BELLSOUTH TELECOMMUNICATIONS, INC.

DIRECT TESTIMONY OF W. KEITH MILNER

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 030851-TP

December 4, 2003

Q. PLEASE STATE YOUR NAME, YOUR BUSINESS ADDRESS, AND YOUR POSITION WITH BELLSOUTH TELECOMMUNICATIONS, INC. ("BELLSOUTH").

A. My name is W. Keith Milner. My business address is 675 West Peachtree Street, Atlanta, Georgia 30375. I am Assistant Vice President - Interconnection Operations for BellSouth. I have served in my present role since February 1996.

Q. PLEASE SUMMARIZE YOUR BACKGROUND AND EXPERIENCE.

A. My career in the telecommunications industry spans over 33 years and includes responsibilities in the areas of network planning, engineering, training, administration, and operations. I have held positions of responsibility with a local exchange telephone company, a long distance company, and a research and development company. I have extensive experience in all phases of telecommunications network planning, deployment, and operations in both the domestic and international arenas.

I graduated from Fayetteville Technical Institute in Fayetteville, North Carolina, in

1970, with an Associate of Applied Science in Business Administration degree. I graduated from Georgia State University in 1992 with a Master of Business Administration degree.

Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE ANY STATE PUBLIC SERVICE COMMISSION, AND IF SO, BRIEFLY DESCRIBE THE SUBJECT OF YOUR TESTIMONY?

A. Yes, I have testified before the state Public Service Commissions in Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, and South Carolina, the Tennessee Regulatory Authority, and the North Carolina Utilities Commission on the technical capabilities of the switching and facilities network, introduction of new service offerings, expanded calling areas, unbundling, and network interconnection.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I describe and support the engineering and network architecture assumptions that form the foundation for BellSouth's Analysis of Competitive Entry ("BACE") Model. I will also discuss how an efficient provider of local telecommunications service entering the market as a facilities-based provider would likely develop and grow its network in order to serve mass-market customers. My testimony is offered in support of BellSouth's positions regarding Issues 5 (d) and 5 (e).

Q. GENERALLY, PLEASE DESCRIBE THE BASIS FOR BELLSOUTH'S

ENGINEERING AND NETWORK ASSUMPTIONS USED IN THE BACE MODEL.

A. Typically, a Competitive Local Exchange Carrier ("CLEC") deploys a switch to serve a large area (often an entire state), and provides local service to its customers in that area by interconnecting with the incumbent local exchange carrier's ("ILEC's") network at an ILEC tandem.

There are three (3) basic network constructs from which an efficient provider entering the telecommunications market would likely choose. Each of these three options can be modeled in BellSouth's BACE Model. Exhibit WKM-1, attached to my testimony, illustrates these three network options. Each of these network options assumes that a CLEC places a switch to serve local customers within a Local Access Transport Area ("LATA"), although, as I said earlier, it is not unusual for a CLEC to use one switch to serve an entire state. Because the BACE Model assumes that a CLEC places a switch in each LATA in which it serves local customers, the results are significantly more conservative than if BellSouth had assumed a CLEC would have only one switch per state.

Q. WHAT IS THE RELATIONSHIP BETWEEN CLEC SWITCHING INVESTMENTS AND TRANSPORT/TRUNKING COSTS?

A. There is an economic tradeoff between the quantity of switches serving a given geography versus the length and accompanying costs of loops or interoffice transport. An efficient facilities-based CLEC entering the local

telecommunications market often finds that it is less expensive to use one switch to serve a large area, even though this network construct results in the CLEC needing to purchase, lease, construct or otherwise obtain transport facilities to carry traffic from its centralized switch to the various central office locations where the CLEC would be able to connect to loops serving its end user customers. Transport facilities are most often built using fiber optic cables and result in high-capacity transmission systems. Thus, the cost of back-hauling traffic is typically less than the cost of placing an additional switch.

