# Home Networking

Gabriola Mac User's Group February 2010

aka

The Bob & Frank Show

# Why WiFi?

- Convenience
- More laptops out there moving around
- More devices in the home (iPod Touch, iPhone
- Cat 5e or Cat 6 Ethernet not run in homes

Questions: How many have a laptop? How many have more than one computer in the house?
Apple laptops account for 70% of their total computer sales
Many homes have more than one laptop, and people like to use them everywhere
iPod Touch and iPhones are growing like crazy, and WiFi is an easy way to make more use of device for little cost (Skype, accessing web for many of the Apps without using Data Time, etc.)

# Agenda

- Short history of WiFi
- Apple products supporting WiFi
- Setting up a simple WiFi (hardware & software)
- Adding printers and/or disk drives
- Streaming sound with Express
- Extending WiFi and Dual band WiFi
- Screen Sharing

WWW.TAKECONTROLBOOKS.COM


This is the best reference for Airport set up that I have found. It is a digital book and only costs about $15.00 at the site at the top. I have referenced this book in this talk

| Standard/ Band | Device (introduced, discontinued) | Raw Speed | Maximum Throughput |
|---|---|---|---|
| 802.11b (B)/ 2.4 GHz | • AirPort (1999, discontinued 2003)<br>• AirPort Card (1999, discontinued 2004) | 11 Mbps | 5.5 Mbps |
| 802.11g (G)/ 2.4 GHz | • AirPort Extreme (2003, discontinued 2007)<br>• AirPort Extreme Card (2003, superseded by built-in adapters, but still available)<br>• AirPort Express (2004)<br>• Built-in 802.11g adapter in Macs (2005)<br>• iPhone (June 2007)<br>• iPod touch (Sept. 2007) | 54 Mbps | 25 Mbps |
| 802.11a (A)/ 5 GHz | • Never separately and officially supported by AirPort, but silently included in the Wi-Fi adapter in early Intel Macs | 54 Mbps | 30 Mbps |
| 802.11n* (Draft N)/ 2.4 GHz and/or 5 GHz | • AirPort Extreme (Feb. 2007)<br>• Apple TV (Feb. 2007)<br>• AirPort Extreme with giga-bit Ethernet (Aug. 2007)<br>• Time Capsule (Feb. 2008)<br>• AirPort Express (Mar. 2008)<br>• AirPort Extreme Simultaneous Dual Band (Mar. 2009)<br>• Time Capsule Simultaneous Dual Band (Mar. 2009)<br>• Built-in 802.11n adapter in all current model desktop, laptop Macs (late 2006)** | 300 Mbps | 140 Mbps (with gigabit Ethernet) |

* Current draft became a tested part of Wi-Fi in June 2007; the final version is due in 2010 in nearly the same form.

** Intel Core 2 Duo Macs except discontinued 1.83 GHz 17-inch iMac and all Mac mini models before March 2009 update; optional adapter for the Mac Pro; not available for Xserve.

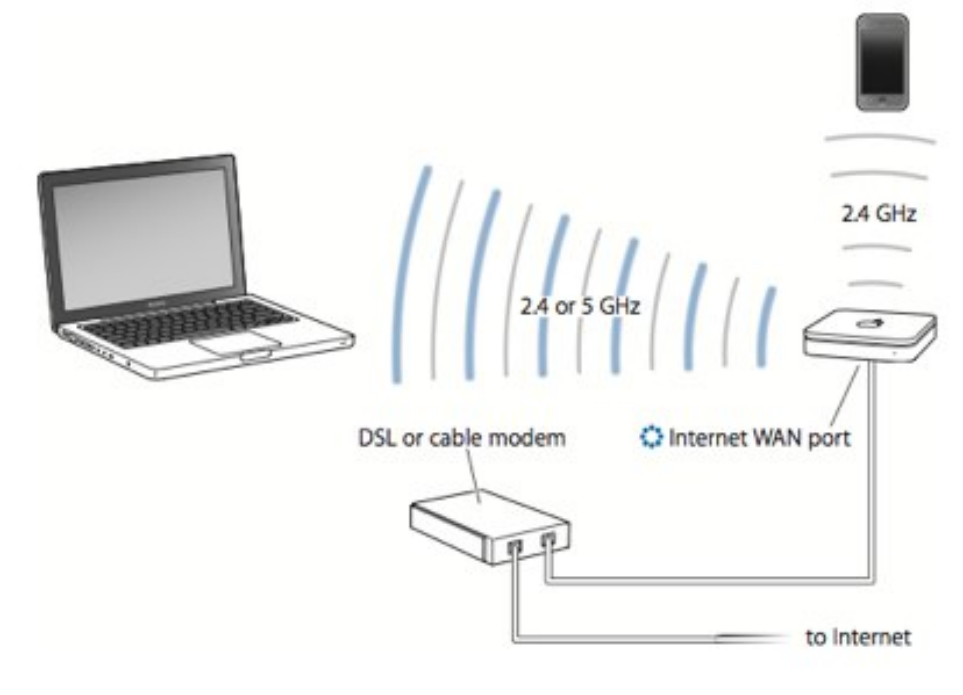
Here is a catalog of Apple WiFi products since they first came out with their 802.11b product line in 1999.
You should note the throughput speeds of each iteration.
Apple never supported the 802.11a specification, since n was on the near horizon.
Note that Apple's 802.11n Airport product line has 2 iterations: before Mar 2009, the Airport would use only one frequency (2.4 or 5.0) and did not have a switch to allow simultaneous use.
The 802.11n will only support the higher 300Mbps speeds on the 5 GHz frequency. All 802.11g devices require the lower 2.4 GHz frequency.
Wired Ethernet achieves between 1/3 to 2/3 the theoretical speeds. Thus, 802.11n is slower than gigabit ethernet, and 802.11g is slower than 100Mbps ethernet.

