Acuity System Networking Introduction

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I. Getting Started

1. What is a network?

A computer network is simply a group of interconnected computers. The network allows computers to communicate with each other and share resources and information. There are two main types of networks, LAN and WAN.

LAN stands for Local Area Network; these types of networks cover a small physical area, like a home or office. Think of a LAN as the mailroom of a corporation. If one department needs to send a memo or some documents to another department, it goes through the mailroom.

WAN stands for Wide Area Network; these networks cover a very large area, crossing regional or national boundaries. An example of a WAN is the Internet. If a LAN is like a mailroom, a WAN is more like the Postal Service. It connects the mailrooms of many corporations together.

2. What is a router?

A router is a piece of hardware that facilitates the movement of data over the LAN. In our metaphor, the router would be the person who sits in the mailroom and makes sure the mail gets to its chosen recipient.

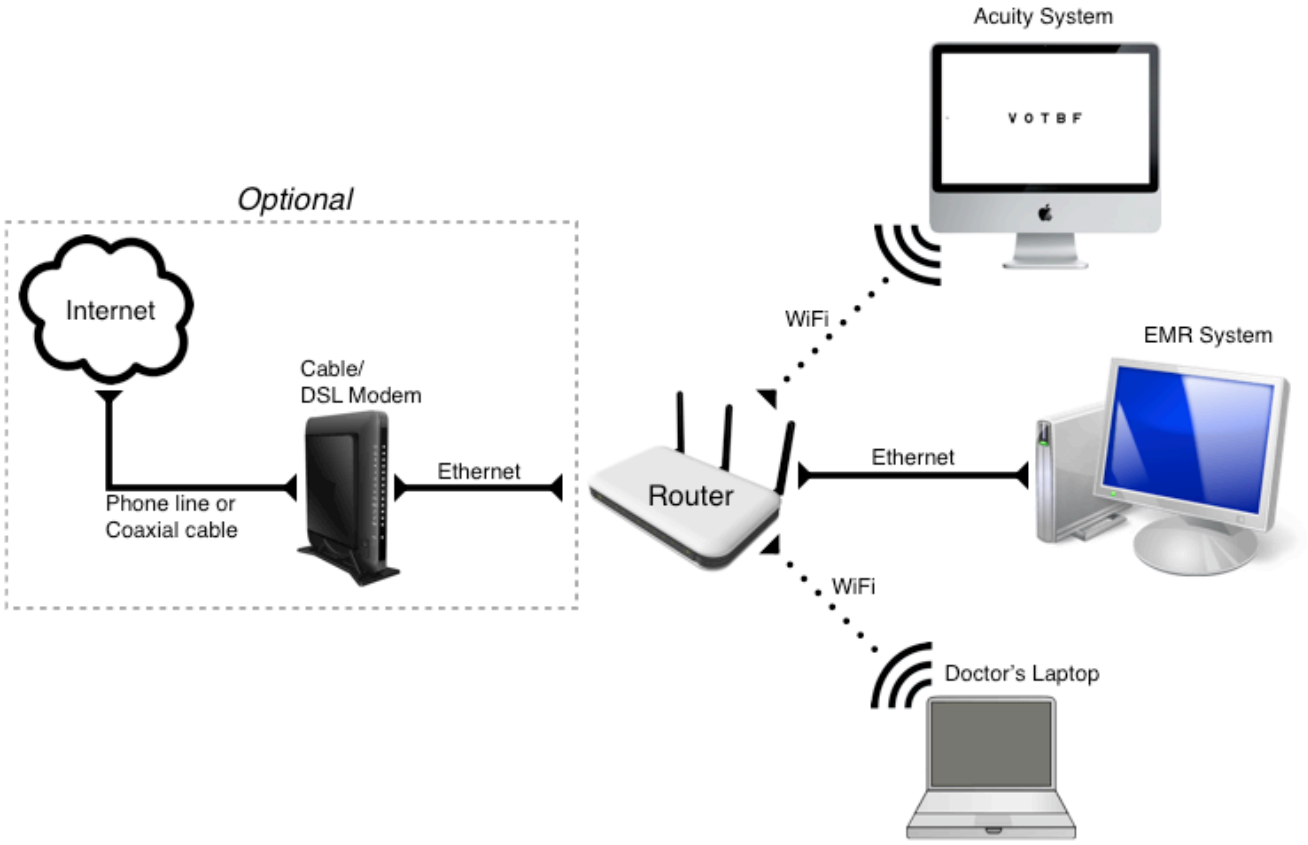
3. What does a router do?

The router is smart enough to differentiate between three different types of messages: WAN to LAN, LAN to WAN, and LAN to LAN.