Q. PLEASE DESCRIBE THE NETWORK CONSTRUCT SHOWN ON PAGE 1 OF EXHIBIT WKM-1 (Option 1).

A. Option 1 shown on page 1 of Exhibit WKM-1 reflects a configuration wherein a CLEC serves an entire LATA with one switch. The CLEC uses Enhanced Extended Links ("EELs"), which are combinations of local loops and interoffice transport, and are used by the CLEC to carry all traffic to the CLEC's sole collocation space in the LATA. At the central office where the CLEC has obtained collocation, the CLEC acquires EELs (for the end users served in central offices other than the central office housing the collocation arrangement) and unbundled loops (for the end users served from that central office). Once the loops are attached to the CLEC's switch, calls originated by the customers served by those loops are handled by the entirely by the CLEC's switch (for example, calls from one of the CLEC's customers to another of the CLEC's customers) or are handled by the CLEC's switch conveying the call using its interconnection facilities between the CLEC switch and BellSouth's tandem

switch (for example, calls from the CLEC's customers to other local service provider's customers).

Q. PLEASE DESCRIBE THE NETWORK CONSTRUCT SHOWN ON PAGE 2 OF EXHIBIT WKM-1 (Option 2).

A. Option 2 shown on page 2 of Exhibit WKM-1 also reflects a configuration wherein a CLEC serves an entire LATA with one switch. In this configuration, however, it is assumed that the CLEC chooses to have collocation space in each BellSouth end office from which the CLEC needs access to its end user's local loop on an unbundled basis. By choosing this configuration, the CLEC also gives itself access to more loops composed entirely of copper facilities, thus enlarging its Digital Subscriber Line ("DSL") footprint without collocating Digital Subscriber Line Access Multiplexers ("DSLAMs") or other equipment at remote terminal sites. The BACE Model can also be run choosing this network configuration.

Q. PLEASE DESCRIBE THE NETWORK CONSTRUCT SHOWN ON PAGE 3 OF EXHIBIT WKM-1 (Option 3).

A. As with the two configurations I just described, Option 3 shown on page 3 of Exhibit WKM-1 reflects a configuration wherein a CLEC serves an entire LATA with one switch. In this third configuration, however, the assumption is that there will be some situations wherein a CLEC will choose to have collocation arrangements in certain BellSouth end offices, and there will also be some situations wherein the CLEC will choose to use EELs in lieu of collocation. The

BACE Model can be run choosing this option, and the model will calculate and choose the more economical configuration for each portion of the CLEC's network. This network configuration is used in the base case that BellSouth filed with Dr. Aron's testimony. As with Option 2, the more end offices in which a CLEC collocates, the greater the access to so-called "all copper" loops and thus the larger a DSL footprint the CLEC can enjoy without collocation of equipment at Remote Terminal sites. As I stated earlier, the BACE Model can be run choosing this network configuration.

Q. FOR THOSE SITUATIONS WHERE COLLOCATION IS ASSUMED IN THE BACE MODEL, PLEASE DESCRIBE THE COLLOCATION ARRANGEMENT USED.

A. Exhibit WKM-2 illustrates a collocation arrangement used in the BACE Model wherein the CLEC collocates within a BellSouth central office. The assumption for this Option is that the CLEC will acquire unbundled two-wire loops and unbundled DS-1 loops. The CLEC acquires unbundled loops and other unbundled network elements, which BellSouth delivers to the collocation arrangement. BellSouth connects the requested unbundled network element (an unbundled loop, for example) to the CLEC's Connecting Facility Assignment ("CFA"), which conveys the requested UNE to the collocation arrangement. The CFA is typically a CLEC-provided tie cable that extends from that CLEC's collocation arrangement to the collocation demarcation point (typically a connector block on a distributing frame). At the CLEC end of the CFA, the requested unbundled network element is often terminated to a Point of

Termination bay ("POT bay") within the collocation arrangement. If provided, the CLEC owns the POT bay and the other equipment within the collocation arrangement. The CLEC may choose to install within the collocation arrangement Digital Loop Carrier ("DLC") equipment for aggregating and concentrating the individual unbundled loops as well as DSLAM equipment for the CLEC's broadband services. This equipment is then attached to multiplexing ("mux") equipment for connection to DS-1 or higher transmission systems to the CLEC's switch located in its own central office.

