

Comments of Hugh Carter Donahue, Ph.D. )  
In the Matter of ) GN Docket No. 09-191  
Preserving the Open Internet )  
Broadband Industry Practices ) WC Docket No. 07-52  
Submitted 10 January 2010 )

### **Consumer QOS Monitoring for Network Neutrality**

Consumer Quality of Service Monitoring (QoS) constitutes a public policy to 1.) promote innovation and investment at application and content peripheries, throughout wireless networks, historic telco and cable networks upgraded for broadband functionalities and in network equipment markets, and 2.) sustain end-to-end connectivity through regulatory certainty.

Consumer Quality of Service Monitoring constitutes a narrowly tailored policy that enables the Commission to achieve regulatory certainty and to stimulate innovation and investment with less risk of incurring the market administration costs of civil litigation, which afflict network administration standards.

### **The Notice of Proposed Rule Making**

The Commission articulates goals of stimulating investment and innovation, specifically of sustaining a regulatory model encouraging innovation and investment at application and content originator and user peripheries, through clarifying and, potentially, promulgating mandatory Network Neutrality policies.

The grave matter shaping the Network Neutrality Notice of Proposed Rulemaking is whether historically voluntary standards are to give way to mandatory ones.

As market administrator, the Commission finds itself evaluating policies to sustain innovation and investment and to maintain end-to-end connectivity.

In part, the emergence of vertically integrated networks capable of exerting market power to foreclose competition drives policy making.

In part, available packet and routing technologies, enabling markets in differentiated speed and service quality, can generate investment and stimulate new markets for a more highly typified Internet. As market administrator, the Commission would wish to cultivate differentiated services to stimulate aggregate demand.

Specifically, the Commission seeks comment on broadband access service provider mandatory compliance with the following four Net Neutrality standards.<sup>i</sup>

1. *Subject to reasonable network management, a provider of broadband Internet access service may not prevent any of its users from sending or receiving the lawful content of the user's choice over the Internet.*
2. *Subject to reasonable network management, a provider of broadband Internet access service may not prevent any of its users from running the lawful applications or using the lawful services of the user's choice.*
3. *Subject to reasonable network management, a provider of broadband Internet access service may not prevent any of its users from connecting to and using on its network the user's choice of lawful devices that do not harm the network.*
4. *Subject to reasonable network management, a provider of broadband Internet access service may not deprive any of its users of the user's entitlement to competition among network providers, application providers, service providers, and content providers.*

The Commission additionally proposes adopting mandatory nondiscrimination and transparency rules<sup>ii</sup> that:

5. *Subject to reasonable network management, a provider of broadband Internet access service must treat lawful content, applications, and services in a nondiscriminatory manner.*
6. *Subject to reasonable network management, a provider of broadband Internet access service must disclose such information concerning network management and other practices as is reasonably required for users and content, application, and service providers to enjoy the protections specified in this part.*

## **Differing Policy Prescriptions**

Differing prescriptions confound policy making.

On the one hand, proponents of mandatory Network Neutrality, non-discriminatory and network administration standards counter that mandatory standards are indispensable to innovation, investment and free speech. Invidious conduct has transpired, they contend, pointing to the *Madison River*<sup>iii</sup> and *Comcast Network Management*<sup>iv</sup> rulings. Bundling strategies insulate competitive entry, they point out, by tying old content to new services. Without mandatory standards, cartelization will throttle Internet commerce and speech, they argue.

Only by regulation can freedom survive, mandatory standards proponents contend.<sup>v</sup>

On the other hand, proponents of voluntary Network Neutrality, non-discriminatory and network administration standards contend that mandatory standards represent a solution in search of a problem. Even if vertically integrated networks wish to foreclose competition, so doing would adversely affect revenues and place them at competitive disadvantage with rivals, they point out. Comcast, in particular, challenges Commission discretionary authority of its network management<sup>vi</sup> and has addressed Commission concerns.<sup>vii</sup> Only by liberty can innovation and commerce flourish, voluntary standard proponents assert.<sup>viii</sup>

### **Uncertainty: Historical Analogies, Prospective Outcomes**

At present, it is unknowable whether the market power of vertically integrated networks will repeat the Titanic or resemble the railroads. Vertically integrated networks are gaming the inertia of consumers, who can and perhaps may find more interest and greater value in competitors offering original news, views and entertainment available over wireless and competing wireline networks. In part, they are so doing to extract value from sunk costs and to milk cash cows. It is unclear whether bundling current and older content with new services will charm, wile away, amuse and divert the attentions and interests of users and consumers adequately. Such ambits may repay: local news, movie stars, professional athletes<sup>ix</sup> and celebrity journalists command value in incumbent media markets and popular culture. The formula is well worn and time tested.<sup>x</sup>

However, user and consumer produced and originated video and written content, available outside the value chains and costs of vertically integrated networks, can assail and could undo the market power and business models of vertically integrated networks. As younger and more diverse users (e.g., immigration) place fresh values on incumbent, local news organizations, professional sport franchises, matinee idols and celebrity reporters, and as they access information and entertainment from sources not owned or controlled by vertically integrated networks, the capabilities and capacities of local news producers, Hollywood actors, professional athletes and broadcast and cable network journalists to draw the attentions of users and consumers by appealing to their heterogeneous desires, tastes and appetites may repay inadequately given their compensation and promotional and advertising costs.

