Exhibit No.:

Issue:	Mass Market/Enterprise Market Cross Over
Witness:	John F. Finnegan
Sponsoring Party:	AT&T Communications of the Southwest,Inc., TCG Kansas City and TCG St. Louis
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AT&T COMMUNICATIONS OF THE SOUTHWEST, INC., TCG KANSAS CITY AND TCG ST. LOUIS

DIRECT TESTIMONY

OF

JOHN F. FINNEGAN

TO-2004-0207

December 18, 2003

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, ADDRESS AND OCCUPATION.

A. My name is John F. Finnegan. My address is 1875 Lawrence St., Denver, CO 80202. I am a Senior Policy Witness in AT&T's Law and Government Affairs organization.

Q. PLEASE PROVIDE YOUR BACKGROUND AND PROFESSIONAL EXPERIENCE AS THEY RELATE TO THE ISSUES IN THIS PROCEEDING.

A. My education and relevant work experience are as follows. I have a B.S. in Engineering from the Rutgers College of Engineering and an M.B.A. from the University of Denver. I have worked for AT&T for over 20 years. After graduating from Rutgers, I spent the next two years with Combustion Engineering in Valley Forge, PA as a Project Engineer. In 1983, I joined AT&T as a purchased product engineer. Over the next 12 years, I spent time with AT&T in a variety of engineering, quality management, sales and marketing positions. Almost half of that time was spent leading a supplier quality management organization.

In 1995, I joined AT&T's New Markets Development Organization and was one of the first employees in AT&T's Western Region to explore the opportunities associated with providing local exchange services. In 1996, I began in my current position of Senior Policy Witness. As a Senior Policy Witness, I am responsible for developing and advocating AT&T's position on a wide range of issues.

During Qwest's attempt to obtain Section 271 relief, I concentrated my work efforts on collaborating with Qwest, CLECs and state regulators on understanding and evaluating Qwest's operational support system ("OSS") and developing performance measurements supporting those OSS. I was AT&T's representative in the Arizona and the Regional Oversight Committee's ("ROC") OSS tests since their inception. Since the issuance of the Triennial Review Order, I have been concentrating my efforts on the cross over point issue that is relevant to this testimony, the batch hot cut process, including participation in industry workshops addressing batch hot cuts, market definition and triggers.

I am a frequent panelist on ROC OSS and Triennial Review Order discussions. I have testified in proceedings in Kansas, Iowa, Minnesota, Arizona, Montana, Wyoming, Utah, Idaho, Colorado, Washington, North Dakota, South Dakota, Nebraska, Oregon, and New Mexico.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to recommend an approach the Commission can use to distinguish the mass market from the enterprise market, as directed by the FCC. I also conduct a quantitative analysis that results in a recommendation in the number of lines that distinguish the mass market from the enterprise market (the cross over point).

I. Summary

Q. WHAT IS THE CROSSOVER POINT THAT YOU RECOMMEND THIS COMMISSION ADOPT?

A. I recommend that the commission adopt a cross over point of 13 lines.

Q. HOW DID YOU ARRIVE AT THIS CONCLUSION?

A. I arrived at this conclusion by determining where it made economic sense for a competitive local exchange carrier ("CLEC") to serve a multi-line plain old telephone service ("POTS") customer using a DS1 based service. In performing the analysis to arrive at that conclusion, I identified all of the costs that are incurred when serving a multi-line POTS customer with a DS1 based service and divided that total cost by the cost of a single UNE-P line. The result of that calculation rounded up to the next whole number is the cross over point.

II. Introduction

Q. PLEASE IDENTIFY THE FUNDAMENTAL CROSS OVER POINT ISSUE THE FCC ASKED STATE COMMISSIONS TO ADDRESS.

A. The FCC tasked the state commissions with determining the point where it makes economic sense for a multi-line customer to be served via a DS1 loop, termed by the FCC as the "crossover point."[1] The purpose of making this determination is to establish when a customer would be considered a "mass market" customer as distinguished from the "enterprise market." The FCC identified the cross over issue in the section of the TRO that is concerned with defining the market.[2]

Q. DID THE FCC SUGGEST UNITS THAT COULD BE USED IN DISTINGUISHING THE MASS AND ENTERPRISE MARKETS?

A. Yes, it did. The FCC suggested that the number of DS0 lines a customer uses at a particular location would be an appropriate unit for the cross over analysis.

[1] *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, and Deployment of Wireline Services Offering Advanced Telecommunications Capability,* CC Docket Nos. 01-338, 96-98 & 98-147, Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, FCC 03-36 (rel. Aug. 21, 2003) *("Triennial Review Order"* or *"TRO").* ¶ 497.
[2] *Id.*, ¶¶ 495 – 497.

Specifically, the FCC stated, "as part of the economic and operational analysis discussed below, a state must determine the appropriate cut-off for multi-line DS0 customers as part of its more granular review."[3] The FCC asked the state commissions to identify the number of DS0 lines needed at a particular customer location before the customer crosses over from the mass market to the enterprise market.

Q. WHAT ARE THE CHARACTERISTICS OF MASS MARKET CUSTOMERS?

A. The mass market customer base is: (a) primarily interested in basic voice POTS service[4]; (b) widely geographically dispersed[5]; and (c) unaccustomed to complex or disruptive provisioning schemes.[6] The TRO recognizes each of these characteristics when it distinguishes mass market from enterprise customers. For purposes of the switching impairment analysis, the FCC stated "mass market customers are analog voice customers that purchase only a limited number of POTS lines, and can only be economically served via DS0 lines."[7] Mass market customers are not located exclusively in concentrated geographic locations such as central business districts; rather residential and small business customers are located across all urban, suburban, and rural locations. These customers expect that using their telephone services, as well as changing service providers, should

[3] *Id.* ¶ 497.
[4] *Id.*
[5] *Id.* ¶ 205.
[6] *Id,* n. 716.
[7] TRO ¶ 497. *See also* ¶ 127 ("Mass market customers consist of residential customers and very small business customers. Mass market customers typically purchase ordinary switched voice service (Plain Old Telephone Service or POTS) and a few vertical features.")

