Network Coding for Content-Centric Networking / Named Data Networking: Requirements and Challenges

draft-matsuzono-nwcrg-nwc-ccn-reqs-01

K. Matsuzono, H. Asaeda, C. Westphal

Draft history

- Document in the Network Coding Research Group (NWCRG), will be presented on Thursday
- v0 initially presented in Singapore.
- v1 updated according to feedback from presentations in ICNRG and NWCRG
- Still evolving.

Key idea

- Both NC and ICN use orthogonal methods to improve content distribution → combine them!
- Create prefix names for coded content
  - Network coding info embedded in name or header
- Use ICN to retrieve this content
- Receive encoded packets, decode, voila.
- Session-less nature of ICN well suited for ICN, can leverage multiple interfaces, can receive packets from multiple sources, etc.
- As always, devil is in the details

Requirements/Challenges

- What are the requirements:
  - Content naming
  - Transport
  - In-Network caching
  - Seamless mobility
  - Security and privacy
- What are the challenges:
  - Convolutional coding
  - Rate and Congestion control
  - Security and Privacy
  - Routing Scalability

Deltas

Table of Contents

Table of Contents

Feedback from IETF 100

- Definition of the security envelope (NC in or out)
- Coding is producer or consumer based?
  - Issue of encoding latency if consumer specifies the LC
- Clarify the “Elastic Window” case
- Add clarification to “seamless mobility” and “security” considerations
- Some placeholders from preliminary need to be filled out

Open issues

- More detailed presentation in NWCRG
  - Thursday 3/22
- Next step: what would a practical scheme look like?
- Welcome feedback and contributions