Networking Essentials v3

Companion Guide

Cisco Certified Support Technician (CCST) Networking 100-150

Networking Academy

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8. Which protocol allows a user to type www.cisco.com into a web browser instead of an IP address to access the web server?

   a. DNS
   b. FTP
   c. HTML
   d. HTTP
   e. SNMP

9. Which protocol is used to transfer web pages from a server to a client device?

   a. HTML
   b. SMTP
   c. HTTP
   d. SSH
   e. POP

10. Which two application layer protocols manage the exchange of messages between a client with a web browser and a remote web server? (Choose two.)

    a. DNS
    b. HTTP
    c. HTML
    d. DHCP
    e. HTTPS

11. Match the port number to the email protocol.

    ○ IMAP4
    ○ POP3
    ○ SMTP

    a. Port number 110
    b. Port number 25
    c. Port number 143

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CHAPTER 17

Network Testing Utilities

Objectives

Upon completion of this chapter, you will be able to answer the following question:

- What network utilities can you use to troubleshoot networks?

Key Terms

There are no key terms for this chapter.

Introduction (17.0)

Kishori tries to reach a website using her desktop computer at her nursing station. She gets an error message when trying to reach the site. She checks the wired connection, and it is fine. She uses her laptop to try to reach that same website, with no success. On the desktop, she goes to the command prompt and pings a different website on the Internet. Now she realizes she has no connection. She calls the IT department. Madhav comes to the station to further investigate the issue. Madhav pings a website. Kishori explains that she tried that already. Then he pings the default gateway and receives a reply. The router is working. It is the ISP that is down. Madhav is impressed that Kishori has learned so much over the past few months. He tells her that she should apply for that promotion and that she can use him as a reference!

Are you ready to learn some troubleshooting commands? Keep reading!

Troubleshooting Commands (17.1)

Several software utility programs are available that can help you to identify network problems.

Overview of Troubleshooting Commands (17.1.1)

Most of the software utility programs are provided by the operating system as command-line interface (CLI) commands. The syntax for the commands may vary between operating systems.

Some of the available utilities include

- **ipconfig**—Displays IP configuration information
- **ping**—Tests connections to other IP hosts
- **netstat**—Displays network connections
- **tracert**—Displays the route taken to the destination
- **nslookup**—Directly queries the name server for information on a destination domain

The ipconfig Command (17.1.2)

When a device does not get an IP address, or has an incorrect IP configuration, it cannot communicate on the network or access the Internet. On Windows devices, you can view the IP configuration information with the **ipconfig** command at the

command prompt. The **ipconfig** command has several options that are helpful including **/all**, **/release**, and **/renew**.

The **ipconfig** command is used to display the current IP configuration information for a host. Issuing **ipconfig** from the command prompt displays basic configuration information including IP address, subnet mask, and default gateway, as shown in Example 17-1.

Example 17-1 The **ipconfig** Command

```
C:\> ipconfig

Windows IP Configuration



Ethernet adapter Ethernet:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . : lan
   Link-local IPv6 Address . . . . . : fe80::a1cc:4239:d3ab:2675%6
   IPv4 Address. . . . . . . . . . . : 10.10.10.130
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 10.10.10.1

C:\>
```

The command **ipconfig /all** displays additional information including the MAC address, IP addresses of the default gateway, and the DNS servers, as shown in Example 17-2. It also indicates if DHCP is enabled, the DHCP server address, and lease information.

How can this utility assist in the troubleshooting process? Without an appropriate IP configuration, a host cannot participate in communications on a network. If the host does not know the location of the DNS servers, it cannot translate names into IP addresses.

Example 17-2 The **ipconfig /all** Command

```
C:\> ipconfig /all

Windows IP Configuration
```

```
   Host Name . . . . . . . . . . . . : your-a9270112e3
   Primary Dns Suffix  . . . . . . . :
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No
   DNS Suffix Search List. . . . . . : lan

Ethernet adapter Ethernet:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Realtek PCIe GBE Family Controller
   Physical Address. . . . . . . . . : 00-16-D4-02-5A-EC
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . : lan
   Description . . . . . . . . . . . : Intel(R) Dual Band Wireless-AC 3165
   Physical Address. . . . . . . . . : 00-13-02-47-8C-6A
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::a1cc:4239:d3ab:2675%6(Preferred)
   IPv4 Address. . . . . . . . . . . : 10.10.10.130(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : Wednesday, September 2, 2020 10:03:43 PM
   Lease Expires . . . . . . . . . . : Friday, September 11, 2020 10:23:36 AM
   Default Gateway . . . . . . . . . : 10.10.10.1
   DHCP Server . . . . . . . . . . . : 10.10.10.1
   DHCPv6 IAID . . . . . . . . . . . : 98604135
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-1E-21-A5-84-44-A8-42-FC-0D-6F
   DNS Servers . . . . . . . . . . . : 10.10.10.1
   NetBIOS over Tcpip. . . . . . . . : Enabled

C:\>
```

If IP addressing information is assigned dynamically, the command **ipconfig /release** releases the current DHCP bindings. The command **ipconfig /renew** requests fresh configuration information from the DHCP server. Both commands are demonstrated in Example 17-3. A host may contain faulty or outdated IP configuration information, and a simple renewal of this information is all that is required to regain connectivity.