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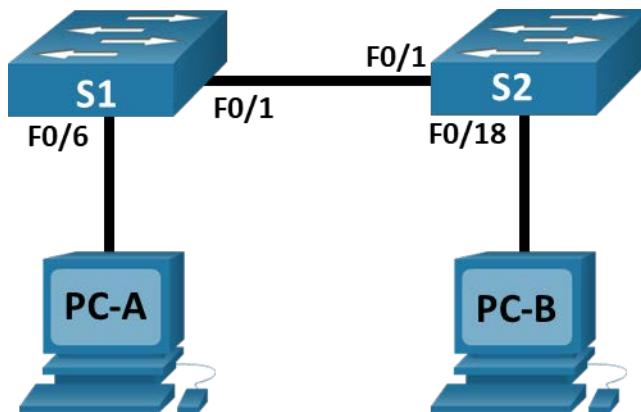
Wales Institute of Science and Art (WISA)

Advanced Networking (ACCA5024)

Lab 1: Design and build a Simple Network

Cisco | **Networking Academy**[®]
| **Mind Wide Open**[™]

Topology



Addressing Table

Device	Interface	IP Address	Subnet Mask
S1	VLAN 1	192.168.1.1	255.255.255.0
S2	VLAN 1	192.168.1.2	255.255.255.0
PC-A	NIC	192.168.1.10	255.255.255.0
PC-B	NIC	192.168.1.11	255.255.255.0

Objectives

- Understand the Switch IOS and its environment
- Set Up the Network Topology
- Configure PC Hosts
- Configure and Verify Basic Switch Settings

Background / Scenario

In this lab, you will build a simple network with two hosts and two switches. You will understand the Switch and End device configurations, and will configure basic settings.

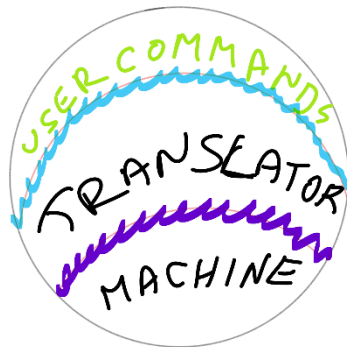
Use of commands like Show, Copy, and Ping will help you in easy understanding of the existing topology.

Environment

- Packet Tracer 7.3.1

Instructions

Step 1: Understand the Device Terms

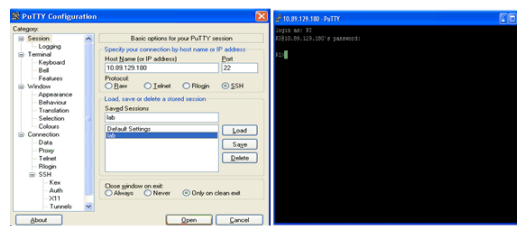


Shell - The user interface that allows users to request specific tasks from the computer. These requests can be made either through the CLI or GUI interfaces.

Kernel - Communicates between the hardware and software of a computer and manages how hardware resources are used to meet software requirements.

Hardware - The physical part of a computer including underlying electronics.

a. Accessing the device



Use either a **Console** or a **Secure Shell (SSH)** (a secure remote CLI connection to a device, through a virtual interface) or **Telnet** (an insecure remote CLI connection)

Use terminal emulation tools like **PuTTY**, **Tera Term** etc to connect to the device

b. Modes

```
Switch>
```

User EXEC mode

```
Switch> enable
Switch#
```

Privileged EXEC mode

```
Switch(config)#
Switch(config)#exit
Switch#
```

Global Configuration mode

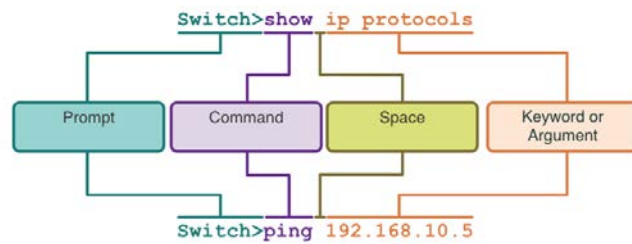
```
Switch(config)#line console 0
Switch(config-line)#exit
Switch(config)#
```

Line Configuration mode

```
Switch(config-line)#interface FastEthernet 0/1
Switch(config-if)#
```

Interface Configuration mode

c. IOS Command Structure



d. Help!

```
Router#ping ?
WORD  Ping destination address or hostname
ip     IP echo
ipv6   IPv6 echo
```

Context-sensitive help

```
Switch#interface fastEthernet 0/1
^
% Invalid input detected at '^' marker.
```

Command syntax

e. HOT Keys!

