



Module 1, Lab 1.1.2 - Calculating Supernets

Introduction and/or Background

A Supernet is the combination of two, or more, networks/subnets with a common Classless Inter-Domain Routing (CIDR) routing prefix. Supernetting, also known as Route Aggregation, allows many subnets to be advertised as one in a router's routing table, thus reducing processing and router decision making.

Objectives

In this project/lab the student will:

- Demonstrate the ability to combine several networks into one summary route, using Supernetting/Route Aggregation

Assignment

Given a series of networks, aggregate/supernet these networks to make one summary route.

Equipment/Supplies Needed

- Scratch paper and pencil for Supernetting calculations
- Computer with Internet connection to upload the completed assignment

Steps for Supernetting:

A. Write out the binary equivalent of the addresses

192.168.16.0 --- 11000000.10101000.0001000.00000000

192.168.17.0 --- 11000000.10101000.0001001.00000000

192.168.18.0 --- 11000000.10101000.0001010.00000000

B. Count all of the common bits from left to right. This will be the new CIDR prefix

= /21 because there are 21 bits in common

192.168.16.0 --- 11000000.10101000.0001000.00000000

192.168.17.0 --- 11000000.10101000.0001001.00000000

192.168.18.0 --- 11000000.10101000.0001010.00000000

C. Convert all the bits that are in common, back to decimal; leave the rest as zeros 192.168.16.0

D. Convert the CIDR Prefix back into decimal for the new subnet mask:

/21 = 11111111.11111111.1111000.00000000 255.255.248.0

All Questions are worth 10 Points Each

1. Supernet the following networks into a single Summary

Route:

10.100.5.0 /24 00001010.01100100.00000101.00000000
10.100.6.0 /24 00001010.01100100.00000110.00000000
10.100.7.0 /24 00001010.01100100.00000111.00000000

Summary Route Answer: 10.100.0.0/21

2. Supernet the following networks into a single Summary

Route:

172.16.30.0 /24 10101100.00010000.00011110.00000000
172.16.31.0 /24 10101100.00010000.00011111.00000000
172.16.32.0 /24 10101100.00010000.00100000.00000000

Summary Route Answer: 172.16.0.0/18

3. Supernet the following networks into a single Summary

Route:

192.168.100.0 /24 11000000.10101000.01100100.00000000
192.168.101.0 /24 11000000.10101000.01100101.00000000
192.168.102.0 /24 11000000.10101000.01100110.00000000

Summary Route Answer: 192.168.96.0/21

4. Supernet the following networks into a single Summary

Route:

101.15.30.0/24 01100101.00001111.00011110.00000000
101.15.31.0/24 01100101.00001111.00011111.00000000
101.15.32.0/24 01100101.00001111.00100000.00000000

Summary Route Answer: 101.15.0.0/18

5. Supernet the following networks into a single Summary Route:

200.10.15.0/24 11001000.00001010.00001111.00000000
200.10.16.0/24 11001000.00001010.00010000.00000000
200.10.17.0/24 11001000.00001010.00010001.00000000

Summary Route Answer: 200.10.0.0/19

6. Supernet the following networks into a single Summary Route:

16.5.0.0/16

00010000.00000101.00000000
0.00000000

16.6.0.0/16

00010000.00000110.0000
0000.00000000

16.7.0.0/16 00010000.00000111.00000000.00000000

Summary Route Answer: 16.0.0.0/13

7. Supernet the following networks into a single Summary Route:

10.1. 0.0/16 00001010.00000001.00000000.00000000

10.2. 0.0/16 00001010.00000010.00000000.00000000

10.3. 0.0/16 00001010.00000011.00000000.00000000

Summary Route Answer: 10.0.0.0/14

8. Supernet the following networks into a single Summary Route:

5.0.0.0/8

00000101.00000000.

00000000.00000000

6.0.0.0/8

00000110.00000000.

00000000.00000000

7.0.0.0/8 00000111.00000000.00000000.00000000

Summary Route Answer: 5.0.0.0/6

9. Supernet the following networks into a single Summary Route:

161.109.12.0/24 10100001.01101101.00001100.00000000

161.109.13.0/24 10100001.01101101.00001101.00000000

161.109.14.0/24 10100001.01101101.00001110.00000000

Summary Route Answer: 161.109.0.0/20

10. Supernet the following networks into a single Summary Route:

15.20. 0.0/16

15.21. 0.0/16

15/22.0.0/16

Summary Route Answer: 15.20.0.0/14

Once the assignment is complete, save it as **Lab 1.1.2_Supernetting** and upload it for grading.