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The Evolution of Internet Service Providers from Partners to Adversaries: Tracking Shifts in Interconnection Goals and Strategies in the Internet’s Fifth Generation

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I. Introduction

In a relatively short time, key interconnection negotiations that make the Internet globally accessible have become less cooperative and more contentious. 1 At the Internet’s inception, Internet Service Providers (“ISPs”) providing essential bit switching and transmission functions largely embraced the twin goals of expanding connections and the number of users. 2 These ventures refrained from metering traffic and charging for carriage based on the assumption that traffic volumes roughly matched, or that traffic measurement was not worth the bother in light of


external funding from government grants. Most ISPs bartered network access through a process known as peering in lieu of metering traffic and billing for network use. ³

As governments removed subsidies and commercial carriers invested substantial funds to build larger and faster networks, ISPs more accurately identified carriers and customers triggering higher costs and targeted them for rates increases. Currently the issue of cost causation has become a key commercial and regulatory policy issue, because of the potential for traffic disconnections and service degradation when parties cannot agree on interconnection terms. ⁴ The Federal Communications Commission (“FCC”) and National Regulatory Agencies (“NRAs”) in other nations have responded with ex ante, common carrier regulatory safeguards designed to anticipate and prevent anticompetitive practices with emphasis on ISPs that provide retail broadband services and also negotiate and implement interconnection agreements with upstream carriers and content distributors. ⁵


⁵ See Formal Complaint of Free Press and Public Knowledge Against Comcast Corp. for Secretly Degrading Peer-to-Peer Applications, Memorandum Opinion and Order, 23 F.C.C.R. 13,028 (2008), vacated, Comcast Corp. v. FCC, 600 F.3d 642 (D.C. Cir. 2010) (FCC deemed to
A number of highly publicized traffic interconnection and compensation disputes have recently occurred among ISPs, and between them and content distributors. The most controversial clashes have involved Netflix and ventures handling its extremely large volume of downstream traffic, on one hand, and “retail ISPs,” such as Comcast and Verizon, that provide last mile delivery of broadband traffic to end users.

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6 “If you are trying to get Netflix and use Verizon’s broadband, then there is a good chance that your video performance is less than optimal. Some Verizon customers might even go as far as calling it a crappy Netflix experience. The reason: a behind-the-scenes power play between Verizon and Cogent Communications, one of the largest bandwidth providers.” Om Malik and Stacey Higginbotham, Having problems with your Netflix? You can blame Verizon, GIGAOM (June 17, 2013); available at: https://gigaom.com/2013/06/17/having-problems-with-your-netflix-you-can-blame-verizon/. See also, Dan Rayburn, Inside The Netflix/Comcast Deal and What The Media Is Getting Very Wrong, StreamingMediaBlog.com (Feb. 23, 2014); http://blog.streamingmedia.com/2014/02/media-botching-coverage-netflix-comcast-deal-getting-basics-wrong.html.

7 “From what information is public, it appears that the largest ISPs are demanding payment from networks that deliver content and services that residential broadband consumers demand. Because the large residential ISPs themselves are the ones keeping the terms of their deals secret, it is raises the question of whether they have something to hide.” Public Knowledge Raises Concerns over Netflix/Comcast Agreement, Press Release (Feb. 23, 2014); https://www.publicknowledge.org/press-release/public-knowledge-raises-concerns-over-netflixcomca; “Alexis Ohanian, startup investor and co-founder of Reddit, lashed out at U.S. broadband policy on Thursday, calling on the FCC to reclassify internet broadband as ‘the utility we all know it to be.’ Ohanian aimed special vitriol at Comcast, affecting a mafia-style voice to accuse the cable giant of ‘legal extortion’ for fiddling with Netflix speeds until the video site paid it to restore proper service.” Jeff John Roberts, Comcast “extortion” shows the need to treat broadband as a utility, Reddit’s Ohanian said, GIGAOM (Oct. 16, 2014);
These disputes evidence a substantial change in strategies and tactics among ventures operating within the Internet ecosystem. In particular, the process for negotiating network interconnection appears increasingly contentious instead of cooperative as carriers attempt to extract higher compensation. Retail ISPs appear most able and inclined to exploit possible market power as terminating monopolies particularly when negotiating with content distributors and Content Distribution Networks (“CDNs”) that provide downstream video delivery.

Most broadband subscribers in the United States have limited facilities-based carrier options, particularly for the high transmission speeds needed for delivery of full motion video


8 “In recent years, more complex arrangements have developed, as companies constantly seek to optimize performance along both financial and engineering dimensions. Some networks now pay for peering in order to guarantee performance on the terminating network. The rise of content delivery networks, which store content close to its destination using caching servers for improved performance, has also changed Internet interconnection dynamics. The environment is considerably more complex today than in the days of ‘Tier 1’ peering.” Kevin Werbach, No Dialtone: The End of the Public Switched Telephone Network, 66 FED. COMM. L.J. 203, 240 (April, 2014). Content providers and distributors can opt to negotiate directly with retail ISPs for the right to install (“co-locate”) equipment on site, or alternatively secure the services of a company, such as Akamai, to negotiate, install and maintain the equipment. Netflix has sought the direct negotiation option with ISPs. Ken Florence, Announcing the Netflix Open Connect Network, U.S. & CAN. BLOG (June 4, 2012), http://blog.netflix.com/2012/06/announcing-netflix-open-connect-network.html.