not be a complicated transaction. As the FCC described it, "mass market customers demand reliable, easy-to-operate service and trouble-free installation."[8]

Q. HOW DOES AN ENTERPRISE CUSTOMER DIFFER FROM A MASS MARKET CUSTOMER?

A. Enterprise customers demand a level of service and capacity – particularly for data services – quite different from the mass market customer. As the FCC put it, "DS1 enterprise customers are characterized by relatively intense, often data centric, demand for telecommunications services sufficient to justify service via high-capacity loops at the DS1 capacity and above."[9]

Enterprise customers also require more sophisticated sales, marketing and technical support than mass market customers. For example, local exchange carriers can generally acquire POTS customers through inbound or outbound telemarketing calls, direct mail or similar simplified marketing techniques. In contrast, convincing a customer served by analog mass market loops to upgrade to "enterprise" status using digital DS1-based service in order to change service providers generally requires sales personnel to visit the customer on one or more occasions. As explained below, such an upgrade requires that changes be made to the customer's CPE at its premises. As a result, CLECs may also need to have Systems Consultants visit with the customer. Consequently, it requires considerably more sales and marketing activity, hence expense, to acquire an enterprise customer than it does a mass market customer.

[8] TRO ¶ 467.
[9] TRO ¶ 451.

In addition, after the CLEC sales personnel visits with the customer, not every customer will decide to take service with that CLEC. In that event, the sales and marketing costs are expended by the CLEC without any accompanying revenue.

Q. HOW MUCH MORE COSTLY IS IT TO MARKET TO AN ENTERPRISE CUSTOMER THAN TO A MASS MARKET CUSTOMER?

A. Industry analysts have estimated that the cost to acquire a mass market customer is $125.[10] I estimate that, because of the additional activities and expertise required, the costs to acquire an enterprise customer are six times higher than the costs to acquire a mass market customer. For purposes of this analysis, I used a marketing cost differential of $625.[11]

Q. HOW DOES THE TRIENNIAL REVIEW ORDER DISTINGUISH THE MASS AND ENTERPRISE MARKETS?

A. The Triennial Review Order provides that a customer served by mass market loops is to be considered part of the enterprise market when "it is economically feasible for a competitive carrier to provide voice service with its own switch using a DS1 or above loop. We determine that this includes all customers that are served by the competing carrier using a DS1 or above loop and all customers meeting the DS0 cutoff described in paragraph 497."[12] In describing the cross over point, the FCC stated that it "may be the point where it makes economic sense for a multi-line customer to be served via a DS1 loop."[13]

[10] *See* Banc of America Securities, Research Brief Wireline Telecommunications, *AT&T Corporation A Case for Consumer Services*, April 30, 2003, p. 20.
[11] Cost to market to an enterprise customer ($750) – Costs to market to a mass market customer ($125) = $625.
[12] TRO ¶ 421, n.1296.
[13] TRO ¶ 497.

Q. WHAT IS THE CROSS OVER POINT FOR MULTI-LINE DS0 CUSTOMERS?[14]

A. This is the point at which ILECs are relieved of their obligation to provide unbundled local switching to an individual customer location.[15] The purpose of the cross over is to establish a governmentally drawn upper boundary to the mass market – in effect, substituting the Commission's judgment of how a customer *should be* served (via a DS-1), for the customer's judgment of how it *has chosen* to be served (multiple POTS lines).

Q. WHAT IS THE PRACTICAL IMPLICATION OF THE CROSS OVER POINT?

A. In all but the most limited situations, an ILEC's unbundled local switching network element is only used as part of a platform with all of the other unbundled network elements known as UNE-P. The cross over point will decide the line level at which a CLEC can and cannot serve customers using UNE-P.

Q. DID THE FCC COME TO ANY PREVIOUS CONCLUSIONS ON DISTINGUISHING THE MASS FROM THE ENTERPRISE MARKET?

A. Yes, it did. The FCC previously found that if a customer had four or more lines at a single customer location in density zone 1 in one of the top 50 Metropolitan Statistical Area ("MSAs") and the ILEC had provided non-discriminatory, cost-based access to the enhanced extended link ("EEL"), then the ILEC had no

[14] *Id.*
[15] It should be noted that if the Commission finds no impairment with respect to unbundled local switching, a Bell Operating Company would still have to provide access to that element (TRO ¶ 653); however, it would not have to provide switching at the rates, terms and conditions mandated by section 252 of the Act (TRO ¶ 656).

obligation to provide unbundled local switching.[16] However, that conclusion did not apply in other than the top 50 MSAs or in density zones other than zone 1 in the top 50 MSAs. This finding has become known as the "three line limit" or the "switching carve-out."

Q. WHAT FACTS DID THE FCC RELY ON IN SETTING THE "THREE LINE LIMIT"?

A. Frankly, the evidence the FCC relied upon in reaching its three line limit was minimal. It appears that the FCC based much of its finding on the presence of CLEC local switches in density zone 1 in the top 50 MSAs. Specifically, the FCC concluded, "exempting incumbent LECs from unbundling local circuit switching in certain circumstances in the top 50 MSAs is reasonable because nearly all of the top 50 MSAs contain a significant number of competitive switches."[17] However, the FCC did not provide any meaningful explanation as to how that finding translated into a three line (or any specific line) limit. Indeed, in his Separate Statement, Commissioner Harold Furchtgott-Roth pointed out the absence of evidence supporting a three line limit when he stated:

> We have before us no clear evidence that there are *material*, switching-related differences in the cost of serving customers with different numbers of lines. Certainly, there is no basis whatsoever for concluding there are *material* differences in the cost of providing switching to customers with three lines, rather than four…..From a technological and economic perspective, there is no difference between a carrier that serves four one-line customers and a carrier that serves one four-line customer. There is consequently no reason to discriminate between the two carriers by giving

[16] Before the Federal Communications Commission, In the Matter of Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, CC Docket No. 96-98, Third Report and Order and Fourth Further Notice of Proposed Rulemaking ("UNE Remand Order"), Decision FCC 99-238, Released November 5, 1999, ¶ 278.
[17] *Id*, ¶ 281.

the first access to local circuit switching, but denying such access to the second. [18]

