3-Wi-Fi MESH CONFIGURATION

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TuCSon COMPUTER SOCIETY

apcug

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Association of Technology
& Computer User Groups

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SUMMARY

If a single Wi-Fi router is unable to cover the entire physical area of your home or business, you can use a Wi-Fi mesh configuration to extend it's horizontal reach.

TOPICS

- Two

Internet Cloud
(= "Data Plan")

Arcadyan "GATEWAY" PROVIDED BY VERIZON

Wi-Fi Extender

Router acting as "Main" part of the mesh

Router acting as Satellite part of the mesh

ADVANTAGES OF MESH CONFIGURATIONS OF WIRELESS ROUTERS

- Automatic hand-off between mesh devices as a cell phone, tablet, or computer moves between the coverage zones pertaining to the various mesh devices

ADVANTAGES OF MESH CONFIGURATIONS OF WIRELESS ROUTERS (continued)

- End user gets a single cell phone or computer app for modifying and troubleshooting the entire collection of mesh devices

Broadband Internet modem provided by Internet provider
connects to
WAN jack of (your or their)

mesh-branded Wireless Router

which has a LAN jack that makes a "backhaul connection" to the WAN jack of either a secondary Wireless Router or to a mesh Wi-Fi device

Broadband Internet modem provided by Internet provider
connects to
WAN jack of (Internet provider's or your)

mesh-branded Wireless Router

which makes a Wi-Fi "backhaul" connection to a secondary Wireless Router or a mesh Wi-Fi device

If you make a wired "backhaul" connection to a secondary Wireless Router or a mesh Wi-Fi device, you can use one or more of the following wired local area network technologies:

Cat 5/6/7 or 8 Ethernet wires

or

Powerline networking adapters

or

Multimedia over Coax Alliance "Wave 2" (if your home has pre-installed TV RG6 coax).

MESH BRANDS:
ASUS "AiMesh
ASUS "ZenWiFi" mesh
Linksys "Velop Whole Home Mesh"
Netgear "Orbi" mesh
Netgear "NightHawk MK32" mesh
"Google Nest Wi-Fi" mesh
"Ubiquiti Amplifi HD" mesh
TP-Link "Deco" mesh
TP-Link "OneMesh"
TP-Link's implementation of "EasyMesh"
Arris "Surfboard" mesh

MESH

- A mesh is a co-operative and coordinated group of two or more of the following devices:
  routers
  Wi-Fi range extenders
  and
  mesh units
  with one of the devices designated as the "Main" unit and others designated as "Satellite" units

MESH (continued)

- "Mesh" has been greatly improved in "Wi-Fi 7".

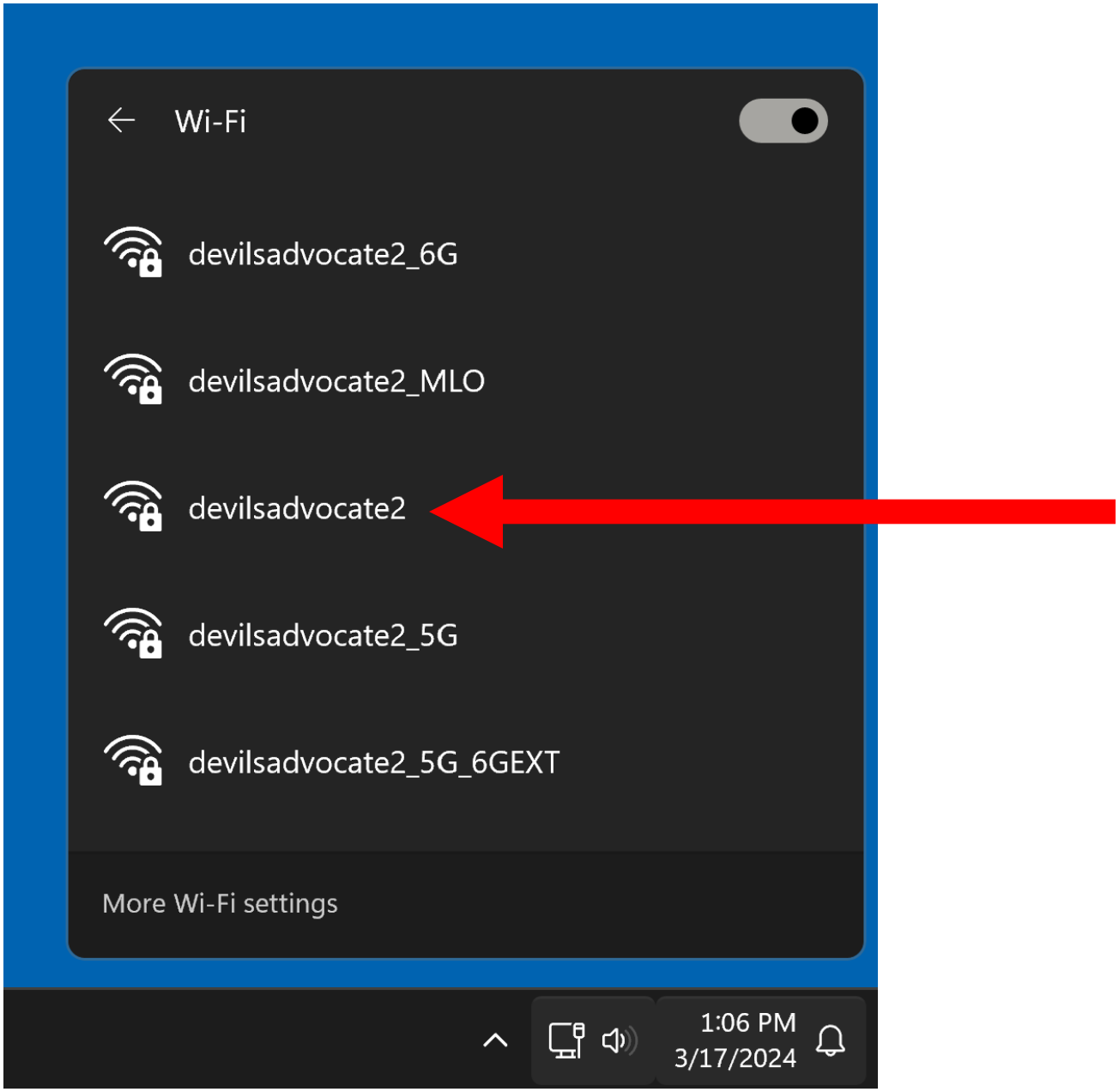
MESH (continued)

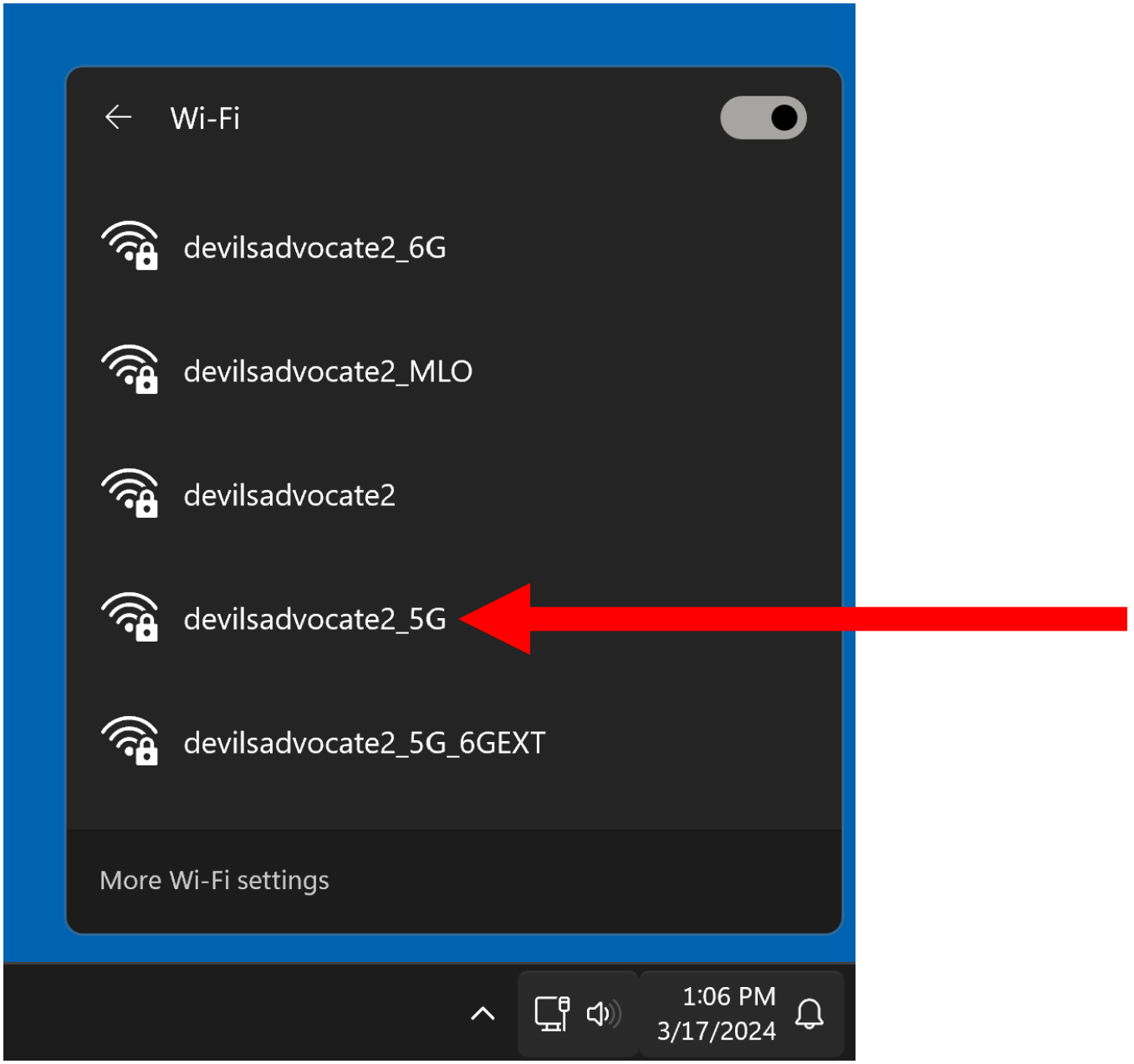
- A mesh is represented as a single "Wireless Access Point" also known as a single "Service Set Identifier" inside the wireless Wi-Fi settings in your computer, tablet, or cell phone.

