



CCNA Exploration 4.0

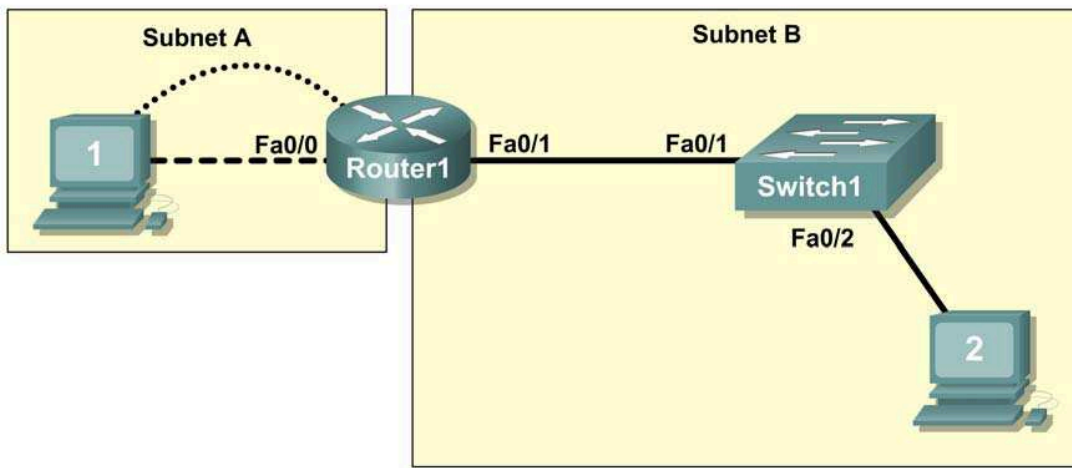
LAN Switching and Wireless

Student Lab Manual

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Lab 1.3.1: Review of Concepts from Exploration 1

Topology Diagram



Learning Objectives

Upon completion of this lab, you will be able to:

- Create a logical topology given network requirements
- Create subnets to meet host requirements
- Configure the physical topology
- Configure the logical topology
- Verify network connectivity
- Configure and verify passwords

Scenario

In this lab, you will design and configure a small routed network and verify connectivity across multiple network devices. This requires creating and assigning two subnetwork blocks, connecting hosts and network devices, and configuring host computers and one Cisco router for basic network connectivity. Switch1 has a default configuration and does not require additional configuration. You will use common commands to test and document the network. The zero subnet is used.

Task 1: Design a Logical LAN Topology

Step 1: Design an IP addressing scheme.

Given the IP address block of **192.168.7.0 /24**, design an IP addressing scheme that satisfies the following requirements:

Subnet	Number of Hosts
Subnet A	110
Subnet B	54

The 0 subnet is used. No subnet calculators may be used. Create the smallest possible subnets that satisfy the requirements for hosts. Assign the first usable subnet to Subnet A.

Subnet A	
Specification	Student Input
Number of bits in the subnet	
IP mask (binary)	
New IP mask (decimal)	
Maximum number of usable subnets (including the 0 subnet)	
Number of usable hosts per subnet	
IP subnetwork address	
First IP host address	
Last IP host address	

Subnet B	
Specification	Student Input
Number of bits in the subnet	
IP mask (binary)	
New IP mask (decimal)	
Maximum number of usable subnets (including the 0 subnet)	
Number of usable hosts per subnet	
IP network address	
First IP host address	
Last IP host address	

Host computers will use the first usable IP address in the subnet. The network router will use the last usable IP address in the subnet.

Step 2: Write down the IP address information for each device.

Device	IP address	Mask	Gateway
Host1			
Router1-Fa0/0			
Host2			
Router1-Fa0/1			

Table 1. IP Address Assignments

Before proceeding, verify your IP addresses with the instructor.

Task 2: Configure the Physical Topology

Step 1: Cable the network.

Refer to the figure and table below for the necessary cables.

Cabling	Cable Type
LAN cable between Host1 and Router1 Fa0/0	Crossover
LAN cable between Switch1 and Router1 Fa0/1	Straight-through
LAN cable between Switch1 and Host2	Straight-through
Console cable between Host1 and Router1	Rollover

