Cisco Switch Catalyst 2960-S Configuration Lab

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Scope of Lab: Reset and Configure a Cisco Catalyst 2960-S Network Switch for use in my Home Network

I recently got my hands on a pre-owned switch, and wanted to take this opportunity to sharpen my networking skills. So, I'll be resetting it, and configuring it for use in my home network.

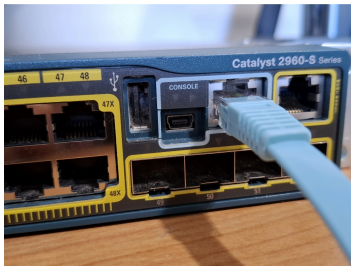
Catalyst 2960-S Device

Resetting the Switch

What we will need:

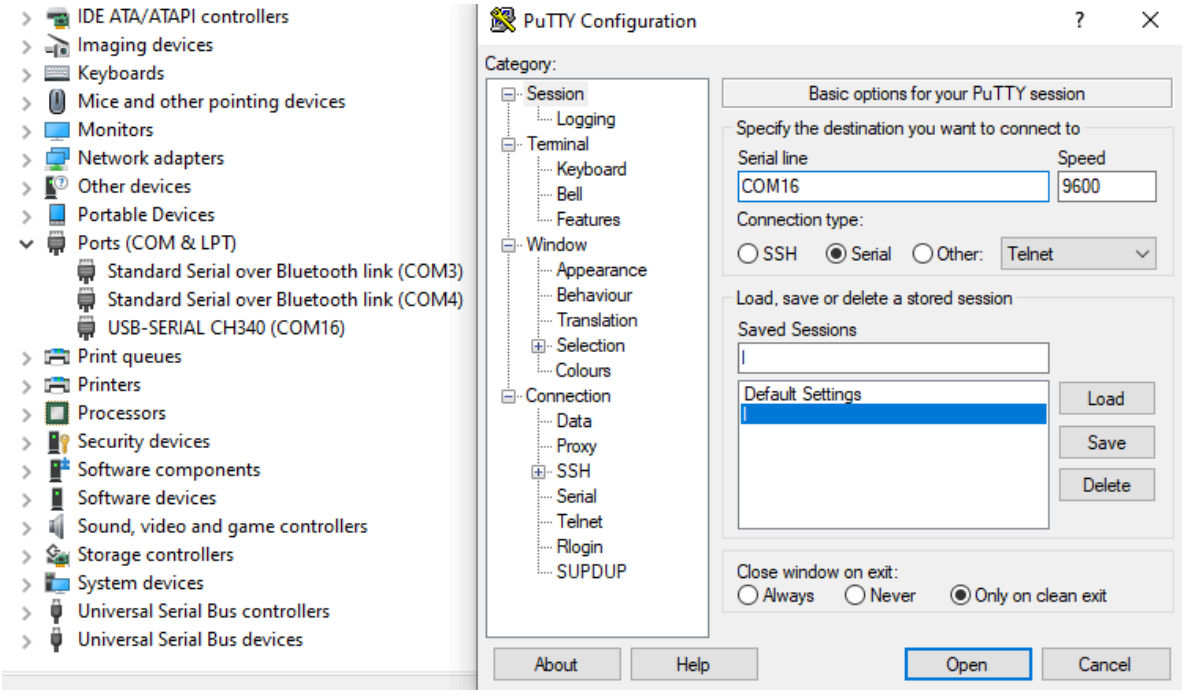
- PuTTY Software
- Console Cable

The Console Cable is used to connect a PC to the powered on switch. For this model, a generic RJ45 console cable can be used, or a USB Mini cable.



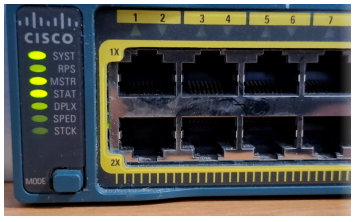
Connecting a console cable

In PuTTY, we need to start a session using the identified COM port in Device Manager, from my Windows 10 PC. I've identified it as COM16, so I will input this into the Serial Line option. The connection type is Serial, Telnet. We will then open a connection to the device.



Device Manager on the left, PuTTY on the right

To reset the switch, we need to press and hold the MODE button. The LEDs will all flash then turn solid green, at this point we release.



