

Convergence Case Study: Voice over IP (Gillett)

This lecture draws on the themes developed in previous lectures to consider a case study of VoIP, arguably the converged Internet application that is furthest along in the marketplace and development of policy responses.

1 Questions for Discussion

- What is VoIP?
- What regulatory policies does it challenge, and why?
 - Regulatory concerns we've discussed in class already
 - Additional telecoms-related regulations
 - Developing country context¹
- What would a sensible regulatory model for VoIP look like?
 - Consider horizontal "layered" approach

2 The VoIP Challenge: Innovation

- Convergence of industries and emergence of "horizontal" applications challenges silo-oriented regulatory legacy
 - PSTN: Telephony as the network **and** the service
 - VoIP: Voice as an application and/or service layered on top of multiple networks (each with different regulatory legacies!). VoIP comes in multiple (and ever-evolving) forms. Not all forms resemble "phone calls" (e.g. talking while gaming, voice-based instant messaging, etc.)

3 Regulating VoIP: Ideals

- Fundamental regulatory issue: should "voice as an application" be regulated same as "telephony as a vertically integrated service?"
 - The easy answer:
 - Yes, if the rationale for regulation (*ideal*) applies equally in both cases (consider a future with no PSTN)
 - No, if it doesn't.
 - Issues that make real world policies more complex:
 - Regulations have to fit within statutory frameworks.
 - E.C.'s 2003 framework makes process of selective application of regulations somewhat easier than U.S. TA96 mess. However,

¹ See "Costa Rica May Criminalize VoIP," February 28, 2004
<http://www.techweb.com/wire/networking/60403862>

technical neutrality also makes it harder not to smother “nascent services” with legacy of regulatory requirements. In this sense, regulations can become a competitive tool of *Interested Parties* (in this case, incumbents).

- At the same time, inconsistent regulatory treatment across jurisdictions invites arbitrage (VoIP providers move to where it’s easiest to operate).
- Explicit discussion of First Principles makes the *ideals* easier to contest.
- Why is PSTN-style telephony regulated?
 - Economic issues discussed previously (market power/monopoly leveraging).
 - Do not generally apply to VoIP as application
 - Indeed VoIP as 3rd-party service more likely to depend on provisions that control others’ market power, such as interconnection rules
 - But also many other political and social issues that have accreted to voice over the years as telecommunications network has become central to functioning of economy. These include:
 - Lawful intercept (wiretapping; U.S. 1994 “Computer Assistance to Law Enforcement Act” CALEA). “Phone calls” only? Which “equipment” required to support (e.g. for Skype)? Role of encryption? Intercept is actually a much larger problem than just VoIP (but it can also be a convenient excuse to regulate VoIP for other unarticulated reasons, such as tax revenues).
 - August 2004: FCC responds to Dept. of Justice petition, issues NPRM on application of CALEA obligations to broadband and VoIP²
 - Tentative conclusions: broadband and VoIP subject to CALEA (now they’re telecoms???) Inconsistent with FCC’s Brand X and Vonage positions)
 - A deal with DoJ for help with Brand X *cert*?
 - Andy Oram: “*What government will do in the case of VoIP, I think, is meet formal CALEA requirements by decreeing that all phone calls pass through recognized ISP servers and that the ISPs incorporate wiretap capabilities on these servers. VoIP users will go along with using servers because of the identity, presence, and security issues mentioned earlier. They will add end-to-end encryption at the customer premise equipment, and law enforcement won’t be able to do anything except wring their hands again.*”
 - Emergency phoning: U.S. 911/E911.³ Issues:
 - Compatibility with PSTN / PSAP system

2 A good summary of this 100-page document can be found at <http://www.techlawjournal.com/topstories/2004/20040809a.asp>

3 This March 6, 2005 CNET article by Ben Charny discusses the problems of VoIP-based 911 in further detail: http://news.com.com/Bells+ringing+in+Net+phone+911/2100-7352_3-5600445.html?tag=nefd.top

- Determining caller's geographic location
- More generally - Why only voice 911? Why not 911 IM, etc.?
- Disability access (requirements for TDD = telephone relay for the deaf. What about text-based messaging? SMS, IM, email etc.)
- Common numbering scheme and phone number portability. Issues similar to mobile in terms of non-geographic correspondence.
- Reliability and service quality standards. Who would these apply to: network? Application vendor (e.g. Skype)? Service provider (e.g. Vonage)?
- U.S.: Taxation / state revenue. "Regulate VoIP because if we don't the tax revenue from phone calls goes away."
- Similar logic for cross-subsidies paid among carriers in name of "universal service."
 - What should universal service actually mean once voice becomes purely an application?
 - How to pay for underlying broadband networks?

4 Regulating VoIP: Implementation

- It has taken a while for policies to go back to the "ideals" (First Principles).
- Earliest regulatory approaches: Litmus tests. Example characteristics that have been tried:
 - U.S.: 1998 Stevens report paragraph 88: *In using the term "phone-to-phone" IP telephony, we tentatively intend to refer to services in which the provider meets the following conditions:*
 - (1) *it holds itself out as providing voice telephony or facsimile transmission service;*
 - (2) *it does not require the customer to use CPE different from that CPE necessary to place an ordinary touch-tone call (or facsimile transmission) over the public switched telephone network; [so what is Vonage?]*
 - (3) *it allows the customer to call telephone numbers assigned in accordance with the North American Numbering Plan, and associated international agreements; and*
 - (4) *it transmits customer information without net change in form or content.*
 - E.C. (1998 framework): *"voice telephony service" means a service available to the public for the commercial provision of direct transport of real-time speech via the public switched network or networks such that any user can use equipment connected to a network termination point at a fixed location to communicate with another user of equipment connected to another termination point.*
 - U.K. (Ofcom) under 2003 E.C. framework: *VoIP service should be regulated as a publicly available telephone service if any of the following conditions apply:*

- *The service is marketed as a substitute for the traditional public telephone service; or*
 - *- the service appears to the customer to be a substitute for the traditional public telephone service over which they would expect to access emergency numbers, directory enquiries etc. without difficulty; or;*
 - *- the service provides the customer's sole means of access to the traditional circuit-switched public telephone network.*
- 2004: FCC – State conflicts
 - States mostly take “functional” approach: “If it walks like a duck and quacks like a duck, then it’s a duck.”
 - Cannon: “functional” is equivalent to “technical” and “layered” approaches once we recognize that choice of “walk” and “talk” as relevant attributes is arbitrary. Why not “has feathers and webbed feet” or any other subset of characteristics?
 - FCC
 - Forbearance: “IP-enabled Services” proceeding open since February (FCC 04-28)
 - Pre-emption of states to “unregulate”
 - Pulver (Free World Dialup) Declaratory Ruling
 - Essentially a directory service. Title I information service, not telecommunications.
 - AT&T Declaratory Ruling
 - Finds access charges still apply because class 1 means users can’t tell the difference. Still a duck.
 - Vonage Memorandum Opinion & Order, pre-empting Minnesota Commission Order subjecting Vonage service to state regulation
 - Finds can’t be separated into intra-state and inter-state.
 - Applies same logic to cable-based VoIP as well.