

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554**

In the Matter of)	
)	DA 09-2517
)	
)	GN Docket Nos. 09-47, 09-51, and
)	09-137
The National Broadband Plan)	

**COMMENTS OF LEVEL 3 COMMUNICATIONS
ON THE TRANSITION FROM CIRCUIT-SWITCHED
NETWORK TO ALL-IP NETWORK**

I. INTRODUCTION

Casting a wide net, the Federal Communications Commission (“Commission”) seeks input on the need for a Notice of Inquiry (“NOI”) examining the transition from a circuit switched network to an all IP-network. This transition has been under way for almost two decades and the issues hindering that transformation are well-documented and debated. An NOI is not required to expedite that transition. Instead the Commission should finish the work that is on its plate by reforming intercarrier compensation, creating regulatory parity and restructuring universal service support so that all three are competitively and technologically neutral. Once the economics of the public switched telephone network have been rationalized and implicit subsidies removed, the transition to an all IP-network will gather steam.

If, however, the Commission decides to pursue an NOI, Level 3 offers comments on targeted areas that should be included. This list is not exhaustive and focuses on core economic and network interconnection issues. Level 3 also suggests that the Commission

structure its NOI so that commenters are not left with the challenge of boiling the regulatory ocean in their submissions.

II. EXECUTIVE SUMMARY

The underlying issues constraining the transition to an all IP-network are the economics of the copper switched network, the regulations designed to preserve that regime and the conflict they create when traffic is exchanged between the PSTN and an IP network. Regulation of the public switched telephone network reflects thousands of constitutive, political and policy choices. Those choices are reflected in the minute detail and range from the arbitrary boundaries conjured up by regulators for local calling areas, Local Access Transmission areas and Major Trading areas through access to emergency services and subsidized universal support. With each new wrinkle, the economics of the PSTN have become more complicated as subsidized services compete with unsubsidized services leading to arbitrage across many technologies and jurisdictions. For example, the dockets of the nation's courts and regulatory bodies are congested with disputes over the economics of the exchange of traffic.

Compare that complex and balkanized regime with the Internet backbone where carriers exchange traffic not within prescribed political or arbitrary boundaries decided by regulators but where it makes most engineering and technological sense. Instead of connecting in each local calling area or tandem switch to exchange traffic in prescribed areas, IP networks exchange traffic where it makes the most engineering, economic and business sense. Traffic moves around the world through a handful of interconnection points. In addition, since IP networks have grown outside of the regulatory regime for the PSTN, the economics are closer to the actual costs of providing an unsubsidized service.

In the IP world, carriers negotiate the cost for the exchange of traffic based upon arm's length transactions. There is no government mandated economic recovery regime based upon where traffic originates and terminates.

IP traffic is exchanged between autonomous systems based on non-regulated, commercially negotiated agreements. Some are essentially (either in whole or in part) bill and keep "peering" agreements where the parties have agreed that the value of interconnection to each is roughly equal. In other cases, one network purchases "transit" from a network provider with market-based pricing reached through commercial negotiations. In many instances, "hybrid" agreements contemplate both settlement-free and paid IP traffic exchanges. In each instance, the parties agree to interconnect and exchange IP traffic based on what makes sense to each business. The crucial concept is that the businesses are best able to unleash the cost benefits of IP and optical technologies through negotiations free of regulatory restrictions that impose additional network costs or inefficiencies.

In that market-based, commercially focused regime, Level 3 has moved in a dozen years from the drawing board to one of the largest IP networks in the world. It provides High Speed Internet Transport, Content Delivery and other bandwidth intensive services to carriers and other large enterprises with high bandwidth demands. Its network reaches from Eastern Europe to Asia and scales with customer demand.

As the IP world has developed, the network operators have been driven by a desire to maximize their investments in new technologies and networks. Armed with the understanding that networks increase in value as the number of users that the network can reach grows, the network operators have sought to expand their reach by interconnecting

with other IP networks. That is a far cry from the beginning of the Bell Telephone system when the Bell System refused to interconnect with any other carrier and prohibited anyone from applying alternative devices to its network. Since the time of the Kingsbury Commitment and the 1956 Consent Decree, much of the regulation around the PSTN has been about controlling the incumbent's activities, advancing a social obligation such as access to emergency services or forcing them to allow competitors into their markets.

As part of an NOI, the Commission will need to resolve a number of policy issues that reach across the silos of communications regulation. Today's regulatory structure presumes separate categories for telecommunications, cable, satellite and uses for spectrum. But today's market shows that as the concept of the monolithic communications provider is giving way to a world where content and voice are applications that run across any number of platforms before reaching the end user. Any NOI must focus on the challenges of exchanging traffic across those platforms and avoiding unnecessary obligations and regulatory burdens imposed upon parties exchanging traffic. Among the issues that the Commission should consider are:

1. Should the focus be on rolling out individual technologies or on broad-use facilities such as fiber deployment?
2. How can the Commission promote federal and private funding for the expansion of the networks and equipment needed for an all IP-network?
3. What policies/steps can the Commission adopt to encourage providers to expand IP technologies into underserved areas? How can such areas be identified and prioritized? How much is needed (how fast does the network need to be)? What role is there for partnering between telecom providers and state entities/research institutions/large businesses to expand facilities in underserved communities?
4. With respect to the existing networks, what are the greatest impediments to the transition to IP and how can they be removed?

