

Barrier and computer

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Computer hardware is no longer a major barrier to wide use of wireless information systems. This is due to the number of different systems available to connect on. I will be discussing 3 of these, Wi-Fi, Bluetooth, and 3G. The Wi-Fi (wireless fidelity) standard is based on the 802.11 specification and is currently the most common standard for wireless home and small-office networking. Wi-Fi is ideal for small-business and home wireless networks with an indoor range of about 150 feet and an outdoor range of about 300 feet.

In a simple network, the network signal is brought into the home/office via a modem, and a router/access point distributes the signal. There are four common versions of 802.11, each with its own advantages and disadvantages. 802.11n The 802.11n specification is the most recent development in the area of Wi-Fi. 802.11n builds on previous 802.11 standards by adding multiple-input multiple-output (MIMO) and 40 MHz channels to the physical (PHY) layer, and frame aggregation to the MAC layer. MIMO is a technology which uses multiple antennas to coherently resolve more information than possible using a single antenna.

Two important benefits it provides to 802.11n are antenna diversity and spatial multiplexing. 802.11g The 802.11g specification is the most recent of the Wi-Fi specs to be approved and is currently the most commonly implemented Wi-Fi standard. Like 802.11n and 802.11b, 802.11g operates in the 2.4GHz spectrum, but without the MIMO advantage of 802.11n, 802.11g is highly subject to interference from other electronic devices that operate in the same spectrum, such as cordless phones and baby monitors. 802.11b As the first popular Wi-Fi technology, the 802.

802.11b specification offers slower data speeds than 802.11n, 802.11g, or 802.11a, with a theoretical throughput of 11Mbps and real-world performance of about 5Mbps. Otherwise, its specs mirror those of 802.11g. 802.11b has an indoor range of about 150 feet, and it operates in the 2.4GHz band, making it highly susceptible to interference from other devices. On the positive side, 802.11b products are very inexpensive, if you can find them. 802.11a An oddity of the Wi-Fi specs is 802.11a--it's less common but does have certain advantages over 802.

802.11g. 802.11a operates in the 5GHz frequency, which means it's less susceptible to interference from cordless phones and microwave ovens. 802.11a also boasts speeds similar to 802.11g, though because 802.11g and 802.11a use different frequencies, they can't talk directly to one another. If you're using an 802.11a adapter on a notebook, you won't be able to connect to most Wi-Fi hot spots. 802.11a also lacks the range of the other Wi-Fi flavors, pning only about 100 feet. Finally, the 5GHz radio inside 802.

11a products will drain power faster than a 2.4GHz radio . Next is Bluetooth, a low-power radio signal specification that allows devices to communicate and exchange information on a smaller scale than Wi-Fi using a personal-area network. Bluetooth's practical throughput is roughly 500Kbps, and its range is no more than 30 feet, making Bluetooth ideal for simple exchanges of information between devices. Bluetooth is also easier to use than Wi-Fi. Bluetooth devices that come within range of each other can communicate automatically with little or no setup.

Common applications for Bluetooth include wireless keyboards and mice for notebook and desktop PCs, communication and file transfers between PCs

and PDAs; wireless printing to a Bluetooth printer; and wireless headsets for cell phones. Newer applications include Bluetooth-enabled cars that communicate with Bluetooth-enabled phones, allowing for true hands-free phone operation in the car. However, Bluetooth operates on the 2.4GHz band, subject to the same interference issues as 802.11 network devices.

3G is a broad term that refers to third-generation wireless networks that deliver broadband speeds to cell phones and other mobile devices. With speeds between 144Kbps and 2.4Mbps, you can download files, surf the Web, send and receive e-mail, or stream music and video over the cellular networks. With a cellular modem or a 3G phone, you don't have to find discrete hot spots; an entire metropolitan area with a 3G network is essentially a giant hot spot of sorts. There are several types of 3G to choose from. The two main versions of 3G are UMTS and EVDO. Speeds for each are comparable, though EVDO is more widely available.

Currently, Verizon Wireless is the main provider of EVDO networks, with coverage in about 50 cities and metropolitan areas. UMTS is available through Cingular/AT&T Wireless, though only in very limited areas. Cingular/AT&T also provides EDGE networks, which are technically 2.5G cellular technology. EDGE is slower than both UMTS and EVDO, transmitting data at rates of about 90Kbps. On the plus side, EDGE networks are more widely available than UMTS, and in fact, Cingular encourages using EDGE networks when outside of their geographically limited UMTS coverage areas.

The next generation of wireless system is, WiBro (Wireless Broadband) is a wireless broadband Internet technology developed by the South Korean telecoms industry. WiBro is the South Korean service name for IEEE 802.16e

international standard. WiBro adopts TDD for duplexing, OFDMA for multiple access and 8.75 MHz as a channel bandwidth. WiBro was devised to overcome the data rate limitation of mobile phones and to add mobility to broadband Internet access. In February 2002, the Korean government allocated 100 MHz of electromagnetic spectrum in the 2.

3 - 2.4 GHz band, and in late 2004 WiBro Phase 1 was standardized by the TTA of Korea and in late 2005 ITU reflected WiBro as IEEE 802.16e. Two South Korean Telecoms (KT, SKT) launched commercial service in June 2006. In the course of just a few short years, wireless technologies have changed the way we connect computers, phones, PDAs, and other devices both to each other and to the Internet. Today, Wi-Fi is the most popular wireless local-area networking technology and is now a common feature of many laptops, PDAs, and even cameras.

Bluetooth has opened the door to low cost wireless personal-area networks (WPAN). Designed primarily as a cable replacement technology, WPAN systems help you connect with low power requirements at short ranges. WWANs, or wireless wide-area networks, are designed to deliver high bandwidth across large areas. WWANs are already beginning to offer wireless alternatives to cable Internet access and DSL. As a result, these technologies and upcoming technologies have led to hardware no longer being a barrier to the wide use of wireless technologies.