# WiFi Speeds

- "b/g" speed products
  - Motorola Based computers
  - iPod Touch and iPhones
  - MacBooks & Pros 2006
- "n" speed products
  - 2007 Intel Based computers

This is why the Simultaneous use of both 2.4 and 5.0 GHz speeds came out: the new Macs could communicate at the faster n speeds, but the handheld devices only support the older slower g speeds.

# Simple WiFi



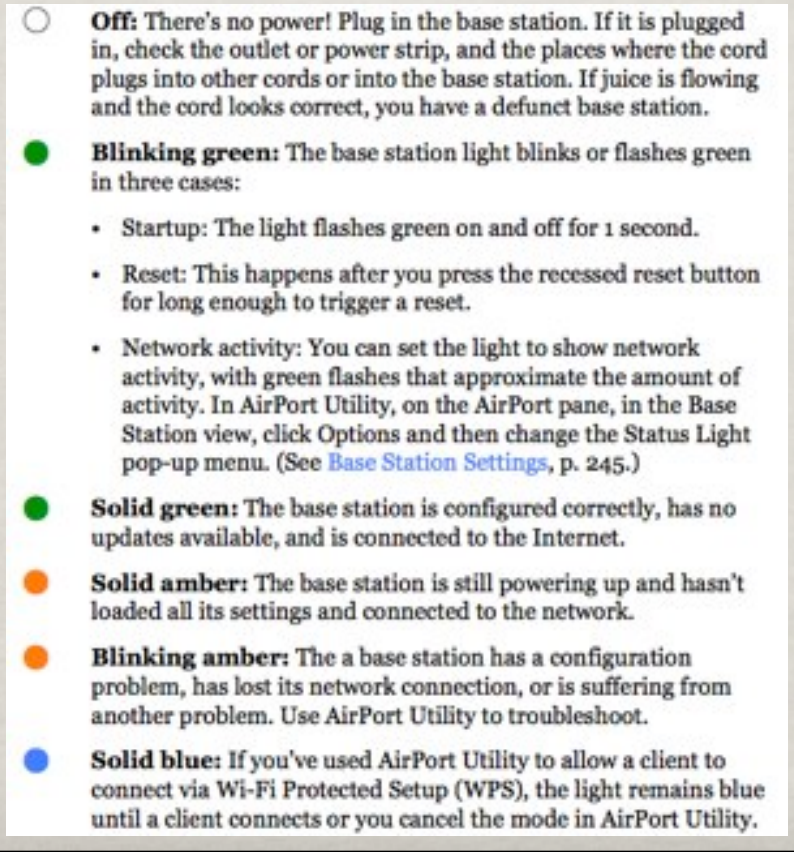

Example of simple WiFi set up using an airport. Note that this example can only happen with the newer Airports. If this was an older (pre Mar 2009) Airport, you could never achieve the 5 GHz if an iPhone were attached

# Setting up Simple

- Plug modem into cable
  - Phone cable for Telus
  - TV cable for Shaw
- Plug Ethernet cable into Modem and Airport
- Plug power cord into Airport
- Use Airport Utility (in Utilities folder) to configure

We will show the use of Airport Utility live in the meeting

# Airport Lights



**Off:** There's no power! Plug in the base station. If it is plugged in, check the outlet or power strip, and the places where the cord plugs into other cords or into the base station. If juice is flowing and the cord looks correct, you have a defunct base station.