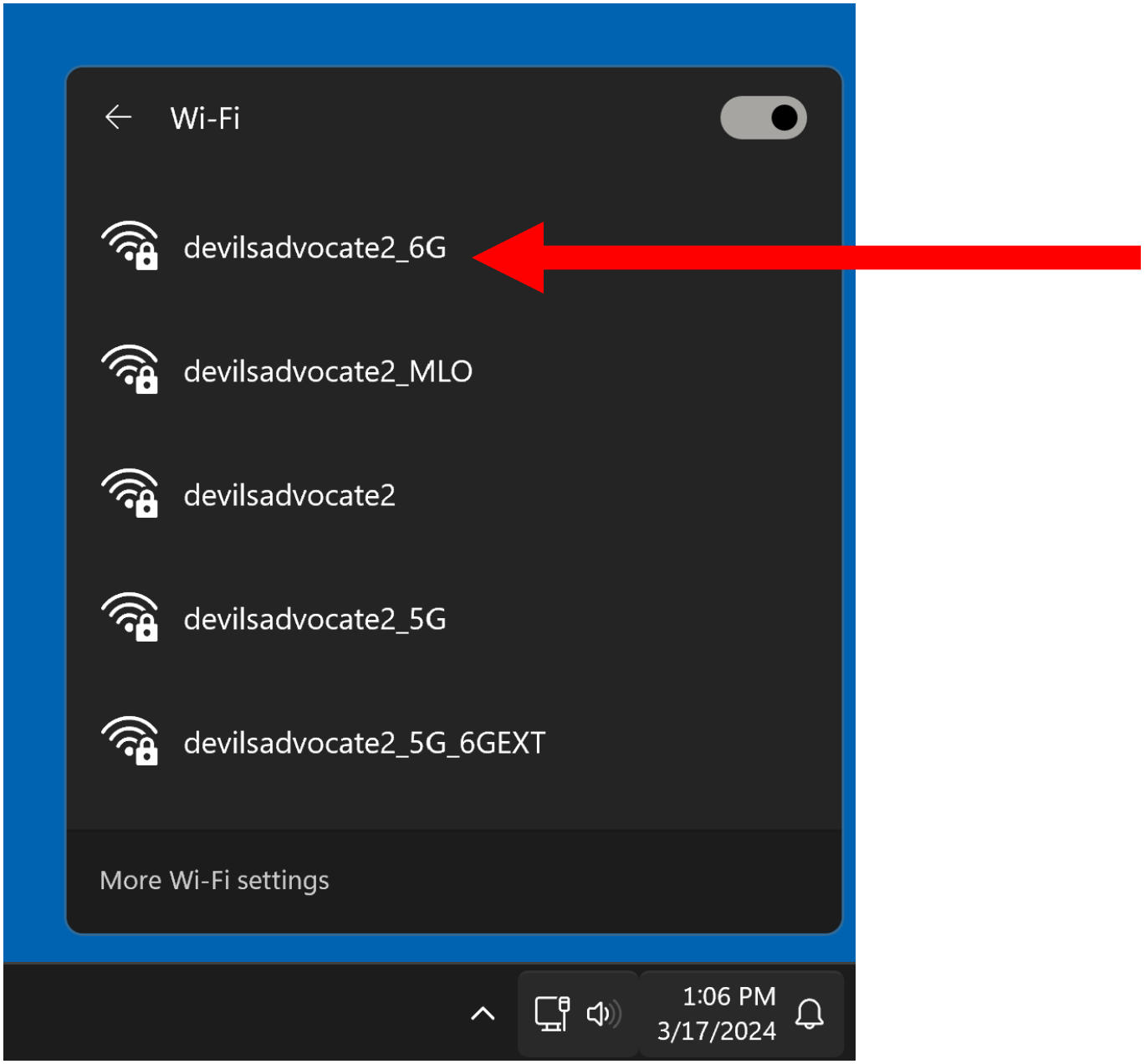
MESH (continued)

- In other words, the "Wireless Access Point" list in a computer, cell phone, or tablet does not tell you if any listing is a single transmitter/receiver in a single router or extender or mesh unit or two or more transmitter/receivers with the same SSID.


Wi-Fi
devilsadvocate2_6G
devilsadvocate2_MLO
devilsadvocate2
devilsadvocate2_5G
devilsadvocate2_5G_6GEXT
More Wi-Fi settings
1:06 PM
3/17/2024


Wi-Fi
devilsadvocate2_6G
devilsadvocate2_MLO
devilsadvocate2
devilsadvocate2_5G
devilsadvocate2_5G_6GEXT
More Wi-Fi settings
1:06 PM
3/17/2024


Wi-Fi
devilsadvocate2_6G
devilsadvocate2_MLO
devilsadvocate2
devilsadvocate2_5G
devilsadvocate2_5G_6GEXT
More Wi-Fi settings
1:06 PM
3/17/2024


Wi-Fi
devilsadvocate2_6G
devilsadvocate2_MLO
devilsadvocate2
devilsadvocate2_5G
devilsadvocate2_5G_6GEXT
More Wi-Fi settings
1:06 PM
3/17/2024

SSID	BSSID	Channel	Frequency	Channel wid...	Band
devilsadvocate2	40:ED:00:47:B0:3C	10	2457	20	2.4
devilsadvocate2	3C:52:A1:6F:43:06	10	2457	20	2.4
devilsadvocate2_5G	40:ED:00:47:B0:3D	36 (50)	5180	160	5
devilsadvocate2_5G	3C:52:A1:6F:43:07	36 (50)	5180	160	5
devilsadvocate2_5G_6GEXT	22:52:A1:6F:43:08	133 (143)	6615	160	6
devilsadvocate2_6G	7A:ED:00:47:B0:3E	165 (175)	6775	160	6
devilsadvocate2_MLO	7A:ED:00:47:B0:30	165 (175)	6775	160	6
devilsadvocate2_MLO	92:ED:00:47:B0:3C	10	2457	20	2.4
devilsadvocate2_MLO	92:ED:00:47:B0:3D	36 (50)	5180	160	5

MESH (continued)

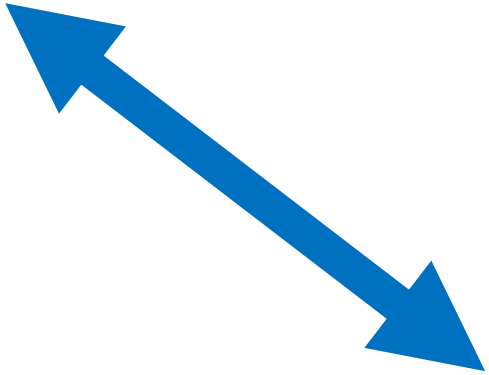
- "Main" device of the mesh is a TP-Link "Archer BE800" Wi-Fi 7 router
- "Satellite" device of the mesh is a TP-Link "Archer BE550" Wi-Fi 7 router

TP-Link Tri-Band BE19000 WiFi 7 Router (Archer BE800) | 12-Stream 19 Gbps | 2 × 10G + 4 × 2.5G Ports | LED Screen | 8 High-Performance Antennas | VPN, Easy Mesh, 4×4 MU-MIMO, HomeShield, Private IoT

Visit the TP-Link Store

3.9 ★★★★☆ 79 ratings | Search this page

200+ bought in past month



TP-Link Tri-Band BE9300 WiFi 7 Router Archer BE550 | 6-Stream 9.2Gbps | **Full 2.5G** Ports | USB 3.0 | 6 Smart Internal Antennas VPN Clients & Server | Easy Mesh, HomeShield, Private IoT Network

Visit the TP-Link Store

4.5 ★★★★½ 17,904 ratings | Search this pag

1K+ bought in past month

22

MESH (continued)

- The "Main" device of the mesh must be connected to either the Local Area side of an existing router that connects to an Internet service provider or to the "Point of Presence" of an existing Internet Service Provider.

MESH (continued)

- "backhaul" connection between the two mesh devices can be wireless Wi-Fi transmitter/receivers on the two routers
  or
  a powerline networking link
  or
  a wired Cat 5 or 6 or 7 or 8

MESH (continued)

- If you do not provide a powerline networking link or a Cat 5/6/7/8 Ethernet cable between the satellite mesh device and the main mesh device, the the backhaul connection will default to a wireless Wi-Fi connection between one of Wi-Fi transmitter/receiver on the "Main" unit and the a similar one on the "Satellite" unit.

MESH (continued)

- "backhaul" connection between the two mesh devices can be
  Wireless Wi-Fi low-band 5 GHz transmitter/receivers on the two routers
  or
  powerline networking kit link
  or
  wired Cat 5 or 6 or 7 or 8

MESH (continued)

- In this example, each mesh SSID shown in the client device consists of
- "Main" device of the mesh is a TP-Link "Archer BE800" Wi-Fi 7 router
- "Satellite" device of the mesh is a TP-Link "Archer BE550" Wi-Fi 7 router

MESH (continued)

- "Main" device of the mesh: https://www.amazon.com/TP-Link-Archer-BE800-High-Performance-HomeShield/dp/B0C4VZWTM7/

MESH (continued)

- "Satellite" device of the mesh: https://www.amazon.com/TP-Link-Tri-Band-Archer-BE550-HomeShield/dp/B0CJSNSVMR/

MESH (continued)

- "Satellite" device of the mesh: https://www.amazon.com/TP-Link-Tri-Band-Archer-BE550-HomeShield/dp/B0CJSNSVMR/

MESH (continued)

- At any single point in time and space, a client device that is connected to a mesh can only be connected to either the transmitter/receiver that is assigned to the mesh in the "Main" device of the mesh
or to a transmitter/receiver that is assigned to the mesh in one single "Satellite" device of the mesh

MESH (continued)

- When the client device is moved away from the coverage area of the mesh device to the coverage area of the other mesh device, an orderly handoff is supposed to occur.

MESH (continued)

- If an orderly handoff does not occur, you can either
  turn off and then back on the Wi-Fi connection from inside the client device
  or you can use a Faraday bag to turn off the Wi-Fi connection for the client device
  (Using a Faraday does not disrupt a Zoom meeting connection)[33]

MESH (continued)

- https://www.amazon.com/stores/page/7460D215-9112-42D7-BCD9-D65FE3D7C198?ingress=2&visitId=d15564ef-0fd5-4c44-8ae1-7db4edddd368&store_ref=bl_ast_dp_brandLogo_sto&ref_=ast_bln

MESH (continued)

- https://www.amazon.com/stores/page/7460D215-9112-42D7-BCD9-D65FE3D7C198?ingress=2&visitId=d15564ef-0fd5-4c44-8ae1-7db4edddd368&store_ref=bl_ast_dp_brandLogo_sto&ref_=ast_bln

MESH BRANDS

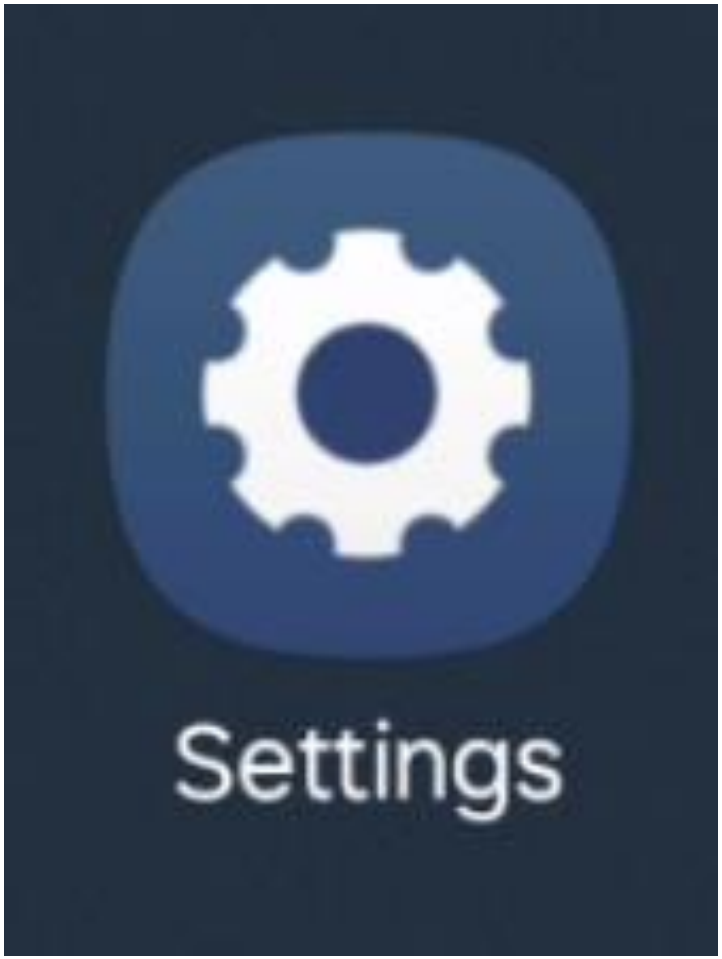
- Each mesh brand belongs to a single router manufacturer.
- "OpenMesh" and "EasyMesh" are two emerging attempts to create a mesh system that all router manufacturers could use for interoperability
- Here are some popular mesh brands:

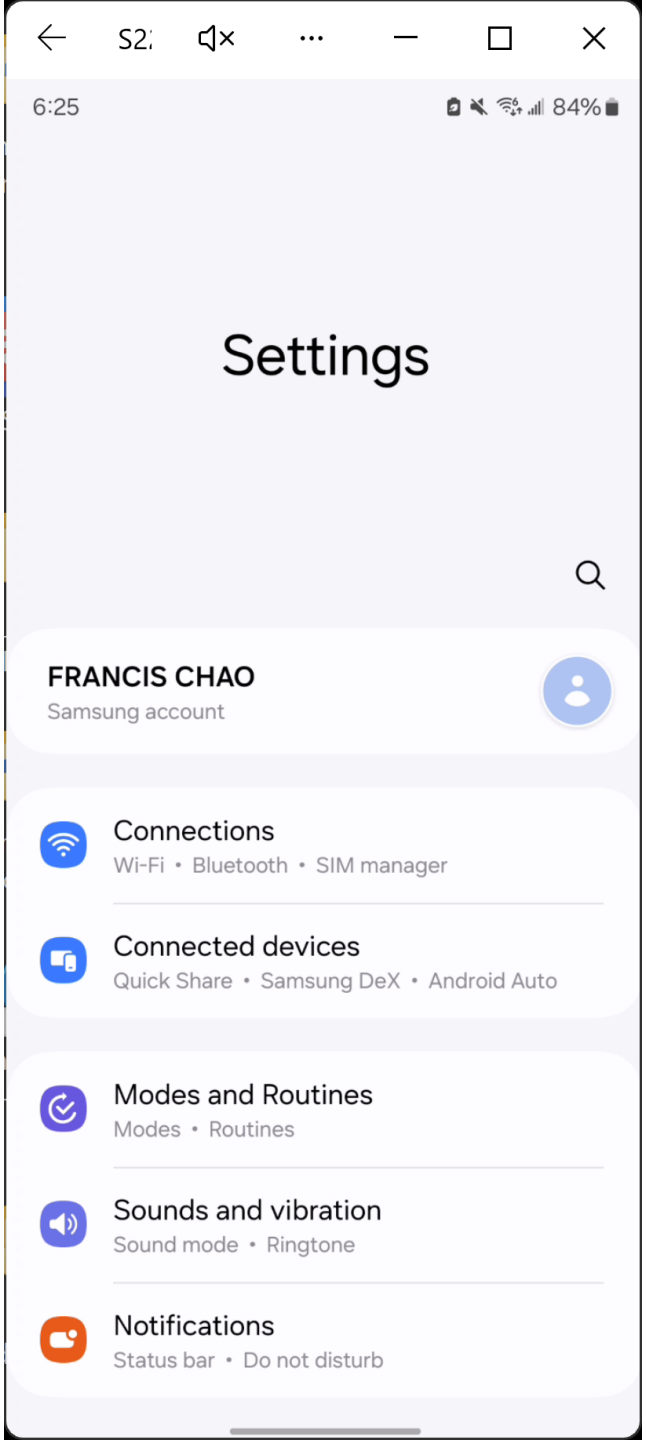
ASUS "AiMesh
ASUS "ZenWiFi" mesh
Linksys "Velop Whole Home Mesh"
Netgear "Orbi" mesh
Netgear "NightHawk MK32" mesh
"Google Nest Wi-Fi" mesh
"Ubiquiti Amplifi HD" mesh
TP-Link "Deco" mesh
TP-Link "OneMesh"
TP-Link's implementation of "EasyMesh"
Arris "Surfboard" mesh

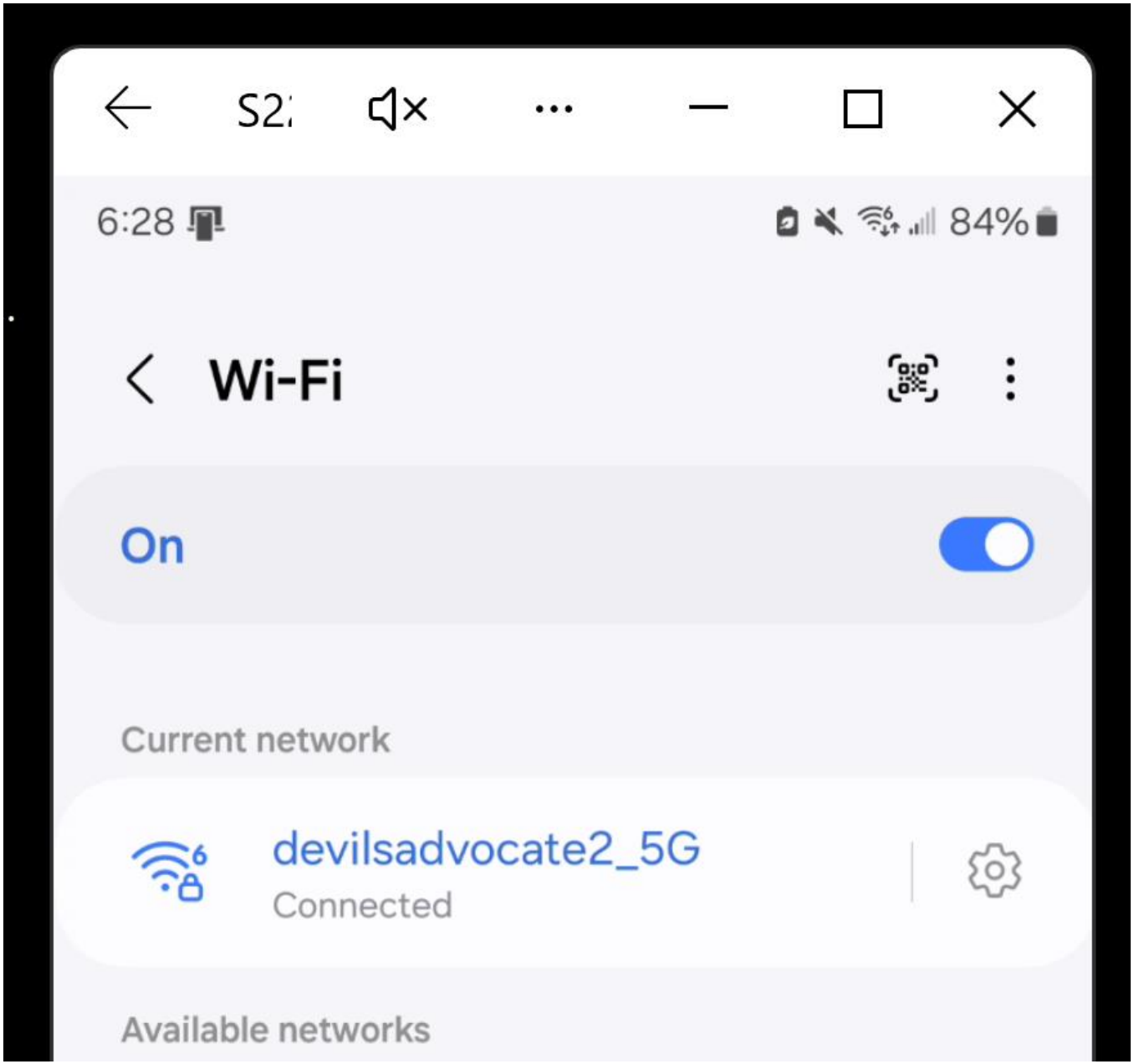
EXAMPLE OF A MESH GROUP

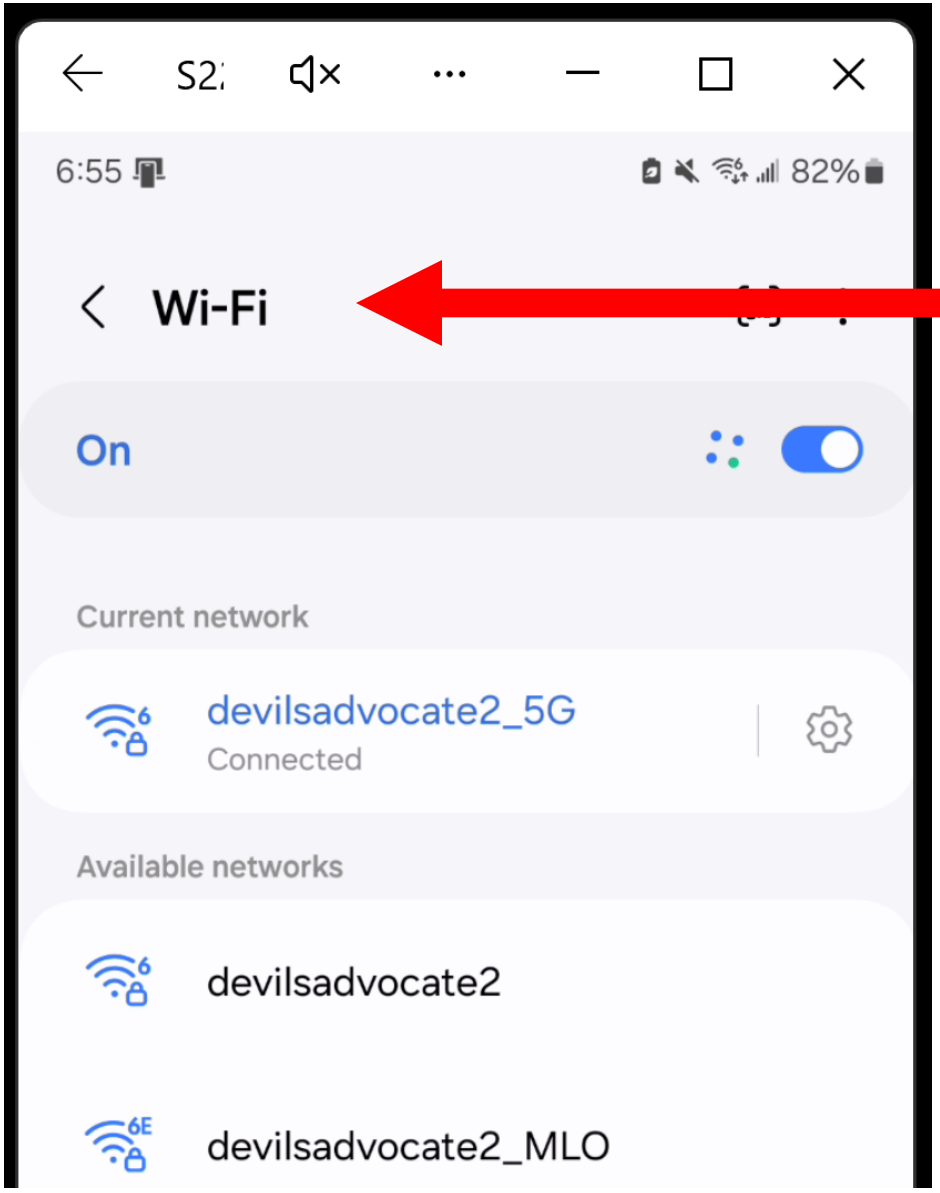
- In order to use TP-Link's "Tether" app to configure or troubleshoot this mesh group, your cell phone must be wirelessly connected to the mesh group:

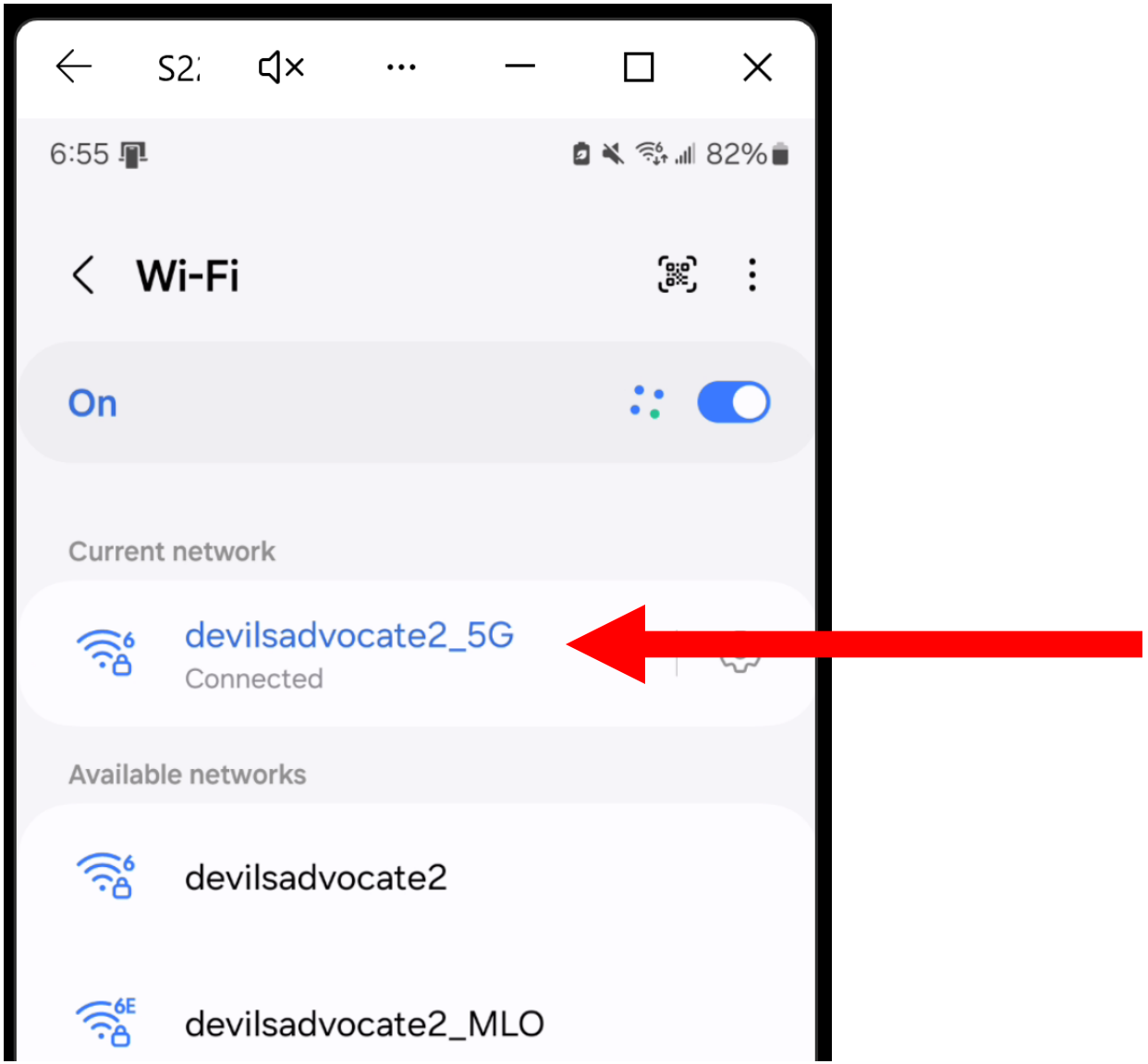

S2
Maximi
6:22
Search
Settings


Settings


S2
6:25
84%
Settings
FRANCIS CHAO
Samsung account
Connections
Wi-Fi • Bluetooth • SIM manager
Connected devices
Quick Share • Samsung DeX • Android Auto
Modes and Routines
Modes • Routines
Sounds and vibration
Sound mode • Ringtone
Notifications
Status bar • Do not disturb


S2
6:28
84%
Wi-Fi
On
Current network
devilsadvocate2_5G
Connected
Available networks

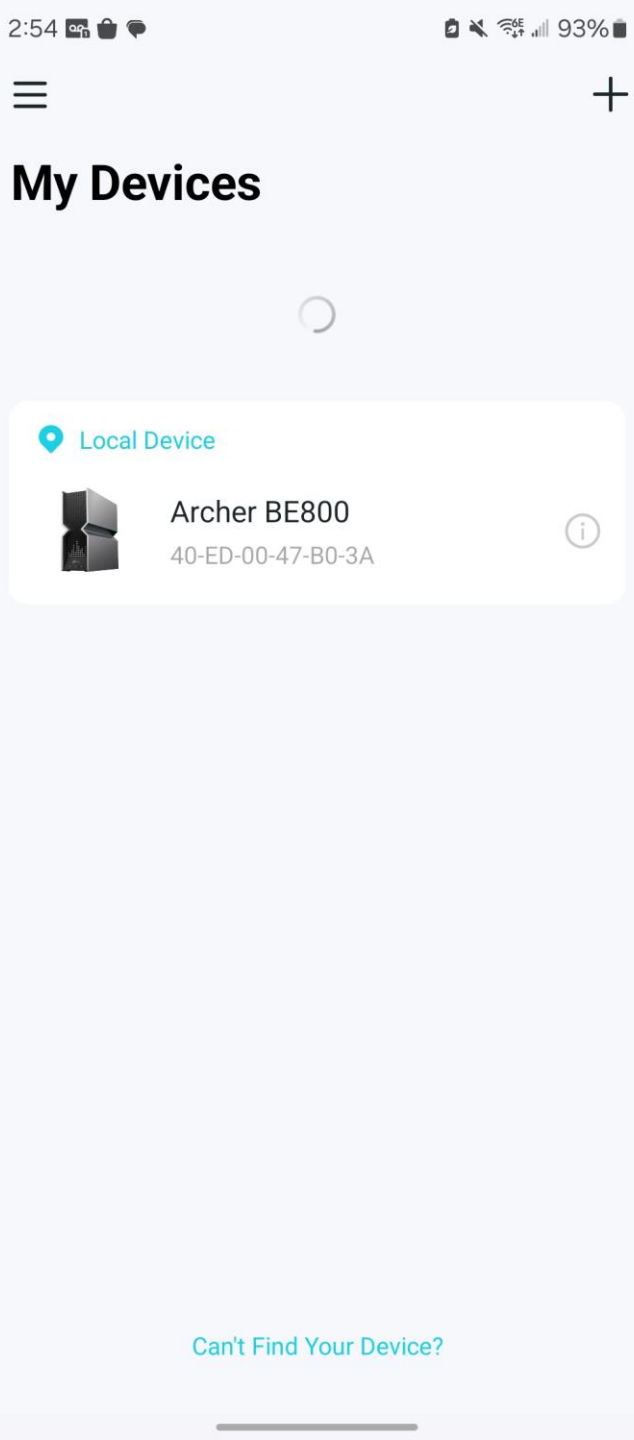

6:55
82%
Wi-Fi
On
Current network
devilsadvocate2_5G
Connected
Available networks
devilsadvocate2
devilsadvocate2_MLO

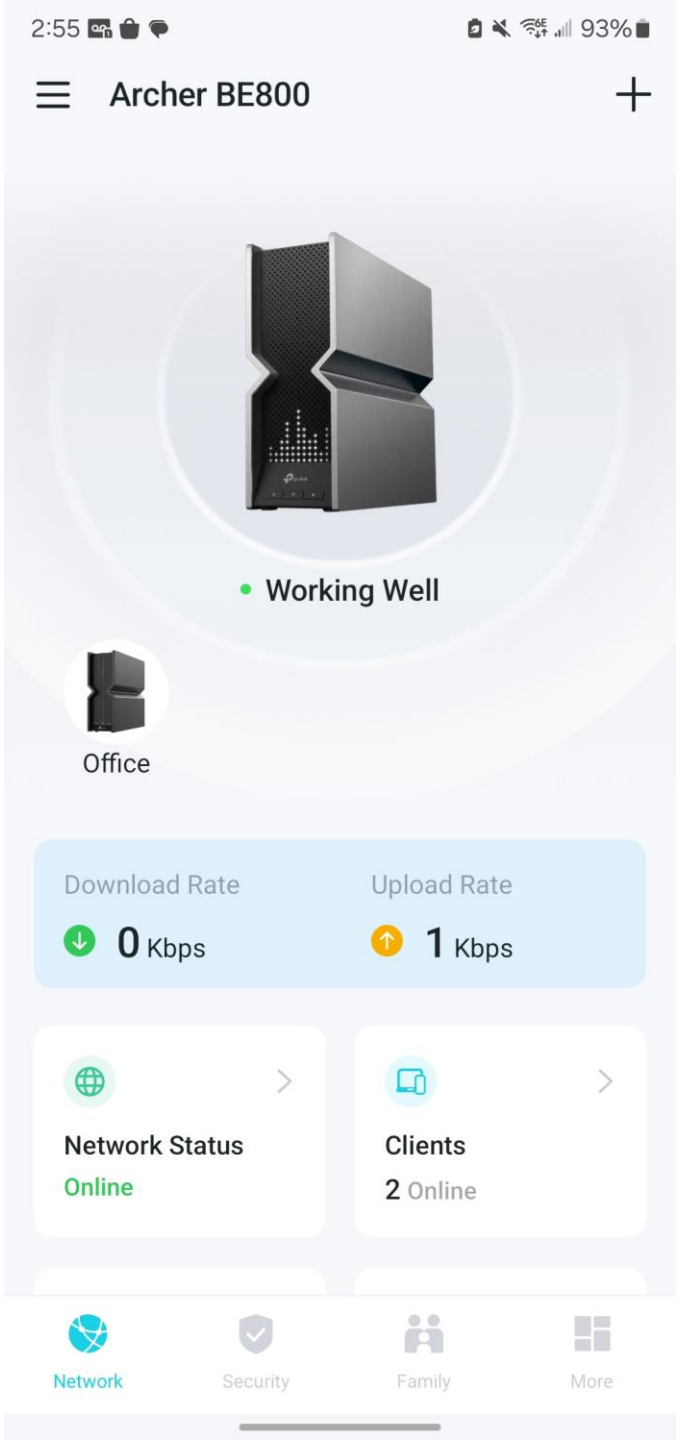

6:55
82%
Wi-Fi
On
Current network
devilsadvocate2_5G
Connected
Available networks
devilsadvocate2
devilsadvocate2_MLO