MODE button on the device

In the PuTTY CLI, it will confirm that the switch is going through a reboot process.

```
000018: *Mar  1 00:18:22.742: %SYS-7-NV_BLOCK_INIT: Initialized the geometry of
nvram
000019: *Mar  1 00:18:22.742: %EXPRESS_SETUP-6-CONFIG_IS_RESET: The configuratio
n is reset and the system will now reboot
000020: *Mar  1 00:18:23.744: %SYS-5-RELOAD: Reload requested by Hulc LED Proces
s. Reload reason: Reason unspecified
```

When prompted, enter the initial configuration dialog. Then, enter the basic management setup. From here, we set a new host name for the device. For the purposes of the lab, I will use "TestSwitch". Default settings are in square brackets. For example, when entering a host name, if we just press enter the name will be "Switch"

```
Would you like to enter the initial configuration dialog? [yes/no]: yes

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.


Basic management setup configures only enough connectivity
for management of the system, extended setup will ask you
to configure each interface on the system

Would you like to enter basic management setup? [yes/no]: yes
Configuring global parameters:

  Enter host name [Switch]: TestSwitch
```

For the device credentials, I will use "admin" for both username and password. If seriously using the device, we would need to choose a more secure password, but this works for the sake of the lab.

```
The enable secret is a password used to protect access to
privileged EXEC and configuration modes. This password, after
entered, becomes encrypted in the configuration.
Enter enable secret: admin

The enable password is used when you do not specify an
enable secret password, with some older software versions, and
some boot images.
Enter enable password: admin
Please choose a password that is different from the enable secret
Enter enable password: admin

The virtual terminal password is used to protect
access to the router over a network interface.
Enter virtual terminal password: admin
Configure SNMP Network Management? [no]: no
```

We will now be given a summary of the current interfaces. The interface I would like to configure is Vlan1.

```
Current interface summary

Interface              IP-Address      OK? Method Status                Protocol
Vlan1                  unassigned      YES unset  up                    down
FastEthernet0          unassigned      YES unset  down                  down
GigabitEthernet1/0/1   unassigned      YES unset  down                  down
GigabitEthernet1/0/2   unassigned      YES unset  down                  down
GigabitEthernet1/0/3   unassigned      YES unset  down                  down
GigabitEthernet1/0/4   unassigned      YES unset  down                  down
GigabitEthernet1/0/5   unassigned      YES unset  down                  down
GigabitEthernet1/0/6   unassigned      YES unset  down                  down
GigabitEthernet1/0/7   unassigned      YES unset  down                  down
GigabitEthernet1/0/8   unassigned      YES unset  down                  down
GigabitEthernet1/0/9   unassigned      YES unset  down                  down
GigabitEthernet1/0/10  unassigned      YES unset  down                  down
GigabitEthernet1/0/11  unassigned      YES unset  down                  down
GigabitEthernet1/0/12  unassigned      YES unset  down                  down
GigabitEthernet1/0/13  unassigned      YES unset  down                  down
GigabitEthernet1/0/14  unassigned      YES unset  down                  down
GigabitEthernet1/0/15  unassigned      YES unset  down                  down
GigabitEthernet1/0/16  unassigned      YES unset  down                  down
GigabitEthernet1/0/17  unassigned      YES unset  down                  down
GigabitEthernet1/0/18  unassigned      YES unset  down                  down
GigabitEthernet1/0/19  unassigned      YES unset  down                  down
GigabitEthernet1/0/20  unassigned      YES unset  down                  down
GigabitEthernet1/0/21  unassigned      YES unset  down                  down
GigabitEthernet1/0/22  unassigned      YES unset  down                  down
GigabitEthernet1/0/23  unassigned      YES unset  down                  down
GigabitEthernet1/0/24  unassigned      YES unset  down                  down
GigabitEthernet1/0/25  unassigned      YES unset  down                  down
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GigabitEthernet1/0/37  unassigned      YES unset  down                  down
GigabitEthernet1/0/38  unassigned      YES unset  down                  down
GigabitEthernet1/0/39  unassigned      YES unset  down                  down
GigabitEthernet1/0/40  unassigned      YES unset  down                  down
GigabitEthernet1/0/41  unassigned      YES unset  down                  down
GigabitEthernet1/0/42  unassigned      YES unset  down                  down
GigabitEthernet1/0/43  unassigned      YES unset  down                  down
GigabitEthernet1/0/44  unassigned      YES unset  down                  down
GigabitEthernet1/0/45  unassigned      YES unset  down                  down
GigabitEthernet1/0/46  unassigned      YES unset  down                  down
GigabitEthernet1/0/47  unassigned      YES unset  down                  down
GigabitEthernet1/0/48  unassigned      YES unset  down                  down
GigabitEthernet1/0/49  unassigned      YES unset  down                  down
GigabitEthernet1/0/50  unassigned      YES unset  down                  down
GigabitEthernet1/0/51  unassigned      YES unset  down                  down
GigabitEthernet1/0/52  unassigned      YES unset  down                  down
```

I will select to configure an IP and Subnet mask for the interface. I have chosen an unused fixed IP address in my private network. "192.168.1.196" When using SSH, this is the IP we will be going to. We don't need to enable as a cluster command switch.

```
Configuring interface Vlan1:
  Configure IP on this interface? [no]: yes
    IP address for this interface: 192.168.1.196
    Subnet mask for this interface [255.255.255.0] :
    Class C network is 192.168.1.0, 24 subnet bits; mask is /24
Would you like to enable as a cluster command switch? [yes/no]: no
```

To save the current configuration to nvram, I'll choose option 2. (Saves to memory, so when the device is rebooted, it will use this configuration)

```
[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]: 2
```

Configuring SSH for the Switch

The following commands will be executed in order to configure SSH for the switch.

