



A Review on Near Field Communication

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Abstract: Mobile phones are presently arguably the most extensive mobile computing devices and have found their way into our social and emotive life. Using corporeal substances as entry facts to data and services can ease mobile information admittance. A novel technology known as (NFC) Near Field Communication, which is an extension of Radio Frequency Identification technology i.e. (RFID), takes the latent to bring mobile devices and physical objects together. NFC enabled mobile phones with the appropriate applications provide consumers with a whole range of new value added services, making everyday tasks easier than ever. For service centers it opens active an entire range of new services and opportunities to improve the business and get closer to costumers.

Keywords- Near Field Communication, Mobile Applications, Emerging Technologies, security

I. INTRODUCTION

Mobile communication systems continue to grow in popularity and have become an integral part for communication in both personal and business purpose. Several mobile devices now included in Personal Digital Assistant (PDA) features such as address books, calendars, task lists, memo, calculators and writing programs, games, media players etc. These various functional devices usually allow users to send and receive electronic mail (email) messages wirelessly and access the internet via a cellular network and/or a wireless local area network (WLAN), for example. **Near field communication (NFC)** is a set of ideas and technology that enables smartphones and other devices to establish radio communication with each other by touching them together or bringing them into proximity, typically a distance of 10 cm (3.9 in) or less. Everybursting NFC device can work in 3 modes: NFC Target; NFC Initiator; and NFC Peer to peer. Early business models such as advertising and industrial applications were not effective, having been overhauled by alternate technologies such as UHF tags, RFID tags or barcodes, but what distinguishes NFC is devices are often cloud associated. All enabled NFC smartphones can be delivered with dedicated apps including 'ticket' readers as opposed to the traditional dedicated infrastructure that specifies a particular (often proprietary) standard for stock ticket, admittance control and payment readers. By distinction all NFC peers can connect to a third party NFC device that acts as a server for any action (or reconfiguration).



Figure 1: NFC tags Objects

NFC complements many popular consumer level wireless technologies, by using the crucial elements in present standards for contactless card technology (ISO/IEC 14443 A&B and JIS-X 6319-4). NFC can be well-matched with existing contactless card infrastructure and enables a consumer to utilize one device across different systems. Extending the ability of the contactless card technology, NFC also makes devices to share information at a distance less than 4 centimeters with a maximum communication speed of 424kbps. Customers can share business cards, make transactions, access information from smart posters or provide credentials for access control systems with a simple touch.

NFC's bidirectional communication ability is ideal for establishing connections with other technologies by the ease of touch. Let consider if the customer wants to connect their mobile device to their stereophonic to play audio or video, they can simply make touch the device to the stereo's NFC touch point and the devices will negotiate the best wireless technology to use.

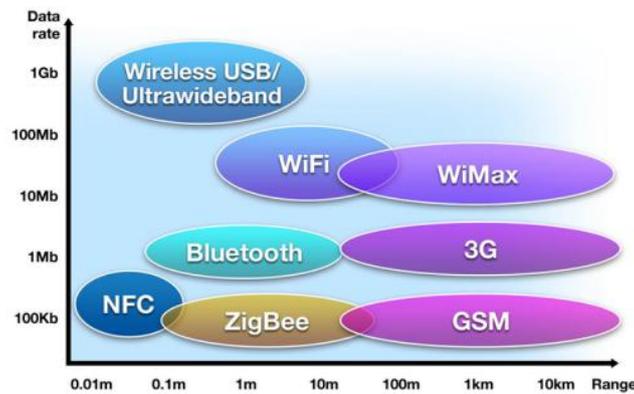


Figure 2: Data rate for different data transfer technique

This contactless technology offers already convenient solutions in the payment industry and transporting. Integrated with the 21st century mobile phone the NFC technology is extended to provide mobile contactless solutions services. Smartphone users using NFC are able to securely buying goods, refill their transport pass and use their coupons by using their mobile phone in a contactless mode.

