ATERWYNNE LLP
ATTORNEYS AT LAW

Suite 1800
222 S.W. Columbia
Portland, OR 97201-6618
503-226-1191
Fax 503-226-0079
www.aterwynne.com

August 23, 2005

VIA ELECTRONIC MAIL AND US MAIL

Filing Center
Oregon Public Utility Commission
550 Capitol Street NE #215
PO Box 2148
Salem, OR 97308-2148

Re: ARB 665 – Testimony of Ron Vidal, Timothy Gates, and Rogier Ducloo on Behalf of Level 3 Communications, LLC

Dear Sir or Madam:

Enclosed for filing in the above-referenced docket is Testimony of Rogier Ducloo, Timothy Gates, and Ron Vidal on Behalf of Level 3 Communications, LLC. This filing is being resubmitted with corrected formatting, including markings on the testimony and exhibits. No other changes have been made. Please contact me with any questions.

Very truly yours,

Jessica A. Gorham

Enclosures

cc: ARB 665 Service List

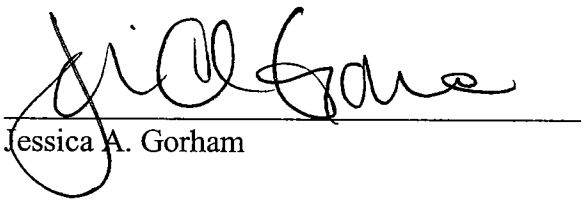
CERTIFICATE OF SERVICE
ARB 665

I hereby certify that a true and correct copy of **TESTIMONY OF RON VIDAL, TIMOTHY GATES, AND ROGIER DUCLOO ON BEHALF OF LEVEL 3 COMMUNICATIONS, LLC** was served via U.S. Mail on the following parties on August 23, 2005:

Thomas Dethlefs
Qwest Corporation
1801 California Street Suite 900
Denver CO 80202

Alex M. Duarte
Qwest Corporation
Suite 810
421 SW Oak Street
Portland OR 97204

ATER WYNNE, LLP



Jessica A. Gorham

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

ARB 665

In the Matter of

LEVEL 3 COMMUNICATIONS, INC's

Petition for Arbitration Pursuant to Section 252(b) of the Communications Act of 1934, as amended by the Telecommunications Act of 1996, and the Applicable State Laws for Rates, Terms, and Conditions of Interconnection with Qwest Corporation

DIRECT TESTIMONY OF RON VIDAL ON BEHALF OF LEVEL 3 COMMUNICATIONS, LLC

August 12, 2005

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

TABLE OF CONTENTS

I. INTRODUCTION…….1

II. PURPOSE OF TESTIMONY.....2

III. KEY ISSUES IN THIS CASE……...9

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

I. INTRODUCTION

Q. Please state your name, title, and business address for the record.

A. My name is Ron Vidal. I am Group Vice-President of Emerging Opportunities for Level 3 Communications, LLC ("Level 3"). My business address is 50 Fremont Street, Suite 2203, San Francisco, CA, 94105.

Q. Please describe your responsibilities for Level 3.

A. As Vice-President of Emerging Opportunities, my responsibilities including identifying, analyzing and evaluating new technology and business models including wireless, optical networking and other advanced communications technologies that may impact Level 3 globally over the next five years.

Q. Please describe your educational background and professional experience.

A. I received a Bachelor of Science from Drexel University. Prior to being Group Vice-President of Emerging Opportunities, I served Level 3 as the head of New Ventures and Investor Relations, where I worked on over $12 billion of capital markets transactions in the equity, debt and convertible debt markets .

Before joining Level 3 I was Vice-President of New Ventures for MFS WorldCom and MFS Communications. I have led technical and operational due diligence teams on over $18 billion in telecommunications mergers & acquisitions (M&A) transactions including MFS's acquisition of UUNET Technologies, MFS's acquisition of Centex Telemanagement, WorldCom's acquisition of MFS and WorldCom's acquisition of Brooks Fiber. I have also worked on integration teams for these transactions post closing. The companies in these transactions were all significant parts of the competitive telecommunications industry and also represented the largest Competitive Local Exchange Carriers (CLEC) in MFS Communications, the largest Internet Protocol (IP) backbone network in UUNET Technologies and one of the largest Interexchange Carriers

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

(IXC) in WorldCom. Additionally at MFS, my team developed and introduced the first commercial DSL service for high speed Internet access.

Q. Have you ever testified before this Commission?

A. No.

Q. On whose behalf was this testimony prepared?

A. This testimony was prepared on behalf of Level 3 Communications, LLC. ("Level 3").

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to identify and discuss the key regulatory, competitive and technology policies that should guide the Commission in resolving the issues identified in the Level 3 Petition for Arbitration ("Petition").[1] This testimony relates generally to all of the issues in this proceeding, and I provide comments on each one. That said, Mr. Gates and Mr. Ducloo provide specific, detailed testimony addressing each issue as well.

Q. Why is policy-oriented testimony necessary in the context of this proceeding?

A. A clear focus on the policies underlying the 1996 Act and related regulatory rulings will be helpful in assessing the parties' claims on specific issues. It will probably turn out that some of the issues are governed by binding FCC rules and rulings. Level 3's attorneys will present those matters in its briefing. However, on some issues, this Commission will have a certain range of discretion in how it will decide. It is therefore helpful to identify the policy considerations that the Commission should consider in exercising its discretion. Moreover, a discussion of the policies underlying this case makes it easier to understand the practical application of those legal and regulatory provisions. These

[1] See, Petition of LEVEL 3 COMMUNICATIONS, LLC for Arbitration of an Interconnection Agreement with Qwest Corporation, pursuant to Section 252 of the Telecommunications Act of 1996; filed on May 13, 2005 ("Petition").

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

policy considerations "put meat on the bones" of sometimes fairly generally-stated legal and regulatory requirements.

Q. What are some of the areas where the Commission must "put meat on the bones" of legal and regulatory requirements?

A. First, several of the key issues separating the parties relate to interconnection of their networks, under Section 251(a)(1) and Section 251(c)(2) of the Communications Act. Section 251(c)(2) in particular requires that terms and conditions of interconnection be "reasonable." That is a relatively open-ended standard, so it is helpful to articulate some specific policy considerations that should guide the Commission in determining what is and is not "reasonable."

Second, other issues in this case relate to the appropriate level of intercarrier compensation to apply in certain circumstances. Section 252(d) of the Act requires such rates to be "reasonable," again calling for some elaboration.

Third, under Section 251(d)(3) of the Act, the Commission is entitled to impose requirements regarding interconnection that are not specified in the Act, as long as those additional requirements are "consistent with the requirements of" Section 251. In considering the question of whether a particular obligation not literally set forth in the Act is "consistent with the requirements" of Section 251, to understand the policies and objectives that underlie that Section.

Basically, there are some things that the law will require the Commission to do, and some things that the law will forbid the Commission from doing. But as the Commission bears down on the different issues, it will almost certainly be the case that one party or the other will be asking the Commission to do something that it ***can*** do, but does not ***have to*** do. At that point in its decision making, the Commission should apply the policies and goals that underlie the Act, in order to render a decision that contributes to accomplishing those goals.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Q. At a very high level, what policy considerations should guide the Commission's decisions in this case?

A. As noted above, the Commission must, of course, follow binding legal and regulatory requirements.

Beyond that, however, there are three high-level policies that should guide the Commission's rulings. In the nature of things, these three high-level policies overlap to some degree, but stating them separately is helpful in considering the issues at hand.

First, the entire purpose of the 1996 Act is to encourage competition in telecommunications markets. The Commission, therefore, should in each case ask whether deciding for or against Level 3 would encourage the development of competition. In this regard, the Commission must focus on decisions that will benefit the development of competition in the market as a whole, not the short-run, private interest of either party.

Second, the Commission should make decisions that encourage development and deployment of new technology and innovative, new services. The history of the telecommunications industry is one of sustained — one might even say unrelenting — technical and service-oriented innovation. On some level, each decision the Commission makes here will either facilitate and encourage such innovation, or will tend to preserve the *status quo.* The 1996 Act is not about preserving the *status quo.* It is about bringing new and innovative services to all segments of the industry.

Third, the Commission should promote and encourage the unfettered growth of the Internet. Section 230 of the Communications Act, and any number of FCC pronouncements, embody a clear policy to promote the growth and development of the Internet and consumer access to it. We are now so accustomed to contacting friends by email, finding information from Google or Yahoo or MapQuest, and downloading our favorite music from iTunes or RealNetworks, that it is easy to forget that these and other

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

incredibly useful services and applications did not just magically appear, and the environment in which they grew and developed was not some stroke of luck. To the contrary, the wide-open environment that made these services possible was the result of conscious policy choices to keep regulation away from the Internet. Frankly, as Internet applications such as Voice over Internet Protocol ("VoIP") services are beginning to hit the incumbents where they live, so to speak, the policy of keeping the Internet unregulated is coming under increasing assault. The Commission, however, should not lose sight of the prize: an unregulated, competitive market in which firms are free to innovate without having to pay homage to regulatory monuments set up in the last Century to accommodate old technologies and old industry structures.

Q. At a high level, how do these policies relate to each other?

A. While they may conflict in some situations, on the whole these policies are mutually reinforcing. Promoting competition creates an environment in which firms are free to innovate and deploy new technology, free from unfair attacks by entrenched monopolists and unnecessary regulatory restrictions. The development and deployment of new and innovative technology, of course, stimulates and enables competition. And the flexible, advanced capabilities of the Internet simultaneously depend on and enable both competition and technical innovation.

Q. Please provide an overview of where Level 3 fits into the communications industry.

A. Level 3 is not a traditional competitive local exchange carrier ("CLEC").

In broad terms, many of the CLECs that were created following the 1996 Act had a business model that boiled down to, "do what the incumbent does, only 5% better." As the regulatory authorities have come to appreciate the need to encourage competition based on investment in competing facilities, this business model has become increasingly unviable. Many of the CLECs that have gone into bankruptcy or been acquired by rivals had placed key reliance on this now-superseded business model.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Level 3, however, takes a very different approach. Level 3's business focuses not only on the traditional public switched telephone network (PSTN), but also — in fact, even more directly — on the Internet. Level 3's entire network architecture arose out of the architecture of the Internet, which, as Mr. Ducloo notes, evolved as a scientific, educational and military network outside the PSTN. The Internet uses packet switching, developed in the 1970s, as opposed to circuit switching, developed, essentially, in the 1870s. (When the original, 19th Century forebear of "Ernestine the Operator" plugged a line into her circuit board, she was doing just what circuit switches do today: creating a dedicated path between two customers for the duration of their call.)

While Level 3 certainly functions as a "local" exchange carrier, in fact Level 3's operations are nationwide, and more, in scope. Level 3 has billions of dollars invested in its network, which consists of an all fiber-optic backbone connected to 68 markets in the U.S. and 17 markets in Europe. Level 3 has over 16,000 route miles of fiber in the US and an additional 3600 route miles in Europe. Riding on this fiber backbone, Level 3 maintains a separate, private IP network, composed of high-speed links (carried over the fiber optic facilities) and core routers (which direct enormous volumes of packetized traffic to the appropriate destinations). The Level 3 IP backbone is connected to the public Internet by means of hundreds of peering arrangements with other large Internet entities, located in approximately 30 different metropolitan areas.

Level 3 is extensively interconnected with other networks. Its central offices are state-of-the-art facilities in the heart of 70 major metropolitan areas, which, as Mr. Ducloo explains, range in size from 50,000 to 550,000 square feet of equipped floor space. In these locations, Level 3 terminates both local and intercity fiber networks, as well as locates its high-speed transmission equipment, routers, and Softswitch equipment. (Softswitch technology bridges the gap between legacy circuit-switched technology and more advanced IP-based networks.)

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Level 3 believes that, while other entities in the communications business — such as, frankly, Qwest — struggle to adapt to change, Level 3, to quote a former President, ***is*** the change.

III. KEY ISSUES IN THIS CASE

Q. Broadly speaking, how does Level 3's approach to the industry relate to the key policies at issue in this case?

A. Level 3's network embodies innovation and new technology. Its services facilitate and encourage access to and development of the Internet. And, it provides competition across a wide spectrum of telecommunications markets. From Level 3's perspective, its entire business plan is consistent with, and dependent on, the policies underlying the 1996 Act.

Q. Please identify the key issues in this case that you address.

A. I address four main issues in this case.

First is the issue of network interconnection architecture. Level 3 wants to be able to interconnect with Qwest at a single POI in each LATA, with each party responsible for the costs of its facilities on its side of the POI. Qwest wants to be able to force Level 3 to deploy uneconomic facilities to establish multiple physical interconnections, and to offload some of Qwest's network costs onto Level 3.

Second is the issue of separate trunking. Level 3 wants to send traffic to Qwest switches using high-capacity trunk groups that combine different regulatory "types" of traffic in an efficient manner. Qwest wants to require Level 3 to incur unnecessary network costs, and degrade efficiency, by breaking the traffic bound for a particular switch into smaller, less efficient, separate trunk groups.

Third is the question of intercarrier compensation for so-called "VNXX" traffic. This is traffic that is dialed by end users, routed through the network, and billed exactly like traditional "local" traffic, but that Qwest wants to exempt from the normal compensation regime applicable to such traffic. Indeed, Qwest wants to ***charge*** Level 3

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

for the privilege of receiving calls that Qwest's customers make to entities served by VNXX arrangements, despite the fact that these arrangements are technically identical to those applicable to local calls.

Fourth is the question of the delivery by Level 3 of VoIP traffic. This type of traffic is the latest of many inroads that the Internet has made over the years into the traditional preserve of the PSTN. Qwest, understandably, wants to suppress or at least slow down the growth of VoIP — at least VoIP not provided by Qwest — and so requests that this information-service traffic be assessed full, subsidy-laden access charges (which will of course tend to make the service less viable). Level 3 believes that the development of VoIP should be encouraged, and so believes that termination of VoIP traffic should be at the same low rate applicable to so-called "Section 251(b)(5) traffic."

Mr. Gates and Mr. Ducloo provide detailed discussion of these issues from the perspective of economics and technology. In the remainder of my testimony I address them from the perspective of the broad policy goals and objectives outlined above.

Q. How do the policies you identified above apply to Level 3's right to interconnect using a single POI?

A. Each of the policies identified above supports allowing Level 3 to interconnect by means of a single POI until and unless Level 3 itself believes additional POIs are needed. For this issue, the primary policy is the promotion and encouragement of competition. Although Level 3, as noted above, has invested billions of dollars in its advanced, fiber-optic, IP-based network, that does not mean that it can or should be called upon to mirror or duplicate the local network architecture of the ILECs with which it interconnects and competes. To the contrary, it would be extraordinary to conclude that a competitor like Level 3 would have any rational interest in duplicating the incumbent's network architecture.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

The essence of Level 3's local business plan is to identify customers with high levels of Internet-based communications, either incoming, outgoing, or both, and provide highly efficient links for such customers both "upstream" to the Internet itself and "downstream" to the PSTN. Level 3 has no independent business reason to try to re-create Qwest's local network architecture. Instead, what Level 3 primarily needs from Qwest in order to serve its customers is efficient, seamless interconnection between Level 3's network and Qwest's network. It seems plain that efficient interconnection of this type will be degraded if Level 3 is subject to regulatory obligations to establish multiple physical interconnections with Qwest, above and beyond those that are necessary to Level 3's business and that Level 3 will put into place itself.

As Mr. Ducloo notes, Level 3 is not averse to establishing multiple physical points of interconnection in a LATA when traffic levels and other factors so warrant; but ***requiring*** Level 3 to interconnect at multiple points on Qwest's network really boils down to punishing Level 3 — in the form of needless mandated capital expenditures — for not having the same network, the same customer base, and the same business plan as Qwest. This is contrary not only to the policy of encouraging competition, but also to the policy of encouraging the deployment of new, innovative services and network architectures.

Clearly, as a policy matter, Qwest is simply wrong in insisting that Level 3 should have to establish more than one physical POI within a LATA.

Q. What about Qwest's proposal to require Level 3 to pay Qwest for facilities on Qwest's side of the POI?

A. Competition between networks is facilitated when each network is fully responsible for its own operations and for the costs generated by its own customers' activities. The 1996 Act provides that each parties is entitled to payment when the other party delivers traffic for termination — so called "intercarrier compensation." Other than these legally-

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

mandated intercarrier compensation payments, however, there should not be any charges between the parties for their respective network facilities and operations. Instead, the parties should work cooperatively to efficiently exchange traffic, with each party responsible for its own costs in doing so, other than the intercarrier compensation noted above. Any Qwest proposal that has the economic effect of shifting its own network costs to Level 3 is inappropriate as policy matter.

Q. How do the policies you identified above apply to establishing separate trunks for different "types" of traffic?

A. On this issue, Qwest is trying to drag Level 3 back into the past. Level 3 proposes to deliver traffic to each Qwest switch on a single, efficient, combined trunk group. As Mr. Ducloo explains, all of the traffic that Level 3 will deliver on this single trunk group is technically identical. That is, each call will arrive properly formatted for delivery on the PSTN by Qwest, with the appropriate call identification information, signaling data, etc. (This is not to say that no calls will ever be delivered without completely accurate signaling. No system of call identification is perfect. It is to say that only small amounts of traffic will not be properly identified.)

Qwest, however, is not concerned about technical efficiency. Instead, because it thinks that different kinds of traffic fall into different regulatory buckets, it wants those types of traffic sent on separate trunk groups. This is anticompetitive, because it will impose needless costs on Level 3. It is also contrary to the development and encouragement of new services, in that it forces Level 3 to classify traffic in accordance with the old, existing service classifications with which Qwest seems most comfortable. And, particularly in the case of VoIP traffic, the inefficiencies imposed by Qwest's suggested a requirement of separate trunking for different "types" of traffic will act to directly suppress the development of this exciting Internet-based innovative service.

The only conceivable legitimate factor supporting Qwest's position is the fact that

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

under current regulatory rules, different "types" of traffic are, indeed, subject to different charging regimes (*i.e.,* access charges versus reciprocal compensation). So, if there were no practical way to apply those different charging regimes without separate trunks, Qwest's position might be entitled to some consideration. In fact, however, as Mr. Ducloo explains, combining different "types" of traffic onto a single, efficient combined trunk group does not interfere with proper billing. If Qwest has implemented a fully functional, robust recording, billing, and mediation system, the industry-standard call signaling and identification data that Level 3 will transmit will allow Qwest to properly bill on a call-by-call basis. If Qwest has not done so, then Level 3's proposal to use periodically updated factors to allocate total traffic among the different billing regimes is a practical and fully adequate solution.

Q. How do the policies you identified above apply to the treatment of VNXX traffic?

A. This is a classic situation in which the incumbent is trying to use regulatory gamesmanship to suppress competition that arises from a competitor's use of a technological arrangement that the incumbent did not originally choose to offer. Not only is it anticompetitive, but, because the main users of VNXX arrangements are Internet Service Providers ("ISPs") trying to provide efficient and economical access to the Internet, it is contrary to the policy favoring Internet development as well.

As Mr. Ducloo and Mr. Gates explain, as a technological and economic matter, when a Qwest customer calls a Level 3 customer served by a VNXX arrangement, what Qwest does is 100%, exactly, the same as what Qwest does when it delivers a traditional, geographically-delimited "local" call to a Level 3 customer. Moreover, Level 3's proposed intercarrier compensation treatment of VNXX calls to ISPs is identical to the intercarrier compensation treatment that would apply to an ISP or anyone else who purchased traditional "FX" service from Qwest itself.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

At bottom, Qwest doesn't like the fact that its subscribers spend a lot of time calling ISPs served by Level 3; it does not like the fact that those ISPs themselves, viewed as customers, have chosen to take service from Level 3 as opposed to Qwest; and, I suspect, at bottom Qwest still feels threatened by the incredible level of consumer interest in accessing the Internet. Given this, Qwest is naturally motivated to throw grit in the gears of the most efficient means of serving those ISP customers and letting its own subscribers connect to them. Qwest obviously can't literally prevent its customers from connecting to their chosen ISP — the consumer and, I would hope, regulatory outrage would be unbearable. So it is trying to do the next best thing, which is to make it economically unviable for Level 3 to offer the efficient arrangement. If Level 3 had to pay originating access charges on VNXX calls to ISPs, that would make the service totally uneconomic.[2] But even depriving Level 3 of the appropriate $0.0007 per minute applicable to ISP-bound traffic would, as Qwest well knows, put a dent in Level 3's business case for serving ISPs.

The Commission should reject Qwest's position and require that VNXX calls to ISPs be treated, for intercarrier compensation purposes, like any other locally-dialed ISP-bound calls.

Q. How do the policies you identified above apply to the question of termination rates for VoIP traffic?

A. VoIP is an exciting and innovative Internet application that turns the voice-centric world of the PSTN on its head by treating voice communication as just another data-oriented application on the worldwide Internet. From a long-run industry perspective, it

[2] I am not a lawyer, but even so it is obviously bizarre for Qwest to claim that ***intrastate*** access charges apply to ISP-bound calls, after the FCC for years has been saying that ISP-bound traffic is ***interstate*** in nature. In April 2001 the FCC set up a special interstate regime for handling compensation for all ISP-bound calls. From my perspective, Qwest's attempts to carve the most common means of providing service to ISPs out from that regime is blatant regulatory gamesmanship.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

represents the triumph of data networks over voice networks. While the PSTN can provide only a limited, low-bandwidth form of data communications (basically, dial-up access to the Internet at 56 kilobits per second), the Internet can do everything the PSTN can do, and more. In my view, it is only a matter of time before the entities that comprise and operate the PSTN convert to IP-based communications, as indeed, Qwest and other PSTN entities are already beginning to do.

One of the features of the Internet is that distance and location are largely irrelevant. As the FCC has explained, the contents of a single web page can come from a variety of different servers in a variety of different locations. Most of us familiar with modern business travel have learned that our email can reach us anywhere, either downloaded to a computer in a hotel room by means of now-ubiquitous broadband connections offered by business hotels, or to wireless devices such as a Blackberry.

VoIP is an Internet application first and a voice application second. By this I mean that VoIP partakes in the distance-insensitive, location-insensitive characteristics of Internet applications. No matter what telephone number might be assigned to a VoIP customer (if any number is assigned at all), the customer might be participating in a call from next door or from around the world.

It is obviously challenging from a regulatory perspective to figure out what to do with VoIP traffic. The FCC has a number of ongoing proceedings trying to sort it out. But one thing is clear: whatever VoIP is, it is not traditional "telephone toll service," where the end user makes a call from some fixed location, completes it to some distant location, and is charged a separate toll charge for the privilege. In both economic and technical terms, VoIP calling is *sui generis.*

In these circumstances, the choice between assessing traditional access charges or lower and more economical reciprocal compensation rates on this traffic should actually be very clear. This is a new and innovative service that we should all want to encourage.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

That means that we should impose the lowest reasonable charges on it, when it needs to interface with the PSTN. That means that as a policy matter this traffic should be subject to reciprocal compensation rates, not access charges.

This makes sense from a competitive and economic perspective as well. In policy terms, the idea of access charges is that a long distance carrier collects "tolls" from end users who make use of the long distance carrier's services, and the long distance carrier then, in effect, shares those tolls with the local carriers on either end of the call. Access charges arose as an historical matter out of the divestiture of the local companies from the old Bell System. They were a means to preserve the traditional (and extensive) subsidy that AT&T Long Lines had provided to the operation of the local portions of the Bell System.

Obviously, this economic logic has no application to VoIP services. There are no traditional "tolls" being collected by VoIP providers with which to fund access charge payments; instead, VoIP services are essentially universally offered at flat rates for PSTN-wide calling. And, there is obviously no historical tradition of VoIP providers subsidizing former Bell System local entities. So, the only question, from a policy perspective, is whether we want to ***require,*** as an affirmative policy decision, that this new and innovative service must provide subsidies to the legacy PSTN, simply because one close PSTN counterpart service — traditional toll service — is required to provide such subsidies.

The answer is clearly "no." All three of the policies I articulated at the beginning of my testimony point to this same conclusion. Permitting VoIP traffic to be terminated at reciprocal compensation rates will encourage competition. VoIP is exactly the kind of new and innovative service that we should be trying to encourage, so it should not be subject to high access charges when lower reciprocal compensation rates provide adequate compensation to Qwest. And, VoIP is the latest innovative service to arise from

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

the Internet, which should be encouraged for independent policy reasons. As a policy matter, therefore, VoIP traffic should be subject to reciprocal compensation, not access charges.

Q. Does this conclude your testimony?

A. Yes.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

ARB 665

In the Matter of

LEVEL 3 COMMUNICATIONS, INC's

Petition for Arbitration Pursuant to Section 252(b) of the Communications Act of 1934, as amended by the Telecommunications Act of 1996, and the Applicable State Laws for Rates, Terms, and Conditions of Interconnection with Qwest Corporation

DIRECT TESTIMONY OF TIMOTHY J GATES ON BEHALF OF LEVEL 3 COMMUNICATIONS, LLC

August 12, 2005

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

TABLE OF CONTENTS

INTRODUCTION 3
Summary of Recommendations 6
Issue 1 -- Interconnection Architecture 9
Issue 2 --Separate Trunking 22
Issue 3 – VNXX, ISP-Bound Traffic and RUF 26
VNXX for ISP-Bound Traffic 27
Relative Use Factor 37
Issue 4 – VoIP 42

I. INTRODUCTION

Q. Please state your name, occupation, and business address.

A. My name is Timothy J Gates. My business address is QSI Consulting, 819 Huntington Drive, Highlands Ranch, Colorado 80126.

Q. What is QSI Consulting, Inc., and what is your position with the firm?

A. QSI Consulting, Inc. ("QSI") is a consulting firm specializing in traditional and non-traditional utility industries, econometric analysis and computer aided modeling. I currently serve as Senior Vice President.

Q. Please describe your educational background and work experience.

A. I received a Bachelor of Science degree from Oregon State University and a Master of Management degree in Finance and Quantitative Methods from Willamette University's Atkinson Graduate School of Management. Since I received my Masters, I have taken additional graduate-level courses in statistics and econometrics. I have also attended numerous courses and seminars specific to the telecommunications industry, including both the NARUC Annual and NARUC Advanced Regulatory Studies Programs.

Prior to joining QSI, I was a Senior Executive Staff Member at MCI. I was employed by MCI and/or MCI/WorldCom for 15 years in various public policy positions. While at MCI I managed various functions, including tariffing, economic and financial analysis, competitive analysis, witness training and MCI's use of external consultants. Prior to joining MCI, I was employed as a Telephone Rate Analyst in the Engineering Division at the Texas Public Utility Commission and earlier as an Economic Analyst at the Oregon Public Utility Commission. I also worked at the Bonneville Power Administration (United States Department of Energy) as a Financial Analyst doing total electric use forecasts while I attended graduate school. Prior to doing my graduate work, I worked for ten years as a reforestation forester in the Pacific Northwest for

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

multinational and government organizations. Exhibit TJG-1, attached hereto to this testimony, is a summary of my work experience and education.

Q. Have you ever testified before this Commission?

A. Yes. I have submitted testimony or comments in six separate docketed proceedings before the Commission in the last twenty-two (22) years, many of which pertain to opening Oregon telecommunications markets to competition. In two of those six proceedings, my testimony was provided on behalf of the Commission. I have also testified more than 200 times in 43 other states and filed comments with the FCC on various public policy issues ranging from costing, pricing, local entry and universal service to strategic planning, merger and network issues. As noted above, a list of proceedings in which I have filed testimony or provided comments is attached hereto as Exhibit TJG-1.

Q. On whose behalf was this testimony prepared?

A. This testimony was prepared on behalf of Level 3 Communications, LLC. ("Level 3").

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to address certain issues identified in the Level 3 Petition for Arbitration ("Petition").[1] Specifically, I will address: **Issue 1:** Interconnection Architecture; **Issue 2:** Separate Trunk Groups; **Issue 3:** Internet Service Provider ("ISP") Bound Traffic, Relative Use Formula ("RUF"), and Virtual NXX ("VNXX"); and **Issue 4:** Voice Over Internet Protocol ("VoIP"). Some of these disputes are primarily engineering issues, but I will be addressing them from an economic perspective.

Q. How is your testimony organized?

A. My testimony is organized by issue. The various discussions of the Tier 1 issues can be found on the following pages:

[1] *See* Petition of Level 3 Communications, LLC for Arbitration of an Interconnection Agreement with Qwest Corporation, pursuant to Section 252(B) of the Telecommunications Act of 1996; filed on June 3, 2005 ("Petition").

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Issue 1 Interconnection Architecture.....Page 10
Issue 2 Separate Trunk Groups.....Page 23
Issue 3 VNXX, ISP-Bound Traffic, and RUF.....Page 27
Issue 4 VoIP .....Page 44

Q. What key economic principles apply to the issues in this arbitration?

A. All of my recommendations in this matter are based on a few simple but important economic principles:

First, neither party to an interconnection agreement should be able to impose unnecessary costs on the other. Obviously the process of interconnection itself entails certain costs, some of which fairly and properly fall on each party. But neither party should be able to insist on interconnection arrangements that are costly to the other party ***for no good reason.*** As a society, we want interconnection arrangements to be as efficient as possible; requiring needless expense is inconsistent with that goal.

Second, interconnection arrangements should reflect the most efficient technical means for handling any particular situation, even if that that is not the technical arrangement currently in place for one of the parties. If a party can prevent an efficient arrangement simply because that party has not taken the time or effort to become efficient itself, the interconnection agreement will, in this respect, become a government-sanctioned transfer of wealth from the more efficient party to the less efficient party. A similar transfer of wealth will occur if the incumbent is allowed to force inefficiencies on the party with which it interconnects. Such inefficiencies do not make any economic sense and are not in the public interest.

Third, it needs to be very clear that the incumbent's way of doing things is not necessarily the most efficient way of doing things. From an economic perspective the purpose of the 1996 Act is to enable and facilitate competition in traditionally monopolized telecommunications markets by removing economic and operational

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

impediments.[2] Further, with the rapid pace of technological advances in transport and switching technologies, no rational provider would adopt the traditional technologies and methods of operation of the incumbent. Facilitating and enabling competition, therefore, necessarily requires analyzing interconnection and intercarrier compensation issues from a forward-looking perspective in which the technology that is most efficient from a long-run economic cost perspective that may not include the technology currently in use by the incumbent. It follows that "because the incumbent does it that way" is not only *not* a good argument in favor of a particular resolution of an issue — in many cases it might be a *good* reason to reach the opposite conclusion.

Fourth and finally, a recognition of the critical role that technological advance has played in contributing to economic welfare in the field of telecommunications justifies a preference for the result that favors, and enables, new technology. There is no dispute that communications technology is a decreasing cost industry. From an economic perspective, anyone who has a large sunk investment in a particular technical approach will rationally do whatever he can to prevent new technologies from making his technology obsolete. But this private interest in protecting existing investment from the forces of competition is directly contrary to the public interest in innovation and the deployment of new, more efficient technologies. From an economic perspective it is not only appropriate but necessary for decisions regarding interconnection disputes to take this factor into account.

II SUMMARY OF RECOMMENDATIONS

Q. With those principles in mind, please summarize your recommendations on the key issues separating qwest and level 3 in this arbitration.

A. **Issue 1** relates to interconnection architecture. Level 3 wants the agreement to clearly

[2] In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; **FIRST REPORT AND ORDER;** CC Docket No. 96-98; Released August 8, 1996; at ¶3. Hereinafter referred to as the FCC's "*Local Competition Order*."

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

state that it is entitled to interconnect with Qwest at a single point of interconnection ("POI") in each LATA; to state that all types of traffic will be exchanged by means of that physical POI; and that each party will bear the costs of its facilities and arrangements on its side of the POI, including all costs of getting its own traffic to the POI. This is the correct result from an economic viewpoint.

Qwest's network architecture reflects a mix of technology and economic decisions that Qwest has made over many decades. That architecture does not remotely reflect what an efficient firm would construct today. It follows that Qwest should not be able to force Level 3 to spend money to duplicate or mirror Qwest's architecture — which is essentially what a multiple-POI requirement does. Rather, each carrier should be responsible for its own network, with the hand-off of traffic between the networks occurring at a single, efficient point. Of course, this does not preclude the parties from voluntarily agreeing to establish whatever additional POIs they may choose in particular cases. It does, however, prevent Qwest from imposing transport and other responsibilities onto Level 3 that arise from Qwest's legacy network architecture.

Issue 2 relates to the use of trunk groups that carry different "types" of traffic on a combined basis to and from the POI. Level 3 wants all traffic exchanged between Qwest and Level 3 switches within a LATA to be carried on a single trunk group between its network and the POI. Qwest wants Level 3 to separate the traffic and route it over different trunk groups based on whether the traffic falls into arbitrary categories. There is no sound economic basis for Qwest's proposal. As Mr. Ducloo testifies, from a technical perspective, taking a large volume of traffic and breaking it up into a set of smaller trunk groups degrades trunking efficiency, so that a higher total number of trunks — and therefore trunk ports on switches — is needed. In economic terms, this results in a pure deadweight loss – *i.e.* costs are imposed with no corresponding economic or societal benefit.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Qwest says that it needs traffic on separate trunk groups in order to properly apply different billing rates to the different types of traffic, but that is simply not true. All that is required is to measure the total volume of traffic on a trunk group, and then apply factors (based on a periodic analysis of the traffic) indicating what proportion of the traffic is subject to reciprocal compensation, what proportion is subject to access charges, etc. These jurisdictional factors have been used for decades.

Issue 3 relates generally to whether ISP-bound traffic should be subject to the FCC-mandated rate of $0.0007 per minute even when the ISP's equipment is not in the originating local calling area (as developed for Qwest's network architecture) of the end user dialing up the ISP. Level 3 maintains that this low rate should apply because the FCC has preempted the states as to intercarrier compensation for this traffic; Qwest apparently takes the view that if the ISP's equipment is not in the originating local calling area, not only should Qwest not pay Level 3 the $0.0007, but Level 3 should actually pay Qwest originating access charges.

Qwest also wants to impose its own network costs on Level 3. Qwest's position is simply wrong. When Qwest delivers an ISP-bound call originated by its customer to Level 3's POI for termination, Qwest's costs are not affected in the slightest by the location of the ISP's equipment. Moreover, Qwest's position would impose a penalty on Level 3 for working with ISP customers to efficiently configure their equipment in a manner to minimize both their and Level 3's costs, or, put another way, would create an incentive on Level 3 and its ISP customers to configure their equipment inefficiently simply in order to avoid regulatorily-imposed payments to Qwest. From an economic perspective, Qwest's position is totally irrational and discriminatory and should be rejected.

Issue 4 relates to the application of the $0.0007 rate to IP-enabled voice traffic, generally referred to as Voice over Internet Protocol or "VoIP", as well as purely "ISP-

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

bound" traffic. This type of traffic should not be burdened with "access charges." Further, there is no technical or economic reason to treat VoIP differently from other ISP-bound traffic. Qwest wants to either exclude this type of traffic entirely from interconnection or impose special, higher charges for terminating that traffic. Here again, Qwest's position makes no economic sense. Qwest does not incur any costs for terminating this VoIP traffic that differ from its costs in terminating traffic that Qwest would acknowledge is subject to the lower rate. From an economic viewpoint, it appears that Qwest is trying to ensure that growth of this new technology is inhibited by means of making it more costly than necessary to actually complete such calls. This is contrary to the public interest and to the efficient development and operation of the market. Unless there is some compelling legal or policy reason that ***requires*** the application of higher charges to this traffic — and I am certainly not aware of any — it makes sense to have the lower rate apply. I discuss each of these issues in more detail below.

Finally, I note that **Issue 5** in this matter is largely "legal" in nature, relating to the incorporation of certain terms by reference into the parties' interconnection agreement. I do not address that issue in this direct testimony.

Issue 1 -- Interconnection Architecture.

Q. Please summarize the positions of Level 3 and Qwest with regard to interconnection architecture.

A. Level 3 wants to exercise its right to establish a single POI for each LATA for the exchange of all types of traffic with Qwest, with each party responsible for the facilities on its side of the POI.[3] Moreover, the only charges from one party to the other for terminating traffic delivered to the POI would be the applicable per-minute charges (reciprocal compensation or access). Qwest seeks to require the establishment of

[3] As will be discussed later in this testimony, a POI is the point at which two networks interconnect for the exchange of traffic.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

multiple POIs in some circumstances and to improperly impose onto Level 3 the cost of establishing and maintaining trunking arrangements put in place for Qwest's own convenience.

Q. Please provide a general overview of the economic rationale for interconnection pursuant to the Act.

A. Interconnection of networks is essential for the provision of telecommunications services. If two networks are not interconnected, their subscribers cannot call each other, which reduces the value of both networks. However, the economic effect of denial of interconnection is not the same for each network. If a large network denies interconnection to a smaller one, the impact on the large network may well be very small (since few of its customers will want or need to contact customers of the other network), while the denial of interconnection will be devastating to the smaller network, since its few subscribers would not be able to call anyone other than others on the same network. Where the dominant network became dominant as a result of government policy (as is the case with the ILECs), it would be wrong to ignore the potential that smaller networks might be harmed as a result of denial of interconnection, or by inefficient interconnection, when government policy (the Telecom Act of 1996) now recognizes the importance of promoting competition.

Q. Did Congress recognize the importance of interconnection to the development of competition?

A. Yes. Congress recognized the importance of interconnection by requiring all telecommunications providers to interconnect, directly or indirectly, in Section 251(a)(1) of the Act. But Congress also recognized that the ILECs were and would remain the overwhelmingly largest networks and the dominant carriers in any given area for the foreseeable future (and, nearly 10 years after the passage of the Act, this remains true). This situation gives the ILECs powerful economic leverage over CLECs: the ILEC will

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

be strongly motivated to use its control over access to its large base of subscribers either to out-and-out destroy its competitors (by not allowing interconnection at all) or hamper their growth by only permitting interconnection on expensive or inefficient terms. So, Congress — quite rationally from an economic standpoint — imposed special interconnection duties on ILECs.

Q. What were those special interconnection duties imposed on ILECs?

A. In Section 251(c)(2) of the Act, ILECs are required to permit a "requesting telecommunications carrier" to physically interconnect its network with that of the ILEC for the exchange of traffic. This limits the ability of the ILEC to exploit its market power — arising from its control of access to the overwhelming majority of subscribers in an area — to the detriment of competitors and consumers who would benefit from a choice in providers.

The FCC implemented this basic interconnection requirement with its specific rules to make clear that once interconnection is established for the exchange of "traditional" traffic — telephone exchange service and exchange access — other types of traffic can and should be exchanged using the same facilities. Specifically, at ¶ 995 of the *Local Competition Order,* the FCC said:

> [I]f a company provides both telecommunications and information services, it must be classified as a telecommunications carrier for purposes of section 251 … . [T]elecommunications carriers that have interconnected or gained access under sections 251(a)(1), 251(c)(2), or 251(c)(3), ***may offer information services through the same arrangement, so long as they are offering telecommunications services through the same arrangement as well.*** Under a contrary conclusion, a competitor would be precluded from offering information services in competition with the incumbent LEC under the same arrangement, thus increasing the transaction cost for the competitor. We find this to be contrary to the pro-competitive spirit of the 1996 Act. By rejecting this outcome we provide competitors the opportunity to compete effectively with the incumbent by offering a full range of services to end users without having to provide some services inefficiently through distinct facilities or agreements.[4]

[4] *See Local Competition Order* at ¶ 995 (emphasis added).

