Network Setup

Router: Netgear WGR614 54 Mbps / 2.4GHz (v5)

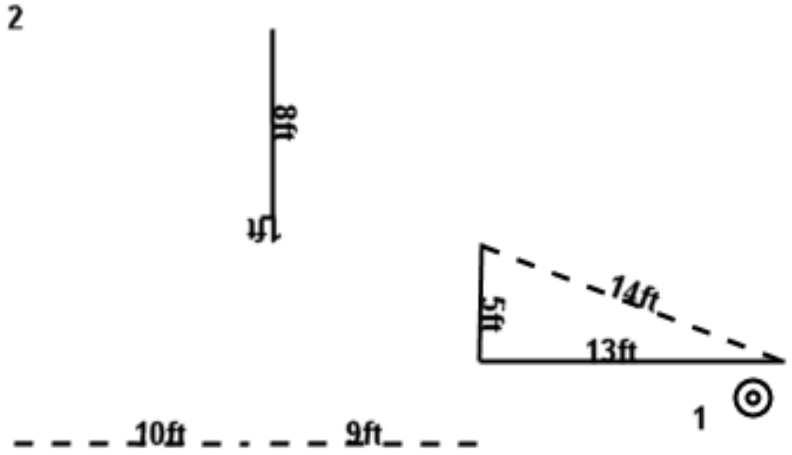
SSID	Nutty Wireless
Region	Canada
Channel	11
Mode	Test Dependent
Wireless AP	ON
Broadcast Name	ON
Security	128bit WEP

Laptop: Dell Inspiron 1150 – Dell Wireless 1450 (a/b/g)

Host Interface	32-bit Mini-PCI		
Standards	IEEE 802.11a/b/g/h (draft)		
Data Rate	802.11a/g	6, 9, 12, 18, 24, 36, 48, 54 Mbps	
	802.11b	1, 2, 5.5, 11 Mbps	
Modulation	802.11a/g	OFDM (6, 9, 12, 18, 24, 36, 48, 54 Mbps)	
	802.11b	CCK (5.5, 11 Mbps), DQPSK (2 Mbps), DBPSK (1 Mbps)	
Architecture	Infrastructure and Ad-hoc		
Frequencies	802.11a	50150 – 5.825 GHz	
	802.11b/g	2.4 – 2.484 GHz	
RF Output	802.11a	21 dBm max @ antenna connector	
	802.11b/g	15 dBm max @ antenna connector	
Antennae Connectors	Hardware diversity support. Main and auxiliary antenna connectors; transmit and receive on both		
Range	802.11a/h	54 Mbps	30m Open 10m Indoors
		18 Mbps	100m Open 50m Indoors
	802.11g	54 Mbps	50m Open 20m Indoors
		18 Mbps	150m Open 75m Indoors
	802.11b	11 Mbps	180m Open 60m Indoors
		1 Mbps	570m Open 125m Indoors
Receive Sensitivity	802.11a/g	-68 dBm @ 54 Mbps; -83dBm @ 18 Mbps	
	802.11b	-84 dBm @ 11 Mbps; -92dBm @ 1 Mbps	
Power Consumption	TX peak	1000mW	
	RX peak	1200mW	
	Idle	740mW	
	Disabled	20mW	
Security	Encryption: WEP, CKIP, TKIP, AES WPA (PSK, 802.1x) CCXv2 (CCKM) Software Upgradeable to 802.11i Single Sign ON EAP modes: LEAP, TLS, TTLS, PEAP, (TLS, MS-CHAPv2, GTC) Single Sign On for LEAP		
Delay	Multi-path RMS delay spread @ 1% FER: 11Mbps > 250nsec; 5.5 Mbps >		

Tolerance	300nsec
Temperatures	Operating 0º - 70º C Storage -40º - 90º C
Humidity	Up to 95%

Wireless Area



Wall Composition	Wood, insulation
Approximate Wall-Cutting	15ft
Interference	Cloths, Filing cabinets, Computers and other electronics (shielded and unshielded), Books, Kitchen equipment
Total Distance to Router Indoors	Location 1: 1ft Location 2: 34.5ft

Notes

Since the laptop wireless isn't true omni directional, the laptop was pointed in the direction of the router to provide maximum signal strength. A 2.4 GHz portable phone is used within the house; however it had no impact on the performance of the wireless tests.