Q. DOES MERE EVIDENCE OF THE EXISTENCE OF COMPETITIVE SWITCHES SUPPORT A THREE LINE LIMIT?

A. No. In considering the evidence regarding the number of competitive switches in zone 1 in the top 50 MSAs, the FCC failed to consider what type of customers were being served by the switches. What the FCC did not appreciate at the time of the UNE Remand Order – and what it does appreciate now, is that competitive switches are used to serve large business enterprise customers. Thus, as the FCC found in the TRO:

> We find that the extent of competitive LEC circuit switch deployment varies tremendously in the enterprise and mass markets. In particular, we find that the record demonstrates significant nationwide deployment of switches by competitive providers to serve the enterprise market, but extremely limited deployment of competitive LEC circuit switches to serve the mass market.[19]

Q. SHOULD THE STATE COMMISSION SIMPLY ACCEPT THE FCC'S THREE LINE AS THE APPROPRIATE CROSS OVER POINT?

A. Absolutely not. As discussed above, the FCC's initial line limit was not based upon a factual analysis. More importantly, the FCC has directed the state commissions to make a fact-based determination of the cross over point as part of its granular analysis, using a cost/economic based review. It follows logically that the FCC would not have delegated this review to the state commissions if it

[18] Separate Statement of Commissioner Harold Furchtgott-Roth, Concurring in Part and Dissenting in Part, Re: Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Third Report and Order and Fourth Further Notice of Proposed Rulemaking, CC Docket 96-98, FCC 99-238, pp. 2-3.
[19] TRO, ¶ 435.

believed that its prior line determination was simply to be adopted by state commissions.

Q. HOW SHOULD THIS COMMISSION DEVELOP THE CROSS OVER POINT?

A. I recommend that the analysis be based on the economic and operational factors that a CLEC must face in deciding whether to serve a customer using multiple UNE-P lines or lines that are aggregated onto one or more DS1 services. This analysis compares the total costs to provision DS1 services at a customer's location to the costs of serving that same customer via UNE-P.

The costs to provision DS1 service at a location are characterized by substantial, upfront marketing, non-recurring and investment costs and monthly recurring costs that are generally not dependent upon the number of lines served at the customer's location. That is because it generally costs a CLEC roughly the same to serve a customer with a DS1 based service whether the customer has one line or twenty-four lines.[20]

In contrast, a CLEC's cost to order and provision UNE-P service include virtually no investment or upfront non-recurring costs. The CLEC's monthly recurring costs are directly related to the number of loops served at a location.[21] For example, if the ILEC's rate for UNE-P service is $20 per line per month, then the total monthly cost to serve a customer with five lines is $100.

[20] A DS1 loop can serve up to 24 voice grade equivalents.

[21] A CLEC that provides a customer with service using UNE-P will certainly incur some non-recurring expenses for activities such as creating an internal order once the customer has agreed to subscribe to the CLEC's service and submitting an order to the ILEC. However, those expenses would also occur if the CLEC served the customer using a DS1 based service. To simplify the analysis, CLEC costs to order either UNE-P or DS1 loops are excluded from the analysis.

To arrive at the recommended cross over point, I calculate the total monthly cost to sell, install and maintain a DS1 based service at a customer's location and then I divided that result by the monthly UNE-P costs of serving that same customer. This result (rounded to the next higher whole number) yields the number of UNE-P lines at which the CLEC should be economically indifferent between using UNE-P or DS1 lines to serve that location. My analysis also generally compares and contrasts the operational issues associated with using UNE-P and DS1 services.

Q. HOW DOES YOUR ANALYSIS ACCOUNT FOR THE DIFFERENT UNE RATE ZONES IN THIS STATE?

A. The costs for a DS1-capable loop and UNE-P can vary substantially by rate zone. Thus, there could conceivably be a different cross over point for each rate zone. However, for the sake of simplicity and administrative efficiency, I recommend a cross over point based upon a weighted average of the cross over points for the individual zones.[22] The weighting is based on the percentage of unbundled loops that are found in each zone.

III. UNE-P and DS1 Network Architectures

Q. DO THE RELATIVE NETWORK ARCHITECTURES OF UNE-P AND DS1 SERVICE AFFECT THE COSTS USED IN THE ANALYSIS?

A. Yes. To understand the analysis, one must first understand the UNE-P and DS1 network architectures.

[22] Since the analysis determines rate zone-specific cross over points, the Commission can alternatively use it to establish cross over points for each rate zone. The analysis can also be used to develop weighted average cross over points if the Commission defines geographic market areas that include more than one rate zone.

Q. PLEASE DESCRIBE THE NETWORK ARCHITECTURE FOR UNE-P.

A. The network architecture for UNE-P is the same, simple POTS architecture that ILECs use to provide retail service to their own end users. To obtain service, a customer with one or more telephone lines merely plugs its analog telephone sets into wall jacks. Each jack will be associated with one or two of the customer's telephone numbers.[23] The wall jacks are connected to the customer's inside telephone wire. The inside wire for a premises terminates at the customer's Network Interface Device ("NID"). For a residential customer, the NID is generally located on the side of the customer's house. For small business customers, the NID can be located on the side of the customer's building or inside the customer's building in some type of equipment closet. For each POTS line at a customer's location, an ILEC twisted copper loop is connected to the NID. The copper loop provides the electrical current necessary to ring the customer's telephone when an incoming call is received and to provide dial tone when the customer attempts to make a call.[24] Because all of the electrical current required to make and receive telephone calls is provided over the copper loop, a customer's telephone service will operate even when the customer has experienced an electrical power outage.

Thus, in its simplest form, with a POTS architecture, each telephone line has its own separate connection from the customer's premises to the local circuit switch

[23] A telephone jack can be wired to support two different telephone lines with two different telephone numbers. This permits a customer to use both telephone lines with a single, two-line, analog telephone set.
[24] If the customer's cooper loop is connected directly to the circuit switch, the switch will provide the ringing current and dial tone. If the customer's loop has multiplexing equipment in the loop, the multiplexing equipment provides the ringing current and dial tone.

serving that customer. For example, a customer with eight POTS lines will have eight separate loop connections to the local circuit switch serving those lines.

