

2	Basic Switch and End Device Configuration
2.7	Configure IP Addressing
2.7.1	Manual IP Address Configuration for End Devices
2.7.2	Automatic IP Address Configuration for End Devices
2.7.3	Syntax Checker - Verify Windows PC IP Configuration
2.7.4	Switch Virtual Interface Configuration
2.7.5	Syntax Checker - Configure a Switch Virtual Interface
2.7.6	Packet Tracer - Implement Basic Connectivity
2.8	Verify Connectivity
2.9	Module Practice and Quiz
3	Protocols and Models
4	Physical Layer
5	Number Systems
6	Data Link Layer

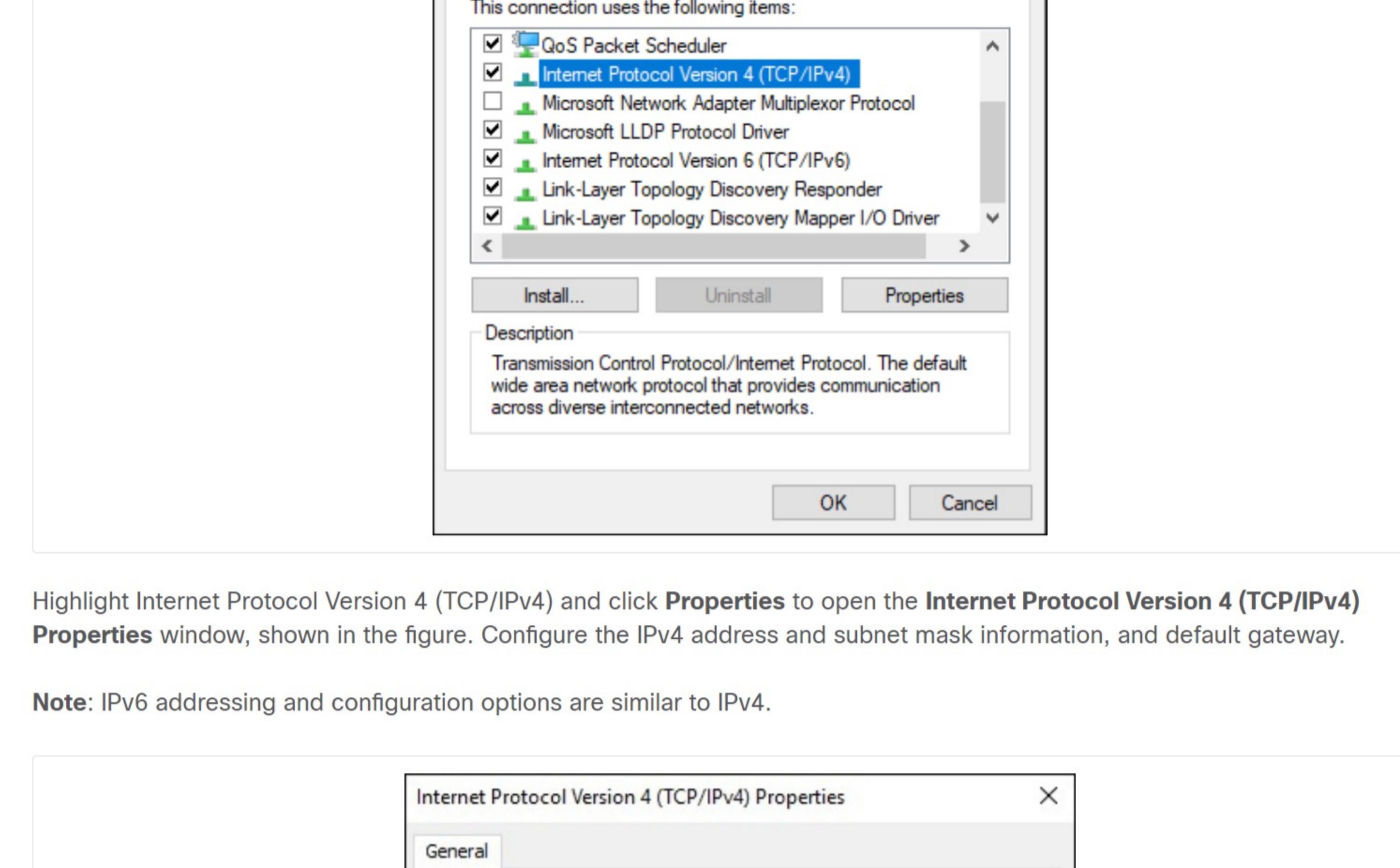
Configure IP Addressing

Manual IP Address Configuration for End Devices

Much like you need your friends' telephone numbers to text or call them, end devices in your network need an IP address so that they can communicate with other devices on your network. In this topic, you will implement basic connectivity by configuring IP addressing on switches and PCs.