- **configure terminal:** This command is used to enter global configuration mode on the switch, where you can make system-wide changes
- **ip domain-name example.com:** This command sets the domain name for the switch. SSH requires the switch to have a domain name, because it's used in generating the RSA key that secures the SSH connection. For the purpose of this lab I've chosen a generic domain name, "example.com"
- **crypto key generate rsa:** This command generates the RSA key pairs used to secure SSH connections.
- **1024:** This command is used to specify the bit size of the RSA key. 1024 bits is considered relatively secure, but the larger, the more secure.

```
TestSwitch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
TestSwitch(config)#ip domain-name example.com
TestSwitch(config)#crypto key generate rsa
The name for the keys will be: TestSwitch.example.com
Choose the size of the key modulus in the range of 360 to 2048 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]
```

- **ip ssh version 2:** This configures the switch to use version 2 SSH, which is more secure than version 1.
- **username admin privilege 15 secret admin:** This creates a user account named admin, with the password admin, giving it the highest privilege level (15).

- **line vty 0 15:** This command accesses the virtual terminal lines 0-15, configuring settings for all lines.
- **transport input ssh:** This ensures that only SSH connections are allowed over VTY lines.
- **login local:** This tells the switch to use the local username and password for authentication when logging in remotely.
- **exit (run x2):** The first exit command exits config-line mode, the second exits the config mode.
- **write memory:** This command saves the current configuration to the startup configuration. This ensures changes are saved.
- **show ip ssh:** Finally, we verify the SSH configuration.

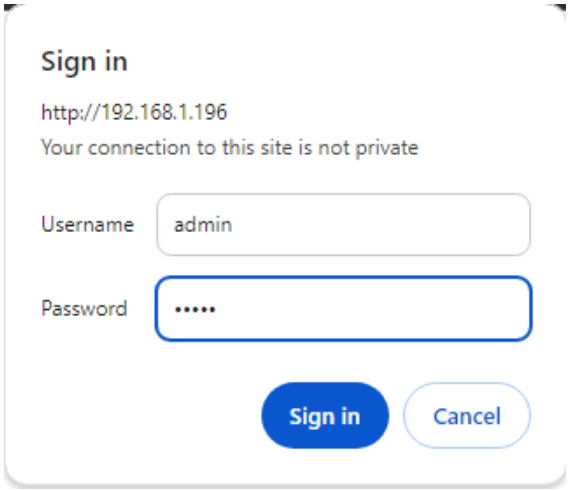
```
TestSwitch(config)#
*Mar  1 00:22:05.934: %SSH-5-ENABLED: SSH 1.99 has been enabled
TestSwitch(config)#ip ssh version 2
TestSwitch(config)#username admin privilege 15 secret admin
TestSwitch(config)#line vty 0 15
TestSwitch(config-line)#transport input ssh
TestSwitch(config-line)#login local
TestSwitch(config-line)#exit
TestSwitch(config)#exit
TestSwitch#write
*Mar  1 00:23:10.306: %SYS-5-CONFIG_I: Configured from console by console
Building configuration...
[OK]
TestSwitch#write memory
Building configuration...
[OK]
TestSwitch#show ip ssh
SSH Enabled - version 2.0
Authentication timeout: 120 secs; Authentication retries: 3
TestSwitch#show running-config | include username
username admin privilege 15 secret 5 $1$NW56$SQ3VP8TkkPonk7aY4qHFm/
```

The switch has successfully been configured with SSH. We can now move on to integrating it into the network, and accessing it via browser.

Switch Integration

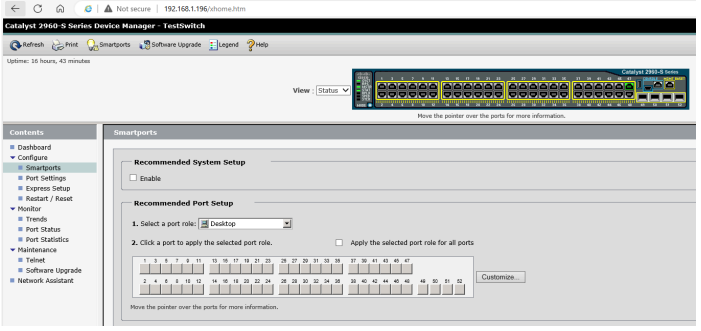
I've moved the switch to my home router, and connected it via an ethernet cable. After a few minutes of startup time, we should now be able to access it through a browser on a PC.

First, we need to go to the IP address of the router, while connected to the same home network. "192.168.1.196". I'll use the credentials we setup earlier, admin/admin.



And just like that, we now have access to the switch. I can configure each port to my needs.

Note that port 47 is highlighted green. That's because this is the port the router is connected to.



Optional Next Steps:

- Update the switch's firmware through the web UI, using a downloaded file from Cisco.
- Create an advanced configuration for different devices connected to the switch ports (Access Points, Switches, Desktops)

Resources Used:

- [Cisco Catalyst 2960 Configuration Guides]