Wi-Fi, Wi-Max, powerline broadband and wireless networks can obsolesce vertically integrated network operators if and as they emerge as facilities based competitive networks and new entrants.

Hence, following the railroad analogy, insistent, some contend, collusive<sup>xi</sup>, incumbent, vertically integrated network operator bundling and blocking and degrading to suppress competitive challenge to perpetuate Robber Barron<sup>xii</sup> monopoly and oligopoly returns by deterring adoption of emerging and available content and conduit alternatives.

Or, mandated net neutrality could redound to the long term institutional advantages of its most vociferous opponents, broadband access providers. The Bell monopoly flourished in no small part due to the expertise of its regulatory experts and counsel. No less sagacious a policy expert than Gerald Faulhaber observes that “should some form of net neutrality regulation be legislated, it would fall to a government regulator, either the FCC or the FTC, to actually regulate and enforce. This action would replace an industry in which the primary focus is on wooing customers by an industry with a government overseer, who can set rules and enforce regulations. A century of experience with telephone regulation is sufficient to show what occurs when there is a government overseer: the focus of competition shifts from pleasing the customer to manipulating the regulator, a game which strongly favors incumbents. The history of telephone regulation tells us the outcome: incumbents develop superb lobbying skills at all levels and branches of government while business and marketing skills are weak. In such a game, newcomers are at a distinct disadvantage and new entry is effectively foreclosed. If we have such legislation, then the duopoly assumption that net neutrality proponents adhere to will become a self-fulfilling prophecy. No one will want to enter an industry in which regulated incumbents rule the roost. If the objective is to turn the broadband ISP industry into the next regulated telephone like industry, net neutrality is the perfect way to do it. Regulation of net neutrality is a solution that virtually guarantees that the underlying problem – market power in the broadband ISP market – will never be solved.”<sup>xiii</sup>

To the extent that Faulhaber’s analogy to analog, wireline, regulated monopoly yet persists for unregulated, digital wireline and wireless hybrids with application and content providers vying for policy preferment as well, network operators could emerge as major beneficiaries of the policies they most detest. A policy making court, where expertise can inflect, rather than commercial market, where price contends, would drive investment and revenue, and network operators could reap the largest benefits.

Or, mandatory standards may cause overall loss. Broadband access providers could find themselves big losers, the Commission could perversely retard broadband deployment and hamstring periphery innovation and investment, and applications and content originators could suffer. Broadband access providers could find themselves hamstrung attracting capital if saddled with mandatory obligations, which become disrupted and obsolesced by technological innovation

by unregulated market entrants. In such an outcome, capital flows to the unregulated, new entrant and consumer welfare may occur, but, in all probability, in high end, early adopter markets, slowing development and deployment of applications and content in other markets to the detriment of consumer welfare and hindering peripheral growth but for niche players.

Or, District of Columbia Circuit Court of Appeals guidance could alter Commission market administration discretion of Network Neutrality entirely or in parts. As they evaluate *Comcast Corporation v. FCC* (08-1291),<sup>xiv</sup> Chief Judge David B. Sentelle and Judges David S. Tatel and A. Raymond Randolph could rule that the FCC is exceeding its congressionally delegated authority regarding Internet regulation.<sup>xv</sup> Or, the panel of judges could rule regarding discretionary authority over specific network administration practices raised in the litigation and leave aside mandatory standards for consumer choice to send and receive lawful content, to run lawful applications and services and to connect devices to their computers, laptops and mobile phones as long as those devices do not damage providers' networks. Any of these outcomes could potentially trigger FCC deliberations on information and telecommunications classifications to achieve Network Neutrality policy consistent with judicial scrutiny, or, further litigation at the Appeals Court and Supreme Court.

### ***Deus Ex Machina: Consumer Quality of Service Monitoring***

In evaluating mandatory standards, Consumer Quality of Service Monitoring emerges as an applied, practicable course, at once capable of sustaining voluntary standards while policing invidious network management and nondiscriminatory conduct, should it occur, in order to realize Network Neutrality policy promoting investment and innovation, sustaining free speech and civic and political engagement, and stimulating aggregate demand.

