

The aim of wireless technology is simple: to remove the restrictions of being attached to expensive and messy wires and cables, both inside the office and out. Wireless technology carries the capability of wired networks to spaces that cables cannot.

WIRELESS COMMUNICATIONS

This brochure is for any business that wants to increase the efficiency and flexibility of its computer network.

It covers best practice guidance on various wireless technologies and their implementation.

WHAT ARE WIRELESS COMMUNICATIONS?

There are several kinds of wireless technologies; the main difference being their range. Some offer connectivity over an area as large as your desktop whilst others can cover a medium-sized office space. Our most familiar wireless network, the mobile phone, covers whole continents. Wireless technology can offer businesses more flexible and inexpensive ways to send and receive data.

The Benefits

The four key benefits of wireless technology are:

- Increased efficiency improved communications leads to faster transfer of information within businesses and between partners/customers.
- You are rarely out of touch you don't need to carry cables or adaptors in order to access office networks.
- Greater flexibility and mobility for users office-based wireless workers can be networked without sitting at dedicated computers.
- Reduced costs relative to 'wired', wireless networks are, in most cases, cheaper to install and maintain.

You can find out more about the specific benefits that different wireless solutions offer you by looking at the different wireless options covered over the next few pages.

Options

Different types of wireless technologies offer different benefits, so work out what your business needs for wireless are.

Local Wireless

Local wireless (or PAN Personal Area Network) solutions may suffice if you want to free-up space, get rid of cables and allow non-office based workers to drop in to the office, use the printers and download data from laptops or PDAs to the office computers.

Wireless Network

Wireless network (WLAN) solutions can help if you need a network providing shared internet, extranet or intranet access, or wish to connect several non-cabled office spaces. They are also a good option if you want to offer convenient network access to visiting employees.

Local Wireless

What is it?

- Cordless products, such as mice and keyboards that use radio or infrared technologies. These are inexpensive to buy and easy to install and use. As a minimum

they allow you connectivity within the range of the desktop, and for certain products, such as the familiar cordless desk phone, a considerably wider range.

- Bluetooth, a relatively new and versatile short range radio technology, allows enabled devices such as phones, mobiles, mice, headsets, PCs, printers and keyboards to connect wirelessly when in range of each other, within a distance of 10m. Bluetooth technology is increasingly built into contemporary mobile phones, PDAs, PCs and PC-related products, while other models can be easily upgraded with a Bluetooth card.

What can it do?

- Wire-free connectivity between mobiles, PDAs, keyboards, laptops and printers increases convenience and flexibility, eliminating the need for cable. Being wire-free makes mobile workers' work kit much lighter and portable.
- Connected Bluetooth devices can synchronise data downloads and uploads and exchange information.

Who is it designed for?

- Because they are cable-free, wireless connections between PCs and peripherals free up floor space and liberate floor plans; ideal for businesses which are space sensitive.
- Bluetooth-enabled products are useful for mobile employees needing to update and synchronise information across office systems. Remote workers visiting the office periodically can bring in a Bluetooth-equipped mobile phone, PDA or laptop and access enabled office-based peripherals such as printers.
- New Bluetooth hardware, for example Bluetooth-enabled in-store labelling handsets, barcode scanners and vending machines, means that several devices are suitable for

the smaller business.

- In industry, Bluetooth can be used to wirelessly control equipment and machinery perfect for servicing inaccessible devices.

Costs

- Individual devices vary in price but most products are cost-effective and within the £50-£400 range. For example, a mouse typically costs between £30-£50, whereas PDAs can range from £300- £400. Bluetooth adaptors for PCs cost from £30 while a Bluetooth card for a PDA costs up to £150.

Pros and Cons

- Cordless technology and Bluetooth are efficient, cost-effective and convenient, with products designed for maximum compatibility across agreed standards.
- It is unlikely that different wireless systems will interfere with each other, although with new technologies and products entering the market, exhaustive tests have yet to be carried out.
- Bluetooth networks are relatively secure, but can be slow in transferring large files in an office network.
- Bluetooth networks within a room or a building provide secure, wireless communication with the flexibility of working anywhere within the network range.
- Bluetooth is a short-range solution and may not be suitable if your business needs wireless connection over larger distances.

WIRELESS NETWORK (WLAN)

What is it?

- A WLAN is a network without cables. Wireless networks can offer all the benefits of traditional cabled networking but without the constraints of miles of unruly cable and

without confining users to working at a desk next to an Ethernet connection point.