Q. DOES A UNE-P ARCHITECTURE REQUIRE THE CLEC TO MAKE ANY INVESTMENT IN CPE OR NETWORK EQUIPMENT?

A. Generally speaking, a CLEC does not have to make any network or CPE investments to serve a customer using UNE-P. A CLEC may, however, invest in its own equipment to provide voice mail service or to provide its own operator or directory assistance services. For purposes of this analysis, no CLEC investment is assumed when the CLEC serves a customer using UNE-P.

Q. WHAT NON-RECURRING UNE-P COSTS ARE CONSIDERED IN THE ANALYSIS?

A. None. Ordinarily, my analysis would assume that a customer with POTS service from the ILEC would be migrated to CLEC UNE-P service and I would include such non-recurring migration costs in this analysis. However, in Missouri the UNE-P migration recurring charge is $1.05, per electronic LSR.[25] Because the costs incurred by the ILEC to migrate a customer from retail to UNE-P are relatively[26] low, I did not include them in the analysis. There are no other non-recurring UNE-P costs that I considered in the analysis.

Q. WHAT ARE THE MONTHLY RECURRING UNE-P COSTS THAT ARE CONSIDERED IN THE ANALYSIS?

A. For purposes of this analysis, the following Missouri UNE-P monthly recurring costs were used:

[25] M2A, Appendix Pricing UNE, Schedule of Prices, 06/27/03.
[26] This charge, when amortized over two years as discussed on page 22, would be pennies.

Rate Zone	Monthly UNE-P Rate
1	$16.60
2	$22.84
3	$25.27
4	$21.55

The UNE-P rate is comprised of the rate zone-specific unbundled analog loop cost, the monthly recurring switch port charge, and any applicable usage sensitive costs (e.g., switching, shared transport, signaling, databases, and Daily Usage File).[27]

Q. PLEASE DESCRIBE THE NETWORK ARCHITECTURE FOR THE DS1 SERVICE.

A. With DS1 service, instead of maintaining a separate connection (analog loop) from the customer's premises to the local circuit switch for each telephone line, special equipment at the customer's premises is used to aggregate the multiple telephone lines onto a single connection (a DS1-capable loop) from the customer's premises to the switch. As with the POTS architecture, with a DS1 architecture a customer with one or more telephone lines can plug analog telephone sets into wall jacks that are connected to the customer's inside wire and that inside wire will terminate at a NID.

In order to aggregate multiple, analog lines onto a common DS1 loop, the signals from all of the customer's analog lines must be converted into digital signals and then multiplexed. The equipment that must be installed at a customer's premises to convert the multiple analog lines onto a single digital DS1 loop is called

[27] The usage sensitive charges assumed 1,668 minutes of combined originating and terminating local and toll calling.

channel bank equipment. If a customer does not already have such equipment (and considering the circumstances being reviewed, there is no reason to assume that it will), then the CLEC must provide it, because the customer would not be willing to incur such costs simply because regulatory rules require that it be moved from "mass market" to "enterprise" status.

With digital DS1 services, unlike analog POTS service, the electric current necessary to ring the customer's telephones and provide dial tone cannot be provided through the digital DS1 loop. Instead, they are provided by the CLEC channel bank equipment at the customer's premises. The channel bank equipment is typically installed inside a customer's premises, either on a wall or on the floor. Although there are varying numbers of lines that may terminate on a single card, the channel bank unit will typically have a 24-line capacity.[28] Examples of frequently used channel bank units are Premisys SlimLine Channel Bank and the Adtran Total Access 750 units.

To power the CLEC's channel bank equipment at the customer's premises, the equipment must be plugged into the customer's commercial AC power. The channel bank unit typically has the ability to convert the customer supplied AC power to the DC power needed to run the customer's CPE. And, as noted above, however, the DS1 loop architecture does not allow the electrical current needed for ringing and dial tone to be provided from the carrier's switch. Thus, in order to provide the customer with continuous service during power interruptions, the CLEC must also provide DC battery back up. To do so, a separate power unit is

[28] This 24-line limit is a natural result in that the capacity of a DS1 loop is 24 voice grade channels.

required to manage the battery string to assure the batteries are fully charged and can be accessed in the event of a power failure. For the purpose of this analysis, an Adtran Total Access 750 Channel Bank with 24 analog line ports, an Adtran AC/DC Power Supply and Battery Charger and an Adtran Battery Backup System (Wall mount) is employed.[29] The backup battery system will provide power during an interruption of commercial power for the channel bank for up to eight hours. The list price of the Adtran channel bank equipment, AC/DC power supply and battery charger and backup battery system is $3,161. I assumed a discount of 30% off of the list price of the Adtran CPE to account for discounts that efficient CLECs would likely obtain from the supplier of the channel bank equipment. The net CPE cost that I used for the analysis was $2,212.70.

In sum, regardless of the variety of names applied to the CPE provided by telecom equipment suppliers, the fundamental set of functionalities that must be provided to support DS1 service are channel banks, power management and battery backup.

Q. WHAT MUST THE CLEC DO TO INSTALL THE CHANNEL BANK AND BATTERY BACKUP EQUIPMENT?

A. To install the equipment, a CLEC must have a technician travel to the customer's premises. To connect the inside copper wires from the individual telephone lines to the channel bank equipment, the CLEC must either provide a wired connection from the NID to the channel bank equipment, or disconnect the inside wires from the NID and reconnect them to the channel bank. For the purpose of this analysis

[29] Technical descriptions of the Adtran Total Access 750 and the associated AC/DC Power Supply and Battery Charger and Battery Backup System are provided in Attachment 1 to this Testimony.

a CLEC installation cost of $94.89 was used. This cost assumes two hours for the installation of the equipment at a rate of $30.93 for the first half hour and $21.32 for every hour thereafter.[30]

Q. WOULD THE INSTALLATION BE THE ONLY TIME THAT A CLEC TECHNICIAN WOULD NEED TO SERVICE THE CHANNEL BANK AND BATTERY BACKUP EQUIPMENT?