Consumer Quality of Service Monitoring imports the Service Level Agreement (SLA), long a staple of private networks, into retail Internet markets.

An application, available over the Internet and lodging on personal computer and mobile devices, could disclose network administration information. Among other factors, it could publish transparency and non discriminatory network management information, data and metrics.

QoS norms could include rating labels or on-line, real time applications for:<sup>xvi</sup>

Speed and data rate- a specified speed or speed range that will be provided to the customer

System uptime – average percentage of service up-time.

Latency – average end-to-end delays to a sample of sites on the Internet.

Jitter – variability in latency

Mail server response – time for mail server to respond to requests

Mail server speed – data rate attained by mail server when downloading mail to user's computer

Applications – time for accessing

Congestion management – policies, practices, conduct, metrics

The following data would be retrieved by research of publicly available information:

Cost - a detailed description of the cost of the service, and the billing period,

Customer service - list of customer services contacts, and average support call wait time.

Privacy policies – implementation of published privacy guidelines as certified by a third party

Restitution - amount of money to be refunded in cases of network problems and/or lack of service.

Congestion management - policies, practices, conduct, metrics

Third-party arbitration - name and contact information where customers can lodge complaints against a high-speed access service provider.

Network operators and applications originators would benefit, for QoS monitoring could emerge as information services enterprises supplying:

Diagnostic capabilities for a fuller picture of user experience than network operations data. With QoS monitoring, broadband network providers can scale bandwidth and establish price tiering for differentiated services. This intelligence will help to maintain and to increase revenues by yielding information on customer use, which can then be employed to optimally address consumer needs for bandwidth. Congestion pricing and policy routing would be more legible. And, originators can assess demand, because consumer QoS addresses command and demand.

In markets with competitive systems, broadband access providers could advertise monitoring results as a marketing tool to promote services.

QoS functionalities enhance customer retention by providing understandable comparison and contrast among broadband networks. QoS monitoring simplifies subscriber choice. It reduces churn by providing customers with sufficient information to satisfy them that they are receiving adequate service via cable modem, DSL dedicated line or wireless signal.

Consumer QoS monitoring simplifies disputes between consumers and providers as to whether the provider has met its contractual obligations.

A process for offering and verifying QoS guarantees encourage the development of Internet telephony and real-time games. As network performance improves, these services can be marketed more easily. With QoS monitoring, service innovations will develop as greater certainty over the availability of reliable network services will attract investors and consumers.

Consumers would benefit, because consumer QoS enables users and consumers to address information asymmetry amid information abundance. As more citizens use broadband as a result of declining real costs and greater varieties of broadband service offerings, users will become more heterogeneous.

Some will want to spend less time evaluating and selecting services, and will instead prefer time-optimizing, simplified information which generates confidence that they are getting what they are paying for. Such information could reduce consumer anxiety over choosing an opaque high tech service.

Others will prefer more detailed broadband QoS descriptions. Many, like those involved in on-line, real time game playing, have already demonstrated their interest in service characteristics like low latency to make their experiences more compelling, and the actively seek granular quality and performance information of the sort a QoS monitoring system and label would provide.

Users' abilities to select a service offering will depend on how successfully system designers create easy-to-understand presentations of QoS monitoring and available choices. Even if software agents eventually weigh the offers made by various service providers, the user interface for configuring the network service "purchasing agent" will have to pose the options in readily comprehensible language and formats. A service that can be trusted to provide up-to-date assessments of the quality of service offered by diverse networks will be in demand as the variety of options for personal communications multiplies.

The Commission would benefit because QoS metrics clarify and, potentially, realize Network Neutrality. By using available information technology to create a QoS servicing industry to create transparent, non discriminatory network administration, the Commission promotes innovation and investment. It advances the public interest by enabling citizens and users to employ available information technologies to evaluate whether they are receiving services for which they are paying and to determine that network operators are not manipulating networks to drive wholly owned or affiliated content and applications to users by diminishing users' access to and uses of content, applications and devices of their own choosing by blocking or degrading. It sustains end-to-end connectivity.

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<sup>i</sup> Federal Communications Commission (2009), Notice of Proposed Rulemaking In the Matter of Preserving the Open Internet Broadband Industry Practices, GN Docket No. 09-191, WC Docket No. 07-52, Released and Adopted, October 22, 2009, paragraphs 88-102.

<sup>ii</sup> *Ibid.*, paragraphs 103-132.

<sup>iii</sup> *Madison River Communications*, File No. EB-05-IH-0110, Order, 20 FCC Rcd 4295 (EB 2005) (*Madison River Order*).

<sup>iv</sup> See Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices; Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management," File No. EB-08-IH-1518, WC Docket No. 07-52, Memorandum Opinion and Order, 23 FCC Rcd 13028 (2008) (Comcast Network Management Practices Order).

