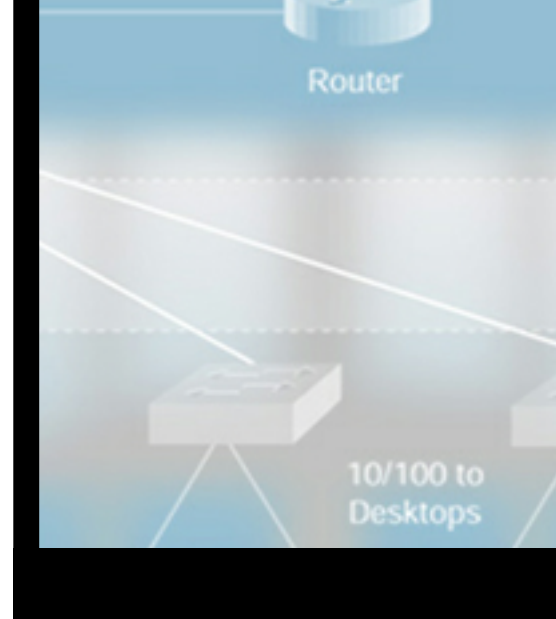


# Wireless LAN Internet Technical Solution Seminar





## **Wireless LAN**

# Internet Technical Solution Seminar

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## Wireless LAN Seminar

# Welcome

Welcome to the Technology Solutions E-seminar on Wireless LANs.

Network users in companies are usually connected to a LAN, for instance to access the Internet, their e-mail, online services or shared information. With wireless LANs, users are able to access these network services without having to look for a place to plug in. At the same time, companies can set up or augment networks without installing or moving wires.

Wireless LANs offer many advantages compared to traditional wired networks, such as enhanced mobility & productivity, increased convenience and potential cost reduction. In a small to medium sized business, the Return on Investment from a wireless LAN can be as short as 3 months.



## Wireless LAN Seminar

# Objectives

In this seminar, we will discuss what Wireless LAN technology is about and how it differs from traditional LAN technology.

We will first explain what a wireless LAN is, and how your company could benefit from it.

We will also discuss the technical aspects of implementing Wireless LANs in your company



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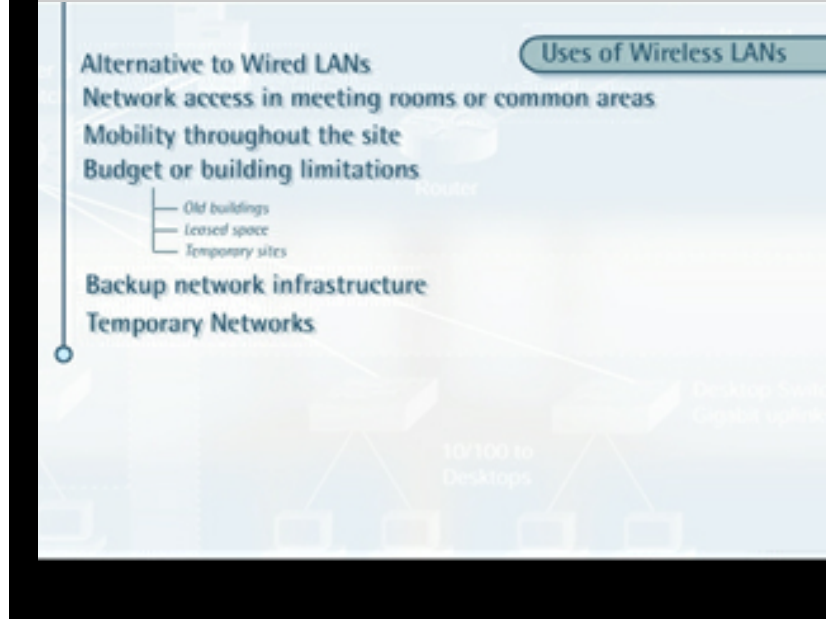
# Defined

Let us start by clearly defining what a Wireless LAN is.

A Wireless Local Area Network is a data communications system which transmits and receives data over the air using radio technology.