- A WAN to LAN message would be downloading a file, or in our metaphor, the company receiving a packet of legal documents from their law firm.
- A LAN to WAN message would be like sending an email to a family member, or the company sending an invoice to one of their clients.
- A LAN to LAN message would be transferring a folder of pictures between a laptop and a desktop on the same LAN. The analogue would be sending a memo to another department within the same company.

The router can decide, based on the "To" and "From" information, where and how to send a message to ensure that it gets to the proper recipient.

4. An example of a network



Here is an example of how a typical LAN might be constructed. There are the clients on the right, which connect to the router. The router may or may not be connected to the WAN on the left (marked 'Optional' in the diagram). If it is, the computers on the LAN would have Internet access; if not, they would only be able to talk to each other.

II. Setting Up Your Network

1. Router configuration - the basics

The most basic setting on a router is the method that it uses to decide to route information. There are two basic methods, static and DHCP (dynamic). In static routing, all computer addresses must be manually set. This is equivalent to an internal memo that was addressed to "Floor 5, Room 23". If the recipient moved offices, it might never arrive, or it might go to the wrong person. DHCP automatically assigns addresses for the recipients of the data. This is more like addressing something to "Steve, in Accounting", and using common sense to make sure it got to its destination - if Accounting moved, take the message to the new offices, for example.

DHCP is the most common routing method on modern routers, and is probably the default setting on your router. If not, check your router documentation for details on how to engage DHCP routing. This is the only crucial setting on your router. Check your router documentation for other options, if you want to change other settings.

2. Router placement guidelines

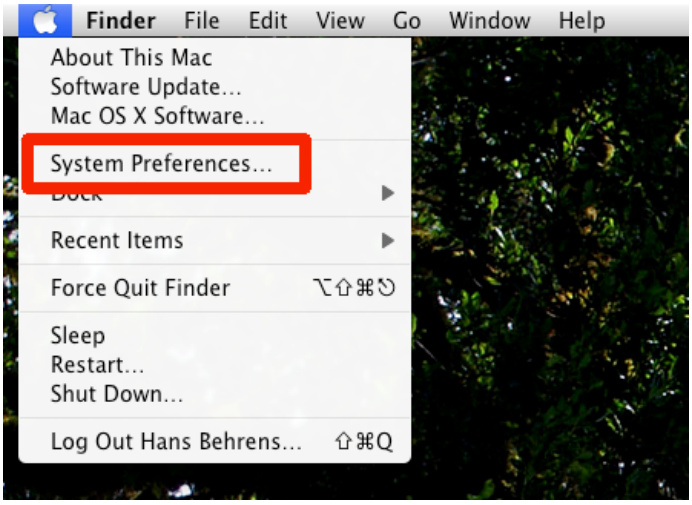
A computer can be connected to a router in two ways: wired or wireless. Both will work equally well, but if your systems are connected to the router wirelessly, there are a few things you should consider.

- First, a wireless router generates a "bubble" of coverage - all the clients must be within this bubble to get proper coverage. This bubble is centered on the router.
- Second, walls and floors (and doors, etc) partially block wireless coverage, reducing the size of the bubble in that direction. A good rule of thumb is to make sure none of the clients are more than about 100 ft (about 30 m) away from the wireless router; if the distance is much more, the signal may be too weak to connect.
- Finally, don't be afraid to mix and match connection technology. You can connect some computers via wire if they're close to the router, and then have the rest connect via wireless. The goal is just to make sure each computer is connected to the router in some way.

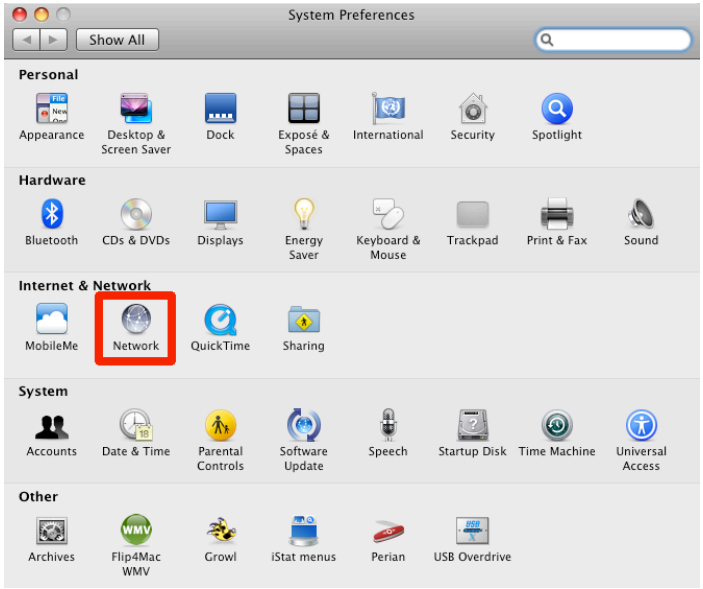
3. Client setup - Macintosh

Once you've connected your router, you'll need to set up the clients to connect to it. If you're using wired connections (Ethernet), then there's nothing you need to configure - it will all be done automatically. If you're using wireless, however, there are a few simple steps you'll have to follow. The OS may offer to set this up automatically for you, but here are the manual steps for setting up a wireless connection on a Mac.

