Transmission of IPv6 Packets over Near Field Communication

draft-ietf-6lo-nfc-08

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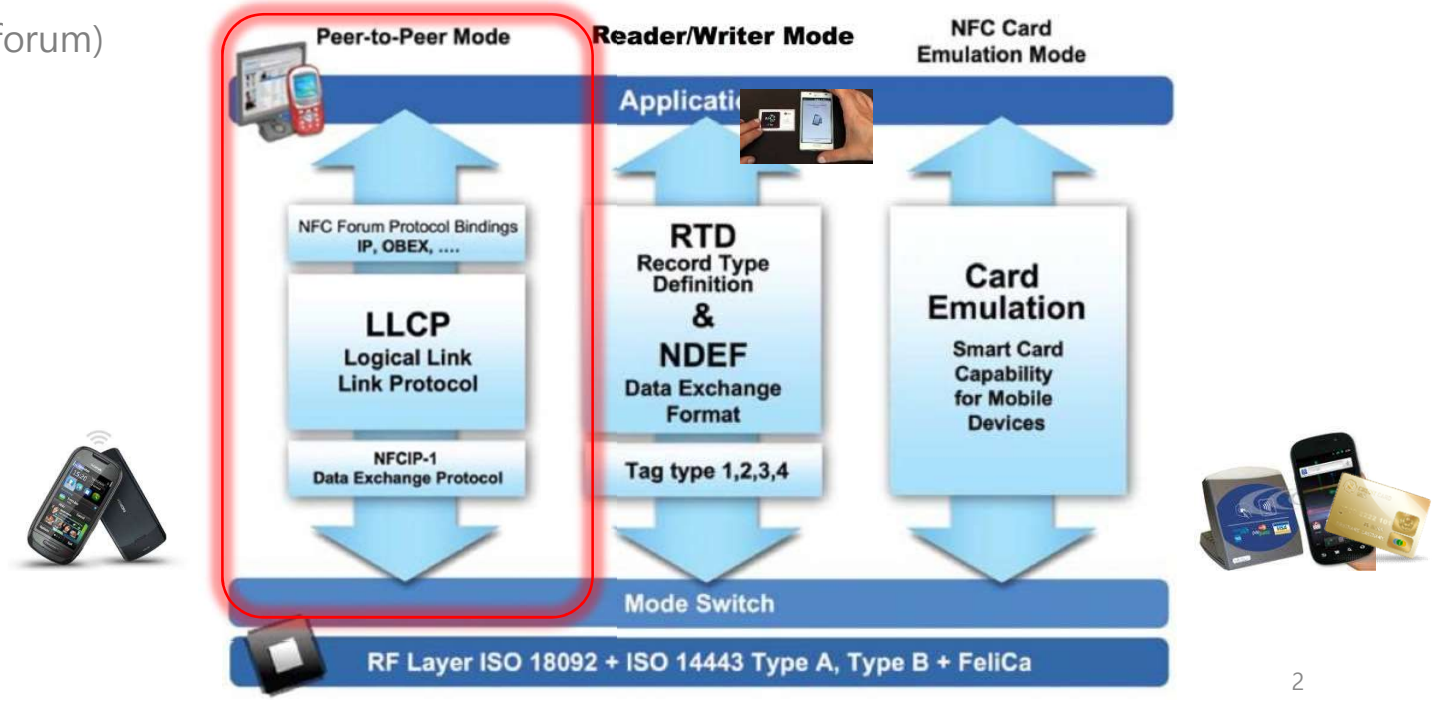
What is Near Field Communication (NFC) ?

