



# VIEWS AND NEWS

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## Net Neutrality, “Paid Prioritization,” and “Network Management” – Part II

Last month we began a two-part discussion focusing upon some of the most contentious issues in the “Net Neutrality” debate – the right of Internet access providers to charge customers for prioritizing certain traffic, and the providers’ right to implement so-called “network management” measures whose effect would be to limit or prevent altogether certain uses of their Internet access services. These issues are certainly not unrelated; indeed, effective network management makes “paid prioritization” possible. Moreover, to the extent that any “network management” tactics are targeted to specific content or applications, they have the potential to competitively disadvantage non-affiliated (downstream) application and content providers and in so doing restrict competition for these services. For example, among the claims advanced in opposition to Comcast’s use of “deep packet inspection” as a device for detecting its customers’ use of “peer-to-peer” video file sharing was the suggestion that by frustrating its Internet customers’ ability to download movies and other video content from peer-to-peer networks, Comcast was benefitting its own cable TV and other fee-for-content video offerings. In this article, we explore these and other arguments on both sides of the “network management” debate.

### Network Management

Back in 2007, two public interest groups – Free Press and Public Knowledge – asked the FCC to put a halt to Comcast’s practice of blocking its customers’ use of so-called “peer-to-peer (“P2P”) file sharing” via a protocol known as “BitTorrent.” P2P is an arrangement under which Internet users communicate directly with each other rather than via an intermediary host. P2P file sharing can be accomplished by means of any of several file sharing protocols, enabling users to exchange content such as music, movies, video, or other large files, with one another. One such protocol is BitTorrent, which allows users to obtain large files quickly by downloading small fragments of the large file from each of many different users that had previously downloaded some or all of the file. The entire process is managed, and the overall content reassembled from the individual file fragments, using client software. Using this file sharing technology, a given amount of content can typically be downloaded far faster by using the available bandwidth of many P2P network members than a similar amount of content if obtained from a single server.

The *quid pro quo* for a P2P network member’s ability to obtain downloads through this process is that the user is then expected to

make his local copy of the entire file available for fragment downloads by other members of the P2P network, generating substantial uplink traffic. It is this aspect of P2P file sharing that Comcast was attempting to address and to constrain.

The specific means by which Comcast undertook to control its customers’ use of P2P file sharing involved a technique known as “deep packet inspection” (“DPI”), a process in which Comcast would examine the payload of the users’ packet traffic rather than the IP header in order to identify traffic associated with P2P. Upon determining that the customer was engaging in this practice, Comcast would then generate a forged “reset packet” that would cause the download to immediately terminate. We do not address the merits of Comcast’s enforcement methods, but focus instead on the source and merits of Comcast’s concerns about P2P.

Whether deep packet inspection constitutes an intrusion into the nature of the content being viewed by its customers, or whether Comcast’s efforts to limit P2P transmissions had been motivated solely by valid network management concerns rather than by a desire to limit its customers’ ability to obtain competing video content, we leave for others to debate. But because a last mile cable Internet access facility is shared among many users in the immediate vicinity, the use of bandwidth-intensive applications like P2P file sharing by a small number of users can operate to degrade service for everybody else on that shared facility. As such, Comcast or any other last mile broadband service provider has a legitimate basis for addressing this condition.

### Misrepresentation and misunderstanding of consumer broadband Internet access

It would appear that a large source of the disconnect between the service providers’ and their customers’ understanding of this issue lies in the manner in which the service providers have marketed and portrayed their various broadband Internet access services, which appears to differ from the level of service that the ISP actually planned to offer and is capable of providing. Using terms like “always on” and “unlimited use,” and promising “download speeds up to 15 Mbps and uploads up to 3 Mbps with PowerBoost®,” providers such as Comcast create the impression that what the customer is purchasing is dedicated 24/7 capacity at the rated upload and download speeds. As we discussed in the July 2010 *Views and News*, that is decidedly not what Comcast – or any other consumer Internet access service provider – believed that it was actually selling.

