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Course: Computer Network LAB

LAB 11 TASKS

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Step 1: Subnet the 192.168.100.0/24 network into the appropriate number of subnets.

1. Based on the topology, how many subnets are needed?
   5 Four for the LANs, and one for the link between the routers.

2. How many bits must be borrowed to support the number of subnets in the topology table?
   3

3. How many subnets does this create?
   8

4. How many usable hosts does this create per subnet?
   30

   Note: If your answer is less than the 25 hosts required, then you borrowed too many bits.

5. Calculate the binary value for the first five subnets. The first two subnets have been done for you.

Subnet	Network Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1
0	192.168.100.	0	0	0	0	0	0	0
1	192.168.100.	0	0	1	0	0	0	0
2	192.168.100.	0	1	0	0	0	0	0
3	192.168.100.	0	1	1	0	0	0	0
4	192.168.100.	1	0	0	0	0	0	0

6. Calculate the binary and decimal value of the new subnet mask.

First Octet	Second Octet	Third Octet	Mask Bit 7	Mask Bit 6	Mask Bit 5	Mask Bit 4	Mask Bit 3	Mask Bit 2	Mask Bit 1	Mask Bit 0
11111111	11111111	11111111	1	1	1	0	0	0	0	0

First Decimal Octet	Second Decimal Octet	Third Decimal Octet	Fourth Decimal Octet		
255.	255.	255.	224		

7. Fill in the Subnet Table,listing the decimal value of all available subnets, the first and last usable host address, and the broadcast address. Repeat until all addresses are listed.

Note: You may not need to use all rows.

Subnet Table

Subnet Number	Subnet Address	First Usable Host Address	Last Usable Host Address	Broadcast Address
0	192.168.100.0	192.168.100.1	192.168.100.30	192.168.100.31
1	192.168.100.32	192.168.100.33	192.168.100.62	192.168.100.63
2	192.168.100.64	192.168.100.65	192.168.100.94	192.168.100.95
3	192.168.100.96	192.168.100.97	192.168.100.126	192.168.100.127
4	192.168.100.128	192.168.100.129	192.168.100.158	192.168.100.159
5	192.168.100.160	192.168.100.161	192.168.100.190	192.168.100.191
6	192.168.100.192	192.168.100.193	192.168.100.222	192.168.100.223
7	192.168.100.224	192.168.100.225	192.168.100.254	192.168.100.255

a.

# Step 2: Assign the subnets to the network shown in the topology.

a. Assign Subnet 0 to the LAN connected to the GigabitEthernet 0/0 interface of R1: 192.168.100.0 /27

1. Assign Subnet 1 to the LAN connected to the GigabitEthernet 0/1 interface of R1: 192.168.100.32 /27
2. Assign Subnet 2 to the LAN connected to the GigabitEthernet 0/0 interface of R2: 192.168.100.64 /27
3. Assign Subnet 3 to the LAN connected to the GigabitEthernet 0/1 interface of R2: 192.168.100.96 /27
4. Assign Subnet 4 to the WAN link between R1 to R2: 192.168.100.128 /27

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	192.168.100.1	255.255.255.224	N/A
	G0/1	192.168.100.33	255.255.255.224	N/A
	S0/0/0	192.168.100.129	255.255.255.224	N/A
R2	G0/0	192.168.100.65	255.255.255.224	N/A
	G0/1	192.168.100.97	255.255.255.224	N/A
	S0/0/0	192.168.100.158	255.255.255.224	N/A
S1	VLAN 1	192.168.100.2	255.255.255.224	192.168.100.1
S2	VLAN 1	192.168.100.34	255.255.255.224	192.168.100.33
S3	VLAN 1	192.168.100.66	255.255.255.224	192.168.100.65
S4	VLAN 1	192.168.100.98	255.255.255.224	192.168.100.97
PC1	NIC	192.168.100.30	255.255.255.224	192.168.100.1
PC2	NIC	192.168.100.62	255.255.255.224	192.168.100.33
PC3	NIC	192.168.100.94	255.255.255.224	192.168.100.65
PC4	NIC	192.168.100.126	255.255.255.224	192.168.100.97

Topology B:

