Native Deployment of ICN in 4G/LTE Mobile Networks

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https://www.ietf.org/id/draft-irtf-icnrg-icn-lte-4g-00.txt

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Introduction

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- A holistic view of native ICN deployment in 4G and LTE mobile network
- Describes the use cases of how ICN can be deployed natively in:
  - Control plane
  - User plane (data transport)
  - User equipment (UE) using dual stack (IP/ICN) and native ICN deployment models
  - Mobile edge (MEC) network e.g. eNodeB
  - Mobile core network (EPC) gateways e.g. SGW, PGW

Summary of Draft Updates

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- The draft has now become a WG draft
  - Thanks to the chairs, all reviewers and ICN community at large for their votes
- Incorporated the review comments received from the reviewers
  - Major changes
    - Details are provided on next slide
  - Minor changes
    - New co-author: Ravishankar Ravindran
    - Paraphrasing of some of the text and updated/added new references

Important Changes

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- Added a reference to the broadcast/multicast techniques (LTE-B or eMBMS) to handle multicast delivery of pre-planned content such as live content, as compared to the on-demand content (e.g. YouTube)
- Moved from NDN to CCNx based ICN protocol and messaging (inline with ICNRG drafts on CCNx Messages TLVs and Semantics)
  - This shall be normalized after NDN/CCNx convergence efforts are complete
    - https://icnrg.github.io/draft-icnrg-harmonization/draft-icnrg-harmonization-00.txt
    - https://trac.ietf.org/trac/irtf/wiki/icnrg/convergence/meetings
- Removed the TCL (Transport Convergence Layer) from the protocol stack @PGW as there are no IP/ICN based applications running at PGW

Important Changes

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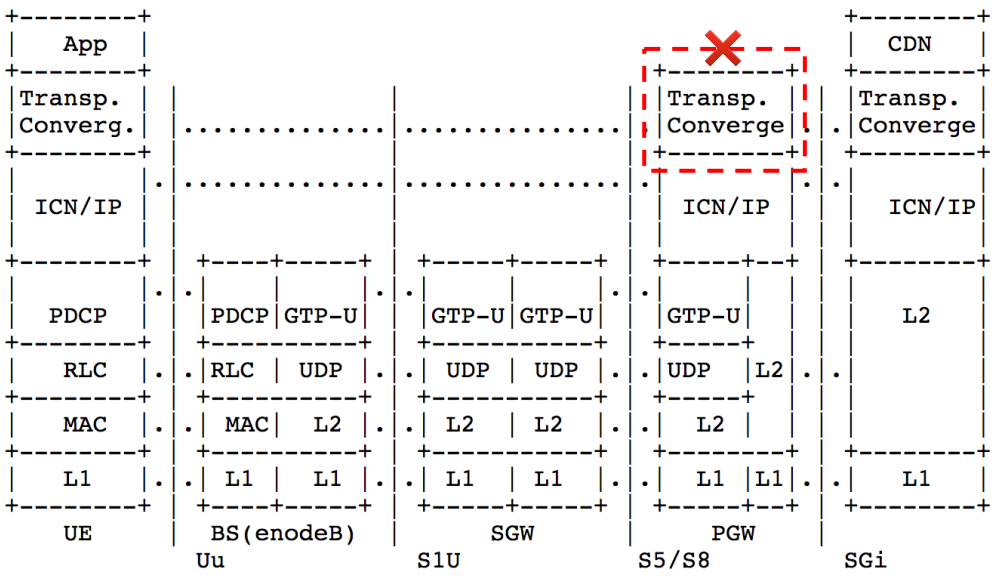
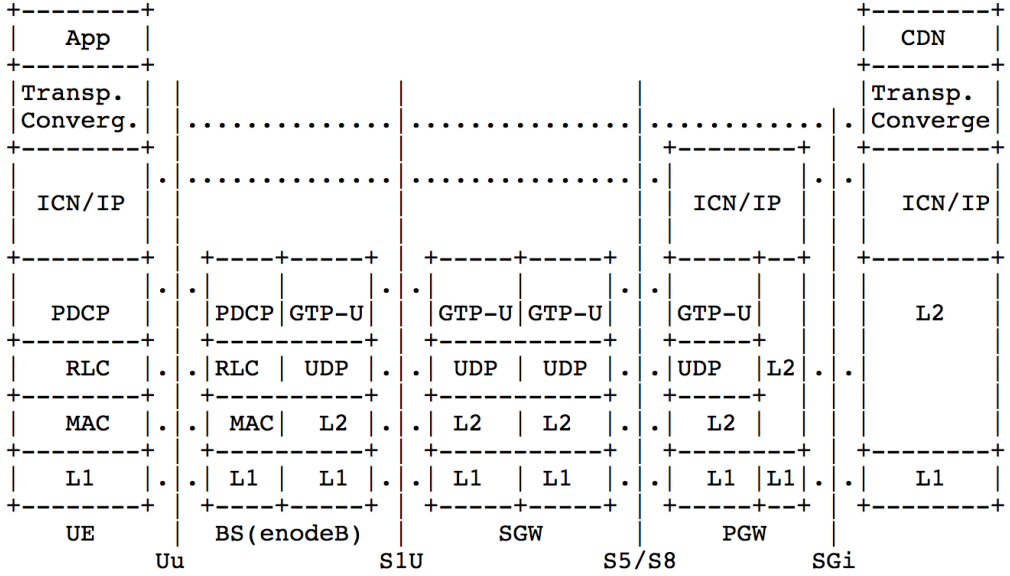


Fig. 6. Dual stack ICN Deployment in UE



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Future Plans

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- The draft proposals are currently being implemented and tested in the lab
  - Future draft versions shall have updates based on the results from the lab trials
- Areas for future draft updates and/or new experimental drafts
  - Investigate how to meet the IP QoS requirements with ICN and improvements (page 9)
  - Investigate the impact of CUPS and traffic offloading at the edge to optimize the user plane traffic path using ICN (page 13)
  - Investigate the realization of TCL (Transport Convergence Layer) (page 14)
  - Impact analysis of ICN on mobility management messages structures and flows (page 17)
  - Investigate how ICN-IP interworking gateway function would perform the conversion between ICN and IP primitives for data retrieval (page 25)
  - Investigate lawful interception, billing/mediation, network slicing, and provisioning APIs requirements (page 26)

Thank you!

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- For your continued support and valuable feedback
- We look forward to further comments and suggestions for improvements