**Blinking green:** The base station light blinks or flashes green in three cases:

- Startup: The light flashes green on and off for 1 second.
- Reset: This happens after you press the recessed reset button for long enough to trigger a reset.
- Network activity: You can set the light to show network activity, with green flashes that approximate the amount of activity. In AirPort Utility, on the AirPort pane, in the Base Station view, click Options and then change the Status Light pop-up menu. (See Base Station Settings, p. 245.)

**Solid green:** The base station is configured correctly, has no updates available, and is connected to the Internet.

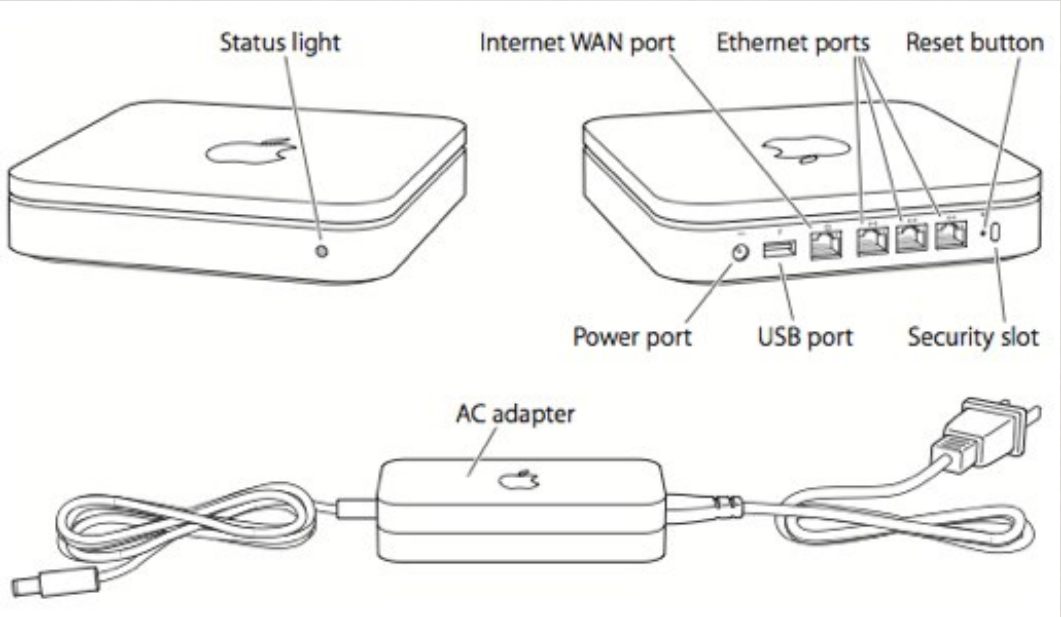
**Solid amber:** The base station is still powering up and hasn't loaded all its settings and connected to the network.

**Blinking amber:** The a base station has a configuration problem, has lost its network connection, or is suffering from another problem. Use AirPort Utility to troubleshoot.

**Solid blue:** If you've used AirPort Utility to allow a client to connect via Wi-Fi Protected Setup (WPS), the light remains blue until a client connects or you cancel the mode in AirPort Utility.

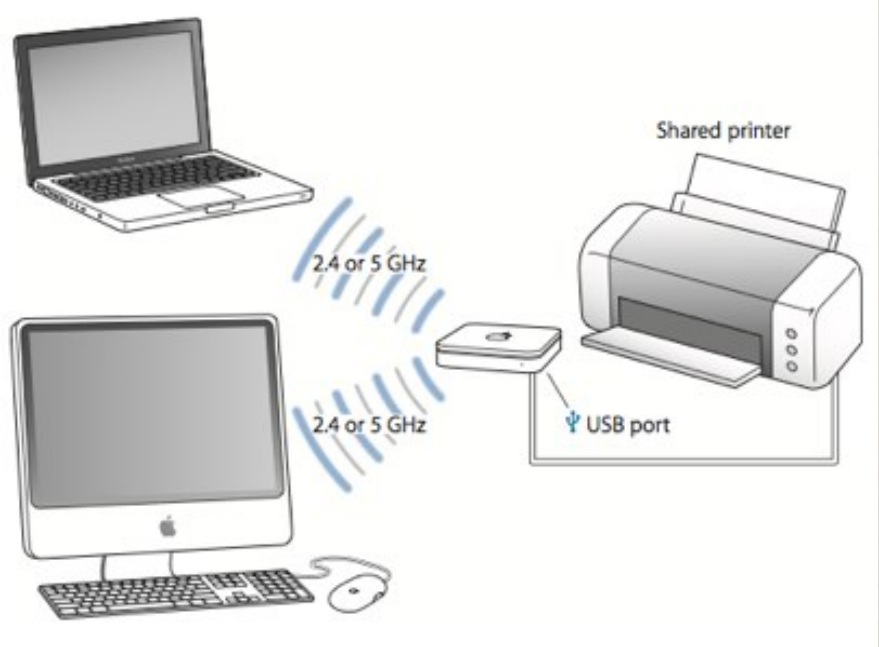
Lights are your only indication of what is happening on the Airport. It is important to take note of them.