Implement Task 4 (Lab 10) in Packet Tracer and Assign IP Addresses to Network

Devices and Verify Connectivity.
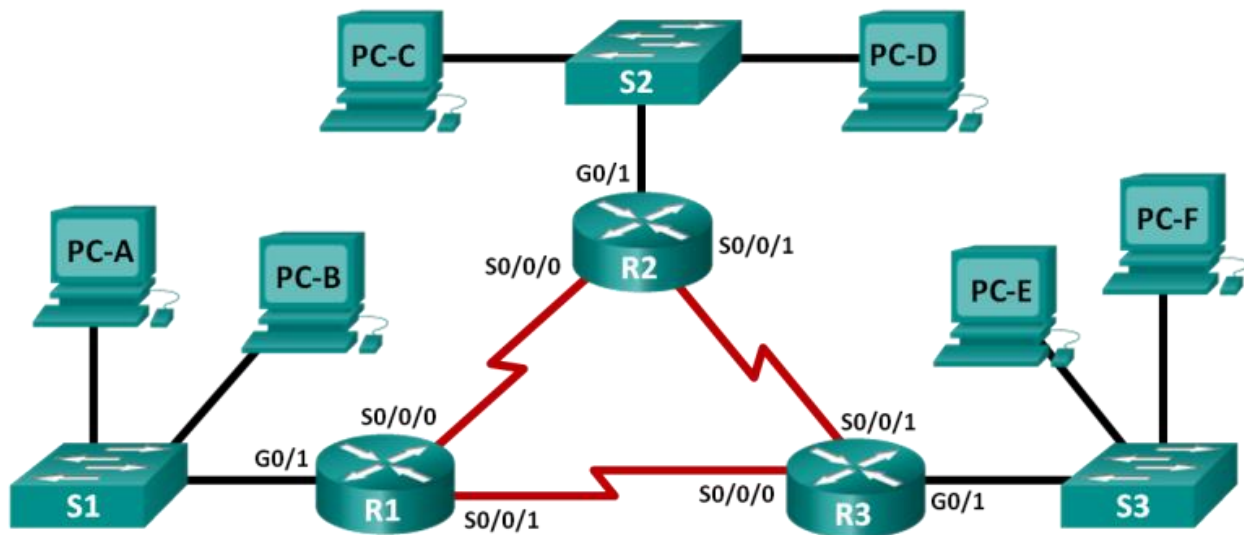
Step 1: Determine the number of subnets in Network Topology C.

 a. How many subnets are there? _____ 6
 b. How many bits should you borrow to create the required number of subnets? _____ 3
 c. How many usable host addresses per subnet are in this addressing scheme? _____ 30
 d. What is the new subnet mask in dotted decimal format?
  _____ 255.255.255.224
 e. How many subnets are available for future use? _____ 2

Step 2: Record the subnet information.

Fill in the following table with the subnet information:

Subnet Number	Subnet Address	First Usable Host Address	Last Usable Host Address	Broadcast Address
0	192.168.10.0	192.168.10.1	192.168.10.30	192.168.10.31
1	192.168.10.32	192.168.10.33	192.168.10.62	192.168.10.63
2	192.168.10.64	192.168.10.65	192.168.10.94	192.168.10.95
3	192.168.10.96	192.168.10.97	192.168.10.126	192.168.10.127
4	192.168.10.128	192.168.10.129	192.168.10.158	192.168.10.159
5	192.168.10.160	192.168.10.161	192.168.10.190	192.168.10.191
6	192.168.10.192	192.168.10.193	192.168.10.222	192.168.10.223
7	192.168.10.224	192.168.10.225	192.168.10.254	192.168.10.255
8				
9				
10				

Step 3: Assign addresses to network devices in the subnets.

A:

Fill in the following table with IP addresses and subnet masks for the router interfaces:

Answers Note: These are suggested IP addresses based on using the first 6 subnets from the table above as assigned to each segment.

B:

Device	Interface	IP Address	Subnet Mask
R1	GigabitEthernet 0/1	192.168.10.1	255.255.255.224
	Serial 0/0/0	192.168.10.33	255.255.255.224
	Serial 0/0/1	192.168.10.65	255.255.255.224
R2	GigabitEthernet 0/1	192.168.10.97	255.255.255.224
	Serial 0/0/0	192.168.10.34	255.255.255.224
	Serial 0/0/1	192.168.10.129	255.255.255.224
R3	GigabitEthernet 0/1	192.168.10.161	255.255.255.224
	Serial 0/0/0	192.168.10.66	255.255.255.224
	Serial 0/0/1	192.168.10.130	255.255.255.224

Device	Interface	IP Address	Subnet Mask	Default Gateway
PC-A	NIC	192.168.10.30	255.255.255.224	192.168.10.1
PC-B	NIC	192.168.10.29	255.255.255.224	192.168.10.1
S1	VLAN 1	192.168.10.2	255.255.255.224	192.168.10.1
PC-C	NIC	192.168.10.126	255.255.255.224	192.168.10.97
PC-D	NIC	192.168.10.125	255.255.255.224	192.168.10.97
S2	VLAN 1	192.168.10.98	255.255.255.224	192.168.10.97
PC-E	NIC	192.168.10.190	255.255.255.224	192.168.10.161
PC-F	NIC	192.168.10.189	255.255.255.224	192.168.10.161
S3	VLAN 1	192.168.10.162	255.255.255.224	192.168.10.161

C:
Fill in the following table with the IP addresses and subnet masks for devices in the LAN as
displayed in topology.
Answers Note: These are suggested IP addresses based on using the first 6 subnets from the table
above as assigned to each segment.