Publish–Subscribe Deployment Option for NDN in the Constrained IoT
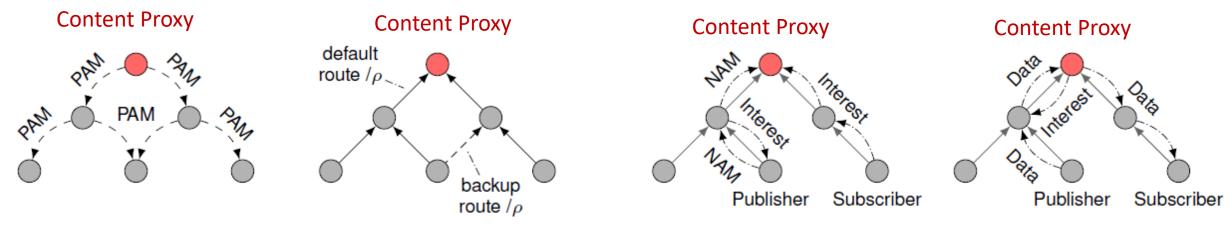
draft-gundogan-icnrg-pub-iot

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Revisiting: Publish–Subscribe for the IoT

- First presented @IETF99 in Prague 2017
- Generated a lengthy debate about an ICN control plane:
  "Do we need an ICMP for ICN?"
  - Got stuck
- Since then:

1. A name: "Hop and Pull – HoPP"
2. Fairly advanced implementation augmenting CCN-Lite on RIOT
3. Cool demos showcasing *publisher* mobility and network *resilience*
4. Extensive evaluation with strong results
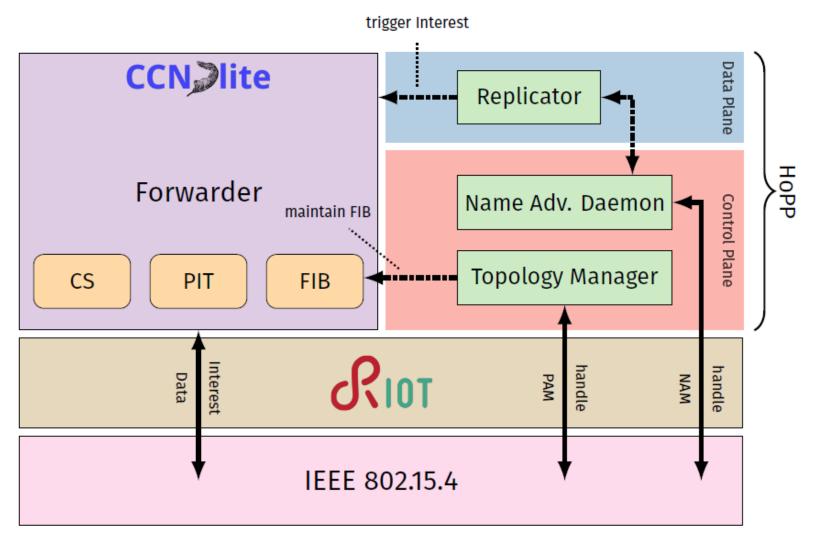
HoPP: Hop and Pull

(a) Establishing a routing DODAG by prefix advertisements

(b) Pubish and Subscribe operations

Originally two control plane messages:

- PAM – Prefix advertisement to bootstrap routing
- NAM – Name advertisement to initiate publishing

Implementation
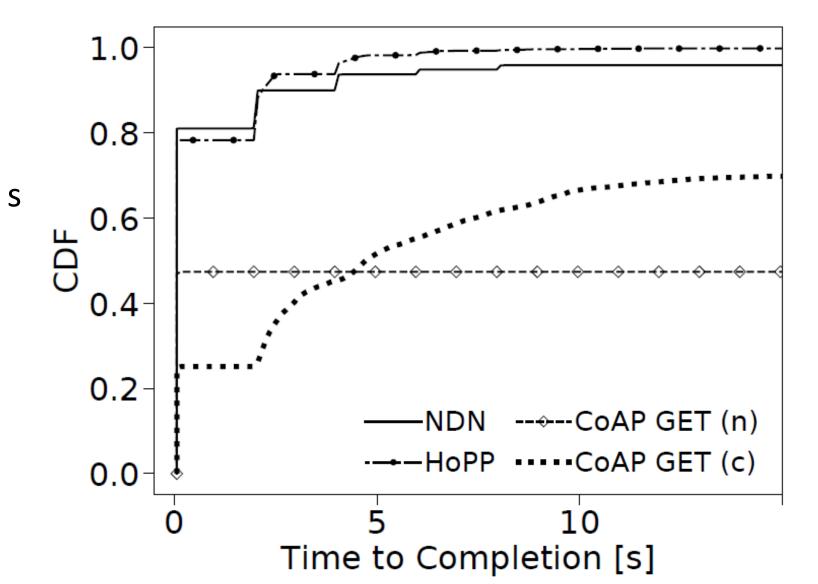
Demos

A series of exhibits demonstrated

- Seamless producer mobility

- Fast recovery from network partitioning

- Resilient M2M Communication

Evaluation Results

Multihop Network:

- 50 Nodes

- Publishing every 5 s

How to continue with that control plane?

- Bootstrapping: Route Establishment
  - Link-local broadcasts
  - Can be achieved on L2 – below ICN
- Publishing: Announcing Data Availabiltiy
  - Signaling between next-hop neighbors
  - Can be done on L2 (using MAC address mapping)
  - Can also be done on NDN: Interest – Interest – Data

- Conclusion: HoPP Likewise Works with Current NDN Primitives

Quo Vadis?

- Continue the Pub-Sub work towards an RG item?