# Airport Ports

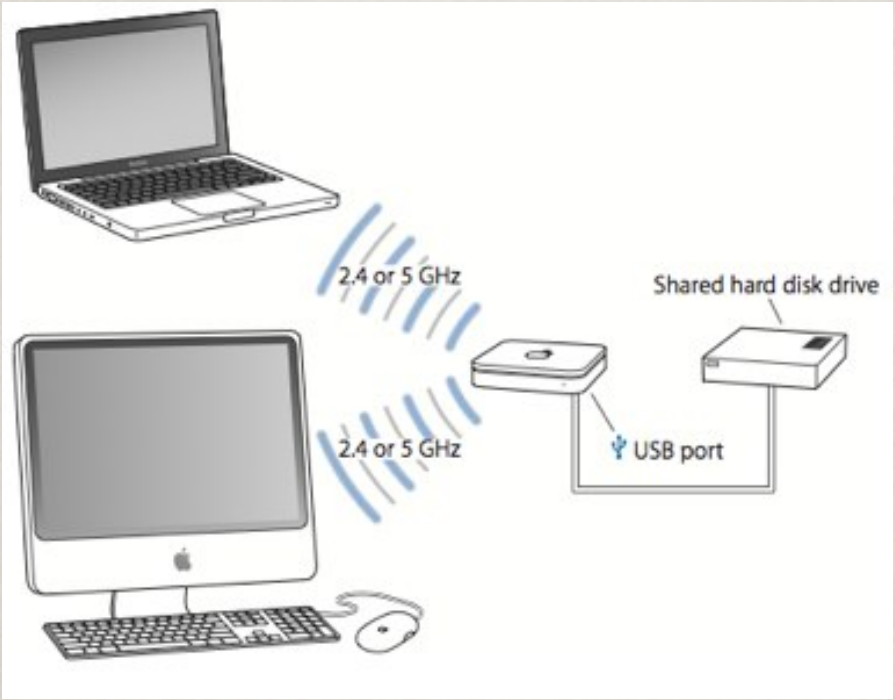



The ports available on the new Airports. The “WAN” port is for the ethernet cable to the modem.

