

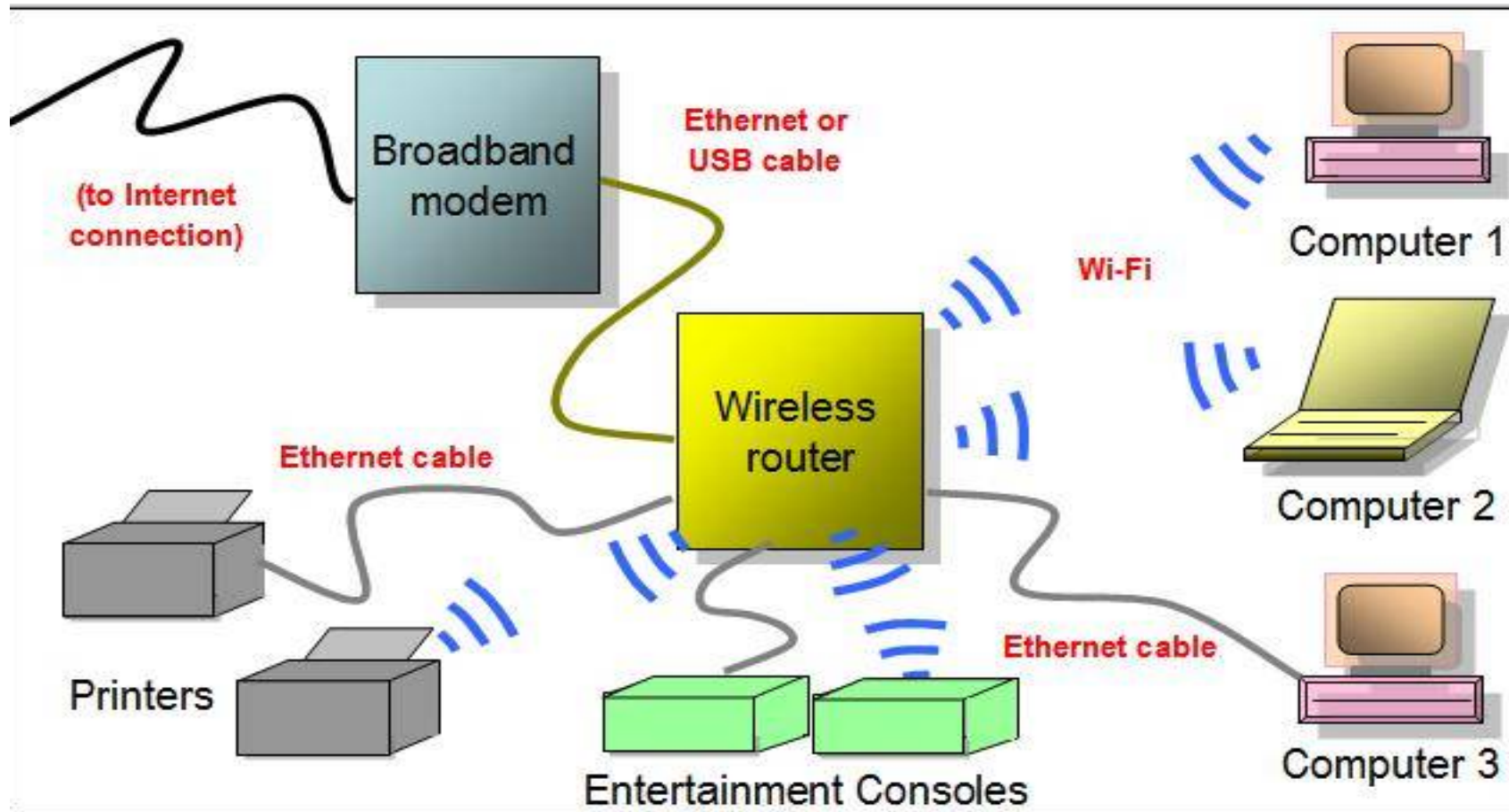
MANAGING YOUR WIRELESS CONNECTIONS

Your internet connection works fine but you are having these problems :

- “ I don't understand how my wireless works”
- “ it's very slow”
- “ how do I get my wireless devices to connect “
- “ how do I get my wireless devices to connect throughout my home”

For answers to these and other related questions come to the session at the Senior Computer Lab on “Managing Your Wireless Connections”.

TYPICAL HOME NETWORK



YOUR NETWORK CONNECTIONS

Wireless:

