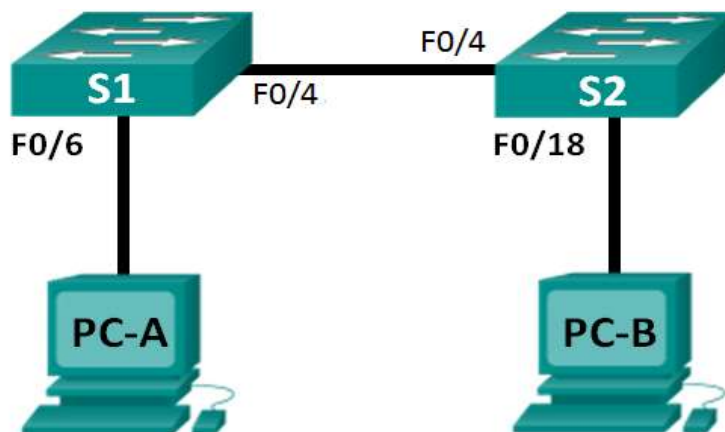


Lab - Building a Simple Network

This lab has been updated for use on NETLAB+

Topology



Addressing Table

Device	Interface	IP Address	Subnet Mask
PC-A	NIC	192.168.1.10	255.255.255.0
PC-B	NIC	192.168.1.11	255.255.255.0

Objectives

Part 1: Configure PC Hosts

Part 2: Configure and Verify Basic Switch Settings

Appendix A: Initializing and Reloading a Switch

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.

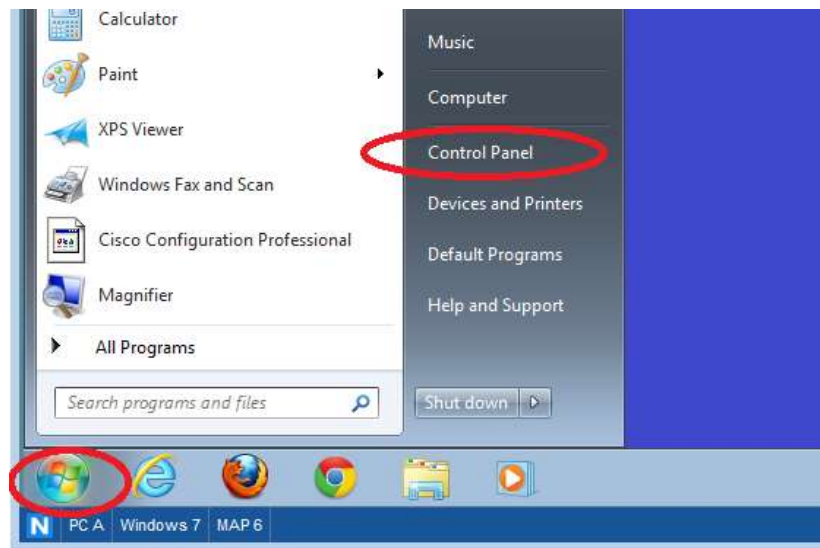
Note: The switches used are Cisco Catalyst 2960s with Cisco IOS Release 15.0(2) (lanbasek9 image). Other switches and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and output produced might vary from what is shown in the labs.

Note: Make sure that the switches have been erased and have no startup configurations. Refer to Appendix A for the procedure to initialize and reload a switch.