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

This is plainly the correct policy from an economic perspective. Once the investment has been made to establish a facility interconnecting two networks, it makes no sense to limit the use of that facility to particular types of traffic, if there are other types of traffic that also need to be exchanged. Instead, the most efficient use should be made of whatever physical interconnection facilities are established. As the FCC itself has noted, the obligations identified in section 251 are necessary to support the FCC's goal of developing competition for the benefit of consumers and the economy.[5] Interconnection should be established on a cost-based, efficient basis that inhibits the ILEC's use of market power in anti-competitive ways to erect barriers to the establishment of an effectively competitive market.

Q. How do these considerations relate to the question of using a single POI per LATA for interconnection?

A. The use of a single POI per LATA is generally an efficient and effective way to exchange all traffic between an ILEC and a CLEC's network. Requiring the CLEC to establish multiple POIs boils down to making the CLEC duplicate some or all of the ILEC's preexisting network architecture. This will not be efficient, given that the CLEC may serve a different customer base than the incumbent and will likely use different (and more modern) technology. As a result, there is every reason to think that requiring the CLEC to mirror the ILEC's network architecture will be inefficient and not in the public interest. Therefore, all that should be required is a single POI interconnection architecture.

Q. Please define a "point of interconnection" or "POI."

A. In order for Level 3 and Qwest to exchange traffic between their respective customers, they must physically interconnect their networks. Per the FCC's rules, "interconnection"

[5] Total Telecommunications Services, Inc and Atlas Telephone Company, Inc v. AT&T Corp, *Memorandum Opinion Order*, FCC 01-84, ¶ 25 (released March 13, 2001).

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

refers to the physical linking of two networks for the mutual exchange of traffic between customers subscribed to the respective networks.[6] A POI is simply the place where the two networks interconnect. It is also normally viewed as the financial and physical demarcation point that defines where one party's financial and operational obligations end and the other party's begin.

Q. Who should bear the costs of interconnection?

A. Basically, each provider should bear its portion of the cost. Each carrier's subscribers benefit from the ability to make calls to and/or receive calls from the other carrier's subscribers. Of course, each carrier is really only able to control the costs and activities on its own network, not on the other party's network. Therefore, it is sensible to require that each carrier be responsible for the costs of its own network, on its side of the POI. This is precisely what the FCC has required in Rule 51.703(b). This rule says that each carrier is fully responsible for the costs incurred in getting traffic from its network to the POI.[7]

Q. What are the economic benefits of using a single POI per LATA?

A. The key benefit of a single POI architecture is that it allows the carrier delivering traffic to aggregate that traffic onto a large, efficient transmission facility to the other carrier, while at the same time it allows the carrier receiving the traffic to route that incoming traffic in whatever manner is most efficient based on its own traffic and network. Now, obviously, a large established carrier would benefit by being able to require its dependent competitor to deliver traffic to each and every switch in the established carrier's network, but from an overall societal point of view that would be terribly inefficient.

Q. How would the dominant provider benefit by requiring a CLEC to deliver traffic to every switch?

[6] *See Local Competition Order* at ¶ 176.

[7] 51.703(b) states, "A LEC may not assess charges on any other telecommunications carrier for telecommunications traffic that originates on the LEC's network."

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

A. The most obvious benefit would be increasing the cost of the potential competitor and thereby disadvantaging that CLEC with respect to its entrance to, and operation in, the market. The FCC recognized the ILEC incentive to disadvantage CLECs. Specifically, the FCC noted:

> Given the incumbent LEC will be providing interconnection to its competitors pursuant to the purpose of the 1996 Act, the LEC has the incentive to discriminate against its competitors by providing them less favorable terms and conditions of interconnection than it provides itself.[8]

Requiring multiple POIs disadvantages the CLECs by increasing their costs. If the ILEC had the same customer and traffic characteristics as the CLEC it would also operate with a single POI. As such, requiring multiple POIs for CLECs when they are not justified is both anticompetitive and discriminatory, not to mention inefficient from both an economic and engineering perspective.

Q. You said that Qwest's proposal would increase Level 3's costs. Is that common in arbitrations?

A. Yes, unfortunately such proposals are common. It is not in the best interest of Qwest to make it easy or cheap for Level 3 to interconnect. In fact, former Chairman Powell recognized the ILEC incentives when he stated, "At times, as I have observed, it is tempting to play the regulatory "game" in the way the incumbents often do. Begging for regulatory protection. Seeking regulatory favoritism that raises the costs of your competitors."[9]

Q. Why would it be inefficient to require a competitor to interconnect at many different points on the ILEC's network?

A. In economic terms, the location of the ILEC's switches reflects a series of choices made over a period of decades about the placement of multiple switches as compared to the use

[8] See Local Competition Order at ¶ 218.

[9] Prepared Remarks of Michael K. Powell, Before the Association of Local Telecommunications Services; "Local Competition…CLECs in the Midst of an Explosion." Convention, Las Vegas, Nevada; December 2, 1998.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

of transport from a smaller number of switches to reach subscribers. In the past when switching was relatively cheap and transmission was relatively expensive, it made sense to have lots of dispersed switches, with relatively short transport links between switches and to subscribers. Today, however – although the costs of both switching and transport have declined over time – switching is relatively expensive and transmission is relatively cheap, and it makes economic sense to have a small number of switches and relatively long transmission links to customers. So, even if it was perfectly efficient and rational for an ILEC to deploy a particular set of switches at various locations in the past, that does not remotely mean that it would be efficient and rational for a CLEC to duplicate those choices today, given the technologies available today and the particular geographic distribution of the CLEC's customers.

Q. Does the Act recognize these differences between ILECs and CLECs?

A. Yes. The 1996 Act recognizes this by giving the CLEC, not the ILEC, the choice of where to interconnect as long as it is technically feasible. Section 251(c)(2) of the Act says that the CLEC can choose to exchange traffic at "any technically feasible point" within the ILEC's network. The criterion is technical feasibility, not the economic impact – albeit minimal - on the ILEC of having to carry its traffic to or from the technically feasible point selected.

Q. Please explain why it makes sense for the CLEC to have the discretion to select POIs and not the ILEC.

A. It makes perfect economic sense, in light of the principles discussed above, to give the choice of where to locate a POI or POIs to the CLEC and not the incumbent.[10] As noted above, the incumbent built out its network over many years in response to a wide variety of then existing economic, technological and demographic conditions. It would be

[10] Indeed, footnote 464 of the *Local Competition Order* states, "Of course, requesting carriers have the right to select points of interconnection at which to exchange traffic with an incumbent LEC under section 251(c)(2)." Many orders since the *Local Competition Order* have supported the CLEC right to have only one POI per LATA.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

irrational to assume that a competitor would find it economic to re-create anything like the same network today, even to serve the same customer base — and of course no competitor will have the kind of ubiquitous customer base as the ILEC. It follows that, where it is economically reasonable for the CLEC to establish multiple POIs at multiple points on the ILEC's network, it will do so. In fact, Level 3 has a history of working closely with the ILECs in the establishment of additional POIs where traffic warrants such additional facilities. But where it does not choose to establish multiple POIs, that is solid evidence that there is no economic reason to require it to do so. To the contrary, forcing the CLEC to take account of the ILEC's network architecture choices — beyond requiring the POI to be "within" the ILEC's network — essentially forces the legacy network design choices and the inefficiencies of the ILEC onto the CLEC.

Q. As you understand the FCC's rules, do ILECs such as Qwest have the right to select POIs?

A. No. As just noted, that right is limited to CLECs and does not extend to ILECs. The FCC explained that this is so because the ILEC "has the incentive to discriminate against its competitors by providing them less favorable terms and conditions of interconnection than it provides itself."[11] Eventually, of course, the hope is that CLEC networks become sufficiently robust such that the erstwhile dominant ILEC literally cannot afford to treat CLECs badly: "competition eventually will eliminate the ability of an incumbent local exchange carrier to use its control of bottleneck local facilities to impede free market competition."[12]

Q. Are you saying that a CLEC, such as Level 3, will always establish a single POI in a LATA?

[11] See Local Competition Order at ¶ 218.

[12] Id. at ¶ 4.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

A. No. The specifics will vary from case to case, but depending on the traffic mix and where the CLEC already has facilities, it may well make sense for the CLEC to establish more than one POI in a LATA. The point, however, is that the choice has to be with the CLEC, not the ILEC. This is because the ILEC will always want to force the CLEC to interconnect at points that are favorable to the ILEC and its legacy network. From my economic perspective, it is clear that the FCC was correct when it recognized the ILEC incentives and abilities at paragraph 10 of the *Local Competition Order* wherein it states in pertinent part:

> Because an incumbent LEC currently serves virtually all subscribers in its local serving area, an incumbent LEC has little economic incentive to assist new entrants in their efforts to secure a greater share of that market. An incumbent LEC also has the ability to act on its incentive to discourage entry and robust competition by not interconnecting its network with the new entrant's or by insisting on supracompetitive prices or other unreasonable conditions for terminating calls from the entrant's customers to the incumbent LEC's subscribers.

Q. Has Level 3 established more than one POI per LATA in certain areas?

A. Yes. In the past, Level 3 has negotiated interconnection agreements that provide for additional POIs if demand or other circumstances merited such an investment. However, establishing additional POIs should be based on the need for such additional POIs, and on traffic patterns, not on Qwest's attempts to force inefficient costs onto Level 3. Moreover, just because Level 3 may have multiple POIs in certain LATAs does not mean that Level 3 should be forced to add POIs in every LATA at Qwest's discretion. To the contrary, from an economic perspective, the fact that in some cases Level 3 has voluntarily established multiple POIs, but in other cases has not, simply confirms that it is not efficient to require Level 3 to mirror Qwest's network architecture. Rather, this fact demonstrates, on the basis of actual market behavior, that Level 3 needs flexibility to establish one or more POIs where it is efficient to do so. Qwest's proposal would not give Level 3 that flexibility.

The Commission should be extremely wary of establishing any obligations in an

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

interconnection agreement that would require Level 3 to deploy significant amounts of capital in situations where Level 3 would not independently find doing so in its interest. Since the implosion of the competitive telecommunications industry in 2000, it has become increasingly difficult for CLECs to attract capital; investors are understandably wary of this sector. SBC has asserted in testimony filed in other state arbitrations that more than 200 CLECs have ceased operations in SBC territory since 2000. I have no reason to think that the numbers would be any different for Qwest's territory. Forcing CLECs to build or lease facilities, where margins are slim or nonexistent, simply to require the CLEC to duplicate the ILEC's legacy network, would only worsen CLEC prospects for attracting capital. Such a result would be inefficient from both an economic and operational standpoint and has consequently been regularly rejected by regulators as not in the public interest. The likely result of such a requirement would not be more CLEC investment; it would be fewer CLECs entering the market because the regulatorily-imposed capital requirements do not justify the investment.

Q. But regardless of the FCC rules and economic principles discussed above, isn't it unfair to Qwest to give Level 3 the choice of where and whether to establish POIs?

A. Not at all. As discussed elsewhere in my testimony, the ILEC is entitled to be paid for the work it does in terminating traffic it receives from the CLEC at a single POI or multiple POIs, just as the CLEC is entitled to compensation for terminating traffic its receives from the ILEC. Although this point is sometimes obscured by the FCC's $0.0007 rate for ISP-bound traffic, the FCC's rules for reciprocal compensation provide for a higher level of payment if traffic has to be routed through an ILEC tandem switch to get to the appropriate end office than if the traffic does not have to go through the tandem switch.[13]

[13] Under the FCC's rules for compensation for ISP-bound calling, an ILEC may choose to avoid paying reciprocal compensation rates for calls its customers make to ISPs by opting into the FCC's special regime for such traffic. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, Inter-Carrier

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

It is not "unfair" to Qwest to have to bear certain costs arising from its status as an incumbent; or, rather, if it is "unfair," that "unfairness" is simply a means to compensate for the fact that it was "unfair" to the public and to potential competitors to allow Qwest to operate in a monopoly environment for many decades prior to the enactment of the 1996 Act. A policy decision to promote competition, such as that embodied in the 1996 Act, necessarily and inevitably means that certain advantages that would otherwise accrue to the incumbent are being taken away.

Obviously an ILEC such as Qwest does not benefit from accommodating Level 3 in its efforts to attract customers, and would like to charge Level 3 as much as possible for whatever it is called upon to do. That is simply rational behavior by a monopolist trying to hold on to its monopoly position. The reason interconnection agreements are subject to statutory standards as to their content, and regulatory oversight via the arbitration process, is precisely to allow regulators such as this Board to ***prevent*** the ILEC from refusing to reasonably accommodate CLECs and to charge CLECs too much for what the ILEC has to do.

In this regard, a useful model to consider is what would happen if there were three competing carriers in an area, each serving one third of the customer base, with each carrier's customers equally valuable to the others. In this competitive situation, if any one of the carriers remained unconnected, it would suffer terribly in the marketplace, and so each carrier would be highly motivated to establish efficient interconnection with the others, at some convenient point to all three. None of them would be in a position to

---

Compensation for ISP-Bound Traffic, *Order on Remand and Report and Order*, 16 FCC Rcd 9151 (2001) at ¶¶ 89-93. If the ILEC does so it only has to pay $0.0007 per minute for calls its customers make to ISPs. But if the ILEC chooses to protect itself economically by electing to only ***pay*** $0.0007 per minute for ISP-bound traffic, it is obliged to accept all traffic from the competitor network for termination at the same $0.0007 rate, whether that traffic is delivered at a tandem, at an end office, or elsewhere. So it is probably true that Qwest would not get any higher payment from Level 3 for traffic Level 3 delivers at the tandem (or elsewhere) as compared to at the end office. But that is only because ***Qwest*** has chosen to protect itself from having to pay full reciprocal compensation rates for ISP-bound traffic by opting into the FCC's regime. From this perspective, giving up additional tandem-based compensation for inbound traffic is part of the price Qwest has chosen to pay in exchange for paying less for outbound ISP-bound traffic.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

dictate to the others where interconnection would occur, and none of them would be in a position to demand that the others pay for its own costs of running its network. Obviously we do not have anything like this kind of competitive situation today, but this hypothetical model provides a good reference point for what makes sense in establishing interconnection arrangements under the 1996 Act.

Whenever Qwest makes a demand for multiple POIs, or for Level 3 to have to pay for the privilege of terminating traffic originated by Qwest's customers, or for Level 3 to split its traffic among different trunk groups based on Qwest's preferred categorization when one trunk group would be more efficient, it is reasonable to ask whether one of our three hypothetical equally-sized competitive carriers could ever hope to get its two competitors to agree to such a thing. If not, then it's a pretty good bet that Qwest isn't being reasonable but, instead, is trying to abuse its position as the dominant provider of services.

Q. Please summarize your testimony regarding establishing a single POI.

A. Competitors using new technology should not be limited by the historic decisions of Qwest network planners who established switch locations and local calling areas decades ago based upon the more limited technology available to them. Those decisions, even if justifiable and supportable then, would certainly be different today given the changes in technology. As such, forcing competitors to conform to the ILEC's legacy network topology would be inconsistent with the goals of the *Local Competition Order* and the Act. Rather, the promotion of efficient markets dictates that a competitor such as Level 3 only be required to interconnect in a specific area where its own assessment of traffic volumes, customer demand, and available technology justify investment in facilities needed to reach that area. Level 3 should not be required to extend its facilities to POIs unilaterally identified by Qwest; instead, Qwest is obligated to provide interconnection for Level 3 facilities at POIs which Level 3 properly determines best serve its network

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

architecture and business plans. This concept actually allows Qwest to continue to design a network around its own needs, while allowing Level 3 to do the same thing.

Q. How should the Commission decide this issue?

A. The Commission should adopt Level 3's position which permits the flexibility of a single POI per LATA and reject Qwest's proposed language.

Q. What types of traffic should be exchanged over the physical interconnection facilities established at any given POI?

A. Any and all traffic should be exchanged over the physical facilities at a given POI. It is economically irrational to require the establishment of different physical facilities for different "types" of traffic when one facility will handle the traffic efficiently.

Q. Is this conclusion limited to whether the traffic falls into the regulatory category of "telecommunications" or not?

A. No. Once a POI has been established, Qwest should be required to use that POI (and should be required to permit Level 3 to use that POI) for the exchange of all types of traffic, whether they are classified as "telecommunications services," "information services," "local services," "access services," "251(b)(5) traffic," or anything else. Assuming that transmitting a particular type of traffic over a given physical facility is technically feasible, it makes no economic sense to require the establishment of additional, duplicative facilities based on the regulatory classification of the traffic. As I noted above, the FCC recognized as much at the very inception of competition under the 1996 Act: once a physical interconnection arrangement has been established for any type of traffic for which such an arrangement is properly called for under the Act, the competitor is permitted to use that same physical arrangement to deliver other types of traffic as well, even including traffic for which interconnection might ***not*** be legally required.[14] The express policy behind this requirement is to prevent ILECs from forcing

[14] See Local Competition Order at ¶ 995.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

competitors to establish duplicative physical facilities for which there is no independent technical or economic need.

Issue 2: Separate Trunking

Q. Please summarize the dispute regarding separate trunking.

A. Mr. DuCloo provides technical testimony on this point. Very briefly, a trunk is a single transmission path between switching systems, and a trunk "group" is a number of trunks similarly configured to act together to carry traffic between the same two end points. While more traffic requires more trunks in a trunk group, as Mr. DuCloo explains, the number of trunks needed to handle the traffic does not rise at the same rate as the traffic. It does not take twice as many trunks to handle twice as much traffic; it takes fewer than twice as many. Traffic engineering is similar for telecommunications and road design. You can gain efficiencies in handling traffic by adding trunks (or lanes on a highway), but the relationship is not one to one. These efficiencies are important to controlling costs for both the ILEC and the CLEC.

Q. Please explain.

A. By efficiencies, I mean that the more traffic that can be included within a single trunk group, the less money it costs both carriers to handle the traffic. On the other hand, for any given volume of traffic between two switches, the more trunk groups into which the traffic is subdivided, the more expensive it becomes at the margin to carry it.

Given this, Level 3, understandably, wants to include all of the traffic exchanged between any given Qwest switch and Level 3 on a single trunk group. From an economic perspective, the technical "trunking efficiencies" noted above guarantee that a single large trunk group will be the most economically efficient solution. Qwest, however, wants to require that the traffic to and from a particular Qwest switch be routed over separate trunk groups based not on the technical characteristics of the traffic, but rather

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

on the regulatory classification of the traffic. This makes no economic sense, and Qwest's position should be rejected.

Adding insult to injury, not only does Qwest want Level 3 to artificially divide traffic into different trunk groups based on economically irrelevant (for these purposes) regulatory classifications, Qwest wants to ***charge*** Level 3 for establishing these separate trunk groups. Qwest is entirely responsible for the cost of getting its traffic to Level 3; and, while Level 3 is entirely responsible for paying Qwest intercarrier compensation for terminating Level 3-originated traffic, that compensation is set on a per-minute basis and does not entail Qwest charging Level 3 for setting up trunks at all.

Q. How would Level 3 be disadvantaged by the language proposed by Qwest?

A. As Mr. DuCloo explains at page 22 of his testimony, under Qwest's proposal, Level 3 will have to spend more on switch programming, trunk administration, trunk ports on switches, digital cross-connect systems, and fiber optic terminals; and at some point will have to spend more on switches themselves. There is no operational or economic justification for imposing these costs on CLECs. Their only purpose would be to disadvantage CLECs vis-a-vis Qwest. In fact, Qwest's proposal would increase its own costs as well. I urge the Board to reject Qwest's proposal.

Q. Are there operational problems associated with Level 3 using trunks to carry both local and toll traffic?

A. No. As Mr. DuCloo explains, there are no technical or operational problems associated with Level 3's proposal to combine different "types" of traffic on a single trunk group that would be avoided by separate trunks. Requiring separate trunk groups, as suggested by Qwest, results in a deadweight economic loss to society, as I noted earlier.

Q. Is there any justification for requiring separate trunks for different types of traffic?

A. No. Qwest says that traffic subject to different billing rates should be put onto separate trunks in order to keep the billing straight, but that makes no sense from an economic

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

perspective either.

Q. Why not?

A. There is a simple, inexpensive way to keep the billing straight that does not entail the significant network inefficiencies of separate trunking. All that is needed is for the parties to periodically sample the traffic going between them and develop factors for how much is subject to reciprocal compensation, how much to access charges, etc. Then all that is required is to keep track of the total minutes exchanged in a given month, apply the factors, and determine the appropriate bill. Mr. DuCloo addresses this in his testimony as well.

Q. Have these factors been used in the past for billing purposes?

A. Yes. These billing factors have been used for decades with great success.

Q. Have other regulators accepted the fact that billing can be accomplished using factors rather than inefficient separate trunks?

A. Yes. The use of factors to allocate traffic on a particular facility or trunk into different billing categories has a long history in the telecommunications business going back at least as far as the early 1980s, when "other common carriers" used business lines to connect to the network to provide their competing long distance services. Eventually they became known as "Feature Group A" lines, and the industry agreed to certain assumptions regarding total traffic on such lines and on how much of the traffic was interstate versus intrastate.

Since the passage of the 96 Act, commissions have approved the use of jurisdictional factors that allows the efficient use of interconnection trunks. For instance, the Michigan Public Service Commission found in a Sprint/Ameritech arbitration proceeding that:

> It appears to the Commission that economic entry into the market requires that Sprint be permitted to use its existing trunks for *all* traffic whenever

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

feasible.[15] (emphasis added) In Texas, the Commission there ordered Verizon to allow Sprint to carry local, intrastate intraLATA and intrastate interLATA traffic on the same trunks.[16] Other states, such as Indiana, have required the use of PLUs (percentage local usage) or other allocators (e.g., PIUs – percent interstate usage) to reflect the jurisdiction of traffic on such trunks for billing purposes.[17]

Q. Other than billing, is there any other argument for Qwest to require separate trunking arrangements for different types of traffic?

A. No, in fact, Qwest would be disadvantaging itself by requiring CLECs to separate traffic of different types onto multiple trunk groups rather than carrying all traffic on a single trunk group. To put it simply, not only is it most efficient for Level 3 to carry all traffic on a single trunk group, it is efficient from Qwest's perspective as well. ***Both*** parties would have to pay extra for trunk ports, switch capacity, etc., if traffic is artificially forced onto separate trunk groups.

Q. Why would Qwest insist on contract language that would be disadvantageous to itself?

A. I cannot answer for Qwest, but it would appear that Qwest is willing to absorb costs in the short term in order to disadvantage or drive its competitors from the marketplace.[18] This is, of course, totally contrary to the public interest in the development of efficient competitive telecommunications networks, but might well be rational from the perspective of Qwest's private interest. This is particularly true if, as Mr. DuCloo notes, Qwest has excess capacity of trunk ports on its switches. If Qwest has already invested

---

[15] In the Matter of the Application of Sprint Communications Company, L.P. for Arbitration to Establish an Interconnection Agreement with Ameritech Michigan, MPSC Case No. U-11203, Order Approving Arbitration Agreement with Modifications, Jan 15, 1997.

[16] Texas Public Utility Commission; *In the Matter of the Petition of Sprint for Arbitration with Verizon*; Docket No. 24306; Final Order Modifying Arbitration Award and Approving Interconnection Agreement; dated February 17, 2004.

[17] Indiana Utility Regulatory Commission; In the Matter of AT&T Petition for Arbitration with Indiana Bell Telephone Company; Cause No. 40571-INT-03; November 20, 2000. Further, in its Revised Response to Level 3 Request No. 22 in the Illinois arbitration, SBC Illinois stated, "SBC Illinois uses a PLU methodology to distinguish local versus intraLATA toll in cases where the CLEC does not provide calling party number (CPN) information."

[18] Given the fragile nature of the competitive telecommunications industry, it would take very little to eliminate facilities-based competition. As such, any decision that disadvantages competitors as compared to Qwest will further diminish the chances for effective competition.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

in an excessive number of trunk ports (perhaps due to overly aggressive estimates of growth of traffic on its network), then it will, in effect, have trunk ports "lying around" unused. This would create a situation in which the short-run cost to Qwest of requiring inefficient trunking is relatively small, while the cost to Level 3 of using inefficient trunking would be large. Qwest could therefore engage in the classic monopolist's strategy of increasing competitors' costs at very little cost to itself by seeking and obtaining a regulatory obligation on competitors to use inefficient trunking. This is entirely rational behavior from Qwest's perspective of trying to maximize shareholder wealth through protection of its monopoly, but of course it makes no sense at all from the perspective of the public interest.

Q. What are your recommendations regarding this issue?

A. I recommend that the Board adopt Level 3's position and allow it to carry different types of traffic on one trunk group. Qwest's proposed language would result in the inefficient use of the network, additional costs to all carriers, and give an unfair competitive advantage to Qwest.

Issue 3 – VNXX, ISP-Bound Traffic and RUF

Q. Please introduce these issues.

A. The ISP-bound traffic and "virtual NXX" issues are very much intertwined. By way of background, ISPs providing dial-up service receive local calls from their customers in order to allow those customers to access the Internet. ISPs do not market and do not expect to receive long distance calls from customers seeking to connect to the Internet because long distance calls have traditionally had per-minute charges associated with them.[19] Thus, making long-distance calls to ISPs is uneconomical for end users. For the ISP, this means that it is important for end users to be able to reach the ISP by means of a

[19] Of course it is technically possible for a person to use a long-distance call to connect to his or her ISP. The point of this testimony is that experience has shown that consumers are not willing to pay long-distance charges to access the Internet.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

local call.

It is, however, terribly inefficient for an ISP to establish a physical presence in each and every ILEC-established local calling area where the ISP might have customers or where it might want to attract customers. Therefore, it is quite common — I would go so far as to call it the standard operating arrangement in the industry — for ISPs to obtain telephone numbers from CLECs or ILECs that are "local" to areas where they have customers. Because the CLECs or ILECs are providing local numbers for the ISPs, where they have no local presence, the service is similar to the FX service offered by Qwest in most states in its serving territory, at least from a end user customer perspective, although it is sometimes referred to as "FX-like," "virtual NXX," or "VNXX."

VNXX for ISP-Bound Traffic

Q. Does the ISP have facilities in each of the local calling areas where they have local numbers?

A. Not usually. As noted above, it would be very expensive for the ISPs to put their own facilities in the many thousands of local calling areas around the country. Instead, they purchase local services from carriers like Qwest and Level 3 in those areas where they have or desire customers.

Q. Does Level 3 provide such a service to ISPs? And, if so, what is it called?

A. Yes. Level 3 sells its direct inward dial ("DID") service to ISPs where it operates as or like a CLEC. This service arrangement is often referred to as "virtual NXX," or "VNXX" service. It is just another name for the functionality that has been provided for decades by ILECs under the name "foreign exchange," or "FX" service. Mr. DuCloo describes FX service in his testimony.

Q. Does Qwest provide FX service in Oregon?

A. The answer to that question is not entirely clear. In response to Level 3 Request No. 024IS which asked whether Qwest offers FX service in Oregon, Qwest stated: "The

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Commission discontinued FX service in Oregon with certain customers grandfathered in 1983." Qwest refers to the Commission's Order 83-839, issued in Docket No. UT 5, in which the Commission "put a freeze" on the provision of traditional FX services, in response to concerns arising out of the break-up of AT&T. However, in response to Level 3 Request No. 3I, Qwest has also indicated that two of its affiliates offer Internet access services in Oregon—but so far has refused to provide any details about how that service is delivered. So, at this point, all we know is that Qwest may be offering FX services to certain grandfathered customers in Oregon, and may be delivering VNXX or FX-like services to its ISP customers, through its affiliates operating in Oregon. (See Exhibit TJG-2)

Q. Please explain the market for VNXX service.

A. Where ISPs, such as Earthlink or AOL, want to offer dial-up Internet access, they contact an ILEC or CLEC to purchase local service. In Level 3's situation, the ISP subscribes to Level 3's DID service and is assigned local numbers from the Level 3 switch in the exchanges where dial-up service is being offered and where Level 3 offers service. The ISPs advise their customers of the numbers that the ISPs have been assigned, who then program the numbers into their computers for accessing the Internet. The customers' computers then dial these local numbers; the calls are routed from the ILEC to Level 3 in exactly the same manner as other local calls; and Level 3 delivers the calls to the ISP being called.

Q. Please explain how the VNXX calls are routed in the network.

A. Actually, "VNXX" calls are routed in exactly the same way as non-VNXX local calls. There is nothing special about these calls.

Q. Please explain.

A. Assume that Level 3 has a single POI in a LATA located at a Qwest tandem in Portland. Assume further that Level 3 serves all of its ISPs who have customers in that LATA from

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

a single switch that Level 3 uses to serve the entire LATA. Now assume that a customer of one of those ISPs, who takes telephone exchange service from Qwest, uses his or her computer's modem to connect to the ISP. In that case, Qwest's switch will receive the number as dialed by its customer, recognize it as a Level 3 number, and direct the call to a trunk group that connects to Level 3's POI. Level 3 then accepts the traffic and routes it to its switch and then on to its ISP customer. This is the same manner in which all local calls are routed.

Q. If this call handling is the same as all local calls then what is the dispute between Qwest and Level 3?

A. ***If*** the Qwest customer making the call happens to be in the same Qwest retail originating local calling area as the ISP's equipment, then Qwest would say that the call is "local" and there is no dispute. On the other hand, if the ISP's gear is in a different Qwest retail local calling area, Qwest says that the call is a "VNXX" call and is not local.

Q. Does the location of the ISP equipment impact the jurisdiction of the call, the handling of the call, or the cost of getting the call to the POI?

A. No. Qwest's responsibilities, and costs, are absolutely identical regardless of the location of the ISP equipment. In each case, a locally dialed call is routed to the POI for termination. All that Qwest does is determine that the dialed telephone number is a Level 3 number and ship the call off to Level 3 on an appropriate trunk group. And, what Level 3 does is the same in both cases: it recognizes the incoming traffic as bound for one of its customers and sends the traffic on to that customer. The only difference is whether the ISP's gear receiving the call is at the end of a short circuit (close to Level 3's switch, and thus often not in the calling party's retail local calling area) or a longer circuit (away from Level 3's switch, and thus, possibly, in the calling party's retail local calling area). Regardless of the distance, it is Level 3's responsibility to complete the call. In other words, it is Level 3 and **not** Qwest that is providing the Level 3 ISP customer with the

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

VNXX functionality. It makes no economic sense whatsoever to make any distinction in Qwest's financial obligations depending on whether Level 3 uses a long or short circuit to connect its customers to its switch.

As the discussion above (I hope) illustrates, from an economic perspective, Qwest's proposal is completely arbitrary and irrational. There is simply no sound economic basis upon which to distinguish these two situations.

Q. Is the routing of VNXX calls different in any way from the routing of any other local call?

A. No. As described above, and by Mr. DuCloo, it is exactly the same.

Q. Do the physical end points of the calls have any impact on Qwest's responsibilities or costs?

A. No. In response to Level 3 Request No. 023, Qwest stated in pertinent part, "The costs Qwest incurs do not vary based upon the physical location of the Level 3 customer." (See Exhibit TJG-3)

Q. Is Qwest's proposal consistent with the historical handling of locally-dialed calls?

A. No. As Mr. DuCloo explains, Qwest is actually trying to invent a new way to classify calls that has no operational or historical basis in the telephone network. Qwest's proposal is to rate and distinguish traffic based on the actual physical location of customers as opposed to the numbers the customers are assigned. This flies in the face of the way calls have been rated since the establishment of the PSTN. What's really going on here is that it is more efficient for a new competitor like Level 3 to offer FX-like services to ISPs than it is for Qwest to do so, leading to ISPs "voting with their feet" and moving their business to competitors like Level 3. Qwest is essentially trying to recoup its losses in the marketplace, and to punish its competitors, for being willing and able to offer a more efficient serving arrangement to the ISPs.

Q. Did Qwest agree in discovery that calls are not rated based on the actual physical

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

location of customers?

A. Yes. In response to Level 3 Request No. 1-029, Qwest said that, "The telephone numbers that Qwest uses for call routing purposes are assigned to its end users based on NPA-NXXs associated with specific LCAs in the state." (See Exhibit TJG-4) This is consistent with Level 3's position in this proceeding. Qwest also noted correctly that "…switches do not route calls based on specific addresses stored within the switches…." (Id.) Indeed, neither Qwest's tariffs nor its switches contain customer specific location information that would be required to implement Qwest's proposal in this proceeding.

Q. Are there negative consequences associated with Qwest's proposal to treat VNXX calls as something other than local calls?

A. Yes. Qwest's proposal would impose substantial additional costs on ISPs. If Level 3 is required to pay access charges for calls it receives to its ISP customers who use VNXX services (or is denied intercarrier compensation for such calls), Level 3's cost of doing business will increase and it may have to raise its rates to its ISP customers. In order to deal with those rate increases, the ISP customers will either have to deploy otherwise unnecessary and inefficient facilities so that their equipment actually is in the calling parties' local calling areas (thereby relieving Level 3 of some of the economic burdens caused by Qwest's proposal), or keep the efficient equipment arrangement but be subject to the higher costs. Either way, the ISPs may have to raise rates to their customers, and, particularly for some areas, may simply decline to provide dial-up access, in order to minimize costs. This is plainly contrary to the public interest.

Moreover, Qwest's proposal to not pay reciprocal compensation on calls to customers who are not "physically located" in the same local exchange, or require toll treatment for such calls, would give Qwest yet another competitive advantage over CLECs. Qwest's proposal would improperly benefit its own affiliated ISPs, increase the cost of Internet access and reduce competition to the detriment of consumers and the

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

economy. Qwest's proposal would put in jeopardy any competition for ISP dial-up services, thereby depriving consumers of choice in what has become an indispensable information, education and economic tool, especially for those still significant portions of customers who cannot yet afford the costs of dedicated broadband connections to the Internet.

Q. Are there any additional negative consequences associated with Qwest's proposal?

A. Yes. In developing its multi-billion dollar nationwide network, Level 3 did not simply duplicate the network of Qwest and other ILECs. Instead, Level 3 has deployed a softswitch technology-based network which is much less capital intensive, and much more location insensitive than traditional ILEC networks. Using this advanced technology, Level 3's network is designed to operate most efficiently by serving large regions of the country on an integrated basis. It is indifferent to ILEC legacy central office boundaries. By taking advantage of such technology shifts, competitors such as Level 3 can participate in the natural progression of market development, perhaps even "pulling even" with ILECs who, by virtue of the presence of their existing networks have incredible inherent market advantages. Qwest's proposal would therefore at least partially negate efficiencies Level 3 designed into its network — which efficiencies Level 3 continues to invest in, as demonstrated by its recent decision to upgrade its network with optical equipment capable of carrying up to 400 gigabits per second over a single fiber strand. These efficiencies are of no use to anyone, however, if Qwest is permitted to burden Level 3 with such arbitrary and unwarranted interconnection and compensation provisions.

Q. Does Qwest offer ISPs a service similar to VNXX service?

A. Yes. In addition to standard offerings such as FX, Qwest offers its "Wholesale Dial" service. According to its online literature, Qwest's service "provides a secure, reliable, cost-effective dial-up network infrastructure solution for ISPs. The service provides the

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

ISPs' end users with seamless dial-up functionality that remains transparent." One of the benefits touted by Qwest is the availability of "local access telephone numbers."[20] So, as you can see, this is yet another example of services provided to ISPs for the purpose of providing local dial-up access for consumers in areas where the ISPs may or may not have a physical presence.

Q. You noted earlier that Qwest wants to impose access charges on Level 3 in connection with calls that Qwest customers make to ISPs served via FX numbers. Is there any economic rationale for doing so?

A. No. VNXX service is a "local" service to which access charges do not apply. Instead, the VNXX calls are ISP-bound calls that terminate (from Qwest's perspective) at the POI. Neither Qwest nor Level 3 imposes any sort of toll charge in connection with calls to FX numbers. As a result, there is no economic basis on which any sort of "access charge" could be imposed.

Q. What would be the economic effect of adopting Qwest's proposal?

A. It would simply eliminate an efficient and technologically advanced means of providing dial-up Internet access to customers throughout the State of Oregon . This would obviously be counter to the public interest.

Q. Is dial-up access to the Internet important to the state of Oregon?

A. Yes. Dial-up for Internet access is the universal service equivalent of a primary line for voice service. In other words, not all people can afford broadband access to the Internet, but most people have a single line with which they can access the Internet over a dial-up connection. Dial-up access is especially important where broadband connections are not yet available.

Rural residents report less broadband availability than their counterparts in suburban or urban areas of the United States. In fact, a Pew Internet & American Life

[20] *See* "Qwest Wholesale Dial" in its Product Catalog. http://www.qwest.com/pcat

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Project study found that rural residents were two to five times more likely to not have broadband availability than urban and suburban residents.[21] Pew research associate Peter Bell also noted:

> While gaps in income and age appear to be partly responsible, the difficulty of getting Internet access remains a big barrier for many rural users. Major Internet service providers accounted for about 40 percent of use among rural residents, whose most frequent reason for choosing an ISP was that it was the only one available to them. In contrast, online users in metropolitan areas usually chose from a range of providers by seeking the best deal.[22]

Although dial-up Internet access is critical in rural areas, as a percentage of the total, it is decreasing. While DSL and cable broadband connections showed large increases, from 2001 to 2003 dial-up Internet access actually decreased by 12.7 percent. The same study showed that in rural areas 74.7 percent of the Internet connections were dial-up connections.[23]

Q. Is dial-up still an important source of Internet access in Oregon?

A, Yes. Although broadband is growing dramatically and dial-up is becoming a smaller proportion of the total, there is still a significant portion of the population that obtains Internet access by dial-up.[24]

Q. Despite the downward trend in dial-up access, do you think it will remain an important type of internet access?

A. Yes. As I mentioned above, dial-up is critical to rural consumers where broadband is not always available and competitive alternatives are limited. Garry Betty, Earthlink's chief executive stated:

---

[21] *See* Pew Internet & American Life Project; Rural Areas and the Internet; "Rural American's Internet Use Has Grown, But They Continue to Lag Behind Others"; February 17, 2004.

[22] *See* TodaysSeniorsNetwork.com; "Rural use of Internet continue to lag, Costs, access remain barriers, new data shows."; June 7, 2005.

[23] *See* "A Nation Online: Entering the Broadband Age"; U.S. Department of Commerce, Economics and Statistics Administration, National Telecommunications and Information Administration; September, 2004, at 5, 13.

[24] *See e.g.*, "High-Speed Services for Internet Access: Status as of December 31, 2004", Industry Analysis and Technology Division, Wireline Competition Bureau (FCC Rel. July 2005).

