Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Connect America Fund	)	WC Docket No. 10-90
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
	)	
Establishing Just and Reasonable Rates for Local Exchange Carriers	)	WC Docket No. 07-135
	)	
High-Cost Universal Service Support	)	WC Docket No. 05-337
	)	
Developing a Unified Intercarrier Compensation Regime	)	CC Docket No. 01-92
	)	
Federal-State Joint Board on Universal Service	)	CC Docket No. 96-45
	)	
Lifeline and Link-Up	)	WC Docket No. 03-109
	)	

REPLY COMMENTS
OF
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Charter Communications, Inc. ("Charter") hereby submits reply comments on select issues raised in Sections XVII(M)-(R), (interconnection and intercarrier compensation related issues) of the Further Notice of Proposed Rulemaking ("FNPRM") issued by the Federal Communications Commission ("FCC" or "Commission") in the above-captioned dockets.[1]

[1] *In the Matter of Connect America Fund, et al.*, Report and Order & Further Notice of Proposed Rulemaking, FCC 11-161 (rel. Nov. 18, 2011) ("*Order and FNPRM*").

INTRODUCTION AND SUMMARY

The Commission's FNPRM properly asks what policies are necessary to enhance incentives for providers to deploy Internet protocol ("IP")-based networks and services. In so doing, the Commission recognizes that significant barriers to the deployment of such networks exist today, including the lack of any IP-to-IP interconnection regime.

Not surprisingly, incumbent providers oppose any further Commission action in this area, and raise a variety of arguments in opposition. But, as explained below, the opponents' arguments lack any compelling legal rationale and are inconsistent with existing Commission policies. Clarifying that the existing interconnection regime applies to IP-to-IP interconnection will enhance incentives for all providers to deploy IP networks and facilitate innovation in the voice services market by providing certainty to incumbents and competitors alike.

Similarly, the Commission should continue pro-competitive policies with respect to the other network interconnection and traffic exchange issues raised in the FNPRM. To wit, the Commission should recognize that incumbents have not demonstrated that transit services are competitive in all markets, and that such services are subject to Section 251(c) as a matter of law. Further, the Commission should reject incumbent LEC proposals to narrow the scope of current point of interconnection rules, and reduce the scope of incumbents' transport obligations under a new bill-and-keep regime. Adoption of these ILECs' proposals would effectively reverse much of Commission's pro-competitive interconnection policies.

Finally, the Commission should continue the process of implementing its new bill-and-keep regime by applying the same principle to all of the remaining transport rate elements not currently covered by the Commission's Order and FNPRM.

I. ADOPTING IP-TO-IP INTERCONNECTION REQUIREMENTS WILL FURTHER SOUND POLICY GOALS, AND IS SUPPORTED BY EXISTING STATUTORY AUTHORITY

A. The Commission Cannot Rely on The Market Alone to Advance IP-to-IP Interconnection

Opponents of IP-to-IP interconnection rules are, for the most part, the same companies whose incumbent LEC affiliates operate the largest TDM-based networks, and who have generally failed to upgrade such networks to IP infrastructure. Their strategy here is clear: do nothing to facilitate IP-to-IP interconnection arrangements with competitors, while at the same time telling the Commission that the "marketplace" will resolve the problem. For example, AT&T asserts that an IP interconnection mandate is unnecessary because such interconnection will develop "organically" (citing traffic exchange arrangements on the "commercial" Internet as support for this proposition).[2] Similarly, Verizon and CenturyLink assert that IP-to-IP interconnection arrangements for voice traffic should be allowed to develop through commercial arrangements,[3] and that the best way to promote the deployment of IP networks is to eliminate (rather than update) legacy interconnection regulations.[4]

But these opponents – with by far the greatest market share – have no incentive to facilitate such interconnection for their competitors, and both Congress and the Commission have long recognized that the market does not provide necessary incentives for incumbent providers to establish mutually-beneficial interconnection arrangements with competitors. Indeed, the Commission has previously found "that incumbent LECs have no ***economic incentive*** … to provide potential competitors with opportunities to interconnect with … the

[2] AT&T Comments at 13-14 (citing peering and transit services on Internet backbone).

[3] CenturyLink Comments at 36; Verizon Comments at 20.

[4] Verizon Comments at 21-22.

incumbent LEC's network and services."[5] Because of these economic realities, the Act and Commission regulations require interconnection among different carriers. That, in turn, has "enabled competition and the associated consumer benefits that [competition] brings through innovation and reduced prices."[6]

IP-to-IP interconnection is no different.[7] Market forces do not provide adequate incentives for incumbent LECs to establish IP-to-IP interconnection arrangements. First, though losing market share, several large incumbent LECs continue to serve the majority of voice subscribers in their particular local markets. Recent history tells us that competitors operating highly-efficient IP networks, and who seek IP-to-IP interconnection arrangements, will likely earn market share from these incumbents. Incumbents following their rational economic interests will thus seek to delay the entry and expansion of such competitors. Second, many incumbents have so far declined to upgrade their TDM networks with IP-capable equipment, despite the clear technical benefits of doing so.[8] They have not done so both because of the cost of the upgrades and because the status quo places economic and technical barriers on their IP-based competitors.[9]

AT&T's and Verizon's claims that IP-to-IP interconnection will develop without Commission intervention are based on misplaced reliance on traffic exchange and peering agreements for traffic on the public Internet. Internet traffic, however, is very different from the

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[5] *Order and FNPRM* at ¶ 1337 (emphasis added).

[6] *Id*. at 1009.

[7] *Id*. at ¶¶ 1366, and 1296 (inviting comment on role of "proper incentives" for IP-to-IP interconnection).

[8] Further, to the extent that intercarrier compensation obligations surrounding exchange of traffic over IP networks is unclear (notwithstanding the Commission's findings in paragraph 1340), incumbents will have no incentive to shift from cost recovery mechanisms associated with TDM-based interconnection.

[9] Again, the record supports these conclusions. While AT&T, Verizon, and others, claim the market will provide for such arrangements, they fail to identify with any specificity the existence or terms of such arrangements. *See also* Sprint Comments, WC Docket 10-90, et. seq. at 12 (filed Feb. 24, 2012) ("Last year, AT&T was unable to identify a single IP interconnection agreement that its ILEC affiliates had executed, and Verizon reported a total of one such agreement.").

managed voice traffic at issue here. Such voice traffic is not delivered via the public Internet because that medium brings latency, packet loss or delay, jitter, poor echo cancellation and distortion issues. Indeed, AT&T itself recognizes that the exchange of managed voice services requires "QoS-aware" internetwork traffic exchange arrangements;[10] but concedes that such arrangements are not addressed in existing Internet traffic exchange or peering agreements: "[d]ifferential packet handling is still uncommon for traffic exchanged between unaffiliated IP networks through ordinary peering and transit arrangements."[11] Thus, the Commission cannot rely upon the existence of peering arrangements for Internet traffic as a basis to conclude the market will address the lack of IP interconnection arrangements for managed voice services.