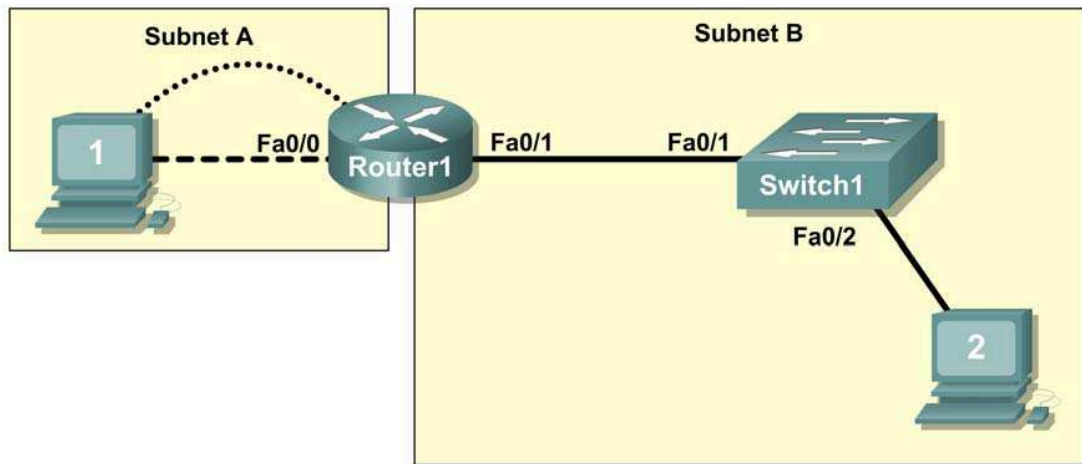


Figure 1. Cabling the network

Step 2: Physically connect lab devices.

Cable the network devices as shown in Figure 1. Turn power on to all devices if it is not already on.

Step 3: Inspect the network connections.

Verify the connections visually.

Task 3: Configure the Logical Topology

Step 1: Configure the host computers.

Configure the static IP address, subnet mask, and gateway for each host computer.

Note: The following directions are for Windows XP. To configure hosts using other operating systems, refer to the operating system manual.

To configure the host, go to **Start > Control Panel > Network Connections > Local Area Connection**. In the Local Area Connection Properties window, select **Internet Protocol (TCP/IP)** and click the **Properties** button.

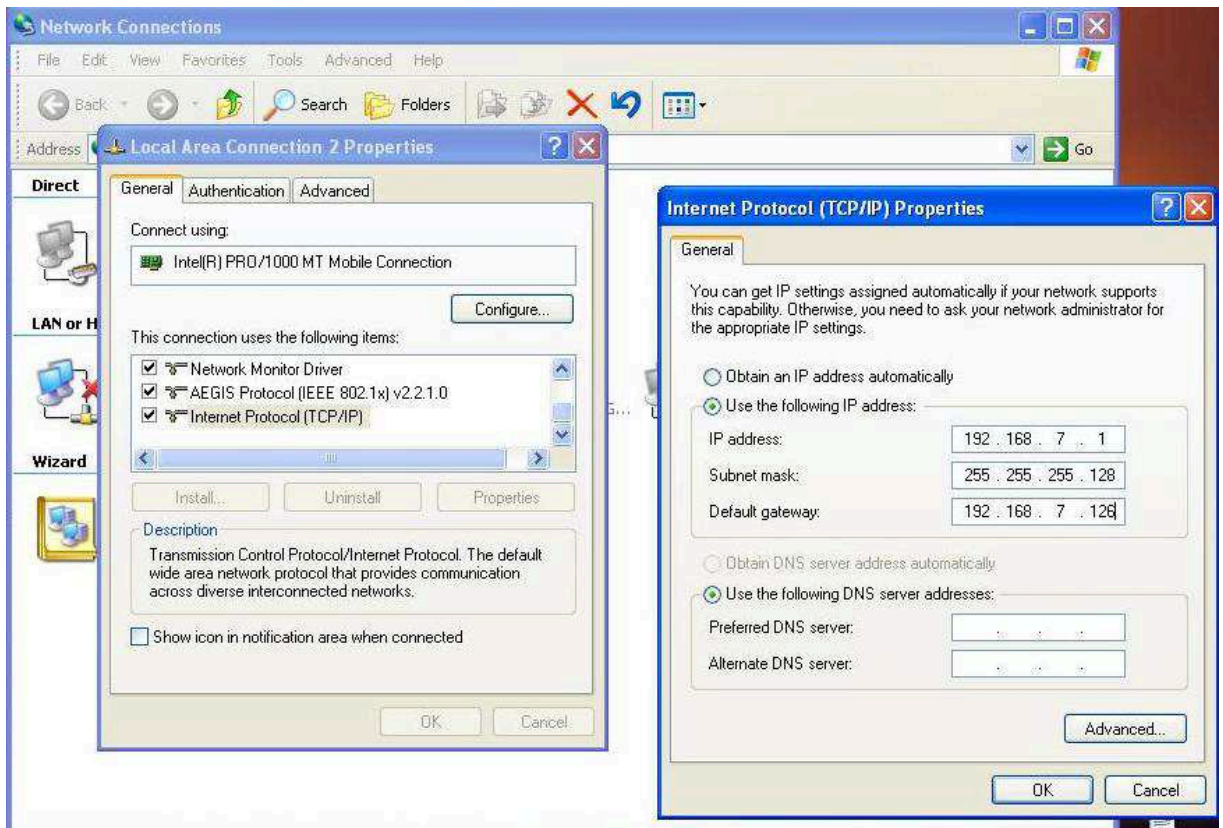


Figure 2. Setting Properties for Internet Protocol (TCP/IP)

In the TCP/IP Properties dialog box for each host, enter the IP address, network mask, and the gateway from Table 1.