- 802.11 b 11 Mb/second
- 802.11 g 54 Mb/second
- 802.11 n 150 Mb/second

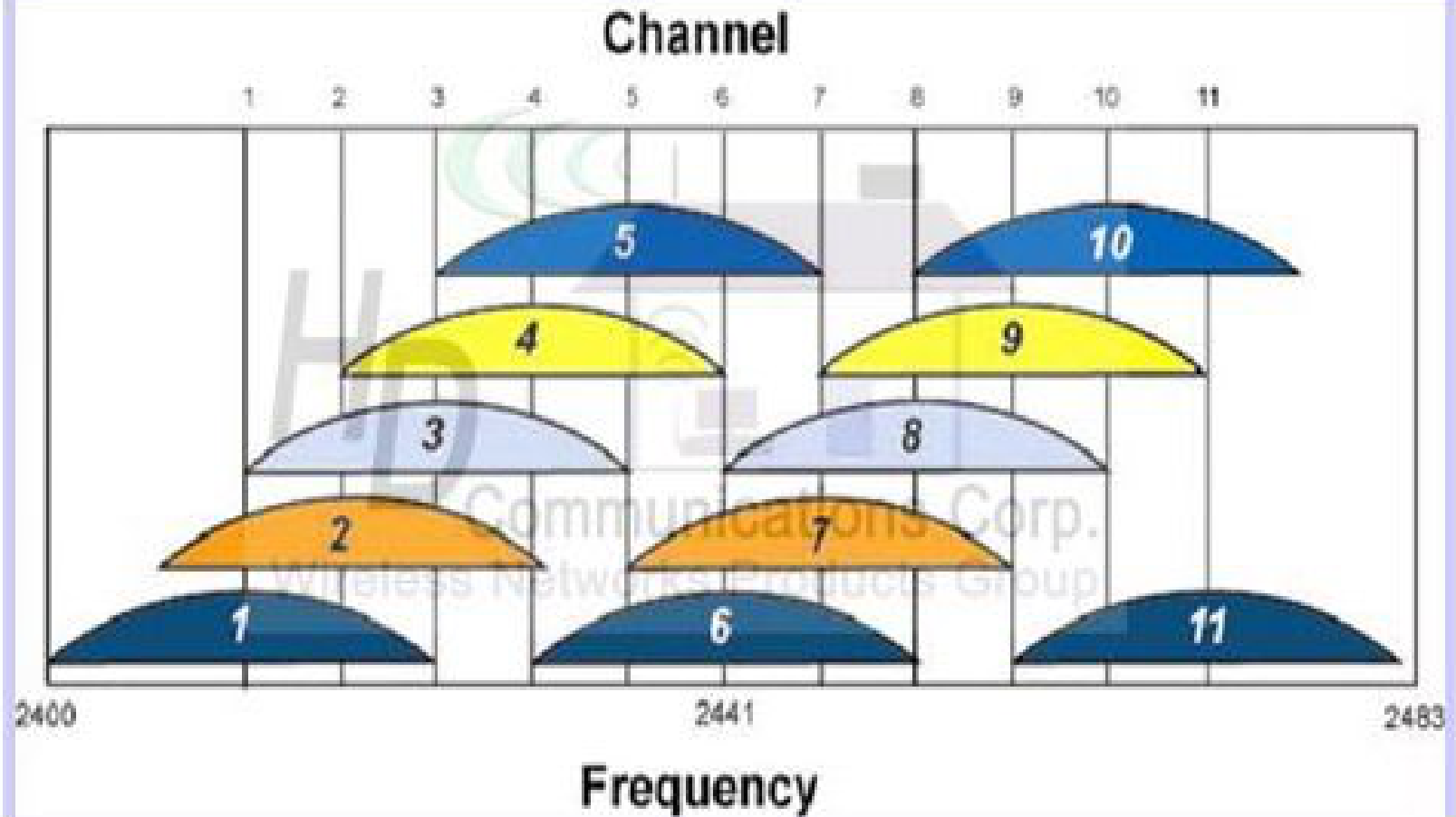
Wired:

