


Simple Guide to Subnet Mask

Simplistic guide to the subnet mask setting to help diagnose network problems

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 ...Big Warning The subnet mask should not be changed by Stuga engineers unless directed. It is strictly controlled by the customer's IT department / consultants. However, It is helpful to know what it is and what it does to help diagnose connection problems


Definition

A subnet mask defines the range of IP addresses that can be used within a network or subnet.

 ...It also separates an IP address into two parts: network bits and host bits.

Practical Application

 ...The 3 digit numbers in an IP address are called octets and range from 0 to 255

 ...I have padded the 3 digit "octets" with zeroes, this is not strictly necessary but it helps with visualisation

In most applications, the subnet 192.168.aaa.bbb is used with a subnet of 255.255.255.0

Where aaa is the same number throughout the factory and bbb is a unique number for each device. This is ok up to a maximum of 255 devices on a network.

In larger factories, the subnet is sometimes changed to 10.000.aaa.bbb and the subnet will be different to 255.255.255.0

Where both aaa and bbb can vary.

Subnet Mask in simple terms - same (255) and different (000).

For the 192.168.... range, subnet mask is always 255.255.255.0, so all ip addresses with the first 3 octets the same will talk to each other

```
192 .168 .001 .101
192 .168 .001 .102
Same Same Same Diff
255 .255 .255 .000
```

For the 10.0.....range, the 3rd octet could vary, so the subnet mask needs to allow for this. With a subnet mask of 255.255.000.000, all Ip addresses with ip address 10.0.aaa.bbb can talk to 10.0.xxx.yyy

```
010 .000 .004 .001
010 .000 .008 .054
Same Same Diff Diff
255 .255 .000 .000
```

The actual numbers in the subnet mask prevent cross talk between subnets and devices



...Again, please do not change the subnet mask unless told to do so by the IT department

Examples

```
IP1    192. 168. 001. 016
IP2    192. 168. 001. 010
SubnetMask 255. 255. 255. 000
      Same Same Same Diff
Can communicate
```

```
IP1    192. 168. 011. 016
IP2    192. 168. 001. 010
SubnetMask 255. 255. 255. 000
      Same Same Diff Diff
Cannot communicate
```

```
IP1    010. 000. 008. 011
IP2    010. 000. 001. 010
SubnetMask 255. 255. 255. 000
      Same Same Diff Diff
Cannot communicate
```

```
IP1    010. 000. 008. 011
IP2    010. 000. 001. 010
SubnetMask 255. 255. 000. 000
      Same Same Diff Diff
Can communicate
```

If you want to understand more about subnets and subnet mask, check out <https://www.freecodecamp.org/news/subnet-mask-definition/>