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SOUTHWESTERN BELL TELEPHONE, L.P. D/B/A

SBC MISSOURI

CASE NO. TO-2004-0207

DIRECT TESTIMONY

OF

GARY A. FLEMING

St. Louis, Missouri

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 GARY R. FLEMING

STATE OF TEXAS)

COUNTY OF COLLIN)

I, Gary R. Fleming, of lawful age, being duly sworn, depose and state:

1 My name is Gary R. Fleming. I am presently a consultant to SBC Management Services, LP.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony.

3 I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Gary R. Fleming

Subscribed and sworn to before me this 10 day of December, 2003.

HORTENSIA F. CHAVES NOTARY PUBLIC STATE OF TEXAS EXPIRES 2-9-2005

Hortensia F. Chaves
Notary Public

My Commission Expires:

2-9-05

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Gary A. Fleming. My address is 6820 Creekside Ln, Plano, Texas, 75023.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am a consultant for SBC Management Services L.P. ("SBC") involved with the switching and policy aspects of the FCC's Triennial Review Order.

Q. WHAT IS YOUR TELECOMMUNICATIONS EXPERIENCE?

A. I have over 30 years of telecommunications experience, with the preponderance in network related positions. I retired from SBC, on November 15, 2001. At the time of my retirement I was Vice President-Network Regulatory. In this capacity, I was responsible for the development of technical regulatory policies, network interconnection negotiations, and advocacy of technical regulatory issues at a state and federal level. During my tenure in this position, I personally testified before several state regulatory commissions concerning various issues, including SBC's 271 applications, and participated in commission sponsored workshops.

Q. PLEASE DESCRIBE YOUR WORK EXPERIENCE WITH SBC.

A. I was hired by Southwestern Bell Telephone Company (now Southwestern Bell Telephone, L.P.) in January of 1972 as Chief Operator of a 3CL switchboard operation. Within six months I was moved to a network position responsible for the administration of electromechanical switches, and remained in network related fields for the rest of my career. From 1973 until 1985, I worked in a variety of network positions including network design, where I was responsible for preparation of network design orders to augment network switches for electromechanical and electronic switching systems; network administration with responsibilities for administration of switching and transport facilities for assigned offices in portions of Oklahoma; and network operations, where I had responsibility for switch and transport facility maintenance and electromechanical

switch replacements in eastern Oklahoma. In 1985 I transferred to Bell Communications Research (now Telcordia) as a Member of Technical Staff where I worked in the North American Numbering Plan Administration and created and published industry guidelines for the allocation of numbering resources. In 1987 I was appointed Director-Carrier Technical Liaison and moderated the Industry Carriers Compatibility Forum, a national industry forum comprised of local exchange and interexchange carriers which dealt with technical interconnection issues. In 1989, I returned to Southwestern Bell Telephone (SWBT) to handle long range network planning for the state of Oklahoma. From 1993 until 1996, I held a series of jobs in the network planning organization for the MOKA (Missouri, Oklahoma, Kansas and Arkansas) region which included responsibilities for network planning process improvement; wire center forecasting, trunk facilities management, numbering planning and network regulatory planning and network interconnection negotiations. I assumed responsibility for the implementation of Local Number Portability (LNP) for SWBT in 1996 during which time I served as SBC's representative to the North American Numbering Council (NANC) LNP Administration Working Group and as President of the Southwest Region Portability Company Limited Liability Corporation. I continued in that role until 1998, when I assumed responsibility for network regulatory management for all of Southwestern Bell Telephone Company. I continued in this position, with a title change to Executive Director-Network Regulatory and then Vice President-Network Regulatory until my retirement.

Q. WHAT IS YOUR EDUCATIONAL BACKGROUND?

A. I hold a Bachelor of Science degree in General Engineering from Oklahoma State University. I also have completed training courses conducted by the Bell System, AT&T (Lucent), Northern Telcom (Nortel), Bellcore (Telcordia) and SWBT on network switching systems.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I will address the appropriate definition of geographic markets in the state of Missouri for the purposes of the mass market switching analysis required by the FCC and the

appropriate DS0 cutoff level for differentiating the mass market from the enterprise market.

Q. COULD YOU PROVIDE A "ROADMAP" OF SBC MISSOURI'S TESTIMONY IN THIS PROCEEDING?

A. Yes. I will provide certain facts and positions supporting SBC Missouri's definition of the geographic market and the DS0 cutoff. Dr. Tim Tardiff addresses the definition of geographic markets from an economic perspective.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. I will first discuss what SBC Missouri believes is the proper definition of a geographic market and present information to support that definition. I will next discuss the proper DS0 cutoff level for defining "enterprise" customers.

Q. ARE YOU INCLUDING ANY ATTACHMENTS WITH YOUR TESTIMONY?

A. Yes. I have included several attachments as described below:

- Schedule GAF-1 – Metropolitan Statistical Areas in Missouri
- Schedule GAF-2HC – SBC Missouri central offices with ported numbers, collocation, EELs, UNE Loops, ALs, and UNE-P lines
- Schedule GAF-3 – CLEC switches in Missouri
- Schedule GAF-4 – Summary of NXX codes assigned to CLECs
- Schedule GAF-5 – AT&T Schedule JR-3 from the testimony of Javier Rodriguez in Case No. TO-2001-455.
- Schedule GAF-6 – CLEC Integrated Access Analysis

II. OVERVIEW OF FCC'S MASS MARKET SWITCHING CONCLUSIONS

Q. WHAT FINDING DID THE FCC MAKE WITH RESPECT TO THE UNBUNDLING OF LOCAL CIRCUIT SWITCHING FOR THE MASS MARKET?

A. Although it made a national finding of impairment with respect to local circuit switching for the mass market (based solely on alleged hot cut related costs and difficulties), the FCC stated in the *Triennial Review Order* (TRO) that "a more granular analysis may reveal that a particular market is not subject to impairment in the absence of unbundled local circuit switching."[1] As the FCC explained, "[b]ecause our [impairment] standard and the guidance from the [D.C. Circuit's] *USTA* decision require that the determination of impairment be made on a granular basis, and because the record provides insufficient evidence concerning the characteristics of particular markets, we find it appropriate to ask the states to assess impairment in the mass market on a market-by-market basis."[2]

Q. CAN YOU PLEASE PROVIDE AN OVERVIEW OF THE ACTIVITIES ASSIGNED TO THE STATES?

A. Yes. The state activities include:

- Determining the geographic markets;
- Establishing a DS0 "cut-off," which serves to differentiate between the mass market and the enterprise market;
- Applying two local switching triggers to the geographic markets;
- If neither of the triggers is satisfied in a geographic market, determining the potential ability of CLECs to deploy their own switches to serve the geographic market;

[1] *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers* (CC Docket No. 01-338), *In the Matter of Implementation of the Local Competition Provisions of the Telecommunications Act of 1996* (CC Docket No. 96-98), *In the Matter of Deployment of Wireline Services Offering Advanced Telecommunications Capability* (CC Docket No. 98-147); Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, FCC 03-36 (released August 21, 2003) ("*Triennial Review Order*" or "*TRO*"), ¶ 461.

[2] *Id*., ¶ 493.

- If the state commission determines that CLECs are impaired without access to unbundled switching, determining whether rolling (e.g., 90-day) access to unbundled local circuit switching would eliminate the impairment.

I will address the first two of these activities in more detail in my testimony below. I will not be discussing the application of the local switching triggers to these areas in this phase of the proceedings.

III. GEOGRAPHIC MARKET DEFINITION

A. Principles of Geographic Market Definition.

Q. DID THE FCC PROVIDE ANY DIRECTION TO STATE COMMISSIONS REGARDING THE ESTABLISHMENT OF APPROPRIATE GEOGRAPHIC MARKETS?

A. Yes. The FCC determined that the geographic market for mass market switching may not be as large as the entire state, nor may it be so small that it fails to reflect available scale and scope economies from serving a wider market. The FCC's specific rule regarding geographic market definition identifies three criteria that must be considered:

> Market definition. A state commission shall define the markets in which it will evaluate impairment by determining the relevant geographic area to include in each market. In defining markets, a state commission shall take into consideration [1] the locations of mass market customers actually being served (if any) by competitors, [2] the variation in factors affecting competitors' ability to serve each group of customers, and [3] competitors' ability to target and serve specific markets profitably and efficiently using currently available technologies. A state commission shall not define the relevant geographic area as the entire state.[3]

Paragraph 496 of the *Triennial Review Order* lists specific factors that a state commission *may* elect to consider in defining a geographic market. These are "how competitors ability to use self-provisioned switches or switches provided by a third-party wholesaler to serve various groups of customers varies geographically"; "how UNE loop rates vary across the state"; "how retail rates vary geographically"; "how the number of high-

[3] 47 C.F.R. § 51.319(d)(2)(i).

revenue customers varies geographically"; and "how the cost of serving customers varies according to the size of the wire center and the location of the wire center"; and "variations in the ability of wire centers to provide adequate collocation space and handle large numbers of hot cuts."[4]

B. Definition of Geographic Markets in Missouri.

Q. DOES SBC MISSOURI HAVE A SPECIFIC RECOMMENDATION FOR THE DEFINITION OF GEOGRAPHIC MARKETS IN MISSOURI?

A. Yes. SBC Missouri believes that the Commission should use Metropolitan Statistical Areas ("MSAs") to define the geographic markets for the purpose of the mass market switching analysis.

Q. DOES YOUR TESTIMONY DEMONSTRATE HOW SBC MISSOURI'S PROPOSED GEOGRAPHIC MARKETS MEET THE CRITERIA ESTABLISHED BY THE FCC?

A. Yes. I discuss the FCC's first criterion below by demonstrating where CLECs are currently serving Missouri mass market customers - both with their own switches and through use of SBC Missouri's unbundled switching. I also use this data to address the FCC's third criterion. For example, I will demonstrate through several different kinds of data that where CLECs have entered a MSA market using their own switches, they have the ability to use them to serve the mass market customers in most if not all of the MSA if they choose. Later in my testimony, I discuss the FCC's second criterion and demonstrate that there is little variation across the MSAs in factors that might substantively affect a competitor's ability to serve mass market customers. Finally, I discuss some of the FCC's factors that state commissions *may* choose to consider in the event that the Commission deems them to be relevant here.

[4] *Triennial Review Order*, ¶¶ 495-96.

Q. WHAT IS A "METROPOLITAN STATISTICAL AREA"?

A. In its June 6, 2003 bulletin, OMB BULLETIN NO. 03-04, the Office of Management and Budget ("OMB") defined a MSA as having at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core, as measured by commuting ties.

Q. HOW MANY MSAs ARE THERE IN MISSOURI?

A. There are eight MSAs in Missouri.

- Columbia, MO Metropolitan Statistical Area
- Fayetteville-Springdale-Rogers, AR-MO Metropolitan Statistical Area
- Jefferson City, MO Metropolitan Statistical Area
- Joplin, MO Metropolitan Statistical Area
- Kansas City, MO-KS Metropolitan Statistical Area
- St. Joseph, MO Metropolitan Statistical Area
- St. Louis, MO-IL Metropolitan Statistical Area
- Springfield, MO Metropolitan Statistical Area

Q. WHAT GEOGRAPHIC AREA IS INCLUDED IN EACH OF THE MSAs?

A. MSAs are composed of counties. Schedule GAF-1 contains a list of the counties included in each MSA in Missouri.

Q. DOES SBC MISSOURI SERVE ENTIRE MSAs?

A. No. There is some territory in each MSA that is served by other incumbent local exchange telephone companies and where SBC Missouri does not provide service. Additionally, there are four MSAs which extend into other states. SBC Missouri is proposing that the Commission define the market areas as those portions of the MSAs located within Missouri, and that the use of these markets for impairment analyses for SBC Missouri be limited to SBC Missouri's service areas. SBC Missouri does not provide service to the Fayetteville-Springdale-Rogers, AR-MO MSA, and I will not

address it further in this testimony. Additionally, the quantity of SBC Missouri access lines within the Columbia and Jefferson City MSAs is minimal, and they also will not be addressed further in my testimony.

Q. DO MSA BOUNDARIES TRACK THE BOUNDARIES OF SBC MISSOURI WIRE CENTERS?

A. In general. Although wire center serving areas, unlike MSAs, are not designed strictly around county boundary definitions. In most instances, the service areas of wire centers in a MSA will be completely within the MSA. Around the periphery of MSAs, however, there may not be an exact match between the wire center service area and the MSA boundary.

Q. HOW DO YOU RECOMMEND THE COMMISSION DEAL WITH THESE VARIATIONS?

A. To accommodate this difference, I propose that the entire service area of a wire center be treated as part of the MSA in which the central office is physically located.

Q. COULD FUTURE CHANGES IN MSA BOUNDARIES MAKE IT DIFFICULT FOR THE COMMISSION TO USE MSAS AS A MARKET AREA DEFINITION?

A. No. First, MSA boundary changes are infrequent, and the current boundaries should be stable for years. The OMB defines MSAs based on census data which is collected only every ten years. The very fact that the OMB has just released a change in MSAs indicates that the current MSAs should be stable for an extended period in the future. While there can be changes in the intervening years, they tend to be administrative and/or limited to an individual state. If future changes by the OMB result in a reassignment of counties in the Missouri MSAs, the Commission could choose to continue with the same market area boundaries or decide to reevaluate those boundaries. Alternatively, if the Commission wishes to dispose of the question now, it could freeze the market boundaries based on the OMB's June 2003 MSA definitions.

Q. PARTS OF THE ST LOUIS AND KANSAS CITY MSAS ARE NOT LOCATED IN MISSOURI. WHAT SHOULD THECOMMISSION DO ABOUT THOSE PARTS OF A MSA?

A. SBC Missouri understands that the Commission has no authority to make decisions about the counties located in Illinois (St. Louis MSA) and Kansas (Kansas City MSA). Therefore, no action is required on these portions of the MSA.

Q. HOW SHOULD AREAS OUTSIDE THE MSAS BE ADDRESSED?

A. Schedule GAF-2HC is a list of SBC Missouri wire centers. As shown on Schedule GAF-2HC, there are a number of SBC Missouri wire centers that are not assigned to an MSA. These are generally located in smaller urban and rural areas. The use of Micropolitan Statistical Areas[5] may be appropriate as geographic markets for the smaller urban areas. However, geographic market definitions for these areas outside of the MSAs in Missouri should be addressed at a later date and are not discussed in this testimony.