Part 1: Configure PC Hosts

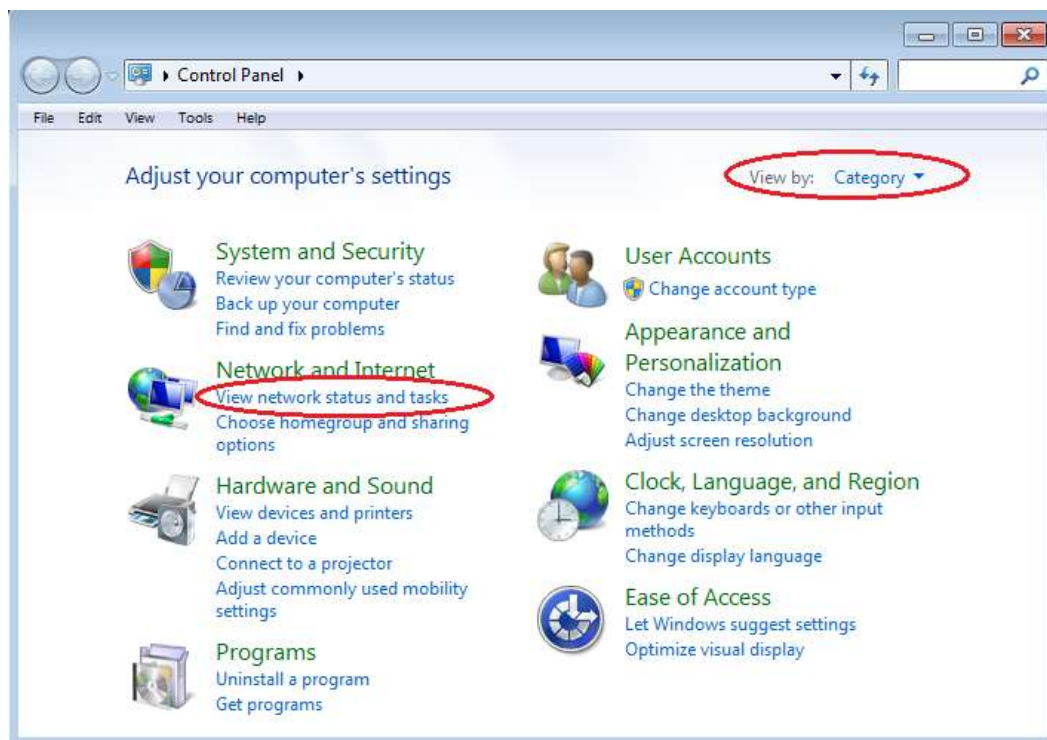
Step 1: Configure static IP address information on the PCs.

- a. Click on **PC-A**.
- b. Click the **Windows Start** icon and then select **Control Panel**.



- c. In the Network and Internet section, click the **View network status and tasks** link.

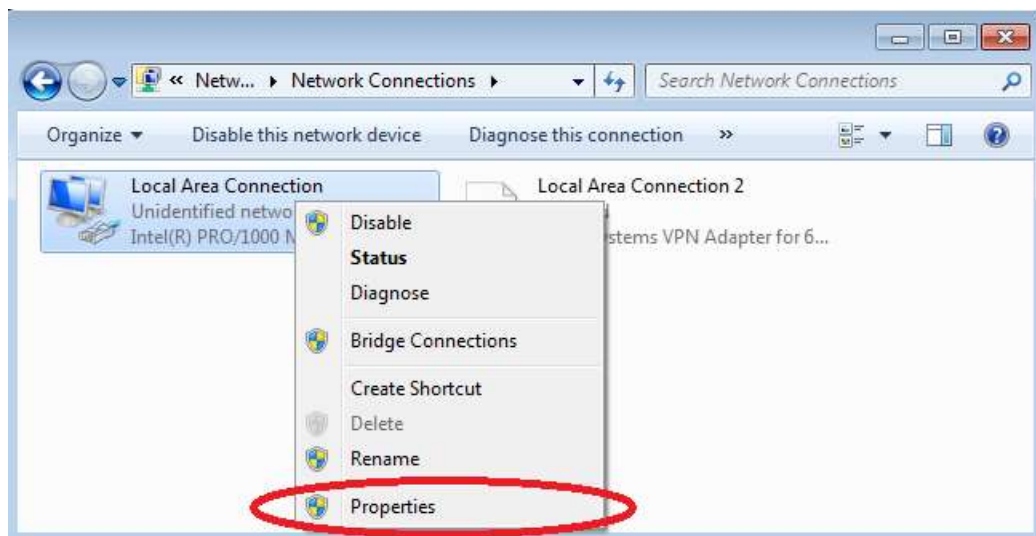
Note: If the Control Panel displays a list of icons, click the drop-down option next to the **View by:** and change this option to display by **Category**.