Wireless LANs are used both in business and home environments, either as extensions to existing networks, or, in smaller environments, as alternatives to wired networks. They provide all the benefits and features of traditional LAN technologies such as Ethernet or Token Ring, without the limitations of wires or cables.

In this way, wireless LANs allow PC users to establish and maintain a network connection anywhere throughout the building.



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# Uses

Wireless LANs redefine the way we view LANs. Connectivity no longer implies physical attachment. Users can remain connected to the network as they move around the building or campus. There is no need anymore to bury the network infrastructure in the ground or hide it behind the walls. With wireless networking, the network infrastructure can move and change at the speed of the organisation.

So in which cases are Wireless LANs interesting? Let's look into some examples.

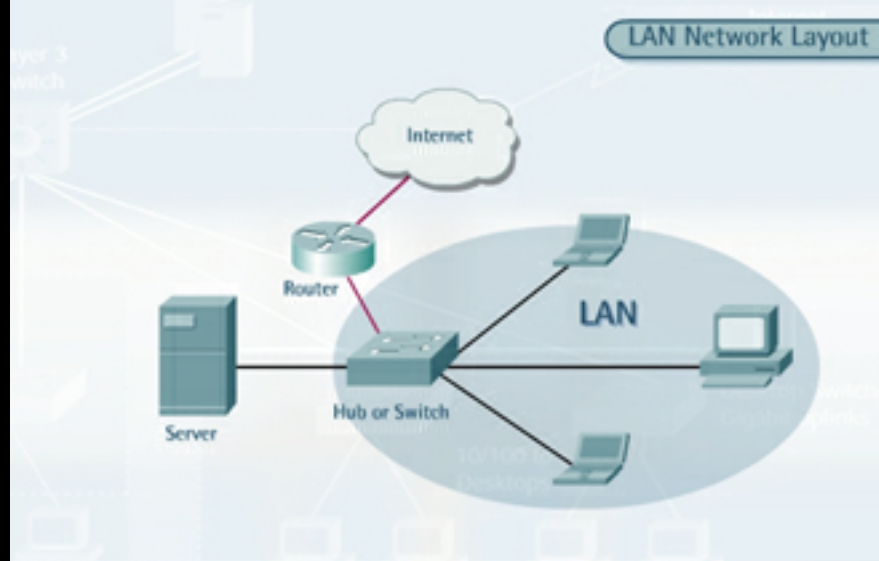
In smaller companies, Wireless LANs can be an alternative to Wired LANs. Wireless LANs are easy to install and offer a great degree of flexibility as an organisation grows.

In Medium sized business, Wireless LANs can be used to offer access in meetings rooms and common areas. They can also provide access for users in less frequently used areas, such as hot desks or "touch-down" areas.

For larger companies, a Wireless LAN can provide a complete mobility overlay network, so that users have access to critical information wherever they are within the building. Business executives, IT professionals, warehouse workers and other mobile employees can combine mobility with constant network access, throughout their company site.

Building or budget limitations may prohibit LAN wiring, for instance in the case of old buildings, leased space, or temporary sites. By using wireless LAN technology, overhead caused by moves or network extensions is minimised. Wireless LANs can even serve as backup infrastructure for mission-critical applications.

With wireless LAN technology, quick temporary network set-ups are possible, for example for training purposes, teamwork, meetings, trade shows, and so on.