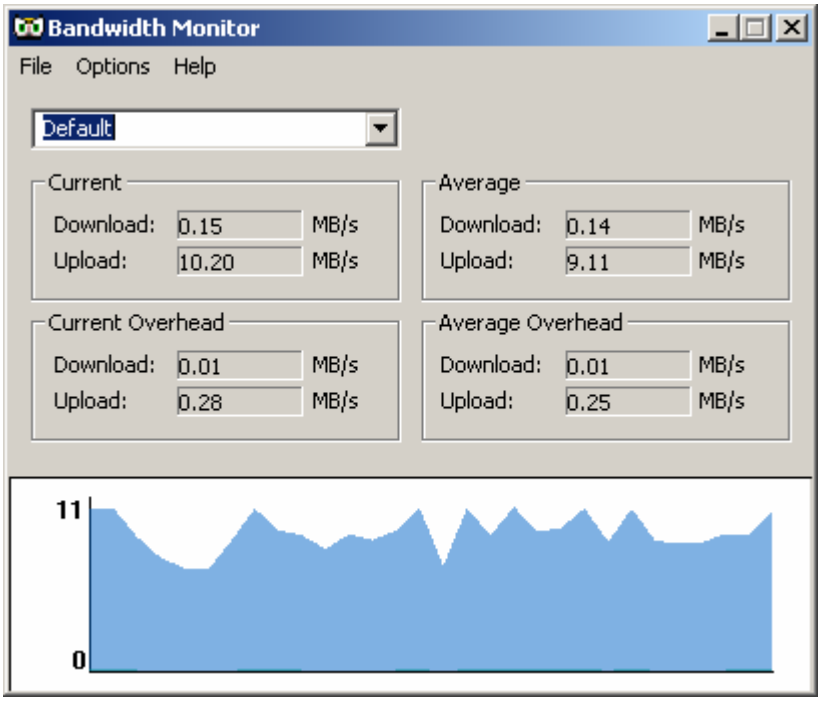
The Netgear WGR614 has been tested by CNet labs to have an average speed of 22 Mbps. Results here are based on my network setup, which are clearly inferior compared to the hardware used at CNet labs. To view their results, visit:
http://reviews.cnet.com/Netgear_WGR614_cable_DSL_wireless_router_54Mbps_2_4GHz/4505-3265_7-21218238-5.html

Tests are conducted on Windows XP Pro SP2. Connections established and maintained by Windows Wireless Zero. Bandwidth Monitor results are based on 30 second network activity. It displays the maximum recorded speed and the amount of instability within the network (represented by a jerky graph).

Tools:

Dell Wireless Tool	Tool provided for use with Dell based wireless network cards. Signal strength and Noise level reports are as equally accurate as NetStumbler.
Bandwidth Monitor	A tool I programmed to analyze network activity. Since I programmed it, I know it's reliable =)