II. NEAR FIELD COMMUNICATION (NFC) TECHNOLOGY

NFC is based on RFID technology and uses the same working principles. The NFC standard [5] was issued in 2003 and is an interface technology for short-range data communication working in the 13.56 MHz frequency band. NFC is standardized in ISO/IEC 18092 and is compatible to ISO/IEC standards 14443 (proximity cards) and 15693 (vicinity cards) and to Sony's FeliCa contactless smart card system. Thus, NFC can be used with existing infrastructures based on the standards mentioned, eliminating the need for a separate NFC infrastructure. The key feature of NFC devices is that they can read out RFID transponders and emulate them. Furthermore, peer-to-peer communication is possible when two NFC devices are carried together. By contrast, classical RFID systems are designed with only a read-write device attached to a computer. NFC was designed to enable instinctive communication with other entities and to offer an intuitive way of sharing data between electronic devices. NFC technology combines two paradigms, the communication between devices that both have computing capabilities and active power supply and the communication between powered devices and passive tags. The supported range of NFC systems is approximately up to ten centimeters. NFC is designed to make communication between two devices very intuitive. Users wanting two devices to communicate simply bring them close together. Then, a protocol will automatically be initiated enabling communication in a peer-to-peer fashion. The required close distance between two NFC devices aggravates overhearing information exchange from outside and adds perceived security to data communication. NFC is expected to support a variety of applications in the future. NFC devices makes easy mobile payment, ticketing and peer-to-peer data exchange are expected to be realized difficult. NFC suits the requirements for physical mobile interfaces very well. Objects can be improved with passive RFID tags and mobile devices can be equipped with NFC chips. This enables interaction between two NFC devices, objects and smartphone devices.

III. SECURITY

If your wallet is stolen, a thief has instant access to all your debit cards, credit cards and photo identity. Storing this information all in one place on your smartphone may sound unsafe at first, but really provides a safer atmosphere than your physical wallet. While you can't password protect your wallet, you can make your smartphone as password protect. If thief can use your cards but they can't unlock the phone to get at them.

In addition, near field communication often creates a secure channel for communication and uses data encryption when sending sensitive information between your phone and other device, such as a card reader. This prevents hackers from theft that information. Finally, having your information stored on one device cuts down on your risk of losing or misplacing a credit card when you're trying to juggle three or more cards in your wallet and switching between them for various purchases. Thieves will find your mobile phone a lot tougher to swipe than that wallet in your back pocket, and if worse comes to worse a GPS enabled smartphone can be tracked down and recovered.

Secure NFC is currently being developed by Philips and combines NFC with smart-card technology to enable the storage of personal data securely [10]. Using Secure NFC ensures that confidential data is stored in a secure memory and remains present. Certification is supported by the NFC device and transmitted data can be encrypted with a private key that is stored in the secure memory of the device. Secure NFC could be realized using either an additional secure integrated circuit or a SIM-card. The connection of a secure storage to a NFC device is essential for many NFC applications. The secure storage is required for storing electronic money, personal data, tickets, keys and many more.

IV. CONCLUSION

Our experiences in implementing and testing the example scenario above showed that NFC technology included into mobile devices and particular phones has a great potential. Even though people may have to learn how to use NFC based physical interface, it immobilefeaturesoptions to be much simpler and quicker than classical screen-based user interfaces on mobile devices. Interesting options for physical and tangible interaction arise from this expertise, specifically when more than one tag is used in a single physical object. Associating a single tag with a specific action (e.g. opening a web page or initiating a call) is only a starting point but not sufficient to support more complex interactions. It can be expected that data capacity of tags will further increase and offer the possibility to store whole services on a tag (e.g. a bus schedule at a bus stop). So that, operators could scan tags without the need for network connections and explore the offered services at no additional cost. This would eliminate negative effects of network connections like costs and delay in time. In such situations the phone's remote network connection is required and invoked only if the user decides to make a transaction.

REFERENCES

- [1] NFC-Forum, Available: <http://www.nfc-forum.org>.
- [2] Ecma International, "Near Field Communication - White Paper", 2005, Ecma/TC32-TG19/2005/012, Available: <http://www.ecma international.org/>
- [3] M. Csapodi, A. Nagy, "New applications for NFC devices", Proc. 16th IST Mobile and Wireless Communications, Budapest, HUNGARY, IEEE, 2007, pp. 245-249.
- [4] B. Ozdenizci, M. N. Aydin, V. Coskun, K. Ok, "NFC Research Framework: A Literature Review and Future Research Directions", Proc. 14th IBIMA International Business Information Management Conf., Istanbul, TURKEY, 2010, pp. 2672-2685.
- [5] AssaAbloy AB. (2008). Vingcard [Online]. Available: <http://www.vingcard.com/binary?id=66705>
- [6] Kerem OK, Vedat COSKUN, Mehmet N. AYDIN, and Busra OZDENIZCI, "Current Benefits and Future Directions of NFC Services ", ICEMT 2010 Conference, 2-4 November 2010.