Q. WOULD SMALLER GEOGRAPHIC MARKETS (*E.G.*, COUNTY OR WIRE CENTER) BE APPROPRIATE?

A. No. Smaller market definitions would conflict with the FCC's mandate that "states should not define the market so narrowly that a competitor serving that market alone would not be able to take advantage of available scale and scope economies from serving a wider market."[6] It would be hard to conceive of a market narrower than a wire center, and from a practical perspective, it would be neither efficient nor reasonable for a competitor to serve only an isolated wire center. The best proof of this is the actual entry pattern of competitors in this state. It does not appear that any competitors have generally chosen to enter the market on a wire center level. Rather, competitors have entered the market on a regional basis, in clear recognition of the economies of scale and

[5] Micropolitan Statistical Areas ("MicroSAs") are a relatively new set of statistical areas defined by the OMB that have at least one urban cluster of at least 10,000 but less than 50,000 population, plus adjacent territory that has a high degree of social and economic integration with the cores as measured by commuting ties. This classification includes about 10 percent of the population. MicroSAs have the same characteristics, albeit on a smaller scale, as MSAs, and allow the states to address competition in smaller metropolitan areas in the State.

[6] *Triennial Review Order*, ¶ 495.

scope available via geographically broader entry. CLEC's market entry activity confirms that CLECs view the market on geographically broad terms, such as an MSA or even larger area.

Q. ARE THERE OTHER REASONS WHY WIRE CENTERS WOULD NOT BE APPROPRIATE FOR THE GEOGRAPHIC MARKET AREA DEFINITION?

A. Yes. Defining the geographic market area as a wire center would also be inconsistent with the TRO because it would give competitive providers the power to perpetuate unbundled switching and UNE-P in wire centers indefinitely based on the *relative* economics of use of their own switch versus low priced UNE switching rather than on whether it is *economically feasible* to serve mass market customers using their own switch. Not only is this inconsistent with the TRO, it would also provide a strong disincentive for competitive providers to expand the use of their switches to serve the mass market.

C. <u>Support for MSAs as the Proper Geographic Market</u>.

Q. WHAT EVIDENCE SUPPORTS THE USE OF MSAS AS THE PROPER GEOGRAPHIC MARKET?

A. The best evidence comes from the manner in which CLECs have deployed their own switches and served customers from those switches in Missouri. CLECs generally have not entered the local market on a county-by-county basis or wire center-by-wire center basis. Instead, CLECs have deployed a large number of switches in Missouri. These switches each can serve very large geographic areas, including entire MSAs or larger areas. As evidenced by data presented below, in those MSA markets where CLECs are using self provisioned switches they are serving a large number of customers, including mass market customers, in wire centers which constitute a significant majority of the SBC access lines in the MSA. Moreover, the CLECs themselves do not view the relevant market as being as small as a county or wire center, but rather speak of entry in terms of entire metropolitan areas (such as MSAs) or even larger areas

1. CLEC Deployment of Their Own Switches.

Q. HAVE CLECS WIDELY DEPLOYED THEIR OWN SWITCHES IN MISSOURI ?

A. Yes. Competitors have widely deployed their own switches in Missouri to provide local telephone services. Moreover, a number of those switches are currently being used to offer service to mass market customers in many locations within MSAs. I have identified over 20 CLECs that have deployed over 40 digital central offices switches to serve Missouri. Schedule GAF-3 is a list of telephone switches owned by CLECs which are used to provide local service in Missouri. Each of these switches has at least one Missouri NXX code assigned to it. Each such switch should be capable of serving CLEC customers throughout the MSA and many are serving *mass market* customers.

Q. WHAT IS THE SOURCE OF YOUR DATA REGARDING CLEC CIRCUIT SWITCHES, AND IS IT RELIABLE?

A. The primary source of data regarding CLEC circuit switch totals and deployment information is Telcordia's *Local Exchange Routing Guide* ("LERG"). This is the database that both incumbent and competitive local carriers use to provide the location of their switches to each other and to interexchange carriers to ensure the proper routing of calls.[7] Because of the obvious importance to all carriers of maintaining accurate and up-to-date information in the LERG, it is a reliable source of information about the presence of competitive switches.

Q. HOW CURRENT IS THE LERG INFORMATION THAT YOU USED?

A. The data was obtained from the LERG in October 2003.

[7] *See* Telcordia, *Telcordia Routing Administration Catalog of Products*, http://www.telcordia.com/products_services /trainfo/catalog_details.html#Telcordia%20LERG%20Routing%20Guide ("The LERG Routing Guide is primarily designed to be used for (1) routing of interLATA calls by interexchange carriers, (2) providing information on the local environment for the numerous carriers involved in the local arena, and (3) any other company needing information about the network, numbering, and other data in the product.").

Q. IS THE LERG A COMPLETE SOURCE OF INFORMATION CONCERNING CLEC SWITCH OPERATIONS?

A. While the routing information in the LERG is correct, all of the information in the LERG is not always complete. A carrier need not populate certain fields in the LERG and, therefore, the data may not be complete. For example, a CLEC does not have to indicate the type of switch that it is using or that the switch is located outside of the state. If the switch is physically located outside of the state but is used to serve Missouri customers, the CLEC will provide the location of the Point of Interconnection rather than that of the actual switch.

Q. HAVE CLECS CONCEDED THAT THEIR SWITCHES SERVE OR CAN SERVE LARGE GEOGRAPHIC AREAS AS LARGE OR LARGER THAN AN MSA?

A. Yes. CLECs have repeatedly testified that their switches are capable of serving areas as large or larger than an entire LATA[8]. For example, AT&T witness Javier Rodriguez testified in Missouri Case No: TO-2001-455,

> "I am presenting a switch list showing the switch name and its physical location (Schedule JR-3). The AT&T switches shown serve our AT&T Local customers throughout the state. The geographic areas served by those switches are comparable to the areas served by SWBT tandem switches. For example, the AT&T switches in Kansas City serve the 521, 522 and 524 LATAs and in St. Louis, the AT&T switches serve the 520 and 521 LATAs. We are currently serving customers throughout the state in locations such as Belton, Branson, Carthage, Cassville, Cape Girardeau, Chesterfield, Columbia, Creve Coeur, Fenton, Gladstone, Jefferson City, Joplin, Kansas City, Ladue, Lebanon, Liberty, Manchester, Osage Beach, Poplar Bluff, Richmond, St. Charles, St. Joseph, St. Louis, Independence, Springfield, Webster Grove, Wentzville and Wright City.

[8] The consideration presented under the FCC's framework for defining the geographic markets in which impairment will be evaluated is significantly different from the test for tandem compensation, which should reflect network costs and functionality. Further, because a switch can serve any particular customer within an MSA does not mean that it can serve all customers within the MSA.

> One can see that the distances to transport calls to these customers from our switches can be anywhere from 5 miles to over 150 miles. This demonstrates that AT&T's switches serve a geographically dispersed customer base, even though that is not a requirement of the FCC's rule for receipt of the TIR. Based on this information our switches clearly cover the same geographic area as the SWBT tandems in the same LATAs."

I have provided a copy of Schedule JR-3 as Schedule GAF-5.

Q. ARE THERE OTHER WAYS TO DETERMINE THE GEOGRAPHIC AREAS WHERE CLECS ARE USING THEIR OWN CIRCUIT SWITCHES TO SERVE END USERS AND HAVE THE ABILITY TO SERVE MASS MARKET CUSTOMERS?

A. Yes. The geographic locations that CLECs serve, or can serve, by using their own switches can be determined by four other methods: (1) examining the locations where CLECs have obtained unbundled local loops without also obtaining unbundled local switching (stand alone loops), (2) examining "ported number" data, (3) examining CLEC NXX assignments, and (4) examining the locations where CLECs have collocated or leased enhanced extended links (EELs)[9] in SBC Missouri central offices.

2. <u>Unbundled Loops.</u>

Q. WHAT INFORMATION DOES SBC MISSOURI HAVE ABOUT THE UNE LOOPS THAT EACH CLEC BUYS?

A. SBC Missouri maintains records in the ordinary course of its business that track the number of UNE loops purchased by each CLEC and where those UNE loops are located.

[9] An enhanced extended link (EEL) consists of a combination of an unbundled loop, multiplexing/concentrating equipment, and dedicated transport. The EEL allows new entrants to serve customers without having to collocate in every central office in the incumbent's territory.

Q. PLEASE EXPLAIN WHY THIS INFORMATION IS RELEVANT TO THIS PROCEEDING.

A. The location of the stand alone unbundled local loops shows the geographic areas within which CLECs are providing service using their own switches, including service to residential and business customers in the mass market. As Schedule GAF-2HC shows, CLECs are using their own switches in conjunction with unbundled loops to serve mass market customers in a large number of wire centers in the largest Missouri MSAs where they have entered the market. The wire centers in MSAs where CLECs are using their own switching facilities and SBC unbundled loops to serve mass market customers account for over 76% of SBC Missouri's total access lines in those MSAs. In most instances, the use of UNE loops also closely parallels the locations where CLECs have obtained collocation space. Schedule GAF-2HC shows how the use of UNE loops correlates to the use of ported numbers, collocation and EELs. As indicated earlier stand alone unbundled loops describe the situation where a CLEC obtains an unbundled loop without unbundled switching, therefore this stand alone loop information excludes loops used as a part of a UNE Platform.

3. Ported Numbers

Q. HOW DO PORTED NUMBERS IDENTIFY GEOGRAPHIC AREAS WHERE CLECS ARE USING THEIR OWN CIRCUIT SWITCHES TO SERVE END USERS?

A. Local number portability (LNP) allows an end user to retain its telephone number when changing service providers by "porting" the end user's number from the ILEC switch to the CLEC switch from which the end user is served. Each ported number represents a line served by a CLEC self-provisioned switch and identifies the wire center area in which the end user customer is located. SBC Missouri maintains internal data regarding the wire centers in which CLECs have ported telephone numbers from SBC Missouri's switches to the CLECs' own switches. Schedule GAF-2HC indicates the number of

CLECs using ported numbers in each SBC Missouri central office and the quantity of ported numbers in each central office.

Q. HAVE CLECS PORTED NUMBERS TO THE MAJORITY OF CENTRAL OFFICES IN MSAS?

A. Yes. In Missouri MSAs where CLECs have entered the MSA market and are serving customers using their own switches they have ported numbers in a majority of the wire centers.

Q. DOES THIS PORTED NUMBER DATA IDENTIFY ALL OF THE CUSTOMERS THAT CLECS ARE SERVING FROM THEIR SELF-PROVISIONED SWITCHES?

A. No. It only identifies those end user lines won from SBC Missouri where the end user has retained its number. It does not include lines that CLECs serve using their own NXXs or lines they have won from other providers which were assigned telephone numbers from the those providers' assigned NXX codes. Thus, this data likely understates the scope of the switch-based CLECs' geographic coverage.

Q. DOES THIS PORTED NUMBER DATA INCLUDE BOTH MASS MARKET AND ENTERPRISE CUSTOMERS?

A. Yes, however, the point of this data is twofold. First, it is responsive to the FCC's criterion 1 as identified earlier, by identifying the location of customers currently being served by CLECs using their own switches. Second, as I explain below, it also addresses criterion 3 in that it is indicative of the CLECs' ability to serve mass market customers profitably and efficiently using the scale and scope economies referenced in the FCC's directions on geographic market area determination. While these ported numbers are likely to include both mass market and enterprise customers, if it were assumed that all of the ported numbers were for enterprise customers, the data would still be relevant to the market determination. The FCC found in paragraph 508 of the TRO that the existence of switching serving customers in the enterprise market in a wire center to be a

significant indicator of the possibility of serving the mass market because of demonstrated scale and scope economies.

4. NXX Codes

Q. WHAT ARE NXX CODES AND HOW ARE THEY ASSIGNED?

A. NXX codes, or central office ("CO") codes, are the three digit code which follows the area code, or NPA code, in a ten digit telephone number. Each NXX code is associated with a "rate exchange area" served by an incumbent LEC and contains 10,000 numbers.[10] The North American Numbering Plan (NANP) CO Code Administrator assigns NXX codes to CLEC switches. In order to obtain a NXX code, CLECs must submit an application to the Code Administrator certifying that a need exists for the assignment of a NXX code to its switch. For initial code assignments in a rate center, CLECs are required to provide documented proof that "(1) the code applicant is authorized to provide service in the area for which the numbering resources are requested and (2) the applicant is or will be capable of providing service within 60 days of the number resource activation date."[11] To prove their ability to provide service in the geographic area covered by an NXX code, CLECs may submit an executed interconnection agreement, a business plan excerpt showing planned coverage areas and in-service dates, a switch installation schedule or other indicators of the presence of an installed switch and interconnection. Thus, the rate exchange areas where CLECs have obtained NXX codes are the areas where CLECs have formally certified their capability and plans to use their own switches to provide telecommunications services. Because NXX codes are a finite resource and NXX assignments directly impact NPA exhaust, codes are not requested or assigned casually. In fact, holders of NXX codes must be prepared to participate in an audit in order to assess code utilization, and if a code holder no longer has a need for a code, the guidelines require the return of the code to the CO Code Administrator.

[10] Rate exchange areas are "geographically defined areas within which calls that originate and terminate (*i.e.*, remain within the area) are considered local calls." *FCC Local Competition Report,* Dec. 1998 ed. at 41, n.17.

[11] Section 4, Central Office Code (NXX) Assignment Guideline, INC 95-0407-008 issued August 15, 2003.

Q. HOW CAN NXX ASSIGNMENTS BE USED TO DETERMINE WHERE CLECS ARE OFFERING SERVICE TO LOCAL CUSTOMERS USING THEIR OWN CIRCUIT SWITCHES?

A. As indicated earlier, besides porting an end-user's existing telephone number to the CLEC's own switch, a CLEC may assign new telephone numbers to end users from the NXX codes assigned to its switch. Because each NXX code is associated with a geographic area (the rate exchange area), the geographic areas that CLECs serve or are capable of serving with their own circuit switches can be determined by the NXX codes that CLECs have obtained. Telcordia's LERG database contains the location of each CLEC circuit switch, the NXX codes associated with those switches, and the rate exchange areas served by those NXX codes. Schedule GAF-4 shows the number of NXX Codes assigned to CLECs in each MSA. As Schedule GAF-4 demonstrates, CLECs have obtained NXX codes to serve a large number of customers in each of the MSAs where CLECs have entered the market.

