# Using Ping, Traceroute, and Ping Plotter to Troubleshoot Network Connectivity

Time required: 45 minutes

**How to Create Screenshots:** Please use the Windows Snip and Sketch Tool or the Snipping Tool. Paste a screenshot of just the program you are working on. If you are snipping a virtual machine, make sure your focus is outside the virtual machine before you snip.

1. Press and hold down the **Windows key** & **Shift**, then type **S.** This brings up the on-screen snipping tool.
2. Click and Drag your mouse around whatever you want to snip.
3. Release the mouse button. This places the snip into the Windows Clipboard.
4. Go into Word or wherever you want to paste the snip. Hold down **CTRL**, then type **V** to paste the snip.

## Lab Description

In this lab, we will simulate troubleshooting network connectivity with Ping, Tracert (Traceroute), and Ping Plotter. When troubleshooting network connectivity, always start from the closest point, and work your way outwards.

## About Ping

The Ping utility is one of the basic tools used to check network connectivity in a TCP/IP network. Every operating System that supports TCP/IP also supports the Ping command.

The Ping command works by sending an ICMP message to the target asking for a reply. If the message reaches the target, it sends an ICMP reply. This indicates that you have network connectivity between the computer where you used the Ping command and the computer you are trying to reach.

When you use the Ping command to troubleshoot a connectivity problem, you should first verify that TCP/IP is working locally properly by pinging the loopback address (also called localhost) **(127.0.0.1)** and then the computer’s own IP address. Then, you should ping each stop along the way to the remote host that you cannot reach to verity that you can reach each stop.

**NOTE:** We are using IPV4 addresses only.

## Use Ping

1. Use **ipconfig /all** to discover your gateway and DNS addresses. Use the adapter that is connected to your network. It will have an IPV4 address, Subnet Mask, Gateway, and DNS Server IPv4 IP addresses. Make a note of these addresses.
2. **Insert a screenshot showing the adapter connected to your network that has internet access:**

Click or tap here to enter text.

1. Unplug your workstation from the network or disable your wireless card.
2. At the command prompt type: **ping 127.0.0.1**
3. You should have 4 successful replies.
4. At the command prompt type: **ping x.x.x.x**(Substitute the IP address of your router/Gateway for x.x.x.x. Do not ping x.x.x.x)
5. **Do you have successful replies?**

Click or tap here to enter text.

1. **Why?**

Click or tap here to enter text.

1. **Insert a screenshot:**

Click or tap here to enter text.

1. Plug your computer back into the network or enable your wireless card.
2. Ping your router/gateway again. It should be successful this time. You have confirmed operation of your local network.
3. **Insert a screenshot:**

Click or tap here to enter text.

1. At the command prompt type: **ping DNSServerAddress** (Where DNSServerAddress is the address of one of the DNS servers you noted earlier. Do not ping DNSServerAddress, this is a placeholder only.)
2. **Insert a screenshot:**

Click or tap here to enter text.

1. **Are your replies successful?**

Click or tap here to enter text.

1. At the command prompt type: **ping 8.8.8.8**
2. **Are your replies successful?**

Click or tap here to enter text.

1. By typing an internet IP address, you are confirming connectivity, but not DNS name resolution.
2. At the command prompt type: **ping www.google.com**
3. **Insert a screenshot:**

Click or tap here to enter text.

1. This try should be successful. You have confirmed that your network is correctly connected to the internet, and DNS is functional.

## About Tracert

Another useful troubleshooting command in a TCP/IP network is the Traceroute command. The Traceroute command traces the path a packet travels as it goes over the network from a source to a destination node. This is particularly useful on large networks (including the Internet), as it can indicate at which hop along the route between two computers a problem exists. In smaller networks where you already know the network path, you can use the Ping command instead. Note that on the Internet, not all firewalls or hosts will respond to the Ping or tracert command.

On Windows machines, the Traceroute command is known as Tracert. The Tracert command begins by sending a packet to the destination host with a TTL (Time to Live) value of one. When the packet reaches the first router along the way, the TTL expires and the router sends an ICMP message back to the computer running the command. The command uses this ICMP message to identify the first router along the path. The computer increases the TTL value by one and sends another packet to the destination host. When the packet reaches the next router, the TTL expires and the next router sends an ICMP message. The tracert command continues to increase the TTL value until it either reaches the destination or until a maximum number of routers have been tested (usually 30 by default.)

## Use Tracert

1. At the command prompt type: **tracert 127.0.0.1**
2. You should have 1 successful hop.
3. Use **ipconfig /all** to discover your gateway and DNS addresses. Make a note of these addresses.
4. At the command prompt type: tracert **x.x.x.x** (Where x.x.x.x is the IP address of your router/gateway. Do not tracert x.x.x.x)
5. **Do you have successful replies?**

Click or tap here to enter text.

1. **Why?**

Click or tap here to enter text.

1. **Insert a screenshot:**

Click or tap here to enter text.

1. At the command prompt type: **tracert DNSServerAddress** (Where DNSServerAddress is the address of one of the DNS servers you noted earlier.)
2. **Insert a screenshot:**

Click or tap here to enter text.

1. **Are your hops successful?**

Click or tap here to enter text.

1. At the command prompt type: **tracert 8.8.8.8**
2. **Insert a screenshot:**

Click or tap here to enter text.

1. By typing an internet IP address, you are confirming connectivity, but not DNS name resolution.
2. At the command prompt type: **tracert lab.wncc.net**
3. **Insert a screenshot:**

Click or tap here to enter text.

## Download and use Ping Plotter

PingPlotter is a graphical implementation of the traceroute command. You can also copy and paste an image or text of the traced route. This is handy for troubleshooting slow internet or VPN response time.

1. Go to [www.pingplotter.com](http://www.pingplotter.com), to **Download**, then to the bottom of the page, to **Download PingPlotter Freeware**. **Download** and **install** the program. Accept the default installation choices.
2. Double Click **PingPlotter** to start the program.
3. Type in the following address: **www.wncc.edu** and Click **Trace.**
4. Click the **Edit** menu, the **Copy as Image** command, then use **CTRL-V** to **paste** the image into this document.

Click or tap here to enter text.

1. Click **Stop**, and Type in the following address: **lab.wncc.net** and Click **Trace.**
2. Click the **Edit** menu, the **Copy as Image** command, then use **CTRL-V** to **paste** the image into this document.

Click or tap here to enter text.

1. Type in the following address: **www.google.com** and Click **Trace.**
2. Click the **Edit** menu, the **Copy as Text** command, then use CTRL-V to **paste** the text into this document.

Click or tap here to enter text.

1. Please write a couple of sentences to reflect on what you learned with this assignment.

Click or tap here to enter text.

## Assignment Submission

1. Attach this completed document to the assignment in Blackboard.