BEFORE THE

Federal Communications Commission

WASHINGTON, D.C.

In the Matter of	)	
	)	
Preserving the Open Internet	)	GN Dkt. No. 09-191
	)	
Broadband Industry Practices	)	WC Dkt. No. 07-52
	)	
	)	
	)	

COMMENTS OF TW TELECOM

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tw telecom inc. ("TWTC"), by its attorneys, hereby files these comments in response to the public notice released in the above-referenced proceedings.[1]

I. INTRODUCTION AND SUMMARY

As the Commission considers how best to address its concerns regarding the regulation that is appropriate for broadband Internet access services ("BIAS"), it must be sure to leave service providers the flexibility to provide critically important specialized services to enterprise customers. In particular, it is critical that TWTC and other firms that serve enterprise customers continue to be able to utilize traffic management techniques such as Diffserv to (1) efficiently utilize the bandwidth on the service provider's network, and (2) enable customers to prioritize their own traffic. These capabilities are prerequisites for the delivery of the efficient and flexible services that enterprise customers demand and that yield enormous benefits to American businesses.

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[1] *See Further Inquiry Into Two Under-Developed Issues in the Open Internet Proceeding*, Public Notice, DA 10-1667, GN Dkt. No. 09-191, WC Dkt. No. 07-52 (rel. Sept. 1, 2010) ("*Public Notice*").

The regulatory guidelines for specialized services discussed in the Public Notice seem to reflect a concern that, if specialized services packets are given greater priority than BIAS packets (even at the direction of the end-user customer), a customer may not receive peak Internet access speeds at all times. But enterprise customers must be free to make their own traffic prioritization decisions, even if that means that certain classes of non-BIAS traffic are effectively granted priority over BIAS traffic. Indeed, TWTC's customers often purchase an access connection used to transmit both BIAS traffic and other traffic such as VoIP, telemedicine data, or cloud computing data. Many customers decide that the performance of non-BIAS traffic (e.g., enterprise VoIP, telemedicine, or cloud computing) delivered over the access link should be given precedence over BIAS traffic. TWTC and other service providers' prioritization services, enabled by Diffserv and similar technologies, allow *the customer* to dynamically allocate its available bandwidth at peak traffic periods to ensure that services *of most importance to the customer* continue to function. Whatever rules the FCC adopts in this proceeding, it should continue to allow service providers to offer such customer-driven arrangements.

In addition, the FCC should encourage and under no circumstances prevent or undermine carriers from entering into arrangements to exchange and honor priority labels sent across networks. As customers increasingly demand that a single carrier serve all of their locations with advanced IP-based services, carriers, particularly those with limited on-net footprints, must be able to utilize off-net (i.e., leased) facilities to provide services. Arrangements to exchange and respect priority labels across networks, including carrier-to-carrier agreements and standards for uniform traffic exchange, could well enable

carriers to serve new locations with innovative products. The result will be lower costs and more choices for consumers.

II. SERVICES THAT UTILIZE LABELING AND PRIORITIZATION YIELD SUBSTANTIAL EFFICIENCIES AND ENABLE FEATURES NOT AVAILABLE OVER THE "BEST EFFORT" INTERNET

TWTC relies on network management techniques to efficiently manage its core network capacity. In addition, TWTC primarily uses techniques such as Diffserv to carry out TWTC's customers' choices as to the traffic that should be prioritized.

TWTC generally provides its customers with network prioritization functionalities pursuant to service level agreements ("SLAs"). As TWTC has explained, under an SLA, the service provider generally agrees to deliver the customer's traffic according to the customer's chosen quality of service ("QoS") parameters that support the applications demanded or provided by the customer. These QoS parameters encompass performance categories such as delay in the delivery of packets,[2] variation in such delay (i.e., jitter), packet loss, throughput and service availability.[3] TWTC, like other service providers, often "packages" these QoS parameters into different Classes of Service ("CoS") designed to support a particular application or set of applications.[4] Each traffic class is prioritized within the BIAS provider's network so that traffic with higher CoS "labels" is

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[2] *See* John Evans & Clarence Filsfils, *Deploying IP And MPLS QoS For Multiservice Networks: Theory and Practice*, at 4-6 (Morgan Kaufmann 2007) ("*Deploying QoS*").

