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School of Information Technology and Engineering
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COURSE CODE	CSE3502
COURSE NAME	INFORMATION SECURITY MANAGEMENT
SLOT	L39+L40
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IP ADDRESS:

```
C:\Users\PRIYAL BHARDWAJ>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 3:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::409:b1aa:4003:4def%16
    IPv4 Address. . . . . : 192.168.56.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :

Wireless LAN adapter Local Area Connection* 13:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::20d7:3761:fb6a:3d8%9
    IPv4 Address. . . . . : 192.168.1.12
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

Ethernet adapter Bluetooth Network Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
```

DOB:

Personal Information	Educational Information	Family Information	Proctor Details
Application Number			2018013568
Student Name			PRIYAL BHARDWAJ
Date Of Birth			20-Jan-2000

Lab – Implement VLANs and Trunking (6 Marks)

Topology



Addressing Table:

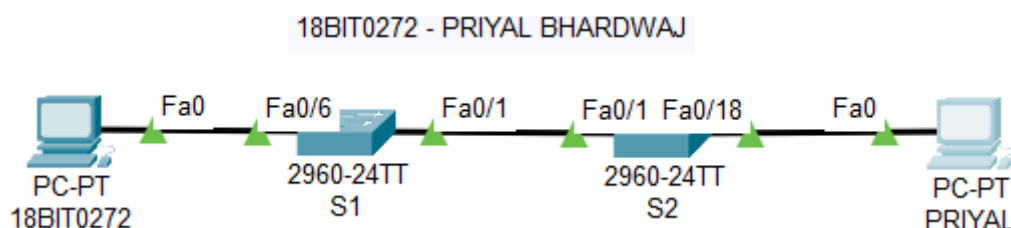
Device	Interface	IP Address	Subnet Mask
S1	VLAN 10	192.168.10.72	255.255.255.0
	VLAN 20	192.168.20.72	255.255.255.0
	VLAN 30	192.168.30.72	255.255.255.0
S2	VLAN 10	192.168.10.02	255.255.255.0
18BIT0272	NIC	192.168.20.20	255.255.255.0
PRIYAL	NIC	192.168.30.20	255.255.255.0

VLAN Table:

VLAN	NAME	INTERFACE ASSIGNED
10	Management	S1: VLAN 10
		S2: VLAN 10
20	Sales	S1: VLAN 20
		S1: F0/6
30	Operations	S1: VLAN 30
		S2: F0/18
999	ParkingLot	S1: F0/2-5, F0/7-24, G0/1-2
		S2: F0/2-17, F0/19-24, G0/1-2
1000	Native	N/A

Part 1: Build the Network and Configure Basic Device Settings

Step 1: Cable the network as shown in the topology.



Step 2: Configure basic settings for each switch.

S1:

1. Console into the switch and enable privileged EXEC mode.

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
```

2. Assign a device name to the switch.

```
| Switch(config)#hostname S1
```

3. Disable DNS lookup.

```
| S1(config)#no ip domain-lookup
```

4. Assign class as the privileged EXEC encrypted password.

```
| S1(config)#enable secret class
```

5. Assign cisco as the console password and enable login.

```
| S1(config)#line console 0  
| S1(config-line)#password cisco  
| S1(config-line)#login
```

6. Assign cisco as the VTY password and enable login.

```
| S1(config-line)#line vty 0 15  
| S1(config-line)#password cisco  
| S1(config-line)#login
```

7. Encrypt the plaintext passwords.

```
| S1(config-line)#service password-encryption
```

8. Create a banner that warns anyone accessing the device that unauthorized access is prohibited.

```
| S1(config)#banner motd $ Authorized Users Only! $
```

9. Copy the running configuration to the start-up configuration.

```
| S1(config)#exit  
| S1#  
| %SYS-5-CONFIG_I: Configured from console by console  
  
| S1#copy running-config startup-config  
| Destination filename [startup-config]?  
| Building configuration...  
| [OK]
```

S2:

1. Console into the switch and enable privileged EXEC mode.

```
| Switch>en  
| Switch#conf t  
| Enter configuration commands, one per line. End with CNTL/Z.
```

2. Assign a device name to the switch.

```
| Switch(config)#hostname S2
```

3. Disable DNS lookup.

```
| S2(config)#no ip domain-lookup
```

4. Assign class as the privileged EXEC encrypted password.

```
| S2(config)#enable secret class
```

5. Assign **cisco** as the console password and enable login.

```
S2(config)#line console 0
S2(config-line)#password cisco
S2(config-line)#login
```

6. Assign **cisco** as the VTY password and enable login.

```
S2(config-line)#line vty 0 15
S2(config-line)#password cisco
S2(config-line)#login
```

7. Encrypt the plaintext passwords.

```
S2(config-line)#service password-encryption
```

8. Create a banner that warns anyone accessing the device that unauthorized access is prohibited.

```
S2(config)#banner motd $ Authorized Users Only! $
```

9. Copy the running configuration to the start-up configuration.

```
S2(config)#exit
S2#
%SYS-5-CONFIG_I: Configured from console by console

S2#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

Part 1 Step 2 all steps for both S1 and S2:

S1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#no ip domain-lookup
S1(config)#enable secret class
S1(config)#line console 0
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#line vty 0 15
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#service password-encryption
S1(config)#banner motd $ Authorized Users Only! $
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
S1#
```

Ctrl+F6 to exit CLI focus

Copy Paste

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S2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S2
S2(config)#no ip domain-lookup
S2(config)#enable secret class
S2(config)#line console 0
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#line vty 0 15
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#service password-encryption
S2(config)#banner motd $ Authorized Users Only! $
S2(config)#exit
S2#
%SYS-5-CONFIG_I: Configured from console by console

S2#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
S2#
```

Ctrl+F6 to exit CLI focus

Copy Paste

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Step 3: Configure PC hosts.

18BIT0272:

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.20.20

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::2E0:F9FF:FE9C:EAE1

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

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PRIYAL:

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.30.20

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::260:3EFF:FEAA:72ED

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

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Part 2: Create VLANs and Assign Switch Ports

In Part 2, you will create VLANs as specified in the table above on both switches. You will then assign the VLANs to the appropriate interface. The **show vlan brief** command is used to verify your configuration settings. Complete the following tasks on each switch.