- NFC technology enables (Source: NFC Forum)
  - simple and safe two-way interactions between electronic devices, allowing consumers to perform contactless transactions, access digital content, and connect electronic devices with a single touch.
- NFC Functions

(Source: NFC forum)



History and Status

- **WG document: draft-ietf-6lo-nfc-00** (Mar 03, 2015)
  - Update Stateless address autoconfiguration (RFC7136)
- **1st Revision: draft-ietf-6lo-nfc-01** (July 05, 2015)
  - MAC PDU size and MTU
  - SLAAC and IPv6 link local address
  - Fragmentation and Reassembly
- **2nd Revision: draft-ietf-6lo-nfc-02** (Oct. 17, 2015) @Buenos Aires, AR
  - Dispatch Header (added)
  - Header Compression (modified for GHC)
- **3rd Revision : draft-ietf-6lo-nfc-03** (Apr. 07, 2016) @Berlin, DE
  - Some typos fixed
  - Section 7. Security Considerations
- **4th Revision : draft-ietf-6lo-nfc-04** (Jul. 08, 2016)
  - NFC FAR-related sentence updated
  - Related to "multi-hop topologies"
- **5th Revision : draft-ietf-6lo-nfc-05** (Oct. 11, 2016) @Seoul, KR
  - Feedback from NFC forum
  - IID generation (feedback from Dave)
- **6th Revision : draft-ietf-6lo-nfc-06** (Mar. 7, 2017) @Chicago, US
  - IID generation (2nd rev.)
- **7th, 8th Rev. : draft-ietf-6lo-nfc-08** (Nov. 11, 2017) @Singapore, SG
  - IID generation (4th rev.) ->RFC7217
  - Neighbor Discovery -> Reworded

Updates #1/3 for the IETF100

- IID generation (feedback from James Woodyatt, Jun. 7, 2017)

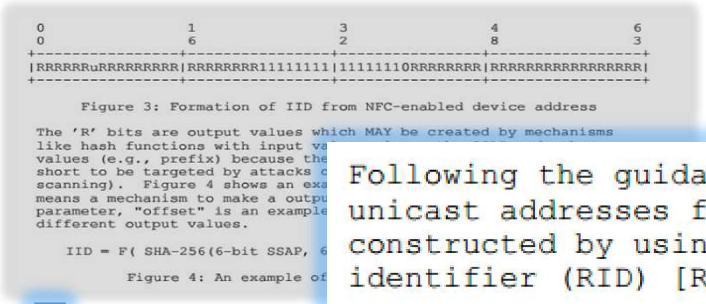


Figure 3: Formation of IID from NFC-enabled device address

The 'R' bits are output values which MAY be created by mechanisms like hash functions with input va... values (e.g., prefix) because the... short to be targeted by attacks ... scanning). Figure 4 shows an exa... means a mechanism to make a outpu... parameter, "offset" is an example... different output values.

IID = F(SHA-256(6-bit SSAP, 6...

Figure 4: An example of...

Following the guidance of [RFC7136], interface identifiers of all unicast addresses for NFC-enabled devices are 64 bits long and constructed by using the generation algorithm of random (but stable) identifier (RID) [RFC7217] (see Figure 3).

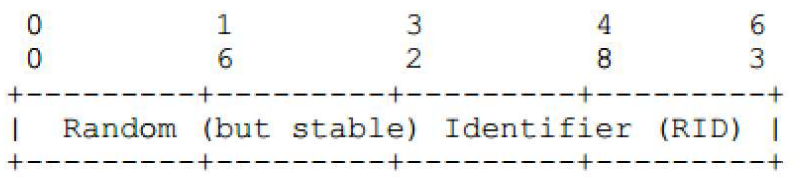


Figure 3: IID from NFC-enabled device

The RID is an output which MAY be created by the algorithm, F() with input parameters. One of the parameters is Net IFace, and NFC Link Layer address (i.e., SSAP) MAY be a source of the NetIFace parameter. The 6-bit address of SSAP of NFC is easy and short to be targeted by attacks of third party (e.g., address scanning). The F() can provide secured and stable IIDs for NFC-enabled devices.

