BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF DETERMINING PRICES (UNEs) IN QWEST CORPORATION'S STATEMENT OF GENERALLY AVAILABLE TERMS (SGAT)

TC 01-098

DIRECT TESTIMONY OF

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QWEST CORPORATION

OCTOBER 15, 2002

EXECUTIVE SUMMARY

This testimony and associated exhibits demonstrate that Qwest has incurred significant expense to meet its obligation to provide Competitive Local Exchange Carriers (CLECs) with access to Qwest's operational support systems (OSS). This testimony also shows that Qwest is legally entitled to compensation for the costs of making these systems available, both for general OSS and for the changes to the OSS necessary to implement line sharing. Specifically, this testimony provides:

- Background regarding OSS and Electronic Interfaces;
- A description of what has been ordered with regard to general OSS, as well as the legal authorization to recover the costs associated with providing CLEC access to general OSS;
- A description of the modifications Qwest has made to provide non-discriminatory access to its OSS and the costs incurred to do so;
- A description of what has been ordered with regard to line sharing and OSS, as well as the legal authorization to recover costs associated with providing CLEC access to OSS for line sharing; and
- A description of the modifications to Qwest's systems to support line sharing and the costs incurred to do so.

The exhibits attached to this testimony provide detailed descriptions of all OSS projects included as input to the cost studies filed by Teresa K. Million. All of this demonstrates that Qwest is entitled to recover the significant costs it has incurred to provide CLEC access to general OSS and OSS for line sharing.

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I. IDENTIFICATION OF WITNESS AND INTRODUCTION

Q. PLEASE STATE YOUR NAME, EMPLOYER, POSITION, AND BUSINESS ADDRESS.

A. My name is Renée Albersheim. I am employed by Qwest Corporation (Qwest), as a Staff Advocate for Policy and Law. My business address is 930 15th St., 10th Floor, Denver, CO, 80202.

Q. PLEASE DESCRIBE YOUR WORK EXPERIENCE AND EDUCATION.

A. I have been working in the Information Technologies Wholesale Systems organization since joining Qwest in October, 1999. Prior to becoming a Qwest employee, I worked for 15 years as a consultant on many systems development projects and in a variety of roles including the following: programmer and systems developer, systems architect, project manager, information center manager and software training consultant. During that time, I worked on many of Qwest's OSS as a consultant on systems development projects.

In addition to working full-time at Qwest, I recently completed course work at the University Of Denver College Of Law, earning a Juris Doctor. I passed the Colorado Bar Examination in October of 2001. I received a Master of Business Administration in Information Systems from the University of Colorado College of Business and Administration in 1985 and I received a Bachelor of Arts degree from the University of Colorado in 1983.

Q. HAVE YOU TESTIFIED BEFORE THIS COMMISSION BEFORE?

A. No, I have not.

Q. HAVE YOU TESTIFIED BEFORE OTHER STATE REGULATORY COMMISSIONS?

A. Yes, I have submitted written testimony to the commissions in Arizona, Colorado, Idaho, Iowa, Montana, New Mexico, Utah, Washington, and Wyoming. I have appeared before the commissions in Arizona, Colorado and Washington.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of this testimony and associated exhibits is to discuss the costs incurred and the modifications that Qwest has performed to provide CLECs with access to Qwest's Operational Support Systems (OSS). I discuss both general OSS as well as OSS changes required for line sharing. I begin in Section II with the legal requirements for providing access to OSS. Then in Section III, I provide a background discussion of OSS and an explanation of electronic interfaces. In Section IV, I describe the modifications Qwest made to provide non-discriminatory access to its OSS and in Section V, the costs involved in making these modifications. In Section VI, I discuss what has been ordered with regard to line sharing and OSS, and finally in Section VII, I describe the modifications required by Qwest's systems to support line sharing and in Section VIII, the costs of making these modifications. The exhibits attached to this testimony include detailed descriptions of all OSS projects included as input to the cost studies filed by Teresa K. Million.

II. LEGAL REQUIREMENTS REGARDING GENERAL OSS

Q. WHAT ARE THE FEDERAL REQUIREMENTS REGARDING OSS AND ELECTRONIC INTERFACES?

A. The Telecommunications Act of 1996 ordered Incumbent Local Exchange Carriers (ILECs) such as Qwest to unbundle network elements and provide CLECs access to these Unbundled Network Elements (UNEs).[1] In its First Report and Order,[2] the FCC identified OSS as a UNE, and required Qwest to unbundle its OSS and provide electronic interfaces to support pre-ordering, ordering and provisioning, maintenance and repair, and billing for resold products and unbundled elements. In order to meet the FCC's requirements, Qwest had to change its OSS to support a multi-vendor environment, and support the introduction of UNEs and resale products which essentially were new products and services.

The Telecommunications Act[3] and the FCC[4] recognize that providing OSS access to CLECs will come at a price: both authorize Qwest to recover the reasonable cost of making its OSS available to CLECs.