Exhibit WKM-3 reflects a typical collocation arrangement within a BellSouth tandem central office. Different from Option 1 described earlier, if the CLEC collocates within the BellSouth tandem central office, it is assumed that the CLEC will aggregate its EELs and other transport requirements at that location. The CLEC then conveys those EELs and transport facilities to its own central office over DS-1 or higher level transmission facilities.

Q. PLEASE DESCRIBE THE CLEC'S SWITCHING ARRANGEMENT ASSUMED IN THE BACE MODEL.

A. Exhibit WKM-4 illustrates the CLEC switching arrangement that is used in the BACE Model. Earlier in my testimony, I have discussed how loop facilities, EELS and transport facilities are aggregated and concentrated and are then conveyed to the CLEC's central office and then to the CLEC's switch. This Exhibit shows the call routing (once the loop has been connected to the CLEC's switch and the end user begins making and receiving calls) assuming the CLEC sends traffic

originated by its end users via BellSouth's tandem switch for completion. Likewise, this Exhibit shows how a CLEC receives traffic originated by the end users of other Local Exchange Carriers bound for that CLEC's end users. In other words, by interconnecting its switched network at BellSouth's access tandem switch location, the CLEC can send and receive traffic between that CLEC's end users and the end users of all other Local Exchange Carriers including BellSouth plus other carriers such as IXCs and wireless service providers.

Q. WHY DO CLECs ROUTE SOME OR ALL OF THEIR TRAFFIC VIA TANDEM SWITCHES?

A. CLECs route traffic through tandem switches for most of the same reasons as does BellSouth. Tandem switching systems are used to interconnect end office switches when direct trunk groups are *not* economically justified, or when the network configuration indicates alternate routing *is* economically justified. Tandem switches typically provide these functions:

- Interconnect end offices
- Connect to other tandems
- Provide access to Interexchange Carriers
- Provide access to operator positions.

In other words, tandem switching systems perform trunk-to-trunk switching and generally provide two basic network functions — traffic concentration and centralization of services. As traffic concentrators, tandems allow the traffic of

groups of end offices to be economically gathered for delivery between the end offices or to distant points. Also, with tandem switches, call recording, LATA-wide access, and operator services functions can be centralized for groups of end offices.

Q. PLEASE DESCRIBE THE CLEC's FACILITIES LOCATED AT ITS OWN SWITCHING CENTER.

A. Exhibit WKM-5 shows the types of equipment within the CLEC's own central office. Aggregated, concentrated loops (including EELs) are conveyed to interface equipment (DSX-1 or DSX-3 panels) then on to the DLC Central Office Terminal in the case of incoming loops or EELS and then to the switch. Equipment for data services such as Asynchronous Transfer Mode ("ATM") packet switches is also housed here. Inbound and outbound calls are received and sent over transport systems at DS-1 or higher transmission levels to and from BellSouth's tandem switch. Finally, the CLEC either provides for itself or acquires from other providers ancillary functions such as operator services and access to call-related databases.

Q. DO YOU HAVE OTHER INFORMATION THAT SUPPORTS YOUR OPINION REGARDING THE MANNER IN WHICH CLECs DESIGN AND IMPLEMENT THEIR NETWORKS?