LAN - Wired

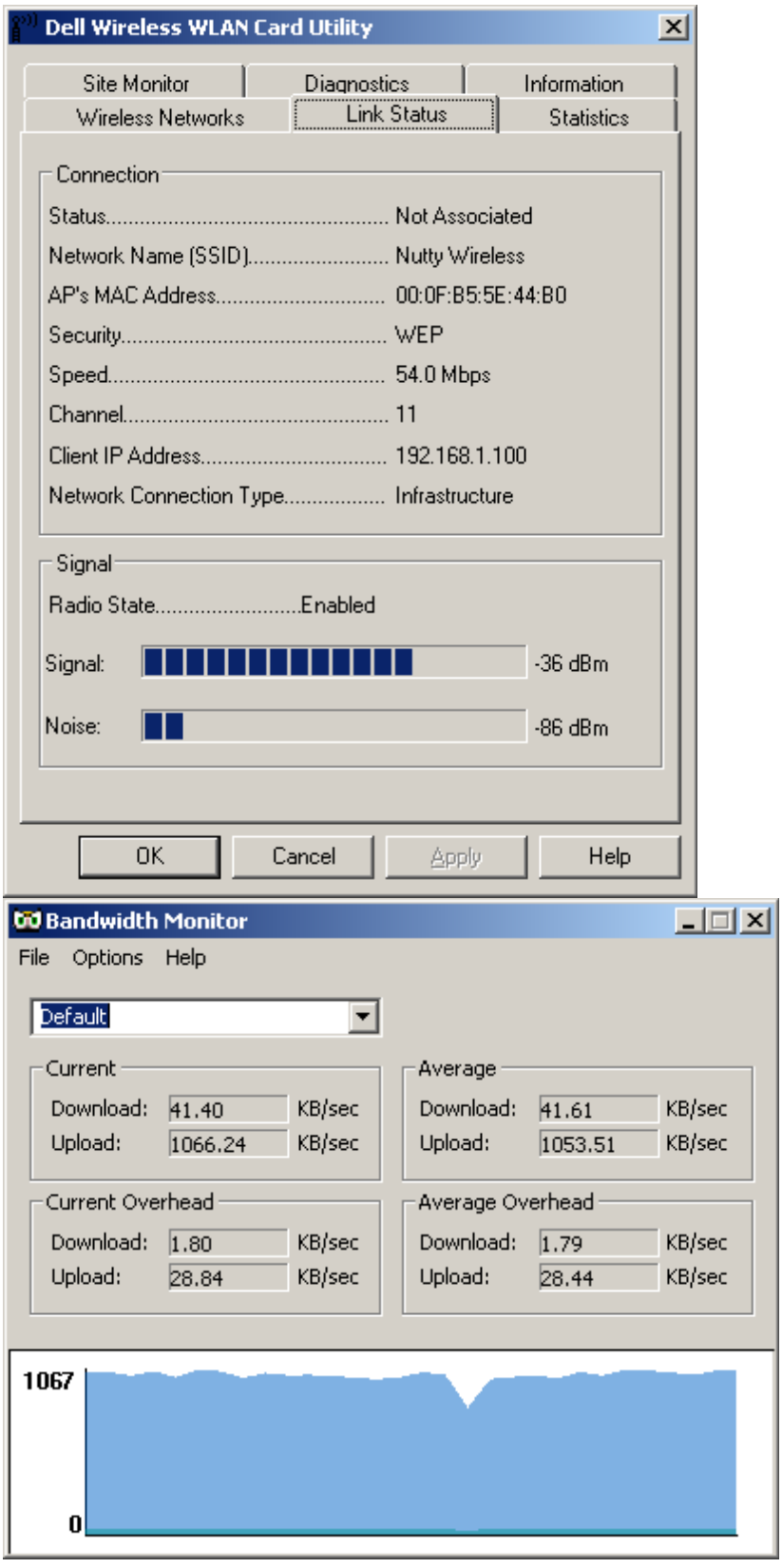


Comments:

LAN test performed to test the performance of the router. Nothing out of the ordinary here.