# Network Printing

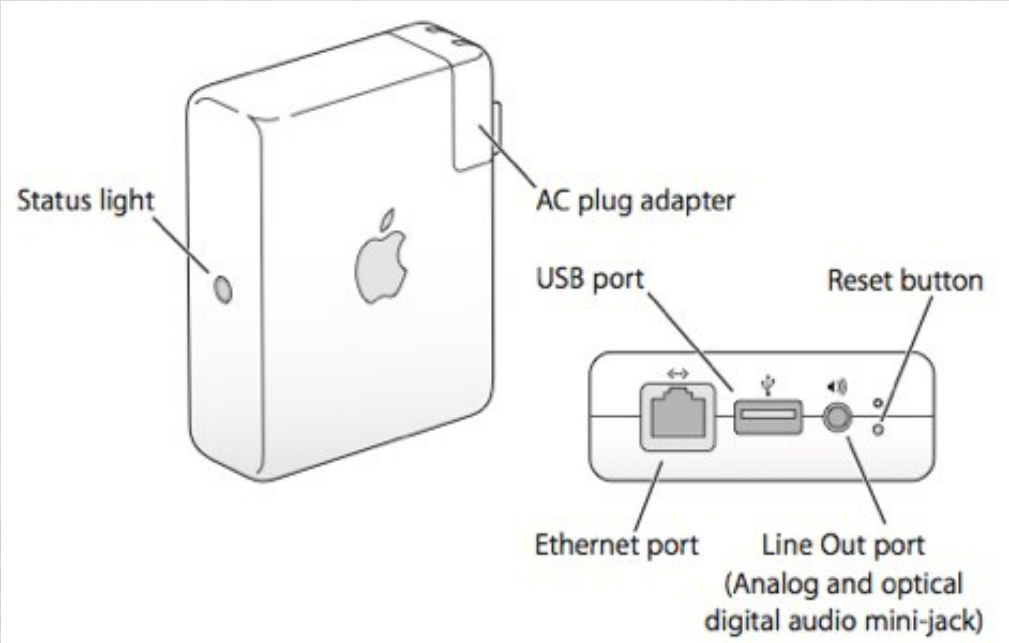


# Network Disk



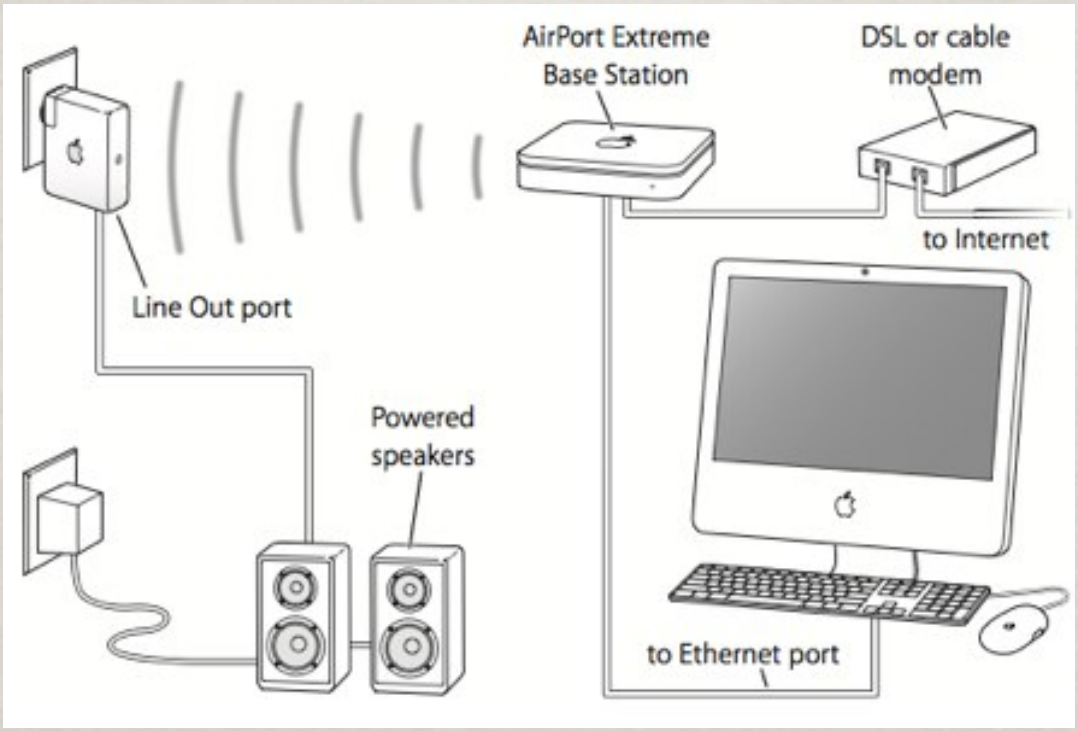

Note that if you want to plug in a disk AND a printer, you will need to use a powered USB hub.

# Express Ports




The main difference here is the Line Out port for sound.

