100MBPS PERFORMANCE IMPROVEMENT DETAILS

Performance Metrics

In 802.11g mode, the new 100Mbps Wireless range from U.S. Robotics offers:

- Up to 2x improvement in throughput coverage area* (higher rates at longer distances)
- 100 Mbps mode: Up to twice the throughput of competitive 802.11g products

** From initial internal testing in multi-vendor 802.11g environments.*

How is 100Mbps achieved?

100Mbps performance is an enhancement to the 802.11g specification that enables higher throughput using a number of techniques. Similar to our previous 802.11b 22Mbps product offerings, 100Mbps performance is completely compatible with all 802.11g and 802.11b devices. Some of the 100Mbps performance throughput enhancements will be seen in a U.S. Robotics to any vendor combination, whereas some are only seen in U.S. Robotics to U.S. Robotics connections.

100Mbps performance uses a procedure called packet aggregation, combining smaller data packets into larger ones. Traditional IEEE 802.11 implementations use a maximum packet length of approximately 1500 bytes, which is the standard for Ethernet LANs. The U.S. Robotics physical layer is designed to use data packets that are up to 4000 bytes long. *These longer packets help reduce protocol overhead and thereby increase effective throughput.*

- Overall improvement from using this technique equates to up to 25-30 Mbps throughput versus 15-20 Mbps average in other 802.11g devices on the market.
- An access point using this technique will still talk to any 802.11b, 802.11b+ (22Mbps) or 802.11g products from U.S. Robotics or any other vendor.
- If the wireless transmission rate goes below 11Mbps, this mechanism is disabled, since the larger packets, when sent at slower data rates, would actually reduce throughput due to the higher error rate and resultant retransmission of packets.

The throughput improvement is only seen in connections between two U.S. Robotics-based WLAN devices.

How does U.S. Robotics offer increased mixed-network performance?

U.S. Robotics 802.11g solution leverages the expertise U.S. Robotics gained in multimode WLAN environments with its 22Mbps technology. 802.11b and 22Mbps use two different modulations, similar to 802.11g and 802.11b. Both 802.11g and 22Mbps require simultaneous operation with 802.11b devices within the network without having the entire network fallback to 802.11b (11 Mbps) rates or cause significant performance degradation of the higher-rate modulation.

U.S. Robotics uses the protection mechanisms outlined in the 802.11g standard, to enable its 802.11g devices to talk to 802.11g or 802.11b devices in the network, without bringing the entire network down to 802.11b data rates. Performance degradation was one of the major problems with pre-standard 802.11g products. *By waiting until the standard was set, U.S. Robotics was able to release a product line with hardware and firmware built for superior performance in mixed-mode networks.* In fact, the technology implemented in U.S. Robotics 100Mbps performance solution was chosen as part of the Wi-Fi Alliance's 802.11g test plan.

- Some competitors have fixed this problem in their latest versions of software, but many have not provided firmware updates for older 802.11g products that were delivered prior to the standard ratification.
- Currently, U.S. Robotics is exhibiting better mixed-mode performance than competitive 802.11g products, which do not have Accelerator technology.

Additional High Points

- Compared to competitive solutions, U.S. Robotics data rates fall back in waterfall curves that are smooth and fall off gracefully, indicating good RF, baseband and multipath performance. This means that consumers using applications such as video or audio, where a constant stream of data is required, will see a constant flow of data, versus jitter and possible lost packets.
- Support for the following:
  - Wi-Fi Protected Access (WPA) – upgrade in September 2003
  - 256-bit WEP encryption (unique to U.S. Robotics on 802.11g compliant products)

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