

Before the  
Federal Communications Commission  
Washington, DC 20554

In the Matter of )  
 )  
Broadband Inquiry Practice ) WC Docket No. 07-52  
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## COMMENTS

Submitted by  
Robert Larribeau, Jr.  
Principal Analyst and Cofounder  
TelecomView  
<http://www.telecomview.info>  
[bobl@telecomview.info](mailto:bobl@telecomview.info)

### I. INTRODUCTION

1. TelecomView is a firm that analyzes telecommunications markets and technologies. It specializes in studying broadband services and networks in particular and has been following broadband wireless and TelcoTV services in particular.

2. It has found the discussion about the so called “net neutrality” has lacked rigor and has not focused on the key issues. These comments attempt to correct these problems and to extend the discussion to areas that the Commission should address to insure consumers are provided choice and that competition is fostered on an equal basis.

### II. BACKGROUND

1. The Commission has issued a set of principles defining a framework for broadband access to the Internet:

- *To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet.*
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2. The nature of services offered over broadband networks is fundamentally changing. Broadband networks such as the FiOS network provided by Verizon and the U-verse network provided by AT&T provide services in addition to and independent of the Internet services. Both AT&T and Verizon offer TelcoTV services over these new networks, in particular. This means that the broadband service should be considered independently of the Internet service since Internet access is only one component of a broadband service.

3. It appears that the cable companies may be moving in the same direction as they introduce 100 Mbps DOCSIS 3.0 based data services. At least some of them are considering offering TV services over this broadband connection using IPTV technologies. It is likely that this will lead to a partitioned broadband service similar to the new telco broadband services.

### III. DEFINING INTERNET AND BROADBAND SERVICES

1. The traditional ADSL and cable modem services introduced in the late 1990s supported only Internet services. In fact, these broadband services were seen as synonymous with Internet services. With ADSL in particular, there have been levels of service that provided different amounts of bandwidth in the downstream and upstream direction with higher prices as the bandwidth increased. Cable modem services were generally less differentiated.

2. The Internet service provided by these traditional ADSL and cable modem services were undifferentiated "best efforts" Internet services. The service guarantees for these services were low and it was at least implied that they were lower priority than other services such as enterprise business services that might also be carried on the networks that carried Internet traffic to the broadband access networks.

3. New kinds of service are now being offered over these best efforts Internet services such as Voice over IP (VoIP) and gaming services that have more stringent packet delivery requirements than web browsing, file transfer, email, and other traditional Internet services. These traditional Internet services provided acceptable levels of service because they did not require large amounts of bandwidth and they could be supported by the excess capacity provisioned into Internet networks to handle the bursty nature of the traffic.

4. In 2000 and 2001 some telcos started to provide TelcoTV services over their broadband networks. Many of them, including a trial deployment at Qwest Communications, used a higher speed access technology, VDSL, to support these TelcoTV services. Others offered TelcoTV services over their ADSL broadband networks with fair to good results. While ADSL can support a single Standard Definition (SD) TV, it does not have enough bandwidth to support multiple SD TVs or any High Definition (HD) TVs. Consequently, ADSL has not proved to be a sufficient technology to support a competitive TelcoTV in the U.S.

5. Higher speed broadband technologies have been introduced that provide more bandwidth, enough to support HD TV along with multiple SD TVs. AT&T is using VDSL for its new U-verse service, which provides a minimum of 25 Mbps. Verizon is using Passive Optical Network (PON) technology that uses a fiber optic cable to bring 100 mbps to each home. AT&T has reserved much of the additional bandwidth for their TelcoTV services and has not made it available to their Internet services as shown in Table I below.

**Table I: AT&T and Verizon Internet Service Structures**

Company	Broadband Link Speed	Internet Service			
		Downstream Speed	TV Channels	Monthly Price	Service Name
AT&T	25 Mbps	1.5 Mbps	100	\$59.00	U-verse U100 + Exress
		3 Mbps	100	\$64.00	U-verse U100 + Pro
		6 Mbps	100	\$74.00	U-verse U100 + Elite
Verizon	100 Mbps	5 Mbps	0	\$39.99	FiOS
		15 Mbps	0	\$48.99	FiOS
		30 Mbps	0	\$179.95	FiOS

Source: AT&T & Verizon

6. The AT&T U-verse offerings all include the TV service; consequently, this table shows the prices with the low end U100 TV package. Verizon does offer FiOS data services without a TV service, so the speeds and prices of the data only services are included in the table. The key point from this table is that AT&T is reserving at least 19 Mbps for its U-verse TelcoTV services and Verizon is reserving at least 70 Mbps for its FiOS TV TelcoTV service today. Neither company is making this bandwidth available for Internet services.