- CAT 5/6 100 & 1000 Mb/second

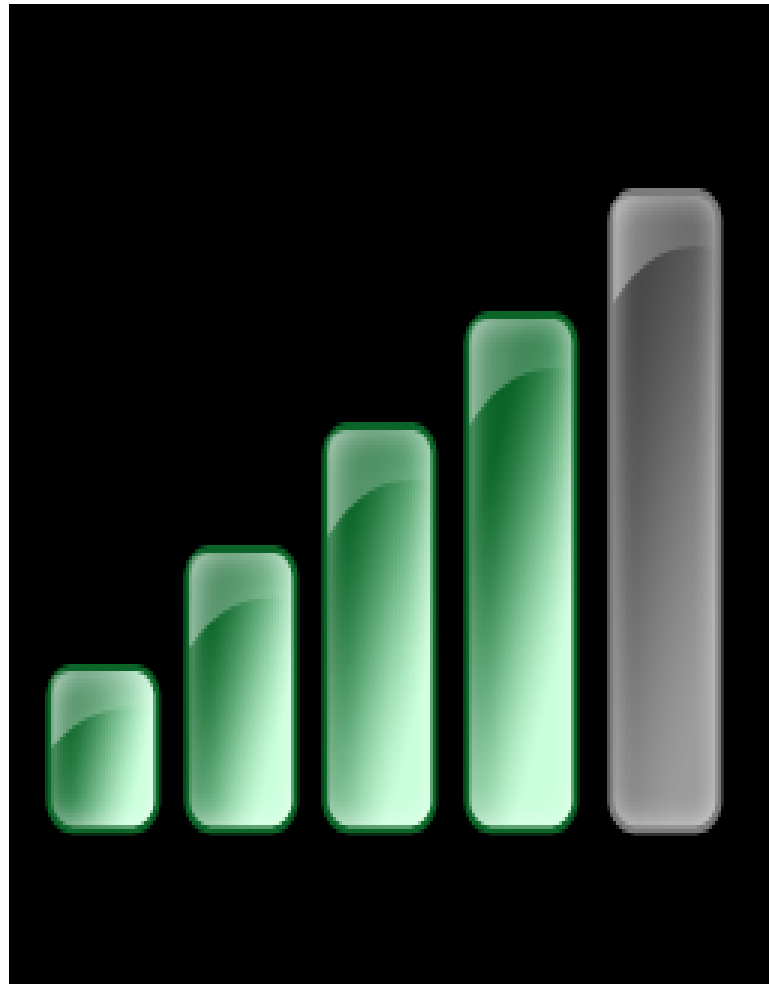
Limitations of Wireless

- Signal strength drops in distance and with objects in path
- Signal strays (“ goes out the window”)
- Neighbors signals (“come in the window”)
- Your equipment might not have enough “ bandwidth” to service your devices
- Interference (cordless phones, microwaves, baby monitors etc.)

802.11 Radio Channels Overlap

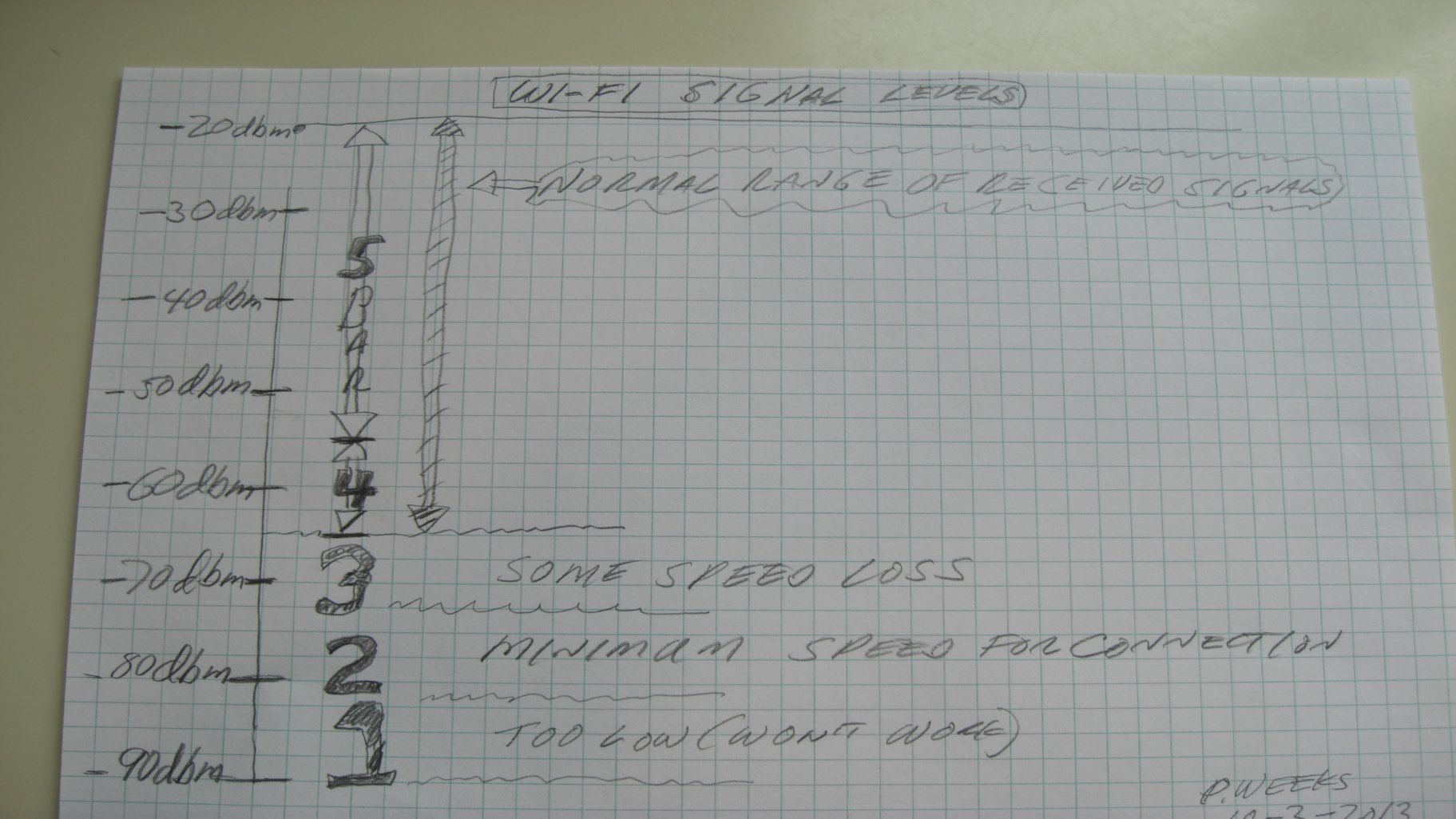


Windows Wireless Signal Levels



5 Bars (0 > ~ -55 dbm)	Great	Maximum Speed
4 Bars (- 55 > -65 dbm)	Good	Some Speed Reduction
3Bars (- 70 dbm)	OK	Significant Speed Reduction
2 Bars (-80 dbm)	Marginal	Minimum Speed
1 Bar (> -85 dbm)	Won't Work	No Conn'n

