Lab - Building a Switch and Router Network (Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

Topology

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	192.168.0.1	255.255.255.0	N/A
	G0/1	192.168.1.1	255.255.255.0	N/A
S1	VLAN 1	N/A	N/A	N/A
PC-A	NIC	192.168.1.3	255.255.255.0	192.168.1.1
PC-B	NIC	192.168.0.3	255.255.255.0	192.168.0.1

Objectives

Part 1: Set Up the Topology and Initialize Devices

- Set up equipment to match the network topology.
- Initialize and restart the router and switch.

Part 2: Configure Devices and Verify Connectivity

- Assign static IP information to the PC interfaces.
- Configure the router.
- Verify network connectivity.

Part 3: Display Device Information

- Retrieve hardware and software information from the network devices.
- Interpret the output from the routing table.
- Display interface information on the router.
- Display a summary list of the interfaces on the router and switch.

Background / Scenario

This is a comprehensive lab to review previously covered IOS commands. In this lab, you will cable the equipment as shown in the topology diagram. You will then configure the devices to match the addressing table. After the configurations have been saved, you will verify your configurations by testing for network connectivity.

After the devices have been configured and network connectivity has been verified, you will use IOS commands to retrieve information from the devices to answer questions about your network equipment.

This lab provides minimal assistance with the actual commands necessary to configure the router. However, the required commands are provided in Appendix A. Test your knowledge by trying to configure the devices without referring to the appendix.

Note: The routers used with CCNA hands-on labs are Cisco 1941 Integrated Services Routers (ISRs) with Cisco IOS Release 15.2(4)M3 (universalk9 image). The switches used are Cisco Catalyst 2960s with Cisco IOS Release 15.0(2) (lanbasek9 image). Other routers, 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. Refer to the Router Interface Summary Table at the end of this lab for the correct interface identifiers.

Note: Ensure that the routers and switches have been erased and have no startup configurations. Refer to Appendix B for the procedure to initialize and reload a router and switch.

Required Resources

- 1 Router (Cisco 1941 with Cisco IOS Release 15.2(4)M3 universal image or comparable)
- 1 Switch (Cisco 2960 with Cisco IOS Release 15.0(2) lanbasek9 image or comparable)
- 2 PCs (Windows 7, Vista, or XP with terminal emulation program, such as Tera Term)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology

Note: The Gigabit Ethernet interfaces on Cisco 1941 routers are autosensing and an Ethernet straight-through cable may be used between the router and PC-B. If using another model Cisco router, it may be necessary to use an Ethernet crossover cable.

Part 1: Set Up Topology and Initialize Devices

Step 1: Cable the network as shown in the topology.

a. Attach the devices shown in the topology diagram, and cable, as necessary.

b. Power on all the devices in the topology.

Step 2: Initialize and reload the router and switch.

If configuration files were previously saved on the router and switch, initialize and reload these devices back to their basic configurations. For information on how to initialize and reload these devices, refer to Appendix B.

Part 2: Configure Devices and Verify Connectivity

In Part 2, you will set up the network topology and configure basic settings, such as the interface IP addresses, device access, and passwords. Refer to the Topology and Addressing Table at the beginning of this lab for device names and address information.

Note: Appendix A provides configuration details for the steps in Part 2. You should attempt to complete Part 2 prior to reviewing this appendix.

Step 1: Assign static IP information to the PC interfaces.

a. Configure the IP address, subnet mask, and default gateway settings on PC-A.

b. Configure the IP address, subnet mask, and default gateway settings on PC-B.

c. Ping PC-B from a command prompt window on PC-A.

Why were the pings not successful?

_____

The router interfaces (default gateways) have not been configured yet so Layer 3 traffic is not being routed between subnets.

Step 2: Configure the router.

a. Console into the router and enable privileged EXEC mode.

b. Enter configuration mode.

c. Assign a device name to the router.

d. Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.

e. Assign **class** as the privileged EXEC encrypted password.

f. Assign **cisco** as the console password and enable login.

g. Assign **cisco** as the VTY password and enable login.

h. Encrypt the clear text passwords.

i. Create a banner that warns anyone accessing the device that unauthorized access is prohibited.

j. Configure and activate both interfaces on the router.

k. Configure an interface description for each interface indicating which device is connected to it.

l. Save the running configuration to the startup configuration file.

m. Set the clock on the router.

Note: Use the question mark (**?**) to help with the correct sequence of parameters needed to execute this command.

n. Ping PC-B from a command prompt window on PC-A.

Were the pings successful? Why?