Q. CAN NXX CODES BE USED FOR BOTH MASS MARKET AND ENTERPRISE CUSTOMERS?

A. Yes. However, just as I indicated in my response regarding ported numbers, the use of NXX code assignment data is twofold. It is used to demonstrate where CLECs are providing local telecommunications services to customers today using their own switches, and it is also relevant to the determination of the market area as an indicator of the ability of CLECs to provide local telecommunications service to the mass market.

5. <u>CLEC Collocation Arrangements</u>.

Q. HOW ARE COLLOCATION AND EELS USED AS INDICATORS OF THE GEOGRAPHIC AREA SERVED BY CLECS?

A. A CLEC that collocates in an SBC Missouri central office has the ability to access the local loops in that office (or, with EELs, to connect to local loops in other offices) and to direct traffic from those loops back to the CLEC's own switch. The presence of collocation and EELs in multiple offices within an MSA indicates a capability and intent

to do business throughout that MSA. And when multiple CLECs collocate or acquire EELs in multiple offices across an MSA, it indicates that they all are viewing the relevant competitive market in much the same way; that is, as the entire MSA.

Schedule GAF-2HC shows the number of CLECs collocated and the number of CLECs with EELs in each SBC Missouri central office. Most significantly in those MSAs where CLECs have entered the market using their own switches, CLECs have collocated or acquired EELs in the majority of the Missouri central offices. For example, CLECs are collocated and or have EELs in 19 of 23 SBC Missouri central offices in the Kansas City MSA ; 42 of 51 SBC central offices in the St. Louis MSA and 10 of 13 SBC central offices in the Springfield MSA. Further in the larger MSAs, most central offices have 3 or more CLECs collocated and/or leasing EELs. In those MSAs markets that CLECs have entered using their own switches they have collocated in wire centers which serve over 95% of SBC Missouri's total access lines in these MSAs.

Q. CAN COLLOCATION ARRANGEMENTS BE USED FOR PROVIDING LOCAL TELECOMMUNICATIONS SERVICE TO BOTH MASS MARKET AND ENTERPRISE CUSTOMERS?

A. Yes. Again, as indicated in my earlier responses on ported numbers and NXX code assignments, collocation data is used to both demonstrate where CLECs are currently providing local telecommunications services using their own switches as well as providing evidence of the CLECs' ability to serve mass market customers profitably and efficiently, and of the scale and scope economies referenced in the FCC's directions on geographic market area determination.

Q. DOES SBC MISSOURI HAVE OTHER DATA WHICH CAN BE USED TO DEMONSTRATE WHERE CLECS ARE SERVING THE MASS MARKET TODAY?

A. Yes. UNE-P residential lines, while addressing only a portion of the mass market, also can be used to demonstrate where CLECs have targeted and are serving mass market customers. UNE-P lines are in use in offices throughout Missouri, which clearly shows that the geographic area for the mass market is large. Additionally, the CLEC focus on

the MSA market areas can be seen in the market penetration of UNE-P which is higher in the MSAs where CLECs are serving the mass market with their own switches than in the rural areas.

6. CLEC-Provided Information.

Q. IN ADDITION TO THE DATA YOU HAVE PRESENTED REGARDING SWITCH DEPLOYMENT, UNBUNDLED LOOPS, PORTED NUMBERS, NXXS, COLLOCATION, AND EELS, DOES CLEC-PROVIDED INFORMATION CONFIRM THAT THE MSA IS AN APPROPRIATE GEOGRAPHIC MARKET?

A. I have had only a very limited opportunity to review CLEC responses to discovery as not all CLECs had responded to discovery requests and others had responded only in a partial fashion. However, public CLEC marketing information tends to confirm that CLECs enter the market on a much broader basis than a single wire center.

Q. DO THE PUBLIC STATEMENTS AND ENTRY BEHAVIOR OF THE CLECS REFLECT MARKET ENTRY AT THE WIRE CENTER LEVEL ?

A. No, they do not. Press releases by Allegiance[12], Gabriel[13] (now Nuvox) and Birch[14] indicate a much broader entry than a wire center level. Additionally, websites for McLeod and AT&T which offer interactive methods to check service availability in the MSAs, indicate that service is available across the MSA.

[12] April 3, 2000 - Allegiance Telecom, Inc. (Nasdaq: ALGX) announced today that it initiated service in St. Louis. The Company will serve small and medium-sized businesses primarily in St. Louis County, including service to the following cities: Bridgeton, Kirkwood, Manchester, Overland, St. Charles and St. Louis.

[13] Kansas City, MO. -- Tuesday, August 17, 1999 **Arrival Of Gabriel Communications, Inc. Changes The Way Kansas City Does Business** Gabriel Communications Inc. is bringing the future of telecommunications to Kansas City businesses with the launch of its integrated communications services today. St. Louis, MO. -- Wednesday, September 15, 1999 **Arrival Of Gabriel Communications, Inc. Changes The Way Springfield Does Business** Gabriel Communications Inc. is bringing the future of telecommunications to Springfield businesses with the launch of its integrated communications services today. St. Louis, MO. -- Tuesday, June 15, 1999 **Arrival Of Gabriel Communications, Inc. Changes The Way St. Louis Does Business** Gabriel Communications Inc. is bringing the future of telecommunications to St. Louis businesses with the launch of its integrated communications services today.

[14] **Kansas City, Mo.** — Birch Telecom today announced that it now is offering local and long-distance services to business and residential telephone customers in the St. Louis metropolitan area.

7. Potential Variation in Ability to Serve Customers.

Q. YOU HAVE NOW DISCUSSED 2 OF THE 3 FACTORS ESTABLISHED BY THE FCC IN RULE 51.319(D)(2)(I). WHAT IS THE THIRD FACTOR?

A. The variation in factors affecting competitors' ability to serve each group of customers.

Q. DID YOU CONSIDER WHETHER THERE IS ANY VARIATION IN FACTORS AFFECTING COMPETITORS' ABILITY TO SERVE EACH GROUP OF CUSTOMERS?

A. Yes. I first considered the amount of variation in UNE loop rates and retail rates in within Missouri MSAs.

Q. PLEASE DESCRIBE THIS ANALYSIS.

A. There are four UNE rate zones in Missouri, numbered 1 through 4, and 4 retail rate groups , A-D, with several subgroups (D1, D2, C1). The sequencing of the UNE Zones from the highest UNE loop rates to the lowest is 3, 2, 4, 1. The sequencing of Retail rates range from highest to lowest is D2, D1, D, C1, C, B, A. There are 3 retail rate groups and associated UNE rate zones in the largest two MSAs, Kansas City and St. Louis. However, over 94 % of SBC access lines are located within the two highest retail (D, B) and two lowest UNE-L (2, 1) rate zones within those MSAs. In addition, in excess of 76 % of SBC access lines are in the Retail Group D, the highest retail group, and UNE Zone 1, the lowest UNE rate zone in those MSAs. Similarly in Springfield, where there are only two retail rate groups and UNE zones, 97% of the access lines are located within the highest retail rate zone (C) and lowest UNE Zone (4) in the MSA. Finally, in the Joplin and St. Joseph MSAs, a similar pattern can be found with over 94% of the access lines in the highest of the 2 retail rate groups and lowest of the 2 UNE rate zones within the MSAs. Further, the potential for increased revenues from optional Metropolitan Calling Area (MCA) service in those portions of UNE rate zones 2 and 3 located in the optional MCA areas, which range from $12.35-$32,50 per month for

residential customers and $24.80-$70.70 for business customers in the St. Louis and Kansas City MCAs and $11.45 for residential customers and $21.75 in the optional MCA areas in Springfield, would effectively offset the higher UNE loop rates in these areas. Based on this data, I conclude that the variation in UNE loop rates and retail rates across the rate zones in the Missouri MSAs does not impair a competitor's ability to serve mass market customers in the those MSAs.

Q. WHAT DID YOU CONSIDER NEXT?

A. I next considered whether there was a material variation in the size of the SBC Missouri wire centers in the MSAs, because this reflects the number of customers available to competitors in a wire center.[15] In the two largest MSAs, Kansas City and St. Louis, 62 out of 75 total wire centers, or over 82 % of the wire centers, contain more than 5000 lines and many wire centers contain in excess of 20,000 access lines. In the Springfield MSA approximately 38% (5/13) of the wire centers are larger than 5000 access lines, but those 5 offices account for almost 90% of the access lines in the MSA.

Q. DID YOU CONSIDER ANY OTHER POTENTIAL VARIATIONS IN FACTORS AFFECTING A COMPETITOR'S ABILITY TO SERVE CUSTOMERS?

A. Yes. As indicated earlier, the FCC noted that the variations in the capabilities of wire centers to provide adequate collocation space was a factor that states may choose to consider in determining the appropriate geographic markets. In addition to demonstrating the areas in which CLECs are providing local services using their own switches, the collocation information in Schedule GAF-2HC also provides an indication of SBC Missouri's ability to provide collocation space to CLECs in its wire centers within the MSAs. As indicated in GAF-2HC, CLECs have engaged in a large amount of collocation already. To date, 25 different CLECs have obtained a total of 300 collocation arrangements in 51 separate SBC Missouri central offices in Missouri MSAs, including collocation arrangements in wire centers serving in excess of 90% of the access lines in the three largest MSAs where CLECs have entered the market using self provisioned switches. Moreover, there are no central offices in SBC Missouri's service territory

[15] See *id.*

which are closed to physical collocation. Additionally, SBC Missouri offers a variety of physical collocation arrangements, virtual collocation and EELs to meet different CLECs' needs.

Q. DID YOU CONSIDER ANYTHING WITH RESPECT TO HOT CUTS?

A. No. The Commission has initiated a separate proceeding to review the Hot Cut process in Phase 2 of Case TO-2004-0207. In that phase of the proceedings the Commission will *either* determine an appropriate batch cut process to be implemented or will determine that such a batch cut process is not necessary. In either event, the hot cut issue will be fully addressed in that phase of the proceeding and need not be considered in any geographic market analysis.

Q. DID YOU CONSIDER HOW A CLEC'S OTHER COSTS MIGHT VARY FROM WIRE CENTER TO WIRE CENTER WITHIN THE MSAS?

A. I did not perform any cost study, but I did consider whether costs for two other key elements in the provision of service to the mass market, equipment costs and collocation rates, vary between wire centers, and determined that they do not. For example, SBC Missouri does not charge any more or any less to provide a collocation arrangement in a central office in the St. Louis MSA than it does in a central office in the Kansas City MSA. I also note that a CLEC would pay its vendor the same price for the equipment it uses in a collocation space, regardless of the SBC Missouri central office in which the CLEC places equipment.

Q. WHAT ABOUT THE COSTS A CLEC WOULD INCUR TO TRANSPORT TRAFFIC WITHIN AN MSA?

A. Transport is a cost that any carrier must bear to provide service within a geographic market. In general, the larger the geographic market from a central office perspective, the more transport costs that a carrier will have to bear. There are network alternatives to minimize transport costs, however, such as through the use of concentration devices in collocation space or by dispersing switching capabilities closer to the customers so that traffic can be switched closer to the location at which it originates or terminates. There

is a trade-off between transport costs and switching costs that all carriers face, and efficient carriers generally find a way to strike an economic balance between the two consistent with there business plans. For example, AT&T witness Dennis Humes' testified in Case No. TO-2001-455, that AT&T has purposefully designed its network considering these relative switching and transport costs:

> "Due to the very high initial cost of switching platforms as compared to the lower incremental cost of high-capacity facilities, AT&T has chosen to deploy fewer switches and more transport on the end-user side of the switch. Even where AT&T has determined the need for multiple switches within a LATA, they are often collocated within the same building. The distinction between the two networks is that while SWBT deploys tandems first and then grows (has grown) into large volumes of high use dedicated trunking between offices, AT&T deploys a single switch combined with long transport on the end-user side of the switch, because that combination is incrementally less costly than adding a new switch in each part of a market."

Q. CAN CLECS OBTAIN TRANSPORT AT REASONABLE RATES?

A. In the *Triennial Review Order*, the FCC made a national finding that CLECs are impaired without access to unbundled interoffice transport at less than an OCn level. Accordingly, SBC Missouri continues to provide unbundled interoffice transport at TELRIC-based rates. Of course, this may change on select routes in the Missouri MSAs as a result of a granular analysis being performed by the Commission in Phase 3 of the Commission's TRO proceedings. Regardless of the outcome of that proceeding, however, interoffice transport will continue to be available to CLECs at reasonable rates. If SBC Missouri cannot persuade the Commission to enter a finding of non-impairment for any particular interoffice transport route, that transport will continue to be available to CLECs at TELRIC-based rates. If, on the other hand, the Commission makes a finding of non-impairment on a particular route, it will be because competitive alternatives are available such that CLECs are not impaired without access to SBC Missouri transport. In either

case, the Commission can be satisfied that transport will be available to CLECs within Missouri MSAs.

Q. WHAT DO YOU CONCLUDE REGARDING TRANSPORT COSTS?

A. I conclude that any variation in costs attributable to transport across the Missouri MSAs is a normal part of any carrier's business. There is nothing unique about the distances involved in the Missouri MSAs that would impair an efficient CLEC's ability to provide mass market service using its own switch across the MSA.

Q. WHAT DO YOU CONCLUDE FROM YOUR REVIEW OF ALL THE FACTORS YOU HAVE DISCUSSED ABOVE?

A. I conclude that there are few, if any, variations in the factors that would substantively affect a CLEC's ability to serve mass market customers in Missouri MSAs. From this, I further conclude that this factor in the FCC's Rule 51.319(d)(2)(i) supports the use of MSAs as the geographic market definition in Missouri.