Step 1: Create VLANs on both switches.

S1:

1. Create and name the required VLANs on each switch from the table above.

Authorized Users Only!

User Access Verification

Password:

S1>en

Password:

S1#conf t

Enter configuration commands, one per line. End with CNTL/Z.

S1(config)#vlan 10

S1(config-vlan)#name Management

S1(config-vlan)#vlan 20

S1(config-vlan)#name Sales

S1(config-vlan)#vlan 30

S1(config-vlan)#name Operations

S1(config-vlan)#vlan 999

S1(config-vlan)#name ParkingLot

S1(config-vlan)#vlan 1000

S1(config-vlan)#name Native

2. Configure the management interface on each switch using the IP address information in the Addressing Table.

```

S1(config-vlan)#^Z
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#en
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface vlan 10
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan10, changed state to up
ip address 192.168.10.72 255.255.255.0
S1(config-if)#interface vlan 20
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan20, changed state to up
ip address 192.168.20.72 255.255.255.0
S1(config-if)#interface vlan 30
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan30, changed state to up
ip address 192.168.30.72 255.255.255.0

```

3. Assign all unused ports on the switch to the ParkingLot VLAN, configure them for static access mode, and administratively deactivate them.

```

S1(config-if)#exit
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface range f0/2-5, f0/7-24, g0/1-2
S1(config-if-range)#switchport mode access
S1(config-if-range)#switchport access vlan 999
S1(config-if-range)#shutdown

```

S2:

1. Create and name the required VLANs on each switch from the table above.

Authorized Users Only!

User Access Verification

Password:

```

S2>en
Password:
S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#vlan 10
S2(config-vlan)#name Management
S2(config-vlan)#vlan 20
S2(config-vlan)#name Sales
S2(config-vlan)#vlan 30
S2(config-vlan)#name Operations
S2(config-vlan)#vlan 999
S2(config-vlan)#name ParkingLot
S2(config-vlan)#vlan 1000
S2(config-vlan)#name Native

```

2. Configure the management interface on each switch using the IP address information in the Addressing Table.

```
S2(config-vlan)#^Z
S2#
%SYS-5-CONFIG_I: Configured from console by console
```

```
S2#en
S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#interface vlan 10
S2(config-if)#
%LINK-5-CHANGED: Interface Vlan10, changed state to up
ip address 192.168.10.02 255.255.255.0
```

3. Assign all unused ports on the switch to the ParkingLot VLAN, configure them for static access mode, and administratively deactivate them.

```
S2(config-if)#exit
S2(config)#exit
S2#
%SYS-5-CONFIG_I: Configured from console by console
```

```
S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#interface range f0/2-17, f0/19-24, g0/1-2
S2(config-if-range)#switchport mode access
S2(config-if-range)#switchport access vlan 999
S2(config-if-range)#shutdown
```

Part 2 Step 1 all steps for both S1 and S2:

S1

Physical Config **CLI** Attributes

IOS Command Line Interface

```

Authorized Users Only!

User Access Verification

Password:

S1>en
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#vlan 10
S1(config-vlan)#name Management
S1(config-vlan)#vlan 20
S1(config-vlan)#name Sales
S1(config-vlan)#vlan 30
S1(config-vlan)#name Operations
S1(config-vlan)#vlan 999
S1(config-vlan)#name ParkingLot
S1(config-vlan)#vlan 1000
S1(config-vlan)#name Native
S1(config-vlan)#^Z
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#en
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface vlan 10
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan10, changed state to up
ip address 192.168.10.72 255.255.255.0
S1(config-if)#interface vlan 20
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan20, changed state to up
ip address 192.168.20.72 255.255.255.0
S1(config-if)#interface vlan 30
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan30, changed state to up
ip address 192.168.30.72 255.255.255.0
S1(config-if)#exit
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface range f0/2-5, f0/7-24, g0/1-2
S1(config-if-range)#switchport mode access
S1(config-if-range)#switchport access vlan 999
S1(config-if-range)#shutdown

