6.10.3 Network Troubleshooting Facts

You should be able to perform some basic troubleshooting steps for network connections. Even if you are unable to fix the problem, taking the steps outlined below will at least help you identify the scope of the problem, which will help you know who to contact for additional help.

Step	Description

Verify the network adapter	Verify that your computer has detected and properly configured the network adapter card.
	▪ To view a list of available network connections, do one of the following:
	  ▪ In the notification area, right-click the **Network** icon and select **Open Network & Internet settings**. Select **Change adapter options**.
	  ▪ In Windows 8 and Windows 10, right-click **Start** and select **Network Connections**.
	▪ If the network interface card is detected and configured, you should see an Ethernet or Wi-Fi icon in the Network Connections window. Make sure that the connection is enabled.
	▪ If there is no icon, check Device Manager to make sure that the device is detected, has the appropriate drivers, and is enabled. If there is no network device, then the hardware could not be detected.

Verify physical connectivity	If you have a network connection in Windows, verify that the adapter can establish a physical connection to the network.
	▪ For wired connections:
	  ▪ The notification area includes a Network icon that indicates the physical status of the connection. If the cable is unplugged or the NIC cannot find a connected device, the Network icon will have an X on it.
	  ▪ Check the status lights on the back of the NIC to verify the physical status. There should be a link light that is green. An unlit link light or one that is another color (like red or yellow) indicates a physical connectivity problem.
	▪ For wireless connections:
	  ▪ The notification area includes a Wireless Network icon that indicates the connection status. If the computer is not connected to any wireless network, the icon will have an X on it.
	  ▪ Make sure the wireless NIC is installed properly and, if applicable, has any necessary antennae installed.
	If you suspect a problem with the physical connection, try the following:
	▪ For wired connections:
	  ▪ Use a different network cable that you know works. You can use a cable tester or cable certifier to test the network cabling behind the wall between the wall jack and the punch-down panel. You can also use a tone generator (sometimes called a toner) and probe to trace the location of cables through the wall and ceiling.
	  ▪ Connect the cable to a different hub or switch port and check the status lights on the port.
	  ▪ Try installing a different network adapter, such as an external adapter that connects through a USB port.
	▪ For wireless connections:
	  ▪ Verify that the SSID settings are correct. If the SSID is hidden, make sure the manually entered SSID has been entered correctly.
	  ▪ Make sure both the authentication type and passphrase are correct.
	  ▪ If MAC address filtering is being used, ensure the device has been properly configured on the access point.
	  ▪ If the SSID is hidden, make sure the manually entered SSID has been entered correctly.
	  ▪ Use a wireless analyzer, which can be installed on a smart phone or tablet, to do the following:
	  ▪ Locate wireless networks.
	  ▪ Identify crowded channels or sources of interference.
	  ▪ Find locations with poor wireless coverage.
	  ▪ Detect rogue access points.

Verify the IP configuration	If the network adapter has a physical connection, verify the IP configuration for the connection. ▪ Use **ipconfig** to view the IP address, subnet mask, and default gateway configured for the system. ▪ Use **ipconfig /all** to view additional information including the MAC address of the network adapter and the DNS server addresses. ▪ Verify that all configuration values are correct. ▪ If the computer is using DHCP and if you see an IP address beginning with 169.254.x.x and a mask of 255.255.0.0, the computer was not able to contact the DHCP server and used the APIPA feature to configure the address automatically. In this case, verify that the DHCP server is connected to the network and properly configured.
Verify network communication	If the computer has a valid network connection and IP configuration values are correctly set, you can use the **ping** command to test connectivity with other network hosts. Ping sends out a request that is answered by the destination device. ▪ If the ping test succeeds, the destination device is working. If you are still having problems, check issues with logon, resource sharing, permissions, or services. ▪ If the ping test fails only to that device, then the device might not be properly configured. ▪ If a ping test fails to any network device, check routers and other devices. ▪ You can use the host name with the **ping** command. If you can ping the device by the IP address but not the host name, then the problem is likely with the DNS configuration.

	Be aware that many devices are now configured not to respond to ping requests. A failed ping test might not give you reliable information about the status of network devices.