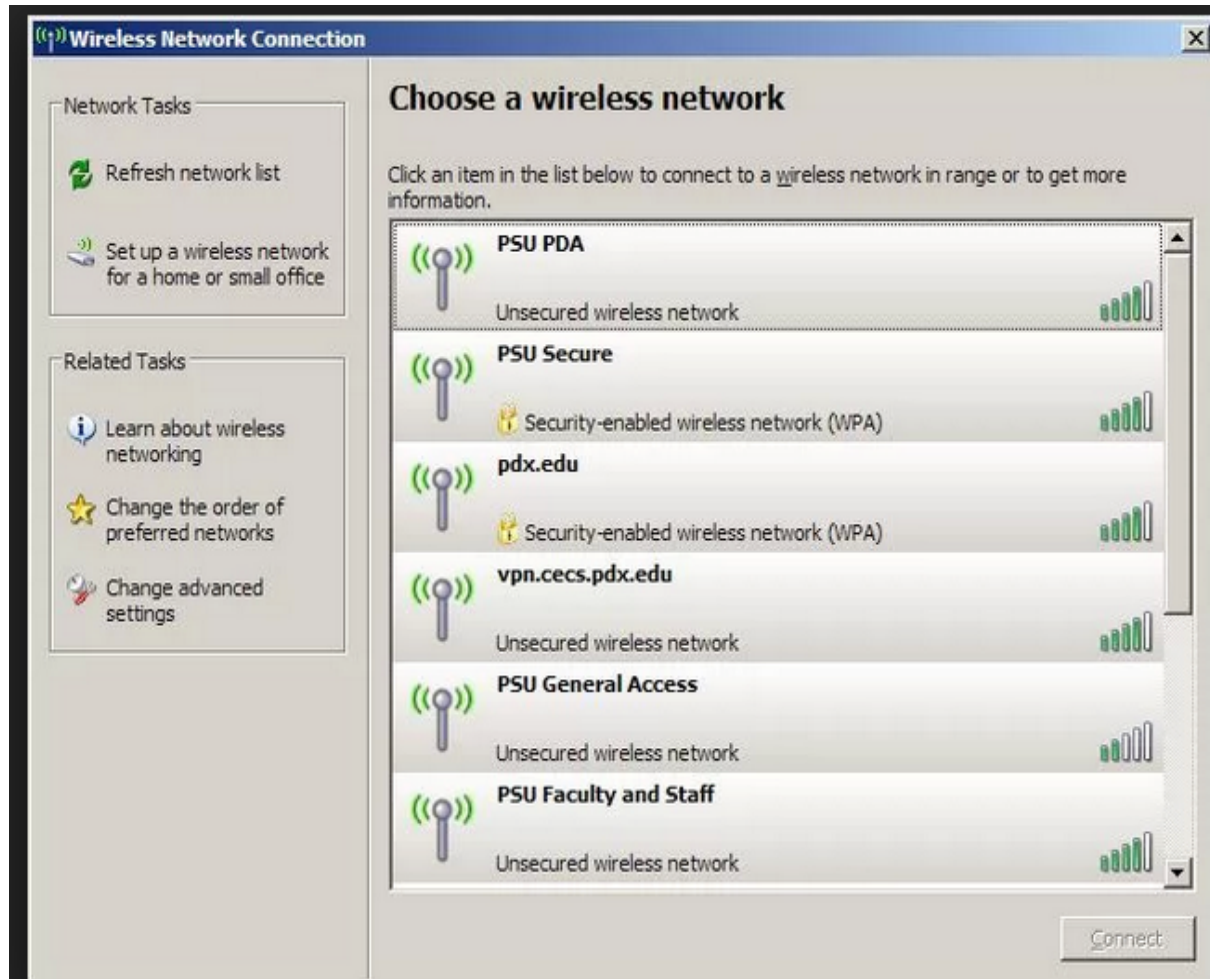
WI FI SIGNAL LEVELS



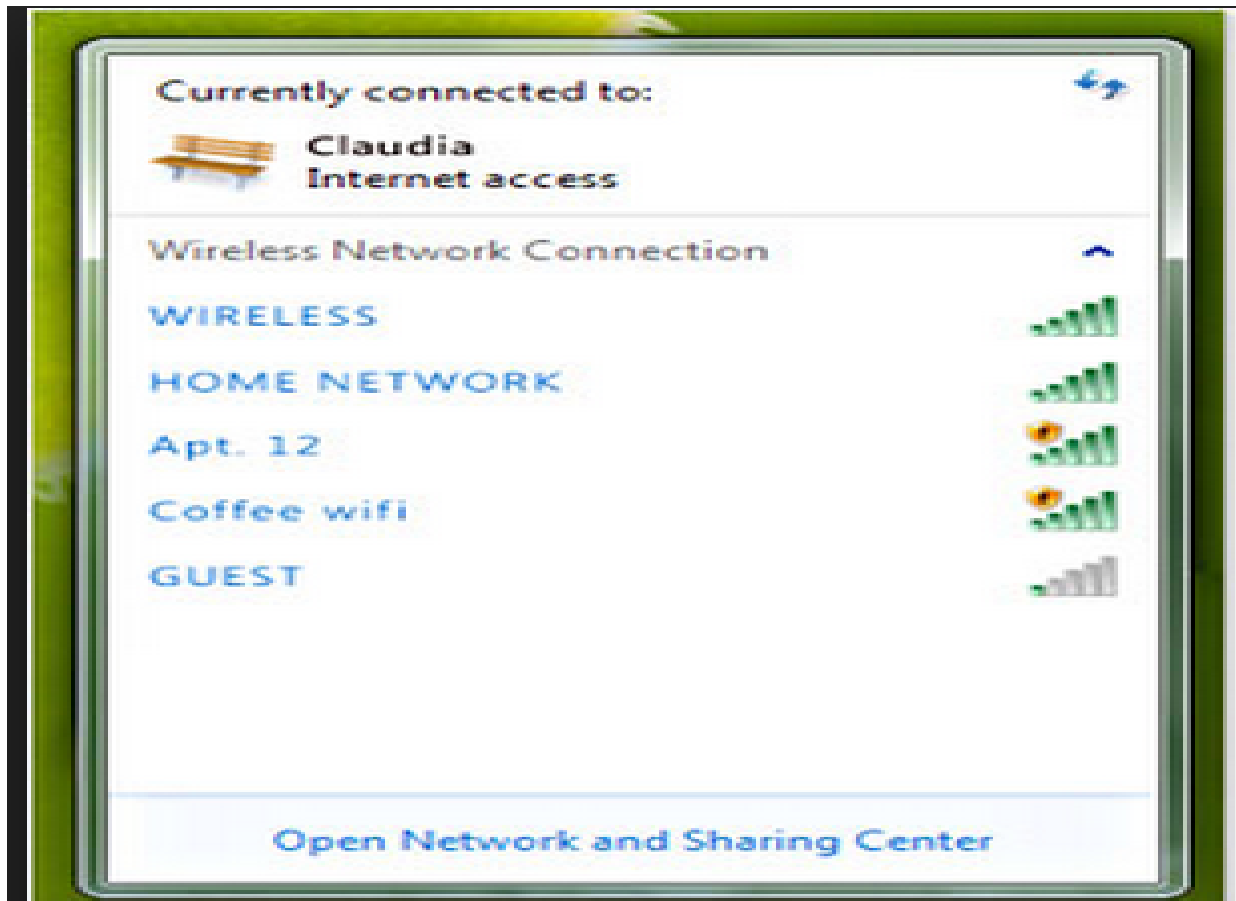
WIRELESS “WALK THROUGH”

Use your laptop to walk through your rooms and see approximately what your “bar (signal levels) “ are to determine the overall situation. Are those signals just yours or “neighbors” ?? What are relative levels?

Wireless Connections Available



Windows 7 – Wireless Conn's Available



Make a Wireless Survey

- Download “InSSIDer” program to a wireless laptop. Open that program and look at display.
- Carry the laptop around to the different rooms of your house and record the signal levels of your wireless source(s) **AND OF YOUR NEIGHBORS !!**
- RSSI (Relative Signal Strength Indicator)
 - -20 to -65 fine (of your wireless sources)
 - Other peoples signals below – 80 or so shouldn't bother you
 - If interference is found switch your channels to avoid it