IV. DS0 CUT-OFF

Q. WHAT IS THE "DS0 CUTOFF" AND HOW IS IT RELEVANT HERE?

A. The TRO establishes different unbundling rules and standards depending on whether a CLEC would use local circuit switching to serve "mass market" customers or "enterprise" customers. The FCC decided that the demarcation point between mass market and enterprise customers would be determined by the number of DS0 lines the customer uses. As the FCC explained:

> At some point, [mass market] customers taking a sufficient number of multiple DS0 loops could be served in a manner similar to that described above for enterprise customers—that is, voice services provided over one or several DS1s, including the same variety and quality of services and customer care that enterprise customers receive. Therefore, 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. This cross over point may be the point where it makes

economic sense for a multi-line customer to be served via a DS1 loop.[16]

Once established, the DS0 cutoff can be used in defining what constitutes a "mass market" customer both for purposes of market definition (by determining which CLEC customer locations are in the mass market) and for purposes of deciding whether a carrier serves mass market customers in the relevant market so as to be counted toward meeting the FCC's triggers.[17]

Q. WHAT IS THE FCC'S RULE REGARDING THE DS0 CUTOFF?

A. The FCC's rule states as follows:

> Multi-line DS0 end users. As part of the economic analysis set forth in paragraph (d)(2)(iii)(B)(3) of this section, the state shall establish a maximum number of DS0 loops for each geographic market that requesting telecommunications carriers can serve through unbundled switching when serving multiline end users at a single location. Specifically, in establishing this "cutoff," the state commission shall take into account the point at which the increased revenue opportunity at a single location is sufficient to overcome impairment and the point at which multiline end users could be served in an economic fashion by higher capacity loops and a carrier's own switching and thus be considered as part of the DS1 enterprise market.[18]

Thus, the FCCs rule requires state commissions to consider in its analysis: (1) "the point at which the increased revenue opportunity [from serving a customer through a DS1 rather than multiple DS0s] at a single location is sufficient to overcome impairment" and (2) "the point at which multiline end users could be served in an economic fashion by

[16] *Triennial Review Order*, ¶ 497.

[17] Similarly, once established, the DS0 cutoff also defines which customers constitute the enterprise market. In other words, enterprise market customers are not only those served by DS1 loops, but also, those served by DS0 loops but could be economically served by DS1 loops.

[18] 47 C.F.R. § 51.319(d)(2)(iii)(b)(4).

higher capacity loops [such as a DS1 rather than multiple DS0s] and a carrier's own switching."

Q. DID THE FCC SET A DEFAULT VALUE FOR THE DS0 CUTOFF IN THE TRIENNIAL REVIEW ORDER?

A. Yes. The FCC stated that, "absent significant evidence to the contrary," it "expect[ed]" that the appropriate cutoff in density zone 1 of the top 50 MSAs, where the switching carve-out was applicable, would be four DS0 lines.[19] In this instance the FCC is describing the minimum number of lines to be considered an enterprise customer.

Q. WHY DID THE FCC'S UNE REMAND ORDER CONCLUDE THAT FOUR LINES WOULD PROVIDE AN APPPROPRIATE POINT TO SEPARATE THE MASS MARKET FROM THE MEDIUM AND LARGE BUSINESS MARKETS?

A. The FCC observed that any business that has three or fewer lines is more likely to share characteristics of the mass market customer than a medium and large business, and likely to purchase similar volumes and types of telecommunications services as a residential mass market customer.[20] Additionally, the FCC noted that that virtually all residential customers would be captured by such a threshold. The FCC stated that while an increasing number of American homes are served by second lines, three lines for residential homes are a rarity, and four lines are even more unusual.

Q. HAS THE FCC DESCRIBED WHAT CONSTITUTES THE MASS MARKET IN ITS TRIENNIAL REVIEW ORDER?

A. Yes. The FCC has defined the mass market as consisting "primarily of consumers of analog 'plain old telephone service' or 'POTS' that purchase only a limited number of

[19] *Triennial Review Order*, ¶ 497. There has been some inconsistency in the use of the term "cutoff". In this cite, the FCCs reference to a "cutoff" of four lines, from the *UNE Remand Order* (paragraph 293 and associated rule 47 CFR 51.319(c)(1)(B)), defines the *minimum number* of DS0 lines to an *enterprise market* customer. In contrast, in its new rule cited above, the FCC defines the DS0 "cutoff" as the *maximum number* of DS0 lines to a *mass market* customer. To reduce confusion that might arise from changing terms at this point, I will define the meaning of the term "cutoff" as I use it.

[20] *UNE Remand Order*, para. 293, and associated rule 47 CFR 51.319(c)(1)(B).

POTS lines and can only economically be served via analog DS0 loops."[21] The FCC also stated that mass market customers "consist of residential and very small business customers."[22] For the purposes of these analyses for this proceeding, SBC Missouri has defined a DS0 line as an analog voice grade loop or subloop to a customer's premises. It has not used DS0 in this context to mean one of the 24 digitized channels making up a DS1 line to a customer's premises.

Q. WHAT IS SBC MISSOURI'S RECOMMENDED DS0 CUTOFF?

A. SBC Missouri proposes a cutoff of four DS0 lines per customer, meaning that a customer served by four or more DS0 lines at a given location would be in the enterprise market, while a customer served by one to three DS0 lines would be in the mass market.[23] This recommendation is based on the FCC's chosen default value and is bolstered by a qualitative analysis of CLEC offerings to small business customers and a quantitative analysis of revenue opportunities from serving such customers through higher capacity loops and the CLEC's own switching.

Q. WHAT "INCREASED REVENUE OPPORTUNITIES" WOULD A CLEC GAIN BY SERVING AN END-USER THROUGH A DS1 LOOP RATHER THAN MULTIPLE DS0 LOOPS?

A. The increased revenue opportunity for a CLEC comes from the ability to combine the customer's voice and data traffic in an efficient manner on a single high-capacity loop. Rather than obtain voice service over analog lines and Internet service over a separate broadband data line, a small business customer could obtain combined voice and broadband Internet data service, at very high speeds, over a single DS1 loop. This leads to increased service options for the customer and increased revenue for the CLEC. In addition, once the CLEC is the customer's data service provider, it can offer additional services (and thus obtain additional revenue) such as hosting the customer's web site on a

[21] *Id.*, ¶ 459.
[22] *Triennial Review Order*, ¶ 127.
[23] For the purposes of this discussion, SBC Missouri has defined a DS0 line as an analog voice grade loop or subloop to a customer's premises. It has not used DS0 in this context to mean one of the 24 digitized channels on a DS1 loop.

virtual private server, providing an IP address, supporting the customer's domain name server ("DNS"), and providing the customer's e-mail server.

Q. DO SMALL BUSINESSES HAVE SUCH SOPHISTICATED TELECOMMUNICATIONS NEEDS?

A. Yes. As AT&T stated in a June 9, 2003 press release:

> Small businesses today have become more sophisticated in terms of communications. Many have multiple locations that cross regional boundaries, interfacing with customers, suppliers and vendors. These businesses often have a growing need for advanced services.

Broadband data and Internet services provide small businesses with access to customers and suppliers at a low cost. Studies have shown that small businesses have rapidly moved online in North America. A June 2000 summary of small business Internet use surveys included results from Dun & Bradstreet and Arthur Andersen, which found that between 75 and 85 percent of small and medium businesses have web sites.[24] A Gallup survey in 2001 found that 44 percent of small businesses that did not have a web site planned to have one within the next year.[25] Similarly, a Small Business Administration (SBA) survey found that 32 percent of small businesses that are not already on the Internet plan to be within the next year.[26] The business that relies on the circuit switched network and does not use broadband access is rapidly becoming an anachronism. At the same time, however, very small business (such as those with one to three lines) may well be satisfied with basic local telephone service, long distance

[24] "Internet Use Increases at Small Businesses," *Computer*, available at www.cyberatlas.internet.com/markets/smallbiz/article/0,,10098_897771,00.html.

[25] Press release, "Summary: SuperPages.com/Gallup Release Results of National Small Business Internet-Use Survey," http://superpages.com/about/press/press3.html, downloaded December 10, 2003.

[26] Joanne Pratt, "E-Biz: Strategies for Small Business Success," October, 2002, p.12, SBA contract number HQ-00-C-0004.

service, and some vertical features (e.g., call waiting, Caller ID), and access to the Internet. Their needs are more like those of a typical residential customer, which is why such businesses would be part of the mass market.

Q. IS THE INCREASED REVENUE OPPORTUNITY FOR CLECS SUBSTANTIAL?

A. Yes. The revenue opportunity associated with providing data services to the typical small business is quite substantial and ranges between $100 and several hundred dollars per month. For example, business class small/home office ("SOHO") ADSL service for e-mail and browsing from Covad ranges from $69.99 to $149.99 per month. Higher-grade data transport services using symmetrical speed SDSL needed for online applications over the Internet range from $139.99 to $299.99 per month.[27] Further examples of CLEC prices for such offerings are discussed below.

Q. CAN YOU GIVE SOME EXAMPLES OF SMALL BUSINESS CUSTOMERS WITH THE KIND OF SERVICE REQUIREMENTS THAT MIGHT BE MOST EFFICIENTLY MET BY A DS1 RATHER THAN MULTIPLE DS0S?

A. Yes. Typically, enterprise customers have a need for data services beyond basic internet access to operate their businesses. This is the case even for the smaller business customers that have only a few voice lines. Some examples of smaller business customers with data requirements may include: franchise customers linking to a corporate or parent computer database; small law firms with large bandwidth needs for research and electronic filings; small retailers providing point-of-sale credit card processing; and small realtors using web-based programs for their listings. Both the customer and CLEC may achieve economies by serving even the smallest business customers via a higher capacity loop in lieu of multiple DS0s. And by using higher capacity loops, a CLEC can achieve incrementally increased revenues by providing its customers with bandwidth for their data needs at the same time they provide voice lines, all via the same loops.

[27] *See* http://www.covad.com/business/solutions/smalloffice.shtml.

Q. ARE CLECS OFFERING SERVICES TO MEET THE DATA NEEDS OF SMALL BUSINESSES?

A. Yes. Many CLECs offer service packages that include multiple voice, data, and Internet combinations over a single DS1 line, thereby saving customers money on their overall telecommunications bills. This is an "increased revenue opportunity" for the CLEC that arises from serving the end-user "in an economic fashion by higher capacity loops."[28] I refer to this type of offering as "Integrated Access Service." For example, Allegiance Telecom markets to businesses that require several phone lines or rapid Internet access or a combination of both. Its Integrated Access Service provides 1.54 Mbps of capacity and can be configured several ways to cost-effectively meet the customer's voice, data and Internet needs over a single access line.[29]

CLECs also report very rapid growth of this type of product. Allegiance reports that during the quarter ended September 30, 2003, its "Integrated Access Service represented approximately 37 percent of net lines sold for the quarter (and when including all services delivered via T1circuits, 54 percent of [its] net lines sold for the quarter)."[30] Allegiance's lowest-priced small business service provides up to six business lines and a 256 Kbps data line for $330 per month.[31]

Q. DO YOU HAVE ANY OTHER EXAMPLES?

A. AT&T also has responded to the need of small business customers for high-speed data services:

> To support these increased needs, AT&T has made its entire portfolio of services available to the small business market, services that competitors often reserve for much larger businesses. In addition to basic services such as local and long distance voice, the company provides data, hosting, Internet Protocol Virtual

[28] 47 C.F.R. § 51.319(d)(2)(iii)(B)(4).

[29] www.algx.com/business/voice/integrated.jsp.

[30] Allegiance 10Q for period ending 9-03.

[31] Price information obtained from Allegiance (November, 2003).

> Private Network (IP VPN), business continuity, managed services and much more, all customized to their individual needs.[32]

In particular, AT&T's "Business Network" provides a customized solution for voice, vertical features, data and Internet services.[33]

McLeod's Preferred Access Integrated Access service "combines voice and data over a single, high-speed connection to McLeodUSA's advanced network, giving your business unprecedented communications power at affordable rates." It features "six local voice lines and 256k of high-speed Internet access, with the ability to grow in single channel increments ."[34] In its July 22, 2003 Press Release announcing the launch of Preferred Advantage service, McLeod explains that, through the use of IADs, "customers will now have the opportunity to add digital channel increments for additional voice and high-speed Internet service at a single price for voice or data. […] This flexible product structure is scalable, making it easy to add or delete channels as business needs dictate."[35]

XO Communications offers its Integrated Access service, which combines local, long distance, and dedicated Internet access over the same facility. It allows the customer to balance its needs for voice lines and data speeds and is suited for any small or growing company with moderate bandwidth and voice requirements.[36] XO Communications offers between six and 23 voice lines, and from 128 Kbps to 1,024 Mbps of Internet access, for between $600 and $900 per month.[37]

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[32] AT&T Press Release, "Small businesses Benefit From Competitive Local and Long Distance Offer".

[33] http://businessesalesa.att.com/products_services/datanetworkproduct_businessnetwork.jhtml

[34] http://www.mcleodusa.com/ProductDetail.do?com.mcleodusa.req.PRODUCT_ID=241500.

[35] McLeodUSA Press Release, July 22, 2003.

[36] www.xo.com/products/smallgrowing/integrated/integratedaccess.

[37] "SME Integrated Access Services & Strategies Assessment" – Stratecast Partners, May 2003, p.l36.

Allegiance Telecom markets to businesses that require several phone lines or rapid Internet access or a combination of both. Its Integrated Access Service provides 1.54 Mbps of capacity and can be configured several ways to cost-effectively meet the customer's voice, data and Internet needs over a single access line.[38]

MCI is offering its "MCI Advantage" service which combines unlimited local and long distance calling with high speed Internet connectivity by replacing existing analog lines with a single VoIP service, a technology trend that is expanding across the US.[39]

Q. WHAT ARCHITECTURE AND TECHNOLOGY DO CLECS USE TO PROVIDE SUCH DS1-BASED SERVICES TO CUSTOMERS WITH ONLY A FEW LINES?

A. CLECs typically install an Integrated Access Device ("IAD") at the customer premise. An IAD is a device that is made available by a number of different technology providers (e.g., Lucent Technologies, Larscom, Adtran, Nortel, etc.) that allows a higher capacity facility to provide voice line ports along with broadband data capabilities. IADs can be provisioned in a variety of configurations, depending on the needs of the end user, by allocating bandwidth across a number of voice lines and varying data speeds. An IAD with the ability to serve 24 lines that is connected to a DS1 loop provides at least 1.54 Mbps of bandwidth to the end user. That bandwidth can then be divided in 64 Kbps segments to provide up to 24 voice lines, or, if the end user only needs a few voice lines, the remaining bandwidth can be used for data services. Some CLEC services are designed such that the bandwidth may be dynamically allocated in accordance with the customer's use of the voice lines and the data. There are larger and smaller IADs available in the marketplace today.