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[1] *Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, codified at 47 U.S.C. §§ 151 et seq., § 252, (Telecommunications Act).*

[2] *See In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, and In the Matter of Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers, CC Docket No. 95-185, ¶ 516 (rel. Aug. 8, 1996), (FCC First Report and Order).*

[3] *Telecommunications Act § 252(d).*

[4] The FCC most recently discussed the ILECs' authorization to recover costs in the Line Sharing Order. *See In the Matters of Deployment of Wireline Services Offering Advanced Telecommunications Capability, CC Docket No. 98-147, and Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, ¶ 144 (rel. Dec. 9, 1999), (Line Sharing Order).*

III. BACKGROUND OF OSS AND ELECTRONIC INTERFACES

Q. WHAT ARE OSS?

A. Qwest uses a variety of computer systems to support the operations of its telecommunications business. An OSS is a computer system that does not directly provide telecommunications service to customers, but supports employees performing "operational" duties, such as issuing service orders, testing trunks and maintaining switching systems. These OSS are specialized; each performs different functions. Certain OSS allow for the ordering of products and services for customers, and others record and process trouble tickets. There are many other OSS that provide a wide variety of other functions.

Q. WHAT PURPOSES DO OSS SERVE IN CONNECTION WITH CLEC ORDERS?

A. CLECs need OSS to obtain products and services from Qwest and other incumbent local exchange carriers (ILECs). Most important, OSS are used to process orders that CLECs submit for resold products and unbundled network elements. CLECs typically submit these orders in the form of local service requests (LSRs) that enter Qwest's OSS, are converted into service orders, and are processed through downstream systems. The downstream systems use the information on the service orders to perform the provisioning functions. Once the customer has service, information about that customer can be found on a customer service record. That information is necessary for the billing and repair functions provided by Qwest's OSS.

Q. WHAT IS MEANT BY OSS ELECTRONIC INTERFACES?

A. Electronic interfaces facilitate the exchange of information between the OSS of a CLEC and those of Qwest. An interface allows a CLEC to submit pre-order and order transactions to Qwest electronically. The interface also permits the electronic exchange of other information between CLECs and Qwest, including information about products and services, installation timelines, the characteristics of facilities, and the completion of orders.

There are two primary methods for exchanging these types of information - batch transfers and real-time transactions. An electronic interface that uses a batch transfer method processes large amounts of information and transmits the information from one computer system to another. This type of data processing accumulates large amounts of information, groups related transactions together, and transmits them on a scheduled basis, generally once a day. Batch transfers enable a large amount of information to be transmitted efficiently between computers. For example, although switches record call detail messages as they are made, Qwest's Customer Record Information System (CRIS) Billing System processes the call details on a scheduled daily basis.

An electronic interface that uses a real-time method, on the other hand, processes data and/or transactions in an interactive mode, similar to a conversation. A transaction or query is sent from one computer system to another and a response is sent back without waiting for a scheduled transfer time. For example, if a CLEC's computer

system submits a request for information about the availability and characteristics of an unbundled loop, Qwest's OSS will receive the request through the interface, conduct a query of its databases, and transmit the responsive information back to the CLEC's computer system. Unlike batch transmissions, real-time transactions are executed in direct response to a request. These transactions are real-time in the sense that the time needed to handle a specific request is the only time that elapses between receipt of a request and sending a response. Qwest's computer system answers the CLEC's computer as soon as it has the information the CLEC requested. Generally, a real-time electronic interface is necessary whenever the information requested is needed to influence the next step of an ongoing process.

Q. WHAT IS IMA?

A. "IMA" or "Interconnect Mediated Access" is a real-time electronic interface offered by Qwest for the exchange of information relating to pre-ordering and ordering of resale service and unbundled network elements. Qwest built and offers a human-to-computer electronic interface, IMA-GUI (Interconnect Mediated Access – Graphical User Interface), and a computer-to-computer electronic interface, IMA-EDI (Electronic Data Interchange).[5] Both interfaces are used for electronic pre-ordering, ordering, and provisioning of resale and line-side unbundled network elements (UNEs). These interfaces allow the CLEC to submit pre-order and order transactions electronically and allow Qwest to send confirming information back to the CLEC

[5] When a CLEC develops an EDI interface it is usually intended to work with its own in-house GUI application.

electronically. See Exhibit RA-01 - Descriptions of Electronic Interfaces, for descriptions of those electronic interfaces offered to CLECs by Qwest.

Q. IS IMA THE ONLY ELECTRONIC INTERFACE THAT CLECS CAN USE TO ACCESS QWEST'S OSS?

A. No. Some Qwest products are ordered using an access service request (ASR). ASRs are used to order Access and Local Network Interconnection services. ASRs can be submitted electronically using EXACT-PC (Exchange Access Control and Tracking for Personal Computers), an electronic interface created by Telcordia. Some of the products ordered using ASRs include Local Interconnect Service products and Unbundled Dedicated Interoffice Transport. In addition, Qwest offers a number of other electronic interfaces for such functions as repair, billing, and to reference information. These interfaces include, among others, Held Escalated & Expedited Tool (HEET), Customer Electronic Maintenance and Repair (CEMR)[6], Raw Loop Data (RLD), Street Address Guide Area (SAGA) and Facility Availability Matrix (FAM).

