

WHAT IS SUBNET-ZERO???

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When you are calculating subnet masks the result of your calculations generates various subnets. Each subnet starts with a number so if you use the example in easy way to subnet you will see that your subnet addresses are:

192.168.1.0

192.168.1.64

192.168.1.128

192.168.1.192

Subnet zero is the subnet which has all binary 0's in the address. So for the number 192.168.1.0 you have in the last octet eight zeros for the subnet number or 00000000. The last octet has all 1's in the subnet part. Please re-read the easy way to subnet section again but remember that we are stealing three bits from the last octet to make a subnet. If you write out the address 192 for the last subnet above you would see that the first three bits of the last octet are binary 1's or 11100000.

The same actually goes for the first subnet. I know I said that there were eight binary 0's in it but only the first three count for the subnet, the last five are for the hosts on that subnet. If subnet zero is not allowed you will always lose two subnets so in the below example if your subnet mask is 255.255.255.224:

192.168.1.0 - You can't use this subnet as it is all 0's in the subnet

192.168.1.64

192.168.1.128

192.168.1.192 - You can use this subnet as it is all 1's in the subnet

If you can use subnet zero you get this:

192.168.1.0 - You can use this subnet

192.168.1.64 - You can use this subnet

192.168.1.128 - You can use this subnet

192.168.1.192 - You can use this subnet

So Can You Use Subnet Zero?

The answer is 'yes you can.' Unless you are told otherwise you should presume that subnet zero is always allowed. In an IT exam it will usually tell you if you are not permitted to use it but to prevent it's use is a bit old fashioned.

What is a zero subnet in the first place?

Before we talk about the command, let's ask ourselves, "In the first place, what is a zero subnet?" Under old IP subnetting rules, the all 0's subnet was reserved for the network, and the all 1's subnet was reserved for the broadcast. Over time, engineers found that the all 0's subnet wasn't really used and, if it could be handed out as a useable network, many IP addresses could be changed.

An example of an IP address that is using a zero subnet is 10.1.0.1 with a subnet mask of 255.255.255.0. This IP address may look pretty weird to you. Some people may even try to argue that it is an invalid IP address because there is a 0 in third octet. However, today, this IP address is perfectly legal when it comes to subnetting. Thus, if I had an IP address of 10.1.0.0 with a 255.255.0.0 subnet mask and wanted to subnet it, I could actually get 255 valid networks out of it by using the 0 subnet. In other words, I could have networks ranging from 10.1.{0-254}.X where the X represents hosts 1-254. This gives me room for networks 0-254, or 255 total networks, by using the 0 subnet.

In this article, we learned the difference between the following 3 commands:

- ip default-gateway
- ip default-network
- ip route 0.0.0.0 0.0.0.0 (configuring a default route)

The default-gateway command should only be used when a router is functioning as a bridge. The ip default-network and ip route 0.0.0.0 0.0.0.0 commands should be used to tell the router what route to select as the "gateway of last resort".