Information-Centric Networking Proposed IRTF RG

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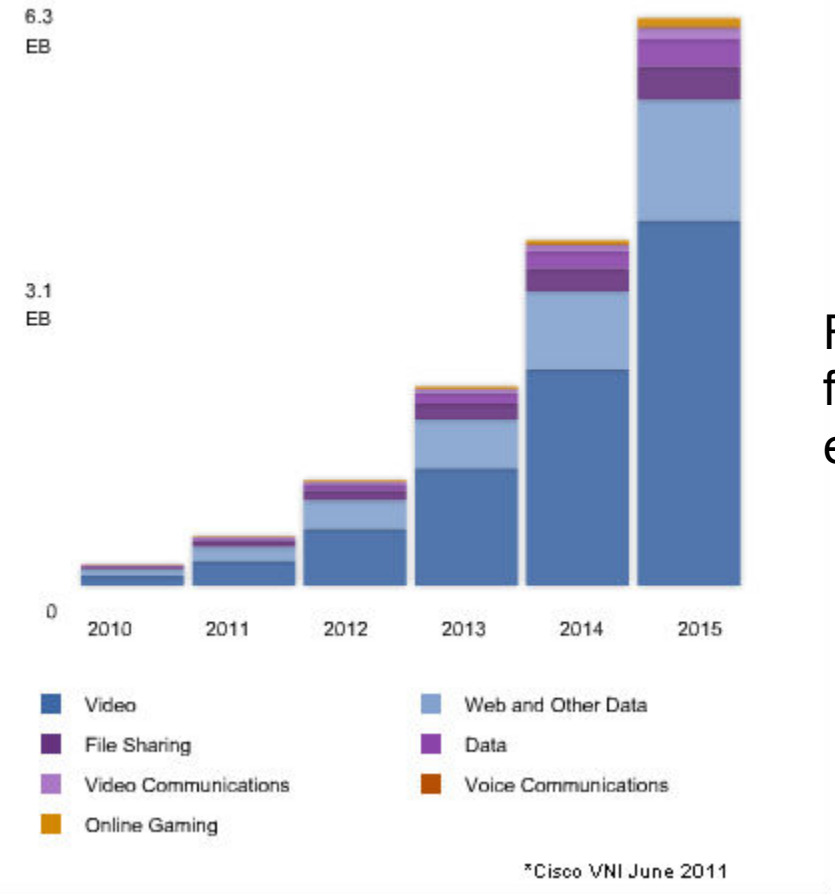
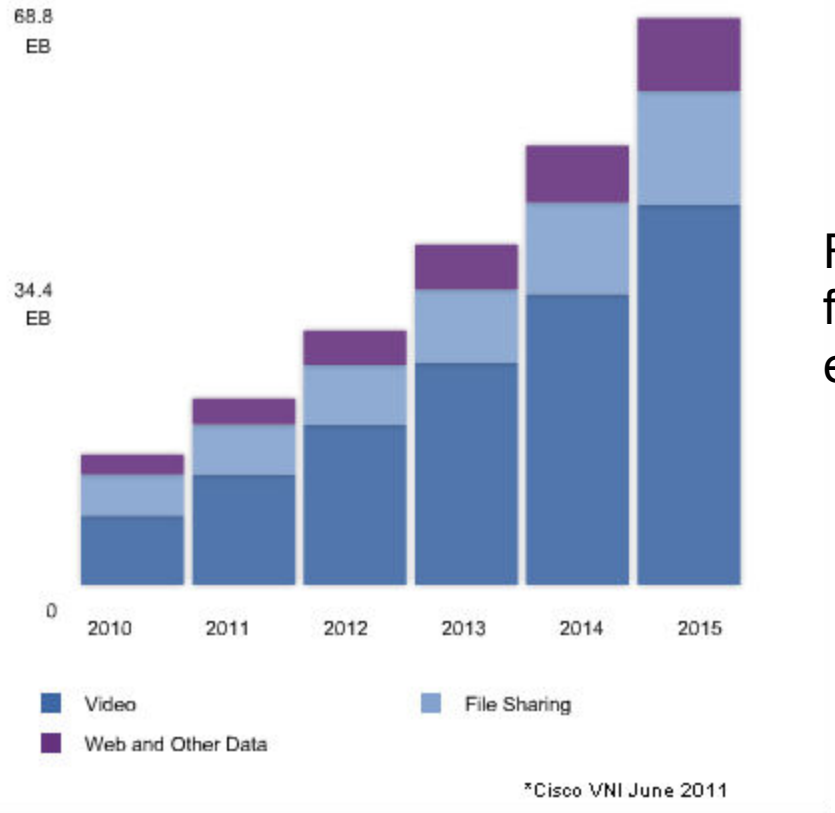
IRTF Open Meeting at IETF-81

