

"WIRED ETHERNET" VERSUS "WIFI"

HIGH-LEVEL EXECUTIVE SUMMARY

Under ideal conditions (with the end-user computer 2 feet away from the wireless access point/router) there were no differences in Internet download and upload speeds between wired Ethernet adapters and WiFi adapters.

When 45 feet and some metallic objects were located between the end-user computer and the wireless access point/router, Internet download speeds were faster for wired Ethernet adapters relative to WiFi adapters with variability between different models of WiFi adapters.

MORE-DETAILED TEST RESULTS

Our empirical tests showed the following:

Under ideal conditions Internet download and upload speeds are similar for wired and wireless network adapters for end-user "Windows 7" computers.

Under ideal conditions Internet download and upload speeds are similar for the various models of WiFi adapters that we tested.

When 45 feet of distance and metallic obstacles separate the end-user computer from the wireless access point or router, wireless network adapters have lower Internet download speeds relative to wired network adapters.

When 45 feet of distance and metallic obstacles separate the end-user computer from the wireless access point or router, different models of Wi-Fi adapters have different Internet download speeds.

In our tests, the Internet upload speeds were unaffected by the distance between the end-user computer and the wireless access point/router.

BACKGROUND

Many participants on various online discussion groups have stated that LAN speeds are so much slower than broadband Internet connection speeds that Internet download speeds are unaffected by the selection of wired and/or wireless network adapters. Others have stated that the encryption overhead of wireless network communications impacts significantly to make wireless LAN speeds much slower than wired LAN speeds.

We performed a series of empirical tests to test these hypotheses.

PCPITSTOP'S INTERNET SPEED TEST

Numerous Web sites are available for testing Internet download and upload speeds. Most are provided by an Internet service provider. We prefer to use a speed test that is provided by a company that cannot benefit from the results of such testing.

In April 2011, Jon Griebel stated that he highly recommends the online Internet speed test at

<http://pcpitstop.com/internet/bw.asp>

We started using this site and have standardized on it for Internet speed testing.

METHODOLOGY

For each specific model of network adapter, we performed the following steps:

Step 1:

Attach the wired or wireless network adapter to the end-user computer.

Step 2:

Power up the wired or wireless network adapter.

Step 3:

Perform the installation procedure that was packaged with the network adapter.

Step 4:

Go to "Change adapter settings" in the Windows "Control Panel" and disable all network adapters except for the network adapter that is being tested.