A. Yes. I have read the sworn testimony of CLECs' witnesses opining on CLEC network architectural considerations. The CLECs have made it clear that their

networks are not configured like BellSouth's, and they are relying on fewer switches and more transport to serve their customers. For example, in Docket No. 000731-TP, AT&T witness, David Talbott testified that:

> "AT&T offers local exchange service in Florida via 4ESS switches, which function primarily as long distance switches, and 5ESS switches, which act as adjuncts to the 4ESS switches. ***AT&T has the ability to connect virtually any qualifying local exchange customer in Florida to one of these switches through AT&T's dedicated access services.*** TCG provides local exchange services using Class 5 switches. TCG is able to connect virtually any customer in a LATA to the TCG switch serving that LATA either through (1) TCG's own facilities built to the customer premises, (2) UNE loops provisioned through collocation in BellSouth end offices, or (3) using dedicated high-capacity facilities (in special access services or combination of UNEs purchased from BellSouth)." [*emphasis added*] [Docket Number 000731-TP, November 16, 2000 Direct Testimony of David Talbott, pp. 31-32.]

WorldCom has likewise filed testimony with this Commission regarding its switch coverage in the South Florida and Orlando areas. Regarding the South Florida area, WorldCom witness Don Price stated that:

> "The WorldCom network consists of four switches, three of which are located in the Miami rate center and one of which is located in the Fort Lauderdale rate center. These switches, combined with the transport network described below, provide local service in eleven rate centers in the South Florida area."

With respect to WorldCom's local network in the Orlando area, Mr. Price testified that:

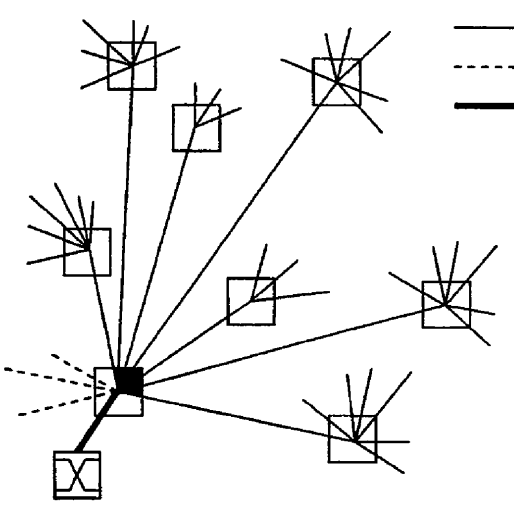
> "the WorldCom network consists of one switch which is configured and equipped to provide local service in fourteen rate centers." [Docket No. 000649-TP, August 17, 2000, Prefiled Direct Testimony of Don Price, pp. 46-47]

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

Option 1

Architecture scenario one – EELs



- One CLEC switch per LATA
- EELs to serve most customers
- Collocation in every LATA at an access tandem to serve all lines within the LATA

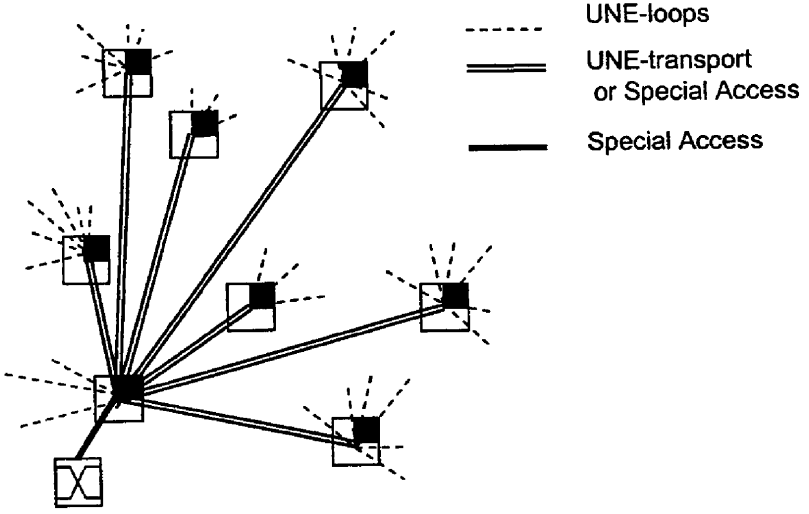
BellSouth CO

BellSouth CO with CLEC collo

CLEC CO (switch)

