Lab - Building a Simple Network

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
PC-A	NIC	192.168.1.10	255.255.255.0	N/A
PC-B	NIC	192.168.1.11	255.255.255.0	N/A

Objectives

Part 1: Set Up the Network Topology (Ethernet only)

- Identify cables and ports for use in the network above.

Part 2: Configure PC Hosts

- Enter static IP address information on the LAN interface of the hosts.

Part 3: Configure and Verify Basic Switch Settings

- Configure each switch with hostname, local passwords, and login banner.
- Save the running configurations.
- Display the running switch configuration.
- Display the IOS version for the running switch.
- Display the status of the interfaces.

Background / Scenario

Networks are constructed of three major components: hosts, switches, and routers. In this lab, you will build a simple network with two hosts and two switches. You will also configure basic settings including hostname, local passwords, and login banner. Use show commands to display the running configuration, IOS version, and interface status. Use the copy command to save device configurations. You will apply IP addressing for this lab to the PCs to enable communication between these two devices. Use the ping utility to verify connectivity.

Note: The switches used are Cisco Catalyst **2960s** with Cisco IOS Release 15.0(2) (lanbasek9 image). Other switches and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and output produced might vary from what is shown in the labs.

Part 1: Set Up the Network Topology

Step 1: Draw a topology as in the diagram above. Identify the cables and ports for use in the network.

Part 2: Configure PC Hosts

Step1: Configure static IP address information on the PCs. Use the information given in the addressing table above.

Step 2: Verify PC settings and connectivity by using ping procedure.

On the command prompt of PC-A, ping ip address PC-B.

PC-A> **ping 192.168.1.11**

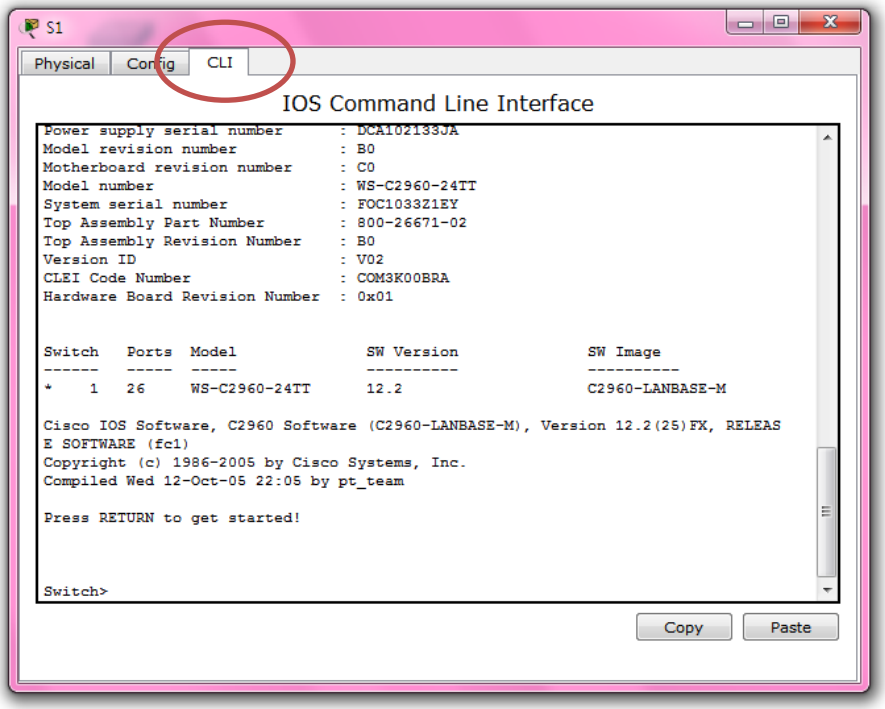
Were the ping results successful? _____

If not, troubleshoot as necessary.

Note: If you did not get a reply from PC-B, try to ping PC-B again. If you still do not get a reply from PC-B, try to ping PC-A from PC-B. If you are unable to get a reply from the remote PC, then have your instructor help you troubleshoot the problem.

