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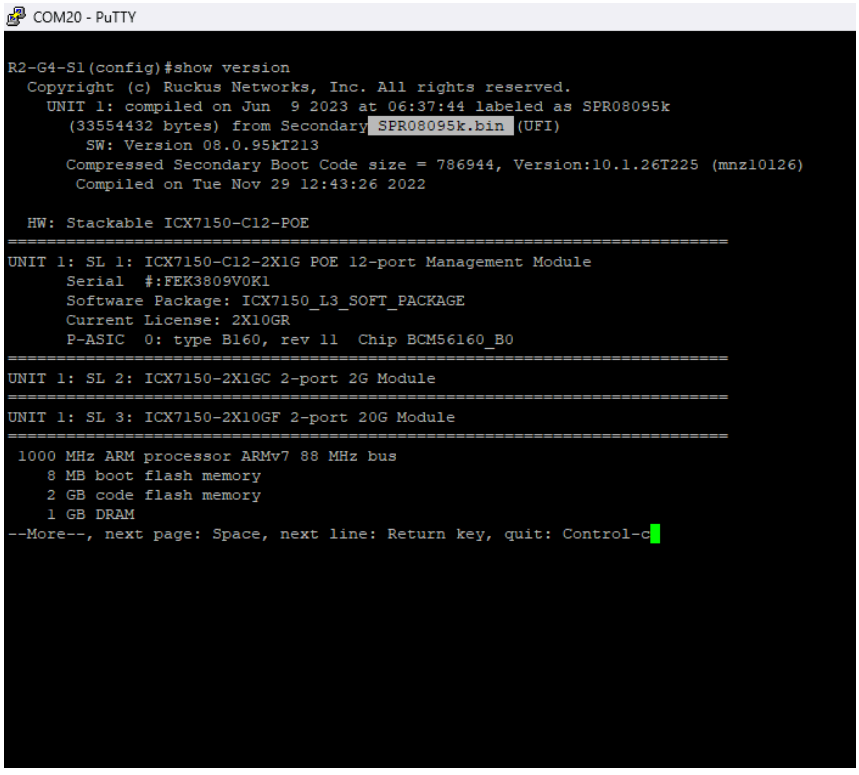
LAB-8

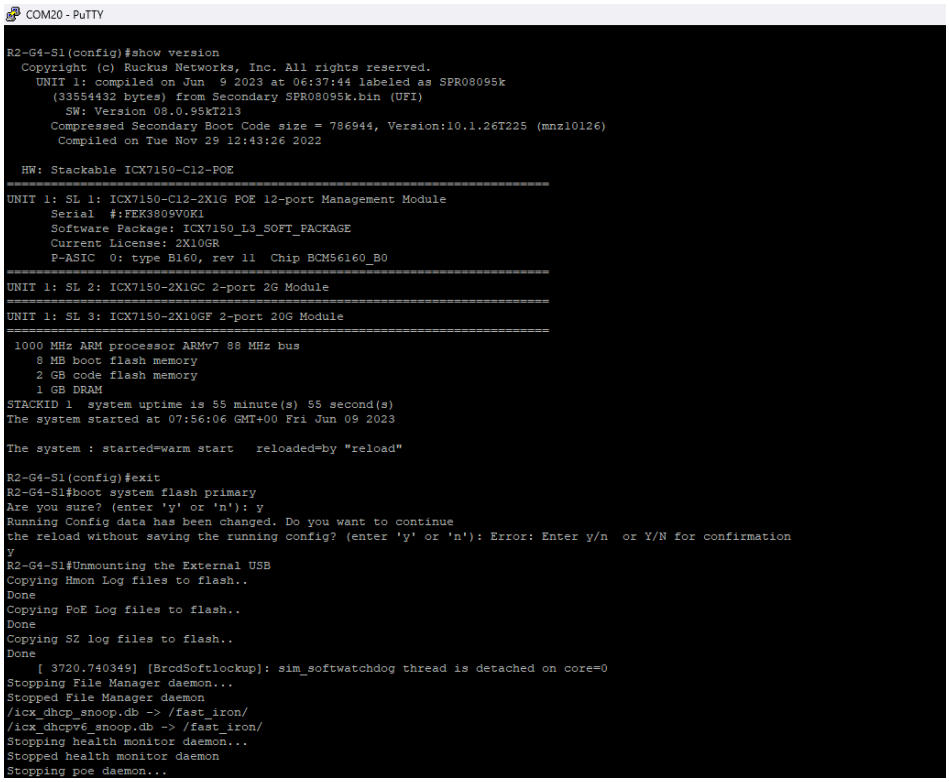
IN ROUTER MODE- Construct an Inter-VLAN network and demonstrate communication between different VLANs

Verify Current Mode and Switch to Router Image

Step 1: Verify Current Operating Mode

First, enable privileged mode and check the switch's current running image by viewing the version information. This confirms whether the switch is operating in Layer 2 (switch) or Layer 3 (router) mode. The output shows it is running the secondary image (SPR08095k), indicating router mode.



