



Connected HHI






# Home Networks 101

Presented by Joe Chappell - Connected HHI

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## Presentation Flow

-  Network Overview - Wired and Wireless (WiFi)
-  Measuring and Understanding WiFi Performance
-  Latest Developments
-  Security Considerations
-  Q&A
-  \*Full presentation available for download

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## Basic Elements of Networks



GLOBAL INTERNET



Local Internet Providers

Hargray  
Spectrum (Time-Warner)



Home Network

Modem  
Router  
Switches  
Wired Connection (Ethernet)  
Wireless Connection (WiFi)



Connected Devices

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## Local Internet Providers

Provide our connection to the INTERNET and govern the **MAXIMUM** performance that we can expect.

Performance varies greatly dependent on


Physical location of our homes

Technology available in that location (Fiber, Cable, Telephone/DSL)

Plan that we choose (Gig, 30MBS, 5MBS)




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Local Internet - Hargray

-  Telephone / DSL transitioning to Fiber
-  Download speeds range from 5mbps to 1000 Mbps (1 Gig)
-  Upload speeds range from 1mbps to 1000Mbps




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Local Internet - Spectrum (Formerly Time-Warner)

-  Cable (Coax) transitioning to Fiber
-  Download speeds range from 30MBS to 1000Mbps
-  Upload Speeds range from 5MBS to 50Mbps


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## Home Network Elements - Wired Connections

-  Wired connections utilize Ethernet cable (Cat 5, 5e, or 6) or Fiber (extremely rare in residential installations).
-  Many HHI homes have been pre-wired with Ethernet, although they may not be connected to anything.
-  Locations are fixed and only work with devices that have an ethernet jack.

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## What is WiFi?



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## Home Network Element - WiFi

-  WiFi is networking using radios instead of wires
-  WiFi has the same challenges as other radios in and near the home:
  - Interference from other radios and electronic devices
  - Physical barriers that impede signals
  - Weakening over distance
-  Not all WiFi devices are equal - power, antennas, processors, and versions (a,b, g.n. ac) determine speed and reach.

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## Networking Roles

- ▶ Modem - connection point between cable and DSL networks and home networks. Only need 1 per home
- ▶ ONT - Optical Network Terminal - connection point between fiber and home network. Only need 1 per home
- ▶ Router - Network traffic controller - manages all traffic within your home network and with the Internet
- ▶ Firewall - smart router that uses rules and processing to screen traffic for malware and intruders.
- ▶ WiFi Access Point - converts a wired network signal to wireless using a WiFi standard
- ▶ WiFi Extender - rebroadcast WiFi traffic to extend wireless reach

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## Network Equipment Options

- ▶ Modem
- ▶ Modem + Router
- ▶ Modem + Router + Wifi Access Point
- ▶ Router
- ▶ Router + WiFi Access Point

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## Modem - Router - WiFi Access Point Combo



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## Router + WiFi Access Point



**Nighthawk Dual-Band WiFi Router, 1.9Gbps**

★★★★★ 4.8 (14260) Write A Review

Get blazing-fast WiFi speeds up to 1.9Gbps and a 1GHz dual-core processor for extended range. Keep your family safe from online threats with an automatic shield of protection for all your connected devices from NETGEAR Armor™. Add NETGEAR Smart Parental Controls to keep kids safe and easily manage their time online.


AC4000 WiFi 5, Tri-band (R8000P)	AC3200 WiFi 5, Tri-band (R8000)
AC2300 WiFi 5, Dual-band (R7000P)	AC1900 WiFi 5, Dual-band (R7000)
AC1750 WiFi 5, Dual-band (R6700)	

