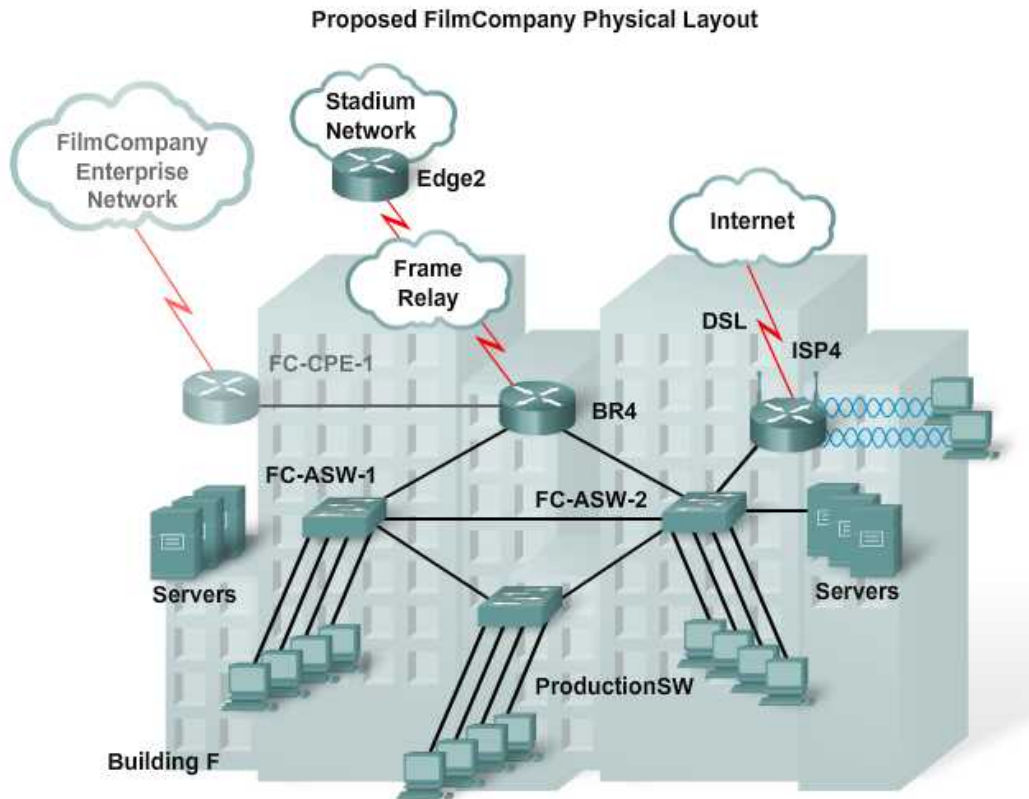


Lab 6.2.2 Determining the Number of IP Networks



Objective

- Define an addressing block scheme to support summarization.

640-802 CCNA Exam Objectives

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

- Describe the operation and benefits of using private and public IP addressing.
- Implement static and dynamic addressing services for hosts in a LAN 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?

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).

With the acquisition of AnyCompany and the new contract with StadiumCompany, the network infrastructure of this branch office of FilmCompany needs to change significantly.

In this lab, you will design an IPv4 addressing plan that satisfies the requirements of the addressing scheme developed for the new FilmCompany network in Lab 6.2.1. This plan will be applied to the network in the next lab.

Task 1: Review Address Block Size

Review and record the total number of hosts to be addressed.

Complete this table with the information determined in Lab 6.2.1.

Network/VLAN Name	#Number of host addresses
Total	

What is the smallest address block size that can potentially satisfy the FilmCompany network needs?

Task 2: Choose or Obtain an Address Block

Step 1: Choose public or private addresses?

A block of addresses needs to be acquired to support the addressing scheme. This block of addresses could be private space addresses or public addresses. In most cases, the network users require only outbound

connections to the Internet. Only a few hosts, such as web servers, require public addresses. These often exist on the local LAN with private addresses and have static NAT entries on the border router to translate to public addresses. Public addresses, however, are expensive and often difficult to justify.

Can you make a justification of the use public addresses in this network? _____

If so, write this justification to forward to the ISP:

Step 2: Ensure that the private space addresses do not conflict

Although you are allowed to use private space addresses any way you choose, you must make sure that the addresses used do not conflict with another private space address to which this network will be connected. You must identify other networks to which you are connected and make sure that you are not using the same private addresses. In this case, you need to examine the addresses used by the StadiumCompany.

What address private space block does the StadiumCompany use?

What address blocks are used by the WAN links?

Are there other devices or connections that need to be excluded from use? _____

What types? _____

What address block? _____

Step 3: Ensure that the private space addresses are consistent with policy

The company should have a network policy and method of allocating addresses. This is true even when using private addresses. You should contact the FilmCompany network administrators to request a block of addresses. In this case, ask your instructor if there is a preferred set of addresses to use.

Did your instructor assign a block of addresses? _____

If so, what block? _____

If your instructor does not assign addresses, you may choose any private space block that does not conflict.

What block of addresses are you using for this FilmCompany Branch?

Task 3: Allocate Addresses for the Network

When assigning addresses to the different networks, start the assignments with the subnet that requires the largest address block and progress to the network that requires the smallest.

Step 1: Order the networks from largest to smallest

Using the information from Lab 6.2.1, list the networks in order of size, from the network that requires the largest address block to the network that requires the smallest block.

Network/VLAN Name	Number of host addresses

Step 2: Assign address blocks to the networks

From the address block chosen in the previous task, begin calculating and assigning the address blocks to these networks. You should use contiguous blocks of addresses when making these assignments.

Network/VLAN Name	Number of host addresses	Network address
Voice	254	
support	126	
production	126	
Future	126	
Null	126	
administrative	62	
Mobile	62	

Peripherals	62	
web_access	14	
Default	14	
management	14	
net_admin	14	

Step 3: Complete the address planning table

Using the addresses you calculated in the previous step, complete this table from Lab 6.2.1. This plan will be used in future labs.

VLAN #	Network/VLAN Name	Number of host addresses	Network Address	Description
1	default	14		Default VLAN for the Layer 2 devices
10	voice	254		Voice VLAN to support Voice over IP
20	management	14		Management hosts and secure peripherals (payroll printer)
30	administrative	62		Administrative hosts
40	support	126		Support hosts
50	production	126		High performance production workstations (stationary)
60	mobile	62		Mobile production hosts.
70	net_admin	14		Network support
80	servers	65534	172.17.0.0 /16	Servers to support video services and storage.
90	peripherals	62		Peripherals for general use (printers, scanners)
100	web_access	14		VLAN for server that are publicly accessible
120	future	126		VLAN for future services
999	null	126		VLAN for terminating unwanted or suspicious traffic
NA	NAT_pool	6	209.165.200.224 /29	Addresses for NAT pool for BR4 or interface to ISP4
NA	DSL_Link	2	192.0.2.40 /30	DSL link to the ISP
NA	Frame_link	2	172.18.0.16/30	Address of the FR link to the stadium

File this information in your design portfolio for use in the next lab.

Reflection / Challenge

This lab specifically used private IPv4 addresses. Discuss the issues to be considered if it was decided to use public IP addresses throughout the network. Are there any situations that would require this?