9 “At the low end of throughput, 4 Mbps and 10 Mbps, the majority of Americans have a choice of only two providers. That is what economists call a ‘duopoly’, a marketplace that is typically characterized by less than vibrant competition. But even two ‘competitors’ overstates the case. Counting the number of choices the consumer has on the day before their Internet service is installed does not measure their competitive alternatives the day after. Once consumers choose a broadband provider, they face high switching costs that include early-termination fees, and equipment rental fees. And, if those disincentives to competition weren’t enough, the media is full of stories of consumers’ struggles to get ISPs to allow them to drop service.” Tom Wheeler, Chairman, FCC, Prepared Remarks: “The Facts and Future of Broadband Competition” 4 (Sept. 4, 2014), available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-329161A1.pdf; see also National Broadband Map: How Connected Is My Community?, Nat’l Broadband Map; available at: http://www.broadbandmap.gov/.
Consumers typically subscribe to only one ISP and they may not readily change carriers even if options exist. Additionally, end users require higher transmission speeds and

“We conclude that advanced telecommunications capability is not being deployed to all Americans in a reasonable and timely fashion. We reach this conclusion for several distinct and independent reasons. First, we find that a significant number of Americans – approximately 55 million, 17 percent – lack access to service capable of originating and receiving at, respectively, 25 Mbps download and 3 Mbps upload speeds or higher – the speed we have determined best satisfies the statutory definition of advanced telecommunications capability. Not only do a significant number and percentage of Americans lack access to advanced telecommunications capability, but the deployment rate is not reasonable and timely. The overall percentage of Americans without access to 25 Mbps/3 Mbps dropped only three percentage points between 2012 and 2013, and the percentage of Americans in rural areas without such access dropped by a mere two percentage points over the same span of time. Moreover, more than half of Americans living in rural areas cannot subscribe to advanced telecommunications capability.” Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, GN Docket No. 14-126, 2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment, FCC 15-10, ¶133 (rel. Feb. 5, 2015); available at: https://www.fcc.gov/document/fcc-finds-us-broadband-deployment-not-keeping-pace-0 [hereinafter cited as FCC 2-15 Broadband Report].

“As described by numerous commenters, and detailed more thoroughly in a Commission report compiling the results of an extensive consumer survey, the costs of switching include: ‘early termination fees; the inconvenience of ordering, installation, and set-up, and associated deposits or fees; possible difficulty returning the earlier broadband provider's equipment and the cost of replacing incompatible customer-owned equipment; the risk of temporarily losing service; the risk of problems learning how to use the new service; and the possible loss of a provider-specific email address or website.’” Verizon v. FCC, 740 F.3d at 647, citing 2010 Open Internet Order, at 17924–25 ¶ 34 and FCC, Broadband Decisions: What Drives Consumers to Switch—Or Stick With—Their Broadband Internet Provider (FCC Working Paper, Dec. 2010), available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-303264A1.pdf/.

“The Commission also convincingly detailed how broadband providers’ position in the market gives them the economic power to restrict edge-provider traffic and charge for the services they furnish edge providers. Because all end users generally access the Internet through a single broadband provider, that provider functions as a “‘terminating monopolist,’ ” with power to act as a “gatekeeper” with respect to edge providers that might seek to reach its end-user subscribers.” Verizon v. FCC, 740 F.3d 623, 646 (D.C. Cir. 2014) (citing Preserving the Open Internet, GN Docket No. 09-191, WC Docket No. 07-52, Report and Order, 25 F.C.C.R. 17905, 17919 (2010)).
downloading capacity in light of growing demand for bandwidth intensive video, often by multiple users at the same location.  

Under current marketplace conditions, Retail ISPs have raised rates and segmented service into different tiers of transmission speed and downloading capacity. Additionally they have imposed surcharges on upstream CDNs and other carriers. Exploiting superior bargaining leverage has translated into a number of new interconnection and compensation arrangements that deviate from both traditional telecommunications and Internet carriage models.  

This paper will examine new models for the carriage of Internet traffic with an eye toward providing insights on how the interconnection process has changed and what positive and negative consequences have resulted. The paper will explain how some types of price and quality of service discrimination benefits and harms consumers. The paper also identifies instances where migration from traditional interconnection arrangements can reduce some of the benefits accruing from network externalities. This paper concludes that NRAs should permit ISPs to negotiate new commercial arrangements, such as paid peering, so long as the parties can demonstrate that both content providers and end users do not incur the absolute necessity to pay higher prices to secure adequate, uncongested service.

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12 “The average household includes 2.58 people, and the average family household includes as many as 4.3 people. Household members may use one or more broadband services, from multiple devices, simultaneously; and there is some evidence that the average household has seven Internet-connected devices. The sheer number and wide array of broadband-capable devices in American households suggest that they are often used simultaneously.” FCC 2015 Broadband Report at ¶38 (citations omitted).

II. Five Generations of Internet Development

In quick succession, the Internet has evolved from a non-commercial, subsidized medium to a commercial ecosystem where ISPs incur ever increasing infrastructure costs to accommodate growing supply and demand for bandwidth. ISPs previously could avoid having to meter traffic and identify supply-push and demand-pull growth in capacity requirements as governments directly underwrote investment in new facilities for switching and routing traffic. Now ISPs have no source of subsidies and thereby have to recoup substantial infrastructure investments from content creators and distributors as well as consumers.