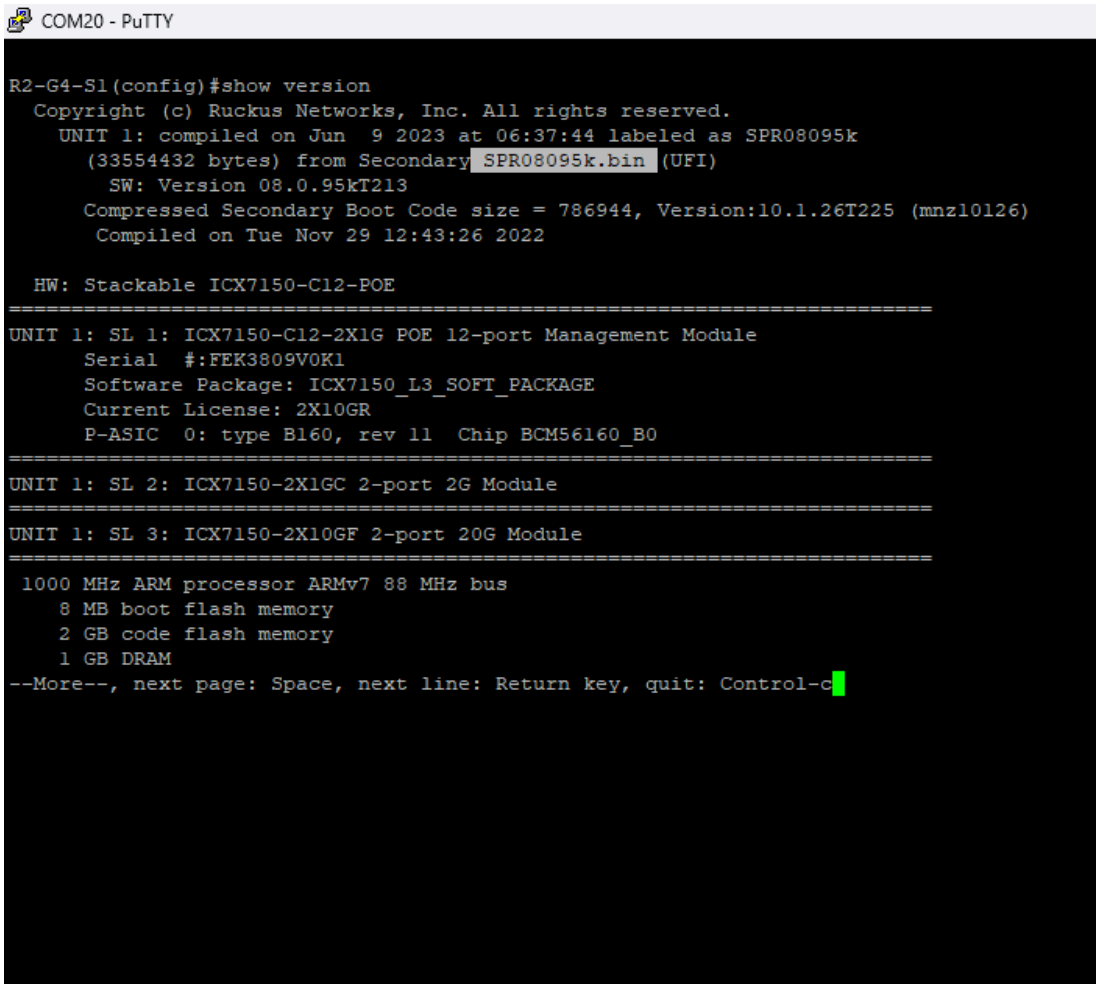


Step 2: Switch to Router Mode

Set the switch to boot from the secondary image (router mode) and reload the device to apply the change.

Login and Enter Configuration Mode

After the switch reloads, log in with the required credentials and enter global configuration mode to start making configuration changes