\$129.99

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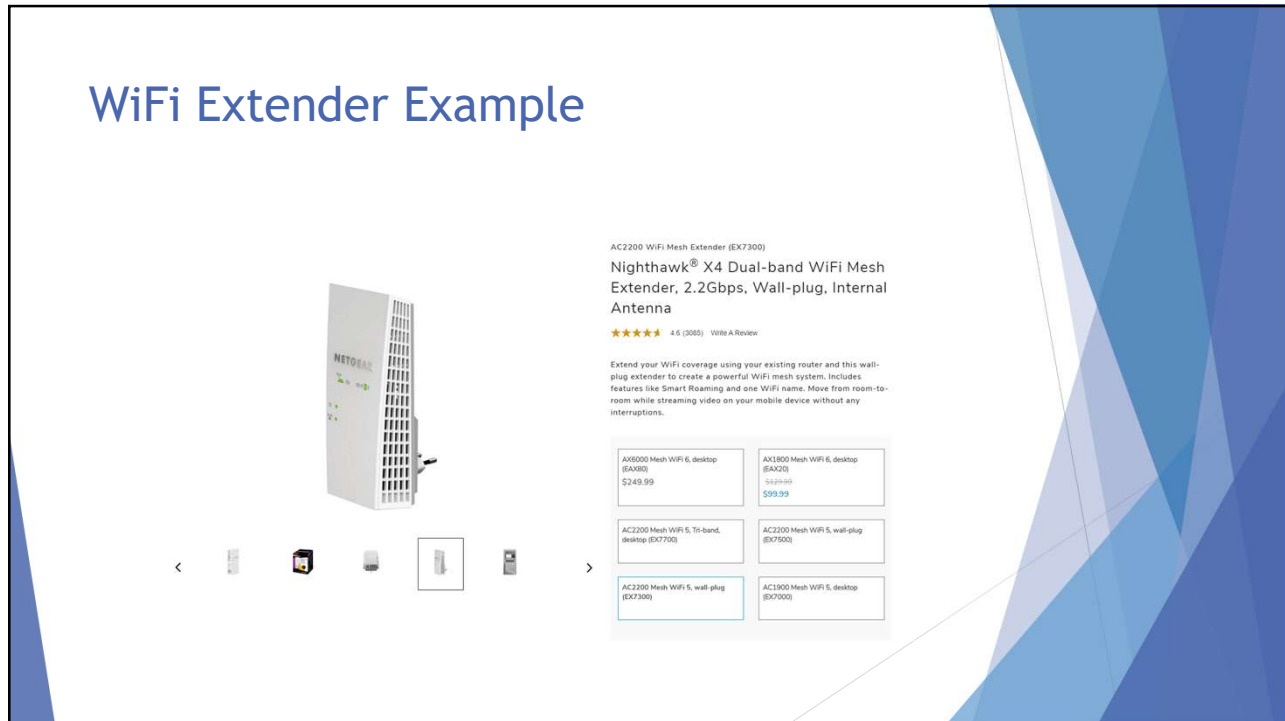
## WiFi Access Point Examples



<b>eero Pro 6E</b> Our most advanced wifi system ever. Ideal for VR/AR, 8K, and Wi-Fi 6E devices. Starting at \$249.99 <a href="#">LEARN MORE</a>	<b>eero 6+</b> Gigabit speeds. For Less. Ideal for smart home connectivity. Starting at \$119.99 <a href="#">LEARN MORE</a>	<b>eero 6</b> Fast, reliable Wi-Fi 6. Ideal for streaming, gaming, and working. Starting at \$79.99 <a href="#">LEARN MORE</a>
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## WiFi Extender Example



AC2200 WiFi Mesh Extender (EX7300)

**Nighthawk® X4 Dual-band WiFi Mesh Extender, 2.2Gbps, Wall-plug, Internal Antenna**

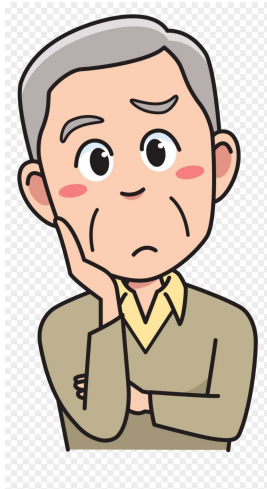
★★★★★ 4.6 (3055) Write A Review

Extend your WiFi coverage using your existing router and this wall-plug extender to create a powerful WiFi mesh system. Includes features like Smart Roaming and one WiFi name. Move from room-to-room while streaming video on your mobile device without any interruptions.

AX6000 Mesh WiFi 6, desktop (RAX80)	AX1800 Mesh WiFi 6, desktop (RAX20)
\$249.99	\$129.99
AC2200 Mesh WiFi 5, Tri-band, desktop (EX7700)	AC2200 Mesh WiFi 5, wall-plug (EX7500)
AC2200 Mesh WiFi 5, wall-plug (EX7300)	AC1300 Mesh WiFi 5, desktop (EX7000)

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## How fast is my WiFi?

