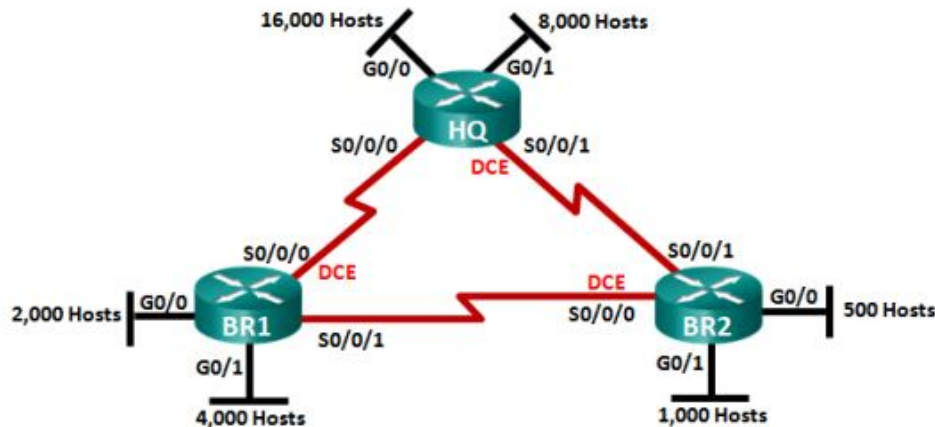


Designing a VLSM Addressing Scheme

Part 1: Examine Network Requirements

In Part 1, you will examine the network requirements to develop a VLSM address scheme for the network displayed in the topology diagram using the 172.16.128.0/17 network address.

Topology



Step 1: Determine how many host addresses and subnets are available.

- How many host addresses are available in a /17 network?
- What is the total number of host addresses needed in the topology diagram?
- How many subnets are needed in the network topology?

Step 2: Determine the largest subnet.

- What is the subnet description (e.g. BR1 G0/1 LAN or BR1-HQ WAN link)?
- How many IP addresses are required in the largest subnet?
- What subnet mask can support that many host addresses?
- How many total host addresses can that subnet mask support?
- Can you subnet the 172.16.128.0/17 network address to support this subnet?
- What are the two network addresses that would result from this subnetting?
- Use the first network address for this subnet.

Step 3: Determine the second largest subnet.

- What is the subnet description?
- How many IP addresses are required for the second largest subnet?
- What subnet mask can support that many host addresses?

- How many total host addresses can that subnet mask support?
- Can you subnet the remaining subnet again and still support this subnet?
- What are the two network addresses that would result from this subnetting?
- Use the first network address for this subnet.

Step 4: Determine the next largest subnet.

- What is the subnet description?
- How many IP addresses are required for the next largest subnet?
- What subnet mask can support that many host addresses?
- Can you subnet the remaining subnet again and still support this subnet?
- What are the two network addresses that would result from this subnetting?
- Use the first network address for this subnet.

Step 5: Determine the next largest subnet.

- What is the subnet description?
- How many IP addresses are required for the next largest subnet?
- What subnet mask can support that many host addresses?
- How many total host addresses can that subnet mask support?
- Can you subnet the remaining subnet again and still support this subnet?
- What are the two network addresses that would result from this subnetting?
- Use the first network address for this subnet.

Step 6: Determine the next largest subnet.

- What is the subnet description?
- How many IP addresses are required for the next largest subnet?
- What subnet mask can support that many host addresses?
- How many total host addresses can that subnet mask support?
- Can you subnet the remaining subnet again and still support this subnet?
- What are the two network addresses that would result from this subnetting?
- Use the first network address for this subnet.

Step 7: Determine the next largest subnet.

- What is the subnet description?
- How many IP addresses are required for the next largest subnet?
- What subnet mask can support that many host addresses?
- How many total host addresses can that subnet mask support?
- Can you subnet the remaining subnet again and still support this subnet?
- What are the two network addresses that would result from this subnetting?
- Use the first network address for this subnet.

Step 8: Determine the subnets needed to support the serial links.

- How many host addresses are required for each serial subnet link?
- What subnet mask can support that many host addresses?
 - a. Continue subnetting the first subnet of each new subnet until you have four /30 subnets. Write the first three network addresses of these /30 subnets below.
 - b. Enter the subnet descriptions for these three subnets below.

Part 2: Design the VLSM Address Scheme**Step 1: Calculate the subnet information.**

Use the information that you obtained in Part 1 to fill in the following table

Subnet Description	Number of Hosts Needed	Network Address /CIDR	First Host Address	Broadcast Address
HQ G0/0	16,000			
HQ G0/1	8,000			
BR1 G0/1	4,000			
BR1 G0/0	2,000			
BR2 G0/1	1,000			
BR2 G0/0	500			
HQ S0/0/0 – BR1 S0/0/1	2			
HQ S0/0/1 – BR2 S0/0/1	2			
BR1 S0/0/1 – BR2 S0/0/0	2			

Step 2: Complete the device interface address table.

Assign the first host address in the subnet to the Ethernet interfaces. HQ should be given the first host address on the Serial links to BR1 and BR2. BR1 should be given the first host address for the serial link to BR2.

Device	Interface	IP Address	Subnet Mask	Device Interface
HQ	G0/0			16,000 Host LAN
	G0/1			8,000 Host LAN
	S0/0/0			BR1 S0/0/0
	S0/0/1			BR2 S0/0/1
BR1	G0/0			2,000 Host LAN
	G0/1			4,000 Host LAN
	S0/0/0			HQ S0/0/0
	S0/0/1			BR2 S0/0/0
BR2	G0/0			500 Host LAN
	G0/1			1,000 Host LAN
	S0/0/0			BR1 S0/0/1
	S0/0/1			HQ S0/0/1