# Streaming Sound



# Streaming Sound

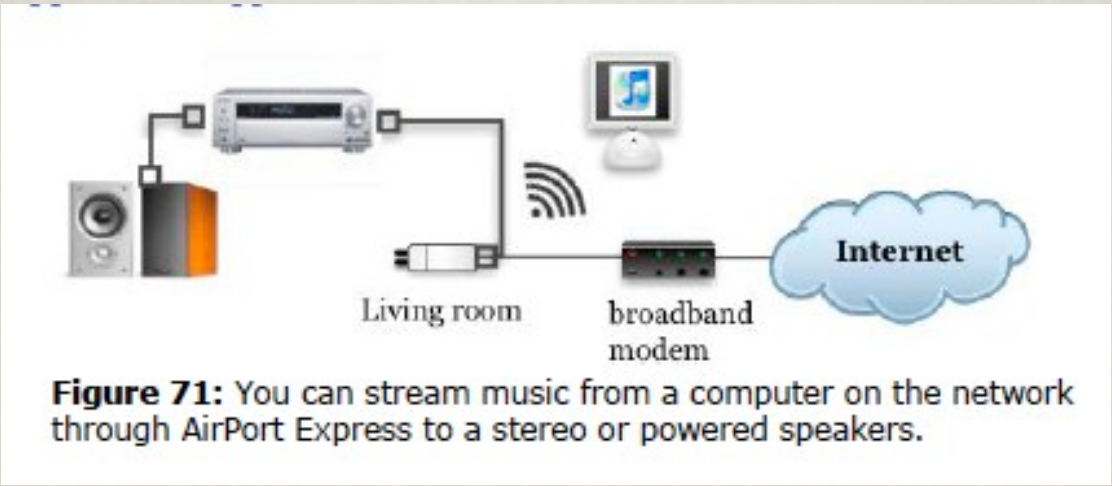
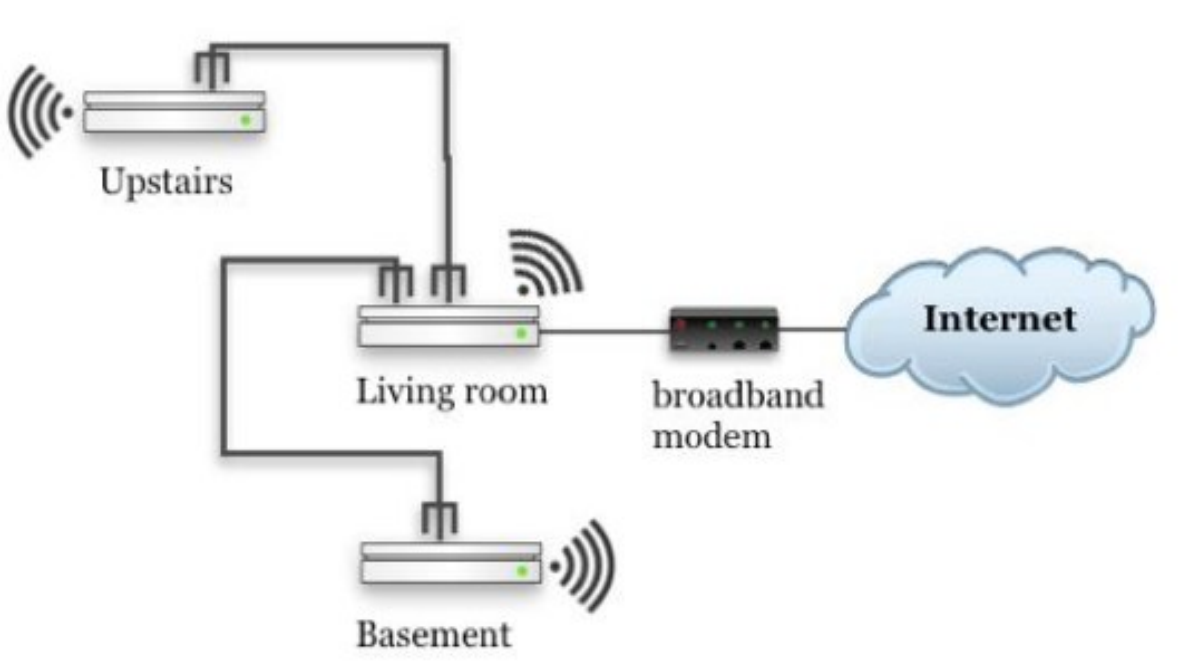



**Figure 71:** You can stream music from a computer on the network through AirPort Express to a stereo or powered speakers.

# Extending WiFi




This is how you extend the range of your WiFi. The additional Airports could as well be Expresses.

# Extending WiFi Setup

- Plug new Airport or Express into the power socket
- Use Airport Utility to configure

# Double Band WiFi

Setting up a two-band network isn't hard, particularly because the Extreme N has an Ethernet switch built in. The goal state for the network is shown in **Figure 85**.

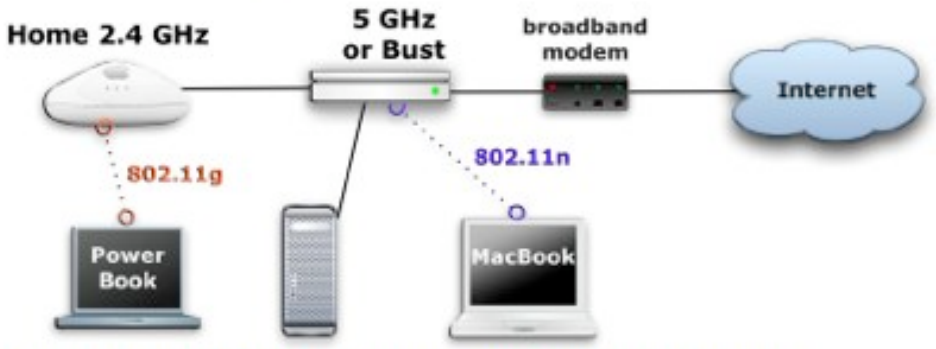



**Figure 85:** The finished mixed network: The Extreme G and desktop Mac are connected to the Extreme N's LAN Ethernet ports. A PowerBook connects via 802.11g to the older base station; a MacBook connects using 802.11n to the newer base station. The Extreme N's WAN port is connected to the broadband modem, which is in turn a conduit to the Internet.