[3] *See id.* at 2.

[4] *See id*. at 3 ("SLAs may be defined in absolute terms, e.g., a worst-case one-way delay of 100 ms, or may be defined statistically, e.g., a loss rate of 0.01%. ... How the loss rate is measured and calculated needs to be defined in order to understand what impact the 0.01% loss rate will have on the end applications; 1 lost packet in every one hundred packets may not have a significant impact on a VoIP call, but 10 consecutive packets dropped out of 1000 will cause a glitch in the call that is audible to the end-user.").

given precedence over other, less time-sensitive classes. Diffserv and similar technologies are the mechanisms used to apply these CoS "labels."

CoS labeling saves both TWTC and its customers substantial costs. *First*, CoS labeling allows TWTC to use its core network capacity efficiently. For example, if a substantial number of customers make phone calls concurrently, the core network will dynamically allocate capacity from best effort class (e.g., Internet access, e-mail) to the priority class (e.g., VoIP) to ensure that there is sufficient capacity to carry all VoIP packets without quality degradation.[5] At the same time, while there may be less bandwidth available for "best effort" BIAS traffic, the customer likely will not perceive a slow-down in service. In this way, Diffserv and other traffic management and labeling techniques allow the core to be "oversubscribed,"[6] reducing provisioning costs.

Second, CoS labeling allows TWTC's customers to purchase significantly less bandwidth than would otherwise be the case. Without the ability to label and prioritize traffic, customers would have to purchase entirely separate physical connections for each service to ensure that traffic from one service does not interfere with and degrade the

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[5] *See id.* at 250-251 ("Diffserv…allows per-class virtual backbones to be built on a single physical backbone. Diffserv simply extends the concept of over-provisioning to multiple classes. … VoIP capacity [can] be over-provisioned by a factor of at least 2 relative to the average class load, hence ensuring the class receives low-delay, low-jitter and low-loss service…This would result in a bandwidth saving over the non-Diffserv case. … Diffserv also provides isolation between different service classes; in unforeseen congestion; different services no longer need to share the same fate as Diffserv ensures that issues in one service class are isolated from impacting other classes.").

[6] *See id.* at 393 ("The chief benefit of traffic engineering is one of cost saving. Traffic engineering gives the network designer flexibility in how to manage their backbone bandwidth in order to achieve their SLAs. The more effective use of bandwidth potentially allows higher SLA targets to be offered with the existing backbone bandwidth. Alternatively, it offers the potential to achieve the existing SLA targets with less backbone bandwidth or delay the time until bandwidth upgrades are required.").

performance of other services. For example, as TWTC has explained, companies are moving away from traditional ISDN video conferencing systems.[7] These legacy services require a dedicated ISDN link between all offices demanding the service. Traditionally, the ISDN link was separate from the phone PBX system which was again separate from the Internet access connection. All of these separate systems had dedicated bandwidth, and, in many cases, separate physical interfaces (e.g., a separate eight line PBX for phone service, a 56k ISDN line for video conferencing and a 1.544 Mbps T-1 line for data). With CoS labeling and network prioritization, a single physical interface at a lower aggregate bandwidth and cost can provide the same functionality.[8]

III. BIAS PROVIDERS SHOULD CONTINUE TO BE ALLOWED TO CHARGE FOR THE BENEFITS PROVIDED BY TRAFFIC PRIORITIZATION

Whatever action the FCC takes in this proceeding, it must continue to permit the traffic labeling and prioritization practices described above and permit carriers to charge for such prioritization. The recent debate over Diffserv and whether Diffserv "authorizes" paid prioritization is a red herring.[9] Diffserv is simply a standard (one of many) established by an independent group (the IETF) which allows traffic to be labeled

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[7] *See Preserving the Open Internet Broadband Industry Practices*, Reply Comments of tw telecom, GN Dkt. No. 09-191, WC Dkt. No. 07-52, at 12 (filed Apr. 26, 2010) ("TWTC Reply Comments").

