

Name Resolution System in ICN: Motivation

Material for discussion

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Document goals

- Provides motivation to consider NRS as a element/requirement of ICN architecture
 - Trying to get the consensus of ICNRG on appropriateness of NRS in ICN

Why we need NRS (1)

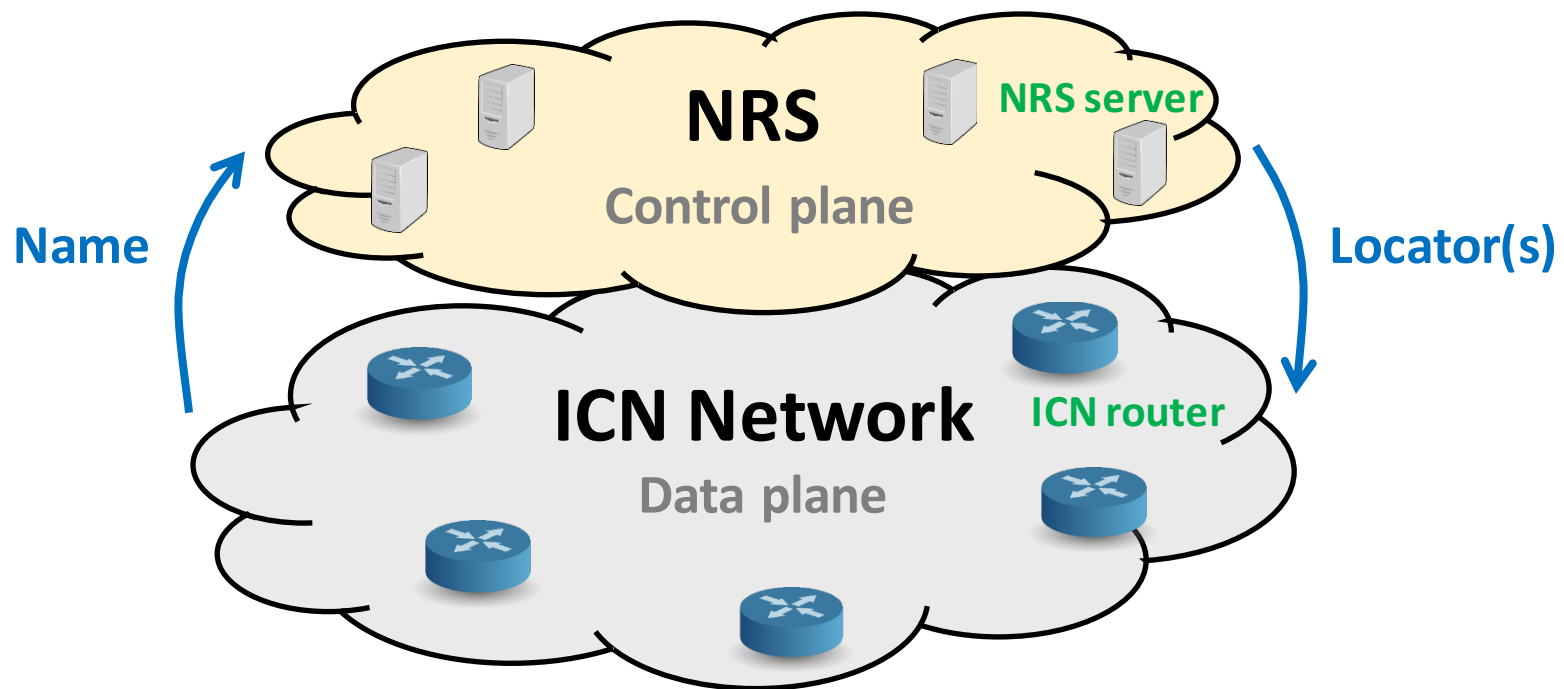
- ICN routing is to find a NDO based on its name
- Three steps of ICN routing
 - 1) Name resolution
 - Translates name of the requested NDO to its locator
 - 2) Discovery
 - Routes the request to the NDO
 - 3) Delivery
 - Routes the NDO to the requestor
- ICN routing schemes according to the combination of the above steps
 - Route by name routing (RBNR) --> 2~3 steps
 - Lookup by name routing (LBNR) --> 1~3 steps
 - Hybrid routing (HR) --> RBNR + LBNR
- NRS is required unless you choose RBNR itself
 - This is cited from draft of ICN research challenges

Why we need NRS (2)

- There are several ICN projects which use the LBNR scheme such as MobilityFirst, NetInf, etc.
- Name resolution is one of ICN challenges for IoT

How to fit into ICN architecture

- NRS will be an overlay network on top of ICN network as control plane completely separated from data plane



Use case 1: Name to locator

- Mapping name to locator is primary in LBNR
- Here, locator denotes routable information
- A name can be mapped to multiple locators due to in-network caches
- Through the mapping, mobility and multi-homing can be supported efficiently and inherently

Use case 2: Name to name

- Even in RBNR scheme, if provider changes the name to another name which is designed for aggregation by provider, resolving the initial name to the aggregated name is required [quoted from ICN Challenges]
- Example: we name this contribution as “NRS motivation”, but the IRTF (provider) may change the name to “/ietf/irtf/ICN/NRS/motivation”

Use case 3: Name to IP address

- In terms of incremental deployment, even RBNR would need a mapping between name and IP address to access the current Internet (IP network) if necessary