More important, the ILECs' arguments rely on assumptions that are contrary to the Commission's preliminary findings, evidence in the record, and the realities of IP interconnection arrangements in today's market. The Commission has repeatedly found that interconnection is a "critical" aspect of a competitive market,[12] but the record demonstrates that incumbent LECs have strong incentives not to upgrade their legacy TDM networks to IP networks – incentives that inhibit and distort the market.

The Commission can eliminate these disincentives by adopting an IP-to-IP interconnection regime based upon the same statutory construct that exists today, 47 U.S.C. Sections 251 and 252, and related FCC rules. Doing so will put in place incentives for incumbents to upgrade their voice networks with IP-compatible equipment. That result is consistent with the Commission's larger policy objective of incentivizing and facilitating the

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[10] AT&T Comments at 18.

[11] *Id*. Although AT&T argues that such agreements are emerging, it can cite to only two such agreements –each with the largest incumbent providers in the United Kingdom (BT), and France (Orange). *Id*. at 19.

[12] *Order and FNPRM* at ¶ 1335.

deployment of IP networks.[13]

Further, a failure to impose an appropriate IP-to-IP interconnection mandate here has the perverse effect of limiting the interconnection options of those providers, like Charter, that have already deployed IP networks. Such providers are forced to assume IP-to-TDM "down" conversion costs in order to exchange traffic with incumbents operating legacy-TDM networks.[14] Consequently, any Commission decision not to act here would, in effect, penalize those competitors that have invested in deploying IP networks, while at the same time rewarding those providers that choose not to invest in such technology, or deploy IP networks. That result reduces incentives to upgrade local networks, and improperly shifts conversion costs on those entities that have invested in IP networks. The Commission should address this problem by mandating IP-to-IP interconnection arrangements as a natural extension of the TDM interconnection arrangements that are mandated by federal law today.

B. An IP Interconnection Mandate Will Promote (Rather Than Impede) Innovation

Large ILECs also assert that the adoption of any IP-to-IP interconnection regime will impede innovation.[15] This oft-repeated claim is unpersuasive. As Charter and other commenters have explained, the Commission can *facilitate* innovation by affirming that the current network interconnection rules of Section 251(c)(2) and FCC regulations apply to IP-to-IP interconnection.[16] These rules have enabled competition and innovation to flourish. For example, in reliance on these rules cable VoIP providers have been able to gain market share by

[13] *Id*.

[14] *See* Cablevision and Charter Comments on FNPR CAF Support Issues; WC Docket 10-90, et. seq., at 3 (filed Jan. 18, 2012).

[15] AT&T Comments at 16, CenturyLink Comments at 39, Verizon Comments at 21.

[16] *See, e.g.*, Charter Communications Initial Comments, WC Docket 10-90 at 8-9 (filed Feb. 24, 2012).

offering VoIP services on highly competitive rates and terms.[17] Equally important, continuing to apply them to IP-to-IP interconnection provides for operational certainty for next generation voice providers, which promotes (rather than impedes) further innovation in the market.

C. IP Interconnection Arrangements Are Technically Feasible and Do Not Require the Development of A "Yet Unbuilt, Superior" Network

The incumbents' claims that IP interconnection arrangements are technically infeasible or would require them to provide a "yet unbuilt, superior" network are simply false.[18] In fact, the entities with the largest ILEC operations, AT&T, Verizon, and CenturyLink have already developed IP networks that operate alongside their existing TDM networks.

These providers hold themselves out as capable of providing IP interconnection, and IP to PSTN network termination services, for preferred commercial and wholesale partners.[19] For example, AT&T offers a service branded as AT&T VoIP Services which purports to provide "transport and termination of [] domestic and international VoIP traffic…"[20] The company explains that "AT&T's IP domain interoperates with the broader Public Switched Telephone Network (PSTN),"[21] and provides termination of "non-native" IP traffic, which is defined as "traffic that originates as TDM, undergoes a protocol conversion to IP in your network and is then ***transported as IP from your network to AT&T's***."[22] In other words, AT&T can accept IP

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[17] *See FCC Local Telephone Competition Report* at 16, Chart 5, Ind. Analysis and Tech. Division, Wireline Competition Bureau (rel. Oct. 2011) (cable VoIP technology holds majority of non-ILEC retail VoIP lines and subscriptions). In addition, the growth of cable VoIP and other over the top VoIP providers so incentives for equipment manufacturers to further innovate in the development of devices serving the IP voice market.

[18] CenturyLink Comments at 47-8 (arguing that an IP-to-IP interconnection mandate would require the incumbent LECs to build a "yet, unbuilt superior" network, which the Eighth Circuit found impermissible under Section 251.).

[19] *See, e.g*., Comments of EarthLink, WC Docket 11-119, tw telecom Petition for Declaratory Ruling, at 8-9 (filed Aug. 30, 2011) (explaining that AT&T comments filed in WC Docket 11-119 confirm that the company, and its affiliates, have deployed IP networks and are offering IP-based services, and they are converting IP traffic to TDM for transmission and routing on the PSTN where necessary.") *Id*. at 8 (citing AT&T Comments, WC Docket 11-119 at 8 (filed Aug. 15, 2011).

[20] *See* AT&T VoIP Services Brochure (attached, hereto, as Exhibit A).

[21] *Id*.

[22] *Id*. (emphasis added).

traffic onto its IP network, and can then deliver that traffic to its own legacy TDM-PSTN network. Verizon,[23] and other incumbent LECs, offer similar services.

Also, CenturyLink asserts that today the company's ILEC affiliates generally are not offering IP-based services, and generally have not deployed the media gateways and other equipment necessary to exchange traffic in IP format.[24] But these statements don't square with the company's own marketing literature. Specifically, CenturyLink advertises a service called "IP Voice 1+ Termination" which provides, among other things, the capability to hand "your IP voice traffic directly to CenturyLink" who will then "transport the IP voice call streams … and terminate the calls to the PSTN."[25] CenturyLink also explains that its IP network includes "Session Border Controller[s]" and "media gateways" which are used to terminate domestic and international traffic "to the PSTN via TDM."[26]

Thus, it is clear that at least with respect to the largest incumbent LECs, they ***already have*** the technical capability to interconnect and exchange IP traffic.[27] There is, therefore, no credible basis for these companies to claim that IP interconnection is technically infeasible or would require them to build a "yet unbuilt, superior" network.

D. <u>The Commission Has the Necessary Authority Under Section 251</u>

Opponents of IP-to-IP interconnection also argue that the Commission lacks authority under Section 251 to mandate these arrangements. For example, AT&T argues that Section

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[23] *See* Verizon commercial IP termination service brochure, (attached, hereto, as Exhibit B), *also available at*: http://www22.verizon.com/wholesale/solutions/solution/carrier%2Bip%2Bterm%2Bsip.html

[24] CenturyLink Comments at 48.