After configuring each host computer, open a command window on the host by selecting **Start > Run**. When prompted to type the name of a program, enter **cmd** in the text box. From the command window, display and verify the host network settings with the **ipconfig /all** command. The settings should match those in the tables below:

Host1 Network Configuration	
IP address	192.168.7.1
Subnet mask	255.255.255.128
Default gateway	192.168.7.126

Host2 Network Configuration	
IP address	192.168.7.129
Subnet mask	255.255.255.192
Default gateway	192.168.7.190

Are the host settings in agreement with the tables? _____ If not, reconfigure as necessary.

Step 2: Configure Router1.

From Host1, connect to the console of Router 1 and establish a console session. Directions for creating a console connection using HyperTerminal are in Appendix 2.

From the router console, configure the following:

Task	Specification
Router name	Router1
Encrypted privileged exec password	cisco
Console access password	class
Telnet access password	class
Router1 interface Fa0/0	Set the description Set the Layer 3 address
Router1 interface Fa0/1	Set the description Set the Layer 3 address

Enter the following commands on the router:

```
Router>enable
Router#config term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Router1
Router1(config)#enable secret class
Router1(config)#line console 0
Router1(config-line)#password cisco
Router1(config-line)#login
Router1(config-line)#line vty 0 4
Router1(config-line)#password cisco
Router1(config-line)#login
Router1(config-line)#interface fa0/0
Router1(config-if)#ip address 192.168.7.126 255.255.255.128
Router1(config-if)#no shutdown
Router1(config-if)#description connection to host1
Router1(config-if)#interface fa0/1
Router1(config-if)#description connection to switch1
Router1(config-if)#ip address 192.168.7.190 255.255.255.192
Router1(config-if)#no shutdown
Router1(config-if)#end
Router1#
```

Task 4: Verify Network Connectivity

Step 1: Use the ping command to verify network connectivity.

You can verify network connectivity using the **ping** command.

Note: If pings to the host computers fail, temporarily disable the computer firewall and retest. To disable a Windows firewall, select **Start > Control Panel > Windows Firewall**, select **OFF**, and then **OK**.

Use the following table to verify connectivity with each network device. Take corrective action to establish connectivity if a test fails.

From	To	IP Address	Ping Results
Host1	NIC IP address	192.168.7.1	
Host1	Router1, Fa0/0	192.168.7.126	
Host1	Router1, Fa0/1	192.168.7.190	
Host1	Host2	192.168.7.129	
Host2	NIC IP address	192.168.7.129	
Host2	Router1, Fa0/1	192.168.7.190	
Host2	Router1, Fa0/0	192.168.7.126	
Host2	Host1	192.168.7.1	

In addition to the **ping** command, what other Windows command is useful in displaying network delay and breaks in the path to the destination? _____

Task 5: Verify Passwords

Step 1: Telnet to the router from Host2 and verify the Telnet password.

You should be able to telnet to either Fast Ethernet interface of the router.

In a command window on Host 2, type:

```
telnet 192.168.7.190
```

When you are prompted for the Telnet password, type **cisco** and press Enter.

Was the telnet successful? _____

Step 2: Verify that the enable secret password has been set.

From the Telnet session, enter privilege exec mode and verify it is password protected:

```
Router>enable
```

Were you prompted for the enable secret password? _____

Step 3: Verify that the console is password protected.

Terminate and then re-establish the console connection from Host1 to the router to verify that the console is password protected.

Depending on the Telnet client that you are using, the session can usually be terminated with Ctrl-]. When the session is re-established, you should be prompted for the console password before being allowed access to the command line interface.

Task 6: Reflection

How are Telnet access and console access different? When might it make sense to set different passwords on these two access ports? _____

Why does the switch between Host2 and the router not require configuration with an IP address to forward packets? _____

Task 7: Clean Up

Unless directed otherwise by your instructor, erase the configurations and reload the switches. Disconnect and store the cabling. For PC hosts that are normally connected to other networks (such as the school LAN or to the Internet), reconnect the appropriate cabling and restore the TCP/IP settings.

Final Router 1 Configuration

```
Router1#show run
<selective output omitted>
!
hostname Router1
!
enable secret class
!
!
interface FastEthernet0/0
description connection to host1
ip address 192.168.7.126 255.255.255.128
no shutdown
!
interface FastEthernet0/1
description connection to switch1
ip address 192.168.7.190 255.255.255.192
no shutdown
!
line con 0
password cisco
login
line aux 0
line vty 0 4
password cisco
login
!
end
```


