

CS100: CPADS

Wireless Networks

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Wireless Networks

- **Allow devices to connect to a network wirelessly**
 - Great for mobile devices
 - Great for connecting a device to a network when it is not conveniently located nearby a wired switch/port
- **Requirements**
 - Wireless Access Point
 - Wireless adapter in computer that you want to connect to wireless network

Wireless Network Adapters

- **Most likely included in *EVERY* mobile computer on the market today**
- **Most desktop computers do NOT come with wireless network adapters**
 - Adding a wireless adapter is cheap and easy
 - **Two possible options**



External USB Wireless Adapter



Internal PCI/PCIe Wireless Adapter

Wireless Access Points

- **Allow wireless devices to connect to network**
 - One side physically plugs into wired network, other side sends/receives radio signals
- **Often integrated into a single device that also contains . . .**
 - a router
 - a switch
 - a firewall
 - sometimes a print server
 - sometimes even a cable modem



Wireless Access Points

- **When setting wireless router, location is key**
 - Desirable to locate the AP nearby wireless devices
 - Performance (i.e. speed) decreases as distance from AP increases
- **Setup requires that you *name* your network with an SSID**
 - This is the name that others see when they are looking for wireless networks
 - It is possible to hide this SSID for extra security



Wireless Access Points

- **Additional security measures**

- Encryption (WEP, WPA, WPA2)

- Add an encryption password to your network to prevent others from accessing your network
- Encrypting packets also prevents others from snatching your data from thin air

- MAC Filtering

- Set up your AP such that only devices with specific MAC addresses can connect



Wireless Standards

- **Multiple wireless standards exist, and will continue to evolve as technology improves**
 - Many different implementation standards for 802.11n and 802.11ac
 - Vary number of antennae
 - More antennae => More simultaneous data streams => More Speed
 - Most 802.11n and 802.11ac computers only support 2-3 simultaneous data streams
 - Most 802.11n handheld devices only support a single data stream

	Frequency (GHz)	Max Data Streams	Avg. Data Rate Per Stream (Mb/s)	Max Data Rate Per Stream (Mb/s)	Max Agg. Data (Mb/s)	Range (ft)
802.11a	5	1	23	54	54	25 - 75
802.11b	2.4	1	5.9	11	11	100 - 150
802.11g	2.4	1	22	54	54	100 - 150
802.11n	2.4 / 5	4	74	150	600	~230
802.11ac	5	8	??	866.7	6770	115