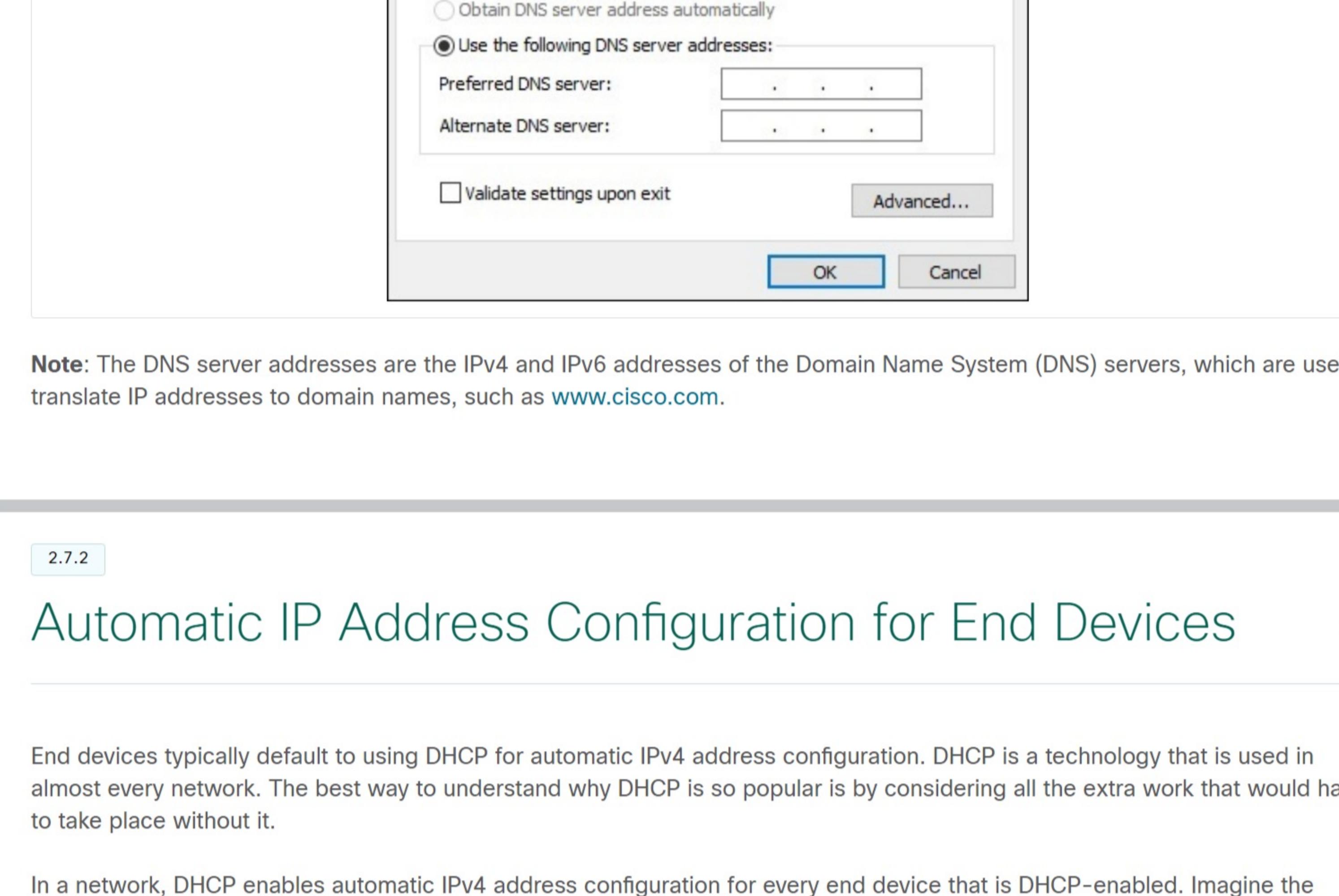
IPv4 address information can be entered into end devices manually, or automatically using Dynamic Host Configuration Protocol (DHCP).

To manually configure an IPv4 address on a Windows host, open the **Control Panel > Network Sharing Center > Change adapter settings** and choose the adapter. Next right-click and select **Properties** to display the **Local Area Connection Properties**, as shown in the figure.



