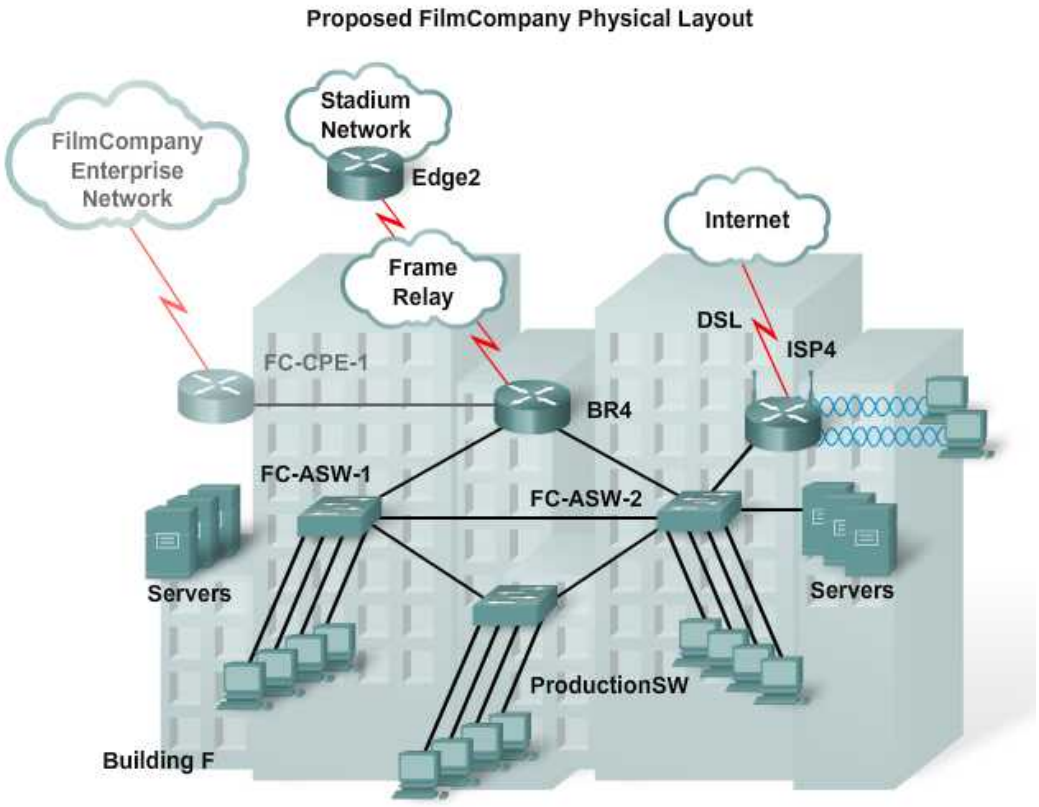
Lab 6.2.5 Creating an Address Allocation Spreadsheet



Objective

- Document the address assignment within the FilmCompany network.

640-802 CCNA Exam Objectives

This lab contains skills that relate to the following CCNA exam objectives:

- Calculate and apply an addressing scheme, including VLSM IP addressing design, to a network.
- Implement static and dynamic addressing services for hosts in a LAN environment.
- Determine the appropriate classless addressing scheme using VLSM and summarization to satisfy addressing requirements in a LAN/WAN environment.

Expected Results and Success Criteria

Before starting this lab, read through the tasks that you are expected to perform. What do you expect the result of performing these tasks will be?

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Background / Preparation

This lab is part of a series of labs in which you design the IP addressing scheme for the new FilmCompany network. This series includes Determining an IP Addressing Scheme (Lab 6.2.1), Determining the Number of IP Networks (Lab 6.2.2) and Creating an Address Allocation Spreadsheet (Lab 6.2.5).

Based on the addressing plan you created in Labs 6.2.1, “Determining the IP Addressing Scheme,” and Lab 6.2.2, “Determining the Number of IP Networks,” you will create a spreadsheet showing the VLSM addressing allocation for the networks. This information will to be placed in the IP Network Requirements table to show the size of the IP address blocks that are needed for each area of the network. You should group areas that have similar requirements, to reduce the number of different subnet masks that must be supported.

By reducing the number of subnet combinations, the designer simplifies the configurations. This makes it easier for the existing FilmCompany network staff to support and troubleshoot. The design requires the support of four different subnet masks.