Much of the growth in the supply of bandwidth intensive content comes from Over the Top ("OTT") applications, particularly ones that offer video content, or provide a cheaper alternative to incumbent services such as voice telephony and text messaging. OTT applications, 14

14 “Over-the-top VoIP [and other] services require the end user to obtain broadband transmission from a third-party provider, and providers of over-the-top [services] can vary in terms of the extent to which they rely on their own facilities.” Preserving the Open Internet, 25 F.C.C.R. 17,905, 17,916 n.48 (2010), aff’d in part, vacated and remanded in part sub nom. Verizon v. FCC, 740 F.3d 623 (D.C. Cir. 2014), on remand, Protecting and Promoting the Open Internet, 79 Fed. Reg. 37,448 (Jul. 1, 2014). In the United States, OTT operators do not need to secure the consent of Internet Service Providers (“ISPs”) for carriage of their content. However, ISPs pay close attention to the volume of traffic generated by OTT operators, particularly ventures offering bandwidth intensive video content such as Netflix. ISPs have demanded additional compensation for their efforts to ensure congestion-free carriage of Netflix content. See Shalini Ramachandran, Netflix to Pay Comcast for Smoother Streaming, WALL ST. J. (Feb. 23, 2014), available at: http://online.wsj.com/news/articles/SB10001424052702304834704579401071892041790. ISP involvement with OTT ventures primarily occurs in the negotiation and execution of agreements to promote congestion-free delivery of video content.
such as Internet Protocol Television ("IPTV"), voice over the Internet Protocol ("VoIP"), video teleconferencing and Internet-based texting ride “on top” of an already functioning broadband link. OTT content and services represent an increasingly significant portion of all broadband traffic and arguably have the greatest impact on many consumers’ decisions whether

15 IPTV offers consumers with broadband connection options to download video files or view (streaming) video content on an immediate “real time” basis. Sky Angel U.S., LLC, 25 F.C.C.R. 3879, 3879 (2010). Some of the available content duplicates what cable television subscribers receive, therein triggering disputes over whether cable operators can secure exclusive distribution agreements and prevent an IPTV service provider from distributing the same content. “Sky Angel has been providing its subscribers with certain Discovery networks for approximately two and a half years, including the Discovery Channel, Animal Planet, Discovery Kids Channel, Planet Green, and the Military Channel. Sky Angel submits that these channels are a significant part of its service offering.” Id. at 3879-80 (footnote omitted). For background on IPTV, see generally, In-Sung Yoo, Comment, The Regulatory Classification of Internet Protocol Television: How the Federal Communications Commission Should Abstain from Cable Service Regulation and Promote Broadband Deployment, 18 COMMLAW CONSPECTUS 199 (2009).

16 “The Internet developed initially as an academic curiosity, based on a commitment to the ‘end-to-end principle.’ This principle requires that all Internet traffic, whether an email, a Voice over Internet Protocol (VoIP) ‘call’ or a video stream, be treated equally and managed through ‘best efforts’ connections. In such a network, data packets pass from one router to another without the prioritization of any particular packets. In practice, this means that Internet traffic reaches its destination at varying times, depending on the traffic levels of the relevant Internet communications links.” Philip J. Weiser, The Next Frontier for Network Neutrality, 60 ADMIN. L. REV. 273, 277-78 (2008).

to subscribe to a broadband service and what tier of transmission speed and monthly capacity allotment to purchase.  

Set out below is a brief summary of the four generations of Internet development that precede the current one driven by growth in OTT video supply and demand:

1) **Incubation**—government administration, first through the United States Defense Department and later through the United States National Science Foundation and universities and research institutes throughout the world (1980s-1995);  

2) **Privatization**—governments eliminate financial subsidies obligating contractors to assess whether and how to operate commercially (1995-1998);  

3) **Commercialization**—private networks proliferate as do ventures creating software applications and content that traverse the Internet. The “dotcom boom” triggers irrational, excessive investment and overcapacity (1998-2001); and  

4) **Diversification**—after the dotcom bust and market re-entrenchment, Internet survivors and market entrants expand the array of available services and ISPs offer diversified terms, conditions and rates, including price and quality of service discrimination needed by “mission critical” traffic having high bandwidth requirements, e.g., full motion video content.  

A. **Generation 1: Incubation**  

Until 1995, the United States government through the Defense Department and later the National Science Foundation (“NSF”), underwrote development and maintenance of the core Internet backbone (NSFnet). National governments in other parts of the world pursued similar

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network projects. The Internet began as specialized, closed networks between specific operators and users. Governments incubated what became the Internet through financial subsidies and by being the first major, “anchor tenant” of newly created networks.

Government stewardship helped expedite the research and development of the technologies and the uniform operating standards needed to achieve broadly accessible and interconnected networking. The engineering necessary to support self-healing, redundant and reliable networks for the military and other government users also supported seamless connectivity among the many different networks operating throughout the world using different vintages of equipment manufactured by many different companies.

After incubating the Internet as a medium for traffic associated with research and education, NSF concluded that it could abandon its public financing and a commercial, privatized Internet could evolve. NSF’s 1993 public solicitation document \(^{19}\) anticipated a privatized Internet with a structure much like what we have today: a hierarchy of many small ISPs serving localities and regions, fewer inter-regional, Tier-2 ISPs and even fewer Tier-1 ISPs serving entire nations with the highest capacity backbone networks.

At the outset of Internet development, government contractors engineered national networks accessible primarily by government, academic and research users. With few operators, generally having the same characteristics in terms of user population, bandwidth, traffic switching capabilities, network management staffing and geographical reach, the parties could agree to simple interconnection and access arrangements. The intelligence behind Internet

\(^{19}\) National Science Foundation, Solicitation for Network Access Point Manager, Routing Arbiter, Regional Network Providers, and Very High Speed Backbone Network Services Provider for NSFNET and NREN Program (May 6, 1993); available at: http://www.intercom.co.cr/internet/research/1993/0506.htm.
network routing sought to achieve efficiency and the ability to route around outages and congestion. Because all the ISPs in this phase had roughly the same characteristics and traffic volumes, their routing assignments generated approximately the same financial burdens.

Internet access in this first phase sought primarily to achieve better geographical reach and more users with little regard to the cost of access and who caused an ISP to incur such costs. This promotional phase emphasized the accrual of positive networking externalities so much so that the parties did not seek to monitor traffic flows. Because few ISPs existed, each having the same characteristics, and operating with government funding, the parties saw little benefit and significant cost in negotiating interconnection agreements that required carriers to meter traffic.

