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Network Interconnection

Verizon welcomes this opportunity to comment on the fourth in a series of white papers regarding the Committee on Energy and Commerce's efforts to modernize the laws governing the communications and technology sectors. As Congress considers a framework for a 21st Century broadband world that barely resembles the communications landscape that existed even as recently as 1996, Congress should move away from prescriptive regulatory models designed for a bygone era that discourage innovation and investment. Instead Congress should adopt a technology-neutral approach that relies primarily on consumer choice, competition, and effective multi-stakeholder processes. In the context of network interconnection, the Committee has the benefit of a real world experiment with two very different approaches to interconnection that have existed in parallel for many years: the prescriptive regulatory model governing traditional voice interconnection and the commercially negotiated approach for Internet interconnection. The prescriptive legacy rules that govern interconnection for traditional voice services already have proven to be anachronisms in today's marketplace, and they have been a constant source of inefficiencies and arbitrage that the Federal Communications Commission (FCC) has spent years trying to ameliorate. The Internet approach – with minimal regulatory involvement – has proven itself a platform for steady investment and innovation. Consumers have remained connected, even as this flexible approach has proven itself sufficiently nimble to evolve with the Internet. Congress should embrace the successful Internet interconnection model and apply it to all traffic exchanged in IP format, including voice traffic.

1. The legacy interconnection model that produced arbitrage, inefficiencies, and other conflict has no place in today's dramatically changed marketplace.

As the Committee knows, the communications marketplace has "changed dramatically" since Congress adopted the Telecommunications Act of 1996. Where there once was monopoly, there is now robust competition and consumer choice. Until the 1990s, to talk with someone outside of your presence, you had to use a phone line provided by an incumbent local exchange carrier (LEC) to call a fixed location that you hoped would be in the vicinity of the person you wanted to talk to. Now customers can choose whether to call a person -- not just a location -- using a wired or wireless device, including phones, computers, tablets and video game consoles. The services may be provided by companies that traditionally were telephone companies, cable

companies, or software companies and may have existed for decades or been formed just last year. And if customers don't want to talk, they can send a text, or an e-mail, or a tweet, or a Facebook message. Customers regularly have access to, and switch back and forth between, these many ways of communicating, and they no longer rely on just one option.

The regulatory framework – including the 1996 Act's interconnection framework – is outdated and has been overtaken by a fundamental revolution that has reshaped the way in which customers communicate. That 1996 interconnection framework, which was designed to replace the traditional local telephone monopolies that once existed, created special rules that singled out the incumbent LECs. Whereas the 1996 Act permitted other carriers to interconnect either directly or indirectly, Section 251 of the 1996 Act required incumbent LECs to interconnect directly with new entrants at artificially low regulated rates to exchange traditional, circuit-switched traffic. The Act also required incumbent LECs to submit disputes to state commissions for arbitration if negotiation failed, which led to each state public utility commission establishing its own interconnection rules and encouraged companies to seek regulatory advantages from the states. This fragmented and cumbersome approach often resulted in inefficiencies and arbitrage. The 1996 Act and the FCC adopted principles and rules to guide those negotiations and state arbitrations, which by design favored the competitive LECs in order to promote new entry as quickly as possible by reducing economic barriers to entry for the new competitors. These new rules – which were thought to make sense in the context of opening the local exchange market because of the incumbent LECs' historic monopoly – were layered upon existing mandatory interconnection requirements that existed for all carriers and the associated tariffed access-charge regime, which governed the compensation that long-distance carriers paid to local exchange carriers when they exchanged long-distance voice traffic.

Under the legacy regulated interconnection regime, each state public utilities commission was charged with developing its own intercarrier compensation rates, and, in conjunction with the FCC, the states administered a highly complex system of explicit and implicit subsidies. Implicit subsidies in particular are problematic because they opaquely force consumers to pay other carriers' network costs. The FCC has found the legacy intercarrier compensation system based on implicit subsidies "is fundamentally in tension with and a deterrent to deployment of all IP networks."[1] The legacy system's balkanized approach, which produced myriad interconnection regulations and intercarrier rates for different types of phone calls, and the mandate for incumbent LECs to interconnect directly at regulated rates, created incentives for arbitrage and gamesmanship as competition took hold in the industry.

