**Net 1060 Introduction to Networks Lab: # 11.5.5**

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**Follow the instructions down below for the lab itself. For this lab, all answers need to be in blue font. For the questions right below, answer in complete sentences. Ensure you paste the screen shot of your score page at the bottom of the document. Even if this does not let you see your grade, still take a screen shot of the score page showing congratulations “your name” you have completed the exercise is pasted at the bottom of this document. You will then need to upload both this word document and your packet tracer file to the assignments link within Netacad. Let the instructor know if you have any questions.**

***Lab Analysis Report***

1. Using complete sentences summarize work you completed during the lab.

I configured the subnets and ip addresses for a network

2. Using complete sentences describe what you learned from the lab. Hint; look at the lab objectives listed at the top of the lab section.

I learned how to figure out the appropriate ip’s and subnetting for a network

***Problems Encountered***

1. Using complete sentences describe any problem(s) experienced during lab.

No problems

2. Using complete sentences describe how you solved your problem(s).

No problems

3. Using complete sentences explain if you needed any assistance with the lab; then list what you learned from that assistance. No problems

Packet Tracer – Subnet an IPv4 Network

# Addressing Table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Device | Interface | IP Address | Subnet Mask | Default Gateway |
| CustomerRouter | G0/0 | blank | *blank* | N/A |
| CustomerRouter | G0/1 | blank | blank | N/A |
| CustomerRouter | S0/1/0 | 209.165.201.2 | 255.255.255.252 | N/A |
| LAN-A Switch | VLAN1 | blank | blank | blank |
| LAN-B Switch | VLAN1 | blank | blank | blank |
| PC-A | NIC | blank | blank | blank |
| PC-B | NIC | blank | blank | blank |
| ISPRouter | G0/0 | 209.165.200.225 | 255.255.255.224 | N/A |
| ISPRouter | S0/1/0 | 209.165.201.1 | 255.255.255.252 | N/A |
| ISPSwitch | VLAN1 | 209.165.200.226 | 255.255.255.224 | 209.165.200.225 |
| ISP Workstation | NIC | 209.165.200.235 | 255.255.255.224 | 209.165.200.225 |
| ISP Server | NIC | 209.165.200.240 | 255.255.255.224 | 209.165.200.225 |

# Objectives

Part 1: Design an IPv4 Network Subnetting Scheme

Part 2: Configure the Devices

Part 3: Test and Troubleshoot the Network

# Background / Scenario

In this activity, you will subnet the Customer network into multiple subnets. The subnet scheme should be based on the number of host computers required in each subnet, as well as other network considerations, like future network host expansion.

After you have created a subnetting scheme and completed the table by filling in the missing host and interface IP addresses, you will configure the host PCs, switches and router interfaces.

After the network devices and host PCs have been configured, you will use the **ping** command to test for network connectivity.

# Instructions

## Subnet the Assigned Network

### Create a subnetting scheme that meets the required number of subnets and required number of host addresses.

In this scenario, you are a network technician assigned to install a new network for a customer. You must create multiple subnets out of the 192.168.0.0/24 network address space to meet the following requirements:

* + - 1. The first subnet is the LAN-A network. You need a minimum of 50 host IP addresses.
      2. The second subnet is the LAN-B network. You need a minimum of 40 host IP addresses.
      3. You also need at least two additional unused subnets for future network expansion.

**Note**: Variable length subnet masks will not be used. All of the device subnet masks should be the same length.

* + - 1. Answer the following questions to help create a subnetting scheme that meets the stated network requirements:

#### Questions:

How many host addresses are needed in the largest required subnet?

Type your answers 50.

What is the minimum number of subnets required?

44

The network that you are tasked to subnet is 192.168.0.0/24. What is the /24 subnet mask in binary?

11111111.11111111.11111111.00000000

* + - 1. The subnet mask is made up of two portions, the network portion, and the host portion. This is represented in the binary by the ones and the zeros in the subnet mask.

#### Questions:

In the network mask, what do the ones represent?

Type your answers Networkhere.

In the network mask, what do the zeros represent?

Type your answers Hosts.

* + - 1. To subnet a network, bits from the host portion of the original network mask are changed into subnet bits. The number of subnet bits defines the number of subnets.

#### Questions:

Given each of the possible subnet masks depicted in the following binary format, how many subnets and how many hosts are created in each example?

**Hint**: Remember that the number of host bits (to the power of 2) defines the number of hosts per subnet (minus 2), and the number of subnet bits (to the power of two) defines the number of subnets. The subnet bits (shown in bold) are the bits that have been borrowed beyond the original network mask of /24. The /24 is the prefix notation and corresponds to a dotted decimal mask of 255.255.255.0.

