IP Internet Protocol

192.168.23.4

1 **4 bytes** **Network number.**Host node

2 **Class C** **First Octet Rule (FOR)**

3 **default subnet mask** **255.255.255.0**

4 **Decimal** **(cf: IPX)**

192=
168=
23=
4=

Subnet Mask 255.255.255.0

```
          1100 0000. 1010 1000. 0001 0111. 0000 0100
AND       1111 1111. 1111 1111. 1111 1111. 0000 0000
```

192.168.23.4/24

A	0xxx xxxx	0~127	N.H.H.H	255.0.0.0
B	10xx xxxx	128~191	N.N.H.H	255.255.0.0
C	110x xxxx	192~223	N.N.N.H	255.255.255.0
D	1110 xxxx	224~239	for multicast	
E	1111xxxx	240~255	reserved for research	

First and last IP addresses of each network are reserved

Available IP = total nodes **-** 2

Not all IP addresses can be assigned to a computer:

Network 127	Reserved for loopback tests
0.0.0.0/0	default route
255.255.255.255	for broadcast

Private Networks (RFC 1918)

10.0.0.0	10.0.0.0/8
172.{16~31}.0.0	172.16.0.0/12
192.168.0.0	192.168.0.0/16

Class	Total networks	Total nodes in each network
A		
B		
C		

subnetting	172.16.0.0/18	255.255.192.0

Exercise 1 network=182.182.0.0 mask=255.255.255.0

Total subnetworks:

Available nodes in each network:

Exercise 2 network=182.182.0.0 mask=255.255.224.0

represent it in / format:

Total subnetworks:

Available nodes in each network:

Exercise 3 Network number=192.168.5.0 needs to have 5 PC's in each subnetwork

1. which class?
2. maximum number of subnets=
3. subnet mask =

Exercise 4 Write down the subnet mask in decimal numbers corresponding to / x

/9 ?	/17	/25
/10	/19	/26
/11	/20	/27
/12	/21	/28
/13	/22	/29
/14	/23	/30
/15	/24	/31 ?

Exercise 5 Write down the broadcast address of 10.1.1.1 with the following subnet masks. Ignore the restriction of invalid first subnet and last subnet.

/8	/17	/25
/10	/18	/26
/11	/19	/27
/12	/20	/28
/13	/21	/29
/14	/22	/30
/15	/23	
/16	/24	

Exercise 6 Write down the broadcast of the following IP addresses. Which one of the following IP addresses is not a valid IP address?

128.1.2.3/29	16.65.30.1/20
128.5.6.7/28	16.65.60.1/19
128.4.5.6/30	16.65.100.1/18
128.3.4.5/26	16.65.200.1/17
128.10.15.20/27	16.65.1.1/16
128.5.160.3/23	16.65.0.0/15
128.6.7.10/25	16.65.3.4/14
128.7.6.4/22	16.65.100.200/13
128.6.27.8/21	16.65.128.255/12

Exercise 7 Which of the following IP address does not belong to the same network as the others in the same group?

Group 1	Group2	Group3
146.201.26.123/25	64.11.2.3/11	64.10.2.3/12
146.201.26.100/25	64.22.3.4/11	64.20.3.4/12
146.201.26.130/25	64.33.4.5/11	64.30.4.5/12

Exercise 8 If a network needs to accommodate 2000 hosts what is the minimum slash number? What is the subnet mask in decimal number of this slash number?

Exercise 9 A PC has been assigned the IP address 146.201.26.27 and subnet mask 255.255.255.0. A packet with which of the following IP address as its destination address would be accepted by this PC?

146.201.26.27
146.201.255.255
127.0.0.1
All of them

Exercise 10 What are the broadcast address of the following IP address?

(1) 10.10.10.10/30

(2) 10.100.100.100/25

(3) 10.80.0.0/12

(4) 10.30.30.1/15

(5) 10.10.10.10/21