

Powerline Networking



Presentation to UCHUG - 2/02/11

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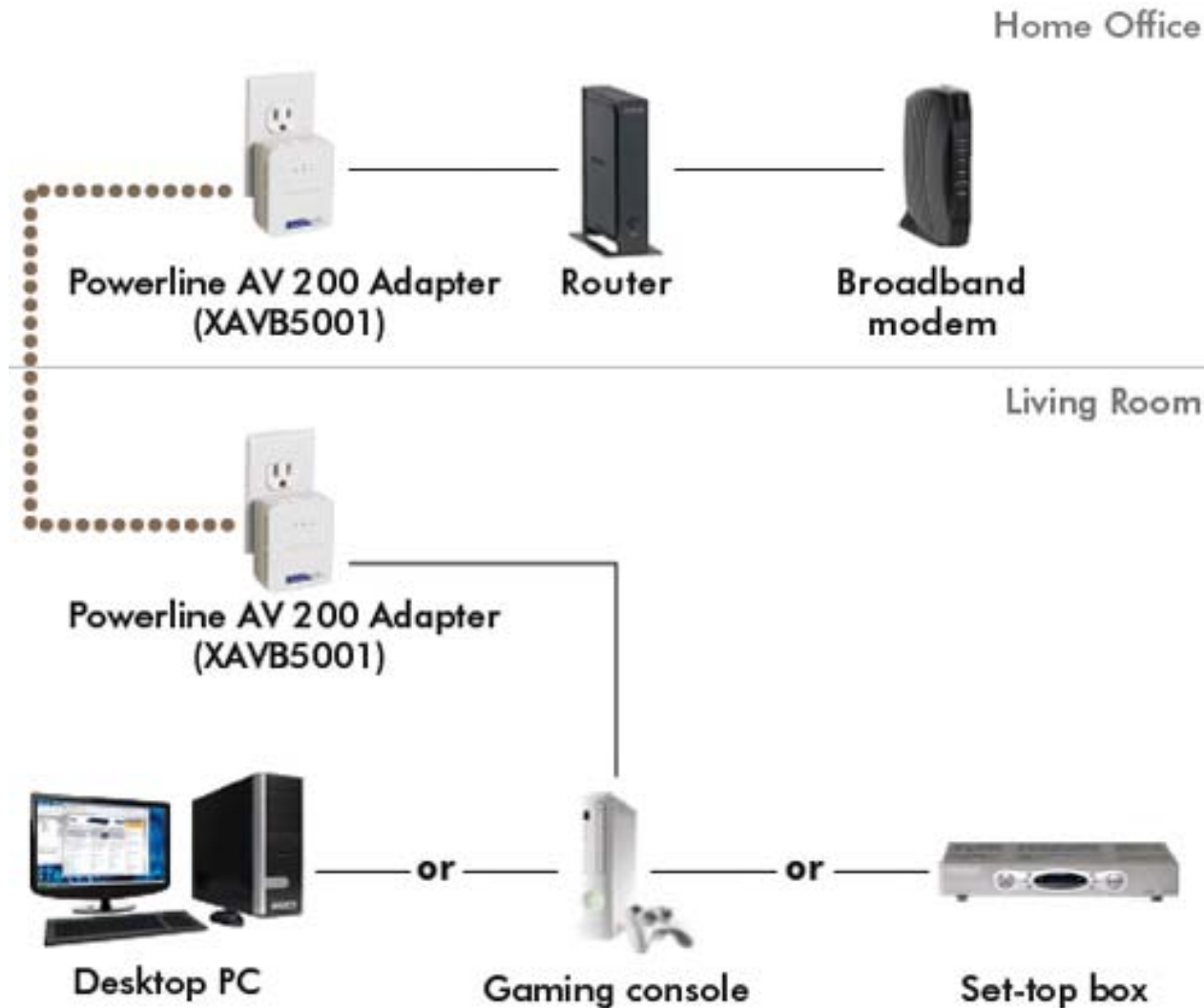
Types of Computer Networks

- Wired
 - Data sent over dedicated UTP cable
 - 10-100BaseT, Gigabit, CAT-5, 5e, 6
- Wireless
 - Data sent as modulated RF signal
 - 802.11b, g, n (Wi-Fi)
- Powerline
 - Data sent as modulated signal on AC power wiring

Powerline Networking

- Extends existing networks without added wires
 - Uses existing home / office ac power wiring
- Can be faster and more secure than wireless
 - 10 to 500 Mbps
 - Data is typically encrypted
- Provides more mobility than wired, but less than wireless

Powerline Network Configuration



Powerline Networking

- Advantages
 - Inexpensive (\$50 to \$160 for a single link)
 - Easy to install
 - Requires no changes to computer
 - Connections can be available in any room
 - Connections can be easily reconfigured
- Disadvantages
 - Slower and less reliable than wired
 - Building wiring can affect performance
 - Uses large plug-in wall devices
 - Less flexible / mobile than wireless

Powerline Networking Modulation

- FSK (frequency-shift keying)
 - Uses two frequencies (one for 1's, one for 0's)
 - Older technology, lower rates, lower performance
- OFDM (orthogonal frequency-division multiplexing)
 - Uses multiple frequencies for increased speed and reliability (4.3 MHz to 20.9 MHz)
 - Similar to DSL modem technology
 - Uses forward error correction and rate-adaptive technology

Powerline Networking Demo Video

- Shows comparison of wired, wireless and powerline Ethernet connections
 - Wired was fastest and most reliable
 - Wireless was most mobile but not so reliable
 - Powerline was in between
- <http://www.youtube.com/watch?v=Sue1Zvmh8JA>
- or search YouTube for “Powerline vs Wireless vs Ethernet Networking (NCIX Tech Tips #52)”

Tests With Netgear XAV101

- Activity Room has restricted Internet access
 - This has hindered our presentations there when Woodbury Hall was occupied
 - We need a way to access the unrestricted Internet provided by the Senior's Group in Woodbury Hall
- Al Brengle provided us with a pair of Netgear Powerline Ethernet adapters to experiment with
 - Connect one to the Woodbury Hall router
 - Connect second one to laptop
 - Verify a connection to the Internet and run speed test

Tests With Netgear XAV101

- First Test - Plug both adapters into same power outlet
 - No link
 - Had to reset encryption on both units to establish link
- Second Test - Move router adapter near router
 - Link established
- Third Test - Move laptop adapter to lobby
 - Only outlet on opposite side of wall from router will provide link
 - Other outlets in lobby and down the hall to the Activity Room won't provide a link

Tests With Netgear XAV101

- Conclusion: Powerline Ethernet adapters don't work in large buildings like Wesley Palms
 - Don't work between separate electrical circuits