Option 2

Architecture scenario two – Collocation



- One CLEC switch per LATA
- UNE-loops to reach customers
- User adjustable choice of transport (UNE-transport or Special Access) as surrogate for CLEC-owned infrastructure
- Larger DSL footprint

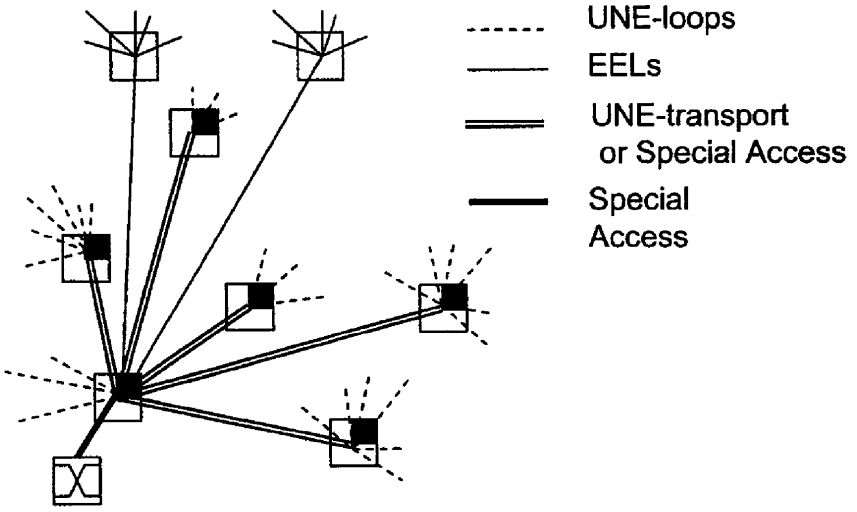
BellSouth CO

BellSouth CO with CLEC collo

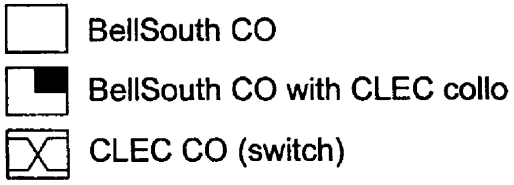
CLEC CO (switch)

Option 3

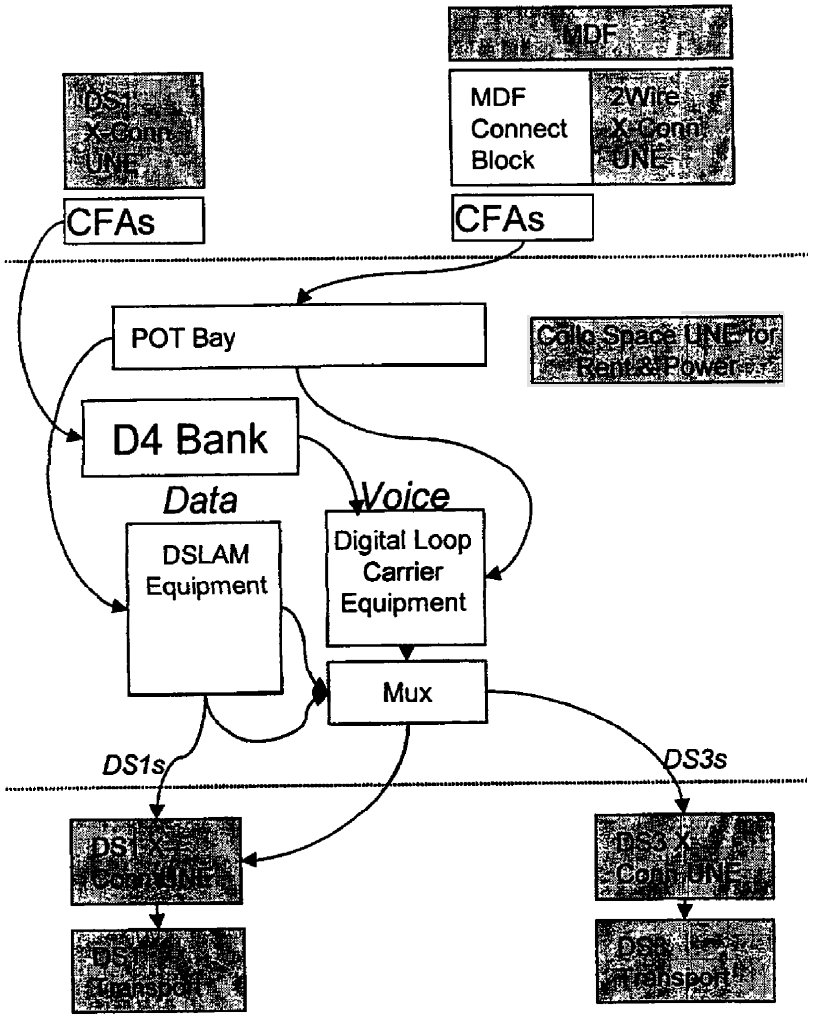
Architecture scenario three – Collocation/EELs Hybrid



