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Advanced Wifi connectivity and Display technologies with Computers....

Author: A.M Samuel

Abstract:

Wi-Fi is a popular technology that allows an electronic device to exchange data wirelessly (using radio waves) over a computer network, including high-speed Internet connections. The Wi-Fi Alliance defines Wi-Fi as any "wireless local area network (WLAN) products that are based on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 standards".[1] However, since most modern WLANs are based on these standards, the term "Wi-Fi" is used in general English as a synonym for "WLAN". A device that can use Wi-Fi (such as a personal computer, video game console, smartphone, tablet, or digital audio player) can connect to a network resource such as the Internet via a wireless network access point. Such an access point (or hotspot) has a range of about 20 meters (65 feet) indoors and a greater range outdoors. Hotspot coverage can comprise an area as small as a single room with walls that block radio waves or as large as many square miles — this is achieved by using multiple overlapping access points.

"Wi-Fi" is a trademark of the Wi-Fi Alliance and the brand name for products using the IEEE 802.11 family of standards. Only Wi-Fi products that complete Wi-Fi Alliance interoperability certification testing successfully may use the **"Wi-Fi CERTIFIED"** designation and trademark.

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Introduction:

Ultra-wideband

It is a radio technology pioneered by Robert A. Scholtz and others which may be used at a very low energy level for short-range, high-bandwidth communications using a large portion of the radio spectrum.[1] UWB has traditional applications in non-cooperative radar imaging. Most recent applications target sensor data collection, precision locating and tracking applications.

Ultra wideband was formerly known as "pulse radio", but the FCC and the International Telecommunication Union Radiocommunication Sector (ITU-R) currently define UWB in terms of a transmission from an antenna for which the emitted signal bandwidth exceeds the lesser of 500 MHz or 20% of the center frequency. Thus, pulse-based systems—where each transmitted pulse occupies the UWB bandwidth (or an aggregate of at least 500 MHz of narrow-band carrier; for example, orthogonal frequency-division multiplexing (OFDM)—can gain access to the UWB spectrum under the rules. Pulse repetition rates may be either low or very high.

Pulse-based UWB radars and imaging systems tend to use low repetition rates (typically in the range of 1 to 100 megapulses per second). On the other hand, communications systems favor high repetition rates (typically in the range of one to two gigapulses per second), thus enabling short-range gigabit-per-second communications systems. Each pulse in a pulse-based UWB system occupies the entire UWB bandwidth (thus reaping the benefits of relative immunity to multipath fading, but not intersymbol interference), unlike carrier-based systems which are subject to deep fading and intersymbol interference.

Technology

One performance measure of a radio in applications such as communication, locating, tracking and radar is the channel capacity for a given bandwidth and signaling format. Channel capacity is the theoretical maximum possible number of bits per second of information which may be conveyed through one or more links in an area. According to the Shannon–Hartley theorem, the channel capacity of a properly-encoded signal is proportional to the bandwidth of the channel and the logarithm of the signal-to-noise ratio (SNR) (assuming the noise is additive white Gaussian noise). Thus channel capacity increases linearly by increasing the channel's bandwidth to the maximum value available, or (in a fixed-channel bandwidth) by increasing the signal power exponentially.

By virtue of the large bandwidths inherent in UWB systems, large channel capacities could be achieved in principle (given sufficient SNR) without invoking higher-order modulations requiring a very high SNR. Ideally, the receiver signal detector should match the transmitted signal in bandwidth, signal shape and time. A mismatch results in loss of margin for the UWB radio link.

Channelization (sharing the channel with other links) is a complex issue, subject to many variables. Two UWB links may share the same spectrum by using orthogonal time-hopping codes for pulse-position (time-modulated) systems, or orthogonal pulses and orthogonal codes for fast-pulse-based systems.

Forward error correction technology (as demonstrated in high-data-rate UWB pulse systems such as low density parity check code) can—perhaps in combination with Reed–Solomon error correction—provide channel performance approaching the Shannon limit. When stealth is required, some UWB formats (mainly pulse-based) may be made to appear like a slight rise in background noise to any receiver unaware of the signal’s complex pattern.[3]

Multipath interference (distortion of a signal because it takes many different paths to the receiver with various phase shift and various polarisation shift) is a problem in narrowband technology. It also affects UWB transmissions, but according to the Shannon-Hartley theorem and the variety of geometries applying to various frequencies the ability to compensate is enhanced. Multipath causes fading, and wave interference is destructive. Some UWB systems use "rake" receiver techniques to recover multipath-generated copies of the original pulse to improve a receiver's performance. Other UWB systems use channel-equalization techniques to achieve the same purpose. Narrowband receivers may use similar techniques, but are limited due to the different resolution capabilities of narrowband systems.

Multiple-antenna: Multiple-antenna systems (such as MIMO) have been used to increase system throughput and reception reliability. Since UWB has almost impulse-like channel response, a combination of multiple antenna techniques is preferable as well. Coupling MIMO spatial multiplexing with UWB's high throughput gives the possibility of short-range networks with multi-gigabit rates.

WirelessHD

It is an industry-led effort to define a specification for a new digital network interface for wireless high-definition signal transmission for consumer electronics products. The consortium currently has over 40 adopters; key members behind the specification include Broadcom, Intel, LG, Panasonic, NEC, Samsung, SiBEAM, Sony, Philips and Toshiba. The founders intend the technology to be used for the Consumer Electronic devices, PCs, and portable devices alike.

Technology

The WirelessHD specification is based on a 7 GHz channel in the 60 GHz Extremely High Frequency radio band. It allows for either compressed (H.264) or uncompressed digital transmission of high-definition video and audio and data signals, essentially making it equivalent of a wireless HDMI. First-generation implementation achieves data rates from 4 Gbit/s, but the core technology allows theoretical data rates as high as 25 Gbit/s (compared to 10.2 Gbit/s for HDMI 1.3 and 21.6 Gbit/s for DisplayPort 1.2), permitting WirelessHD to scale to higher resolutions, color depth, and range. The 1.1 version of the specification increases the maximum data rate to 28 Gbit/s, supports common 3D formats, 4K resolution, WPAN data, low-power mode for portable devices, and HDCP 2.0 content protection.

The 60 GHz band usually requires line of sight between transmitter and receiver, and the WirelessHD specification ameliorates this limitation through the use of beam forming at the receiver and transmitter antennas to increase the signal's effective radiated power. The goal range for the first products will be in-room, point-to-point, non line-of-sight (NLOS) at up to 10 meters. The atmospheric absorption of 60 GHz energy by oxygen molecules limits undesired propagation over long distances and helps control intersystem interference and long distance reception, which is a concern to video copyright owners.[2]

The WirelessHD specification has provisions for content encryption via Digital Transmission Content Protection (DTCP) as well as provisions for network management. A standard remote control allows users to control the WirelessHD devices and choose which device will act as the source for the display.

Concept:

Sony WirelessHD LED: Sony ZX5 BRAVIA LED HDTVs super-slim, wireless 1080p

Dell Wireless Monitors: Dell Entry E2210 22" Widescreen Flat Panel Monitor

WLAN Network Design :

Wifi Enable Classroom teaching programs:

Wifi Enabled Home and connectivity of video and audio and data support via Ultra wide band and Wireless HD Technologies ...

The variety of Wifi enabled devices to use the Ultra wide band and Wireless HD Technologies Protocol and flexibility ...

Conclusion: The Wifi Technologies makes life easy and advanced and provides flexibility of use.

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- The wikipedia encyclopedia
- The Dell and Sony Websites and Products design and technologies used...