

REVIEW LESSON

MTA Course: 98-366 Networking Fundamentals
Lesson name: Understanding Protocols and Services
Topic: Understand TCP/IP
(One 50-minute class period)
File name: NetFund_RL_3.6

Lesson Objective:

3.6: Understand TCP/IP. *This objective may include but is not limited to:* tools such as ping; tracert; pathping; Telnet; IPconfig; netstat, reserved address ranges for local use (including local loopback IP); protocols

Preparation Details

Prerequisite student experiences and knowledge

This MTA Certification Exam Review lesson is written for students who have learned about networking fundamentals. Students who do not have the prerequisite knowledge and experiences cited in the objective will find additional learning opportunities using resources such as those listed in the Microsoft® resources and Web links at the end of this review lesson.

Instructor preparation activities

- Make copies of Student Activity NetFund_SA_3.6

Resources, software, and additional files needed for this lesson

- NetFund_PPT_3.6
- NetFund_SA_3.6
- NetFund_SA_3.6_Key

Teaching Guide

Essential Vocabulary

Ipconfig—displays all current TCP/IP network configuration values, refreshes dynamic host configuration protocol (DHCP) and domain name system (DNS) settings by using the appropriate switches.

local loopback IP—the testing of the TCP/IP protocol implementation on a host, special range of addresses is set aside to loop back to source.

pathping—displays the degree of packet loss at any given router or link along the path.

ping—tests if a particular host is reachable across an IP network; measures the round-trip time for packets sent from the local host including the local host's own interfaces

protocols—a formal description of message formats and the rules for exchanging those messages

netstat—displays current TCP/IP network connections and protocol statistics.

reserved address local use—range of 169.254.0.0–169.254.255.255 is reserved for Automatic Private IP Addressing.

TCP/IP—is one of the core protocols of the Internet Protocol Suite, provides reliable, ordered delivery of a stream of bytes from a program on one computer to another program on another computer; applications include e-mail and file transfer, and the Web.

Telnet—a network protocol used on local area networks, a terminal emulation program for TCP/IP networks such as the Internet.

tracert—used to show the route taken by packets across an IP network.

Lesson Sequence

Activating prior knowledge/lesson staging (Anticipatory Set: 10 minutes)

1. Student prompt (see PowerPoint® slide 3):
Experiment with ping and tracert.
 1. From the start menu, go to the **Run** (Win XP®) or **Search** (Win7®) command and type **cmd**. This brings up a DOS command window.
 2. Type **ping www.microsoft.com**
 3. Ping a few of your favorite sites (www.facebook.com, www.bing.com, www.wikipedia.org , etc.).
 4. Now ping a few geographically close websites (local government, local TV station, local university, etc.).

5. Record the average times to see which "roundtrips" are the fastest.
 6. Now experiment with tracert using the same urls.
 7. Summarize the results.
 8. Summarize your understanding of ping and tracert.
2. Give students a few minutes to respond, allowing them to work until they have finished.

Lesson activity (30 minutes)

1. Teacher Instruction (30 minutes)
Use the included PowerPoint slideshow to review TCP/IP, tools such as ping, tracert, pathping, Telnet, IPconfig, netstat, reserved address ranges for local use (including local loopback IP), and protocols.

Assessment/lesson reflection (10 minutes)

1. Students are to complete Student Activity NetFund_SA_3.6
2. Review the activity quiz with the students.

Microsoft resources and Web links

- **Protocols: TCPIP**
<http://www.protocols.com/pbook/tcpip1.htm>
- **SS64: pathping**
<http://ss64.com/nt/pathping.html>
- **TCP/IP: Local Loopback IP**
http://www.tcpipguide.com/free/t_IPReservedPrivateandLoopbackAddresses.htm
- **TheFreeDictionary: TCP/IP**
<http://encyclopedia2.thefreedictionary.com/TCP/IP>
- **Wikipedia: TCP/IP**
http://en.wikipedia.org/wiki/Transmission_Control_Protocol

Additional notes to the instructor

If the command prompt is not available to students for the anticipatory set activity, use this alternative:

1. Visit one of these online services:
<http://ping.eu/>
<http://centralops.net/co/>
<http://www.tlshopper.com/tools/ping/>
2. Experiment with the ping and traceroute tools using several website addresses that you are familiar with such as www.bing.com.
3. Summarize your understanding of ping and traceroute.