Highlight Internet Protocol Version 4 (TCP/IPv4) and click **Properties** to open the **Internet Protocol Version 4 (TCP/IPv4) Properties** window, shown in the figure. Configure the IPv4 address and subnet mask information, and default gateway.

Note: IPv6 addressing and configuration options are similar to IPv4.



Note: The DNS server addresses are the IPv4 and IPv6 addresses of the Domain Name System (DNS) servers, which are used to translate IP addresses to domain names, such as www.cisco.com.

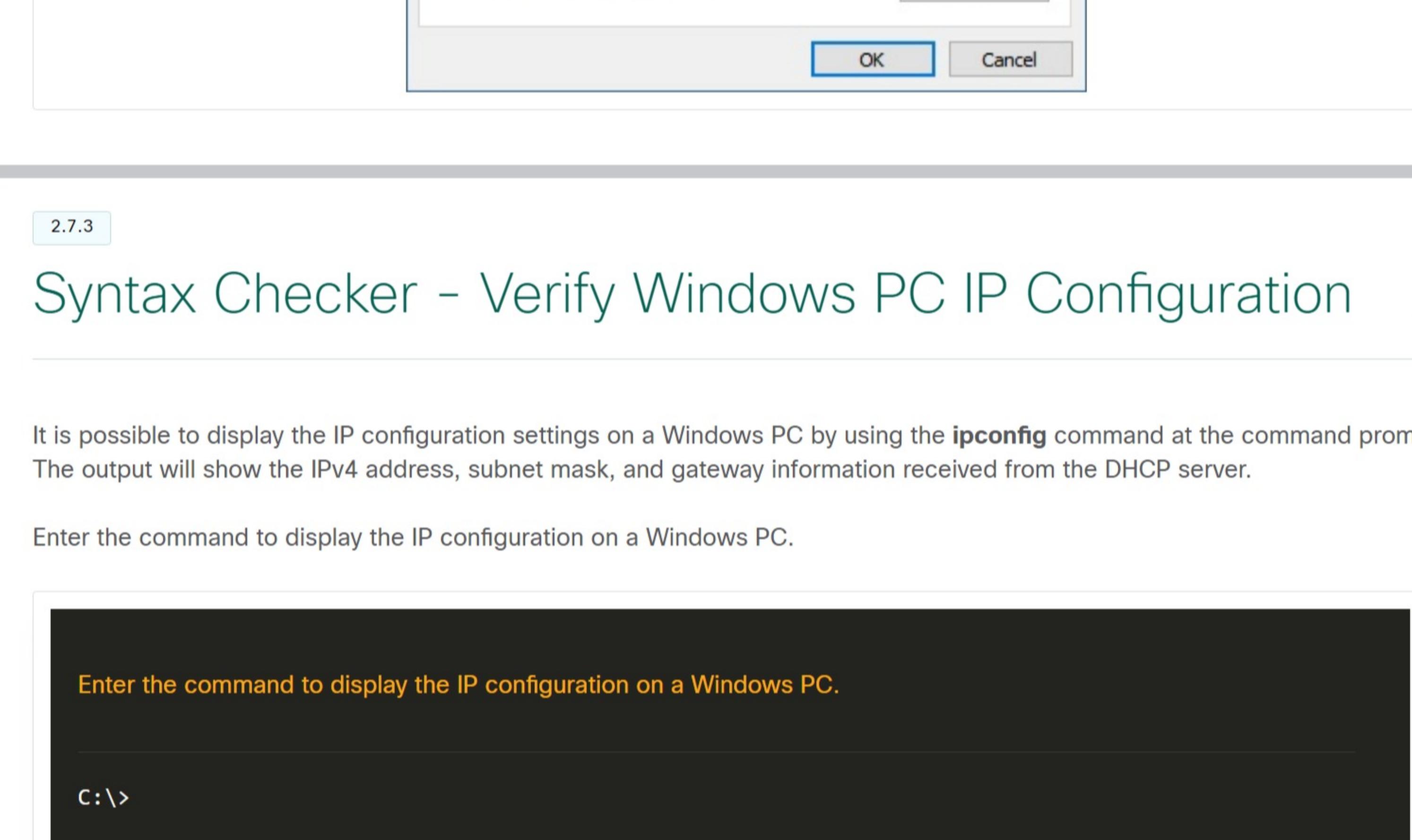
Automatic IP Address Configuration for End Devices

End devices typically default to using DHCP for automatic IPv4 address configuration. DHCP is a technology that is used in almost every network. The best way to understand why DHCP is so popular is by considering all the extra work that would have to take place without it.