Q. WHAT IS AN LSR?

A. An LSR is a local service request that CLECs use to order products and services from Qwest.

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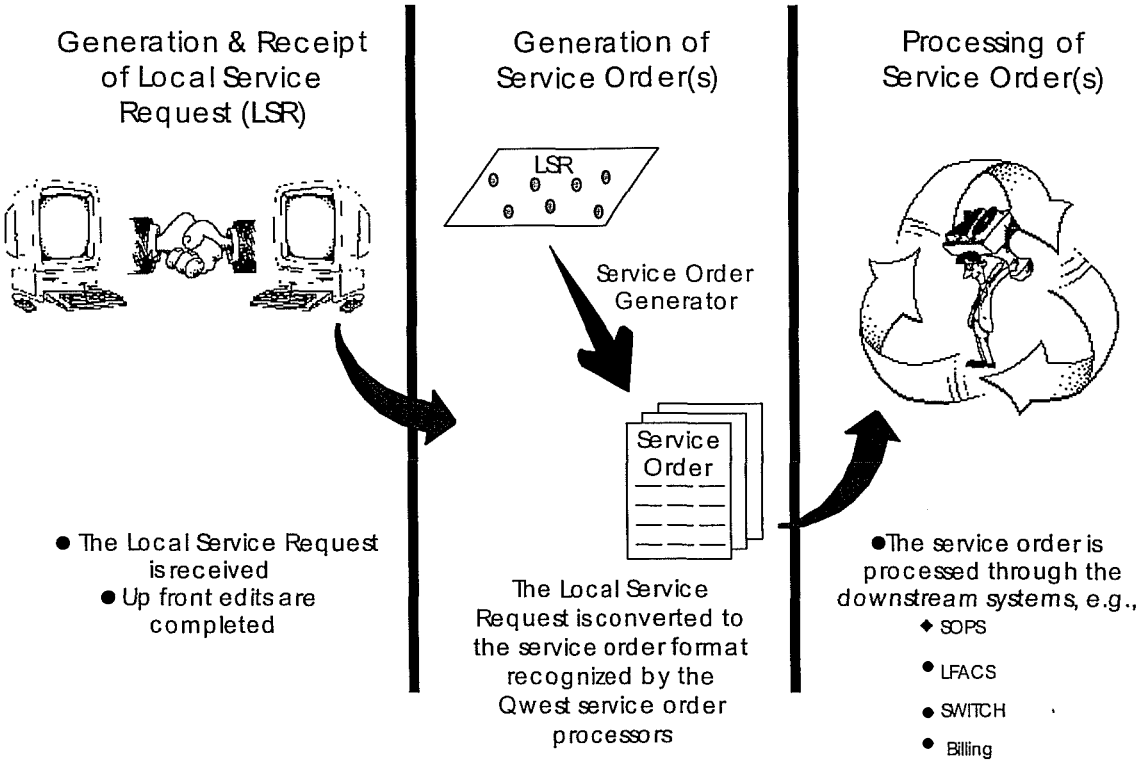
[6] In July 2000 the CEMR application replaced repair reporting functionality which originally existed as part of the IMA-GUI. The costs presented in this testimony are associated with development of repair functions in IMA-GUI, and also include initial development of the CEMR application.

Q. PLEASE DESCRIBE THE TYPES OF INFORMATION THAT QWEST AND CLECS ARE LIKELY TO EXCHANGE THROUGH ELECTRONIC INTERFACES USING AN LSR.

A. In addition to the general information that CLECs must provide when they submit an LSR, CLECs must identify the element(s) ordered, provide information identifying the specific customer for whom the order is sought, and supply appropriate information, as necessary, about where the CLEC's equipment will connect with Qwest's equipment.

Q. PLEASE DESCRIBE HOW AN LSR IS PROCESSED.

A. When a CLEC submits an LSR, Qwest must process the LSR through all of the systems necessary to deliver a service to a customer. The service ordering process is the component that takes the CLEC's LSR and converts it to the service order format required to process the request through Qwest's service order systems. The ordering process is comprised of three major functions depicted in the following picture and explained below.



1) Local Service Request Generation and Receipt. A CLEC creates an LSR, in a format defined by the OBF (Ordering and Billing Forum), and transmits it to Qwest either via an electronic interface or facsimile.

2) Service Order Generation. Qwest's OSS understand information contained on service orders. Therefore, Qwest must take the information from the LSR and create one or more service orders. A service order contains product codes (USOCs - Universal Service Order Codes) and Field Identifiers (FIDs). FIDs are the additional information required to provide a specific product.

3) Service Order Processing. Service orders are processed by many downstream systems resulting in the provisioning of service, inventory of equipment, and updates of customer accounts.

Q. WHAT HAPPENS AFTER A CLEC SUBMITS AN LSR?

After an LSR is submitted to Qwest, it is processed through the IMA gateway. The service order processors (SOPs), and other downstream installation OSS, are critical components of the process that play a role after pre-ordering and ordering, and before the later activities of provisioning, maintenance and repair, and billing. While the SOPs vary somewhat by region within Qwest's 14-state territory, in each region, the SOPs are the common points through which orders pass for most product types. For South Dakota, which is in the central region, the SOP is known as Service Order Processor and Distribution (SOPAD). SOPAD receives Qwest service orders from several sources and, in turn, communicates with the Service Order Activation and Control System (SOAC) that manages the service order process with respect to the specialized systems that design and activate network-based services, assign facilities, maintain central office inventory, and manage customer account information. In doing so, SOAC directs each service order through all steps necessary to complete the order and provision the service.