5. What regulatory incentives can be provided to increase the amount of bandwidth available to end user customers? For example, would a regime that allows carriers to grow out of the requirements by increasing the amount of bandwidth made available to end users with the yearly amount increasing under some formula.
6. What programs and polices are needed to ensure long-term viability for IP networks and the infrastructure investments needed to support them?
7. Predicting the technological advances possible for IP networks will fall short. But to ensure continued advancement, can existing or additional industry organizations be empowered to:
 - a. Ensure interoperability between different networks;
 - b. Maximize flexibility to encourage development of new applications; and
 - c. Allow deployment of new applications across different carrier platforms

III. NETWORK INTERCONNECTION

One of the tenets of regulation is the necessity to force market actors to exchange goods and services. This has often taken the form of requiring carriers to interconnect. Those efforts have ranged from the telephone networks to railroad tracks. As the PSTN withers away as a technological platform, one core issue will be how does traffic flow between the PSTN and an IP network. That happens today with IP networks generally bearing additional costs to convert traffic on the PSTN from Time Division Multiplexing (TDM) to packets and vice versa. At some point in time, the volume of traffic may shift in such a manner that IP networks will expect that conversion to take place before it accepts the traffic. Maintaining the ability of parties to resolve those issues based around technological and economic rationale is paramount to a successful transition to IP.

In addition, Level 3 believes that the Commission will be encouraged to intervene in the currently unregulated world of interconnection between IP networks. Carriers operating IP networks have been able to determine with whom and where they can

connect their networks and to negotiate the appropriate economics based on arms length negotiations. Unnecessarily injecting any government mandate may skew the marketplace and create issues of cost allocation and recovery that will create vested economic positions. History shows that once a section of an industry is invested in the economic regime established by regulation, it will fight to oppose all attempts to eliminate or reduce that revenue component.

However, if the Commission moves ahead, it should seek perspectives in the following areas of interconnection:

1. To what extent, and for what networks or portions thereof, has the migration from circuit-switched to IP networks already occurred?
 - a. What were the economic, technological and network considerations that drove that migration?
 - b. Was that migration helped, hindered or not influenced by the lack of regulatory boundaries such as local calling areas, LATAs, or other political boundaries when negotiating interconnection?
 - c. From a service perspective, wireless , nomadic VoIP and other technologies and applications are erasing the relevance of local calling areas, LATAs or even national and state boundaries when it comes to providing flat-rate and innovative services. What impact does this have on IP migration?
2. What are the major impediments to migration from circuit switched networks to IP networks, particularly where IP networks and circuit switched networks use the same physical facilities or serve the same physical location?
3. What are the structural assumptions that underlie regulatory changes as networks shift to an all IP environment?
4. Should the COMMISSION allow carriers to explore alternative interconnection arrangements when exchanging traffic with the PSTN? Does the COMMISSION need to create incentives such as alternative forms of regulation or relief from rules to provide an incentive for carriers to explore such options?
5. Which interconnection rules that are based on “switched technology” should be revised or eliminated? Are any regulations relevant that distinguish between voice, data, video or other combinations in a transition where IP networks do not distinguish between packets?

6. If the Commission mandates – even in limited circumstances – direct interconnection between IP networks, how would the Commission ensure that carriers did not bear disproportionate burdens with respect to traffic exchange?
 - a. Over what geography, would the Commission mandate interconnection?
 - b. In what segments of the IP network would the government mandate interconnection? Last mile? Middle mile? Backbone?
 - c. If the Commission was going to mandate interconnection, would it then have to set the prices and cost for such arrangements?
 - d. If so, what economic pricing model would it have to apply?
 - e. And, if the Commission became involved in the establishing the economics of the IP interconnection, will it thwart or slow the transition to an IP-world?

7. If the Commission begins to regulate or compel IP interconnection, will the Commission then be forced to regulate the traffic exchanged over the IP interconnection? If so, what are the limits, the Commission's jurisdiction over IP formatted information.

These seven questions are the tip of the iceberg concerning the threshold question of whether the Commission can or needs to regulate IP interconnection. It will be important to gather a clear set of data and an understanding of the type of networks for which interconnection is sought. The Commission should only move ahead if industry can present clear, convincing evidence of a market failure and market failure must be defined as more than simply not being able to get the elements you want at the price you want.

IV. INTERCARRIER COMPENSATION

No issue thwarts the transition to an IP environment more than the mind-numbing confusion and complexity of the industry's intercarrier compensation system. With apologies to Abraham Lincoln, it is certain that a system that includes seven different rates for the same function cannot stand in a world of converging technological platforms

where consumption is increasing (measured in capacity and applications) and content can be accessed separately from the provider of transmission services. Where Level 3's IP network involves the exchange of traffic with PSTN, it has found that incumbent local exchange carriers have been hesitant or unwilling to consider alternative compensation mechanisms that stray from the historic access and reciprocal compensation regime. Whether this hesitance is based on economic or regulatory concerns, this reluctance slows the transition to an all IP network. Instead of pursuing new arrangements that could bring down costs, carriers pursue their addiction to an economic stream established by government fiat. The capital investment, operations expense, overhead and other expenses such as legal fees to pursue payments are all focused on supporting an antiquated platform instead of being redirected toward investment in new technologies.

