Video-over-IP as a *Specialized Service*

William Lehr  
MIT

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An observation and a question

- **Internet Video is the major driver of infrastructure investment**
  - Cisco VNI: by 2019, *video will be 80% of Internet traffic*
  - Most of this is linear entertainment, aka “TV/Movies”
  - Most of this will be handled by CDNs
  - (Above is a forecast...)

- **Question: What if Video-over-IP were *not* Internet??**
  - Does this traffic *belong* on the Internet?
    - Do we want an Internet optimized for TV?
    - If so, is that still essential infrastructure?
  - How might Internet differ if video-over-IP is NOT part of Internet?
    - Benefits/costs of separate networks? Tech, Biz, policy implications?
    - How might we get there from here (if we wanted to...)?
Video-over-IP as a *Specialized Service*

- **Video traffic is a lot of things... but a lot of it is TV**
  - **Linear TV**: Netflix, Hulu, Xfinity, HBOGo, etc.
  - YouTube, New Media, Gaming
  - Surveillance/monitoring cameras
  - Video conferencing

- **Linear TV has well defined, distinctive characteristics**
  - Cacheable, delay tolerant
  - One-way, asymmetric traffic (HD video)
  - (inherently) multicast
  - Bundled content+conduit: Subscription, PPV, and advertising supported (“free”)
  - (Copyright protection an issues of special concern?)

- **Internet: heterogeneous, adaptive, anything-over-anything**
  - Ubiquitous Connectivity (anywhere to anywhere)
  - Two-way, symmetric (and everything else)
  - Inherently end-to-end (content under end-user control)
  - Conduit only: Subscription, MB usage tiered, content/application agnostic
Policy Convergence: legacy ➔ future; silos ➔ ?

- **Broadcast/media regulation : content (editorial)**
  - Content regulation: domestic content, porno, public programming
  - Must-carry & retransmission consent
  - Media Concentration
  - Program access, etc.
  - MVPD copyright rules (STELA)
  - First Amendment

- **Telecom (PSTN) regulation : conduit**
  - Universal service: everyone has affordable access to telephone
  - Interconnection: ubiquitous connectivity, including international (ITU)
  - Advanced Services (S706)
  - CALEA, e911, etc.

- **Broadband: Open Internet Order (OIO)**
  - BIAS : open, neutral Internet access
  - Non-BIAS (aka, Specialized Services) : ?? Unregulated ??
Benefits of separate Internet & Video-over-IP networks?

- **Technical:** separate networks share resources when efficient
  - Internet: lower average data rate, higher peak/average
  - Layer 3 isolation easier (agnostic about PHY/application layers)
  - Separate networks: multi-homing, end-user autonomy, resiliency, ...

- **Business Model:** integrators bundle silos at retail
  - Today’s triple play: separate networks for Internet, VoIP, IPTV
  - Capacity isolation ⇔ ensure min allocation resources to each

- **Regulatory:** regulating “silos” focuses scope of regulation
  - Universal service: subsidize basic infrastructure, not entertainment
  - Interconnection: IP Video interconnection regulation (if needed) better than general Internet interconnection regulation.
  - Advanced services: Optimize Internet for IoT future – smart healthcare, energy, eGovernment, *not* more ways to enjoy toys...
Some research questions...

- **How might we get there from here?**
  - How does this impact OIO? OVD review? PSTN transition?
  - Is it desirable *and* feasible to define Title II IPTV service?

- **Implications for measurement?**
  - How does performance measurement differ when Video is part of Internet traffic v. when Video is separate network (that may share resources)?
  - Implications on Video performance measurement?

- **One or multiple networks better?**
  - How does separate network for specialized services impact value of *Differentiated Services for Internet* (v. *Best effort*)?
    - *(For whom? Which is easier to evolve?)*

- **Lots more....**
Other stuff...

- **OIO Concerns about specialized services**
  - Reachability (¶47): BIAS is about general reachability. A service that is for special application not BIAS.
  - Capacity Isolation (¶ 112): Protect BIAS from “dirt road”
  - Pricing & Payment (¶114): Attempts to hide BIAS as non-BIAS
- **MVPD Review: FCC NPRM (December 2014)**
  - OVD reclassification? (Aereo...)

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