Task 1: Create a Spreadsheet Showing VLSM Addresses and Assignment

Use a spreadsheet program to create a spreadsheet with columns for each of the network addressing requirements based on the table shown here. Using a spreadsheet to create a table like this one can make the allocation of addresses easier to plan and visualize. The spreadsheet can also be used to record where each block of addresses is implemented in the network. This helps to avoid overlapping address blocks.

FilmCompany Network Block	Networks with 254 hosts	Networks with 126 hosts	Networks with 62 hosts	Networks with 14 hosts	Network Names

For this task, first list the block you have chosen and then show the allocation of this block into the subnets. Begin with the largest block and work to the smallest.

NOTE: You may want to use a pencil to fill in this table so that you can make changes until it is complete and final.

Step 1: Record the network address block

In the first column, record the address block used for the entire FilmCompany network chosen in the previous lab.

Step 2: Define the 254-host networks

Based on the requirements for the FilmCompany network, the address block is divided into twelve separate networks using four different masks.

a. In the second column of the table above, record the network blocks that will support 254 hosts per network.

b. In the last column, record the names of the networks that need to be assigned to these blocks.

NOTE: Use only as many blocks as required to meet the address assignments.

The CIDR notation mask for the 254-host network is /24. What is the dotted decimal equivalent mask?

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Step 3: Define the 126-host networks

a. In the third column of the table above, choose the first unused 254-host address block to subdivide into 126-host networks.

b. In the last column, record the names of the networks assigned to these 126-host blocks.

NOTE: Use only as many blocks as required to meet the address assignments.

The CIDR notation mask for the 126-host network is /25. What is the dotted decimal equivalent mask?

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NOTE: As you further divide these networks, you may need to move the networks around in the table to make room to show the further subnetting of these blocks.

Step 4: Define the 62-host networks

a. In the fourth column of the table above, choose the first unused 126-host address block to subdivide into 62-host networks.

b. In the last column, record the names of the networks assigned to these 62-host blocks.

NOTE: Use only as many blocks required that meet the address assignments.

The CIDR notation mask for the 62-host network is /26. What is the dotted decimal equivalent mask?

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Step 5: Define the 14-host networks

a. In the fifth column of the table above, choose the first unused 62-host address block to subdivide into 14-host networks.

b. In the last column, record the names of the networks assigned to these 14-host blocks.

NOTE: Use only as many blocks as required to meet the address assignments.

The CIDR notation mask for the 14-host network is /28. What is the dotted decimal equivalent mask?

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NOTE: This FilmCompany branch office does not require any 30-host networks.

Task 2: Define the Host Address Assignments

For each network, determine and document the host addresses and broadcast addresses. Use the table below to document these networks and host information.

Step 1: Record the network names and addresses in the addressing table

In the table below, record the network names for the FilmCompany in the first column and the corresponding network address in the second column.

Step 2: Calculate the lowest host address in the addressing table

The lowest address for a network is one greater than the address of the network. Therefore, to calculate the lowest host address, add a 1 to the network address. For each of these networks, calculate and record the lowest host address in the second column of the table.

Step 3: Calculate the broadcast address in the addressing table

The broadcast address uses the highest address in the network range. This is the address in which the bits in the host portion are all 1s. To calculate the broadcast for each of the networks listed, convert the last octet of

the network address into binary. Then fill the remaining host bits with 1s. Finally, convert the binary back to decimal. For each of these networks, calculate and record the broadcast address in the last column.

Step 4: Calculate the highest host address in the addressing table

The highest address for each address is the network address is one less than the broadcast address for that network. Therefore, to calculate the highest host address, subtract a 1 from the broadcast address. For each of these networks, calculate and record the highest host address in the second column.

Network Names	Network Address	Lowest Host Address	Highest Host Address	Broadcast Address

Task 3: Examine Address Blocks for Overlapping Addresses

One of the major issues of planning network addresses is overlapping addresses. This is especially true when using VLSM addressing. Examine the table in the previous step to ensure that each network has a unique address range.

Are there any overlapping addresses in the networks? _____

If there are any overlapping addresses, recalculate the addressing plan for the FilmCompany network.

Important: File this information in your design portfolio; it is an essential part of your design documentation.

Reflection / Challenge

Examine the network addressing table in Task 1. Discuss how it may be used to determine address summarization. Also, consider how these summarizations might be used.