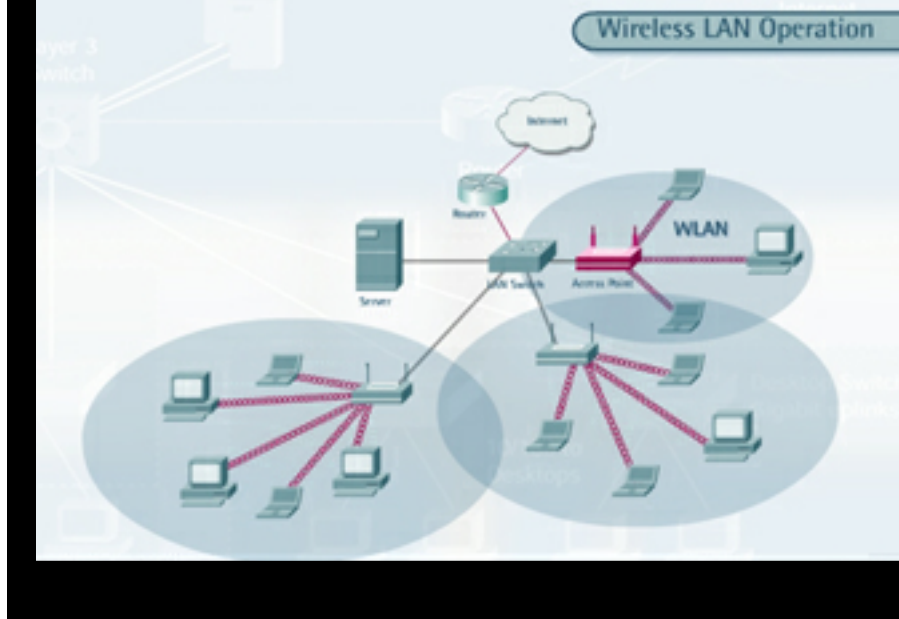


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# LAN Network Layout

In the traditional LAN networks used today, desktop or laptop PCs are usually connected to a central hub or LAN switch by means of cables. Through this central point, they have access to shared data or applications residing on servers, or, through a router, to the Internet.

This is a LAN in its simplest form.



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# Operation

A wireless LAN environment is very similar. In this example topology, a device called “Access Point” is inserted, which acts as the centre point in the wireless network, and as a connection point between the wired and the wireless network.

The Access Point manages the wireless client traffic in its coverage areas. It receives, buffers, and transmits data, between the wireless LAN and the wired network. A single access point can support a small group of users and can function within a range of less than one hundred to several hundred feet, depending on the data transmission speed.

To extend wireless connectivity, multiple Access Points can be arranged so that their coverage areas are adjacent to one another.

End users access the wireless LAN through wireless-LAN client adapters, which are implemented as PC cards in notebook or palmtop computers, as cards in desktop computers, or integrated within hand-held computers.





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# Building - to - Building

Using the same radio technology, networks located in buildings which are many kilometers from each other, can be integrated into a single local-area network.

This can provide a company a connectivity, between two locations, that otherwise might have been impossible or very expensive. Obstacles, highways or lakes, for instance, may make it very difficult to create a connection with a traditional copper or fiber-optic cable. By installing Wireless Bridges, these problems can easily be overcome. A wireless bridge transmits data through the air, and as such provides fast, cost-effective integration of remote sites and users.

A building-to-building link can often be installed at a lower price than a traditional fixed wire connection, and unlike these traditional systems, the use of the link is free. There are no additional running costs.

Wireless point-to-point or point-to-multipoint bridges can connect different buildings or offices with each other.



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# Components

So let us focus a bit more on the three main components of Wireless LANs: Access Points, Client Adapters and Wireless Bridges.

Access points provide intelligent links between wired and wireless networks and act as the connection between the wired LAN and the wireless LAN. Intra-building access points can trade off between range and speed. For instance, indoors, an Access Point could typically have a speed of 11 Megabits per second for a range up to 40 meters, or 1 Megabit per second for a range of over 100 meters. Of course, multiple access points can be used to increase the coverage area.

The Client Adapters include PC cards for portable and notebook computers, ISA and PCA network interface cards for desktop and server PCs, and external client adapters. These adapters either have an antenna attached or work with an external antenna.

Wireless Bridges are devices that enable high-speed, long-range outdoor links between buildings. At a speed of 11 Megabits per second, their reach is over 5.3 kilometers, and at a speed of 2 Megabits per second, they can bridge a distance up to 11 kilometers.



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# Security Considerations

Many organisations are concerned that wireless LANs do not provide the same level of security as wired LANs. Some people are afraid that wireless LAN transmission signals could be intercepted.

Before discussing these concerns, let's first stress that ANY network, wired or wireless, can be subject to security risks. Every company should therefore adopt an overall network security strategy, as discussed in the Technology Solutions E-Seminar on Network Security.