[38] www.algx.com/business/voice/integrated.jsp.

[39] http://business.mci.com/small_business/local_long_distance/mci_advantage.jsp

IADs allow CLECs to use DS1s for smaller and smaller customers in a flexible, economic, and efficient manner because they allow use of broadband pipes to integrate voice and data on single loop and allocate bandwidth based on the needs of the end-user at any point in time. This provides tremendous advantages, in terms of revenue to the CLEC and service to the end-user, compared to using multiple DS0 lines, even for the smallest business customers.

Q. YOU HAVE EXPLAINED WHY SMALL MULTILINE CUSTOMERS WOULD DESIRE THE KINDS OF SERVICE MOST EFFICIENTLY PROVIDED OVER A DS1 AND HOW CLECS ARE MEETING THEIR NEEDS WITH INTEGRATED ACCESS OFFERINGS. HAS ANY QUANTITATIVE ANALYSIS BEEN PERFORMED TO SUPPORT SBC MISSOURI'S PROPOSED DS0 CUTOFF?

A. Yes. This analysis, which was performed under my supervision, identifies combinations of voice and data services that make it economic and efficient for a CLEC to use a DS1 to serve a small business customer that has as few as four DS0 lines. The analysis compares the economics of the CLEC providing "voice-only" over multiple DS0s to the economics of providing both data and voice via a single DS1 loop. The purpose of the analysis is to determine the number of voice lines which, in conjunction with provision of data transmission, make it economic for the CLEC to serve the customer via a DS1 access loop; in other words, the economically efficient cut-over point from DS0 to DS1.

Q. PLEASE DESCRIBE THE TYPICAL CLEC THAT IS ASSUMED IN THE ANALYSIS.

A. The CLEC is assumed to serve business customers in the mass and enterprise markets and may also serve residential customers. It offers local, long-distance, and vertical services. When providing integrated access it offers business grade broadband Internet access. As the Internet access provider, the CLEC may also provide other data services including, as I noted previously, web site hosting on a virtual private server, provision of IP addresses, support for DNS, and provision of an e-mail server.

Q. HOW DID YOU MODEL THE PROVISION OF INTEGRATED ACCESS?

A. The model is explained in detail in Schedules GAF-6.

Q. WHAT ARE THE RESULTS OF THE ANALYSIS?

A. Results depend on the UNE density zones. In Missouri, a DS1 line is cost-effective, compared to four DS0s, so long as the customer has at least:

a. $108.81 per month of data revenues in Zone 1;

b. $89.48 per month of data revenues in Zone 2; and

c. $86.73 per month of data revenues in Zone 3; and

d. $94.20 per month of data revenues in Zone 4.

Based on the product bundles and prices discussed above, which CLECs are offering in the market today, a CLEC can reasonably expect to sell these amounts of data services, even to small business customers with only a few DS0 lines.

Q. IS THIS ANALYSIS SPECIFIC TO MISSOURI?

A. Yes. All of the UNE loop rates, inter-office transport rates, hot-cut charges, income and property tax rates, and depreciable lives used in the analysis are Missouri-specific.

Q. BASED ON THIS ANALYSIS AND THE DISCUSSION ABOVE, DO YOU RECOMMEND THAT THE COMMISSION ADOPT SBC MISSOURI'S PROPOSED DS0 CUTOFF?

A. Yes. This analysis provides significant evidence that the FCC's default cutoff of four DS0s defining the minimum number of DS0 lines in the enterprise market is entirely reasonable for all Missouri zones.

VI. CONCLUSION

Q. PLEASE SUMMARIZE THE KEY POINTS OF YOUR TESTIMONY.

A. The key points included in this testimony along with the testimony of the other SBC witness identified in this testimony are as follows:

1. Metropolitan Statistical Areas (MSAs) best meet the FCC's criteria and should be used by the Commission for its mass market impairment analysis.
2. The FCC default cut-off of three DS0 lines at a customer location provides the most reasonable line of demarcation between the mass market and enterprise market and should be adopted by the Commission for use within Missouri geographic market areas.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

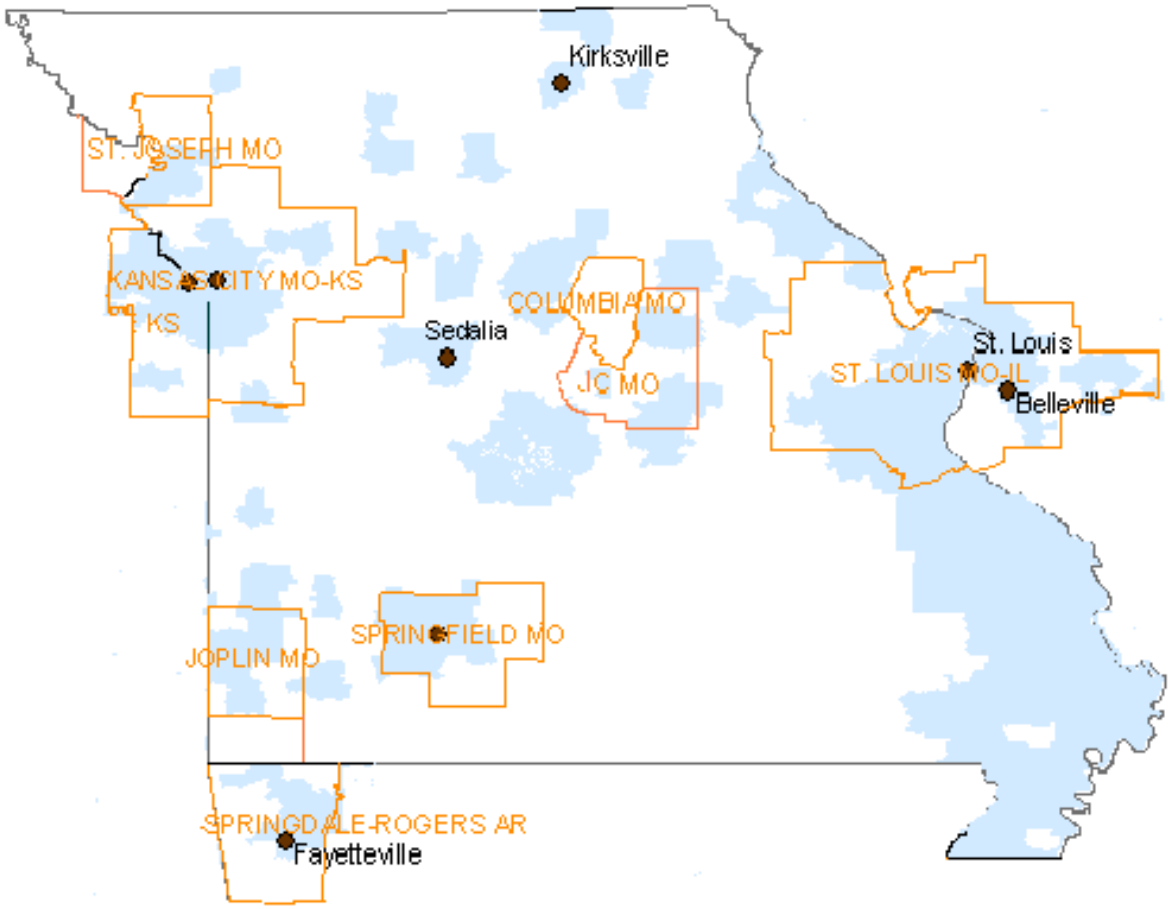
Metropolitan Statistical Areas

Metropolitan Statistical Areas	Assigned Counties
Columbia, MO MSA	Boone County, MO
	Howard County, MO
Fayetteville-Springdale-Rogers, AR-MO MSA	McDonald County, MO
Jefferson City, MO MSA	Callaway County, MO
	Cole County, MO
	Moniteau County, MO
	Osage County, MO
Joplin, MO MSA	Newton County, MO
	Jasper County, MO
Kansas City, MO-KS MSA	Bates County, MO
	Caldwell County, MO
	Cass County, MO
	Clay County, MO
	Clinton County, MO
	Jackson County, MO
	Lafayette County, MO
	Platte County, MO
	Ray County, MO
Springfield, MO MSA	Christian County, MO
	Dallas County, MO
	Greene County, MO
	Polk County, MO
	Webster County, MO
St. Joseph, MO-KS MSA	Andrew County, MO
	Buchanan County, MO
	DeKalb County, MO
St. Louis, MO-IL MSA	Crawford County, MO (pt.)*
	Franklin County, MO
	Jefferson County, MO
	Lincoln County, MO
	St. Charles County, MO
	St. Louis city, MO
	St. Louis County, MO
	Warren County, MO
	Washington County, MO

Missouri Metropolitan Statistical Areas (MSAs)

SBC Missouri Serving Area

MSA Boundaries



MISSOURI CENTRAL OFFICES

MSA, Micropolitan Statistical Area (MicroSA)	Wire Center CLLI8	Wire Center Name	# CLEC Collocated in WC	# CLECs with EELs in WC	# CLECs with Ported TNs	Total Ported TNs	Mass Market UNE Loops	UNE-P Res
Columbia, MO MSA	ARMSMOCR	ARMSTRONG 273						** **
	FYTTMOCH	FAYETTE 248						** **
	GLSGMOFE	GLASGOW 338						** **
	NWFRMOVI	NEW FRANKLIN 848						** **
Jefferson City, MO MSA	ARGYMOPA	ARGYLE						** **
	FEBGMORI	FREEBURG 744						** **
	FLTNMOMI	FULTON 642						** **
	LINNMOTW	LINN 897						** **
	METAMOBA	META 229						** **
	WPHLMOGL	WESPHALIA 455						** **
Joplin, MO MSA	NESHMOGL	NEOSHO 451			** **	** **		** **
	CRJTMOMI	CARL JUNCTION 649						** **
	CRTHMOFL	CARTHAGE 358	** **		** **	** **		** **
	JPLNMOMA	JOPLIN 623	** **		** **	** **		** **
	JSPRMOEX	JASPER 394						** **
	WBCYMOOR	WEBB CITY 673						** **
St. Joseph, MO-KS MSA	AGNCMOAL	AGENCY 253						** **
	RUVLMORA	DEKALB 685						** **
	RUVLMORA	RUSHVILLE 688						** **
	SNANMOMO	SAN ANTONIO 667						** **
	STJSMODN	ST JOE DWNTWN 232	** **	** **	** **	** **		** **
	STJSMOMD	ST JOE ELWOOD 365			** **	** **		** **
Kansas City, MO-KS MSA	ADRNMOAX	ADRIAN 297						** **
	ARCHMOAX	ARCHIE 293						** **
	BLSPMOCA	BLUE SPRINGS 228	** **	** **	** **	** **	** **	** **
	EXSPMOME	EXCELSIOR SPRGS 637			** **	** **		** **
	KSCYMO01	BENTON 231	** **	** **	** **	** **	** **	** **
	KSCYMO02	HILAND 444	** **	** **	** **	** **	** **	** **
	KSCYMO04	WABASH 921	** **	** **	** **	** **	** **	** **
	KSCYMO05	WESTPORT 931	** **	** **	** **	** **	** **	** **
	KSCYMO20	NASHUA 436	** **	** **	** **	** **		** **
	KSCYMO21	GLADSTONE 452	** **	** **	** **	** **	** **	** **
	KSCYMO22	INDEPENDENCE 461	** **	** **	** **	** **	** **	** **
	KSCYMO23	FARLEY 546	** **	** **	** **	** **	** **	** **
	KSCYMO24	RAYTOWN 353	** **	** **	** **	** **	** **	** **
	KSCYMO25	SOUTH 761	** **	** **	** **	** **	** **	** **
	KSCYMO40	BELTON 331	** **	** **	** **	** **		** **
	KSCYMO41	LEESUMIT-GREENWD TOT	** **	** **	** **	** **	** **	** **
	KSCYMO42	LIBERTY 781	** **	** **	** **	** **		** **
	KSCYMO44	EAST INDEP 257		** **	** **	** **		** **
	KSCYMO45	WILLOW 942	** **	** **	** **	** **		** **
	KSCYMO48	SOUTH INDEP 795	** **	** **	** **	** **	** **	** **
	KSCYMO55	MCGEE 474	** **	** **	** **	** **	** **	** **