LEARN

NETWORKS

FILTERS + -

SSID or Vendor Channel Signal Security 802.11

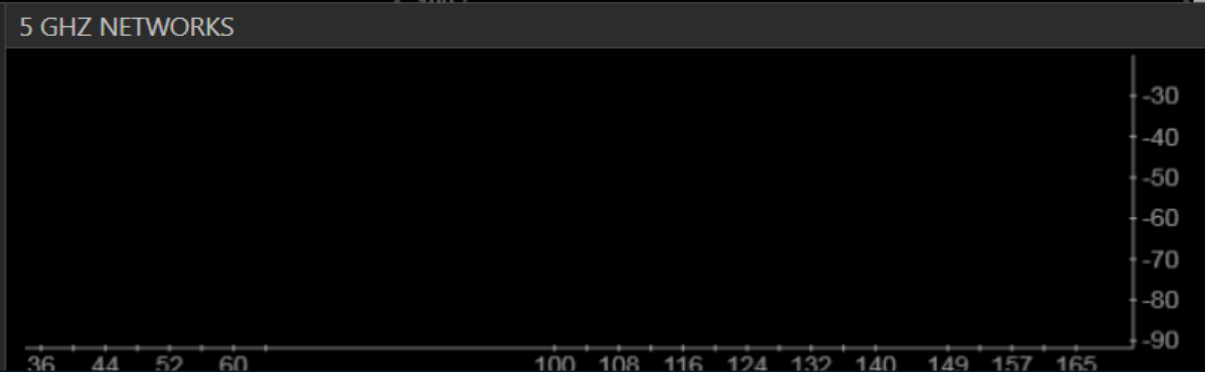
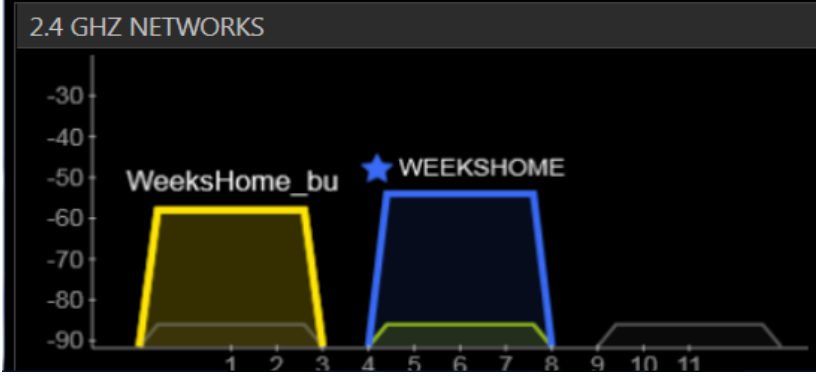
SSID	SIGNAL	CHANNEL	SECURITY	MAC ADDRESS	802.11
★ WEEKSHOM	-54	6	Open	00:25:9C:3D:1F:64	n
WeeksHome_bu	-58	1	Open	00:13:10:CE:E4:A6	g
MP_Network	-86	6	Open	C8:3A:35:F2:D0:B8	n
MP_Network	-86	6	WPA2-Personal	C8:3A:35:42:9F:80	n
belkin54g	-86	11	Open	00:30:BD:90:D0:21	g
Luo_2GEXT	-86	1	WPA2-Personal	2C:B0:5D:3A:F7:EB	n

★ WEEKSHOME **6** **83**
Channel Link Score

★ WeeksHome_bu **1** **91**
Channel Link Score

MAC 00:13:10:CE:E4:A6
Security Open
802.11 g
Max Rate 54

Co-Channel 1 Network
Overlapping 0 Networks
Signal -58 dBm



Easy way to visualize “Wireless Signal (ie “wifi”) Losses

<u>db Loss</u>	<u>Signal Loss</u>
3 db	50 %
10 db	90 %
20 db	99 %

FILTERS



SSID or Vendor

Channel



Signal

Security

802.11

	SSID	SIGNAL	CHANNEL	SECURITY	MAC ADDRESS	802.11
★	Netgear_Wee	-52	11	Open	30:46:9A:9A:10:26	n
	WEEKSHOME	-54	6	Open	00:25:9C:3D:1F:64	n
	WeeksHome_bu	-58	1	Open	00:13:10:CE:E4:A6	b, g
	belkin54g	-86	11	Open	00:30:BD:90:D0:21	g