In a network, DHCP enables automatic IPv4 address configuration for every end device that is DHCP-enabled. Imagine the amount of time it would take if every time you connected to the network, you had to manually enter the IPv4 address, the subnet mask, the default gateway, and the DNS server. Multiply that by every user and every device in an organization and you see the problem. Manual configuration also increases the chance of misconfiguration by duplicating another device's IPv4 address.

As shown in the figure, to configure DHCP on a Windows PC, you only need to select **Obtain an IP address automatically** and **Obtain DNS server address automatically**. Your PC will search out a DHCP server and be assigned the address settings necessary to communicate on the network.

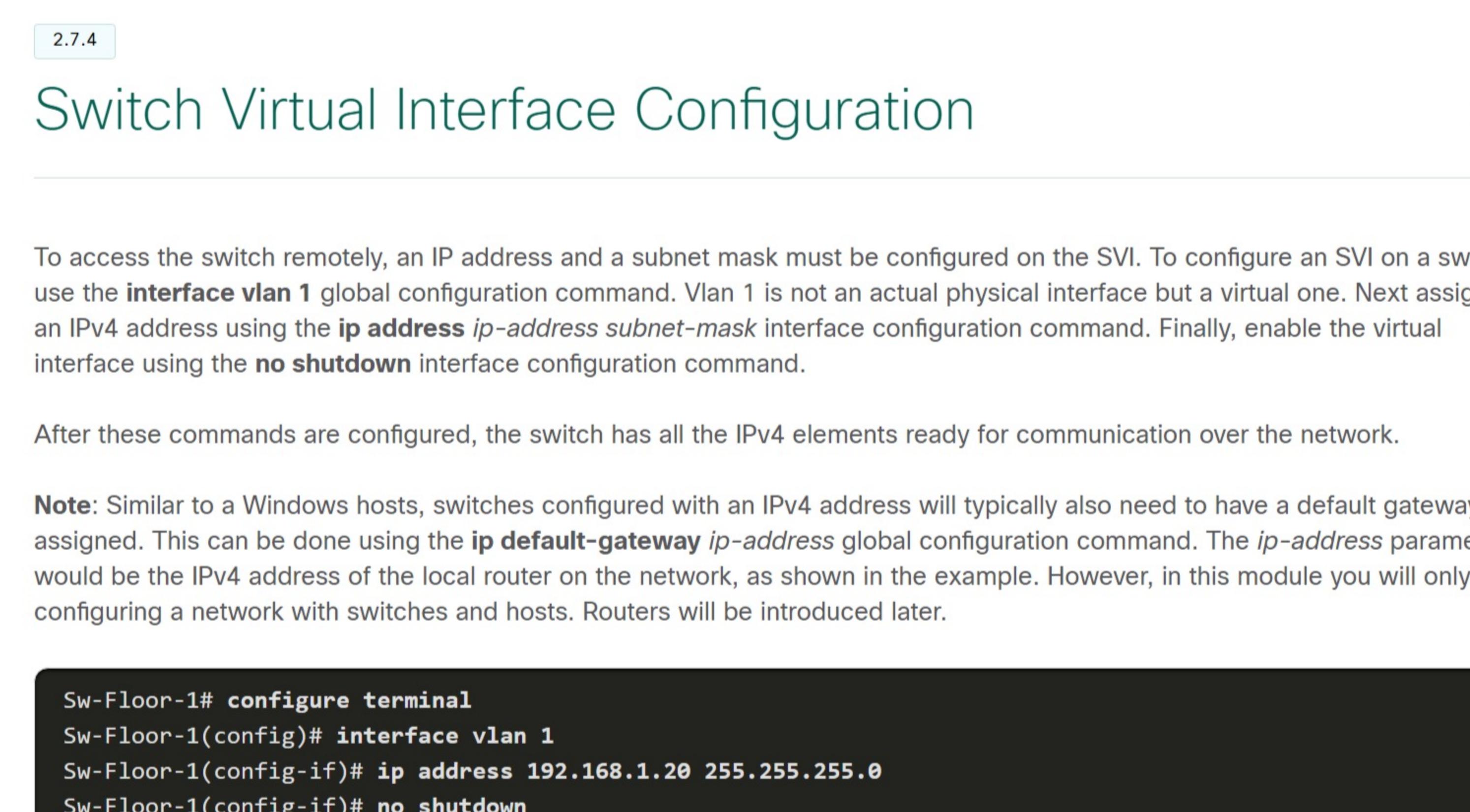
Note: IPv6 uses DHCPv6 and SLAAC (Stateless Address Autoconfiguration) for dynamic address allocation.