MSA, Micropolitan Statistical Area (MicroSA)	Wire Center CLLI8	Wire Center Name	# CLEC Collocated in WC	# CLECs with EELs in WC	# CLECs with Ported TNs	Total Ported TNs	Mass Market UNE Loops	UNE-P Res
Kansas City, MO-KS MSA(cont'd)	RCMDMOPR	RICHMOND 776						** **
	SMVLMOTR	SMITHVILLE TOT		** **	** **	** **		** **
Springfield, MO MSA	ASGVMOOR	ASH GROVE 672		** **	** **	** **		** **
	BLNGMOMY	BILLINGS 695 TOT BLD		** **	** **	** **		** **
	CLVRMOLU	CLEVER 583 TOT BLD						** **
	FRGVMOPL	FAIR GROVE 759						** **
	NIXAMOAA	NIXA 725		** **	** **	** **		** **
	RPBLMOPE	REPUBLIC 732		** **	** **	** **		** **
	RRVLMOPL	ROGERSVILLE 753		** **	** **	** **		** **
	SPFDMOMC	SPGFLD MCDANIEL 862	** **	** **	** **	** **	** **	** **
	SPFDMOTE	SPGFLD TEMPLE 833		** **	** **	** **		** **
	SPFDMOTU	SPGFLD TUXEDO 881	** **	** **	** **	** **	** **	** **
	STFRMORE	STRAFFORD 736		** **	** **	** **		** **
	WLGVMOWY	WALNUT GROVE 994						** **
	WLRDMOSH	WILLARD 742		** **	** **	** **		** **
St. Louis, MO MSA	ANTOMO50	ANTONIA TOT			** **	** **		** **
	BUFTMOHU	BEAUFORT						** **
	CDHLMO51	CEDAR HILL						** **
	CHFDMO52	CHESTERFIELD TOTAL	** **	** **	** **	** **	** **	** **
	DESTMOGI	DESOTO			** **	** **		** **
	ELSBMOTW	ELSBERRY						** **
	EURKMO53	EUREKA TOT		** **	** **	** **		** **
	FNTNMO54	FENTON TOTAL	** **	** **	** **	** **	** **	** **
	FSTSMOYE	FESTUS		** **	** **	** **		** **
	GRSMMO55	GRAY SUMMIT		** **	** **	** **		** **
	HGRGMO56	HIGH RIDGE TOT		** **	** **	** **		** **
	HGRGMO57	HOUSE SPRINGS TOT		** **	** **	** **		** **
	HLBOMO66	HILLSBORO		** **	** **	** **		** **
	HVTRMO67	HARVESTER TOT	** **	** **	** **	** **	** **	** **
	IMPRMO58	IMPERIAL TOTAL		** **	** **	** **		** **
	MNCHMO59	MANCHESTER TOTAL	** **	** **	** **	** **	** **	** **
	MXVLMO60	MAXVILLE TOTAL		** **	** **	** **		** **
	PCFCMO61	PACIFIC		** **	** **	** **		** **
	PONDMO62	POND TOTAL	** **	** **	** **	** **		** **
	PRSXMO68	PORT DES SIOUX TOT			** **	** **		** **
	PVLYMOAA	HERCULANEUM-PEVELY		** **	** **	** **		** **
	RCWDMOOR	RICHWOODS						** **
	STCHMO63	ST CHARLES TOT	** **	** **	** **	** **	** **	** **
	STCLMOMA	ST CLAIR						** **
	STLSMO01	CHESTNUT	** **	** **	** **	** **	** **	** **
	STLSMO02	EVERGREEN	** **	** **	** **	** **	** **	** **
	STLSMO03	FLANDERS	** **	** **	** **	** **	** **	** **
	STLSMO04	FOREST	** **	** **	** **	** **		** **

MISSOURI CENTRAL OFFICES

MSA, Micropolitan Statistical Area (MicroSA)	Wire Center CLLI8	Wire Center Name	# CLEC Collocated in WC	# CLECs with EELs in WC	# CLECs with Ported TNs	Total Ported TNs	Mass Market UNE Loops	UNE-P Res
St. Louis, MO MSA (cont'd)	STLSMO05	JEFFERSON	** **	** **	** **	** **	** **	** **
	STLSMO06	MISSION	** **	** **	** **	** **	** **	** **
	STLSMO07	PARKVIEW	** **	** **	** **	** **	** **	** **
	STLSMO08	PROSPECT	** **	** **	** **	** **	** **	** **
	STLSMO11	MELROSE		** **	** **	** **		** **
	STLSMO20	FERGUSON	** **	** **	** **	** **		** **
	STLSMO21	LADUE	** **	** **	** **	** **	** **	** **
	STLSMO22	MEHLVILLE	** **	** **	** **	** **	** **	** **
	STLSMO23	OVERLAND	** **	** **	** **	** **	** **	** **
	STLSMO24	RIVERVIEW	** **	** **	** **	** **		** **
	STLSMO25	SAPPINGTON	** **	** **	** **	** **	** **	** **
	STLSMO26	WEBSTER GROVES	** **	** **	** **	** **	** **	** **
	STLSMO27	CREVE COEUR	** **	** **	** **	** **	** **	** **
	STLSMO40	FLORISSANT	** **	** **	** **	** **	** **	** **
	STLSMO41	KIRKWOOD 821	** **	** **	** **	** **	** **	** **
	STLSMO42	BRIDGETON	** **	** **	** **	** **	** **	** **
	STLSMO43	HAZELWOOD	** **	** **	** **	** **	** **	** **
	STLSMO45	SPANISH LAKE	** **	** **	** **	** **		** **
	STLSMOAA	WOODSMILL ORM		** **	** **	** **		** **
	UNINMOLU	UNION		** **	** **	** **		** **
	VYPKMO64	VALLEY PARK TOTAL	** **	** **	** **	** **	** **	** **
	WAREMOWH	WARE						** **
	WASHMOBE	WASHINGTON			** **	** **		** **
	WDSPMO01	WELDON SPRINGS TOTAL		** **	** **	** **		** **
Cape Girardeau-Jackson, MO-IL MicroSA	ADVNMORA	ADVANCE 722						** **
	CPGRMOED	CAPE GIRARDEAU	** **		** **	** **		** **
	DELTMOSW	DELTA 794						** **
	JCSNMOCI	JACKSON 243			** **	** **		** **
	MRHLMOBE	MARBLE HILL 238						** **
	OKRGMOAM	OAK RIDGE 266						** **
	OLAPMOST	OLD APPLETON 788						** **
	PATNMOTO	PATTON 866						** **
	PCHNMOTE	POCA NEW WELLS 833						** **
Farmington, MO MicroSA	BNTRMOFL	BONNE TERRE 358		** **				** **
	BSMRMOPE	BISMARCK 734						** **
	FLRVMOGE	FLAT RIVER 431			** **	** **		** **
	FRTNMOPL	FARMINGTON 756			** **	** **		** **
	LDWDMOLO	LEADWOOD 562						** **
Hannibal, MO MicroSA	CNTRMOAM	CENTER 267						** **
	HNBLMOAC	HANNIBAL 221						** **
Kennett, MO MicroSA	CDWLMOOL	CARDWELL 654						** **
	CMPBMOCH	CAMPBELL 246						** **
	HLCMMOSW	HOLCOMB						** **

MISSOURI CENTRAL OFFICES

MSA, Micropolitan Statistical Area (MicroSA)	Wire Center CLLI8	Wire Center Name	# CLEC Collocated in WC	# CLECs with EELs in WC	# CLECs with Ported TNs	Total Ported TNs	Mass Market UNE Loops	UNE-P Res
Kennett, MO MicroSA(cont'd)	HRNVMOPE	HORNERSVILLE 737						** **
	KNNTMOTU	KENNETT 888						** **
	MLDNMOCR	MALDEN 276						** **
	SENTMORE	SENATH 738						** **
Kirksville, MO MicroSA	DWNGMOFR	DOWNING 379						** **
	KKVLMOMO	KIRKSVILLE 665	** **	** **				** **
	LNCSMOGL	LANCASTER 457						** **
Marshall, MO MicroSA	MRSHMOGA	MARSHALL 886						** **
	SLTRMOLA	SLATER 529						** **
Mexico, MO MicroSA	MEXCMOJU	MEXICO 581	** **		** **	** **		** **
Moberly, MO MicroSA	HIGBMOGL	HIGBEE 456						** **
	MBRLMOAM	MOBERLY 263	** **					** **
Poplar Bluff, MO MicroSA	FISKMOWO	FISK 967						** **
	PPBLMOSU	POPLAR BLUFF 785						** **
	QULNMOFA	QULIN 328						** **
Sedalia, MO MicroSA	LAMTMODI	LA MONTE 347						** **
	SDLIMOTA	SEDALIA 826	** **	** **				** **
Sikeston, MO MicroSA	BNTNMOKI	BENTON 545						** **
	CHFFMOTU	CHAFFEE 887						** **
	ORANMOCO	ORAN 262			** **	** **		** **
	SCCYMOCO	SCOTT CITY 264						** **
	SKSTMOGR	SIKESTON 471			** **	** **		** **
Warrensburg, MO MicroSA	KNNSMOLO	KNOB NOSTER 563						** **
WC Switch Not in MSA or MicroSA	BLCYMORE	BELL CITY						** **
	BLDLMOGU	BLOOMSDALE		** **				** **
	BLFDMOLO	BLOOMFIELD 568						** **
	BNVLMOTU	BOONVILLE 882		** **				** **
	BRFDMOCL	BROOKFIELD 258						** **
	BWLGMOEA	BOWLING GREEN 324						** **
	CHLCMOMI	CHILLICOTHE 646	** **					** **
	CHTNMOMU	CHARLESTON 683						** **
	CLSPMOFI	CLIMAX SPRINGS 347						** **
	CLSPMONO	CLIMAX SPRINGS N 345						** **
	CLVLMOCI	CLARKSVILLE 242						** **
	CMTNMODI	CAMDENTON 346						** **
	CMTNMONO	CAMDENTON NORTH 873						** **
	CRTNMOLI	CARROLLTON 542	** **					** **
	CTVLMOED	CARUTHERSVILLE 333						** **
	DRNGMOPL	DEERING 757						** **
	DXTRMOMA	DEXTER 624						** **
	EDINMOEX	EDINA 397						** **
	ELDNMOEX	ELDON 392						** **
	EPRRMONI	EAST PRAIRIE 649						** **

MISSOURI CENTRAL OFFICES

MSA, Micropolitan Statistical Area	Wire Center CLLI8	Wire Center Name	# CLEC Collocated in WC	# CLECs with EELs in WC	# CLECs with Ported TNs	Total Ported TNs	Mass Market UNE Loops	UNE-P Res
WC Switch Not in MSA or MicroSA (cont'd)	ESSXMOAV	ESSEX 283						** **
	FRFRMOST	FRANKFORD 784						** **
	FRHNMOTA	ALT-FROHNA 824						** **
	FRTWMOST	FREDERICKTOWN 783			** **	** **		** **
	GIDNMOHI	GIDEON 448						** **
	GRMLMOFR	GRAVOIS MILLS 372						** **
	HAYTMOFL	HAYTI 359						** **
	LAMRMOOV	LAMAR 682						** **
	LCWDMOCE	LOCKWOOD 232			** **	** **		** **
	LKOZMOEN	LAKE OZARK TOTAL						** **
	LLBRMOOV	LILBOURN 688						** **
	LOSNMOSK	LOUISIANA 754						** **
	MCCKMOEM	MACKS CREEK 363						** **
	MNTTMOBE	MONETT 235						** **
	MRCLMOCH	MARCELINE 376						** **
	MRHSMONO	MOREHOUSE 667						** **
	MRNVMOHO	MARIONVILLE 463		** **	** **	** **		** **
	MRTNMONI	MARSTON 643						** **
	MTCYMOLO	MONTGOMERY CITY 564						** **
	NEVDMONO	NEVADA 667	** **					** **
	NWMDMOSH	NEW MADRID 748						** **
	OSBHMOFI	OSAGE BEACH 348			** **	** **		** **
	PGVLMODR	PORTAGEVILLE 379						** **
	PRCYMOGR	PIERCE CITY 476						** **
	PRVLMOLI	PERRYVILLE 547						** **
	PUXCMOAC	PUXICO 222						** **
	PUXCMOWE	PUXICO WEST 222						
	PYVLMOTI	PAYNESVILLE 847						** **
	RISCMOEX	RISCO 396						** **
	SGNVMOTU	STE.GENEVIEVE						** **
	SNBHMOFR	SUNRISE BEACH 374						** **
	STMYMOLI	ST MARYS 543						** **
	STNBMOSU	STANBERRY 783						** **
	TRENMOEL	TRENTON 359	** **					** **
	TSCMMOEM	TUSCUMBIA 369						** **
	TWACMOAB	TOWN & COUNTRY ORM						
	VINNMOGA	VIENNA						** **
	VRSLMODR	VERSAILLES 378						** **
	WARDMOMA	WARDELL 628						** **
	WLVLMOMU	WELLSVILLE 684						** **
	WYTTMOOR	WYATT 675						** **

