Troubleshooting Networks

Contents: Configuration, Verification and Troubleshooting

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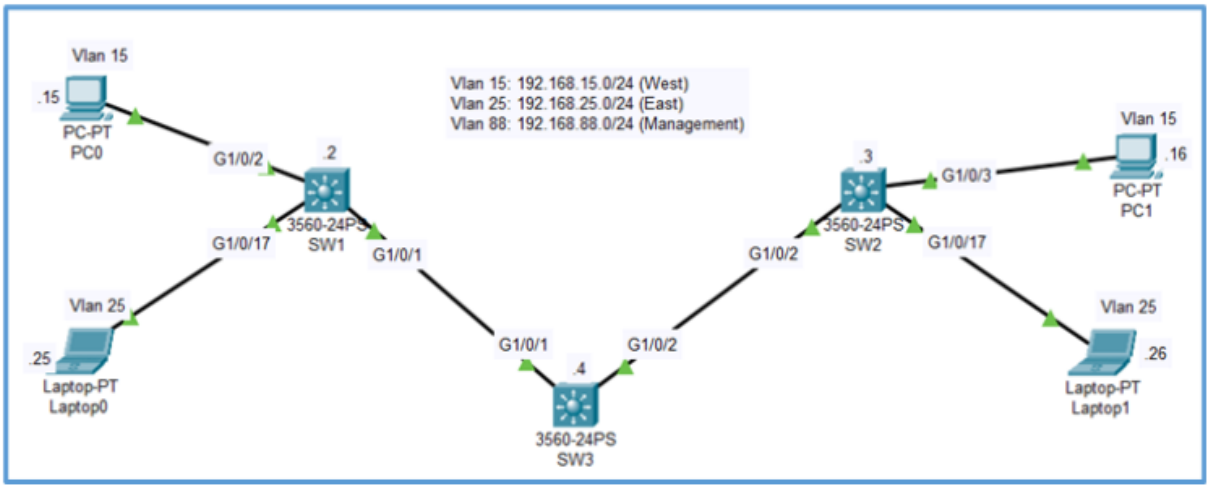
Step 1: *Set up the Network Topology.*

Simulate the topology by using all the devices as mentioned above and then cable all the devices together:

- Turn on the devices
- Connect the PCs with their respective switches
- Make sure all the lights between switches and PCs are active/green



Step 2: *Configure PCs.*

Configure the following on PCs according to the addressing table:

- IP address
- Subnet Mask
- Default Gateway

Addressing Table:

Device	Interface	IP Address	Subnet Mask/CIDR	Default Gateway
SW1	VLAN88	192.168.88.2	255.255.255.0	N/A

SW2	VLAN88	192.168.88.3	255.255.255.0	N/A
SW3	VLAN88	192.168.88.4	255.255.255.0	N/A
PC0	NIC	192.168.15.15	255.255.255.0	192.168.15.1
Laptop0	NIC	192.168.25.25	255.255.255.0	192.168.25.1
PC1	NIC	192.168.15.16	255.255.255.0	192.168.15.1
Laptop1	NIC	192.168.25.26	255.255.255.0	192.168.25.1

Step 3: *Configure and verify*

Configure and verify following switch settings on each switch.

- Console into the switch and enter the global configuration mode:
    - Assign the switch with a name according to the addressing table.
    - Disable unwanted DNS lookup.
    - Configure SVI on each switch as per addressing table.
    - Enter a login MOTD banner to warn about illegal access.
    - Encrypt all current and future passwords.
    - Save the configuration.

```
SW1>en
SW1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
SW1(config)#no ip domain-lookup
SW1(config)#interface vlan 88
SW1(config-if)#
*Dec 10 23:30:54.953: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan88,
anged state to down
SW1(config-if)#ip address 192.168.88.2 255.255.255.0
SW1(config-if)#no shutdown
SW1(config-if)#exit
SW1(config)#banner motd "warning"
SW1(config)#service password-encryption
SW1(config)#exit
SW1#w
*Dec 10 23:32:15.389: %SYS-5-CONFIG_I: Configured from console by consol
SW1#write memory
Building configuration...
[OK]
```

```
SW2(config)#no ip domain-lookup
SW2(config)#interface vlan 88
SW2(config-if)#ip address 192.168.88.3 255.255.255.0
SW2(config-if)#no shutdown
SW2(config-if)#exit
SW2(config)#banner motd "warning"
SW2(config)#service password-encryption
SW2(config)#exit
SW2#
*Apr  3 09:08:28.898: %SYS-5-CONFIG_I: Configured from console by console
SW2#write memory
Building configuration...
[OK]
```

```
SW3(config)#no ip domain-lookup
SW3(config)#interface vlan 88
SW3(config-if)#ip address 192.168.88.4 255.255.255.0
SW3(config-if)#no shutdown
SW3(config-if)#banner motd "Warning!"
SW3(config)#service password-encryption
SW3(config)#exit
SW3#
*Oct  3 04:21:33.870: %SYS-5-CONFIG_I: Configured from console by console
SW3#write memory
Building configuration...
[OK]
```

Step 4: *configuration from Appendix*.