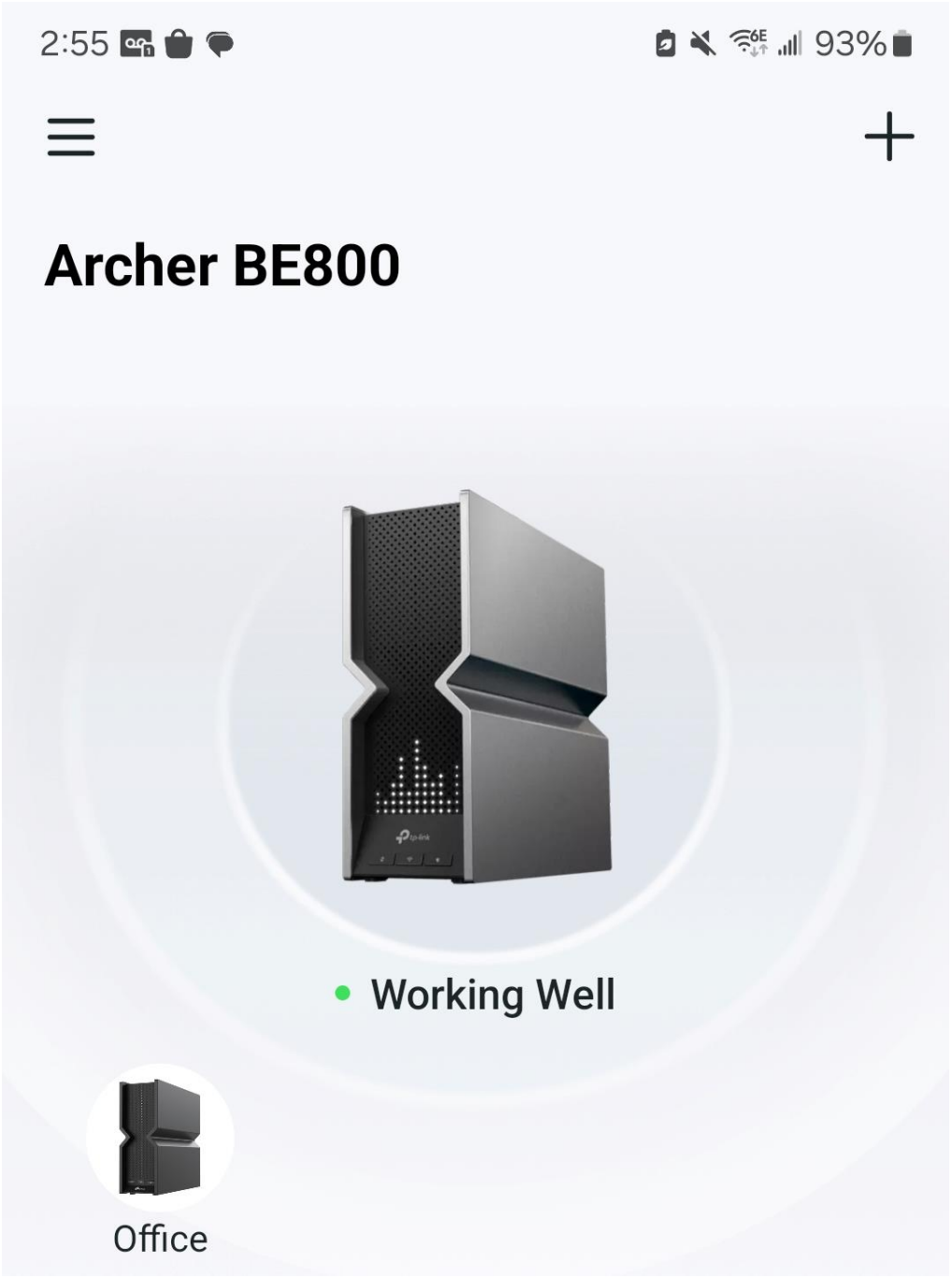
EXAMPLE OF A MESH GROUP (continued)

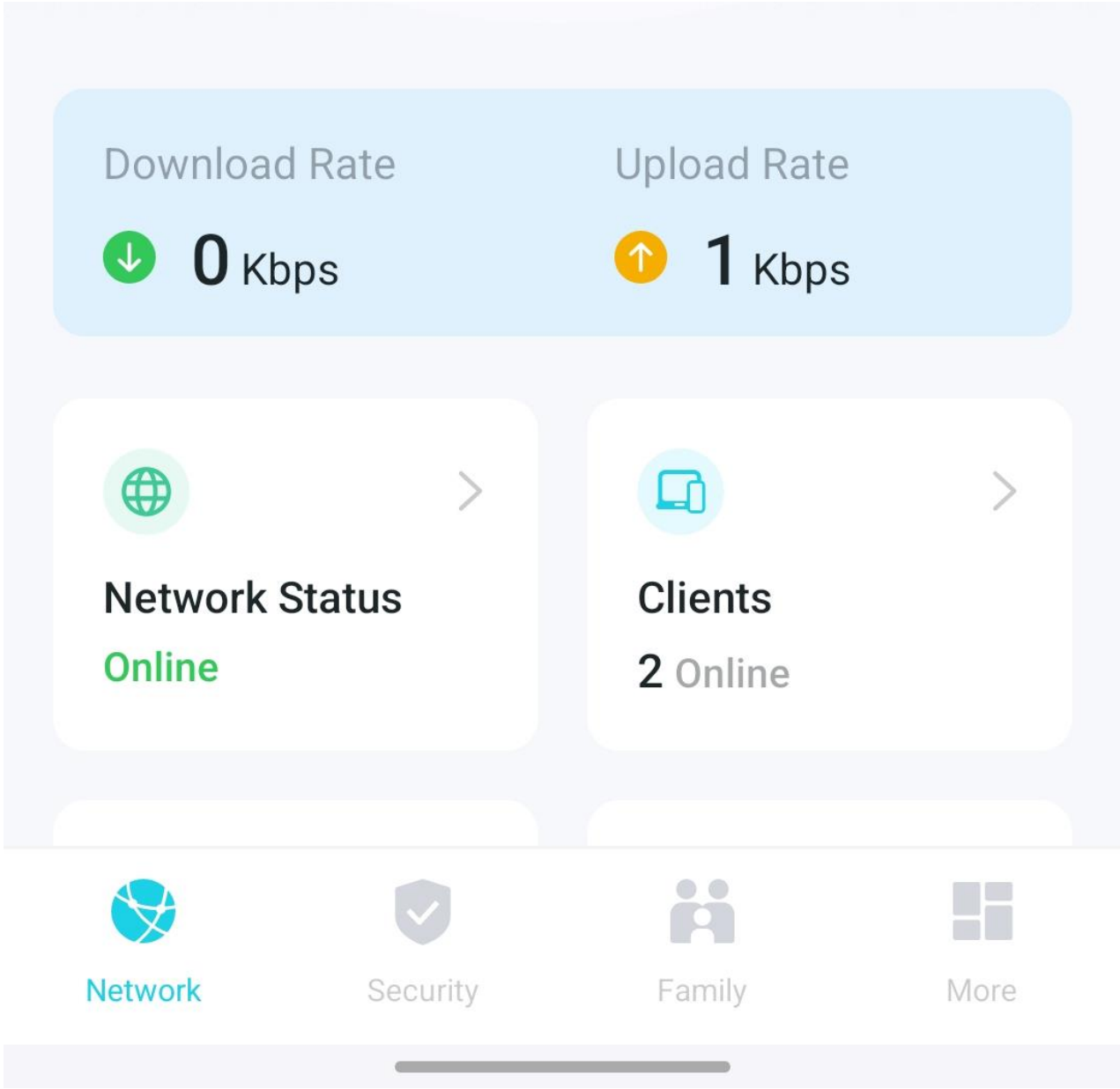
- "Main" mesh unit has a high-band 5 GHz transmitter/receiver that has an SSID of **devilsadvocate2_5G**
- "Satellite" mesh unit has a high-band 5 GHz transmitter/receiver that has a SSID of **devilsadvocate2_5G**

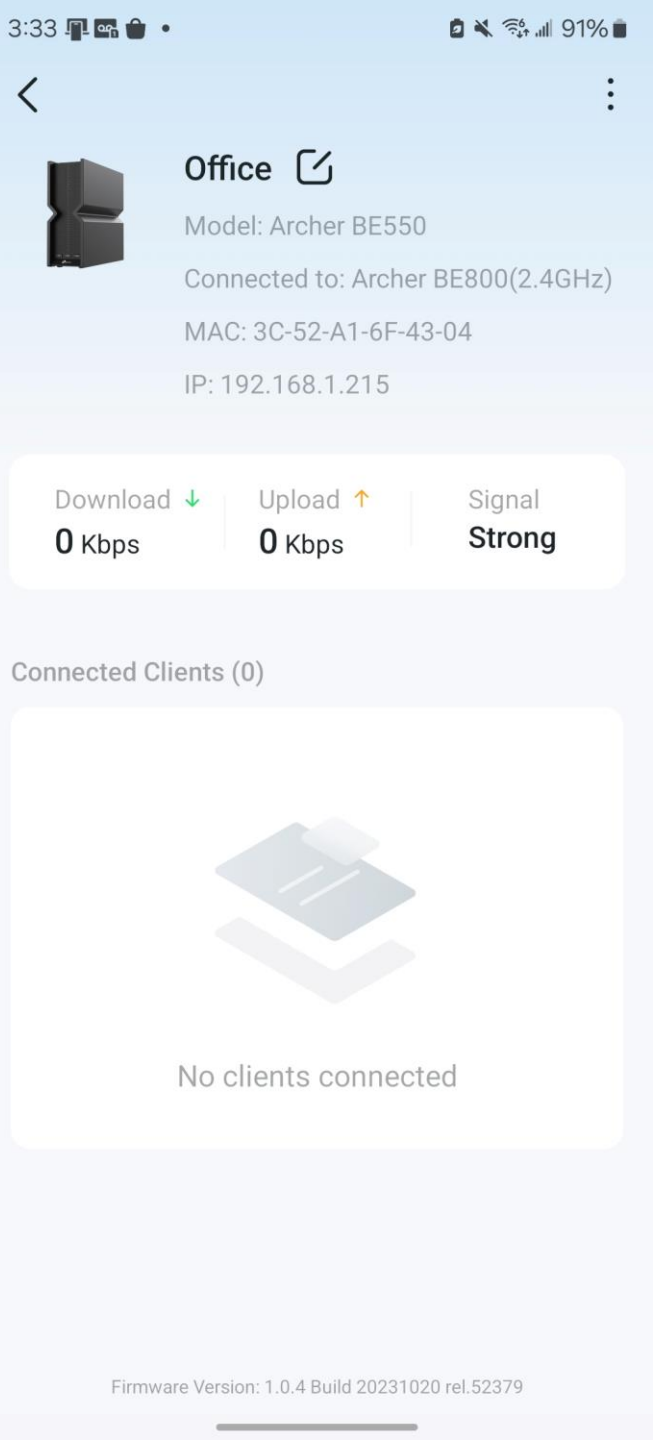

Tether


2:54
93%
My Devices
Local Device
Archer BE800
40-ED-00-47-B0-3A
Can't Find Your Device?


2:55
93%
Archer BE800
Working Well
Office
Download Rate
0 Kbps
Upload Rate
1 Kbps
Network Status
Online
Clients
2 Online
Network
Security
Family
More


2:55
93%
Archer BE800
Working Well
Office


Download Rate
0 Kbps
Upload Rate
1 Kbps
Network Status
Online
Clients
2 Online
Network
Security
Family
More


3:33
91%
Office
Model: Archer BE550
Connected to: Archer BE800(2.4GHz)
MAC: 3C-52-A1-6F-43-04
IP: 192.168.1.215
Download
0 Kbps
Upload
0 Kbps
Signal
Strong
Connected Clients (0)
No clients connected
Firmware Version: 1.0.4 Build 20231020 rel.52379