Appendix 1: Last Octet Subnet Chart

Subnet Addressing for Last Octet

	25 (1 subnet bit) 1 subnet 128 hosts	26 (2 subnet bits) 3 subnets 62 hosts	27 (3 subnet bits) 7 subnets 30 hosts	28 (4 subnet bits) 15 subnets 14 hosts	29 (5 subnet bits) 31 subnets 6 hosts	30 (6 subnet bits) 63 subnets 2 hosts		
.0	.128	.0 (1-.62)	.0 (1-.30)	.0 (1-.14)	.0 (1-.6)	.0 (1-.2)		
.4							.8 (9-.14)	.4 (5-.9)
.8				.16 (17-.22)	.8 (9-.14)	.8 (9-.14)		
.12				.24 (25-.30)	.16 (17-.22)	.16 (17-.18)		
.16			.32 (33-.62)	.16 (17-.30)	.32 (33-.46)	.32 (33-.38)	.24 (25-.26)	.24 (25-.26)
.20								
.24				.48 (49-.54)	.48 (49-.54)	.48 (49-.50)	.48 (49-.54)	.48 (49-.50)
.28				.56 (57-.62)	.56 (57-.62)	.56 (57-.58)	.56 (57-.58)	.56 (57-.58)
.32		.64 (65-.126)	.64 (65-.94)	.64 (65-.78)	.64 (65-.70)	.72 (73-.78)	.64 (65-.68)	
.36								.80 (81-.94)
.40				.96 (97-.102)	.96 (97-.102)	.96 (97-.98)	.96 (97-.98)	.96 (97-.98)
.44				.96 (97-.126)	.96 (97-.126)	.104 (105-.110)	.104 (105-.110)	.108 (109-.116)
.48			.112 (113-.118)					
.52			.120 (121-.126)		.120 (121-.126)	.120 (121-.122)	.124 (125-.126)	.124 (125-.126)
.56			.128 (129-.190)		.128 (129-.156)	.128 (129-.142)	.136 (137-.142)	.144 (145-.150)
.60				.144 (145-.158)				
.64	.160 (161-.174)	.160 (161-.166)		.160 (161-.166)	.164 (165-.166)	.164 (165-.166)		
.68	.160 (161-.190)	.160 (161-.190)		.176 (177-.182)	.168 (169-.174)	.176 (177-.182)	.172 (173-.174)	
.72			.184 (185-.190)					.184 (185-.186)
.76		.192 (193-.198)	.192 (193-.198)	.192 (193-.194)	.196 (197-.199)	.192 (193-.194)		
.80		.200 (201-.206)	.200 (201-.206)	.208 (209-.214)	.204 (205-.206)	.204 (205-.206)		
.84	.192 (193-.222)	.192 (193-.222)	.208 (209-.222)	.216 (217-.222)	.216 (217-.218)	.220 (221-.222)		
.88							.224 (225-.230)	.224 (225-.230)
.92		.232 (233-.238)	.232 (233-.238)	.240 (241-.246)	.236 (237-.238)	.240 (241-.242)		
.96		.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.244 (245-.246)	.244 (245-.246)		
.100	.224 (225-.254)	.224 (225-.254)	.240 (241-.254)	.248 (249-.254)	.248 (249-.250)	.252 (253-.254)		
.104							.252 (253-.254)	.248 (249-.250)
.108		.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)	
.112								.248 (249-.250)
.116	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.120							.248 (249-.250)	.248 (249-.250)
.124	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.128							.248 (249-.250)	.248 (249-.250)
.132	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.136							.248 (249-.250)	.248 (249-.250)
.140	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.144							.248 (249-.250)	.248 (249-.250)
.148	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.152							.248 (249-.250)	.248 (249-.250)
.156	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.160							.248 (249-.250)	.248 (249-.250)
.164	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.168							.248 (249-.250)	.248 (249-.250)
.172	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.176							.248 (249-.250)	.248 (249-.250)
.180	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.184							.248 (249-.250)	.248 (249-.250)
.188	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.192							.248 (249-.250)	.248 (249-.250)
.196	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.200							.248 (249-.250)	.248 (249-.250)
.204	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.208							.248 (249-.250)	.248 (249-.250)
.212	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.216							.248 (249-.250)	.248 (249-.250)
.220	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.224							.248 (249-.250)	.248 (249-.250)
.228	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.232							.248 (249-.250)	.248 (249-.250)
.236	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.240							.248 (249-.250)	.248 (249-.250)
.244	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.248							.248 (249-.250)	.248 (249-.250)
.252	.240 (241-.246)	.240 (241-.246)	.248 (249-.254)	.248 (249-.250)	.248 (249-.250)	.252 (253-.254)		
.256							.248 (249-.250)	.248 (249-.250)

All co

Appendix 2: Creating a Router Console Session using HyperTerminal

Task 1: Connect a Router and Computer with a Console Cable

Step 1: Set up a basic physical connection.

Connect the console (rollover) cable to the console port on the router. Connect the other cable end to the host computer with a DB-9 or DB-25 adapter to the COM 1 port.

Step 2: Power on devices.

If not already powered on, enable power to the computer and router.

Task 2: Configure HyperTerminal to Establish a Console Session with a Cisco IOS Router

Step 1: Start the HyperTerminal application.