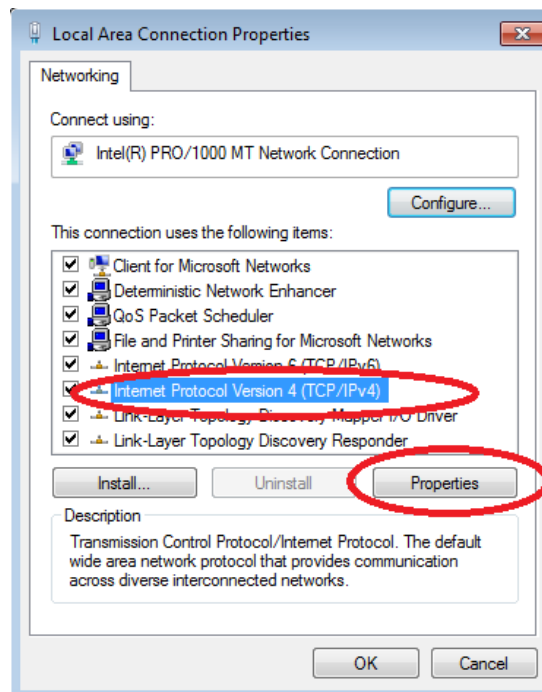
- d. In the left pane of the Network and Sharing Center window, click the **Change adapter settings** link.



- e. The Network Connections window displays the available interfaces on the PC. Right-click the **Local Area Connection** interface and select **Properties**.

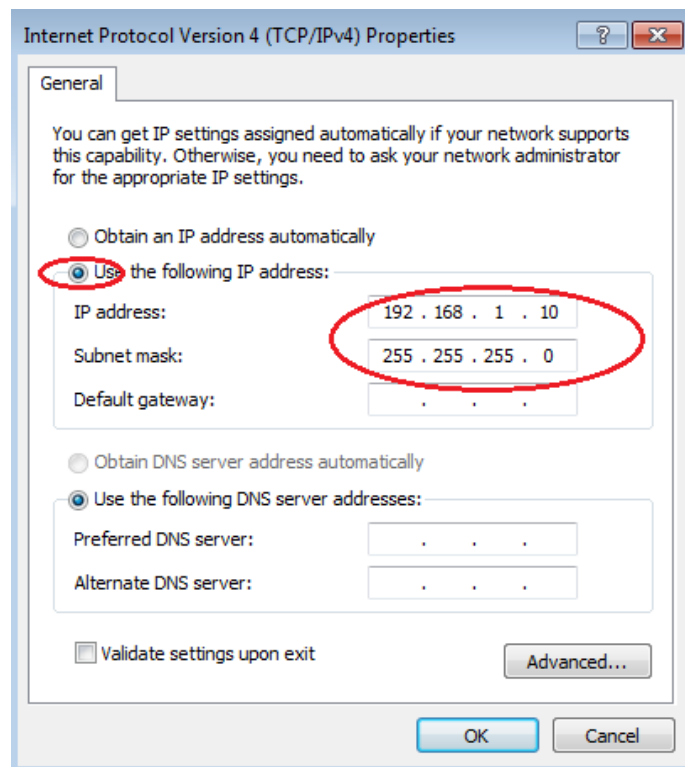


- f. Select the **Internet Protocol Version 4 (TCP/IPv4)** option and then click **Properties**.



Note: You can also double-click **Internet Protocol Version 4 (TCP/IPv4)** to display the Properties window.

- g. Click the **Use the following IP address** radio button to manually enter an IP address, subnet mask, and default gateway.



Note: In the above example, the IP address and subnet mask have been entered for PC-A. The default gateway has not been entered, because there is no router attached to the network. Refer to the Addressing Table on page 1 for PC-A's IP address information.

- h. After all the IP information has been entered, click **OK**. Click **OK** on the Local Area Connection Properties window to assign the IP address to the LAN adapter.
- i. Repeat the previous steps to enter the IP address information for PC-B.

Step 2: Verify PC settings and connectivity.

Use the command prompt (**cmd.exe**) window to verify the PC settings and connectivity.

- a. From PC-A, click the **Windows Start** icon, type **cmd** in the **Search programs and files** box, and then press **Enter**.