_____

_____

_____

Yes. The router is routing the ping traffic across the two subnets. The default settings for the 2960 switch will automatically turn up the interfaces that are connected to devices.

Part 3: Display Device Information

In Part 3, you will use **show** commands to retrieve information from the router and switch.

Step 1: Retrieve hardware and software information from the network devices.

a. Use the **show version** command to answer the following questions about the router.

```
R1# show version
Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.2(4)M3, RELEASE
SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2012 by Cisco Systems, Inc.
Compiled Thu 26-Jul-12 19:34 by prod_rel_team
```

```
ROM: System Bootstrap, Version 15.0(1r)M15, RELEASE SOFTWARE (fc1)


R1 uptime is 10 minutes
System returned to ROM by power-on
System image file is "flash0:c1900-universalk9-mz.SPA.152-4.M3.bin"
Last reload type: Normal Reload
Last reload reason: power-on


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 CISCO1941/K9 (revision 1.0) with 446464K/77824K bytes of memory.
Processor board ID FTX1636848Z
2 Gigabit Ethernet interfaces
2 Serial(sync/async) interfaces
1 terminal line
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
250880K bytes of ATA System CompactFlash 0 (Read/Write)



License Info:


License UDI:


--------------------------------------------------
Device#        PID                 SN
--------------------------------------------------
*0      CISCO1941/K9            FTX1636848Z



Technology Package License Information for Module:'c1900'


-----------------------------------------------------------------
Technology    Technology-package              Technology-package
              Current        Type             Next reboot
```

```
     ----------------------------------------------------------------
     ipbase         ipbasek9       Permanent      ipbasek9
     security       None           None           None
     data           None           None           None

     Configuration register is 0x2142 (will be 0x2102 at next reload)
```

What is the name of the IOS image that the router is running?

_____

Image version may vary, but answers should be something like c1900-universalk9-mz.SPA.152-4.M3.bin.

How much DRAM memory does the router have?

_____

_____

Answers may vary, but the default DRAM memory configuration on a 1941 router is 512MB or 524,288K bytes. The total can be calculated by adding the two DRAM numbers together from the output of the show version command: Cisco CISCO1941/K9 (revision 1.0) with 446464K/77824K bytes of memory.

How much NVRAM memory does the router have?

_____

Answers may vary, but the output from the show version on 1941 router is: 255K bytes of non-volatile configuration memory.

How much Flash memory does the router have?

_____

Answers may vary, but the default output from the show version command on the 1941 router is 250880K bytes of ATA System CompactFlash 0 (Read/Write).

b. Use the **show version** command to answer the following questions about the switch.

```
Switch# 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, RELEASE SOFTWARE
(fc1)

S1 uptime is 1 hour, 2 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
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

Switch#
```

What is the name of the IOS image that the switch is running?

_____

Image version may vary, but answers should be something like c2960-lanbasek9-mz.150-2.SE.bin.

How much dynamic random access memory (DRAM) does the switch have?

_____

Answers may vary, but the default DRAM memory configuration on a 2960-24TT-L switch is 65536K of memory.

How much nonvolatile random-access memory (NVRAM) does the switch have?

_____

Answers may vary, but the default non-volatile memory configuration on a 2960-24TT-L switch is 64K bytes.

What is the model number of the switch?

_____

Answers may vary, but the answer should appear in this form: WS-C2960-24TT-L.

Step 2: Display the routing table on the router.

Use the **show ip route** command on the router to answer the following questions.

```
R1# show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       + - replicated route, % - next hop override

Gateway of last resort is not set

      192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.0.0/24 is directly connected, GigabitEthernet0/0
L        192.168.0.1/32 is directly connected, GigabitEthernet0/0
      192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.1.0/24 is directly connected, GigabitEthernet0/1
L        192.168.1.1/32 is directly connected, GigabitEthernet0/1
```

What code is used in the routing table to indicate a directly connected network? _____

The C designates a directly connected subnet. An L designates a local interface. Both answers are correct.

How many route entries are coded with a C code in the routing table? _____ 2

What interface types are associated to the C coded routes?

_____

Answers may vary depending of router type, but on the 1941 the correct answer is G0/0 and G0/1.

Step 3: Display interface information on the router.