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

> Despite compelling reasons to switch to broadband, dial-up lines will always have a place in American homes. Customers in rural areas where broadband is not available will continue to log on via a dial-up connection; other people may prefer the simplicity of dial-up.[25]

For those citizens of Oregon that either can't afford or don't have available to them broadband connectivity, dial-up internet provides access to one of – if not the - cornerstone of economic and community vitality. The ability to apply for jobs, get weather reports, crop price forecasts on a real time basis, participate in educational endeavors, gain community information on safety and health, and communicate via e-mail to friends and businesses, form the very fabric of commerce in the world we live in. Non-participation or lack of access, simply stated, sentences portions of our society to second class status. Without vigorous competition to ensure low cost dial-up Internet access, both the citizens of Oregon and the State itself will suffer irreparable harm as a significant segment of the population is unable to compete economically, advance educationally and establish community ties.

Q. It is sometimes suggested by ILECs that industry numbering guidelines prohibit the assignment of numbers for FX or similar services. Is that true?

A. No. In fact Section 2.14 of the Numbering Guidelines specifically identifies FX services as being eligible for number assignment:

> **2.14 It is assumed from a wireline perspective that CO Codes/blocks allocated to a wireline service provider are to be utilized to provide service to a customer's premise physically located in the same rate center that the CO codes/blocks are assigned.** Exceptions exist, for example tariffed services such as with the exception of foreign exchange service. [26] **(emphasis added)**

If it were improper or a violation of the guidelines to use virtual NXX codes then all ILECs nationwide who are currently providing FX and FX-type services, including Qwest, would be in violation today.

[25] *See*, The New York Times, "Dial-up Internet Going the Way of Rotary Phones"; June 21, 2005.

[26] Alliance for Telecommunications Industry Solutions; Sponsor of Industry Numbering Committee; Central Code (NXX) Assignment Guidelines; Released May 28, 2004.; hereinafter referred to as "Numbering Guidelines".

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Q. What are NXX number blocks?

A. NXX number blocks are groups of numbers assigned to carriers for distribution to customers. The blocks contain 10,000 numbers, or where number pooling is in place, blocks of 1,000 numbers. The NXX codes are the fourth through sixth digits of a ten-digit telephone number. For instance, the NXX code for my telephone number (303-424-4433) is 424. These codes are used as rate center identifiers for rating and routing of calls.

Q. Must a carrier be local number portability ("LNP") capable to participate in number pooling?

A. Yes. Level 3 is LNP capable and able to participate in number pooling. Further, Level 3 normally utilizes only numbers in the 4,000 block within a 10,000 block. By not contaminating the numbers in the other thousand blocks, should jeopardy occur and pooling be imposed, Level 3 could return numbers to the administrator.

Q. How are carriers assigned an NXX code?

A. Carriers who meet the criteria for the assignment of central office codes, like Level 3 and Qwest, request and are assigned blocks of telephone numbers by the numbering administrator.[27] The numbers are loaded into Level 3's switch and referenced in the Local Exchange Routing Guide ("LERG") for routing by other carriers. Level 3 then assigns numbers from within those blocks to its customers as requested.

Q. How is the rating of calls impacted by the numbers assigned to customers?

A. Standard industry practice and procedure provides that each NXX code is associated with a particular rate center within a local calling area. A single rate center may have more than one NXX code, but each code is assigned to one and only one rate center. This uniquely identifies the end office switch serving the NXX code, so that each carrier that is routing a call knows which end office switch to send the call to.

[27] *See* Numbering Guidelines, Section 4.0.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Q. Is it uncommon for NXX codes to be assigned to customers who are not physically located in the local calling area where the NXX is "homed" or assigned?

A. No. It is also not uncommon for the "routing" point for an NXX code to differ from the "rating" point for the same code. In other words, although an NXX may be rated or homed to a specific end office switch, the routing information in the LERG may specify that calls to that NXX code be routed to a different wire center, for instance, a tandem.

Q. Is it improper or against any rules for CLECs to provide numbers to their customers?

A. No, not at all. In fact, as noted above, carriers must request numbers in order to provide service in a particular exchange. Based on my review of Level 3's practices, Level 3 utilizes and abides by the Numbering Guidelines.[28] In fact, Level 3 has developed its own LNP solution and has established stringent guidelines that result in very efficient use of numbering resources.

Q. Please summarize your testimony on VNXX traffic.

A. Level 3's FX-like traffic is a competitive response to ILEC FX service and is the primary service used by ISPs to provide local dialing for their customers. Calls to such FX and VNXX numbers are local calls in every sense of the phrase and do not impose any additional costs or responsibilities on Qwest. The CLEC assignment of numbers in exchanges where they serve is completely consistent with the industry numbering guidelines. Qwest's proposal to impose access charges on these calls should be rejected.

Relative Use Factor

Q. Please describe the dispute between the parties regarding the "relative use factor," or "RUF."

A. Prior to recent FCC rulings, it was commonplace for some CLECs to call on the ILEC to establish a transmission facility (often called an "entrance facility") running from some

[28] The Numbering Guidelines require compliance as a condition of receiving numbers.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

point on the ILEC's network to the CLEC's switch location. In its original ruling regarding interconnection under the 1996 Act,[29] the FCC addressed the question of rates applicable to "transmission facilities that are dedicated to the transmission of traffic ***between*** two networks" (emphasis added), and ruled that the cost should be apportioned in accordance with relative use of the facility. In cases where a CLEC obtained an entrance facility from the ILEC to connect to the CLEC's switch, the effect of this rule (which remains embodied in 47 CFR § 51.709(b)) was to reduce the ILEC's charges for the entrance facility based on what proportion of the traffic going over it was ILEC-originated, as opposed to CLEC-originated. This is, generally speaking, what the "RUF" is intended to capture (although Qwest's particular language does not properly track the FCC's rule). The FCC's *Triennial Review Remand Order,* however, held that entrance facilities were no longer to be provided — at least not at TELRIC-based rates — for these purposes.[30] This suggests that even Qwest would not think that the RUF would apply between the parties.

Q. Would a RUF apply for facilities on either side of the POI?

A. No. RUF logically applies in the case of a "meet point" interconnection at a POI. The very definition of a "meet point" or POI-based form of interconnection is that each party bears its own costs for the facilities needed to get to the POI. The FCC in the *Local Competition Order* specifically recognized that each party is responsible for its own costs in getting to a meet point, and expressly found that it is perfectly reasonable to require the ILEC to build out new facilities at its own expense, at least to some extent, to accommodate a meet point interconnection.[31] Level 3 seeks to interconnect with Qwest at a single meet-point POI per LATA. It follows that there will not ***be*** any situations in

[29] See Local Competition Order at ¶ 1062.

[30] *See* FCC **Order on Remand** in WC Docket No. 04-313, CC Docket No. 01-338, Released February 4, 2004 at ¶ 137.

[31] See Local Competition Order at ¶ 553.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

which there are "transmission facilities that are dedicated to the transmission of traffic between" Level 3 and Qwest. Instead, the two networks will ***meet*** at a particular ***point,*** with no inter-network facilities, per se, at all. Each party will be responsible for the costs of its own facilities up to the POI, which will constitute a "meet point" as the FCC used that term.

Q. What is Level 3's concern with the RUF?

A. Level 3 is concerned that Qwest is trying to use the "RUF" concept to avoid the economic logic of establishing a meet-point POI. Level 3 is concerned, specifically, that even with a single POI, Qwest will try to assign some of the costs of its own network on its side of the POI to Level 3, based in some way on the amounts of traffic that Qwest sends Level 3 and vice versa. That is unreasonable in and of itself.

Q. Assuming there was a reason to make a RUF calculation, does Qwest put forth a correct algorithm?

A. No. Qwest gets it wrong on the calculation, by seeking to unfairly and unreasonably exclude the substantial volumes of ISP-bound traffic it sends to Level 3 from calculating the "relative use" of the facilities it uses to deliver that traffic. As described below, there is no basis for excluding ISP-bound traffic from any RUF calculation that might be appropriate in light of the way Level 3 and Qwest actually interconnect.

Q. Why is this a contentious issue?

A. It is contentious because of the traffic flows. A significant amount of the traffic exchanged between Qwest and Level 3 will be calls originated by Qwest customers for termination to Level 3 customers. The Level 3 customers tend to be ISPs. The one-way nature of this type of traffic means that Qwest would pay for the vast majority of the interconnection facilities assuming such a calculation were to be made.

Q. Is that unfair?

A. No. To the contrary, it is completely consistent with the economic rule of cost-causation

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

and the accounting concept of matching. It is the Qwest customers who are originating the calls to the Level 3 customers. As such, Qwest is originating the traffic and causing the use and consequent costs of the network facilities. As such, the cost causer – Qwest – should pay for the costs. Further, Qwest customers are paying local rates to make those calls. As such, Qwest has both the revenues and the costs associated with the calls. To foist those costs on Level 3 while only Qwest enjoys the revenues would violate the matching principle. It would be unfair and inequitable for Qwest to impose those costs on Level 3.

Perhaps an example would help clarify the situation. In some cities, people must pay tolls to travel on roads. The tolls supposedly pay for the cost of the roads. Now suppose a new amusement park is opened and traffic on the toll roads to that amusement park is significant. Forcing the amusement park to pay the tolls associated with the peoples' choice to visit the amusement park would be unfair. After all, the people decided to visit the amusement park and they decided to drive to the facility. It was their decision to go and as such, they are the cost-causers with respect to the tolls.

Forcing Level 3 to pay for the Qwest facilities when Qwest originates the vast majority if not all of the calls, would be like charging the amusement park for the cost of getting the people to the park. Qwest customers purchase Qwest local service and decide to make the calls and it is Qwest's obligation – under the reciprocal compensation rules – to pay Level 3 for the cost of terminating those calls. Rule 51.703(b) specifically states that "a LEC may not assess charges on any other telecommunications carrier for local telecommunications traffic that originates on the LEC's network."[32]

Note in this regard that one of the effects of consumer demand for dial-up Internet access was to lead consumers to purchase additional telephone lines into their homes in order to allow the consumers to use dial-up Internet access while also engaging in voice

[32] 47 C.F.R., §51,703(b).

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

telephone conversations on the other line. These second lines have almost exclusively been provided by the ILEC. As time goes on, of course, more and more people are switching from dial-up to broadband Internet access, which will simultaneously (from Qwest's perspective) lower second line revenues, increase DSL revenues, and lower intercarrier compensation payments for ISP-bound traffic. But looking only at the dial-up segment, Qwest has received and will continue to receive substantial additional revenues, in the form of second line revenues, in connection with its customers' calls to ISPs. Given this, any claim that Qwest has been or is being economically harmed by delivering ISP-bound calls without receiving access charges, or any claim that Qwest cannot afford to pay intercarrier compensation with respect to such calls, must therefore be viewed with great skepticism.

Q. Is Qwest's position consistent with 47 C.F.R. § 51.703(b)?

A. No. This rule is very straightforward and simple in its reading. Qwest may not assess charges on any other telecommunications carrier for telecommunications traffic that originates on its network. Qwest's position is just the opposite. Qwest wants to exclude the ISP-bound traffic, even though it is originated by its own customers, from the relative use calculation. There is simply no support for that position and it is clearly contrary to the existing rules and the economic principles of cost causation.

Q. Is there any other reason to exclude ISP-bound traffic from the relative use calculation?

A. No. Again, it is clear that RUF calculations are not appropriate in a POI situation. But if for some reason the Board were to decide to apply the RUF, ISP traffic must be included in the calculation. Simply because the calls are directed to an ISP does not change the fact that these are locally dialed telecommunications calls that traverse the circuit switched network in exactly the same fashion as any other local call. The effect of Qwest's mathematical manipulation of the formula is to transfer to Level 3 a large

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

portion of the costs of delivering Qwest-originated traffic. There is simply no economic, engineering or public policy reason to exclude the traffic from the calculation.

Q. Please summarize your position on the relative use calculation.

A. There is no need to apply a RUF calculation on each side of the POI since each party is responsible for getting its traffic to the POI. Nevertheless, if a RUF calculation is made it must include the ISP-bound traffic. The traffic is telecommunications traffic originated by Qwest customers and, as such, is the responsibility of Qwest.

Issue 4 – VoIP

Q. Please introduce this issue and the dispute between Level 3 and Qwest.

A. IP-Enabled services, such as IP-enabled voice traffic -- the most common form of which is referred to as voice over Internet protocol or VoIP -- are becoming more common as they offer significant efficiencies from both an economic and network operations perspective. Qwest and Level 3 disagree on the proper regulatory treatment of these services. To the extent that this Board has regulatory authority over any aspect of these services, Level 3 urges the Board take a "hands-off" approach to regulation. As described below, VoIP constitutes a form of "enhanced" or "information" service, like Internet access, so that under existing FCC rules it would not be appropriate for such services to be subject to access charges in any event. But putting aside that point, from an economic perspective it would be a mistake to subject VoIP services to traditional access charges, whether or not it would be permissible to do so from a legal or regulatory perspective. In contrast, Qwest encourages the Board to treat these services like traditional long distance calls, and impose access charges on this traffic, unless the VoIP provider's point of presence is in the same local calling area as the called party.

Q. What is voice over internet protocol or "VoIP" traffic?

A. Mr. DuCloo discusses this in more detail. Briefly, VoIP services involve using the same network that carries Internet traffic to carry packetized voice communications. Because

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

voice data packets can be dispersed among other types of Internet traffic, such as e-mail messages, web pages, Instant Messaging conversations, music downloads from iTunes or similar services, etc., VoIP doesn't use as much bandwidth as in a circuit-switched network. This makes phone calls essentially as cheap to transmit as e-mail.[33] Indeed, VoIP is a good example of the convergence of computers, telephones and television into a single and more efficient integrated information environment.

Q. Please describe the fundamental differences between VoIP calls and typical PSTN calls.

A. In the simplest of terms, VoIP is an information service application that uses the Internet backbone and discrete data packets to deliver real-time voice communications. Rather than voice information being transmitted across the traditional circuits of the PSTN, VoIP uses the Internet Protocol, and the Internet backbone, or some other private IP network. In addition to this difference in transmission, VoIP calling, being IP-enabled, facilitates the introduction and integration all sorts of potential capabilities not present with PSTN circuit switched calls.[34] From a regulatory perspective the IP-based capabilities distinguish VoIP – an information service – from basic circuit-switched telecommunications services.

Q. **Is Qwest offering VoIP services today?**

A. Yes. On December 8, 2004, Qwest announced that its VoIP service (Qwest OneFlex™) is available to business customers nationwide. In that same press release Qwest noted that if offers a range of VoIP solutions including OneFlex™ Integrated Access, OneFlex™ Hosted VoIP and IP Centrex Prime.[35]

---

[33] *See* Comments of VON Coalition in CC Docket No. 01-92, WC Dockets No. 02-361, 03-211, 03-266, 04-36; filed August 19, 2004, at page 2.

[34] For instance, when you have a missed call on Vonage service, you get an email detailing the call information (time, calling number, etc.). The features and capabilities of VoIP services are many and expanding.

[35] *See* Qwest Press Release entitled, "Qwest Launches Expanded Nationwide VoIP Service for Businesses." Released December 8, 2004.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Q. Has Qwest admitted in discovery that its OneFlex[tm] service provides up to five virtual numbers that allow people to call the subscriber on a local instead of a toll basis?

A. Yes. I have attached Qwest's Response to Level 3 Request No. 17A-S1, in which Qwest admits that Qwest Communications Corporation ("QCC") does offer OneFlex™ with virtual numbers. (See Exhibit TJG-6)

Q. How does Qwest price its Qwest OneFlex service?

A. In Response to Level 3 Request No. 20A-S1, Qwest admitted that QCC offers its VoIP service for approximately $30 per month, plus 5 cents per minute for long-distance calls with a $2.99 month fee. The offering also includes a full range of features, including caller ID and voice mail. (See Exhibit TJG-7).

ILECs and CLECs alike are offering VoIP and other IP-Enabled services. For instance, and as discussed above, Qwest also offers its "Wholesale Dial" service. Qwest's service provides many of the same benefits and features as Level 3's service, including local dialing for dial-up Internet access. In fact, Qwest notes that its service provides a dial-up network architecture "…covering 85 percent of the U.S. population with a local call."[36]

Q. Is there any economic justification for treating Level 3's services for ESPs that provide VoIP applications like typical telephone services?

A. No. As noted by the FCC in its IP-Enabled Services NPRM, "Dial-up, or narrowband, Internet access utilizes the same PSTN infrastructure that telephone subscribers use to place traditional circuit-switched voice calls."[37] Broadband VoIP services do not impose any additional costs on the ILECs or their network either. As such, treating these services as if they were traditional long distance telecommunications services, and

[36] *See* <http://www.qwest.com/wholesale/pcat/wholesaledial.html>.

[37] *See* FCC Notice of Proposed Rulemaking; WC Docket No. 04-36; Released March 10, 2004, FN 32.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

imposing their associated access charges, would allow ILECs to over-recover their network costs. At the same time, imposing these high call origination and termination rates on this new technology would suppress the use of the new services and, effectively, tax a new, efficient competitor for the benefit of the legacy, incumbent operator. Such a result would not only constitute a windfall for ILECs, but it would impede the natural efficiency of the market by unnecessarily burdening the development of new services. There is simply no economic justification for treating IP-Enabled services as if they were traditional services.

Q. Is there precedent in the telephone industry for adopting policies that insulate nascent, innovative technologies from bearing an undue portion of the costs of the legacy network?

A. Yes. In fact, the FCC has repeatedly recognized that encouraging innovation in this industry requires exempting nascent technologies and industry segments from providing support to the legacy network. One of the earliest examples of this policy dates from the 1970s and early 1980s. Historically, all customer premises equipment ("CPE") had been provided to customers by the regulated telephone company as part of telephone service. In the 1960s the FCC ruled (in a famous case called *Carterphone*) that the Bell System could not forbid the attachment of "foreign" devices that did not harm the network.[38] In response, the Bell System grudgingly permitted non-Bell CPE to be connected to the network, but imposed charges for "protective connecting arrangements" on that new CPE. The FCC responded to this anticompetitive tactic by establishing network interconnection specifications that applied to all CPE – Bell and non-Bell alike – and then by requiring the Bell System to provide all CPE on an unregulated basis, through a

[38] The Carterphone case started as a court case and the FCC (Docket Nos. 16942, 17073) then found the AT&T tariff to be unreasonable in that it prohibited the use of interconnection devices (the Carterphone) which did not adversely affect the telephone system. *See* FCC 68-661, Adopted June 26, 1968. I do not cite to this case for legal reasons, but only to show that unreasonable interconnection requirements are not in the public interest.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

separate subsidiary. This allowed the then-nascent competitive CPE market to develop without having to pay a "legacy network tax" to the Bell System.

Another example of protecting nascent technologies and services from supporting the legacy network is the "ESP Exemption" from access charges. In 1983 the FCC ruled that even though interstate traffic to and from enhanced service providers could, logically, be subject to per-minute access charges, those charges would not apply. The explicit basis for this ruling was that this new market should not be required to pay rates that include subsidies for the traditional network. As noted above, I believe that this exemption directly applies to VoIP; but whether it literally applies or not, the ***policy*** behind it applies with full force here. VoIP is a nascent technology. There are many different forms of these services. Different entities are pursuing different technical and business strategies with respect to it. While we should not ask legacy network operators like Qwest to provide explicit subsidies to these new services, neither should we ask the new services to provide subsidies to legacy network operators like Qwest. It follows, from an economic perspective, that VoIP services should be permitted to interconnect with the legacy network at low, cost-based rates (either Section 251(b)(5) reciprocal compensation rates or the FCC-established $0.0007 rate), rather than requiring those services to pay subsidy-laden access charges.[39]

Still another example is the FCC's treatment of interconnection between landline LECs and wireless carriers. The FCC has long sought to encourage the growth of wireless services, free from the traditional constraints of the legacy network. In the *Local Competition Order* the FCC advanced this goal by establishing extremely broad geographic regions within which traffic exchanged between landline and wireless carriers

[39] Even though interstate access rates have been declining over time, they are still well above what an economist would view as a cost-based rate. To be cost-based from an economic perspective requires that a rate be in line with forward-looking incremental cost. Intercarrier compensation rates developed in connection with Section 251(b)(5) and ISP-bound calling reflect this approach; traditional access rates do not.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

would be viewed as "local" and thus not subject to access charges.[40] As a result of this ruling, a call from a wireless customer in western Wisconsin to a landline customer in North Dakota (or vice versa) is "local," as is a call from southern Iowa to southeastern South Dakota (or vice versa). Even though these calls would be treated as "long distance" calls within the traditional landline network, the wireless carrier only has to pay the low reciprocal compensation rate when it is the originating carrier, and the wireless carrier gets paid that rate — as opposed to paying originating access charges — when it is the terminating carrier. This decision to exempt large amounts of "long distance" wireless traffic from traditional access charges is, from an economic perspective, an explicit policy decision by the FCC — and one of which I completely approve — to exempt this relatively new, growing technology from having to pay subsidies to support the legacy network.

Just as sound regulatory policy exempted ESPs and wireless carriers from having to support the legacy network by paying access charges, so too sound regulatory policy supports exempting VoIP services from them as well. Again, this is true from an economic perspective independent of whether, as a legal or regulatory matter, the so-called "ESP Exemption" literally applies to VoIP traffic.

Q. Has the FCC stated any positions regarding the economic impact of regulating VoIP?

A. Yes. Former FCC Chairman Powell maintained this support for leaving IP-Enabled services unregulated at the FCC Forum on Voice over Internet Protocol in Washington, where he was quoted as saying, "As one who believes unflinchingly in maintaining an Internet free from government regulation, I believe that IP-based services such as VoIP should evolve in a regulation-free zone." Then Chairman Powell went on to caution regulators with respect to IP-Enabled services' regulation, saying "No regulator, either

[40] *Local Competition Order* at ¶ 1036. *See also* 47 C.F.R. § 51.701(b)(2).

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

federal or state, should tread into this area without an absolutely compelling justification for doing so."[41] Chairman Powell's statements were part of a daylong forum to address business, technical, service feature and policy issues. Consistent with those statements, Chairman Powell stated,

> The burden should be placed squarely on government to demonstrate why regulation is needed, rather than on innovators to explain why it is not."[42]

Q. Can you discuss further why the "hands-off" approach by the FCC has been so successful?

A. Yes. By refraining from regulating technology, the FCC has eliminated the uncertainty that regulation sometimes imposes on the industry. This has allowed the capital markets and industry players to develop business plans and to invest capital to meet consumer demand.

It is very difficult for companies to develop products and technology when faced with a patchwork of regulatory requirements. The balkanization of the regulatory landscape increases not only the costs of compliance – if what constitutes compliance can even be determined – but also embeds an unacceptable level of inefficiency resulting from an inability to achieve economies of scale – economies of scale that the ILECs have enjoyed throughout their life cycle by virtue of their monopoly hold on the market. In other words, there should be one unified regulatory approach to VoIP services and technology, not a 50-state patchwork of regulation.

Q. Are you suggesting that the states should simply follow the lead of the FCC?

A. No. But the Federal approach has been very successful, so the states should seriously consider what benefits would derive from imposing multiple and perhaps wildly varying regulatory paradigms of their own. The Board should not apply access charges on IP-

[41] Opening Remarks of FCC Chairman Michael K. Powell at the FCC Forum on Voice over Internet Protocol (VoIP) December 1, 2003 – Washington, D.C.

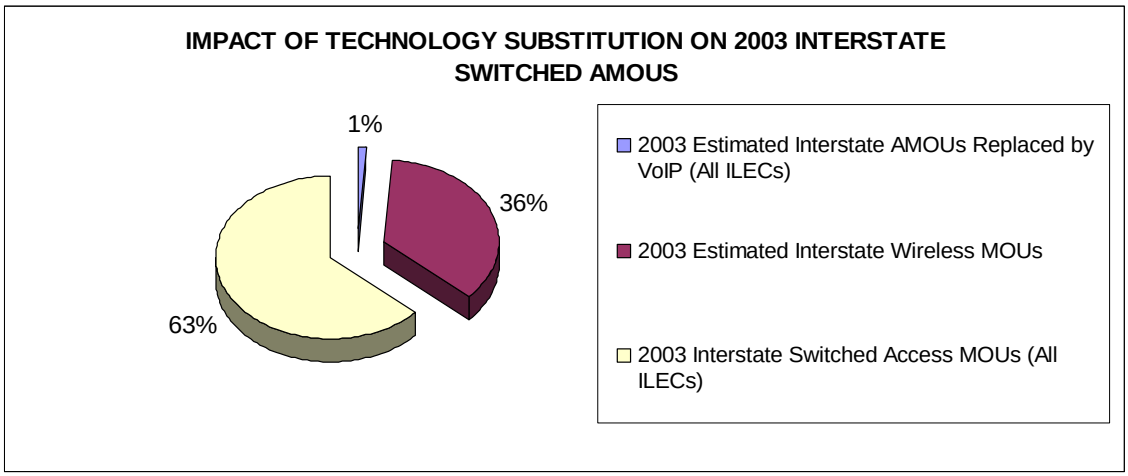
[42] *See*, US News & World Report, "Courting Calls – Telecom and Cable Firms Scramble to Offer Internet Calls"; by Mary Kathleen Flynn; Feb 2, 2004.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Enabled traffic until the FCC completes its investigations in the NPRMs (*Developing a Unified Intercarrier Compensation Regime*, CC Docket No. 01-92 and *IP-Enabled Services*, WC Docket No. 04-36). The information gathered in the FCC proceedings will be useful in the evolving policy debate at the state level.

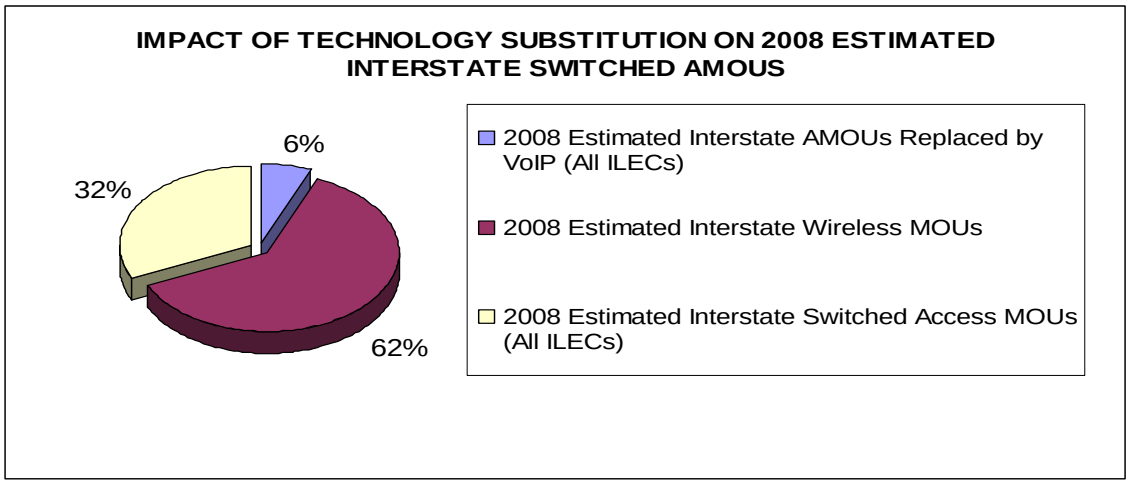
Q. Is IP-enabled or VoIP traffic a significant part of the total traffic in the United States?

A. No, but it is a growing percentage. In the two charts below, a comparison of various technologies is provided for 2003 and for 2008.[43] The first chart shows VoIP minutes were about one percent of total switched minutes of use in 2003. In the second chart, we see projected 2008 VoIP minutes to be about six percent of the total.



[43] These charts and their underlying data were taken from publicly available research sources and compiled for use in FCC Docket Nos. 04-36, 03-266.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191



At the same time, we see dramatic increases in the projected amount of wireless minutes of use. So, while VoIP is getting significant attention today, the volumes and revenues associated with that traffic are not yet significant. Further, to the extent substitution is occurring in the market, the majority of that substitution is occurring because of wireless and not VoIP.

Q. Won't ILECs be harmed by not receiving access charges on IP-enabled traffic, even if that traffic is a small percentage of the total?

A. No. First of all, as discussed above, the traffic to date is *de minimis*. Second, Qwest is being fully compensated for the traffic, albeit at a lower rate.

Q. If Qwest and the other RBOCs were correct about the impact on revenues and earnings, would that justify regulation of IP-enabled services?

A. No. Neither the ILECs' dire predictions of reduced local revenue (as market share shifts to VoIP providers), nor their dire predictions of all long distance traffic moving to VoIP to avoid access charges, even if they were correct, would justify common carrier regulation of IP-Enabled services. Moreover, as Verizon's Chief Executive Officer Seidenberg has stated: "Our view is to let cannibalization occur."[44] Seidenberg has said that while VoIP probably would reduce Verizon's local phone market share from 90% to

[44] Communications Daily, (June 20, 2001).

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

60%, Verizon plans to participate in VoIP both as a backbone provider and as an ISP, "meaning more revenue per customer."[45]

Q. Has Qwest supported the federal "hands off" approach to IP-enabled services?

A. Yes. Qwest has supported the FCC's position against regulation of voice communications over the Internet. In an article dated December 5, 2003, Qwest's CEO said, "…it would be inconsistent for the commission to regulate what's known as "voice over Internet protocol" (VoIP) service when similar services, such as telephone via cable connection and wireless phones, are not regulated." He went on to note that Qwest was launching its VoIP service in Minnesota and that VoIP could be more profitable to the company than traditional phone service, because it does not have the added costs of regulation.[46]

Q. Have ILECs argued in the past that, in the absence of access charge revenues, ratepayers would be negatively impacted?

A. Yes. The faulty premise of the previous RBOC argument has been that the impact of VoIP would negatively impact RBOC margins, resulting in the need for RBOCs to increase local rates. Today, however, as discussed above, the RBOCs are rapidly deploying VoIP services and embracing the new technology. Indeed, the RBOCs are supporting the FCC decision to not regulate these services, in part because of their offerings. In fact, on Qwest's website it boasts about its IP network and its ability to provide "mission critical applications" such as VoIP:

> For years, Qwest's state-of-the-art IP network has been transferring voice and data across the globe for businesses of all sizes. The Qwest network has the capacity and advanced capabilities to support today's mission critical applications such as Voice over IP (VoIP), as well as bandwidth-intensive business applications such as Enterprise Resource Planning, Customer Relationship Management, and other business-to-business functions.[47]

[45] *Id.*

[46] "Qwest Chief Backs Up FCC on Voice Over Internet"; Denver Post, Dec 5, 2003.

[47] *See* http://www.qwest.com/about/qwest/network/index.html.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

AT&T has rolled out an aggressive VoIP initiative. Time Warner Cable has said that it is teaming with MCI and Sprint to offer VoIP services nationally. As such, this is not just a niche market, but one that all providers – ILECs, CLECs, cable providers, etc. – are rushing to participate in. As a U. S. News and World Report article concluded, "The bottom line: Consumers and businesses stand to benefit from lower prices and a wide range of sophisticated features."[48]

Q. Why would Qwest seek to impose access charges on VoIP traffic when it is deploying the service?

A. Qwest is attempting to maintain its sinecure access revenue as a prop as it migrates itself to the IP platforms – the end result being a continuation of its predominant market position and the lack of competition.

Q. Assuming VoIP is substituting for other services, are there offsets to the substitution occurring in the industry?

A. Yes. Over the last few years, RBOCs have been the beneficiaries of gaining, for the first time, access to markets and associated revenues that have experienced tremendous growth. For example, Qwest announced last year that it had achieved one million DSL subscribers. This growth in DSL is directly related to the growing popularity of the Internet and related services, including VoIP. Specifically Qwest stated:

> As a direct result of strategic DSL investments and initiatives, Qwest Communications International Inc. (NYSE: Q) announced today that it has achieved one million DSL subscribers. This represents an important milestone for the company and highlights the fact that Qwest's four consecutive quarters of double-digit subscriber growth is outpacing the current industry average.[49]

Qwest's consumer data and Internet revenues were up nearly 50 percent in 2004. Qwest also ended 2004 with 4.6 million long-distance lines, more than double the 2.2 million

[48] *See*, US News & World Report, "Courting Calls – Telecom and Cable Firms Scramble to Offer Internet Calls"; by Mary Kathleen Flynn; Feb 2, 2004.

[49] *See* Qwest Press Release entitled, "Qwest Achieves One Million DSL Subscriber Milestone", released December 13, 2004.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

lines a year earlier. These significant gains, combined with reduction in the access line losses, shows that Qwest is not being harmed by the introduction of IP-Enabled services.

Q. Please explain what you mean by "reduction in access line losses."

A. Prior to the passage of the 96 Act and the introduction of competition in the local market, ILECs had essentially 100 percent of the access lines. As CLECs entered to the local market, ILECs saw a reduction in the total number of access lines. Generally, the number of access lines lost increased over time. Since the demise of UNE-P, however, and the continuing consolidation in the CLEC market, the loss in access lines has decreased. In its fourth quarter 2004 financial reports, Qwest stated,

> The company continues to make significant inroads in stemming competitive loss from facilities-based competitors. Resold lines declined 28,000 sequentially as changes in the regulatory environment have reduced competition from UNE resellers.[50]

In that same document Qwest also noted under **Operational Highlights**, "Major drivers of Qwest's revenue included operational progress in key growth areas, as well as improvement in access line losses." So the "reduction in access line loss" is an indication that Qwest is taking back lines or losing fewer lines than in the past.

Q. Is there any reason why VoIP and other IP-enabled offerings should not be given the freedom to develop?

A. No. The Internet, VoIP applications, wireless, fixed wireless and other developing technologies only increase the value of local phone service. Today we are seeing significant investments in newer technologies (3G wireless, IP networks, IP CPE, PDAs, cable plant upgrades, automation and robotics, etc.) instead of continuing investment in the traditional circuit switched network.[51] These new investments and technologies are

---

[50] *See* Qwest News Release, "Qwest Improves in Key Growth Areas and Sees Margin Expansion in Fourth Quarter 2004."

[51] I am not suggesting that investment in the traditional PSTN has stopped. Investments continue to be made, including maintenance on existing plant in service; the new investments, however, are focusing on new technologies.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

resulting in more efficient provisioning of service, new features and mobility, and flexibility in managing services and features. In fact, IP-Enabled services, with their integrated voice and data features, will make business and personal use of communications much more efficient. This new trend is adding value to the economy and consumers (residential and business alike) are enjoying new services and flexibility.

Q. Why are VoIP, wireless and other technologies so intriguing to consumers?

A. There are several reasons why consumers are attracted to these new offerings. These new services offer flexibility that a fixed wireline cannot offer and, as such, provide an important complement to wireline services. Wireless and VoIP services are portable so you can in effect take your service with you. In certain environments this is a significant benefit to consumers. Efficiency, which always entails a cost advantage, is also a consumer issue. Further, companies will enjoy savings and efficiencies through virtual call centers, reduced commuting costs as employees work more efficiently from home and the obvious savings that competition will bring.

Q. Have some states recognized the potential efficiencies and savings that VoIP might provide?

A. Yes. A California Performance Review noted that "Moving to VoIP could reduce the state's phone bill by between $20 million and $75 million a year."[52] An article on the review also referred to findings that "VoIP technology has competitive features that would benefit the state. Internet-based phone calling has built-in benefits such as integrated caller ID, flexibility and network management tools that provide real-time monitoring of bandwidth."[53]

---

[52] "The ultimate goal of the California Performance Review is to restructure, reorganize and reform state government to make it more responsive to the needs of its citizens and business community. Only by demonstrating through concrete action the responsiveness of state government can the public's trust and confidence be regained." http://cpr.ca.gov/about/#cpr. The entire report can be found on the Internet at http://www.report.cpr.ca.gov/. The quotation in the text above is from the fourth volume of that report, at SO15, Voice Over Internet Protocol Statewide Network Infrastructure.

[53] *See*, "California Urged to Use Open Source, VoIP", c|net News.Com; August 13, 2004.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Q. Please summarize your testimony regarding the regulation of IP-enabled services.

A. The Board should adopt the same "hands off" policy that has been so successful in encouraging the development of Internet and other IP-based applications, including VoIP. Concurrently, the Board should reaffirm its commitment to competitors, especially competitors that serve the VoIP application community, that non-discriminatory, cost based, pro-competitive access to the network infrastructure of the ILECs will be vigorously promoted and enforced. Unless there is some specific need to regulate such offerings, they should be allowed to thrive or fail based on the market dynamics they face and create.

Q. Does this conclude your testimony?

A. Yes, it does.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

QSI consulting, inc.

Qualifications of Timothy J. Gates
Exhibit TJG-1

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. Prior to my current position with QSI Consulting, I was a Senior Executive Staff Member in MCI WorldCom's ("MCIW") National Public Policy Group. In this position, I was responsible for providing public policy expertise in key cases across the country and for managing external consultants for MCIW's state public policy organization. In certain situations, I also provided testimony in regulatory and legislative proceedings.

Prior to my position with MCIW in Denver, I was an Executive Staff Member II at MCI Telecommunications ("MCI") World Headquarters in Washington D.C.. In that position I managed economists, external consultants, and provided training and policy support for regional regulatory staffs. Prior to that position I was a Senior Manager in MCI's Regulatory Analysis Department, which provided support in state regulatory and legislative matters to the various operating regions of MCI. In that position I was given responsibility for assigning resources from our group for state regulatory proceedings throughout the United States. At the same time, I prepared and presented testimony on various telecommunications issues before state regulatory and legislative bodies. I was also responsible for managing federal tariff reviews and presenting MCI's position on regulatory matters to the Federal Communications Commission. Prior to my assignment in the Regulatory Analysis Department, I was the Senior Manager of Economic Analysis and Regulatory Policy in the Legal, Regulatory and Legislative Affairs Department for the Midwest Division of MCI. In that position I developed and promoted regulatory policy within what was then a five-state operating division of MCI. I promoted MCI policy positions through negotiations, testimony and participation in industry forums.

Prior to my positions in the Midwest, I was employed as Manager of Tariffs and Economic Analysis with MCI's West Division in Denver, Colorado. In that position I was responsible for managing the development and application of MCI's tariffs in the fifteen MCI West states. I was also responsible for managing regulatory dockets and for providing economic and financial expertise in the areas of discovery and issue analysis. Prior to joining the West Division, I was a Financial Analyst III and then a Senior Staff Specialist with MCI's Southwest Division in Austin, Texas. In those positions, I was responsible for the management of regulatory dockets and liaison with outside counsel. I was also responsible for discovery, issue analysis, and for the development of working relationships with consumer and business groups. Just prior to joining MCI, I was employed by the Texas Public Utility Commission as a Telephone Rate Analyst in the Engineering Division responsible for examining

QSI consulting, inc.

telecommunications cost studies and rate structures.

I was employed as an Economic Analyst with the Public Utility Commissioner of Oregon from July, 1983 to December, 1984. In that position, I examined and analyzed cost studies and rate structures in telecommunications rate cases and investigations. I also testified in rate cases and in private and public hearings regarding telecommunications services. Before joining the Oregon Commissioner's Staff, I was employed by the Bonneville Power Administration (United States Department of Energy) as a Financial Analyst, where I made total regional electric use forecasts and automated the Average System Cost Review Methodology. Prior to joining the Bonneville Power Administration, I held numerous positions of increasing responsibility in areas of forest management for both public and private forestry concerns.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL CREDENTIALS.