IV. DESCRIPTION OF MODIFICATIONS MADE TO DOWNSTREAM SYSTEMS

Q. WERE MODIFICATIONS NECESSARY FOR THE EXISTING OSS TO COMPLY WITH THE FCC REQUIREMENTS?

A. Yes. Certain OSS had to be modified to add data about CLECs and to add the functionality necessary to handle that data. For example, Qwest's SOPs, which are OSS, were designed to handle Qwest service orders. Now, service orders must be properly associated with a CLEC. This requires a unique code. The SOPs had to be modified to handle this new data element. Another example is the creation of new universal service order codes (USOCs) and field identifiers (FIDs) to support unbundled elements and resale products and their placement into the service order processing and billing production environments. USOCs and FIDs are codes that are put on service orders in order to allow systems to provision and bill for products and services.

Q. WHAT MODIFICATIONS HAS QWEST MADE TO ITS DOWNSTREAM SYSTEMS IN ORDER TO MEET THE REQUIREMENTS ESTABLISHED BY THE FCC?

A. Qwest has made and will continue to make modifications to its OSS to provide pre-ordering, ordering, provisioning, maintenance and repair, and billing functionality to CLECs. Exhibit RA-02 provides a diagram and descriptions of the downstream provisioning system flows for designed and non-designed services after LSRs are converted to service orders for these services, which pass through to the SOPs.

Q. PLEASE BROADLY DESCRIBE THE CHANGES MADE TO THESE DOWNSTREAM SYSTEMS.

A. These system modifications can be categorized based on broad product categories as follows:

Unbundling - Unbundling allows a CLEC to obtain facilities from Qwest at an unbundled rate. UNEs include the unbundled loop, local switching, transport elements and line ports. Capacity in various OSS had to be expanded to handle the additional data that identifies the specific UNEs and their features and to allow for their ordering, provisioning, repair and billing. Additionally, various functions and features were added to many systems. These functions and features included changes to downstream systems such as the SOPs to accommodate additional Universal Service Order Codes (USOCs) along with the associated edits. See Exhibit RA-03 for a description of unbundling projects undertaken from 1997 through 2000.

Rebundling - Rebundling occurs when a CLEC provides service to a customer using a combination of unbundled elements. In this case, the rebundling of unbundled elements gives service to that customer. An example of a rebundled service is UNE-P. Unbundled rates continue to apply. Examples of downstream systems changed to provide these products include Loop Management Operating System (LMOS), SOAC, the SOPs, Loop Facility Assignment and Control (LFACS) and others. See Exhibit RA-04 for a description of rebundling projects undertaken from 1997 through 2000.

Local Interconnect Services (LIS) - LIS trunks are the interoffice facilities supporting interconnection traffic. Changes were made to the Trunk Integrated Record Keeping System (TIRKS) for trunk inventory and Work Force Administration (WFA) for circuit installation management and repair. In addition, billing capabilities were added to IABS for these new products. See Exhibit RA-05 for a description of LIS projects undertaken from 1997 through 2000.

Collocation - Collocation permits a CLEC's equipment to reside in leased space within a Qwest central office. Specific examples of systems work include modifying the billing systems for collocation. See Exhibit RA-06 for a description of collocation projects undertaken from 1997 through 2000.

Systems Access - This term is used to describe the work and functions involved in creating and enhancing the electronic interfaces. These interfaces allow a CLEC to access Qwest's OSS to perform pre-ordering, ordering, provisioning, maintenance and repair, and billing functions. Work was also done on the processes needed to convert LSRs to service orders and process them in downstream systems. All of the software development tasks required to make these changes are included in these projects. Examples include defining functional requirements, producing design specifications, coding modules, developing and executing test scripts, planning and building interface releases, and moving application code into production environments. See Exhibit RA-07 for a description of system access projects undertaken from 1997 through 2000.

Cross Product - Some projects involved efforts that applied to all products offered by Qwest to the CLECs. These projects have been classified as cross product projects. One example is the expansion of Qwest mainframe capacity to handle the increased data and access by CLEC representatives. See Exhibit RA-08 for a description of cross product projects undertaken from 1997 through 2000.

Resale - Resale allows a CLEC to serve a customer with a finished service at a resale rate. The capacity or the ability to process work volumes of many existing systems has been increased to account for the increased activity level and the need for additional storage of data. Such systems include Customer Record Information System (CRIS) for billing, BOSS/CARS for customer service records, the SOPs, LFACS, TIRKS, and WFA. For example, the SOPs required changes to add Reseller IDs and associated resale edits. See Exhibit RA-09 for a description of resale projects undertaken from 1997 through 2000.

