

The Expanding Wireless Data Cloud

There's a new, rapidly growing business opportunity for home electronic integrators and it's literally coming out of thin air. Over the last few years the market has seen an explosive growth in the adoption of IEEE 802.11, a wireless standard that allows computing devices to connect to one another and the Internet at speeds of up to 54 megabits per second and distances as great as 25 miles away! According to the Dell'Oro Group, the Wireless LAN/802.11 market (including 802.11a and 802.11b) grew 21 percent, quarter to quarter, with revenues of \$363.3 million in the fourth quarter of 2001. For the year, the 802.11b market more than doubled to \$1.2 billion.

The implications of this trend to the home electronics integrator is significant, especially to those who are adding a focus on home networking to their business model. The success of the 802.11 standard has prompted numerous manufacturers to add wireless interface capabilities to their product lines and has stimulated the growth of their existing products with exciting new applications. I think it's important to step back and take a look at some of the new wireless products that have entered the home and how they are being used. In so doing, we can begin to make some predictions as to where this new wireless world may be taking us.

The most obvious home networking product is the ubiquitous laptop computer with a wireless 802.11b interface card inserted into a PCMCIA slot. Today many laptop manufacturers are actually embedding the wireless technology and antennas into the base laptop just as they integrated wired 802.3 Ethernet ports into these laptops a few years ago. Linked to a wireless access point connected to the home's Internet access gateway, these wireless laptops allow the homeowner to surf the Internet anywhere in their home or backyard without the limitations of being near an electrical outlet or data jack. A common application that our customers enjoy is the ability to check and respond to their e-mail anywhere they want to in the home and then

print these e-mails or documents to a networked attached printer in their home office.

The web pad is a new wireless product that has emerged in the home over the past year. Similar to the laptop in that it is a fully functioning computing device on the home network, it also adds the invaluable feature of having a touch-screen interface built into a portable device that weighs less than two pounds. The touch-screen interface makes these web pads ideal solutions for home control applications. Now you can see the status of your home's lighting, thermostat settings, security panel or home cameras with the touch of an icon on the web pad's screen. These new web pads are also being used to control home theater components. Instead of a remote control that relies on inconsistent infrared commands, these 802.11b-based web pads control home theater components by communicating via a home control server computer to the RS-232 ports found on newer home theater equipment. For example, Premise Systems' SYS software program allows systems programmers to model audio/video component controls and to publish the control graphical user interface to any Windows-based computer portal in a home.

Another web-pad application is one where it displays an ongoing slide show of family digital photos while it's resting in the charging cradle. These digital photos may be stored on the shared hard drive of an office computer and then wirelessly transmitted to the high-resolution color screen of the web pad.

Several manufacturers have introduced 802.11b wireless print server devices into the home over the past year. These useful products let you place a home printer anywhere in the house where you have an electrical plug and allow all the computers in the home to print to it. This is very convenient when you want to have a shared

printer but do not have a data jack nearby. To extend the previous web-pad example, you could be wirelessly checking your e-mail from the comfort of your bed and then print a document to a printer in the hallway connected



to a wireless print server.

The 802.11b standard is also providing a communications path in the home for audio and video distribution. At the EH

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Expo in Orlando last month, GE Smart introduced wireless 802.11b speakers (see www.gesmart.com/news/audiovideomarket.asp for more information.) These speakers will allow the homeowner to place them

wherever there is an electrical outlet and play their digital music. A typical example of this would be to mount these speakers externally (say on a backyard deck near an electrical outlet), and they could be used to wirelessly retrieve MP3 songs from a shared hard drive somewhere inside the home.

Video distribution is also being deployed over the 802.11a and b spectrum. Any computing device with Windows Media Player or Real Player can take digital video sources from the Internet (such as from the site www.intertainer.com) or use local MPEG files and play them in real time. These

computing devices could be desktop computers, laptops, webpads, personal digital assistants or even web-enabled phones

In the future we can expect wireless data technologies to encompass many other aspects of our home. As the speed increases (with the new 802.11a and g standards that will deliver data rates up to 54 MB/sec) the quality of wireless video transmission will improve. As the quality of service improves (the ability to prioritize the sending of packet information) we will see more Internet-enabled IP phone products in the home. And lastly, as the price continues to drop (wireless interface cards are now under \$75) we will see more devices with wireless interface capabilities built in.

It's not unreasonable to anticipate that we will see wireless-connected microwave ovens, thermostats, sprinkler systems and even hot tub and pool controls in the near future. All of this wireless development and deployment bodes well for the future of connected home initiatives and creates an even larger opportunity for the custom electronics integrator to bring these wireless applications to life for their customers.

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