[25] *See* "CenturyLink IP Voice 1+ Termination" (attached, hereto, as Exhibit C); *also available at*: http://centurylink.cm/wholesale/pcat/natipvoiceterm.html.

[26] *Id*. While this service appears to be primarily targeted to IXCs, there is no dispute that the same technology can be used to exchange "local" IP traffic with competitive LECs.

[27] Indeed, Commission rules recognize that evidence of existing interconnection arrangements "…is substantial evidence that interconnection … is technically feasible … in networks employing substantially similar facilities." *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report and Order, 11 FCC Rcd 15499 at ¶ 204 (1996); *see also* 47 C.F.R. § 51.305(c)-(d).

251(c) inures only to the benefit of telecommunications carriers and that VoIP providers are information services providers, not telecommunications carriers.[28] But as this Commission well knows, VoIP providers utilize CLECs – who are clearly telecommunications carriers – to obtain their wholesale interconnection arrangements with ILECs. The Commission has made clear that such telecommunications carriers do not lose their status merely because they may be carrying traffic that is not a telecommunications service.[29] Moreover, accepting AT&T's argument to the contrary would eventually erode interconnection rights under Section 251 as more competitive carriers rely upon IP networks to transport their voice traffic.[30]

Some commenters also assert that Section 251(c)(2) is inapplicable to the exchange of VoIP traffic because, they claim, VoIP is not telephone exchange service or exchange access, as Section 251(c)(2)(A) requires.[31] As Charter has explained, however, the provision of VoIP service falls within the scope of "telephone exchange service" or "exchange access" regardless whether it is a telecommunications service or an information service.[32] The Communications Act defines the term "telephone exchange service" as "service within a telephone exchange, or within a connected system of telephone exchanges within the same exchange area operated to furnish to subscribers intercommunicating service of the character ordinarily furnished by a single exchange, and which is covered by the exchange service charge."[33] The attributes of Charter's VoIP service (and that of most others in the industry) clearly fall within the scope of

[28] AT&T Comments at 47-8.

[29] *See Time Warner Cable Request for Declaratory Ruling*, Memorandum Opinion and Order, 22 FCC Rcd 3513 at 15 (2007). AT&T's argument also ignores the fact that the Commission has clearly not determined whether VoIP constitutes a telecommunications or information service. *See Order and FNPRM* at ¶ 954.

[30] The implications of AT&T's position would undermine the Commission's pro-competitive interconnection policies. Consider that as networks increasingly shift to use VoIP technology, AT&T's logic – if accepted – would eventually erode interconnection rights under Section 251entirely as more carriers rely upon IP networks to carry their voice traffic. AT&T's position would effectively sunset competitive carrier interconnection rights.

[31] AT&T Comments at 36-40.

[32] Charter Initial Comments at 5-6 (citing Cablevision and Charter Comments; WC Docket No. 11-119 at 9 (filed Aug. 15, 2011)).

[33] 47 U.S.C. § 153(47)(A).

these definitions: they provide an "intercommunicating service" within a single exchange, which is covered by a service charge.

These common sense conclusions are also supported by prior Commission findings. Indeed, the Commission has previously held that the term "telephone exchange service" is not limited to circuit-switched technology, and applies equally to packet-switched services.[34] And at least one federal court has agreed: "[I]t is clear that the FCC does not intend to limit telephone exchange service to traditional telephone services or technologies."[35]

The same principles apply to exchange access service, which is defined by the geographic end points of the call and does not depend on how the calls are priced, or the technology used.[36] CLECs that carry VoIP traffic – whether to their own customers or to VoIP providers' customers – are clearly providing interexchange carriers with the ability to place calls to, and receive calls from, retail VoIP customers in other telephone exchanges. That basic functionality clearly satisfies the statutory definition of exchange access service – and hence the interconnection criteria under Section 251(c)(2).

II. BECAUSE TRANSIT SERVICES ARE NOT COMPETITIVE IN ALL MARKETS THE COMMISSION SHOULD USE ITS AUTHORITY UNDER SECTION 251 TO OVERSEE RATES AND TERMS OF TRANSIT SERVICES

On the question of whether transit services should be subject to treatment similar to other transport rate elements, the largest incumbent LECs (AT&T and CenturyLink) are again united. Not surprisingly, as the predominant provider of these services, they each claim that transit services are generally competitive and that the regulation of such services is not necessary. For

[34] *Advanced Services Order* at ¶ 22; *see also Deployment of Wireline Services Offering Advanced Telecommunications Capability*, Order on Remand, 15 FCC 385 at ¶ 22 (1999) ("*Advanced Services Remand Order*").
[35] *BellSouth Telecomm. Inc. v. Finley*, 2010 U.S. Dist. LEXIS 131839 at * 33 (E.D.N.C. Dec. 10, 2010).
[36] Charter Initial Comments at 6 (citing *Global NAPs v. Verizon New England*, 454 F.3d 91, 98 (2nd Cir. 2000)).

example, AT&T asserts that ILECs face "strong competition" in the market for transit services.[37] CenturyLink argues separately that the Commission lacks authority to mandate bill-and-keep for transit services.[38] Also, at least one competitive provider of transit services, alleges that the market for such services is "highly" competitive and that the Commission need not take any further action.[39]

A. ILECs and Neutral Tandem Have Failed to Offer Evidence That Transit Services are Competitive in All Markets

The assertions regarding the state of competition for transit services are remarkably self-serving, and lack any independently verifiable supporting evidence. The proponents of a "hands off" approach ask the Commission to maintain that approach based upon unproven assertions that a competitive market for these services exists. However, none of the companies making these arguments provides any independent, verifiable, data showing that transit services are uniformly competitive in all markets. AT&T, for example, merely states that ILECs face "strong" competition and identifies several companies that it characterizes as "highly efficient" competitors.[40] But it fails to provide any independent data to support these claims, or any explanation for its characterization of the relative strengths of these competitors. Nor does AT&T define the relevant geographic market, seemingly suggesting that transit services are competitive in *every* local market.

Notably, the only "evidence" of competition that AT&T offers is quotes from prior Neutral Tandem filings concerning the scope of that company's service offerings. But we know those comments are misleading because, as Charter has shown in prior pleadings, Neutral

[37] AT&T Comments at 57, 60.
[38] CenturyLink Comments at 16-18.
[39] Neutral Tandem, d/b/a Inteliquent Comments at 3.
[40] AT&T Comments at 57.