Syntax Checker - Verify Windows PC IP Configuration

It is possible to display the IP configuration settings on a Windows PC by using the **ipconfig** command at the command prompt. The output will show the IPv4 address, subnet mask, and gateway information received from the DHCP server.

Enter the command to display the IP configuration on a Windows PC.



Switch Virtual Interface Configuration

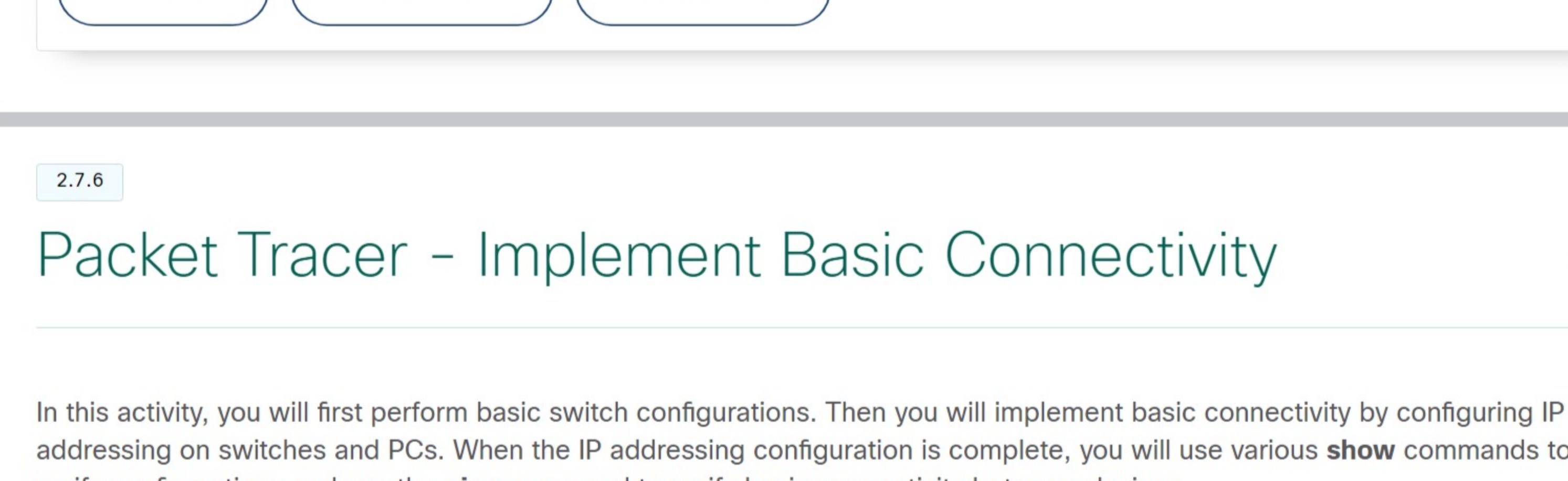
To access the switch remotely, an IP address and a subnet mask must be configured on the SVI. To configure an SVI on a switch, use the **interface vlan 1** global configuration command. Vlan 1 is not an actual physical interface but a virtual one. Next assign an IPv4 address using the **ip address ip-address subnet-mask** interface configuration command. Finally, enable the virtual interface using the **no shutdown** interface configuration command.

After these commands are configured, the switch has all the IPv4 elements ready for communication over the network.

Note: Similar to Windows hosts, switches configured with an IPv4 address will typically also need to have a default gateway assigned. This can be done using the **ip default-gateway ip-address** global configuration command. The **ip-address** parameter would be the IPv4 address of the local router on the network, as shown in the example. However, in this module you will only be configuring a network with switches and hosts. Routers will be introduced later.

```
Sw-Floor-1# configure terminal
Sw-Floor-1(config)# interface vlan 1
Sw-Floor-1(config-if)# ip address 192.168.1.20 255.255.255.0
Sw-Floor-1(config-if)# no shutdown
Sw-Floor-1(config-if)# exit
Sw-Floor-1(config)# ip default-gateway 192.168.1.1
```

Syntax Checker - Configure a Switch Virtual Interface



Packet Tracer - Implement Basic Connectivity

In this activity, you will first perform basic switch configurations. Then you will implement basic connectivity by configuring IP addressing on switches and PCs. When the IP addressing configuration is complete, you will use various **show** commands to verify configurations and use the **ping** command to verify basic connectivity between devices.

Implement Basic Connectivity

Implement Basic Connectivity

Ports and Addresses **Verify Connectivity**