Near Field Communication (NFC)
NFC is a short-range wireless connectivity
Range within few centimeters
Up to 20 cm
Two devices are literally “touch” one another
The interface can operate in several modes
Used in: payment & ticketing, electronic keys, identification etc....
UART
FIFO buffers
Microcontroller
Analog circuitry
RF level detector
Contactless Host interface
Passive Communication Mode

The Initiator device provides a carrier
The Target device answers by modulating existing field
Target device act as a transponder
Active communication mode

Both Initiator and Target device communicate by generating their own field
HOW NFC WORKS?

Start

Initial RF collision avoidance

RF field detected?

Application switches to initiator mode for active communication and chooses transfer speed

Activation in active communication mode

Parameter selection (PSL)

Data exchange protocol (DEP)

De-activation

End of transaction

Application switches to initiator mode for passive communication and chooses the transfer speed and performs initialisation

Activation in passive communication mode

NFC Initiator
Smartcard/RF-ID Reader

NFC Target
Smartcard/RF-ID Tag

NFC Initiator
NFC Target

NFC Target
NFC Initiator

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# Comparison with Other Technologies

<table>
<thead>
<tr>
<th></th>
<th><strong>NFC</strong></th>
<th><strong>Benefits of NFC</strong></th>
<th><strong>Bluetooth</strong></th>
<th><strong>IR</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N/W Type</strong></td>
<td>Point-to-point</td>
<td>Pairing= bringing</td>
<td>Point to multipoint</td>
<td>Point-to-point</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>&lt;0.1m</td>
<td>Suitable for crowded</td>
<td>10m</td>
<td>1m</td>
</tr>
<tr>
<td><strong>Max Speed</strong></td>
<td>1 mbps</td>
<td>faster</td>
<td>721 kbps</td>
<td>115 kbps</td>
</tr>
<tr>
<td><strong>Set-Up Times</strong></td>
<td>&lt;0.1 s</td>
<td>Fast transaction</td>
<td>6 s</td>
<td>0.5 s</td>
</tr>
<tr>
<td><strong>Modes</strong></td>
<td>A-A, A-P</td>
<td>Reader &amp; card</td>
<td>A-A</td>
<td>A-A</td>
</tr>
<tr>
<td><strong>Compatible with RFID</strong></td>
<td>yes</td>
<td>Can use existing infrastructure</td>
<td>no</td>
<td>No</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>low</td>
<td>Affordable for most devices</td>
<td>moderate</td>
<td>low</td>
</tr>
</tbody>
</table>
NFC enabled mobiles

Nokia 6280
K750i
Maximum Reading Range:
68mm

Motorola A925
68mm

Sony Ericsson
45mm
Eavesdropping

- RF filed characteristic of the given sender device
- Characteristic of the attacker’s antenna
- Quality of the attacker’s receiver
- Quality of the attacker’s RF signal decoder
- Setup of the location where the attack is performed
- Power sent out by the NFC device
SECURITY ASPECTS...

Data corruption

- Modification of data send by NFC
- Achieved by transmitting valid freq of the data spectrum a correct time
- No manipulation possible
ADVANTAGES OF 13.56...

Frequency band available worldwide as an ISM frequency
At this frequency transponders are very cheap and easy to manufacture.
Minimal shielding effects from adjacent objects and the human body
Damping effects of water relatively small, field penetrates dense materials
Excellent immunity to environmental noise and electrical interference
APPLICATIONS...

Touch and go
Touch and confirm
Touch and connect
Touch and explore .......

Mobile Payment

Inside Bus

At railway station

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ADVANTAGES

Availability for all applications
Lower cost (less complex, circuit size, ...)
Better performance
Low-power encryption
  ensures all sensitive data is not disclosed to unwelcome third parties
Easy to operate, simply hold closer
Both powered & non powered
FUTURE SCOPE
Uniform support for standard applications
Enable security-sensitive applications by adding
Setting up membership to networks
Managing privacy-sensitive information
CONCLUSION

Smart Touch introduces the next connected experiences
Focus on improved security and privacy
Availability of NFC enabled handsets will be critical in gaining user base
NFC can bring together information, payment and location through the medium of mobile phone
THANK YOU
QUESTIONS ???