[8] *See id.* at 13-14.

[9] *See* Press Release, Free Press, *Internet Engineering Task Force Says 'AT&T is Misleading' on Net Neutrality* (Sept. 8, 2010), *available at* http://www.freepress.net/press-release/2010/9/8/internet-engineering-task-force-says-%E2%80%98att-misleading%E2%80%99-net-neutrality.

and prioritized within and among private networks.[10] Whether or not the IETF has *endorsed* a particular use for that standard (i.e., differential pricing) has no bearing on whether or not the FCC should permit the standard to be used in that manner.

In any event, there can be no doubt that a service which allows customers to prioritize traffic provides value over and above a service which does not allow such prioritization.[11] Accordingly, TWTC and other service providers charge a fee for Diffserv-enabled labeling and prioritization.[12] Preventing service providers from charging for prioritization would eliminate the incentive to develop and offer prioritization. As explained, without the ability to prioritize traffic, entire categories of service would be unavailable and BIAS providers' and customers' costs would increase substantially.

TWTC sells the ability to prioritize traffic as an "add on" to its existing virtual private networking ("VPN") service. As is the case with many other carriers, TWTC provides IP VPN using Multi-Protocol Label Switching ("MPLS") technology. MPLS

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[10] *See* Information Technology & Innovation Foundation Reply Comments at 7 (attached to *Ex Parte* Letter from Richard Bennett, ITIF, to Chairman Genachowski *et al*., GN Dkt. No. 09-191, WC Dkt. No. 07-52 (Aug. 9, 2010)) ("ITIF Reply Comments") ("Networks employ several means for identifying the desired class of service for particular packets above and below the level of the Diffserv option in the Internet Protocol; Quality of Service designators are found in IEEE 802.1(d) (VLAN), 802.3 (Ethernet), and 802.11(e) Wi-Fi. They are also found in DOCSIS, DSL, in BGP Community Attributes and in MPLS.").

[11] *See id.* at 5 ("What point would there be in differentiating Internet packet services if every level of service had the same price?").

[12] *See id*. at 7 ("It's certainly clear that commercial Internet services are routinely sold with Service Level Agreements which specify differentiated pricing for differentiated transport services."); CDT Letter at 3 (arguing that it is unobjectionable to "charge business customers for the ability to prioritize certain services of their own choosing on their own networks.").

rides on top of the underlying layer 2 protocol used for last-mile access links (e.g., TDM or Ethernet).[13] MPLS allows the customer to mix and match access technologies within a single MPLS-enabled VPN. For example, one customer location in the VPN might be served by a 10 Mbps Ethernet access link, while another location is served by three DS1 channel terminations.

MPLS[14] utilizes a classification and prioritization scheme that works in concert with Diffserv.[15] By overlaying MPLS or Diffserv on top of layer 2 access links, the customer can prioritize and classify traffic seamlessly regardless of the layer 2 access technology.[16] In addition, the classification and prioritization schemes built into layer 2

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[13] *See* Cisco, Inc., *CISCO IOS Switching Services Configuration Guide: Multiprotocol Label Switching Overview* 4, *available at* http://www.pulsewan.com/data101/mpls.pdf. Layer 1 is the physical layer. *See also The TCP/IP Guide*: *Physical Later (Layer 1), available at* http://www.tcpipguide.com/free/t_PhysicalLayerLayer1.htm.

[14] Both MPLS and Diffserv are IETF standards. *See* E. Rosen & Y. Rekhter, Cisco Systems, Inc., *BGP/MPLS VPNs* (March 1999) (describing MPLS), *available at* http://www.ietf.org/rfc/rfc2547.txt.

