

Video over ICN

IETF 91

Honolulu, HI

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# Draft focus

- Video composes most of the traffic in current network
- No signs for trend to abate: any new Internet architecture need to handle video
- Questions of the draft:
  - Can current Internet mechanisms for video distribution be adapted to an ICN?
  - ~~– Should new mechanisms be designed that are native to ICN?~~

# Draft-video

- 4th version of the draft: Berlin, London, Toronto, Honolulu
- After Toronto, official WG item
- No seismic changes: same contributors, roughly same length (32 pages to 35 pages, *10,704* words to *11,782*)
- Updated to reflect discussion in IETF90
- But new organization, new abstract, modified ToC/organization, sharpened focus
  - Two new sections

# ToC Deltas...

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# Current video mechanisms

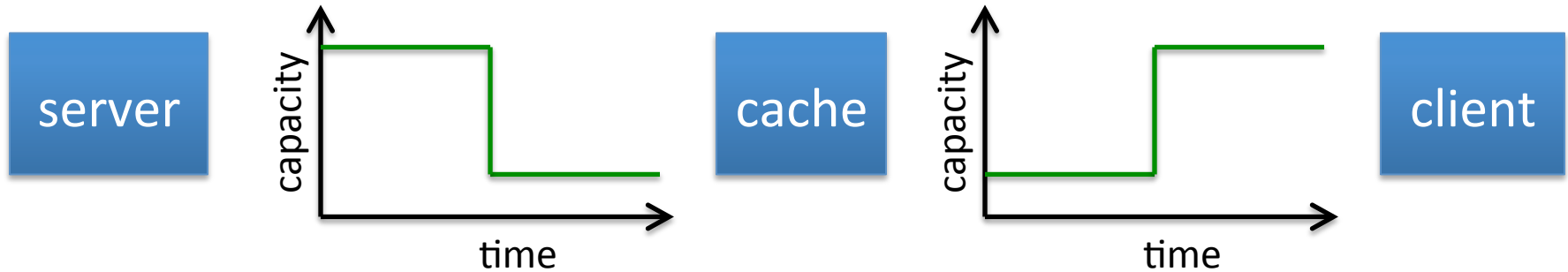
- Look at some use-cases trying to capture a range of requirements:
  - Video download
  - Netflix-like video streaming
    - Biggest share of traffic, but also simpler
    - DASH-like mechanisms exhibit similarity and complementarities with ICN architecture
  - P2P video distribution
    - Infrastructure-less scenario is one of the key selling point of ICN
    - PPSP-based ICN extensions
  - IPTV
    - Real-time delay constraints
- Other use-cases not in the draft: mentioned in research items.
  - Flash crowds/peak
  - Video-conferencing
  - (not mentioned, but discussed in Toronto: In- network DVR?)

# Expanded list of research Items

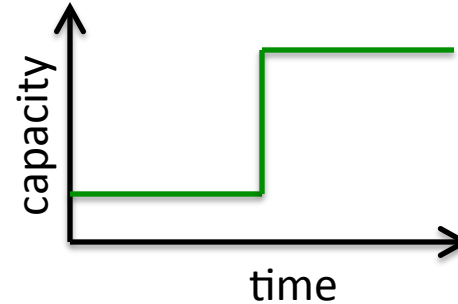
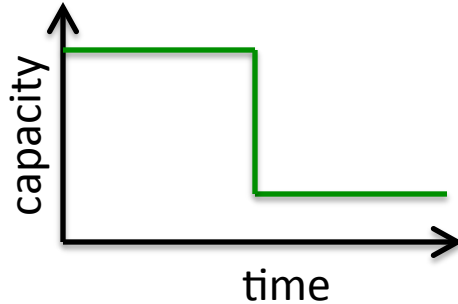
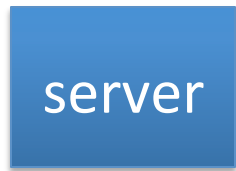
- Potentially the structure of a “ICN-specific video mechanisms” document
- Items thus far:
  - Real-time issues (video conferencing)
  - Requirements of flash crowd, local video distribution (stadium, concert, demonstration, etc...) for scalability, content discovery, content sharing
  - Store-and-forward benefits + transport issues
    - Short discussion next!
  - Heterogeneous environments
  - Network coding for video distribution in ICN
- What do you want to contribute?

# Store&Forward, Transport issues

- Caching discussed mostly to reduce bandwidth in the network by avoiding to repeat duplicate requests
- But can be used to increase network capacity for a single transmission



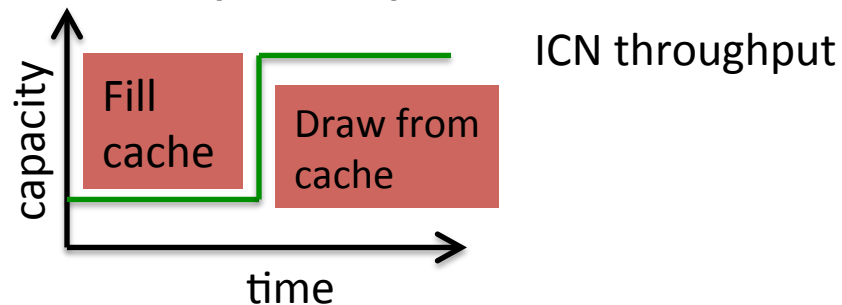
# Store&Forward



- e2e rate adaptation achieves the minimum bandwidth



- ICN-specific/cache-aware mechanisms achieves wireless bandwidth capacity





# Store&Forward

- Questions: how to adapt rate in this situation?
- What is the proper rate adaptation mechanism to avoid buffering events, rate variations while at the same time maximizing QoE for end user
- What are the mechanisms to insert cache awareness in the video stream?

# Next steps?

- Move this document to Informational RFC?
  - What would it take?
- Next document: native ICN video streaming, what would it look like?
  - How to fully leverage the abstractions of, say, CCN/NDN? What transport layer? How to use cache? New ways to do rate adaptation? Multi-source transport?
  - Draft list some research questions