

ICNRG @ IETF-103

Bangkok

Information-Centric Networking Research Group
Thursday, November 8th, 2018

Chairs' Slides

Dirk Kutscher
Börje Ohlman
Dave Oran

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ICNRG Administrativa

- IRTF RG on Information-Centric Networking
- Mailing list: icnrg@irtf.org
- Web: <http://irtf.org/icnrg>
- Wiki: <http://trac.tools.ietf.org/group/irtf/trac/wiki/icnrg>

- Chairs
 - Dirk Kutscher (Huawei)
 - Börje Ohlman (Ericsson Research)
 - Dave Oran (Network Systems Research Design)

- This meeting
 - Notes taker: Marie-Jose Montpetit **THANKS!**
 - Etherpad: <https://etherpad.tools.ietf.org/p/notes-ietf-103-icnrg>
 - Meeting
 - Materials: <https://datatracker.ietf.org/meeting/103/session/icnrg>

Agenda

- **Chairs Intro:** Agenda Bashing, Minutes taker, Bluesheets, Status
- **Benefits of the ICN Architecture in Smart Buildings** - Szymon Slupik
- **Air Quality Monitoring: an ICN use case?** - Kanchana Kanchanasut
- **ICN Management Tools**
 - **CCNinfo next steps discussion** - Hitoshi Asaeda
 - **Ping and Traceroute** - Dave Oran
- **MapMe** update - Dave Oran
- **Update on ICN-IoT draft** - Ravi Ravindran
- **ICN-Lowpan status** - Thomas C. Schmidt
- **Wrapup**

Recent Interims

- ACM ICN-2018 in Boston
 - <https://datatracker.ietf.org/meeting/interim-2018-icnrg-03/session/icnrg>
- IETF-103 (last Sunday)
 - <https://datatracker.ietf.org/meeting/interim-2018-icnrg-04/session/icnrg>

ICNRG Specs in a Nutshell

Apps (Web, RTC, AR/VR, Edge Computing),
APIs

Mobility
Support
Schemes

Name
Resolution

Extensions
(RICE etc)

Flow
Classificati
on, QoS

Management
Tools,
Telemetry

Core Protocol Specs

Underlays, Embeddings, Convergence Layers

RG Drafts -- Specs

- **Update on CCNx protocol documents -**
 - <https://datatracker.ietf.org/doc/draft-irtf-icnrg-ccnxmessages/>
 - <https://datatracker.ietf.org/doc/draft-irtf-icnrg-ccnxsemantics/>
 - Passed final IRSG poll
 - Next: IESG review and RFC editor -- waiting for IRTF Chair since July
- **File-Like ICN Collection (FLIC)**
 - <https://datatracker.ietf.org/doc/draft-irtf-icnrg-flic/>
 - Describes a bare bones "index table"-approach for organizing a set of ICN data objects into a large, File-Like ICN Collection (FLIC)
 - Somewhat orphaned due to Chris Wood's new non-ICN focus. Need people to step up if this is to move forward
 - Currently expired...

Recently Finished Drafts (1/2)

- **Research Directions for Using ICN in Disaster Scenarios**
 - <https://datatracker.ietf.org/doc/draft-irtf-icnrg-disaster/>
 - Outlines some research directions for ICN wrt applying ICN approaches for coping with natural or human-generated, large-scale disasters
 - IRSG Review in progress - one set of comments received, more expected
 - Next step is to address comments, reissue draft, then send for final IRSG Poll
 - Waiting for authors to submit revision

Recently Finished Drafts (2/2)

- **Deployment Considerations for ICN**
 - <https://datatracker.ietf.org/doc/draft-irtf-icnrg-deployment-guidelines/>
 - Provides a number of deployment considerations in the interest of helping the ICN community move forward to the next step of live deployments
 - Passed RG Last Call
 - Waiting for IRTF Chair to initiate IRSG review

Recently Adopted RG Drafts (1/2)

- **CCNinfo: Discovering Content and Network Information in Content-Centric Networks**
 - <https://datatracker.ietf.org/doc/draft-irtf-icnrg-ccninfo/>
 - Discovering topology and other properties in ICN networks
 - Relatively powerful tool (more than just traceroute)
 - Just recently adopted -- on the agenda today
- **ICN Adaptation to LowPAN Networks (ICN LoWPAN)**
 - <https://datatracker.ietf.org/doc/draft-irtf-icnrg-icnlowpan/>
 - Convergence layer for CCNx and NDN over IEEE 802.15.4 LoWPAN networks
 - New frame format to adapt CCNx/NDN packets to the small IEEE 802.15.4 MTU size with semantic and syntactic changes to TLV-based headers
 - Stateful and stateless compression
 - Version 00 submitted before meeting -- on the agenda today

Recently Adopted RG Drafts (2/2)

- **Requirements for Name Resolution Service in ICN**
 - <https://datatracker.ietf.org/doc/draft-irtf-icnrg-nrs-requirements/>
 - Discusses motivation and requirements for name resolution in ICN
 - Recently adopted, was presented on Sunday
- **Architectural Considerations of ICN using Name Resolution Service**
 - <https://datatracker.ietf.org/doc/draft-irtf-icnrg-nrsarch-considerations/>
 - Discusses architectural considerations and implications of NRS in ICN
 - Recently adopted, was presented on Sunday
 - Note: started discussion with MobilityFirst folks on Global Name Service (GNS) at September Interim

Other RG Drafts

- **ICN CCN/NDN Terminology**

- <https://datatracker.ietf.org/doc/draft-irtf-icnrg-terminology/>
- Overview of the terminology and definitions that have been used in describing concepts in CCN&NDN
- Version 01 submitted before IETF-103
- Minimal editorial updates
- Next steps?