In this first promotional phase all participating ISPs agreed to network “peering” meaning that they would provide reciprocal access to each other’s subscribers in a free exchange of traffic that would take place at a few shared, “public” Network Access Points (“NAPs”). The few

20 A positive network externality exists when the cost incurred by a user of the Internet does not fully reflect the benefit derived with the addition of new users and points of communications. See John Farrell & Garth Saloner, Standardization, Compatibility and Innovation, 16 RAND J. OF ECON. 70 (1985); Michael L. Katz. & Carl Shapiro, Network Externalities, Competition and Compatibility, 75 Am. Econ. Rev. 424 (1985). See also Mark A. Lemley & David McGowan, Legal Implications of Network Economic Effects, 86 CAL. L. REV. 479 (1998).

ISPs operating at this time agreed to receive traffic from the other ISPs for onward delivery to the final intended destination, or to another ISP in exchange for the same traffic acceptance and delivery commitment from the other ISPs. This barter interconnection commitment triggered no exchange of funds based on the “rough justice” expectation that an ISP would deliver roughly the same amount of traffic generated by other ISPs that it handed off for delivery by those ISPs. 22 In the vernacular of telecommunications carriers this arrangement constituted a “bill and keep” and “sender keep all” arrangement, 23 because each ISP retained all revenues it generated.


22 “Most . . . peering relationships have been historically ‘settlement free’ because they benefit both parties and because traffic demands were symmetrical.” Dirk Grunwald, The Internet Ecosystem: The Potential for Discrimination, 63 FED. COMM. L.J. 411, 427 (March 2011).

23 “In a bill-and-keep or sender-keeps-all arrangement, each carrier bills its own customers for the origination of traffic and does not pay the other carrier for terminating this traffic. In a settlement arrangement, on the other hand, the carrier on which the traffic originates pays the other carrier to terminate the traffic. If traffic flow between the two networks is balanced, the net settlement that each pays is zero, and therefore a bill-and-keep arrangement may be preferred because the networks do not have to incur costs to measure and track traffic or to develop billing systems. As an example, the Telecommunications Act of 1996 allows for incumbent local exchange carriers to exchange traffic with competitors using a bill-and-keep arrangement.” Michael Kende, The Digital Handshake: Connecting Internet Backbones, 11 COMLCON 45, n.60 (2003) (citing 47 U.S.C. §252 (d)(2)(B)(i) (2000)). “The sharing of traffic over the interconnected networks forming the Internet on a statistical and un-metered ‘settlements’ (or ‘bill & keep’) basis was a hallmark of early federal agency involvement in the development of the Internet. This system of traffic carriage free of charge became known as ‘peering.’” Barbara Esbin, INTERNET OVER CABLE: DEFINING THE FUTURE IN TERMS OF THE PAST 20 (F.C.C., O.P.P. Working Paper No. 30, 1998); available at 1998 WL 567433.
from subscriptions for traffic carriage regardless of whether it solely provided the transmission, or whether it handed off the traffic for carriage by other ISPs.

B. Generation 2: Privatization

NSF’s glide path to privatization largely succeeded with former contractors migrating to positions of owning and operating backbone networks and NAPs. MCI, whose assets Verizon now holds, won the solicitation to take over the very high speed backbone network that previously had served NSF-sponsored research institutions including Cornell University, supercomputer centers in Pittsburgh and San Diego and several government facilities. MCI upgraded its Asynchronous Transfer Mode network from OC-3 (155 megabits per second) to OC-12 (622 megabits per second).

The NSF privatization solicitation also created four private NAPs in Chicago, operated by the Ameritech Bell Operating Company, now owned by AT&T, and Bellcore, the former research arm of AT&T before its acquisition by Southwestern Bell Telephone Company, spun-off to the divested Bell Operating Companies, metropolitan New York/Philadelphia, operated by Sprint and the San Diego Supercomputer Center and San Francisco, operated by the Bell Operating Company Pacific Telesis, now owned by AT&T, and BellCore, the research and development arm of the local telephone companies spun off from AT&T in 1984, and Washington, D.C., operated by Metropolitan Fiber Systems, a networking firm subsequently acquired by MCI.

With the privatization of the Internet, a hierarchical industrial structure developed. At the top of the pyramid stood a handful of Tier-1 ISPs whose network size, customer base and operational success qualified them for the direct and cost-free exchange of traffic. While peering used to predominate as the primary mode of the NSF network interconnection, the
commercialization of the Internet created opportunities for market entry by more ISPs and new incentives for all ISPs to charge what the market would bear for network access. The composition of ISPs expanded and diversified in terms of available bandwidth, geographical reach, subscribership, types of available content, etc.

In light of this diversification and proliferation of ISPs, universal peering became unsustainable. ISPs not having sufficient size and importance, became customers of network access provided by the Tier-1 and other ISPs. This meant that smaller ISPs had to pay the larger Tier-1 ISPs for the privilege of accessing the Tier-1 ISP’s customers and network connections. The term transit—also borrowed from the telecommunications vernacular—refers to a negotiated business relationship whereby one ISP sells access to its customers, its network and its access to other ISP networks it has negotiated.