Tandem's anecdotal evidence ignores the fact that few competitive transit service providers operate in smaller, more rural "Tier 2" and "Tier 3" markets today. In fact, although Neutral Tandem purportedly maintains connections to the "largest national and regional carriers," it does not have the same number of connections with small rural and independent LECs serving smaller, more rural markets that Charter serves.[41]

Similarly, although the US Telecom Association claims that there is "substantial evidence that competition for transit services exists in most urban and suburban territories"[42] it fails to cite any evidence in the record to support this claim. That is not surprising given that Charter has already demonstrated that this record (and records in related proceedings) lacks sufficient evidence to find that transit services are competitive in ***all*** markets. Indeed, as Charter explained in its opening comments, the leading non-incumbent provider of these services, Neutral Tandem, admits the same in its annual report. Specifically, in its 2010 annual report Neutral Tandem states that the company is "unable to provide accurate market share information," concerning the scope of competition because "no regulatory body or industry association requires carriers to identify amounts of voice traffic to other carrier types."[43] Hence, there is simply ***no independent verifiable data*** concerning the scope of competitive transit services.[44]

Moreover, even using Neutral Tandem's own metrics, the scope of its service offerings are relatively limited. As explained in prior comments, Neutral Tandem's claims to have connections to "more than 100 of the largest national and regional telecommunications carriers"

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[41] Charter Communications, Inc., WC Docket 10-90, *Ex Parte Letter* at 3 (filed Oct. 21, 2011).

[42] Neutral Tandem d/b/a Inteliquent Comments at 5.

[43] *See* Neutral Tandem, Inc. 2011 Form 10-K Annual Report at 10 (for period ending 12/31/11), (available at: http://ir.inteliquent.com/sec.cfm) (emphasis added). The company explained that such information does not exist, in part because no regulatory body or industry association requires carriers to identify the amounts of voice traffic delivered to other carrier types, or compiles market data regarding such arrangements. *Id*.

[44] *See* Charter Initial Comments at 16-18.

actually reveals that the company has connections to approximately eight (8%) percent of all incumbent LECs operating in the nation.[45]

In contrast, a broad variety of entities in the industry (CLEC, cable, CMRS and rural LECs) have all filed comments stating that transit services are not competitive in all markets, and primarily exist, if at all, in only larger urban and suburban markets.[46] Indeed, Charter has explained that in its experience transit services in many smaller rural markets are not competitive.[47]

Thus, in sum, the lack of any independent verifiable data reflecting actual levels of competition in the market undermines any assertions by Neutral Tandem or the largest ILECs that these services are competitive in all markets. To the contrary, the experience of the vast majority of commenting parties is quite the opposite. As such, the record provides support for the Commission to conclude that purchasers of transiting services lack competitive alternatives in all markets.

B. Federal Courts and State Commissions Have Already Affirmed That Transit Services Are Subject to Section 251

Nor does CenturyLink's claim that the Commission lacks any authority in this area[48] stand up to scrutiny. In fact, several federal courts have ruled that transit services are governed by Section 251(c), clearly establishing the Commission's authority to assert jurisdiction over such services.

As explained in it is opening comments, federal courts in Connecticut and Nebraska affirmed state commission determinations that all ILECs have the obligation to provide transit

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[45] *See* Charter *Ex Parte*, WC Docket 10-90, *et. seq*. at 2 (filed Oct. 21, 2011).

[46] *See* Comcast Comments at 7-11; Sprint Comments at 58-69; XO Comments at 6-7; and Windstream Comments at 8-12.

[47] Charter Initial Comments at 17-18.

[48] CenturyLink Comments at 16-19.

under Section 251(c)(2), as a matter of law.[49] Indeed, any other conclusion would undermine the purpose and intent of the statute: to promote competition.[50] The Commission's failure to acknowledge these rulings is curious. These decisions are evidence of the fact that reasonable transit terms are **not** available in every market, and that competitors are forced to arbitrate and litigate with incumbents simply to obtain reasonable transit terms.

These conclusions are supported by the plain language of Section 251(c)(2), which requires ILECs to interconnect with any requesting telecommunications carrier "for the transmission and routing of telephone exchange service and exchange access."[51] The statute does not limit the ILEC's obligation to only that traffic to, or from, the ILECs' own customers, and can clearly be read to include third-party provider's traffic that arises in a transit situation. As such, nothing in that statute limits the scope of an ILEC's obligation, or precludes the reasonable conclusion that transit traffic is a duty mandated by this statute.

III. THE COMMISSION MUST PRESERVE (RATHER THAN RETIRE) PRO-COMPETITIVE PRINCIPLES IN ANY NEW INTERCONNECTION REGIME

Although the Commission asks how it should extend its interconnection policies under a new bill-and-keep regime, several incumbent LECs ask the Commission to abandon current policies and take a step backwards with respect to issues like POI locations and allocation of transport costs. The Commission should reject these and recognize that one basis for the success of competitive voice providers today is the interconnection policies adopted by the Commission in the First Report and Order. Many of the decisions made in that Order laid the foundation for

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[49] Charter Initial Comments at 20.

[50] *See SNET*, 2011 U.S. Dist. LEXIS 48773 at * 8 ("… the 1996 Act and its attendant regulations should be interpreted so as to promote competition.") (citing *Mich. Bell Telephone Co. v. Covad Communs. Co*., 597 F.3d 370, 387 (6th Cir. 2010)). The District Court of Connecticut also relied upon the reasoning and conclusions of the District Court of Nebraska, which has also ruled that transit obligations arise from Section 251, as a matter of law. *See, e.g.*, *Qwest v. Cox Nebraska Telecom, LLC*, 2008 U.S. Dist. LEXIS 102032 (D. Neb. 2008).

[51] *See* Level 3 Communications LLC Comments at 19-21.

competitors to obtain interconnection on just and reasonable terms, a critical component to any market entry (or market expansion) plan. These policies must be continued, rather than rejected, as we move forward.

A. Windstream's Proposal to Narrow Current POI Rules Represents A Step Backwards

Incumbents continue to seek modifications to the very rules that have done so much to foster competition in the voice market. For example, Windstream asks the Commission to revise current point of interconnection ("POI") rules in a manner that would increase competitors' costs. Specifically, Windstream urges the Commission to "state that an incumbent LEC must provide one point of interconnection per interconnected network, i.e., a ubiquitous network, and not adopt a one-POI-per-LATA requirement."[52] Windstream argues that this change in the existing rule is appropriate because the single POI per LATA rule "applies only to RBOCs, and has never applied generally to incumbent LECs under the Section 251 regime."[53]

Windstream's argument is misguided. The Commission recognized in its Further Notice that Section 251(c)(2)(B) establishes a general rule with respect to interconnection points between incumbent and competitive provider networks. Specifically, the Commission affirmed that the statute requires that "an incumbent LEC must allow a requesting telecommunications carrier to interconnect at any technically feasible point. The Commission has interpreted this provision to mean that competitive LECs have the option to interconnect at a single point of interconnection (POI) per LATA."[54] Notably, the Commission does not limit this rule to only those ILECs that are also RBOCs. Nor does the statute except non-RBOC ILECs from the duty to interconnect with competitors at any technically feasible ***point*** on the ILEC's network. Thus,

[52] Windstream Comments at 13.
[53] *Id*.
[54] *Order and FNPRM* at ¶ 1316.