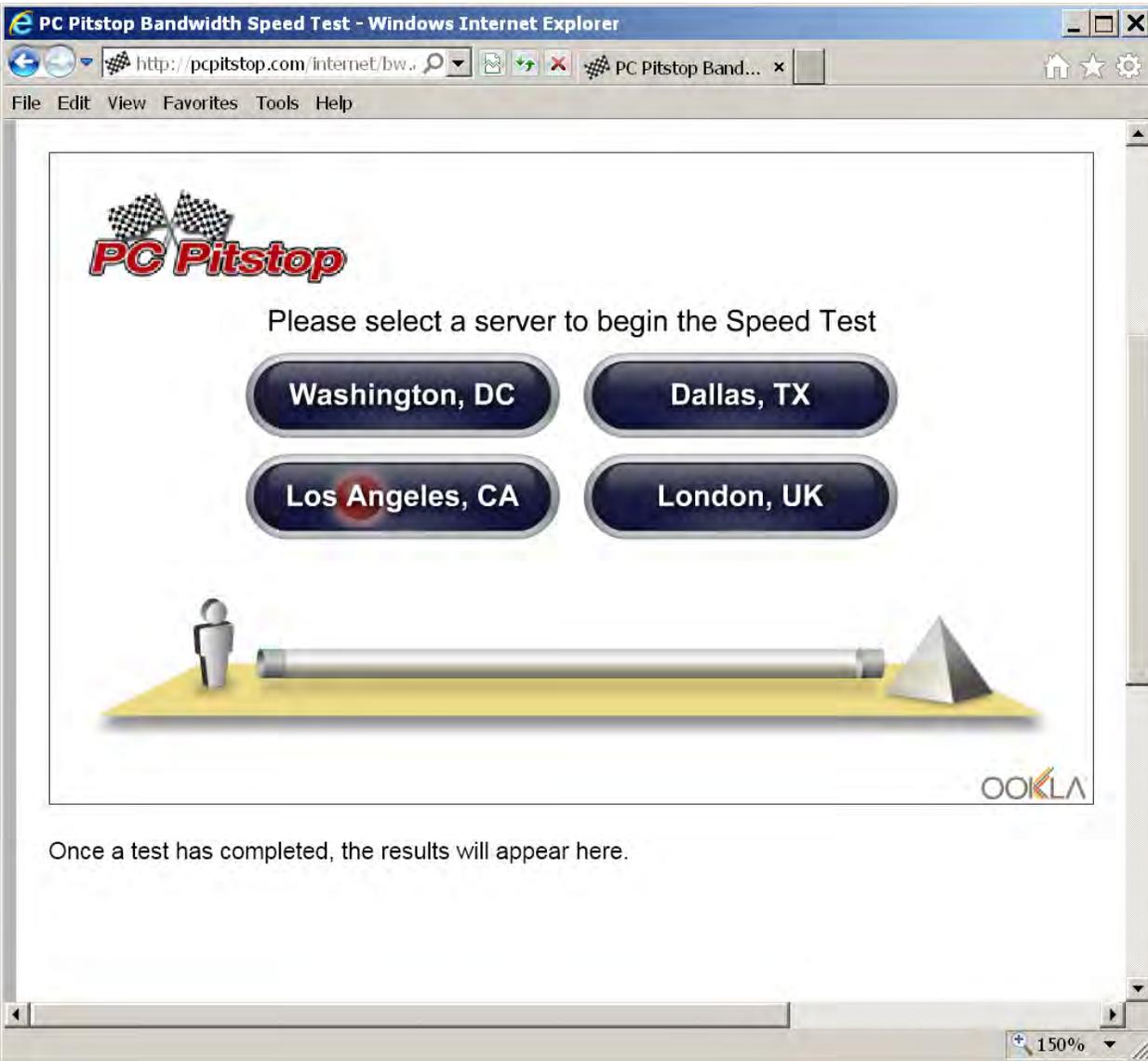
Step 5:

Start the 64-bit version of "Internet Explorer 9".

Step 6:

Go to

<http://pcpitstop.com/internet/bw.asp>



Step 7:
Click on the "Dallas, TX" button.

Step 8:
A download speed test and an upload speed test will occur:

The screenshot shows a web browser window titled "PC Pitstop Bandwidth Speed Test - Windows Internet Explorer". The address bar shows the URL "http://pcpitstop.com/internet/bw...". The browser's menu bar includes "File", "Edit", "View", "Favorites", "Tools", and "Help".

The main content area features the "PC Pitstop" logo at the top left. In the center is a large speedometer with a needle pointing to "2.71" Mbps. The speedometer scale ranges from 0 to 50M+ with markers at 0, 1M, 3M, 5M, 10M, 20M, 30M, and 50M+. To the left of the speedometer is a "Download Speed" button with a downward arrow icon, and to the right is an "Upload Speed" button with an upward arrow icon.

Below the speedometer, the text "Your IP: 71.226.114.130" is displayed next to a small person icon, and "Server Location: Dallas, TX" is displayed next to a pyramid icon. A "PING: 54ms" result is shown in a dark box on the left. At the bottom of the test area, it says "Testing Download Speed" and the "OOKLA" logo is visible on the right.

At the bottom right of the browser window, the zoom level is set to "150%".

