

TRACKING INTERNET PROVIDER PATHS

by Francis Chao
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Web location for this
presentation:

<http://aztcs.apcug.org>

Click on

"Meeting Notes"

SUMMARY

You can use the pathping command in the "Terminal" app in a Windows.. computer to track part of the path of routers that your Internet provider uses to help your Web browser access locations out in the Internet cloud.

TOPICS

- Reasons To Track Your Internet signal
- Basic Path of an Internet Provider's Connection
- Steps For Tracking An Internet Connection

REASONS TO TRACK YOUR INTERNET SIGNAL

- Locate Internet slow-downs in your home network
- Determine if the bundled router in your Internet provider's "gateway" or "modem" device is a bottle-neck
- Determine the actual Mobile Network Operator's "Radio Access Network" that your "MVNO" (= "Mobile Virtual Network Operator") is actually using

BASIC PATH OF AN INTERNET PROVIDER'S CONNECTION

- Your computer or your cell phone's data plan connects to a router (in your home or in the cell phone company's "Radio Access Network")
 - > connects to another router
 - > connects to another router
 - > connects to another router, etc., etc. and then finally
 - > connects to a server somewhere

STEPS FOR TRACING AN INTERNET CONNECTION

- BIG STEP 100:
Connect the target Internet connection to a Windows.. computer
- BIG STEP 200:
Start "Terminal" in a Windows.. computer
- BIG STEP 300:
Type in
pathping cisco.com
- BIG STEP 400:
Place the router addresses into
iplocation.com

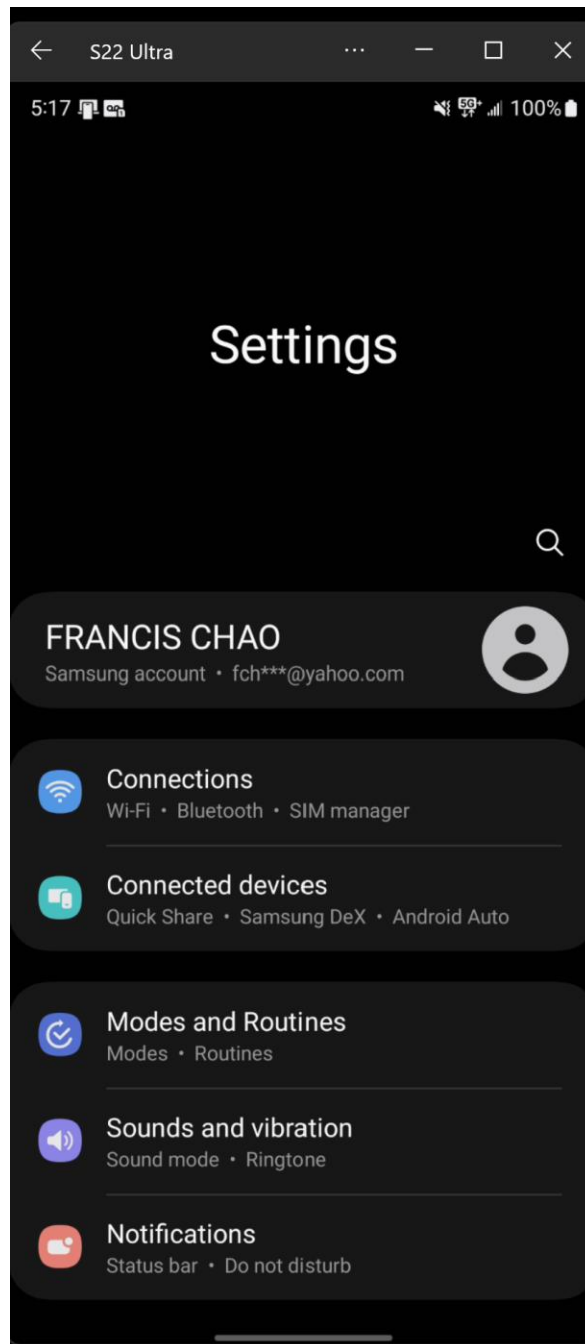
BIG STEP 100 (CONNECT TO THE TARGET INTERNET CONNECTION)

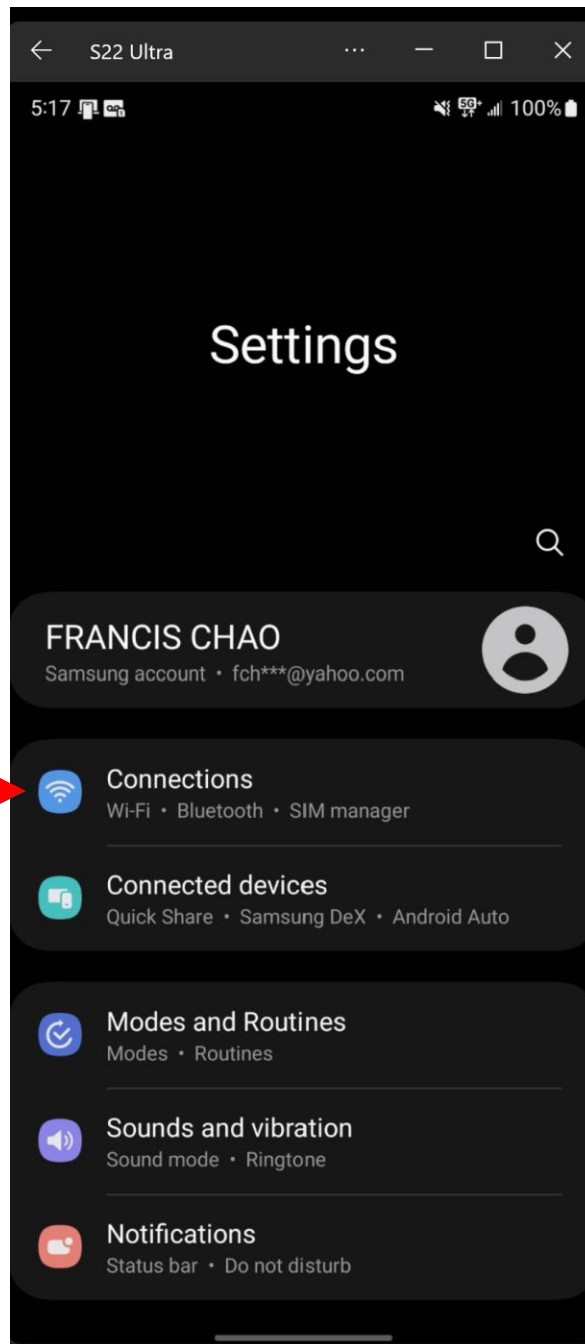
- **SMALL STEP 101:**
Physically connect the Internet connection of the Internet provider that you are testing to your Windows.. computer, using a wired Ethernet cable or a USB cable or a wireless Wi-Fi connection

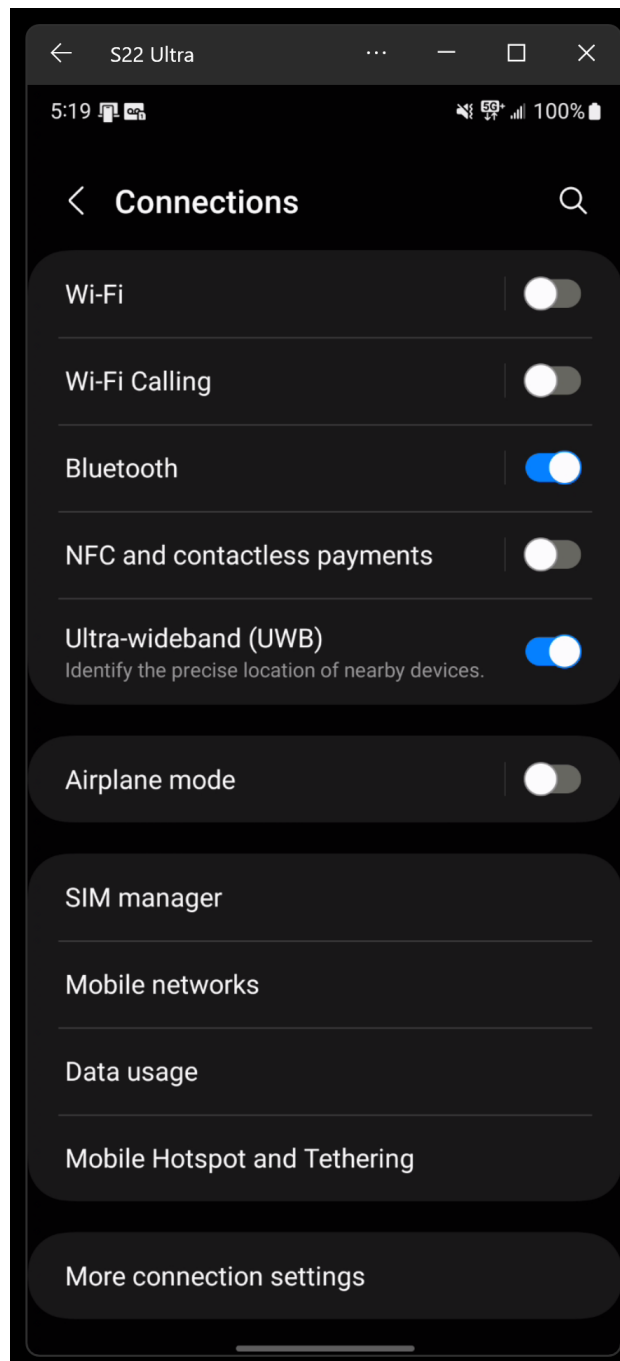
BIG STEP 100 (CONNECT TO THE TARGET INTERNET CONNECTION)

