

April 14, 2016

**VIA ECFS**

***EX PARTE***

Ms. Marlene H. Dortch  
Secretary  
Federal Communications Commission  
445 12th Street, SW, Room TW-A325  
Washington, DC 20554

**Re: *In the Matter of Special Access Rates for Price Cap Local Exchange Carriers, WC Docket No. 05-25; AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services, RM-10593***

Dear Ms. Dortch:

The purpose of this letter is to supplement the record in the above-referenced proceedings regarding the extent to which Ethernet services provided by cable companies via their hybrid fiber/coaxial networks (“Ethernet-over-HFC”) are viable competitive alternatives to Ethernet provided via incumbent LEC conditioned copper and DSn loops (“Ethernet-over-legacy loops”) or Ethernet provided via fiber loops (“Ethernet-over-fiber”).

In a declaration filed in support of the Joint CLECs’ comments in the above-referenced proceedings, Chris McReynolds of Level 3 explained that Level 3 does not consider Ethernet-over-HFC service to be competitive with the dedicated services<sup>1</sup> that Level 3 sells.<sup>2</sup> In another

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<sup>1</sup> As used herein, the term “dedicated service” has the meaning defined in the mandatory data request. *See Special Access for Price Cap Local Exchange Carriers; AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, Order on Reconsideration, 29 FCC Rcd. 10899, App. A (2014) (defining “dedicated service” as a service that “transports data between two or more designated points, *e.g.*, between an *End User’s* premises and a point-of-presence, between the central office of a local exchange carrier (LEC) and a point-of-presence, or between two *End User* premises, at a rate of at least 1.5 Mbps in both directions (upstream/downstream) with prescribed performance requirements that include bandwidth-, latency-, or error-rate guarantees or other parameters that define delivery under a *Tariff* or in a service-level agreement”).

<sup>2</sup> *See* Declaration of Chris McReynolds, Level 3, ¶ 22 (attached as App. A to Comments of Birch, BT Americas, EarthLink, and Level 3, WC Docket No. 05-25, RM-10593 (filed Jan. 27, 2016) (“Joint CLECs Comments”)) (“McReynolds Decl.”).

declaration filed in support of the Joint CLECs' comments, Gary Black, Jr. of Level 3 explained that Level 3 cannot rely on Ethernet-over-HFC as an input to the dedicated services that Level 3 sells to its customers.<sup>3</sup> Both Messrs. McReynolds and Black explained that Ethernet-over-HFC is available only in a relatively small number of locations and that, where it is available, such services are often subject to high levels of jitter and a relatively low maximum transmission unit ("MTU"), and are generally less reliable than Ethernet-over-fiber or dedicated services offered by incumbent and competitive LECs.<sup>4</sup> Several other parties to this proceeding have reached similar conclusions.<sup>5</sup> We provide further detail on these issues below.

*First*, the jitter levels associated with Ethernet-over-HFC are too high to meet the needs of most of the customers that demand dedicated services. Ethernet-over-fiber and Ethernet-over-legacy loop services are typically offered subject to service level agreements ("SLAs") under which the service provider commits to jitter levels low enough to support real-time applications, such as video and voice applications.<sup>6</sup> These SLAs typically require that the service provider pay penalties to customers if the service provider fails to meet the jitter commitment. In contrast, Ethernet-over-HFC is not typically offered subject to SLAs with performance commitments for jitter. Instead, Ethernet-over-HFC is typically offered with service level objectives for jitter that do not require the cable company to pay customers a penalty if they fail to meet these objectives. Even the jitter *objectives* for Ethernet-over-HFC are set at levels that are significantly higher (*i.e.*, at lower performance levels) than the *commitments* typically made by Ethernet providers under SLAs and at levels that are too high to reliably support real-time applications.<sup>7</sup>

Furthermore, the actual jitter levels Level 3 has observed in tests of Ethernet-over-HFC offerings by cable companies are far higher than the jitter levels observed in Ethernet-over-fiber or Ethernet-over-legacy loops. And, importantly, the actual jitter levels observed for Ethernet-over-HFC are significantly above the levels needed to reliably support real-time applications, whereas the actual jitter levels observed for Ethernet-over-fiber and Ethernet-over-legacy loops

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<sup>3</sup> See Declaration of Gary Black, Jr., Level 3, ¶ 19 (attached as App. B to Joint CLECs Comments).

<sup>4</sup> *Id.*; McReynolds Decl. ¶¶ 18, 22.

<sup>5</sup> See, e.g., Letter from Jennifer Bagg, Counsel for Sprint, to Marlene Dortch, FCC, WC Docket No. 05-25, RM-10593, at 5-9 & Attach. B (filed Mar. 24, 2016) ("Sprint March 24 Ex Parte"); Reply Comments of Windstream, GN Docket No. 13-5, WC Docket No. 05-25, & RM-10593, at 7 (filed Feb. 19, 2016).