Windstream's claim that this rule applies only to RBOCs is simply incorrect. Indeed, the single POI rule admits of no exceptions for ILECs with multiple affiliates who are themselves interconnected, *in any way*, in a single LATA. Further, allowing ILECs like Windstream to evade the rule simply by operating multiple affiliates undermines the intent of the single POI rule, which is "to obligate the incumbent [LEC] to accommodate the new entrant's network architecture" and require the ILEC to "accept the novel use of, and modification to, its network facilities to accommodate the interconnector."[55]

Similarly, Windstream's proposal to modify the rule and exclude ILECs with networks that are not ubiquitous, or interconnected, would represent bad policy. As Charter previously explained, if rural ILECs are permitted to force competitors to interconnect at every local network operated by that ILEC's affiliates in any particular LATA, the competitor could be forced to build or lease facilities to multiple end offices in the same LATA.[56] There is no pro-competitive basis for forcing competitors to deploy facilities in such an inefficient allocation of network resources given that modern IP networks can aggregate and transport large quantities of traffic onto a single facility. Thus, because Windstream's proposal would increase operational and administrative costs of competitors, it should be rejected.

B. CenturyLink's Proposed Network Edge Rules Would Improperly Shift Costs onto Competitors

Similarly, CenturyLink's network edge proposal is ill-advised because it would shift an inordinate share of transport costs to competitors interconnecting with rural LECs. Specifically, CenturyLink proposes that the Commission "establish a default network edge for carriers of last resort … that establishes the edge for traffic terminating to the ILEC's end users at the ILEC's

[55] *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report and Order, 11 FCC Rcd 15499 ¶ 202 (1996).

[56] Charter Initial Comments at 11-13.

first point of switching in the call path to the ILEC called party."[57] Further, CenturyLink suggests that its network edge rules should require IXCs, competitive carriers, and CMRS providers to assume financial responsibility for "transporting the traffic ***in the other direction*** as well from that same point on the ILEC network."[58] Finally, CenturyLink urges the Commission to apply this proposed edge rule even to the extent that, in a given traffic arrangement, traffic flows in only one direction.[59] CenturyLink is thus asking the Commission to adopt a network edge definition that would define the incumbent LECs' interconnection and traffic exchange duties as narrowly as possible, and in a way that places an inordinate financial burden on the competitor.

This proposal is inequitable because it improperly favors incumbents. To begin with, this proposal would require competitors to deliver their traffic, and interconnect with the ILEC's network, at ***multiple*** points in any given geographic region (state, LATA, MTA, etc.). If the first point of switching is a tandem switch, then the competitor would be responsible for delivering all of its traffic to that tandem. However, if the ILEC operates multiple tandems in a single LATA the competitor will be forced to establish POIs at each of those tandems, effectively requiring multiple POIs per LATA. And, of course, if the ILEC does not operate the tandem in that service area, competitors' will be obligated to deliver their calls to, possibly, several different service areas (if served by different end offices).[60] Under either circumstance, this proposal would invariably ***increase*** the number of POIs (effectively, where the competitor will

[57] CenturyLink Comments at 22.

[58] *Id*. (emphasis added).

[59] *Id*.

[60] Another limitation of CenturyLink's proposal is that it fails to account for the fact that some providers may not use of a hierarchical switching network, but may have deployed a distributed switching architecture like that used by some cable operators' and VoIP providers' CLECs.

interconnect to deliver its traffic to the incumbent) at which competitors currently interconnect and exchange traffic with incumbent LECs, which will only raise competitors' costs.

CenturyLink's proposal also requires competitors to bear 100% of the costs of facilities used to carry CenturyTel's originated traffic between CenturyLink's first point of switching and the competitor's network.[61] Shifting costs onto competitors in this way is inequitable, as the Commission has long held that where two interconnected providers utilize a single transmission facility to exchange traffic between their networks, the costs of that facility should be split and assigned based upon each provider's proportional use of the facilities.[62] That principle has effectively allocated costs between competitors and incumbents since its adoption, and should not be changed now.

As Charter explained in opening comments, the more equitable approach is to use an exchange boundary or another competitively neutral location where competitors have competitive interconnection and transport alternatives, other than the incumbent, to transport traffic to the terminating carrier's network.[63] This proposal would include points at which the incumbent interconnects with its own affiliated carriers, or other ILECs.

IV. ILEC PROPOSALS TO RETAIN TRANSPORT AND RELATED RATE ELEMENTS WILL ONLY CREATE NEW OPPORTUNITIES FOR ARBITRAGE

Opponents of the Commission's proposal to transition transport rate elements to bill-and-keep, consistent with terminating rate elements, do not provide any legal or policy rationale for deviating from that course of action. As the Commission recognizes, if ILEC transport rate

[61] CenturyLink Comments at 22 (competitors should be financially responsible for transporting traffic "in the other direction", i.e., from CenturyLink's first point of switching to the competitor's network, even if traffic only flows in one direction).

[62] *See* 47 C.F.R. § 51.709(b) ("[t]he rate of a carrier providing transmission facilities dedicated to the transmission of traffic between two carriers' networks shall recover only the costs of the proportion of that trunk capacity used by an interconnecting carrier to send traffic that will terminate on the providing carrier's network.").

[63] Charter Initial Comments at 13-14.

elements remain in place after bill and keep is fully implemented for end office rate elements, opportunities for arbitrage and/or improper cost-shifting will likely arise.[64]

A. The Commission Has The Necessary Authority to Transition All Transport Rate Elements to Bill and Keep

CenturyLink asserts that the Commission "lacks authority" to impose a bill-and-keep regime upon carriers assessing the transport rate elements addressed in paragraphs 1306-1310 of the Order.[65] Although not clearly articulated, CenturyLink appears to argue that bill-and-keep does not satisfy the requirements of section 252(d)(2) because bill-and-keep does not: (1) provide for adequate cost recovery;[66] and, (2) meet the broader constitutional requirement that carriers have a reasonable opportunity to recover their costs.[67]

These arguments fail to address the very clear language of Section 251(b)(5), which governs both transport and termination arrangements. This statute provides the requisite authority to for the Commission to impose bill-and-keep regime on the remaining transport rate elements not already covered in the Commission's Transformation Order. As other parties have explained, the dictates of Section 251(b)(5) without question allow the Commission to adopt the same pricing methodology for remaining transport rate elements that is has already adopted for termination and other transport rate elements, as both transport and termination are covered by Section 251(b)(5).[68]

Further, CenturyLink's claim that bill-and-keep will impermissibly limit its ability to recover costs, or otherwise limit its constitutional rights to reasonable recovery of costs, is

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[64] *Order and FNPRM* at ¶ 1297 (citing comments that a failure to take prompt action could perpetuate inefficiencies).

[65] CenturyLink Comments at 11-16.

[66] *Id*. at 11.

[67] *Id*.

