

Using Tracert and ping to troubleshoot connection drops

Background

This guide was written in an attempt to help a redditor diagnose a connection issue they were having with their GoNetspeed fiber service. See thread below:

https://www.reddit.com/r/GoNetspeed/comments/yh2std/gonetspeed_service_startstop_issue/

Disclaimer: this is a "fast post" guide - thrown together quickly, and written late at night when my head's all in a fog, so it's (a) definitely not as clear as I normally write, and (b) far too damned long-winded. If I'm motivated enough, I may clean it up later.

Overview

When attempting to troubleshoot where drops are occurring, I often find it helpful to run batch of "ping" tests. It may take a bit of time to set up if you're not familiar with this stuff, but may be worth the effort.

As data moves between your computer and its destination, the data travels through a number of "hops" along the way. Think of runners in a relay race passing the baton or stops your package makes between Amazon and your house. For data leaving your computer, the first hop would be your router. The next would be GoNetspeed's equipment - probably the ONT device in your house. Next would be a GoNetspeed switch or other routing equipment, likely in your town, possible not too far from your house (I'm admittedly a bit fuzzy on residential fiber switching). Then, more switches/routers further "upstream", then hand-offs as it leaves GoNetspeed's network for other networks, and so on until it reaches its destination.

You can run a command ("tracert") built into Windows that will list the "hops" that it takes to reach a known destination. Then, focusing on some of those key "hops", you can run multiple copies of another Windows command ("ping") to send packets of data (pings) to each hop at regular intervals (roughly once/sec). The idea is you let those ping tests run in the background, then wait for the drop-out to occur. When it does, flip over to the ping tests, and you should see a drop in one or more of those ping tests.

In a nutshell, I'd suggest setting up continuous pings to your router and the next two "hops", plus one last ping to a known address such as one of Google's DNS servers (8.8.8.8).

Test steps begin on the next page

Using Tracert and ping to troubleshoot connection drops

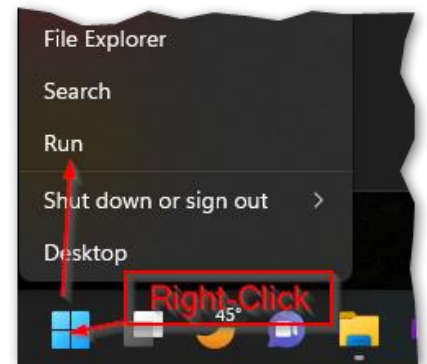
For these tests, we will need to open “Command Prompt” windows to run the tracert and ping commands.

First, **Either**:

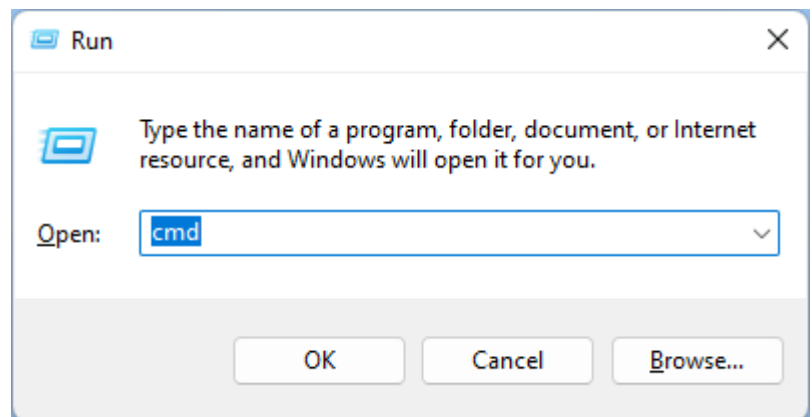
hold down the **Windows** key on your keyboard and press **R**

