CDMA White Paper

Executive Summary

As enterprises across the globe continue to become more and more mobile, wireless technologies are bombarding themselves into our everyday work life as never before. And, as mobile carriers across the globe continue to roll out packet data technologies, Gartner believes that few of these networks will have sufficient capacity to support packet data without an influx of a new spectrum. One of the networks that do have sufficient capacity to support packet data is Code Division Multiple Access (CDMA) technology. CDMA forms the basis of the third generation (3G) mobile phone offering consumers converged Internet and wireless communication technologies.

CDMA is a digital cellular technology that uses a special type of digital modulation techniques called *spread spectrum*[1] to better utilize the radio spectrum by allowing multiple users to share the same physical channel. Spread spectrum technology takes the user's stream of bits and scatters them across a very wide channel in a pseudo-random manner. What happens is that CDMA digitizes a telephone conversation and tags it with a special frequency code and the receiving device is instructed to decipher only the data corresponding to a particular code to reconstruct the signal.

So, what does this all mean in English? The best way to understand CDMA technology is to imagine that you are in a room full of people (paired off in couples) all attempting to carry on one-on-one conversations with their specific partner at the same time. In order for each couple in the room to hear what their partner is saying and for each couple to have an equal amount of time to speak, each couple would have to take turns speaking and probably only utter one sentence at a time to allow for each couple to have an equal amount of speaking time. And, because there is never more than one person in the room speaking at a time, no one has to worry about being heard over other noise and/or conversations going on in that room. However, this can be quite time consuming, as the conversations between the couples would take forever to be completed.

With CDMA technology, each couple can talk at the same time because the technology actually assigns each couple their own language and each couple is only capable of understanding the language, which was assigned to them. Therefore, the background noise from the other conversations does not cause any real problems and each couple in the room can speak as long as they wish.

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[1] Spread spectrum enables a signal to be transmitted across a frequency band that is much wider than the minimum bandwidth required by the information signal. The transmitter *spreads* the energy, originally concentrated in narrowband, across a number of frequency band channels on a wider electromagnetic spectrum.

The problem

Enterprise users have always judged mobile phone networks by the quality of service they provide including reliability, speed, voice quality, and data transmission. And remotely accessing enterprise networks no longer consists of simply dialing a narrowband ISP and passing an authentication test that grants users a free pass to roam the network. It now entails pervasive and persistent secure access to corporate resources by wireless access points, Internet kiosks, and Internet hot spots.

One of the problems with wireless technologies in the past was that a large number of users could not share a common pool of radio channels, which in turn prevented support for multiple customers. And, as enterprises continue to view wireless technology more of a necessity than a luxury, these same enterprises are demanding wide area wireless coverage, which offers full security, support, and cost control all built into a unified remote access solution. CDMA forms the basis of the third generation (3G) mobile phone that offers users converged Internet and wireless technologies, and according to Gartner[2], CDMA has improved spectrum efficiency compared with GSM[3] and TDMA[4] and it has an elegant 2g to 3G migration path. For example, under GSM, which is globally deployed and very popular, the number of users that can be connected at any time is limited and interference is a critical factor. CDMA technology provides enhanced capacity and less interference.

According to Gartner, no single wireless technology provides for people's access needs and this will continue to be true 10 years from now. However, Gartner anticipates a greater convergence of standards between networking domains – but this will not be evident

The challenge
The solution
The benefits of the technology
Summary

Fiberlink is a leading provider of secure remote access solutions, unifying worldwide remote access, management and enforcement within existing IT policy. Fiberlink addresses the growing infrastructure complexities of enterprise access brought on by the demands of an expanding

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[2] "Personal to Global: Wireless Technologies, 2005-2010," Peter Richardson, analyst, Gartner Group, Inc. 2001
[3] GSM (Global System for Mobile communication) is a digital mobile telephone system that is widely used in Europe and other parts of the world.
[4] TDMA (time division multiple access) is a technology used in digital cellular telephone communication that divides each cellular channel into three time slots in order to increase the amount of data that can be carried.

business ecosystem. From employees to partners, remote offices to extranets, dial-up to wireless to broadband, Fiberlink allows enterprises to capitalize on extended business opportunities. Multi-network redundancy, best-of-breed application services and support, low total cost-of-ownership and minimal impact on IT help make Fiberlink an important business partner.

Analyst firms including Gartner, Burton Group and Yankee Group recognize Fiberlink as a leader and innovator in the remote access industry. Fiberlink has more than 300,000 corporate users. Fiberlink customers include General Electric, BMC Software, Computer Sciences Corporation, Royal Caribbean, The Gillette Company and Sun Healthcare. Headquartered in Blue Bell, Pa., USA, Fiberlink has offices throughout North America, Europe and Asia Pacific.
For more information on Fiberlink, visit its website at http://www.fiberlink.com.

Sierra Wireless

Sierra Wireless is a global leader in providing wireless communication solutions that enable our customers to improve their productivity and lifestyle. Products designed by Sierra Wireless are recognized as unique, offering differentiated and reliable solutions, backed by world-class support.

Founded in 1993 in Vancouver, Canada, Sierra Wireless was instrumental in developing some of the first wireless data devices and continues to innovate with new products and software for new and emerging networks. In 1998, Sierra Wireless formed the Wireless Ready Alliance to advance the development and deployment of wireless communication. In 1999, the company was named Canada's fastest growing technology company by Deloitte & Touche and named the Company of the Year by the British Columbia Technologies Industry Association. In 2000, "Team Sierra Wireless" was named Entrepreneur of the Year by Ernst & Young; in 2002 Sierra Wireless was included on the 2002 Deloitte & Touche Technology Fast 500 list; and in 2003, the company was honored on PROFIT Magazine's PROFIT 100 list. For more information on Fiberlink, visit its website at http://www.sierrawireless.com.

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