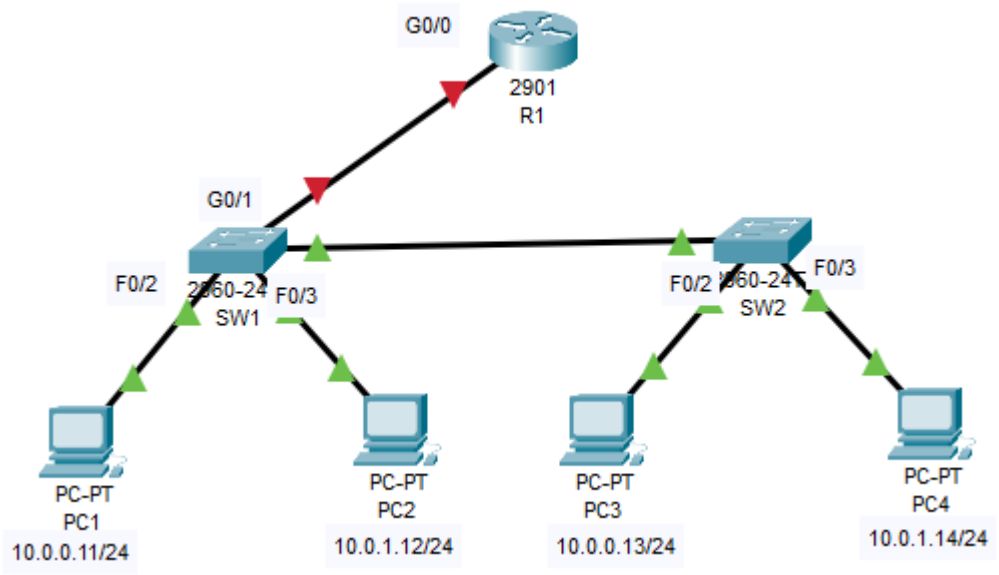
ACTIVITY 20: Review Configuration Lab 1



1. Configure the hostnames of R1, SW1, and SW2 according to the diagram.

```
Router(config)#hostname R1
Switch(config)#hostname SW1
Switch(config)#hostname SW2
```

2. Configure an enable secret of 'CCNA' for each networking device.

```
R1(config)#enable secret CCNA
SW1(config)#enable secret CCNA
SW2(config)#enable secret CCNA
```

3. Configure the switchports to which PCs are connected as access ports in the following VLANS:

VLAN13: PC1, PC3 VLAN24: PC2, PC4

```
SW1(config)#interface f0/2
SW1(config-if)#switchport mode access
SW1(config-if)#switchport access vlan 13
% Access VLAN does not exist. Creating vlan 13
SW1(config-if)#interface f0/3
SW1(config-if)#switchport mode access
SW1(config-if)#switchport access vlan 24
% Access VLAN does not exist. Creating vlan 24

SW2(config)#interface f0/2
SW2(config-if)#switchport mode access
SW2(config-if)#switchport access vlan 13
% Access VLAN does not exist. Creating vlan 13
SW2(config-if)#interface f0/3
SW2(config-if)#switchport mode access
SW2(config-if)#switchport access vlan 24
% Access VLAN does not exist. Creating vlan 24
```

4. Use CDP to know the interfaces connecting SW1 and SW2, configure a trunk link between them.

```
SW1#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID    Local Intrfce   Holdtme    Capability   Platform    Port ID
SW2          Fas 0/1          126            S       2960        Fas 0/1
```

```
SW1(config-if)#switchport mode trunk
SW2(config-if)#switchport mode trunk
```

5. Configure port security on the switchports connected to PCs, with the following settings:
-sticky MAC address learning enabled -violation action: 'restrict'

```
SW1(config)#interface range f0/2-3
SW1(config-if-range)#switchport port-security
SW1(config-if-range)#switchport port-security mac-address sticky
SW1(config-if-range)#switchport port-security violation restrict

SW2(config)#interface range f0/2-3
SW2(config-if-range)#switchport port-security
SW2(config-if-range)#switchport port-security mac-address sticky
SW2(config-if-range)#switchport port-security violation restrict
```

