Ecma/TC32-TG19/2005/013
(supersedes 2004/028)

# Near field communication (NFC)

# Near Field Communication

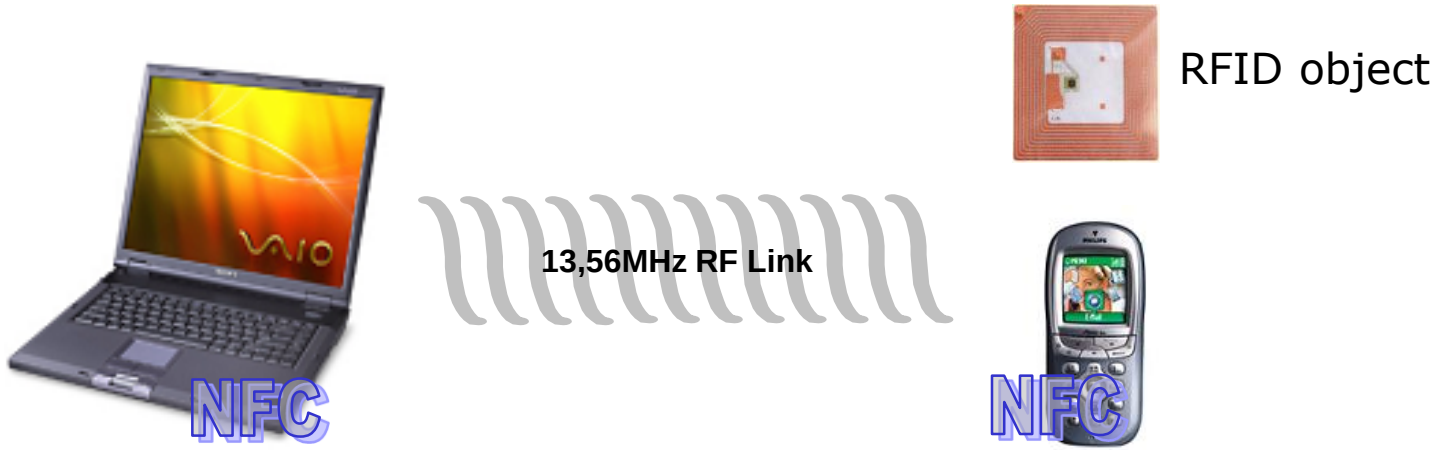
- Easy to use wireless communication interface for the last few centimeters
- Easy to use target selection, by simply holding two devices close to each other

**NFC is as easy as….**

**… a touch**

## Wireless Short Range Communication Technology

- *Based on RFID technology at 13,56 MHz*
- *Operating distance typical up to 10 cm*
- *Compatible with today's field proven contactless RFID technology*
- *Data exchange rate today up to 424 kilobits/s*



## Wireless short range communication technology

- *NFC is designed for short distance wireless communication*
- *Allows intuitive initialization of wireless networks*
- *NFC is complementary to Bluetooth and 802.11 with their long distance capabilities*
- *NFC also works in dirty environment*
- *NFC does not require line of sight*
- *Easy and simple connection method*
- *Provides communication method to non-self powered devices*