Flat-rate or unlimited use pricing has long pervaded telecom service offerings – particularly those targeted at residential con-

sumers. Flat-rate pricing allows the service provider to avoid the need to measure and bill its customers for usage, particularly where such transaction-driven costs may on average actually exceed the costs of the service itself. From the customer's perspective, flat-rate pricing removes the risk of running up a large and perhaps unexpected bill, eliminating the customer's need to keep tabs on family member usage of the service. One problem with flat-rate pricing, however, is that once having committed to pay the monthly "flat" rate, customers then perceive all usage as "free."

In practice, however, the flat-rate charge is typically set by the service provider based upon average usage levels for a given class of customer. For example, since residential telephone customers typically make fewer phone calls per access line than do business customers, local phone companies routinely charge lower flat monthly usage fees to residential than to business users. Similar differentiation has developed for unlimited long distance pricing plans that have emerged over the past decade as the Bells pushed their way back into the long distance business. Prices are set by the service provider on the expectation and understanding that use of the service will be limited to members of the customer's household. To enforce this, the carrier typically includes restrictions in its terms of use (to which the customer must agree) that prevent the service from being resold, used for business purposes, or (in the case of unlimited long distance pricing plans) even being used for dial-up Internet access. Flat-rate arrangements are sometimes referred to as "all you can eat" pricing. And it is an "all you can eat" plan, and not true "unlimited" pricing, that Comcast and other carriers believed they were selling.

Unlike "all you can eat" pricing at a buffet restaurant, where the average consumption of food by patrons falls within a predictable and narrow range such that even the occasional glutton will not overwhelm the capacity of the buffet, Comcast's shared coaxial network design and pricing arrangements (also based upon some average level of usage) simply did not contemplate the rapidly changing landscape of the Internet and an end user's ability to consume so much bandwidth. The asymmetric nature of the broadband distribution network was not designed to accommodate large quantities of outbound traffic, and Comcast's "unlimited" pricing and marketing efforts obviously did not envision the exponentially growing demand for uplink capacity, especially as required for P2P traffic.

Cable-based Internet access utilizes a hybrid fiber/coax distribution architecture, in which the coax segment is shared by a number of customers whose homes it passes. The coax segment has finite capacity – particularly in the uplink direction – and would be incapable of handling the volume of traffic were all of the customers who share that same facility to use it continuously, at maximum speed, on a 24/7 basis. Were that to occur, transmission speeds for all customers sharing the cable would be seriously degraded, or the cable company would be required to deploy significant quantities of additional capacity to meet this level of demand. Even in so-called fiber-to-the-premises ("FTTP") distribution networks, such as Verizon's FiOS, similar facility sharing takes place, albeit a bit further from the individual customer.

Given these capacity constraints, some network management is warranted to ensure that any one user of the network does not degrade the service of others. Comcast does have stated restrictions on the use of its "unlimited" residential internet service. Comcast's Acceptable Use Policies (AUPs), for example, includes the following specific restriction, requiring that subscribers may not

resell the Service or otherwise make available to anyone outside the Premises the ability to use the Service (for example, through wi-fi or other methods of networking), in whole or in part, directly or indirectly. The Service is for personal and non-commercial residential use only and you agree not to use the Service for operation as an Internet service provider or for any business enterprise or purpose (whether or not for profit).

Restrictions of this type are reasonable when viewed in the context of a flat-rate pricing regime intended to accommodate average or typical residential usage patterns and levels, especially because they are not biased for or against any particular type of application or content. Any other network management regime, even if it requires decreasing available bandwidth to one or more users to ensure network access for others, should be similarly agnostic to the applications and content being sent over the network.