Part 3: Configure and Verify Basic Switch Settings

Step 1: Double click on Switch 1 (S1) to get the Command Line Interface (CLI)



Step 2: Enter privileged EXEC mode

You can access all switch commands in privileged EXEC mode. The privileged EXEC command set includes those commands contained in user EXEC mode, as well as the **configure** command through which access to the remaining command modes are gained. Enter privileged EXEC mode by entering the **enable** command.

```
Switch> enable
Switch#
```

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

Step 3: Enter configuration 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.

Step 4: Give the switch a name
Use the **hostname** command to change the switch name to **S1**.

```
Switch(config)# hostname S1
S1(config)#
```

Step 5: 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
S1(config)#
```

Step 6: Enter local passwords
To prevent unauthorized access to the switch, passwords must be configured.

```
S1(config)# enable secret class
S1(config)# line con 0
S1(config-line)# password cisco
S1(config-line)# login
S1(config-line)# exit
S1(config)#
```

Step 7: Enter a login MOTD banner
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
S1#
```

Step 8: 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#
```

Step 9: 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 1 – 8 are highlighted below.

```
S1# show running-config

Building configuration...
Current configuration : 1409 bytes
!
! Last configuration change at 03:49:17 UTC Mon Mar 1 1993
!
version 15.0
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname S1
!
boot-start-marker
boot-end-marker
!
enable secret 4 06YFDUHH61wAE/kLkDq9BGho1QM5EnRtoyr8cHAUg.2
!
no aaa new-model
system mtu routing 1500
!
!
no ip domain-lookup
!
<output omitted>
```

```
!
banner motd ^C
Unauthorized access is strictly prohibited and prosecuted to the
full extent of the law. ^C
!
line con 0
 password cisco
 login
line vty 0 4
 login
line vty 5 15
 login
!
end

S1#
```

Step 10: 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

ROM: Bootstrap program is C2960 boot loader
BOOTLDR: C2960 Boot Loader (C2960-HBOOT-M) Version 12.2(53r)SEY3, RE-
LEASE SOFTWARE (fc1)

S1 uptime is 1 hour, 38 minutes
System returned to ROM by power-on
System image file is "flash:/c2960-lanbasek9-mz.150-2.SE.bin"

This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and use.
Delivery of Cisco cryptographic products does not imply third paty au-
thority to import, export, distribute or use encryption. Importers, ex-
porters, distributors and users are responsible for compliance with U.S.
and local country laws. By using this product you agree to comply with
applicable laws and regulations. If you are unable to comply with U.S.
and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found
at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.
```

```
cisco WS-C2960-24TT-L (PowerPC405) processor (revision R0) with 65536K
bytes of memory.
Processor board ID FCQ1628Y5LE
Last reset from power-on
1 Virtual Ethernet interface
24 FastEthernet interfaces
2 Gigabit Ethernet interfaces
The password-recovery mechanism is enabled.

64K bytes of flash-simulated non-volatile configuration memory.
Base ethernet MAC Address       : 0C:D9:96:E2:3D:00
Motherboard assembly number     : 73-12600-06
Power supply part number        : 341-0097-03
Motherboard serial number       : FCQ16270N5G
Power supply serial number      : DCA1616884D
Model revision number           : R0
Motherboard revision number     : A0
Model number                    : WS-C2960-24TT-L
System serial number            : FCQ1628Y5LE
Top Assembly Part Number        : 800-32797-02
Top Assembly Revision Number    : A0
Version ID                      : V11
CLEI Code Number                : COM3L00BRF
Hardware Board Revision Number  : 0x0A

Switch Ports Model              SW Version            SW Image
------ ----- -----              ----------            ----------
*    1 26    WS-C2960-24TT-L    15.0(2)SE             C2960-LANBASEK9-M
Configuration register is 0xF

S1#
```