[68] COMPTEL Comments at 7-8.

mistaken. As the Commission has explained, bill-and-keep does not limit cost recovery, but instead actually ensures "recovery of each carrier of [the] costs" associated with transport and termination.[69] In particular, "Section 252(d)(2)(B) makes clear that "arrangements that waive mutual recovery (such as bill-and-keep arrangements)" are consistent with section 252(d)'s pricing standard."[70] Thus, under a prospective rule imposing bill-and-keep mandates upon all transport rate elements, each carrier will "recover" its costs from its own end users, or from explicit support mechanisms such as the federal universal service fund.[71]

B. Any Decision to Delay Further Transition to Bill-and-Keep Would Present Opportunities for Arbitrage or Improper Cost-Shifting

In addition to the statutory and constitutional arguments discussed above, CenturyLink also asserts that "from a policy standpoint" the Commission "should move toward deregulatory of such services" or "[i]n all events, [the Commission] should not take any further regulation action…"[72] In support of this assertion, CenturyLink claims that "there are competitive alternatives" to these transport services.[73]

Despite its claims that these services are "competitive," CenturyLink offers absolutely no evidence or reasoning to support that assertion, and there is no evidence in the record that such services are competitive. To the contrary, there is ample evidence that incumbent LECs continue to assert bottleneck control over most forms of transport, particularly special access.[74]

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[69] *Order and FNPRM* at ¶ 775 (explaining that "although bill-and-keep by definition "waive[s] mutual recovery" (47 U.S.C. § 252(d)(2)(B)(i)) in that carriers do not pay each other for transporting and terminating calls, a bill-and-keep framework provides for "reciprocal" recovery because each carrier exchanging traffic is entitled to recover their costs through the same mechanism, i.e., through the rates they charge their own customers.").

[70] *Id*.

[71] *Id*.

[72] CenturyLink Comments at 12.

[73] *Id*. at 15.

[74] *See* Cbeyond, Earthlink, Integra Telecom, and tw telecom Comments at 9-11.

CenturyLink's unsupported claims must be rejected. As Charter explained in its opening comments, if the Commission fails to take any further action on these remaining transport rate elements, opportunities for arbitrage or improper cost-shifting will likely arise.[75] For example, if left unresolved (or "unregulated" as CenturyLink hopes) ILECs will have the opportunity to raise rivals' costs and impose rates above the incremental costs of transmission. Because no evidence in the record suggests that the reduction of these remaining transport rates merits a special exception to the Commission's prior conclusion to adopt a bill-and-keep regime, the Commission should move forward and subject remaining rate elements to the same approach.

V. CONCLUSION

The Commission should ensure that all providers have the proper incentives to continue the transition to IP networks, including the interconnection of such networks, by adopting the policies set forth in Charter's comments. Further, the Commission should ensure interconnection policies which have fostered competition in today's market are extended to future markets served by providers deploying IP networks.

[75] Charter Initial Comments at 15-16 (noting that ILECs will have incentives to shift costs from end office functions to transport and tandem switching functions in order to increase competitive carriers' traffic exchange costs.).

Respectfully Submitted,

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On behalf of
Charter Communications, Inc.

March 30, 2012

Exhibit A

AT&T VoIP Service Brochure

AT&T VoIP Services

AT&T Voice Over IP Connect Service (AVOICS)

Your VoIP customers expect high quality voice services. With AT&T Voice Over IP Connect Service (AVOICS) you get unbranded and unbundled transport and termination of your domestic and international VoIP traffic with the reliability, security and performance you expect from AT&T. Give your VoIP service a competitive edge by also offering your end users access to unbranded Directory Assistance for the domestic U.S., Canada and Puerto Rico – a great value-added service available with AVOICS.

Your connection to AVOICS is via AT&T's Managed Internet Service (MIS)/Multiprotocol Label Switching – Private Network Transport (MPLS-PNT) service, which provides class-of-service voice quality, key security elements and advanced network reliability. Your service implementation is managed end-to-end by our highly experienced team of VoIP experts. Our multi-layer support structure is designed to provide you with industry-leading customer service every step of the way.

AVOICS accepts your U.S. originated domestic outbound (1+) calls and U.S. originated international outbound (011+) calls using Session Initiation Protocol (SIP) signaling. AVOICS also supports codecs G.711 and G.729 A/B. AVOICS provides long distance termination of "native" IP traffic, defined as traffic that originates as IP and is transported as IP from its point of origination to AT&T. AVOICS accepts U.S. originated domestic outbound (1+) calls and U.S. originated international outbound (011+) calls using Session Initiation Protocol (SIP) signaling. AVOICS also supports codecs G.711 and G.729 A/B. In addition, the AT&T network supports T.38 fax over IP.

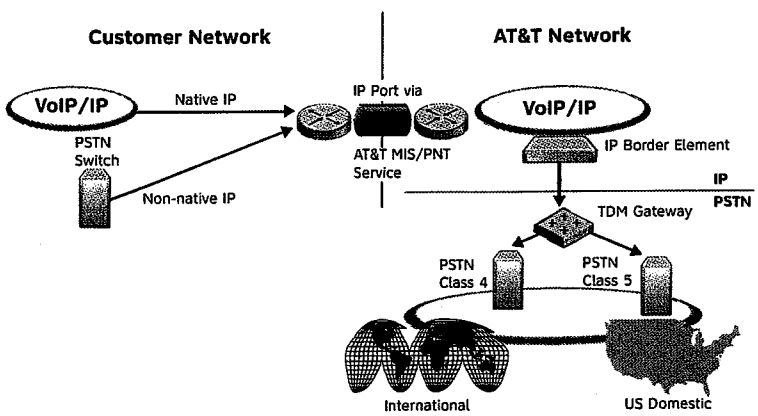
BENEFITS

- Expand your reach – AT&T's IP domain interoperates with the broader Public Switched Telephone Network (PSTN)
- Cost savings – Offer advanced voice services over your IP network
- Reliability – AT&T is one of the most dependable communication providers in the industry, offering 24/7 proactive network monitoring
- Security – AVOICS employs state-of-the-art security technologies and intrusion detection features

FEATURES

- Class-of-service voice quality
- Domestic and international terminations
- Supports SIP signaling
- Supports codecs G.711 and G.729 A/B
- AT&T network supports T.38 fax over IP
- Flexible options for receiving CDRs
- Proactive and reactive monitoring, 24/7
- Optional access to Directory Assistance

AVOICS Connectivity



at&t

AVOICS also provides long distance termination of "non-native" IP traffic, defined as traffic that originates as TDM, undergoes a protocol conversion to IP in your network and is then transported as IP from your network to AT&T's.

AVOICS's rate structure is designed to help you better manage costs and accurately bill your end users. AVOICS service for domestic termination has an unbundled rate structure with separate rate elements for transport and terminating access. Connectivity facilities are billed under the applicable agreements for those facilities (e.g., MIS agreement). AVOICS service for international termination has a bundled rate structure for transport and termination and requires connectivity facilities in the same manner as for domestic termination.

On a daily basis, AT&T will collect, format, guide and rate minutes of use for your AVOICS service and create a file of Call Detail Records (CDRs). For your convenience, AT&T offers flexible options for receiving your CDRs, including an electronic interface.