### **The end of "flat rate" Internet access?**

An alternative to promulgation and enforcement of AUPs whose effect is to limit usage to a level consistent with a flat-rate pricing structure is to eliminate flat-rate pricing and replace it with a usage-based rate structure. Customers would then be confronted with additional charges for increased usage and, if the usage-based price bears a close relationship to usage-sensitive costs, the provider would be assured additional revenue sufficient to defray the costs associated with providing additional capacity. Usage-based pricing would almost certainly diminish interest in P2P file sharing, since participants in such arrangements would be confronted with bills that reflect the bandwidth they provide for the benefit of others to download file fragments.

Wireless data services other than SMS are generally subject to usage-sensitive pricing. AT&T Mobility recently withdraw flat-rate data pricing for its iPhone and iPad customers. Users of wireless Internet access services have now come to accept such measured-use pricing as a standard attribute of these services. Usage-based pricing has been slow to catch on for wireline broadband Internet access, but Comcast, Time Warner and others have tiptoed into measured use pricing for cable-based Internet access where aggregate monthly usage volumes exceed a relatively high threshold.

Telecommunications carriers have a long tradition of utilizing measured-use pricing as a device to facilitate market segmentation and price discrimination, extracting disproportionately higher revenues from "heavy" users (deemed to exhibit lower demand elasticity) by setting the usage-based charges well in excess of usage-sensitive costs. Their ability to maintain such excessive price levels was a direct result of their *de facto*, if not also *de jure*, monopoly status. As competition developed in the long distance market beginning in the mid-1980s, usage-based long distance prices began a steady decline, with domestic rates dropping from price points in the 40 to 50 cents per minute range to today's prices of one or two cents per minute, and in some cases such calls are offered at no charge at all. International rates experienced an even more precipitous decline, from the \$1 to \$2 range to pennies per minute. Significantly, while competition was taking hold in the long distance segment, it was still more hope than reality in the case of local services, producing the seemingly

anomalous result that local usage charges were frequently higher than even coast-to-coast or international long distance rates.

The introduction of measured-use pricing for high-speed Internet access, while perhaps addressing the “all-you-can-eat” problem encountered by Comcast with respect to P2P usage, has the potential to facilitate the same types of market segmentation and price discrimination practices that had long been applied for local and long distance telephone services – precisely because the high-speed Internet access market is decidedly not competitive or open to retail-level competition.

Measured use pricing may overcome the P2P concern that Comcast was attempting to address, but may prove to be an even less acceptable “solution” than Comcast’s aggressive network management practices. Nevertheless, whether via pricing or some sort of administrative device, it is not unreasonable, in principle, for ISPs to seek ways to limit their customer’s aggregate level of usage where capacity is finite. What is unreasonable, however, is for this entirely legitimate concern to provide a camouflage for what may otherwise be monopolistic or anticompetitive conduct. Cost-based usage-sensitive pricing may be reasonable and efficient, but an excessive usage-based price level would discourage otherwise efficient usage and could undermine downstream content and application markets. Even worse, if a usage-based price is employed as a device for discriminating on the basis of content or the nature of the content or application provider, competition in these adjacent markets could be adversely affected, and economic trade-offs among alternative technologies could be seriously distorted. As long as the last mile broadband market retains its current noncompetitive character, these concerns remain, and some type of regulatory oversight may be appropriate.

For more information on this subject, please contact Dr. Lee L. Selwyn at [lselwyn@econtech.com](mailto:lselwyn@econtech.com).

## **FCC proposes new rules intended to protect wireless customers from “bill shock”**

Earlier this month, the FCC proposed a set of new rules (at CG Docket No. 10-207) “that would require mobile service providers to provide usage alerts and information that will assist consumers in avoiding unexpected charges on their bills.” Responding to various horror stories about consumers who ran up charges of as much as \$35,000 for roaming, texting, or web surfing, the Commission now proposes to require that wireless carriers provide customers with notifications that they are about to exhaust their monthly usage allowance, and that they also make available easy-to-use tools to enable customers to view and manage their usage, so that the consumer can be informed, before any additional charges are incurred, that further use of the service during that billing cycle will engender such added fees.