3:33 • 91%

Office

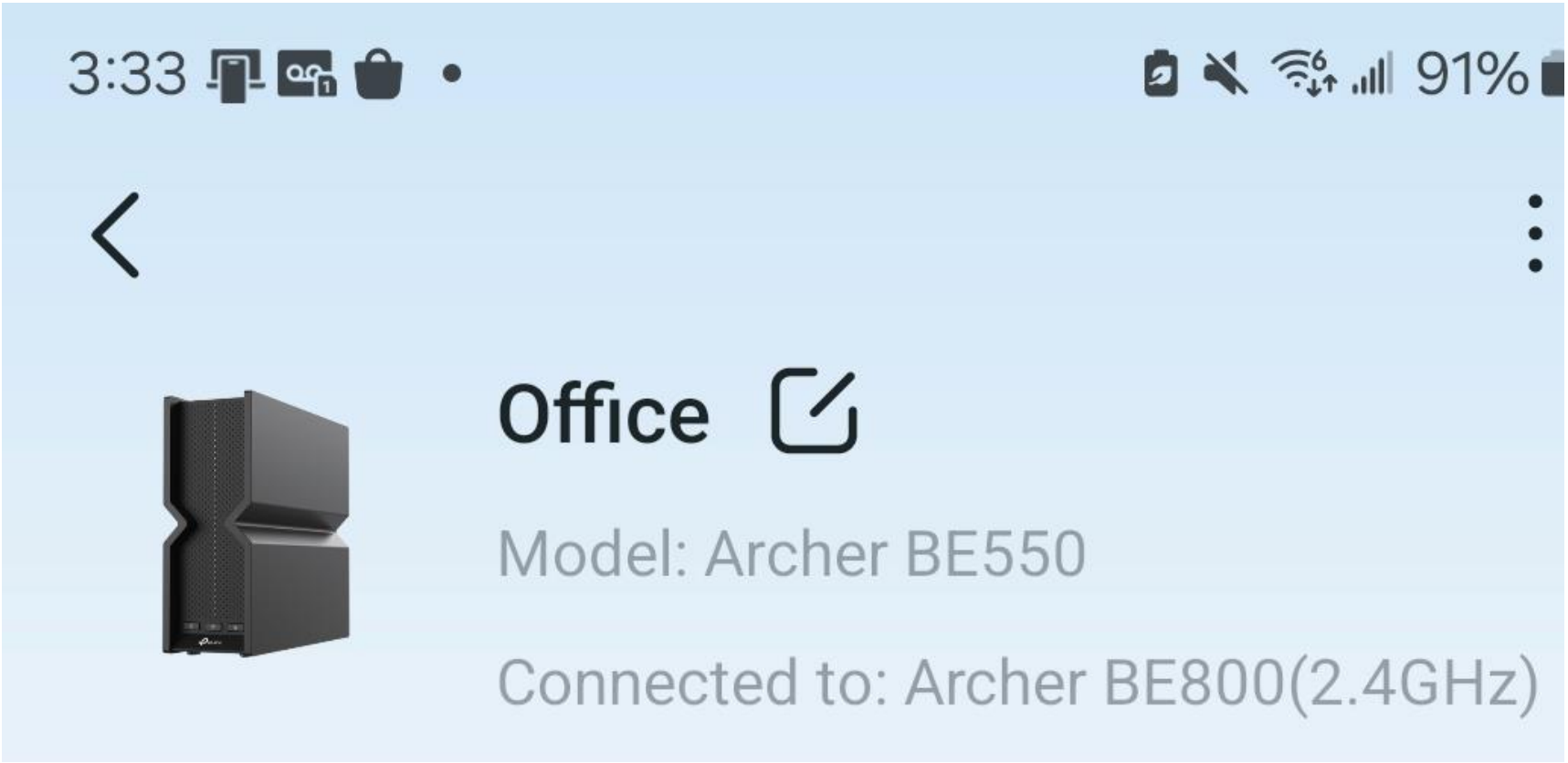
Model: Archer BE550

Connected to: Archer BE800(2.4GHz)

MAC: 3C-52-A1-6F-43-04

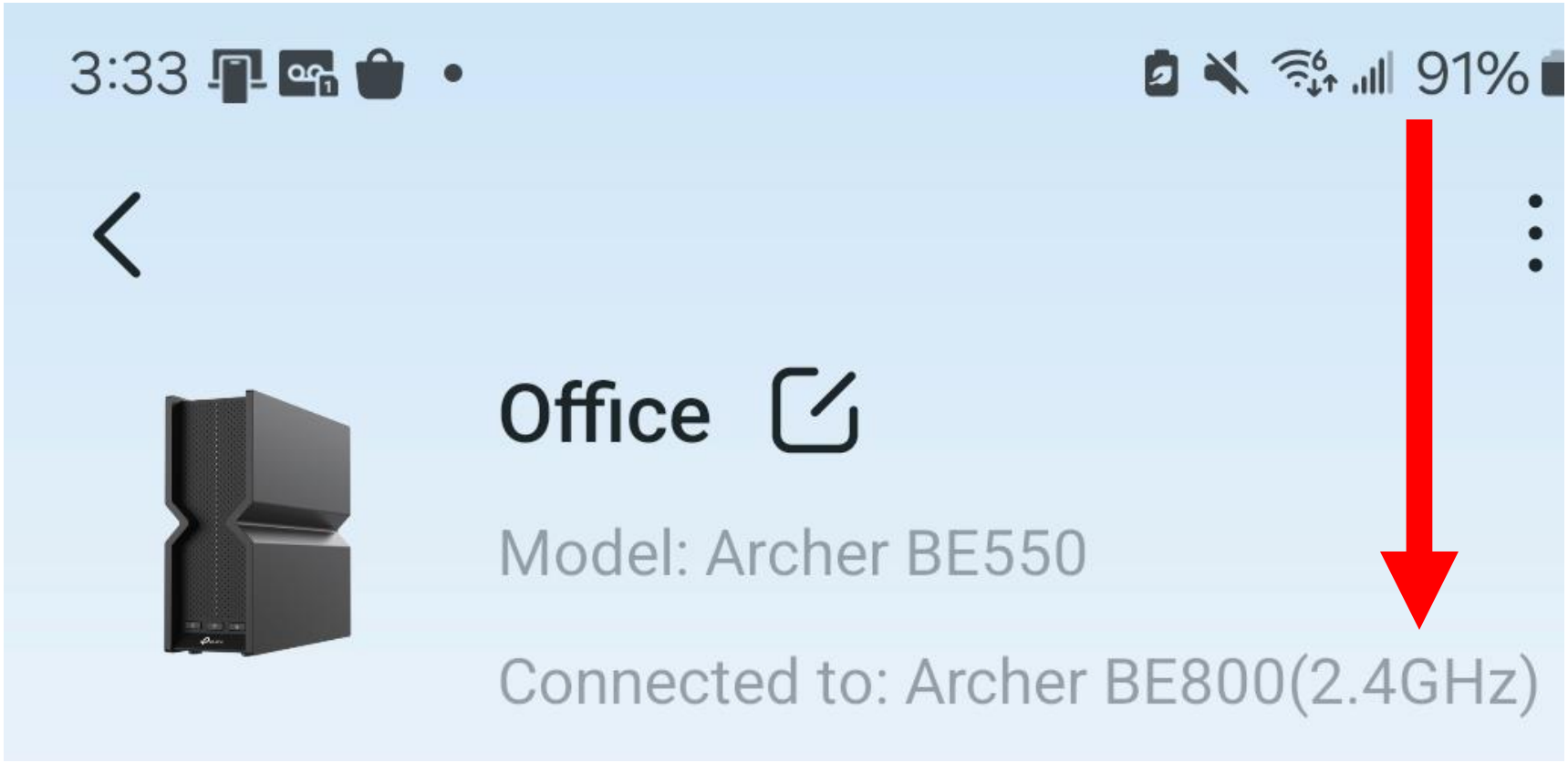
IP: 192.168.1.215

Download ↓	Upload ↑	Signal
0 Kbps	0 Kbps	Strong


3:33
91%
Office
Model: Archer BE550
Connected to: Archer BE800(2.4GHz)

EXAMPLE OF A MESH GROUP (continued)

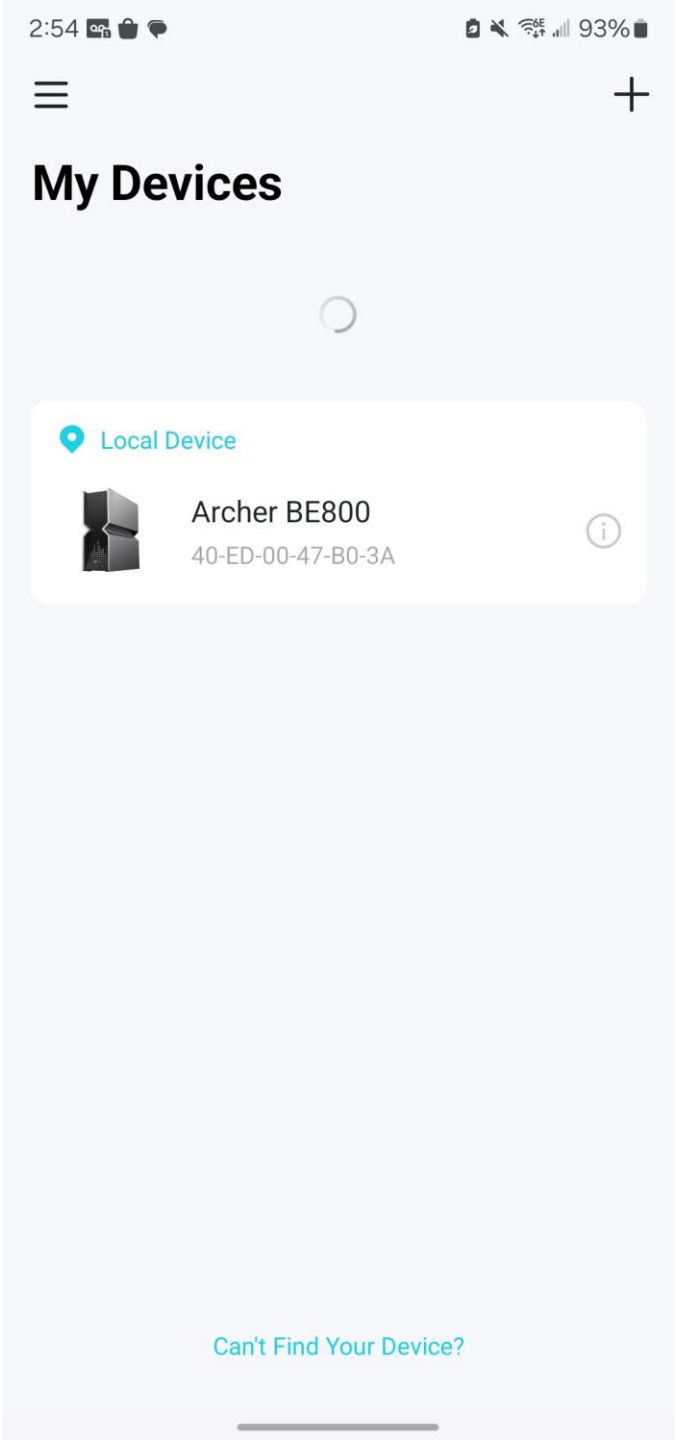
- In this case, the mesh group of routers decided to make the backhaul via a connection between the 2.45 transmitter/receiver of the "Main" router to the 2.45 transmitter of the "Satellite" router named "Office":

