Tap and play: NFC in gaming

Public
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Tap and play: NFC adds magic to gaming
Near Field Communication (NFC)

NFC is a proximity technology, it only works when two devices are brought close together. NFC is unique in the way it uses energy. Only one of the two devices needs to be powered. The first can power the second, so the second does not need a battery at all.

Co-developed by NXP Semiconductors and Sony Electronics in 2002, NFC is the tap-and-play-technology:

- Short-range radio frequency communication (up to 10cm)
- Contactless interaction between objects/devices

1.7 Billion NFC-enabled smartphones in the market by 2018 according to ABI Research
NFC is here now - evidence by the use cases

Payment
Door opener
Car sharing
Remote planning

Personalization
Bus ticket
City Bike
Check-in

Touch & Travel
Car key
Mobile Ticketing

... and many more to come!
NFC is here now - evidence by the use cases

Payment
Door opener
Car sharing
Remote planning

Personalization

Touch & Travel

Gaming

PRESS START
FOR THE FUN PART

... and many more to come!
Why NFC in gaming?

Social spread
- Of gamers play with others: they’re social
  - 60%

Smartphone as link
- NFC enabled smartphones by 2017
  - 1.6 bn

Huge industry
- Industry expected by 2017
  - $102.9 bn

Opportunities ahead!
Tap and play: NFC adds magic to gaming

NFC stickers and inlays can be inserted in game controllers and consoles, as well as physical toys and cards.

Players can link all of these items and use them in gameplay simply by tapping them together.

It also allows to store and manage data securely and easily on one chip.
Success stories
Zoom on Activision Skylanders

- Launched 2011
- 240M toys sold
- Transformed the gaming industry

Disney Interactive doubled their turnover thanks to Disney Infinity
(source: http://www.polygon.com/2013/11/7/5078544/disney-interactive-q4-revenue-up-205m-thanks-to-infinity)
Animal crossing: amiibo cards

- NFC enabled cards
- Used against Nintendo 3DS
- Tap and play magic
- From physical world to virtual world
IC Carddass: DRAGON BALL

- Released Sept’15
- NFC enabled cards
- Supports F2F and online gaming
- NFC reader for PC or NFC enabled devices
Use Cases in gaming*

*ideas shown are not necessarily real cases. We demonstrate our ideas with commonly known products
Smart toys

*How it works - it’s easy*

Note: our cute teddy bear is just an example, it can be anything, a figurine, doll, plush toy, vehicle, board game tiles, playing cards, trading cards, electronic devices. Anything goes!
Possible interactions of a smart toy

NFC enables the communication between objects and devices
Toy to toy

Tamagotchi can communicate with each other. Kids can play games, exchange items etc.

Tap a toy to your smartphone for extended play

Tap a Tamagotchi to a soft drink or a menu item in a restaurant. For a little extra fee, your toy can drink and eat what it likes best
Figurines and videogames

1. Reader recognizes toy
2. Toy awakes in game
3. Player has fun and levels up
4. Reader writes progress onto toy
Use existing readers like Wii U controllers or smartphones. This is the quick solution and you start with a huge user base.

Or

Design your own reader/writer device. One portal for all your games. Generate extra revenues by selling your portal.

Convert virtual goods to physical items like cards or toys and sell them in retail.

The fascination of collectables helps generating extra revenues.

Your customers can play with the toys, trade them, store their game progress or even use them for a secure and convenient login to their accounts.
Mobile Apps

- **Authentication**: Login to your app securely
- **Personalization**: Store e.g. success, level on toy, card in game
- **Interactivity**: Trade toy or card with friends
- **Upselling**: Toy activates voucher
- **Promotion**: Browser opens video or weblink
- **Real to virtual**: Toy awakes in app

Tap toy or card to mobile device
Trade cards & stickers

1. Buy trading cards in retail stores
2. Tap card to Reader (portal or smartphone)
3. Your card appears as a digital version
4. Build your team and play online
Family games

Board games

Readers implemented in the board

Tiles, cards and dice with tags
Mobile devices can add new dimensions to the gameplay. It can be an input device, show animations, display secret messages for selected players etc.
RC vehicles, models, slot cars, etc.