Step 11: 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                  unassigned      YES unset  up            up
FastEthernet0/1        unassigned      YES unset  up            up
FastEthernet0/2        unassigned      YES unset  down          down
FastEthernet0/3        unassigned      YES unset  down          down
FastEthernet0/4        unassigned      YES unset  down          down
FastEthernet0/5        unassigned      YES unset  down          down
FastEthernet0/6        unassigned      YES unset  up            up
FastEthernet0/7        unassigned      YES unset  down          down
FastEthernet0/8        unassigned      YES unset  down          down
FastEthernet0/9        unassigned      YES unset  down          down
FastEthernet0/10       unassigned      YES unset  down          down
FastEthernet0/11       unassigned      YES unset  down          down
FastEthernet0/12       unassigned      YES unset  down          down
FastEthernet0/13       unassigned      YES unset  down          down
FastEthernet0/14       unassigned      YES unset  down          down
FastEthernet0/15       unassigned      YES unset  down          down
FastEthernet0/16       unassigned      YES unset  down          down
FastEthernet0/17       unassigned      YES unset  down          down
FastEthernet0/18       unassigned      YES unset  down          down
FastEthernet0/19       unassigned      YES unset  down          down
```

```
FastEthernet0/20       unassigned      YES unset  down          down
FastEthernet0/21       unassigned      YES unset  down          down
FastEthernet0/22       unassigned      YES unset  down          down
FastEthernet0/23       unassigned      YES unset  down          down
FastEthernet0/24       unassigned      YES unset  down          down
GigabitEthernet0/1     unassigned      YES unset  down          down
GigabitEthernet0/2     unassigned      YES unset  down          down

S1#
```

Step 12: Repeat Steps 1 to 12 to configure switch S2
The only difference for this step is to change the hostname to S2.

Step 13: Record the interface status for the following interfaces.

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

Why are some FastEthernet ports on the switches are up and others are down?

_____

_____

Reflection
What could prevent a ping from being sent between the PCs?

_____

Note: It may be necessary to disable the PC firewall to ping between PCs.

Appendix A: Initializing and Reloading a Switch

Step 14: Connect to the switch.
Enter privileged EXEC mode.

```
Switch> enable
Switch#
```

Step 15: Determine if there has been any virtual local-area networks (VLANs) created.
Use the **show flash** command to determine if any VLANs have been created on the switch.

```
Switch# show flash

Directory of flash:/

    2  -rwx        1919   Mar 1 1993 00:06:33 +00:00  private-config.text
    3  -rwx        1632   Mar 1 1993 00:06:33 +00:00  config.text
    4  -rwx       13336   Mar 1 1993 00:06:33 +00:00  multiple-fs
    5  -rwx    11607161   Mar 1 1993 02:37:06 +00:00  c2960-lanbasek9-mz.150-
2.SE.bin
```

```
    6  -rwx         616   Mar 1 1993 00:07:13 +00:00  vlan.dat

32514048 bytes total (20886528 bytes free)

Switch#
```

Step 16: Delete the VLAN file

a. If the **vlan.dat** file was found in flash, then delete this file.

```
Switch# delete vlan.dat
Delete filename [vlan.dat]?
```

You will be prompted to verify the file name. At this point, you can change the file name or just press **Enter** if you have entered the name correctly.

b. When you are prompted to delete this file, press **Enter** to confirm the deletion. (Pressing any other key will abort the deletion.)

```
Delete flash:/vlan.dat? [confirm]
Switch#
```

Step 17: Erase the startup configuration file

Use the **erase startup-config** command to erase the startup configuration file from NVRAM. When you are prompted to remove the configuration file, press Enter to confirm the erase. (Pressing any other key will abort the operation.)

```
Switch# erase startup-config
Erasing the nvram filesystem will remove all configuration files!
Continue? [confirm]
[OK]
Erase of nvram: complete
Switch#
```

Step 18: Reload the switch

Reload the switch to remove any old configuration information from memory. When you are prompted to reload the switch, press Enter to proceed with the reload. (Pressing any other key will abort the reload.)

```
Switch# reload
Proceed with reload? [confirm]
```

Note: You may receive a prompt to save the running configuration prior to reloading the switch. Type **no** and press Enter.

```
System configuration has been modified. Save? [yes/no]: no
```

Step 19: Bypass the initial configuration dialog.

After the switch reloads, you should see a prompt to enter the initial configuration dialog. Type **no** at the prompt and press Enter.

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