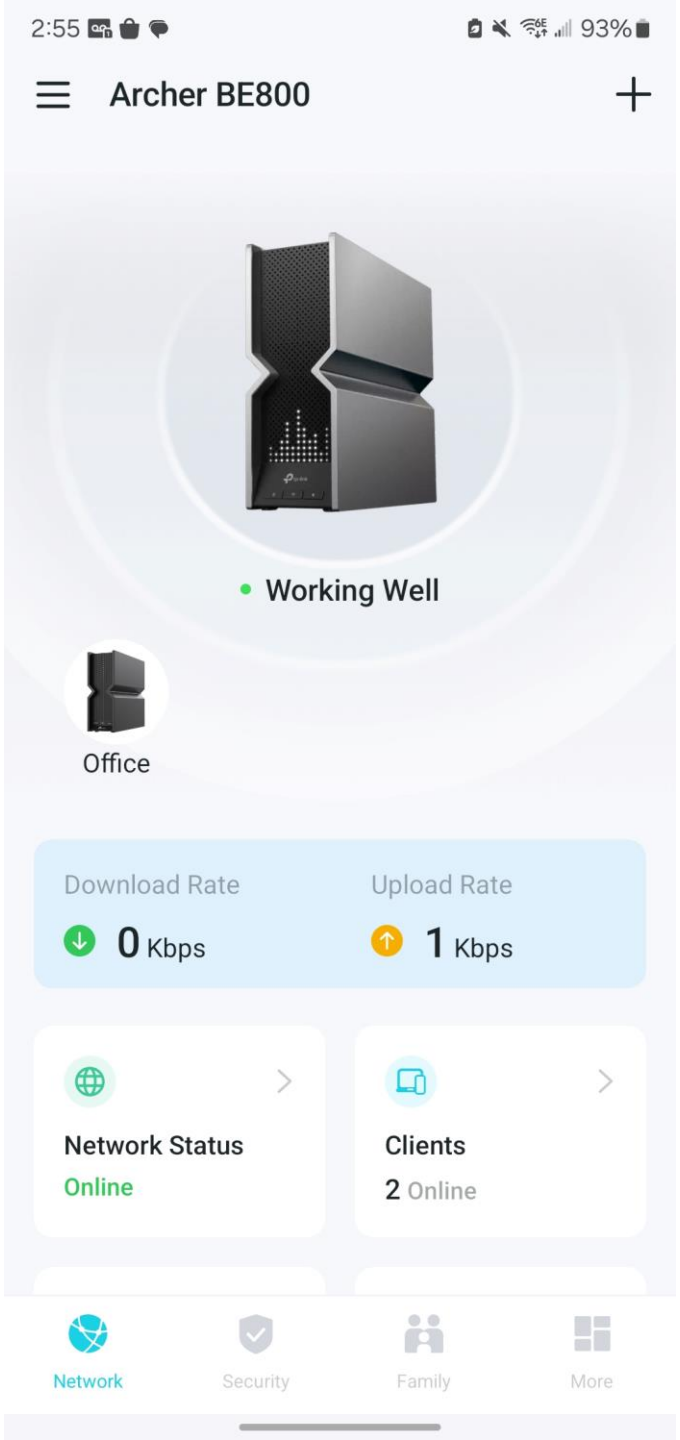

3:33
91%
Office
Model: Archer BE550
Connected to: Archer BE800(2.4GHz)

ADDING A NEW ROUTER OR A MESH-CAPABLE Wi-Fi EXTENDER TO AN EXISTING MESH GROUP

- Connect your cell phone to any of the SSIDs of your existing mesh group
- Download the "TP-Link Tether" app
- Start the "TP-Link Tether" app.
- Tap on the "Main" router of the existing mesh group


Tether


2:54
93%
My Devices
Local Device
Archer BE800
40-ED-00-47-B0-3A
Can't Find Your Device?

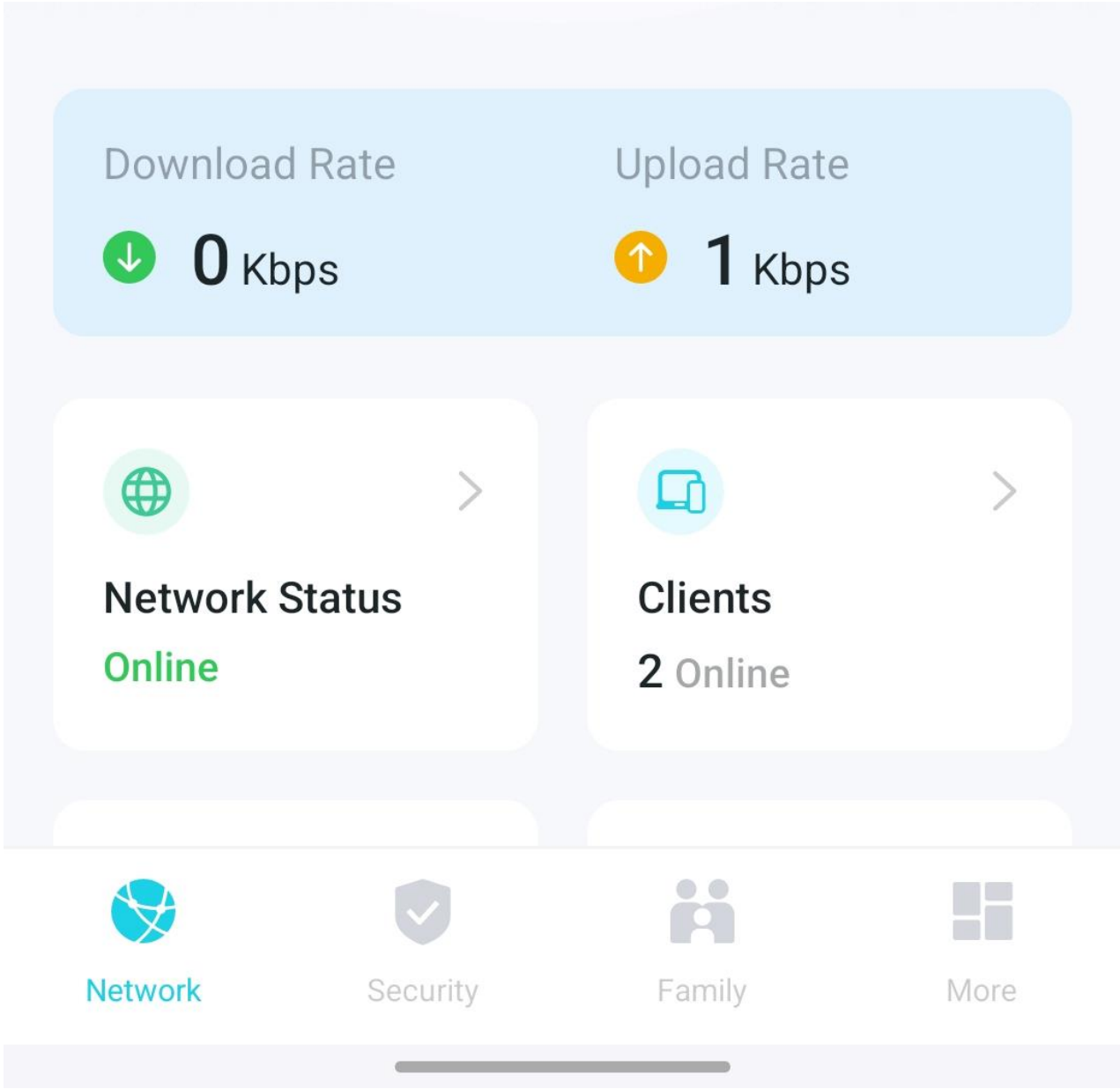

2:55
93%
Archer BE800
Working Well
Office
Download Rate
0 Kbps
Upload Rate
1 Kbps
Network Status
Online
Clients
2 Online
Network
Security
Family
More

2:55 93%

Archer BE800

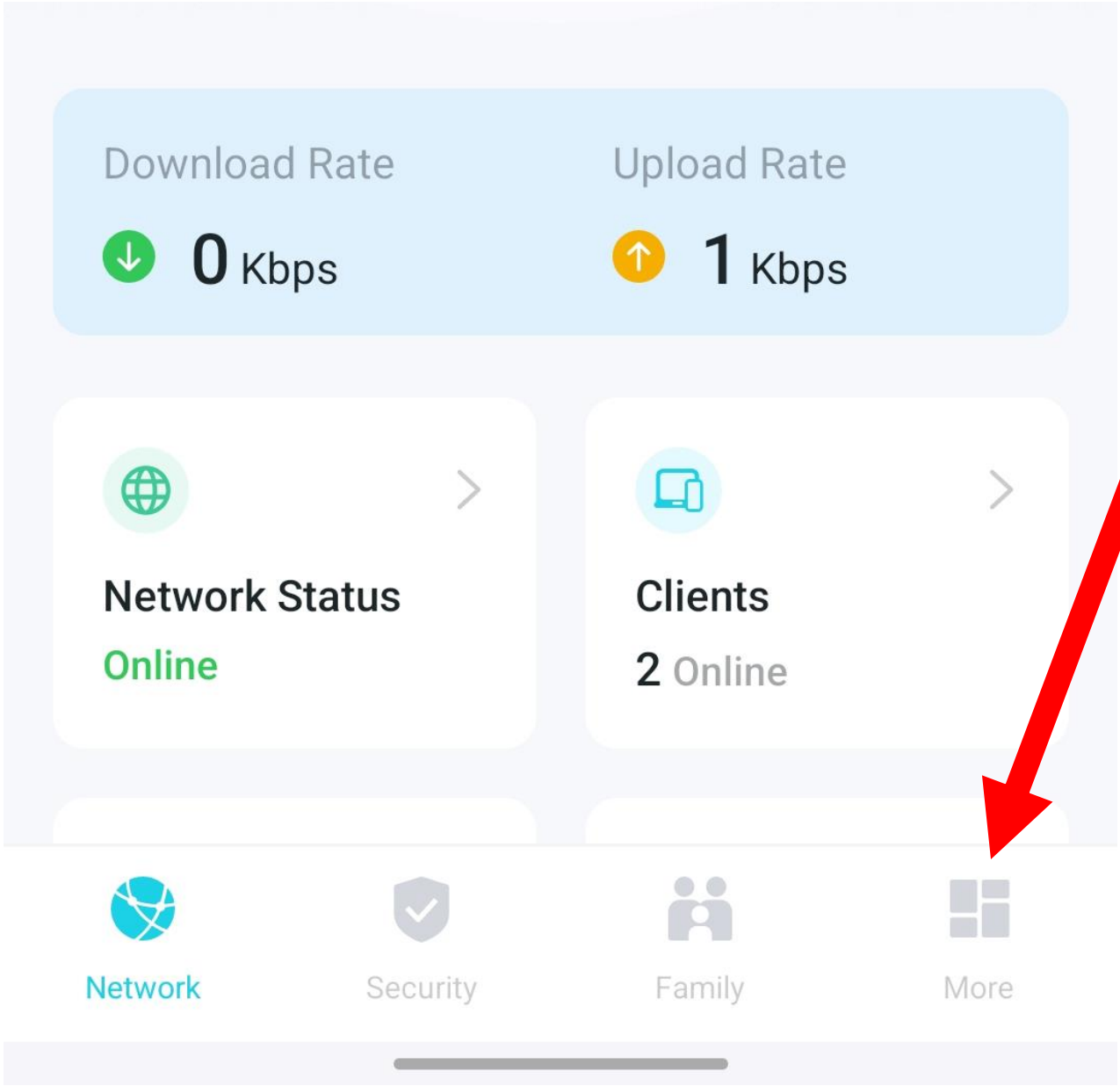
Working Well

Office


Download Rate
0 Kbps
Upload Rate
1 Kbps
Network Status
Online
Clients
2 Online
Network
Security
Family
More