<sup>v</sup> Endnote v.

<sup>vi</sup> *Comcast Corporation v. FCC* (08-1291).

<sup>vii</sup> Comcast Corporation, noting granularity, "Attachment B: Comcast Corporation Description of Planned Network Management Practices to be Deployed Following the Termination of Current Practices, submitted pursuant to paragraphs 54 and 59 of Memorandum Opinion and Order, 23 FCC Rcd 13028 (2008) (Comcast Network Management Practices Order), 2008.

<sup>viii</sup> Federal Communications Commission (2009), Notice of Proposed Rulemaking In the Matter of Preserving the Open Internet Broadband Industry Practices, GN Docket No. 09-191, WC Docket No. 07-52, Released and Adopted, October 22, 2009, see paragraphs 34-79 for a discussion.

<sup>ix</sup> In different eras and locations, "by sports like these are all their cares beguil'd," Oliver Goldsmith, *The Traveller, or a Prospect of Society*, 1764, noting the emergence of manufacturing and urban culture displacing agriculture and rural culture. "The Indians call the game baggatiway. By the French in Canada it is named 'le jeu de la crosse,'" Alexander Henry notes in 1763. The Olympics date from approximately 776BC and included music and literature as well as running, wrestling and javelin. Pindar memorialized Olympic athletes, e.g., "...fame...shines from afar in the races of the Olympic festivals, where there are contests for swiftness of foot, and the bold heights of toiling strength. A victor throughout the rest of his life enjoys honeyed calm, so far as contests can besto," in *Olympic Odes* (476BC).

<sup>x</sup> "The real business of making movies became the business of making idols," Louis B. Mayer on Greta Garbo, Jack Kelly, "Louis B. Mayer Invents a Hollywood Dream Machine," American Heritage, [www.americanheritage.com/.../20071128-louis-b-mayer-mgm-hollywood-film-industry-movies.shtml](http://www.americanheritage.com/.../20071128-louis-b-mayer-mgm-hollywood-film-industry-movies.shtml)

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<sup>xi</sup> "Cable Industry Claims Collusion is Pro-Consumer: Response of NCTA to TV Everywhere," <http://ammori.org/>, January 5, 2010; *CableFax Daily*, Volume 21, Number 002, January 5, 2010.

<sup>xii</sup> Although Matthew Josephson places "Robber Barrons" in historical analysis of late nineteenth century, American capitalism in *The Robber Barons: The Great American Capitalists, 1861-1901*, (1934), Charles Francis Adams employs the term in *Railroads, their Origin and Problems* (1878), e.g. "The commissioner has not hesitated to give his opinion of the foreign owner as a 'robber baron,'" and Carl Schurz attaches "Robber Barrons" to investment manipulation, e.g., "It will not be surprising at all to see some day a movement set on foot to put an end to the operations of the modern robber barons, who, by corporate rascality, supplemented with tricks of the stock exchange, manage to plunder at will not only their fellow-gamblers, but the innocent bona fide investors in corporate enterprises," *The Boston Herald*, June 30, 1882.

<sup>xiii</sup> Gerald R. Faulhaber, "Network Neutrality: The Debate Evolves," *International Journal of Communication* 1 (2007), p. 693.

<sup>xiv</sup> *Comcast Corporation v. FCC* (08-1291), Oral Arguments, January 8, 2009.

<sup>xv</sup> The D.C. Circuit Court of Appeals has ruled that the Commission exceeded its congressionally delegated authority on a number of issues, see, Hugh Carter Donahue, *The Battle To Control Broadcast News*, 1989.

<sup>xvi</sup> Earlier versions of the following passages are presented in: Hugh Carter Donahue, Ph.D. and Josephine Ferrigno Stack, "Broadband Quality of Service Monitoring: A Promising Public Policy Response," Submitted to: Request for Comments on Deployment of Broadband Networks and Advanced Telecommunications, Docket No. 011109273-1273-01, National Telecommunications and Information Administration, December, 2001 and Hugh Carter Donahue and Josephine Ferrigno-Stack, "Quality of Service Monitoring: A Timely Idea," 2<sup>nd</sup> IEEE Conference on Standardization and Innovation in Information Technology, *SIIT 2001 Proceedings*, Boulder, Colorado, October, 2001. Separately, see Shawn O'Donnell, Hugh Carter Donahue, Josephine Ferrigno-Stack, "Quality of service monitoring: Performance metrics across proprietary content domains," Telecommunications Policy Research Conference 29th Research Conference on Communication, Information and Internet Policy, Alexandria, VA, October 28, 2001. Also, Hugh Carter Donahue, "The Network Neutrality Inquiry," *Info*, January, 2010.