

Practical Assignment - 10

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1. Find default subnet masks, network bits, host bits, host per subnet, no. of subnets, subnet numbers, 1st valid IP address, last valid IP address and broadcast address.

i) 8.1.4.5/16

Class A

Subnet mask: 255.255.0.0

Network bits: 16, Host bits: 8

Host per subnet: $2^8 - 2 = 254$

No. of subnets within the classful: $2^{16-8} = 256$

Subnet numbers: 8.1.0.0

First usable: 8.1.0.1

Last usable: 8.1.255.254

Broadcast address: 8.1.255.255

Network address: 8.1.0.0

ii) 130.4.102.1/24

Class B

Subnet mask: 255.255.255.0

Network bits: 24, Host bits: 8

Host per subnet: $2^8 - 2 = 254$

No. of subnets within the classful: $2^{24-16} = 256$

Subnet numbers: 130.4.102.0

First usable: 130.4.102.1

Last usable: 130.4.102.254

Broadcast address: 130.4.102.255



iii) 130.4.102.1/22

Class B

Subnet mask : 255.255.255.0⁷

Network bit: 22, Host bits: 10

Host per subnet : $2^6 - 2 = 1022$

No. of subnet within the classful : $2^{22-16} = 64$

Subnet numbers: 130.4.100.0

First usable : 130.4.100.1

Last usable : 130.4.103.254

Broadcast address: 130.4.103.255

iv) 199.1.1.100/27

Class C

Subnet mask: 255.255.255.224

Network bits : 27, Host bits: 5

Host per subnet = $2^5 - 2 = 30$

No. of subnets within the classful = $2^{27-24} = 8$

Subnet numbers: 199.1.1.96

First usable : 199.1.1.97

Last usable : 199.1.1.126

Broadcast address: 199.1.1.127

2. A host in a class C network has been assigned an IP 192.168.17.9. Find the number of address in the network block, the first address and the last address.

Block : $2^{24} = 255.255.255.0$

Number of addresses in the block: $2^{32-24} = 256$

First address: 192.168.17.0

First usable address: 192.168.17.1

Last address: 192.168.17.255

Last usable address: 192.168.17.254

3. An address in a block is given at 185.28.17.9. Find the no. of addresses in the block, the first address and the last address.

Block: $2^{16} = 255.255.0.0$

Number of addresses in the block: $2^{32-16} = 65536$

First address: 185.28.0.1

Last address: 185.28.255.255

First usable address: 185.28.0.1

Last usable address: 185.28.255.254

4. A block of addresses is granted to small organization that one of the address is 205.16.37.39/28. What is the first address, last address, number of address in.

Subnet mask : 255.255.255.240

Block size : $2^{32-28} = 16$

For nth octet block : 16 \Rightarrow covers 32-47

First address : 205.16.37.32

First usable address : 205.16.37.33

Last address : 205.16.37.47

Last usable address : 205.16.37.46

Number of addresses in the block : 16

5. Subnet the IP address 216.21.3.0 into 30 hosts in each subnet. Find class, Default Mask, Subnet mask, Bit borrowed, New subnet mask, No. of Host & subnet network ranges (subnets).

Class : C

Default subnet mask : 255.255.255.0

Bits borrowed : 3

New subnet mask : 255.255.255.224

Number of subnets : $2^3 = 8$

Host per subnet : $2^5 - 2 = 30$

Network Range:

- 1) 216.21.5.0 - 216.21.5.31
- 2) 216.21.5.32 - 216.21.5.63
- 3) 216.21.5.64 - 216.21.5.95
- 4) 216.21.5.96 - 216.21.5.127
- 5) 216.21.5.128 - 216.21.5.159
- 6) 216.21.5.160 - 216.21.5.191
- 7) 216.21.5.192 - 216.21.5.223
- 8) 216.21.5.224 - 216.21.5.255

6. Subnets IP address 192.10.20.0 into 52 hosts in each subnet. Find class, Default mask, Bit borrowed, New subnet mask, No. of subhosts of subnet, Network ranges (subnets).

Class C

Bit Borrowed = 2

Net subnet mask : 255.255.255.192

No. of subnet : $2^2 = 4$

Host per subnet : 62

Network ranges:

- 1) 192.10.20.0 - 192.10.20.63
- 2) 192.10.20.64 - 192.10.20.127
- 3) 192.10.20.128 - 192.10.20.191
- 4) 192.10.20.192 - 192.10.20.255



7.) Determining the subnet mask for device A and B:

a) Device A: 172.16.17.30/20

Third-octet block size: 16

Network: 172.16.16.6

Usable: 172.16.16.0 - 172.16.31.254

Broadcast: 172.16.31.255

b) Device B: 172.16.28.15/20

Same block: 16-31

Network: 172.16.16.0

Usable: 172.16.16.1 - 172.16.31.254

Broadcast: 172.16.31.255