- WLAN-enabled laptops and handheld devices are connected anytime they are in a wireless network's range. All you need to set up a WLAN is an access point, antennas and adapters for each PC, laptop and handheld device though most laptops are wirelessly enabled without an external adapter.
- You may have heard the term WiFi in connection with WLANs often the two are assumed to be the same and you will probably read more in the press about WiFi than WLAN. In fact, WiFi is short for Wireless Fidelity and refers to a set of industry standards (IEEE 802.11) that most WLANs are built to.

What can it do?

- WLAN enables workers to easily share a single business broadband connection across the office, and to remain online if they move their laptop/PDA around the wireless-enabled space.
- WLANs can be used to easily extend network accessibility to areas where cabling might not be cost-effective or practical, for example from an office to its adjacent warehouse or storeroom, across retail outlets and hotels, or across public spaces such as health centres and job centres. Mechanics in a warehouse can access parts information via a handheld wirelessly-enabled PDA rather than continually crossing the floor to check a PC.
- Wireless connectivity allows users to make more flexible and efficient use of space and to provide non-networked users with access to hardware, such as WLAN-enabled printers and peripherals.
- WLAN 'hotspots' are wireless-enabled areas offering customers access to a broadband internet connection, usually for a usage fee.

Who is it designed for?

- The size of your business and premises will dictate your wireless needs. A WLAN access point or gateway serves as the central base station for your network. A typical WLAN access point can support some 15 to 20 users, so most small offices need only a single access point. A WLAN can cover up to 100m indoors and 300m outdoors. The range may vary based on the building or environment you're using it in.
- WLAN technology suits relatively stationary or slow-moving, but not desk-bound, users in a defined area, and opens up non-cabled areas of space away from the desk for working, for example 'quiet rooms' or extra meeting rooms. The application of WLAN technology in warehouses, for example barcode scanners, can be useful for many businesses.
- With additional hardware (networking bridge) or linked hotspots, businesses that have separate locations up to a few miles apart can use a WLAN to network offices.
- WLAN provides a good networking basis for users wanting to move to VoIP-type systems (Voice over Internet Protocol) see the VoIP area of our website for more information. Using VoWLAN (Voice over WLAN) technology, along with special handsets that look like phones, wireless networks can carry voice data in the same way that VoIP does, allowing a complete 'hot desking' scenario in the office.

Costs

- Setting up a WLAN requires an access point (or 'base station'), antennas and an adapter for each PC, laptop or handheld that is to access the network. Many of the latter now come with WLAN adapters or cards built in, and adapters/cards are widely available for

those that don't. WLAN is easily and quickly installed and relatively cost-effective around £315 for a small office network. If you have more space to cover, you may need more than one base station.

- Costs for access to WLAN hotspots are currently from £5 to £15 per 24 hours, or from £20-£40 per month. Many WLAN hotspots are provided free for customers' use, for example in cafés.

Pros and Cons

- Using WLAN-enabled devices in commercially developed 'hotspots' is more cost-effective, especially when compared to the cost of using mobile phone services to access the internet or to send and receive files. Devices include notebooks, PDAs and smartphones (mobile phones with PDA functionality).
- Metal and other dense materials can affect the transmission of radio waves, and stone, brick, heavy woods and even water can also affect range. Test a system or get an expert opinion before choosing a WLAN if you want to link businesses in separate locations.
- You can improve the network's range and performance by experimenting with the placement of the base station, antennas and receiving hardware such as laptop computers and PDAs. Setting up an 'unidirectional' antenna can narrow the overall beam width of your base station, providing much improved range.
- WLANs need to be used in conjunction with robust security practices. Security is now built in to many of the best products.
- WLAN, like wired networks, is a shared medium. Depending on conditions, a typical WLAN can provide up to 11Mbps of bandwidth shared between users. If ten users are simultaneously using the network, each may

get only 1Mbps. Simply sending and receiving email barely taxes the network, whilst a roomful of WLAN users accessing high-resolution files over a single access point may well result in a slowdown. To solve this problem, you could add in additional access points or upgrade to higher bandwidth WLAN.

- Easy to install, no cables to lay.
- Adding new users to a wireless network or moving desk locations within the network range does not require costly changes to the network infrastructure.

MOBILE PHONE NETWORK

What is it?

These networks are increasingly used for much more than voice calls. The improved capability of handsets and the networks' increased data transfer speeds mean increasingly sophisticated mobile phones and handheld PCs.

The following is a list of the most common abbreviations connected with mobile phone services.

| | |
|-----|--|
| GPS | Global Positioning System |
| IM | Instant Messaging |
| SMS | Short Messaging Service (Text messaging) |
| MMS | Multimedia Services |

What can they do?

