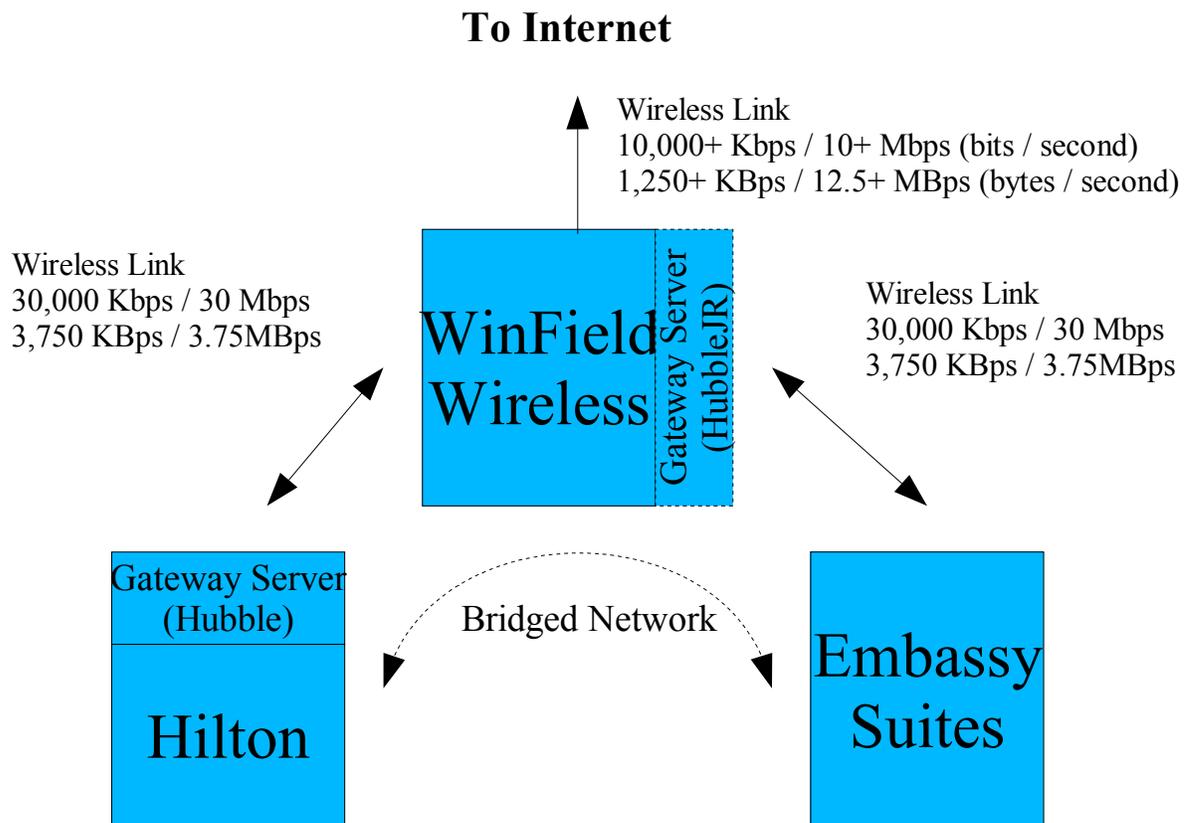To: Executive Committee, IEEE 802 LMSC

Re: Embassy Suites Wireless Network Bandwidth Issue

Date: July,14 2004

Internet Access / Network Design – Portland IEEE Conference, July 2004

To Internet

Wireless Link
10,000+ Kbps / 10+ Mbps (bits / second)
1,250+ KBps / 12.5+ MBps (bytes / second)

Wireless Link
30,000 Kbps / 30 Mbps
3,750 KBps / 3.75MBps

WinField Wireless

Gateway Server (HubbleJR)

Wireless Link
30,000 Kbps / 30 Mbps
3,750 KBps / 3.75MBps

Gateway Server (Hubble)

Hilton

Bridged Network

Embassy Suites

Background

The network design for the IEEE conference depends on the existence of a high quality network infrastructure provided by the hotel facilities and Winfield Wireless. This infrastructure was described to us by Paul Allais of Winfield Wireless as consisting of one high speed wireless Internet access link of greater than 10Mbps of bandwidth at his point of presence (POP) and two high speed connections from his POP to the two main hotel facilities. I.D.E.A.L. NSD staff placed a requirement of a minimum of 30Mbps of usable bandwidth between the facilities and

recommended enterprise quality, 100Mbps, full duplex wireless network bridges similar to the one used at the previous Albuquerque, NM conference in November 2003. Paul Allais assured I.D.E.A.L. and the IEEE 802 LMSC that the equipment and service would meet our requirements.

Issue

Monday July 12th through 12 noon Wednesday July 14th the wireless bridge and Internet connectivity for the IEEE members located at the Embassy Suites was severely restricted and almost completely inoperable. It was determined by NSD staff through testing, including installation of a new gateway server, that the problem resided with the ISP service provider, Winfield Wireless. The initial diagnosis on Monday by I.D.E.A.L. Technology staff was that the local service provider had lower bandwidth levels between the hotels and to the Internet than was contractually required.

The bridged network connection from the Hilton to the Embassy Suites did not perform under load at anywhere approaching the required 30Mbps capacity. Bandwidth tests of just the link between the facilities during the points of highest utilization during the day on Tuesday showed transfers of less than 100Kbps. Per our requirements there should have been significant available overhead on the link between the facilities. The service provider disputed our diagnosis for two days until our staff had worked significant hours testing other possible scenarios.

Resolution

NSD staff attempted to troubleshoot the issues caused by this limited bandwidth by creating a second gateway server at the Winfield Wireless POP and dividing the two hotel networks, but once demands for Internet bandwidth increased, the serious network congestion returned. NSD staff again pointed out that the bandwidth being used was almost exactly 10Mbps by examining/ monitoring the statistical data we collect on our primary gateway server. This was consistent with the statistical information we reported to Winfield Wireless on Monday when the bandwidth issue was first detected. We again requested that Winfield Wireless examine their network configurations and insure that the bandwidth was not being artificially constrained. Their subsequent examination revealed that they did in fact have their network or Internet service network equipment misconfigured. This was corrected at approximately noon on Wednesday. The Internet access began operating at required capacity.

Below is the before and after data that demonstrates the available bandwidth at Embassy Suites.

Before corrective action:

PING tests from the Embassy Suites hotel to google.com: Average latency 115ms
File transfer test over the Embassy Suites / Hilton Bridge: 11KBps / 88Kbps

File transfer test from the Embassy Suites hotel to the Internet: connection timed out

After corrective action:

PING tests from the Embassy Suites hotel to google.com: Average latency 30ms
File transfer test over the Embassy Suites / Hilton Bridge: N/A
File transfer test from the Embassy Suites hotel to the Internet: 176KBps / 1.4Mbps

Summary

The Internet and bridged network bandwidth were not performing to our requirements. The issues were tracked to a configuration issue of the network equipment of Winfield Wireless. Once the configuration was corrected, the Internet access began operating at acceptable levels.