Wireless LAN technology today provides several mechanisms to increase the security level of the wireless communication itself. In general, security provisions are typically already built into wireless LANs, but they can and should be enhanced with additional security mechanisms.

One of these mechanisms is the Wired Equivalent Privacy feature, or WEP. WEP is used to encrypt and decrypt data signals transmitted between Wireless LAN devices. In essence, WEP makes a wireless LAN link as secure as a wired link.

It is already very difficult to listen in on wireless LAN traffic. The complex encryption techniques used by the wireless technology make it very hard for anyone to gain unauthorised access to such network traffic. Furthermore, routers can be used in conjunction with wireless bridges, to provide data protection through IPSec-encrypted tunnels.

Cisco also has a centrally managed, scaleable, secure architecture available which makes use of industry standard products such as Radius-based Access Control Servers. These can be used to build a Wireless LAN which is both secure and scaleable, to meet the management demands of larger customers.



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# Benefits

So what are the main benefits of Wireless LANs?

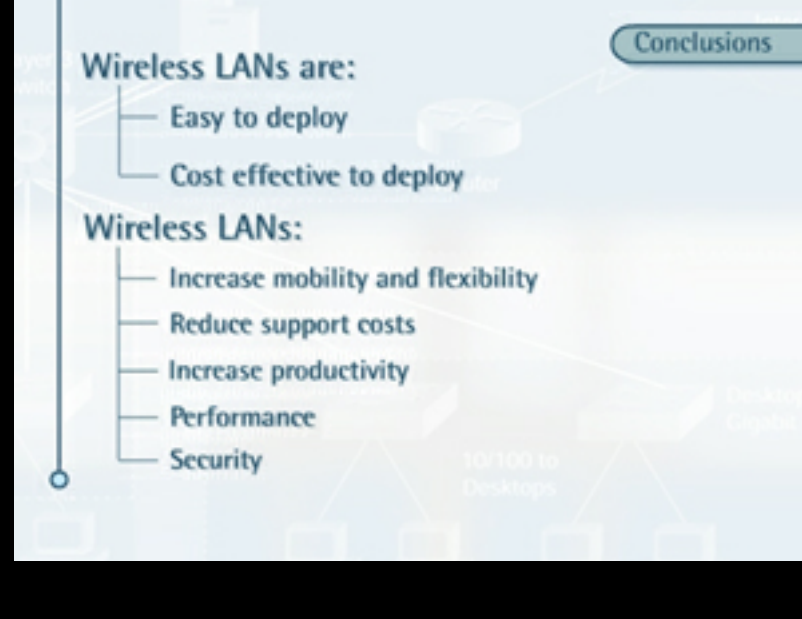
An obvious advantage of a wireless LAN is that it can provide users with access to real-time information anywhere in their organisation. This mobility increases productivity and brings service opportunities which would not be possible with wired networks. Research shows that average users achieve an increase in productivity of one and a quarter hours a day by being able to access the network wirelessly. In addition to this they also report that because they have greater access to data, they are less likely to make mistakes, which otherwise cost their employers time and money to rectify.

The installation of a wireless LAN can be fast and simple and does not require cables to be pulled through walls, floors or ceilings.

With wireless technology, companies have the flexibility to deploy and redeploy networks as needed.

Companies can significantly reduce the cost of installing and maintaining their networks by making use of wireless LANs. The cost of cables and cabling is dramatically reduced, and maintenance is simplified as changes, moves and additions to the network are much easier than in the case of wired LANs.

Finally, wireless LAN technology is very scalable. It can support a small number of users as well as big networks with a large number of users, and either be integrated with existing wired LANs, or serve as an entire LAN medium.



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# Conclusions

Let's summarise the most important points.

Wireless LANs are easy and cost-effective to deploy. By increasing mobility and flexibility of the network users, they are attractive alternatives to wired LAN networks.

Wireless LANs reduce the costs associated with network installation, maintenance and support and increase employee productivity.

A variety of topologies and configurations exists, from simple peer-to-peer networks to complex designs supporting many users.

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