

Wireless LAN

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Definition

A wireless local area network (WLAN) is a flexible data communications system implemented as an extension to, or as an alternative for, a wired LAN. Using radio frequency (RF) technology, wireless LANs transmit and receive data over the air, minimizing the need for wired connections. Thus, wireless LANs combine data connectivity with user mobility.

Wireless Local Area Network is simply a LAN without cables.

Background

One decade ago WLANs were expensive toys with low speed and high cost. Currently, WLAN users are enjoying products with 11 Mbps worth of viable throughput costing them a lot less than conventional LAN.

In the late 80's there were products that delivered a 1-2 Mbps over a 900 MHz frequency. In the early 90's there were products of 2.4 GHz frequency and technology leaders pushed for a standard. It took a long time for a standard to be agreed on and finally in June 97 the IEEE802.11 was released. It was only then where WLAN technology has a real kick-off start.

Who uses it

This technology is employed in hard-to-wire buildings, low budgeted IT departments and where mobility is essentially required. Network Managers, temporary offices, students, show rooms, warehouses and medical staff are amongst the growing base of users that employ WLAN technology now a days.

More and more users are using WLAN and in deferent fields every day.

WLAN technologies

WLAN uses Radio Waves or Infrared. Radio Spread-Spectrum technology, introduced by military in the 40's, is the most widely used. Spread-Spectrum's key advantages are the difficulty of detecting, decoding or jamming. There are actually two general forms of spread-spectrum technology. In addition to frequency-hopping (FHSS) where frequencies hops in a manner known to both sender and receiver, there is a second form, called direct sequence spread-spectrum (DSSS). DSSS involves modulating the source digital bitstream (the stream of digital data that represents the information to be sent) with another binary code known as the "chipping code." Radio Waves penetrate walls and glass but can not go through concrete.

Infrared, though costs less, is not commercially common because of its low performance and the requirements of no physical obstacles between infrared connected devices .

Standards

There are many standards for wireless connectivity. Following are some of the major ones:

The IEEE802.11 standard operates in the first 2 layers of the ISO Model, the Physical Layer and the Data Link layer. It uses the Ethernet technology. There are 2 issue of this standard a & b. The a standard was designed for the 5 GHz frequency and the b for the 2.4 GHz over 11 Mbps throughput. This standard

(i.e b) is backed by major technology leaders.

HyperLAN/2 is a European based standard typical to the 802.11. The only difference is that it uses ATM technology.

Bluetooth standard is a protocol that allows wireless hand-held computers, PDAs, printers, cameras, phones and palm computers to communicate. Usage and future of devices that has Bluetooth chip installed is promising.

WAP (wireless Application Protocol), allows devices with a micro internet browser to browse WAP enabled internet pages.

How does WLAN work

WLAN technology uses a device called Access Point and is the corner stone in a WLAN. End users access the wireless LAN through wireless-LAN adapters, which are implemented as PC cards in notebook or palmtop computers, as cards in desktop computers, or integrated within hand-held computers. wireless LAN adapters provide an interface between the client network operating system (NOS) and the airwaves via an antenna. The nature of the wireless connection is transparent to the NOS.

Installing an access point to a wired network allows each client to have access to server resources as well as to other clients. Each access point can accommodate many clients; the specific number depends on the number and nature of the transmissions involved. Many real-world applications exist where a single access point services from 15-50 client devices. Clients must install the proper adapters to communicate to the access point.

Roaming

Roaming is a major feature of WLAN. It allows users to roam around while maintain connectivity. A user will remain connected as long as he is in the access point range of transmission.

Security and safety of WLAN

Because wireless technology has roots in military applications, security has long been a design criterion for wireless devices. WEP (Wired Equivalent Privacy) exists on WLAN. Any security software implemented on a wired LAN can be applied on WLAN. It is extremely difficult for unintended receivers (eavesdroppers) to listen in on wireless LAN traffic. Complex encryption techniques make it impossible for all but the most sophisticated to gain unauthorized access to network traffic. In general, individual nodes must be security-enabled before they are allowed to participate in network traffic.

No known health or industrial hazards from WLANs.

Considerations when installing a WLAN:

A site survey must be conducted when installing a WLAN. Location of the access points is determined by testing the transmission in deferent areas via a mobile laptop. Most PC WLAN cards comes with software with them that statistically inform the user where the transmission is weaker or stronger. The number and type of users must be taken into consideration to determine the data traffic therefore the number and type of access points is planned.

The best Vendors of WLAN products must be selected to meet your future needed support.

2.4 GHZ Microwave ovens and cordless telephones cause interference with WLAN.

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