Bluetooth

Jon Jermey*

WHAT IS IT?

It would have made a wonderful Monty Python sketch. The scene opens on a Viking longship drawing close to a rocky shore. A voice-over pontificates: "In 965 AD Harald Bluetooth Gormson, King of Denmark, became the first Viking ruler to convert to Christianity. If he had known that over a thousand years later..." and we zoom in on the approaching ship to see the Vikings using mobile phones, tapping away at little keyboards, shouting into headsets. The voice brightens; "– his name would be used for a wireless personal networking standard, then".

Then what? Until they have mobile phone coverage in Heaven (or Valhalla?) we'll never know. But Harald's nickname was adopted because the system was originally developed by Ericsson in Sweden, where the king was renowned for diplomatically arranging talks between warring rulers; hence its application to a communications system.

Essentially, Bluetooth is a set of specifications which define a short-range radio system. Most Bluetooth-equipped devices – including mobile phones and PDAs – have an operating range of about 10 metres. Within that area, they can send and receive information of various kinds. Bluetooth nodes, which are often attached to personal computers, can transmit to a distance of about 100 metres. Bluetooth will penetrate fibreboard walls but not brick or concrete. Bluetooth hardware is quite small and requires little power. A small "dongle", costing between $15 and $50, can be plugged into a USB port to turn any PC into a Bluetooth node. Internal Bluetooth cards for PCs are also available, although these are not widely used.

What makes Bluetooth different from ordinary wireless networking is that security is built in. Bluetooth devices can be set to recognise each other and exclude intruders from the system. When connection is made between devices, a request for a four-digit PIN code can be sent – the recipient and the sender must respond with the same code before a connection can be made.

Bluetooth is currently used in four ways: for communication between computers; for communication among computers and mobile phones; for communication between computers and portable devices; and to operate computer peripherals, such as headsets and keyboards.

BLUETOOTH COMPUTER NETWORKING

Two computers with Bluetooth cards or dongles can communicate – if they're close enough – in the same way as any two networked computers. Bluetooth is slower than a standard wireless connection, which in turn is slower than a cable connection; so, copying large files, for example, will take some time. However, on the plus side, any device can very quickly be slotted into a Bluetooth network, without having to reboot or otherwise manipulate network settings; all that is required is for the Bluetooth software on each computer to scan for and identify another Bluetooth device in the vicinity. The connection can be made secure by requiring the same four-digit code to be entered on each computer – once this has been done, the computers can be "paired", so that they will recognise each other and connect again in future. An auditor, for instance, travelling from State to State with a laptop, could connect via Bluetooth to the accounting department's computer in each State branch. With a spare Bluetooth dongle and setup software, the auditor could also network on an ad hoc basis with any other PC he/she happened to encounter along the way.

Bluetooth networking provides a simple solution to the problem of other users "eavesdropping" on ordinary wireless networks, or using other people's wireless accounts to obtain their own connections to the web. Although security can be provided for ordinary wireless networking, the process is more cumbersome.

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BLUETOOTH AND MOBILE PHONES

Bluetooth capabilities are now found in an increasing number of mobile phones. Its use is always optional; users can turn Bluetooth off altogether, set it to prompt for permission before connecting, or adjust it so that it only receives messages from "paired" devices. Essentially, Bluetooth removes the need for a cable connecting the phone with the PC.

The ways in which Bluetooth can be used vary from one phone to another; some of the most common activities are:

- transferring files between a PC and a mobile phone eg pictures taken with camera phones, or music files that can be transferred from a PC to a phone and used as ringtones;
- synchronising calendar, contact and memo details on a mobile phone with a master set maintained on the PC with Microsoft Outlook or similar software;
- "pushing" individual calendar, contact or memo items from Microsoft Outlook to a particular phone;
- sending messages and files between nearby mobile phones privately, free of charge, and in areas without mobile phone coverage;
- writing SMS messages using the PC and sending them to other mobile phones via a nearby phone; and
- communicating between a mobile phone and a separate headset/microphone device without the need for a cable connection.

There is an option for SMS messages to be broadcast to receptive phones that enter the immediate area, for instance a local council could broadcast details of roadworks to all mobile phones that pass along a particular road. Unfortunately, the risk of this feature being used for "spamming" means that most Bluetooth users choose not to accept unsolicited broadcasts.

BLUETOOTH AND OTHER PORTABLE DEVICES

An increasing number of portable devices now produce files and other material which the user needs to transfer, usually to a PC, but sometimes elsewhere eg directly from a camera to a printer. Where there is Bluetooth on both devices, it can take the place of a cable connection. On a PDA, Bluetooth can be used to synchronise contacts and appointment details, to transfer emails to and from a PC for reading and replying on the road, and to send and receive files. The Palm PDA also has a Bluetooth chat service built in; it was claimed at one time that Palm owners were using this to locate and chat up potential partners – "toothing" – this was subsequently shown to be a hoax.

BLUETOOTH PERIPHERALS

Bluetooth and similar systems can reduce the number of cables protruding from the back of most PCs. The monitor requires a high-bandwidth connection and is not likely to be replaced any time soon, and the power cable will have to remain till the development of better hydrogen fuel cells; however, the printer, the keyboard and the mouse can all be operated via wireless. Printers are probably the next major growth area for Bluetooth connection, particularly as more users develop a need to print material directly from laptops, PDAs and even from mobile phones.