★ Netgear_WeeksHome

11 **91**
Channel Link Score

WeeksHome_bu

1 **100**
Channel Link Score

MAC 00:13:10:CE:E4:A6

Security Open

802.11 b, g

Max Rate 11

Co-Channel 0 Networks

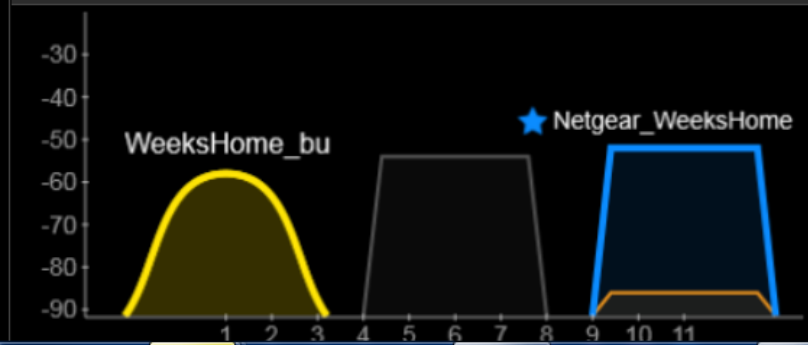
Overlapping 0 Networks

Signal -58 dBm

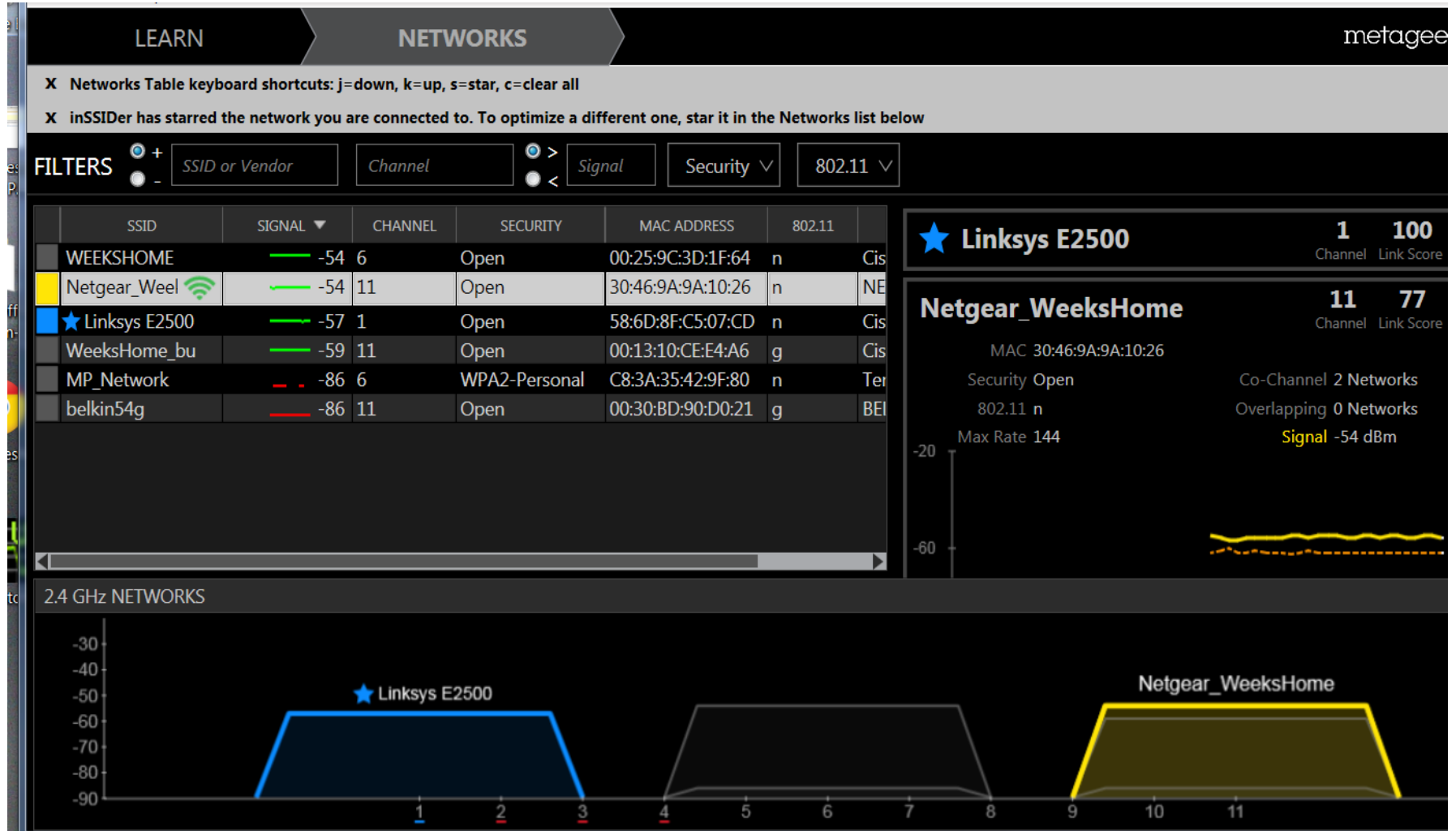


2.4 GHz NETWORKS

5 GHz NETWORKS



More Wireless Sources

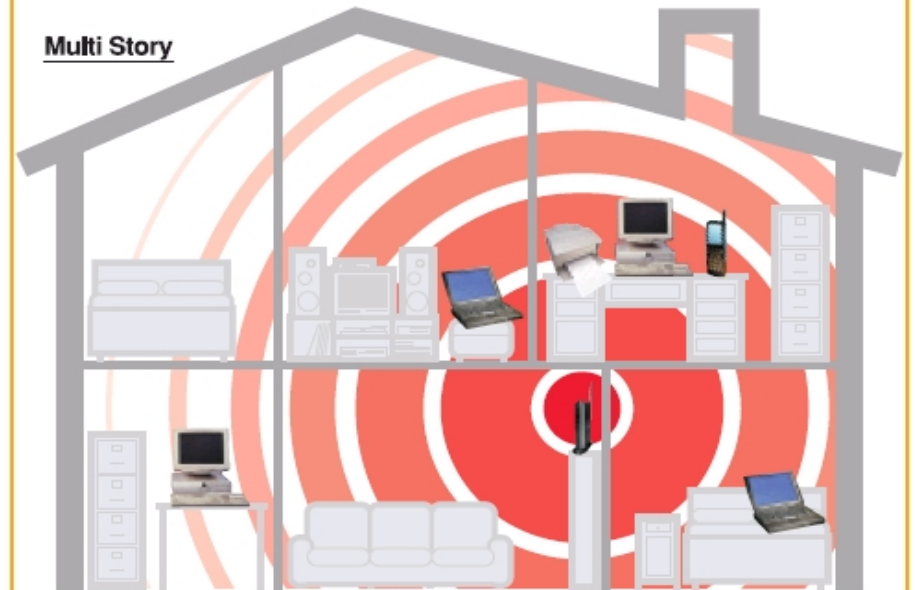


WIRELESS SURVEY FORM

ROOM	SSID NAME (YOURS)	CHAN- NEL	RSSI	FIX	SSID (OTHERS)	CHAN- NEL	RSSI
Wireless Router Location							
2 nd Room							
3 rd Room							

