

Video - Configuring a Switch Virtual Interface (7 min)

An access layer switch, like the Cisco 2960 Series switch, is typically used as a Layer 2 device and therefore does not need an IP address to function correctly. The only reason for assigning an IP address to a switch is to be able to remotely manage it over the network. In other words, right now, I can manage or configure the switch using a console cable and a terminal emulation program. But what if I want to configure the switch from another building or room on the network?

In this case, the switch will need an IP address, and I'll use a protocol like SSH to establish a remote terminal connection. To assign an IP address to a switch, you assign it to a switched virtual interface, not to an individual switch port. In other words, the IP address will be assigned to a virtual LAN interface-- in this case, Interface VLAN 1, which is the default VLAN interface on the switch. To do this, I'll go into the desktop PC, click on the terminal emulation program, click OK.

You can see I have a console command line interface. I'll type "enable" to get to privileged exec mode, "configure terminal" to get to global config mode, and now I need to go into Interface VLAN 1, which is the default switched virtual interface. I'll type in "interface vlan 1," and you can see I'm now in interface subconfiguration mode. I can now assign an IP address to the switch. I'll assign IP address 192.168.1.10, with a subnet mask of 255.255.255.0. Interface VLAN 1 is shut down by default. To activate the interface, I'll need to put in the "no shutdown" command. You can see the interface has now changed state to up. We can verify it in the running configuration. I'll do a Control+C to get back to privileged exec mode, type "show run," and page down to the bottom of the configuration, where you can see Interface VLAN 1 and the IP address. I'll also examine some summary information about the interface by typing in the command "show ip interface brief." Once again, I'll page down by pressing the space bar, and you can see that the VLAN 1 interface, 192.168.1.10, is physically up and logically down. It's physically up because we enabled it with the no shutdown command. It's logically down because none of the fast Ethernet switch ports that are assigned to VLAN 1 have come up yet or are active or plugged in to any devices. If I minimize this window and take a look at the switch, only a console connection to the console port is running from the PC to the switch.

Let's get an Ethernet cable and see if we can bring up one of these switch ports. I'll grab a straight-through Ethernet cable and run it from the PC by clicking and clicking and dragging, and then I'll click on the switch and attach it to FastEthernet0/1. Notice the Ethernet port on the desktop PC has gone green and is up, and the switch port FastEthernet0/1 is in the process of coming up. I can fast-forward time to speed up the process. I'll go back into the desktop PC and issue the command again. Up arrow, "show ip interface brief." Page down. And you can see that Interface VLAN 1 is physically up, enabled, and now logically up, because a switch port in VLAN 1 is now active.

By default, all switch ports on the switch are assigned to VLAN 1. So Interface VLAN 1, which is a virtual interface, is reachable by all of the switch ports that are up. To verify that I can communicate from the PC to the switch, I'll close the terminal window, open the IP configuration window, and assign an IP address to the PC. I'll assign an IP address and a subnet mask, close the window, open up a command prompt, and attempt to ping the switch. You can see that I'm getting a reply from 192.168.1.10. The ping, or echo request, was successful, and we can now communicate from the PC to the switch using the TCP/IP protocol. I'd like to stress that since the IP address has been assigned to a virtual interface, Interface VLAN 1, that means that it is reachable by any of the switch ports on the switch that have been assigned to VLAN 1.

In other words, the difference between the PC and the switch is that the IP address on the PC is bound to the Ethernet port, whereas on the switch, the IP address is bound to the VLAN. So if I disconnect the Ethernet cable from the switch and put it into a different switch port-- this time, I'll put it into this GigabitEthernet port-- we should still be able to communicate to the switch using the IP address. I'll fast-forward time, bring up the PC, repeat the ping command, and you can see that the switch is still responding to the IP address 192.168.1.10. This will work on any of the switch ports that have been assigned to VLAN 1.