Step 3:Clear Previous Configuration

Remove Existing VLANs

To avoid conflicts with previous settings, delete the old VLANs (VLAN 10 and VLAN 20). This ensures a clean starting point for configuring inter-VLAN routing.Verify the removal of VLANs by displaying the VLAN list; only the default VLAN (VLAN1) should remain

```
Configuration filename: None
        Image filename: None
            DNS Server: N/A
               IP MTU: 1500
R2-G4-S1(config)#ip address 192.168.100.41
Incomplete command.
R2-G4-S1(config)#ip address 192.168.100.41 255.255.255.0
R2-G4-S1(config)#show ip

     Switch IP address: 192.168.100.41

           Subnet mask: 255.255.255.0

Default router address: None
   TFTP server address: None
Configuration filename: None
        Image filename: None
            DNS Server: N/A
               IP MTU: 1500
R2-G4-S1(config)#write memory

Flash Memory Write (8192 bytes per dot)
.
Write startup-config done.
Copy Done.
R2-G4-S1(config)#show vlan
Total PORT-VLAN entries: 3
Maximum PORT-VLAN entries: 1024

Legend: [Stk=Stack-Id, S=Slot]

PORT-VLAN 1, Name DEFAULT-VLAN, Priority level0, On
 Untagged Ports: (U1/M1)   5   6   7   8
 Untagged Ports: (U1/M2)   1   2
 Untagged Ports: (U1/M3)   1   2
   Tagged Ports: None
 Mac-Vlan Ports: None
     Monitoring: Disabled
PORT-VLAN 10, Name VLAN10, Priority level0, On
 Untagged Ports: (U1/M1)   1   2   3   4
   Tagged Ports: None
 Mac-Vlan Ports: None
     Monitoring: Disabled
PORT-VLAN 20, Name VLAN20, Priority level0, On
 Untagged Ports: (U1/M1)   9  10  11  12
   Tagged Ports: None
 Mac-Vlan Ports: None
     Monitoring: Disabled
R2-G4-S1(config)#no vlan 10
R2-G4-S1(config)#no vlan 20
R2-G4-S1(config)#
```

Step 4:Configure Inter-VLAN Routing

Create VLAN 10 and Assign Ports: Create VLAN 10 and assign untagged ports 1/1/1 to 1/1/4. Then, associate VLAN 10 with a virtual router interface (VE 10), which acts as the Layer 3 interface for routing.

Assign IP Address to VLAN 10 Interface:Configure the virtual interface VE 10 with an IP address (10.0.0.1/24), which will serve as the default gateway for devices in VLAN 10.

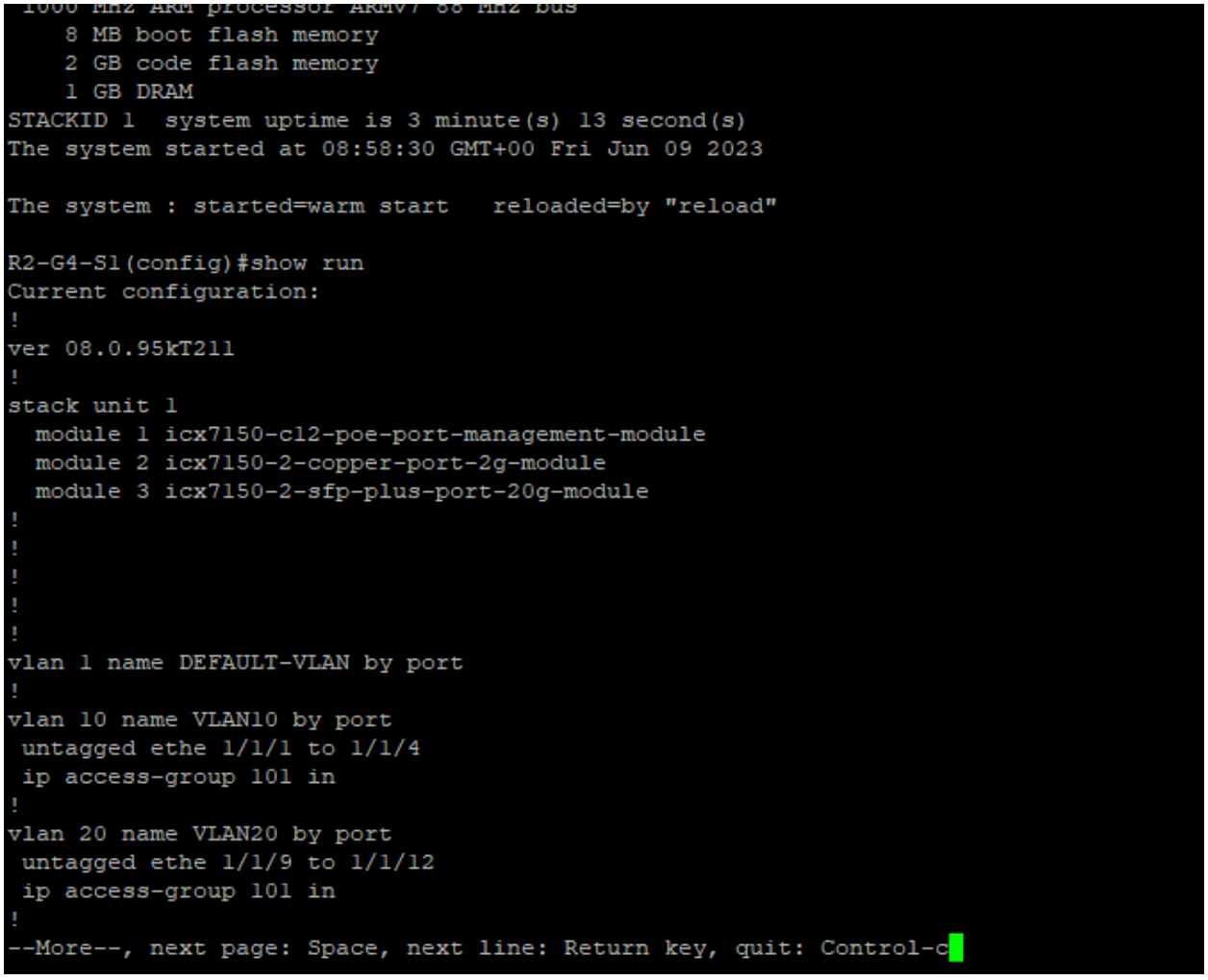
Create VLAN 20 and Assign Ports:Similarly, create VLAN 20, assign untagged ports 1/1/5 to 1/1/8, and bind VLAN 20 to router interface VE 20.