Or

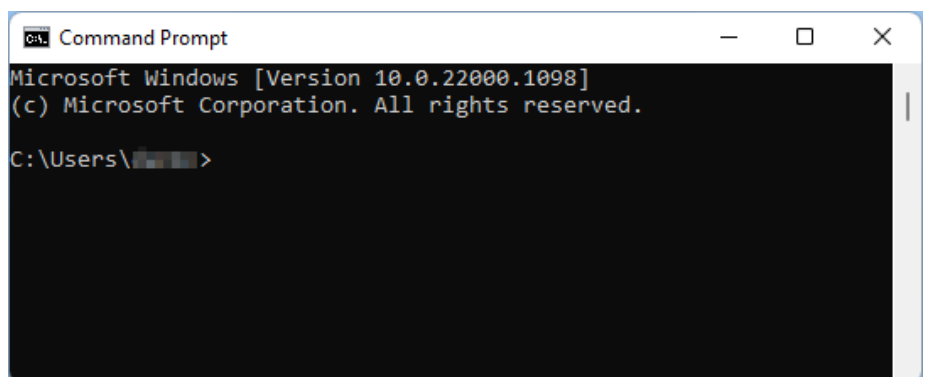
Right-click on the start button in the bottom-left corner of your screen (if you use Windows 11, this may be towards the middle-bottom of your screen) and choose **Run**.



In the “Run” window that appears, type **cmd** and hit **enter** on your keyboard (or click **OK**).



The command prompt window should look similar to this (your username will appear in the blurred area).

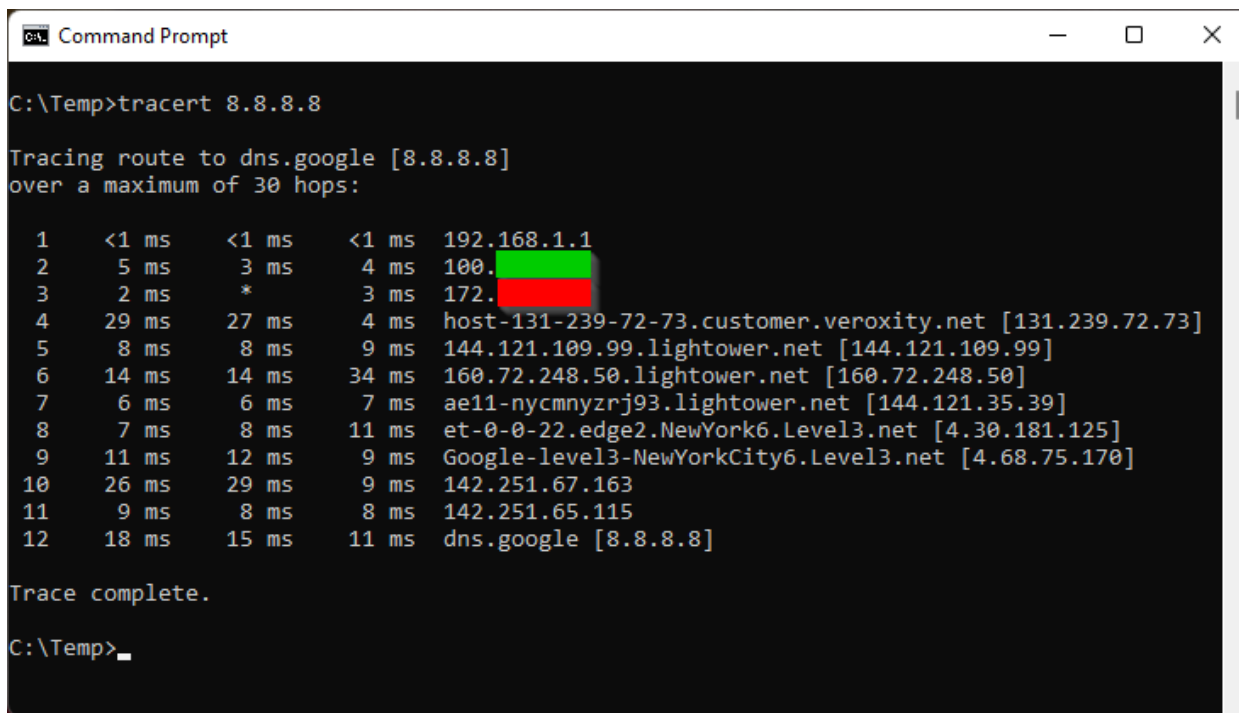


Using Tracert and ping to troubleshoot connection drops

First, we'll run the **tracert** command to a well-known Internet address. **8.8.8.8** is a reliable Google server and is also easy to type.

In the command prompt window, enter **tracert 8.8.8.8** and press Enter.