Updates #2/3 for the IETF100

- Neighbor Discovery (Sec. 4.5)
  (feedback from Pascal Thubert, Jun. 7, 2017)

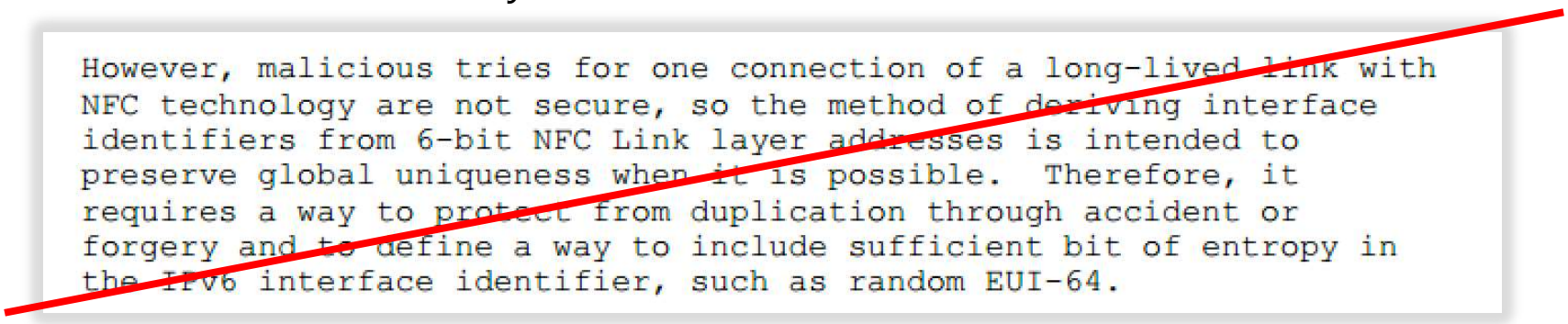
Neighbor Discovery Optimization for 6LoWPANs ([RFC6775]) describes the neighbor discovery approach in several 6LoWPAN topologies, such as mesh topology. NFC does not support a complicated mesh topology but only a simple multi-hop network topology or directly connected peer-to-peer network. Therefore, the following aspects of RFC 6775 are applicable to NFC:

o In a case that an NFC-enabled device (6LN) is directly connected to a 6LBR, an NFC 6LN MUST register its address with the 6LBR by sending a Neighbor Solicitation (NS) message with the Address Registration Option (ARO) and process the Neighbor Advertisement (NA) accordingly. In addition, if DHCPv6 is used to assign an address, Duplicate Address Detection (DAD) MAY not be required.

o In a case that two or more NFC 6LNs meet within a sigle hop range (e.g., isolated network), one of them can become a router for 6LR/6LBR. If they have the same properties, any of them can be a router. Unless they are the same (e.g., different MTU, level of remaining energy, connectivity, etc.), a performance-outstanding device can become a router.

Updates #3/3 for the IETF100

- Editorial Updates
  - References style changed: [1] -> [RFC2119]
  - Section 7. Security Considerations (feedback from Pascal)



Others (with NFC Forum)

- **Technical Review Request to NFC Forum**
  - (28/05/2015) Firstly Informed IPv6 over NFC in IETF 6lo working group
  - (09/05/2016) request for technical review of "draft-ietf-6lo-nfc"
    - Issues
      - IID generation by using NFC node ID
      - MTU extension of NFC Link Layer
    - NO liaison process between NFC Forum and IETF
  - (11/05/2016) BoD meeting (of NFC Forum)
    - discussed the review request
    - Replied: (conf-call & F2F meeting) with Technical committee
  - (15/06/2016) NFC Forum Member meeting (@Dallas)
    - Decided to accept the review request
  - (04/07/2016) request for the discussion results (by e-mail)
  - (19/08/2016) received Feedback from NFC Forum (by e-mail)
  - (12/10/2016) resolution of Feedback to NFC Forum (by e-mail)
  - **(so far) No more feedback from NFC forum**
    - after the last resolution (@IETF97)

Next Step

- History of Document Review for WGLC
  - 1st review (by Dave Thaler, Sep. 2016)
    - Editorial updates for the whole document
    - Security issue for IID generation of NFC

  → Resolved by ver. (-06) & (-07)
  - 2nd review (by James Woodyett & Pascal Thubert, Jun. 2017)
    - issue of F( ) for NFC IID generation (RFC7217)
    - ND issue

  → Resolved by ver. (-08)

- Ready for WGLC?