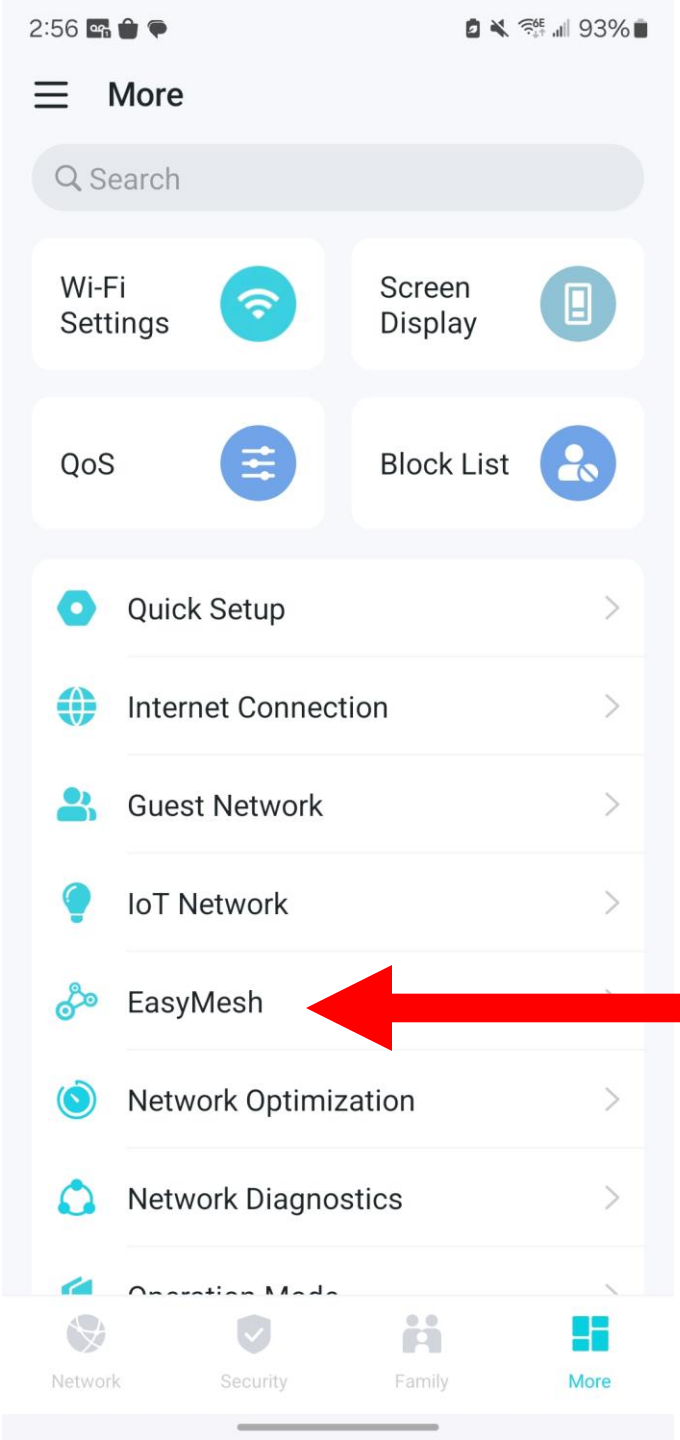
ADDING A NEW ROUTER OR MESH-CAPABLE Wi-Fi EXTENDER TO AN EXISTING MESH GROUP (continued)

- Tap on the fuzzed-out "More" button at the bottom of the screen:


Download Rate
0 Kbps
Upload Rate
1 Kbps
Network Status
Online
Clients
2 Online
Network
Security
Family
More

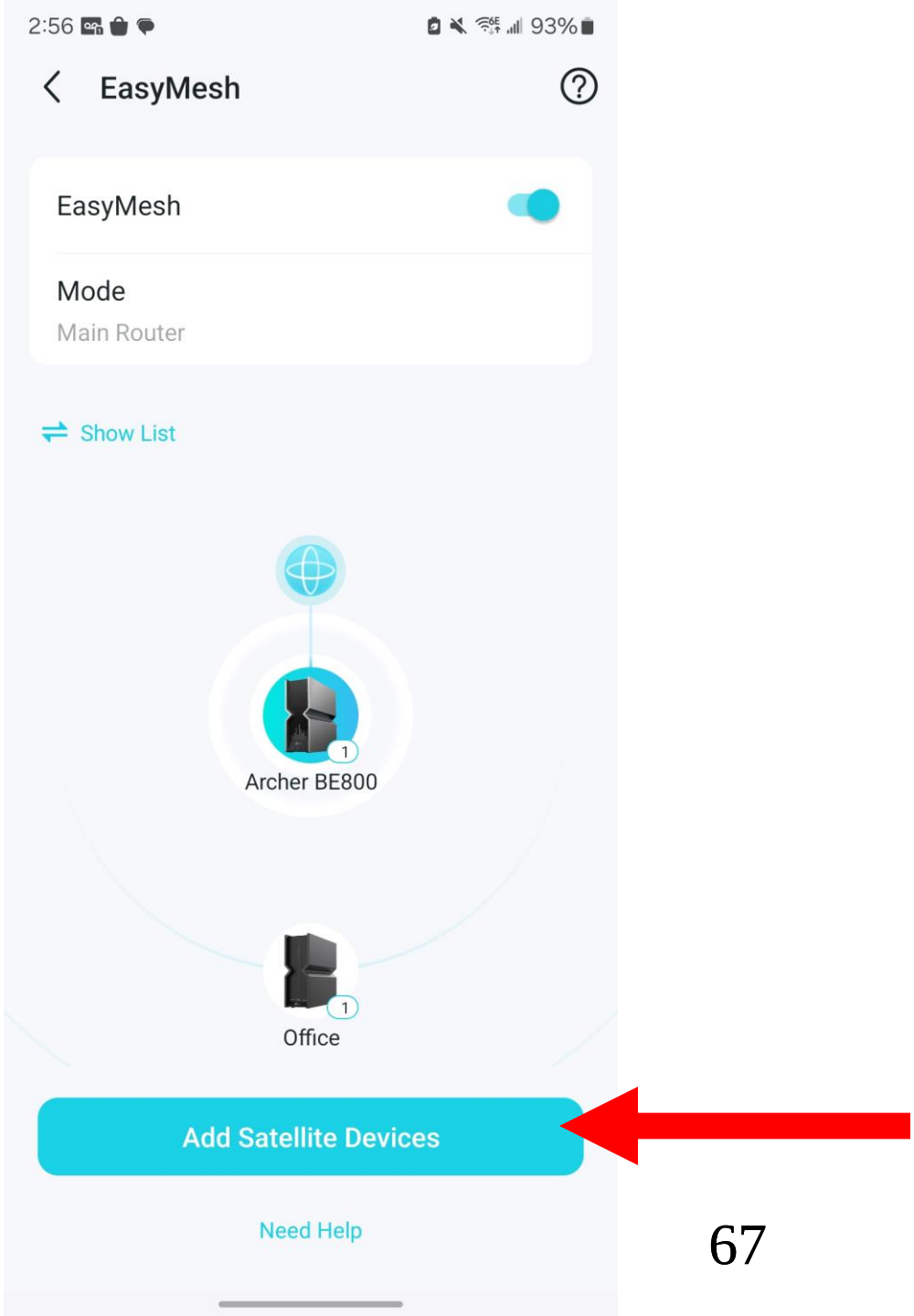
ADDING A NEW ROUTER OR MESH-CAPABLE Wi-Fi EXTENDER TO AN EXISTING MESH GROUP (continued)

- Tap on "EasyMesh":


2:56
93%
More
Search
Wi-Fi Settings
Screen Display
QoS
Block List
Quick Setup
Internet Connection
Guest Network
IoT Network
EasyMesh
Network Optimization
Network Diagnostics
Network
Security
Family
More

ADDING A NEW ROUTER OR MESH-CAPABLE Wi-Fi EXTENDER TO AN EXISTING MESH GROUP (continued)

- Tap on "Add Satellite Devices":


2:56
93%
EasyMesh
EasyMesh
Mode
Main Router
Show List
1
Archer BE800
1
Office
Add Satellite Devices
Need Help

ADDING A NEW ROUTER OR MESH-CAPABLE Wi-Fi EXTENDER TO AN EXISTING MESH GROUP (continued)

- Follow the displayed instructions. Then click on "Next".

4:23 • 89%

Prepare your TP-Link satellite routers

1. Make sure your routers support EasyMesh or OneMesh. A firmware update may be required for earlier OneMesh models.

View EasyMesh Device List

View OneMesh Device List

2. Plug in the satellite router near your main router.

Next

ADDING A NEW ROUTER OR MESH-CAPABLE Wi-Fi EXTENDER TO AN EXISTING MESH GROUP (continued)

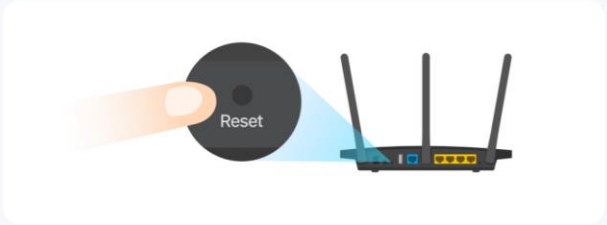
- Use a small tool to reset the new mesh device.
  Then click on "Next" in the Tether app:

4:24 • 89%

Reset the satellite router

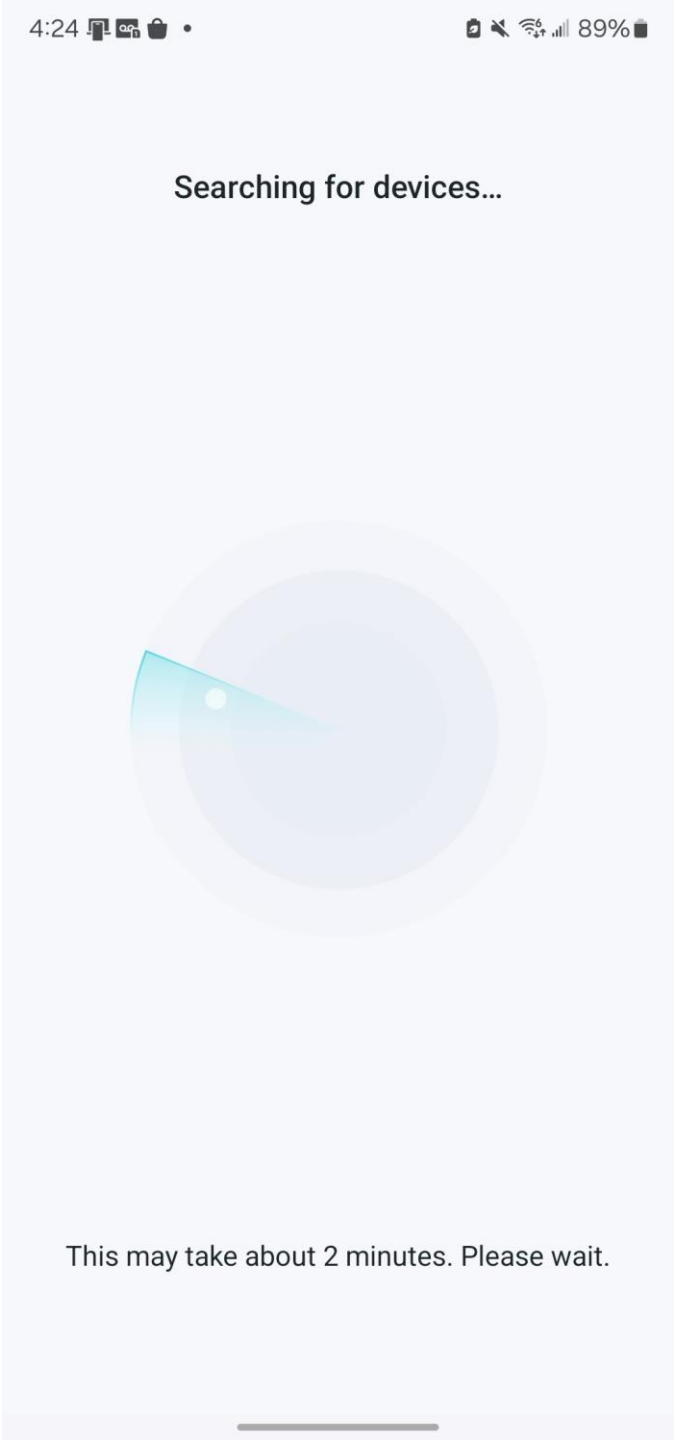
1. Disconnect the Ethernet cable if any, then press the reset button to restore its factory settings.

2. Wait until the Power LED is solid on.



Next

Power LED not solid on?


4:24
89%
Searching for devices...
This may take about 2 minutes. Please wait.