

Before the Federal Communications Commission
Washington D.C. 20554

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In the Matter of)
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AT&T Petition to Launch a Proceeding) WC Docket No. 12-353
Concerning the TDM-to-IP Transition)
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Reply comments of Bret T. Swanson¹

The Internet is altering the communications landscape even faster than most imagined. In the last two decades, U.S. Internet and IP traffic has grown to some 20 exabytes per month from just 10 terabytes per month – a two-millionfold increase. Traffic continues to grow around 50 percent per year. In the last four and a half years, the the number of mobile app downloads has exploded, from essentially zero in early 2008 to a cumulative total of more than 70 billion today. The topology of our networks is shifting, too. Data and apps are increasingly delivered by a growing and diverse set of firms and platforms – although over a basically standardized IP base layer. At the same time, the old voice network is being used less and less every day. These dramatic changes – the *divergence* of providers, platforms, services, content, and apps, and the *convergence* on IP – suggest policy must also change to support continued investment and innovation.²

The Commission has set the goals of expanding broadband access and adoption and of transitioning from the old, limited telephone infrastructure to modern, converged, broadband IP networks. As the astonishing figures of Internet growth attest, we have already achieved

remarkable progress. Private firms have invested over \$1 trillion in broadband networks,³ and they will continue to invest many tens of billions more every year. Yet a set of our broadband investors are also required by law to keep investing in the old telephone networks that the companies, and the Commission, wish to phase out. The companies believe much of this investment is duplicative and wasteful and that it diverts capital from modern broadband. The fact is, however, that consumers and rival firms and technologies are phasing out the old telephone networks whether anyone else wishes it to happen: use of the old telephone networks is in precipitous decline. The question is whether laws and rules should deny this reality and mandate good money after bad.

The Dynamic Internet

The dynamism of the Internet ecosystem is its chief virtue. From cable TV to the cloud, from broadband to Big Data, from iPad to the App Economy – infrastructure, services, and content are delivered by an ever wider array of firms and platforms in overlapping and constantly shifting markets.

Google, Amazon, Apple, Microsoft, Facebook, and Netflix are today major Internet infrastructure companies. We used to think of them as, respectively, search, ecommerce, computer, software, social, and motion-picture-delivery firms. But today they build and operate vast data farms and fiber networks. Several build mobile devices. All are competing to be the hub – or at least *a* hub – of the consumer’s digital life. Each, however, approaches the converged digital world from a different angle and with a distinct business model.

This is possible in large part because the network – the Internet – supplies a standard infrastructure that supports multifaceted content, services, and devices.

The traditional telecom companies are of course a central factor in the digital equation. Here, too, the field is shifting. Cable disrupted telco through broadband cable modem services, but now cable is being disrupted by free content and subscription services like Netflix. Mobile is a massively successful new business, yet it is cannibalizing wireline services, with further disruptions from Skype and other IP communications apps. Mobile service providers, moreover, used to control the handset market, but today handsets have become mobile computers that wield their own substantial power with consumers. The competitive and cooperative relationships among all these companies are complex and dynamic.

The topology of the Internet looks wildly different than it did just a decade ago. As Christopher Yoo, author of *The Dynamic Internet*,⁴ reminds us, Internet access used to consist of a rather simple three-tier structure: access lines, regional ISPs, and backbone networks. A typical Internet session, say, sending an email or retrieving a webpage, would take the following route: dial-up access line (tier 3) – regional ISP (tier 2) – public Internet backbone (tier 1) – regional ISP (tier 2) – DS3 access line (tier 3).

This simple formula no longer holds. Today, many networks peer directly with each other. They do so, moreover, under a variety of business arrangements, including paid peering, paid transit, and content delivery services. Comcast or Verizon, for example, may peer directly with Facebook's massive cloud infrastructure. Netflix, using Akamai's content delivery network, may plug in directly to AT&T's or Time Warner's broadband network. Google, naturally, plugs directly into everyone's network via its geographically distributed data farms to deliver the

fastest, most reliable services (search, Gmail, maps, etc.). Network scientist Craig Labovitz was among the first to document the growing size and power of these new Internet infrastructure players.⁵ He called them “hyper giants.” Indeed, by some estimates, 80 percent of today’s network traffic bypasses what we used to think of as the public Internet.