Concerns about the negative consequences of the outdated 1996 interconnection regime are not just theoretical. Rather, the FCC and state regulators have been addressing problems arising from this regime continuously for over 15 years. In one of the earlier examples of post-1996 arbitrage, carriers took advantage of compensation rules that required direct interconnection at non-economic rates and targeted customers like dial-up Internet Service Providers (ISPs) that

primarily or exclusively received traffic. Carriers since have engaged in access stimulation, or traffic pumping, in which carriers artificially inflated their traffic volumes to increase intercarrier compensation payments. In another arbitrage scheme, known as phantom traffic, carriers have removed or masked call identifying information to frustrate intercarrier billing. Because the regime created incentives and opportunities to game the system, it produced endless disputes between carriers. Further, both the resulting lack of certainty and predictability, and the requirement that incumbent LECs interconnect directly at artificially low rates, impeded investment. In addition, the legacy system was laden with implicit subsidies by which companies subsidized competitors, although wireless and other companies competed largely without those subsidies. At the end of the day, consumers were harmed by a system that impeded investment in IP networks and by "paying more on their wireless and long distance bills than they should in the form of hidden, inefficient charges."[2]

The legacy Section 251 regime is based on the assumption that direct interconnection between a new-entrant competitive LEC and the incumbent LEC was needed in order for the new entrants to compete. That's simply not the case in today's world. As discussed below, in the Internet space, while some networks interconnect directly, others interconnect indirectly through third-party networks. In general, there are many different paths to reaching any particular Internet network and the end users served by it. Because of the wide availability of connection points and the Internet's architecture, there is little possibility that a network would be disconnected from the Internet, even if it were unable to reach agreement on interconnection terms with one or more networks. The same principles easily could apply to IP-based voice traffic to ensure that voice calls reach their destinations. In fact indirect interconnection and exchange of traffic is widely used today for voice calls in order to achieve redundancy, diversity, and capacity management. Companies will interconnect, directly or indirectly, because interconnectivity increases the value of their networks, and indirect interconnection will help ensure that networks that carry voice traffic are always fully interconnected.

2. The flexible and tremendously successful Internet interconnection model demonstrates that commercial agreements effectively ensure efficient interconnection.

Compare this failed system with the tremendously successful story of the Internet. The Internet developed through purely voluntary commercially negotiated agreements that interconnect a series of individual networks owned and operated by many different entities, without a regulatory mandate. Those agreements may contain different terms, depending on the various networks' needs, but each assumes a perceived equitable value exchange between the interconnecting parties.

Throughout the Internet's history, content providers and their service providers have relied on commercially negotiated agreements with backbone operators who themselves make arrangements with other backbone providers, and traffic carried between Internet endpoints often

transits multiple backbone networks. The commercial agreements between networks might create "peering" relationships, in which networks interconnect directly and exchange traffic, or "transit" relationships, in which one provider agrees to ensure that another provider's traffic will reach its destination, even if it must travel over the networks of additional *other* providers. If each network receives equal value from the mere fact of interconnection, the parties may agree to exchange traffic on a settlement-free basis to avoid the hassles and burdens that billing each other for roughly even traffic flows would create. By contrast, if one network receives greater value from interconnection, then that network will compensate the other network.

The Internet meets consumer demands efficiently, in large part because it has developed without regulation. The commercial arrangements that underlie and self-regulate the Internet enable it to adapt quickly to market changes and innovations, and technology changes, to best fit consumer needs and evolving demands. The Internet interconnection experience demonstrates that negotiated commercial agreements are the most effective way to ensure efficient interconnection arrangements and efficient network deployment. These negotiated, commercial agreements have been tremendously successful, and they have fueled the rapid growth in the Internet's capacity. They have created a flexible framework for networks to evolve in order to address new demands quickly.