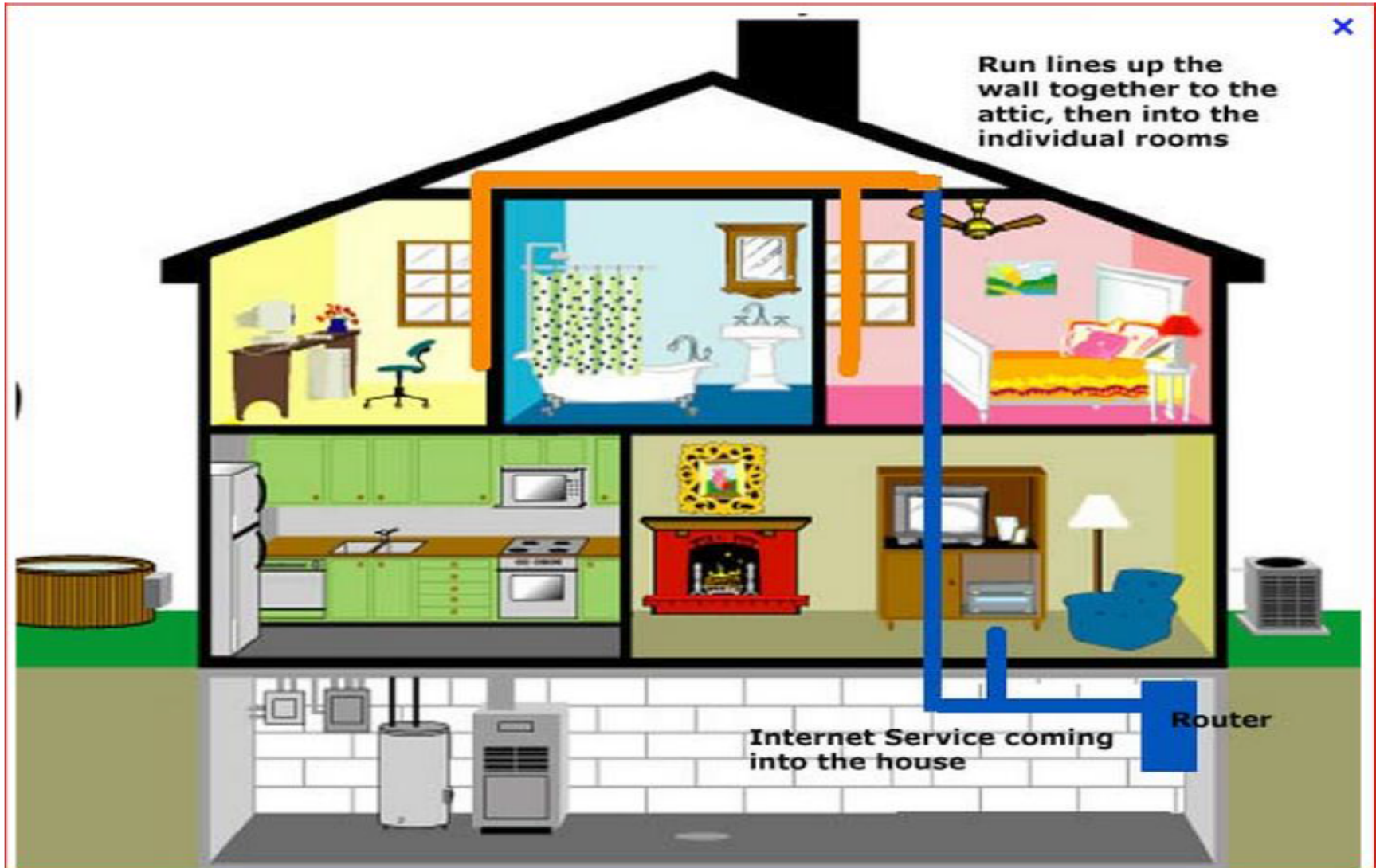
RESOLVING SURVEY ISSUES

- Take Action Based on Survey Results:
 - Neighbor signals interfere with yours (Change your channel)
 - Everybody else is mostly using Channel 6 (Use the ones they're not using)
 - My signals aren't strong enough in some of the rooms I'd like to have coverage in (Hard Wire* to that area and add an access point in that area or possibly re-position your wireless source)
 - There is just too much interference from neighbors in some of my rooms (Hard wire* to that room)
- * Hard Wire – Run ethernet cable to that area or use PowerLine/PhoneLine units/ MOCA (existing Coaxial cable).



Poor Placement of Router – Location is not central to wireless network. Too many walls, floors, heavy furniture and electronic equipment (which may cause interference) intervening, may result in weak or lost signal.

Optimal Placement of Router – Location is central to wireless network. Intervening walls, floors, and heavy furniture are minimized, electronic equipment (which may cause interference) is moved, allowing the maximum signal.



- The survey will have defined the problem. Take the most inexpensive step(s) first. Resurvey to see what improvement the simple steps have made.
- Keep your survey results. Spot check your survey occasionally .Your neighbors may change or their equipment may change and you may have to do some re-adjustment.