When the tracert command finishes, you'll see an entry for each "hop" between you and the destination address. For most fiber networks, the first line is usually your router, the next is usually your ONT box. Beyond that, are (likely) hops in your carrier's network. I've blocked the two hops that are just past of my router, but the colors will match those in later screenshots.



```
Command Prompt
C:\Temp>tracert 8.8.8.8

Tracing route to dns.google [8.8.8.8]
over a maximum of 30 hops:

  0  <1 ms    <1 ms    <1 ms    192.168.1.1
  1  5 ms      3 ms     4 ms     100. [redacted]
  2  2 ms      *        3 ms     172. [redacted]
  3  29 ms    27 ms    4 ms     host-131-239-72-73.customer.verocity.net [131.239.72.73]
  4  8 ms      8 ms     9 ms     144.121.109.99.lighttower.net [144.121.109.99]
  5  14 ms    14 ms    34 ms    160.72.248.50.lighttower.net [160.72.248.50]
  6  6 ms      6 ms     7 ms     ae11-nycmnyzrj93.lighttower.net [144.121.35.39]
  7  7 ms      8 ms    11 ms    et-0-0-22.edge2.NewYork6.Level3.net [4.30.181.125]
  8  11 ms    12 ms    9 ms     Google-level3-NewYorkCity6.Level3.net [4.68.75.170]
  9  26 ms    29 ms    9 ms     142.251.67.163
 10  9 ms      8 ms     8 ms     142.251.65.115
 11  18 ms    15 ms    11 ms    dns.google [8.8.8.8]

Trace complete.

C:\Temp>
```

In this example, we will start ping tests to the first 3 hops (my router, my ONT, and the next carrier hop "upstream" from my home) plus a final ping test to the well-known Internet address (8.8.8.8). You will need to make a note the first 3 addresses from your own tracert results, as they will likely differ – or move this window aside and refer to it in the next tests.

Using Tracert and ping to troubleshoot connection drops

For the ping tests, we will need four command prompt windows. To open additional command prompt windows, just repeat the steps on page 2.)

The screenshot below shows the four windows that I've opened, resized and arranged so that I can see all four at once.

Type one of the following lines into each of the four command prompt windows and hit enter:

ping address1 -t

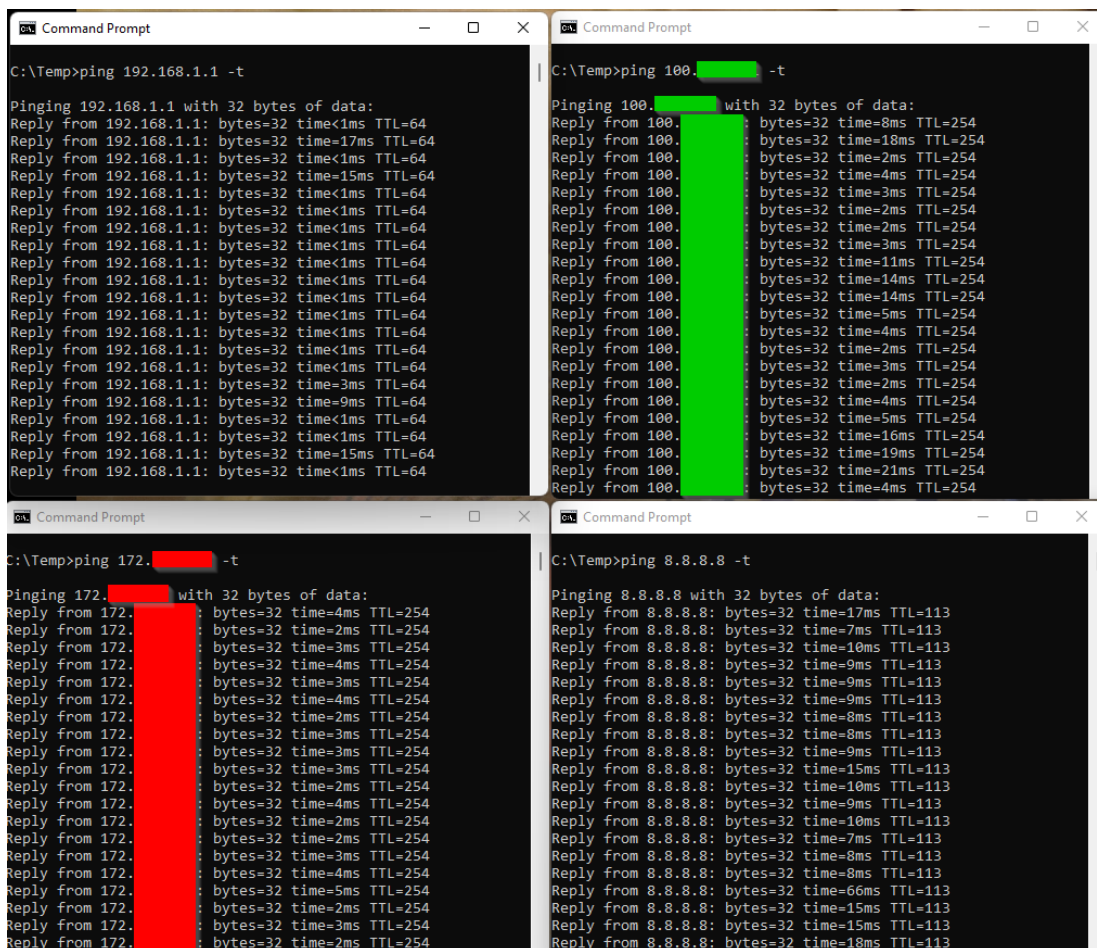
ping address2 -t

ping address3 -t

ping address4 -t

where "address1" is the first address from your tracert results, "address2" and "address3" are the second and third, and "address4" is the well-known address (8.8.8.8). So, if your first address is 192.168.1.1, the first command should read:

ping 192.168.1.1 -t



Each screen will begin to fill up with the results of the each ping. The screenshot above shows a normal connection, with no drops. As a side note, the "time" shown (in milliseconds) indicates how long it took to the ping to reach the destination. This can be useful for troubleshooting *slow* connections.

Using Tracert and ping to troubleshoot connection drops

Once these tests are set up and running, **leave them running on your screen**, and try to duplicate the drop-out issue. When you experience a drop, quickly look at the ping results in the 4 windows.

When a drop occurs, you *should* something *other* than the normal “reply from” lines (from the above screenshot) in one or more of these windows - you may see “request timed out”, and/or “Reply from <address>: Destination net unreachable”.