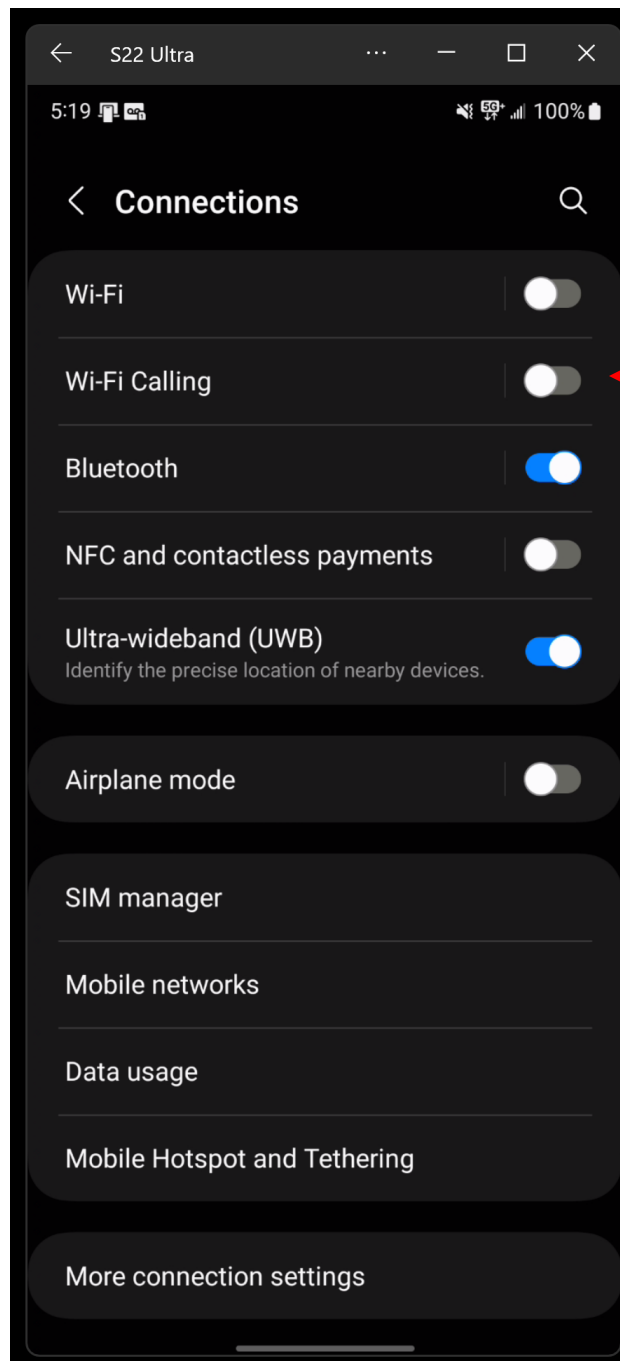
- SMALL STEP 102:

If you are testing the hot spot or tethering of a cell phone so that the cell phone is providing Internet access for your Windows.. computer, go to "Settings"/"Connections" and disable the "Wi-Fi" connection and the "Wi-Fi calling" of the cell phone.









BIG STEP 100 (CONNECT TO THE TARGET INTERNET CONNECTION) (continued)

- SMALL STEP 103:
Use the RIGHT mouse button to click on the "Start" button of Windows..