Start the HyperTerminal program by clicking **Start > Programs > Accessories > Communications > HyperTerminal**.

Step 2: Configure HyperTerminal.



Figure 3. HyperTerminal Name Configuration Window

In the Connection Description window, enter a session name in the Name field. Select an appropriate icon, or keep the default. Click **OK**.



Figure 4. HyperTerminal Connection Type

Enter COM 1 in the Connect Using field, and then click **OK**. (Depending upon the PC you are using, it may be necessary to use a different COM port. If COM1 does not work, then systematically try the additional COM ports until you are successful.)

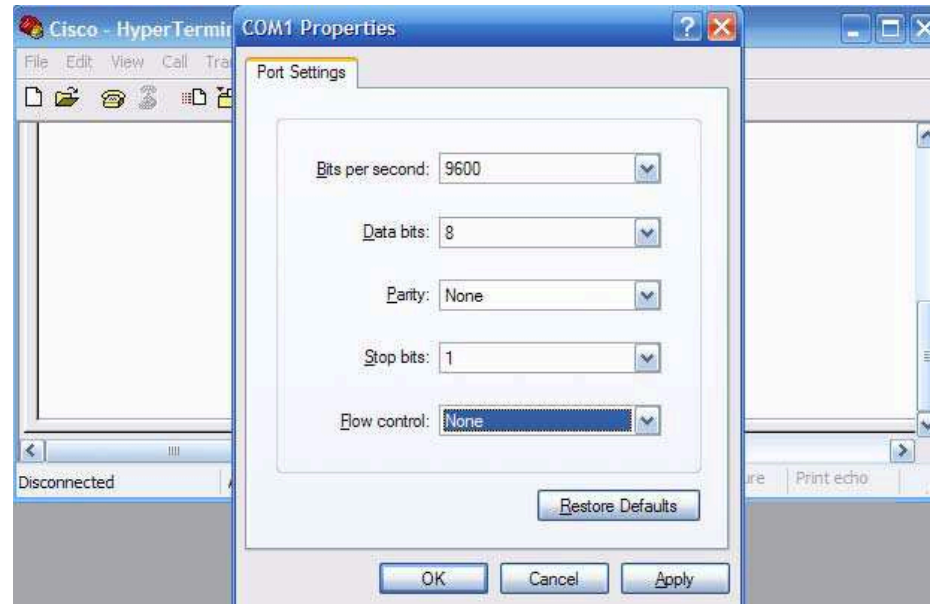


Figure 5. HyperTerminal COM1 Port Settings

As shown in Figure 3, change port settings to the following values, and then click **OK**:

Setting	Value
Bits per second	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

When the HyperTerminal session window appears, press **Enter**. There should be a response from the router. This indicates that the connection has been successfully completed. If there is no connection, troubleshoot as necessary. For example, verify that the router has power. Check the connection to the COM 1 port on the PC and the console port on the router. If there is still no connection, ask the instructor for assistance.

Step 3: Close HyperTerminal.

When finished, close the HyperTerminal session by choosing **File > Exit**. When asked whether to save the session, click **Yes**. Enter a name for the session.

Step 4: Reconnect the HyperTerminal session.

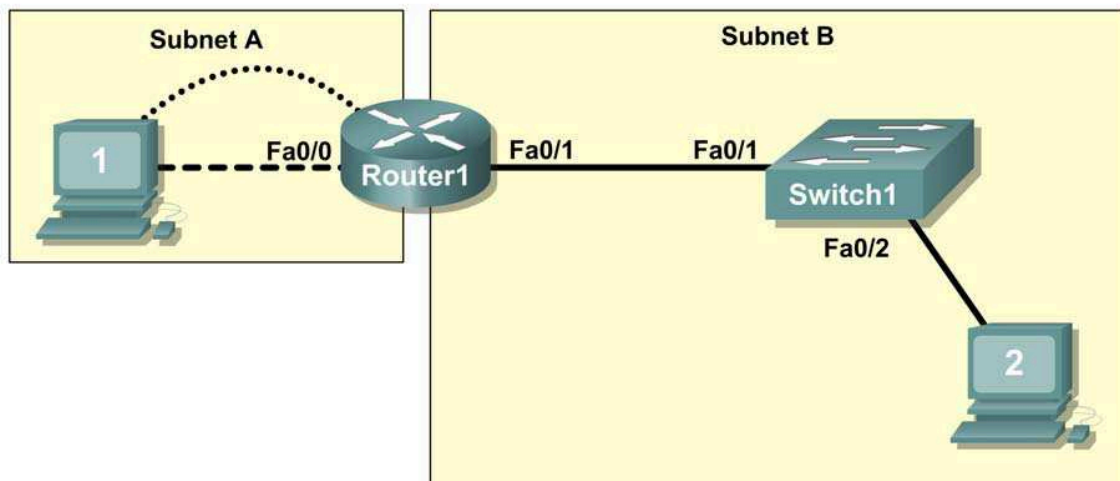
Reopen the HyperTerminal session as described in Task 2, Step 1. This time, when the Connection Description window appears (see Figure 3), click **Cancel**.

