WIRELESS TECHNOLOGY GLOSSARY

- **1G:** The first generation of analog cellular communications; heavy, bulky, and primarily limited to voice calls.
- **2G:** The second generation of cellular devices, which consisted of digital phones with limited data capabilities (e.g., caller identification and short message service paging).
- **2.5G:** These cell phones provide higher data rates, offer always-on Internet and e-mail, and typically use general packet radio service (GPRS).
- **2.75G:** Cell phones using 2.75G have reasonable Internet browsing capabilities with speeds up to 384 kilobytes per second, and include Enhanced data rates for GSM evolution (EDGE) technology.
- **3G:** This is the third generation of cellular communication networks, consisting of packet-based devices with higher speeds than 2.5G that support video conferencing and the streaming of Internet applications.
- **3.5G:** This is the current leading-edge, high-speed cellular technology available in the market today.
- **3.75G:** High-speed cellular technologies intended to extend the capabilities of 3.5G until 4G technologies are developed.
- **4G:** Not yet developed; will be an Internet protocol-based (IP), fully integrated "anytime, anywhere" technology.
- **802.1X:** A standard from the Institute of Electrical and Electronic Engineers (IEEE) for port-based network access control that provides authentication for devices connected to a network and uses the extensible authentication protocol (EAP).
- **802.11:** The IEEE's wireless LAN and mesh network standards, which include:
  - **802.11a:** "Orthogonal Frequency Division Multiplexing in the 5 Gigahertz Band"; this standard specifies a method of sharing bandwidth among multiple devices simultaneously.
  - **802.11b:** "High Rate Direct Sequence Spread Spectrum in the 2.4 Gigahertz Band"; this standard specifies a method of sharing bandwidth among multiple devices simultaneously.
  - **802.11c:** "Bridge Operation Procedures"; this standard provides a bridging standard for wireless access points.
  - **802.11d:** "Global Harmonization"; this standard provides wireless development standards to promote compliance with various national spectrum requirements and regulations.
  - **802.11e:** "Media Access Layer Enhancements for Quality of Service"; this standard provides prioritization of traffic criteria based on the time or performance sensitivity of the session to optimize data transmission.
  - **802.11f:** "Inter Access Point Protocol"; this standard establishes interoperability standards to allow various vendors' WAPs to communicate in a heterogeneous environment.
  - **802.11g:** "High-Speed (54 Mbps) Enhancement to the 2.4 Gigahertz Band (compatible with 802.11b)"; this specifies backward compatibility with 802.11b standards for newer high-speed devices.
  - **802.11i:** "Medium Access Control (MAC) Security Enhancements Standard"; this standard addresses early wireless security issues through the use of AES, TKIP, and 802.1X. (See also WEP, WPA, and WPA2 below).

- **802.11n:** "High Speed (100 Mbps) 802.11a/b/g Compatible Mixed Frequency (2.4/5 GHz) Multiple Input/Multiple Output (MIMO) Standard"; this standard provides guidance for interoperability across multiple device access methodologies and bandwidth frequencies.
- **802.11x:** Refers to the general collection of 802.11 specifications.

- **802.16:** IEEE standard for broadband wireless access.
- **802.3:** The IEEE's ethernet networking standard.
- **AES:** Advanced encryption standard.
- **Bluetooth:** A short-range communication technology that serves as a replacement for USB and serial cables.
- **CDMA:** Code division multiple access.
- **EAP:** Extensible authentication protocol; an authentication framework implemented in various forms, such as the protected extensible authentication protocol (PEAP), the lightweight extensible authentication protocol (LEAP), the extensible authentication protocol — transport layer security (EAP-TLS), and others. All of the various forms have their own request for comment (RFC) available from the Internet Engineering Task Force (IETF), which provides the specific technical details for the individual implementations.
- **EAP-TLS:** Extensible authentication protocol — transport layer security.
- **EDGE:** Enhanced data rates for GSM evolution.
- **IrDA:** Infrared Data Association, an organization that provides specifications for wireless communication using infrared light for near distance line-of-sight data transmissions.
- **GPRS:** General packet radio service; a 2.5G technology implemented in GSM networks that offers wireless data access speeds of up to 144 kilobytes per second in user devices.
- **GSM:** Global system for mobile communication.
- **HSDPA:** High-speed download packet access.
- **HSUPA:** High-speed uplink packet access.
- **HTTP:** Hypertext transfer protocol; a plain text (i.e., sent in a clear, unencrypted form) communication protocol that is used for Web-based communications.
- **HTTPS:** HTTP over SSL.
- **IEEE:** Institute of Electrical and Electronics Engineers, an international nonprofit professional organization for the advancement of technology related to electricity. The IEEE develops standards for networking, among other things, known as IEEE 802.
- **IETF:** Internet Engineering Task Force.
- **IP:** Internet protocol; one of the core protocols of TCP/IP networks.
- **ISO:** International Organization for Standardization.
- **LEAP:** Lightweight extensible authentication protocol.
- **PEAP:** Protected extensible authentication protocol.
- **OSI:** Open systems interconnect; a theoretical model of network communication protocols that provides granularity of function and abstraction between layers, developed by the ISO.
- **SSL:** Secure socket layer; a protocol designed to establish an encrypted connection or tunnel between two end points of a communication session at layer 5 of the OSI model.

- **TDMA:** Time division multiple access.
- **TKIP:** Temporal key integrity protocol; a dynamic encryption key exchange protocol.
- **TLS:** Transport layer security; a protocol designed to establish an encrypted connection or tunnel between two end points of a communication session at layer 4 of the OSI model.
- **UMTS:** Universal mobile telecommunications system.
- **VoIP:** Voice over Internet Protocol; an Internet-based (i.e., packetized) voice communication technology.
- **VPN:** Virtual private network; a technology designed to establish an encrypted connection or tunnel between two end points, typically a user and a corporate gateway (i.e., a temporary use) and between two corporate networks (i.e., a permanent use).
- **WAP:** Wireless access point; the base station to which wireless users and devices connect to access the network and which is also wired to the network.
- **WEP:** Wired equivalency privacy; an early encryption standard for wireless networking that uses the RC4 stream cipher and is superseded by WPA and WPA2 (802.11i). It is available in 40-bit and 104-bit strengths. A weak (i.e., static) implementation makes this scheme easy to hack.
- **Wi-Fi:** Commonly used to refer to 802.11; it is a wireless communications technology that is compliant with the IEEE standards and a medium-range wireless solution for network connectivity (e.g., replacing CAT5 cables).
- **WiMAX:** Worldwide interoperability for microwave access; sometimes erroneously called 802.16e. It has fixed and mobile deployments (e.g., point-to-point or building-to-building) and mobile user deployments (e.g., for a user traveling in a car).
- **WPA:** Wi-Fi protected access; the Wi-Fi Alliance's early replacement for WEP to address the weakness of the design. It also uses the RC4 stream cipher with a 128-bit key strength, 48-bit initialization vector (IV), and TKIP. Superseded by WPA2.
- **WPA2:** Wi-Fi protected access v.2; a fully 802.11i compliant implementation for wireless security that initiates 802.1X for authentication, EAP, robust security network (RSN) for keeping track of associations, and the advanced encryption standard (AES) block cipher with a 128-bit, 192-bit, or 256-bit key size.