- Parcours race: reach certain stages
- Battery management system
- Interact with LED accessories
- Capacitive touching
- Smart LEDs and sound control
- Car2track communication (e.g. laps counter), remote control, communication, motor control
Security is an issue

77 Mio customers of the Sony Playstation network were compromised

NXP Security solutions available to protect your gaming application

>30 Mio Steam accounts suffered a potential data loss incl. credit card details
What are your ideas to bring gaming to the next level?
System solutions
Smart toys solution

High level architecture

NFC enabled board game

Console accessory

Game controller

NFC enabled card

NFC enabled board game

Smart toy solution

NFC Powered Basic

NFC Tag
NTAG21x
TNPI

NFC Powered - enhanced

Connected
Tag
NT3H1101
TNPI

Smart Toy – Battery powered

NFC AP2P
PN512

BLE
Network Processor
QN9022

MCU
LPC8x

Sensors

Speaker
PA
SA58672

Battery
2xAA
or LiPo
Interfacing with NFC enabled figurines…

**Console accessory**

*High level architecture*

- Smart toy solution
- Console accessory
- Game controller
- NFC enabled card
- NFC enabled board game
Game controller

High level architecture

- Smart toy solution
- Console accessory
- NFC enabled card
- NFC enabled board game

Game controller

- Contactless Reader
  - CLRC663
  - PN512
- Gyro, Accel, Touch Sensors
- BT Network Processor
  - BCMxx
- Authentication
  - AP7005CG
- Connected Tag
  - NT3H1101
  - TNPP
- MCU
  - LPC43xx
- Logic & Discreets
  - MOSFET’s
  - Analog MX
- Haptic feedback
- Speaker Driver I2S
  - TFA9882
NFC enabled cards

**High level architecture**

- Smart toy solution
- Console accessory
- Game controller
- NFC enabled card
- NFC enabled board game

![Diagram of NFC enabled cards and components]

- Cards
  - NFC Tag NTAG21x
  - NFC Tag ICODE ILT

- Portable Card Reader
  - Contactless Reader CLRC663 PN512
  - BLE Network Processor QN9022
  - MCU LPC11Uxx
  - Logic & Discreets MOSFET's LOGIC
NFC enabled board game

High level architecture
NFC Readers solutions for gaming
NFC Reader solutions

Connected NFC tag solutions
Our connected NFC tag solutions include a NFC Forum RF interface, an EEPROM, and a field-detection function (NTAG F) or a field-detection function with an I²C interface (NTAG I²C).

NFC frontend solutions
Our standalone frontends, which work seamlessly with the NFC Reader Library, are the most flexible way to add NFC to a system.

NFC controller solutions
Our NFC controller solutions enable higher integration with fewer components combining an NFC frontend with an advanced 32-bit microcontroller.

Customizable Firmware
NFC Dual Interface Controller PN7462
Host (optional)
Connected tags - NTAG I²C and NTAG F

**NTAG F**
- NFC Forum Tag Type 2 compliant
- Interoperability with any NFC device in the market
- Up to 888 bytes of user memory for NDEF message
- Field-detection signal for optimized power management

**NTAG I²C**
- NFC Forum Tag Type 2 compliant
- Interoperability with any NFC device in the market
- 888 or 1,904 bytes of user memory for NDEF message
- Field-detection signal for optimized power management
- Energy harvesting
- I²C interface and NFC interface

<table>
<thead>
<tr>
<th>Product</th>
<th>Board</th>
<th>Photo</th>
<th>Description</th>
<th>More info</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTAG I²C</td>
<td>NTAG I²C Demo Kit OM5569/NT312D</td>
<td><img src="image" alt="NTAG I²C demo board" /></td>
<td>Includes the NTAG I²C demo board plus a class 5 antenna board</td>
<td><a href="http://www.nxp.com/demoboard/OM5569.html">http://www.nxp.com/demoboard/OM5569.html</a></td>
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</table>
PN512 - NFC Transceiver

PN512
“Full NFC Forum-compliant solution”

Reader:
ISO/IEC 14443A & B & FeliCa
MIFARE & NTAG

P2P:
Active Target/Initiator
Passive Target/Initiator

Card Emulation:
NFC Forum Tag Type 2,4 A

► Extensive Software support available in NFC Reader Library.
► Several boards available public on web and over distributor.