A. I received a Bachelor of Science degree from Oregon State University and a Master of Management degree in Finance and Quantitative Methods from Willamette University's Atkinson Graduate School of Management. I have also attended numerous courses and seminars specific to the telecommunications industry, including the NARUC Annual and Advanced Regulatory Studies Program.

Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES?

A. Effective April 1, 2000, I joined QSI Consulting as Senior Vice President and Partner. In this position I provide analysis and testimony for QSI's many clients. The deliverables include written and oral testimony, analysis of rates, cost studies and policy positions, position papers, presentations on industry issues and training.

Q. PLEASE IDENTIFY THE JURISDICTIONS IN WHICH YOU HAVE TESTIFIED.

A. I have filed testimony or comments on telecommunications issues in the following 44 states: Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Florida, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Washington, West Virginia, Wisconsin and Wyoming. I have also filed comments with the FCC and made presentations to the Department of Justice.

QSI consulting, inc.

I have testified or presented formal comments in the following proceedings and forums:

Alabama:

October 18, 2000; Docket No. 27867; Adelphia Business Solutions Arbitration with BellSouth Telecommunications; Direct Testimony on Behalf of Adelphia.

January 31, 2001; Docket No. 27867; Adelphia Business Solutions Arbitration with BellSouth Telecommunications; Rebuttal Testimony on Behalf of Adelphia.

Arkansas:

September 7, 2004; Docket No. 04-0999-U; In the Matter of Level 3 Petition for Arbitration with Southwestern Bell Telephone, L.P. D/B/A SBC Arkansas; Direct Testimony on Behalf of Level 3.

Arizona:

September 23, 1987; Arizona Corporation Commission Workshop on Special Access Services; Comments on Behalf of MCI.

August 21, 1996; Affidavit in Opposition to USWC Motion for Partial Summary Judgment; No. CV 95-14284, No. CV-96-03355, No. CV-96-03356, (consolidated); On Behalf of MCI.

October 24, 1997; Comments to the Universal Service Fund Working Group; Docket No. R-0000-97-137; On Behalf of MCI.

May 8, 1998; Comments to the Universal Service Fund Working Group; Docket No.R-0000-97-137; On Behalf of MCI.

November 9, 1998; Docket No. T-03175A-97-0251; Application of MCImetro Access Transmission Services, Inc. to Expand It's CCN to Provide IntraLATA Services and to Determine that Its IntraLATA Services are Competitive; Direct Testimony on Behalf of MCI WorldCom, Inc.

September 20, 1999; Docket No. T-00000B-97-238; USWC OSS Workshop; Comments on Behalf of MCI WorldCom, Inc.

January 8, 2001; Docket Nos. T-03654A-00-0882, T-01051B-00-0882; Petition of Level 3 Communications, LLC, for Arbitration with Qwest Corporation; Direct Testimony on Behalf of Level 3.

QSI consulting, inc.

February 20, 2001; Superior Court of Arizona; Count of Maricopa; ESI Ergonomic Solutions, LLC, Plaintiff, vs. United Artists Theatre Circuit; No. CV 99-20649; Affidavit on Behalf of United Artists Theatre Circuit.

September 2, 2001; Docket No. T-00000A-00-0194 Phase II – A; Investigation into Qwest's Compliance with Wholesale Pricing Requirements for Unbundled Network Elements and Resale Discounts; Rebuttal Testimony on Behalf of WorldCom, Inc.

January 9, 2004; Docket No. T-00000A-03-0369; In the Matter of ILEC Unbundling Obligations as a Result of the Federal Triennial Review Order; Direct Testimony on Behalf of WorldCom, Inc. (MCI).

November 18, 2004; Docket No. T-01051B-0454; In the Matter of Qwest Corporation's Amended Renewed Price Regulation Plan; Direct Testimony on Behalf of Time Warner Telecom, Inc.

July 15, 2005; Docket No. T-03654-05-0350, T-01051B-05-0350; In the Matter of Level 3 Communications, LLC Petition for Arbitration with Qwest Corporation, Direct Testimony on Behalf of Level 3.

Arkansas:

September 7, 2004; Docket No. 04-099-U; In the Matter of Level 3 Petition for Arbitration Pursuant to Section 252(b) with Southwestern Bell Telephone, L.P. D/B/A SBC Arkansas; Direct Testimony on Behalf of Level 3 Communications, LLC.

California:

August 30, 1996; Application No. 96-08-068; MCI Petition for Arbitration with Pacific Bell; Direct Testimony on Behalf of MCI.

September 10, 1996; Application No. 96-09-012; MCI Petition for Arbitration with GTE California, Inc.; Direct Testimony on Behalf of MCI.

June 5, 2000; Docket No. A0004037; Petition of Level 3 Communications for Arbitration of an Interconnection Agreement with Pacific Bell Telephone Company; Direct Testimony on Behalf of Level 3 Communications, LLC.

QSI consulting, inc.

June 1, 2004; Docket No. A.04-06-004; Petition of Level 3 Communications for Arbitration with SBC; Direct Testimony on Behalf of Level 3 Communications LLC.

Colorado:

December 1, 1986; Investigation and Suspension Docket No. 1720; Rate Case of Mountain States Telephone and Telegraph Company; Direct Testimony on Behalf of MCI.

October 26, 1988; Investigation and Suspension Docket No. 1766; Mountain States Telephone and Telegraph Company's Local Calling Access Plan; Direct Testimony of Behalf of MCI.

September 6, 1996; MCImetro Petition for Arbitration with U S WEST Communications, Inc.; Docket No. 96A-366T (consolidated); Direct Testimony on Behalf of MCI.

September 17, 1996; MCImetro Petition for Arbitration with U S WEST Communications, Inc.; Docket No. 96A-366T (consolidated); Rebuttal Testimony on Behalf of MCI.

September 26, 1996; Application of U S WEST Communications, Inc. To Modify Its Rate and Service Regulation Plan; Docket No. Docket No. 90A-665T (consolidated); Direct Testimony on Behalf of MCI.

October 7, 1996; Application of U S WEST Communications, Inc. To Modify Its Rate and Service Regulation Plan; Docket No. Docket No. 90A-665T (consolidated); Rebuttal Testimony on Behalf of MCI.

July 18, 1997; Complaint of MCI to Reduce USWC Access Charges to Economic Cost; Docket Nos. 97K-237T, 97F-175T (consolidated) and 97F-212T (consolidated); Direct Testimony on Behalf of MCI.

August 15, 1997; Complaint of MCI to Reduce USWC Access Charges to Economic Cost; Docket Nos. 97K-237T, 97F-175T (consolidated) and 97F-212T (consolidated); Rebuttal Testimony on Behalf of MCI.

March 10, 1998; Application of WorldCom, Inc. for Approval to Transfer Control of MCI to WorldCom, Inc.; Docket No. 97A-494T; Supplemental Direct Testimony on Behalf of MCI.

QSI consulting, inc.

March 26, 1998; Application of WorldCom, Inc. for Approval to Transfer Control of MCI to WorldCom, Inc.; Docket No. 97A-494T; Rebuttal Testimony on Behalf of MCI.

May 8, 1998; Application of WorldCom, Inc. for Approval to Transfer Control of MCI to WorldCom, Inc.; Docket No. 97A-494T; Affidavit in Response to GTE.

November 4, 1998; Proposed Amendments to the Rules Prescribing IntraLATA Equal Access; Docket No. 98R-426T; Comments to the Commission on Behalf of MCI WorldCom and AT&T Communications of the Mountain States, Inc.

May 13, 1999; Proposed Amendments to the Rules on Local Calling Area Standards; Docket No. 99R-128T; Oral Comments before the Commissioners on Behalf of MCIW.

January 4, 2001; Petition of Level 3 Communications, LLC for Arbitration with Qwest Corporation; Docket No. 00B-601T; Direct Testimony on Behalf of Level 3.

January 16, 2001; Petition of Level 3 Communications, LLC for Arbitration with Qwest Corporation; Docket No. 00B-601T; Rebuttal Testimony on Behalf of Level 3.

January 29, 2001; Qwest Corporation, Inc., Plaintiff, v. IP Telephony, Inc., Defendant. District Court, City and County of Denver, State of Colorado; Case No. 99CV8252; Direct Testimony on Behalf of IP Telephony.

June 27, 2001; US WEST Statement of Generally Available Terms and Conditions; Docket No. 991-577T; Direct Testimony on Behalf of Covad Communications Company, Rhythms Links, Inc., and New Edge Networks, Inc.

January 26, 2004; Regarding the Unbundling Obligations of ILECs Pursuant to the Triennial Review Order; Docket No. 03I-478T; Direct Testimony on Behalf of WorldCom, Inc. (MCI).

February 18, 2005; Regarding Application of Qwest for Reclassification and Deregulation of Certain Products and Services; Docket No. 04A-411T; Direct Testimony on Behalf of Time Warner Telecom.

July 11, 2005; Petition of Level 3 Communications, LLC for Arbitration with Qwest Corporation; Docket No. 05B-210T; Direct Testimony on Behalf of Level 3.

QSI consulting, inc.

Connecticut:

November 2, 2004; Petition of Level 3 Communications, LLC for Arbitration Pursuant to Section 252(b) with Southern New England Telephone Company d/b/a/ SBC Connecticut; Level 3/SNET Arbitration; Direct Testimony on Behalf of Level 3 Communications, LLC.

Delaware:

February 12, 1993; Diamond State Telephone Company's Application for a Rate Increase; Docket No. 92-47; Direct Testimony on Behalf of MCI.

Florida:

July 1, 1994; Investigation into IntraLATA Presubscription; Docket No. 930330-TP; Direct Testimony on Behalf of MCI.

October 5, 2000; Petition of Level 3 for Arbitration with BellSouth; Docket No. 000907-TP; Direct Testimony On Behalf of Level 3.

October 13, 2000; Petition of BellSouth for Arbitration with US LEC of Florida Inc.; Docket No. 000084-TP; Direct Testimony On Behalf of US LEC.

October 27, 2000; Petition of BellSouth for Arbitration with US LEC of Florida Inc.; Docket No. 000084-TP; Rebuttal Testimony On Behalf of US LEC.

November 1, 2000; Petition of Level 3 for Arbitration with BellSouth; Docket No. 000907-TP; Rebuttal Testimony On Behalf of Level 3.

June 11, 2004; Petition of KMC Telecom for Arbitration with Sprint Communications; Docket No. 031047-TP; Direct Testimony on Behalf of KMC Telecom III, L.L.C, KMC Telecom V, Inc., and KMC Data, L.L.C.

July 9, 2004; Petition of KMC Telecom for Arbitration with Sprint Communications; Docket No. 031047-TP; Rebuttal Testimony on Behalf of KMC Telecom III, L.L.C, KMC Telecom V, Inc., and KMC Data, L.L.C.

Georgia:

December 6, 2000; Docket No. 12645-U; Petition of Level 3 for Arbitration with BellSouth; Direct Testimony on Behalf of Level 3.

QSI consulting, inc.

December 20, 2000; Docket No. 12645-U; Petition of Level 3 for Arbitration with BellSouth; Rebuttal Testimony on Behalf of Level 3.

Idaho:

November 20, 1987; Case No. U_1150_1; Petition of MCI for a Certificate of Public Convenience and Necessity; Direct Testimony on Behalf of MCI.

March 17, 1988; Case No. U_1500_177; Investigation of the Universal Local Access Service Tariff; Direct Testimony on Behalf of MCI.

April 26, 1988; Case No. U_1500_177; Investigation of the Universal Local Access Service Tariff; Rebuttal Testimony on Behalf of MCI.

November 25, 2002; Case No. GNR-T-02-16; Petition of Potlatch, CenturyTel, the Idaho Telephone Association for Declaratory Order Prohibiting the Use of "Virtual" NXX Calling; Comments/Presentation on Behalf of Level 3, AT&T, WorldCom, and Time Warner Telecom.

Illinois:

January 16, 1989; Docket No. 83-0142; Appropriate Methodology for Intrastate Access Charges; Rebuttal Testimony Regarding Toll Access Denial on Behalf of MCI.

February 16, 1989; Docket No. 83-0142; Appropriate Methodology for Intrastate Access Charges; Testimony Regarding ICTC's Access Charge Proposal on Behalf of MCI.

May 3, 1989; Docket No. 89-0033; Illinois Bell Telephone Company's Rate Restructuring; Direct Testimony on Behalf of MCI.

July 14, 1989; Docket No. 89-0033; Illinois Bell Telephone Company's Rate Restructuring; Rebuttal Testimony on Behalf of MCI.

November 22, 1989; Docket No. 88-0091; IntraMSA Dialing Arrangements; Direct Testimony on Behalf of MCI.

February 9, 1990; Docket No. 88-0091; IntraMSA Dialing Arrangements; Rebuttal Testimony on Behalf of MCI.

QSI consulting, inc.

November 19, 1990; Docket No. 83-0142; Industry presentation to the Commission re Docket No. 83-0142 and issues for next generic access docket; Comments re the Imputation Trial and Unitary Pricing/Building Blocks on Behalf of MCI.

July 29, 1991; Case No. 90-0425; Presentation to the Industry Regarding MCI's Position on Imputation.

November 18, 1993; Docket No. 93-0044; Complaint of MCI and LDDS re Illinois Bell Additional Aggregated Discount and Growth Incentive Discount Services; Direct Testimony on Behalf of MCI and LDDS.

January 10, 1994; Docket No. 93-0044; Complaint of MCI and LDDS re Illinois Bell Additional Aggregated Discount and Growth Incentive Discount Services; Rebuttal Testimony on Behalf of MCI and LDDS.

May 30, 2000; Docket No. 00-0332; Level 3 Petition for Arbitration to Establish and Interconnection Agreement with Illinois Bell Telephone Company; Direct Testimony on Behalf of Level (3) Communications, LLC.

July 11, 2000: Docket No. 00-0332; Level 3 Petition for Arbitration to Establish and Interconnection Agreement with Illinois Bell Telephone Company; Supplemental Verified Statement on Behalf of Level (3) Communications, LLC.

June 22, 2004; Docket No. 04-0428; Level 3 Petition for Arbitration to Establish an Interconnection Agreement with Illinois Bell Telephone Company; Direct Testimony on Behalf of Level (3) Communications, LLC.

September 3, 2004; Docket No. 04-0428; Level 3 Petition for Arbitration to Establish an Interconnection Agreement with Illinois Bell Telephone Company; Direct Testimony on Behalf of Level (3) Communications, LLC.

Indiana:

October 28, 1988; Cause No. 38561; Deregulation of Customer Specific Offerings of Indiana Telephone Companies; Direct Testimony on Behalf of MCI.

December 16, 1988; Cause No. 38561; Deregulation of Customer Specific Offerings of Indiana Telephone Companies; Direct Testimony on Behalf of MCI Regarding GTE.

April 14, 1989; Cause No. 38561; Deregulation of Customer Specific Offerings of Indiana Telephone Companies; Direct Testimony on Behalf of MCI Regarding Staff Reports.

QSI consulting, inc.

June 21, 1989; Cause No. 37905; Intrastate Access Tariffs -- Parity with Federal Rates; Direct Testimony on Behalf of MCI.

June 29, 1989; Cause No. 38560; Reseller Complaint Regarding 1+ IntraLATA Calling; Direct Testimony on Behalf of MCI.

October 25, 1990; Cause No. 39032; MCI Request for IntraLATA Authority; Direct Testimony on Behalf of MCI.

April 4, 1991; Rebuttal Testimony in Cause No. 39032 re MCI's Request for IntraLATA Authority on Behalf of MCI.

September 2, 2004; Cause No. 42663-INT-01; In the Matter of Level 3 Communications, LLC Petition for Arbitration with SBC Indiana; Direct Testimony on Behalf of Level 3 Communications, LLC.

October 5, 2004; Cause No. 42663-INT-01; In the Matter of Level 3 Communications, LLC Petition for Arbitration with SBC Indiana; Rebuttal Testimony on Behalf of Level 3 Communications, LLC.

Iowa:

September 1, 1988; Docket No. RPU 88_6; IntraLATA Competition in Iowa; Direct Testimony on Behalf of MCI.

September 20, 1988; Docket No. RPU_88_1; Regarding the Access Charges of Northwestern Bell Telephone Company; Direct Testimony on Behalf of MCI.

September 25, 1991; Docket No. RPU-91-4; Investigation of the Earnings of U S WEST Communications, Inc.; Direct Testimony on Behalf of MCI.

October 3, 1991; Docket No. NOI-90-1; Presentation on Imputation of Access Charges and the Other Costs of Providing Toll Services; On Behalf of MCI.

November 5, 1991; Docket No. RPU-91-4; Investigation of the Earnings of U S WEST Communications, Inc.; Rebuttal Testimony on Behalf of MCI.

December 23, 1991; Docket No. RPU-91-4; Investigation of the Earnings of US WEST Communications; Inc.; Supplemental Testimony on Behalf of MCI.

January 10, 1992; Docket No. RPU-91-4; Investigation of the Earnings of U S WEST Communications, Inc.; Rebuttal Testimony on Behalf of MCI.

QSI consulting, inc.

January 20, 1992; Docket No. RPU-91-4; Investigation of the Earnings of U S WEST Communications, Inc.; Surrebuttal Testimony on Behalf of MCI.

June 8, 1999; Docket NOI-99-1; Universal Service Workshop; Participated on numerous panels during two day workshop; Comments on Behalf of MCIW.

October 27, 1999: Docket NOI-99-1; Universal Service Workshop; Responded to questions posed by the Staff of the Board during one day workshop; Comments on Behalf of MCIW and AT&T.

November 14, 2003; Docket Nos. INU-03-4, WRU-03-61; In Re: Qwest Corporation; Sworn Statement of Position on Behalf of MCI.

December 15, 2003; Docket Nos. INU-03-4, WRU-03-61; In Re: Qwest Corporation; Sworn Counter Statement of Position on Behalf of MCI.

July 20, 2005; Docket No. ARB-05-4; In the Matter of Level 3 Communications, LLC Petition for Arbitration with Qwest; Direct Testimony on Behalf of Level 3.

Kansas:

June 10, 1992; Docket No. 181,097-U; General Investigation into IntraLATA Competition within the State of Kansas; Direct Testimony on Behalf of MCI.

September 16, 1992; Docket No. 181,097-U; General Investigation into IntraLATA Competition within the State of Kansas; Rebuttal Testimony on Behalf of MCI.

August 31, 2004; Docket No. 04-L3CT-1046-ARB; In the Matter of Arbitration Between Level 3 Communications LLC and SBC Communications; Direct Testimony on Behalf of Level 3 Communications, LLC.

Kentucky:

May 20, 1993; Administrative Case No. 323, Phase I; An Inquiry into IntraLATA Toll Competition, an Appropriate Compensation Scheme for Completion of IntraLATA Calls by Interexchange Carriers, and WATS Jurisdictionality; Direct Testimony on Behalf of MCI.

December 21, 2000; Case No. 2000-404; Petition of Level 3 Communications, LLC for Arbitration with BellSouth; Direct Testimony on Behalf of Level 3.

QSI consulting, inc.

January 12, 2001; Case No. 2000-477; Petition of Adelphia Business Solutions for Arbitration with BellSouth; Direct Testimony on Behalf of Adelphia.

Louisiana:

December 28, 2000; Docket No. U-25301; Petition of Adelphia Business Solutions for Arbitration with BellSouth; Direct Testimony on Behalf of Adelphia.

January 5, 2001; Docket No. U-25301; Petition of Adelphia Business Solutions for Arbitration with BellSouth; Rebuttal Testimony on Behalf of Adelphia.

Maryland:

November 12, 1993; Case No. 8585; Competitive Safeguards Required re C&P's Centrex Extend Service; Direct Testimony on Behalf of MCI.

January 14, 1994; Case No. 8585; Competitive Safeguards Required re C&P's Centrex Extend Service; Rebuttal Testimony on Behalf of MCI.

May 19, 1994; Case No. 8585; Re Bell Atlantic Maryland, Inc.'s Transmittal No. 878; Testimony on Behalf of MCI.

June 2, 1994; Case No. 8585; Competitive Safeguards Required re C&P's Centrex Extend Service; Rebuttal Testimony on Behalf of MCI.

September 5, 2001; Case No. 8879; Rates for Unbundled Network Elements Pursuant to the Telecommunications Act of 1996; Rebuttal Testimony on behalf of the Staff of the Public Service Commission of Maryland.

October 15, 2001; Case No. 8879; Rates for Unbundled Network Elements Pursuant to the Telecommunications Act of 1996; Surrebuttal Testimony on behalf of the Staff of the Public Service Commission of Maryland.

Massachusetts:

April 22, 1993; D.P.U. 93-45; New England Telephone Implementation of Interchangeable NPAs; Direct Testimony on Behalf of MCI.

May 10, 1993; D.P.U. 93-45; New England Telephone Implementation of Interchangeable NPAs; Rebuttal Testimony on Behalf of MCI.

QSI consulting, inc.

Michigan:

September 29, 1988; Case Nos. U_9004, U_9006, U_9007 (Consolidated); Industry Framework for IntraLATA Toll Competition; Direct Testimony on Behalf of MCI.

November 30, 1988; Case Nos. U_9004, U_9006, U_9007 (Consolidated); Industry Framework for IntraLATA Toll Competition; Rebuttal Testimony on Behalf of MCI.

June 30, 1989; Case No. U-8987; Michigan Bell Telephone Company Incentive Regulation Plan; Direct Testimony on Behalf of MCI.

July 31, 1992; Case No. U-10138; MCI v Michigan Bell and GTE re IntraLATA Equal Access; Direct Testimony on Behalf of MCI.

November 17, 1992; Case No. U-10138; MCI v Michigan Bell and GTE re IntraLATA Equal Access; Rebuttal Testimony on Behalf of MCI.

July 22, 1993; Case No. U-10138 (Reopener); MCI v Michigan Bell and GTE re IntraLATA Equal Access; Direct Testimony on Behalf of MCI.

February 16, 2000; Case No. U-12321; AT&T Communications of Michigan, Inc. Complainant v. GTE North Inc. and Contel of the South, Inc., d/b/a GTE Systems of Michigan; Direct Testimony on Behalf of AT&T. (Adopted Testimony of Michael Starkey)

May 11, 2000; Case No. U-12321; AT&T Communications of Michigan, Inc. Complainant v. GTE North Inc. and Contel of the South, Inc., d/b/a GTE Systems of Michigan; Rebuttal Testimony on Behalf of AT&T.

June 8, 2000; Case No. U-12460; Petition of Level 3 Communications for Arbitration to Establish an Interconnection Agreement with Ameritech Michigan; Direct Testimony on Behalf of Level (3) Communications, LLC.

September 27, 2000; Case No. U-12528; In the Matter of the Implementation of the Local Calling Area Provisions of the MTA; Rebuttal Testimony on Behalf of Focal Communications, Inc.

June 1, 2004; Case No. U-14152; Petition of Level 3 Communications LLC for Arbitration with SBC Michigan; Direct Testimony on Behalf of Level 3 Communications, LLC.

QSI consulting, inc.

Minnesota:

January 30, 1987; Docket No. P_421/CI_86_88; Summary Investigation into Alternative Methods for Recovery of Non-traffic Sensitive Costs; Comments to the Commission on Behalf of MCI.

September 7, 1993; Docket No. P-999/CI-85-582, P-999/CI-87-697 and P-999/CI-87-695, In the Matter of an Investigation into IntraLATA Equal Access and Presubscription; Comments of MCI on the Report of the Equal Access and Presubscription Study Committee on Behalf of MCI.

September 20, 1996; Petition for Arbitration with U S WEST Communications, Inc.; Docket No. P-442, 421/M-96-855; P-5321, 421/M-96-909; and P-3167, 421/M-96-729 (consolidated); Direct Testimony on Behalf of MCI.

September 30, 1996; Petition for Arbitration with U S WEST Communications, Inc.; Docket No. P-442, 421/M-96-855; P-5321, 421/M-96-909; and P-3167, 421/M-96-729 (consolidated); Rebuttal Testimony on Behalf of MCI.

September 14-16, 1999; USWC OSS Workshop; Comments on Behalf of MCI WorldCom, Inc. re OSS Issues.

September 28, 1999; Docket No. P-999/R-97-609; Universal Service Group; Comments on Behalf of MCI WorldCom, Inc. and AT&T Communications.

April 18, 2002; Commission Investigation of Qwest's Pricing of Certain Unbundled Network Elements; Docket Nos. P-442, 421, 3012/M-01-1916; P-421/C1-01-1375; OAH Docket No. 12-2500-14490; Rebuttal Testimony on Behalf of McLeod USA Telecommunications Services, Inc., Eschelon Telecom of Minnesota, Inc., US Link, Inc., Northstar Access, LLC, Otter Tail Telecomm LLC, VAL-Ed Joint Venture, LLP, dba 702 Communications.

January 23, 2004; In the Matter of the Commission Investigation into ILEC Unbundling Obligations as a Result of the Federal Triennial Review Order; Docket No.: P-999/CI-03-961; Direct Testimony on Behalf of WorldCom, Inc. (MCI).

Mississippi:

February 2, 2001; Docket No. 2000-AD-846; Petition of Adelphia Business Solutions for Arbitration with BellSouth Telecommunications; Direct Testimony on Behalf of Adelphia.

QSI consulting, inc.

February 16, 2001; Docket No. 2000-AD-846; Petition of Adelphia Business Solutions for Arbitration with BellSouth Telecommunications; Rebuttal Testimony on Behalf of Adelphia.

Montana:

May 1, 1987; Docket No. 86.12.67; Rate Case of AT&T Communications of the Mountain States, Inc.; Direct Testimony on Behalf of MCI.

September 12, 1988; Docket No. 88.1.2; Rate Case of Mountain States Telephone and Telegraph Company; Direct Testimony on Behalf of MCI.

May 12, 1998; Docket No. D97.10.191; Application of WorldCom, Inc. for Approval to Transfer Control of MCI Communications Corporation to WorldCom, Inc.; Rebuttal Testimony on Behalf of MCI.

June 1, 1998; Docket No. D97.10.191; Application of WorldCom, Inc. for Approval to Transfer Control of MCI Communications Corporation to WorldCom, Inc.; Amended Rebuttal Testimony on Behalf of MCI.

Nebraska:

November 6, 1986; Application No. C_627; Nebraska Telephone Association Access Charge Proceeding; Direct Testimony on Behalf of MCI.

March 31, 1988; Application No. C_749; Application of United Telephone Long Distance Company of the Midwest for a Certificate of Public Convenience and Necessity; Direct Testimony on Behalf of MCI.

New Hampshire:

April 30, 1993; Docket DE 93-003; Investigation into New England Telephone's Proposal to Implement Seven Digit Dialing for Intrastate Toll Calls; Direct Testimony on Behalf of MCI.

January 12, 2001; Docket No. DT 00-223; Investigation Into Whether Certain Calls are Local; Direct Testimony on Behalf of BayRing Communications.

April 5, 2002; Docket No. DT 00-223; Investigation Into Whether Certain Calls are Local; Rebuttal Testimony on Behalf of BayRing Communications.

QSI consulting, inc.

New Jersey:

September 15, 1993; Docket No. TX93060259; Notice of Pre-Proposal re IntraLATA Competition; Comments in Response to the Board of Regulatory Commissioners on Behalf of MCI.

October 1, 1993; Docket No. TX93060259; Notice of Pre-Proposal re IntraLATA Competition; Reply Comments in Response to the Board of Regulatory Commissioners on Behalf of MCI.

April 7, 1994; Docket Nos. TX90050349, TE92111047, and TE93060211; Petitions of MCI, Sprint and AT&T for Authorization of IntraLATA Competition and Elimination of Compensation; Direct Testimony on Behalf of MCI.

April 25, 1994; Docket Nos. TX90050349, TE92111047, and TE93060211; Petitions of MCI, Sprint and AT&T for Authorization of IntraLATA Competition and Elimination of Compensation; Rebuttal Testimony on Behalf of MCI.

New Mexico:

September 28, 1987; Docket No. 87_61_TC; Application of MCI for a Certificate of Public Convenience and Necessity; Direct Testimony on Behalf of MCI.

August 30, 1996: Docket No. 95-572-TC; Petition of AT&T for IntraLATA Equal Access; Rebuttal Testimony on Behalf of MCI.

September 16, 2002; Utility Case No. 3495, Phase B; Consideration of Costing and Pricing Rules for OSS, Collocation, Shared Transport, Nonrecurring Charges, Spot Frames, Combination of Network Elements and Switching; Direct Testimony on Behalf of the Staff of the New Mexico Public Regulation Commission.

February 9, 2004; Case Nos. 03-00403-UT and 03-00404-UT; Triennial Review Proceedings (Batch Hot Cut and Local Circuit Switching); Testimony on Behalf of WorldCom, Inc. (MCI).

May 11, 2004; Case No. 00108-UT; Regarding Unfiled Agreements between Qwest Corporation and Competitive Local Exchange Carriers; Testimony on Behalf of Time Warner Telecom

New York:

April 30, 1992; Case 28425; Comments of MCI Telecommunications Corporation on IntraLATA Presubscription.

QSI consulting, inc.

June 8, 1992; Case 28425; Reply Comments of MCI Telecommunications Corporation on IntraLATA Presubscription.

North Carolina:

August 4, 2000; Docket No. P779 SUB4; Petition of Level (3) Communications, LLC for Arbitration with Bell South; Direct Testimony on Behalf of Level (3) Communications, LLC.

September 18, 2000; Docket No. P779 SUB4; Petition of Level (3) Communications, LLC for Arbitration with Bell South; Rebuttal Testimony on Behalf of Level (3) Communications, LLC.

October 18, 2000; Docket No. P-886, SUB 1; Petition of Adelphia Business Solutions of North Carolina, LP for Arbitration with BellSouth; Direct Testimony on Behalf of Adelphia.

December 8, 2000; Docket No. P-886, SUB 1; Petition of Adelphia Business Solutions of North Carolina, LP for Arbitration with BellSouth; Rebuttal Testimony on Behalf of Adelphia.

North Dakota:

June 24, 1991; Case No. PU-2320-90-183 (Implementation of SB 2320 -- Subsidy Investigation); Direct Testimony on Behalf of MCI.

October 24, 1991; Case No. PU-2320-90-183 (Implementation of SB 2320 -- Subsidy Investigation); Rebuttal Testimony on Behalf of MCI.

December 4, 2002; Case No. PU-2065-02-465; Petition of Level 3 for Arbitration with SRT Communications Cooperative; Direct Testimony on Behalf of Level (3) Communications, LLC.

May 2, 2003; Case No. PU-2342-01-296; Qwest Corporation Price Investigation; Direct Testimony on Behalf of the CLEC Coalition (US Link, Inc., VAL-ED Joint Venture LLP d/b/a 702 Communications, McLeodUSA Telecommunications, Inc. and IdeaOne Telecom Group, LLC).

Ohio:

February 26, 2004; Case No. 04-35-TP-COI; In the Matter of the Implementation of the FCC's Triennial Review Regarding Local Circuit Switching in the Cincinnati Bell Telephone Company's Mass Market; Direct Testimony on Behalf of AT&T.

QSI consulting, inc.

Oklahoma:

April 2, 1992; Cause No. 28713; Application of MCI for Additional CCN Authority to Provide IntraLATA Services; Direct Testimony on Behalf of MCI.

June 22, 1992; Cause No. 28713; Application of MCI for Additional CCN Authority to Provide IntraLATA Services; Rebuttal Testimony on Behalf of MCI.

Oregon:

October 27, 1983; Docket No. UT 9; Pacific Northwest Bell Telephone Company Business Measured Service; Direct Testimony on Behalf of the Public Utility Commissioner of Oregon.

April 23, 1984; Docket No. UT 17; Pacific Northwest Bell Telephone Company Business Measured Service; Direct Testimony on Behalf of the Public Utility Commissioner of Oregon.

May 7, 1984; Docket No. UT 17; Pacific Northwest Bell Telephone Company Business Measured Service; Rebuttal Testimony on Behalf of the Public Utility Commissioner of Oregon.

October 31, 1986; Docket No. AR 154; Administrative Rules Relating to the Universal Service Protection Plan; Rebuttal Testimony on Behalf of MCI.

September 6, 1996; Docket ARB3/ARB6; Petition of MCI for Arbitration with U S WEST Communications, Inc.; Direct Testimony on Behalf of MCI.

October 11, 1996; Docket No. ARB 9; Interconnection Contract Negotiations Between MCImetro and GTE; Direct Testimony on Behalf of MCI.

November 5, 1996; Docket No. ARB 9; Interconnection Contract Negotiations Between MCImetro and GTE; Rebuttal Testimony on Behalf of MCI.

November 6, 2002; Docket No. UM 1058; Investigation into the Use of Virtual NPA/NXX Calling Patterns; Comments/Presentation on Behalf of Level (3) Communications, LLC.

Pennsylvania:

December 9, 1994; Docket No. I-00940034; Investigation Into IntraLATA Interconnection Arrangements (Presubscription); Direct Testimony on Behalf of MCI.

QSI consulting, inc.

September 5, 2002; Docket No. C-20028114; Level 3 Communications, LLC v. Marianna & Scenery Hill Telephone Company; Direct Testimony on Behalf of Level (3) Communications, LLC.

Rhode Island:

April 30, 1993; Docket No. 2089; Dialing Pattern Proposal Made by the New England Telephone Company; Direct Testimony on Behalf of MCI.

South Carolina:

October 2000; Docket No. 2000-0446-C; US LEC of South Carolina Inc. Arbitration with BellSouth Telecommunications; Direct Testimony on Behalf of US LEC.

November 22, 2000; Docket No. 2000-516-C; Adelphia Business Solutions of South Carolina, Inc. Arbitration with BellSouth Telecommunications; Direct Testimony on Behalf of Adelphia.

December 14, 2000; Docket No. 2000-516-C; Adelphia Business Solutions of South Carolina, Inc. Arbitration with BellSouth Telecommunications; Rebuttal Testimony on Behalf of Adelphia.

South Dakota:

November 11, 1987; Docket No. F_3652_12; Application of Northwestern Bell Telephone Company to Introduce Its Contract Toll Plan; Direct Testimony on Behalf of MCI.

May 27, 2003; Docket No. TC03-057; Application of Qwest to Reclassify Local Exchange Services as Fully Competitive; Direct Testimony on Behalf of WorldCom, Inc., Black Hills FiberCom and Midcontinent Communications.

Tennessee:

January 31, 2001; Petition of Adelphia Business Solutions for Arbitration with BellSouth Telecommunications; Direct Testimony on Behalf of Adelphia.

February 7, 2001; Petition of Adelphia Business Solutions for Arbitration with BellSouth Telecommunications; Rebuttal Testimony on Behalf of Adelphia.

QSI consulting, inc.

Texas:

June 5, 2000; PUC Docket No. 22441; Petition of Level 3 for Arbitration with Southwestern Bell Telephone Company; Direct Testimony on Behalf of Level (3) Communications, LLC.

June 12, 2000; PUC Docket No. 22441; Petition of Level 3 for Arbitration with Southwestern Bell Telephone Company; Rebuttal Testimony on Behalf of Level (3) Communications, LLC.

October 10, 2002; PUC Docket No. 26431; Petition of Level 3 for Arbitration with CenturyTel of Lake Dallas, Inc. and CenturyTel of San Marcos, Inc.; Direct Testimony on Behalf of Level (3) Communications, LLC.

October 16, 2002; PUC Docket No. 26431; Petition of Level 3 for Arbitration with CenturyTel of Lake Dallas, Inc. and CenturyTel of San Marcos, Inc.; Reply Testimony on Behalf of Level (3) Communications, LLC.

July 19, 2004; PUC Docket No. 28821; Arbitration of Non-costing Issues for Successor Interconnection Agreement to the Texas 271 Agreement; Direct Testimony on Behalf of KMC Telecom III, L.L.C, KMC Telecom V, Inc. (d/b/a KMC Network Services, Inc.), and KMC Data, L.L.C.

August 23, 2004; PUC Docket No. 28821; Arbitration of Non-costing Issues for Successor Interconnection Agreement to the Texas 271 Agreement; Rebuttal Testimony on Behalf of KMC Telecom III, L.L.C, KMC Telecom V, Inc. (d/b/a KMC Network Services, Inc.), and KMC Data, L.L.C.

Utah:

November 16, 1987; Case No. 87_049_05; Petition of the Mountain State Telephone and Telegraph Company for Exemption from Regulation of Various Transport Services; Direct Testimony on Behalf of MCI.

July 7, 1988; Case No. 83_999_11; Investigation of Access Charges for Intrastate InterLATA and IntraLATA Telephone Services; Direct Testimony on Behalf of MCI.

November 8, 1996; Docket No. 96-095-01; MCImetro Petition for Arbitration with USWC Pursuant to 47 U.S.C. Section 252; Direct Testimony on Behalf of MCI.

November 22, 1996; Docket No. 96-095-01; MCImetro Petition for Arbitration with USWC Pursuant to 47 U.S.C. Section 252; Rebuttal Testimony on Behalf of MCI.

QSI consulting, inc.

September 3, 1997; Docket No. 97-049-08; USWC Rate Case; Surrebuttal Testimony on Behalf of MCI.

September 29, 1997; Docket No. 97-049-08; USWC Rate Case; Revised Direct Testimony on Behalf of MCI.

February 2, 2001; Docket No. 00-999-05; In the Matter of the Investigation of Inter-Carrier Compensation for Exchanged ESP Traffic; Direct Testimony on Behalf of Level 3 Communications, LLP.

January 13, 2004; Docket No. 03-999-04; In the Matter of a Proceeding to Address Actions Necessary to Respond to the FCC's Triennial Review Order; Direct Testimony on Behalf of WorldCom, Inc. (MCI).

Washington:

September 27, 1988; Docket No. U-88-2052-P; Petition of Pacific Northwest Bell Telephone Company for Classification of Services as Competitive; Direct Testimony on Behalf of MCI.

October 11, 1996; Docket No. UT-96-0338; Petition of MCImetro for Arbitration with GTE Northwest, Inc., Pursuant to 47 U.S.C.252; Direct Testimony on Behalf of MCI.

November 20, 1996; Docket No. UT-96-0338; Petition of MCImetro for Arbitration with GTE Northwest, Inc., Pursuant to 47 U.S.C.252; Rebuttal Testimony on Behalf of MCI.

January 13, 1998; Docket No. UT-97-0325; Rulemaking Workshop re Access Charge Reform and the Cost of Universal Service; Comments and Presentation on Behalf of MCI.

December 21, 2001; Docket No. UT-003013, Part D; Continued Costing and Pricing of Unbundled Network Elements, Transport, and Termination; Direct Testimony on Behalf of WorldCom, Inc.

October 18, 2002; Docket No. UT-023043; Petition of Level 3 for Arbitration with CenturyTel of Washington, Inc.; Direct Testimony on Behalf of Level (3) Communications, LLC.