Recycle Bin

Sunday, March 26, 2023



5:24 PM
3/26/2023





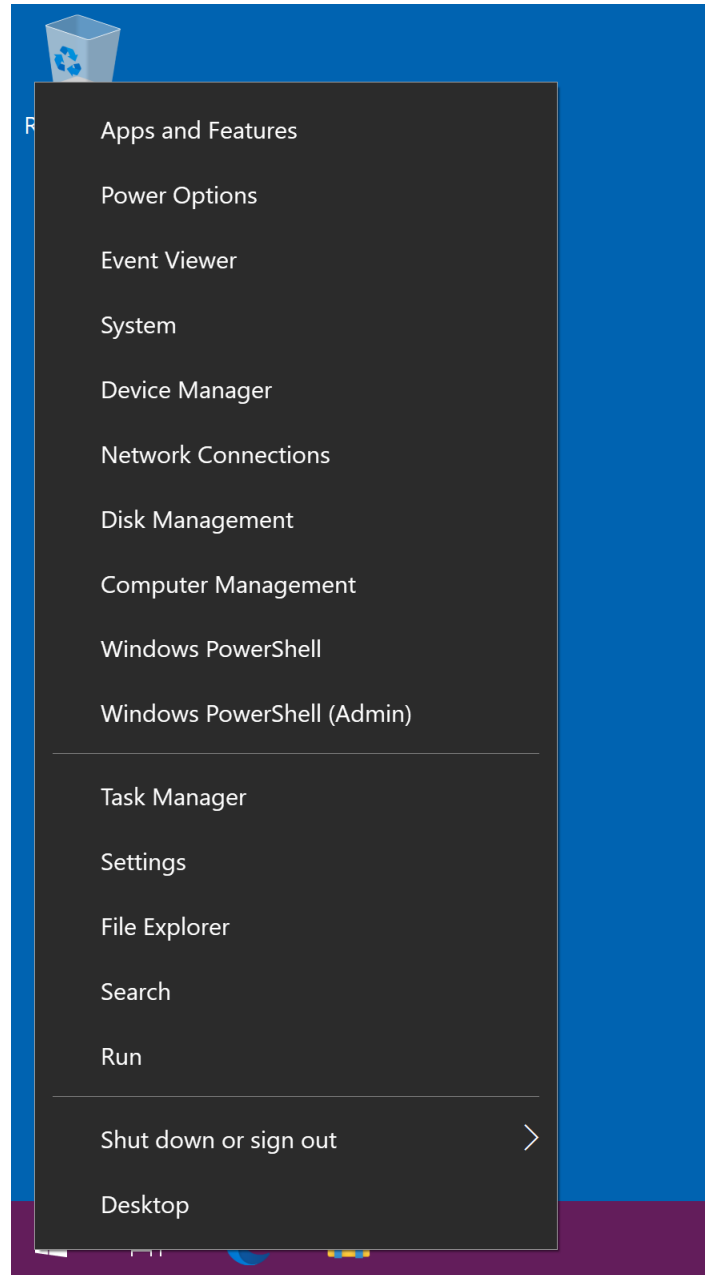
Recycle Bin



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3/26/2023

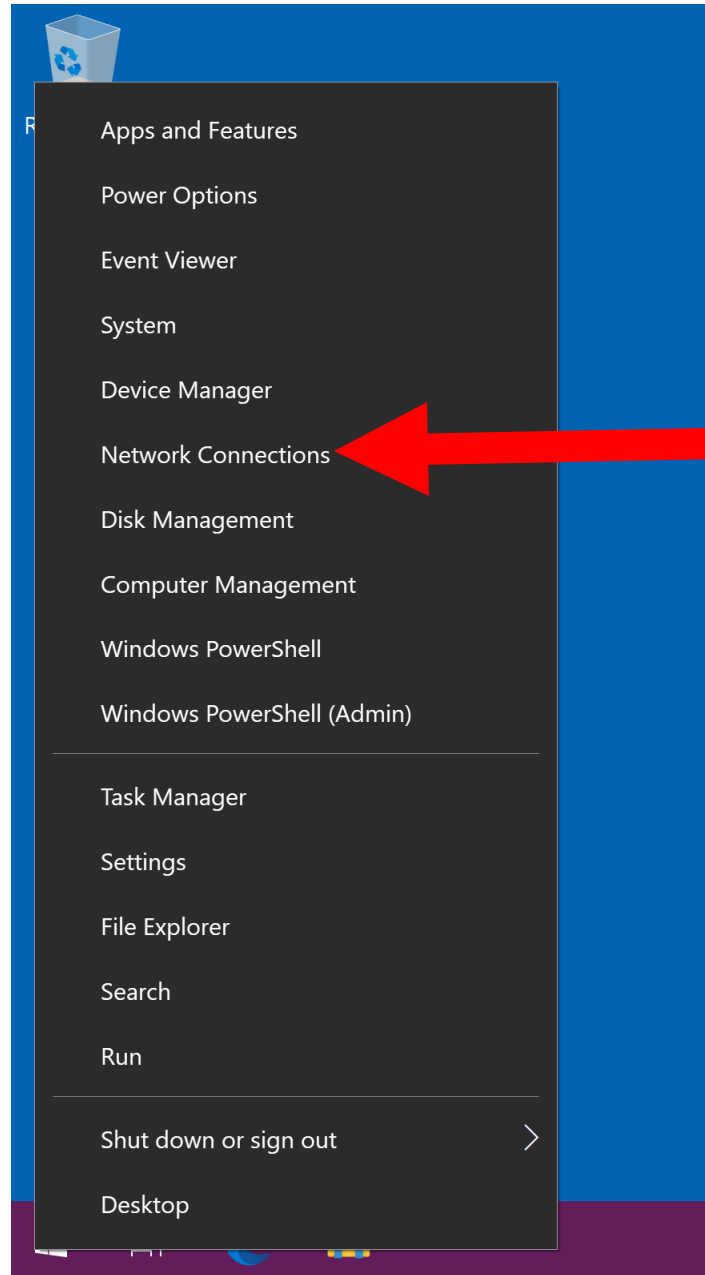
Sunday, March 26, 2023





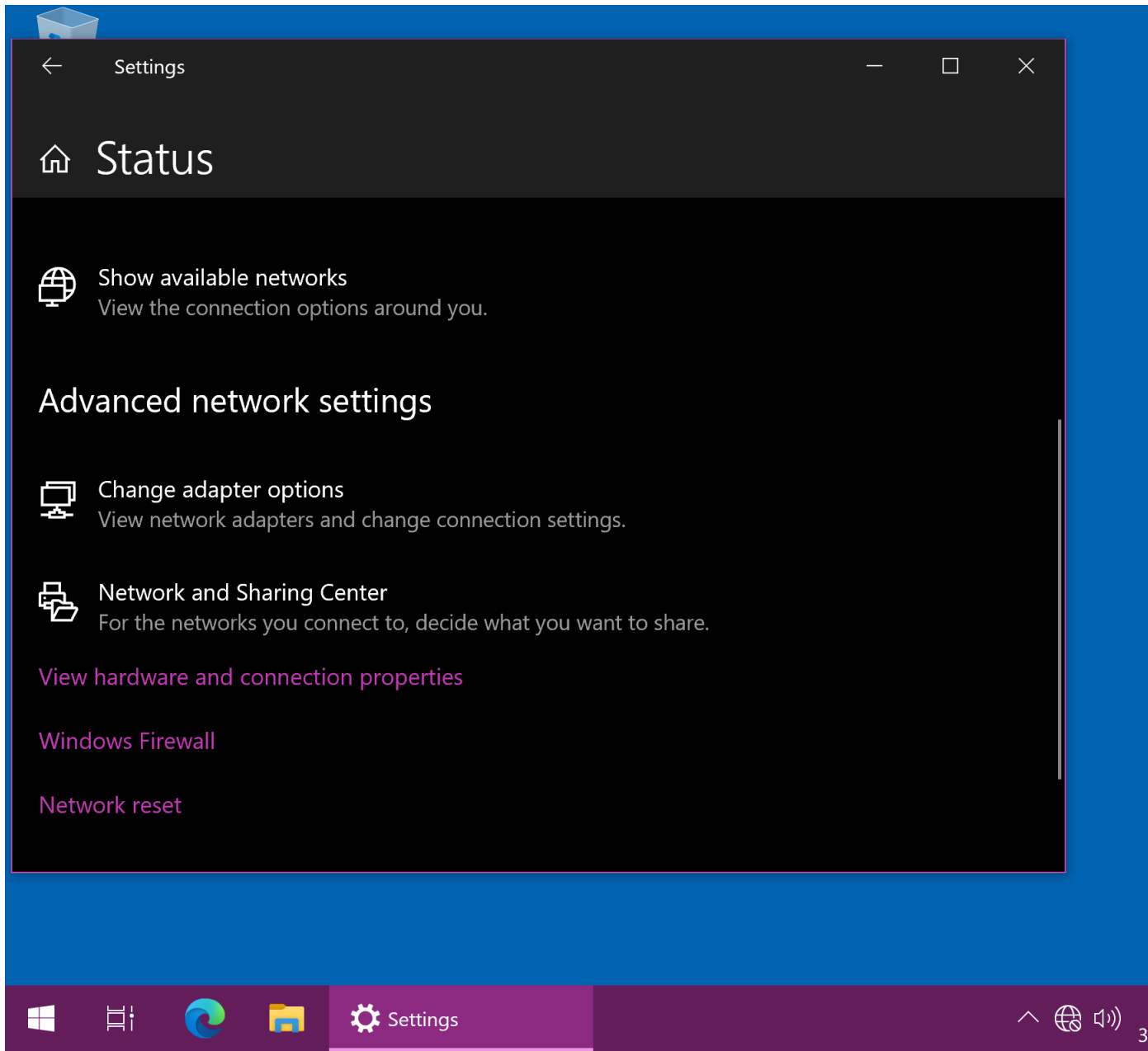
BIG STEP 100 (CONNECT TO THE TARGET INTERNET CONNECTION) (continued)

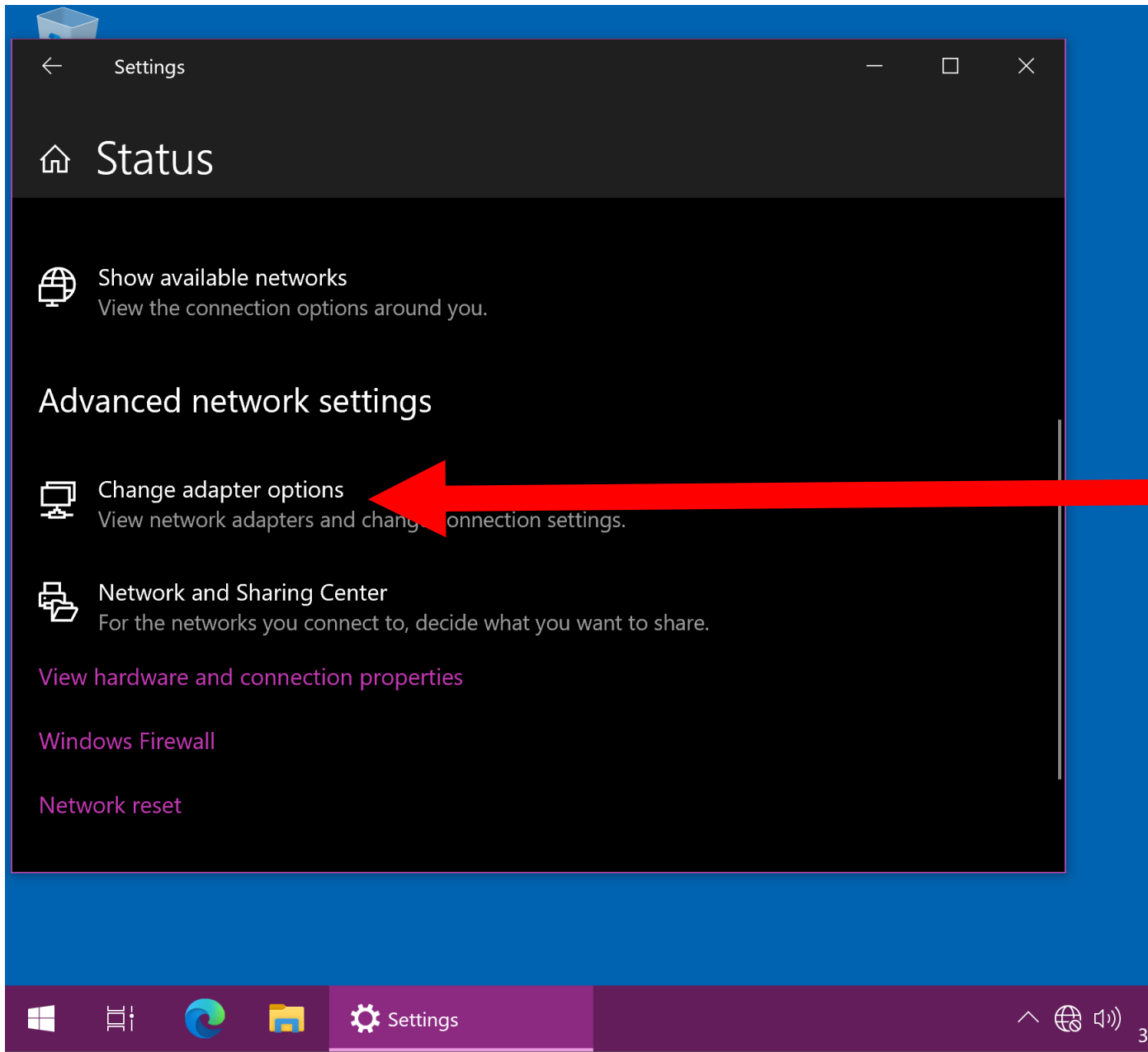
- SMALL STEP 104:
Use the LEFT mouse button to click on "Network Connections"