AVOICS is monitored 24/7 by our highly experienced technical staff in AT&T's Global Customer Support Centers (GCSC).

The GCSC performs proactive and reactive monitoring to support problem determination, reporting and resolution. Our state-of-the-art network management systems are designed and maintained to keep your service running smoothly.

For more information contact your AT&T Representative or visit us at www.att.com/wholesale.

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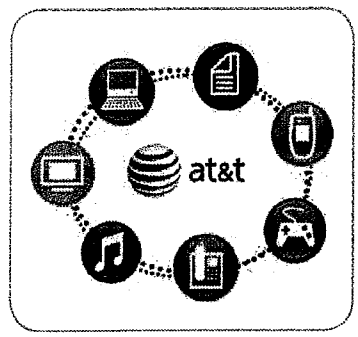
Your world. Delivered.

ATTACHMENT 2

AT&T Network Convergence and the Role of IMS

IP Driving Anytime, Anywhere Communications

As Internet Protocol (IP)-based communications continue to take hold in the U.S., the long-promised benefits of convergence are becoming a reality. Still, with so much focus on IP-based applications and devices, the true key to convergence has often been overlooked. It all starts with the network. And the network must be able to deliver applications and information anytime, anywhere, and to any IP-enabled device.



With IP-based services and a fully converged network to carry them, customers in the near future will no longer have to associate specific applications with specific devices or network connections. A full range of information and content will be accessible via a single device, and the intelligent network will deliver it over the best available connection at a given place and time.

The prospects for convergence are exciting, but bridging the gap from hype to reality requires continual innovation and a complete range of network assets – from wireless and wireline access to a powerful and advanced IP backbone network to carry information around the globe.

IMS: Enabling the Next Evolution in Communications

For the past 10 years, AT&T has pursued its vision for delivering network convergence, building the nation's most advanced IP backbone network and complete wireless and wireline access capabilities, and playing a key role in the development of IP-based applications.

AT&T was the first major U.S.-based carrier to implement IP multimedia subsystem (IMS) technology into its network. IMS is a network architecture that allows wireless and wireline networks and devices to work together and provides for standardized interfaces between applications, network layers and back-office systems. It's the glue that will enable AT&T to deliver communications virtually anytime, anywhere and on any device.

AT&T's Common Architecture for Real-Time Services (CARTS): Building From IMS

IMS is not a service – it's an architecture. And AT&T is taking IMS to a new level with its Common Architecture for Real-Time Services (CARTS) – the company's IMS platform and foundation for converged services. As it matures and deployment expands, the architecture will enable AT&T to build intelligence into its network and share information with any of the "three screens" – the PC, TV and wireless device.

IMS at a Glance

What It Is	What It Is Not
> An architectural framework	> A service
> Based on SIP and IP	> An application
> Multimedia service delivery platform	> A complete network architecture
> Standardized in 3GPP, initially for next-generation wireless network	> Limited to voice
> Very sophisticated with complex capabilities	> Completely standardized
> Standardizes interfaces between applications, network layers and back-office systems	> Rigidly defined
> Delivers on the promise of wireless-wireline convergence	> A widely deployed mature platform
> Capable of being deployed with its full capabilities by AT&T	

at&t

What AT&T CARTS Will Deliver

1. Consistent user experience
2. Seamless transition between networks and devices
3. Single, common service platform, with uniform treatment of access technologies
4. Communications and entertainment that adapt to the customer's lifestyle

AT&T will begin introducing CARTS-enabled applications for residential and business customers later this year and will continue through 2008 and beyond. Following is an overview of the rollout road map.

2007	2008 and Beyond
> AT&T Video Share	> Continue to build new IMS-enabled services for consumer, wireless and enterprise markets
> IMS-enabled U-verse℠ Voice managed VoIP service	> Complete evolution of wireline and wireless networks to CARTS unified network
> VoIP IMS-enabled services and applications for enterprise customers	> Dual-mode service
> Beginning of long distance phone network migration to CARTS network	

Converged Services of the Future

The new-generation services delivered from AT&T's IMS CARTS architecture will enable business and residential users to work and communicate more efficiently and effectively than ever before. The combination of applications on a single device means that services that were once separate can now be consolidated to perform in ways that we wouldn't have thought possible a few years ago – a phone that can be a video home monitoring device or a TV that can be the messaging hub for voice, text or video communications.

Following is a snapshot of the types of services that both businesses and consumers could benefit from in the not-so-distant future.

Consumer Convergence Applications of the Future	Business Convergence Applications of the Future
> Video services and sharing	> Dual-mode phone
> Social networking	> PBX capabilities in remote locations, across many devices
> Music	> Video sharing
> Location-based service enabler	> Vertical applications
> TV voicemail	
> TV talking caller ID	
> TV wireless caller ID	
> Dual-mode phone	

Exhibit B

Verizon IP Termination Service Brochure

Carrier IP Term SIP
Solution Information
Overview
Availability
Pricing
Service Details
Features
Technical Details
Detailed Information
Diagrams

Carrier IP Termination (SIP)

Overview

Partner with Verizon Business for a Powerful Combination

Verizon's Carrier IP Termination is an essential element of a successful Voice over Internet Protocol (VoIP) service that transports VoIP media between IP networks and the Public Switched Telephone Network (PSTN). This allows Verizon Wholesale Services customers to quickly and easily offer packet-based telephony products and services to their subscribers. Carrier IP Termination accepts Media traffic from retail VoIP telephony providers by way of native Session Initiation Protocol (SIP) over Verizon Dedicated Internet Access products or the Public Internet. Verizon's Carrier IP Termination enables IP transfer via a SIP interface for termination over the Verizon Business long distance network.

SIP calls must be *IP originated*. IP Originated means the calls originate as Voice over IP (from a subscriber's premises using IP-enabled customer premises equipment). Calls will be handed to Verizon in a SIP format.

The use of the Verizon Business Global network with IP functionality and the competitive cost structure creates a powerful combination to serve the VoIP market.

How It Works

Customers can choose to interface with the Verizon IP Network via the Public Internet, Dedicated Internet Access (DIA), or SIP Internet Access (SIA). An IP SEC Tunnel and the ability to support a P-Asserted ID is required for this application regardless of the interface type chosen. Verizon manages the billing of this traffic by building internal customer specific trunks between the Verizon IP Network (CS2K/PVG) and a Class 3 (LD) switch. IP traffic is routed over these trunks, converted to TDM and terminated over the PSTN.

Benefits

Offers IP-based network customers the ability to interface by way of Session Initiation Protocol (SIP) without the additional need or cost to convert to Time Division Multiplexing (TDM).
Provides easy acceptance of IP-originated voice traffic for smooth call completion
Offers long distance transport and termination
Allows service providers to control operating expenses while leveraging capital investment in VoIP-enabled network equipment

Applications

Carrier IP Termination SIP provides customers the opportunity to hand off *true IP-originated* outbound traffic for termination around the world.