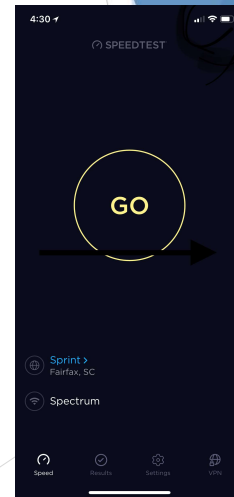
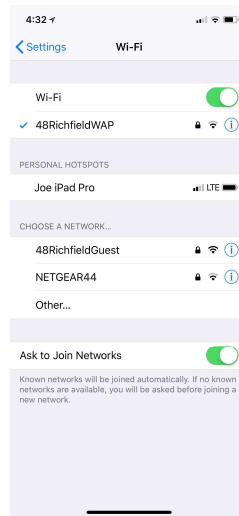


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## Measuring WiFi Speed

- ▶ **Speedtest.net**
- ▶ **Netspot and other Network Analyzers**
- ▶ Okay as a relative indicator, but not an absolute measurement!
- ▶ Often devices used to measure WiFi speed are “slower” than the actual WiFi connection.



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## Ways to Improve WiFi Reach and Speed



QUALITY OF EQUIPMENT

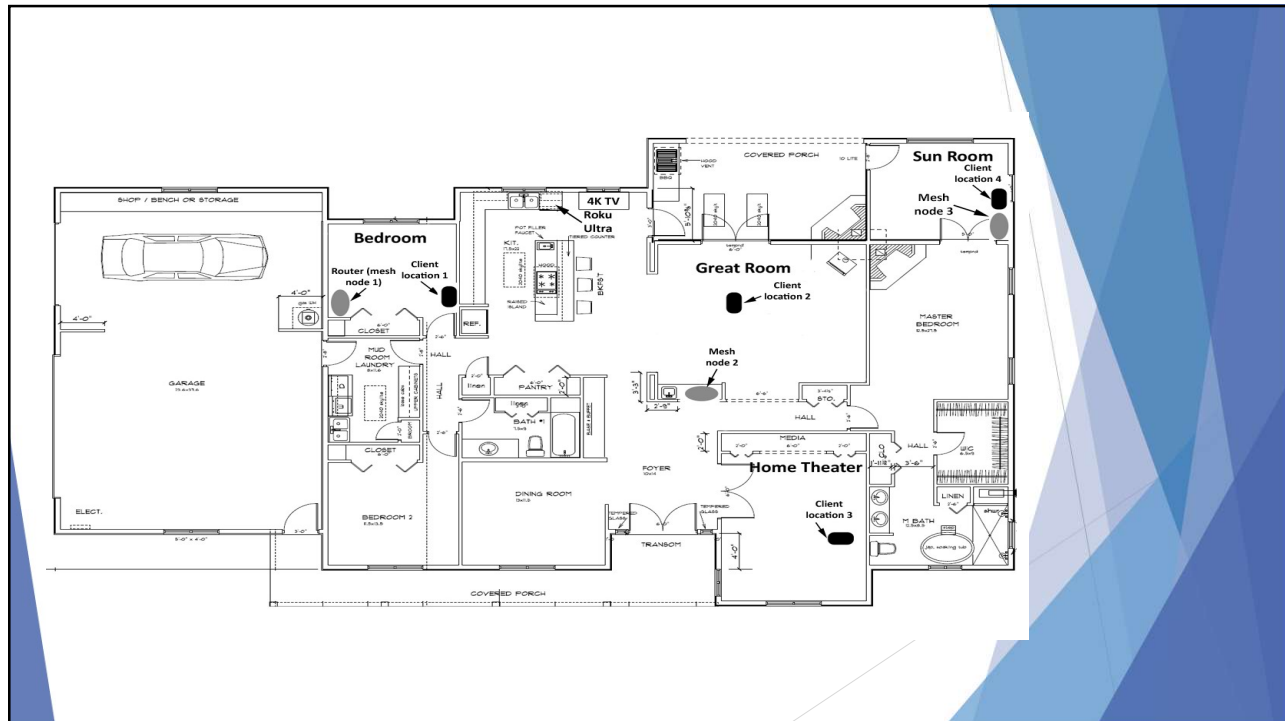


LOCATION OF EQUIPMENT






SPEED OF YOUR INTERNET SERVICE

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## When Will You Need Multiple WiFi Access Points