```

S2

Physical Config **CLI** Attributes

IOS Command Line Interface

```

Authorized Users Only!

User Access Verification

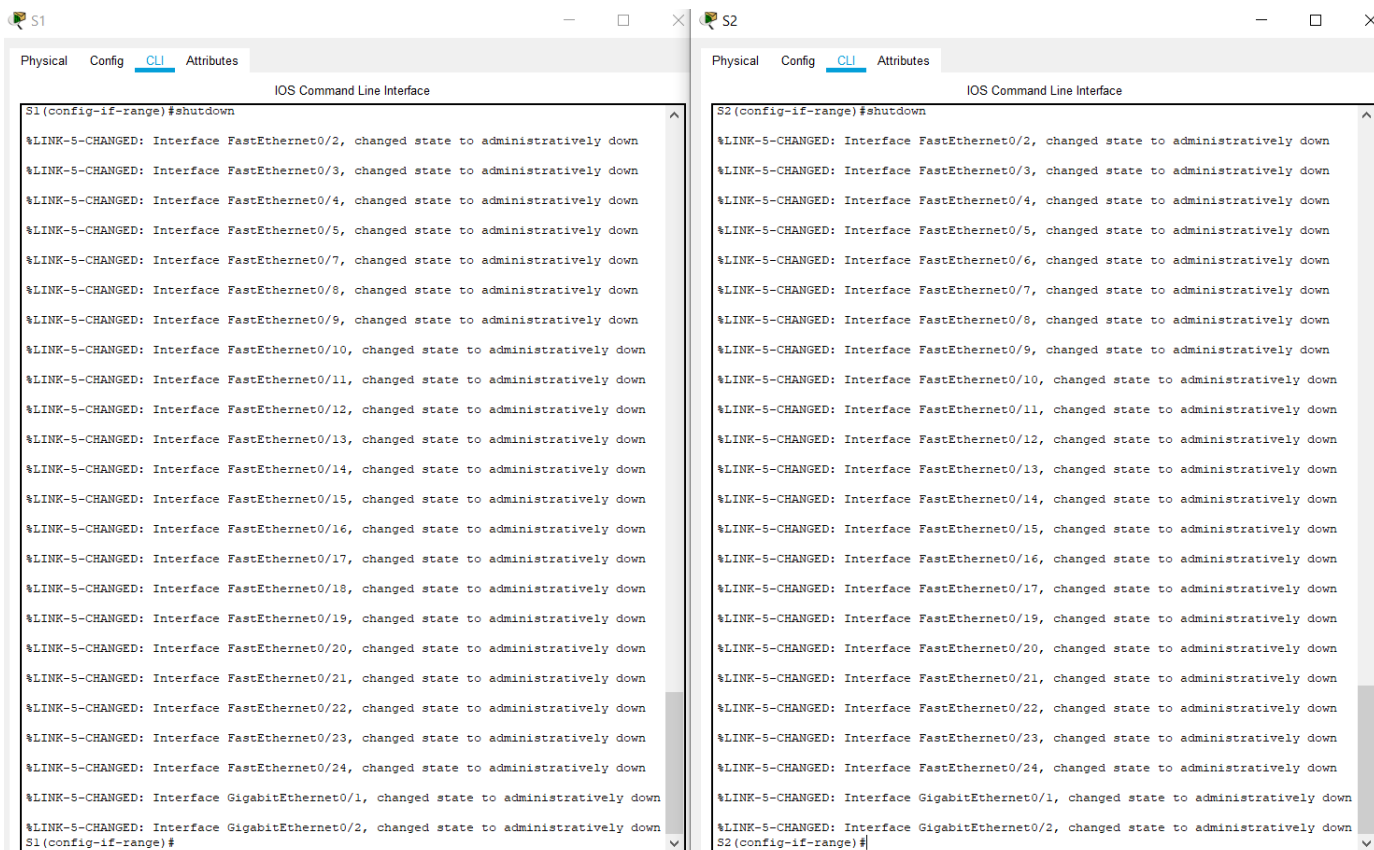
Password:

S2>en
S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#vlan 10
S2(config-vlan)#name Management
S2(config-vlan)#vlan 20
S2(config-vlan)#name Sales
S2(config-vlan)#vlan 30
S2(config-vlan)#name Operations
S2(config-vlan)#vlan 999
S2(config-vlan)#name ParkingLot
S2(config-vlan)#vlan 1000
S2(config-vlan)#name Native
S2(config-vlan)#^Z
S2#
%SYS-5-CONFIG_I: Configured from console by console

S2#en
S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#interface vlan 10
S2(config-if)#
%LINK-5-CHANGED: Interface Vlan10, changed state to up
ip address 192.168.10.02 255.255.255.0
S2(config-if)#exit
S2(config)#exit
S2#
%SYS-5-CONFIG_I: Configured from console by console

S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#interface range f0/2-17, f0/19-24, g0/1-2
S2(config-if-range)#switchport mode access
S2(config-if-range)#switchport access vlan 999
S2(config-if-range)#shutdown

```

Step 2: Assign VLANs to the correct switch interfaces.

S1:

1. Assign used ports to the appropriate VLAN (specified in the VLAN table above) and configure them for static access mode.

```
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface f0/6
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 20
S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan20, changed state to up
```

2. Verify that the VLANs are assigned to the correct interfaces.

```
S1(config-if)#exit
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console
```

```
S1#show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1
10	Management	active	
20	Sales	active	Fa0/6
30	Operations	active	
999	ParkingLot	active	Fa0/2, Fa0/3, Fa0/4, Fa0/5 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
1000	Native	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

S2:

1. Assign used ports to the appropriate VLAN (specified in the VLAN table above) and configure them for static access mode.

```
S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#interface f0/18
S2(config-if)#switchport mode access
S2(config-if)#switchport access vlan 30
```

2. Verify that the VLANs are assigned to the correct interfaces.

```
S2(config-if)#exit
S2(config)#exit
S2#
%SYS-5-CONFIG_I: Configured from console by console
```

```
S2#show vlan brief
```

VLAN Name	Status	Ports
1 default	active	Fa0/1
10 Management	active	
20 Sales	active	
30 Operations	active	Fa0/18
999 ParkingLot	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 Fa0/19, Fa0/20, Fa0/21, Fa0/22 Fa0/23, Fa0/24, Gig0/1, Gig0/2
1000 Native	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

Part 2 Step 2 all steps for both S1 and S2:

S1

Physical Config CLI Attributes

IOS Command Line Interface

```
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface f0/6
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 20
S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan20, changed
state to up

S1(config-if)#exit
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#show vlan brief
```

VLAN Name	Status	Ports
1 default	active	Fa0/1
10 Management	active	
20 Sales	active	Fa0/6
30 Operations	active	
999 ParkingLot	active	Fa0/2, Fa0/3, Fa0/4, Fa0/5 Fa0/9, Fa0/10 Fa0/13, Fa0/14 Fa0/17, Fa0/18 Fa0/21, Fa0/22 Gig0/1, Gig0/2
1000 Native	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

S1#

S2

Physical Config CLI Attributes

IOS Command Line Interface

```
S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#interface f0/18
S2(config-if)#switchport mode access
S2(config-if)#switchport access vlan 30
S2(config-if)#exit
S2(config)#exit
S2#
%SYS-5-CONFIG_I: Configured from console by console

S2#show vlan brief
```

VLAN Name	Status	Ports
1 default	active	Fa0/1
10 Management	active	
20 Sales	active	
30 Operations	active	Fa0/18
999 ParkingLot	active	Fa0/2, Fa0/3, Fa0/4, Fa0/5 Fa0/8, Fa0/9 Fa0/12, Fa0/13 Fa0/16, Fa0/17 Fa0/21, Fa0/22 Gig0/1, Gig0/2
1000 Native	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

S2#

Part 3: Configure an 802.1Q Trunk Between the Switches

Step 1: Manually configure trunk interface F0/1.

S1:

1. Change the switchport mode on interface F0/1 to force trunking. Make sure to do this on both switches.

```
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface f0/1
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan10, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up
```

2. Set the native VLAN to 1000 on both switches.

```
S1(config-if)#switchport trunk native vlan 1000
S1(config-if)#
S1(config-if)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/1 (1000), with S2 FastEthernet0/1 (1).
```

3. As another part of trunk configuration, specify that only VLANs 10, 20, 30, and 1000 are allowed to cross the trunk.