LAN – Wireless & No Extended Antenna

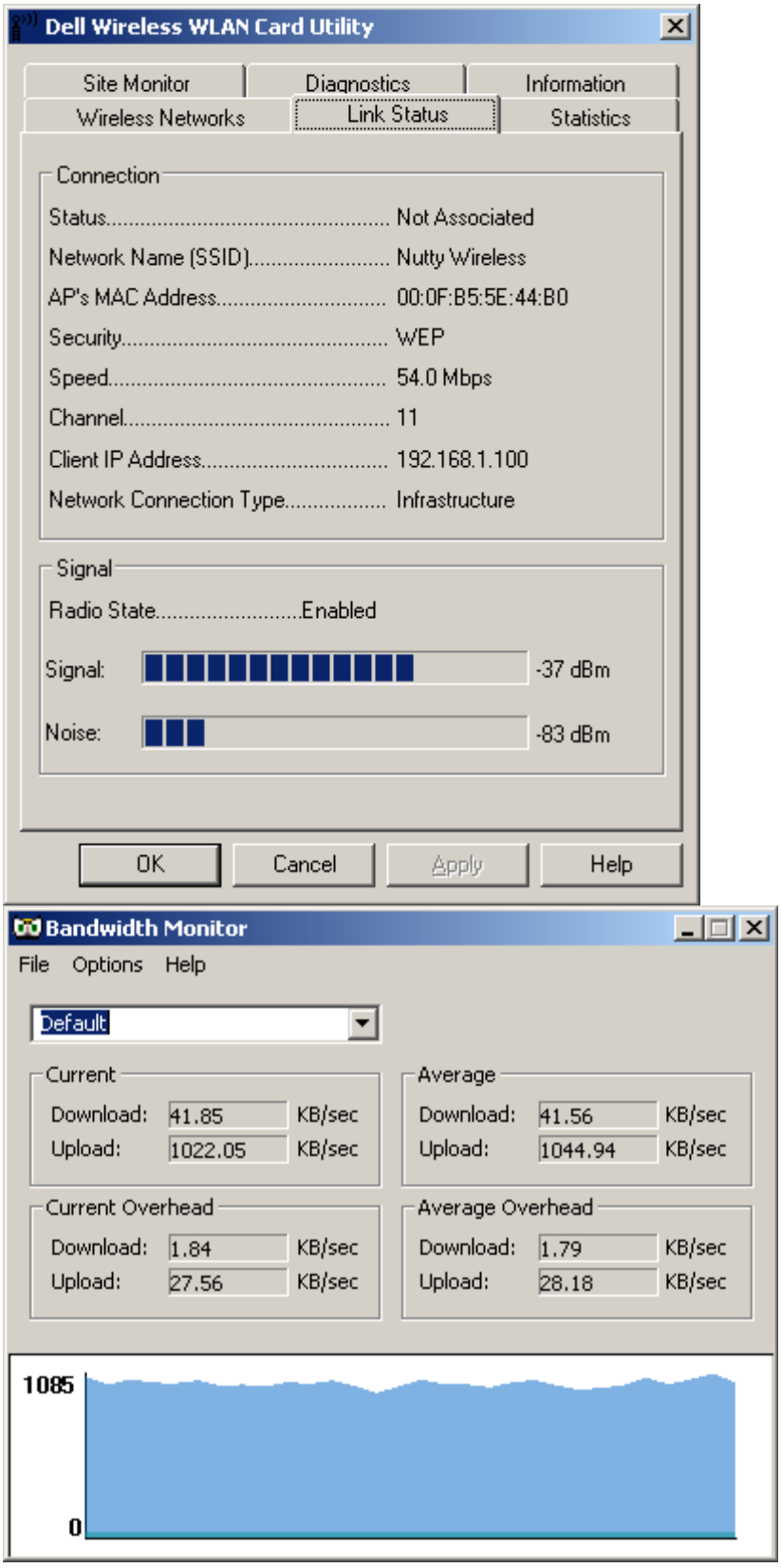
Location 1 – Test 1 – Mix Mode "g/b":



Comments:

Very low speeds were recorded. Possibly due to an unknown interference or that my Dell wireless network card is poor quality.

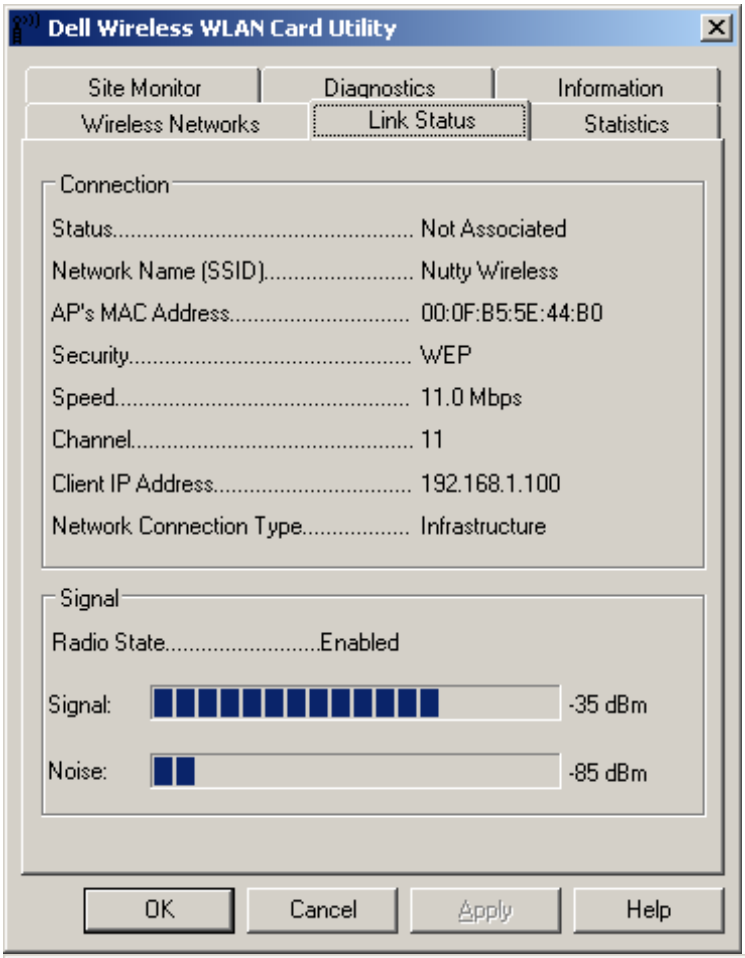
Location 1 – Test 2 – Mode g Only:

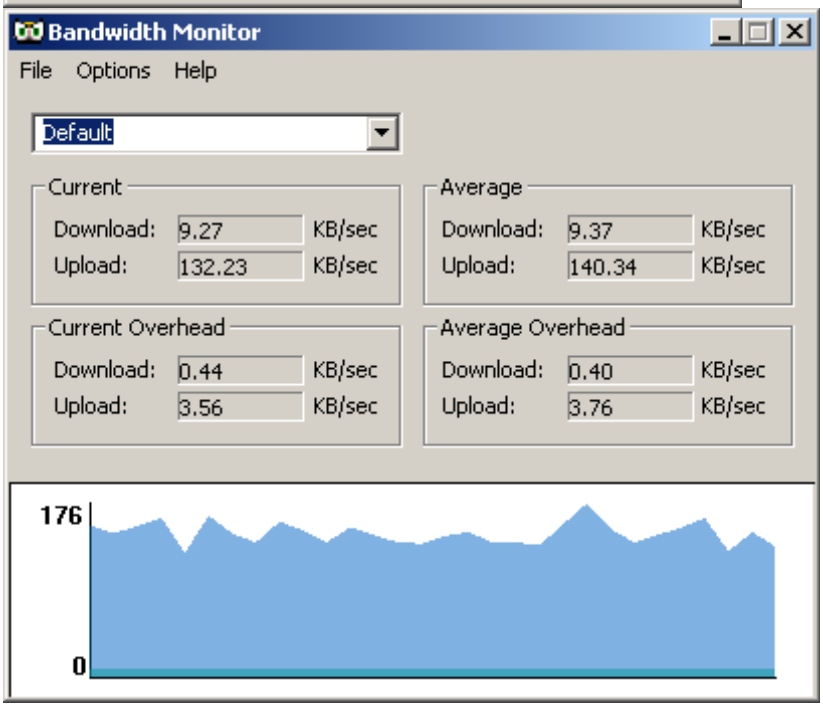


Comments:

Again, it appears I am limited to 1 MB/sec.

Location 1 – Test 3 – Mode b Only:

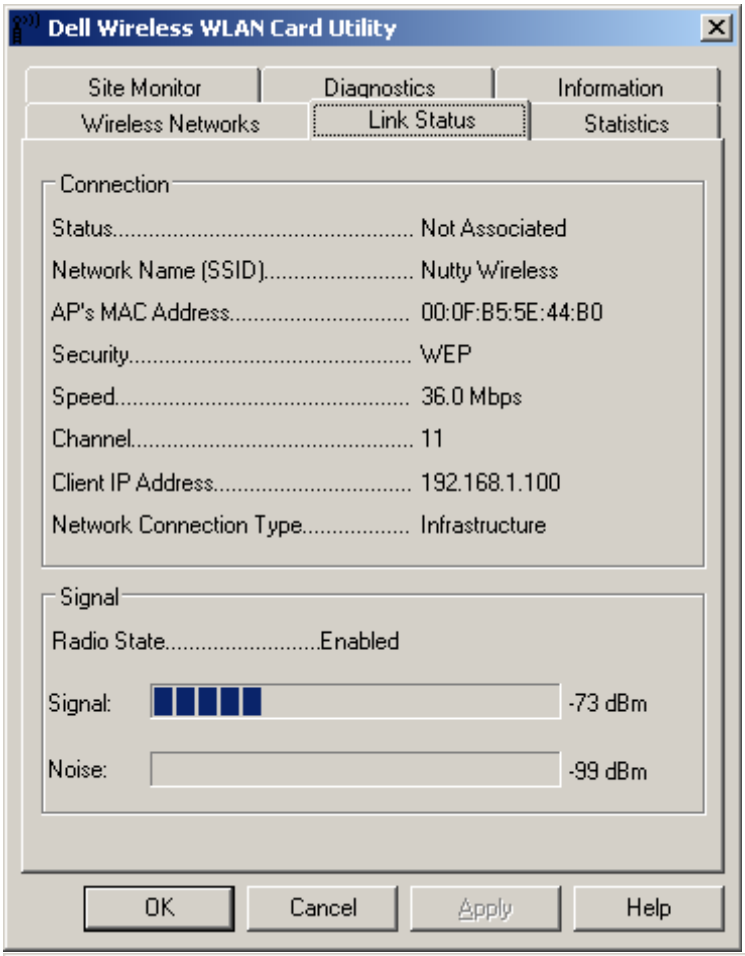


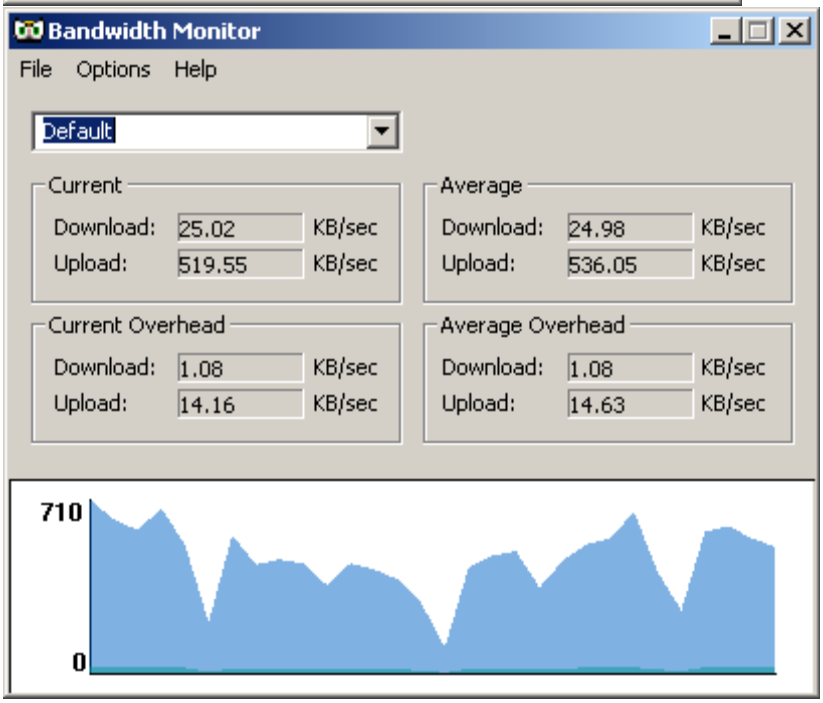


Comments:

This was an unexpected result. The wireless-b network had speeds about 1/5th that of the wireless-g. Since the wireless-g network was operating at wireless-b speeds, I figured wireless-b would have operated just fine. I was wrong.

Location 2 – Test 1 – Mix Mode "g/b":