Planning - The project in this category was created to account for time spent in planning and administration of projects in all of the other categories. Costs assigned to this category cover such tasks as requirements analysis, project management, budget planning and tracking, CLEC negotiations, Business Integration Test (BIT) Team participation, and customer access testing. See Exhibit RA-10 for a description of planning undertaken from 1997 through 1999. This project was eliminated after 1999, and planning functions were integrated into individual projects in 2000.

Q. DO THE CLECS BENEFIT FROM THE ENHANCEMENTS TO OSS YOU HAVE DESCRIBED?

A. Yes. All the modifications to OSS described in this testimony were made to enable CLECs to resell products, access unbundled network elements, and interconnect with Qwest's telecommunications services. But for the requirement of the FCC, these modifications would not have been necessary. For example, the new USOCs and FIDs Qwest has created for the order entry, provisioning and billing systems enable CLECs to bill these products to their customers at a price of the CLECs' choice. Also, new reporting functionality had to be created so that Qwest can provide daily reports showing the customers that each CLEC has acquired. Another example of a modification for the CLECs' benefit involves expanding the capacity of certain OSS. In order to handle the increased traffic caused by CLEC transactions, the capacity of many systems had to be increased. This action allows for the processing of CLEC transactions, which facilitate their business functions.

Q. DOES QWEST BENEFIT FROM THESE ENHANCEMENTS?

A. No. I would first like to note that the issue of whether Qwest benefits is irrelevant to the question of how costs should properly be recovered. On this point, the FCC's rules, and this Commission's orders, are clear that cost recovery for these expenditures is from the cost causers, i.e., the CLECs. However, Qwest anticipates that some parties may make the argument that these expenditures benefit Qwest and that Qwest should therefore assume some of the costs. This argument is without

merit. Qwest has been serving its existing retail customers for many years without the enhanced functionality described earlier. The modifications do not add any efficiencies or cost savings to Qwest's existing retail business. On the contrary, the additional functionality and the additional data and systems infrastructure make increased demands on Qwest's resources and require Qwest to operate and maintain this more complex systems environment.

Q. DOES QWEST CONSIDER THE DEVELOPMENT OF OSS FOR CLECS COMPLETE?

A. No. Qwest continues to make improvements and enhancements to its interfaces and downstream systems. Some enhancements will be prompted by advances in technology, and others by the needs of Qwest's customers, including CLECs. In fact, CLECs have the ability to communicate their needs to Qwest via the Change Management Process (CMP). The CMP also allows CLECs to prioritize the enhancements Qwest makes to its OSS on their behalf.

Q. DOES QWEST ENDEAVOR TO PERFORM SYSTEMS DEVELOPMENT ACTIVITIES INTERNALLY?

A. Yes. Whenever possible, Qwest uses the resources of the Information Technologies division to conduct systems development for the corporation. Every OSS project is evaluated by the Qwest Information Technologies engineering staff to determine whether or not Qwest can perform the work internally. The engineering staff is made up of systems engineers, system architects, and software developers. Qwest's goal is

to perform as much systems development work as possible using Qwest's own in-house resources, and using Qwest employees and/or leased labor, under the direct management of Qwest Information Technologies, as this allows Qwest to maintain control of the software, and gives Qwest more flexibility in design and execution of systems enhancements.

V. COST OF GENERAL OSS CHANGES

Q. WHAT GENERAL OSS COSTS DOES QWEST SEEK TO RECOVER?

A. Qwest is requesting recovery for the development of the electronic interfaces and for modifications to existing downstream OSS. Additionally, Qwest seeks reimbursement of the ongoing maintenance and operations costs of the electronic interfaces.

Q. HOW DOES QWEST TRACK THE ACTUAL COST OF A PROJECT?

A. Once a project is initiated, it is assigned a project code, and is entered into the Business Management System (BMS), along with projected expenses. All expenses related to this project are then fed into BMS. All persons who work on the project enter their time, by project code, into a time reporting system known as EZWARP. This information is then transmitted from EZWARP into BMS through a monthly batch process. All expenditures including capital and equipment purchases are assigned by project code as well, and this too is entered into BMS. In this way, Qwest keeps track of actual costs for all activities by project, and tracks actual performance against each budget.

Q. CAN YOU PROVIDE AN EXAMPLE OF HOW THE COSTS FOR A GIVEN PROJECT ARE TRACKED?

A. Yes. Qwest completed and installed IMA Release 7.0 in 2000.[7] All of the work performed for this specific release of IMA was tracked in project code 15923ZZ. All direct, labor, and capital expenses were recorded in BMS for this project. The data in BMS then served as input to the cost studies presented in this docket by Theresa K. Million.

A. DEVELOPMENT COSTS

Q. PLEASE DESCRIBE DEVELOPMENT COSTS.

A. Development costs, also known as start-up costs, are one-time costs related to modifying existing OSS and developing new OSS. Development costs are also associated with establishing electronic interfaces including design and construction costs. There are two types of development costs: expense and capital. Expense costs include salaries, benefits and overhead for employees who identify business needs, define systems to support those needs, project manage or design the systems, as well as code and test them. Expense costs also include charges for the purchase of software licenses and costs associated with other development/modification-related tasks. Capital costs include the cost of computer equipment, for example, hardware, computer software, telecommunications links, and/or labor expenses incurred in setup

[7] A detailed description of the systems development work associated with IMA Release 7.0 can be found in confidential Exhibit RA-07 Systems Access OSS Projects.

of this hardware. Both expense and capital development costs apply to the projects described in my testimony and exhibits.