[15] *See A Network Engineers' Primer on Broadband Internet Access Service and Reasonable Network Management Practices for Wireline Networks* 22 (attached to *Ex Parte* Letter from Thomas Cohen, Counsel, Fiber to the Home Council, to Marlene H. Dortch, Secretary, FCC, GN Dkt. No. 09-191, WC Dkt. No. 07-52 (Aug. 12, 2010)) ("Diffserv is a relatively simple scheme for classifying traffic into a small number of service or applications classes in order to give priority to certain traffic types. … Diffserv is often used in association with MPLS, which adds a label to packets traversing an IP network. With MPLS, data packets are assigned labels and packet forwarding decisions are [based] solely on the contents of this label, without the need to examine the packet itself allowing the creation of virtual end-to-end circuits across the network. Among other things, these methods permit different Classes of Service ("CoS") to be applied to different applications…."); *Deploying QoS* at 173 ("Diffserv can be applied in an MPLS network essentially in the same way as a plain IP network.").

[16] *See, e.g.*, IP Infusion Inc., *Quality of Service and MPLS Methodologies* (2004), http://www.ipinfusion.com/pdf/IP_InfusionQoS_MPLS2.pdf; Protocols.com, *Diffserv Vs. MPLS* (last visited Oct. 11, 2010), http://www.protocols.com/papers/diffserv.htm ("Diffserv (differentiated services) and MPLS (Multiprotocol Label Switching) are two separate standards which purport to help solve the IP quality problem. Diffserv takes the

technologies (e.g., Ethernet)[17] can work with and be mapped to MPLS and Diffserv classes.[18]

TWTC sells three levels of VPN service.[19] TWTC's "IP VPN" service does not offer traffic prioritization on either the end-user link *or* within the TWTC core network.

IP TOS (type of service) field, renames it the DS byte, and uses it to carry information about IP packet service requirements. It operates at Layer 3 only and does not deal with lower layers. On the other hand, MPLS specifies ways that Layer 3 traffic can be mapped to connection-oriented Layer 2 transports like ATM and Frame Relay. MPLS adds a label containing specific routing information to each IP packet and allows routers to assign explicit paths to various classes of traffic. It also offers traffic engineering and techniques that can boost IP routing efficiency."); *Deploying QoS* at 190 ("Other considerations can apply to multi-access layer 2 technologies, such as ATM, Frame Relay and Ethernet, which have some of their own explicit QoS capabilities at layer 2; in such cases end-to-end IP SLAs can be achieved by interworking between layer 3 QoS functions and the underlying layer 2 QoS capabilities.…").

[17] *See* White Paper, Altera Corp., *Increase Flexibility in Layer 2 Switches by Integrating Ethernet ASSP Functions into FPGAs* 3-4 (Feb. 2006), *available at* http://www.altera.com/literature/wp/ wp-aab091005.pdf.

[18] *See Deploying QoS* at 196 ("The use of the [Ethernet VLAN tag] is analogous to the use of the DSCP field in IP and the EXP field in an MPLS network; the field is used to indicate the 'priority' of the frame, which is used to determine the forwarding behavior of that frame at each bridging hop."); White Paper, Cisco Systems, *Diffserv -- The Scalable end-to-End Quality of Service Model* 4 (Aug. 2005), http://www.cisco.com/en/US/technologies/tk543/tk766/technologies_white_paper09186a00800a3e2f.pdf ("Before the IETF defined IP (Layer3) QoS methods, the International Union for Telecommunications, Telecommunications (ITU-T), the Asynchronous Transfer Mode (ATM) Forum, and the Frame-Relay Forum (FRF) had already arrived at standards to perform Layer2 QoS in ATM and Frame-Relay networks. … Though these rich QoS mechanisms exist in Layer2 transport technologies, true end-to-end QoS is not achievable unless a Layer3 solution is overlaid. Service providers offering both ATM/Frame-Relay and IP services want to provide robust QoS solutions to customers. Mapping Layer3 QoS to Layer2 QoS is the first step toward achieving a complete solution that does not depend on any specific Layer2 technology. … Introduction of a Gigabit Ethernet link somewhere along the path of a packet poses no problem to deliver QoS, as the Layer3 QoS is still preserved and can even be enhanced by mapping to the 802.1p (user-priority) QoS mechanism on Ethernet (RFC-1349).").