# Near Field Communication Applications

**Smart Key**

- for mobile local payment

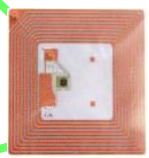

**Peer to Peer communication, Virtual Connector**

- either directly or by establishing wireless links

NFC

NFC

NFC



**Low cost solution to distribute info / services**

-e.g. by passive loops embedded in paper media

**NFC enables a unique blend of valued applications**

# ECMA-340: NFCIP-1 Interface and protocol
## (ISO/IEC 18092)

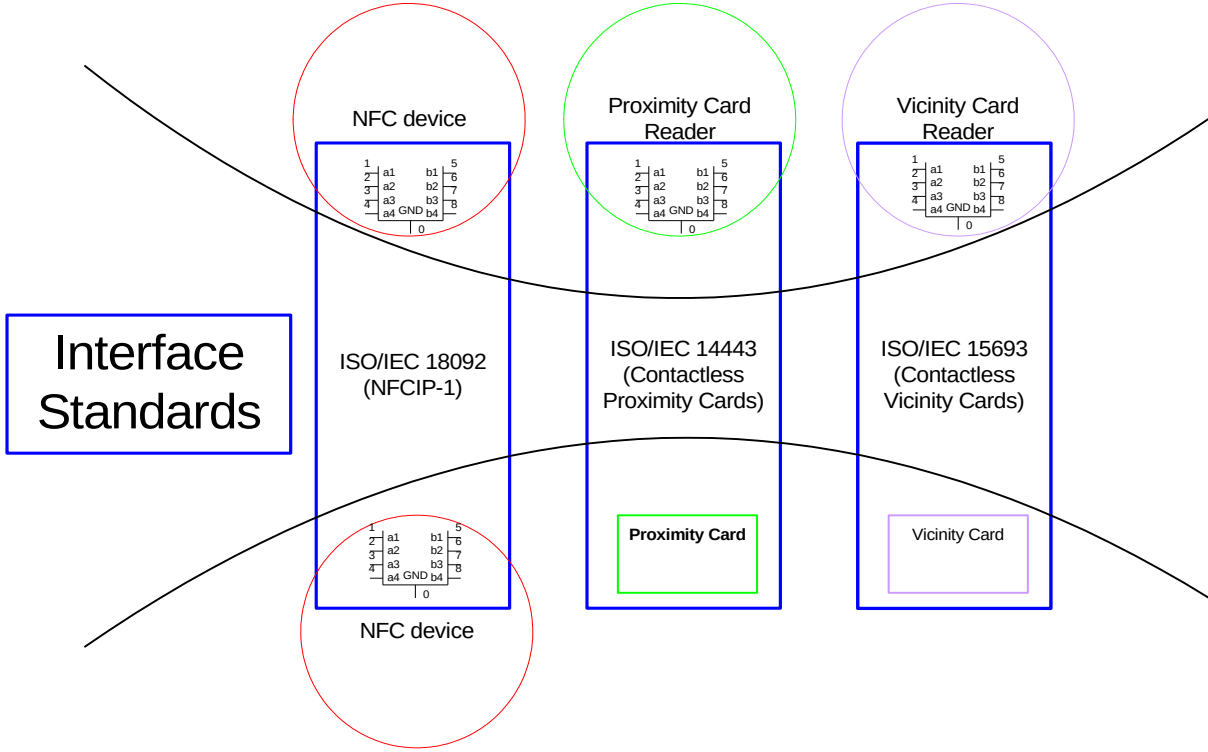
## Key points:

- *The NFC communication is based on an inductive RF link on 13.56 MHz*
- *Active and passive NFC mode at different transfer speeds from 106 to 424 kbps*
- *Backward compatibility with RFID systems*
- *Allows communication between*
  - **Two powered devices**
  - **Powered and non self-powered devices**
- *Standardization of*
  - **Communication signal interface**
  - **General protocol flow**

# ECMA-352: NFCIP-2 Interface and protocol
## (ISO/IEC 21481)

**Key points:**

- **Gateway between**
  - *ECMA-340*
  - *ISO/IEC 14443 PCD mode*
  - *ISO/IEC 15693 VCD mode*



# ECMA-356: NFCIP-1 – RF interface Test Methods (ISO/IEC 22536)

## Key points:

- *Basic standard to ensure interoperability on the RF interface for ECMA-340 devices*
- *Description of test equipment and procedures to perform interoperability tests on the RF interface*
- *Description of the tests to be performed on Initiator and Target side*

# ECMA-362: NFCIP-1 - Protocol Test Methods
**(ISO/IEC 23917)**

## Key points:

- *Basic standard to ensure interoperability of ECMA-340 devices for:*
  - **the initialization**
  - **the single device detection**
  - **the transmission protocol**
- *Description of test equipment and procedures to perform tests*
- *Description of the tests to be performed on Initiator and Target side*

# Future NFC work items

- *A mapping of NFC to other communication protocols including the Internet Protocol (IP), GSM and Bluetooth*
  - **Advanced Logical Link Control with addressing and segmentation support**
- *Support for Data Link and end-to-end security and key management*
- *Air-to-wired interface specification*
- *Application extensions in NFCIP-1*
  - **Power control as an example application extension**

# TC32-TG19 membership

**The following Ecma International member companies have nominated representatives to TC32-TG19:**

- *Avaya-Tenovis, Ericsson, Hitachi/Mitsubishi Electric, Hewlett Packard, Innovision, Philips, Samsung, Siemens, Sony, Texas Instruments*

**Convenor: Reinhard Meindl , Philips Semiconductors**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