

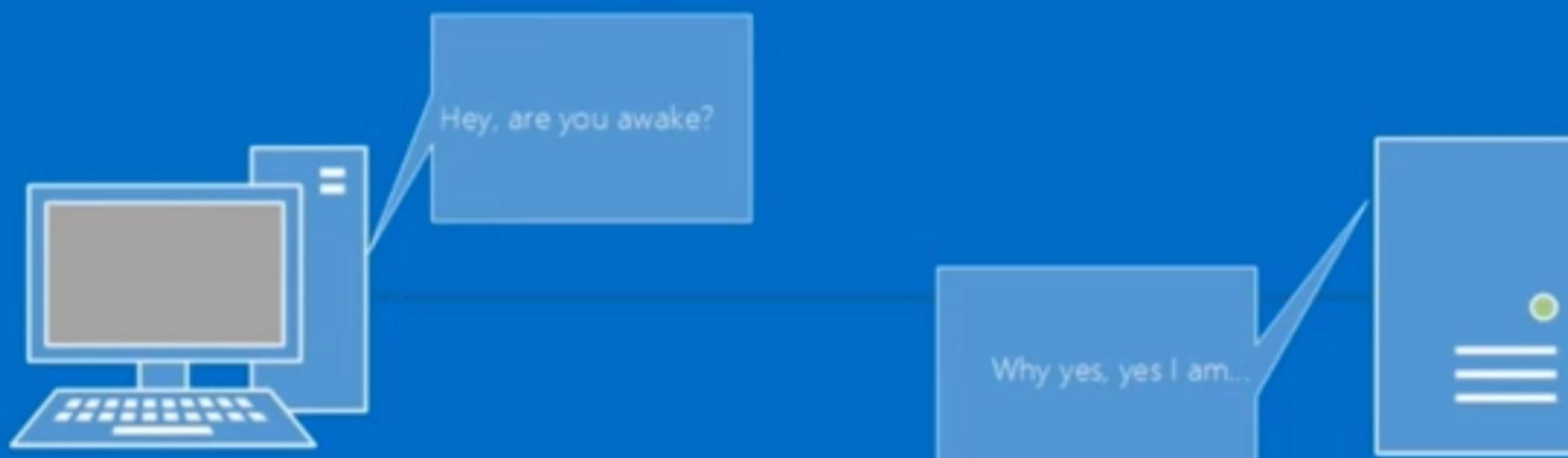
# TCP/IP Tools

## ipconfig

- Displays the current configuration of the installed IP stack on a networked computer using TCP/IP
- The /all switch can be used to view additional details about each adapter
- Can be used to refresh Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) settings