[19] A VPN connects a customer's locations and (usually) connects those locations to the Internet. A VPN allows the transmission of private and internet data between and among the locations served by the VPN. *See* Jeff Tyson, *How Virtual Private Networks Work*, HowStuffWorks, *at* http://www.howstuffworks.com/vpn.htm (last visited Oct. 11).

All packets are treated with the same priority within the network. TWTC's "IP VPN Premium" service permits traffic prioritization on both the TWTC core network and on the end-user link, but the customer must manage its own equipment to achieve its desired prioritization settings. TWTC's "Managed IP VPN" also permits traffic prioritization on both the end-user link and within the TWTC core network, but TWTC executes the customer's prioritization settings so that the customer need not do so itself.

Importantly, all classification and prioritization decisions for TWTC's IP VPN traffic are made by TWTC's customer, not by TWTC or a third party. For example, TWTC's IP VPN services (IP VPN Premium and Managed IP VPN) allow the customer to separate its traffic into up to five different classes of service. The customer can either utilize "off-the-shelf" classes or define and select its own classes.[20] The lowest class, with no QoS guarantees, can be used by the customer for best effort traffic (e.g., Internet access traffic) while the highest class could be reserved for VoIP[21] or desktop virtualization programs which need low latency and jitter to operate efficiently.

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[20] *See* tw telecom, *IP VPN*, at 2 (Feb. 2009) ("With tw telecom's IP VPN Premium, you can manage multiple applications that are competing for the same network resources by prioritizing traffic with 5 service classes."), *available at* http://www.twtelecom.com/Documents/Resources/PDF/MarketingCollateral/twtc_IP_VPN_2250.pdf; tw telecom, *Managed IP VPN Services*, at 1 (Jan. 21, 2009) ("Managed IP VPN provides customers with five optional service classes. This Class of Service (CoS) feature provides a mechanism for managing traffic in a network by logically grouping similar traffic profiles, or applications. Each group is defined within its own 'Service Class' and Service Level Agreement (SLA), related to end-to-end tolerance specifications based on packet delay, packet loss and jitter. *You may choose to utilize tw telecom's CoS Policy template or customize your CoS policies based on your own unique applications and requirements—you decide with tw telecom's Managed IP VPN service*.") (emphasis added), *available at* http://www.twtelecom.com/Documents/Resources/PDF/MarketingCollateral/TW_22501bManagedIPVPN.pdf.

[21] *See* Doug Mohney, *tw telecom Scores 51 Site IP VPN Deal*, Fierce Telecom, Mar. 2, 2009 ("Suncoast's old network was a point-to-point designated and has been fully

The following example illustrates the manner in which TWTC's customer-driven prioritization model can be used. Assume that a TWTC IP VPN customer location is served by a 10 Mbps Ethernet access circuit. The customer could designate that one Mbps of bandwidth will be used to receive the highest class of traffic available. For example, that one Mbps virtual circuit could be reserved for VoIP calls to ensure that multiple VoIP calls could be sent or received at the same time.[22] When there are no calls on the network, the one Mbps reserved for VoIP service could be reallocated for another, lower priority class used for BIAS. As a result, BIAS performance would improve.[23] As soon as the VoIP packets begin to flow again, those packets would take precedence over all other traffic until the one Mbps ceiling is reached.

The Commission should ensure that it does not adopt rules that undermine service providers' ability to continue to offer these services and to charge for them. For example, because of the user-driven nature of specialized services, it would not make any sense for the FCC to adopt regulations that either (1) place caps or limits on the bandwidth that

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replaced by an IP VPN with Class of Service. … CoS is important as it allows Suncoast to prioritize critical transmissions as needed and to give priority to voice traffic on the network."), *available at* http://www.fiercetelecom.com/story/tw-telecom-scores-51-site-ip-vpn-deal/2009-03-02.

[22] *See Deploying QoS* at 214 ("The [service provider] will normally limit the maximum percentage of the access link bandwidth that is available for th[e VoIP] class in order to ensure that the class latency commitments can be met."); *id*. at 217 ("The contract will stipulate that classification criteria that the SP will use to identify the VoIP class at the network edge. … Once classified and policed, conformant traffic with be marked with a defined Diffserv codepoint (DSCP) value $D_{v,}$ … such that within the network core, traffic classes can be identified by their DSCP markings.").