A. No. A CLEC technician would also have to visit the customer's premises to service the equipment in the event that the equipment needed repair, or in the event that the customer discontinues service altogether or switches its service to another provider.

Q. HOW OFTEN IS THE EQUIPMENT THE CLEC INSTALLS AT THE CUSTOMER'S PREMISES IN NEED OF REPAIR?

A. It is difficult to pinpoint an exact failure frequency. However, for the purposes of this exercise I would suggest that one visit by a CLEC technician to service the CLEC equipment every three years would be a reasonable projection. Some customers may require service sooner or later than once every three years. For purposes of this analysis, I assume the costs of 1/3 of a repair visit during the period that the CLEC serves the customer. I would also estimate a single visit would require one hour to perform the repair work. For the purpose of this analysis I used an average maintenance cost per year of $17.42.[31]

[30] As a proxy for the CLEC technician labor rate for installing the CPE, I used the Maintenance of Service Charges – Basic Time of $30.93 for the first half hour and $21.32 for every half hour thereafter from the M2A Appendix Pricing UNE, June 27, 2003. While AT&T continues to believe that these rates are excessive, since they were approved by the Commission, I used them for this analysis.
[31] 1/3 of a visit * 1.00 hour per visit * ($30.93 for the first half hour + $21.32 for the second half hour).

Q. DOES YOUR ANALYSIS INCLUDE A COST FOR EQUIPMENT REMOVAL IN THE EVENT THAT THE CUSTOMER DISCONNECTS ITS SERVICE WITH THE CLEC?

A. Yes, it does. If the customer stops obtaining service from the CLEC, the CLEC would have to send a technician to the customer's premises to disconnect and remove the CPE. For the purposes of the analysis, I estimated $52.25 in equipment removal costs. I estimate that the removal of the CLEC's equipment from the customer's premises would take one hour at a rate of $30.93 for the first half hour and $21.32 for the second. To account for the fact that the equipment removal costs will take place in the future, I calculated the net present value ("NPV") of the $52.25 expenditure assuming the customer will find a different provider of DS1 service in two years. The ("NPV") of a $52.25 expenditure made two years into the future is $41.42.[32]

Q. HOW WOULD THE CONNECTION FROM THE CPE TO THE CLEC'S SWITCH BE MADE?

A. The connection from the channel bank to the CLEC's collocation is provided by a 4-wire DS1-capable loop that terminates in the ILEC central office on a DSX-1 panel or its equivalent. The DS1 loop provides the connection between the CPE and the ILEC's central office. Assuming that the ILEC had DS1-capable loops available at the customer's location, the ILEC could install the DS1 loop in parallel with the existing analog loops that the customer uses for its POTS service. The ILEC installation would involve performing cross connections between the DSX-1 panel and the CLEC's collocation. For purposes of this analysis, the non-

[32] For the net present value calculation, I used a cost of capital of 12.32%. This figure was determined by adding 2% to the approved cost of capital for SBC in this state (10.32%.) I added a 2% premium to the ILEC cost of capital to account for the additional risk lenders face in loaning money to a CLEC industry that is replete with bankrupt CLECs.

recurring and recurring costs for a DS1-capable loop and the non-recurring cost for a DS1 cross connection were used. The non-recurring costs for a DS1 loop from SBC include both the four wire digital loop cost and the central office access charge. In Missouri, the non-recurring costs for installation of a DS1 unbundled loop is $123.77.[33] The recurring cost of a cross connection for a DS1 unbundled loop is $9.00 and the nonrecurring cost is $45.03.[34]

Q. PLEASE DESCRIBE THE EQUIPMENT A CLEC USES IN ITS COLLOCATION TO RECEIVE THE DS1 LOOP.

A. A multiplexer is required in the CLEC collocation in order to consolidate individual DS1 loops onto a higher capacity DS3 transport facility connecting the collocation to the CLEC switching node. The EdgeLink100 from Telco Systems is a product that is frequently used to multiplex DS1 circuits onto a DS3 circuit.[35] For the purposes of this analysis, I use a cost of $3,600 for the Edgelink 100 multiplexer. Assuming that twenty-eight DS1 circuits are being multiplexed by the multiplexers in the CLEC's collocation, a single DS1 loop would be responsible for 1/28 of the $3,600 cost of each multiplexer, or $128.57.[36]

Q. HOW DOES THE MULTIPLEXED DS3 CIRCUIT REACH THE CLEC'S LOCAL SWITCH?

A. The DS3 circuit would be backhauled from the CLEC's collocation in the ILEC central office to the CLEC's local switch location. As previously discussed, at the CLEC's switch location, the DS3 circuit must be demultiplexed back to individual

[33] M2A Appendix Pricing UNE, Schedule of Prices, June 27, 2003.
[34] M2A Appendix Pricing UNE, Schedule of Prices, June 27, 2003.
[35] A technical description of the Telco Systems EdgeLink 100 is provided in Attachment 2 to this Testimony.
[36] The per DS1 loop investment assumed for this analysis was calculated as follows: 1 multiplexer * 1/28 * 3,600 = $128.57.

DS1 circuits. The individual DS1 circuits are terminated at the CLEC's switch into a DS1 switch port. The DS1 switch port is necessary whether the DS1 is carrying one line of a customer's voice traffic or the maximum of 24 lines of a customer's voice traffic. For the purposes of this analysis, I used a monthly recurring cost of $17.94 to backhaul the customer's DS1 service on the transport DS3.[37] For the multiplexing at the CLEC's switching location, CLEC DS1 switching costs and the transport between the CLEC switch serving the customer and other switches, I used a monthly recurring cost of $40.60.[38] A diagram of the DS1 based architecture can be found in Attachment 3.

IV. Operational Issues

Q. DOES THE MIGRATION OF A CUSTOMER'S SERVICE TO A DS1-BASED SERVICE INVOLVE A HOT CUT AND A LOSS OF SERVICE BY THE CUSTOMER?

A. Yes, it does. For customers with existing POTS service, the process of the CLEC connecting the customer's inside wire to the channel bank will require some period of time when the customer is totally out of service and unable to make or receive incoming telephone calls. In addition, even after the CLEC technician has completed the process of installing the channel bank and other equipment, the customer will be unable to receive telephone calls until the customer's telephone numbers have been ported by the CLEC. The interval between when the CLEC technician starts the conversion until the CLEC ports the customer's telephone numbers can be over an hour.