- b. The cmd.exe window is where you can enter commands directly to the PC and view the results of those commands. Verify your PC settings by using the **ipconfig /all** command. This command displays the PC hostname and the IPv4 address information.

```
C:\Windows\system32\cmd.exe

C:\Users\NetAcad>ipconfig /all

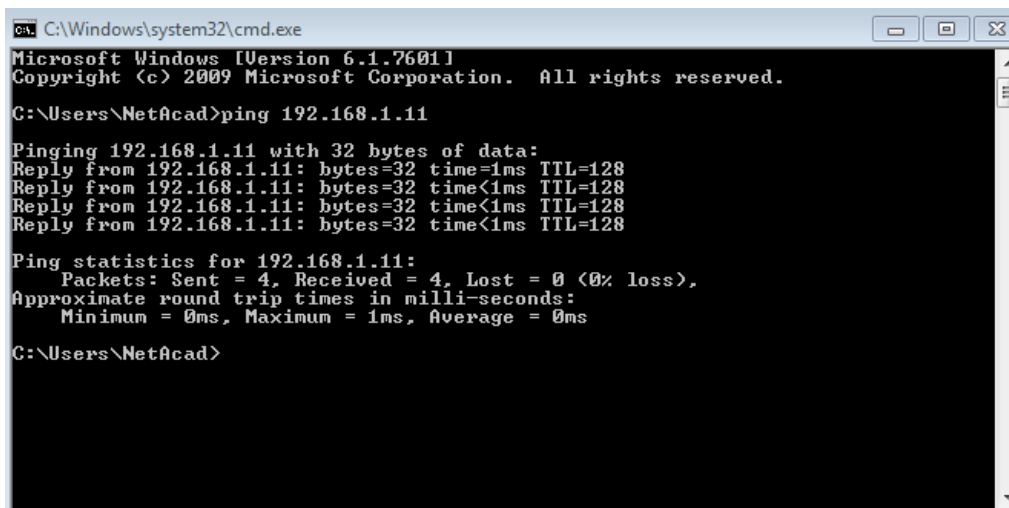
Windows IP Configuration

    Host Name . . . . . : PC-A
    Primary Dns Suffix . . . . . : 
    Node Type . . . . . : Hybrid
    IP Routing Enabled. . . . . : No
    WINS Proxy Enabled. . . . . : No

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix . : 
    Description . . . . . : Intel(R) PRO/1000 MT Network Connection
    Physical Address. . . . . : 00-50-56-BE-6C-89
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . : Yes
    Link-local IPv6 Address . . . . . : fe80::d428:7de2:997c:b05a%11(Preferred)
    IPv4 Address. . . . . : 192.168.1.10(Preferred)
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 
    DHCPv6 IAID . . . . . : 234884137
    DHCPv6 Client DUID. . . . . : 00-01-00-01-17-F6-72-3D-00-0C-29-8D-54-44
```

- c. Type **ping 192.168.1.11** and press **Enter**.



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\NetAcad>ping 192.168.1.11

Pinging 192.168.1.11 with 32 bytes of data:
Reply from 192.168.1.11: bytes=32 time=1ms TTL=128
Reply from 192.168.1.11: bytes=32 time<1ms TTL=128
Reply from 192.168.1.11: bytes=32 time<1ms TTL=128
Reply from 192.168.1.11: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users\NetAcad>
```

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 2: Configure and Verify Basic Switch Settings

Step 1: Console into the switch.

Click on **S1**.

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 06YFDUHH6lwAE/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
```


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Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE, RELEASE SOFTWARE (fcl)

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, RELEASE SOFTWARE (fcl)

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-party authority to import, export, distribute or use encryption. Importers, exporters, 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

Lab - Building a Simple Network

```
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  administratively down down
FastEthernet0/3    unassigned      YES unset  administratively down down
FastEthernet0/4    unassigned      YES unset  administratively 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.

Note: 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 up and others 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 1: Connect to Switch 1.

```
Switch> enable
Switch#
```

Step 2: Determine if there have 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 3: 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 4: 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 5: 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 6: 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
Switch>
```