Here’s what the ping tests look like if my computer is dropping its connection to the router (192.168.1.1). Note that the timeouts occur in all 4 windows. That means that the problem is somewhere inside my network – either my computer, or the router.

```
Command Prompt - ping 192.168.1.1 -t
Reply from 192.168.1.1: bytes=32 time=15ms TTL=64
Reply from 192.168.1.1: bytes=32 time=1ms TTL=64
Reply from 192.168.1.1: bytes=32 time=15ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time=15ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time=14ms TTL=64
Reply from 192.168.1.1: bytes=32 time=14ms TTL=64
Reply from 192.168.1.1: bytes=32 time=6ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.

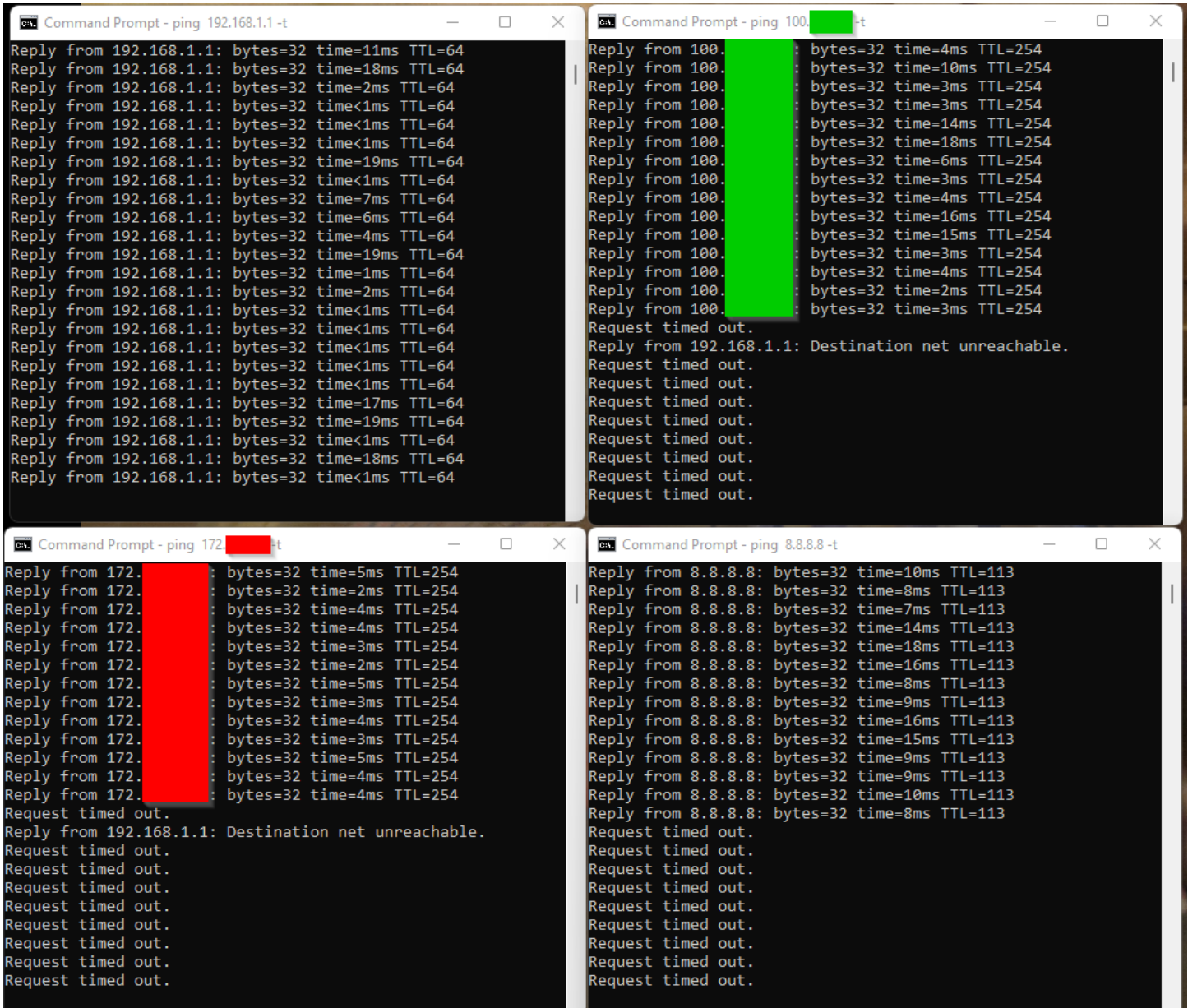
Command Prompt - ping 100.100.100.100 -t
Reply from 100.100.100.100: bytes=32 time=3ms TTL=254
Reply from 100.100.100.100: bytes=32 time=15ms TTL=254
Reply from 100.100.100.100: bytes=32 time=25ms TTL=254
Reply from 100.100.100.100: bytes=32 time=9ms TTL=254
Reply from 100.100.100.100: bytes=32 time=2ms TTL=254
Reply from 100.100.100.100: bytes=32 time=4ms TTL=254
Reply from 100.100.100.100: bytes=32 time=3ms TTL=254
Reply from 100.100.100.100: bytes=32 time=2ms TTL=254
Reply from 100.100.100.100: bytes=32 time=13ms TTL=254
Reply from 100.100.100.100: bytes=32 time=20ms TTL=254
Reply from 100.100.100.100: bytes=32 time=16ms TTL=254
Reply from 100.100.100.100: bytes=32 time=19ms TTL=254
Reply from 100.100.100.100: bytes=32 time=17ms TTL=254
Reply from 100.100.100.100: bytes=32 time=11ms TTL=254
Reply from 100.100.100.100: bytes=32 time=3ms TTL=254
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Command Prompt - ping 172.172.172.172 -t
Reply from 172.172.172.172: bytes=32 time=3ms TTL=254
Reply from 172.172.172.172: bytes=32 time=3ms TTL=254
Reply from 172.172.172.172: bytes=32 time=3ms TTL=254
Reply from 172.172.172.172: bytes=32 time=2ms TTL=254
Reply from 172.172.172.172: bytes=32 time=4ms TTL=254
Reply from 172.172.172.172: bytes=32 time=2ms TTL=254
Reply from 172.172.172.172: bytes=32 time=4ms TTL=254
Reply from 172.172.172.172: bytes=32 time=4ms TTL=254
Reply from 172.172.172.172: bytes=32 time=4ms TTL=254
Reply from 172.172.172.172: bytes=32 time=3ms TTL=254
Reply from 172.172.172.172: bytes=32 time=4ms TTL=254
Reply from 172.172.172.172: bytes=32 time=2ms TTL=254
Reply from 172.172.172.172: bytes=32 time=4ms TTL=254
Reply from 172.172.172.172: bytes=32 time=2ms TTL=254
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Command Prompt - ping 8.8.8.8 -t
Reply from 8.8.8.8: bytes=32 time=14ms TTL=113
Reply from 8.8.8.8: bytes=32 time=11ms TTL=113
Reply from 8.8.8.8: bytes=32 time=8ms TTL=113
Reply from 8.8.8.8: bytes=32 time=25ms TTL=113
Reply from 8.8.8.8: bytes=32 time=8ms TTL=113
Reply from 8.8.8.8: bytes=32 time=9ms TTL=113
Reply from 8.8.8.8: bytes=32 time=7ms TTL=113
Reply from 8.8.8.8: bytes=32 time=8ms TTL=113
Reply from 8.8.8.8: bytes=32 time=23ms TTL=113
Reply from 8.8.8.8: bytes=32 time=10ms TTL=113
Reply from 8.8.8.8: bytes=32 time=16ms TTL=113
Reply from 8.8.8.8: bytes=32 time=14ms TTL=113
Reply from 8.8.8.8: bytes=32 time=9ms TTL=113
Reply from 8.8.8.8: bytes=32 time=9ms TTL=113
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
```

