CS0424IT - S1/L2 - IP Addresses

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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.

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: $172.16.0.1 - 172.16.255.254$