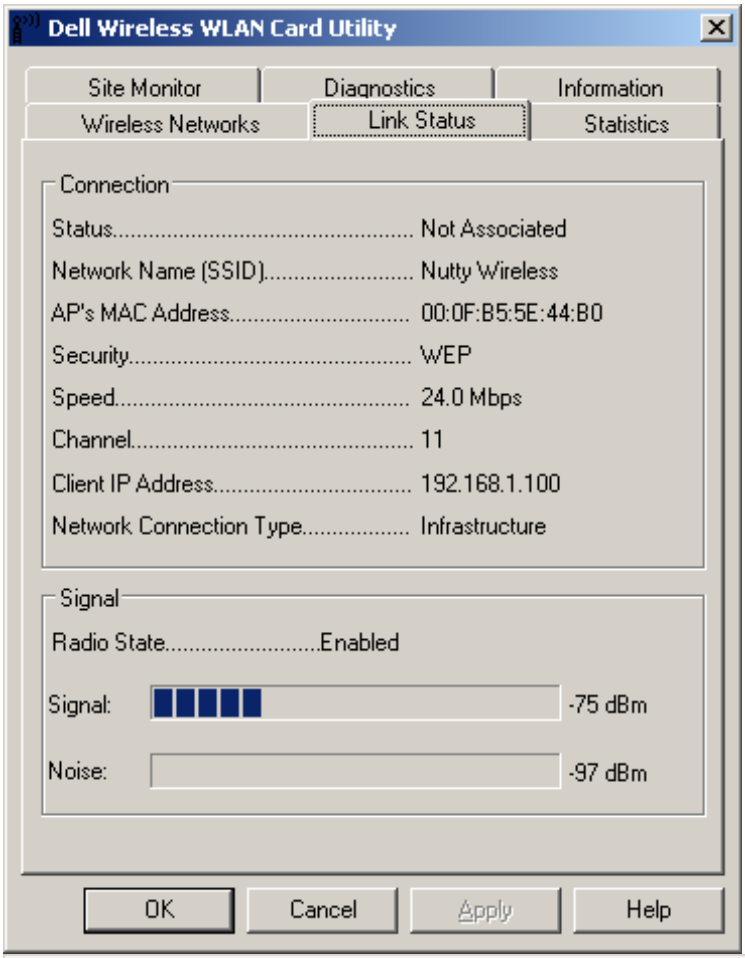


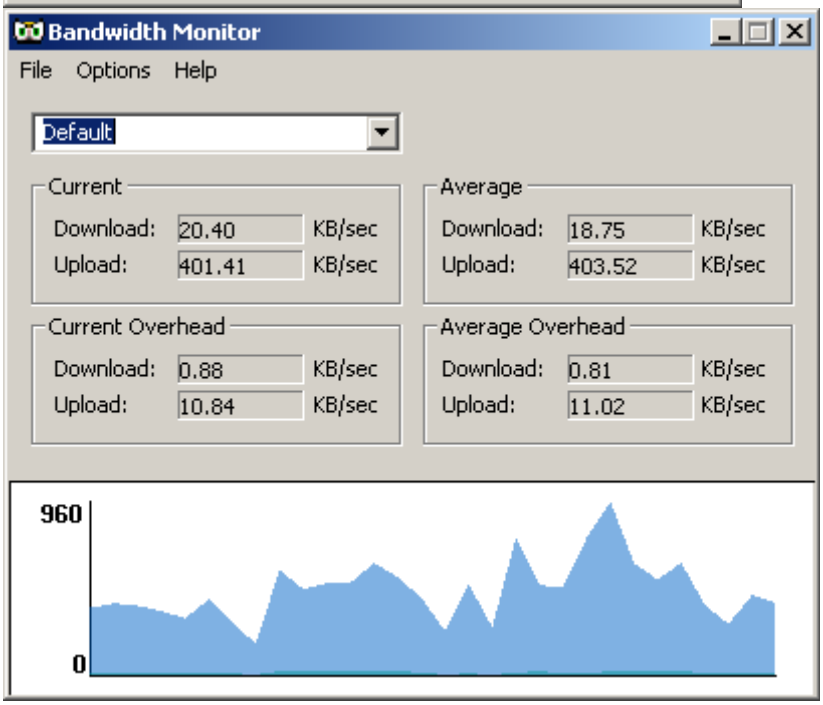


Comments:

Throughput seems to have decreased by half. Given the level of interference between the laptop and the router, this result (or lower) is expected. The jerkiness in the graph indicates there was a bit of difficulty in communication.

Location 2 – Test 2 – Mode g Only:

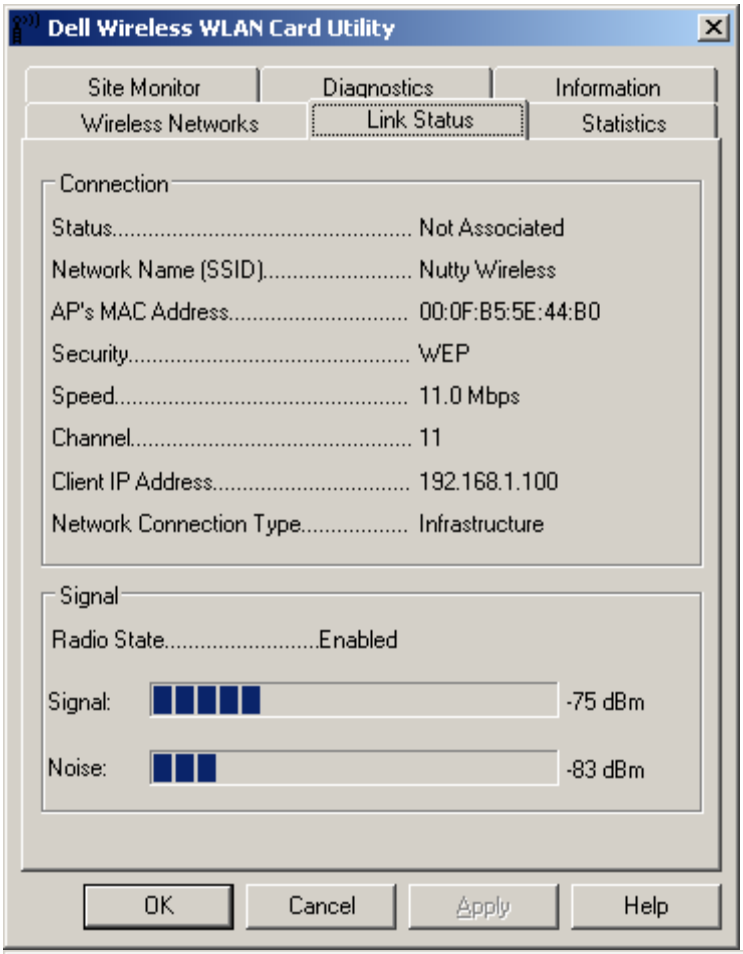


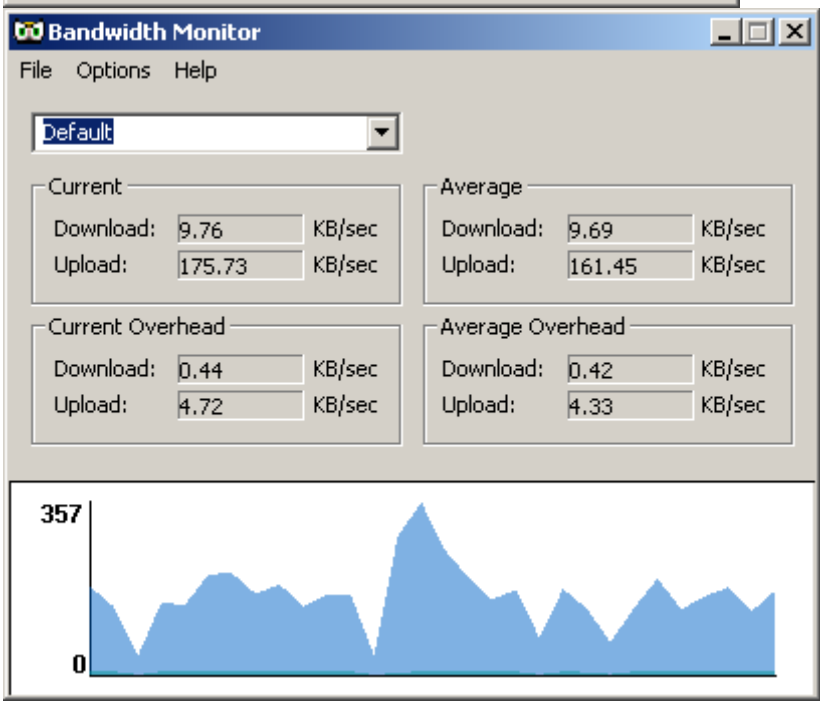


Comments:

Overall the performance is on par with the previous test. There are major spikes within both tests, suggesting difficulty in the communication.

Location 2 – Test 3 – Mode b Only:





Comments:

Speed appears to be on par with the 3rd test done from location 1. The jerkiness within the network activity clearly suggests there is quite a bit of interference. Unlike the wireless-g network, wireless-b seems to have maintained roughly the same speeds as done from location 1, test 3.

Overall

While my setup is far from optimal, I was still content that the wireless signal managed to penetrate a lot of obstructions. Poor results are either due to a poor router, a poor wireless card, or a lot of interference. Since the results obtained from the point-blank connection was poor, I’m lead to believe either the router or wireless card is of poor quality. There is no other nearby wireless setup operating on that frequency band, and my wireless phone had no impact on performance. Since CNet labs achieved results of about 22 Mbps with their hardware, I’m more likely to conclude that the Dell 1450 wireless card is poor quality. Without enough evidence of performance tests conducted by others on either hardware, it is inconclusive to pin-point the problem.