif)#int fa0/0.100
Gateway(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.100, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.100, changed state to up

Gateway(config-subif)#description Payroll VLAN 100
Gateway(config-subif)#encapsulation dot1q 100
Gateway(config-subif)#ip add 172.16.100.1 255.255.255.0
Gateway(config-subif)#int fa0/0.200
Gateway(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.200, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.200, changed state to up

```

```

Gateway(config-subif)#int fa0/0.200
Gateway(config-subif)#description Engineering VLAN 200
Gateway(config-subif)#encapsulation dot1q 200
Gateway(config-subif)#ip add 172.16.200.1 255.255.255.0

```