BIG STEP 100 (CONNECT TO THE TARGET INTERNET CONNECTION) (continued)

- **SMALL STEP 105:**
Scroll or page vertically downward.
Then use the LEFT mouse button to click on "Change adapter options" inside "Advanced network settings".
If "Change adapter options" is not displayed, use the LEFT mouse button to click on "More network adapter options"; then click on "Change adapter options".





BIG STEP 100 (CONNECT TO THE TARGET INTERNET CONNECTION) (continued)

- **SMALL STEP 106:**
Enable the network connection for the Internet connection that you are testing by using the **RIGHT** mouse button to click on it, if it is not already enabled



Recycle Bin

Network Connections

> Control Panel > All Control Panel Items > Network Connections >

Search Network Connecti...

Organize ▾ Enable this network device Diagnose this connection Rename this connection ▾

Ethernet0 Network 4 Intel(R) 82574L Gigabit Network ...	usb_xhci Disabled Realtek USB GbE Family Controller	A8000_NETGEAR Not connected NETGEAR A8000 WiFi 6 & 6E Ada...
---	---	--

3 items | 1 item selected |

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2






Recycle Bin

Network Connections

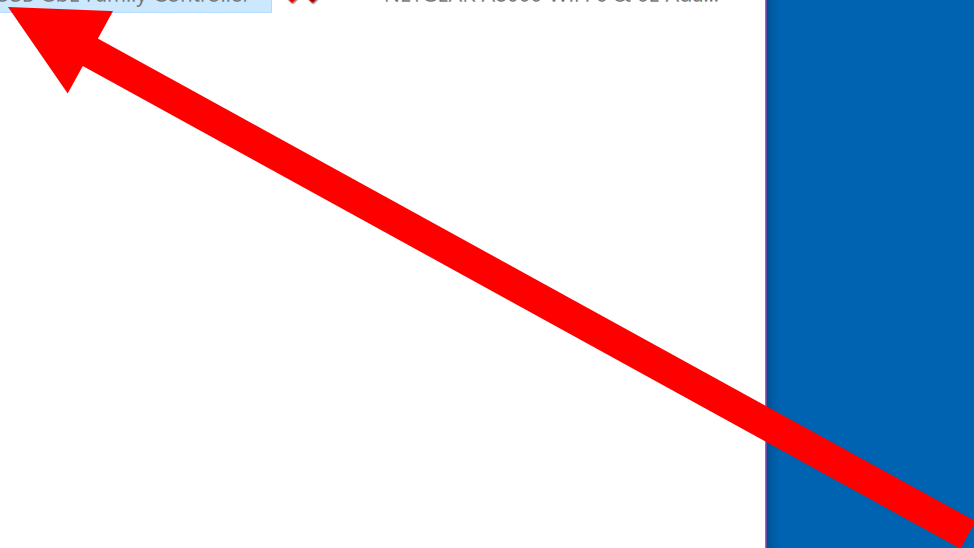
Control Panel > All Control Panel Items > Network Connections

Search Network Connecti...

Organize Enable this network device Diagnose this connection Rename this connection

 Ethernet0 Network 4 Intel(R) 82574L Gigabit Network ...	 usb_xhci Disabled Realtek USB GbE Family Controller	 A8000_NETGEAR Not connected NETGEAR A8000 WiFi 6 & 6E Ada...
--	--	---

3 items | 1 item selected |



Windows taskbar icons: Start button, Task View, Microsoft Edge, File Explorer, and Network Connections window.

System tray icons: Network, Volume, and Notification Area Icons. Notification Area Icons: 2.

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3/26/2023



Recycle Bin

Network Connections



Control Panel > All Control Panel Items > Network Connections >

Search Network Connecti...

Organize ▾

Enable this network device

Diagnose this connection

Rename this connection



Ethernet0

Network 4

Intel(R) 82574L Gigabit Network ...



usb_xhci

Disal

Real



Enable

Status

Diagnose

Create Shortcut



Delete



Rename



Properties



A8000_NETGEAR

Not connected

NETGEAR A8000 WiFi 6 & 6E Ada...

3 items | 1 item selected |



Network Connectio...



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Recycle Bin

Network Connections



Control Panel > All Control Panel Items > Network Connections >

Search Network Connecti... 🔍

Organize ▾

Enable this network device

Diagnose this connection

Rename this connection



Ethernet0

Network 4

Intel(R) 82574L Gigabit Network ...



usb_xhci

Disal

Real



Enable

Status

Diagnose

Create Shortcut



Delete



Rename



Properties



A8000_NETGEAR

Not connected

NETGEAR A8000 WiFi 6 & 6E Ada...

3 items | 1 item selected |



Network Connectio...



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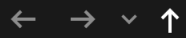
BIG STEP 100 (CONNECT TO THE TARGET INTERNET CONNECTION) (continued)

- **SMALL STEP 107:**
Use the RIGHT mouse button to disable all other the network connections so that the Internet connection that you are testing is the only one that is enabled.



Recycle Bin

Network Connections



Control Panel > All Control Panel Items > Network Connections >



Search Network Connecti...

Organize ▾



Ethernet0
Network 4
Intel(R) 82574L Gigabit Network ...



usb_xhci
TMOBILE-A4BB
Realtek USB GbE Family Controller



A8000_NETGEAR
Not connected
NETGEAR A8000 WiFi 6 & 6E Ada...

3 items |



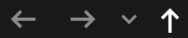
Network Connectio...





Recycle Bin

Network Connections



Control Panel > All Control Panel Items > Network Connections >

Search Network Connecti...

Organize ▾



Ethernet0
Network 4
Intel(R) Gigabit Network ...



usb_xhci
TMOBILE-A4BB
Realtek USB GbE Family Controller



A8000_NETGEAR
Not connected
NETGEAR A8000 WiFi 6 & 6E Ada...

3 items |



Network Connectio...





Recycle Bin



Network Connections



Control Panel > All Control Panel Items > Network Connections >



Search Network Connecti... 🔍

Organize ▾

Disable this network device

Diagnose this connection

Rename this connection



Ethernet0

Network 4

Intel(R) 8



Disable

Status

Diagnose



Bridge Connections

Create Shortcut



Delete



Rename



Properties



usb_xhci

TMOBILE-A4BB

Realtek USB GbE Family Controller



A8000_NETGEAR

Not connected

NETGEAR A8000 WiFi 6 & 6E Ada...

3 items | 1 item selected |



Network Connection...





Recycle Bin



Network Connections



Control Panel



All Control Panel Items



Network Connections



Search Network Connecti...

Organize

Disable this network device

Diagnose this connection

Rename this connection



Ethernet0
Network adapter
Intel(R) 8



Disable

Status

Diagnose



Bridge Connections

Create Shortcut



Delete



Rename



Properties



usb_xhci

Network adapter

Realtek USB GbE Family Controller



A8000_NETGEAR

Not connected

NETGEAR A8000 WiFi 6 & 6E Ada...

3 items | 1 item selected |



Network Connection...





Recycle Bin



Network Connections



Control Panel > All Control Panel Items > Network Connections >



Search Network Connecti...

Organize ▾

Enable this network device

Diagnose this connection

Rename this connection



Ethernet0

Disabled

Intel(R) 82574L Gigabit Network ...



usb_xhci

TMOBILE-A4BB

Realtek USB GbE Family Controller



A8000_NETGEAR

Not connected

NETGEAR A8000 WiFi 6 & 6E Ada...