```
S1(config-if)#switchport trunk allowed vlan 10,20,30,1000
S1(config-if)#^Z
S1#
%SYS-5-CONFIG_I: Configured from console by console
```

4. Issue the **show interfaces trunk** command to verify trunking ports, the native VLAN and allowed VLANs across the trunk.

```
S1#show interfaces trunk

Port      Mode      Encapsulation  Status      Native vlan
Fa0/1     on        802.1q         trunking    1000

Port      Vlans allowed on trunk
Fa0/1     10,20,30,1000

Port      Vlans allowed and active in management domain
Fa0/1     10,20,30,1000

Port      Vlans in spanning tree forwarding state and not pruned
Fa0/1     10,20,30,1000
```

S2:

1. Change the switchport mode on interface F0/1 to force trunking. Make sure to do this on both switches.

```
S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#interface f0/1
S2(config-if)#switchport mode trunk
```

- Set the native VLAN to 1000 on both switches.

```
S2(config-if)#switchport trunk native vlan 1000
S2(config-if)%%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking FastEthernet0/1 on VLAN1000. Port consistency restored.

%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking FastEthernet0/1 on VLAN0001. Port consistency restored.
```

- As another part of trunk configuration, specify that only VLANs 10, 20, 30, and 1000 are allowed to cross the trunk.

```
S2(config-if)#switchport trunk allowed vlan 10,20,30,1000
S2(config-if)#^Z
S2#
%SYS-5-CONFIG_I: Configured from console by console
```

- Issue the **show interfaces trunk** command to verify trunking ports, the native VLAN and allowed VLANs across the trunk.

```
S2#show interfaces trunk

Port                Mode                Encapsulation    Status        Native vlan
Fa0/1                on                  802.1q           trunking      1000

Port                Vlans allowed on trunk
Fa0/1                10,20,30,1000

Port                Vlans allowed and active in management domain
Fa0/1                10,20,30,1000

Port                Vlans in spanning tree forwarding state and not pruned
Fa0/1                none
```

Part 3 Step 1 all steps for both S1 and S2:

The image displays two side-by-side screenshots of Cisco IOS Command Line Interfaces (CLI) for switches S1 and S2. Both switches are in the configuration mode for interface Fa0/1.

S1 CLI:

```
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface fa0/1
S1(config-if)#switchport mode trunk
S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up
S1(config-if)#switchport trunk native vlan 1000
S1(config-if)#
S1(config-if)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/1 (1000), with S2 FastEthernet0/1 (1).
S1(config-if)#switchport trunk allowed vlan 10,20,30,1000
S1(config-if)#^Z
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#show interfaces trunk
Port                Mode                Encapsulation    Status        Native vlan
Fa0/1                on                  802.1q           trunking      1000

Port                Vlans allowed on trunk
Fa0/1                10,20,30,1000

Port                Vlans allowed and active in management domain
Fa0/1                10,20,30,1000

Port                Vlans in spanning tree forwarding state and not pruned
Fa0/1                10,20,30,1000
```

S2 CLI:

```
S2#en
Password:
S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#interface fa0/1
S2(config-if)#switchport mode trunk
S2(config-if)#switchport trunk native vlan 1000
S2(config-if)%%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking FastEthernet0/1 on VLAN1000. Port consistency restored.
%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking FastEthernet0/1 on VLAN0001. Port consistency restored.

S2(config-if)#switchport trunk allowed vlan 10,20,30,1000
S2(config-if)#^Z
S2#
%SYS-5-CONFIG_I: Configured from console by console

S2#show interfaces trunk
Port                Mode                Encapsulation    Status        Native vlan
Fa0/1                on                  802.1q           trunking      1000

Port                Vlans allowed on trunk
Fa0/1                10,20,30,1000

Port                Vlans allowed and active in management domain
Fa0/1                10,20,30,1000

Port                Vlans in spanning tree forwarding state and not pruned
Fa0/1                none

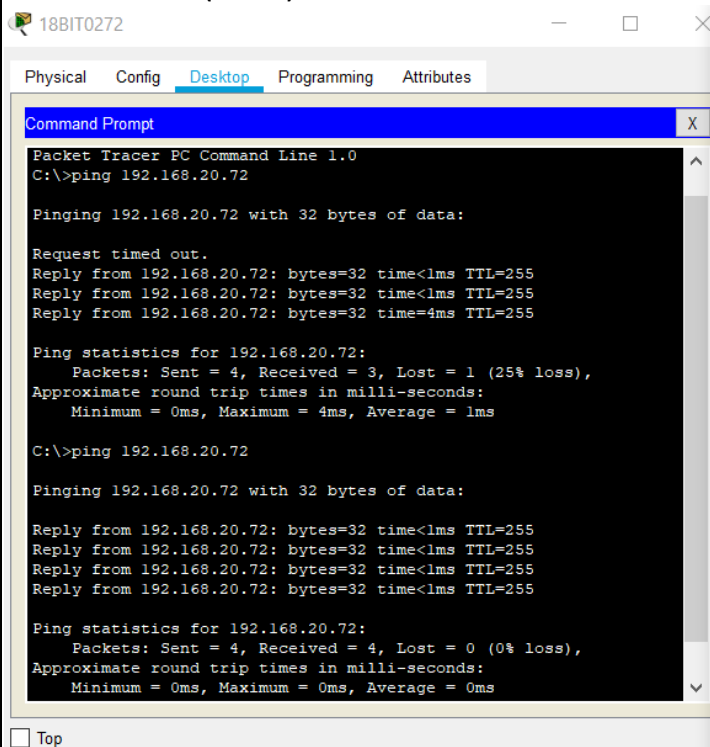
S2#
```

Step 2: Verify connectivity.

Verify connectivity within a VLAN. For example, PC-A should be able to ping S1 VLAN 20 successfully.

Were the pings from PC-B to S2 successful? Explain.

18BIT0272 (PC-A)



```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.20.72

Pinging 192.168.20.72 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.72: bytes=32 time<1ms TTL=255
Reply from 192.168.20.72: bytes=32 time<1ms TTL=255
Reply from 192.168.20.72: bytes=32 time=4ms TTL=255

Ping statistics for 192.168.20.72:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 4ms, Average = 1ms