CLEC SWITCHES SERVING MISSOURI

CLEC NAME	CLLI-8	SW CODE	SWITCH TYPE	SW STREET	SW CITY	SW STATE	NXXS	CLLI-11/HOST
ALLEGIANCE TELCOM MO	STLSMOWQ	5E2	LUCENT TECHNOLOGIES 5ESS-2000 SWITCH	710 N TUCKER 4TH FLR	ST LOUIS	MO	12	STLSMOWQDS0
AT&T LOC - NY	HLBOMO01	4E	WESTERN ELECTRIC 4 ESS	8201 HWY 21	HILLSBORO	MO	3	HLBOMO01DS0
	KSCYMO09	4E	WESTERN ELECTRIC 4 ESS	1425 OAK TRFY	KANSAS CITY	MO	6	KSCYMO09DS1
	KSCYMO09	5E	WESTERN ELECTRIC 5 ESS	1425 OAK TRFY	KANSAS CITY	MO	1	KSCYMO09DS2
	STLSMO09	4E	WESTERN ELECTRIC 4 ESS	2651 OLIVE	ST LOUIS	MO	5	STLSMO09DS1
	STLSMO09	5E	WESTERN ELECTRIC 5 ESS	2651 OLIVE	ST LOUIS	MO	3	STLSMO09DS2
BIG RIVER TELCO - MO	CPGRMOCP	ES2	EXCEL SWITCHING CORP EXS 2000	24 S KELLER AVE	CAPE GIRARDEAU	MO	1	CPGRMOCPDS1
BIRCH TELECOM OF MO	KSCYMOSW	5E	WESTERN ELECTRIC 5 ESS	324 E 11TH ST	KANSAS CITY	MO	13	KSCYMOSWDS3
		GSX	#N/A	324 E 11TH ST	KANSAS CITY	MO	1	KSCYMOSWDS3
	MRHGMO02	5E	WESTERN ELECTRIC 5 ESS	107 WELDON PKY	MARYLAND HEIGHTS	MO	24	MRHGMO02DS0
BROOKS FIBER COM MO	KSCYMOSW	5E	WESTERN ELECTRIC 5 ESS	324 E 11TH ST	KANSAS CITY	MO	2	KSCYMOSWDS0
	SPFDMOPY	5E	WESTERN ELECTRIC 5 ESS	940 E TRAFFICWAY ST	SPRINGFIELD	MO	4	SPFDMOPYDS0
CD TELECOMMS - MO	BASNMOCU	DMH	NORTHERN TELECOM DMS 100	607 STHWY 165	BRANSON	MO	1	BASNMOCUDS0
CHARTER FIBERLINK MO	OLVEMOAX	CS2	#N/A	9333 DIELMAN INDUSTRIAL	OLIVETTE	MO	3	OLVEMOAXCA0
	OLVEMOAX	CS2	#N/A	9333 DIELMAN INDUSTRIAL	OLIVETTE	MO	1	OLVEMOAXCA1
	OVLDMOBK	DMH	NORTHERN TELECOM DMS 100	2411 VERONA	OVERLAND	MO	8	OVLDMOBKDS0
DAVIDSON TELECOM MO	STLSMOZC	DS	GENERIC DIGITAL SWITCHING SYSTEM	900 WALNUT ST	ST LOUIS	MO	2	STLSMOZCDS3
DIGITAL TELEPORT MO	MRHGMOQA	NT5	NORTEL DMS 500	11111 DORSETT RD	MARYLAND HEIGHTS	MO	9	MRHGMOQADS1
EVEREST CONNECT - MO	KSCBMO35	5ES	#N/A	9674 MARION RDG	KANSAS CITY	MO	2	KSCBMO35DS0
	LENXKS24	5E	WESTERN ELECTRIC 5 ESS	9669 LACKMAN RD	LENEXA	KS	1	LENXKS24DS0
FIDELITY COMM-MO	SLLVMOXA	EXM	AT&T NETWORK SYSTEMS EXM-2000; COMPONENT OF 5ESS-20	1304 HWY 72 E	ROLLA	MO	1	SLLVMOXADS0
GLOBAL CROSSING-MO	KSCYMOMC	NT5	NORTEL DMS 500	1100 MAIN ST CENTER CITY	KANSAS CITY	MO	17	KSCYMOMCDS0
INTERMEDIA COMM - MO	HVTRMO67	RSS	NORTEL DMS 500	111 TOELLE	HARVESTER	MO	1	STLSMOXTDS0
	KRWDMO01	RSS	NORTEL DMS 500	115 W ADAMS AVE	KIRKWOOD	MO	1	STLSMOXTDS0
	STLSMO25	RSS	NORTEL DMS 500	11640 GRAVOIS RD	ST LOUIS	MO	1	STLSMOXTDS0
	STLSMO42	RSS	NORTEL DMS 500	12397 SAINT CHARLES ROCK RD	BRIDGETON	MO	1	STLSMOXTDS0
	STLSMO27	RSS	NORTEL DMS 500	12930 OLIVE ST RD	ST LOUIS	MO	1	STLSMOXTDS0
	STLSMO21	RSS	NORTEL DMS 500	135 N LINDBERGH BLVD	ST LOUIS	MO	1	STLSMOXTDS0
	STLSMOXTG	NT5	NORTEL DMS 500	1445 N WARSON RD	ST LOUIS	MO	1	STLSMOXTDS0
	CHFDMO52	RSS	NORTEL DMS 500	16752 WILD HORSE CREEK RD	CHESTERFIELD	MO	1	STLSMOXTDS0
	FNTNMO54	RSS	NORTEL DMS 500	200 MAIN ST	FENTON	MO	1	STLSMOXTDS0
	MNCHMOBI	RSS	NORTEL DMS 500	200 MANCHESTER RD	MANCHESTER	MO	2	STLSMOXTDS0
	VYPKMO64	RSS	NORTEL DMS 500	324 FOREST AVE	VALLEY PARK	MO	1	STLSMOXTDS0
	STLSMO23	RSS	NORTEL DMS 500	3501 WOODSON RD	ST LOUIS	MO	1	STLSMOXTDS0
	STCHMO63	RSS	NORTEL DMS 500	402 N 3RD ST	ST CHARLES	MO	1	STLSMOXTDS0
	STLSMO22	RSS	NORTEL DMS 500	4321 LEMAY FERRY	ST LOUIS	MO	1	STLSMOXTDS0
	STLSMO26	RSS	NORTEL DMS 500	5 W LOCKWOOD	ST LOUIS	MO	1	STLSMOXTDS0
KMC TELECOM III MO	KSCAMO54	A58	CISCO AS5800	1201 TROOST AVE	KANSAS CITY	MO	5	KSCAMO5400W
	STLSMOZC	C18	NORTEL NETWORKS CVX 1800 ACCESS SWITCH	900 WALNUT ST	ST LOUIS	MO	7	STLSMOZC01W
	WCHTKSMR	A58	CISCO AS5800	117 N MARKET ST	WICHITA	KS	2	WCHTKSMR00W
KMC TELECOM V - MO	STLSMOZC	C18	NORTEL NETWORKS CVX 1800 ACCESS SWITCH	900 WALNUT ST	ST LOUIS	MO	8	STLSMOZC01W
LEVEL 3 COMM - MO	KSCZMODR	DS	GENERIC DIGITAL SWITCHING SYSTEM	1100 WALNUT	KANSAS CITY	MO	5	KSCZMODRDS0
	STLSMOPL	EN4	ENTERPRISE EDS 4500 DIGITAL SWITCH	1015 LOCUST	ST LOUIS	MO	22	STLSMOPLDS0
	STLSMOPL	DS	GENERIC DIGITAL SWITCHING SYSTEM	1015 LOCUST ST	ST LOUIS	MO	2	STLSMOPLDS3
MCI WORLDCOM COMM MO	STLTMOBO	DS	GENERIC DIGITAL SWITCHING SYSTEM	11636 LACKLAND RD	ST LOUIS	MO	18	STLTMOBODS1
MCLEODUSA TEL - MO	KSCAMO54	DS	GENERIC DIGITAL SWITCHING SYSTEM	1201 TROOST AVE	KANSAS CITY	MO	1	KSCAMO54DS0
	SPFDMOOS	DM5	NORTHERN TELECOM DMS-250	331 PARK CENTRAL E	SPRINGFIELD	MO	1	SPFDMOOSDS0
	STLSMOGZ	NT5	NORTEL DMS 500	210 N TUCKER BLVD	ST LOUIS	MO	11	STLSMOGZDS0
MISSOURI TELECOM	SPFEMO05	DS	GENERIC DIGITAL SWITCHING SYSTEM	427 SOUTH KIMBROUGH	SPRINGFIELD	MO	7	SPFEMO050MD
NUVOX COMM OF MO	LENXKS02	DMH	NORTHERN TELECOM DMS 100	7945 BOND ST	LENEXA	KS	18	LENXKS02DS0
	OLVEMO01	DMH	NORTHERN TELECOM DMS 100	10405 BAUR BLVD	OLIVETTE	MO	24	OLVEMO01DS0
	SPFDMO45	DMH	NORTHERN TELECOM DMS 100	1521-1527 E LARK ST	SPRINGFIELD	MO	12	SPFDMO45DS0
SOCKET TELECOM - MO	STLSMOZC	LNX	EXCEL, INC. LNX 2000	900 WALNUT ST	ST LOUIS	MO	14	STLSMOZCDS2
SPRINT COMM CO - MO	KSCYMOEC	PEO	#N/A	101 HOLMES ST	KANSAS CITY	MO	4	KSCYMOECPS0
TC ST LOUIS	CRVCMOGM	5E	WESTERN ELECTRIC 5 ESS	11840 BORMAN DR	CREVE COEUR	MO	22	CRVCMOGMDS0
TCG KANSAS CITY - MO	KSCYMOSW	5E	WESTERN ELECTRIC 5 ESS	324 E 11TH ST	KANSAS CITY	MO	17	KSCYMOSWDS4
WINSTAR COMM. - MO	CRVCMOEX	VCD	LUCENT TECHNOLOGIES 5ESS-2000 SWITCH VCDX	11656 LILBURN PARK RD	CREVE COEUR	MO	4	CRVCMOEXDS0
XO MISSOURI, INC.	MRHGMOGY	NT5	NORTEL DMS 500	2020 WESTPORT CENTER DR	MARYLAND HEIGHTS	MO	14	MRHGMOGYDS0
	MRHGMOGY	DS	GENERIC DIGITAL SWITCHING SYSTEM	2020 WESTPORT CENTER DR	MARYLAND HEIGHTS	MO	1	MRHGMOGYDS2
XSPEDIUS MGMT - MO	KSCYMOMC	5E	WESTERN ELECTRIC 5 ESS	1100 MAIN ST, CITY CENTER SQUAR	KANSAS CITY	MO	3	KSCYMOMCDC0

MISSOURI NXX CODES ASSIGNED TO CLECS

MSA	Competitive Provider	NXXs
JEFFERSON CITY, MO MSA	KMC TELECOM III MO	1
	SOCKET TELECOM - MO	1
JOPLIN, MO MSA	MISSOURI TELECOM	3
	NUVOX COMM OF MO	1
KANSAS CITY, MO MSA	AT&T LOC - NY	7
	BIRCH TELECOM OF MO	13
	BROOKS FIBER COM MO	2
	EVEREST CONNECT - MO	3
	GLOBAL CROSSING-MO	17
	KMC TELECOM III MO	4
	LEVEL 3 COMM - MO	5
	MCLEODUSA TEL - MO	1
	NUVOX COMM OF MO	18
	SPRINT COMM CO - MO	4
	TCG KANSAS CITY - MO	17
	XSPEDIUS MGMT - MO	3
ST. JOSEPH, MO MSA	BIRCH TELECOM OF MO	1
	KMC TELECOM III MO	1
ST. LOUIS, MO MSA	ALLEGIANCE TELCOM MO	7
	AT&T LOC - NY	4
	BIRCH TELECOM OF MO	10
	CHARTER FIBERLINK MO	8
	DAVIDSON TELECOM MO	2
	DIGITAL TELEPORT MO	9
	INTERMEDIA COMM - MO	9
	KMC TELECOM III MO	1
	LEVEL 3 COMM - MO	11
	MCI WORLDCOM COMM MO	11
	MCLEODUSA TEL - MO	6
	NUVOX COMM OF MO	9
	SOCKET TELECOM - MO	1
	TC ST LOUIS	15
	WINSTAR COMM. - MO	3
	XO MISSOURI, INC.	9
SPRINGFIELD, MO MSA	BROOKS FIBER COM MO	4
	CD TELECOMMS - MO	1
	MCLEODUSA TEL - MO	1
	MISSOURI TELECOM	1
	NUVOX COMM OF MO	10

AT&T SWITCH LOCATIONS

AT&T Switch	Location	Type
HLBOMO01DS0	HILLSBORO	4E
KSCYMO09DS1	KANSAS CITY	4E
STLSMO09DS1	ST LOUIS	4E
STLSMO09DS2	ST LOUIS	5E
CRVCMOGMDS0	CREVE COEUR	5E
KSCYMOSWDS4	KANSAS CITY	5E

ATTACHMENT: CLEC INTEGRATED ACCESS ANALYSIS

December 10, 2003

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1. INTRODUCTION

The FCC has defined the mass market as including residence, single line business and multi-line customers below the threshold established by the state for the DS1 enterprise market. The FCC directed each state to establish a maximum number of DS0s[1] that CLECs can serve through unbundled switching when serving multi-line end users at a single location. In establishing this threshold, the FCC rules state that the state commission should take into account the increased revenue opportunity at a single location and the threshold at which multi-line end users could be served in an economic fashion by higher capacity loops and a CLEC's own switching and thus be considered as part of the DS1 enterprise market. The FCC includes in the enterprise market not only those customers currently served by DS1 lines to the customers' premises, but also those multi-line customers currently served by DS0 lines that could be economically served by DS1.[2]

The purpose of this analysis is to provide the Commission an appropriate economic analysis for establishing the maximum number of DS0s that constitute the mass market as defined by the FCC. This attachment is organized as follows: it describes how CLECs operate and identifies and describes the network components used by an efficient CLEC to provide a DS1 line; it describes the services provided and how the appropriate network arrangement works; and it describes the piece-parts and costs of each component. Calculations are shown on the attached spreadsheet.

2. BUSINESS OPPORTUNITY FOR CLECS TO PROVIDE BROADBAND DATA SERVICES TO SMALL BUSINESS

2.1. THE CLEC MARKET

In this analysis, the CLEC is assumed to serve mass market business and residential customers. It offers local, long-distance and vertical services. When providing integrated access service it offers business-grade broadband Internet access. As the Internet access provider the CLEC may

[1] For the purposes of this analysis, a DS0 line is defined as an analog voice grade loop or sub-loop to a customer's premises. In this context, DS0 does not mean one of the 24 digitized channels making up a DS1 line to a customer's premises. The FCC defines the mass market at ¶ 459 as follows: "The mass market for local services consists primarily of consumers of analog 'plain old telephone service' or 'POTS' that purchase only a limited number of POTS lines and can only economically be served via analog DS0 loops."

[2] The FCC determined that multi-line customers currently served by DS0 "could be served in an economic fashion by higher capacity loops and a carrier's own switching and thus be considered as part of the DS1 enterprise market." [*See* 47 CFR 51.319(d)(2)(iii)(B)(4).]

also provide other data services including hosting the customer's web site on a virtual private server, providing IP addresses, supporting DNS and providing the customer's email server.

Integrated Access Service allows multiple voice, data and Internet combinations over a single access loop, saving customers money on their overall telecom bills. CLECs report a very rapid growth of this product.[3] This analysis models combinations of voice and data access and other data services that make the CLEC provision of DS1 access service viable to small business customers.[4] The analysis compares the business case for the CLEC's providing "only-voice" with that of the CLEC's providing both data and voice via a single DS1 loop.

2.2. CUSTOMER-PREMISE COMPONENTS

CLECs' Integrated Access Service requires the installation of multiplexing/routing equipment on the customer premise to carry voice and data traffic over a single T-1 line. Most CLECs deploy integrated access devices ("IADs") that integrate analog voice and high-speed data without conversion of voice to VoIP.[5] The most widely used IAD is the Adtran 850.

At the customer premise, individual business lines and the premise router connect to voice and data ports on the IAD. The IAD uses TDM technology to create the number of DS0 channels specified by the customer, and establishes a broadband channel at a specified data speed. The IAD connects to the CLEC's 4-wire DS1 loop which terminates at the customer's serving central office, where the CLEC establishes its remote terminal location, as described below.

2.3. CLEC NETWORK COMPONENTS REQUIRED TO PROVIDE INTEGRATED ACCESS

The facilities-based CLEC establishes remote terminals at ILEC COs where the CLEC is collocated. It provides its own digital-loop-carrier ("DLC") equipment. The DLC equipment separates voice and data traffic, concentrates the voice and data loops, so that fewer outgoing voice and data channels are required for transport across the local area network to the CLEC's POP.