- One CLEC switch per LATA
- BACE optimizes collocation and EELs

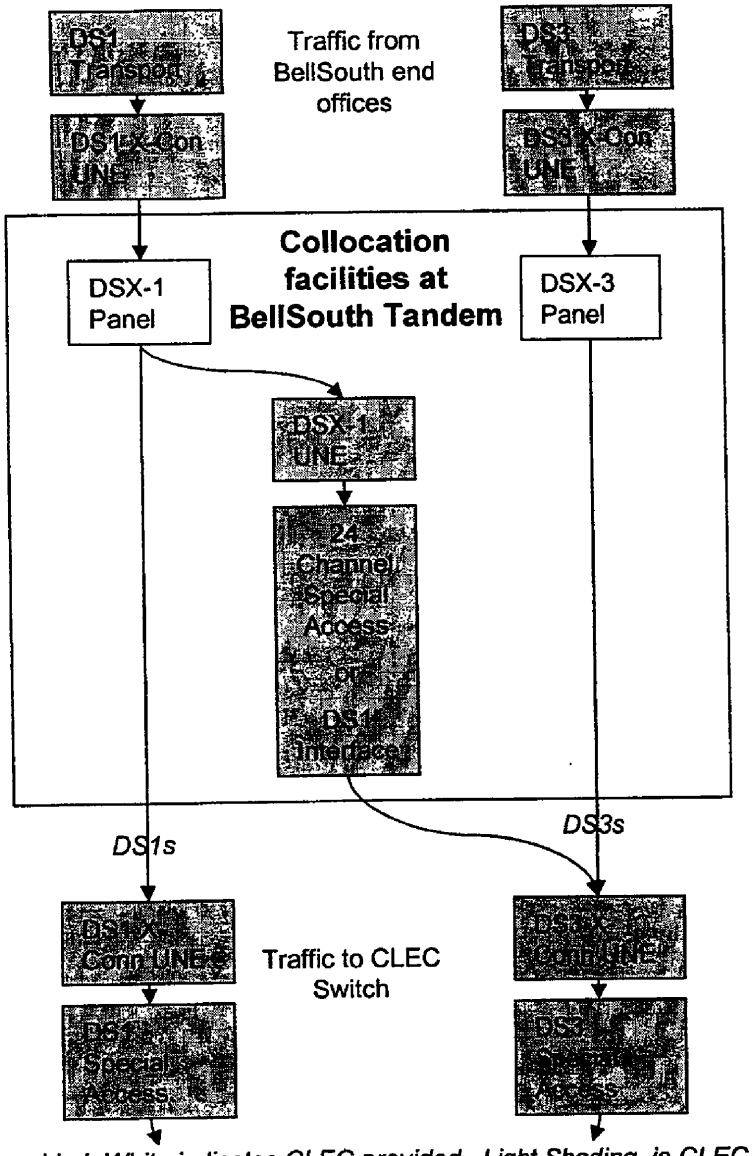


Collocation CLEC Facilities at BellSouth End Office



