

draft-zhang-icnrg-icniot-requirements-00.txt

- Requirements and Challenges for IoT over ICN

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Draft History

draft-zhang-iot-icn-architecture-00

draft-lindgren-icnrg-efficientiot-00

draft-zhang-iot-icn-challenges-00

...Rev -03

...Rev -02

draft-zhang-iot-icn-architecture-00

Focuses on challenges and design choices for ICN-IoT

- > IoT Requirement
- > IP-overlay issues
- > ICN-IoT suitability and Challenges
- > Scenarios & Requirements

ICN-IoT middleware discussion

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“Requirements and Challenges for IoT over ICN”

- These drafts have evolved since first presented at IETF-90

Draft Objectives

- Identify research challenges on realizing heterogeneous IoT services over ICN.
- Understand IoT requirements to achieve a unified ICN-IoT infrastructure
 - This is considering that, today these are looked in specific scenario context.
- Discuss suitability of ICN for IoT
- Discussion on scenarios, considering solutions will be information-centric, different from host-centric realizations today.

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New section
on ICN
suitability for
IoT

- Scenarios presented as a new Appendix section.
- The main text is scenario

Section 4: Advantages of using ICN for IoT

- **Naming of Devices/Data/Services**
 - IoT applications are information-centric in nature
 - ICN focus on inter-connecting Consumers, Services, Content meets IoT requirements
- **Distributed Caching and Processing**
 - Infrastructure Caching/Storages
 - Hierarchical In-Network Processing
- **De-coupling Senders from Receivers**
 - Required considering intermittent connectivity
 - Content replication via caching improves data dissemination reliability
 - Opportunistic forwarding

Section 5: Naming and Name Resolution

These two topics have been separated with some new contributions.

- **Challenges in Naming of Devices/Content/Services**

- Naming of Devices: actuator services, managing/monitoring, identifiers as part of metadata to make it searchable.
- Size of Data vs Service Names : Challenges around overhead ICN naming to the data payloads
- Hash Based Name
- Metadata-based Naming
- Flexibility/Trust/Confidentiality

...

- **Challenges related to Name resolution**

- Agility : dynamic evolution of data
- Scalability
- Deployability
- Latency

Section 5.8/5.9

Included two more ICN challenges for IoT:

- **Self-Organization**

- Challenges to realize scope based self-organization in the constrained and non-constrained IoT infrastructure
- Security implication across control and forwarding functions such as device/service discovery, naming, topology construction, routing and caching.

- **Communication Reliability**

- Key for mission critical IoT services
- Build redundancy and reliability to handle wide range of disruption such as Congestion, short or long term disconnections, last mile wireless impairments.
- Understand tradeoff between Forwarder complexity and flexibility of deployment choices, considering performance requirements.

Other Changes

- Section 5.6: Security and Privacy
 - Some more elaboration on suitability of object based security model of ICN for ICN-IoT
- Few more recent ICN-IoT work cited [59] [60]
 - For more recent work please do bring it to our notice.
- Section 6 is the Appendix for scenarios
 - For completeness and also being ICN, specific solution design choice and

Future Work

- A good starting point for an ICN-IoT RG document.
- We are proposing it for adoption
- Feedback is welcome on any aspect anytime for improving it and making it more relevant.