Clearly no ISP beneficiary of cost-free peering appreciated the demoted status of having to pay for access as a customer and reseller. Yet this demotion appeared to occur on the basis of sound business judgment made by individual Tier-1 ISPs and not on the basis of collusion or concerted refusals to deal. ISPs in Asia-Pacific and Africa bore the greatest financial burden in having to self-provision lines to and from NAPs in North America and Europe as well as the obligation to pay for transit. But smaller ISPs everywhere incurred a similar, albeit less expensive burden as well. ISPs in North America generated less telecommunications expense in reaching a Tier-1 ISPs NAP, or Point of Presence, in light of the proliferation of such facilities and their close proximity to most Tier-1 ISPs. ISPs located in more remote areas had to procure at their expense the complete link to Tier-1 ISP facilities, even though once installed these two-way links provided Tier-1 ISPs with a cost-free pathway to the smaller remotely located ISP and its subscribers.
ISPs in remotely located regions objected to having to provide typically well financed Tier-1 ISPs a “free ride” for the delivery of traffic from the Tier-1 ISPs. Certainly from a telecommunications service orientation it appeared that the remotely located ISP underwrote the full cost of “return” traffic in light of the bi-directional nature of telecommunications links instead of having to pay half of such cost. However, in the context of Internet service the free ride attribution breaks down. First, the Internet seamlessly combines telecommunications bit transport conduit function with access to content. Particularly at the time of Phase Two in the Internet’s development, ISP subscribers could access most of the content available via the Internet for nothing more than the cost of their ISP subscription. Put another way when an ISP pays another larger ISP for transit services, the smaller ISP acquires access to the larger ISP’s subscribers and the content available from these customers as well as the customers of other ISPs with which the larger ISP peers, or pays for transit. Smaller ISPs had to pay for access to and from larger ISPs in North America and Europe, but the smaller ISPs could then acquire and deliver content that their subscribers sought. Much of the most desired content resided on servers located in North America and Europe meaning that remote ISPs had to secure access to be able to deliver the content their subscribers expected to access.

Internet transit access arrangements also do not match the limited geographical scope of a telecommunications transit arrangements. In telecommunications service, transit arrangements typically secure an indirect link for a carrier in one location, primarily because this carrier might not have sufficient traffic volume to secure a direct link. In Internet service, transit arrangements typically provide access to a vast array of networks certainly not limited to one country, or carrier. In its most expansive role one Internet transit payment arrangement with one major Tier-1 ISP can provide a small, remote ISP with access to the Rest of the World, because the Tier-1
ISP has secured ubiquitous access and therefore can offer (advertise in the Internet vernacular) an extensive list of routing opportunities.

C. Generation 3: Commercialization

The “irrational exuberance” of the dotcom bubble stimulated a gold rush mentality among investors keen on finding “ground floor” stock ownership opportunities. Undocumented and belatedly refuted claims that the Internet doubled in size on a monthly basis encouraged risk taking based on the assumption that a rising tide would raise all ships, i.e., that anyone investing at the onset of the Information Revolution would reap ample returns. Investors sank several hundred billion dollars in incumbent and new telecommunications and ISP networks. The resulting glut in local and long haul transmission capacity had the impact of creating substantial downward pressure on Internet transport cost and precluding any pricing discipline by Tier-1 ISPs individually, or even collectively had they attempted to collude. Similarly, even before the dotcom implosion, several Tier-1 ISPs experienced financial distress, but the infusion of more of investment helped create new aspiring Tier-1 and Tier-2 operators.

D. Generation 4: Diversification

The popping of the dotcom bubble triggered substantial losses in the Internet marketplace and a relatively short period of irrational pessimism. The post dot com bubble environment appears to emphasize a shorter transition to profitability, but substantial funds continue to be invested in business plans requiring the use of Internet connections. With less tolerance for financial losses, investors expect to see a realistic timetable for profitability. Throughout the Internet ecosystem ventures have a greater appreciation for cost control and the need to turn cash flow positive quickly.
ICE ventures in this fourth phase have to pay close attention to costs. This means that the carriers providing traffic delivery services will closely monitor traffic flows and have little patience for instances where a traffic partner has executed a peering agreement, but either generates comparatively more downstream traffic, or lacks the network capacity upstream to route traffic it receives from a peer. While relatively few in number, perhaps because ISPs generally use Non Disclosure Agreements to shroud peering terms and disputes, the onset of peering disputes create incentives for a partner quickly to force a renegotiation of terms, possibly leading to conversion from zero cost peering to a transit payment when a traffic imbalance arises.

Greater vigilance of traffic volumes and the proliferation of Internet-mediated services also has created incentives for ISPs to diversify the nature, type, terms and conditions for network interconnection beyond the peering/transiting dichotomy. While NDAs obscure which ISP has agreed to what terms new traffic routing and interconnection arrangements the diversification of services carried via the Internet has prompted ISPs to expand the types of interconnection arrangements. For example, the growing market for access to full motion, video

24 The “norms [for a blend of FCC and industry self-regulation of the Internet] might include requirements to provide some level of transparency over the terms of treating a counterpart as a peer deserving of settlement-free interconnection as opposed to a customer required to pay for transit.” Philip J. Weiser, The Future of Internet Regulation, 43 U.C. DAVIS L. REV. 529, 576 (Dec. 2009); see also, Frank Pasquale, Beyond Innovation and Competition: The Need for Qualified Transparency in Internet Intermediaries, 104 N.W. U.L. REV. 105 (Winter, 2010).

content delivered on an instantaneous, “real time basis” has stimulated the creation of a new type of service provider called Content Delivery Network (“CDN”) that offers guaranteed “better than best efforts” routing of traffic. 26 Because many CDNs concentrate on the downstream delivery of traffic, they may have the volume that would stimulate interest in a peering arrangement, but not necessarily the networks capable of handling a commensurate upstream flow.

Ongoing need to upgrade infrastructure to handle increasingly bandwidth intensive applications, creates a powerful financial incentive for ISPs to change the terms and conditions for service both upstream and downstream. Many ISPs initially offered retail subscribers an “all you can eat” unmetered service plan based on the correct perception that all but early adopters would need financial inducements to “test drive” the Internet. Now that the Internet marketplace has evolved, many ISPs see unmetered service as conferring an unnecessary windfall on high volume users to the detriment of the carrier and low volume users. ISPs perceive Network Neutrality initiatives as foreclosing necessary pricing flexibility.