* + - * 1. (/25) 11111111.11111111.11111111.**1**0000000

Dotted decimal subnet mask equivalent:

Type 255.255.255.128 answers here.

Number of subnets? Number of hosts?

Type your answers 2 Subnets and 126 hostshere.

* + - * 1. (/26) 11111111.11111111.11111111.**11**000000

Dotted decimal subnet mask equivalent:

Type your255.255.255.192 answers here.

Number of subnets? Number of hosts?

Type your 4 subnets 64 hostsanswers here.

* + - * 1. (/27) 11111111.11111111.11111111.**111**00000

Dotted decimal subnet mask equivalent:

Type yor 255.255.255.224 here.

Number of subnets? Number of hosts?

Type your 8 Subnets 32 hosts here.

* + - * 1. (/28) 11111111.11111111.11111111.**1111**0000

Dotted decimal subnet mask equivalent:

Type your 255.255.255.240 here.

Number of subnets? Number of hosts?

Type your 16 Subnets 16 hosts

* + - * 1. (/29) 11111111.11111111.11111111.**11111**000

Dotted decimal subnet mask equivalent:

255.255.255.248

Number of subnets? Number of hosts?

Type your 32 subnets 8 hosts here.

* + - * 1. (/30) 11111111.11111111.11111111.**111111**00

Dotted decimal subnet mask equivalent:

255.255.255.252

Number of subnets? Number of hosts?

64 subnets 4 hosts

Considering your answers above, which subnet masks meet the required number of minimum host addresses? /25 and /26

Type your answers here.

Considering your answers above, which subnet masks meets the minimum number of subnets required? /26 /27 /28 /29 /30

Type your answers here.

Considering your answers above, which subnet mask meets both the required minimum number of hosts and the minimum number of subnets required? /26 will give the 4 subnets needed and 62 hosts which is enough for the 50 required.

Type your answers here.

When you have determined which subnet mask meets all of the stated network requirements, derive each of the subnets. List the subnets from first to last in the table. Remember that the first subnet is 192.168.0.0 with the chosen subnet mask.

|  |  |  |
| --- | --- | --- |
| Subnet Address | Prefix | Subnet Mask |
| 192.168.0.0 | /26 | 255.255.255.192 |
| 192.168.0.64 | /26 | 255.255.255.192 |
| 192.168.0.128 | /26 | 255.255.255.192 |
| 192.168.0.192 | /26 | 255.255.255.192 |

### Fill in the missing IP addresses in the Addressing Table

Assign IP addresses based on the following criteria: Use the ISP Network settings as an example.

* + - 1. Assign the first subnet to LAN-A.
         1. Use the first host address for the CustomerRouter interface connected to LAN-A switch.
         2. Use the second host address for the LAN-A switch. Make sure to assign a default gateway address for the switch.
         3. Use the last host address for PC-A. Make sure to assign a default gateway address for the PC.
      2. Assign the second subnet to LAN-B.
         1. Use the first host address for the CustomerRouter interface connected to LAN-B switch.
         2. Use the second host address for the LAN-B switch. Make sure to assign a default gateway address for the switch.
         3. Use the last host address for PC-B. Make sure to assign a default gateway address for the PC.

## Configure the Devices

Configure basic settings on the PCs, switches, and router. Refer to the Addressing Table for device names and address information.

### Configure CustomerRouter.

* + - 1. Set the enable secret password on CustomerRouter to **Class123**
      2. Set the console login password to **Cisco123**.
      3. Configure **CustomerRouter** as the hostname for the router.
      4. Configure the G0/0 and G0/1 interfaces with IP addresses and subnet masks, and then enable them.
      5. Save the running configuration to the startup configuration file.

### Configure the two customer LAN switches.

Configure the IP addresses on interface VLAN 1 on the two customer LAN switches. Make sure to configure the correct default gateway on each switch.

### Configure the PC interfaces.

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

## Test and Troubleshoot the Network

In Part 3, you will use the **ping** command to test network connectivity.

* + - 1. Determine if PC-A can communicate with its default gateway. Do you get a reply?

Type yourYes answers here.

* + - 1. Determine if PC-B can communicate with its default gateway. Do you get a reply?

Type your Yes here.

* + - 1. Determine if PC-A can communicate with PC-B. Do you get a reply?

Type your Yes here.

If you answered “no” to any of the preceding questions, then you should go back and check your IP address and subnet mask configurations, and ensure that the default gateways have been correctly configured on PC-A and PC-B.

End of Document