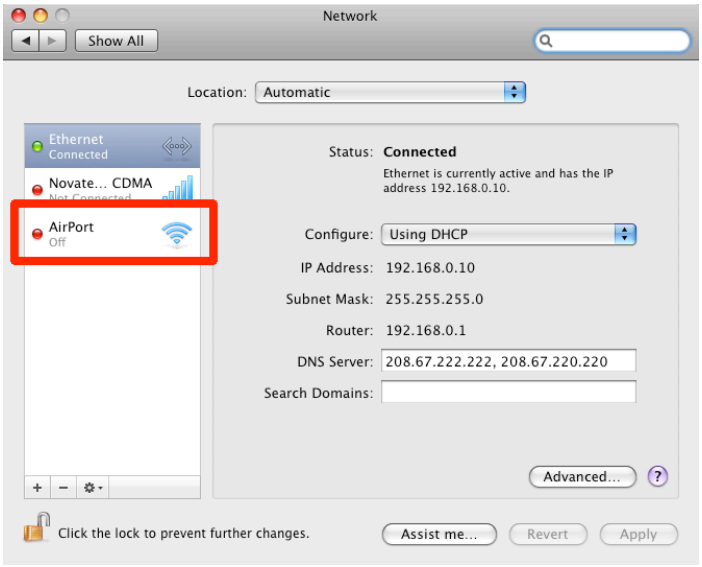
1) Click on the Apple menu in the upper lefthand corner of your screen, and select "System Preferences..."



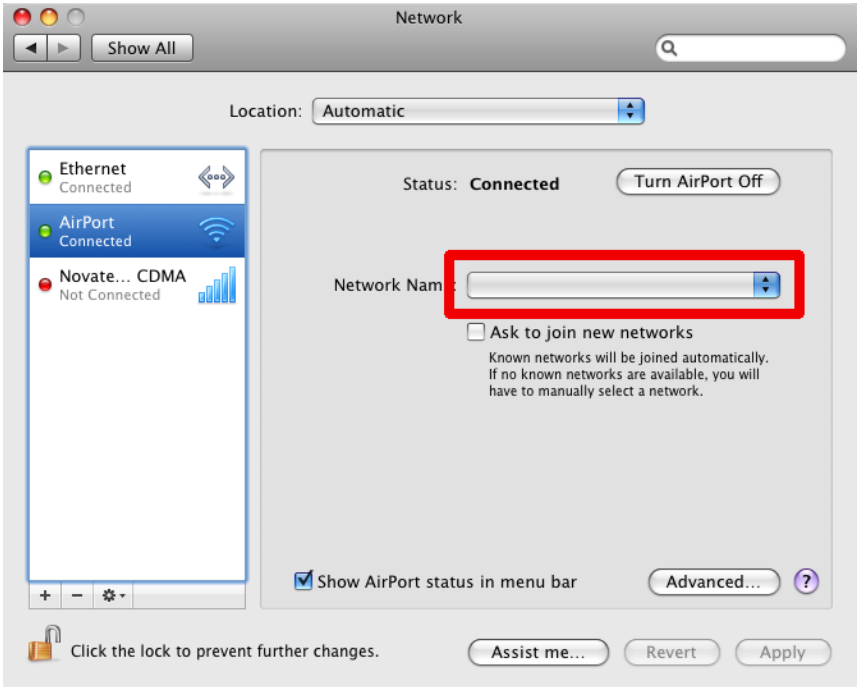
2) Once the System Preferences have loaded, click "Network."



3) Once you're in the network screen, first make sure that you're working on the Airport card by selecting it from the list on the left.



4) Then, select your network from the dropdown menu on the right. Unless you renamed it yourself, it will probably include the manufacturer of your wireless router somewhere in it (e.g. Netgear's default is "netgear" and Linksys's default SSID is "linksys", etc.). If you're unsure, check your router's documentation.



5) You should be all set. You should now be connected to the wireless network you created. If you'd like to try some more advanced settings like wireless network security, please reference your router's manual.