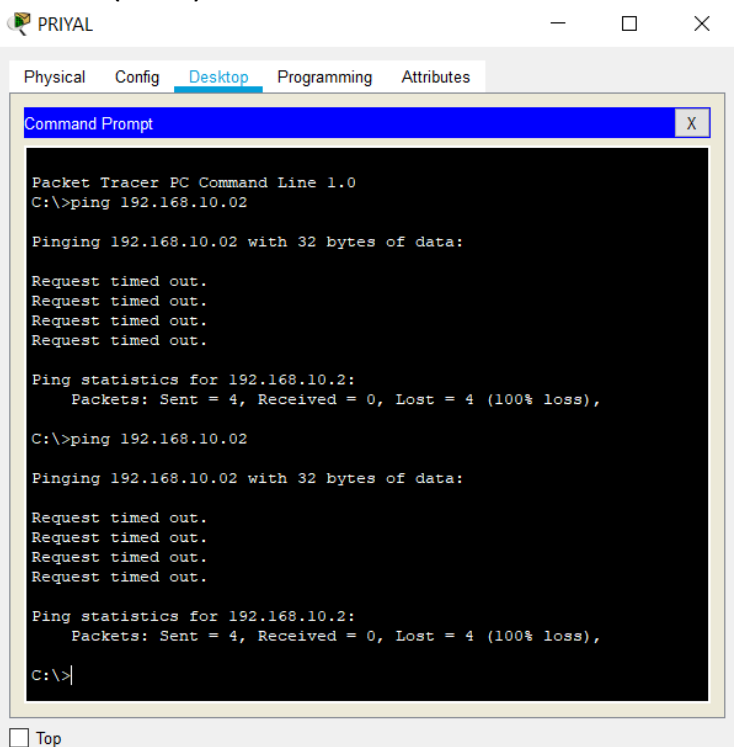
C:\>ping 192.168.20.72

Pinging 192.168.20.72 with 32 bytes of data:

Reply from 192.168.20.72: bytes=32 time<1ms TTL=255
Reply from 192.168.20.72: bytes=32 time<1ms TTL=255
Reply from 192.168.20.72: bytes=32 time<1ms TTL=255
Reply from 192.168.20.72: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.20.72:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PRIYAL (PC-B)



```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.02

Pinging 192.168.10.02 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.168.10.02

Pinging 192.168.10.02 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

We can verify that PC-A (18BIT0272) can ping S1 VLAN 20 successfully.

The pings from PC-B (PRIYAL) to S2 are not successful as seen above as they are not in the same VLAN. A router is needed to communicate between VLANs.

Q-2 EACL (4 Marks)

Watch this video and implement the same EACL in CPT.

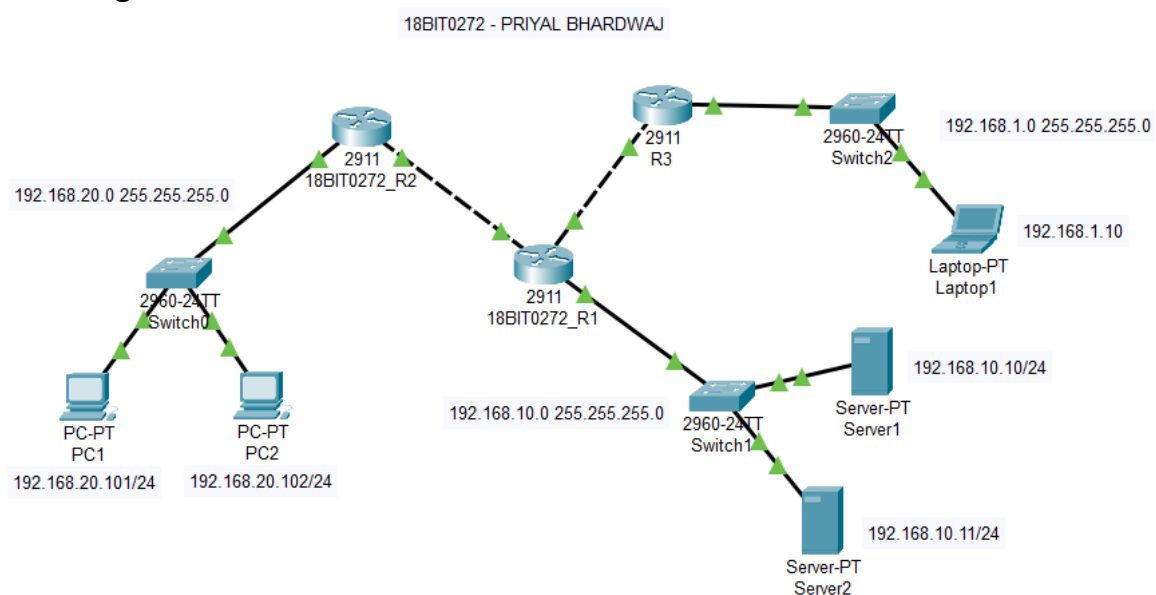
<https://www.youtube.com/watch?v=f45ukYQsdTE>

Configure ip address of 192.168.2.0 network as 192.168. xx. 0 where xx is your Date of Birth

Configure ip address of 192.168.3.0 network as 192.168.yy.0 where yy is your Month of Birth

Name R1 and R2 as your regno

Connection Diagram:



PC Configurations:

PC1

PC1

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.20.101

Subnet Mask 255.255.255.0

Default Gateway 192.168.20.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::230:F2FF:FE6C:8AA2

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

☐ Top

PC2

PC2

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.20.102

Subnet Mask 255.255.255.0

Default Gateway 192.168.20.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::2D0:FFFF:FE06:E5C0

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

☐ Top

Server Configuration:

Server1 Server2

Server1

Physical Config Services **Desktop** Programming Attributes

IP Configuration X

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.10.10

Subnet Mask 255.255.255.0

Default Gateway 192.168.10.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::2E0:A3FF:FE25:64D

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

☐ Top

Server2

Physical Config Services **Desktop** Programming Attributes

IP Configuration X

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.10.11

Subnet Mask 255.255.255.0

Default Gateway 192.168.10.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::230:F2FF:FE63:E795

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

☐ Top

Note: Since my Birth Month is 1, I have changed the Server IPs to 10 in third octet.

Laptop Configuration:

Laptop1

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.1.10

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::260:47FF:FEFE:90E2

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

☐ Top

Router Configurations:

18BIT0272_R1:

18BIT0272_R1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

GigabitEthernet0/0

Port Status ☒ On

Bandwidth ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00D0.9705.CB01

IP Configuration

IP Address 192.168.10.1

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Equivalent IOS Commands

Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#
Router(config)#interface GigabitEthernet0/0
Router(config-if)#

☐ Top

18BIT0272_R1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

GigabitEthernet0/1

Port Status ☒ On

Bandwidth ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00D0.9705.CB02

IP Configuration

IP Address 192.168.21.1

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Equivalent IOS Commands

Router(config)#
Router(config)#
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#

☐ Top

18BIT0272_R1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

GigabitEthernet0/2

Port Status ☒ On

Bandwidth ☒ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00D0.9705.CB03

IP Configuration

IP Address 192.168.22.1

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Equivalent IOS Commands

Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#

☐ Top

18BIT0272_R1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

Static Routes

Network

Mask

Next Hop

Add

Network Address

192.168.20.0/24 via 192.168.21.2

192.168.1.0/24 via 192.168.22.2

Remove

Equivalent IOS Commands

Router(config-if)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#

☐ Top

18BIT0272_R2:

18BIT0272_R2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

GigabitEthernet0/0

Port Status

☒ On

Bandwidth

☐ 1000 Mbps

☒ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0001.6427.E701

IP Configuration

IP Address

192.168.20.1

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#

☐ Top

18BIT0272_R2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

GigabitEthernet0/1

Port Status

☒ On

Bandwidth

☒ 1000 Mbps

☐ 100 Mbps

☐ 10 Mbps

☒ Auto

Duplex

☐ Half Duplex

☒ Full Duplex

☒ Auto

MAC Address

0001.6427.E702

IP Configuration

IP Address

192.168.21.2

Subnet Mask

255.255.255.0

Tx Ring Limit

10

Equivalent IOS Commands

Router(config-if) #
Router(config-if) #exit
Router(config) #interface GigabitEthernet0/2
Router(config-if) #
Router(config-if) #exit
Router(config) #interface GigabitEthernet0/1
Router(config-if) #

☐ Top

18BIT0272_R2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

Static Routes

Network

Mask

Next Hop

Add

Network Address

192.168.1.0/24 via 192.168.21.1

192.168.10.0/24 via 192.168.21.1

Remove

Equivalent IOS Commands

Router(config-if) #exit
Router(config) #interface GigabitEthernet0/1
Router(config-if) #
Router(config-if) #exit
Router(config) #
Router(config) #

☐ Top

Extended Access List Configuration:

18BIT0272_R1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Router(config)#interface GigabitEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#do sh access list
Router(config)#access-list 108 deny ip 192.168.20.0 0.0.0.255 host 192.168.10.11
Router(config)#access-list 108 permit ip any any
Router(config)#do sh access list
Router(config)#int g0/1
Router(config-if)#ip access-group 108 in
Router(config-if)#^
% Invalid input detected at '^' marker.
Router(config-if)#ip access-group 108 in
Router(config-if)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#sh access-lists
Extended IP access list 108
 10 deny ip 192.168.20.0 0.0.0.255 host 192.168.10.11
 20 permit ip any any
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

Pinging Servers from PCs:

PC1

PC1

Physical Config **Desktop** Programming Attributes

Command Prompt