For example, players in the Internet ecosystem have created new and innovative interconnection arrangements in response to changes in end users' demands. Commercial interconnection agreements have evolved to facilitate new arrangements, like content delivery networks (CDNs), to meet the growing demand for video traffic.

As new business models have arisen, the Internet itself has shifted from a hierarchical network featuring large Internet backbones interconnecting with smaller backbones and (ultimately) the ISPs serving content providers and end users into a much more complex network in which providers interconnect in a multitude of ways.

The flexibility inherent in these commercial agreements permits parties to handle issues as they arise, and the Internet works well as a result. The need for flexibility – and the complexity of this sector – has increased over time as many companies assume multiple roles in the Internet ecosystem. The diversity of roles and interconnection options has become critical to the Internet's functioning – without them, the Internet might still be optimized for text-based news sites and blogs rather than for streaming massive volumes of high-definition content.

Moreover, even amidst burgeoning complexity, this system has functioned smoothly, and traffic has reached its destination. But the robust ecosystem we enjoy today would not exist if policymakers had adopted a regulatory approach to Internet interconnection rather than the market-driven approach it chose.

3. Policymakers should continue the decades-old light-touch regulatory approach to Internet and IP-based interconnection, whether for data or voice.

Regulatory history amply demonstrates that, especially in industries marked by rapid technological change, rules based on static assumptions about technology and markets quickly become obsolete—and worse, can lead to unintended negative consequences, including stifling investment and innovation. Policymakers "are often wrong both in their predictions of how the market will develop and in their judgments of what regulatory measures will best promote consumer welfare."[3] To their credit, policymakers of both parties have pursued a light-touch approach to regulating data and the Internet over the last two decades, which has fostered high levels of innovation, investment, and competition.

By contrast, a regime centered on inflexible rules would undercut the innovation and investment that characterize today's Internet. Government-imposed rules regarding interconnection can lead to economic and technological inefficiencies. New government rules would be less likely to fully take advantage of advanced technologies and network configurations, inadvertently resulting in more costly interconnections that impose unnecessary costs on consumers. And the negative consequences would be especially harmful to consumers and competition if applied in the context of mobile wireless services.

Presented with two options – one the heavily regulatory model for legacy voice that slowed investment and generated endless disputes, the other the flexible light-touch approach that relied on commercial agreements and fostered the tremendous success of the Internet – policymakers should have an obvious choice as they consider how to regulate interconnection prospectively. Choose the model that works. The nation's decades-long commitment to flexible Internet regulation has been a resounding success, and it promises to continue to create an environment in which voice and data communications flow seamlessly and deliver high-quality services to consumers.

4. Providers already are interconnecting in IP format to exchange voice traffic without a regulatory mandate.

While the number of traditional circuit-switched telephone lines in service has been declining for years and account now for only a small percentage of all lines used for voice service, the number of VoIP subscriptions has been increasing. And wireless providers – which have become the primary or sole voice service for many customers – also are moving to IP-based technologies. As more and more customers adopt innovative IP-based services, it will make more and more sense for providers to exchange voice traffic – which in any event will be only a small percentage of the overall set of IP-enabled traffic – in a manner very similar to how they exchange Internet traffic. Negotiated commercial agreements are the most effective way to ensure efficient IP interconnection arrangements, whether for voice or data service. Commercial agreements allow providers to negotiate network configurations that best accommodate their

underlying networks. The best way for two parties to obtain a mutually beneficial IP interconnection arrangement is for them to negotiate, actually taking the time to work through the technical and operational challenges.

These types of arrangements already are occurring. Although the idea of "long-distance" traffic is going by the wayside with the evolution of the communications marketplace to all-distance services, communications providers have exchanged long-distance traffic in IP format for a long time. This made sense, because those providers transported their own traffic in IP format, and it was more efficient to exchange the traffic in IP format rather than converting it to a legacy protocol simply for the exchange. Similarly, wireless traffic now in many instances is transported and exchanged between providers in IP format. As more and more end users adopt VoIP services, and more and more traffic can travel end-to-end in IP format without needing a protocol conversion to reach a customer that has not adopted VoIP, then providers' existing incentives to interconnect in IP format for voice services will increase.