[37] The backhaul cost conservatively assumes the distance between the collocation and the CLEC's switch node is 3 miles and the backhaul is provided via ILEC special access.
[38] The $40.60 cost assumed 12 lines were being served at the customer's location. That cost includes the transmission equipment, the switch investment and transport facilities.

Much attention has been given lately to the hot cut process for individual customer analog loops. In that process, the movement of the wires is done by the ILEC in the ILEC central office. With a DS1 based service, a hot cut with the accompanying loss of service is still necessary; the difference is that it is performed by the CLEC at the customer's premises instead of the ILEC at the ILEC central office.

The TRO may have created the mistaken impression that hot cuts are unnecessary for customers served via a DS1 based service when it stated, "if a customer has enough lines to justify the expense of purchasing multiplexing equipment and a high-capacity line, it makes sense to aggregate the customer's loops at the customer's premises, which avoids the need for hot cuts at the incumbent LEC's central office."[39] While it is true that hot cuts at the incumbent LEC's central office would be avoided, it is also true that since wires at the customer's location must be disconnected and reconnected, a hot cut at the customer's premises would be required.

Q. DOES THE MIGRATION OF A CUSTOMER'S SERVICE TO A DS1-BASED SERVICE ALSO REQUIRE THE PORTING OF THE CUSTOMER'S TELEPHONE NUMBERS?

A. Yes, it does. Virtually all customers – and certainly all business customers -- want to retain their existing telephone numbers if they change their local service provider. Thus, a customer served by a DS1 loop must still have its numbers ported. The steps needed to port a customer's telephone number when the CLEC

[39] TRO, n. 1544.

uses a DS1 based service are the same as if the CLEC migrated multiple analog loops.[40]

Q. ARE THERE ANY REASONS WHY A CUSTOMER USING MULTIPLE POTS LINES WOULD NOT BE INTERESTED IN A DS1-BASED SERVICE?

A. Yes, there are several. First, the customer must set aside inside and protected floor or wall space to accommodate the CLEC's channel bank, power management and backup battery equipment. With a POTS service such as UNE-P (and even UNE-L), there is no need to install and maintain any CLEC equipment at the customer's premises. Thus, it is likely that some customers will be unable or unwilling to set aside the protected space needed to accommodate the required CLEC equipment. This, in turn, inherently limits the number of customers that a CLEC could serve with a DS1 based service. At a minimum, it takes additional sales and related support resources to convince a customer to allow the CLEC to make the necessary changes at its premises.

Second, even if the customer were willing to devote protected space to house the equipment needed to support a DS1 based service, it must also be subjected to a premises visit by the CLEC technician and cope with a service outage. These inconveniences will also limit the number of customers that are willing to change from multiple ILEC-provided POTS lines to a CLEC-provided DS1 service. And again, convincing the customer to subject itself to these inconveniences requires

[40] Therefore, the ILEC must still established the ten digit trigger for the ported numbers before the port, and the CLEC must still send the message to port the customer's telephone numbers to the Number Portability Administration Center ("NPAC") as soon as possible after the customer's inside wire has been connected to the channel bank.

considerably more sales support than a UNE-P order, which does not (or at least should not) require the customer to suffer any inconveniences at all.

IV. The Cost Analysis

Q. WHAT TYPES OF COSTS ARE GENERALLY CONSIDERED IN THE ANALYSIS?

A. Generally speaking, the analysis considered three types of costs. These include: 1) investment in customer premises equipment ("CPE") and network equipment, 2) non-recurring costs and 3) monthly recurring expenses.

Q. HOW WERE THE CPE AND NETWORK INVESTMENT COSTS CONSIDERED?

A. The investment costs were converted to an amortized monthly cost using the PMT function in Microsoft Excel. The costs were amortized based on a CLEC cost of capital of 12.32.[41] For the CPE, I used an economic life of ten years in the amortization calculation. As previously discussed, the transmission equipment, switching investment and the costs of the transport necessary to carry calls to and from the DS1 customer was converted to a monthly recurring cost.

Q. HOW WERE THE NON-RECURRING COSTS CONSIDERED?

A. The non-recurring costs were converted to an amortized monthly cost again using the PMT function in Microsoft Excel. The non-recurring costs were amortized over a two-year period. I estimated that the expected time a CLEC would be

[41] See footnote 35, above.

serving an average customer would be two years.[42]

Q. HOW WERE THE MONTHLY RECURRING EXPENSES CONSIDERED?

A. The monthly recurring expenses were used in the analysis without adjustment.

Q. HOW DID YOU ARRIVE AT THE TOTAL MONTHLY COST FOR THE DS1 BASED SERVICE?

A. The analysis separately calculated the DS1 costs for each rate zone. In calculating the DS1 costs, I first added the: 1) amortized monthly CPE investment, 2) amortized monthly network equipment investment, 3) amortized monthly non-recurring costs and 4) monthly recurring expenses. Then, I divided that total by the rate zone specific monthly recurring costs for UNE-P.[43] This is the cross over point because it represents the number of UNE-P lines that would create costs equal to the monthly costs to provide a customer a DS1 service. After calculating the cross over point for each rate zone, I next calculated a statewide weighted average cross over point. The weighted average cross over point was based upon the percentage of ILEC loops that were found in each rate zone and it was rounded up to the next whole number. The spreadsheets supporting the analysis are provided in Attachment 4

[42] Industry analysts have estimated an annual churn rate for CLECs of 42.8% of the customer base. *See* Banc of America Securities, Research Brief Wireline Telecommunications, *AT&T Corporation A Case for Consumer Services*, April 30, 2003, p. 10. Using that number, a CLEC will, on average, lose a customer within two years.

[43] As discussed above, if the Commission seeks to establish rate zone-specific cross over points(s), the analysis would end here.