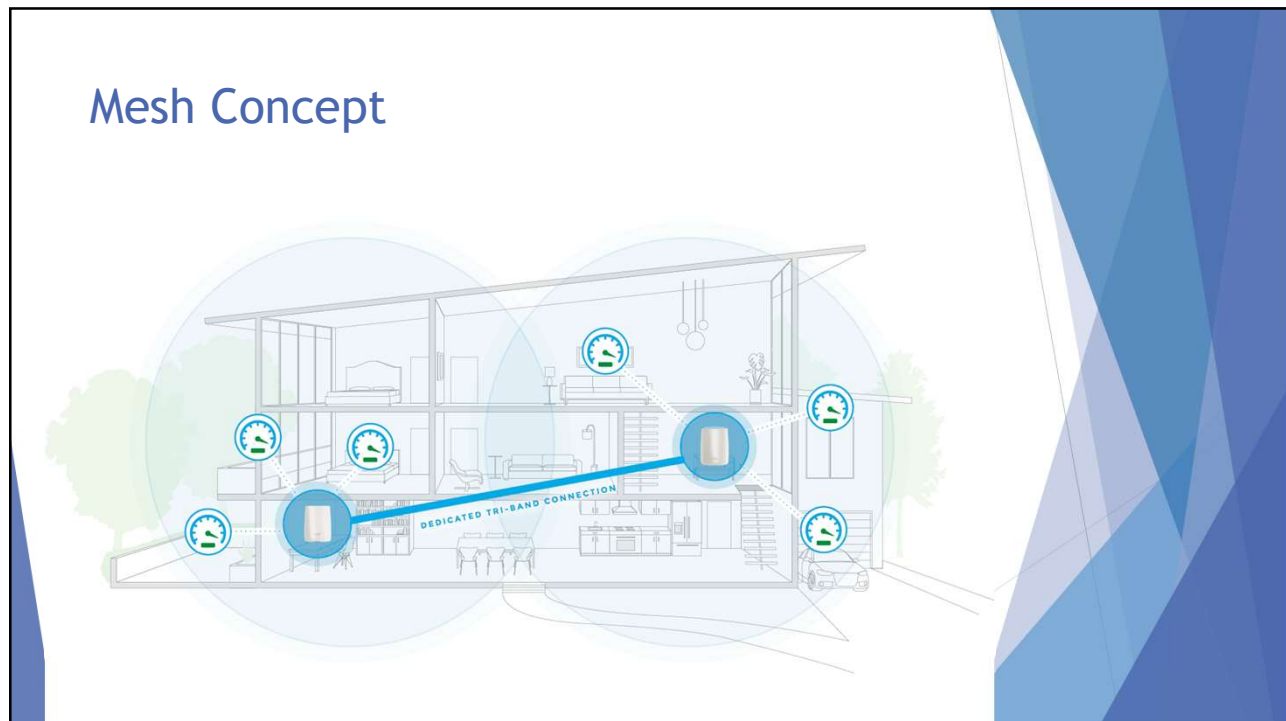
-  Large homes and homes that “sprawl”
-  If your internet connection is in the corner of your home
-  If you have architectural features that reduce or interfere with WiFi radio signals
-  If you want to reach zones not currently served - pool, bonus room, master suite, garage.

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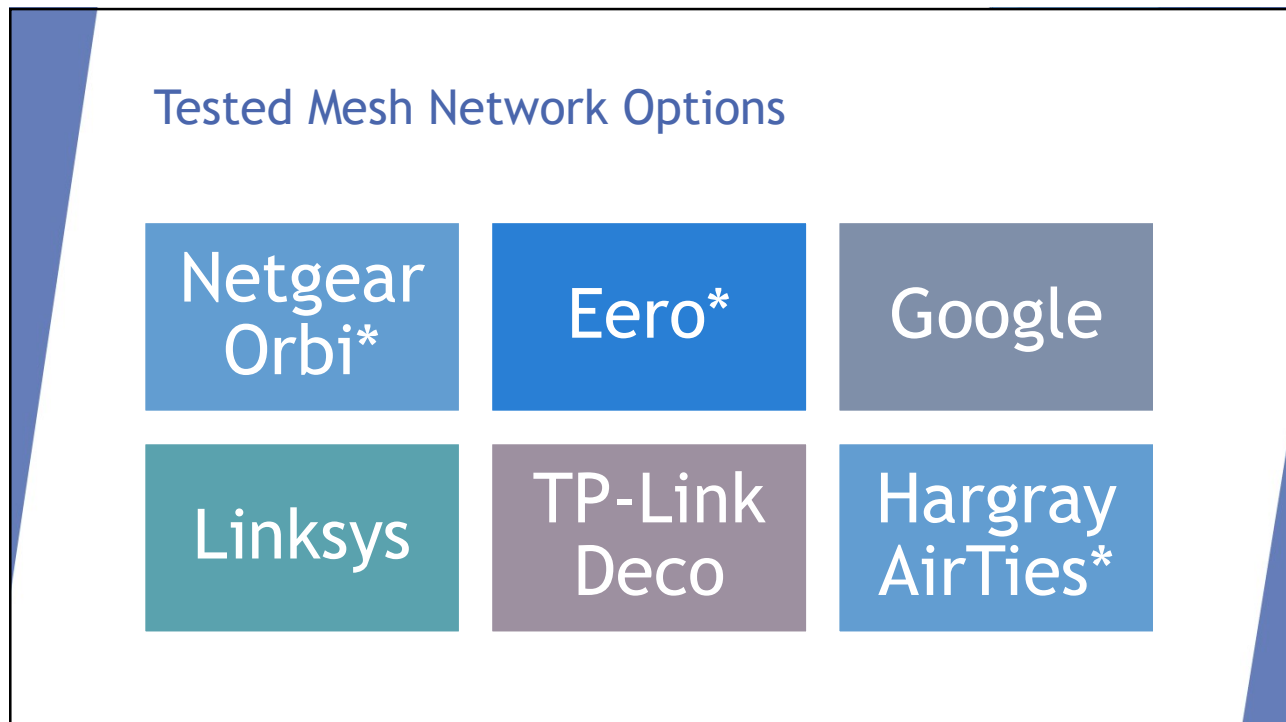
## Mesh WiFi Networks