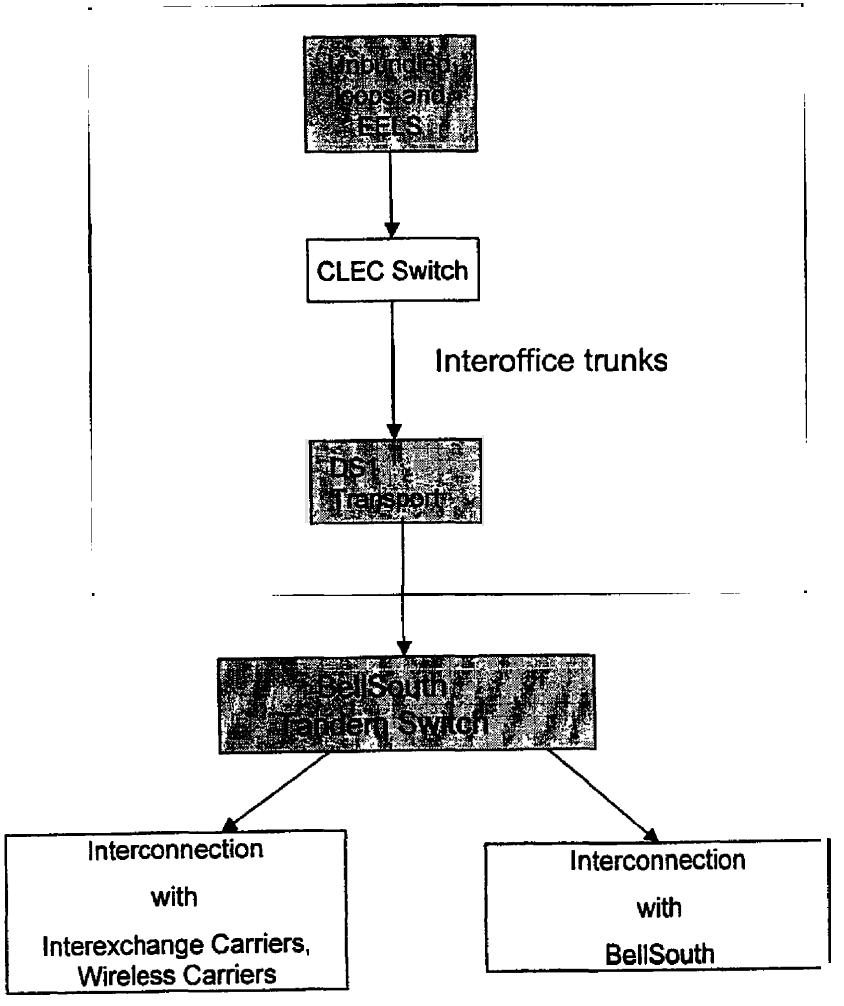
Dark shading indicates BST provided: White indicates CLEC provided, Light Shading is CLEC space