The issues surrounding intercarrier compensation are not new. Numerous proposals and petitions have been filed with the Commission for resolution of these questions. By setting a unified rate for the exchange of traffic on the PSTN, the Commission will establish a converged rate that will become the proxy for exchanging traffic with IP networks. Level 3 expects that over time as networks adjust their architectures based on technological and engineering considerations, carriers will move away from a converged per minute rate to flat capacity rates. Such a rate structure more accurately reflects the mixed nature of packets exchanged between the PSTN and an IP network, leads to greater economic certainty by reducing arbitrage and reduces the time spent on billing and collections. This will free capital for further investment in the network with each expansion of fiber and IP interconnection extending the benefits and increasing the value of IP networks.

While Level 3 believes that the Commission can jump start the transition by completing its work on intercarrier compensation reform, if it believes an NOI is necessary, the following questions should be included:

1. Is there a proven need for the Commission to regulate compensation for the exchange in an all IP environment? What specific market failure requires such action?
 - a. Since packets can contain video, voice or other data applications that are delivered by a party different from the network operator, for what service is the carrier being compensated?
 - b. Will industry have to be able to identify the nature of each packet to determine the appropriate compensation?
 - c. If the Commission focuses on certain types of packets such as voice, will data or other content packets also be charged? If the Commission excludes classes of packets from the compensation regime will that lead to market arbitrage?
2. Payment obligations on the PSTN have been structured on a "sent-paid" basis or calling party pays. However, IP services typically involve the user purchasing two-way access capacity (e.g., to and from the Internet). Are these structures compatible, or would extension of the "sent-paid" model require extending compulsory termination charges requiring tariff and other obligations?
 - a. Does originating access continue to be a viable construct in a network of IP networks?
 - b. Would per-minute of use charges make sense in a network environment where parties exchange or purchase a specific amount of bandwidth and do not measure per minute usage?
3. If parties are allowed to tariff services, when should that ability terminate?
 - a. If at the cessation of operation of a carrier's circuit switched network, is that a competitively neutral result as between circuit switched and IP-based providers?
4. What forms of regulatory relief can the Commission provide now to incumbent local exchange carriers to encourage implementation of interconnection arrangements that are free of the existing intercarrier compensation regime so they will experiment and try new compensation mechanisms with individual carriers?

In addition, the Commission should seek guidance on removing the implicit subsidies that distort the intercarrier compensation system. As communications platforms converge, the road to cost recovery becomes bumpier and bumpier if carriers position themselves to obtain the best regulatory classification for their traffic. Regulated local rates, inter- and intrastate access charges and subscriber line charges are only part of a complex web of cost recovery vehicles that may not reflect true market economics. That contradiction is best reflected in the explosion in competitive wireless services and devices as compared to the residential telephone market.

It has been a bedrock assumption of telecommunications regulation that the price of local services should be kept low. In order to achieve this, regulators have used intercarrier compensation to subsidize the cost recovery for local services. Interstate and intrastate access charges have been maintained at specific levels to keep local prices low. Without the ability to compete against the subsidized rates of the incumbents, in part because of the size of their historic customer base, competitive carriers have not focused their efforts on residential markets. Instead, competition in that segment has come from cable companies that already had facilities deployed to the local premises. By adding voice to their service offerings, cable companies have been able to provide competition to the incumbents. Yet, their pricing structure is dictated in large part by the subsidized or capped rates of the incumbent local exchange carriers. If regulators compared those rates with what carriers are willing to pay for flat-rated wireless services, they would find consumers willing to pay more than the prescribed local rates for the ability to receive voice, data and other Internet services. It is no secret that many younger Americans are abandoning wireline voice services altogether. As a result, one question the Commission

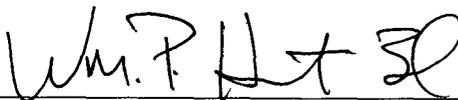
should study is whether it is time to restructure the cost recovery methodology for local services to reflect market rates. If the costs for the services move closer to cost, will the number of competitors of those local connection increase across technological platforms?

Having observed that the existing intercarrier compensation regime may hinder transition to all-IP networks, Level 3 must also caution against precipitous changes to the existing structure. Any efforts to reform intercarrier compensation must occur with a sufficiently lengthy and smooth transition so that carriers can prepare for the economic changes that will undoubtedly result from reform.

V. CONCLUSION

The transition to an all IP environment has been under way for more than two decades. The explosive growth of IP traffic is a testament to the ability of those network operators to pursue interconnection and compensation policies free of the historic regulatory regime that has crystallized around the PSTN. Level 3 believes that an NOI is not necessary and urges the Commission complete the work in front of it concerning intercarrier compensation, interconnection and universal service.

Respectfully submitted,
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