Switch Ports Allocation Table:

Switch	Ports	Assignment	Network
SW1	G1/0/1	802.1Q Trunk	N/A
	G1/0/2-10	VLAN15	192.168.15.0/24
	G1/0/11-18	VLAN25	192.168.25.0/24
SW2	G1/0/2	802.1Q Trunk	N/A
	G1/0/2-10	VLAN15	192.168.15.0/24
	G1/0/11-18	VLAN25	192.168.25.0/24

SW3	G1/0/1-2	802.1Q Trunk	N/A
	G1/0/2-10	VLAN15	192.168.15.0/24
	G1/0/11-18	VLAN25	192.168.25.0/24

a) Ping from PC0 to PC1.

```
C:\Users\cyberuser5>ping 192.168.15.16

Pinging 192.168.15.16 with 32 bytes of data:
Reply from 192.168.15.16: bytes=32 time=1ms TTL=128
Reply from 192.168.15.16: bytes=32 time=1ms TTL=128
Reply from 192.168.15.16: bytes=32 time=1ms TTL=128
Reply from 192.168.15.16: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.15.16:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Result: Pinging is successful as both PC's are on the same VLAN and are properly configured.

b) Ping from Laptop0 to Laptop1.

```
C:\Users\sherv>ping 192.168.25.26

Pinging 192.168.25.26 with 32 bytes of data:
Reply from 142.124.37.123: Destination net unreachable.
Reply from 142.124.37.123: Destination net unreachable.
Reply from 142.124.37.123: Destination net unreachable.
Reply from 142.124.37.123: Destination net unreachable.

Ping statistics for 192.168.25.26:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

Result: Pinging is unsuccessful because the connected VLAN is not configured properly.

c) Ping from PC0 to Laptop1.

```
C:\Users\cyberuser5>ping 192.168.25.26

Pinging 192.168.25.26 with 32 bytes of data:
Reply from 142.124.37.123: Destination net unreachable.
Reply from 142.124.37.123: Destination net unreachable.
Reply from 142.124.37.123: Destination net unreachable.
Reply from 142.124.37.123: Destination net unreachable.

Ping statistics for 192.168.25.26:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

Result: Pinging is unsuccessful because the devices are on different VLAN's and there is no inter-VLAN routing present.

- Selected all un-used ports, using only one command.
- Shutdown all un-used ports.
- Moved all the un-used and un-assigned ports into a separate VLAN33.

```
SW1(config)#vlan 33
SW1(config-vlan)#name UNUSED
SW1(config-vlan)#exit
```

```
SW1(config)#int range g1/0/19-24
SW1(config-if-range)#switchport mode access
SW1(config-if-range)#switchport access vlan 33
SW1(config-if-range)#exit
SW1(config)#
```

Step 5: *Troubleshoot VLAN 15 on SW1, SW2, and SW3.*

- VLAN15 is configured successfully on all switches as per the addressing table.

```
SW1(config)#vlan 15
SW1(config-vlan)#name WEST
SW1(config-vlan)#exit
```

```
SW1(config)#int range gl/0/2-10
SW1(config-if-range)#switchport mode access
SW1(config-if-range)#switchport access vlan 15
SW1(config-if-range)#exit
```

```
SW2(config)#vlan 15
SW2(config-vlan)#name WEST
SW2(config-vlan)#exit
```

```
SW2(config)#int range gl/0/3-10
SW2(config-if-range)#switchport mode access
SW2(config-if-range)#switchport access vlan 15
SW2(config-if-range)#exit
```

```
SW3(config)#vlan 15
SW3(config-vlan)#name WEST
SW3(config-vlan)#exit
```

```
SW3(config)#int range gl/0/1-2
SW3(config-if-range)#switchport mode trunk
SW3(config-if-range)#switchport trunk allowed vlan 15,25,88
SW3(config-if-range)#exit
```

a) Ping from PC0 to PC1

```
C:\Users\cyberuser5>ping 192.168.15.16

Pinging 192.168.15.16 with 32 bytes of data:
Reply from 192.168.15.16: bytes=32 time=1ms TTL=128
Reply from 192.168.15.16: bytes=32 time=1ms TTL=128
Reply from 192.168.15.16: bytes=32 time=1ms TTL=128
Reply from 192.168.15.16: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.15.16:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Result: Pinging is successful because they are in the same VLAN and are properly configured.

Step 6: *Troubleshoot VLAN 25 on SW1, SW2, and SW3.*

- VLAN25 is successfully configured on all switches as per the addressing table.

```
SW1(config)#vlan 25
SW1(config-vlan)#name EAST
SW1(config-vlan)#exit
```

```
SW1(config)#int range g1/0/11-18
SW1(config-if-range)#switchport mode access
SW1(config-if-range)#switchport access vlan 25
SW1(config-if-range)#exit
```

```
SW2(config)#vlan 25
SW2(config-vlan)#name EAST
SW2(config-vlan)#exit
```

```
SW2(config)#int range g1/0/11-18
SW2(config-if-range)#switchport mode access
SW2(config-if-range)#switchport access vlan 25
SW2(config-if-range)#exit
```

```
SW3(config)#vlan 25
SW3(config-vlan)#name EAST
SW3(config-vlan)#exit
```

```
SW3(config)#int range g1/0/1-2
SW3(config-if-range)#switchport mode trunk
SW3(config-if-range)#switchport trunk allowed vlan 15,25,88
SW3(config-if-range)#exit
```

a) Ping from laptop0 to laptop1

```
C:\Users\sherv>ping 192.168.25.26

Pinging 192.168.25.26 with 32 bytes of data:
Reply from 192.168.25.26: bytes=32 time=6ms TTL=128
Reply from 192.168.25.26: bytes=32 time=4ms TTL=128
Reply from 192.168.25.26: bytes=32 time=4ms TTL=128
Reply from 192.168.25.26: bytes=32 time=4ms TTL=128

Ping statistics for 192.168.25.26:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 6ms, Average = 4ms
```

Result: Pinging is successful because they are on the same VLAN and are properly configured.