Availability

VoIP telephony service providers simply need to have the ability to hand off long distance VoIP calls via SIP interface to the Verizon IP network. This long distance traffic is converted to TDM within the Verizon gateway and directed to the Verizon LD network. Domestic and international termination is supported, allowing customers to take advantage of Verizon├s extensive network reach.

Pricing

Calls that originate IP and terminate anywhere in the domestic U.S. will receive the benefits of interstate like rates.

The domestic rate structure is based on the terminating Local Access Transport Area (LATA) and the Operating Company Number (OCN) or classification of Local Exchange Carrier (LEC), or can be based solely on the

Doing Business

Getting Started
Getting Started with Wholesale Access
Contact Us
Ordering
Ordering Systems
Carrier Services Gateway (Web)
Ordering Guidelines
Access Ordering Services
Provisioning
Provisioning for Access Services
Trouble Admin
VTAG (Web)
EBTA (OSI)
ISP Trouble Reporting Contacts-East
ISP Trouble Reporting Contacts-West
Billing
Billing Web
ISP Billing Contacts-East
ISP Billing Contacts-West
Training
Access Systems Training
Access Ordering Web-Based Training
Access Job Aids
VTAG Web-Based Training
FAQ
Access FAQs

terminating LATA.

The international rate structure is based on the terminating location (landline and wireless termination).

Interstate- and intrastate-defined traffic will rate at a six-second minimum/six-second increment.

The extended domestic traffic will rate at a six-second minimum/six-second increment.

The international traffic will rate at a 30-second minimum/six-second increment, except for Mexico, which will rate at a 60-second minimum/60-second increment.

Features

IP transfer for termination over Verizon's network

Directory Assistance is supported.

Call Detail Records available in a daily, weekly or monthly format.

The customer web portal, Portfolio, provides various tools (i.e. eBilling, Call Record Delivery, Reporting) and easy account management for customers.

24x7 monitoring and support

Detailed Information

Service level agreements (SLAs) for Carrier IP Termination are available in conjunction with the SIP Internet Access (SIA) agreement. For those customers looking for dedicated internet access, SIA is a separate product that can be provisioned to support Carrier IP Termination services. The SLAs available under the SIA agreement include Network Availability and Mean Opinion Score (MOS). (Terms and conditions apply.)

Diagrams

Copyright 2008 Verizon Privacy Policy

Exhibit C

CenturyLink IP Voice Termination Service Brochure

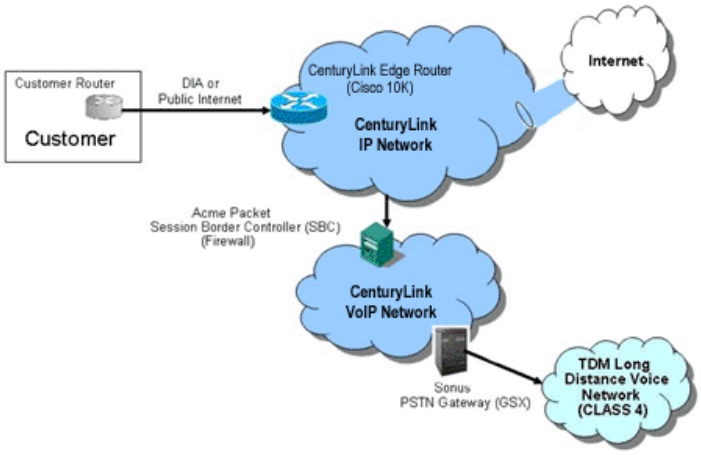
Wholesale: Products & Services

IP Voice 1+ Termination

Your Ideal IP Voice Termination Provider

CenturyLink™'s expertise in both broadband and telephony make CenturyLink an ideal company to provide you with Internet Protocol (IP) Voice 1+ Termination services. CenturyLink'sIP Voice 1+ Termination service is a cost-effective way for you to terminate telephone calls to over 250 countries while taking advantage of IP technology. CenturyLink™ IP Voice 1+ Termination service provides an IP-based connection for voice traffic exchange with other service providers. Once connected to CenturyLink's OC-192 network, with over 1,700 access points and over 16,000 routes, you will benefit from soft switch technology that achieves quality comparable to the public switched telephone network (PSTN).

Network Architecture



How It Works

Traditionally, long distance (LD) providers convert IP voice traffic to time division multiplex (TDM) and hand the traffic to their LD provider for termination. In many instances, the LD provider then converts that traffic back to IP to traverse their LD network, converts the traffic once again to TDM and terminates the call. With CenturyLink IP Voice 1+ Termination, you can hand your IP voice traffic directly to CenturyLink. CenturyLink will transport the IP voice call streams across its OC-192 MPLS network and terminate the calls to the PSTN. No longer will you need to purchase or manage the gateways necessary to make these conversions – CenturyLink does it all! First, your IP voice traffic traverses the CenturyLink IP transport to the Session Border Controller (SBC).

The SBC provides the necessary firewall protection to give your traffic an additional level of protection on CenturyLink's IP voice infrastructure. CenturyLink's media gateways terminate your IP voice calls to the TDM circuit-switched network. Calls are terminated either domestically or internationally to the PSTN via TDM.

Features

- OCN-based and class-type pricing structures offer facilities-based providers significant value opportunity through your choice of billing granularity
- OCN-based pricing allows facilities-based providers to better manage their network routing costs
- Bill reconciliation is easier with a finer level of detail on both the invoice summary and monthly call detail records (CDRs)
- IP Voice automatically supports Outbound 8xx
- Comprehensive North American LATA coverage

Benefits

Savings

- Reduce your capital expenditures by using a scalable single point of access with CenturyLink Dedicated Internet Access, or by delivering traffic across the public Internet instead of using costly TDM trunks and managing multiple IP/TDM gateways

Quality and Security

- With dedicated internet access, CenturyLink's IP voice infrastructure provides quality and service levels comparable to the PSTN
- 24x7x365 network monitoring and management enables real-time troubleshooting while enhancing network uptime
- Advanced network firewall protection using the SBC to provide IP address security and fraud protection

Reach

- CenturyLink can terminate traffic in over 250 countries through both landline and mobile terminations

Ease of Use

- CenturyLink can be your single provider for both traditional long distance as well as IP Voice 1+ Termination

Service Technology

- **Connection Types**: Connect to CenturyLink's network using a DS-1 to OC-48 dedicated data circuit. Providers collocated in a CenturyLink point of presence (PoP) location may connect via an Ethernet cross-connect. Service providers may also connect via the public Internet*
- **Protocol**: SIP
- **Codec**:G.711, ulaw, G.711 alaw, G.729A and G.729AB
- **FAX**: Standard fax and T.38 with G.711 or G.729
- **RFC2833 and SIP info**: Supported for G.729 only

How to Get Started

For more information on CenturyLink IP Voice 1+ Termination service, contact your CenturyLink Sales Representative.

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*CenturyLink does not provide service level agreements or quality of service guarantees for traffic connected across the public Internet.