November 1, 2002; Docket No. UT-023043; Petition of Level 3 for Arbitration with CenturyTel of Washington, Inc.; Rebuttal Testimony on Behalf of Level (3) Communications, LLC.

QSI consulting, inc.

January 31, 2003; Docket No. UT-021569; Developing an Interpretive or Policy Statement relating to the Use of Virtual NPA/NXX Calling Patterns; Comments on Behalf of WorldCom, Inc. and KMC Telecom.

May 1, 2003; Docket No. UT-021569; Developing an Interpretive or Policy Statement relating to the Use of Virtual NPA/NXX Calling Patterns; Workshop Participation on Behalf of MCI, KMC Telecom, and Level (3) Communications, LLC.

August 13, 2003; Docket No. UT-030614; In the Matter of the Petition of Qwest Corporation for Competitive Classification of Basic Exchange Telecommunications Services; Direct Testimony on Behalf of MCI, Inc.

August 29, 2003; UT-030614; In the Matter of the Petition of Qwest Corporation for Competitive Classification of Basic Exchange Telecommunications Services; Rebuttal Testimony on Behalf of MCI, Inc.

September 13, 2004; Docket No. UT-033011; In the Matter of Washington Utilities and Transportation Commission, Petitioners, v. Advanced Telecom Group, Inc., et al, Respondents; Direct Testimony on Behalf of Time Warner Telecom of Washington, LLC.

West Virginia:

October 11, 1994; Case No. 94-0725-T-PC; Bell Atlantic - West Virginia Incentive Regulation Plan; Direct Testimony on Behalf of MCI.

June 18, 1998; Case No. 97-1338-T-PC; Petition of WorldCom, Inc. for Approval to Transfer Control of MCI Communications Corporation to WorldCom, Inc.; Rebuttal Testimony on Behalf of MCI.

Wisconsin:

October 31, 1988; Docket No. 05_TR_102; Investigation of Intrastate Access Costs, Settlements, and IntraLATA Access Charges; Direct Testimony on Behalf of MCI.

November 14, 1988; Docket No. 05_TR_102; Investigation of Intrastate Access Costs, Settlements, and IntraLATA Access Charges; Rebuttal Testimony on Behalf of MCI.

December 12, 1988; Docket No. 05_TI_116; In the Matter of Provision of Operator Services; Rebuttal Testimony on Behalf of MCI.

QSI consulting, inc.

March 6, 1989; Docket No. 6720_TI_102; Review of Financial Data Filed by Wisconsin Bell, Inc.; Direct Testimony on Behalf of MCI.

May 1, 1989; Docket No. 05_NC_100; Amendment of MCI's CCN for Authority to Provide IntraLATA Dedicated Access Services; Direct Testimony on Behalf of MCI.

May 11, 1989; Docket No. 6720_TR_103; Investigation Into the Financial Data and Regulation of Wisconsin Bell, Inc.; Rebuttal Testimony on Behalf of MCI.

July 5, 1989; Docket No. 05-TI-112; Disconnection of Local and Toll Services for Nonpayment -- Part A; Direct Testimony on Behalf of MCI.

July 5, 1989; Docket No. 05-TI-112; Examination of Industry Wide Billing and Collection Practices -- Part B; Direct Testimony on Behalf of MCI.

July 12, 1989; Docket No. 05-TI-112; Rebuttal Testimony in Parts A and B on Behalf of MCI.

October 9, 1989; Docket No. 6720-TI-102; Review of the WBI Rate Moratorium; Direct Testimony on Behalf of MCI.

November 17, 1989; Docket No. 6720-TI-102; Review of the WBI Rate Moratorium; Rebuttal Testimony on Behalf of MCI.

December 1, 1989; Docket No. 05-TR-102; Investigation of Intrastate Access Costs, Settlements, and IntraLATA Access Charges; Direct Testimony on Behalf of MCI.

April 16, 1990; Docket No. 6720-TR-104; Wisconsin Bell Rate Case; Direct Testimony of Behalf of MCI.

October 1, 1990; Docket No. 2180-TR-102; GTE Rate Case and Request for Alternative Regulatory Plan; Direct Testimony on Behalf of MCI.

October 15, 1990; Docket No. 2180-TR-102; GTE Rate Case and Request for Alternative Regulatory Plan; Rebuttal Testimony on Behalf of MCI.

November 15, 1990; Docket No. 05-TR-103; Investigation of Intrastate Access Costs and Intrastate Access Charges; Direct Testimony on Behalf of MCI.

April 3, 1992; Docket No. 05-NC-102; Petition of MCI for IntraLATA 10XXX 1+ Authority; Direct Testimony on Behalf of MCI.

QSI consulting, inc.

September 30, 2002; Docket No. 05-MA-130; Petition of Level 3 for Arbitration with CenturyTel; Direct Testimony on Behalf of Level (3) Communications, LLC.

October 9, 2002; Docket No. 05-MA-130; Petition of Level 3 for Arbitration with CenturyTel; Reply Testimony on Behalf of Level (3) Communications, LLC.

September 1, 2004; Docket No. 05-MA-135; Petition of Level 3 for Arbitration with Wisconsin Bell, Inc. d/b/a/ SBC Wisconsin; Direct Testimony on Behalf of Level (3) Communications, LLC.

Wyoming:

June 17, 1987; Docket No. 9746 Sub 1; Application of MCI for a Certificate of Public Convenience and Necessity; Direct Testimony on Behalf of MCI.

May 19, 1997; Docket No. 72000-TC-97-99; In the Matter of Compliance with Federal Regulations of Payphones; Oral Testimony on Behalf of MCI.

Comments Submitted to the Federal Communications Commission and/or the Department of Justice

March 6, 1991; Ameritech Transmittal No. 518; Petition to Suspend and Investigate on Behalf of MCI re Proposed Rates for OPTINET 64 Kbps Service.

April 17, 1991; Ameritech Transmittal No. 526; Petition to Suspend and Investigate on Behalf of MCI re Proposed Flexible ANI Service.

August 30, 1991; Ameritech Transmittal No. 555; Petition to Suspend and Investigate on Behalf of MCI re Ameritech Directory Search Service.

September 30, 1991; Ameritech Transmittal No. 562; Petition to Suspend and Investigate on Behalf of MCI re Proposed Rates and Possible MFJ Violations Associated with Ameritech's OPTINET Reconfiguration Service (AORS).

October 15, 1991; CC Docket No. 91-215; Opposition to Direct Cases of Ameritech and United (Ameritech Transmittal No. 518; United Transmittal No. 273) on Behalf of MCI re the introduction of 64 Kbps Special Access Service.

November 27, 1991; Ameritech Transmittal No. 578; Petition to Suspend and Investigate on Behalf of MCI re Ameritech Directory Search Service.

September 4, 1992; Ameritech Transmittal No. 650; Petition to Suspend and Investigate on Behalf of MCI re Ameritech 64 Clear Channel Capability Service.

QSI consulting, inc.

February 16, 1995; Presentation to FCC Staff on the Status of Intrastate Competition on Behalf of MCI.

November 9, 1999; Comments to FCC Staff of Common Carrier Bureau on the Status of OSS Testing in Arizona on Behalf of MCI WorldCom, Inc.

November 9, 1999; Comments to the Department of Justice (Task Force on Telecommunications) on the Status of OSS Testing in Arizona and the USWC Collaborative on Behalf of MCI WorldCom, Inc.

Presentations Before Legislative Bodies:

April 8, 1987; Minnesota; Senate File 677; Proposed Deregulation Legislation; Comments before the House Committee on Telecommunications.

October 30, 1989; Michigan; Presentation Before the Michigan House and Senate Staff Working Group on Telecommunications; "A First Look at Nebraska, Incentive Rates and Price Caps," Comments on Behalf of MCI.

May 16, 1990; Wisconsin; Comments Before the Wisconsin Assembly Utilities Committee Regarding the Wisconsin Bell Plan for Flexible Regulation, on Behalf of MCI.

March 20, 1991; Michigan; Presentation to the Michigan Senate Technology and Energy Committee re SB 124 on behalf of MCI.

May 15, 1991; Michigan; Presentation to the Michigan Senate Technology and Energy Commission and the House Public Utilities Committee re MCI's Building Blocks Proposal and SB 124/HB 4343.

March 8, 2000; Illinois; Presentation to the Environment & Energy Senate Committee re Emerging Technologies and Their Impact on Public Policy, on Behalf of MCI WorldCom, Inc.

February 19, 2004; Presentation to the Iowa Senate Committee Regarding House Study Bill 622/Senate Study Bill 3035; Comments on Behalf of MCI.

Presentations Before Industry Groups -- Seminars:

May 17, 1989; Wisconsin Public Utility Institute -- Telecommunications Utilities and Regulation; May 15-18, 1989; Panel Presentation -- Interexchange Service Pricing Practices Under Price Cap Regulation; Comments on Behalf of MCI.

QSI consulting, inc.

July 24, 1989; National Association of Regulatory Utility Commissioners -- Summer Committee Meeting, San Francisco, California. Panel Presentation -- Specific IntraLATA Market Concerns of Interexchange Carriers; Comments on Behalf of MCI.

May 16, 1990; Wisconsin Public Utility Institute -- Telecommunications Utilities and Regulation; May 14-18, 1990; Presentation on Alternative Forms of Regulation.

October 29, 1990; Illinois Telecommunications Sunset Review Forum; Two Panel Presentations: Discussion of the Illinois Commerce Commission's Decision in Docket No. 88-0091 for the Technology Working Group; and, Discussion of the Treatment of Competitive Services for the Rate of Return Regulation Working Group; Comments on Behalf of MCI.

May 16, 1991; Wisconsin Public Utility Institute -- Telecommunications Utilities and Regulation Course; May 13-16, 1991; Participated in IntraLATA Toll Competition Debate on Behalf of MCI.

November 19, 1991; TeleStrategies Conference -- "Local Exchange Competition: The $70 Billion Opportunity." Presentation as part of a panel on "IntraLATA 1+ Presubscription" on Behalf of MCI.

July 9, 1992; North Dakota Association of Telephone Cooperatives Summer Conference, July 8-10, 1992. Panel presentations on "Equal Access in North Dakota: Implementation of PSC Mandate" and "Open Network Access in North Dakota" on Behalf of MCI.

December 2-3, 1992; TeleStrategies Conference -- "IntraLATA Toll Competition -- A Multi-Billion Dollar Market Opportunity." Presentations on the interexchange carriers' position on intraLATA dialing parity and presubscription and on technical considerations on behalf of MCI.

March 14-17, 1993; NARUC Introductory Regulatory Training Program; Panel Presentation on Competition in Telecommunications on Behalf of MCI.

May 13-14, 1993; TeleStrategies Conference -- "IntraLATA Toll Competition -- Gaining the Competitive Edge"; Presentation on Carriers and IntraLATA Toll Competition on Behalf of MCI.

May 23-26, 1994; The 12th Annual National Telecommunications Forecasting Conference; Represented IXCs in Special Town Meeting Segment Regarding the Convergence of CATV and Telecommunications and other Local Competition Issues.

QSI consulting, inc.

March 14-15, 1995; "The LEC-IXC Conference"; Sponsored by Telecommunications Reports and Telco Competition Report; Panel on Redefining the IntraLATA Service Market -- Toll Competition, Extended Area Calling and Local Resale.

August 28-30, 1995; "Phone+ Supershow '95"; Playing Fair: An Update on IntraLATA Equal Access; Panel Presentation.

August 29, 1995; "TDS Annual Regulatory Meeting"; Panel Presentation on Local Competition Issues.

December 13-14, 1995; "NECA/Century Access Conference"; Panel Presentation on Local Exchange Competition.

October 23, 1997; "Interpreting the FCC Rules of 1997"; The Annenberg School for Communication at the University of Southern California; Panel Presentation on Universal Service and Access Reform.

February 5-6, 2002; "Litigating Telecommunications Cost Cases and Other Sources of Enlightenment"; Educational Seminar for State Commission and Attorney General Employees on Litigating TELRIC Cases; Denver, Colorado.

February 19-20, 2003; Seminar for the New York State Department of Public Service entitled "Emerging Technologies and Convergence in the Telecommunications Network". Presented with Ken Wilson of Boulder Telecommunications Consultants, LLC.

July 25, 2003; National Association of Regulatory Utility Commissioners Summer Committee Meetings; Participated in Panel regarding "Wireless Substitution of Wireline – Policy Implications."

Oregon
ARB 665
L3CI 01-024I

INTERVENOR: Level 3 Communications, Inc.

REQUEST NO: 024I

Does Qwest offer any kind of foreign exchange ("FX") service in this state? If so, please provide a service description (including, but not limited to, tariff pages) for each such service.

RESPONSE:

No. The Commission discontinued FX service in Oregon with certain existing customers grandfathered in 1983. (See Order No. 83-839).

Respondent: Larry Brotherson

Oregon
ARB 665
L3CI 01-023I

INTERVENOR: Level 3 Communications, Inc.

REQUEST NO: 023I

Does Qwest contend that the costs it incurs in originating a call to a Level 3 customer differ in any respect whatsoever based upon the physical location of the Level 3 customer? If Qwest responds to the above question with anything other than an unequivocal "no," please provide a detailed explanation of how the location of Level 3's customer on Level 3's side of the POI could affect Qwest's costs. Include in that explanation all cost studies and any other documentation in your possession that you believe provide support for your position.

RESPONSE:

No. The costs Qwest incurs do not vary based upon the physical location of the Level 3 customer. Qwest's overall costs incurred to complete a call, however, vary depending on the originating voice caller's location and the location of the Level 3 POI.

Respondent: Larry Brotherson

Oregon
ARB 665
L3CI 01-029A-S1

INTERVENOR: Level 3 Communications, Inc.

REQUEST NO: 029A-S1

Qwest has transported VoIP traffic over its network in the State of Oregon. If your answer is anything other than an unqualified admission, please describe in detail your qualification or denial, and provide any information or evidence which supports your qualification or denial.

RESPONSE:

Please see Qwest's response to Data Request/Request for Admission No. 1, which Qwest incorporates fully herein.

SUPPLEMENTAL RESPONSE DATED 07/08/05:

Without waiving the foregoing objection, Qwest provides the following response:

Admitted.

Given the fact that VoIP is provided by a variety of providers (including Qwest's affiliate), Qwest Corporation has certainly transported traffic that meets the proper definition of VoIP (though, given the fact that the traffic may have been handed off to Qwest by a VoIP provider's carrier in TDM, Qwest would be unlikely to know that the traffic was a VoIP call since all TDM traffic appears the same to Qwest's network).

Oregon
ARB 665
L3CI 01-017A-S1

INTERVENOR: Level 3 Communications, Inc.

REQUEST NO: 017A-S1

Please admit that Qwest currently offers Qwest® OneFlexTM Voice over Internet Protocol services within Oregon which provides customers:

> [T]he option of choosing up to five additional phone numbers (virtual numbers) that will ring to your phone. Calls placed to a virtual phone number will ring the same phone as calls placed to your primary phone number. A virtual phone number can be beneficial if you have colleagues, friends or family living outside your local calling area. You could request a virtual number within their area and the people who live in that local calling area can call you for a price of a local phone call.

If your answer is anything other than an unqualified admission, please describe in detail your qualification or denial, and provide any information or evidence which supports your qualification or denial.

RESPONSE:

Please see Qwest's response to Data Request/Request for Admission No. 1, which Qwest incorporates fully herein.

SUPPLEMENTAL RESPONSE DATED 07/08/05:

Without waiving the foregoing objections, Qwest admits this request as to QCC but denies it as to Qwest Corporation.

Oregon
ARB 665
L3CI 01-020A-S1

INTERVENOR: Level 3 Communications, Inc.

REQUEST NO: 020A-S1

Qwest® OneFlexTM Voice over Internet Protocol offering is less expensive than its Choice Home Plus package, which includes unlimited local calling and a full range of features, which costs approximately $35 per month, with about $10 in taxes and fees, with one long-distance option at 5 cents per minute plus a $4.99 monthly fee. If your answer is anything other than an unqualified admission, please describe in detail your qualification or denial, and provide any information or evidence which supports your qualification or denial.

RESPONSE:

Please see Qwest's response to Data Request/Request for Admission No. 1, which Qwest incorporates fully herein.

SUPPLEMENTAL RESPONSE DATED 07/08 /05:

Qwest can neither admit nor deny this request. It is not clear what "Qwest VoIP offering" is being referred to in this request, thus making it impossible to make the requested comparison.

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

ARB 665

In the Matter of

LEVEL 3 COMMUNICATIONS, INC's

Petition for Arbitration Pursuant to Section 252(b) of the Communications Act of 1934, as amended by the Telecommunications Act of 1996, and the Applicable State Laws for Rates, Terms, and Conditions of Interconnection with Qwest Corporation

DIRECT TESTIMONY OF ROGIER R. DUCLOO ON BEHALF OF LEVEL 3 COMMUNICATIONS, LLC

August 12, 2005

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Table of Contents

I. Introduction....3
II. Statement Of Scope And Summary....3
III. ISSUE 2: Combining Different Traffic Types on Interconnection Trunks....9
IV. ISSUE 5: ESP Traffic - VoIP Traffic....31
XII. Conclusions....52

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

I. Introduction

Q. Please state your name, position, employer, and business address.

A. My name is Rogier R. Ducloo. I am a Director with Level 3 Communications, LLC. My business address is 1025 Eldorado Blvd, Colorado, 8021. I am filing this testimony on behalf of Level 3 Communications, LLC of Broomfield, CO.

Q. Please review your education and relevant work experience.

A. I received a Bachelor of Science in Business and Management from the University of Amsterdam, the Netherlands in 1996. I've worked at Level 3 since 1998. Most of my experience with Level 3 has been with the company's network group. I've worked in network provisioning, network engineering & design, and network planning & project management of network deployment. Since 2002, I have worked in network planning and regulatory support. Prior to joining Level 3 I worked in business development and international institutional sales.

II. Statement Of Scope And Summary

Q. What is the purpose of your testimony?

A. I am testifying on behalf of Level 3 Communications, LLC ("Level 3"), regarding interconnection agreement terms and conditions between Level 3 and Qwest that we have been unable to resolve during negotiations. I will address various technical issues to provide a network and engineering perspective for the issues that are in dispute in this case.

Q. Please summarize your testimony, including your conclusions and recommendations.

A. Level 3 is a facilities-based Competitive Local Exchange Carrier ("CLEC"). To facilitate fair competition, and for Level 3 to meet customer demands, Level 3 must be permitted to interconnect with Qwest on reasonable terms, rates and conditions. Moreover, because of Level 3's experience operating the largest next-generation, end-to-end Internet

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Protocol ("IP")-based network in the United States, Level 3 is uniquely positioned to propose terms that are not only reasonable and technically sound, but also consistent with the overall public interest in the continued technical advancement of the nation's communications infrastructure.

Qwest, in contrast, takes an extremely limited and one-sided view of interconnection. The Qwest-sponsored provisions to which Level 3 objects would cause inefficiencies in the network by, among other things, requiring technically unnecessary trunks and facilities, as well as changes to efficient interconnection architecture. As a result, Qwest's proposals are detrimental to overall network efficiency, quality, and to Level 3's ability to offer services in furtherance of the public interest in facilitating and developing a competitive telecommunications market. As summarized here and as explained in greater detail below, Qwest's one-sided proposals cause problems at several levels.

First, Qwest proposes to place a number of restrictions on switching and trunking operations. It does this through the definitions of various terms in the Agreement. None of these restrictions has any technical basis. In each case, Qwest would impose engineering inefficiencies on Level 3 (and in some cases on Qwest itself as well) for no reason other than, as far as I can tell, to impede Level 3's growth or to extract extra revenues from us. These definitional issues affect the outcome of Issues 1 and 2 and I deal with the definitional concerns in the course of discussing the relevant issues.

Second, the companies disagree on the how to divide the traffic we send each other into different trunk groups. We agree that when total traffic between Level 3 and a particular Qwest end office switch reaches a certain reasonable volume, we will establish a direct trunk group between that end office and Level 3. The technical and engineering efficiency of both parties' networks will be maximized by including all traffic between Level 3 and the affected Qwest switch on a single large trunk group. Qwest, however,

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

wants us to establish multiple trunk groups between each pair of switches, with the traffic divided based on regulatory classifications that have no engineering significance. This is, pure and simply, inefficient. I understand that governing law requires the terms and conditions of interconnection to be "reasonable." From an engineering perspective, what Qwest is proposing is patently unreasonable. Level 3 fully recognizes that different regulatory "types" of traffic might be subject to different rates; but we have a proposal for dealing with that situation simply and efficiently, without degrading network efficiency and imposing needless costs, discussed below.

Third, in Issue 4 Qwest is arguing that certain types of Enhanced Service Provider ("ESP") traffic, including specifically VoIP traffic, should be included within the regulatory category of switched access traffic. My understanding is that the status of traffic as ESP traffic depends on certain technical characteristics of the entities that provide it, so that entities that qualify as ESPs are entitled to have their traffic rated on an end-user basis, as opposed to on a carrier basis. I understand that there are legal and regulatory considerations affecting this issue which Level 3's lawyers will address in our filings. From a technical perspective, however, it is clear that VoIP traffic is a form of information service, that is, the VoIP providers that Level 3 serves meet what I understand to be the relevant criteria for having their traffic treated as end-user, as opposed to carrier, traffic. In this regard, and irrespective of how this traffic is rated (reciprocal compensation versus access), Qwest also seeks to have ESP traffic, including VoIP traffic, routed over distinct trunk groups and perhaps over distinct facilities. For the reasons noted above, this is grossly inefficient and patently unreasonable.

In Issue No. 3 the ISP/RUF (VNXX) issue, Qwest is trying to shift the financial responsibility for maintaining its own network, on its side of the Point of Interconnection ("POI"), to Level 3. As a contractual matter, the parties agree that the cost of facilities used to connect their networks will be split based on relative use, so that cost

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

responsibility follows in proportion to which party originates which portion of traffic on the affected facilities. But what Qwest seeks to do is to exclude from the calculation the overwhelming majority of traffic that it sends to Level 3. As a simple matter of mathematics, this sleight-of-hand would relieve Qwest of cost responsibility for facilities that Qwest uses (in the sense of originates traffic over) much, much more than Level 3 does. In certain cases (VNXX traffic), Qwest would go even farther, and would send Level 3 bills for originating intrastate access charges. Again, Level 3's lawyers will address the legal flaws in Qwest's position, but from an engineering perspective, treating VNXX calls like intrastate toll traffic is absurd.

The **LIS NRC** section continues the issue of who is responsible for the cost of interconnection, and explains why Qwest should not be able to pass the cost of installation and maintenance of its own network to Level 3.

Finally, the section of the **Determination of Traffic Types** provides a description of how Level 3 proposes to calculate the traffic mix on trunks. The section also explains a dispute over the new way that Qwest is proposing to determine whether a call is "local" or not. New contract language is proposed in this section to specify Level 3's proposal on how to calculate and manage traffic factors for billing purposes.

Q. To provide some background, please give a brief overview of the difference between the Qwest circuit switch-based network and Level 3's softswitch-based network.

A. Qwest's network is comprised of circuit switches connected to each other by fiber and copper transmission paths, and to end user customers largely by means of copper loops. Qwest's Class 4 (tandem) and Class 5 (end office) switches are the "brains" of its network. Like the traditional PSTN of which it is a part, the Qwest network operates using a centralized architecture which evolved starting more than 50 years ago with the introduction of automatic (originally, mechanical) circuit switching. The entire design objective of the PSTN was to do just one thing — deliver voice calls — very, very well.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

This design objective led to the old Bell System's implementation of computerized switches in a hierarchical architecture, the development of time-division multiplexing for use initially on copper and later on optical fiber, as well as the design of customer premises equipment and the specification of the interfaces between that equipment and the PSTN. The goal, and the result, of this focus was a network in which end-to-end network resources are devoted to the completion of large volumes of plain old voice telephone calls.

Level 3's network is quite different, arising not out of the hierarchical, circuit-switched PSTN but instead out of the distributed, open architecture of the Internet. The Internet evolved as a scientific, educational and military network outside the PSTN, beginning in the 1960s. The Internet uses packet switching, not circuit switching. Rather than devoting end-to-end network resources to communicate information (voice or otherwise), a packet switched network breaks the information down into pieces (packets) and then separately routes the packets to their destination, often by very diverse routes, based dynamically on which switches (called "routers" on the Internet) and links are free or busy on a near-instantaneous basis. The packets are then reassembled into the proper order at the destination, so that the information is properly delivered.

Using Internet Protocol technology, Level 3 operates a distributed softswitch architecture. All internal connections between nodes on Level 3's network are by means of high-capacity optical fiber. Level 3's softswitch- and IP-based network is based on an open architecture that optimizes the use of computing technology to maximize the efficiency of the network infrastructure transport layer. Softswitch technology is able to bridge the gap between legacy circuit-switched technology and more advanced IP-based networks. Because it knew that its customers would need to interface with the PSTN, Level 3 retro-engineered its network — from one perspective, "dumbed it down" — to be able to exchange IP-based traffic with the PSTN.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

A simple metaphor illustrates the difference. Qwest's network is like a funny kind of highway system. Imagine dedicated roads leading traffic from one point to another on fixed highways with multiple lanes, like the real highway system. On a circuit-switched network like Qwest's, however, when there is a car running down one lane of the highway — say on a trip from Portland to Phoenix — no other car is allowed be in its lane, all the way from Portland to Phoenix. Only when the first car has completed its journey can any other car use "its" lane.

In contrast, Level 3's softswitch and router based network is like the human brain. It is a smart, highly interconnected network that functions in parallel, so that traffic can take many different paths to get to the same place, and packets containing bits from different conversations can travel the same path at the same time for part, or all, of the route.

From Level 3's perspective, the technical superiority of its flexible, IP-based network is obvious — even for the traditional mainstay of the PSTN, voice calls. From both an engineering and business perspective, this is extremely threatening to PSTN operators like Qwest, who have enormous amounts of money and expertise invested in what is manifestly an old-fashioned and increasingly obsolete way of doing things. It is only natural that those with such a heavy investment in old technology and old knowledge would do everything possible to delay the day when they are overtaken by the new. For that reason, it is understandable why Qwest would want to shoe-horn Level 3's operations, as much as possible, into network architectures, regulatory classifications, and business models that Qwest understands, and that are in harmony with Qwest's own network and operations. But the entire point of introducing competition into the telecommunications business — at least from my technical perspective — is to make it possible for consumers to enjoy the benefits made possible by newer and more technically sophisticated networks. In assessing what constitutes "reasonable" terms for

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

interconnection in this proceeding, therefore, I urge the Commission to recognize and take account of this fact. I submit that on the issues I address, Qwest is acting primarily to avoid the impact of new technology-based competition on its legacy network, not in the best interest of the citizens of Oregon.

III. ISSUE 2: Combining Different Traffic Types on Interconnection Trunks

Statement of the Issue: Qwest wants Level 3 to provision separate trunk groups for different types of traffic, thus forcing Level 3 to set up duplicate, inefficient trunk groups to every Qwest end office and tandem office switch.

Q. What is Level 3's position on this issue?

A. Level 3 and Qwest should not be required to set up different trunk groups for different regulatory "types" of traffic. Instead, all types of traffic going from Level 3 to Qwest (local and toll, interLATA and intraLATA, interstate and intrastate, "telecommunications service" or "information service," circuit switched end-to-end or IP-enabled) should be combined on the same trunk group along a given route. I understand that regulatory rules might require that different types of traffic be subject to different rating regimes, but that is no reason to degrade network efficiency by handling technically equivalent traffic in different ways as a matter of network engineering and architecture. I note in this regard that Level 3 has agreements with the 3 other RBOCs, covering 39 states and the District of Columbia that allow for the most network-efficient exchange of all types of traffic. Qwest is a real outlier on this issue.

Q. What is Qwest's position?

A. Qwest wants Level 3 to order and provision multiple, separate trunk groups to every tandem and end office in the state. They want one set of trunk groups for local and IntraLATA traffic, and another set of trunk groups for InterLATA traffic. If they will accept IP-enabled traffic at all — which they appear to contest — they want that on separate trunks too. From an engineering perspective, setting up all these separate trunk

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

groups for traffic going to and coming from the same place is grossly inefficient. I submit that it cannot be considered a "reasonable" condition of interconnection.

Q. What is a trunk?

A. A trunk is a logical connection between two switches, provisioned by means of physical facilities between those two switches. The physical facility is not the trunk. It may be any appropriate medium — copper, optical fiber, microwave radio, coaxial cable, etc. The trunk is the logical path ***carried on*** the physical facility. The term "trunk" arises from within the PSTN, so, not surprisingly a trunk refers to a single voice-grade connection, capable of carrying one voice call between two switches.

Q. What is a trunk group?

A. A trunk group is a collection trunks, normally (but not necessarily) provisioned over the same physical facility connecting two switches, configured to operate as a cohesive unit when delivering multiple voice connections between the two switches. You can think of the physical facility carrying a trunk group as completely unmarked road — just a wide concrete path between two cities. Each individual lane that we paint on the highway is a trunk. All the lanes going together in the same direction are a trunk group. The wider the highway, the more lanes it has, and the more traffic it can carry.

Q. How do you measure the capacity of trunk groups?

A. A single trunk — that can carry a single voice conversation — is known as a "DS0." Putting 24 DS0s together creates a DS1, which is the basic unit of carrier-to-carrier trunking in the PSTN. Putting 28 DS1s together creates a DS3, which is equivalent to 672 DS0s. (For historical reasons, there is no "DS2.") DS0s, DS1s and DS3s can all be carried on any normal transmission medium (copper, fiber, or radio).

More modern, high-capacity networks exchange traffic using optical fiber connections. The data-carrying capacity of optical fiber utterly dwarfs the capacity of copper wires. The smallest normal unit of capacity on an optical network is an OC-3,

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

which is the equivalent of three DS3s. Other common capacity measures for optical networks are the OC-12 (12 DS3s), the OC-48 (48 DS3s), and the OC-192 (192 DS3s).

Q. How do telecommunications engineers decide how much capacity to put into place between two switches?

A. At a very high level, the more traffic that will flow between the switches, the bigger the trunk group you will put into service. But it is actually more complicated than that.

Think about the highway example discussed above. Imagine that you are trying to design a highway between a large city and a populous suburb. You would not look at the number of cars driving between the city and the suburb at 3:00 on Sunday morning. And, although perhaps not as obvious, you would not just look at the total number of cars that travel that route over the course of a day or week or month. Instead, to properly design the highway, you would look at how many cars are trying to travel that route at the very same time, at rush hour on the busiest day of the week. That way, you would know how much traffic your new road will need to be able to handle when it is at its busiest. ***That*** will tell you how big to make your highway.

This same principle applies to deciding how big to make trunk groups between switches. Different routes that serve different types of customers have different "rush hours" (called "busy hours" in the telecommunications business). A route between switches that mainly serve business customers might have a busy hour between 9:00 and 10:00 a.m. when people arrive at their offices for work. On the other hand, a route between switches that mainly serve residential customers might have a busy hour between 3:00 and 4:00 p.m. as children get home from school and they and their parents start calling each other to discuss homework, social events, or the evening's plans.

There is a final, but critically important, consideration in determining how large trunk groups should be. This issue is known as "trunking efficiencies."

Q. What do you mean by "trunking efficiencies?"

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

A. For reasons which I will briefly explain below, it turns out that, while the number of trunks that you need in a trunk group to carry a given amount of busy hour traffic definitely increases as the amount of traffic increases, the number of trunks goes up at a ***slower rate*** than the traffic goes up. If the current amount of traffic is carried on a single DS1 (24 DS0s), it will ***not*** require three DS1s to carry three times as much traffic. Instead, it will require, perhaps, only two DS1s. Moreover, this effect continues as the traffic growth get larger, so that ten times as much busy hour traffic will not require anything near a 10-fold increase in the number of trunks.

In practical terms, this means that carriers can greatly conserve on the number of trunks they need to establish between two switches, by combining as much of the interswitch traffic as possible onto a single, large trunk group.

Q. What trunking is at dispute in this issue?

A. There are several issues. The first has to do with handling incoming (to Qwest) interLATA traffic. The bulk of traffic between Level 3 and Qwest is "local" interconnection traffic. However, Level 3 also has some InterLATA traffic that it carries for IXCs that must be delivered to Qwest customers. Today, Level 3 routes this traffic to 3rd parties (IXCs) for completion to Qwest. These 3rd party IXCs price this service at relatively high rates, causing this to be an expensive solution for Level 3. Level 3 would like to complete this traffic directly to Qwest. Unfortunately, Qwest wants to require Level 3 to use separate trunk groups for this traffic, rather than simply to deliver this traffic on existing interconnection trunks.

Q. Is Level 3 trying to avoid paying access charges on this IXC traffic?

A. Absolutely not. Level 3 agrees that this traffic is subject to access charges, and has language in its proposed agreement that provides for the payment of those access charges. However, for the reasons explained briefly above, it would be technically much more efficient to include this traffic on the same trunk group that Level 3 uses to deliver

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

"local" traffic to Qwest. That would allow Level 3 (and Qwest) to take advantage of the trunking efficiencies discussed above.

Q. What other trunking issues exist between Level 3 and Qwest?

A. Qwest seems reluctant to accept incoming IP-enabled traffic (that is, traffic that originated by means of a broadband data connection as opposed to a normal telephone) at all. To the extent that it will accept the traffic, however, it wants that traffic, too, to be on trunks other than the existing "local" interconnection trunks. In addition, Qwest may even want separate trunking for some calls from its customers to ISPs served by Level 3.

Q. Is there any technical reason to require separate trunk groups for local, IntraLATA, InterLATA, ISP-bound, and/or IP-enabled calls?

A. No. Although various kinds of calls might begin in non-PSTN format, or be transported some or all of the way along their journey in a non-PSTN format (such as IP-enabled), Level 3 delivers all of its traffic bound for Qwest subscribers in standard PSTN circuit switched format and standard SS7 signaling, and receives all traffic from Qwest in that same, standard format. (As I mentioned above, one of the capabilities of our softswitches is precisely to do the necessary conversions from IP to PSTN format and vice-versa). So, all traffic coming from Qwest is obviously in normal PSTN format, and by the time we deliver any this traffic to Qwest, it is all in that same format as well — no matter what transformations and changes it may undergo at other parts of its journey.

Now, not surprisingly, Qwest and Level 3 have some disputes about the proper charging regime to apply to traffic that might fall into different regulatory categories. But no matter how those disputes might turn out, there is absolutely no technical reason to carry these different regulatory "types" of traffic on different trunk groups. Yet, that is what Qwest is proposing to require.

Q. Would it be efficient to build two highways right next to each other, both going to the same place?

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

A. No. One large highway is, obviously, more efficient than two smaller highways with the same number of lanes. As noted above, car traffic on a highway behaves in the much the same way as traffic on a telephone network. The same types of traffic engineering calculations are used to size both. The same types of congestion, blocking and capacity are common to both. Again, though, that is what Qwest's language would seem to require.

Q. What are some of the reasons why a single large trunk group is better than multiple smaller trunk groups?

A. As alluded to above, requiring multiple trunk groups along the same path between two switches is unnecessary, inefficient, costly, and can harm network performance. For example, one key problem is that using multiple trunk groups will lower the blocking Grade of Service (GOS), unless additional trunks are installed.

Q. Why would the requirement for separate trunk groups cause Level 3 to build separate networks?

A. To meet the Qwest requirement, Level 3 would need to order, build and provision multiple trunk groups from the Level 3 switch serving the state to each Qwest tandem, and over time to each end office. Essentially, Level 3 would need to build a separate network for each type of traffic that Qwest requires to be split out. Each separate network would be composed of transport facilities and switching facilities between the Level 3 switch to all Qwest tandems and eventually to virtually all Qwest end offices. Over time, this would require needless duplication of both transport and switch facilities, for both Level 3 and Qwest.

Q. Why is this inefficient?

A. From a network point of view, it is always preferable to combine as much traffic as possible on single trunk groups. Large single trunk groups are much more efficient than multiple smaller trunk groups. For example, one trunk group with four DS1s will handle

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

much more traffic than two trunk groups, each with two DS1s. To handle the same amount of traffic, the two trunk groups would need to contain 3 DS1s each to have the same capacity. This would require a total of six DS1s to do the same job as four DS1s on one trunk group. "Breakage" of a single trunk group into multiple trunk groups always requires additional trunks to carry the same traffic load with the same blocking grade of service.

Q. Earlier you mentioned "blocking grade of service." What does that term refer to?

A. Blocking Grade of Service ("GOS") is the measure of call blocking on a trunk group. Blocking is generally measured at the busy hour and is given as a percent of the calls that are blocked due to insufficient trunk capacity. A standard, acceptable blocking GOS would be 2% end-to-end. This means that for every 100 calls that customers try to make that would be carried on that route, group, two calls will be blocked due to insufficient capacity. When 2% call blocking is desired end-to-end, an allocation is made to various facilities and equipment to achieve the 2%. Typically, a trunk group between two switches is allocated 1% blocking level so that 2% can be maintained end-to-end. This is due to the fact that many calls involve more than one switch and thus more than one trunk group. There are also small probabilities of blocking on digital loop carrier equipment and associated loop transport. (Within the traditional PSTN, you would know that you had encountered blocking on a trunk group when you heard a "fast busy" signal, or a recording telling you that "all circuits are busy.")

Q. What is the impact on blocking GOS when a large amount of traffic must be broken down into multiple trunk groups?

A. If a large trunk group (say, 48 DS0s, or 2 DS1s) is split into multiple trunk groups with the same total size (two groups of 1 DS1 each), the overall carrying capacity of the multiple smaller trunk groups is smaller than the carrying capacity of the original one trunk group. The laws of trunk engineering dictate that the total number of trunk

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

members in multiple trunk groups must be significantly larger in order to carry the same amount of traffic. The effect is like congestion on the highway. One four-lane highway will carry considerably more traffic than two, 2-lane highways. For example, a single trunk group with 48 members (two DS1s) can carry about 15% more traffic than two trunk groups with 24 members each.

Q. Is there another type of inefficiency with respect to splitting a large trunk group into multiple smaller trunk groups?

A. Yes. Earlier I mentioned "breakage." This term is used to describe the problem when facilities with discrete sizes must be divided into smaller facilities. As I noted earlier, the DS1 (24 DS0s, or 24 simultaneous calls) is the smallest normal unit in which trunks between switches are ordered and provisioned. This is because the DS1 is the most common size of "port" on switching and transport equipment. This makes the practical effect of the inefficiencies of breaking a large trunk group down into two or more smaller trunk groups even worse.

For example, suppose that if a trunk group needs a total capacity of 30 DS0 trunks. Because trunks are ordered and provisioned in DS1 units, two DS1s must be used (that is, 48 DS0s). Even though the need is only for 6 DS0s above the first DS1, two complete DS1s will be established, because the switching and transport gear accepts trunk groups in DS1-sized "chunks."