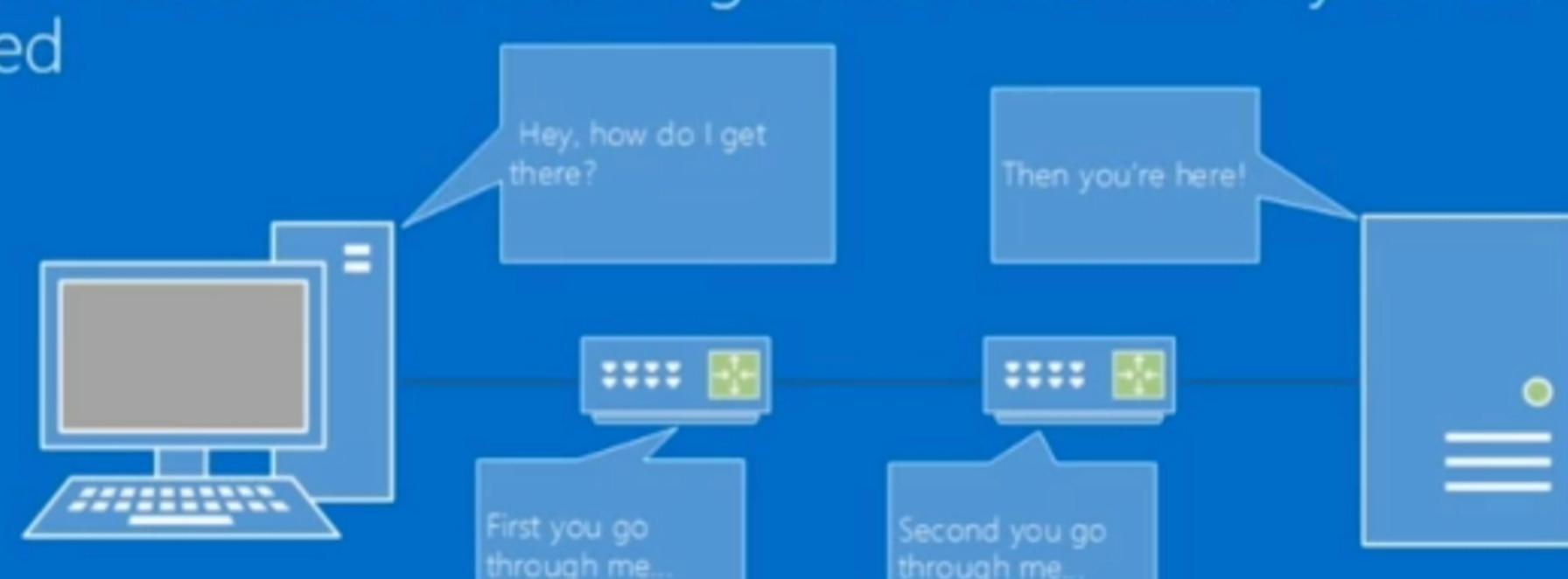
## Ping

- Verifies IP-level connectivity to another TCP/IP device by sending Internet Control Message Protocol (ICMP) Echo Request messages
- A number of switches can accommodate different testing scenarios
- Can be used to test IPv4 and IPv6 connectivity



## traceroute

- Determines the path taken to a destination by sending Internet Control Message Protocol (ICMP) Echo Request messages to the destination with incrementally increasing Time to Live (TTL) field values
- Used to “trace” a network path from sending to receiving device
- Useful if the local device is testing ok but connectivity can’t be established



# Advanced TCP/IP Tools

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## Netstat

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- Displays active TCP connections, ports on which the computer is listening, Ethernet statistics, the IP routing table, IPv4 statistics (for the IP, ICMP, TCP, and UDP protocols), and IPv6 statistics (for the IPv6, ICMPv6, TCP over IPv6, and UDP over IPv6 protocols)
- Used without parameters, netstat displays active TCP connections

## NbtStat

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- Displays NetBIOS over TCP/IP (NetBT) protocol statistics for local and remote computers, NetBIOS name tables for both the local computer and remote computers, and the NetBIOS name cache
- NetBIOS was developed in the 1980s to allow applications to communicate over a network using the session layer of the OSI model
- NetBIOS establishes logical names on the network, establishes sessions between two logical names on the network, and supports reliable data transfer between computers that have established a session
- NetBIOS over TCP/IP sends the NetBIOS protocol within TCP and UDP sessions

→ NetBIOS allowed computers to have names before Microsoft actually implemented DNS

# PathPing

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- A command-line route tracing tool that combines features of the tools Ping and TraceRt that includes additional information
- PathPing sends packets to each router on the way to a final destination over a period of time, and then computes results based on the packets returned from each hop
- PathPing can show the degree of packet loss at any specified router or link enabling you to pinpoint links that might be causing network problems

# Nslookup

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- Displays information that you can use to diagnose Domain Name System (DNS)
- The Nslookup command-line tool is available only if you have installed the TCP/IP protocol
- You should be familiar with DNS before using this tool

# Netsh

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- A command-line scripting utility that enables you to display or modify the network configuration of a computer currently running
- Command works on local or remote computers
- Provides a scripting feature that allows you to run a group of commands in batch mode against a specified computer
- Enables you to save a configuration script in a text file for archival purposes or to help you configure other servers

# Route

- Displays and modifies the entries in the local IP routing table
- The Route Print command can be used to display routing table for a Windows machine  
This command gives the same result as netstat -r, but it is more commonly used
- The Route command can also be used to add and delete static routes

→ IP routing table gives paths to the destination

# Telnet

- The telnet command enables you to communicate with a remote computer that is using the Telnet protocol
- You can run telnet without parameters in order to enter the telnet context, indicated by the Telnet prompt (telnet>)
- From the Telnet prompt, use the following commands to manage a computer running Telnet Client
- A network administrator can connect to a remote computer, server, router, or switch by typing telnet [IPAddress].
- Telnet is an older, out-of-date protocol, and as such, it should be replaced with a more secure program such as SSH.
- It can also be used for troubleshooting by adding a port number
  - *telnet server01 25*