<sup>6</sup> The levels of jitter to which service providers commit in SLAs for Ethernet-over-legacy loops are typically similar to those for Ethernet-over-fiber.

<sup>7</sup> See, e.g., Comcast Enterprise Services Product-Specific Attachment Ethernet Transport Services, Attachment Identifier: Ethernet Transport, Version 1.5 ("Comcast Ethernet PSA"), [http://business.comcast.com/terms-conditions-ent/Enterprise\\_Ethernet-Transport-Services-PSA](http://business.comcast.com/terms-conditions-ent/Enterprise_Ethernet-Transport-Services-PSA).

do reliably support real-time applications.<sup>8</sup> Such applications include, among other things, video conferencing, business voice services, and certain financial applications. These applications are often critically important to competitive LECs' customers' businesses. Such customers therefore frequently insist that their service providers make commitments in SLAs to jitter levels sufficiently low to support real-time applications, and that the service providers' actual performance supports such applications.

*Second*, the MTU supported by Ethernet-over-HFC is too small to meet the needs of many customers that demand dedicated services. MTU is a key performance standard for Ethernet because it has a significant effect on the rate and efficiency of throughput. The higher the MTU, the higher the rate of throughput. Ethernet-over-HFC delivers an MTU of 1518 bytes (1522 bytes with a single virtual LAN tag).<sup>9</sup> This is significantly below the MTU that can be supported by Ethernet-over-fiber and Ethernet-over-legacy loop networks, which are increasingly supporting MTUs far above 2,000 bytes. In fact, the MTU for Ethernet-over-HFC is so low that it cannot be used to offer service that meets the standards for Ethernet set forth by the Metro Ethernet Forum ("MEF"), which requires an MTU of at least 1522 bytes.<sup>10</sup> In other words, Ethernet-over-HFC cannot support MEF-compliant Ethernet service, rendering it simply unacceptable for the many customers that require such service.

The relative deficiencies of Ethernet-over-HFC have affected the manner in which cable companies offer those services to customers. Cable companies have made clear that these services are not to be viewed as a substitute for Ethernet transmission that supports real-time services. Unsurprisingly, cable companies also do not in most circumstances offer customers purchasing Ethernet-over-HFC the same performance capabilities (including jitter as well as other performance characteristics) or, relatedly, prioritization capabilities (also known as classes of service) that are available to Ethernet-over-fiber customers. This means that customers using Ethernet-over-HFC cannot be sure that traffic associated with applications that are sensitive to delay and packet loss will be transmitted at acceptable performance levels or adequately prioritized. Given that many purchasers of dedicated services demand such capabilities as a means of ensuring that real-time applications function reliably, this further supports the conclusion that such customers would not find Ethernet-over-HFC to be a substitute for the dedicated services they purchase today.

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<sup>8</sup> The actual jitter levels observed for Ethernet-over-legacy loops are typically similar to those for Ethernet-over-fiber.

<sup>9</sup> See Comcast Ethernet PSA, SCHEDULE A-1, Technical Specifications and Performance Standards for Services, § 5 ("For Services delivered On-Net HFC, frame sizes may not exceed 1518 MTU size (1522 with a single VLAN tag). All frames that exceed specifications shall be dropped.").

<sup>10</sup> See Metro Ethernet Forum Technical Specification MEF 6.2, EVC Ethernet Services Definitions Phase 3, § 8.4, at 18 (Aug. 2014), [https://www.mef.net/Assets/Technical\\_Specifications/PDF/MEF\\_6.2.pdf](https://www.mef.net/Assets/Technical_Specifications/PDF/MEF_6.2.pdf).

*Third*, Ethernet-over-HFC delivers speeds that are insufficient to serve many business customers' locations. Many parties, including the incumbent LECs, have discussed the fact that Ethernet-over-HFC typically delivers no more than 10 Mbps.<sup>11</sup> As Sprint recently explained, this means that customers that need more than 10 Mbps are unlikely to view Ethernet-over-HFC as a substitute for the many dedicated services that do deliver more than 10 Mbps.<sup>12</sup> Moreover, cable companies offer Ethernet-over-HFC only at capacities below 10 Mbps in many locations. There are also many locations in which Ethernet-over-HFC is not available at all.

Please do not hesitate to contact me if you have any questions or concerns regarding this submission.

Respectfully submitted,

/s/ Thomas Jones  
*Counsel for Level 3 Communications, LLC and EarthLink, Inc.*

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<sup>11</sup> *See, e.g.*, Letter from Maggie McCreedy, Verizon, to Marlene Dortch, FCC, WC Docket No. 05-25, RM-10593, at 3 (filed Mar. 1, 2016).

<sup>12</sup> *See* Sprint March 24 Ex Parte at 7 (“Because of bandwidth limitations alone, HFC services represent an insignificant constraint on pricing for the Ethernet services purchased by Sprint.”).