IV. Conclusion

Q. WHAT ARE YOUR OVERALL CONCLUSIONS?

A. When a fact-based, quantitative analysis is performed using cost information from this state, the point at which it is economically rational for a CLEC to use a DS1-based service, rather than UNE-P, is when a customer has 13 or more lines. The evidence used to arrive at this conclusion is objective and quantitative and the analysis performed was granular and specific to this state. In addition, this analysis is representative of how a CLEC would view a decision to serve a customer with UNE-P versus a DS1-based service. As previously discussed, the Commission can easily use the analysis to calculate cross over points for whatever markets the Commission eventually identifies.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

Featured Solutions

Cost-Effective Integrated Service Delivery Over T1 or ATM Networks

High-Density POTS

ISDN Support

Point-to-Point Off Premises Extension (OPX) and LAN Connectivity

Voice and Optional Data Support

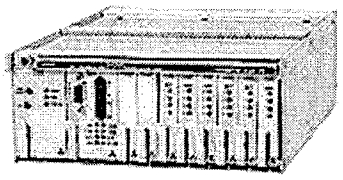
Services

ACES (ADTRAN Custom Extended Services)

Resources

- Course Description
- FAQ
- Firmware
- Images
- Installation/Maintenance
- Job Aid
- Technical Support Notes
- Visio Objects

Total Access 750 Chassis w/ BCU L1



- Cost-effective single T1/FT1 TDM IAD
- Terminates single T1
- Modular chassis supports voice-only or voice and data
- Compact size, 3.5"(h) x 8.5"(w) x 11"(d)
- Requires BCU (L1 or L2) and PSU for operation
- Variety of optional access modules for voice and data deployment
- Wallmount
- Rackmount with 19" or 23" Kit
- DC-powered
- Can be AC-powered with available adapter/battery charger
- Optional rackmount or wallmount battery backup
- Dual Chassis also available

Name	Part Number	CLEI Description
Total Access 750 DC Chassis (BCU L1)	4175001L1	
Total Access 750 AC Chassis (BCU L1)	4175001L1#AC	Modular Multi-Service Integrated Access Device with T1 interface
Total Access 750 DC Chassis w/12 FXS (BCU L1)	4175001L3	
Total Access 750 AC Chassis w/12 FXS (BCU L1)	4175001L3#AC	
Total Access 750 DC Chassis w/24 FXS (BCU L1)	4175001L6	
Total Access 750 AC Chassis w/24 FXS (BCU L1)	4175001L6#AC	
Total Access 750 AC Chassis w/24 FXS (BCU L1) & L2 Battery	4175001L6#ACB	
Total Access 750 AC Chassis w/24 FXS (BCU L1) & L1 Battery	4175001L6#ACB1	

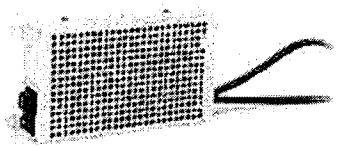
Modules, Software and Accessories

- Total Access 750 Access Modules
- Total Access 750 Accessories
- Total Access 750 Chassis and Commons

Resources

- Installation/Maintenance
- Manual
- Visio Objects

Total Access 750/850 AC Power Supply/Battery Charger



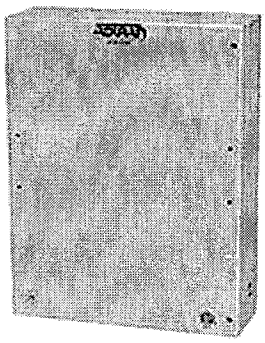
- Provides an AC power source for DC-powered Total Access chassis
- Charges battery backup system
- Mounts to side of Total Access 750/850 chassis or battery backup system,
- FCC, NEBS Level 3, an dUL 1950 compliant
- Compact with modular connections, status LED, auxiliary ground stud, and user accessible fuse
- Provides uninterrupted power output if battery backup system connected

Name	Part Number	CLEI	Description
Total Access 750/850 AC Power Supply/Battery Charger	1175043L3	SIMPAADARA	Total Access 750/850 Accessories

Resources

- Data Sheet
- Installation/Maintenance
- Job Aid

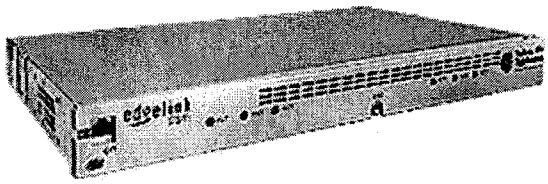
Total Access 750/850 Battery Backup System (Wallmount)



- Hinged, standalone battery back-up system
- 48 Volt ADTRAN designed battery backup
- Eight hours uptime
- Designed for use with Total Access 612, 616, 624, 750 and 850
- Mounting brackets available (1200626L2) for mounting a Total Access 612, 616, or 624 to this Wallmount Battery Backup System (1175044L2)
- Replacement batteries available (PN: 1975044L1)

Name	Part Number	CLEI	Description
Total Access 750/850 Battery Backup System (Wallmount)	1175044L2	SIMPBBCARA	Total Access 750/850 Accessories