Now, if this trunk group must be divided to handle two different call types on two different trunk groups, it is quite possible that the ratio between the two call types is not 50/50. If the trunk requirement is larger than a multiple of 24 (even if it is only one trunk member larger – say 25 DS0s) a new DS1 must be provisioned and the associated equipment added to terminate the new DS1. Coupled with the need for additional capacity to maintain the same blocking GOS, this leads to significant increases in the overall number of DS1s needed for a given traffic volume when the trunk groups must be

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

split. Taking this factor and the blocking factor into account, one trunk group with 48 members cannot be replaced with two trunk groups of 24 members. To get the same blocking grade of service using two trunk groups, both trunk groups would need to have two DS1s. So the effect of splitting the large trunk group into two is actually to ***double*** the total number of DS1s needed — to carry the ***exact same amount of traffic!***

Q. What cost elements are added to the network when multiple separate trunk groups must be maintained?

A. In physical terms, to establish a DS1 trunk group between two switches requires, essentially, the following. First, each switch must be programmed to separately identify the traffic bound for the particular trunk group and to direct that traffic to the appropriate "port" on the switch. Second, there must actually ***be*** a trunk port (a separate physical device) available on the switch to accommodate the new DS1 trunk group. The capacity of switches to accommodate new trunk ports is limited; at some point it is necessary to add new switch modules (that contain more ports) in order to add new trunk groups, and, for any given switch, at some point the total number of ports is reached and the only way to establish a new trunk port is to add a new switch.

The same holds true for the transmission medium (in Level 3's case, typically optical fiber) used to carry a DS1 trunk group between Level 3 and Qwest. The DS1 trunk physically runs from the Level 3 switch to a device known as a digital cross-connect system (DCS) – which has its own DS1 ports and port-capacity limits – and then on to the fiber optic terminal (FOT) that actually sends and receives the laser signals used to convey information over optical fiber. The FOT also has its own DS1 ports and port-capacity limits. Adding DS1s, therefore, sooner or later requires the purchase of additional trunk ports on switches, DCSs, and FOTs, eventually requiring that these devices be "grown" or that new switches, DCSs, and/or FOTs be purchased. Obviously, over time this will greatly increase the capital requirements of operating the network.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Finally, although obviously much of the operation of a modern telecommunications network is automatic, behind the scenes a large number of people are required to monitor, maintain and operate the system. Provisioning and maintaining additional trunk groups and the resultant facilities requires additional staff time as well.

From Level 3's perspective, when it is necessary to incur these costs due to growth in traffic volume, we of course do so. But at the same time, if it is ***not*** necessary to incur these costs in order to carry a given volume of traffic, we obviously do not want to do so. This is why the issue of using efficient trunking arrangements is so important to Level 3, and why we believe that it is entirely unreasonable to allow Qwest to require that traffic be broken down into multiple, smaller trunk groups if there is no technical reason for doing it.

Q. Would Qwest face the same inefficiencies from multiple trunk groups that you have described above for Level 3?

A. Yes. Just like Level 3, Qwest would need to dedicate DS1 ports on its FOTs, DCSs, and switches to the additional DS1 trunk groups made necessary by inefficient, multiple trunk groups.

Q. Why would Qwest want to impose such inefficiencies on itself?

A. I obviously can't say for sure. That said, it is well known among telecommunications engineers that traffic is migrating off the traditional landline PSTN. Some normal voice traffic is just "disappearing" as end users communicate via email and instant messaging, rather than making telephone calls at all. Some PSTN voice traffic is migrating to wireless, as people use their cell phones to make calls that would otherwise have been made over the landline network. Some PSTN voice traffic (although not as much as Qwest might want the Commission to believe, at least in the short run, as Mr. Gates describes) is migrating to VoIP services such as those offered by Vonage or Skype. Unless Qwest had perfect foresight, it is quite possible that it overestimated its own needs

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

for capacity and could well have over-invested in switch, DCS, and/or FOT capacity. (Of course, since Level 3 is a relatively new and still-growing carrier, Level 3 is not sitting around with excess capacity on its switches, FOTs, etc. Level 3 has to spend capital dollars to meet growing demand.) In that situation, Qwest might see it as advantageous to ***require*** a competitor like Level 3 to use an inefficiently large number of trunks. If Qwest already has the excess capacity on hand — which it would, if total demand for its services was shrinking — then it could impose large capital and other costs on Level 3, with little or no new cost to itself, simply by convincing this Commission that there was some reason to require multiple, inefficient trunk groups.

Q. Are there still other potential problems with Qwest's proposal?

A. Yes. Taking essentially the reverse of the situation described above, if Qwest does ***not*** have excess capacity, Qwest might actually not be able to add the necessary trunk ports in a timely fashion. This would put an effective limit on the rate at which Level 3 could grow and make competitive inroads in the market. At least from the perspective of the industry as a whole, this is not hypothetical. As I understand it, in a case within the last year or so, the FCC found that Verizon had violated the Communications Act by reason of having insufficient capacity to permit interconnection with a competitor (Core Communications) to grow. If a true industry giant like Verizon did not invest in enough capacity to handle growth in interconnection requirements, it is of course possible that Qwest would be in the same position.

Q. Will there be any increase in misrouted calls if "local," "toll," and other "types" of are carried on a single, large trunk group?

A. No, not at all. Briefly, to determine how to route a call, the switches looks at the first six digits of the telephone number (the "NPA-NXX"). Part of the human staff effort described above in administering trunk groups is properly programming the switch to know that, if the NPA-NXX of the called number on an outgoing call is "602-222," the

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

call gets routed to "Trunk Group XX," but if the NPA-NXX is "602-555," the call gets routed instead to "Trunk Group YY."

Of course, in actual practice it's a bit more complicated than that. For example, if the called number has been ported from its original carrier to a competing carrier, the switch doesn't look at the NPA-NXX of the number that was actually ***dialed,*** it looks at the "NPA-NXX"-equivalent portion of the "Location Routing Number," or LRN. And, if the NPA-NXX in question is subject to "thousands-block pooling," it will be necessary to look not only at the first six digits of the number (the NPA-NXX), but also at the seventh digit — essentially, the NPA-NXX-X — as well.

But the point is that none of this activity involved in routing a call outbound from Qwest to Level 3, or vice versa, is affected in any way by any regulatory overlay that classifies a call as "local" or "toll" or "intraLATA" or "IP-enabled" or "ISP-bound" or "interstate" or "intrastate." What matters is the dialed number or, for ported numbers the LRN. The rest of the regulatory stuff has literally no impact at all on call routing.[1] The network will have no trouble correctly routing any type of calls, no matter how many are combined on the same trunk group. While there will always be some small numbers of misrouted calls in the network, this number will not increase when these traffic types are combined on the same trunk group.

Q. Does combining different regulatory "types" of traffic (such as local and access traffic) on the same trunk group result in an increase in the possibility of fraud or intentional misrouting of calls?

[1] In fact, even if there ***is*** a regulatory requirement to treat some class of traffic differently for ***routing*** purposes, such a requirement is basically impossible to implement unless the requirement can be translated into handling calls with different NPA-NXXs differently. For example, that's how interLATA calls are routed to a customer's presubscribed long distance carrier. Originating ILEC switches contain a list of NPA-NXXs that are "local" to the switch contained in their programming, along with a particular trunk port assigned for outgoing calls to each "local" NPA-NXX. If a customer dials an NPA-NXX that is not on that list, either the call will be sent to the customer's presubscribed IXC or, in areas where "1+" dialing is required for toll calls, directed to a recording saying that the call "cannot be completed as dialed" or some similar message.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

A. No. Any company can intentionally misroute calls to perpetrate fraud, whether or not traffic is combined on a single trunk group. Dishonest carriers can change the SS7 call identification information to make access traffic appear to be local traffic if they so choose. This can be done whether the traffic is put on separate trunk groups or on a single trunk group. Level 3 always pays the appropriate access charges for access traffic and has no intention of changing call information or inappropriately routing calls to avoid access charges. But requiring separate trunk groups to prevent so-called "call laundering" is no more useful or effective than it would be to require banks to provide one copy of everyone's bank statement on plain white paper, and then an extra copy on special yellow-and red-striped paper, to prevent "money laundering." You can establish such a requirement — obviously at an increased cost — but doing so has nothing to do with preventing the problem at issue.

Q. Please describe the process by which proper bills for intercarrier compensation are developed.

A. Normally billing for intercarrier compensation is accomplished in several stages. First, the SS7 signaling network transmits data about an incoming call, such as the identification of the carrier delivering the call, the calling number, the dialed number, the LRN if the dialed number has been ported, etc. The switch receiving the traffic generates a record, known as an "AMA" record in traditional PSTN circuit switches, that records this information, along with other information such as the time (to the second) that the call starts and stops, perhaps the specific trunk on which the call was received, and other switch-specific information. These "AMA" records are then processed through what is known as a "mediation" system into industry-standard "EMI" (or "electronic message interchange") records. The EMI record basically takes the AMA or equivalent data and puts it into an industry-standard format (sometimes known as a "CDR," or "call detail

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

record"). These records are then run through a billing system that applies programmed logic to the data in the records to determine whether, how much, and who to bill.

This process normally occurs on a call-record-by-call-record basis. So, it doesn't actually matter, for LEC-to-LEC traffic exchange, whether the traffic on a given trunk is subject to different charging regimes or the same; each call is (or can be) rated individually.

Q. Is that the way all carriers actually bill for this type of traffic exchange?

A. No. First, some carriers have less capable mediation or billing systems than others, so not all carriers are capable of performing the call-by-call review. Another carrier might have a bill-and-keep arrangement with respect to much or all of the traffic exchanged with interconnected LECs, and so not need to go through the call-by-call process. Second, carriers can establish a Percent Local Use (PLU) and Percent Interstate Use (PIU) for calls on a trunk group, updating the information periodically to assure that it is correct. Basically, instead of reviewing the call-by-call data on a monthly basis for billing, all or a sample of a month's traffic is reviewed periodically to determine what percent of traffic falls into which billing category. In this regard, Level 3 has offered to track the Percent of IP Use (PIPU) to measure the percent of IP-Enabled traffic that is exchanged between the parties.[2] This information can be audited if there is any doubt as to its validity. These two methods are being used today by various CLECs and ILECs to manage the combining of different traffic types on trunk groups.

Q. How does Level 3 propose to calculate the PLU factor?

A. I describe the process in detail below in Section XI of this testimony, "Determination of Traffic Types." This process is being used by Level 3 in all of the Bell South states, SBC

[2] See Intercarrier Compensation Sections 3.2.2.4 -3.2.2.5, Issue IC-2.See Intercarrier Compensation Sections 3.2.2.4 -3.2.2.5, Issue IC-2.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

states, and Verizon states, and similar processes are used by other CLECs with the ILECs.

Q. Have other companies dealt with the billing issues associated with combining different types of traffic on interconnection trunks?

A. Yes. Other CLECs have been using factors in many states for more than five years. Several IXCs with CLEC affiliates combine different traffic types on FGD trunks with Qwest, using PLU to handle carrier billing. These IXCs started off with an FGD network for the purpose of exchanging intrastate and interstate access traffic. As their business strategy changed and these carriers decided to enter the local market, they made use of the FGD network that was already in place to handle the exchange of all their traffic. Similarly, Level 3 started out with a "local" network established for the purpose of exchanging "local" traffic. As described above, there is no technical or "billing"-related reason that Level 3 should not be able to use those same trunks for terminating FGD and other types of traffic. In this regard, the distinction between local and toll services is fast disappearing. Level 3's customers are demanding packaged services that include the termination of intrastate and interstate access traffic. Level 3 would like to be able to make most efficient use of the network that is already in place today. Qwest and Level 3 will be able to do so if Qwest is required to allow the exchange of all traffic over the existing "local" trunks.[3]

Q. Does Qwest use a PLU for distinguishing local and IntraLATA toll traffic on interconnection trunks?

A. Yes. That is, Qwest already permits the combination of local and intraLATA toll traffic — normally subject to different charging regimes — on a single trunk group, and uses

[3] Qwest calls these "LIS" trunks, for "Local Interconnection Service," but that is actually a misnomer. Qwest and Level 3 are co-carriers; although each is responsible for the transport and termination of traffic delivered by the other, Qwest is not providing Level 3 a "service" in the normal sense, any more than Level 3 is providing Qwest a "service." Rather, in order for each carrier to provide full "service" to its respective customers, the two carriers enter into interconnection arrangements.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

PLU factors for determining how many minutes are subject to access charges and how many are subject to reciprocal compensation. In other words, even Qwest allows mixed traffic on the same trunk group today. To distinguish the traffic that is subject to reciprocal compensation from the traffic that is subject to intrastate access, it provides on a quarterly basis, a PLU factor to the terminating carrier. Likewise, it expects any carrier originating traffic that terminates to Qwest to provide a PLU factor to Qwest. It is neither technically challenging nor in any way unreasonable to extend that process to include a PIU or other factors to determine the distribution of traffic among whatever different regulatory traffic "types" might end up existing under our final contract.

Q. Has Level 3 agreed to send only "local" traffic to Qwest's "local only" tandem switches?

A. Yes. Most Qwest switches are currently carrying both local and toll traffic. These switches can easily handle trunk groups that carry both local and toll traffic. Where Qwest has a tandem switch that currently only handles local traffic, however, as an accommodation, Level 3 has agreed to send only local traffic to such switches. However, I would emphasize that Level 3 agreed to this not because it thinks this is good network engineering. To the contrary, for all the reasons discussed above, it is not sensible to separate traffic into different types and trunk groups if not required. Because the amount of affected traffic is small in this case, however, Level 3 chose not to continue to dispute with Qwest on this topic in the limited circumstance of "local only" tandems.

Q. Has Level 3 agreed not to send toll traffic that doesn't terminate to Qwest end users or UNE/resale customers to Qwest end office switches?

A. Yes. Qwest has told Level 3 that is expects difficulty with Independent Telephone Companies ("ITCs") and other CLECs that expect to receive recording data from the Qwest tandem switch when an IXC terminates traffic to such other carrier's through Qwest's network. Because Qwest has chosen to configure its so-called "LIS" trunks

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

without the same recording capabilities as FGD trunks have, Qwest will not be able to provide such data to these carriers. This would create a situation in which these 3rd party LECs would receive traffic as to which they would legitimately be entitled to charge access rates, but as to which they would have inadequate information to actually render an access bill. To avoid this situation, for the relatively limited amount of IXC traffic that Level 3 will deliver to Qwest for further delivery to ITCs or other CLECs, Level 3 has agreed to send such traffic only to Qwest's toll tandems where adequate recordings for the 3rd parties can be made. Again, Level 3 is making this accommodation to Qwest because its impact is relatively small. The fact that we are doing so does not mean that it would be sensible to generally carve out different types of traffic for separate trunking, for all the reasons discussed above.

Q. Qwest states that Level 3 must design its interconnection to comport with Qwest's existing network and not interconnect in a manner that risks exhausting Qwest tandems. Are these statements justified?

A. Qwest is completely wrong to suggest that Level 3 is or should be required to design any part of its network to mirror, match, duplicate, or conform to Qwest's network design. Put aside the fact, as discussed above, that Level 3 is a new carrier without any need (yet) for a ubiquitous network such as Qwest's; and put aside the fact that Level 3's customer base differs from that of Qwest, which would lead to a different network design. The fact is that network technology has changed so much since Qwest started deploying its network in Oregon that if ***Qwest*** were building a new network today, to serve its own existing customer base, ***Qwest itself*** would not re-generate the same network that it actually has today. It makes no engineering or technical sense to suggest that there is anything sacrosanct, or even particularly efficient or optimal, about Qwest's existing network. There is not.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Now, that said, Qwest does have a legitimate technical concern that neither Level 3 nor any other interconnected carrier should deliver such large amounts of traffic to Qwest's tandem that the capacity of the tandem itself would be overloaded. It is standard practice in the circuit-switched telephone industry to establish direct trunks between switches when the level of traffic between them exceeds a certain level. Given this, Level 3 is perfectly willing to work with Qwest to avoid the problem of tandem overload by jointly engineering separate trunk groups that go directly between Level 3 and those Qwest end offices with enough traffic to justify the direct trunking. These are known in the industry as "Direct End Office Trunks," or DEOTs.

Q. Doesn't establishing DEOTs lead to the creation of multiple trunk groups, which you have testified above are inefficient?

A. To a certain extent, yes. However, all network engineering involves making tradeoffs. There is, to coin a phrase, no such thing as a free lunch. While looking at trunking alone, it is more efficient for both Qwest and Level 3 to connect their networks with a single, massive trunk group from Level 3 to Qwest's tandem, that requires that all traffic between the parties be switched by Qwest twice, once at the end office, and once at the tandem. In addition, it requires Qwest to make use of three trunk ports for all traffic between the networks: one at the "Level 3" side of Qwest's tandem, to accept incoming traffic and send outbound traffic to Level 3; another at the "Qwest Network" side of Qwest's tandem, to connect the tandem to trunks bound for particular end offices; and then a third trunk port at the end office itself, to connect that end office to the tandem. With DEOTs, even though the total number of trunks will be higher than would be the case in a single massive trunk group, Qwest is able to avoid the use of tandem switching and to cut down on the total number of trunk ports it has to use. Level 3 is certainly willing to work with Qwest to permit Qwest to obtain those network efficiencies.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Q. Given these technical concerns with establishing multiple trunk groups along the lines Qwest is suggesting, how do the key technology policies you identified earlier in your testimony relate to the question of establishing multiple trunk groups to the same Qwest switch or switches?

A. From a high-level policy perspective, on this issue, Qwest is trying to drag Level 3 back into the past. Level 3 proposes to deliver traffic to each Qwest switch on a single, efficient, combined trunk group. Qwest, however, is not concerned about technical efficiency. Instead, because it thinks that different kinds of traffic fall into different regulatory buckets, it wants those types of traffic sent on separate trunk groups. This is anticompetitive, because, as described above, it will impose needless costs on Level 3. It is also contrary to the development and encouragement of new services, in that it forces Level 3 to classify traffic in accordance with the old, existing service classifications with which Qwest seems most comfortable. And, particularly in the case of VoIP traffic (addressed below), the inefficiencies imposed by Qwest's suggested requirement of separate trunking for different "types" of traffic will act to directly suppress the development of this exciting Internet-based innovative service.

Q. In order to be perfectly clear, how does the issue of establishing separate trunk groups for different types of traffic relate to the question of establishing new, physical points of interconection — that is, new transmission facilities — between Level 3 and Qwest?

A. As noted above, physical transmission facilities and trunk groups are two different things. One way to look at it is to consider a physical highway running between two cities. Looking just at the one city-to-city route, the transmission "facility" is the physical slab of concrete and asphalt that the cars and trunks will drive on. Setting up a trunk group is analogous to drawing lane lines on the concrete, indicating that some lanes are for traffic

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

going northbound, some for traffic going southbound, some for trucks only, some for passenger cars only, etc.

As between two communications networks, a single, high-capacity fiber optic facility between the two networks can easily contain dozens of different trunk groups. One trunk group might be traffic directed to the ILEC tandem. Another trunk group might be traffic directed to a specific ILEC end office switch. Still another trunk group might carry traffic bound for the ILEC's operator service network. But whatever might lead the carriers to establish different trunk groups (such as traffic bound for different switches), that is a totally separate question from any need to establish different physical facilities linking the carriers' networks. The idea behind setting up a physical "meet point" between two networks is that each carrier is responsible for all the switching, transmission and related facilities on its side of the meet point. The two carriers then cooperate with each other to establish whatever trunk groups need to be established, ***carried over that meet point interconnection facility.***

Given this, it is important to recognize that the establishment of separate direct end office ***trunks*** does not at all mean that it makes sense to establish any separate ***facilities*** linking Level 3 with Qwest end offices. To the contrary, the ***facilities*** to carry the trunks from the Qwest tandem location (where Level 3 will normally physically interconnect in a LATA) to the affected end office already exist; they are the same facilities (normally optical fiber) that carry the traffic from the tandem to the end office before the DEOT is established. The new DEOT trunk group will ride the same fiber optic interconnection facility between Qwest and Level 3 that all other traffic rides, at the parties' single POI in the LATA.

All that said, it makes no sense at all to suggest, as Qwest does, that putting local, toll, or other types of traffic on a single combined trunk group will risk exhausting Qwest tandems in any way. What avoids exhausting Qwest's tandem is establishing DEOTs to

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

carry ***all*** the traffic from Level 3 to a Qwest end office on an efficient basis. Level 3 is willing to do this. Simply provisioning several inefficient trunk groups of separate "types" of traffic to Qwest's tandem will not only not help with tandem exhaust, it will cause the tandem to exhaust its trunk port capacity more rapidly than keeping the different types of traffic together in the same trunk group. Again, the solution to tandem exhaust is DEOTs — which separate traffic out based on ***destination switch*** — not separate trunk groups for different "types" of traffic.

Q. How do the key technology policies you identified earlier in your testimony relate to the prospect of Level 3 being required to establish additional physical POIs — that is, additional physical transmission facilities between Level 3 and Qwest?

A. Each of the three pro-technology policies identified above supports allowing Level 3 to interconnect by means of a single POI until and unless Level 3 itself believes additional POIs are needed. For this issue, the primary policy is the promotion and encouragement of competition. Although Level 3, as noted above, has invested billions of dollars in its advanced, fiber-optic, IP-based network, that does not mean that it can or should be called upon to mirror or duplicate the local network architecture of the ILECs with which it interconnects and competes. To the contrary, it would be extraordinary to conclude that a competitor like Level 3 would have any rational interest in duplicating the incumbent's network architecture.

The essence of Level 3's local business plan is to identify customers with high levels of Internet-based communications, either incoming, outgoing, or both, and provide highly efficient links for such customers both "upstream" to the Internet itself and "downstream" to the PSTN. Level 3 has no independent business reason — and certainly no engineering reason — to try to re-create Qwest's local network architecture. Instead, what Level 3 primarily needs from Qwest in order to serve its customers is efficient, seamless interconnection between Level 3's network and Qwest's network. It seems

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

plain that efficient interconnection of this type will be degraded if Level 3 is subject to regulatory obligations to establish multiple physical interconnections with Qwest, above and beyond those that are necessary to Level 3's business and that Level 3 will put into place itself.

As I note elsewhere in my testimony, Level 3 is not averse to establishing multiple physical points of interconnection in a LATA when traffic levels and other factors so warrant; but ***requiring*** Level 3 to interconnect at multiple points on Qwest's network really boils down to punishing Level 3 — in the form of needless mandated capital expenditures — for not having the same network, the same customer base, and the same business plan as Qwest. This is contrary not only to the policy of encouraging competition, but also to the policy of encouraging the deployment of new, innovative services and network architectures.

Clearly, as a policy matter, Qwest is simply wrong in insisting that Level 3 should have to establish more than one physical POI within a LATA.

Q. What is Level 3 asking this Commission to decide on this issue?

A. Level 3 is asking this Commission to rule that Qwest must allow Level 3 to use single interconnection trunk groups between the carrier's switches instead of multiple trunk groups, using PLU, PIU and PIPU for carrier compensation and billing purposes. This will preserve network efficiency, maintain reasonable call blocking standards, and minimize the trunking and switching equipment both parties need for interconnection. The language that Level 3 is proposing for this issue is fair and balanced and will allow the efficient use of trunks by both companies.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

IV. ISSUE 5: ESP Traffic - VoIP Traffic

Statement of the Issue: Whether Qwest may prohibit Level 3 from utilizing local interconnection facilities to terminate Internet-enabled traffic, specifically for VoIP traffic.[4]

Q. What is Internet-Enabled traffic?

A. Internet-Enabled traffic is meant to be a broader term for Enhanced Service Provider (ESP) traffic. Internet-Enabled traffic includes VoIP and other forms of enhanced communications capabilities made possible by the Internet and IP technology.

Q. What is the Internet?

A. The Internet is an open-ended, network of networks that allows virtually anyone with a computer and a high speed or low speed link to connect to anyone or any business in the world. Historians debate about when the Internet really began. It had its roots in the 1970s and 1980s with research, government and business networks. The "Internet" as such was opened to the public for commercial purposes around 1995. The Internet has grown quickly in less than a decade to include hundreds of millions of computers worldwide and has become a major factor in the global economy.

Q. How does the Internet differ from the PSTN?

A. The PSTN is a closed network, controlled by large telephone companies, including ILECs, ICOs, IXCs, CLECs and CMRS operators. Access to the PSTN is through a variety of equipment such as dial-up phones, PBXs and more lately cordless phones and cellular phones. All terminal devices on the PSTN must be connected through a switch controlled by one of the phone companies. In fact, to be "on" the PSTN basically means that you have a telephone number assigned by one of the entities noted above. That telephone number is, in effect, a "network address" on the PSTN.

[4] The following paragraphs in the agreement are covered by the testimony in this issue: Interconnection Trunking Requirements Appendix, Section 13.1, Intercarrier Compensation, Sections 3.1, 4.5, 4.7-4.7.2.1, 7.1, 7.2, 16.1. DPL Issues ITR 19; IC 1, 4, 8, 9, 14.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

In contrast to the PSTN, the Internet is comprised of (among other things) hundreds of thousands of routers and switches owned by tens of thousands of different companies. Routers and switches with new networks attached are added to the Internet every day. Anyone who abides by the standards and protocols used on the Internet can set up a new network and connect themselves or their customers to the Internet without any detailed application process or regulatory scrutiny.

Q. What is Voice over Internet Protocol, or VoIP?

A. One of the basic protocols of the Internet is called "IP," which means (sensibly enough) "Internet Protocol." Another basic protocol is called "TCP," or "Transaction Control Protocol." There are many, many protocols that work with these basic protocols to define how the Internet performs various functions. These include SMTP (Simple Mail Transfer Protocol, used for email); FTP (File Transfer Protocol, used to allow the retrieval of files from remote locations); HTTP (Hyper-Text Transfer Protocol, used for transmitting web pages and establishing web links); and many others. All of these different protocols rely on the basic TCP/IP protocols to permit different applications (email, file transfer, world-wide web, etc.) to function on the Internet.

Voice over Internet Protocol, or VoIP, refers to various specific protocols that use the basic TCP/IP system to treat voice communications like any other Internet application. With VoIP, telephony signals, including voice signals, are digitized and transmitted as packets to their destination, just as with an email, streaming video, or any other kind of IP transaction. While the PSTN, as noted above, was designed with a laser-sharp focus on one thing — delivering voice calls — the Internet focuses equally sharply on something very different — delivering data packets, no matter what those data packets might represent. This means that while the PSTN treats data as some unusual thing that requires special treatment, the Internet treats all data the same — even if the data in

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

question happens to represent a voice call. As a result, the Internet essentially destroys the old distinctions between "voice" and "data" that are a standard part of PSTN thinking.

Indeed, because the information associated with any particular application is broken down into packets of bits and does not re-assume its original form (i.e. sound, text or pictures) until it is reassembled at the terminating end, it is virtually impossible to assign the transmission of packets to any particular service classification at any point other than origin or destination. An IP network provider, for example, can be carrying real-time two-way voice packets without actually offering voice service to any end-user customer.

When a VoIP call starts with a computer or with some device on a broadband data network (such as a DSL line or a cable modem service), and then is delivered to the PSTN, the protocol, or format, of the transmission has clearly and fundamentally changed. Specifically, a net protocol conversion is required to convert the packetized IP data into the Time Division Multiplexed (TDM) signal that is used on the PSTN. Today, VoIP applications come in many forms. Some resemble traditional phone service, from the point of view of the end user, more than others. But the application as a whole clearly entails changing the form (and perhaps even the content) of the signals at issue. As I understand the relevant regulatory classifications, this means that VoIP is properly viewed as an "information service" rather than a "telecommunications service."

Q. Is VoIP, as facilitated by Level 3, a telecommunications service?

A. No. Level 3 performs many functions for its various customers. For example, Level 3 is a CLEC that performs telecommunications functions for its customers — transmission of traffic between points specified by the customer; assigning telephone numbers and switching calls to and from them, etc. But the service that Level 3 provides to VoIP entities is a translation or protocol conversion service that allows communications between end users of the PSTN and the Internet. This service enables customers to have

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

oral communications over the Internet that may seem to be the similar to ordinary telephone calls, but in fact are very different. Access to Level 3-provided VoIP is through high-speed data lines, not phone lines with phone numbers; and the terminal equipment is not a telephone, but a computer or computer phone. In this regard, the PSTN itself is not compatible or interoperable with the Internet. Frequently, communications from end users ***to*** the Internet are carried by means of PSTN services — this happens every time a customer dials up a connection to his or her ISP. But the only way that the PSTN can be actually ***connected*** to the Internet in any meaningful sense is by means of a protocol conversion of the signal from Time Division Multiplexing (TDM) on the PSTN to Internet Protocol (IP) for the Internet. Level 3 does a net (or complete) protocol conversion from TDM to IP to enable VoIP users to communicate with the end users of PSTN services.

Q. What is net protocol conversion?

A. Net protocol conversion occurs when the media stream that uses one protocol, native to one particular type of network, is converted into a different media stream using a different protocol on a different type of network. In the case of VoIP, a voice call originating on the PSTN using TDM must be converted to IP by packetizing the data, generating the Internet protocol and sending out the result on the packet network.

Q. Is net protocol conversion necessary on VoIP calls between Level 3 and Qwest?

A. Absolutely. All VoIP calls that begin with a Level 3 customer and terminate to a Qwest customer require a net protocol conversion. Likewise, calls that begin with a Qwest customer and terminate to a Level 3 customer also require a net protocol conversion. The reason for this is simple. Level 3 has no PSTN-like, TDM-using, circuit switches on its network. Any and all media streams generated by Level 3 will originate in an IP format and must be converted to TDM for terminating on the PSTN. The reverse is also true. A call originating from a Qwest end user (on the Qwest network) must be converted to IP in

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

order for Level 3 to move the signal through its network. In this regard, Level 3 has had to backwards-engineer its network to be able to facilitate the conversion from TDM based services offered on the PSTN to IP based services offered Level 3's (and others') next generation networks. Finally, Level 3 receives and terminates services to its ESP customers in an IP format – the media originated in TDM on the PSTN is ***not*** converted back to TDM by Level 3 before hand-off to its ESP customers. Thus, a net protocol conversion occurs – media streams go from IP to TDM or vice versa depending on whether Level 3 originates or terminates the call.

Q. Does normal cellular telephony require a protocol conversion?

A. No. The cell phone uses modulation and compression techniques in the over the air channel (from the cell phone's antenna to the cell site's antenna), but there is no protocol conversion at the cell site. The signal is demodulated and decoded as any radio signal would be. The cell phone and cell site are merely using an efficient means of radio communication. The cell site operates in the TDM domain and is part of the Public Switched Telephone Network. This is quite distinct from the protocol conversion that occurs between the IP domain and the TDM domain.

Q. What type of customer premises equipment is needed for VoIP?

A. VoIP requires specialized Customer Premises Equipment (CPE). Standard Touch Tone or dial pulse phones will not work on a VoIP network, unless they themselves are connected to a computer or similar device that ***can*** handle VoIP format. Special phones, called "SIP" phones ("SIP" stands for "Session Initiation Protocol," and is another Internet-related protocol like FTP, SMTP, and HTTP) can be used for VoIP. These phones have small computers built into them that packetize the voice data and generate SIP messages. Computers with headsets and microphones can also be used for VoIP.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Q. Can a VoIP customer move his or her SIP phone or computer phone to different locations, while still maintaining the same phone number?

A. Yes. A SIP phone or computer phone can be plugged into any broadband connection to receive VoIP service. The end user could send and receive calls from any location with this type of broadband connection. This gives VoIP users a degree of mobility that is not available to users of PSTN service. This type of mobility is coming to be known in the industry as a "nomadic" service, in order to distinguish it from more traditional "mobile" service of the kind provided by normal wireless phones.

Q. Is there currently any way to determine where a VoIP user is located when he or she makes a call?

A. No. At present, the geographic location of a VoIP user is indeterminate. That user can take a computer from one location to another and make VoIP calls in either location. Since the "telephone number" is resident in the computer terminal or SIP phone, the calling number is the same whether the device is located in Washington or Oregon. Of course, as one might imagine, an indeterminate location makes it challenging for VoIP services to function properly in connection with location-based E911 services. The VoIP industry is working on this issue, and the FCC recently required VoIP services that use normal telephone numbers and that meet certain other criteria to find a way to supply "normal" 911 capabilities to their users.

Q. Cellular telephones can be used in any location. Do cellular providers and ILECs have the same problem with geographic location as VoIP service?

A. No. The location of a cell phone user is always known within a pretty small geographic area. The cell phone registers with all cell sites that are nearby and service is provided by a particular cell site that has a definite location. So if a cell phone user travels from a home location in Washington to a location in Oregon, the cell phone system will automatically "know" that the user is in Oregon and not Washington when the user

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

makes a call. This is fundamentally different from the VoIP situation, where the geography of a call is not known by the ESP that provides the service or carrier that completes the call. Indeed, the broadband service provider to which a VoIP user connects his or her SIP phone in most cases probably has no idea that the packets going back and forth to that particular node on the network represent voice communications as opposed to email, web site traffic, or any other Internet activity.

Q. Please describe the Level 3 fiber and IP networks.

A. Level 3 has a large all fiber-optic backbone network that connects 68 markets in the U.S. and 17 markets in Europe, with over 16,000 route miles of fiber in the US intercity network and 3600 route miles in Europe. Exhibit RRD #1 shows the current configuration of the Level 3 fiber network that is installed and operational in the US. Riding on this Fiber Backbone, Level 3 maintains a large IP network that it manages as a separate network, composed of high-speed links and core routers. Exhibit RRD #2 shows the current configuration of Level 3's IP network. The Level 3 IP backbone is run as a private network and is connected to the public Internet via hundreds of peering arrangements at Level 3 Gateways, located in 29 metropolitan areas.[5] Level 3 central office facilities are state-of-the-art facilities in the heart of 70 major metropolitan areas. As noted earlier, these facilities range in size from 50,000 to 550,000 square feet of equipped floor space. This is where both local and intercity fiber networks terminate, where high-speed transmission equipment is situated, and where routers and Softswitch equipment is located.

Q. Is Level 3 a facilities based carrier in Oregon?

[5] Peering arrangements, as used here, refer to locations at which Level 3 exchanges traffic with other providers of Internet connectivity. Suppose an end user connected to an ISP that uses Level 3 for its Internet connectivity seeks to download information from a web site that is hosted by an ISP that uses some other entity (say, UUNet) for its Internet connectivity. For the information to get from the UUNet network to the Level 3 network, there must be connections between them. That is what the peering arrangements are.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

A. Yes. Level 3 has fiber facilities in Oregon as well as Points of Interconnection (POIs) with Qwest. Exhibit RRD #3 shows the fiber route, fiber regeneration facilities and POIs in Oregon.

Q. How has the Level 3 network been optimized for IP?

A. The Level 3 network was designed as a high-speed packet network for carrying IP traffic. It is composed of IP routers instead of PSTN type switches, and all of its facility links are IP-based.

Q. What is the basic difference between the PSTN and Level 3's IP based network?

A. As noted above, the PSTN was designed to carry voice traffic. The PSTN is made up of circuit switches and facilities linking them that carry circuit-based phone traffic. The Level 3 IP network is a data network, not a voice network. It is made up of IP routers and IP data links between the routers.

Q. What types of customers does Level 3 serve and what types of services do they use?

A. Level 3 serves ESPs and ISPs, a subset of ESPs. ISPs require local connectivity to the PSTN and transport and termination services from Level 3, including modem banks and collocation space. ESPs and ISPs use the Level 3 network to pass all types of data, including email, web download services, computer-to-computer data transfer, VoIP and other streaming media. Level 3 also serves cable companies, DSL providers some large enterprise companies and other carriers with transport and termination of VoIP and TDM traffic.

Q. Do Level 3 customers need Level 3 to provide them with the ability to receive traffic from the PSTN and to originate traffic bound for the PSTN?

A. Yes. Traditional ISPs need to receive dial-up modem access from the PSTN. Though high-speed service from cable and DSL is becoming increasingly popular, there are still a great number of customers who utilize dial-up modems to access the Internet from the PSTN, in part because the costs of high-speed access to the edge of the network are still

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

too expensive for many customers. Many Qwest customers today call Level 3's ISP customers for dial up Internet service. Level 3's VoIP customers today need Level 3 to complete calls to Qwest end users and to receive calls from Qwest end users bound for Level 3's customers' end users.

Q. Can you give a general description of what happens with a VoIP call?

A. Exhibit RRD #9 shows a high level depiction of a VoIP connection. In this example an end user sitting at a VoIP terminal requests a connection to a Qwest customer. The VoIP terminal uses a broadband connection to access a VoIP Feature Server ('FS"). The VoIP terminal and the FS negotiate features and functionality, giving the user a wide variety of options. The VoIP terminal initiates signaling protocol that is passed through the FS, through the Level 3 IP network, and on to the Level 3 Softswitch and SS7 Gateway. The Level 3 SS7 Gateway turns the SIP messages into SS7 messages and thru the SS7 Signaling Transfer Points ("STP") passes them on to the Qwest network, where appropriate trunking is negotiated. When this call set up has been completed, the VoIP phone begins passing packetized voice data to the Level 3 IP network. The Level 3 IP network sends the packets on to the Level 3 Media Gateway ("MG"), which completes a net protocol conversion on the packetized voice to turn it into Time Division Multiplex (TDM) signals that are recognized by the Qwest trunks and switches. The Qwest switch sends the call on to the Qwest end user. In this example voice type data is passed between the end users.

Q. Does the Qwest network need to terminate VoIP calls in a manner that is different from the termination of normal PSTN based local telephone calls?

A. No. Qwest terminates VoIP calls to its end users in the same manner they would use to terminate regular PSTN based local calls to their end users. There are no extra processes, no additional transport, and no additional switching. This is possible because Level 3 itself has already done the work of converting the IP-format data stream into a TDM-

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

format circuit-switched voice call that Qwest's network is capable of recognizing and handling.

Q. How do the key issues of technology policy that you discussed earlier in your testimony relate to the issue of VoIP calls?

A. At a high level, VoIP is an innovative Internet application that turns the voice-centric world of the PSTN on its head by treating voice communication as just another data-oriented application on the worldwide Internet. From a long-run industry perspective, it represents the triumph of data networks over voice networks. While the PSTN can provide only a limited, low-bandwidth form of data communications (basically, dial-up access to the Internet at 56 kilobits per second), the Internet can do everything the PSTN can do, and more. In my view, it is only a matter of time before the entities that comprise and operate the PSTN convert to IP-based communications, as indeed, Qwest and other PSTN entities are already beginning to do.

One of the features of the Internet is that distance and location are largely irrelevant. As the FCC has noted, the contents of a single web page can come from a variety of different servers in a variety of different locations. Most of us familiar with modern business travel have learned that our email can reach us anywhere, either downloaded to a computer in a hotel room by means of now-ubiquitous broadband connections offered by business hotels, or to wireless devices such as a Blackberry.

VoIP is an Internet application first and a voice application second. By this I mean that VoIP partakes in the distance-insensitive, location-insensitive characteristics of Internet applications. No matter what telephone number might be assigned to a VoIP customer (if any number is assigned at all), the customer might be participating in a call from next door or from around the world.