```
C:\>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Reply from 192.168.10.10: bytes=32 time<1ms TTL=126
Reply from 192.168.10.10: bytes=32 time<1ms TTL=126
Reply from 192.168.10.10: bytes=32 time<1ms TTL=126
Reply from 192.168.10.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.

Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

☐ Top

PC2

PC2

Physical Config **Desktop** Programming Attributes

Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Reply from 192.168.10.10: bytes=32 time<1ms TTL=126
Reply from 192.168.10.10: bytes=32 time<1ms TTL=126
Reply from 192.168.10.10: bytes=32 time<1ms TTL=126
Reply from 192.168.10.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.

Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

☐ Top

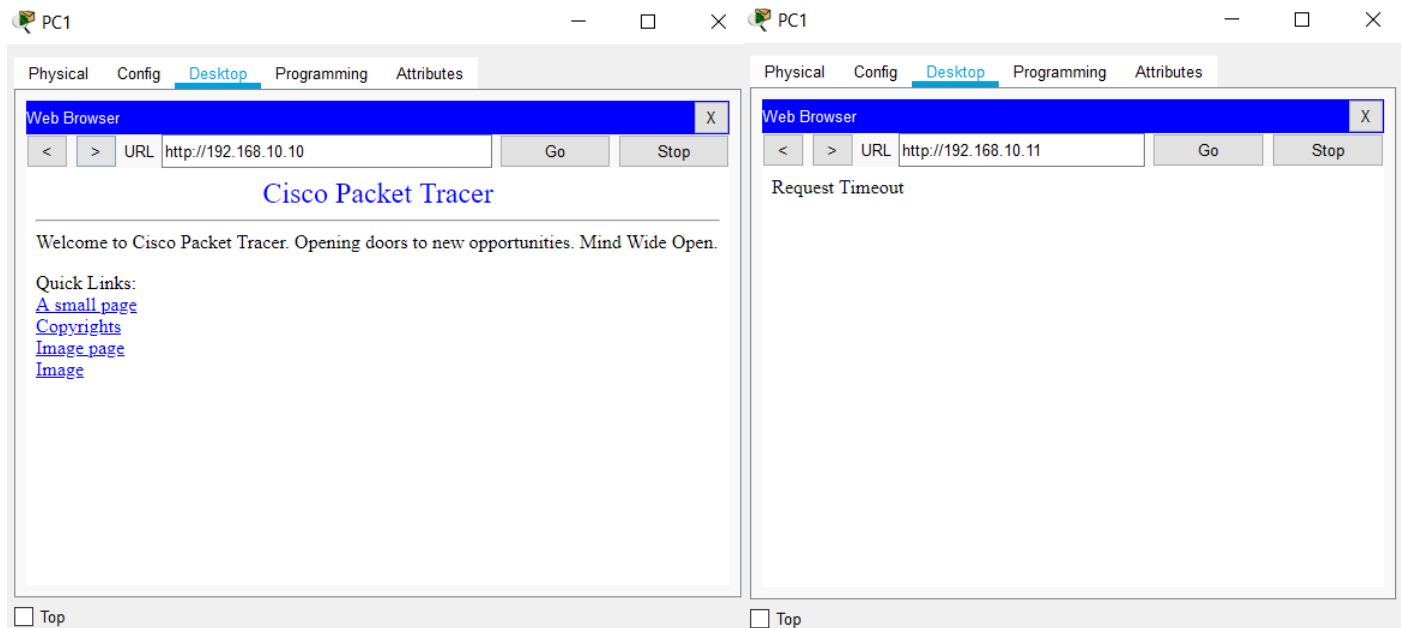
We can ping 192.168.10.10 but not 192.168.10.11 as we get *Destination host unreachable*