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<tr>
<td>PN512</td>
<td>PNEV512B</td>
<td>An expansion board, designed for use with Raspberry Pi, which is a card-sized ARM-based computer running Linux.</td>
<td><a href="http://www.nxp.com/demoboard/PNEV512R">www.nxp.com/demoboard/PNEV512R</a></td>
</tr>
<tr>
<td>PN512</td>
<td>PNEV512B</td>
<td>A two-board combination that stacks a PN512 board on an LPC-Link prototyping board, for use with NXP’s LPC microcontrollers. NFC Forum-compliant reader IC.</td>
<td><a href="http://www.nxp.com/demoboard/PNEV512B.html">www.nxp.com/demoboard/PNEV512B.html</a></td>
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CLRC663 - ISO14443 / ISO15693 Reader IC

**CLRC663**

“High-performance multi-protocol NFC frontend”

**Reader:**
ISO/IEC 14443A & B & FeliCa
ISO/IEC 15693
EPC Class 1-HF
ISO/IEC 18000-3M3
**MIFARE & NTAG & ICODE**

**P2P:**
Passive Initiator

- Development board with connection to LPCXpresso available.
- Complete NFC SW library available for easy design in and development.

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<tr>
<td>CLRC663</td>
<td>CLEV663</td>
<td><img src="image1.png" alt="CLRC663_CLEV663_1" /></td>
<td>Evaluation board for multi-protocol CLRC663. Testing reader IC functionalities.</td>
<td><a href="http://www.nxp.com/demoboard/CLEV663.html">www.nxp.com/demoboard/CLEV663.html</a></td>
</tr>
<tr>
<td>CLRC663</td>
<td>CLEV663B</td>
<td><img src="image2.png" alt="CLRC663_CLEV663B_1" /></td>
<td>A two-board combination, with a CLRC663 board stacked on an LPC-Link prototyping board, for use with NXP’s LPC microcontrollers.</td>
<td><a href="http://www.nxp.com/demoboard/CLEV663B.html">www.nxp.com/demoboard/CLEV663B.html</a></td>
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PN7462 – Dual Interface Smart Card Controller

PN7462
“Dual Interface Smart Card Controller”

CONTACTLESS READER
Reader:
ISO/IEC 14443A & B & FeliCa, ISO/IEC 15693
MIFARE & NTAG & ICODE
P2P:
Active and Passive
Card Emulation:
NFC Forum Tag Type 2,4 A

CONTACT READER
Class A, B, C cards
Fully integrated ISO/IEC 7816

MCU
Cortex M0, Multiple host interfaces, Large flash memory (160K)

► Single chip solution for contact & NFC with a large flash user memory saving cost and space with respect of previous solutions.
► Reduced time to market and easy integration, reader libraries and development boards.
► Combining NFC, USB, SPI and I2C interfaces
NFC Value Proposition

Connect the real and virtual world

Add new dimensions of gameplay

Enter new markets

Activate new target groups

Re-vitalize traditional brands

Sales

• Generate income out of your core business
• Collectable items generate recurring revenues
• upsell products & services
• make money with functional merchandise

Marketing

• Establish a direct customer interaction
• Marketing co-operations
NXP Value Proposition

NXP acts as enabler for game publishers seeking solutions to enhance the gaming experience of their standard portfolio.

NXP provides the required technology and know how and brings together all relevant parties to realize new, innovative projects.

Technology

- NFC inventor
- Standards & Certifications
- Long experience
- Best support & training
- Proven success

Portfolio

- Best in class reader portfolio
- Best in class tag portfolio
- All required components from one partner
- Seamless and secure integration
- Quick time to market
Reference material & documentation:

- NFC Everywhere
  http://www.nxp.com/nfc

- NFC Everywhere support page:
  http://www.nxp.com/techzones/nfc-zone/community.html

- NFC in Gaming
  http://www.nxp.com/techzones/nfc-zone/use-cases/connected-home/gaming.html

For other questions or further support, please contact: nfc.readers@nxp.com
We are a global competence team of hardware and software technical experts in all areas related to contactless technologies and applications.

Our services include:
- Application and system Design Engineering support
- Project Management
- Technological Consulting
- Advanced Technical Training services

We address all the exploding identification technologies that include NFC, secure micro-controllers for smart cards and mobile applications, reader ICs, smart tags and labels, MIFARE family and authentication devices.

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