The Commission noted the opposition of wireless carriers to such requirements based upon the carriers’ contention that “the [wireless] marketplace is competitive, creating incentives for providers to make available consumer information and usage tools without regulatory mandates” but nevertheless concluded that “mobile service providers are not providing consumers with complete information concerning

the tools available to manage their usage and control their costs” and that “[t]o the extent that providers offer methods to monitor and cap usage to avoid bill shock, consumers are often unaware of these tools.” While the FCC’s initiative is certainly to be applauded and may well help some consumers avoid receiving wireless bills of biblical proportions, for others the FCC’s proposal may be more like those health warnings on packages of cigarettes that are largely ignored by hard-core smokers. The real source of the bill shock problem is the enormous market power held by the two largest wireless carriers – AT&T and Verizon – that collectively control some 61.2% of the US wireless market.

Bill shock arises from the proliferation of complex and confusing rate plans – something that could not happen if effective competition were actually present in the wireless market. Carriers have developed the myriad of pricing plans as a means for segmenting the market to support a general strategy of market segmentation – charging different prices to different customers or groups of customers for what is essentially the same product or service. In so doing, a carrier can capture the highest revenue from those customers who place the greatest value on the service and thus exhibit the highest willingness-to-pay. A key factor in the success of any market segmentation strategy is the ability of the provider to prevent customers falling into segments deemed capable of supporting relatively high price levels from accessing lower prices being targeted to customers in other segments. Airlines, for example, accomplish this by imposing advance purchase requirements as a means for separating pleasure travelers from business travelers willing to pay more for a ticket for a short-notice trip. In the case of wireless services, one widely-used method for forcing customers’ to remain within their “assigned” segment is to create barriers aimed at limiting existing customers who subscribe to a relatively high-priced plan to switch to an alternate at a lower price. This result may also be achieved by limiting the dissemination of information on new, lower-priced plans beyond the targeted market segment.

For example, when wireless carriers introduce new pricing plans or promotions, they typically apply these only to new customers while “grandfathering” their existing customers under the customers’ preexisting plan. If the new pricing plan is less expensive than the plan being provided to an existing customer, in order to obtain the benefit of the lower price the existing customer must affirmatively ask to be shifted to the new offering. The carrier will usually accede to such a request, but may require that the customer enter into a new two-year contract and be subject to a new early termination liability. And if that doesn’t discourage the customer from shifting to the new, lower priced service package, the carrier may also impose an “activation charge” even though the customer’s handset is already activated on the carrier’s network.

Carriers typically offer “block-of-time” pricing plans where for a specified monthly charge the customer is provided with a certain quantity of minutes. If that quantity is exceeded in any given month, “overage” charges are applied, but at a considerably higher rate than under the basic plan. For example, a carrier might offer a block of 400 minutes for \$40 per month, but then charge \$0.40 or \$0.50 for each “overage” minute above the 400. The effective price per minute is thus minimized at precisely 400 minutes of use – any usage above or below 400 leads to an increase in the

average per-minute price.

Block-of-time pricing of this type requires that the customer guess, in advance, the level of usage he or she is likely to make. If the consumer is relatively risk-averse – and many, perhaps even most, are – he is more likely to *overestimate* his expected usage, and thus subscribe for a larger-than-necessary rate plan. AT&T offers its customers the ability to “bank” unused minutes in any given month to be applied against overtime minutes in subsequent months. But no other wireless carrier in the US currently offers this “rollover” feature, such that in low-use billing cycles the unused minutes are forfeited, whereas in high-use periods the excess minutes are subject to high overtime charges.

