New Survey on New Bluetooth Technology

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Abstract:

A fundamental strength of Bluetooth wireless technology is in its ability to handle simultaneous data and voice transmissions. This functionality gives users a variety of innovative solutions, such as hands-free headsets for voice calls, printing and fax capabilities, and synchronization of PCs and mobile phones, to name just a few.

Keywords —Cloud Computing Security , Public cloud, Data protection strategy,

Introduction:

Bluetooth is an always-on, short-range radio hookup that resides on a microchip. It was initially developed by Swedish mobile phone maker Ericsson in 1994 as a way to let laptop computers make calls over a mobile phone. Since then, several thousand companies have signed on to make Bluetooth the low-power short-range wireless standard for a wide range of devices. Industry observers expect Bluetooth to be installed in billions of devices by 2005. The concept behind Bluetooth is to provide a universal short-range wireless capability. Using the 2.4 GHz band, available globally for unlicensed low-power uses, two Bluetooth devices within 10 m of each other can share up to 720 Kbps of capacity. For example, audio devices can include headsets, cordless and standard phones, home stereos, and digital MP3 players

BLUETOOTH TECHNOLOGY HARDWARE OR SOFTWARE?

It's a combination of both. When someone says a product contains Bluetooth that means it includes a small computer chip containing the Bluetooth radio. But it also needs software to connect, via Bluetooth wireless technology, to other products

Bluetooth Smart and Bluetooth Smart Ready?

Bluetooth Smart and Bluetooth Smart Ready are extensions of the original Bluetooth brand introduced in 2011. The Smart and Smart Ready designations indicate compatibility of products using the low energy feature of the Bluetooth v4.0 specification. A Bluetooth Smart Ready product connects to both classic Bluetooth and Bluetooth Smart low energy products. By contrast, a Bluetooth Smart product collects data and runs for months or years on a tiny battery. Think of a Smart product as a sensor that works for a long time without changing the battery (like a fitness heart rate monitor) and a Smart Ready product as a collector (like a smart phone or tablet receiving the information and displaying it in an application).

Range

Range is application-specific, and although the core specification mandates a minimum range, there is not a limit, and manufacturers can tune their implementation to support the use case they are enabling.

The range varies depending on the class of radio used in an implementation:

- Class 3 radios — range of up to 1 meter or 3 feet
- Class 2 radios — most commonly found in mobile devices — range of 10 meters or 33 feet
- Class 1 radios — used primarily in industrial use cases — range of 100 meters or 300 feet

How Bluetooth Works

This section seeks to give you an overview of the technology and specification that will provide context for the Bluetooth implementation on OS X. If you're already familiar with the Bluetooth specification and how Bluetooth devices work, you might choose to skip ahead to "Bluetooth on OS X."

Bluetooth devices operate at 2.4 GHz in the license-free, globally available ISM (Industrial, Scientific, and Medical) radio band. The advantage of operating in this band is worldwide availability and compatibility. A potential disadvantage is that Bluetooth devices must share this band with many other RF emitters. These include automobile security systems, other wireless communications standards (such as 802.11), and ordinary noise sources (such as microwave ovens).

To overcome this challenge, Bluetooth employs a fast frequency-hopping scheme and uses shorter packets than other standards in the ISM band. This scheme makes Bluetooth communication more robust and more secure.

Security

Security is a challenge faced by every communications standard. Wireless communications present special security challenges. Bluetooth builds security into its model on several different levels, beginning with the security inherent in its frequency-hopping scheme (described in "Frequency Hopping").

At the lowest levels of the protocol stack, Bluetooth uses the publicly available cipher algorithm known as SAFER+ to authenticate a device's identity. The generic-access profile depends on this authentication for its device-pairing process. This process involves creating a special link to create and exchange a link key. Once verified, the link key is used to negotiate an encryption mode the devices will use for their communication.

The Bluetooth profile:
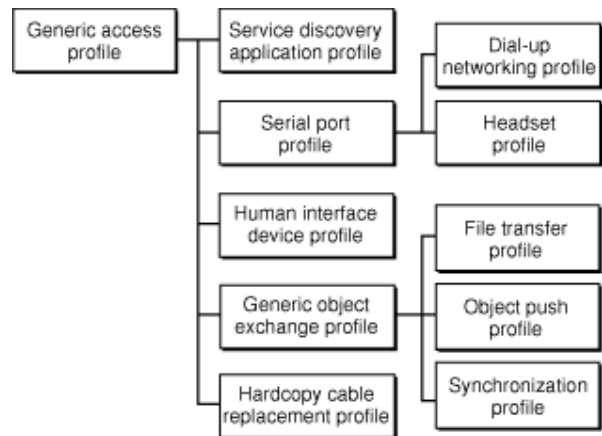
Service discovery application profile describes how an application should use the SDP (described in "The Bluetooth Protocol Stack") to discover services on a remote device. As required by the GAP, any Bluetooth device should be able to connect to any other Bluetooth device. Based on this, the service discovery application profile requires that any application be able to find out what services are available on any Bluetooth device it connects to.