Using Tracert and ping to troubleshoot connection drops

Next, here's how things look when I can reach my router just fine (no time outs to the router), but pings to the Fiber ONT are timing out. This could be an issue with the ONT itself, a problem between the router and the ONT, or with your service.



The image displays four screenshots of Windows Command Prompt windows, each showing the results of a continuous ping test (-t) to a specific IP address. The windows are arranged in a 2x2 grid.

- Top-left window:** Command Prompt - ping 192.168.1.1 -t. Shows successful replies from 192.168.1.1 with varying response times (e.g., 11ms, 18ms, 2ms, <1ms, 19ms, 7ms, 6ms, 4ms, 19ms, 1ms, 2ms, <1ms, <1ms, <1ms, <1ms, <1ms, 17ms, 19ms, <1ms, 18ms, <1ms) and TTL=64.
- Top-right window:** Command Prompt - ping 100. [redacted] -t. Shows successful replies from 100. [redacted] with varying response times (e.g., 4ms, 10ms, 3ms, 3ms, 14ms, 18ms, 6ms, 3ms, 4ms, 16ms, 15ms, 3ms, 4ms, 2ms, 3ms) and TTL=254. It ends with "Request timed out." and "Reply from 192.168.1.1: Destination net unreachable."
- Bottom-left window:** Command Prompt - ping 172. [redacted] -t. Shows successful replies from 172. [redacted] with varying response times (e.g., 5ms, 2ms, 4ms, 4ms, 3ms, 2ms, 5ms, 3ms, 4ms, 3ms, 5ms, 4ms, 4ms) and TTL=254. It ends with "Request timed out." and "Reply from 192.168.1.1: Destination net unreachable."
- Bottom-right window:** Command Prompt - ping 8.8.8.8 -t. Shows successful replies from 8.8.8.8 with varying response times (e.g., 10ms, 8ms, 7ms, 14ms, 18ms, 16ms, 9ms, 8ms, 16ms, 15ms, 9ms, 10ms, 8ms) and TTL=113. It ends with "Request timed out."

Using Tracert and ping to troubleshoot connection drops

If pings to both your router and your ONT are fine (the first two hops), but the third address times out, then there may be an issue somewhere in the fiber connection beyond the ONT – e.g. the fiber connection leaving your house, or somewhere in the neighborhood/area.

If the first 3 addresses do not time out, but you see time outs to the well-known address, the issue is likely further “upstream”. **Note:** an *occasional* time out is normal on most connections, particularly on WiFi networks.