Use the **show interface g0/1** to answer the following questions.

```
R1# show interfaces g0/1
GigabitEthernet0/1 is up, line protocol is up
  Hardware is CN Gigabit Ethernet, address is fc99.4775.c3e1 (bia fc99.4775.c3e1)
```

```
        Internet address is 192.168.1.1/24
        MTU 1500 bytes, BW 100000 Kbit/sec, DLY 100 usec,
            reliability 255/255, txload 1/255, rxload 1/255
        Encapsulation ARPA, loopback not set
        Keepalive set (10 sec)
        Full Duplex, 100Mbps, media type is RJ45
        output flow-control is unsupported, input flow-control is unsupported
        ARP type: ARPA, ARP Timeout 04:00:00
        Last input 00:00:06, output 00:00:04, output hang never
        Last clearing of "show interface" counters never
        Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
        Queueing strategy: fifo
        Output queue: 0/40 (size/max)
        5 minute input rate 0 bits/sec, 0 packets/sec
        5 minute output rate 0 bits/sec, 0 packets/sec
           17 packets input, 5409 bytes, 0 no buffer
           Received 17 broadcasts (0 IP multicasts)
           0 runts, 0 giants, 0 throttles
           0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
           0 watchdog, 13 multicast, 0 pause input
           14 packets output, 1743 bytes, 0 underruns
           0 output errors, 0 collisions, 1 interface resets
           3 unknown protocol drops
           0 babbles, 0 late collision, 0 deferred
           0 lost carrier, 0 no carrier, 0 pause output
           0 output buffer failures, 0 output buffers swapped out
```

What is the operational status of the G0/1 interface?

_____

GigabitEthernet0/1 is up, line protocol is up

What is the Media Access Control (MAC) address of the G0/1 interface?

_____

Answers will vary but will appear in the form of: xxxx.xxxx.xxxx, where each x will be replaced with a hexadecimal number.

How is the Internet address displayed in this command?

_____

Internet address is 192.168.1.1/24.

Step 4: Display a summary list of the interfaces on the router and switch.

There are several commands that can be used to verify an interface configuration. One of the most useful of these is the **show ip interface brief** command. The command output displays a summary list of the interfaces on the device and provides immediate feedback to the status of each interface.

a. Enter the **show ip interface brief** command on the router.

```
R1# show ip interface brief
Interface                  IP-Address      OK? Method Status                Protocol
Embedded-Service-Engine0/0 unassigned      YES unset  administratively down down
```

```
GigabitEthernet0/0      192.168.0.1    YES manual up                     up
GigabitEthernet0/1      192.168.1.1    YES manual up                     up
Serial0/0/0             unassigned     YES unset  administratively down down
Serial0/0/1             unassigned     YES unset  administratively down down
R1#
```

b. Enter the **show ip interface brief** command on the switch.

```
Switch# show ip interface brief
Interface           IP-Address    OK? Method Status            Protocol
Vlan1               unassigned    YES manual up                up
FastEthernet0/1     unassigned    YES unset  down              down
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  up                up
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
Switch#
```

Reflection

1. If the G0/1 interface showed administratively down, what interface configuration command would you use to turn the interface up?

   _____

   R1(config-if)# **no shut**

2. What would happen if you had incorrectly configured interface G0/1 on the router with an IP address of 192.168.1.2?

   _____

   _____

PC-A would not be able to ping PC-B. This is because PC-B is on a different network than PC-A which requires the default-gateway router to route these packets. PC-A is configured to use the IP address of 192.168.1.1 for the default-gateway router, but this address is not assigned to any device on the LAN. Any packets that need to be sent to the default-gateway for routing will never reach their destination.
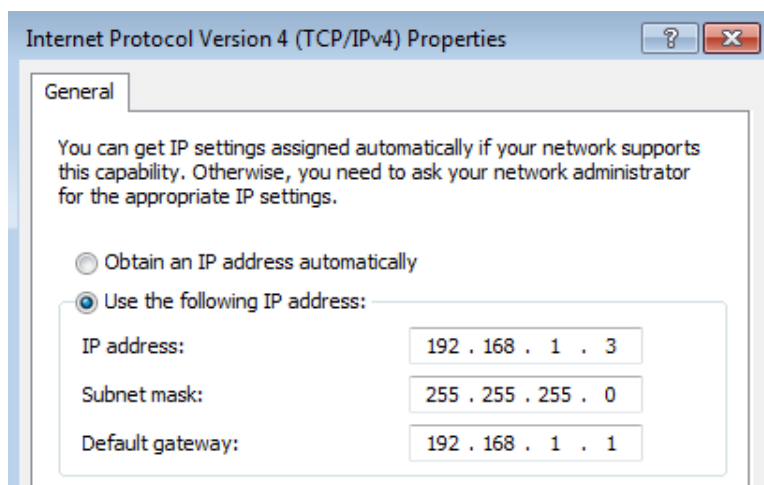
Router Interface Summary Table