E. The Internet’s Fifth Generation

The Internet’s most current evolution combines the widespread diffusion of broadband infrastructure with growing consumer interest in accessing video content anytime, anywhere, via any device and in any transmission and presentation format. Consumers increasingly consider OTT applications as functional equivalents to incumbent media. In growing numbers, they

26 “Today, much Web content is not delivered to the ultimate recipient directly from the Web server belonging to the original creator, but via a content delivery network (CDN)-a collection of servers that cache the content and deliver it on demand.” David D. Clark and Marjory S. Blumenthal, The End-To-End Argument and Application Design: The Role of Trust, 63 FED. COMM. L.J. 357, 364-65 (March 2011).
consider reducing or eliminating incumbent media subscriptions, because new OTT options offer
greater value, lower prices, more flexibility and accessibility from more than one device.

Cord cutting refers to the decision by incumbent media consumers to abandon their
monthly subscriptions. The term cord shaving refers to the decision by subscribers to reduce the
number and price of content options by migrating to a lower-priced tier, or bundle of channels.
Young and price sensitive consumers have begun to consider Internet-delivered video options as
a partial or complete alternative to traditional broadcast, satellite and wireline content delivery.
Such widespread interest in new content delivery options evidences dissatisfaction with
traditional media display models that tie content to a particular time, channel and sequence of
access, a process commonly referred to as “appointment television.” 27

Increasingly consumers expect content availability anytime, anywhere, via any device
and in any presentation format. Consumers have little alliance to any specific distribution
technology, and expect to have “on demand” access. They want to have access to all content via
television sets, personal computer terminals, smartphone screens and tablets. Additionally they
are pleased when content providers, such as Netflix, opt to make an entire season’s worth of
episodes in lieu of the traditional model that distributes one episodes in a weekly sequence.
More broadly, incumbent media may have less ability to ration content access in a series of
access “windows” based on consumers’ willingness to pay.

Content providers have begun to experiment with alternative distribution options that
eliminate intermediaries such as local broadcast stations, DBS operators and cable television

27 “A secular trend toward narrowcasting has intensified on the web, as more individuals
forsake appointment television for the ‘long tail’ of online content.” Frank Pasquale, Beyond
Innovation and Competition: The Need for Qualified Transparency in Internet Intermediaries,
providers. One alternative involves the use of new, Internet-based intermediaries, such as Hulu, Amazon and YouTube. Another option eliminates the intermediary so that content providers directly serve end users. Netflix, HBO and professional sport leagues, such as Major League Baseball provide examples of this model.

Content providers move cautiously and incrementally, because they have concerns about the potential for piracy and do not want to replace an existing intermediary model with a less profitable direct access option. It appears increasingly likely that content producers will have to offer direct access models in light of growing consumer dissatisfaction with the status quo, particular the lack of options for an ala carte access to a specific network or program instead of the conventional packaging a programming tiers or bundles containing many different content sources, many of which consumers have no interest in watching.

Old media ventures have resisted consumer demand for alternatives based on real concerns that they may lose audiences, revenues and sole source intermediary status. Some ventures, particularly cable television operators, have offered to expand content access in terms of time and device, provided consumers retain their subscription with the intermediary. So called television everywhere options provides a solution to consumers’ antipathy toward appointment television, but it maintains the intermediary model and the packaging of content in expensive tiers containing dozens of channels.

In the near term content intermediaries will confront growing subscriber resistance to the tiered content access and ala carte, or smaller tiered service will become available. Recently Dish network, a DBS operator packaged a “skinny bundle” of fewer channels for access via the Internet. 28 Verizon, a major diversified telecommunications and Internet company has offered its

video programming subscribers the option of acquiring smaller and more narrowly tailored, service tiers of video content. 29

III. Increasing Disputes over Interconnection and Compensation Terms

The Internet increasingly becomes a functional equivalent to old media with emphasis on providing more convenient and mobile access to video content. 30 In light of the bandwidth intensive nature of video content delivery, retail ISPs have demanded additional compensation from upstream content providers and distributors, as well as downstream end users.

Retail ISPs operate in what economists call a double-sided market, 31 because on one side, upstream content providers and distributors need ISPs to deliver content to end users, and on the


31 “Platform businesses compete in “multi-sided markets.” For example, video game console companies such as Sony, Nintendo, and Microsoft compete for game developers and users, while payment card companies such as American Express, MasterCard, and Visa compete for merchants and cardholders. Platform businesses must deal with interdependent demand when devising pricing, production, and investment strategies. These strategies can be quite different from non-platform businesses that do not serve mutually dependent customer groups. The optimal price on a particular side of the market, whether measured socially or privately, does not follow marginal cost on that side of the market. Many platform businesses charge one side little or nothing; for example, most operating system vendors collect scant revenue from software developers who use their intellectual property. In many cases, the joint provision of a good that services multiple groups of customers makes the assignment of costs to any one side arbitrary . . .” David S. Evans, The Antitrust Economics of Multi-Sided Platform Markets, 20 YALE J. ON REG. 325, 328 (Summer, 2003). See also, David S. Evans, Governing Bad Behavior By Users of Multi-Sided Platforms, 27 BERKELEY TECH. L.J. 1201 (Fall, 2012);
other side, downstream retail broadband subscribers need access to the Internet cloud. Put another way, retail ISPs provide an essential and not easily replaced platform or interface for access to high value, “must see” video content.

ISPs control a platform through which a variety of content, applications and content traverse. ISPs can use flexibility to determine how best to recoup investment costs, possibly erecting subsidies that enhance consumer welfare by facilitating access to free or low cost services. On the other hand, such flexibility can provide ISPs with the ability to price access in ways that favor ISPs ventures and affiliates. Because Internet service involves multiple ventures providing different services in the link from content source to end user, an NRA or court might have great difficulty in detecting and sanctioning an ISP that had used techniques that tilt the competitive playing field in favor of an affiliate, or a venture agreeing to pay a surcharge for preferred treatment.