Choose **File > Open**. Select the saved session and then click **Open**. Use this step to reconnect the HyperTerminal session to a Cisco device without reconfiguring a new session.

When finished, exit HyperTerminal.

Lab 1.3.2: Review of Concepts from Exploration 1 - Challenge

Topology Diagram



Learning Objectives

Upon completion of this lab, you will be able to:

- Create a logical topology given network requirements
- Create subnets to meet host requirements
- Configure the physical topology
- Configure the logical topology
- Verify network connectivity
- Configure and verify passwords

Scenario

In this lab, you will design and configure a small routed network and verify connectivity across multiple network devices. This requires creating and assigning two subnetwork blocks, connecting hosts and network devices, and configuring host computers and one Cisco router for basic network connectivity. Switch1 has a default configuration and does not require additional configuration. You will use common commands to test and document the network. The zero subnet is used.

Task 1: Design a Logical LAN Topology

Step 1: Design an IP addressing scheme.

Given the IP address block of **192.168.30.0 /27**, design an IP addressing scheme that satisfies the following requirements:

Subnet	Number of Hosts
Subnet A	7
Subnet B	14

The 0 subnet is used. No subnet calculators may be used. Create the smallest possible number of subnets that satisfy the requirements for hosts. Assign the first usable subnet to Subnet A.

Subnet A	
Specification	Student Input
Number of bits in the subnet	
IP mask (binary)	
New IP mask (decimal)	
Maximum number of usable subnets (including the 0 subnet)	
Number of usable hosts per subnet	
IP subnetwork address	
First IP host address	
Last IP host address	

Subnet B	
Specification	Student Input
Number of bits in the subnet	
IP mask (binary)	
New IP mask (decimal)	
Maximum number of usable subnets (including the 0 subnet)	
Number of usable hosts per subnet	
IP subnetwork address	
First IP host address	
Last IP host address	

Host computers will use the first usable IP address in the subnet. The network router will use the last usable IP address in the subnet.

Step 2: Write down the IP address information for each device.

Device	IP address	Mask	Gateway
Host1			
Router1-Fa0/0			
Host2			
Router1-Fa0/1			

Before proceeding, verify your IP addresses with the instructor.

Task 2: Configure the Physical Topology

Step 1: Determine cabling requirements.

Referring to Figure 1, identify each cable type required and document it in the table.

Correct Cabling	Cable Type
LAN cable between Host1 and Router1 Fa0/0	
LAN cable between Switch1 and Router1 Fa0/1	
LAN cable between Switch1 and Host2	
Console cable between Host1 and Router1	

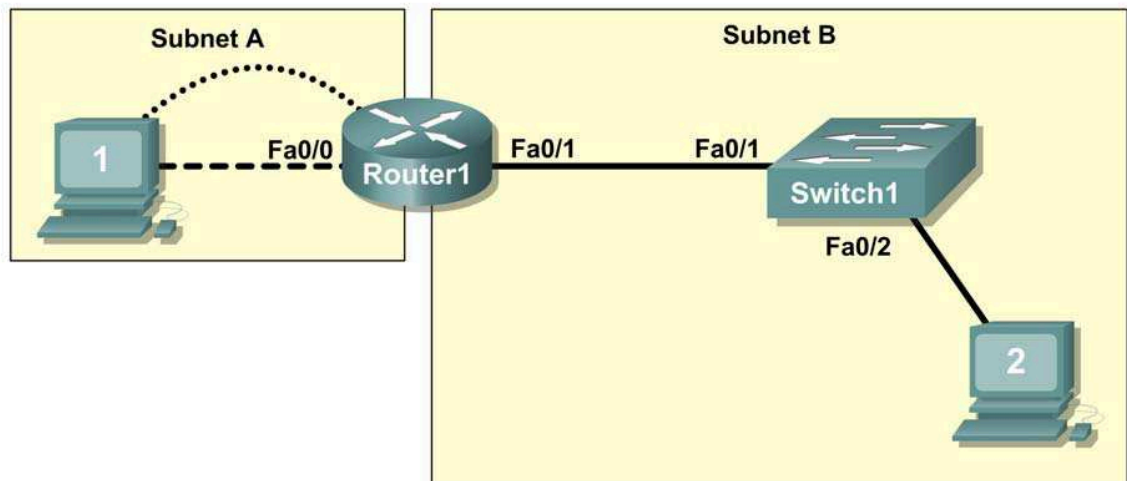


Figure 1. Cabling the network.

Step 2. Physically connect lab devices.

Cable the network devices as shown in Figure 1. Turn power on to all devices if it is not already on.

Step 3: Inspect the network connections.

After cabling the network devices, verify the connections..

Task 3: Configure the Logical Topology

Step 1: Configure the host computers.

