A white grid with black numbers

AI-generated content may be incorrect.

The above picture is the cheat sheet used to solve any subnetting problem, we finished with /25 so we will continue from /24 on the next row. This is to solve for the third octet:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 | Represents group size |
| 128 | 192 | 224 | 240 | 248 | 252 | 254 | 255 | Represents subnet mask |
| /25 | /26 | /27 | /28 | /29 | /30 | /31 | /32 | Represents CIDR |
| /17 | /18 | /19 | /20 | /21 | /22 | /23 | /24 | 3rd octet |

To figure out how to solve for the third octet, we will solve for 10.4.77.188 /19.

First, we look at the CIDR which is /19 so the subnet mask would be 255.255.224.0. As we can see the subnet number is used for the third octet. Every value to the left would be 255 and every value to the right would be 0. The group size is 32 so we will increment with that for the relevant column. Since /19 is for the third octet, the third octet of the target IP is .77 so that is the relevant column:

A number with red and blue numbers

AI-generated content may be incorrect.

The network ID is 10.4.64.0, the first host IP is 10.4.64.1, the next network is 10.4.96.0, the broadcast IP is 10.4.95.255, the last host IP is 10.4.95.254. to solve for the number of IP addresses we would do 2^(32-CIDR). So, 32-19 is 13. So, 2^13 is 8192. There are 8192 IP addresses (8190 usable).

Network ID: 10.4.64.0

Broadcast IP: 10.4.95.255

First Host IP: 10.4.64.1

Last Host IP: 10.4.95.254

Next Network: 10.4.96.0

Number of IP addresses: 8192 (8190 usable)

CIDR/Subnet: /19 ---> 255.255.224.0

Now lets solve for 10.4.235.99 /21. We can see that the CIDR is /21, so the subnet mask is 255.255.248.0, so the group size is 8 so that is what we increment by.

A red and green numbers

AI-generated content may be incorrect.

This would take a long time so we can use some of the speed tips. We can just start at 224 then continue incrementing:

A red and green numbers

AI-generated content may be incorrect.

We can see that the network ID is 10.4.232.0, the next network is 10.4.240.0. The broadcast IP is 10.4.239.255, the first host IP is 10.4.232.1, the last host IP is 10.4.239.254. The number of IP addresses is 2^(32-21) which is 2048. There are 2048 IP addresses (2046 usable).

Network ID: 10.4.232.0

Broadcast IP: 10.4.239.255

First Host IP: 10.4.232.1

Last Host IP: 10.4.239.254

Next Network: 10.4.240.0

Number of IP addresses: 2048 (2046 usable)

CIDR/Subnet: /21 ---> 255.255.248.0

Lets solve for 10.4.211.66 /18. We can see that the CIDR is /18, so the subnet mask is 255.255.192.0. The group size is 64 so that’s our increment:

A red and blue numbers

AI-generated content may be incorrect.

Since the increment which passes the target IP is not a valid IP address, we have to make it into 0 and increment the octet to the left by 1:

A red and blue numbers

AI-generated content may be incorrect.

So now we can solve as normal. The network ID is 10.4.192.0. The next network is 10.5.0.0. the broadcast IP is 10.4.255.255. the last host IP is 10.4.255.254. The first host IP is 10.4.192.1. The number of IP addresses is 2^(32-18) which is 16384 (16382 usable).

Network ID: 10.4.192.0

Broadcast IP: 10.4.255.255

First Host IP: 10.4.192.1

Last Host IP: 10.4.255.254

Next Network: 10.5.0.0

Number of IP addresses: 16384 (16382 usable)

CIDR/Subnet: /18 ---> 255.255.192.0