A. The FCC’s Latest Attempt to Prevent Harmful OTT Content Discrimination

The FCC initially classified OTT carriage of non-voice content as an information service largely free of regulation. In a very controversial decision, the Commission reclassified


broadband Internet access as a telecommunications service subject to a streamlined common carrier regulatory regime. 33 For ventures that produce or acquire content, while also operating the network used to deliver it to consumers, a confusing blend of regulatory safeguards apply to promote neutral carriage and an open Internet for competing content. The FCC emphasizes common carrier regulation on ISPs providing the first and last broadband link to the Internet cloud. However, the Commission extends this classification to ISPs serving as intermediaries between content providers and downstream ISPs providing first and last kilometer service.

Unlike some other NRAs, the FCC assumes that network operators, providing carriage of content, will operate biased, non-neutral networks with the ability to affect the quality of service and other key factors relating to how the content arrives:

[B]roadband providers have both the incentive and the ability to act as gatekeepers standing between edge providers and consumers. As gatekeepers, they can block access altogether; they can target competitors, including competitors to their own video services; and they can extract unfair tolls. 34

The FCC has decided to mandate network neutrality largely based on the assumption that network operators will get “involved” in the distribution of content and not operate as neutral conduits. The Commission has concluded that absent significant government oversight, ISPs will operate biased networks that harm competitors and consumers.

33 The FCC currently requires that telecommunications service providers comply with the requirements established in Title II of the Communications Act of 1934, as amended, 47 U.S.C. § 201-276 (2014). These regulations impose common carriage duties including the obligation to provide service on a nondiscriminatory basis.

34 2015 Open Internet Order at ¶ 20.
In contrast to a largely unconditional commitment not to regulate Internet content, the FCC imposes common carrier regulation on ISPs. The FCC believes that absent government oversight, an ISP would act on its incentive and ability to favor corporate affiliates and ventures agreeing to pay for traffic prioritization. The FCC worries that absent common carrier regulation ISPs would bifurcate the Internet into fast lanes, providing “better than best efforts” traffic carriage at a premium price and slow lanes providing “best efforts” service prone to congestion and quality of service degradation.

The FCC emphasizes the need for regulation of ISPs that provide deliver content to end users. Broadband subscribers typically retain the services of only one “last mile ISP” for access from and to the Internet cloud. Additionally few consumers in the U.S. have access to a robustly competitive market for broadband service making it more likely that any Retail ISP can operate in a discriminatory manner without loss of customers and revenues.

The FCC has constructed a regulatory regime designed to ensure open access to the Internet by requiring ISPs to operate as neutral conduits. This network neutrality, or open Internet policy, requires ISPs to refrain from using techniques that would block lawful traffic, deliberately slow (“throttle”) traffic streams even in the absence of network congestion and offer paid prioritization of traffic. Network neutrality regulation seeks to prevent ISPs from creating artificial congestion as justification for network management that interferes with traffic streams to achieve anticompetitive goals.

The FCC emphasized the need for narrowly crafted rules designed to “prevent specific practices we know are harmful to Internet openness—blocking, throttling, and paid prioritization—as well as a strong standard of conduct designed to prevent the deployment of
new [anticompetitive] practices that would harm Internet openness.”

The Commission emphasized that ISPs have both the incentive and ability to leverage access in ways that can thwart the virtuous cycle of innovation and investment in the Internet ecosystem.

The FCC emphasized that while subjecting ISPs to Title II, common carrier oversight, the Commission will use its statutory authority quite narrowly as evidenced by the decision to forbear from applying “27 provisions of Title II of the Communications Act, and over 700 Commission rules and regulations.” The Commission recognized the need to explain how the new requirements satisfy pressing needs, but in the most narrow and well calibrated matter in light of virulent opposition from most ISPs and the two Republican Commissioners. The Order reports that “there will be fewer sections of Title II applied than have been applied to

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35 Id. at ¶ 4.

36 47 U.S.C § 160(a) authorizes the FCC to streamline the scope of its Title II oversight by forbearing from applying many common carrier requirements: “[T]he Commission shall forbear from applying any regulation or any provision of this chapter to a telecommunications carrier or telecommunications service, or class of telecommunications carriers or telecommunications services, in any or some of its or their geographic markets, if the Commission determines that—(1) enforcement of such regulation or provision is not necessary to ensure that the charges, practices, classifications, or regulations by, for, or in connection with that telecommunications carrier or telecommunications service are just and reasonable and are not unjustly or unreasonably discriminatory; (2) enforcement of such regulation or provision is not necessary for the protection of consumers; and (3) forbearance from applying such provision or regulation is consistent with the public interest.”

37 Id. at ¶ 5. The major provisions of Title II that the Order will apply are: nondiscrimination and no unjust and unreasonable practices under Sections 201 and 202; authority to investigate complaints and resolve disputes under section 208 and related enforcement provisions, specifically sections 206, 207, 209, 216 and 217; protection of consumer privacy under Section 222; fair access to poles and conduits under Section 224, protection of people with disabilities under Sections 225 and 255; and providing universal funding for broadband service, but not the requirement to collect contributions to such funding through partial application of Section 254.
Commercial Mobile Radio Service (CMRS), [the regulatory classification for wireless voice telecommunications service] where Congress expressly required the application of Sections 201, 202, and 208, and permitted the Commission to forbear from others. In fact, Title II has never been applied in such a focused way.”