The IP Experiment

Despite these wholesale changes, the old rules treat the incumbent telecom firms as if they are still monopoly providers. In many markets and for many services, however, these companies are no longer even dominant, let alone monopolistic. Cable MSOs are the largest residential broadband providers and are increasingly successful in serving small and medium businesses. Wireless services are replacing many wireline offerings altogether. All-IP online offerings, such as Skype and Netflix, moreover, show how access infrastructure and access service are now often decoupled from application. According to a February 13, 2013, Telegeography report, Skype now accounts for one-third of all international phone traffic.⁶ Netflix, meanwhile, may account for one-third of U.S. broadband access network traffic during peak evening hours.⁷ Rules that presume the incumbents monopolize any component of the ecosystem – network infrastructure, access service, or applications – are outdated and have become severely counterproductive.

Incumbent providers have stated that as much as half of their wireline investments are steered into the old, increasingly obsolete networks purely for regulatory reasons. The old rules thus require that tens of billions of dollars a year be spent on infrastructure we want to retire, and that we not spend it on the networks of the future.

AT&T's proposal that the FCC conduct a series of wire center trials is a novel but pragmatic suggestion. Everyone knows we need to complete the transition to modern networks and services. Yet because the old network and regulatory regime was with us for so long, there is much inertia. Resistance to change is understandable. An experiment, therefore, is a smart idea both to gather information and allow all parties to participate, weigh in, and see what a technology-and-regulatory transition might look like.

Just today, the Phoenix Center for Advanced Legal & Economic Public Policy Studies unveiled a simple model it developed to analyze the IP wire center trials.⁸ It believes the trials will deliver useful information to regulators about what an all-IP world would look like. Phoenix's analysis also shows the trials would likely point toward a regime that will yield benefits not only to the incumbents but also to consumers and competitors.

Phoenix makes a crucial point about regulatory complexity. Communications law has lots of moving parts, some dating to the Communications Act of 1934. One might say the rules are complex and interconnected just like the networks they attempt to govern. Phoenix makes a strong argument for allowing the trials to occur in an environment free of all legacy regulation. Only a fully deregulated trial – a so called “blank slate” – will allow observers to see how new all-IP markets might truly function.

A case for AT&T's proposal can be made by comparing the available alternatives. Picking and choosing which regulations remain essential for next-generation communications services may proceed in (at least) two ways. First, legacy regulations can be removed or reformed as they are found to be unnecessary or inadequate. This piecemeal approach suffers from numerous shortcomings. Regulation is like a house of cards, where the removal of one rule impacts the

adherence to and enforcement of other rules. Getting rid of one rule may lead to disaster, whereas getting rid of the same rule in addition to another may render a desirable outcome. It is not always obvious how regulations interact. Further, the observed behaviors and practices of firms, whether generally or in trials, are influenced by the regulatory constraints placed on the behaviors and practices of firms. Thus, behaviors and practices in a heavily-regulated world may not reflect the behaviors and practices in a less regulated world. Additionally, regulations that do not apply in the context of the trial, and thus draw no attention, may later place constraints on behaviors.

The second approach, as offered by AT&T, is to start with a blank slate, and in so doing permit marketplace dealings to reveal those areas where marketplace transactions break down. While we admit that this approach will be unnerving for some, the “blank slate” option allows the Commission to target its activities at genuine, observable shortfalls in unregulated marketplace dealings. In light of its narrow application to a few select trial areas, the costs of errors are minimized, but the benefits of experimentation are maximized – particularly in terms of revealing what regulations are not necessary for next-generation services offered in a competitive market.