Now if we go back to 18BIT0272_R1 and show access-lists we will see traffic matches

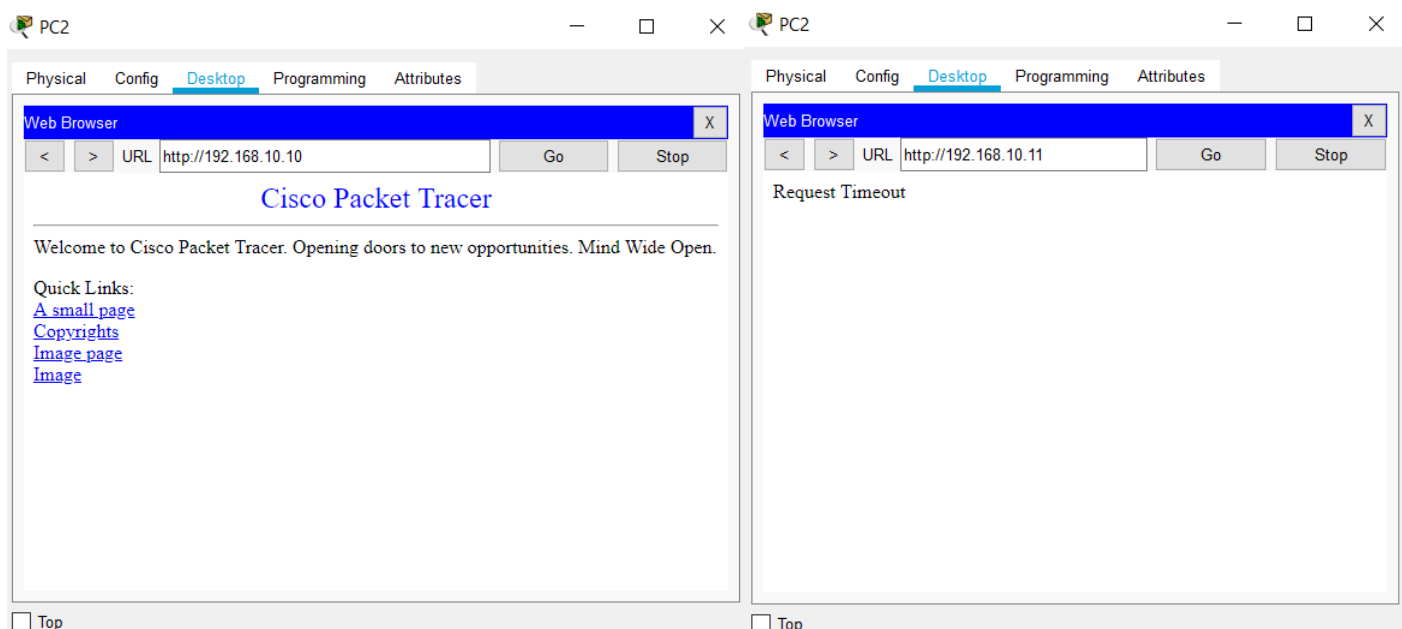
```
Router#sh access-lists
Extended IP access list 108
 10 deny ip 192.168.20.0 0.0.0.255 host 192.168.10.11 (12 match(es))
 20 permit ip any any (8 match(es))
```

Checking Web Browser:

PC1:



PC2:



Again, we only get a response from 192.168.10.10 and not from 192.168.10.11 as it shows *Request Timeout*.

Now we make an extended access list that will open in web browser but cannot be pinged.

Extended Access List Configuration:

18BIT0272_R1

Physical Config CLI Attributes

IOS Command Line Interface

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no access-list 108
Router(config)#do sh acc
Router(config)#access-list 105 permit tcp 192.168.20.0 0.0.0.255 host 192.168.10.11 eq www
Router(config)#access-list 105 deny ip 192.168.20.0 0.0.0.255 host 192.168.10.11
Router(config)#access-list 105 permit ip any any
Router(config)#do sh acc
Extended IP access list 105
  10 permit tcp 192.168.20.0 0.0.0.255 host 192.168.10.11 eq www
  20 deny ip 192.168.20.0 0.0.0.255 host 192.168.10.11
  30 permit ip any any

Router(config)#int g0/1
Router(config-if)#ip access-group 105 in
Router(config-if)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#sh access-lists
Extended IP access list 105
  10 permit tcp 192.168.20.0 0.0.0.255 host 192.168.10.11 eq www
  20 deny ip 192.168.20.0 0.0.0.255 host 192.168.10.11
  30 permit ip any any
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

Again, we try pinging the Servers from PCs.

PC1

PC1

Physical Config Desktop Programming Attributes

Command Prompt

```
C:\>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Reply from 192.168.10.10: bytes=32 time=1ms TTL=126
Reply from 192.168.10.10: bytes=32 time<1ms TTL=126
Reply from 192.168.10.10: bytes=32 time<1ms TTL=126
Reply from 192.168.10.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.

Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

☐ Top

PC2

PC2

Physical Config Desktop Programming Attributes

Command Prompt

```
C:\>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Reply from 192.168.10.10: bytes=32 time=1ms TTL=126
Reply from 192.168.10.10: bytes=32 time<1ms TTL=126
Reply from 192.168.10.10: bytes=32 time=11ms TTL=126
Reply from 192.168.10.10: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 3ms

C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.
Reply from 192.168.21.1: Destination host unreachable.

