

Updates on NRS documents

ICNRG interim meeting in Bangkok

Jungha Hong

ETRI

Contents

- ICNRG documents (adopted after IETF102)
 - Requirements for Name Resolution Service in ICN
 - draft-irtf-icnrg-nrs-requirements-00
 - Architectural Considerations of ICN using Name Resolution Service
 - draft-irtf-icnrg-nrsarch-considerations-00
- Internet-draft
 - CCNx Extension for Name Resolution Service
 - draft-hong-icnrg-ccnx-nrs-02

Requirements for NRS in ICN

- draft-irtf-icnrg-nrs-requirements-00
- This document compose of
 - Conventions and Terminology
 - NRS in ICN
 - Motivation of NRS in ICN
 - Requirements for NRS in ICN
- New author, Ved Kafle from NICT
 - Discussed what to revise to improve the document

2. Conventions and Terminology

- Clarifying the meaning of standard terms used in the document to refer to
 - NRS components
 - e.g., consumer, producer, provider, named data object, ICN router, NRS server/node, name record, etc.
 - NRS processes
 - e.g. name resolution, name registration, name update, name deletion, etc.
- Changing to generic ICN terms from specific CCN/NDN terms

3. NRS in ICN (1/2)

- Adding a figure and related description
 - clarifies the assumed ICN scenario containing NRS as a component
 - Such figure and description would be helpful to make folks clearly understand the position and relevancy of NRS in the ICN generic scenario

3. NRS in ICN (2/2)

- Standalone name resolution vs. Name based routing approaches
 - Standalone name resolution approach :
 - name resolution is separated from the content discovery
 - Name based routing approach :
 - name resolution is integrated with the content discovery
 - This is the routing and forwarding by names as done by Internet routers by resolving IP prefix to next hop
- Suggestion: two name resolution approaches depending on who performs it
 - Consumer/end user
 - Consumers resolve names to locators and use locators in ICN request packets
 - Network or ICN routers
 - Consumers simply use the names in the content request
 - As the request traverses the network, ICN router that cannot route the packet by using the data name only can perform name resolution to obtain related locator and route the packet by using locator

4. Motivation of NRS in ICN

- Use cases of NRS are separated as subsection 4.4 in Motivation Section 4
- May change the Section 4 title from motivation to objectives and embed each use cases in proper subsections
 - To support various types of naming schemes
 - To support consumer and producer mobility
 - To keep routing system scalable and stable
 - To support off-path caching
 - To support Nameless object
 - To support Manifest

5. Requirements for NRS in ICN

- Adding more descriptions to clarify what requirements are
 - The current is not clear enough
- Will discuss more on this Section 5 for revision
 - Any comments are welcome!

Architectural Considerations of ICN using NRS (1/3)

- draft-irtf-icnrg-nrsarch-considerations-00
- Just submitted as a RG document
 - Not updated
- This document discusses architectural considerations and implications of ICN related to the usage of the NRS
- It describes that how ICN architecture changes and what implications are in the routing system when NRS is utilized in ICN

Architectural Considerations of ICN using NRS (2/3)

- In general, NRS is not mandatory in an ICN architecture
- Thus adopting a NRS would change the ICN architecture at least on
 - Procedure
 - The procedure of the name resolution has to be added
 - When added, need to consider who and how the resolution does
 - Latency
 - The additional latency of the resolution obviously occurs
 - The total latency could be minimized if the nearest copies or off-path caches can be found
 - There is a trade-off between the resolution latency and inter-domain traffic reduction
 - Security
 - authentication of NRS messages and name spaces
 - protecting NRS entities from DoS or DDoS attacks

Architectural Considerations of ICN using NRS (3/3)

- This document has been written based on a real experience in implementing a NRS system
 - Bloom filter based NRS
 - CCNx Extension for NRS
- We are looking for contributors who have implemented a NRS system
 - Will collaborate with TNO (Bastiaan) for revision

CCNx Extension for NRS

- draft-hong-icnrg-ccnx-nrs-02
- This document presents the implementation of NRS based on CCNx/CICN
 - It describes TLV-based CCNx messages for Name resolution and management
 - Also describes CCNx forwarder modification for NRS messages
- This has not been updated since last meeting
- This NRS system is distributed as a project, **CICN-NRS** on Nov. 1st, 2018 under Apache 2.0 license
 - <https://github.com/etri/cicn-nrs>

Thank you!