6. Configure inter-VLAN routing with the 'router on a stick' method, according to the network diagram and the following subinterface addresses: VLAN13: 10.0.0.1 VLAN24: 10.0.1.1

```
R1(config)#interface g0/0
R1(config-if)#no shutdown
R1(config-if)#interface g0/0.13
R1(config-subif)#encapsulation dot1Q 13
R1(config-subif)#ip address 10.0.0.1 255.255.255.0
R1(config-subif)#interface g0/0.24
R1(config-subif)#encapsulation dot1q 24
R1(config-subif)#ip address 10.0.1.1 255.255.255.0

SW1(config)#interface g0/1
SW1(config-if)#switchport mode trunk
```

7. Ping between the PCs to confirm full connectivity, including between different VLANs.

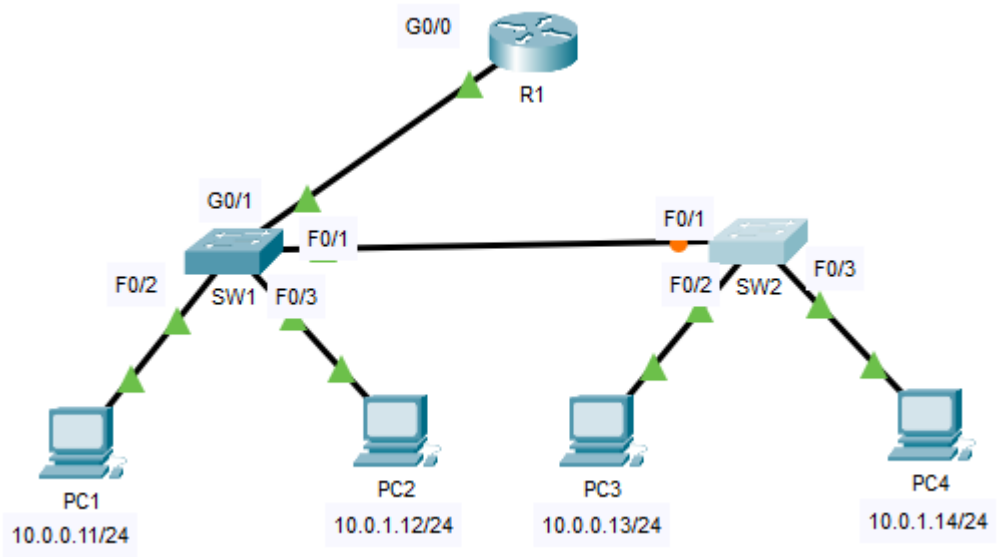
From PC1

```
C:\>ping 10.0.0.13

Pinging 10.0.0.13 with 32 bytes of data:

Reply from 10.0.0.13: bytes=32 time<1ms TTL=128
Reply from 10.0.0.13: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.0.13:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

```
C:\>ping 10.0.1.12

Pinging 10.0.1.12 with 32 bytes of data:

Request timed out.
Reply from 10.0.1.12: bytes=32 time=18ms TTL=127
Reply from 10.0.1.12: bytes=32 time<1ms TTL=127

Ping statistics for 10.0.1.12:
    Packets: Sent = 3, Received = 2, Lost = 1 (34% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 18ms, Average = 9ms
```

```
C:\>ping 10.0.1.14

Pinging 10.0.1.14 with 32 bytes of data:

Request timed out.
Reply from 10.0.1.14: bytes=32 time<1ms TTL=127
Reply from 10.0.1.14: bytes=32 time<1ms TTL=127
Reply from 10.0.1.14: bytes=32 time<1ms TTL=127
```

ACTIVITY 21: Review Troubleshooting Lab 1



There are 1-2 misconfigurations per networking device (R1, SW1, SW2). Find the errors and fix them. You have solved all problems when each PC can ping each other PC.
The devices are configured according to the intructions of the previous lab (#020), which are as follows:

1. Configure the hostnames of R1, SW1, and SW2 according to the diagram.
2. Configure an enable secret of 'CCNA' for each networking device.
3. Configure the switchports to which PCs are connected as access ports in the following VLANS:

VLAN13: PC1, PC3
VLAN24: PC2, PC4

4. Use CDP to identify which interfaces are used to connect SW1 and SW2, and configure a trunk link between them.
5. Configure port security on the switchports connected to PCs, with the following settings:

-sticky MAC address learning enabled
-violation action: 'restrict'

6. Configure inter-VLAN routing with the 'router on a stick' method, according to the network diagram and the following subinterface addresses:

VLAN13: 10.0.0.1
VLAN24: 10.0.1.1

7. Ping between the PCs to confirm full connectivity, including between different VLANs.

SOLUTION:

1. All hostnames are correct.
2. All enable secrets are correct after entering CCNA after the “enable” command.
3. Let’s check the VLANs and trunks on SW1:

```
SW1#show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    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, Gig0/2
13   VLAN0013                         active    Fa0/2
24   VLAN0024                         active    Fa0/3
1002 fddi-default                     active
```

All VLANs on SW1 are correctly configured. Let's check the trunks:

```
SW1#show interfaces trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/1       on           802.1q         trunking      1
Gig0/1      on           802.1q         trunking      1

Port        Vlans allowed on trunk
Fa0/1       1-1005
Gig0/1      1-1005
```

All interface trunks on SW1 are correctly configured.

- Let's check the VLANs and trunks on SW2:

```
SW2#show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, 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
13   VLAN0013                         active
23   VLAN0023                         active    Fa0/2
24   VLAN0024                         active    Fa0/3
1002 fddi-default                     active
```

➔ VLAN 13 is misconfigured. It should be on F0/2. VLAN23 should not exist so let's configure it:

```
SW2(config)#no vlan 23
SW2(config)#interface f0/2
SW2(config-if)#switchport mode access
SW2(config-if)#switchport access vlan 13
```

Now all VLANs on SW2 are correctly configured.

```
SW2(config-if)#do show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, 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
13   VLAN0013                         active    Fa0/2
24   VLAN0024                         active    Fa0/3
```

Let's check the interface trunks on SW2:

```
SW2(config-if)#do show interfaces trunk


SW2(config-if)#
```

➔ Nothing is displayed. So let's configure the trunk on f0/1.

```
SW2(config-if)#interface f0/1
SW2(config-if)#switchport mode trunk
```

After a while, the interface f0/1 becomes green. So, let's check if PCs are pinging each other.

PC1 cannot ping PC3 nor PC2:

```
C:\>ping 10.0.0.13

Pinging 10.0.0.13 with 32 bytes of data:

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

```
C:\>ping 10.0.1.12

Pinging 10.0.1.12 with 32 bytes of data:

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

But PC2 can ping PC4 but not PC3:

```
C:\>ping 10.0.1.14

Pinging 10.0.1.14 with 32 bytes of data:

Reply from 10.0.1.14: bytes=32 time<1ms TTL=128
Reply from 10.0.1.14: bytes=32 time<1ms TTL=128
Reply from 10.0.1.14: bytes=32 time<1ms TTL=128
Reply from 10.0.1.14: bytes=32 time<1ms TTL=128
```

```
C:\>ping 10.0.0.13

Pinging 10.0.0.13 with 32 bytes of data:

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

It means that VLAN24 works but not VLAN13. The inter-VLAN routing doesn't work either. So, let's check step 5:

```
SW1#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
               (Count)       (Count)         (Count)
-----------------------------------------------------------------------
        Fa0/2        1           1                12         Restrict
        Fa0/3        1           0                 0         Restrict
-----------------------------------------------------------------------
```

