NFC – Near Field Communication in Japan

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OOP Muenchen 2012

200M+ Cards
1M+ Stations
NFC – Near Field Communication in Japan

65 Million+ Handsets

Physical is the Next Frontier
NFC – Near Field Communication in Japan

**Passive**

Communication (Load Modulation)

**Active**

**Power**

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<table>
<thead>
<tr>
<th>Security</th>
<th>File System / Structure</th>
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<td>AES, DES</td>
<td>ISO 18092</td>
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<tr>
<td>NFC IP-1</td>
<td>ISO 14443</td>
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<tr>
<td>Felica (Sony)</td>
<td>Mifare (Sony)</td>
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Standards and Vendors

- Physical Layer, Link Layer: ISO 14443 Parts 1-4
  - Philips Mifare (ISO 14443 Type A)
  - Sony Felica (~ISO 14443 Type C)
- FeliCa Networks = “Mobile Felica”
  - NTT / JR / Sony joint.
  - Integration with mobile phone.
  - Tag Type specifications
  - Record Type specifications
- JSR 257: Contactless Communication API

### NFC

- Short Range (2-5cm)
- 1:1 (mostly)
- Read / write
- Large Capacity
- AES/DES
- A few Dollars
- Standards, some fragmentation
- Country specific

### RFID

- Longer range (several meters)
- Many to one
- Mostly read
- Relatively dumb
- Not necessarily
- Extreme low-cost
- Standardized
- Widely deployed

### Bluetooth Low Energy

- up to 50m
- Many to one
- Read write
- Smart device
- AES
- Embedded in device
- Core spec
- iPhone 4s
NFC – Near Field Communication in Japan

2001
SUICA (JR) & Edy (Bitwallet)
(Sony FeliCa)

2006
Mobile SUICA
(NTT, Sony, JR)

2001 2005 2010
Phase 1 Phase 2 Phase 3

• Initial killer app (transport)
• Technology adoption

• Broad deployment
• Payment
• Mobile FeliCa

• Loyalty
• Points
• Coupons
• Social
• Games

Stages of Adoption

Education, trust Mainstream use Innovation
NFC – Near Field Communication in Japan

Payment: 370k Shops + 400k Vending Machines

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<th>(Prepaid)</th>
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<tr>
<td>利用環境</td>
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<td>Online</td>
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<tr>
<td></td>
<td>166,000店</td>
<td>79,420店</td>
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<tr>
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<td>1サイト</td>
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<tr>
<td>PASMO</td>
<td>JR東日本</td>
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<tr>
<td>NTTドコモ</td>
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<tr>
<td>JCB</td>
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<tr>
<td>PayPass</td>
<td>2,000サイト</td>
<td></td>
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<tr>
<td>Card</td>
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FeliCa | Type A or B | FeliCa |
Local Search - NaviTouch

- At Station Exit
- Restaurants
  - Retail
  - Hotels
  - Attractions

Local Search – Roppongi Retail Association

- 92 Lamp posts in Roppongi equipped with Felica
- Lamp post typically owned / operated by retail association
- Includes local search, basic navigation, open now
Points / Coupons: Gurunavi Touch

- 10000 Devices, stand-alone
- 1200 in Tokyo, 19 in Roppongi
- Store owner gains insight
- Lottery game
- Stamp Card
- Loyalty: “free beer after 3 visits”

Campaigns

Collect Avatar items

Point / Coupons w/ POS Integration

McDonalds

- Download application to phone
- Select coupon
- Coupon stored in Mobile Felica chip
- Redeem via NFC at register
Games / Loyalty

“Stamp Rally”

Shima Ken

- JR / SUICA
- Reads SUICA/Edy purchase history to obtain a place as “territory”
- Think “Foursquare” based on spend

Loyalty Points

Member Reg.

Stamp Rally
NFC – Near Field Communication in Japan

Google NFC

Standards

- NFC Forum
- SNEP

Devices

- Android 2.3+
- Beam (4.0)

Platform & Applications

- Google Wallet
- Payment & Offers
Physical Access to Google Services

Physical Button
NFC – Near Field Communication in Japan

Remembering a Place

Giving Feedback

Coming Back & Getting a Deal

Mobile to Off-line Conversion Tracking

• Connect on-line ad impression and physical action
• For example, check-in, coupon redemption
• Allows advertisers to optimize on-line campaigns for off-line conversions
• Physical “button” behaves analogous to on-line button
“Smart Tag” NFC Base Station

- Off-the-shelf Felica / NFC Module
- AVR microcontroller ($2)
- Rechargeable battery or USB power
- AES encryption, USB HID emulation
- NFC & FeliCa
- Watchdog, no malloc