

ipv4 Addressing

Class - RFC 1918

Class A	1-126	N.H.H.H	Unicast
Class B	128-191	N.N.H.H	
Class C	192-223	N.N.N.H	
Class D	224-239		Multicast
Class E	240-255		

Private addresses

Class A	10.0.0.0 - 10.255.255.255
Class B	172.16.0.0 - 172.31.255.255
Class C	192.168.0.0 - 192.168.255.255

Exhausting ipv4

- ipv6 with 128-bit address
- **CIDR** - using subset of public address
- **NAT** - mapping multiple private addresses with few public address
- **VLSM** - diff. size subnet as required

Route Summarization

- Route aggregation / supernetting
- Saves memory and CPU load
- Assign top address to LANs and bottom to WANs

Subnet mask

- Size of subnet

1111 1100 masked bit - 1 (x)
unmasked bit - 0 (y)

Subnets - 2^x

Host/subnet - $2^y - 2$ (2 = subnet ID + broadcast addr.)

$$S = P - N$$

Practice

1.

IP Address	Class	Network Octets	Host Octets	Network ID	Network Broadcast Address
1.1.1.1					
128.1.6.5					
126.5.4.3					
192.0.0.1					
191.255.1.47					
223.223.0.1					

2.

IP Address	Mask	Subnet ID - Broadcast
10.77.55.3	255.248.0.0	
172.30.99.4	255.255.192.0	
192.168.6.54	255.255.255.252	
10.77.3.14	255.255.128.0	
172.22.55.77	255.255.254.0	
1.99.53.76	255.255.255.248	

192.168.4.255	/23	
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128 64 32 16 8 4 2 1
192 224 240 248 252 254 255

1.

IP Address	Class	Network Octets	Host Octets	Network ID	Network Broadcast Address
1.1.1.1	A	1	3	1.0.0.0	1.255.255.255
128.1.6.5	B	2	2	128.1.0.0	128.1.255.255
126.5.4.3	A	1	3	126.0.0.0	126.255.255.255
192.0.0.1	C	3	1	192.0.0.0	192.0.0.255
191.255.1.47	B	2	2	191.255.0.0	191.255.255.255
223.223.0.1	C	3	1	223.223.0.0	223.223.0.233

2.

IP Address	Mask	Subnet ID - Broadcast
10.77.55.3	255.248.0.0	10.72.0.0 - 10.79.255.255
172.30.99.4	255.255.192.0	172.30.64.0 - 172.30.128.255
192.168.6.54	255.255.255.252	192.168.6.52 - 192.168.6.55
10.77.3.14	255.255.128.0	10.77.0.0 - 10.77.127.255
172.22.55.77	255.255.254.0	172.22.54.0 - 172.22.55.255
1.99.53.76	255.255.255.248	1.99.53.72 - 1.99.53.79
192.168.4.255	/23	192.168.4.0 - 192.168.5.255