Router Interface Summary				
Router Model	**Ethernet Interface #1**	**Ethernet Interface #2**	**Serial Interface #1**	**Serial Interface #2**
1800	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
1900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2801	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/1/0 (S0/1/0)	Serial 0/1/1 (S0/1/1)
2811	Fast Ethernet 0/0 (F0/0)	Fast Ethernet 0/1 (F0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)
2900	Gigabit Ethernet 0/0 (G0/0)	Gigabit Ethernet 0/1 (G0/1)	Serial 0/0/0 (S0/0/0)	Serial 0/0/1 (S0/0/1)

Note: To find out how the router is configured, look at the interfaces to identify the router type and how many interfaces the router has. There is no way to effectively list all the combinations of configurations for each router class. This table includes identifiers for the possible combinations of Ethernet and Serial interfaces in the device. The table does not include any other type of interface, even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in Cisco IOS commands to represent the interface.
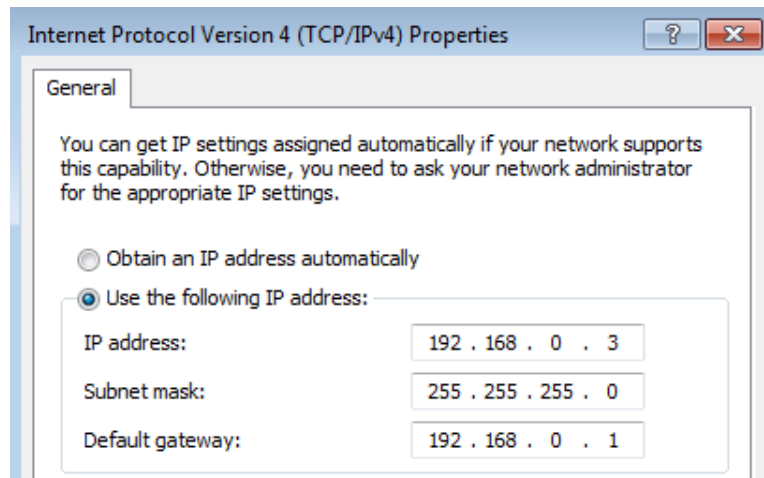
Appendix A: Configuration Details for Steps in Part 2

Step 1: Configure the PC interfaces.

a. Configure the IP address, subnet mask, and default gateway settings on PC-A.

b. Configure the IP address, subnet mask, and default gateway settings on PC-B.

c. Ping PC-B from a command prompt window on PC-A.

Step 2: Configure the router.

a. Console into the router and enable privileged EXEC mode.

```
Router> enable
Router#
```

b. Enter configuration mode.

```
Router# conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
```

c. Assign a device name to the router.

```
Router(config)# hostname R1
```

d. Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.

```
R1(config)# no ip domain-lookup
```

e. Assign **class** as the privileged EXEC encrypted password.

```
R1(config)# enable secret class
```

f. Assign **cisco** as the console password and enable login.

```
R1(config)# line con 0
R1(config-line)# password cisco
R1(config-line)# login
```

```
R1(config-line)# exit
R1(config)#
```

g. Assign **cisco** as the vty password and enable login.

```
R1(config)# line vty 0 4
R1(config-line)# password cisco
R1(config-line)# login
R1(config-line)# exit
R1(config)#
```

h. Encrypt the clear text passwords.

```
R1(config)# service password-encryption
```

i. Create a banner that warns anyone accessing the device that unauthorized access is prohibited.

```
R1(config)# banner motd #
Enter TEXT message.  End with the character '#'.
  Unauthorized access prohibited!
#
R1(config)#
```

j. Configure and activate both interfaces on the router.

```
R1(config)# int g0/0
R1(config-if)# description Connection to PC-B.
R1(config-if)# ip address 192.168.0.1 255.255.255.0
R1(config-if)# no shut
R1(config-if)#
*Nov 29 23:49:44.195: %LINK-3-UPDOWN: Interface GigabitEthernet0/0, changed state to
down
*Nov 29 23:49:47.863: %LINK-3-UPDOWN: Interface GigabitEthernet0/0, changed state to
up
*Nov 29 23:49:48.863: %LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/0, changed state to up
R1(config-if)# int g0/1
R1(config-if)# description Connection to S1.
R1(config-if)# ip address 192.168.1.1 255.255.255.0
R1(config-if)# no shut
R1(config-if)# exit
R1(config)# exit
*Nov 29 23:50:15.283: %LINK-3-UPDOWN: Interface GigabitEthernet0/1, changed state to
down
*Nov 29 23:50:18.863: %LINK-3-UPDOWN: Interface GigabitEthernet0/1, changed state to
up
*Nov 29 23:50:19.863: %LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/1, changed state to up
R1#
```