Human interface device (HID) profile describes how to communicate with a HID class device using a Bluetooth link. It

describes how to use the USB HID protocol to discover a HID class device's feature set and how a Bluetooth device can support HID services using the L2CAP layer.

Serial port profile defines RS-232 serial-cable emulation for Bluetooth devices. As such, the profile allows legacy applications to use Bluetooth as if it were a serial-port link, without requiring any modification. The serial port profile uses the RFCOMM protocol to provide the serial-port emulation.

Dial-up networking (DUN) profile is built on the serial port profile and describes how a data-terminal device, such as a laptop computer, can use a gateway device, such as a mobile phone or a modem, to access a telephone-based network.

Headset profile describes how a Bluetooth enabled headset should communicate with a computer or other Bluetooth device (such as a mobile phone). When connected and configured, the headset can act as the remote device's audio input and output interface

Hardcopy cable replacement profile describes how to send rendered data over a Bluetooth link to a device, such as a printer. Although other profiles can be used for printing, the HCRP is specially designed to support hardcopy applications.

generic object exchange profile provides a generic blueprint for other profiles using the OBEX protocol and defines the client and server roles for devices. As with all OBEX transactions, the generic object exchange profile stipulates that the client initiate all transactions.

Object push profile defines the roles of push server and push client. These roles are analogous to and must interoperate with the server and client device roles the generic object exchange profile defines.

File transfer profile is also dependent on the generic object exchange profile. It provides guidelines for applications that need to exchange objects such as files and folders, instead of the more limited objects supported by the object push profile.

Synchronization profile is another dependent of the generic object exchange profile. It describes how applications can perform data synchronization, such as between a personal data assistant (PDA) and a computer. Not surprisingly, the synchronization profile, too, defines client and server device roles.

1) How the name Bluetooth comes?
While many new technologies bear technical names, like RS-232 or IEEE 802.11b, Bluetooth, the wireless technology, is different. Bluetooth was named for the 10th Century Viking king , Harald Blatand (A.K.A., Bluetooth) who peacefully united all the tiny island kingdoms of Denmark, southern Sweden, and southern Norway into one country . In keeping with its namesake, Bluetooth, the new low-cost radio technology, is designed to unite or connect all different types of devices to effectively work as one. By uniting devices, Bluetooth eliminates the need for cabling in a wide range of products, including cellular phones, PCs, headphones, audio equipment, printers, and many more.

Specifications:
The Bluetooth specification was developed in 1994 by Jaap Haartsen and Sven

Mattisson, who were working for Ericsson Mobile Platforms in Lund, Sweden.

The specifications were formalized by the Bluetooth Special Interest Group (SIG). The SIG was formally announced on May 20, 1998. Today it has a membership over 7000 companies worldwide.

It was established by Ericsson, Sony Ericsson, IBM, Intel, Toshiba, and Nokia, and later joined by many other companies

The Advantages of Bluetooth: Bluetooth does not require a clear line of sight between the synced devices. This means that the devices need not be facing each other, and it is also possible to carry out transfers when both the devices are in separate   rooms.
The fact that this technology requires no cables and wires is something that has made it so popular. With so many devices engulfing our lives today, the need for clutter-free technology is becoming more intense.
The maximum range that it offers is 100 meters, but this range is not the same for all similar connections. It depends on the nature of the devices and the version that they   operate   upon.
The processing power and battery power that it requires in order to operate is very low. This makes it an ideal tool for so many electronic devices, as the technology can   be   implemented   pretty   much anywhere. One major advantage is its simplicity of use. Anyone can figure out how to set up a connection and sync two devices   with   ease.   Moreover,   the technology is completely free to use and requires no charges to be paid to any

service provider. The chances of other wireless networks interfering with yours are very low. This is because of the low powered   wireless   signals   that   the technology adopts, and also because of something known as frequency hopping.

Bluetooth Vendors and Products

For   February   202   version   of   printer adapters
Red-M Communications Ltd. introduced Red-M blade that attaches to Palm devices and enables Bluetooth-enabled phones to communicate with Palm.
Motorola introduces Time port 270 using Bluetooth technology. A tri-mode CDMA, hands-free   speaker   phone,   with   4-way joystick, headset connectivity and a PIM. Price around $350 (August 2001). The handset will communicate with a headset to be introduced shortly.
Cambridge   Silicon   Radio   of   England announced its Blue Lab SDK and Blue Core   serial   protocol   that   has   been incorporated into CE.NET by Microsoft. - November 2001.
Red-M   of   Wexam   Springs,   England announced 1050 - an access point that connects Bluetooth devices to a wireless LAN.   Product   will   be   available   in November 2001 at $495.
Silicon Wave Inc. announced processors and SDK's for Bluetooth (takes 12KB of RAM and processors cost $5.00 a piece.
TDK announced at Fall Comdex 2001, a USB adapter for Bluetooth.

REFERENCES:

 Adams, Douglas (2002). Guzzardi, Peter, ed. The Salmon of Doubt: Hitchhiking the Galaxy One Last Time.

Webb, Nick (2005). Wish You Were Here: The Official Biography of Douglas Adams.