- | | |
|--------------------------|--|
| 1. TAB Key | Completes a partial command name entry. |
| 2. Backspace | Erases the character to the left of the cursor. |
| 3. Left Arrow or Ctrl+B | Moves the cursor one character to the left. |
| 4. Right Arrow or Ctrl+F | Moves the cursor one character to the right. |
| 5. Up Arrow or Ctrl+P | Recalls the commands in the history buffer, beginning with the most recent commands. |
| 6. Ctrl-C | When in any configuration mode, ends the configuration mode and returns to privileged EXEC mode. |
| 7. Ctrl-Z | When in any configuration mode, ends the configuration mode and returns to privileged EXEC mode. |
| 8. Ctrl-Shift-6 | All-purpose break sequence used to abort DNS lookups, traceroutes, pings, etc. |
| 9. Ctrl + A | Move to the 1 st character |
| 10. Ctrl + E | Move to the last character |

Step 2: Set Up the Network Topology

In this step, you will cable the devices together according to the network topology.

a. Design the Topology as given above in Cisco Packet Tracer 7.3.1

Step 3: Configure PC Hosts

- a. Configure static IP address information on the PCs according to the Addressing Table.

PC→Desktop→ IP Configuration → “Configure IP, Subnet Mask as per addressing table

- b. Verify PC settings and connectivity.

From PC-A, open a Command Prompt PC→Desktop→Command Prompt to verify the PC settings and connectivity using the ipconfig command at the prompt.

To test the connectivity to PC-B, enter ping 192.168.1.11 at the prompt. The ping should be successful. If not, troubleshoot as necessary.

Step 4: Configure and Verify Basic Switch Settings

- a. In the switch, initially, erase the existing configuration and reload.

```
Switch>
Switch>enable
Switch#era
Switch#erase
% Incomplete command.
Switch#erase ?
    startup-config  Erase contents of configuration memory
Switch#erase st
Switch#erase startup-config
Erasing the nvram filesystem will remove all configuration files!
Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Switch#reload
Proceed with reload? [confirm]
```

- b. Enter the global configuration mode.

Switch> enable

Switch#

The prompt changed from Switch> to Switch# which indicates privileged EXEC mode.

Use the configuration terminal command to enter configuration mode.

Switch# configure terminal

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

Switch(config)#

The prompt changed to reflect global configuration mode.

- c. Give the switch a name according to the Addressing Table.

Use the hostname command to change the switch name to S1.

Switch(config)# hostname S1

- d. Prevent unwanted DNS lookups.

To prevent the switch from attempting to translate incorrectly entered commands as though they were hostnames, disable the Domain Name System (DNS) lookup.

S1(config)# no ip domain-lookup

- e. Enter local passwords. Use **class** as the privileged EXEC password and **cisco** as the password for console access.

To prevent unauthorized access to the switch, configure passwords.

S1(config)# enable secret class

S1(config)# line con 0

S1(config-line)# password cisco

S1(config-line)# login

S1(config-line)# exit

- f. Configure and enable the SVI according to the Addressing Table.

```
S1(config)# interface vlan 1
S1(config-if)# ip address 192.168.1.1 255.255.255.0
S1(config-if)# no shut
```

- g. Enter a login MOTD banner to warn about unauthorized access.

A login banner, known as the message of the day (MOTD) banner, should be configured to warn anyone accessing the switch that unauthorized access will not be tolerated.

The banner motd command requires the use of delimiters to identify the content of the banner message. The delimiting character can be any character as long as it does not occur in the message. For this reason, symbols, such as the #, are often used.

```
S1(config)# banner motd #
Enter TEXT message. End with the character '#'.
Unauthorized access is strictly prohibited and prosecuted to the full
extent of the law. #
S1(config)# exit
```

- h. Save the configuration.

Use the copy command to save the running configuration to the startup file on non-volatile random access memory (NVRAM).

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

- i. Display the current configuration.

The show running-config command displays the entire running configuration, one page at a time. Use the spacebar to advance paging. The commands configured in Steps a - h are highlighted below.

```
S1# show running-config
Building configuration...

Current configuration : 1409 bytes
!
```

- j. Display the IOS version and other useful switch information.

Use the show version command to display the IOS version that the switch is running, along with other useful information. Again, you will need to use the spacebar to advance through the displayed information.

```
S1# show version
Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE,
RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2012 by Cisco Systems, Inc.
Compiled Sat 28-Jul-12 00:29 by prod_rel_team
```

- k. Display the status of the connected interfaces on the switch.

To check the status of the connected interfaces, use the show ip interface brief command. Press the spacebar to advance to the end of the list.

S1# show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	192.168.1.1	YES	unset	up	up
FastEthernet0/1	unassigned	YES	unset	up	up
FastEthernet0/2	unassigned	YES	unset	down	down

- l. Configure switch S2.

Repeat the previous steps for Switch S2. Make sure the hostname is configured as S2.

- m. Record the interface status for the following interfaces.

Interface	S1 Status	S1 Protocol	S2 Status	S2 Protocol
F0/1				
F0/6				
F0/18				
VLAN 1				

- n. From a PC, ping S1 and S2.

- o. From a switch, ping PC-A and PC-B.

Record your reflection

Why do you erase the Startup Configuration in the switch? Is it required for all/ any switch or only for an old switch?

Are all the FastEthernet ports on the switches up? Yes/ No. If YES, Why? If No, Why?

What is your understanding on PING and TRACEROUTE utilities? What is the purpose of using them?