Q. HOW MUCH HAS QWEST ACTUALLY SPENT IN DEVELOPMENT COSTS FOR THE ELECTRONIC INTERFACES AND OSS WORK FROM 1997 THROUGH 2000?

A. In 1997, Qwest spent $27,419,876 across Qwest's 14-state region. In 1998, Qwest spent $52,182,295 across Qwest's 14-state region. In 1999, Qwest spent $82,605,322 across Qwest's 14-state region. In 2000, Qwest spent $81,621,850 across Qwest's 14-state region. See Exhibit RA-11 for a table outlining these total costs. Qwest witness Ms. Teresa K. Million explains how these costs are used in the cost study for OSS development costs.

B. Ongoing Operations Costs

Q. PLEASE DESCRIBE ONGOING OPERATIONS COSTS.

A. Qwest also incurs ongoing maintenance and operations costs associated with the usage of OSS and the interfaces. These costs are incurred in performing minor changes to the electronic interfaces' software programs in addition to running OSS and the interfaces on a daily basis. These costs include salaries, travel and training expenses for people involved in making table updates, resolving error conditions, starting up the application software and performing other maintenance-and-operations-related tasks. Qwest operates and maintains these interfaces solely for the benefit of the CLECs. But for the obligation to provide CLECs access to OSS

through electronic interfaces, it would not be necessary for Qwest to operate or maintain these interfaces. Therefore, the CLECs should pay for the ongoing maintenance and operations costs.

Q. WHAT SOURCE DATA DID QWEST USE TO ESTABLISH A BASIS FOR ONGOING OPERATIONS COSTS?

A. Qwest identified two projects that were originally established to track maintenance activities. These projects were:

- 14694ZZ – IMA Maintenance

  The work tracked by this project involved necessary, non-release related activities required to keep the IMA electronic interfaces functional.

- 14780ZZ – CLEC Helpdesk Support Maintenance

  The work tracked by this project included standard support for CLEC connectivity to Qwest OSS.

Qwest used the costs for these projects in 1999 as a basis for the cost study presented by Qwest witness Ms. Teresa K. Million. In 1999, the costs associated with these projects totaled $4.7 million.

VI. LINE SHARING

A. INTRODUCTION

Q. HOW DO CLECS INFORM QWEST THAT THEY WISH TO ORDER A LINE SHARING ARRANGEMENT WITH AN END-USER?

A. CLECs issue local service requests (LSRs) to provide data services to an end-user that is receiving voice services from Qwest using a line sharing arrangement.

Q. PLEASE DESCRIBE THE TYPES OF INFORMATION THAT QWEST AND CLECS ARE LIKELY TO EXCHANGE THROUGH ELECTRONIC INTERFACES TO FACILITATE LINE SHARING.

A. In addition to the general information that CLECs must provide when they send an LSR for line sharing, CLECs must:

- show that the order is for a shared line;
- provide information identifying the specific customer for whom line sharing is sought; and
- supply information about the appropriate meet point where the CLEC's equipment will connect with Qwest's equipment.

Q. ARE QWEST'S OSS CURRENTLY EQUIPPED TO HANDLE LSRS FOR LINE SHARING?

A. Yes. In order to support line sharing in a reasonable and timely manner, Qwest developed interim solutions in addition to long-term solutions to allow electronic processing of requests for line sharing. The costs associated with the implementation

of the interim line sharing solutions that Qwest incurred are not included in this testimony. As I explain in detail later in this testimony, Qwest, in order to implement the long-term solutions described above, made substantial modifications to its OSS to handle orders for line sharing. The long-term solutions were identified in Exhibit RA-12 Gap Matrix, and are described in further detail in Section VII of this testimony. The modifications that were needed relate not only to processing LSRs, but also to providing the provisioning (assignment and inventory), repair, and billing functionality needed to support all aspects of line sharing. The majority of these long-term solution modifications were implemented by December 2000; the costs for these modifications are included in this testimony and are explained in detail in Section VII of this testimony.

B. Legal Requirements Regarding OSS and Line Sharing

Q. ARE THERE RELEVANT LEGAL PRONOUNCEMENTS THAT RECOGNIZE THE RELATIONSHIP BETWEEN OSS AND LINE SHARING?

A. Yes. In the fall of 1999, the Minnesota Public Utilities Commission (MNPUC) and the Federal Communications Commission (FCC) issued orders that recognize this relationship and that require actions by ILECs (Qwest) and CLECs. The OSS modifications that Qwest made for line sharing were driven by these orders and the CLECs' needs for loop information and line sharing ordering.