7. TelecomView believes that this is an appropriate service structure. Both AT&T and Verizon along with the many smaller U.S. telcos investing in VDSL or fiber technologies in their broadband networks need the revenue from TelcoTV services to recoup this investment. Separating the Internet and TelcoTV services from each other and reserving bandwidth for each also makes sense because it virtually eliminates any interface between them. A teenager downloading a large file on the computer in her room will not interfere with the video of the HD TV program that her parents are watching in the living room.

8. This arrangement does put companies offering TV services over the Internet at a disadvantage. Given the capabilities of the popular video streaming systems, a typical 3 Mbps ADSL broadband service can support only a single SD TV set with a small margin so that a PC user sharing the broadband connection may negatively impact the quality on the TV. Today, an HD TV requires 8 to 10 Mbps of bandwidth, which is beyond virtually all ADSL and cable modem services, at least with good quality. The AT&T VDSL U-verse service shown in Table I cannot support it. The Verizon 15 Mbps and 30 Mbps data services shown in Table I are among the few broadband Internet services that can support HD over an Internet connection.

9. It now appears likely that at least some cable companies will create similar service structures as they introduce higher speed data services using DOCSIS 3.0 technology. Comcast, in particular, has started a trial of IPTV technology over DOCSIS 3.0. It is logical to infer that the cable companies will isolate their IPTV over broadband services to insure the quality of the video experience, just as the telcos have done.

10. Section V of these Comments addresses ways that the FCC should consider to level this playing field.

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#### IV. SERVICE DIFFERENTIATION

1. One of the questions in this inquiry is whether or not all packets on an Internet service should receive equal treatment. TelecomView believes that the answer to this is no, that there should be service differentiation that gives the packets for some services higher priority over other services. However, this must be done in a way that provides fairly priced equal access to all service providers and does not discriminate against one or the other. In particular, this approach should not enable the broadband service provider to offer a better level of service and relegate its competitors to a lower level of service.

2. Most traditional Internet data services such as email, web browsing, and file transfer have a high tolerance for packet errors and delays in the network. These services are able to mask many of these problems and, in fact, users will generally notice only a tolerable amount delay, if they notice anything. This is why a best effort strategy works for these services.

3. VoIP services are much more sensitive to packet error and delay. Network problems that would not be noticeable with web browsing could cause noise or some other defect in a voice call.

4. Users that play network games over the Internet are particularly sensitive to delays. A delay can put a player at a disadvantage and cause them to lose the game. In addition, there are times when game players might like to speed up their Internet connection for a period of time using a “turbo button” service that speeds up the connection as a chargeable event.

5. TelecomView believes that giving priority to VoIP packets and for gaming packets are reasonable service offerings. TelecomView also believes that providing a “turbo” service that temporarily speeds up the speed of the connection is a reasonable service offering. Both of these preferential service offerings will improve the broadband experience for significant sets of users and if they are properly engineered should not negatively affect the service for other users.

6. When considering this, it is important to note that the bottleneck for most broadband services is the broadband connection itself. These broadband networks are generally supported by networks with more than enough capacity to meet the needs of the subscribers. It is the connection to the user that limits bandwidth and where congestion is most likely to occur.

7. With a telco broadband service, the broadband connection is dedicated to each subscriber. This is specifically true for DSL and Ethernet access services. Fiber based PON systems share connections using optical splitters, but there is a fixed amount of bandwidth that is allocated to each subscriber. Consequently, providing differentiated services over telco broadband services will affect only the other users at the subscriber’s location. In this situation, most families would agree that a clear VoIP telephone connection for one family member is worth a minor slow down of file transfer speeds for the rest of the family.

8. Cable modem services are aggregated and share the same bandwidth across several hundred homes. This will permit the usage in one home to affect the performance of the service seen at another home. Providing differentiated services for VoIP and gaming should also prove quite acceptable in this environment since it will account for a relatively small portion of the traffic and the effects of prioritization should be easily absorbed.

9. Independent of whether the broadband service provider is a telco or a cable company, differentiated services will have to be carefully engineered. This can certainly be done for either type of network.