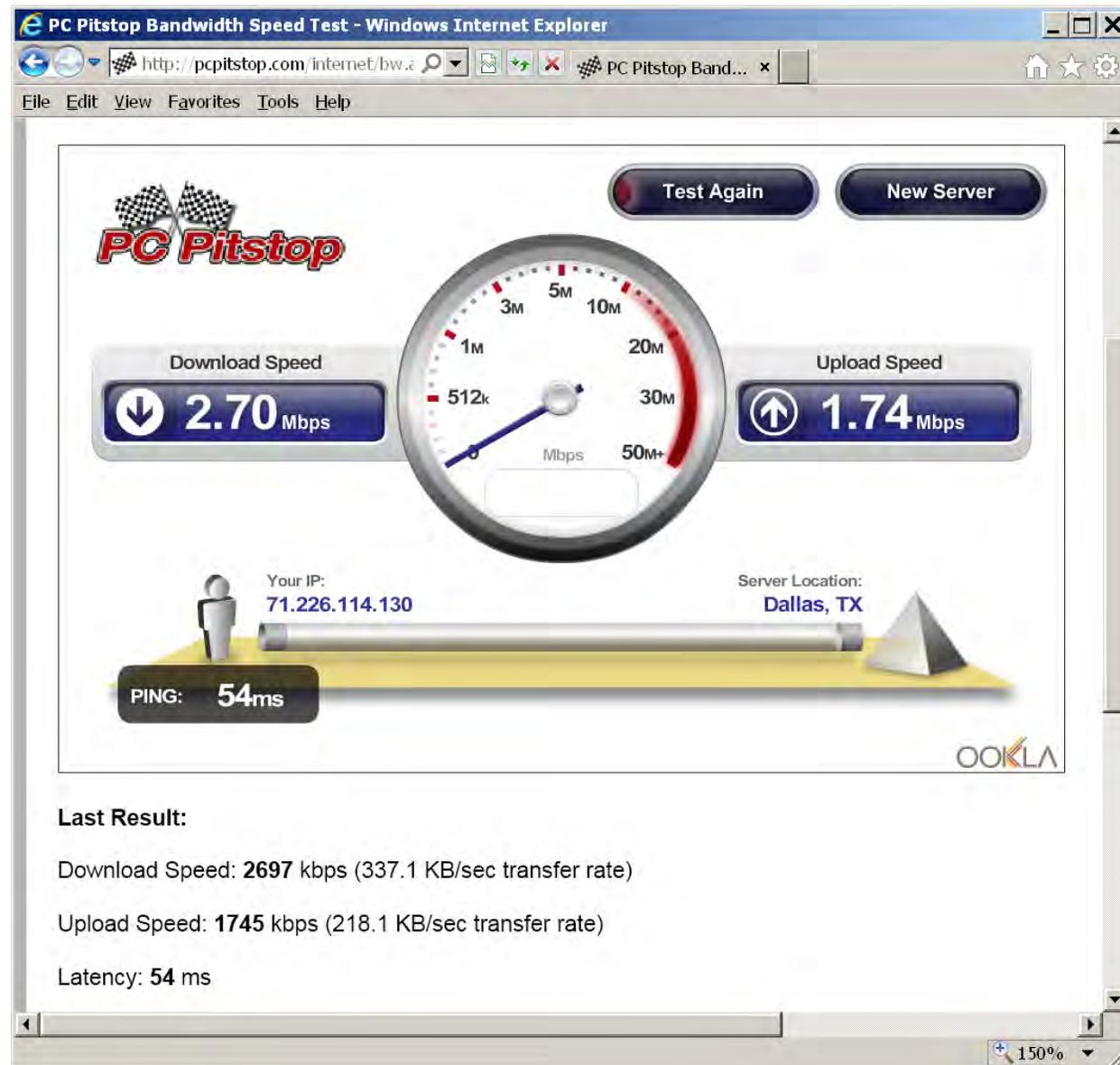
Once a test has completed, the results will appear here.

Step 9:

The download test will complete.

Then the upload test will complete.

Record the upload and download test results in a spreadsheet worksheet:



Step 10:

Click on the "Test Again" button.

Step 11:

A download speed test and an upload speed test will occur.

Step 12:

The download test will complete.

Then the upload test will complete.

Record the upload and download test results in a spreadsheet worksheet:

Step 13:

Repeat steps 10, 11, and 12 eighteen more times until 20 download and upload tests have been completed.

Step 14:

Power down the computer.

Step 15:

Remove the network adapter.

Step 16:

Power up the computer.

Step 17:

Remove all software and drivers that were installed in "Step 3".

EMPIRICAL TEST RESULTS

See our detailed results at

http://aztcs.org/meeting_notes/2011-09-07/speedtests-2011-09-05.xls