Q. WHAT DID THE MNPUC ORDER REGARDING LINE SHARING AND OSS?

A. On October 8, 1999, the MNPUC ordered Qwest and any interested CLECs to "work together . . . to develop the terms and conditions under which Qwest would provide line sharing to data CLECS . . .."[8] In parallel, the MNPUC also ordered Qwest and any interested CLECs to "participate in good faith in a technical trial . . . for the purpose of confirming which (if any) of the interested data CLECs' equipment does not interfere with Qwest's voice grade network."[9]

By focusing on the "terms and conditions" relating to line sharing, the MNPUC's order clearly implicates OSS, since OSS are necessary for line sharing. Accordingly, in compliance with the MNPUC's order, Qwest worked closely with CLECs to develop OSS that properly support line sharing.

Q. WHY IS A MNPUC ORDER ON LINE SHARING RELEVANT TO SOUTH DAKOTA?

A. First, the timing of the MNPUC order, and the deadline imposed by that order, had a significant impact on the amount of time available to Qwest to implement line sharing. Second, as will be discussed further, the system solution for line sharing, like most wholesale systems development projects, was created for Qwest's entire 14-state region, not just for the state of Minnesota.

Q. WHAT DID THE FCC CONCLUDE REGARDING LINE SHARING AND OSS?

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[8] *In the Matter of a Commission Initiated Investigation into the Practices of Incumbent Local Exchange Companies Regarding Shared Line Access, Docket No. P-999/CI-99-678, at* 6 (Issued October 8, 1999).
[9] *Id.*

A. In its Line Sharing Order, the FCC recognized that the ILECs must modify their systems to support line sharing and that the ILECs will incur costs in doing so.[10] The FCC found that the ILECs should recover "reasonable incremental costs of OSS modification that are caused by the obligation to provide line sharing as an unbundled element."[11]

C. THE JOINT QWEST/CLEC OPERATIONAL REVIEW RELATING TO OSS

Q. PLEASE DESCRIBE THE PROCESS USED BY QWEST AND THE CLECS TO MEET THE OBLIGATIONS SET FORTH BY THE MNPUC AND THE FCC.

A. First, it must be understood that Qwest was the first ILEC in the country to implement line sharing. Line sharing is a very complex UNE. Unlike other UNEs that are provided to and used by a single LEC, the line sharing UNE is shared by two LECs - Qwest and the CLEC. As a result, it was essential that Qwest and the CLECs work closely together, especially in the area of OSS. This was accomplished through weekly face-to-face meetings attended by representatives of Qwest and interested CLECs. At these meetings, the joint team developed high-level processes for line sharing and identified issues to be resolved related to those processes. The joint team considered the five general categories of OSS issues: 1) pre-ordering (e.g., pre-qualification of loops for ADSL compatibility); 2) ordering; 3) provisioning; 4)

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[10] *Line Sharing Order* ¶ *142.*
[11] *Line Sharing Order* ¶ *144.*

billing and 5) repair and maintenance. When necessary, the group relied on sub-groups to address specific issues.

Q. IS THE OPERATIONAL IMPACT REVIEW ORDERED BY THE MNPUC AND CONDUCTED BY QWEST AND THE CLECS RELEVANT TO PROVIDING LINE SHARING IN SOUTH DAKOTA?

A. Yes. Qwest and the CLECs negotiated the business and technical OSS requirements for line sharing following the Operational Impact Review in Minnesota. Qwest's OSS are deployed throughout its entire 14-state region. Therefore, the business and technical OSS requirements for line sharing that were negotiated as a result of the Operational Impact Review in Minnesota drove the deployment of line sharing throughout Qwest's entire 14-state region.

Q. SPECIFICALLY, WHAT TASKS DID THE PARTIES PERFORM?

A. The first step was to identify business requirements. The joint team spent a great deal of time identifying the data needs of the CLECs. Qwest and the participating CLECs discussed the needs for pre-ordering, ordering, provisioning, repairing, and billing functionality. The requirements that were agreed to are documented in the Operational Impact Team minutes that were submitted as part of the stipulation that was entered into on November 22, 1999. The second step was to turn those business requirements into systems impacts. As shown in the attached Exhibit RA-12 - Gap Matrix, the joint team identified eight broad areas for modification of Qwest's OSS. These areas are referred to as "gaps." The joint team developed long-term solutions

and deployment timeframes (when known) for each of those gaps. In those cases where the CLECs desired a more immediate solution, the parties negotiated interim solutions and timeframes.

Q. WHAT ADDITIONAL ACTIVITIES DID THE JOINT TEAM ACCOMPLISH?

A. In addition to identifying the OSS impacts, the joint team defined the provisioning and repair processes. Because there is such a close nexus between the OSS impacts, the process, and the network architecture, the team also defined the network architecture. In general, the joint team determined that the CLECs would have to provide additional line sharing information that, among other things, would designate the end-user customer, and the meet points where the CLECs' equipment and Qwest's equipment will connect. The team also agreed that the POTS provisioning and repair flows would be used. To ensure that the end-user customer would not be negatively impacted, the joint team also agreed to develop a joint repair process.