Necessary on all Airports purchased prior to March 2009

For all those who have older equipment, this is how you set things up to gain max speed for all your devices. Note that if your modem (like Telus provides) is a 2.4 GHz WiFi, you could easily attach a pre-March 2009 802.11n Airport to this via an ethernet cable and also have a 5.0 GHz support for your faster products.

# Interference Issues

- Microwave Ovens
- Cordless Phones (2.4 or 5.0 GHz Range)
- Other Base Stations
- Older cables for Satellite TV
- Power lines, Power stations
- Older BlueTooth devices

Ovens and cordless phone base stations should be at least 25 feet from the Airport or Express
Change channels on Cordless
Change channels on Airport
Buy a new cordless that uses 5.8 GHz band
Get rid of pre-2003 bluetooth devices
You can use Wi-Spy a spectrum analyzer

# Screen Sharing

- Collaborate on a project (website or presentation)
- Monitor use
- Use to access a computer at home when away
- Solve a problem on another's computer

# Set up Sharing

**To set up screen sharing:**

1. Choose Apple menu > System Preferences and click Sharing.

2. Select the Screen Sharing checkbox.

3. To specify who can share your screen, select one of the following:

   All users: Select this if you want to allow any user with a user account on your computer to share your screen.

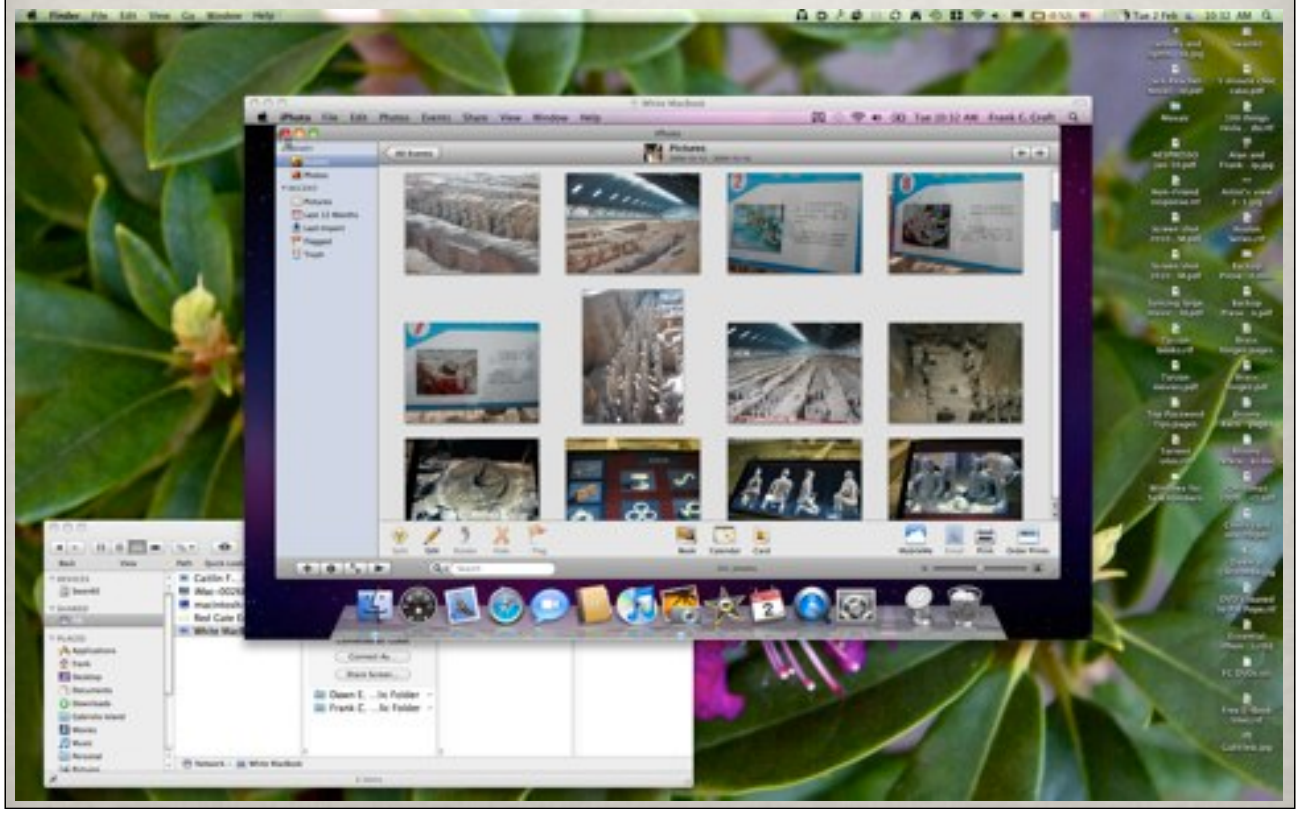
   Only these users: Select this if you want to restrict screen sharing to specific users.