Configure the static IP address, subnet mask, and gateway for each host computer. After configuring each host computer, display and verify the host network settings with the **ipconfig /all** command.

Host1 Network Configuration	
Physical address	
IP address	
Subnet mask	
Default gateway	

Host2 Network Configuration	
Physical address	
IP address	
Subnet mask	
Default gateway	

Step 2: Configure Router1.

From Host1, connect to the console of Router 1 and configure the following:

Task	Specification
Router name	Router1
Encrypted privileged exec password	class
Console access password	cisco
Telnet access password	cisco
Router1 interface Fa0/0	Set the description Set the Layer 3 address
Router1 interface Fa0/1	Set the description Set the Layer 3 address

Task 4: Verify Network Connectivity

Step 1: Use the ping command to verify network connectivity.

You can verify network connectivity using the **ping** command.

Note: If pings to the host computers fail, verify the existence of a firewall program running on the hosts. If a firewall is running on the host temporarily disable it and retest. To disable a Windows firewall, select **Start > Control Panel > Windows Firewall**, select **OFF**, and then **OK**.

Use the following table to verify connectivity with each network device. Take corrective action to establish connectivity if a test fails.

From	To	IP Address	Ping Results
Host1	NIC IP address		
Host1	Router1, Fa0/0		
Host1	Router1, Fa0/1		
Host1	Host2		
Host2	NIC IP address		

Host2	Router1, Fa0/1		
Host2	Router1, Fa0/0		
Host2	Host1		

In addition to the **ping** command, what other Windows command is useful in displaying network delay and breaks in the path to the destination? _____

Task 5: Verify Passwords

Step 1: Telnet to the router from Host2 and verify the Telnet password.

You should be able to telnet to either Fast Ethernet interface of the router.

Step 2: Verify that the enable secret password has been set.

From the Telnet session, enter privilege exec mode and verify that it is password protected.

Step 3: Verify that the console is password protected.

Terminate and then re-establish the console connection from Host1 to the router to verify that the console is password protected.

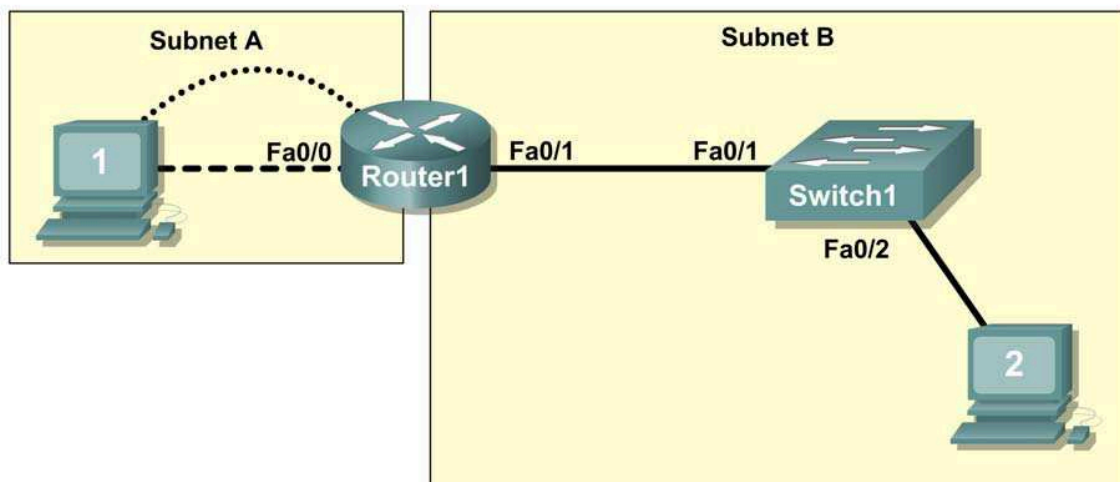
Depending on the Telnet client that you are using, the session can usually be terminated with Ctrl-].

Task 6: Clean Up

Unless directed otherwise by your instructor, erase the configurations and reload the switches. Disconnect and store the cabling. For PC hosts that are normally connected to other networks (such as the school LAN or to the Internet), reconnect the appropriate cabling and restore the TCP/IP settings.

Lab 1.3.3: Troubleshooting a Small Network

Topology Diagram



Learning Objectives

Upon completion of this lab, you will be able to:

- Verify that a paper design meets stated network requirements
- Cable a network according to the topology diagram
- Erase the startup configuration and reload a router to the default state
- Load the routers with supplied scripts
- Discover where communication is not possible
- Gather information about the misconfigured portion of the network along with any other errors
- Analyze information to determine why communication is not possible
- Propose solutions to network errors
- Implement solutions to network errors

Scenario

In this lab, you are given a completed configuration for a small routed network. The configuration contains design and configuration errors that conflict with stated requirements and prevent end-to-end communication. You will examine the given design and identify and correct any design errors. You will then cable the network, configure the hosts, and load configurations onto the router. Finally, you will troubleshoot the connectivity problems to determine where the errors are occurring and correct them.

using the appropriate commands. When all errors have been corrected, each host should be able to communicate with all other configured network elements and with the other host.

