Deployment Considerations for ICN

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IETF-100 (Singapore), November 2017

https://tools.ietf.org/html/draft-rahman-icnrg-deployment-guidelines-04

Introduction

- The ICNRG charter identifies deployment guidelines as an important topic area for the ICN community

- Specifically, the charter states that defining concrete migration paths for ICN deployments which avoid forklift upgrades, and defining practical ICN interworking configurations with the existing Internet paradigm, are key topic areas that require further investigation

- This draft attempts to addresses this topic

Key Take-Aways (1/2)

- Classified deployment configurations into 4 meta classes:
  - Clean-slate ICN
  - ICN-as-an-Overlay
  - ICN-as-an-Underlay
  - ICN-as-a-Slice

- Summarized key trial experiences:
  - FP7 SAIL, NDN Testbed, Hybrid ICN, etc.
  - H2020 Projects (POINT, RIFE, FLAME), NDN-IoT, etc.

Key Take-Aways (2/2)

- Identified approaches for deployment migration paths for:
  - Application and Service migration
  - CDN migration
  - Edge Network migration
  - Core Network migration
- Identified deployment issues requiring further standardization (to aid in interoperability):
  - E.g. ICN mapping to HTTP exchanges, Dynamic naming, Routing interactions, etc.
- Summary
  - Synthesis of key points for an entity looking to deploy ICN technology

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Revision History

- Rev-00: Presented in IETF-98 (Chicago) and received good feedback
- Rev-01: Addressed feedback from IETF-98 (Chicago)
- Rev-02: Addressed detailed comments received from Dave Oran’s review of draft
- Rev-03: Addressed feedback received in IETF-99 (Prague)
- Rev-04: Addressed detailed comments received from Cisco’s review of draft (Prakash Suthar and two other colleagues)

Summary of Key Changes (1/4)

- Main Changes between Rev-03 and Rev-02:
  - Added reference to dual mode devices in section 4.1 (Application and Service Migration) and referenced Prakash's "Native ICN for LTE" as an example
  - Added a summary section of deployment trial experiences in new section 5.3 to draw conclusions from our analysis of the various deployments
  - Scrubbed section 6 ("further standardization") and added some more items (i.e. OAM, SFC impacts) to summary of protocol gaps Table 1 and corresponding text

Summary of Key Changes (2/4)

- Main Changes between Rev-03 and Rev-02 (continued):
  - Added references to ICN over Low Power WLAN Experiments from Thomas Schmidt, and added new section 5.2.4. (NDN IoT Trials)

  - Various editorial updates including:
    - Adding reference to ICNRG Charter in Intro
    - Clarified the differences in the island approach between "ICN-as-an-Overlay" and "ICN-as-an-Underlay"

Summary of Key Changes (3/4)

- Main Changes between Rev-04 and Rev-03:
  - Clarified that ICN can be run on many types of networks (access, transport, edge processing, CDN, core, data center, etc.) though in the main discussion text we just stuck to access network, core network and CDNs for simplicity
  - Changed “wholesale replacement” term to the more commonly used “clean-slate”, and clarified that it involves changes to existing applications, protocol stacks, etc. in addition to changes to IP routing
  - Clarified interaction between normal IP routing running in the Internet and ICN based routing in (1) ICN-as-an-Overlay, and (2) ICN-as-an-Underlay

Summary of Key Changes (4/4)

- Main Changes between Rev-04 and Rev-03 (continued):
  - Added references to ONAP.org which does MANO support for ICN-as-a-Slice
  - Added more details about Cisco's Hybrid-ICN approach, including reference to their open source Cicn project, and expected trials
  - Clarified the main stakeholders in ICN deployments (included adding end device manufacturer and user)
  - Clarified details of NDN testbed

Next Steps

- Any other ICN Deployment Trial experience that we should add to the document?

- Are we ready to adopt as WG/RG draft (now that we have had another round of reviews via several Cisco reviewers)?