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[3] Allegiance reports that during the quarter ended September 30, 2003, its "Integrated Access Service represented approximately 37% of net lines sold for the quarter (and when including all services delivered via T1 circuits, 54% of our net lines sold for the quarter)." (10Q for period ending 9-03) Allegiance's lowest-priced small business service provides up to six business lines and a 256 kbps data line for $330 per month.

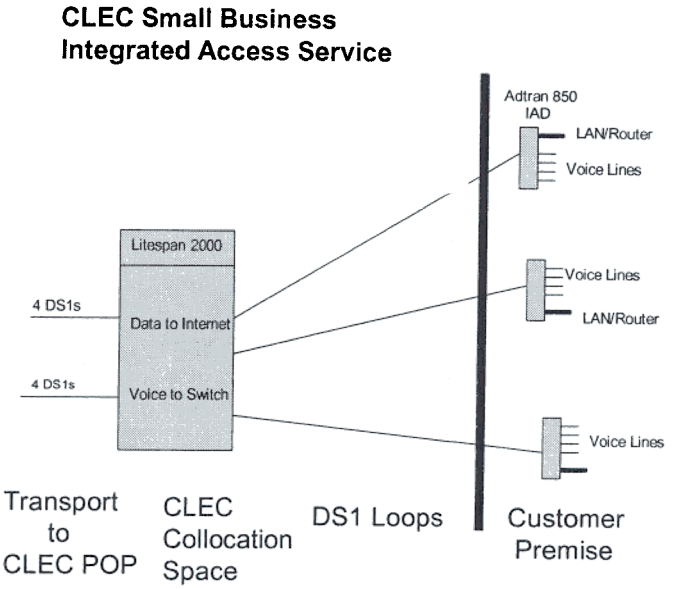
[4] Large corporate businesses are migrating from circuit switched voice services to Voice over Internet Protocol ("VoIP") for internal voice communications, integrating voice and data over the corporate data network. Significant savings are possible through the elimination of separate voice and data access lines. VoIP is less practical for the mass market in the short term, because most CLECs already invested in circuit switches. For small and medium-size businesses, CLECs have introduced Integrated Access Service which provides substantial benefits without the need to convert voice to VoIP

[5] One exception is Cbeyond Communications which uses VoIP technology throughout its network., and media gateways that convert packet VoIP to analog voice when connecting to the PSTN.

CLEC INTEGRATED ACCESS ANALYSIS

A CLEC POP has one or more voice switches depending on the number of DS0 voice lines it has relative to the number that can be handled by one switch. If the CLEC provides data services, it also has data LANs, servers and routers in the POP. As the customer's Internet access provider, the CLEC concentrates individual customer data traffic for routing to the Internet backbone.

The DLC in a remote terminal configuration can accommodate voice analog loops, 4-wire DS1 loops, or some combination of the two.[6] For voice lines, the CLEC can achieve a concentration ratio of four DS0 lines to one VG channel of a DS1 trunk. We estimate that twenty-five data lines may be concentrated at the DLC onto one data DS1 trunk.[7] Assume, for example, that a CLEC combines data and four business lines at each of 84 establishments served from its remote terminal. These 84 T1s could be concentrated onto only 8 DLC outgoing T1s from the DLC to the CLEC's POP as represented in the diagram below.



[6] For example, the Alcatel Litespan 2000 DLC, in a remote terminal configuration, can accommodate a maximum of 2,016 DS0s or 84 DS1s.

[7] According to Covad, one 512Kbps data line can serve 50 data users. It follows that a DS1 can serve 150 users. Assuming an average of six employees per business connecting to the Internet, the CLEC could serve 25 firms with just one outgoing DS1 transport channel to its POP.

3. COSTS OF THE NETWORK AND LOOP COMPONENTS

The cost factors that affect the economic cross-over from multiple DS0 lines to a single DS1 line include (1) the estimated cost of customer premise equipment required, (2) the costs of network components used by an efficient carrier to fully realize the potential of a DS1 line, and (3) the non-recurring and recurring charges for both a basic two-wire analog (i.e., DS0) unbundled loop and a DS1 unbundled loop.

Some of these costs are network capital equipment costs subject to depreciable lives, some are non-recurring costs associated with the customer "life" or the reciprocal of the CLEC's expected customer churn rate. Some of these are recurring monthly costs. The analysis describes the procedures used to express these costs on a common basis.

3.1. CUSTOMER PREMISE EQUIPMENT COST

The Adtran 850 IAD is widely available online from different equipment suppliers serving the computer equipment market. We use a simple average of the prices and conservatively exclude any additional discount that the CLEC would receive for bulk purchase. The FXS and FXO cards establish the voice and data channels across the DS1 loop. [8]

Adtran Equipment Prices				
		NexTag.com		cdw.com
Equipment	Average	Low	High	
Chasis Bundle	$1,265.88	$1,008.00	$1,220.00	$1,569.63
Quad FXS Card	$175.67	$146.00	$225.00	$156.00
Quad FXO Card	$245.00	$204.00	$313.00	$218.00
Total	$1,686.54	$1,358.00	$1,758.00	$1,943.63

[8] Prices reflected in the table of the Adtran 850 components. NexTag.com provides links to many distributors of both the chassis bundle and individual cards. High and low prices of required items appear in the table. CDW.com is an online distributor of these components. The chassis bundle comes preconfigured, with power supply unit and router control unit. Prices reflect single quantity purchases.

3.2. DLC AND IAD EQUIPMENT CAPITAL COST

The Alcatel Litespan 2000 DLC in a remote terminal configuration provides either a maximum of 2,016 DS0 line-side connections or 84 DS1 connections. We derive the fixed and per-line costs under each configuration from Alcatel prices. [9]

DLC Remote Terminal Cost						
Per Line:	Fixed	Per Line	# Lines	Total Cost	Cost/DS0	Cost/DS1
DS0s	$12,500	$51	2,016	$115,316	$57	
DS1s	$12,500	$389	84	$55,176		$538

Total Capital Cost per DS1 ($)	
IAD	$1,687
DLC	$538
Total	$2,224

3.3. DS1 EQUIPMENT ANNUAL COST ($)

The annual capital costs per DS1 loop are derived from the following analysis: An annual capital cost per DS1 loop was calculated based on income tax, property tax applied as a fraction against net capital, the circuit termination equipment depreciation life specified by the Commission, and the weighted average cost of capital at the state and federal tax rate. A DLC savings per DS0 displaced by the DS1 reflect the reduction in DLC line cards replaced by the DS1 line card. The annual savings per DS1 depends upon the number of DS0s that ride the DS1 loop. Monthly costs are calculated as annual costs divided by twelve.

[9] Proprietary Alcatel DLC component prices were provided by SBC. Costs were calculated for two system size configurations. Variable costs are derived by calculating the slope per DS0 line. Fixed costs were calculated based the minimum system configuration without any line cards. DS1 variable costs were calculated the same way as DS0 variable costs after replacing DS0 line cards with DS1 line cards.

CLEC INTEGRATED ACCESS ANALYSIS

General Costs	Rates and Costs
Amortization Rate	0.12
Income Tax Rate	0.380
Other Taxes	0.010
Depreciation Life	8
Wtd. Cost of Capital	16.9%
Annual Capital Cost	
IAD+DLC Costs per DS1	$676.35
DLC Savings per DS0	$17.39

3.4. RECURRING LOOP COSTS

The recurring loop costs for DS0 and DS1loops are as follows:

Loop Type	Zone	Recurring
2-Wire Analog Loop	1	$12.71
	2	$18.64
	3	$19.74
	4	$16.41
4-Wire Digital Loop	1	$91.06
	2	$95.45
	3	$97.10
	4	$91.25

3.5. NONRECURRING LOOP COSTS

The CLEC is assumed to migrate all of the customer's loops from the ILEC at the same time. CLECs incur an internal cost per line for hot cuts of unbundled network element analog loops from ILECs of $10 per line.[10]

[10] From CLEC statements in the record of the FCC's Triennial Review: *See* Microeconomic Consulting and Research Associates, *The Cost of Serving Residential Customers Using UNE Loops*, January 8, 2003, at 6; and Letter from Joan Marsh, AT&T Government Affairs, to Marlene Dortch, Secretary, FCC, re: Notice of Written Ex Parte Communication, *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, CC Docket Nos. 01-338, 96-98 and 98-147, February 4, 2003, at 16.

Other Non-Recurring Costs				
Hot-Cut Costs	Loop Type	Internal Cost	Price per Line	Total Charge
	2-Wire Analog Loop	$10.00	$24.98	$34.98
Non-Recurring Charges	Loop Type	Administrative Charge per Order	Per Additional Line	First Line
	2-Wire Analog	$0.00	$8.32	$19.55
Non-Recurring Charges	Loop Type	Administrative Charge per Order	Customer Connection Charge	Total Charge
	4-Wire Digital	$0.00	$0.00	$102.47

Nonrecurring loop costs are customer costs which should be amortized over the life of the customer. The amortization rate should reflect the churn rate of an efficient CLEC. CLECs that target small business customers have reported monthly churn rates of below one percent per month. Our analysis capitalizes all nonrecurring loop costs at the pre-tax weighted cost of capital rate and amortizes these costs at a rate of 1 percent per month or 0.12 per year.[11]

4. CLEC ADDITIONAL DATA NETWORK COSTS

The appropriate measure of data revenues are net revenues, i.e., net of the costs of providing data services. To provide Internet access service, the CLEC must provide transport from the DLC remote terminal to its own POP. It is likely that the CLEC will aggregate the data DS1s onto higher bandwidth facilities to connect to the Internet. In addition, the CLEC must pay for connections to an Internet backbone provider.

Because data concentration occurs at the DLC, little if any further data concentration is required. It is likely that the CLEC will multiplex the DS1s from the DLC onto higher capacity channels to send to the Internet. Nevertheless, we can estimate the backbone network costs by reference to the profile of a typical U.S. ISP.

[11] *See* Kelly Shafer, "Finding the Leaks" (downloaded from www.fatpipeonline.com/sep2003water.asp, on 9/19/03). Nonrecurring costs per DS0/DS1 per month are summed, and multiplied by the sum of annual weighted cost of capital and amortization rate divided by twelve.

A typical U.S. ISP dial service operator pays 30 percent of its total costs for Internet backbone network (including POP aggregation).[12] Dial services are available from $7.95 per month per account.[13] This would imply that the upstream costs for backbone connectivity are quite small—at most $2.00-- per dial account. We extrapolate per DS1 access to backbone costs of $12 per DS1 access.[14]

In addition, the CLEC must pay for the DS1 transport interoffice costs to its POP. The DS1s average $150 per interoffice DS1 per month or about $6 per access DS1 per month. We believe that a reasonable estimate of data costs in addition to the DLC aggregation is no more than $20 per DS1 access.[15]

This additional cost of providing data service has been included in the revenue calculations.

5. RESULTS OF ANALYSIS

The results of the analysis are presented below. The results depend on the UNE density zones. I find that a DS1 line is cost-effective, compared to four DS0s, so long as the customer has at least:

$108.81 per month of data revenues in Zone 1;

$89.48 per month of data revenues in Zone 2; and

$86.73 per month of data revenues in Zone 3; and

$94.20 per month of data revenues in Zone 4

[12] See Geoff Huston, ISP Survival Guide, Figure 13.4.,p.516.

[13]Frontline Communications Corporation includes two email accounts with the service. See: http://www.fcc.net/Internet_for_Home/Nationwide _Dial-Up/nationwide_dial-up.html.

[14] We assume six users at the premise riding the DS1.

[15] It includes additional customer care costs in addition to services already provided.

INTEGRATED DS0 - DS1 ANALYSIS: RESULTS

Loop Type	Zone	Recurring
2-Wire Analog Loop	1	$12.71
	2	$18.64
	3	$19.74
	4	$16.41
4-Wire Digital Loop	1	$91.06
	2	$95.45
	3	$97.10
	4	$91.25

General Costs	Rates and Costs
Amortization Rate	0.12
Income Tax Rate	0.380
Other Taxes	0.010
Depreciation Life	8
Wtd. Cost of Capital	16.9%
Annual Capital Cost	
IAD+DLC Costs per DS1	$676.35
DLC Savings per DS0	$17.39

Other Non-Recurring Costs				
Hot-Cut Costs	Loop Type	Internal Cost	Price per Line	Total Charge
	2-Wire Analog Loop	$10.00	$24.98	$34.98
Non-Recurring Charges	Loop Type	Administrative Charge per Order	Per Additional Line	First Line
	2-Wire Analog	$0.00	$8.32	$19.55
Non-Recurring Charges	Loop Type	Administrative Charge per Order	Customer Connection Charge	Total Charge
	4-Wire Digital	$0.00	$0.00	$102.47

DS0/DS1 Costs	1	2	3	4
DS0s/DS1	4	4	4	4
DS0 Recurring	$12.71	$18.64	$19.74	$16.41
Capitalized DS0-NR	$1.11	$1.11	$1.11	$1.11
Total DS0 per Month	$13.82	$19.75	$20.85	$17.52
DS1 Recurring	$91.06	$95.45	$97.10	$91.25
Capitalized DS1-NR	$2.47	$2.47	$2.47	$2.47
Net IAD/DLC Costs	$50.56	$50.56	$50.56	$50.56
Add'l Data Ntwk Costs	$20.00	$20.00	$20.00	$20.00
Total DS1 per Month	$164.09	$168.48	$170.13	$164.28
Required Revenue per DS1/Month	$108.81	$89.48	$86.73	$94.20

INTEGRATED DS0 - DS1 ANALYSIS: EQUIPMENT COSTS

DS1 Equipment Annual Cost ($)	
Capital per DS1	
IAD	$1,687
DLC	$538
Total	$2,224

Adtran Equipment Prices				
	NexTag.com			cdw.com
Equipment	Average	Low	High	
Chassis Bundle	$1,266	1008	1220	1569.63
Quad FXS Card	$176	146	225	156
Quad FXO Card	$245	204	313	218
Total	$1,687	$1,358	$1,758	$1,944

DLC Remote Terminal Cost						
Per Line:	Fixed	Per Line	# Lines	Total Cost	Cost/DS0	Cost/DS1
DS0s	$12,500	$51	2,016	$115,316	$57	
DS1s	$12,500	$389	84	$45,176		$538

Annual Cost of Capital		
	Percent of Capitalization	Annual Cost
Debt	45%	0.08
Equity	55%	0.15