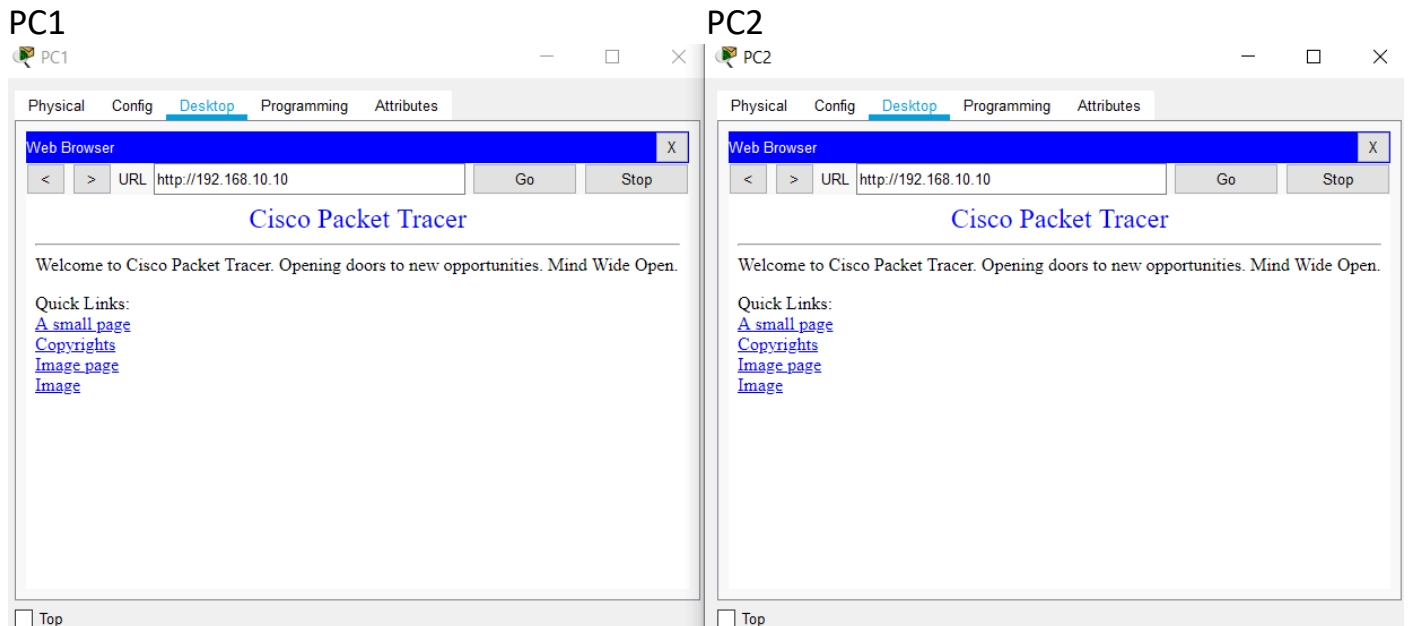
Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

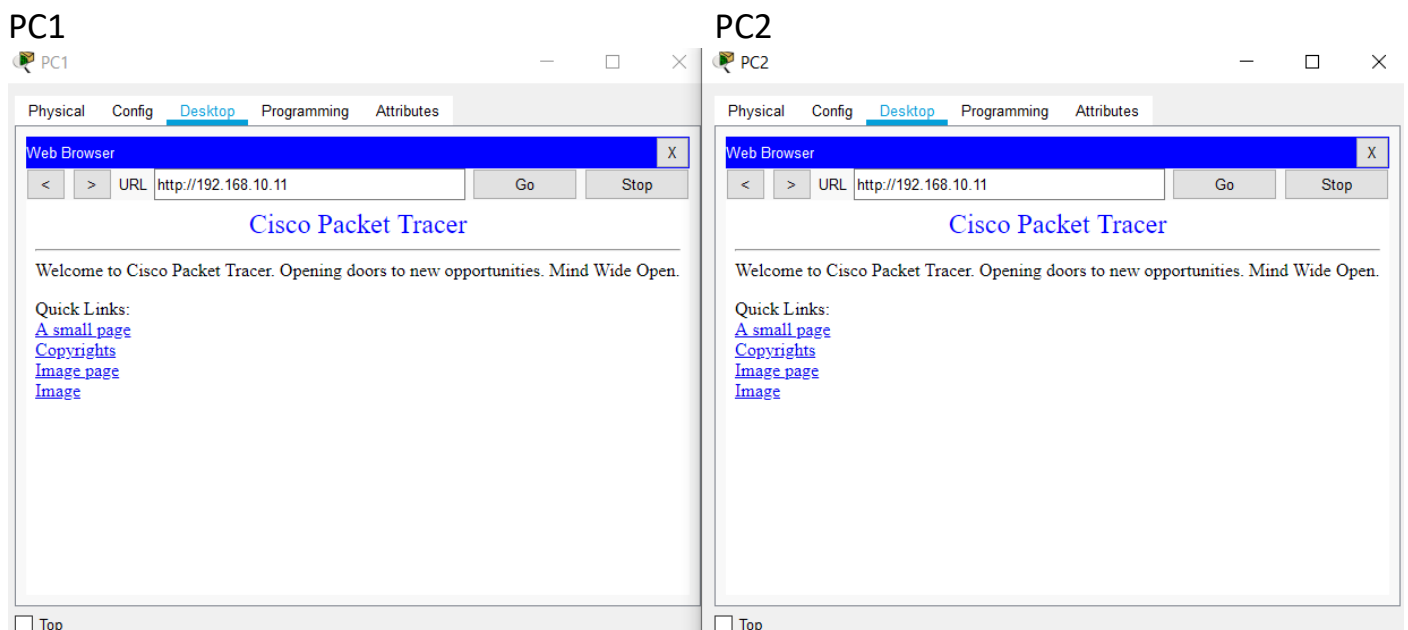
☐ Top

Now we try opening in Web Browser again.

192.168.10.10



192.168.10.11



This time browser gives response for both Servers unlike before.

Therefore, we have created an Extended Access List that allows Servers to open in Web Browser but cannot be pinged.

Traffic matches:

```
Router#sh access-lists
Extended IP access list 105
 10 permit tcp 192.168.20.0 0.0.0.255 host 192.168.10.11 eq www (15 match(es))
 20 deny ip 192.168.20.0 0.0.0.255 host 192.168.10.11 (8 match(es))
 30 permit ip any any (18 match(es))
```