It is obviously challenging from a regulatory perspective to figure out what to do with VoIP traffic. The FCC has a number of ongoing proceedings trying to sort it out.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

But one thing is clear: whatever VoIP is, it is not traditional "telephone toll service," where the end user makes a call from some fixed location, completes it to some distant location, and is charged a separate toll charge for the privilege. In both economic and technical terms, VoIP calling is *sui generis.*

In these circumstances, the choice between assessing traditional access charges or lower and more economical reciprocal compensation rates on this traffic should actually be very clear. This is a new and innovative service that we should all want to encourage. That means that we should impose the lowest reasonable charges on it, when it needs to interface with the PSTN. That means that as a policy matter this traffic should be subject to reciprocal compensation rates, not access charges.

Basically, all three of the policies I articulated at the beginning of my testimony point to this same conclusion. Permitting VoIP traffic to be terminated at reciprocal compensation rates will encourage competition. VoIP is exactly the kind of new and innovative service that we should be trying to encourage, so it should not be subject to high access charges when lower reciprocal compensation rates provide adequate compensation to Qwest. And, VoIP is the latest innovative service to arise from the Internet, which should be encouraged for independent policy reasons. As a policy matter, therefore, VoIP traffic should be subject to reciprocal compensation, not access charges.

XI. Determination of Traffic Types

Q. What issues must be resolved for the proper determination of traffic types?

A. First, in order to efficiently combine traffic on single interconnection trunk groups, a Percent Local Use must be calculated to determine traffic types for billing. Second, Qwest is proposing a new, technically infeasible method of determining whether traffic is local or toll.

Q. How does Level 3 propose to calculate the PLU, PIU and PIPU factors?

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

A. Level 3 maintains local calling area tables as does Qwest. Over a given period of time, Level 3 can collect all call data on calls exchanged between the parties. Once this data is collected Level 3 will, per industry standard, calculate and report the Percent Interstate Usage (PIU). The remaining traffic is a combination of local and Intrastate traffic. Level 3 will then once again compare the remaining call data with call tables and from this calculation determine the PLU as the percent of local traffic compared to the percent of intrastate traffic. So, by first determining the percentage of interstate traffic from the total traffic and then determining the local traffic from the remaining traffic, you end up with the traffic that is intrastate toll and the traffic that is local. For IP-Enabled traffic, Level 3 will create a Percent IP Use (PIPU) for both originating and terminating traffic. This will allow Qwest and Level 3 to properly compensate each other for IP traffic. Alternatively, Level 3 has proposed to attach an Originating Line Identifier (OLI) code to the call record to identify calls that originate as IP-Enabled traffic.

Q. What is Level 3's proposal for the use of the OLI field in the identification of IP-enabled traffic?

A. The OLI field is part of the SS7 protocol. It is currently used to identify calls from payphones, from prisons and for other purposes. Level 3 would like to use the OLI field to identify IP-Enabled traffic. It is reasonable to assume that IP-Enabled traffic may be handled differently for purposes of compensation over time; thus, the companies need a way to identify IP-Enabled calls. Level 3 can identify IP-Enabled calls and can set a unique identifier in the OLI field for each IP-Enabled call. This would help Qwest to identify the traffic if they so choose. Level 3 is offering to mark the OLI field for each IP-Enabled call so that Qwest can track IP-Enabled traffic.

Q. Is there a dispute over the use of the OLI field for the identification of IP traffic?

A. There is currently no guideline or standard that calls for the use of the OLI field in SS7 messages for the identification of IP traffic, though this is one of the mechanisms that is

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

being reviewed nationally. Qwest is reluctant to commit to the use of the OLI field, and a particular identifier, before national guidelines are set. Level 3 believes the OLI field is an excellent way to identify IP traffic.

Q. Is there precedent in the industry for using optional SS7 fields or unused identifiers before national guidelines are set?

A. Yes, there is precedent in the industry for carriers to agree on the use of optional or unused SS7 fields and codes and billing format fields and codes for legitimate business uses. SBC, for example, does this in many areas of billing, where they have customized billing formats for their own purposes and now ask carriers who exchange bills with them to use the customized formats with the optional fields. For example, my understanding is that SBC wants CLECs to use what are known as "Category 92/99" records. The use of Category 92/99 records is entirely unique to SBC's Southwest region.

Q. If Level 3 provides Qwest with PIPU factors for the compensation of IP traffic, is there any need for the identification of IP traffic with the OLI field?

A. Not really. The use of PIPU will allow the companies to correctly compensate each other for IP traffic without the use of the OLI field. The OLI field identifier for IP traffic is only needed if the companies want to track every IP call. The PIPU factor makes such identification unnecessary.

Q. Can Level 3 accurately calculate the PLU, PIU and PIPU?

A. Yes. The calculation of PLU, PIU and PIPU is accurate and can be used for billing purposes on traffic that is originated by Level 3. Qwest can perform the same calculations on the calls that it originates. Level 3 can create PIPU for both originating and terminating traffic, as is discussed below in our proposed contract language.

Q. Does BellSouth have a procedure for administering PLU with Level 3 and other CLECs?

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

A. Yes. BellSouth has agreed to allow Level 3 to combine different traffic types on interconnection trunks, and they have established a procedure for administering the PIU and PLU. I am including the Bell South procedure for PLU below for comparison:

> PLU – Percent Local Usage
>
> This factor is the percentage of intrastate terminating usage that is categorized as Local Jurisdiction. For purposes of this guide the total intrastate usage includes intrastate local usage and intrastate non-local usage. The local jurisdiction is applicable to Competitive Local Exchange Carriers (CLECs) that are terminating local traffic from their network to the BellSouth network. CLECs that totally utilize resale or unbundled network elements to provision local services are not required to report PLU factors. Interexchange Carriers that do not terminate local traffic as a CLEC are not required to report PLU factors. The local jurisdiction is normally defined per Local Interconnection contractual agreements and is calculated as follows where MOUs are billed minutes of use: *Total Local MOUs [divided by] Total Intrastate MOUs.* The total intrastate minutes can be determined by multiplying the total minutes by (1- PIU). Therefore the PLU may also be calculated as follows:
>
> Total Local MOUs [divided by] (Total MOUs) x (1-TPIU)
>
> This factor is calculated on a statewide basis by Access Carrier Name Abbreviation (ACNA).

Q. Does Level 3 have contract language that it is proposing for the calculation of PLU, PIU and PIPU and for the transmission and assurance of accuracy of these measures?

A. Yes, Level 3 is proposing contract language for definition and calculation of PLU, PIU and PIPU as well as language for the transfer and verification of these traffic factors on a monthly basis. That language is contained in Level 3's proposals for Section 7 of the Interconnection Agreement.

Q. Do these contract provisions adequately codify the accurate collection of data, calculation of factors, exchange of factors and verification by the Parties that is necessary for proper billing of calls?

A. Yes. I am not an attorney, but I can read and use the English language. Based on a review of the attached contract provisions, it seems clear that they spell out the

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

responsibilities of Level 3 in generating accurate factors and Qwest's right to verify and audit the results. By using these procedures, the companies can bill each other for access charges and reciprocal compensation for all types of traffic flowing over the interconnection trunks.

Q. **How do the traffic calculations work when interconnection trunks carry local, IntraLATA, InterLATA and IP traffic?**

A. The calculation of factors is spelled out in the language contained in Traffic data is collected for one month. When the traffic is evaluated to calculate the factors, first the IP-Enabled traffic is taken out and its percentage calculated. The Level 3 network can determine whether an originating or terminating call is IP-Enabled or not by looking at how the calls is originated or terminated (end points can be certified as IP or TDM). When the call is IP originated the SIP signaling will reflect that, and one of the SS7 call set up message parameters (OLI) is set to a particular value (65) to flag the call as enhanced to Qwest. From this process PIPU is tabulated. Next, interstate traffic is separated from intrastate traffic by calculating the PIU factor. This is done by examining call records against a database that can tell whether the calling number and the called number are in the same state. Phone numbers are traditionally associated with a geographic area (rate center). Rating of TDM based services is done based on the geographic assignment of the phone numbers. If the terminating phone number is associated with a rate center that is outside of the state that the originating phone number is associated with, then the call is rated as interstate and the call counts towards the calculation of PIU. Finally, the PLU factor is calculated on the remaining traffic by using a state specific database that looks at whether the calling number and the called number are associated with rate centers in the same applicable local calling area. This is a simplified description of the process that is used to put traffic in the correct buckets for proper compensation. The creation of PLU and PIU factors is a process that is done

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

throughout the industry. Level 3 is leading the industry in the ability to create the PIPU factor.

Q. Is there a basic dispute between Qwest and Level 3 on how to determine whether traffic is "local"?

A. Yes. As I understand it there is a fundamental disagreement between the parties with respect to what traffic is properly characterized as "local" and what is not. I recognize that there are legal and policy aspects to this disagreement. However, I will relate the technical aspects of this dispute.

That said, the dispute is basically this: Level 3 contends that since the only thing the PSTN "knows" about a call is the originating and terminating telephone number, the status of traffic as "local" should be determined based on the geographic area associated with the telephone numbers of the calling and called parties. Qwest, by contrast, seeks to change that traditional arrangement and to attempt to assess the status of a call as "local" or not based on the actual physical location of the calling and called parties.

Q. What is Qwest's position on how to characterize traffic as "local" or not?

A. As noted, Qwest maintains that the definition of a local call should be changed to reflect the geographic location of both the calling and called party premises as opposed to the originating and terminating phone numbers that have traditionally been used.

Q. Does Level 3 agree with this new method?

A. No. There are a number of technical problems with the method that Qwest is promoting.

Q. Has the customer premises location been the determining factor in the definition of a local call in the past?

A. No. As I described above in connection with routing calls, the PSTN uses the calling party's number and the called party's number to determine if a call is a local call.

Q. Do local switches know the location of the parties when a call is made?

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

A. No. Circuit switches have no way of knowing the geographic location of the calling or called party end user. The switch is programmed with a list of which numbers are "native" to its area and treats calls to and from such numbers accordingly (i.e., it routes them on trunks to other switches to which it is connected, based on the NPA-NXX dialed). Calls that it recognizes as "toll" are routed to the caller's presubscribed IXC. Older circuit switches have a limited geographic range within which it can serve end users and maintain its quality standards. Before Local Number Portability ("LNP") and number block pooling, a process by which 10,000 number NPA-NXXs blocks are divided across multiple carriers and switches in increments of 1000 number blocks (NPA-NXX-X) to make more efficient use of numbering resources, each phone number assigned from a given circuit switch fairly reasonable correlated to the geographic location of the end user. This is simply because the phone number can only be assigned to end users within that limited geographic range from the circuit switch. With the introduction of newer technology switches, soft-switches and now VoIP those distance limitations are fading, phone numbers can be assigned to end users anywhere within the country or world, and switches have no way of knowing the geographic location of the end user.

Q. How are calls routed in the PSTN?

A. Local calls are routed between switches according to the routing tables in each switch. Depending on the number dialed (putting aside number portability), a switch either handles a call entirely on its own (such as a call between next-door neighbors); or it sends the call off to some other switch by routing it outbound on a particular trunk port. Toll calls — that is, calls carried by IXCs — are routed according to the Local Exchange Routing Guide (LERG). The LERG is a database that identifies switches and numbers associated with those switches, based on the NPA NXX codes of the North American Numbering Plan (NANP), as well as specific physical locations at which traffic bound for particular switches may be delivered. Thus, for example, in the normal course within the

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

PSTN, the LERG would indicate that a call to a number within the "515" NPA should be delivered to a particular carrier, at a particular location in Oregon. Which carrier and which location will depend on the "NXX" of the dialed number. Switches within a local calling area know which numbers are associated with the local calling area and which numbers are not.

Q. So calls between two local numbers are treated as local calls?

A. Yes. As noted above, each end office switch has a table of NPA-NXXs that the particular switch views as "local." For all such NPA-NXXs, the switch has to make only one decision: "Is this call 'mine' or do I need to send it to some other switch?" If the dialed number "belongs" to the originating switch, as noted above, the call stays there. But if the dialed number "belongs" to some other switch, the only thing the originating switch needs to know is which trunk port to send the call out on.

Note that, from this network perspective, the only truly "local" calls are calls that begin and end in the same physical switching device. Long ago, however, retail local calling plans grew to include customers served by many different switches. As a result, what constitutes a "local" call for a retail customer is not really a technical matter at all. It is simply a retail, marketing decision by the originating carrier. From a technical perspective it is essentially an arbitrary decision which NPA-NXXs to include on the programmed list of "local" calls and which to exclude (which means, usually, that the customer has to dial a "1" before the NPA-NXX-XXXX in order to complete the call).

Q. From a technical network perspective, is there any limitation on the distance that a "local" call can travel, the size of a "local" calling area, or the number of customers in a "local" calling area?

A. None at all. And, in fact, the size and scope of "local calling areas" varies greatly from place to place around the country. Some states have large local calling areas; others have small local calling areas. Again, from this perspective, the technical network personnel

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

have no basis to care one way or another. The carrier's marketing and/or regulatory personnel just have to tell the engineers which NPA-NXXs to include on the "local" list for any given switch. The originating switch does not "care" (in the sense of doing anything at all technically different) where it is actually sending a "local" call to a number served by some other switch; and the terminating switch does "care" (in the same sense) where a "local" call is coming from. These are retail marketing questions, not technical questions.

Q. How would switches implement the Qwest idea of using the geographic location as the determination for a local call?

A. I have no idea. A switch has no way of storing information regarding the premises location associated with a phone number assigned to that switch, and no way of receiving or storing information about the premises location assigned to a phone number calling someone served by that switch. The SS7 protocol that sends information between switches for call set-up and billing purposes does not have any parameters to identify the premises locations of calling or called parties. I have asked engineers that have worked in switch design for 25 years and no one has ever heard of a feature that would store the geographic location associated with a phone number in the switch or in any peripheral that is accessible by a switch. If Qwest were to design such a feature in a peripheral device, it would no doubt be expensive to implement since each call would need to reference a database, and the database itself would need to be created and maintained.

As I pointed out above, moreover, the status of any given call as "local" or not is an arbitrary marketing-oriented retail choice, not anything that affects or is driven by any relevant network technology. So, from my network engineering perspective, it seems to me that Qwest, by pressing its premises-location-based notion of what constitutes a "local" call, is just trying to impose its own retail marketing choices onto Level 3. There is certainly no technical basis for Qwest's position that I can see.

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Q. Even if the switches, or an outboard database, could utilize customer location information, how would this information be updated and kept current?

A. Today, local routing tables must be updated in the switches when a new NXX code is activated in a rate center. This updating is a labor-intensive process, but fortunately is only needed when new codes are required. The thought of managing and updating a database that would hold each customer's geographic location is daunting. Instead of dozens of changes per year there would be hundreds of thousands in a large LATA. Each time a customer moved in or out of a house or apartment the database would need to be changed, and each carrier would have changes for each of their customers who moved.

Q. What is VNXX?

A. As Mr. Gates explains in his testimony, ISP-bound traffic and "virtual NXX" issues have become very much intertwined. At the network level, VNXX is somewhat of a misnomer. This is because telephone switches route calls based upon assignments in the LERG, not upon how they may or may not be rated or later classified as a regulatory or legal matter. So, where Level 3 provides DID / DOD services for their ISP customers, Level 3 establishes one or more POIs in the LATA. The rules permit a single POI per LATA. So the calls route to Level 3. Qwest would have Level 3 establish a "physical presence" in every local calling area, but this is not required nor, as Mr. Gates explains, does it make economic sense for an interconnecting carrier to mirror its architecture according to its competitor's retail offerings. As a retail matter, Level 3 neither markets nor sells 'long distance" services associated with "VNXX" traffic. This is a long winded way of saying that the definition of "VNXX" depends upon how you look at it. For purposes of interconnection at a single POI, it should not matter. Calls are exchange at the Single POI. Mr. Gates explains that for purposes of interconnection the LATA is the "local" calling area, as it should be. From an ILEC-centric viewpoint, however, VNXX

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

allows the customers of ISPs to reach the internet without incurring "toll" charges – even if their ISP does not maintain equipment within the customers' local calling areas.

Q. How are these VNXX calls routed?

A. VNXX calls are routed between the local switches as normal local calls, or as toll calls, depending on whether the NPA-NXX of the VNXX number being called is included in the calling switch's table of "locally dialable" NPA-NXXs. Neither the originating nor terminating switch has any way to know where the end user with the VNXX service is actually located, nor does it matter for proper switching and delivery of the traffic. The switch that hosts the VNXX customer has a circuit coming in that it associates with phone service, providing dial tone and other local services. The switch has no way to know whether the customer loop is 500 yards, 2 miles, or 200 miles long.

Q. How are these VNXX calls billed?

A. Neither CLEC nor ILEC billing systems, nor the FCC for that matter, distinguishes between "local" ISP-bound traffic and "toll" ISP-bound traffic. Accordingly, carriers bill for ISP-bound traffic based upon billing records collected from the interconnection trunks and other factors that the parties have agreed to use. For example, assume that a person signs up for Qwest's wireline (circuit-switched) telephone service. Assume further that this person decides to access the Internet via a dial-up account (perhaps DSL or cable modem are too expensive or not available) provided by an ISP that is a Level 3 customer. The Qwest customer calls a telephone number that routes to Level 3's network. When that person wishes to access the Internet, Qwest's network routes that call to Level 3's POI. As to how these calls might be rated according to traditional (largely pre-Act) methods, the originating and terminating phone numbers are assigned to switches. Those switches also have rate centers associated with them. Rate centers are geographic coordinates that carriers on circuit switched networks have traditionally used to apply distance sensitive charges to calls. In that sense, they are economic boundaries,

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

not network boundaries. Returning to our call flow, if the originating and terminating NPA-NXX appear as "local" to each other when the call record data is later examined, then the originating carrier would rate the call as "local" call and there is no toll charge. It does not matter if the calling or called party is 500 yards, 2 miles, or 200 miles from the end office out of which the number is assigned because in every instance the call is handed to Level 3 at the POI where Level 3 then carries this call.

Q. Is Qwest's interconnection trunking the same no matter where the Level 3 end user customer is located?

A. Yes. Qwest's trunking is always to the POI, no matter where the Level 3 end-user customer is located. It doesn't matter if the Level 3 customer is 500 yards, 2 miles, or 200 miles from the POI. Level 3 carries the traffic to its end-user customer, no matter where they are located. Qwest's interconnection trunking to the POI is the same no matter where the Level 3 customer that they are calling is actually located.

Q. So the distance Qwest transports traffic is the same whether the Level 3 customer is 500 yards, 2 miles, or 200 miles from the POI?

A. Yes. Qwest transports calls that it originates to the POI, regardless of where the Level 3 customer is located. The location of the Level 3 customer or end user is immaterial to Qwest's call transport or for Qwest's costs for that matter. Mr. Gates will discuss in his testimony how Qwest's costs are the same no matter where the Level 3 end user is located.

XII. Conclusions

Q. Have you reviewed the contract language proposed by Level 3 and Qwest in this case?

A. Yes, I have.

Q. For the issues you have addressed, which language is more consistent with the points you have made in this testimony?

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

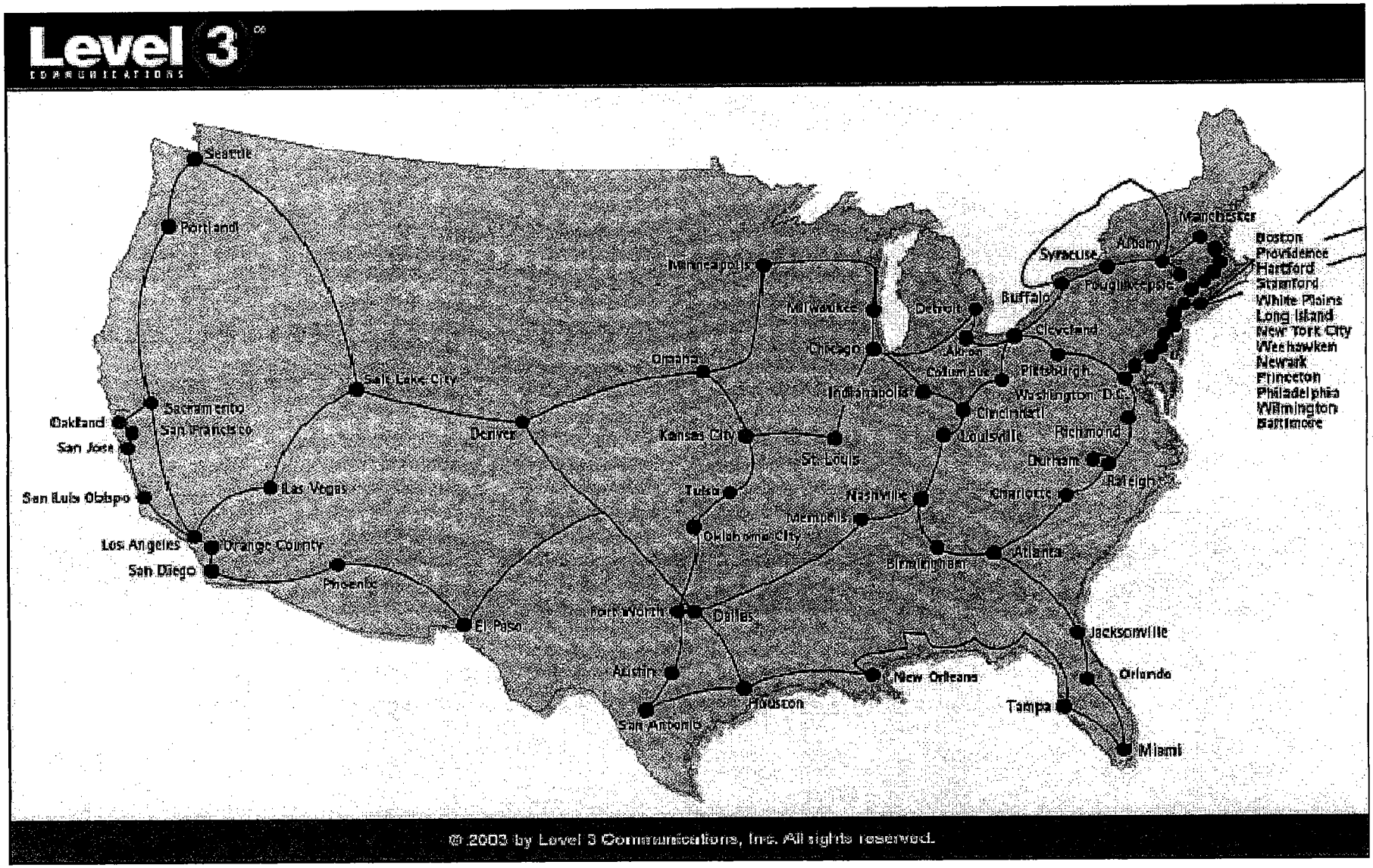
A. Level 3's language is reasonable and balanced from a technical and engineering standpoint and is consistent with the FCC's orders from an engineering point of view. Adoption of Qwest's language, by contrast, would require the parties to degrade the efficiency of their networks, imposing substantial costs on Level 3 and possibly on Qwest as well, while at the same time potentially permitted Qwest to bill Level 3 for costs and charges for functions that Qwest itself should perform without a charge to Level 3.

Q. Does this conclude your testimony?

A. Yes

ATER WYNNE LLP
222 SW COLUMBIA, SUITE 1800
PORTLAND, OR 97201-6618
(503) 226-1191

Exhibit RRD #1: Level 3 Fiber Network

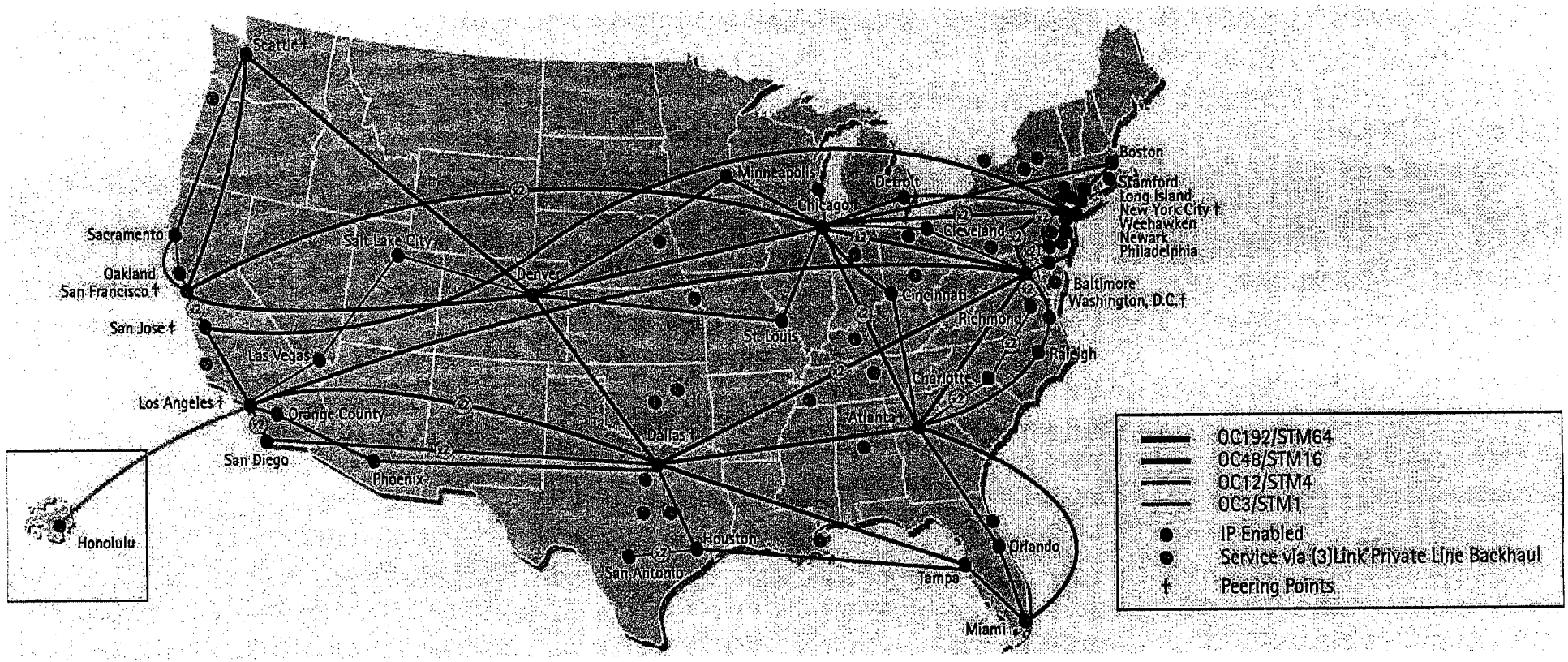


Level(3) COMMUNICATIONS

The Level 3 Fiber Network

MAKE THE SWITCH

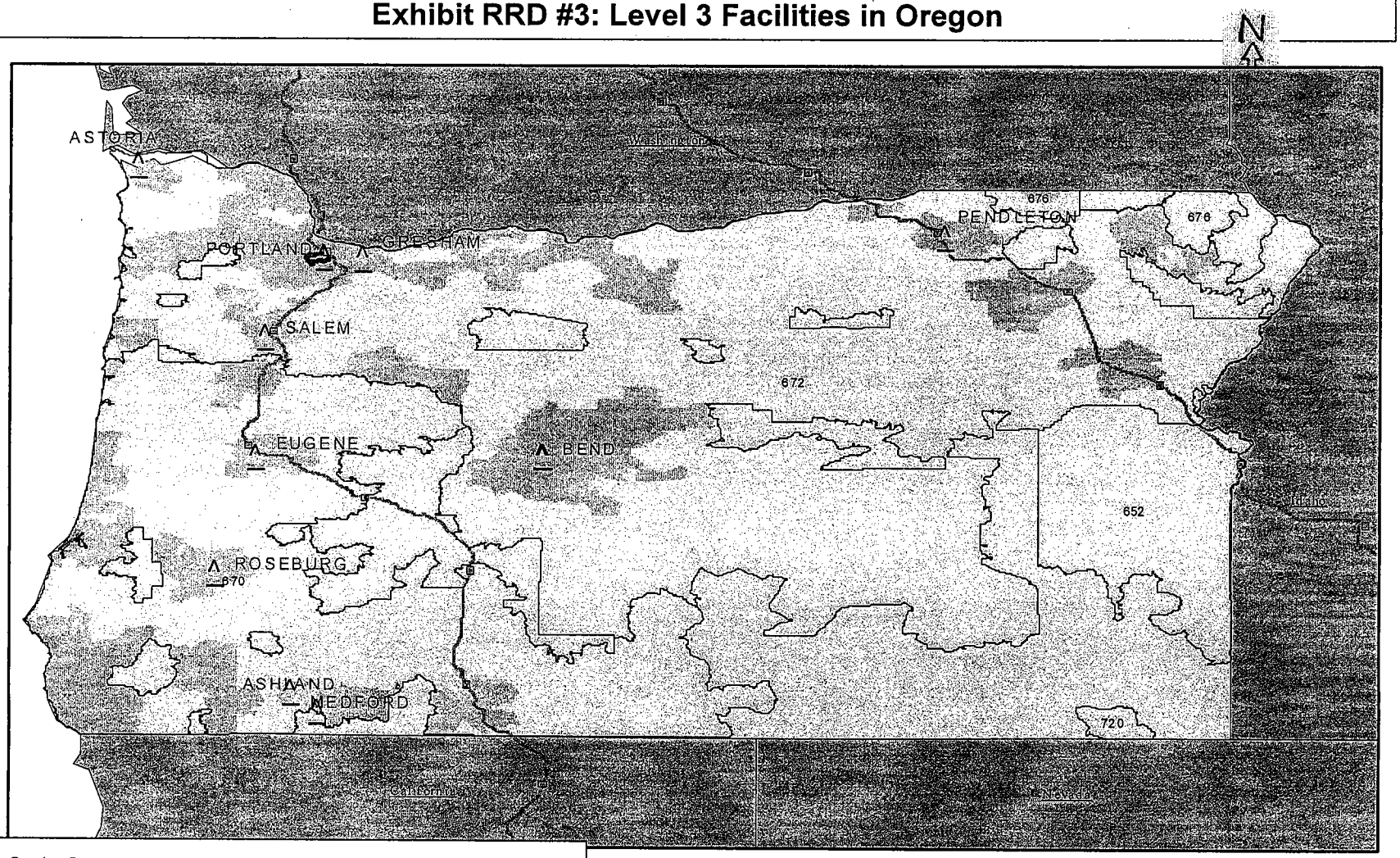
Exhibit RRD #2: Level 3 IP Network



Level (3) COMMUNICATIONS

MAKE THE SWITCH

Exhibit RRD #3: Level 3 Facilities in Oregon



Level 3 Code Coverage in Qwest Territory within Oregon
Region

Level 3 Physical Facilities
Point

Level 3 Intercity Backbone
Line

Level 3 Metro Loops
Line

Level 3 POIs in Oregon
Point

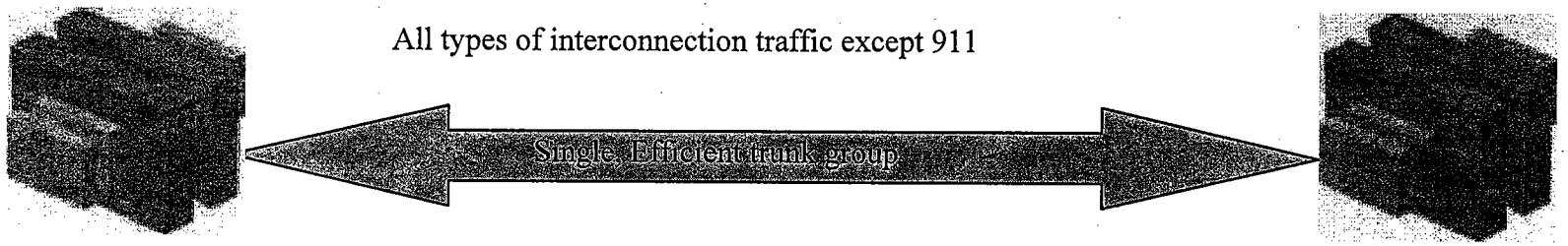
Oregon

deliver the difference (3)

Exhibit RRD #4: COMBINING TRAFFIC ON A SINGLE TRUNK GROUP

Qwest Switch

Level 3 Switch



A single trunk group with combined traffic is much more efficient, requiring fewer facilities, fewer trunk ports and less equipment

Level 3 COMMUNICATIONS

MAKE THE SWITCH

Exhibit RRD #5: QWEST DEMANDS SEPARATE TRUNK GROUPS

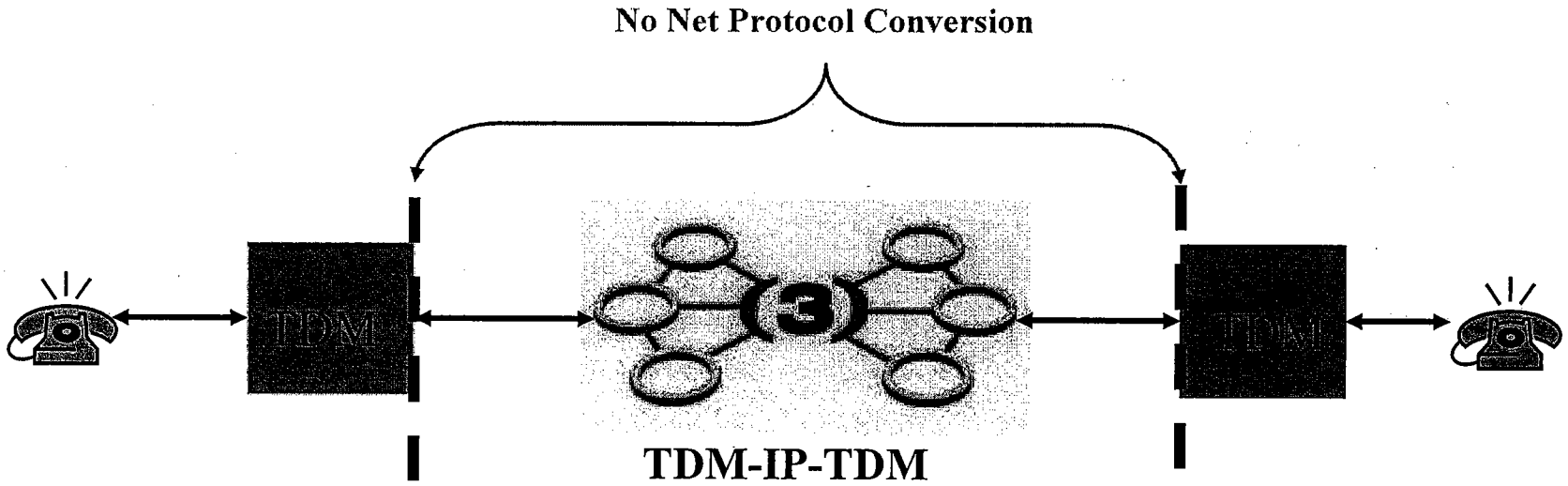
Two trunk groups are less efficient, sometimes requiring the CLEC to more than double the number of trunks

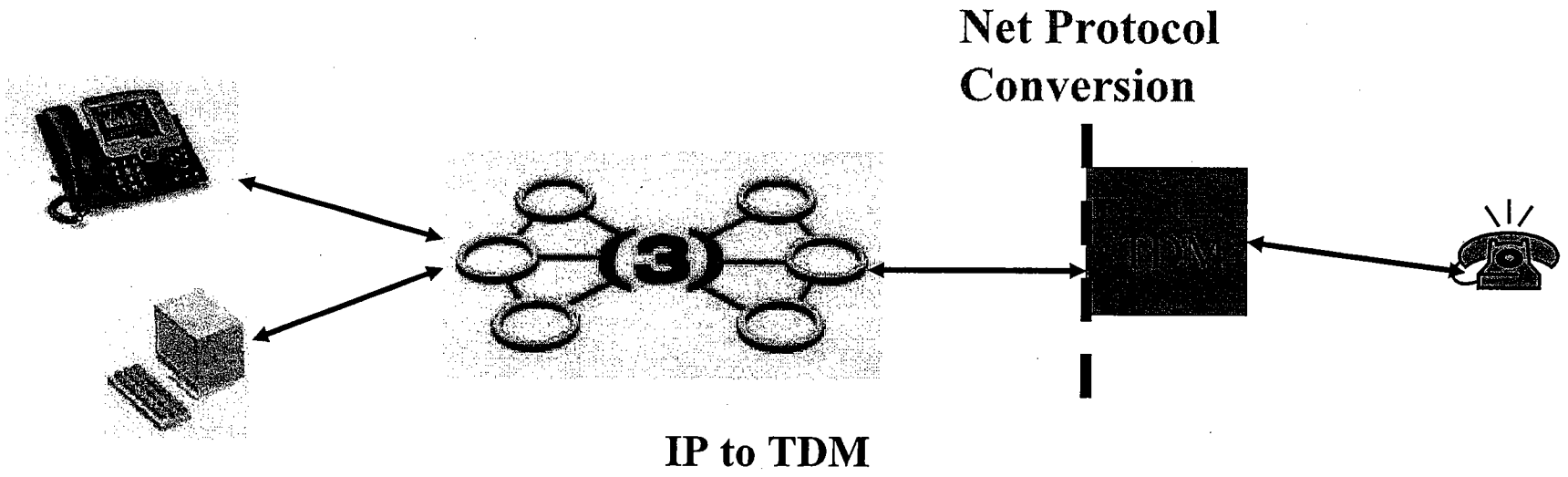
Two trunk groups do the work of one efficient trunk group. Qwest's demand would force Level 3 to build two separate networks. This requires additional trunk terminations for Qwest as well. Qwest may actually be demanding additional trunk groups for Transit Traffic and IP Traffic.