Mobile Data Traffic Prediction



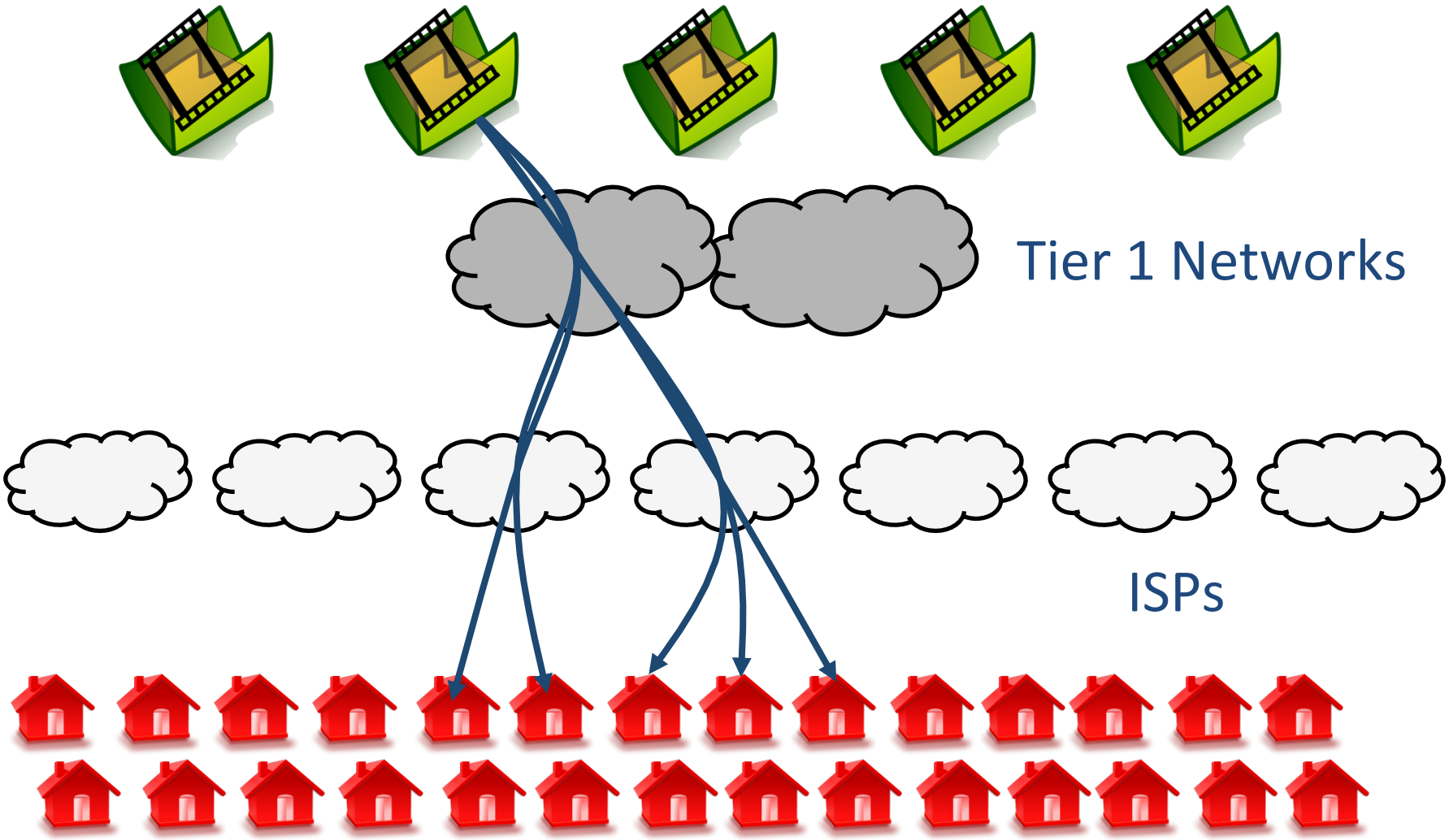
From 2010 to 2015: factor 26 increase expected

Video Data Traffic Prediction



From 2010 to 2015: factor 5 increase expected

Popular Conception:
Content Distribution Over the Internet Does Not Scale



Problems with Today's Networks

- URLs and IP addresses are overloaded with locator and identifier functionality
  - Moving information = changing it's name => 404 file not found
- No consistent way to keep track of *identical copies*
  - No consistent *representation of information* (copy-independent)
- Information dissemination is inefficient
  - Can't benefit from existing copies (e.g. local copy on client)
  - No "anycast": e.g., get "*nearest*" copy
  - Problems like *Flash-Crowd effect, Denial of Service, …*

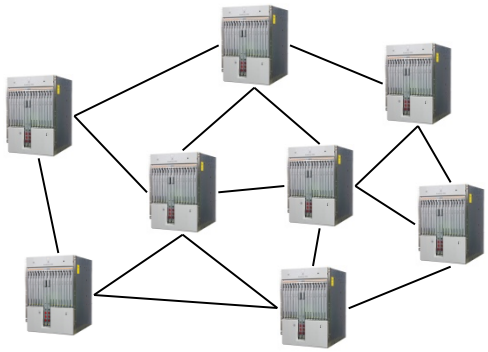
Problems with Today's Networks

- Can't trust a copy received from an untrusted node
  - Security is host-centric
  - Mainly based on *securing channels* (encryption) and *trusting servers* (authentication)
- Application and content provider independence
  - CDNs focus on web content distributions for major players
  - What about other applications and other players?