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## V. EQUAL ACCESS FOR INTERNET AND BROADBAND NETWORKS

1. The Commission has recognized that competition is an important force in providing the best and most cost effective set of services to the consumer. It has recognized that competition must be structured in ways that stimulate rather than discourage investment in new broadband infrastructure. These principles have been the basis for the current set of broadband regulations.

2. The current regulations protect the incumbent telcos from be required to provide unbundled access to the new VDSL and fiber based broadband networks that they are building. This has reduced the amount of competition within the telco broadband markets compared to Europe, for instance, where unbundling has become a significant method for increasing competition within these markets. The Commission is encouraging between technologies such as cable modems and broadband wireless to create competition with the telcos.

3. TelecomView believes that there are now new opportunities for stimulating service competition by extending the principle of equal access that was developed as part of the AT&T divestiture in 1984 to broadband services. Basically, service providers should be able offer services over any broadband network on an equal basis with each other and with the broadband service provider itself. This would apply to the Internet service, to the TelcoTV service, and to any other service offered over a broadband network.

4. The Internet and, therefore, the broadband Internet services, have a long tradition of equal access. Internet service providers regularly peer with each other and exchange traffic at both public and private peering pints. Web based service providers such as Google, Yahoo!, Ebay, and Amazon can purchase connections to the Internet and make their services available to the full population of Internet users.

5. These Internet interconnection services have been on an equal basis without preference in the past. TelecomView believes that this practice should continue for best efforts traffic. The exception is described in the next paragraph is on a service by service basis not a company by company basis.

6. TelecomView believes that differentiated services can be added to these services that permit VoIP telephony and gaming services to offer preferential services that improve the experience of their users. These services should be offered on an equal basis to all companies and should not be part of exclusive agreements between the broadband operator and a few others or used only by the broadband carrier itself. This means that Vonage, Packet8, and Verizon should be able to provide priority treatment for their VoIP services delivered over AT&T's broadband network and that AT&T should not be able to provide this preferential service only for its own VoIP service.

7. TelecomView also believes that the TelcoTV services that the broadband service providers offer today should be opened up on an equal access basis. It should be possible for Akimbo or MovieLink to offer a supplementary video on demand service through AT&T's U-verse or Verizon's FiOS TV service though an open interface and with a fair set of access charges. It should also be possible for a video service provider to offer an alternative video offering to the AT&T U-verse or the Verizon FiOS TV offering, again through an open interface and with a fair set of access charges.

8. IP networks allow for straightforward peering arrangements of services between service providers. The peering arrangements can be made at a public peering service or on a private basis. These peering arrangements may be made with or without collocation. Internet service providers have been able to work out collocation arrangements with private peering arrangements, so this should not be a significant problem.

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## VI. RECOMMENDATIONS

### 1. TelecomView is making the following recommendations to the Commission:

- Best efforts Internet services should be treated equally by broadband service providers. There should no discrimination between best efforts data services between Internet service provider or between the broadband operators own Internet service and other Internet service providers.
- Prioritization and preferential treatment should be permitted and even encouraged on a service basis to improve the quality of VoIP, gaming, and other services that require a higher level of packet delivery performance. This prioritization should be provided in ways that do not substantially reduce the quality of traditional best efforts Internet services such as email, web browsing, or file transfer.
- Access to all of the broadband services such as TelcoTV services that broadband operators offer. This access should be provided on an open basis and at a fair price.

### 2. TelecomView recommends that the Commission add the following points to its framework:

- To encourage the availability of a broad set of consumer choice on broadband networks, equal access should be provided to third party service providers that wish to offer Internet access, TelcoTV, or other services on these broadband networks. This access should be available to all service providers on an equal, non discriminatory basis, at a reasonable price.
- Differentiated services that provide prioritized or preferred packet delivery across broadband networks to satisfy the needs of VoIP, gaming, and other applications that require higher levels of packet delivery than best efforts Internet traffic. These differentiated services should not significantly reduce the quality of traditional, best efforts Internet traffic. Access to these differentiated services should be available to all service providers on an equal, non discriminatory basis, at a reasonable price.

3. TelecomView believes that these changes will create a more competitive environment, which will provide more choice to consumers. The broadband service providers have been provided significant accommodation that eliminated the requirement to provide competitive unbundled access to their broadband networks to encourage investment in these networks. Given that, it is fair that these networks be open to third party services to maximize the choices open to consumers.