Level(3) COMMUNICATIONS

MAKE THE SWITCH

Exhibit RRD #6: VoIP Network Configurations





Level 3 COMMUNICATIONS

MAKE THE SWITCH

Exhibit RRD #7: ESP Exemption—Pre 1996

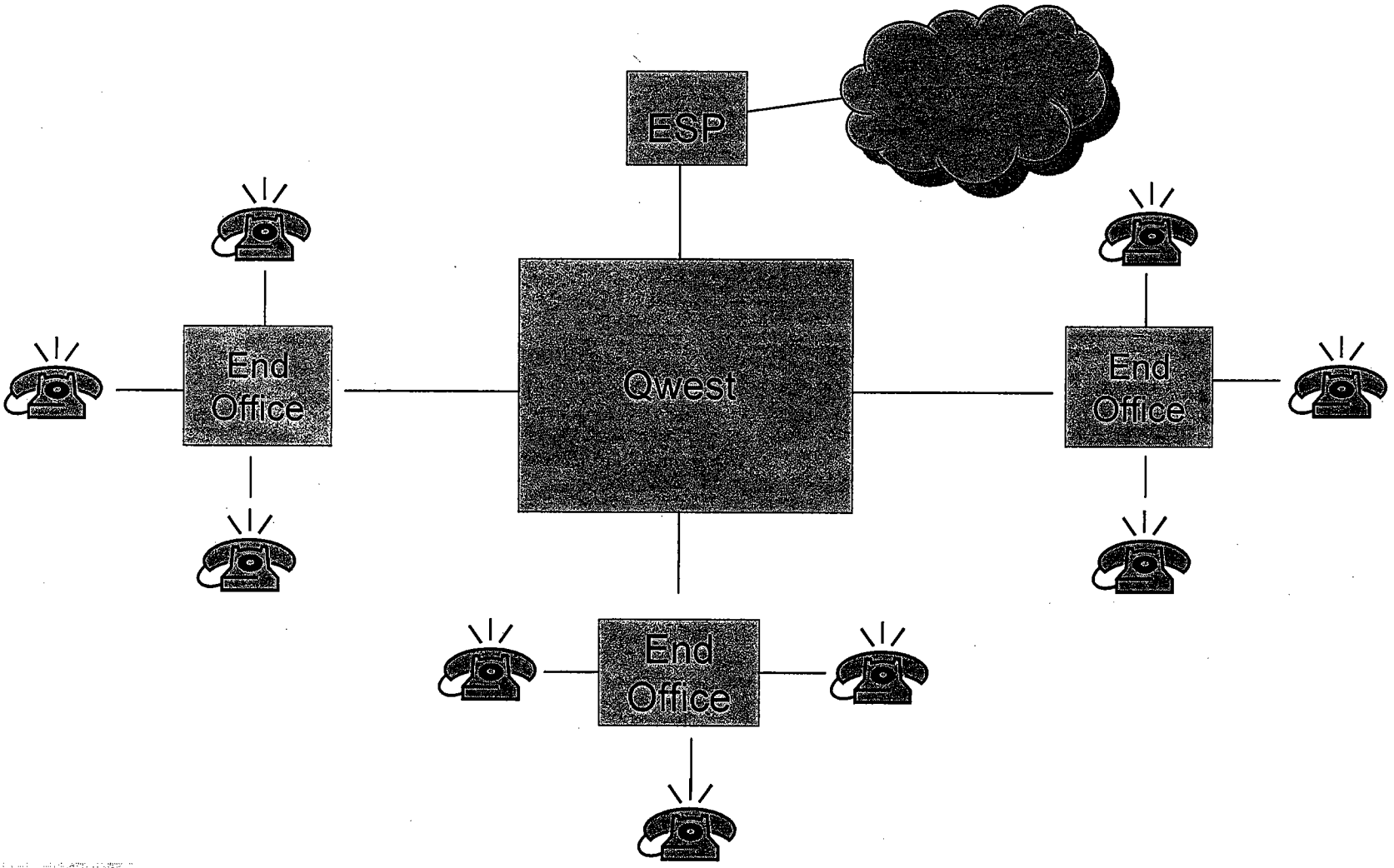
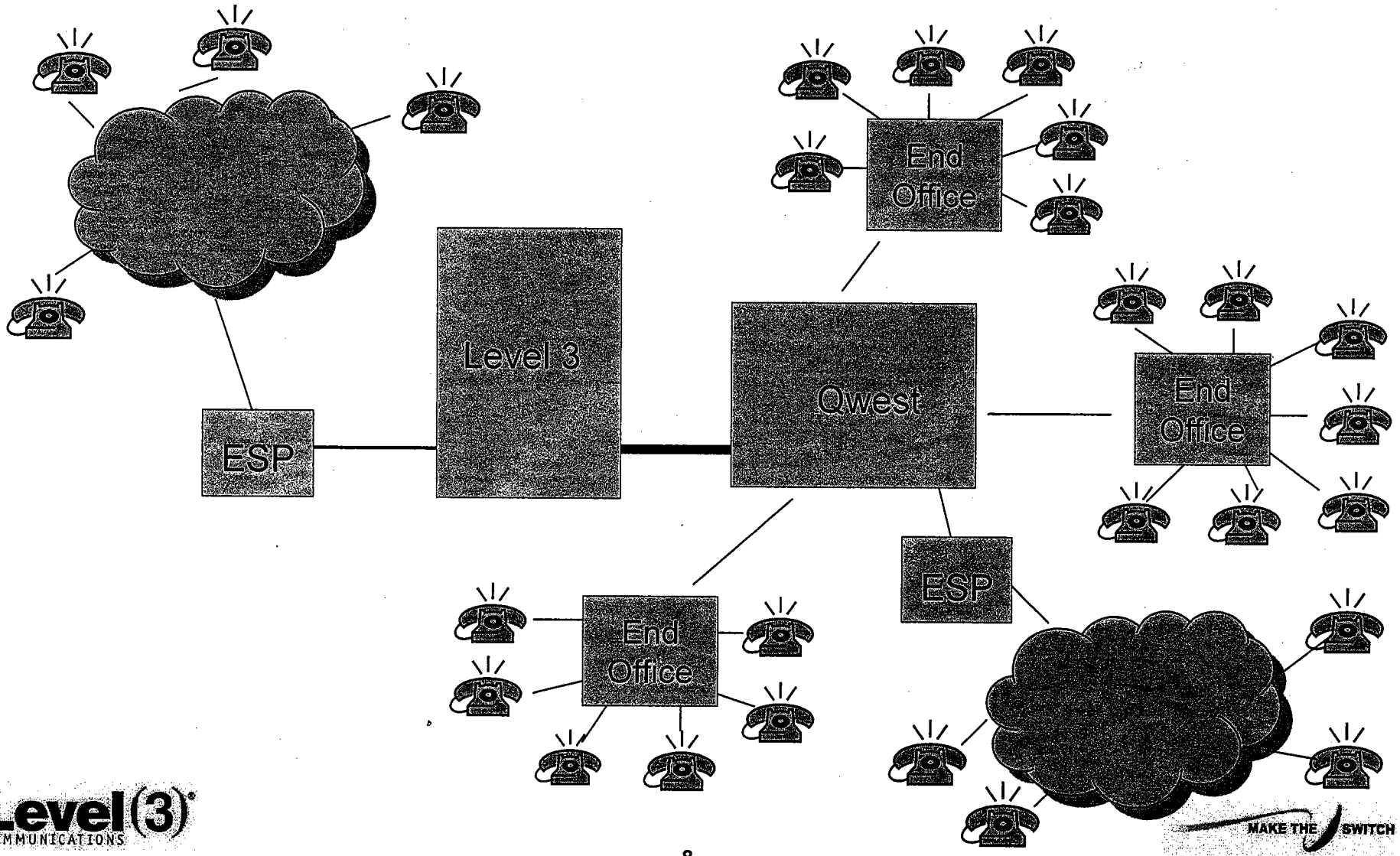
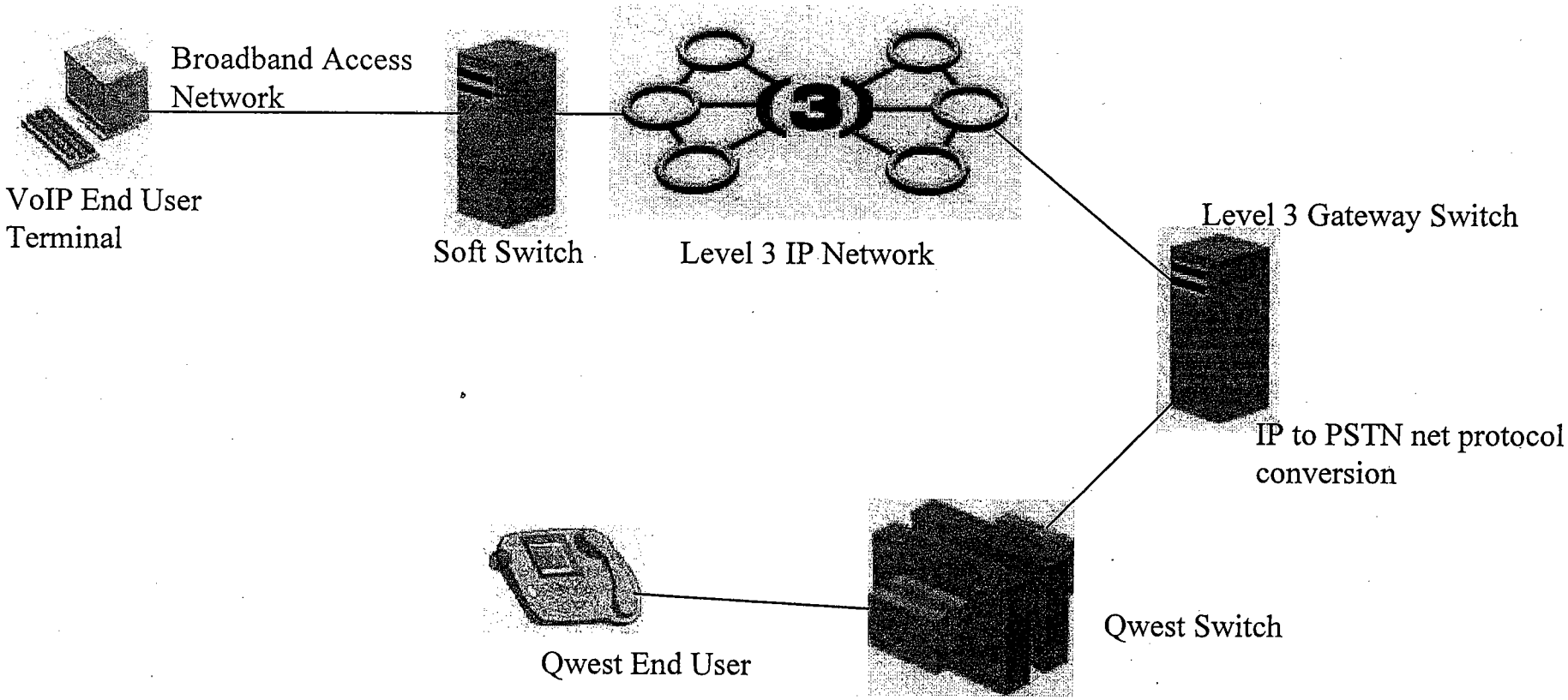


Exhibit RRD #8: ESP Exemption–post 1996



Level 3/Exhibit 308
Ducloo/Page 1 of 1

Exhibit RRD #9: VoIP CALL FLOW



VoIP terminals allow new features and functions and a host of data and network applications

Level (3) COMMUNICATIONS

MAKE THE SWITCH

Exhibit RRD #10: Traditional FX Service (a)

Traditional FX Call
From LCA 1 to LCA 2

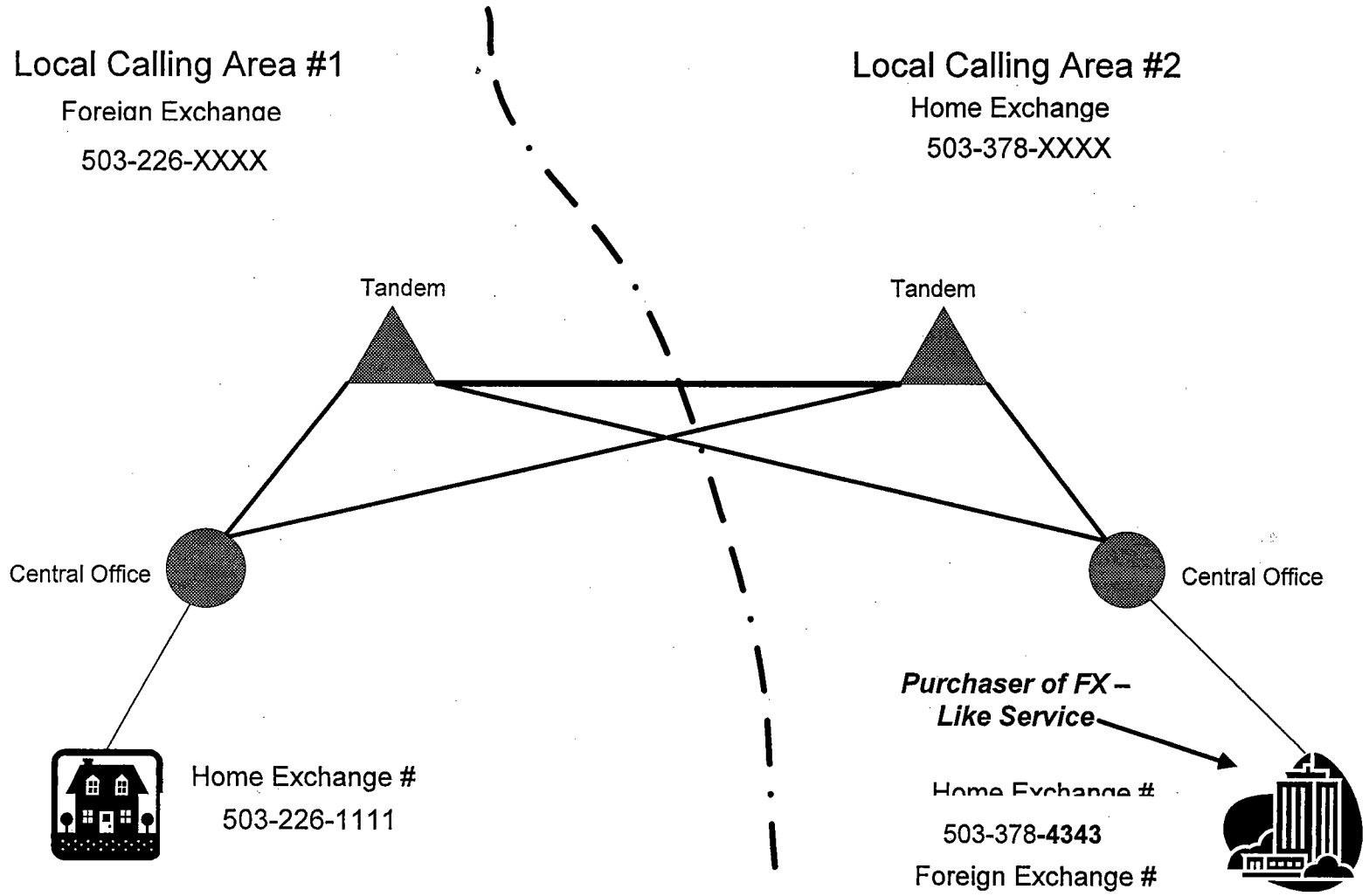


Exhibit RRD # 11 Traditional FX Service

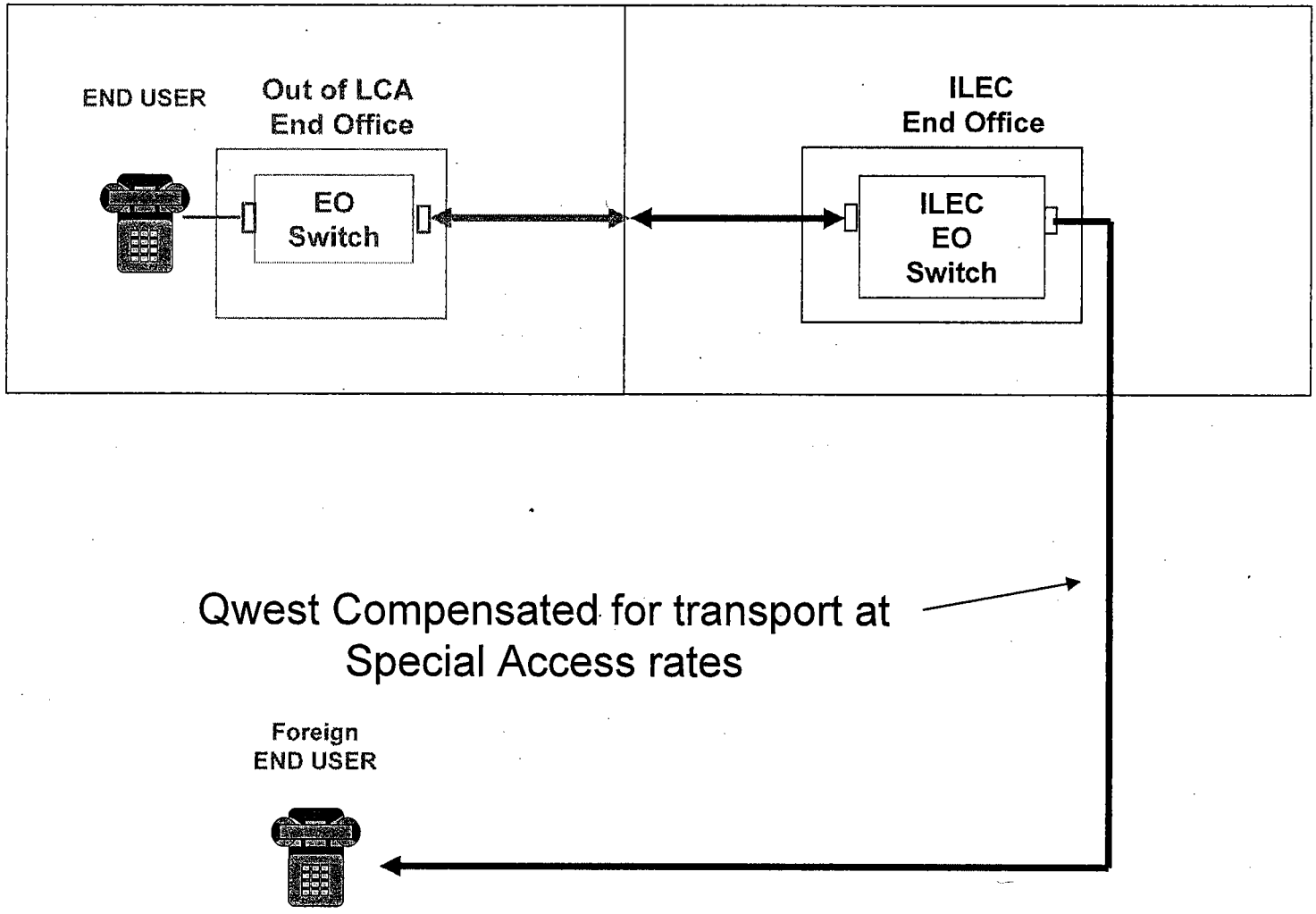
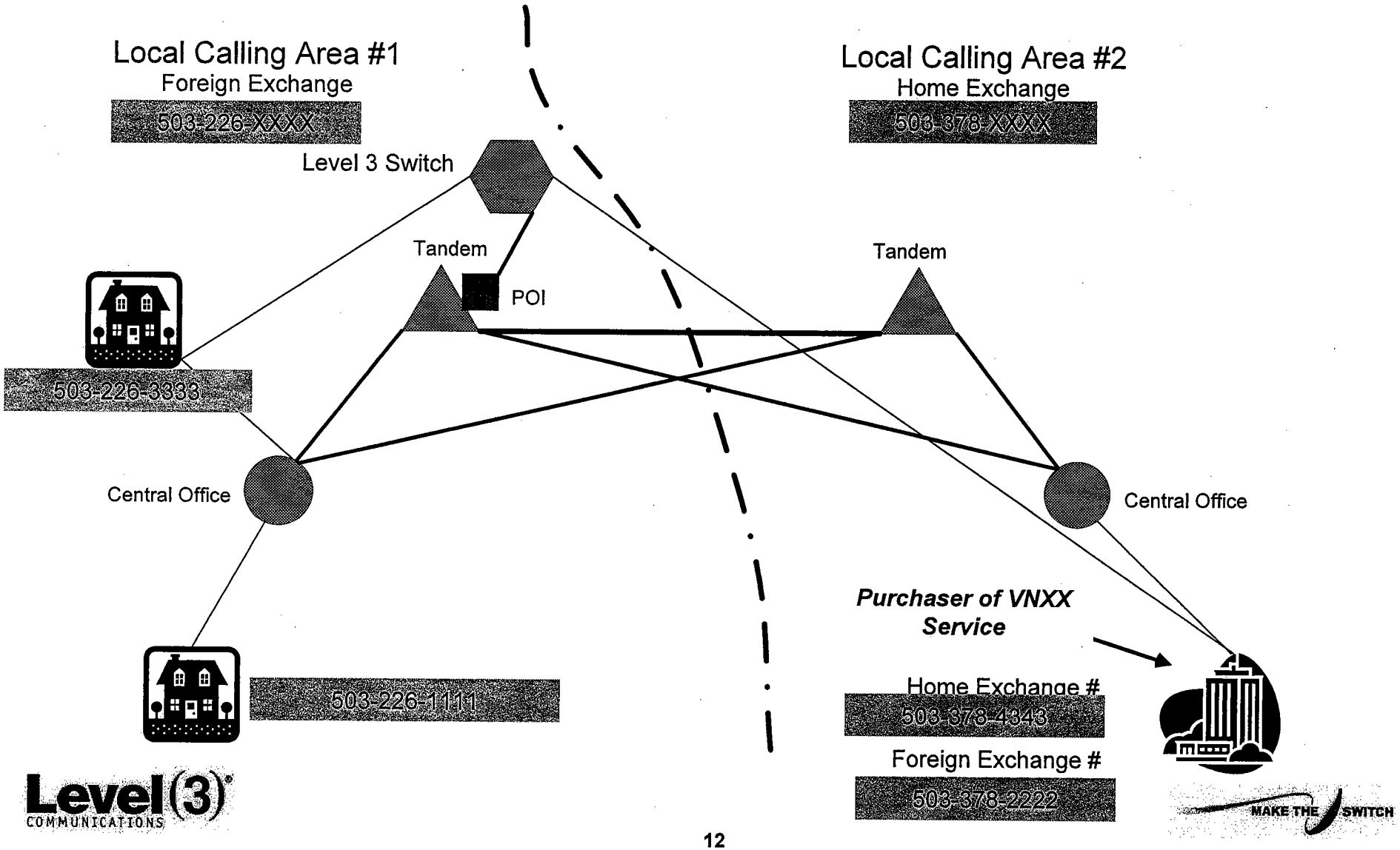


Exhibit RRD #12: VNXX Service

TYPICAL VNXX CALL

From LCA 1 to LCA 2



Level (3) COMMUNICATIONS

Exhibit RRD # 13: Traditional Local Service

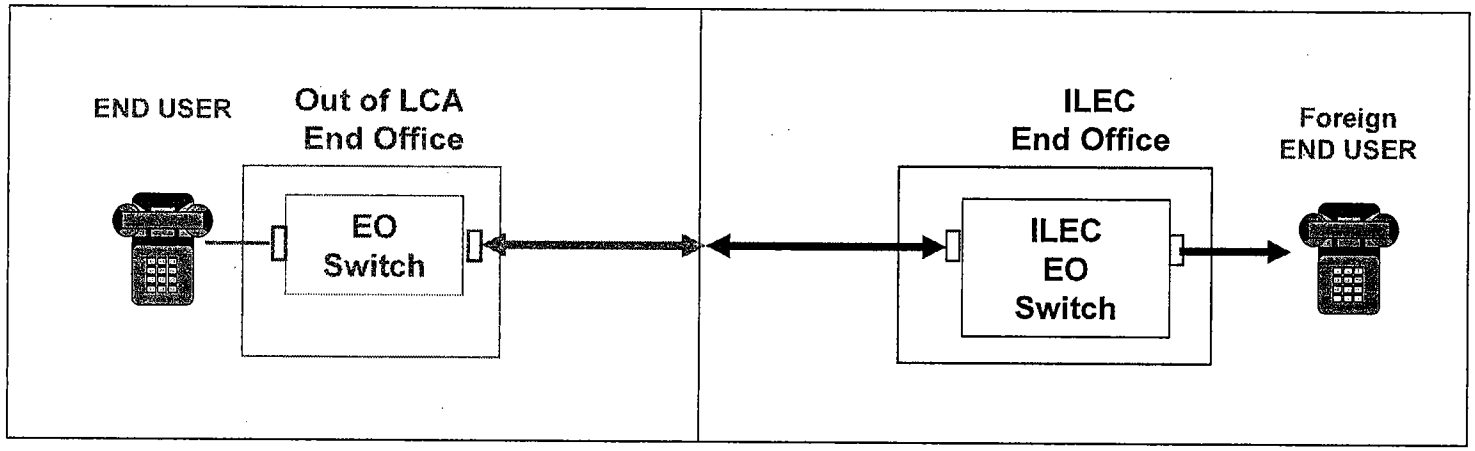


Exhibit RRD # 14: CLEC Local Service

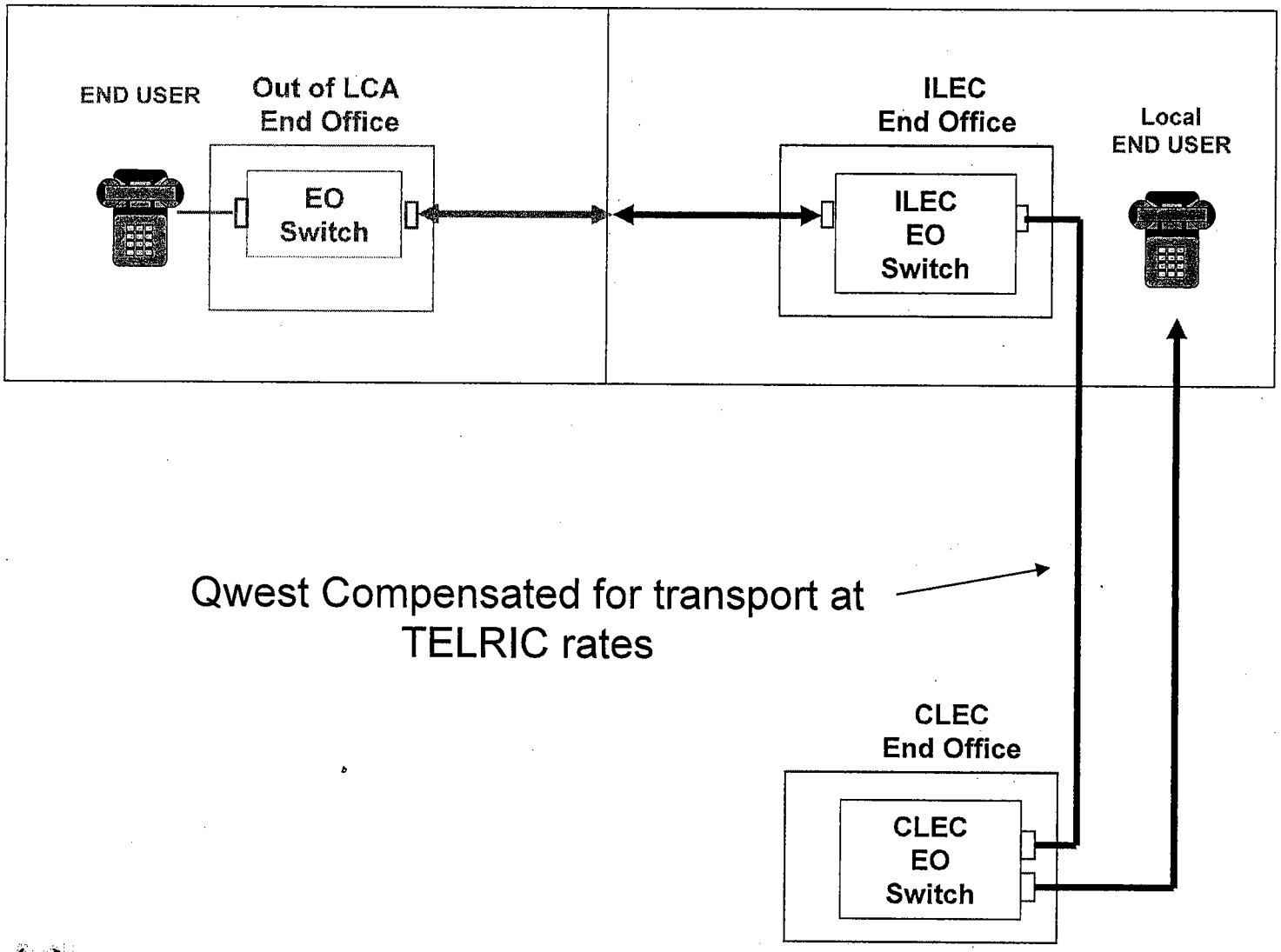
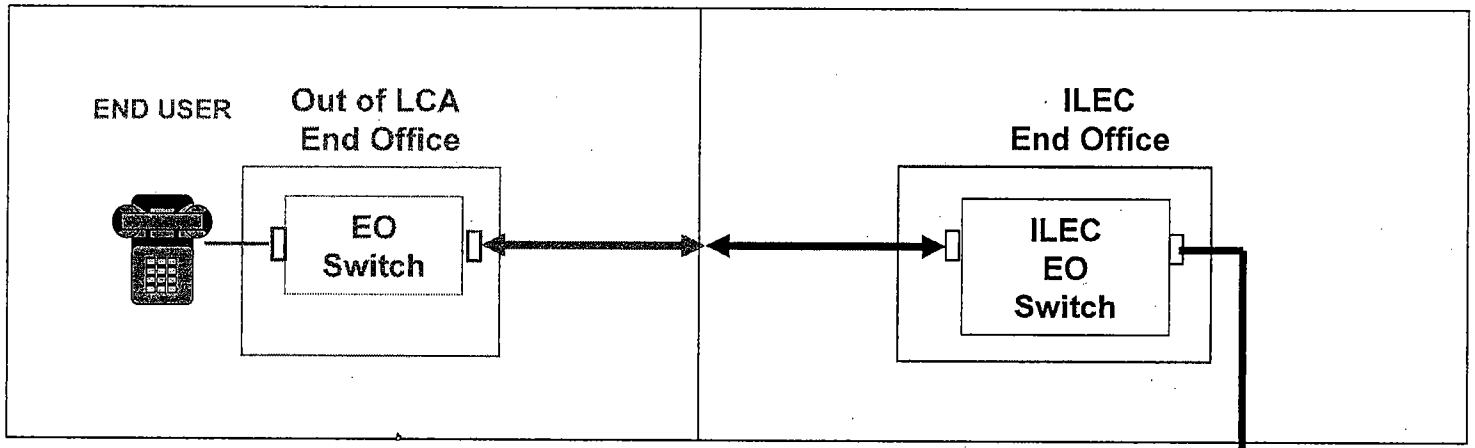
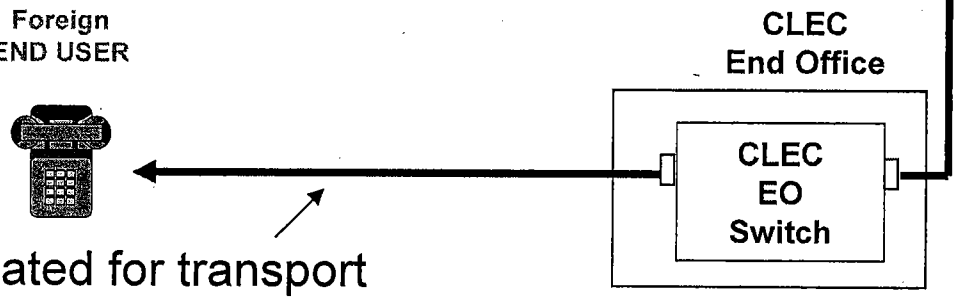


Exhibit RRD #15: CLEC FX Service



Qwest Compensated for transport at TELRIC rates

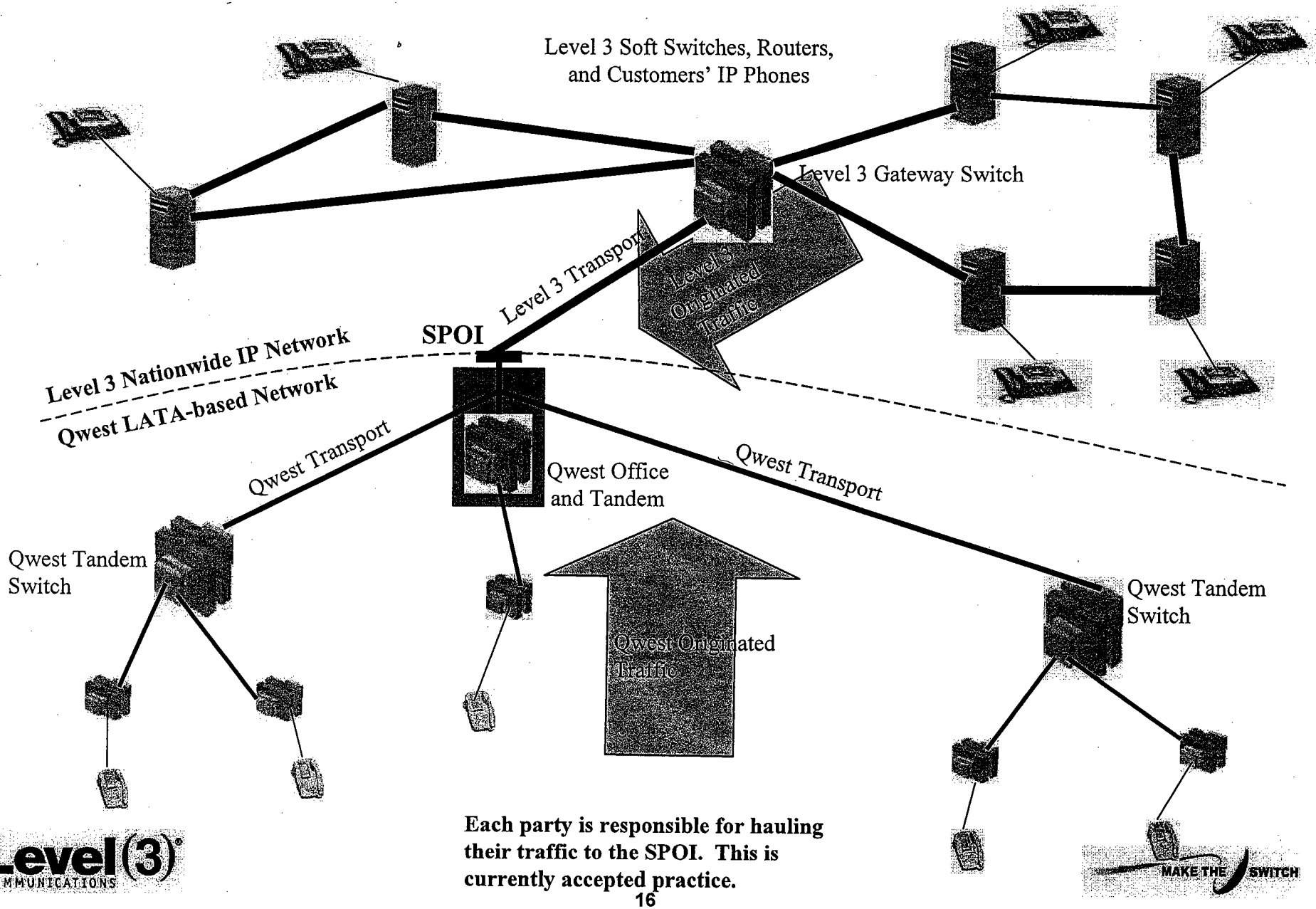


CLEC Compensated for transport

Level (3) COMMUNICATIONS

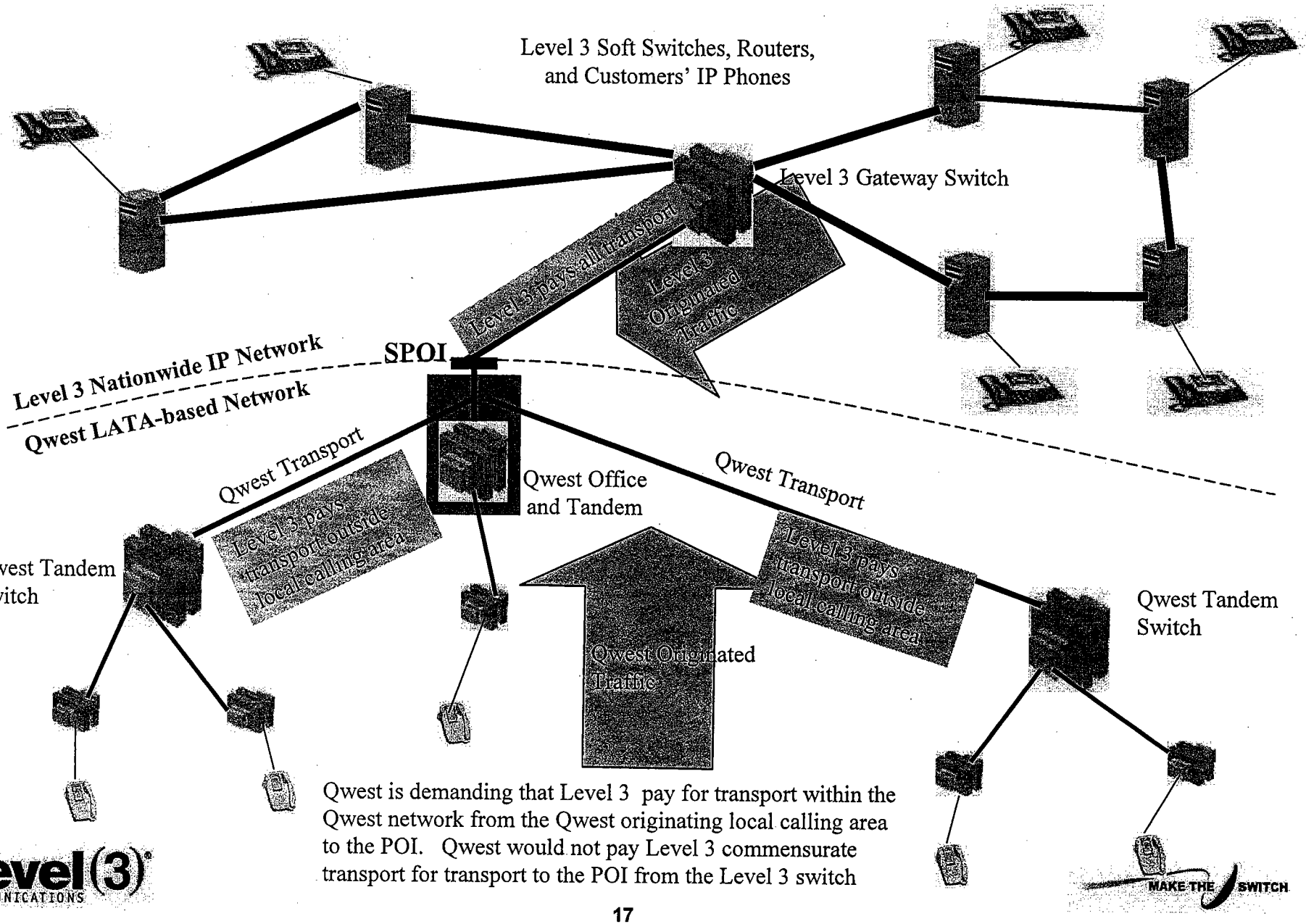
MAKE THE SWITCH

Exhibit RRD # 16: SPOI CONFIGURATION



Each party is responsible for hauling their traffic to the SPOI. This is currently accepted practice.

Exhibit RRD # 17: SPOI CONFIGURATION – QWEST PROPOSAL



Qwest is demanding that Level 3 pay for transport within the Qwest network from the Qwest originating local calling area to the POI. Qwest would not pay Level 3 commensurate transport for transport to the POI from the Level 3 switch

Level (3) COMMUNICATIONS