- **Native Deployment of ICN in LTE, 4G Mobile Networks**

- <https://datatracker.ietf.org/doc/draft-irtf-icnrg-icn-lte-4g/>
- Allow ICN to be enabled natively over the current LTE stack comprising of PDCP/RLC/MAC/PHY or in a dual stack mode (along with IP) help optimize the mobile networks by leveraging the inherent benefits of ICN
- Updates on test procedures, simulation (was presented on Sunday)
- See e-mail on next steps on list

- **Design Considerations for Applying ICN to IoT**

- <https://datatracker.ietf.org/doc/draft-irtf-icnrg-icniot/>
- How IoT can leverage ICN features
- Recently updated to 02 -- presentation today

Other Drafts (1/2)

- **MAP-Me : Managing Anchorless Mobility in Content Centric Networking**
 - <https://datatracker.ietf.org/doc/draft-irtf-icnrg-mapme/>
 - an anchor-less solution to manage micro-mobility of content producers via a name-based CCN/NDN data plane, with support for latency-sensitive apps
 - Individual submission -- needs to be renamed
 - IPR declaration for Cisco patent submitted
 - Recently updated (02)
 - Will be presented today
- **ICN Ping and Traceroute**
 - <https://datatracker.ietf.org/doc/draft-mastorakis-icnrg-icnping/>
 - <https://datatracker.ietf.org/doc/draft-mastorakis-icnrg-icntraceroute/>
 - Basic testing and path discovery (simpler than CCNInfo)
 - Will talk about it later
- **Flow Classification in Information Centric Networking**
 - <https://datatracker.ietf.org/doc/draft-moiseenko-icnrg-flowclass/>
 - Encoding equivalence classes in ICN
 - Discussing consumer, producer, forwarder behavior
 - Potential basis for QoS schemes

Other Drafts (2/2)

- **Internet Protocol Tunneling over Content Centric Mobile Networks**
 - <https://datatracker.ietf.org/doc/draft-white-icnrg-ipoc/>
 - Tunneling IP over CCN
 - Providing ICN-based mobility plane to IP without current GTP
 - Version 02 submitted in June, last presented in March
 - Next steps?
- **Enabling ICN in 3GPP's 5G NextGen Core Architecture**
 - <https://datatracker.ietf.org/doc/draft-ravi-icnrg-5gc-icn/>
 - Describing 5G Core NextGen Architecture
 - Proposing extensions of user/control plane mechanisms to support ICN
 - Discussing service scenarios and use cases
- **DMS: Dynamic Inter- and Intra-Domain Mobility Support Framework for Information Centric Networking**
 - <https://datatracker.ietf.org/doc/draft-azgin-icnrg-mobility/>
 - ICN mobility framework for consumer and producer mobility
 - Network-driven mobility support

New Work (1/2)

- **Supporting QoS aware Data Delivery in Information Centric Networks**
 - <https://datatracker.ietf.org/doc/draft-anilj-icnrg-icn-qos/>
 - How to achieve QoS in ICN
 - Draft currently focused on Diffserv-based model
 - Led broader ICN QoS and to new ideas:
<https://www.ietf.org/mail-archive/web/icnrg/current/msg02619.html>
 - See material and meeting minutes from Sunday Interim
 - Thinking that this could be promising topic for future work
- **RICE: Remote Method Invocation in ICN**
 - <https://datatracker.ietf.org/doc/draft-kutscher-icnrg-rice/>
 - General purpose, ICN-idiomatic RMI protocol
 - Proposed as basis for NFN-like systems, in-network computing etc.
 - Was presented on Sunday

New Work (2/2)

- **AR/VR and ICN**

- <https://datatracker.ietf.org/doc/draft-westphal-icnrg-arvr-icn/>
- Use cases and ICN support for AR/VR
- Was presented at IETF-102

More Drafts (Datatracker)

[draft-dinh-icnrg-sdnnfvicn-00](#)

Considerations for Using SDN/NFV in ICN

[draft-hong-icnrg-ccnx-nrs-02](#)

CCNx Extension for Name Resolution Service

[draft-mendes-icnrg-dabber-01](#)

Information-centric Routing for Opportunistic Wireless Networks

[draft-wang-icnrg-icn-edge-01](#)

Consideration on Applying ICN to Edge Computing

[draft-zhang-icnrg-hn-09](#)

Uniform information with a hybrid naming (hn) scheme

Now - time for today's presentations

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Wrap-Up

- Future ICNRG meetings
 - IETF-104 in Prague: usual Sunday / regular meetings
 - Interest in Interim in January? Would need a host
- AOB?