[23] *See id.* at 218 ("The std class SLA is defined in terms of a specified bandwidth, availability, and commitment for per flow sequence preservation. Jitter is not important for this class and thus it is not defined, … This class can re-use any other class's idle bandwidth up to the available [access] link bandwidth.").

could be allocated to specialized services or (2) that prevent specialized services from "crowding out" broadband Internet access services even at times of peak network usage.[24] The very purpose of specialized services generally and CoS-enabled services specifically is to permit customers to decide when to throttle down lower priority services (such as broadband internet access) to ensure that critical, delay sensitive services, such as voice and video, can continue to operate at peak performance.

Finally, it is also important to note that TWTC does not prioritize Internet access traffic bound for its customers. For example, if a TWTC IP-VPN customer initiated two separate video conference calls with locations not on TWTC's network, TWTC cannot of course control the bandwidth allocated to or the prioritization given to the video traffic on the portion of the transmission path that is outside of TWTC's network.[25] In addition, when those video packets enter TWTC's network, TWTC treats them as BIAS traffic and gives priority according to the customer designated CoS parameters for Internet access (likely best effort).

IV. THE FCC SHOULD PERMIT AND ENCOURAGE THE USE OF DIFFSERV OR OTHER NETWORK PRIORITIZATION SCHEMES ACROSS NETWORKS

Enterprise customers increasingly demand that their service provider serve most or all of the enterprise customers' locations. TWTC and other competitors often cannot

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[24] *See Public Notice* at 4 ("*Guaranteed Capacity for Broadband Internet Access Service*: Require broadband providers to continue providing or expanding network capacity allocated to broadband Internet access service, regardless of any specialized services they choose to offer. Relatedly, prohibit specialized services from inhibiting the performance of broadband Internet access services at any given time, including during periods of peak usage.").

[25] Unless, as explained below, it has an arrangement to preserve CoS labels across networks.

deploy transmission facilities to all of a customer's locations. Competitors must therefore serve many customer locations via leased off-net facilities. But in order for TWTC to offer a customer served by such off-net facilities the capability to utilize traffic prioritization, it is necessary that CoS and QoS information be transmitted and honored between TWTC's network and the network of the off-net facility provider. It follows that internetworking arrangements which allow, for example, the transmission and preservation of Diffserv and MPLS labels between and among network owners, are crucial for companies like TWTC with limited on-net connectivity to serve and expand their addressable market.

It is true that Diffserv and other traffic prioritization schemes have traditionally only been utilized within a single provider's network, rather than among multiple providers.[26] This is because it is difficult to ensure that a terminating provider will respect the originating provider's priority markings.[27] As several commenters have noted, Diffserv and MPLS do not establish the SLAs of each class or how many classes a provider must offer; that task is left up to the provider in cooperation with its end-user customer.[28]

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[26] *See* T. Li & Y. Rekhter, *A Provider Architecture for Differentiated Services and Traffic Engineering*, Network Working Group, § 3.0 (Oct. 1998), *available at* http://www.faqs.org/rfcs/rfc2430.html.

[27] *See id.*

[28] *See* ITIF Reply Comments at 6 ("In the packet forwarding path, differentiated services are realized by mapping the codepoint contained in a field in the IP packet header to a particular forwarding treatment, or per-hop behavior. … The code points may be chosen from a set of mandatory values defined later in this document, from a set of recommended values to be defined in future documents, or may have purely local meaning."); Alcatel-Lucent Comments, GN Dkt. No. 09-191, WC Dkt. No. 07-52, at 12 (Jan. 14, 2010) ("The Commission should defer to service providers and consumers, who should be free to define the performance parameters of a class of service."); AT&T

There are several ways in which service providers can maintain CoS markings for traffic that traverses another service provider's network. *First*, in the absence of an agreement between service providers, the service provider leasing a circuit at an off-net location can place network equipment at the off-net customer premises. This equipment essentially allows the leased access link to operate as part of the leasing provider's network. The service provider leasing the circuit is able to preserve CoS markings transmitted to and from off-net and on-net locations. Unfortunately, this solution is expensive to implement because of the cost of the electronics, maintenance, and the extra truck-roll necessary for installation.