CLEC Facilities Collocated at BellSouth Tandem Switching Central Office



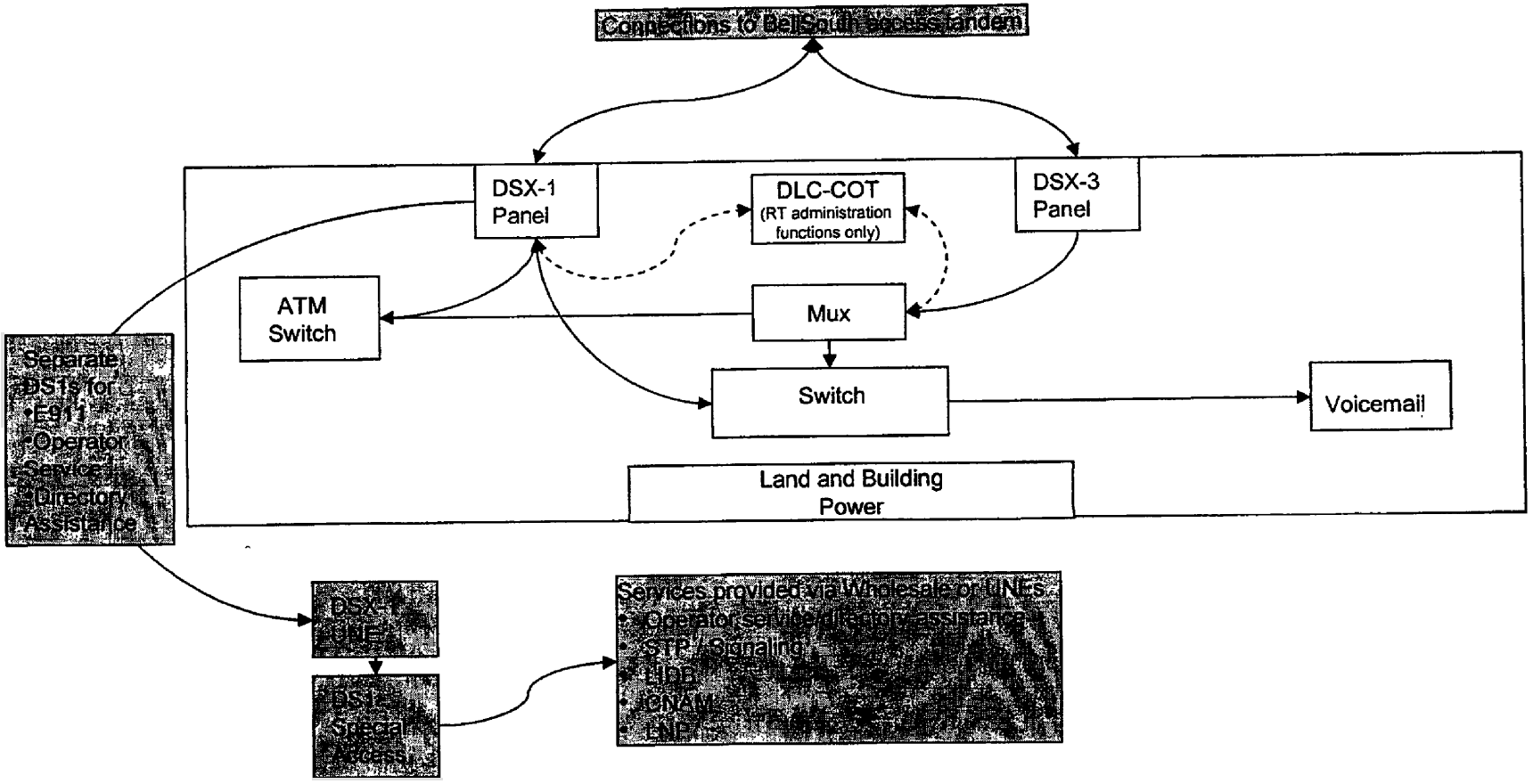
- Dark Shading indicates BellSouth provided: White indicates CLEC provided , Light Shading is CLEC space

Interconnection with other service providers



- Dark shading indicates BST provided: White indicates CLEC provided : Medium shading is other entities

NETWORK DESIGN:
DESCRIBING CLEC FACILITIES – CLEC Switching Center



- Dark shading indicates BST provided (or wholesale purchase): White indicates CLEC provided, Light shading is CLEC space.