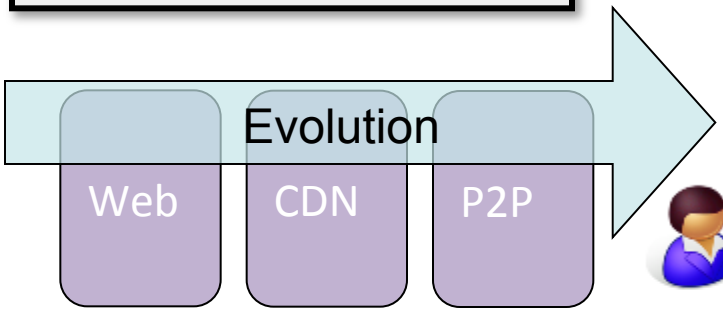
Information Centric Networking

Today's Internet

Focus on
nodes

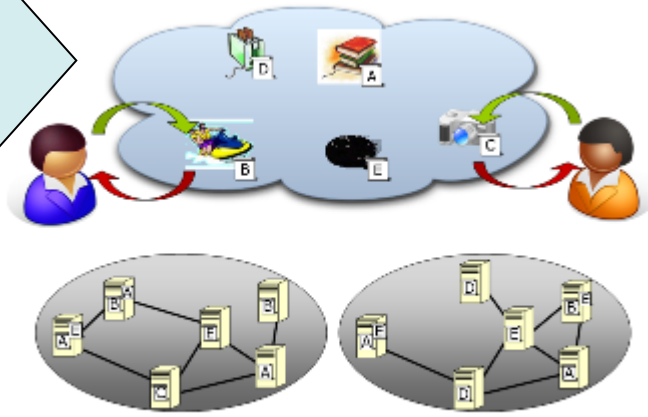


In today's Internet, accessing information is the dominating use case!



Information Centric Network

Focus on
information objects



- Considering important requirements
  - **Accessing named resources – not hosts**
  - **Scalable distribution through replication and caching**
  - **Good control of resolution/routing and access**
- With ubiquitous caching
  - But for all applications
  - And for all users and content/service providers

Why an IRTF Effort Would be Useful

- Topic seems important – quite some interest
  - Content-distribution perspective
  - Internet evolution perspective
- Quite a number of research projects
  - Beneficial to bring people together in an IRTF/IETF context
  - Internet development expertise considered important
- Related to on-going IETF efforts
  - PPSP, DECADE, CDNI
- RG for persistent activity
  - Different than typical conferences, workshops etc.

Possible Research Topics

- Naming schemes for ICN
- Scalable name resolution for flat names
- Scalable routing schemes
- Security and privacy
- Application/application-protocol design
- APIs
- Business, legal and regulatory framework
- Internet evolution / migration

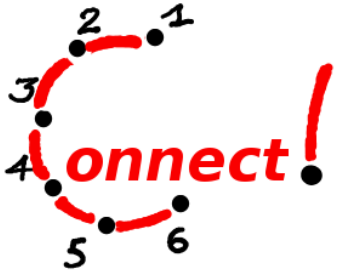
ICNRG current status

- Well attended bar meeting in Prague
- ICN-interest mailing list: 130 subscribers
- Positive feedback from all research projects in the area (that we heard from)
- Initial contacts with IRTF chairs Aaron Falk (previous) and Lars Eggert (current) – positive feedback
- The ICNRG proposal was discussed at a side meeting Tuesday in Quebec
  - Charter proposal on IRTF Wiki
- Planning group
  - Bengt Ahlgren, Stephen Farrell, Volker Hilt, Dirk Kutscher, Börje Ohlman, Jörg Ott, Martin Vigoureux, Lixia Zhang

Projects We Heard Of

Named Data Networking

http://www.named-data.net/



http://www.anr-connect.org/

http://www.fp7-pursuit.eu/

http://www.comet-project.org/

http://www.ict-convergence.eu/

http://www.sail-project.eu/

ICN Community Forming

- Dagstuhl seminar on Information-Centric Networking; Dec 2010

- SIGCOMM-2011 Workshop on Information-Centric Networking; August 2011

- IEEE Communications Magazin Special Issue on ICN
  - CfP open now
- Elsevier Computer Communications Journal 2012
  - CfP to be published
- ICN Interest Mailing List
  - https://listserv.netlab.nec.de/mailman/listinfo/icn-interest