Keyboards and mouses are already well-served by ordinary wireless connections, and until the price of Bluetooth keyboards and mouses comes down they are unlikely to make much impact in this area. However, Bluetooth may have a role to play in places such as call centres, where a lot of wireless keyboards and mice operate close together and may interfere with each other – a Bluetooth keyboard and mouse set can be "paired" with a particular PC to prevent this happening.

Bluetooth headsets can be used with PCs in the same way as with mobile phones. Bluetooth barcode scanners are now available, and Bluetooth for more specialised equipment, such as portable CT scanners, is being discussed.

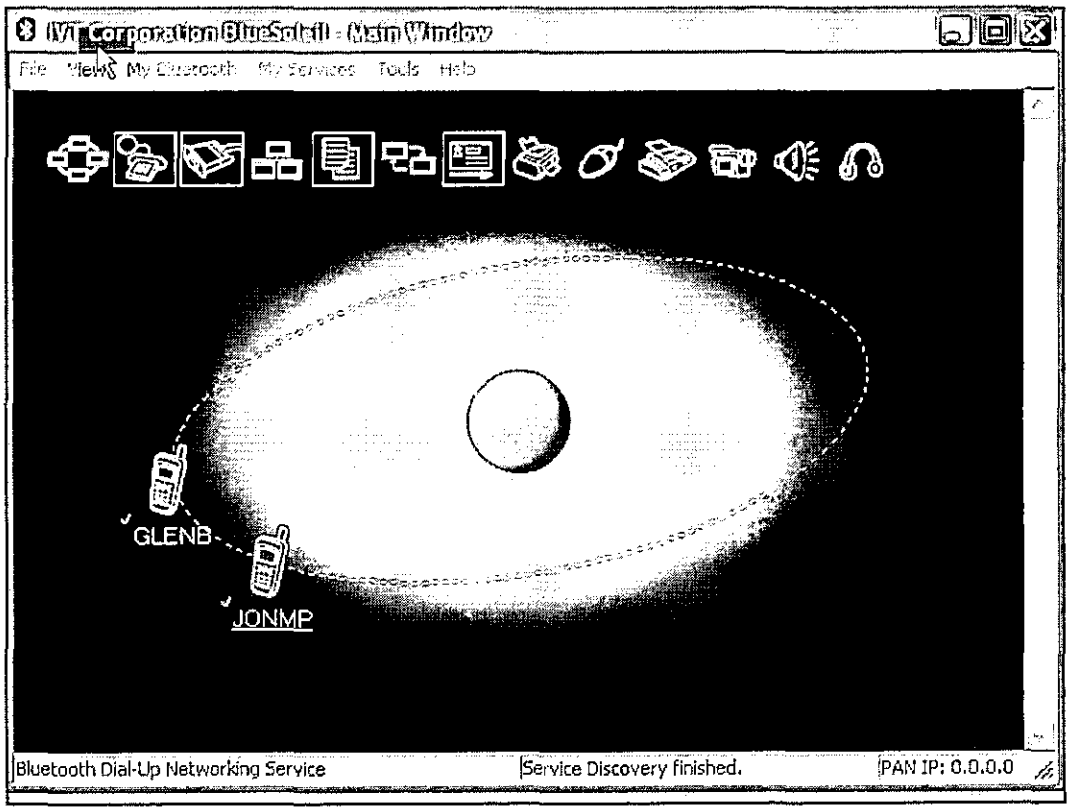
IN PRACTICE

I tested a Bluetooth dongle on a Windows XP computer with a four-year-old Palm PDA and three new mobile phones. Setup was fairly simple, although for such a small device there were an alarming number of new drivers to be installed. The accompanying software was BlueSoleil from IVT

Corporation. When this was up and running, I selected "Bluetooth Device Discovery" to locate and identify the other devices. When this was done, they were paired with the PC. Some initial problems required a second installation, but after this things worked smoothly. Transfer time for a 194 KB file from the phone to the PC was about 15 seconds.

Along with the phones we were provided with PC software that allowed for communication via cable or Bluetooth. Using this, I was able to copy a set of contacts and appointments from the PC to each of the phones. The process of synchronising each phone with the PC took about 20 seconds. One major advantage of the connection was that I could write quite lengthy SMS messages on the PC, including text copied from other documents, and send them to other mobile phones via the Bluetooth connection to a local phone. This is much easier than struggling with a phone keypad to write an SMS message!

FIGURE 1 BlueSoleil (http://www.bluesoleil.com) Bluetooth Management Software, showing two phones connected to PC



SECURITY ISSUES

Bluetooth specifications are fairly secure; however, particular implementations have been shown to have problems. "Bluesnipers" can sometimes identify PIN numbers and use this information to obtain lists of contacts and appointments from Bluetooth-equipped phones. More sophisticated phones contain a programming system that could, in theory, be taken over by a hacker in the same way as a PC can be taken over by a virus, but there are no records of this happening in practice. Setting the Bluetooth accessibility level on your device to "hidden" will block most attackers but, when in doubt, turn it off altogether. Bluetooth 3.0, due for release in 2007, will contain more security features as well as faster data transfer.

The Bluetooth specification is part of international standard IEEE 802.15, which can be found at http://standards.ieee.org/getieee802/802.15.html. Detailed information about Bluetooth can be found in Wikipedia (http://en.wikipedia.org/wiki/Bluetooth) and on the official Bluetooth website at http://www.bluetooth.com. Information about the other Bluetooth can be found at http://bibleocean.com/OmniDefinition/Harold_Bluetooth, a website that gives access to the whole of the 11th Edition of *Britannica*.

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