3 items | 1 item selected |



Network Connectio...



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Inter



Recycle Bin



Network Connections



Control Panel

All Control Panel Items

Network Connections



Search Network Connecti...

Organize

Enable this network device

Diagnose this connection

Rename this connection



Ethernet0

Disabled

Intel(R) 82574L Gigabit Network ...



usb_xhci

TMOBILE-A4BB

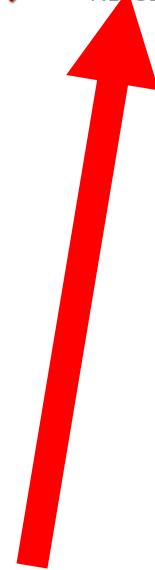
Realtek USB GbE Family Controller



A8000_NETGEAR

Not connected

NETGEAR A8000 WiFi 6 & 6E Ada...



3 items | 1 item selected |



Network Connectio...



TMO
Inter



Recycle Bin

Network Connections

← → ▾ ↑

Control Panel > All Control Panel Items > Network Connections >

Search Network Connecti...

Organize ▾

Connect To

Disable this network device

Diagnose this connection

⋮

Ethernet0
Disabled
Intel(R) 82574L Gigabit Network ...

usb_xhci
TMOBILE-A4BB
Realtek USB GbE Family Controller

A8000_NETGEAR
Not connected
NETGEAR

3 items

|

1 item selected

|

Disable

Connect / Disconnect

Status

Diagnose

Bridge Connections

Create Shortcut

Delete

Rename

Properties

Network Connection...

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Network Connections

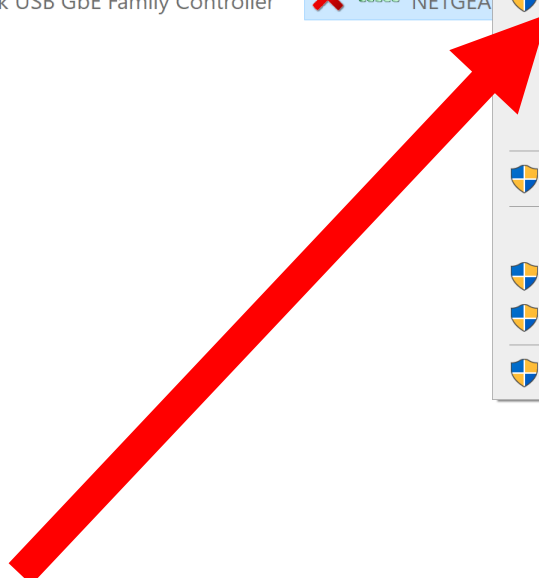
Control Panel > All Control Panel Items > Network Connections

Organize Connect To Disable this network device Diagnose this connection

Icon	Name	Status	Manufacturer
	Ethernet0	Disabled	Intel(R) 82574L Gigabit Network ...
	usb_xhci	Connected	TMOBILE-A4BB Realtek USB GbE Family Controller
	A8000_NETGEAR	Not connected	NETGEAR

3 items | 1 item selected

- Disable
- Connect / Disconnect**
- Status
- Diagnose
- Bridge Connections
- Create Shortcut
- Delete
- Rename
- Properties





Recycle Bin

Network Connections



Control Panel > All Control Panel Items > Network Connections >



Search Network Connecti...

Organize ▾

Enable this network device

Diagnose this connection

Rename this connection



Ethernet0

Disabled

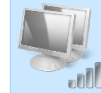
Intel(R) 82574L Gigabit Network ...



usb_xhci

TMOBILE-A4BB

Realtek USB GbE Family Controller



A8000_NETGEAR

Disabled

NETGEAR A8000 WiFi 6 & 6E Ada...

3 items | 1 item selected |



Network Connectio...



BIG STEP 100 (CONNECT TO THE TARGET INTERNET CONNECTION) (continued)

- SMALL STEP 108:
Use the LEFT mouse button to close the "Network Connections" window



Recycle Bin



Network Connections



Control Panel

All Control Panel Items

Network Connections



Search Network Co...



Organize

Enable this network device

Diagnose this connection

Rename this connection



Ethernet0

Disabled

Intel(R) 82574L Gigabit Network ...



usb_xhci

TMOBILE-A4BB

Realtek USB GbE Family Controller



A8000_NETGE

Disabled

NETGEAR A8000 WiFi 6 & 6E Ada...

3 items | 1 item selected |



Network Connectio...



BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER)

- SMALL STEP 201:
Use the RIGHT mouse button to click on the Windows.. "Start button"



Recycle Bin





Recycle Bin



5:55 PM
3/26/2023



BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER) (continued)

- SMALL STEP 202:
Use the LEFT mouse button to click on "Terminal" or "Terminal (Admin)" or "Windows Powershell" or "Windows Powershell (Admin):"



Re

Apps and Features

Power Options

Event Viewer

System

Device Manager

Network Connections

Disk Management

Computer Management

Windows PowerShell

Windows PowerShell (Admin)

