

**Computer Networks Lab 11**



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Task 1 : Determine Network Address of the following IP Address

Solution:

Address: 10.128.240.50 00001010.10000000.11110000.001100 10  
Net-mask: 255.255.255.252 = 30 11111111.11111111.11111111.111111 00  
Wildcard: 0.0.0.3 00000000.00000000.00000000.000000 11

Network: 10.128.240.48/30 00001010.10000000.11110000.001100 00 (Class A)  
Broadcast: 10.128.240.51 00001010.10000000.11110000.001100 11  
HostMin: 10.128.240.49 00001010.10000000.11110000.001100 01  
HostMax: 10.128.240.50 00001010.10000000.11110000.001100 10  
Hosts/Net: 2 [Private Internet](http://www.ietf.org/rfc/rfc1918.txt)

Task 2 : Determine the network and broadcast addresses and number of hosts bits

and hosts for the given IPv4 addresses and prefixes in the following table.

Solution:

Task 2 :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IPv4 Address/Prefix | Network Address | Broadcast Address | Total Number  of Host Bits | Total Number of  Hosts |
| 192.168.100.25/28 | 192.168.100.16 | 192.168.100.31 | 4 | 14 |
| 172.30.10.130/30 | 172.30.10.128 | 172.30.10.131 | 2 | 2 |
| 10.1.113.75/19 | 10.1.96.0 | 10.1.127.255 | 13 | 8190 |
| 198.133.219.250/24 | 198.133.219.0 | 198.133.219.255 | 8 | 254 |

Task 3: Network Topology A

In Part 1, you have been given the 192.168.10.0/24 network address to subnet, with the following

topology. Determine the number of networks needed and then design an appropriate addressing

scheme.

Solutiion:

Step 1: Determine the number of subnets in Network Topology A.

A: 2

B: 1

C: 126

D: 255.255.255.128

E: 0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Subnet number | Subnet address | First useable host address | Last useable host address | Broadcast address |
| 0 | 192.168.10.0 | 192.168.10.1 | 192.168.10.126 | 192.168.10.127 |
| 1 | 192.168.10.128 | 192.168.10.129 | 192.168.10.254 | 192.168.10.255 |

Task 4: Network Topology B

The topology has changed again with a new LAN added to R2 and a redundant link between R1 and R3.

Use the 192.168.10.0/24 network address to provide addresses to the network devices. Also provide an IP

address scheme that will accommodate these additional devices. For this topology, assign a subnet to each

network.

Solution:

A: 6

B: 3

C: 30

D: 255.255.255.224

E: 2

| 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 |

a.

| 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 |