- Mobile handsets can offer access to e-mail, SMS, GPS, IM, MMS and Wap.
- Increasingly, smart handsets can offer remote workers access to mobile business applications and wireless internet services, for example combining MMS with internet technology enables staff to take, record and show images and pictures in real time.
- Using web services technology, businesses can create new applications for mobile phone business use, for example enabling customers using mobiles or PDAs to access wireless

ordering, billing and online buying.

- 3G networks will lead to faster data transfer and the development of more handset-based real-time business applications.

Who are they designed for?

- GSM/GPRS networks offer national and international coverage and connectivity for out of office workers using a mobile phone, a proprietary handset, a PDA or a laptop.
- Developing services include mobile phone-attached barcode scanners for delivery workers, allowing them to scan parcel data.

Costs

- Costs for both handsets and network operators' packages vary enormously so be sure to research the options carefully. Business packages tend to offer more advanced features and tariffs than personal ones, such as unlimited data usage for a fixed monthly sum.

Pros and Cons

- Mobile networks offer tried and tested technology, proven national and global connectivity and billing systems rival WLAN hotspots cannot match this yet.
- Data services may initially be expensive to use.
- Mobile network speeds are not increasing as quickly as predicted and, although many new handsets are available, their real effectiveness depends on the networks delivering the promised faster network speeds.

Considerations

Once you have considered the pros and cons of the various systems, there are several other issues you will need to consider.

Security

Networks

- Wireless networks can be more vulnerable than traditional wired networks, although security is improving and is, to a large extent, dependent upon the user making the most of the options available. Make sure that you build in security to your WLAN.
- Make sure that access to a WLAN is password-protected; most products allow this facility but, in tests, few users had enabled it.
- Security standards are constantly evolving and you may be able to upgrade your network, so research the market thoroughly and choose upgradable kit.
- Always activate the Wired Equivalent Privacy (WEP) encryption standards that come with most WLAN networks, using the 128-bit key if possible, and remember to reset the default passwords. Some WLANs are upgrading to the tighter WiFi Protected Access (WPA) standard, so check what is on offer before you buy the hardware.

Devices

- Protect data: if a PDA or laptop should be lost or stolen, how quickly and efficiently can you shut down its access to the network?
- Many handheld devices now feature in-built security and encryption options, and off-the-shelf software can also bolster device security.

Wireless-Future Developments

Wireless services are quickly gaining popularity across the world and, as they do, products and services are being upgraded.

- WLAN hotspots, also known as WiFi hotspots, (subscription only, pay-per-use and free for customers) are being rolled out globally. BT has plans to offer a GPRS/WLAN access package that would enable nationwide

wireless connectivity using a combination of GPRS mobile phone and BT WLAN hotspot access.

- One current issue is that different service and equipment providers may not be using agreed standards, so you'll need to check that any products you buy will be compatible with the services you plan to use.
- Increasingly, products and standards are being agreed and, as more WLAN hotspots appear in airports, hotels, cafés, pubs and motorway service stations, operators are beginning to get together and offer mobile phone style 'roaming' facilities that will mean you only need to subscribe to one service.
- UK WLAN hotspot providers, needing at least one broadband connection to offer to users, are beginning to deliver broadband to increasingly remote areas of the UK and rural businesses may be able to 'piggy-back' on these extended broadband services.
- Most WiFi networks today are based on a common set of standards (IEEE 802.11). The Institute of Electrical and Electronics Engineers is currently working on new versions of these standards that will enhance the speed and security of WLANs.

CASE STUDY - CHRISTCHURCH FINANCIAL MANAGEMENT

Christchurch is a small investment management business, operating in a highly competitive market. In order to give the best financial advice, it's crucial for Christchurch's advisers to have up-to-date information about changes in the market. To begin with, Christchurch met this challenge by appointing a team of assistants to support advisers either with research or by fielding questions over the telephone. But this soon proved to be a time-consuming, expensive and sometimes unreliable solution. "Apart from

the opportunities for costly errors, the expense of using mobile phones for voice communication was escalating out of control," recalls Director, Keith Perry.

The company needed a system that would allow advisers to access the latest information through e-mail, organise their diary and receive immediate notification of any sudden changes in the market. They also needed to be able to do all of this remotely.

Christchurch contacted technology specialists, Peramon, which believed its 'Mobiliser' system could provide the solution. This system worked with the Microsoft Outlook and Exchange software that Christchurch was already using. By simply adding mobile internet infrastructure products and applications, it gave the software wireless functionality. Effectively it transforms mobile phones and PDAs into sophisticated business appliances, enabling users to access all of their information and applications wherever they are. It also incorporates SMS alerts for company-wide, time-sensitive news about changes in the marketplace. Information is downloaded either to a mobile phone or to a PDA, depending on the choice of the individual adviser.