In fact, Verizon already is doing this because it makes business sense. IP interconnection offers considerable efficiencies to providers and benefits to consumers in the form of new features that all-IP transmission makes possible. Vonage has said its IP agreement with Verizon will allow "Verizon and Vonage customers to enjoy the quality of service and cost benefits that come from the IP exchange of traffic."[4] That's why Verizon recently has entered into eight agreements for the exchange of voice traffic in IP format between its incumbent LEC entities and other providers, and three similar agreements between Verizon Wireless and other providers. We are negotiating others and expect more will follow.

The historic monopoly conditions that led to the legacy interconnection arrangements embodied in the 1996 Act no longer exist. In the innovative new world of IP networks, there are no incumbents. Everyone is a new entrant, and there is vibrant competition. And because there are no incumbent networks or providers, there is no good reason to regulate one set of companies differently than the others. The largest VOIP providers are companies that didn't exist when the 1996 Act was written, and no company has market power when it comes to IP interconnection. The prospective regulatory framework must take that into account and recognize that companies will enter into commercial interconnection arrangements because their natural business incentives will drive them there. We have 20 years of experience that demonstrates that marketplace participants have sufficient business incentives to reach commercial agreements.

5. The commercial Internet interconnection model provides the necessary flexibility for providers to adapt to marketplace changes and resolve disputes quickly.

While the Internet interconnection model has been successful, there have been occasional disputes, as there are in any competitive market made up of hundreds of players and thousands of agreements. But the providers involved have been able to work out those disputes quickly and through ordinary commercial means, without protracted regulatory proceedings. These disputes

were resolved without regulatory involvement precisely because the flexible light-touch regulatory framework encourages providers to negotiate mutually beneficial interconnection arrangements. And, notably, these isolated disputes generally all have involved the same scenario: formerly balanced traffic exchange that has greatly increased in asymmetry and volume, altering the original value exchange the parties had agreed to. While online video and similar applications can generate these high volumes and asymmetry, voice communications generally do not. Voice traffic is relatively balanced, and the volume of voice traffic being added to IP networks is a tiny fraction of the traffic already on those networks, which are governed by commercial agreements. There is no reason to think these issues would arise in the voice context.

Simply put, the Internet marketplace has proven capable of working through issues as they arise, without a regulatory mandate to do so, and it is critical that providers retain the flexibility to do so. In 1996, no policymakers anticipated or predicted the swift rise of online video and other high-volume traffic, and if they had enacted statutes and interconnection regulations that did not allow Internet providers to adapt quickly to marketplace changes, the results for the Internet and its users could have been devastating.

So, too, it will be difficult – if not impossible – to predict what new arrangements will arise to serve consumers' and providers' needs *going forward*, as usage patterns, content offerings, and capacity levels continue to evolve. Under these circumstances, statutes and regulations that restrict or dictate the scope of permissible interconnection arrangements or their rates, terms, and conditions would undercut consumer interests and distort and impede the Internet's ability to serve consumers' ever-changing needs.

6. Any government backstop must be federal, limited in scope, and available only if and when market forces fail to resolve disputes

Even so, some have said a regulatory backstop is needed to ensure that companies negotiate in good faith and enter into IP interconnection agreements so that no one is cut off from the Internet. Interconnection is fundamental to functioning Internet ecosystem, and Internet networks are more valuable by virtue of being interconnected. Rural companies and others have had no problems interconnecting with other Internet networks. Companies have options to interconnect indirectly or directly with one another. And, as a threshold matter, existing legal protections, including the FCC's transparency rule and generally applicable antitrust and consumer protection laws, as well as multi-stakeholder groups, already provide an effective backstop to prevent and address future issues that could emerge.

Given its success, there should be a strong presumption that the Internet interconnection model works and that commercial agreements will form the basis of network interconnection, whether for voice or data. Technology trends have fortunately allowed us to work ourselves out of the arbitrage-ridden legacy interconnection model, as voice service is already transitioning to IP-based interconnection arrangements through commercially negotiated agreements, and that

will continue. To adopt a policy framework other than one that relies primarily on the hugely successful model of Internet interconnection would be a profound mistake, and the burden of proof to demonstrate why for the first time we should introduce heavy-handed regulation into IP interconnection should be extremely high.