Assign IP Address to VLAN 20 Interface:Assign IP address 20.0.0.1/24 to VE 20, which acts as the gateway for VLAN 20 devices.

Configure Trunk Ports for VLAN Traffic:Configure ports 1/2/1 to 1/2/2 as tagged for both VLAN 10 and VLAN 20. These trunk ports allow VLAN traffic to pass between switches or network devices, enabling communication across VLANs

```
R2-G4-S2>en
No password has been assigned yet...
R2-G4-S2#conf t
R2-G4-S2(config)#vlan 10
R2-G4-S2(config-vlan-10)#untagged eth 1/1/1 to 1/1/4
Added untagged port(s) ethe 1/1/1 to 1/1/4 to port-vlan 10.
R2-G4-S2(config-vlan-10)#router-interface ve 10
R2-G4-S2(config-vlan-10)#int ve 10
R2-G4-S2(config-vif-10)#ip address 10.0.0.1/24
R2-G4-S2(config-vif-10)#exit
R2-G4-S2(config)#vlan 10
R2-G4-S2(config-vlan-10)#tagged eth 1/2/1 to 1/2/2
Added tagged port(s) ethe 1/2/1 to 1/2/2 to port-vlan 10.
R2-G4-S2(config-vlan-10)#exit
R2-G4-S2(config)#vlan 20
R2-G4-S2(config-vlan-20)#untagged eth 1/1/5 to 1/1/8
Added untagged port(s) ethe 1/1/5 to 1/1/8 to port-vlan 20.
R2-G4-S2(config-vlan-20)#router-interface ve 20
R2-G4-S2(config-vlan-20)#int ve 20
R2-G4-S2(config-vif-20)#ip address 20.0.0.1/24
R2-G4-S2(config-vif-20)#exit
R2-G4-S2(config)#vlan 20
R2-G4-S2(config-vlan-20)#tagged eth 1/2/1 to 1/2/2
Added tagged port(s) ethe 1/2/1 to 1/2/2 to port-vlan 20.
R2-G4-S2(config-vlan-20)#exit
R2-G4-S2(config)#
```

save the Configuration Save the running configuration to memory to ensure the changes persist after a reboot Verify Running Configuration Display the current running configuration to confirm that VLANs, interfaces, and IP addresses are correctly set.



Testing Inter-VLAN Routing

Configure PCs in VLAN 10 and VLAN 20 with appropriate IP addresses and gateways (10.0.0.10/24 with gateway 10.0.0.1 for VLAN 10, and 20.0.0.20/24 with gateway 20.0.0.1 for VLAN 20).
From PC1 in VLAN 10, ping its gateway (10.0.0.1) to verify local connectivity.
From PC2 in VLAN 20, ping its gateway (20.0.0.1) similarly.
Finally, test inter-VLAN communication by pinging from PC1 (VLAN 10) to PC2's IP address (20.0.0.20). Successful replies indicate proper inter-VLAN routing configuration

```
C:\Users\RVU>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:
Reply from 10.0.0.1: bytes=32 time<1ms TTL=64
Reply from 10.0.0.1: bytes=32 time=1ms TTL=64
Reply from 10.0.0.1: bytes=32 time=1ms TTL=64
Reply from 10.0.0.1: bytes=32 time=1ms TTL=64

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
C:\Users\RVU>ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data:
Reply from 20.0.0.1: bytes=32 time<1ms TTL=64
Reply from 20.0.0.1: bytes=32 time=1ms TTL=64
Reply from 20.0.0.1: bytes=32 time=1ms TTL=64
Reply from 20.0.0.1: bytes=32 time=1ms TTL=64

Ping statistics for 20.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

successful pings between different VLANs and demonstrate that inter-VLAN routing is working