

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

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Draft history

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

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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 NWCRCG
 - Thursday 3/22
- Next step: what would a practical scheme look like?
- Welcome feedback and contributions