CS0424IT - S1/L2 - IP Addresses

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May 28, 2024

Assignment

For each of the following IP addresses, write the IP network, IP gateway, IP broadcast, which and how many octets are available for the hosts, and which and how many are available for the network.

◆ Example for IP 10.240.0.0/24

Address	10.240.0.0	00001010.11110000.00000000.00000000
Netmask /24	255.255.255.0	11111111.11111111.11111111.00000000
Broadcast	10.240.0.255	00001010.11110000.00000000.11111111
First host	10.240.0.1	00001010.11110000.00000000.00000001
Last host	10.240.0.254	00001010.11110000.00000000.11111110
Hosts/Net	254	

IP: 1.1.1.1/8

- Class: A

- IP address (decimal): 1.1.1.1

- IP address (binary): 00000001.00000001.00000001.00000001

- CIDR notation: /8

- Subnet Mask (decimal): 255.0.0.0

- Subnet Mask (binary): 11111111.00000000.00000000.00000000

- Network octets: 1

- Host octets: 3

- Network IP address: 1.0.0.0

- Broadcast IP address: 1.255.255.255

- IP Gateway: 1.0.0.1

- Total number of host bits: 24

- Total number of hosts: $2^{24} = 16777216$

- Range of addresses: $1.0.0.0 - 1.255.255.255$

- Total number of usable hosts: $2^{24} - 2 = 16777214$

- Range of usable host addresses: $1.0.0.1 - 1.255.255.254$

IP: 128.1.6.5/12

- Class: B
- IP address (decimal): 128.1.6.5
- IP address (binary): 10000000.00000001.00000110.00000101
- CIDR notation: /12
- Subnet Mask (decimal): 255.240.0.0
- Subnet Mask (binary): 11111111.11110000.00000000.00000000
- Network octets: 2
- Host octets: 2
- Network IP address: 128.0.0.0
- Broadcast IP address: 128.15.255.255
- IP Gateway: 128.0.0.1
- Total number of host bits: 20
- Total number of hosts: $2^{20} = 1048576$
- Range of addresses: $128.0.0.0 - 128.15.255.255$
- Total number of usable hosts: $2^{20} - 2 = 1048574$
- Range of usable host addresses: $128.0.0.1 - 128.15.255.254$

IP: 200.1.2.3/24

- Class: C
- IP address (decimal): 200.1.2.3
- IP address (binary): 11001000.00000001.00000010.00000011
- CIDR notation: /24
- Subnet Mask (decimal): 255.255.255.0
- Subnet Mask (binary): 11111111.11111111.11111111.00000000
- Network octets: 3
- Host octets: 1
- Network IP address: 200.1.2.0
- Broadcast IP address: 200.1.2.255
- IP Gateway: 200.1.2.1
- Total number of host bits: 8
- Total number of hosts: $2^8 = 256$
- Range of addresses: $200.1.2.0 - 200.1.2.255$
- Total number of usable hosts: $2^8 - 2 = 254$
- Range of usable host addresses: $200.1.2.1 - 200.1.2.254$

IP: 192.192.1.1/22

- Class: C
- IP address (decimal): 192.192.1.1
- IP address (binary): 11000000.11000000.00000001.00000001
- CIDR notation: /22
- Subnet Mask (decimal): 255.255.252.0
- Subnet Mask (binary): 11111111.11111111.11111100.00000000
- Network octets: 3
- Host octets: 1
- Network IP address: 192.192.0.0
- Broadcast IP address: 192.192.3.255
- IP Gateway: 192.192.0.1
- Total number of host bits: 10
- Total number of hosts: $2^{10} = 1024$
- Range of addresses: $192.192.0.0 - 192.192.3.255$
- Total number of usable hosts: $2^{10} - 2 = 1022$
- Range of usable host addresses: $192.192.0.1 - 192.192.3.254$

IP: 126.5.4.3/9

- Class: A
- IP address (decimal): 126.5.4.3
- IP address (binary): 01111110.00000101.00000100.00000011
- CIDR notation: /9
- Subnet Mask (decimal): 255.128.0.0
- Subnet Mask (binary): 11111111.10000000.00000000.00000000
- Network octets: 1
- Host octets: 3
- Network IP address: 126.0.0.0
- Broadcast IP address: 126.127.255.255
- IP Gateway: 126.0.0.1
- Total number of host bits: 23
- Total number of hosts: $2^{23} = 8388608$
- Range of addresses: $126.0.0.0 - 126.127.255.255$
- Total number of usable hosts: $2^{23} - 2 = 8388606$
- Range of usable host addresses: $126.0.0.1 - 126.127.255.254$

IP: 200.1.9.8/24

- Class: C
- IP address (decimal): 200.1.9.8
- IP address (binary): 11001000.00000001.00001001.00001000
- CIDR notation: /24
- Subnet Mask (decimal): 255.255.255.0
- Subnet Mask (binary): 11111111.11111111.11111111.00000000
- Network octets: 3
- Host octets: 1
- Network IP address: 200.1.9.0
- Broadcast IP address: 200.1.9.255
- IP Gateway: 200.1.9.1
- Total number of host bits: 8
- Total number of hosts: $2^8 = 256$
- Range of addresses: $200.1.9.0 - 200.1.9.255$
- Total number of usable hosts: $2^8 - 2 = 254$
- Range of usable host addresses: $200.1.9.1 - 200.1.9.254$

IP: 172.16.0.4/16

- Class: B
- IP address (decimal): 172.16.0.4
- IP address (binary): 10101100.00010000.00000000.00000100
- CIDR notation: /16
- Subnet Mask (decimal): 255.255.0.0
- Subnet Mask (binary): 11111111.11111111.00000000.00000000
- Network octets: 2
- Host octets: 2
- Network IP address: 172.16.0.0
- Broadcast IP address: 172.16.255.255
- IP Gateway: 172.16.0.1
- Total number of host bits: 16
- Total number of hosts: $2^{16} = 65536$
- Range of addresses: $172.16.0.0 - 172.16.255.255$
- Total number of usable hosts: $2^{16} - 2 = 65534$
- Range of usable host addresses: $172.16.0.1 - 172.16.255.254$