Task Manager

Settings

File Explorer

Search

Run

Shut down or sign out



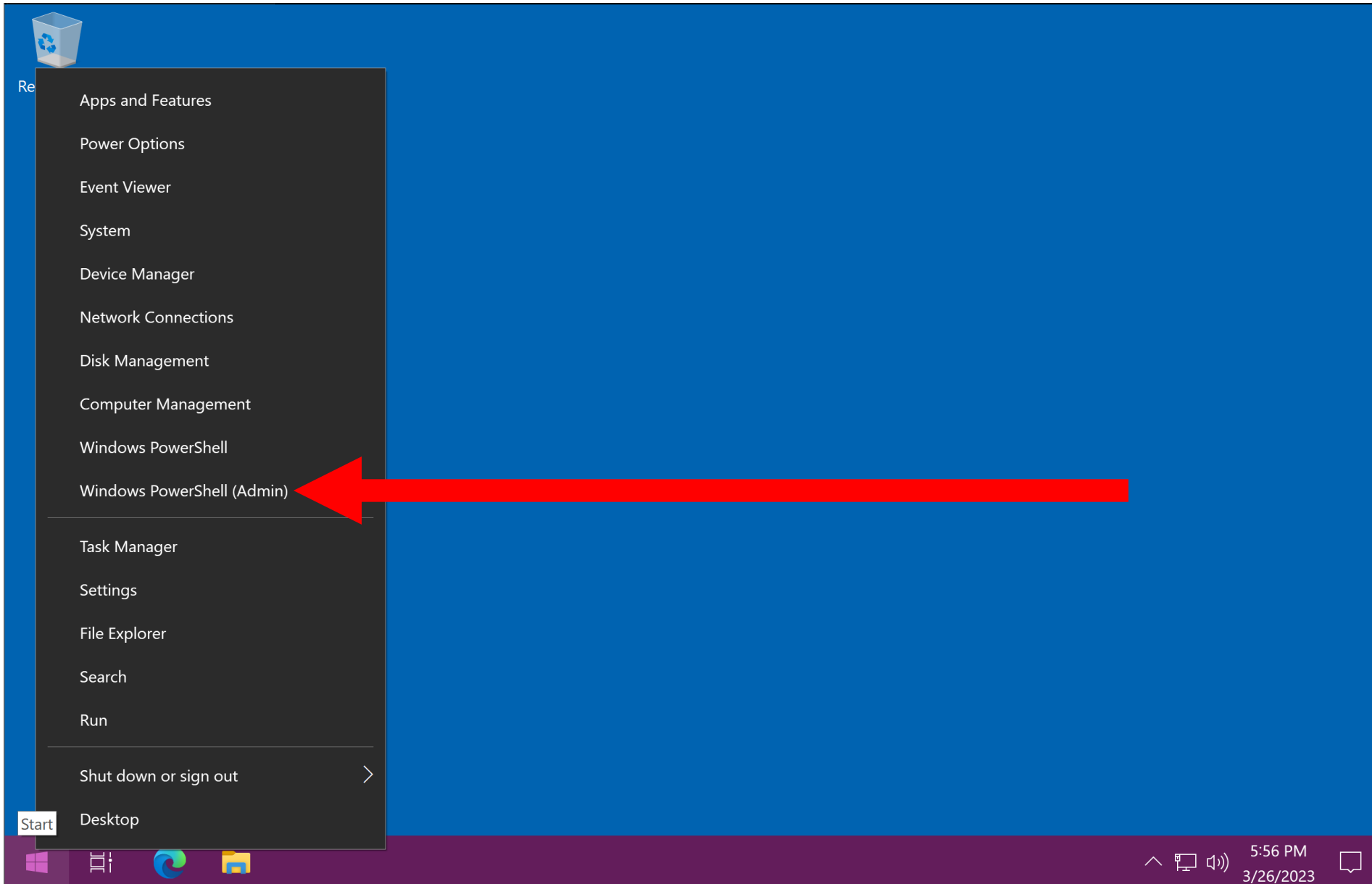
Start

Desktop



5:56 PM
3/26/2023

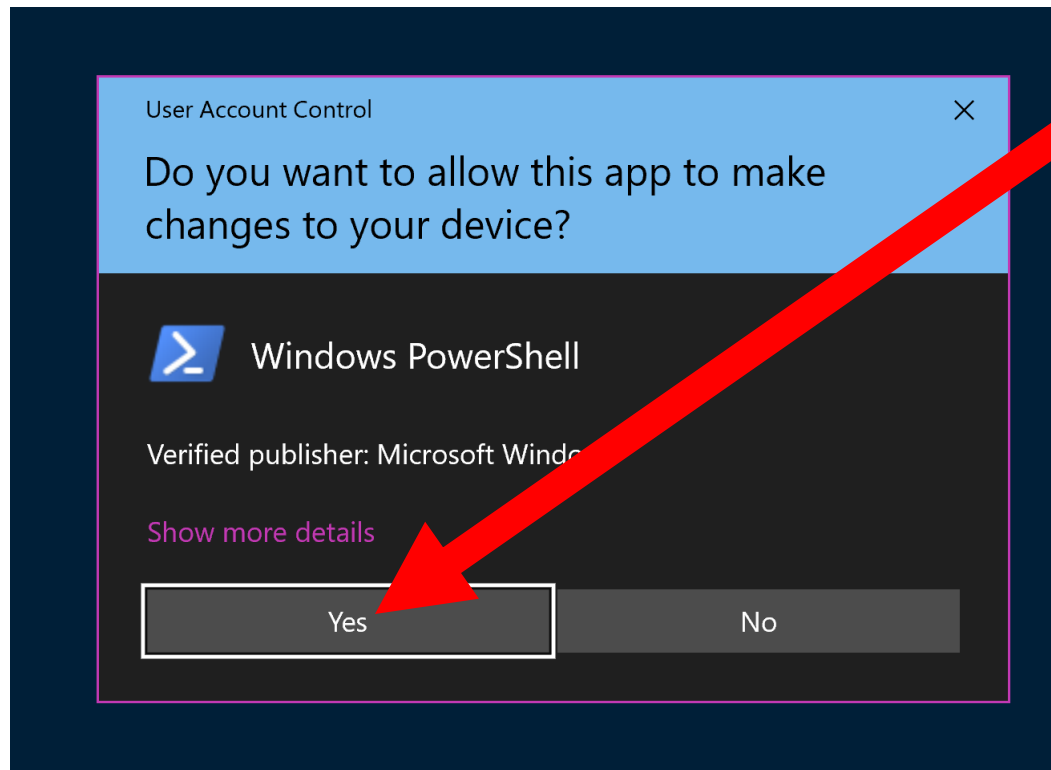




BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER) (

- SMALL STEP 203:
If a "User Account Control" dialog box pops up, click on it's "Yes button:





BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER) (

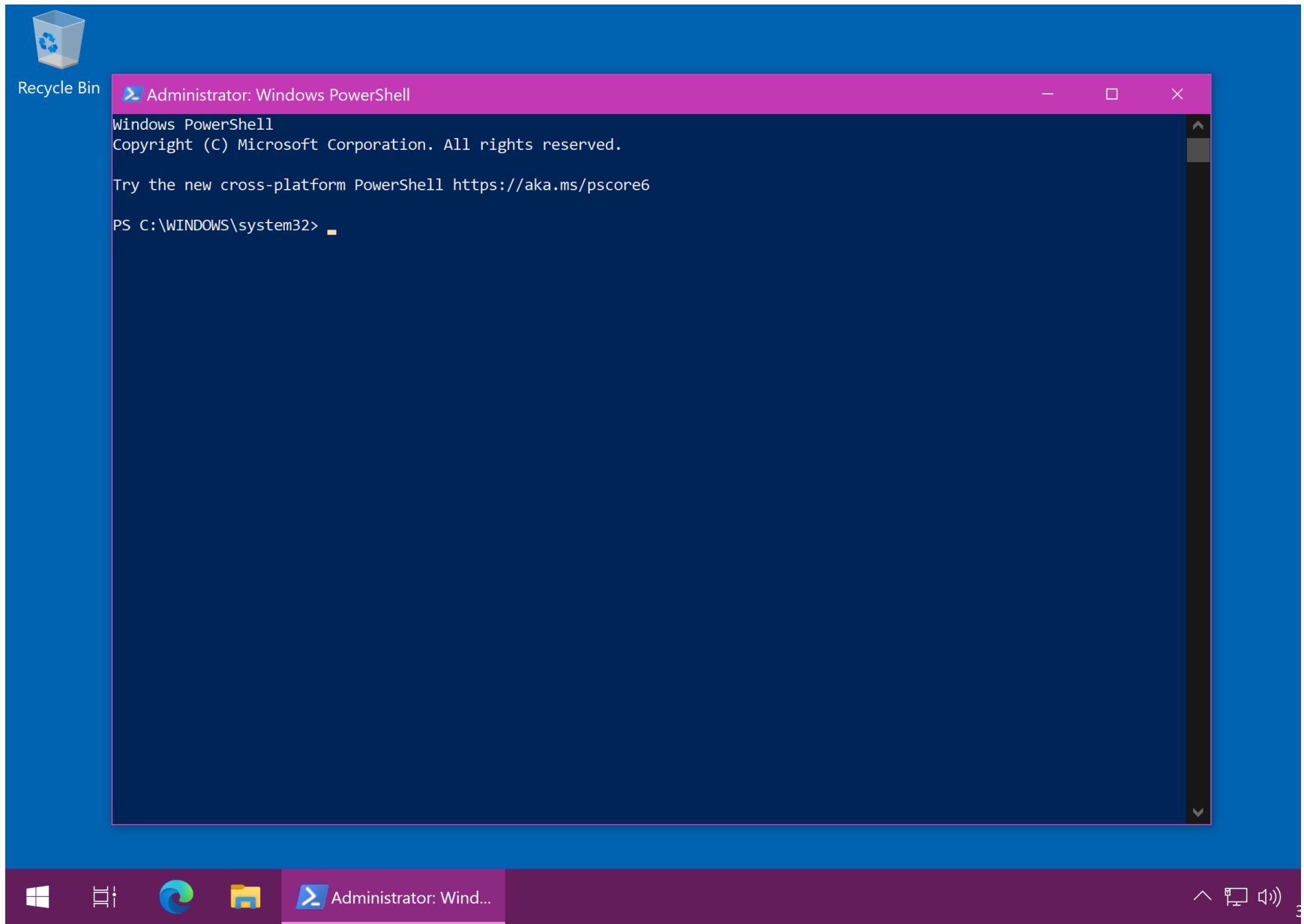
- SMALL STEP 204:

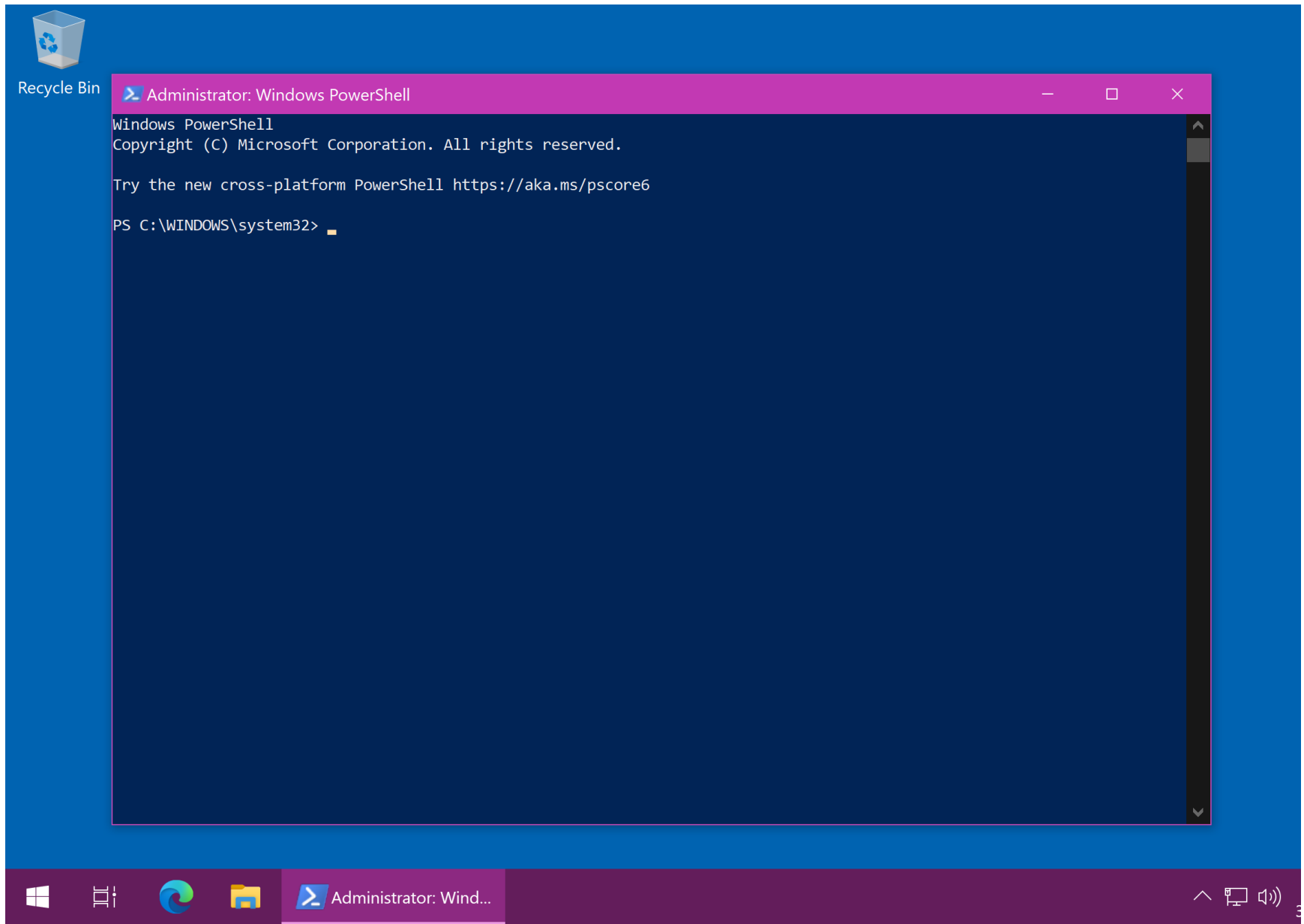
At the "prompt" of "Terminal..", type in
pathping cisco.com

(the number of spaces between
pathping
and

cisco.com

is not important as long as you have at least
one space)







Recycle Bin

Administrator: Windows PowerShell

Windows PowerShell

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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

PS C:\WINDOWS\system32> pathping cisco.com



Administrator: Wind...



BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER)

- SMALL STEP 205:
Depress the <Enter> key of the keyboard of your computer

BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER)

- SMALL STEP 206:
Some IP addresses will be displayed

```
Administrator: Windows PowerShell
PS C:\WINDOWS\system32> pathping cisco.com

Tracing route to cisco.com [2001:420:1101:1::185]
over a maximum of 30 hops:
  0  DESKTOP-03N8U4I [2607:fb90:586:eb15:c083:98a1:7036:1804]
  1  2607:fb90:586:eb15::82
  2  2607:fb90:586:eb15:0:9:e51e:1840
  3  * * *
Computing statistics for 50 seconds...
Hop  RTT      Source to Here   This Node/Link   Address
  0                               0/ 100 = 0%      |
  1   3ms      0/ 100 = 0%      0/ 100 = 0%      2607:fb90:586:eb15::82
                               100/ 100 =100%   |
  2   ---      100/ 100 =100%   0/ 100 = 0%      2607:fb90:586:eb15:0:9:e51e:1840

Trace complete.
PS C:\WINDOWS\system32> 
```

BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER)

- SMALL STEP 207:
Start a Web browser and go to
<https://iplocation.com>



Recycle Bi



New tab



iplocation.com



Import favorites

For quick access, place your favorites here on the favorites bar. [Manage favorites now](#)



Microsoft

Sign in



Search the web



Quick links



My Feed

Sports



Headings only



New tab - Profile 1 ...

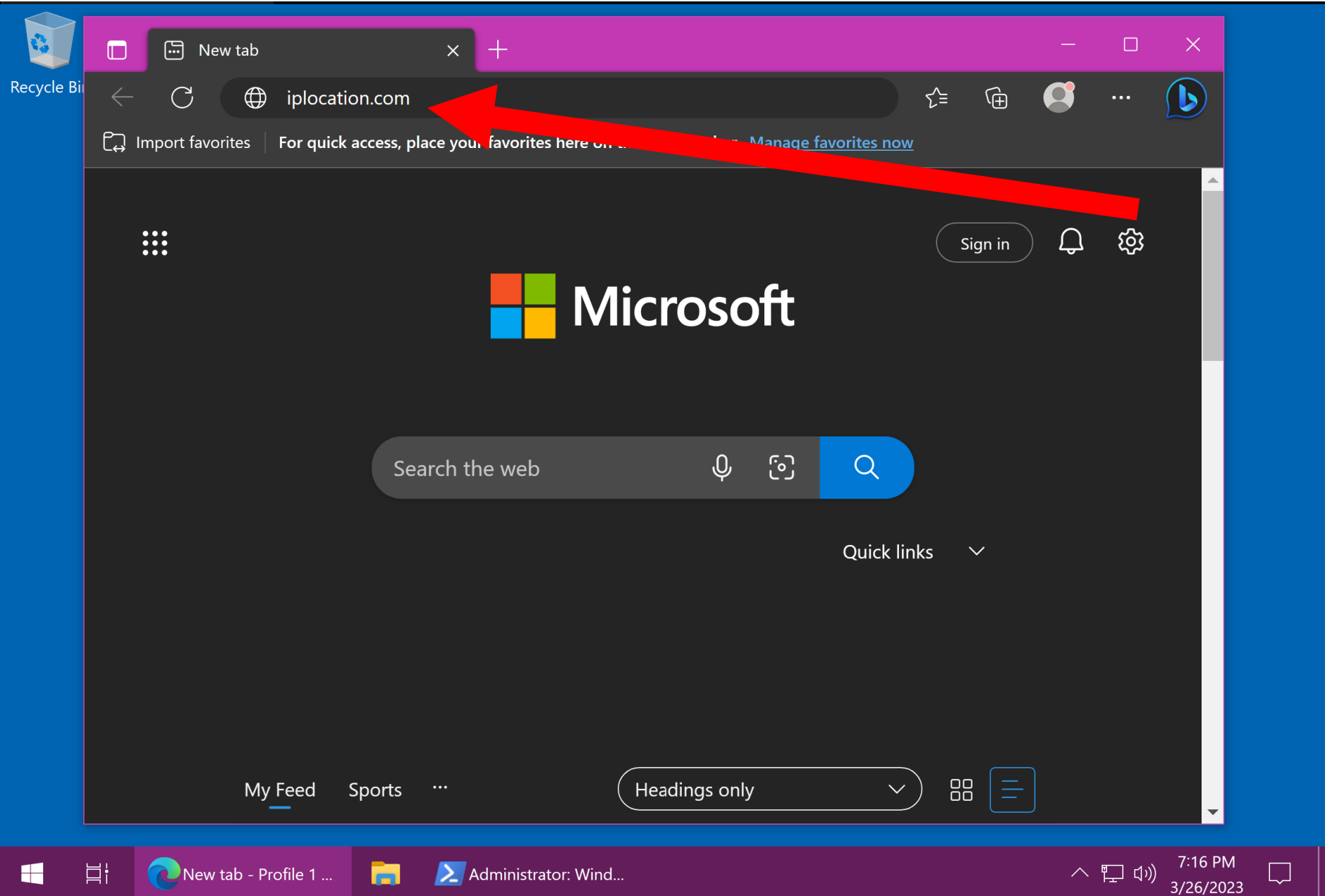


Administrator: Wind...



7:16 PM
3/26/2023






Recycle Bin

IP Location

https://iplocation.com




IP LOCATION

INSTANTLY LOCATE ANY IP ADDRESS

This free online tool allows you to see the geographical location of any IP address. Just input the IP address and you will be shown the position on a map, coordinates, country, region, city and organization.