Still, given the paramount importance of interconnection, policymakers may want to consider adopting a limited government backstop as a safety value that would only kick in if and when marketplace competition is not sufficient to adequately protect consumers. To ensure that no one is left behind, some form of a government backstop may be appropriate in those rare instances where commercial negotiations, coupled with generally applicable antitrust and consumer protection laws, fail to prevent demonstrable harm to competition or consumers. Any backstop would have to be highly targeted, apply only to substantial and non-transitory risks of harm, and should not result in a new regulatory construct that discourages investment and innovation or invites arbitrage and regulatory gamesmanship in place of negotiations. Congress should authorize an agency to intervene only after it has found that competition would not solve the problem. And when weighing whether to intervene, government should consider whether indirect interconnection options are available and whether its intervention would impede investment in network facilities and innovation in services. Any backstop must be flexible enough to encourage experimentation and innovation, while protecting consumers and competition.

Whatever government backstop results, if any, must be federal in nature, and it must not resemble Section 251's heavily regulatory model. A single commercial IP interconnection agreement can govern the exchange of VoIP traffic within and between all of the states uniformly and efficiently. Heightened oversight along legacy regulatory lines — potentially by more than 50 different regulatory regimes — would lead to myriad disputes and would result in technical interconnection details being resolved at a glacial pace not by engineers and other experts but by more than 50 different state public utility commissions applying disparate views of what is and is not appropriate. In fact, the mere possibility that legacy rules could be applied to these arrangements already is deterring commercial negotiations.

Furthermore, legacy voice interconnection, including Section 251's mandatory direct interconnection by incumbent LECs at artificially low rates, was intertwined with a complex system of implicit subsidies that created competitive distortions and harmed consumers by requiring them to pay to support other carriers' network costs. As those implicit subsidies fade away, there may well be instances where the transition to commercial IP-based interconnection arrangements upset certain companies' longstanding business models, including some rural providers. These are important and real concerns that policymakers must address. The FCC has recognized these companies' concerns and need for support in its 2011 order reforming intercarrier compensation and universal service. But the need for support is a financial issue, not a network issue. Policymakers should not conflate the two. Instead, policymakers should address

legitimate needs for financial support in the context of modernizing universal service policy. They should not allow financial concerns to drive decision-making on the optimal interconnection policy framework to meet changing consumer demands. In the 1996 Act, Congress directed the FCC to make universal support explicit.[5] To the extent support is needed as part of the move to IP interconnection, that support too should be explicit. Whatever steps Congress now takes with respect to support should start from where the FCC left off in its 2011 reform order and should include only explicit subsidies, not implicit.

The Committee also notes the evolution of emergency communications and asks how it may affect interconnection. Like with universal service, regulators will continue to play an important role ensuring that public safety including E911 and NG911 concerns are addressed. Government will continue to administer a public-safety regime to protect the public as voice and data communications converge and voice more and more becomes an application.

Conclusion

The Committee recognizes that the rapid changes in the communications industry warrant a reexamination of the nation's communications laws so that they are more suited for the 21st Century broadband-based communications landscape. Flexibility to respond to consumer demand and competitive forces should underpin Congress's approach to competition policy generally and network interconnection specifically. A framework that relies on commercially negotiated agreements and avoids prescriptive regulations, like the framework that fostered the Internet, would provide that flexibility and encourage innovation and investment.

[1] *Connect America Fund, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, ¶ 648 (2011).

[2] *Id.* ¶ 9.

[3] Jonathan E. Neuchterlein & Philip J. Weiser, Digital Crossroads: American Telecommunications Policy in the Internet Age (2005), at 428.

[4] Comments of Vonage Holdings Corp., *Numbering Policies for Modern Communications*, WC Docket 13-97; *et al.*, at 2-3 (March 4, 2014).

[5] 47 U.S.C. § 254(e).