Task 1: Examine the Logical LAN Topology

The IP address block of 172.16.30.0 /23 is subnetted to meet the following requirements:

Subnet	Number of Hosts
Subnet A	174
Subnet B	60

Additional requirements and specifications:

- The 0 subnet is used.
- The smallest possible number of subnets that satisfy the requirements for hosts should be used, keeping the largest possible block in reserve for future use.
- Assign the first usable subnet to Subnet A.
- Host computers use the first IP address in the subnet. The network router uses the last network host address.

Based on these requirements, the following topology has been provided to you:

Subnet A	
Specification	Value
IP mask (decimal)	255.255.255.0
IP address	172.16.30.0
First IP host address	172.16.30.1
Last IP host address	172.16.30.254

Subnet B	
Specification	Value
IP mask (decimal)	255.255.255.128
IP address	172.16.31.0
First IP host address	172.16.31.1
Last IP host address	172.16.31.126

Examine each of the values in the tables above and verify that this topology meets all requirements and specifications. Are any of the given values incorrect? _____

If yes, correct the values in the table above and write the corrected values below:

Create a configuration table similar to the one below using your corrected values:

Device	IP address	Mask	Gateway
Host1	172.16.30.1	255.255.255.0	172.16.30.254
Router1–Fa0/0	172.16.30.254	255.255.255.0	N/A
Host2	172.16.31.1	255.255.255.128	172.16.31.126

Router1–Fa0/1	172.16.31.126	255.255.255.128	N/A
---------------	---------------	-----------------	-----

Task 2: Cable, Erase, and Reload the Routers

Step 1: Cable the network.

Cable a network that is similar to the one in the topology diagram.

Step 2: Clear the configuration on each router.

Clear the configuration on the router using the **erase startup-config** command and then reload the router. Answer **no** if asked to save changes.

Task 3: Configure the Host Computers

Step 1: Configure host computers.

Configure the static IP address, subnet mask, and gateway for each host computer based on the configuration table created in Task 1. After configuring each host computer, display and verify the host network settings with the **ipconfig /all** command.

Task 4: Load the Router with the Supplied Scripts

```
enable
!
config term
!
hostname Router1
!
enable secret class
!
no ip domain-lookup
!
interface FastEthernet0/0
description connection to host1
ip address 172.16.30.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
description connection to switch1
ip address 192.16.31.1 255.255.255.192
duplex auto
speed auto
!
!
line con 0
password cisco
login
line vty 0
login
```

```
line vty 1 4
 password cisco
 login
 !
end
```

Task 5: Identify Connectivity Problems

Step 1: Use the ping command to test network connectivity.

Use the following table to test the connectivity of each network device.

From	To	IP Address	Ping Results
Host1	NIC IP address	172.16.30.1	
Host1	Router1, Fa0/0	172.16.30.254	
Host1	Router1, Fa0/1	172.16.31.126	
Host1	Host2	172.16.31.1	
Host2	NIC IP address	172.16.30.1	
Host2	Router1, Fa0/1	172.16.31.126	
Host2	Router1, Fa0/0	172.16.30.254	
Host2	Host1	172.16.30.1	

Task 6: Troubleshoot Network Connections

Step 1: Begin troubleshooting at the host connected to the BRANCH router.

From host PC1, is it possible to ping PC2? _____

From host PC1, is it possible to ping the router fa0/1 interface? _____

From host PC1, is it possible to ping the default gateway? _____

From host PC1, is it possible to ping itself? _____

Where is the most logical place to begin troubleshooting the PC1 connection problems?

Step 2: Examine the router to find possible configuration errors.

Begin by viewing the summary of status information for each interface on the router.

Are there any problems with the status of the interfaces?

If there are problems with the status of the interfaces, record any commands that are necessary to correct the configuration errors.

Step 3: Use the necessary commands to correct the router configuration.

Step 4: View a summary of the status information.

If any changes were made to the configuration in the previous step, view the summary of the status information for the router interfaces.

Does the information in the interface status summary indicate any configuration errors on Router1?

If the answer is **yes**, troubleshoot the interface status of the interfaces.

Has connectivity been restored? _____

Step 5: Verify the logical configuration.

Examine the full status of Fa 0/0 and 0/1. Is the IP addresses and subnet mask information in the interface status consistent with the configuration table? _____

If there are differences between the configuration table and the router interface configuration, record any commands that are necessary to correct the router configuration.

Has connectivity been restored? _____

Why is it useful for a host to ping its own address?

Task 7: Clean Up

Unless directed otherwise by your instructor, erase the configurations and reload the switches. Disconnect and store the cabling. For PC hosts that are normally connected to other networks (such as the school LAN or to the Internet), reconnect the appropriate cabling and restore the TCP/IP settings.