One recent “bill shock” situation that received a lot of publicity arose when Verizon changed a customer’s rate plan from unlimited to measured-use data and, according to the customer, did not provide adequate notice, or any notice at all, of the change. By the time that the customer had become aware of the problem, some \$18,000 worth of data use charges had accumulated. Verizon eventually backed down from its demand that the bill be paid in full, but not until the customer had managed to get local and ultimately national media coverage of the dispute.

The very existence of “bill shock” is compelling evidence that the wireless market is far from competitive. If it were actually competitive, customers would be able to rapidly and costlessly shift from one carrier to another in response to price changes, and would be assured access to full, complete and accurate information upon which to make such choices. In reality, of course, such information is not readily available, and cross-carrier comparisons are often difficult to make. The lack of effective competition in the US wireless market is further demonstrated by the persistent failure of the two dominant wireless carriers to respond to more aggressive pricing plans offered by their smaller rivals – Sprint, T-Mobile, and Metro PCS, among others. Until the FCC either finds ways to advance the development of competition in this sector, or to foster pricing regimes that are transparent and readily understandable to all wireless consumers, problems like bill shock are likely to persist.

For more information on this subject, please contact Colin Weir at [cweir@econtech.com](mailto:cweir@econtech.com).

## FCC Announces Developer Application Programming Interface (API) for Data Access

On September 7, the FCC launched a new website: <http://reboot.fcc.gov/developer>. The website promises “Data Transparency” and states that “[t]he FCC actively promotes the innovative application of agency data in the public and private sectors. FCC.gov/Developer connects citizen developers with the tools they need to unlock government data.” We couldn’t be more excited about the prospect of easy access to useful FCC data. But while the FCC data interface seems like a positive step in this direction, its ultimate success in achieving the stated goal will require that the Commission continue to include additional data sets in the repository, and more importantly that it renew its commitment to *data collection*.

A quick review of the FCC developer API page reveals that very

little actual data is currently being provided through the new interface. Only four data sets are available: (1) Consumer Broadband Tests, (2) FCC Census Block Conversions, (3) FCC broadband company registration numbers, and (4) Spectrum License View. In many respects, these aren’t even separate resources, inasmuch as the first three are all interrelated to the Congressionally mandated broadband data collection initiative.

The FCC already collects a wealth of other data that has yet to make its way to the new website. The Wireline Competition Bureau Statistical Reports (available online at <http://www.fcc.gov/wcb/iatd/stats.html>) is just one compilation of data that could be made more accessible through a developer API. The FCC has over ten years of Form 477 local telephone competition and broadband reporting data, yet has fallen woefully behind in publishing even its annual summary reports of these data series. The Commission also maintains a mountain of data on the wireless industry, which it similarly summarizes in an annual *CMRS Report* to Congress. Including the source data underlying these reports to the data to be made available through the new API would make the new website vastly more useful.

A large concern not addressed by the re-release of already-public data via this new interface is the Commission’s declining commitment to collect useful data in the first place. One of the largest collections of FCC telecom industry data resides in its Automated Reporting Management Information System (“ARMIS”) database. Not only is this data not accessible through the new developer API, the FCC has actually eliminated the requirement that major wireline companies continue to submit any ARMIS data at all. ARMIS data has long been used to verify the reasonableness of ILEC rate levels overall and for specific categories of service, to identify the presence of possible cross-subsidization, and to inform the FCC’s decision making process on key regulatory initiatives. Once the richest source of public data about the inner workings of telephone companies, and one of the only tools to monitor service-category-level detail, ARMIS has been relegated to the realm of regulatory archeology – not because of the manner in which the data is made available, but because the FCC decided (at the behest of major telecommunications providers) to stop collecting any ARMIS data at all.

Only by collecting and making available good *and current* data can the FCC “realize the ideal of the Gov 2.0 movement of government and private sector innovating together to solve our great policy challenges.” We hope that the new FCC developer API signals a new momentum on the part of the FCC in its efforts to present *and to collect* useful industry data, and to use that data to inform its critical policy decisions.

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