   Click Add (+) at the bottom of the Users list and select a user from Users & Groups (accounts you have set up in Accounts preferences), Network Users (users on your network), or your Address Book. Or click New Person and enter a name and password to create a sharing account. Then select that user from the list and click Select.

4. Click Computer Settings and set the following options:

   Anyone may request permission to control screen: Select this to allow anyone on your network to request to share your screen.

# Screen Sharing Example



# Apple TV

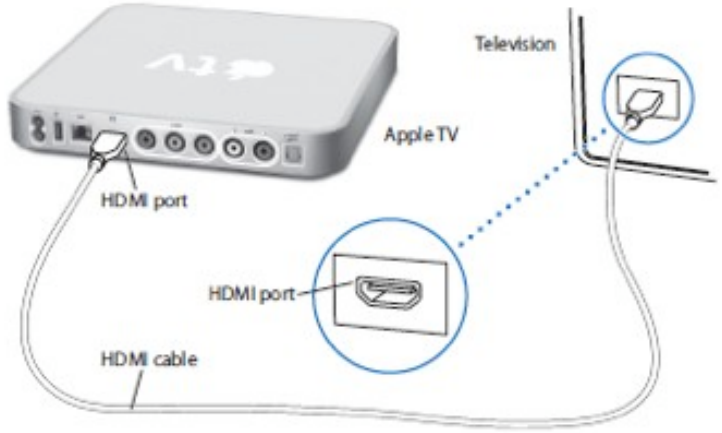
**Step 1:** Connecting the cables

Choose the setup that matches the ports on your TV or receiver.

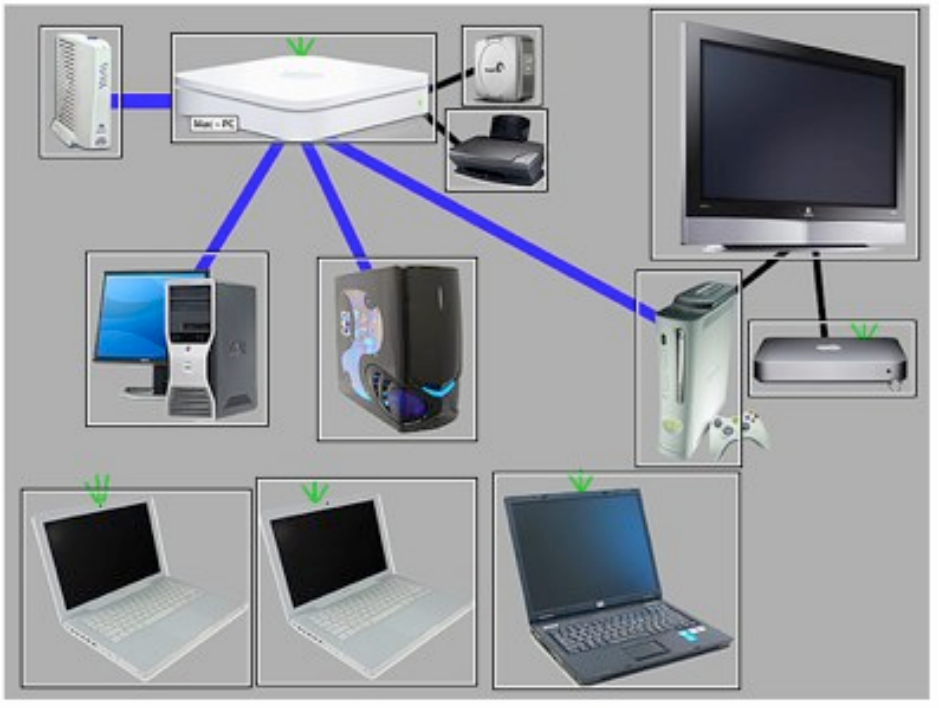
**To connect a widescreen TV with an HDMI port:**

1 Connect one end of an HDMI cable to the back of your TV.

2 Connect the other end to the back of Apple TV.



# Home Network



# Next Meetings

- March - i(make)Movie Madness
- April - Software (email your 2 favorite free software packages and source to Doug or myself) - don't forget your iPhone apps!
- May - Social Networking
- June - New Product Showcase