Either approach is feasible, and both have been proposed. However, there is little need to run trials to see how legacy regulations influence decisions, since the market is already burdened with legacy regulations. What we cannot observe today is outcomes from less regulated settings. Since many believe substantial reforms are necessary, it perhaps makes more sense to take the more radical but far more informative approach, at least in very limited trials with regulatory oversight.⁹

The broadband Internet is increasingly the foundation of our economy and social fabric. It is an historic achievement. Continued success, however, will require smart policy. No, policymaking cannot move as fast as the digital economy. Policies that explicitly discourage investment in

modern infrastructure, however, cannot be permitted to remain in force. And speed is important.

Or, as we concluded in a recent Forbes.com article:

Both native apps and Web apps will be powered by increasingly sophisticated and pervasive cloud resources: storage, computation, collaboration, transactions, location services, content distribution, and remote 3D video rendering. This dependence on the cloud, moreover, will require ever increasing network coverage and speed. This means more cell towers, more small cells, more Wi-Fi, more advanced technology like LTE and MIMO, more spectrum, and more Ethernet optical fiber links connecting all these wireless and data center nodes. All of which requires more investment.

But old style phone regulations often require network operators to maintain and expand obsolete copper wires and TDM (time division multiplexing) switching technologies. This necessarily diverts capital from crucial investments in modern optical fiber and 4G wireless. Kansas City residents may not be overly inconvenienced by Google's failure to offer "phone," but a failure to keep investing in modern networks will affect all Americans. It could hamper service quality today and depress the rate of innovation in coming years.

In the last four years – essentially the brief life of the mobile app – U.S. network operators have invested around \$250 billion in broadband and wireless infrastructure. As anyone who wants yet wider and more reliable service and faster speeds will tell you, however, we need much more investment at every layer of the network. Fortunately, the FCC, at the urging of Commissioner Ajit Pai, has just launched a new task force to study the much needed final transition away from obsolete telephone regulation and toward the free, open, and unlimited era of apps. The faster this task force moves, the faster the future will arrive.¹⁰

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² For our purposes, “IP” is a generic reference. It encompasses a range of modern, interoperable technologies and protocols for transmission of information over data networks. It is not necessarily a specific reference to the TCP/IP protocol, although TCP/IP makes up the greatest portion of “IP.” Consistent with our view of a highly dynamic Internet, new technologies and protocols will come along. The “IP” reference is not intended to cement in place any particular protocol or technology.

³ Kovacs, Anna-Maria. “U.S. Broadband Deployment: The Glass is 98% Full.” FierceTelecom. August 27, 2012. <http://www.fiercetelecom.com/story/us-broadband-deployment-glass-98-full/2012-08-27>

⁴ Yoo, Christopher S. *The Dynamic Internet*. The AEI Press. Washington, D.C. 2012.

⁵ Labovitz, Craig, et al. “2009 Annual Report.” Atlas Internet Observatory. Nanog 47. 2009. http://www.nanog.org/meetings/nanog47/presentations/Monday/Labovitz_ObserveReport_N47_Mon.pdf; also see Craig Labovitz. “Internet Traffic Evolution: 2007-2011.” Global Peering Forum. April 6, 2011. http://www.monkey.org/~labovit/papers/gpf_2011.pdf

⁶ “The Bell Tolls for Telcos?” Telegeography. February 13, 2013. <http://www.telegeography.com/press/press-releases/2013/02/13/the-bell-tolls-for-telcos/index.html>

⁷ “Global Internet Phenomena.” Sandvine. November 7, 2012. http://www.sandvine.com/news/pr_detail.asp?ID=394

⁸ Ford, George S., and Lawrence W. Spiwak. “Searching for a New Regulatory Paradigm: A Comment on AT&T’s Petition for Wire Center Trials.” Phoenix Center. February 25, 2013. <http://www.phoenix-center.org/perspectives/Perspective13-01Final.pdf>

⁹ Ibid.

¹⁰ Swanson, Bret. “‘Phone’ Is Just An App; Why Regulate It?” Forbes.com. December 12, 2012. <http://www.forbes.com/sites/bretswanson/2012/12/12/phone-is-just-an-app-why-regulate-it/>