Type in an IP address FIND



new lower price
on 100s of items

plus 10% off*
all outdoor furniture

shop now

Your IP address	172.56.185.116 (change)
Latitude	34.0447
Longitude	-118.2946

Windows taskbar: IP Location - Profile... Administrator: Wind... 7:18 PM 3/26/2023

BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER)

- SMALL STEP 208:
Go back to the "Terminal.." window and copy one or more of the IP addresses into the text field at
<https://iplocation.com>
and/or
<https://ip2location.com>
to determine the ownership of the various routers that were detected by the pathping command

```
Administrator: Windows PowerShell
PS C:\WINDOWS\system32> pathping cisco.com

Tracing route to cisco.com [2001:420:1101:1::185]
over a maximum of 30 hops:
  0  DESKTOP-03N8U4I [2607:fb90:586:eb15:c083:98a1:7036:1804]
  1  2607:fb90:586:eb15::82
  2  2607:fb90:586:eb15:0:9:e51e:1840
  3  * * *
Computing statistics for 50 seconds...
Hop  RTT      Source to Here   This Node/Link   Address
     Lost/Sent = Pct Lost/Sent = Pct
  0                                     DESKTOP-03N8U4I [2607:fb90:586:eb15:c083:98a1:7036:1804]
     0/ 100 = 0%      0/ 100 = 0%      |
  1   3ms      0/ 100 = 0%      0/ 100 = 0%      2607:fb90:586:eb15::82
     100/ 100 =100%   100/ 100 =100%   |
  2   ---     100/ 100 =100%  0/ 100 = 0%      2607:fb90:586:eb15:0:9:e51e:1840

Trace complete.
PS C:\WINDOWS\system32> 
```

BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER)

- SMALL STEP 209:
Use the mouse to highlight the IP address.
Then press
Ctrl + c
with the keyboard:

```
Select Administrator: Windows PowerShell

PS C:\WINDOWS\system32> pathping cisco.com

Tracing route to cisco.com [2001:420:1101:1::185]
over a maximum of 30 hops:
 0  DESKTOP-03N8U4I [2607:fb90:586:eb15:c083:98a1:7036:1804]
 1  2607:fb90:586:eb15::82
 2  2607:fb90:586:eb15:0:9:e51e:1840
 3  * * *
Computing statistics for 50 seconds...
Hop  RTT      Source to Here   This Node/Link   Address
    Lost/Sent = Pct Lost/Sent = Pct
 0                                DESKTOP-03N8U4I [2607:fb90:586:eb15:c083:98a1:7036:1804]
    0/ 100 = 0%      0/ 100 = 0%      |
 1    3ms      0/ 100 = 0%      0/ 100 = 0%      2607:fb90:586:eb15::82
    100/ 100 =100%   100/ 100 =100%   |
 2    ---     100/ 100 =100%   0/ 100 = 0%      2607:fb90:586:eb15:0:9:e51e:1840

Trace complete.
PS C:\WINDOWS\system32> 
```


BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER)

- SMALL STEP 210:
Go back to the Web browser.
Use the LEFT mouse button to click in the
"Type in an IP address" field.
Then press
Ctrl + v
with the keyboard:

Recycle Bin

IP Location

https://iplocation.com




IP LOCATION

INSTANTLY LOCATE ANY IP ADDRESS

This free online tool allows you to see the geographical location of any IP address. Just input the IP address and you will be shown the position on a map, coordinates, country, region, city and organization.

FIND



new lower price

on 100s of items

plus 10% off*

all outdoor furniture

shop now

Your IP address	172.56.185.116 (change)
Latitude	34.0447
Longitude	-118.2946

Windows Taskbar

IP Location - Profile...

Administrator: Wind...


7:18 PM
3/26/2023

65

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IP Location

https://iplocation.com




IP LOCATION

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Type in an IP address [FIND](#)



new lower price
on 100s of items

plus 10% off
all outdoor furniture

[shop now](#)


Your IP address	172.56.185.116 (change)
Latitude	34.0447
Longitude	-118.2946

Windows taskbar: IP Location - Profile... Administrator: Wind... 7:18 PM 3/26/2023

IP Location

https://iplocation.com

Settings and more (Alt+F)




IP LOCATION

INSTANTLY LOCATE ANY IP ADDRESS

This free online tool allows you to see the geographical location of any IP address. Just input the IP address and you will be shown the position on a map, coordinates, country, region, city and organization.

FIND



new lower price
on 100s of items

plus 10% off*
all outdoor furniture

shop now

Your IP address	172.58.22.186 (change)
Latitude	34.0526
Longitude	-118.2122
Country	United States


BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER)

- SMALL STEP 211:
Use the LEFT mouse button to click on the "Find" button:

IP Location

https://iplocation.com

Settings and more (Alt+F)




IP LOCATION

INSTANTLY LOCATE ANY IP ADDRESS

This free online tool allows you to see the geographical location of any IP address. Just input the IP address and you will be shown the position on a map, coordinates, country, region, city and organization.

FIND



new lower price
on 100s of items

plus 10% off*
all outdoor furniture

shop now

IP address	2607:fb90:586:eb15::82 (change)
Latitude	34.0322
Longitude	-118.2836
Country	United States


BIG STEP 200 (START "TERMINAL" IN A WINDOWS.. COMPUTER)

- SMALL STEP 212:
Page Down or vertically scroll down to determine the owner of the router:

IP Location

https://iplocation.com

Settings and more (Alt+F)




IP LOCATION

INSTANTLY LOCATE ANY IP ADDRESS

This free online tool allows you to see the geographical location of any IP address. Just input the IP address and you will be shown the position on a map, coordinates, country, region, city and organization.

FIND



new lower price
on 100s of items

plus 10% off*
all outdoor furniture

shop now

IP address	2607:fb90:586:eb15::82 (change)
Latitude	34.0322
Longitude	-118.2836
Country	United States

IP Location

https://iplocation.com

IP address2607:fb90:586:eb15::82 (change)

Latitude34.0322

Longitude-118.2836

CountryUnited States

RegionCalifornia

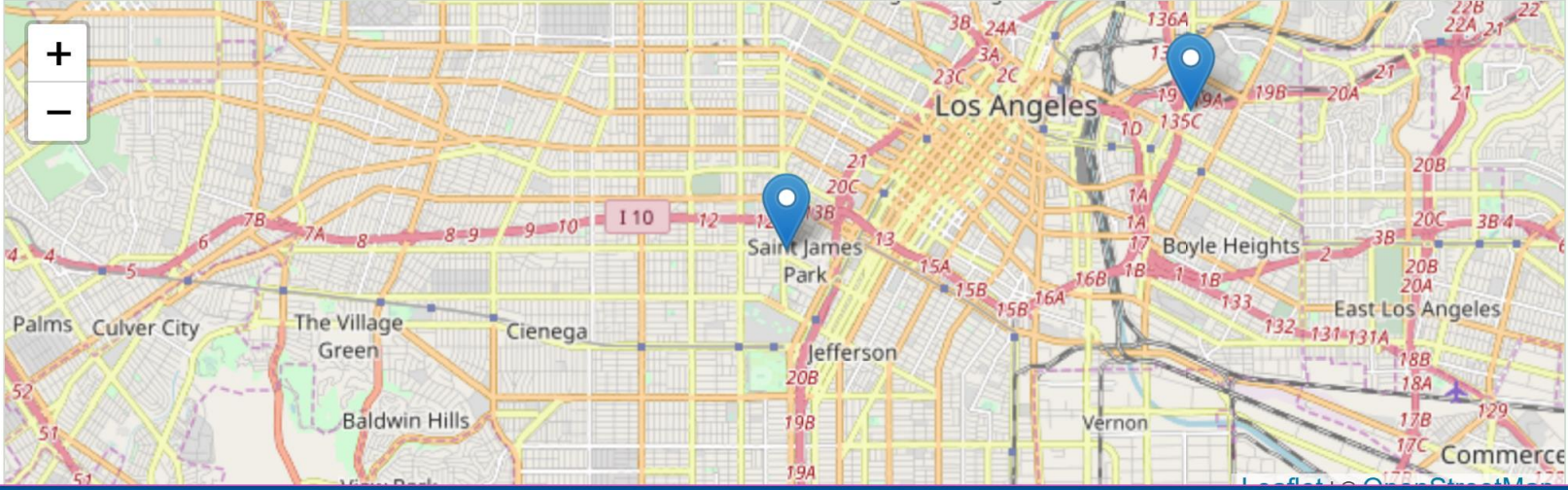
CityLos Angeles

OrganizationT-Mobile USA

IP Location

https://iplocation.com

IP address	2607:fb90:586:eb15::82 (change)
Latitude	34.0322
Longitude	-118.2836
Country	United States
Region	California
City	Los Angeles
Organization	T-Mobile USA



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