Second, a service provider can enter into a network-to-network interconnection agreement ("NNI") with another service provider. For example, TWTC has entered into an NNI with another service provider to serve customers in international destinations.[29] That agreement specifies that three different classes of service with SLAs will be maintained across TWTC's and the other service provider's network. Each class has separate packet delivery and latency SLAs which TWTC's partner has committed to achieve.

Third, standards-setting bodies are working to establish standardized classes with set SLAs for the exchange of traffic. These standardized classes would diminish the need

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Comments, GN Dkt. No. 09-191, WC Dkt. No. 07-52, at 67 (Jan. 14, 2010) ("Choices among queuing techniques—the algorithms that determine the manner in which buffers sequentially deliver traffic to transport links—are inherently provider-specific, and there 'are no real industry standards.'").

[29] *See* Press Release, tw telecom, *tw telecom Announces Global Expansion of IP VPN Service Portfolio* (Aug. 10, 2009), *available at* http://www.twtelecom.com/Documents/Announcements/News/2009/Global_VPN_Expansion_FINAL.pdf.

for detailed bilateral, provider-to-provider agreements. For example, initiatives like the Metro Ethernet Forum's ("MEF") E-NNI framework seek to establish standardized classes and SLAs for Ethernet traffic so that little additional interprovider negotiation is necessary. Once a service provider is MEF "certified," by standardizing its classes in accordance with the E-NNI standard, it could be assured that its class markings will be preserved when transmitted over another BIAS provider's network.[30] While the E-NNI standard was ratified earlier this year, BIAS providers are only now beginning to implement the standard.[31]

There is widespread agreement in the record that these arrangements yield important benefits and that they must not be prohibited or undermined by FCC regulations.[32] It is important that the FCC does not restrict the ability of service providers

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[30] *MEF Ratified ENNI Spec*, LightReading, Feb. 11, 2010, *available at* http://www.lightreading.com/document.asp?doc_id=187856 ("This specification, which standardizes the reference point between service providers' MEF Certified Carrier Ethernet networks and services, marks a significant advance in the MEF's Global Interconnect Program. It will greatly accelerate the current lengthy and complex process of matching different providers' Carrier Ethernet services. By supporting standardized interconnect and Ethernet services spanning multiple-operator Ethernet networks, and bringing issues such as CoS, SLAs and management into line, the ENNI will have a major impact on the industry, with new global business opportunities for service providers and vendors. It will also generate even wider opportunities for world business with its promise of fast and cost-effective global interconnection.").

[31] *See id.*; *see also* Press Release, Glowpoint, Inc., *Glowpoint Aligns with Equinix to Offer Enhanced Managed Services to End Users Globally via Equinix Ethernet Exchange* (Sept. 14, 2010), *available at* http://www.equinix.com/news/press/glowpoint-aligns-with-equinix-to-offer-enhanced-managed-services-to-end-sers-globally-via-equinix-ethernet-exchange/.

[32] *See* Letter from Robert W. Quinn, Jr., Senior VP, Fed. Regulatory, and Chief Privacy Officer, AT&T, to Marlene H. Dortch, Secretary, FCC, GN Dkt. Nos. 09-191 & 10-127, at 4 (Sept. 15, 2010) ("OTI and CDT further agree with AT&T that prioritization of Internet traffic on an 'end to end' basis 'across multiple networks' is consistent with IETF specifications.").

to establish arrangements to preserve CoS and QoS across networks. These agreements are particularly important to BIAS providers with limited on-net networks. Their continued development will facilitate additional competition in the marketplace, resulting in lower prices and increased competition.

V. CONCLUSION

The Commission should ensure that the rules adopted in this proceeding enable BIAS providers to provide the specialized services to enterprise customers.

Respectfully submitted,

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