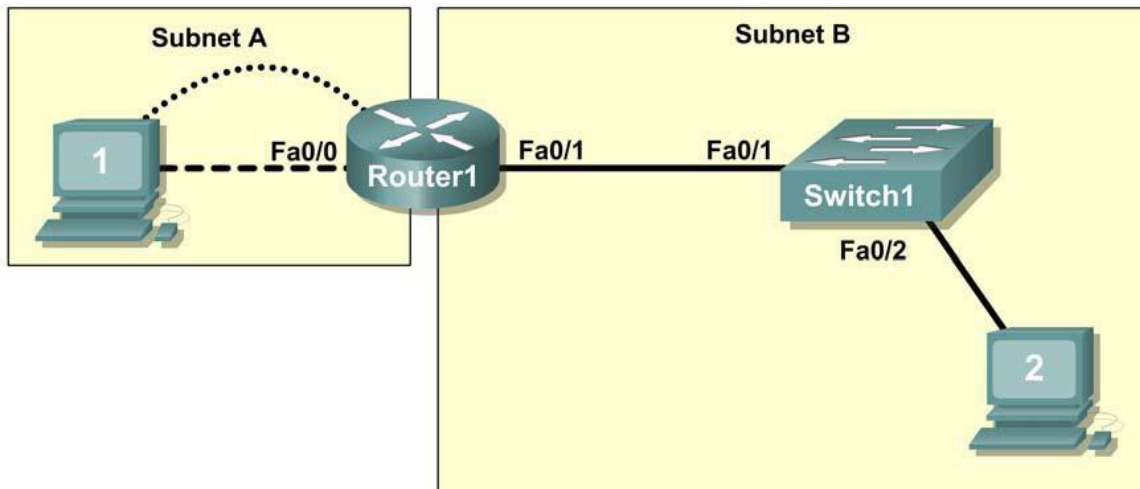


## Lab 1: Review of Concepts

### Topology Diagram



### Scenario

In this lab, you will design and configure a small network and verify connectivity across multiple network devices. This requires creating and assigning two subnetwork address ranges, connecting hosts and network devices, and configuring all devices for network connectivity.

Switch1 has a default configuration that is adequate for this lab and does not require additional configuration. You will use common commands to test and document the network.

Although this lab has been designed to be done with physical network devices, it can also be done as a Packet Tracer simulation.

### Task 1: Design a Logical LAN Topology

#### **Step 1: Select subnetwork IP address ranges.**

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

Subnet	Number of Hosts
Subnet A	110
Subnet B	54

Split the address range you are given into the smallest possible subnetwork ranges that will satisfy the required number of hosts. You should have an unused address range when you are finished.

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Subnet A	
Parameter	Value
Bits in the subnetwork address	
Netmask (binary)	
Netmask (decimal)	
Subnetwork address	
Number of usable hosts	
First usable host address	
Last usable host address	

Subnet B	
Parameter	Value
Bits in the subnetwork address	
Netmask (binary)	
Netmask (decimal)	
Subnetwork address	
Number of usable hosts	
First usable host address	
Last usable host address	

Follow this convention: host computers use the first usable IP address in the subnet; routers 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

## **Task 2: Configure the Physical Topology**

This task can be done using real devices or as a Packet Tracer simulation. If you use Packet Tracer, you do not need to connect anything to the simulated console port on the router. You can gain console access by clicking on the router's icon in the Packet Tracer model.

**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

Cable the network as indicated in the table above. If you use physical devices, be sure each device is powered up. Double-check your connections.

## **Task 3: Configure the Logical Topology**

If you use a physical router, verify it has no previous configuration. Reset the router if necessary. This is not needed in Packet Tracer. When a device is first added to a Packet Tracer model, it is added in its initial, default, and unconfigured state.

### **Step 1: Configure the host computers.**

Configure each host computer's static IP address, subnet mask, and default gateway. After configuring each host computer, open a command window to check the settings. The settings should match those in the tables below:

Host1 Configuration	Host2 Configuration
IP address 192.168.7.1	IP address 192.168.7.129
Subnet mask 255.255.255.128	Subnet mask 255.255.255.192
Default gateway 192.168.7.126	Default gateway 192.168.7.190

### **Step 2: Configure Router1.**

In a physical network, from Host1, connect to the console of Router1 to establish a console session. In Packet Tracer, open a console window on Router1 by clicking on the router's icon in the model.

From the router console, use the commands shown below to configure the following:

Task	Specification
Router name	Router1
The enable password	hotdog
Console access password	hamburger
Telnet access password	hamburger
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# configure terminal
Router(config)# hostname Router1
Router1(config)# enable secret hotdog
Router1(config)# line console 0
Router1(config-line)# password hamburger
Router1(config-line)# login
Router1(config-line)# line vty 0 15
Router1(config-line)# password hamburger
Router1(config-line)# login
Router1(config-line)# interface FastEthernet0/0
Router1(config-if)# ip address 192.168.7.126 255.255.255.128
Router1(config-if)# description connection to Host1
Router1(config-if)# no shutdown
Router1(config-if)# interface FastEthernet0/1
Router1(config-if)# ip address 192.168.7.190 255.255.255.192
Router1(config-if)# description connection to Switch1
Router1(config-if)# no shutdown
```

```
Router1(config-if)# end
```

## **Task 4: Check the switch**

If you use a physical switch, verify it has no previous configuration. Reset the switch if necessary.

## **Task 5: 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 turn off the computer firewall and retest (only relevant for physical hosts). To turn off 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.

<b>From</b>	<b>To</b>	<b>IP Address</b>	<b>Ping results</b>
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	

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## **Task 6: Verify Passwords**

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

You should be able to telnet to the FastEthernet interface of the router. In a command window on Host 2, type:

```
> telnet 192.168.7.190
```

When prompted for the Telnet password, type **hamburger** 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?

**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 7: Reflection**

How are Telnet access and console access different? When might setting different passwords on these two access ports make sense?

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

## **Task 8: Clean Up**

This task is only relevant if you are using physical network devices.

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

## **Submission**

There is no submission for this lab. Work through the steps to familiarize yourself with network addressing, Packet Tracer, etc. These are skills you will need to do the later labs.