EdgeLink100

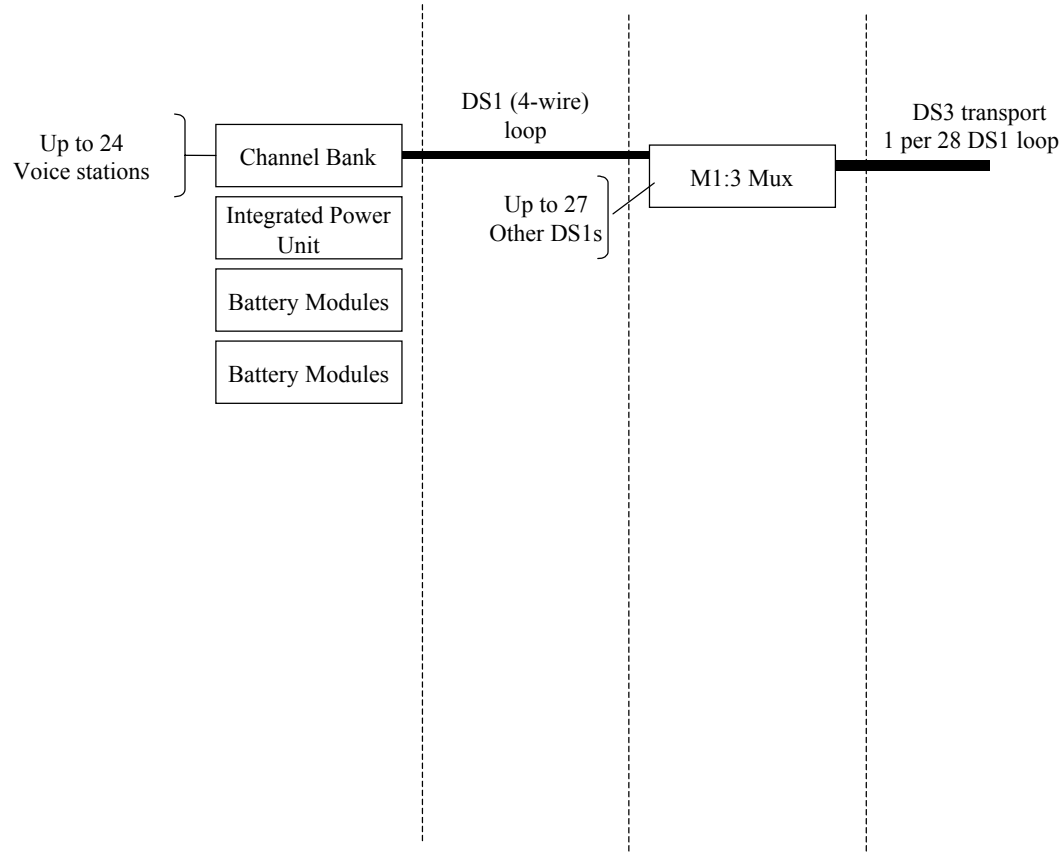


EdgeLink100 is the industry's smallest, most cost-effective DS3 multiplexer available. Its compact, plug-and-play architecture enables service providers to turn up T1s fast, saving installation time and costs as well as valuable real estate. Deployed at every edge of the network from the core to the CPE Edge.

Cuts service deployment costs

- Compact – only 1 RU – saves valuable real estate
- Plug-and-play architecture – fast and easy to install
- Remotely manageable
- TFTP Software Downloadable – in-service upgrades
- Redundant architecture – 1:1

JFF Attachment 3 - DS1 Architecture



JFF Attachment 4
Crossover Analysis

Estimating the UNE-P to DS1 Crossover
State **MO**

Crossover by Zone	Monthly DS1 CPE + Network + DS1 Cost	Monthly UNE-P Cost	Crossover	% of Loops In Zone	Weighted Average
Zone 1	$231.04	$16.60	13.9	53.0%	7.4
Zone 2	$235.43	$22.84	10.3	31.0%	3.2
Zone 3	$237.08	$25.27	9.4	8.0%	0.8
Zone 4	$231.23	$21.55	10.7	9.0%	1.0
				Total	13

Calculation of Monthly Amortized CPE and Marketing Costs	Total Costs	NPV	Amortized Monthly Cost
CPE Investment	$ 2,212.70		$32.16
CPE Installation	$ 94.89		$4.48
CPE Removal	$ 52.25	$41.42	$1.96
CPE Maintenance	$ 17.42		$0.82
Marketing	$ 625.00		$29.51
Total Monthly Amortized CPE and Marketing Costs		$64.45	
Calculation of Monthly Amortized Network Costs			
Multiplexing	$ 128.57	$2.14	
Total Monthly Amortized Network Costs		$2.14	
Monthly DS1 Switching and Transport Costs (Assuming 12 VGE)		$ 40.60	

UNE DS1 Loop Rates	MRC	NRC	Disconnection Charge	NPV of Disconnection Charge	Monthly Amortized Disconnection Charge	Monthly Amortized NRC	Total Monthly DS1 Loop Cost
Zone 1	$ 91.06	$ 123.77	$ -	$0.00	$0.00	$5.84	$96.90
Zone 2	$ 95.45	$ 123.77	$ -	$0.00	$0.00	$5.84	$101.29
Zone 3	$ 97.10	$ 123.77	$ -	$0.00	$0.00	$5.84	$102.94
Zone 4	$ 91.25	$ 123.77	$ -	$0.00	$0.00	$5.84	$97.09
Loop Cross Connection Cost Per DS1 Connection	$9.00	$ 45.03				$2.13	$11.13

UNE-P Rates	MRC
Zone 1	$16.60
Zone 2	$22.84
Zone 3	$25.27
Zone 4	$21.55

DS-1 Backhaul Charges	DS-3 Special Access Fixed	DS-3 Special Access Per-Mile	DS-3 Special Access Mileage	DS3 NRC	Monthly Amortized NRC Cost	Total DS-3 Backhaul	Per-DS1 Backhaul Cost
Backhaul	$384.98	$39.15	3	$0.00	$0.00	$502.43	$17.94

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of a Commission Inquiry into The Possibility of Impairment without Unbundled Local Circuit Switching When Serving the Mass Market	))))	**Case No. TO-2004-0207**

AFFIDAVIT OF JOHN F. FINNEGAN

I, John F. Finnegan, being duly sworn, state that I am a Senior Policy Witness for AT&T. I have participated in the preparation of the attached Direct Testimony in question and answer form to be presented in this case, and the answers were given by me. I have knowledge of the matters set forth in such answers and that such answers are true and correct to the best of my knowledge and belief.

Dated this 18th day of December 2003.

John F. Finnegan

STATE OF COLORADO)
) **ss**
CITY AND COUNTY OF DENVER)

SUBSCRIBED AND SWORN TO before me this 18th day of December 2003 by John F. Finnegan who certifies that the foregoing is true and correct to best of his knowledge and belief.

Witness my hand and official seal.

NOTARY PUBLIC
ADAM W. WALCZAK
STATE OF COLORADO

My Commission Expires 1/22/06

Notary Public

My commission expires:

1/22/06

CERTIFICATE OF SERVICE
(TO-2004-0207)

I certify that copies of the Phase I Direct Testimony of John F. Finnegan on behalf of AT&T Communications of the Southwest, Inc.were served on the following by e-mail on December 18, 2003.

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