**UD.09. Network Architecture and Components - Activities 2**

**Exercise 1**

Given the next IP addresses, fill up the information about them:

* **191.168.1.55**

Class: B Public

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | BYTE 1 | BYTE 2 | BYTE 3 | BYTE 4 |
| Network Address: | 10111111 | 10101000 | 00000001 | 00110111 |
| Mask: | 255 (11111111) | 255 (11111111) | 0 | 0 |

Slash format Mask: 191.168.1.55/16

* **172.22.156.32**

Class: B Private

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | BYTE 1 | BYTE 2 | BYTE 3 | BYTE 4 |
| Network Address: | 10101100 | 00010110 | 10011100 | 00100000 |
| Mask: | 255 (11111111) | 255 (11111111) | 0 | 0 |

Slash format Mask: 172.22.156.32/16

* **10.240.20.10**

Class: A Private

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | BYTE 1 | BYTE 2 | BYTE 3 | BYTE 4 |
| Network Address: | 00001010 | 11110000 | 00010100 | 00001010 |
| Mask: | 255 (11111111) | 0 | 0 | 0 |

Slash format Mask: 10.240.20.10/8

**Exercise 2**

Given the network ip address 192.168.20.0 first divide it in 2 subnets and then in 4. Take into account that the mask is the one of its class. For each subnet define:

• First network addresss with mask.

• First host.

• Last host

• Broadcast address

• Max number of hosts per network.

This is a Private Class C IP address, with a mask 255.255.255.0. It can accommodate 254 hosts per network.

To divide it into 2 subnets, we need to add 1 extra bit to the mask. We divide the 254 hosts into 2 to split the network, and those will be the first and last hosts of the network.

Subnet 1:

* Network address: 192.168.20.0/25
* Mask: 255.255.255.128 (como es /25, el último byte es 128)
* First host: 192.168.20.1
* Last host: 192.168.20.126
* Broadcast address: 192.168.20.127
* Max number of hosts per network: 126

Subnet 2:

* Network address: 192.168.20.128/25
* Mask: 255.255.255.128
* First host: 192.168.0.129
* Last host: 192.168.0.254
* Broadcast address: 192.168.20.255
* Max number of hosts per network: 126

To divide subnets 1 and 2 into 2 subnets each, we’ll need to take 1 more bit of the mask:

Subnet 1: (we divide 126 by 2)

Subnet 1.1:

* Network address: 192.168.20.0/26
* Mask: 255.255.255.192
* First host: 192.168.20.1
* Last host: 192.168.20.62
* Broadcast address: 192.168.20.63
* Max number of hosts per network: 62

Subnet 1.2:

* Network address: 192.168.0.64/26
* Mask: 255.255.255.192
* First host: 192.168.20.65
* Last host: 192.168.20.126
* Broadcast address: 192.168.20.127
* Max number of hosts per network: 62

Subnet 2:

Subnet 2.1:

* Network address: 192.168.20.128/27
* Mask: 255.255.255.192
* First host: 192.168.20.129
* Last host: 192.168.20.190
* Broadcast address: 192.168.20.191
* Max number of hosts per network: 62

Subnet 2.2:

* Network address: 192.168.20.192/27
* Mask: 255.255.255.192
* First host: 192.168.20.193
* Last host: 192.168.20.254
* Broadcast address: 192.168.20.255
* Max number of hosts per network: 62

**Exercise 3**

Given the network address 202.127.20.0, first divide it in 2 subnets and then in 4. Take into account that the mask is the one of its class. For each subnet define:

• First network addresss with mask.

• First host.

• Last host.

• Broadcast address.

• Maximum number of hosts per network: in total 254.

This is a public Class C network.

To divide the network into 2 subnets:

Subnet 1:

* First network address with mask: 202.127.20.0/25 (mask 255.255.255.128)
* First host: 202.127.20.1
* Last host: 202.127.20.126
* Broadcast address: 202.127.20.127
* Max number of hosts per network: 126

Subnet 2:

* First network address with mask: 202.127.20.128/25 (mask 255.255.255.128)
* First host: 202.127.20.129
* Last host: 202.127.20.254
* Broadcast address: 202.127.20.255
* Max number of hosts per network: 126

To divide the subnets into 4 subnets:

Subnet 1:

Subnet 1.1:

* First network address with mask: 202.127.20.0/26 (mask 255.255.255.192)
* First host: 202.127.20.1
* Last host: 202.127.20.62
* Broadcast address: 202.127.20.63
* Max number of hosts per network: 62

Subnet 1.2:

* First network address with mask: 202.127.20.64/26 (mask 255.255.255.192)
* First host: 202.127.20.65
* Last host: 202.127.20.126
* Broadcast address: 202.127.20.127
* Max number of hosts per network: 62

Subnet 2:

Subnet 2.1:

* First network address with mask: 202.127.20.128/26 (mask 255.255.255.192)
* First host: 202.127.20.129
* Last host: 202.127.20.190
* Broadcast address: 202.127.20.191
* Max number of hosts per network: 62

Subnet 2.2:

* First network address with mask: 202.127.20.192/26 (mask 255.255.255.192)
* First host: 202.127.20.193
* Last host: 202.127.20.254
* Broadcast address: 202.127.20.255
* Max number of hosts per network: 62

**Exercise 4**

Given the network address 10.20.20.26/24, first divide it in 2 subnets and then in 4. For each subnet define:

• First network addresss with mask.

• First host.

• Last host.

• Broadcast address.

• Maximum number of hosts per network: in total 254.

This is a private Class A network.

Subnet 1:

* First network address with mask: 10.20.20.0/25 (mask 255.255.255.128)
* First host: 10.20.20.1
* Last host: 10.20.20.126
* Broadcast address: 10.20.20.127
* Max number of hosts per network: 126

Subnet 2:

* First network address with mask: 10.20.20.128/25 (mask 255.255.255.128)
* First host: 10.20.20.129
* Last host: 10.20.20.254
* Broadcast address: 10.20.20.255
* Max number of hosts per network: 126

To divide the subnets into 4 subnets:

Subnet 1:

Subnet 1.1:

* First network address with mask: 10.20.20.0/26 (mask 255.255.255.192)
* First host: 10.20.20.1
* Last host: 10.20.20.62
* Broadcast address: 10.20.20.63
* Max number of hosts per network: 62

Subnet 1.2:

* First network address with mask: 10.20.20.64/26 (mask 255.255.255.192)
* First host: 10.20.20.65
* Last host: 10.20.20.126
* Broadcast address: 10.20.20.127
* Max number of hosts per network: 62

Subnet 2:

Subnet 2.1:

* First network address with mask: 10.20.20.128/26 (mask 255.255.255.192)
* First host: 10.20.20.129
* Last host: 10.20.20.190
* Broadcast address: 10.20.20.191
* Max number of hosts per network: 62

Subnet 2.2:

* First network address with mask: 10.20.20.192/26 (mask 255.255.255.192)
* First host: 10.20.20.193
* Last host: 10.20.20.254
* Broadcast address: 10.20.20.255
* Max number of hosts per network: 62