NFC state of the union

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Agenda

- NFC status
- NCI Stack
- NFC Handover
NFC status
Near Field Communication

- A short range (< 5cm) wireless technology.
- Low throughput (< 500 kbps).
- Low cost.
- Not Bluetooth, not RFID.
- Partly standardized by the NFC Forum.
- “Tap-to-share” NDEFs.
- NFC tags and NFC devices.
The overall picture

Kernel space

User space

NFC Hardware

NFC Drivers

NFC Core

AF_NFC Sockets

NFC Netlink

neard

D-Bus API

application
NFC Frames

SHDLC | HCI
---|---
| Payload

HCI
---
| Payload

NCI
---
| Payload

Proprietary
---
| Payload
NFC Payload

- Tags

Command  NDEF

- Peer to Peer

LLCP  NDEF

LLCP  SNEP...  NDEF
Kernel Architecture

- netlink socket
- PROTO_LLCP
- PROTO_RAW
- LLCP
- AF_NFC
- NFC Core
- NCI
- HCI
- SHDLC
- pn533
- wilink
- μread
- pn544
Kernel Status

• AF_NFC and netlink
  • RAW and LLCP sockets, netlink for NFC mgmt.
• Complete p2p support.
  • SNL, connection and connection less, late binding.

• Drivers
  • Full HCI support: pn544 and microread
  • NCI almost complete: nfcwilink.
  • Cheap USB pn533 based dongles.
Userspace NFC

- Tag specific handling (R/W).
- Transport protocols on top of LLCP.
- Adapter and targets management.
- NDEF parsing.
- Handover.
- D-Bus APIs.
- Plugin based.
- GLib and libnl dependency.
# Hardware and Features Support

<table>
<thead>
<tr>
<th>Supported Hardware</th>
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</thead>
<tbody>
<tr>
<td>Linux</td>
</tr>
<tr>
<td>NXP pn544, NXP pn53x¹, TI nfcwilink, Inside Secure microread</td>
</tr>
<tr>
<td>Android</td>
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<td>NXP pn544</td>
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<tr>
<td>Inside Secure</td>
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<tr>
<td>Inside Secure microread</td>
</tr>
<tr>
<td>libnfc</td>
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<tr>
<td>NXP pn53x</td>
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<td>nfcpy</td>
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<tr>
<th>Interfaces</th>
<th>Tag R/W</th>
<th>LLCP</th>
<th>Handover</th>
<th>Card Emulation</th>
</tr>
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<tbody>
<tr>
<td>Linux</td>
<td>HCI, NCI, USB</td>
<td>Yes</td>
<td>SNEP, NPP</td>
<td>Bluetooth, WiFi</td>
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<tr>
<td>Android</td>
<td>HCI</td>
<td>Yes</td>
<td>SNEP, NPP</td>
<td>Bluetooth</td>
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<td>HCI</td>
<td>Yes</td>
<td>SNEP</td>
<td>Bluetooth, WiFi</td>
</tr>
<tr>
<td>libnfc</td>
<td>USB, UART</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>nfcpy</td>
<td>USB</td>
<td>Yes</td>
<td>SNEP</td>
<td>Bluetooth</td>
</tr>
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</table>

¹ PN532 not supported yet
Plans

• Short term
  • Secure Element and card emulation netlink API.
  • Improve MIFARE support.
  • Inside Secure microread support.

• Long term
  • Handover: Wi-Fi and Microsoft.
  • OBEX and IP over NFC.
  • Personal Health Device Communication.
  • libneard.
Questions ?

- NFC daemon
  
  http://git.kernel.org/?p=network/nfc/neard.git;a=summary

- NFC kernel
  
  http://git.kernel.org/pub/scm/linux/kernel/git/sameo/nfc-3.0.git

- Web site
  
  - https://www.01.org/linux-nfc

- Mailing list
  
  https://lists.01.org/mailman/listinfo/linux-nfc

- sameo@linux.intel.com