

Enabling ICN in 3GPP's 5GC Architecture

(draft-ravi-icnrg-5gc-icn-02)

Ravi Ravindran, Prakash Suthar, Dirk Trossen, Greg White

Ravi.Ravindran@Huawei.com

psuthar@cisco.com

Dirk.trossen@interdigital.com

Greg.white@cablelabs.com

IETF/ICNRG, July, 2018, Montreal

Draft Objectives

- **Explore opportunities of deploying ICN in 3GPP's 5GC architecture**
- **Motivations include:**
 - Flatter Architecture, related work going on in DMM too
 - Benefits from ICN enabled receiver-oriented transport, Storage/Caching, Seamless Mobility, network integrated edge computing
 - New ways to handle challenges from eMBB, MMTC and URLLC classes of application
- **Propose architectural control and user functions to enable ICN formally in 5GC**
 - Considering Network Slicing, NFV/SDN principles
- **Using the non-IP PDU for native deployment of ICN in 5G and open issues related to using this feature**
- **Use case Scenarios**
 - Smart Mobility
 - Multi-viewer VR
 - Seamless Mobility
 - Underlay for Control function

[1]Ravi Ravindran, Prakash Suthar et al, "*Deploying ICN in 3GPP's 5G NextGen Core Architecture*", IEEE, 5G World Forum, July, 2018

Draft Outline

Table of Contents

1. Introduction	2
2. Terminology	4
3. 5G NextGen Core Design Principles	5
4. 5G NextGen Core Architecture	6
5. 5GC Architecture with ICN Support	8
5.1. Control Plane Extensions	10
5.1.1. Normative Interface Extensions	12
5.2. User Plane Extensions	13
5.2.1. Normative Interface Extensions	14
5.2.2. ICN over non-IP PDU	15
6. 5G/ICN Deployment Scenarios	16
6.1. Smart Mobility	16
6.1.1. IP-MEC Scenario	17
6.1.2. ICN-MEC Scenario	18
6.1.3. IP-over-ICN MEC Scenario	18
6.2. Multi-viewer Virtual Reality	19
6.3. ICN Session Mobility	20
6.4. Cloud-native (mobile) Operator Environments	22
7. Conclusion	22
8. IANA Considerations	22
9. Security Considerations	23
10. Acknowledgments	23
11. Informative References	23
Authors' Addresses	25

Draft Updates

- New co-author Greg White
- Editorial corrections
- Section 5.2.2 : ICN over non-IP PDU
 - IPoC considerations towards non-IP PDU deployments
 - IPoC proposal follows from draft-white-icnrg-ipoc-01
 - In addition to native ICN applications, IP services can benefit from ICN too.
- Section 6: 5G/ICN Deployment Scenarios
 - ICN operation in Cloud-Native Operator Environment
 - Discusses a use case of ICN as an underlay to support control functions in 5G
 - This is in the context of IP-over-ICN architecture proposal based on IP-over-ICN architecture (Dirk Trossen et al.)

Next Steps

- A good document to capture ICN in 5GC enablement related work , flexible to adapt to other contributions related to :
 - Architecture
 - Routing, Mobility, Caching, Computing etc
 - Policy, Charging, Legal Intercepts, QoS etc.
 - Use case scenarios
- Would like to see the interest in the group to take it up as a RG item
 - Could make good case for ICN in Rel 16 and beyond.