In addition to the specific prohibitions on blocking, throttling and paid prioritization, the FCC established a general prohibition on ISP practices that would unreasonably interfere with, or disadvantage downstream consumers and upstream edge providers of content, applications and services. The Commission will consider on a case-by-case basis whether an ISP has engaged in a practice “that unreasonably interfere[s] with or unreasonably disadvantage[s] the ability of consumers to reach the Internet content, services, and applications of their choosing or of edge providers to access consumers using the Internet.” The Commission opted to apply more open-ended evaluative than legal standard prohibiting commercially unreasonable practices it had proposed in the 2014 Open Internet NPRM. The Commission concluded that it should “adopt a governing standard that looks to whether consumers or edge providers face unreasonable interference or unreasonable disadvantages, and makes clear that the standard is not limited to whether a practice is agreeable to commercial parties.”

38. Id. at ¶ 38.

39. Id. at ¶ 135.

40. Id. at ¶ 150. The FCC identified a number of factors it will consider in future evaluations. These include an assessment whether a practice allows end-user control and is consistent with promoting consumer choice, its competitive effect, whether consumers and opportunities for free expression are promoted or harmed, the effect on innovation, investment, or broadband deployment, whether the practice hiders the ability of end users or edge providers to use broadband access to communicate with each other and whether a practice conforms to best practices and technical standards adopted by open, broadly representative, and independent Internet engineering, governance initiatives, or standards-setting organization. Id. at ¶¶ 139-145.
The FCC reported that it will use the “no-unreasonable interference/disadvantage” standard to evaluate controversial subjects including the lawfulness of “sponsored data” arrangements where an ISP accepts advertiser payment in exchange for an agreement not to meter and debit the downstream traffic delivery. The Commission also will use this standard to consider the lawfulness of data caps that tier service by the amount of permissible downloading volume. In both instances, the FCC sees the potential for an ISP to create artificial scarcity to extract higher revenues, to favor corporate affiliates and third parties willing to pay a surcharge as well as the potential for disadvantaging competitors, e.g., using data caps to harm new vendors of video programming that compete with an ISP service. On the other hand, the

The Order expresses the view that reclassifying Internet access as a telecommunications service provides the strongest legal foundation for the Open Internet regulations, coupled with a secondary reference to Section 706 of the Telecommunications Act of 1996 and Title III, which addresses the use of radio spectrum and applies common carriage regulation to wireless voice carriers. 41 By using the stronger Title II foundation, the FCC asserts that it can establish clear and unconditional statutory authority, but also use the flexibility contained in Title II to forbear from applying most common carrier requirements not relevant to modern broadband service just as occurs for wireless telephone service. However, with a Title II regulatory foundation, the

41 “We ground the open Internet rules we adopt today in multiple sources of legal authority—section 706, Title II, and Title III of the Communications Act. We marshal all of these sources of authority toward a common statutorily-supported goal: to protect and promote Internet openness as platform for competition, free expression and innovation; a driver of economic growth; and an engine of the virtuous cycle of broadband deployment.

We therefore invoke multiple, complementary sources of legal authority. As a number of parties point out, our authority under section 706 is not mutually exclusive with our authority under Titles II and III of the Act.” Id. at ¶¶ 273-74.
Order makes it possible for the FCC to create an open Internet conduct standard that ISPs cannot harm consumers or edge providers with enforcement tools available to sanction violations.  

The Commission’s decision to treat aspects of Internet access as common carriage certainly will trigger a third judicial appeal and review whether such reclassification constitutes a reasonable decision based on a complete evidentiary record. By opting for the reclassification option, the FCC underscores the riskiness in imposing ex ante regulation without an explicit legislative mandate.

IV. Conclusions and Recommendations

The FCC’s 2015 Open Internet Order does not impose a comprehensive regulatory regime over interconnection and compensation agreements executed between retail ISPs and upstream ventures. The FCC articulates a wait and see approach rather than anticipate the need to intervene in disputes. The Commission wisely defers to commercial incentives that support connectivity that would provide consumers with congestion-free access to OTT content.

However, the FCC and other NRAs may not avoid having to intervene when parties cannot reach timely settlement of disputes. Regulatory agencies should use a complaint resolution process to resolve disputes with emphasis on expediting a solution rather than applying service definitions that trigger different regulatory status and burdens. NRAs should permit ventures to negotiate compensation arrangements that enhance quality of service and

42 With an eye toward providing timely, certain and flexible enforcement of its open Internet rules, the FCC announced its intention to use advisory opinions similar to those issued by the Department of Justice’s Antitrust Division. “Advisory opinions will enable companies to seek guidance on the propriety of certain open Internet practices before implementing them, enabling them to be proactive about compliance and avoid enforcement actions later. The Commission may use advisory opinions to explain how it will evaluate certain types of behavior and the factors that will be considered in determining whether open Internet violations have occurred. Because these opinions will be publicly available, we believe that they will reduce the number of disputes by providing guidance to the industry.” Id. at ¶ 229.
provide better than best efforts switching and routing of must see video content. Consumers expect to receive such content on a seamless and congestion free basis. Indeed they pay significant subscription fees based on the assumption that Netflix and other video content will arrive without degradation or delay.

While NRAs should permit ISPs to negotiate and secure surcharges for traffic prioritization, advocates for such arrangements should bear the burden of proving that they will not intentionally degrade service to ventures opting not to pay a premium. ISPs should not have the opportunity to create artificial congestion as a way to nudge or shove consumers and content providers to premium services. Additionally ISPs should bear the burden of proving that they will offer premium service arrangements to any venture regardless of affiliation.

NRAs should use dispute resolution procedures to ensure that ISPs operate in a transparent manner when offering alternatives to conventional best efforts routing. They should ensure that ISPs continue to offer basic services that should suffice for most ventures. ISPs should not have the ability to bifurcate their networks into fast and slow lanes where conventional services are all but certain to offer unacceptably slow and inferior service. On the other hand, they should have the opportunity to engage in commercially desirable price and quality of service discrimination that does not harm competition and consumers.