Assignment: Calculating IPv4 Subnets

Part 1: Determine IPv4 Address Subnetting

Determine the network, broadcast addresses, number of host bits and hosts for the given IPv4 addresses and prefixes in the following table.

IPv4 Address/Prefix	Network Address	Broadcast Address	Total Number of Host Bits	Total Number of Hosts
192.168.100.25/28				
172.30.10.130/30				
10.1.113.75/19				
198.133.219.250/24				
128.107.14.191/22				
172.16.104.99/27				

Part 2: Calculate IPv4 Address Subnetting

Fill out the tables below with appropriate answers given the IPv4 address, original subnet mask, and new subnet mask.

Problem 1:

Given:	
Host IP Address:	**192.168.200.139**
Original Subnet Mask	**255.255.255.0**
New Subnet Mask:	**255.255.255.224**
Find:	
Number of Subnet Bits	
Number of Subnets Created	
Number of Host Bits per Subnet	
Number of Hosts per Subnet	
Network Address of this Subnet	
IPv4 Address of First Host on this Subnet	
IPv4 Address of Last Host on this Subnet	
IPv4 Broadcast Address on this Subnet	

Problem 2:

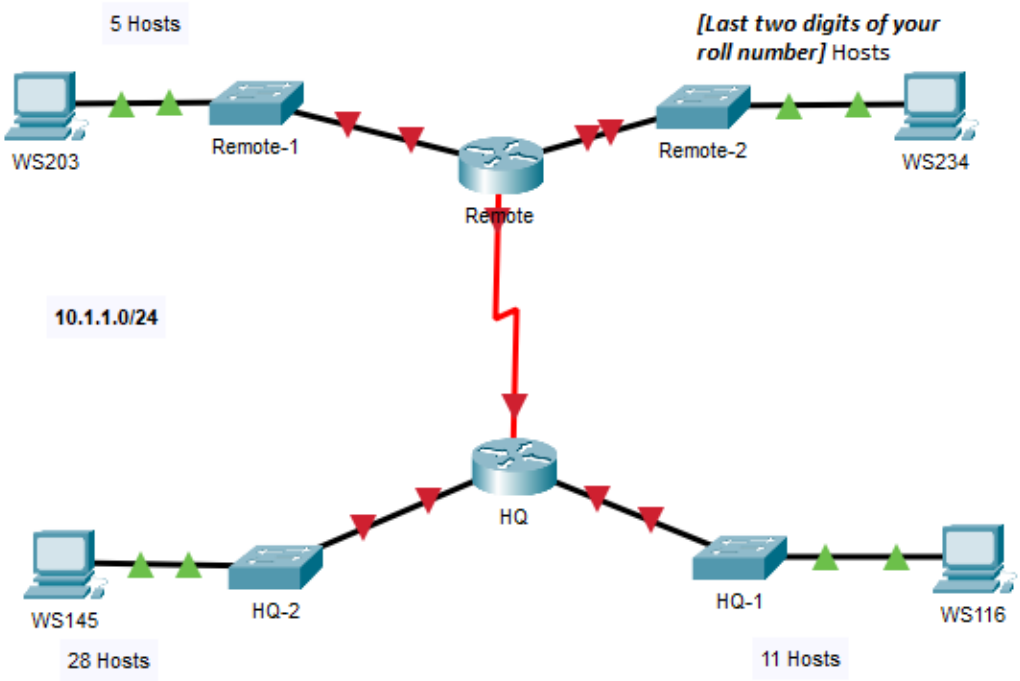
Given:	
Host IP Address:	**128.107.0.55**
Original Subnet Mask	**255.255.0.0**
New Subnet Mask:	**255.255.255.0**
Find:	
Number of Subnet Bits	
Number of Subnets Created	
Number of Host Bits per Subnet	
Number of Hosts per Subnet	
Network Address of this Subnet	
IPv4 Address of First Host on this Subnet	
IPv4 Address of Last Host on this Subnet	
IPv4 Broadcast Address on this Subnet	

Problem 3:

Given:	
Host IP Address:	192.135.250.180
Original Subnet Mask	255.255.255.0
New Subnet Mask:	255.255.255.248
Find:	
Number of Subnet Bits	
Number of Subnets Created	
Number of Host Bits per Subnet	
Number of Hosts per Subnet	
Network Address of this Subnet	
IPv4 Address of First Host on this Subnet	
IPv4 Address of Last Host on this Subnet	
IPv4 Broadcast Address on this Subnet	

Part 3: Design and Implement a VLSM Addressing Scheme

Design a VLSM IP addressing scheme given a network address, host requirements in the topology.



Calculate the IP addressing scheme using VLSM and Fill up the following tables:

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
	G0/0			N/A
	G0/1			N/A
	S0/0/0			N/A
	G0/0			N/A
	G0/1			N/A
	S0/0/0			N/A
	VLAN 1			
	VLAN 1			
	VLAN 1			
	VLAN 1			
	NIC			
	NIC			
	NIC			
	NIC			

Host Requirements:

LAN	Number of Addresses Required

Design Requirements

- Create the addressing design. Follow guidelines provided in the curriculum regarding the order of the subnets.
- The subnets should be contiguous. There should be no unused address space between subnets.
- Provide the most efficient subnet possible for the point-to-point link between the routers.
- Document your design in a table such as the one below.

Subnet Description	Number of Hosts Needed	Network Address/CIDR	First Usable Host Address	Broadcast Address

Configuration Requirements

- Assign the first usable IP addresses in the appropriate subnets to HQ for the two LAN links and the WAN link.
- Assign the first usable IP addresses in the appropriate subnets to Remote for the two LANs links. Assign the last usable IP address for the WAN link.
- Assign the second usable IP addresses in the appropriate subnets to the switches.
- Assign the last usable IP addresses in the appropriate subnets to the hosts.

Instructions for submission:

Please note that you have to solve each problem by showing the calculation and then fill up the table.

You need to upload your assignment in the classroom.
Any form of softcopy is allowed (for example, you can also submit the clear photographs of the handwritten assignment). Please save your file with your full Registration Number.

Deadline: Thursday, 26 November, 2020.