k. Save the running configuration to the startup file.

```
R1# copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
```

```
     [OK]
     R1#
```

l.   Set the clock on the router.
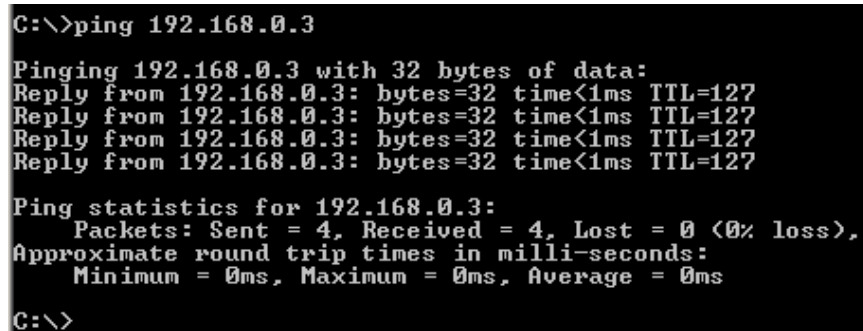
```
     R1# clock set 17:00:00 29 Nov 2012
     R1#
     *Nov 29 17:00:00.000: %SYS-6-CLOCKUPDATE: System clock has been updated from 23:55:46
     UTC Thu Nov 29 2012 to 17:00:00 UTC Thu Nov 29 2012, configured from console by
     console.
     R1#
```

Note: Use the question mark (**?**) to help determine the correct sequence of the parameters needed to execute this command.

m.   Ping PC-B from a command prompt window on PC-A.

Appendix B: Initializing and Reloading a Router and Switch

Part 1:   Initialize the Router and Reload

Step 1:   Connect to the router.

Console into the router and enter privileged EXEC mode using the **enable** command.

```
     Router> enable
     Router#
```

Step 2:   Erase the startup configuration file from NVRAM.

Type the **erase startup-config** command to remove the startup configuration from nonvolatile random-access memory (NVRAM).

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

Step 3:   Reload the router.

Issue the **reload** command to remove an old configuration from memory. When prompted to Proceed with reload, press Enter to confirm the reload. Pressing any other key will abort the reload.

```
     Router# reload
```

```
Proceed with reload? [confirm]


*Nov 29 18:28:09.923: %SYS-5-RELOAD: Reload requested by console. Reload Reason:
Reload Command.
```

Note: You may receive a prompt to save the running configuration prior to reloading the router. Respond by typing **no** and press Enter.

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

Step 4: Bypass the initial configuration dialog.

After the router reloads, you are prompted to enter the initial configuration dialog. Enter **no** and press Enter.

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

Step 5: Terminate the autoinstall program.

You will be prompted to terminate the autoinstall program. Respond **yes** and then press Enter.

```
Would you like to terminate autoinstall? [yes]: yes
Router>
```

Part 2: Initialize the Switch and Reload

Step 1: Connect to the switch.

Console into the switch and enter privileged EXEC mode.

```
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>
```

Device Configs

Router R1

```
R1#show run
Building configuration...

Current configuration : 1360 bytes
!
version 15.2
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname R1
!
boot-start-marker
boot-end-marker
```

```
!
!
enable secret 4 06YFDUHH61wAE/kLkDq9BGho1QM5EnRtoyr8cHAUg.2
!
no aaa new-model
memory-size iomem 15
!
!
!
!
!
!
!
no ip domain lookup
ip cef
no ipv6 cef
multilink bundle-name authenticated
!
!
!
!
!
!
!
!
!
!
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
!
interface GigabitEthernet0/0
 description Connection to PC-B.
 ip address 192.168.0.1 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 description Connection to S1.
 ip address 192.168.1.1 255.255.255.0 duplex auto
 speed auto
!
interface Serial0/0/0
 no ip address
 shutdown
 clock rate 2000000
!
interface Serial0/0/1
```

```
 no ip address
 shutdown
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
!
!
!
!
control-plane
!
!
banner motd ^C
Unauthorized access prohibited!
^C
!
line con 0
 password 7 13061E010803
 login
line aux 0
line 2
 no activation-character
 no exec
 transport preferred none
 transport input all
 transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
 stopbits 1
line vty 0 4
 password 7 070C285F4D06
 login
 transport input all
!
scheduler allocate 20000 1000
!
end
```