There had been 12 violation on the f0/2 interface port-security. Let's check the configuration:

```
SW1#show port-security address
               Secure Mac Address Table
------------------------------------------------------------------------
Vlan    Mac Address       Type                          Ports   Remaining Age
                                                                    (mins)
----    -----------       ----                          -----   -------------
  13    AAAA.AAAA.AAAA    SecureConfigured              Fa0/2         -
  24    0060.3E33.C66C    SecureSticky                  Fa0/3         -
------------------------------------------------------------------------
Total Addresses in System (excluding one mac per port)     : 0
Max Addresses limit in System (excluding one mac per port) : 1024
```

➔ The MAC-address on VLAN13 is not sticky but static. Let's configure it:

```
SW1(config)#interface f0/2
SW1(config-if)# switchport port-security mac-address AAAA.AAAA.AAAA
SW1(config-if)#switchport port-security mac-address sticky
```

Now PC1 can ping PC3 but not PC2:

```
C:\>ping 10.0.0.13

Pinging 10.0.0.13 with 32 bytes of data:

Reply from 10.0.0.13: bytes=32 time<1ms TTL=128
Reply from 10.0.0.13: bytes=32 time<1ms TTL=128
Reply from 10.0.0.13: bytes=32 time=1ms TTL=128
Reply from 10.0.0.13: bytes=32 time=2ms TTL=128
```

```
C:\>ping 10.0.1.12

Pinging 10.0.1.12 with 32 bytes of data:

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

Let's check step 6:

```
R1#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  up                    up
GigabitEthernet0/0.13  10.0.0.2        YES manual up                    up
GigabitEthernet0/0.24  10.0.1.1        YES manual up                    up
GigabitEthernet0/1     unassigned      YES unset  administratively down down
Vlan1                  unassigned      YES unset  administratively down down
```

As we see, the IP address in G0/0.13 should be 10.0.0.1 not .2. So, let's configure it:

```
R1(config)#interface g0/0.13
R1(config-subif)#ip address 10.0.0.1 255.255.255.0
```

After this, PC1 still can't ping PC2. Let's check the interface configuration on R1.

```
R1#show interfaces g0/0.13
GigabitEthernet0/0.13 is up, line protocol is up (connected)
  Hardware is PQUICC_FEC, address is 000a.4199.4501 (bia 000a.4199.4501)
  Internet address is 10.0.0.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID 13
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last clearing of "show interface" counters never
```

Everything seems correct on g0/0.13. Let's check for g0/0.24:

```
R1#show interfaces g0/0.24
GigabitEthernet0/0.24 is up, line protocol is up (connected)
  Hardware is PQUICC_FEC, address is 000a.4199.4501 (bia 000a.4199.4501)
  Internet address is 10.0.1.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID 2
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last clearing of "show interface" counters never
```

As we can see, the VLAN ID should be 24 not 2. Let's configure it:

```
R1(config)#interface g0/0.24
R1(config-subif)#encapsulation dot1q 24
```

Now PC1 can ping PC2. PC2 can ping PC3.

```
C:\>ping 10.0.1.12

Pinging 10.0.1.12 with 32 bytes of data:

Request timed out.
Reply from 10.0.1.12: bytes=32 time<1ms TTL=127
Reply from 10.0.1.12: bytes=32 time<1ms TTL=127
Reply from 10.0.1.12: bytes=32 time<1ms TTL=127
```

```
C:\>ping 10.0.0.13

Pinging 10.0.0.13 with 32 bytes of data:

Request timed out.
Reply from 10.0.0.13: bytes=32 time<1ms TTL=127
Reply from 10.0.0.13: bytes=32 time<1ms TTL=127
Reply from 10.0.0.13: bytes=32 time<1ms TTL=127
```