The roll-out of the new system has been popular with both the staff, who find it convenient and practical, and the clients, who appreciate a fast response. "Since the system went live, Christchurch's service quality has definitely improved," says Keith Perry. "We believe that our initial outlay of £5,000 saves us, conservatively, over £30,000 per year." This is based on the saved cost of at least one administrative person as well as the savings from reduced phone charges. In addition to all this is the unquantifiable improvement in what Christchurch can offer to clients.

Implementation Checklist

- Check Availability
- Can you get broadband in your area? Use the broadband checker at <http://www.bt.com/broadband>

Set Targets

- Set goals for wireless communication, for example greater flexibility and employee satisfaction.
- Agree specific, measurable objectives for what you want to achieve, such as cost savings and increased efficiency.

Research

- Consider what sort of wireless solution you need.
- Talk to other businesses that have implemented wireless solutions.
- Think carefully about the security issues of implementing a wireless communication solution.

Cost Benefit Analysis

- Compare the costs of wireless communication such as software, installation and maintenance.

Consult

- If you lack the skills in-house, contact your Business Link adviser for help on how best to:
 - outline your requirements
 - establish how much you can afford to pay
 - scope the project
 - plan implementation
 - receive training and software support.

With customers and business partners:

- Think through what your business partners/customers want and, in the case of close partners, examine the business systems

that they have in place.

- Businesses use a range of wireless standards. If you are aiming to work wirelessly with partners, can your business processes cost-effectively support all the wireless standards used by partners/ customers or will you be limiting your range by targeting only certain wireless users?
- Is it possible to adapt your wireless network to work with your partners' networks?

PLAN & TEST**Evaluate options**

Consider your three main options:

Local wireless solutions which free up space with wireless networks, but may not have sufficient speed for an office network. Wireless network solutions which can provide shared internet, extranet or intranet access, or connect several non cabled office spaces. They are also a good option if you want to offer convenient network access to visiting employees. Mobile phone networks or WAN technologies which can help mobile sales staff stay in touch.

PLAN THE ROLLOUT PHASE

- Look at training implications what will the cost be?
- Decide which staff will require training and allow time for them to adjust to the new system.
- Consider the cultural impact: how will you feel if none of your employees are sitting at their desks, or are not present in the office at all?
- Can your business environment adapt to this kind of working pattern?
- Ensure your technical infrastructure can cope.
- You'll need to adapt your fixed and wireless networks to work together. Be aware that it can be difficult to monitor wireless devices, for example an employee's PDA accessing your network.

- Aim to standardise solutions and hardware and to enforce robust security standards.
- Are your other systems, for example telephones, as flexible?
- Do you have the expertise and the resources to manage a WLAN and to train staff?
- Are you ready for the additional volume of communication that may be generated?

ACT**Implement wireless communications**

- Roll out any necessary training.
- Encourage staff involvement and feedback. This will help smooth implementation, as staff buy-in can make or break a technology project.
- Consider setting up a cross-departmental taskforce to manage the implementation process it will help with staff buy-in and ensure that implementation works company-wide.

EVALUATE

- Monitor and review the impact on your business against your objectives.
- Get feedback from staff, customers and suppliers on the changes.
- Evaluate the impact after 6 months and 1 year. Have you achieved your objectives? Establish how you could improve things further.

FURTHER HELP AND ADVICE

Achieving best practice in your business is a key theme within DTI's approach to business support solutions, providing ideas and insights into how you can improve performance across your business. By showing what works in other businesses, we can help you see what can help you, and then support you in implementation.

INDEPENDENT ADVICE

<http://www.adslguide.org.uk> end-user guidance
<http://www.infoconomy.com> educational: investment in business technology, trends
<http://www.wlan.org.uk> community WLANs
<http://www.bluetooth.com>
<http://www.wi-fi.org>

Technology suppliers' information

bluetooth <http://www.brainboxes.com>
 ADSL <http://www.bt.com/openzone>
 WiFi <http://www.daconi.co.uk>
 Wireless <http://www.intel.com/netcomms/bbw/index.htm>

Hotspots locator

See bottom of this page for website

Security information

<http://www.adslguide.org.uk> ADSL security
<http://www.vicomsoft.com> Firewalls

GENERAL BUSINESS ADVICE

For more information on achieving best practice in your business: Contact your local Business Link advisor by visiting the website at <http://www.businesslink.gov.uk> or calling 0845 600 9 006.

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