- One Wired Connection
- One or more wireless Satellites
- Single Network Name (SSID)
- Network manages your WiFi connection as you move from zone to zone.
- Capable of very high speeds
- Easy to Configure and Install
- Now available from Hargray for a monthly fee!

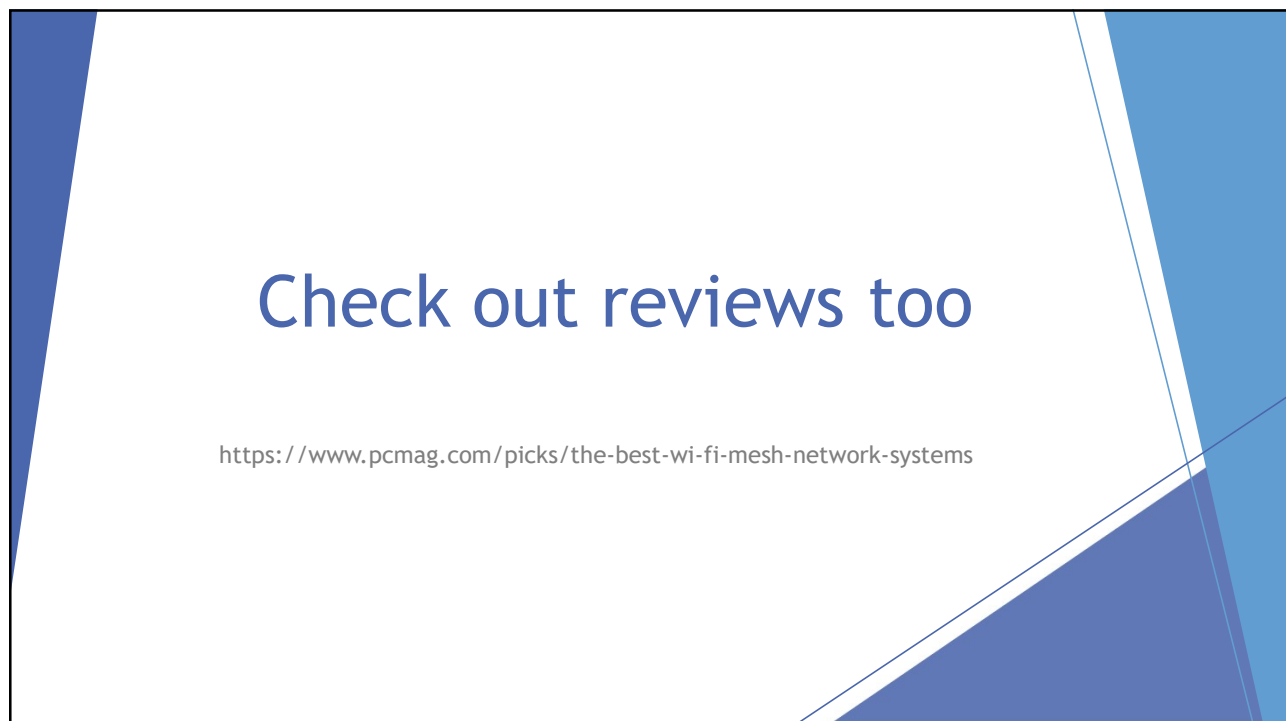
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## How Secure is my WiFi?



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## Q&A

- Joe Chappell
- Connected HHI

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