

# Mobile Communication – Infrared, Bluetooth and NFC

Infrared, Bluetooth and now NFC – all these technologies had done its part in different period. I used to remember keeping 2 Nokia phones in the straight line to transfer an image. Now it's just a tap away. Here are some details about each technology – one is outdated, one is widely used and we yet to know the potential of last one.

## **Infrared**

As the name indicates, the communication is established via infrared signals. This technology is used by most of the remote controls. This technology is device specific and there should be direct line of sight between (max 3 feet) transmitter and receiver. This communication is more secure since it can be intercepted by a device and it's one-to-one.

I'm not going to more details about this technology since it is not used in mobile devices anymore

## **Bluetooth**

Compared to infrared, Bluetooth devices can work together, its omni-directional. Current devices can transfer in the range of 30 feet. Bluetooth uses radio frequency and hence transmission is possible through walls or other objects and hence it is widely used in computers, PDA, headsets, mobile handsets etc. These devices can communicate with each other irrespective of the manufacturer since it is using

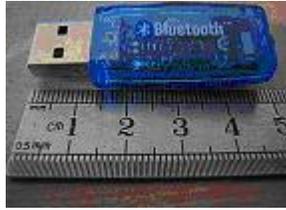
standard 2.4 GHz frequency (ISM – Industrial Scientific and Medical devices – band).



Bluetooth communication does not need user intervention and uses very little power: – we connect devices such as phone, car GPS, mobile, PC and control them smartly (it automatically switches to the appropriate devices – handsfree is an example, if you setup devices in car audio and home land phone, the call switched automatically to these devices ...pretty cool rite?). Current devices can transfer data up to 3Mbps (2.0 devices).

As I said earlier, it works in RF and lot of other devices such as cordless phones, baby-monitors, garbage door openers too are using same ISM band. Bluetooth uses very weak signal of 1 milli-watt to avoid interference and hence limits the range to 30 feet. Also it can connect 8 devices simultaneously and uses spread-spectrum frequency hopping method to avoid interference with each other (too technical, so no details).

Like other wireless network, Bluetooth also faces security issues since hackers can try to grab your data or interfere with signals with same frequency. Bluetooth offers several security options to avoid this – allowing only trusted devices, making the devices non-discoverable, pairing etc. Similar to hacking there is bluejacking – sending a business card as text message, contact added in address book by mistake and the hacker gets the control of the address book and phone. BT communication can be done with a computer and other devices using a USB-dongle (most laptops have added this in-built)



## NFC

Near Field Communication a.k.a NFC is the current hot topic in the smartphone market and it takes communication to the next level. I don't think it is a replacement for BT, but NFC is preferable in some places. In simple words, BT is like a phone communication – sender and receiver should be available and NFC is like an e-mail – we can transfer some information to a device (called tags) and then this can be used in any other device

As the name (near field) indicates, maximum distance for communication is only 4 centimeters. NFC can interact with other device with a single wave and it's faster compared to BT (needs only 1/10 seconds to establish). It also reduces the security risk specified in case of BT and NFC needs minimal power compared to BT. The speed of NFC is only 424 kbit/s and it can be used in combination with BT to speed up the process.



NFC can make use of un-powered chip called as tag to communicate – that's why I said, its like an e-mail. Many vendors are creating these tags and X-peria smart tags are one of the popular one. You can save your phone settings, or browser

bookmarks to a tag and this can be restored in any other NFC powered devices. NFC is similar to RFID (radio frequency identification) technology.

### **Android and NFC :**

Android uses NFC technology as Android-beam and this was launched in Android 4.0 ICS. They have customized the technology and made data transfer a dream – just swipe or touch the devices. It also supports technology called Wi-Fi Direct, previously known as Wi-Fi P2P. As the name shows, your mobile device can do peer-to-peer networking and transfer data. I think this is the coolest feature of NFC (torrent in smartphone?)



NFC, Android beam, S-beam have so-many features and I have to include them in another article. We can expect more stuff in NFC since it's in growing stage and Android 4.1 jelly bean is already started hitting the market. I pity I-phone users since they can't try these stuffs in near future

Source : <http://technogravity.wordpress.com/2013/07/23/mobile-communication-infrared-bluetooth-and-nfc/>