Q. WERE THE PARTIES ABLE TO COME TO AN AGREEMENT ON THE OSS IMPACTS?

A. Yes. The joint team agreed that Qwest's systems could be modified to support line sharing. In addition, the joint team agreed that initial deployment would be based on a combination of automated and manual work steps, with full mechanization not occurring until delivery of the long-term solution. The joint team developed a decision point list (DPL) that was also a part of the stipulation and was used to

display joint positions when the parties reached full agreement on an issue and to display divergent positions when there was either no agreement or partial agreement. The DPL shows full agreement on all of the OSS issues. In fact, Qwest agreed to provide as much functionality as possible within as short a time frame as possible. The only item that did not result in a first quarter 2000 interim solution was billing the CLECs for charges associated with line sharing. Qwest offered to delay issuing its wholesale bills for line sharing until the second quarter of 2000, instead of delaying the initial deployment.

Q. AFTER REACHING AGREEMENT WITH THE CLECS ON THE ISSUES RELATING TO OSS, WHAT STEPS DID QWEST TAKE TO BEGIN IMPLEMENTING THE MODIFICATIONS?

A. The extensive exchange of information between Qwest and the CLECs allowed Qwest to prepare a statement of work describing in detail the OSS modifications that were needed for line sharing. That statement of work is attached to my testimony as confidential Exhibit RA-13 Statement of Work for Shared Loop. Qwest provided the statement to an outside contractor, Telcordia, for preparation of a plan for implementation and a cost quote. In addition, the agreements between Qwest and the CLECs on OSS modifications permitted Qwest to identify and begin planning the OSS changes that it will implement in-house.

Q. WHY DID QWEST SUBMIT A STATEMENT OF WORK TO TELCORDIA?

A. The majority of the systems that were impacted by the line sharing business requirements agreed to between Qwest and the CLECs are owned by Telcordia and licensed to Qwest. Accordingly, Telcordia was the appropriate party to carry out the OSS modifications that were needed to support line sharing for those systems. Following negotiations for the price of the modifications, Qwest signed a contract with Telcordia for completion of the work.

Q. WAS QWEST'S RELIANCE ON TELCORDIA FOR LINE SHARING SOFTWARE CHANGES REASONABLE?

A. Yes. Though the software was controlled by Telcordia, Telcordia did not dictate the price Qwest paid. The terms of the contract for the changes were negotiated, and, though it is not possible to quantify an amount, the parties involved in the negotiations have indicated that Qwest received a discount from Telcordia. Also, the initial work to implement line sharing has served as a basis for more products for CLECs. Because the core system changes required for line sharing are similar to those required for other shared products, and because these changes are in place, Qwest has been able to build on them, allowing faster, lower-cost implementation of additional shared products such as remote line sharing, and line splitting.

Q. HAVE QWEST AND THE CLECS CONTINUED TO WORK TOGETHER TO DEPLOY LINE SHARING?

A. Yes. After the initial agreement was reached in Minnesota, Qwest and the CLECs began negotiating an agreement to address line sharing in the other 13 states

throughout Qwest's region, including South Dakota. That 13-state agreement, signed on April 24, 2000, is attached as Exhibit RA-14 Interim Line Sharing Agreement. Qwest has also encouraged CLEC input during the development of new shared products and the processes and tools created to support these products.

VII. OSS MODIFICATIONS NECESSARY TO SUPPORT LINE SHARING

D. DESCRIPTION OF MODIFICATIONS

Q. WERE MODIFICATIONS NECESSARY FOR THE EXISTING OSS TO SUPPORT LINE SHARING?

A. Yes. Certain OSS were modified to add loop information required by the CLECs and to add the functionality necessary to handle that data, as well as to handle the multiple-provider environment required to implement line sharing.

Q. PLEASE DESCRIBE THE ELECTRONIC INTERFACES AND OSS THAT QWEST USES TO PROVIDE CLECS ACCESS TO PRE-ORDERING, ORDERING, AND PROVISIONING FUNCTIONS.

A. These interfaces and systems were fully described earlier in Sections III and IV of this testimony. The same systems and interfaces used to provide CLECs access to pre-ordering, ordering, and provisioning of other products and services are used to provide CLECs access for line sharing. Please see Exhibit RA-01 for a description of the electronic interfaces. Please see Exhibit RA-15 System Descriptions for a description of the downstream systems that interact with the electronic interfaces.

Q. PLEASE DESCRIBE THE MODIFICATIONS THAT WERE MADE TO THE PRE-ORDERING, ORDERING, AND PROVISIONING SYSTEMS TO SUPPORT LINE SHARING.

A. First, the CLECs agreed that the pre-order loop information provided by the IMA GUI/EDI 4.2 release was sufficient to begin line sharing. As a result, no pre-order modifications were necessary at that time to provide loop make-up information. However, to further support line sharing as well as other CLEC xDSL related services, beginning mid-year 2000, Qwest began deploying additional loop qualification tools to enable CLECs to evaluate whether the requested loop facility is capable of providing the service the CLEC seeks to offer its customers.

To support line sharing, the ordering and provisioning processes were modified to reflect the fact that two local service providers (the ILEC and a CLEC) will now serve one end-user customer. The presence of two providers for one customer has a substantial impact on the OSS ordering and provisioning processes. Qwest modified the systems that support these processes to allow the CLEC to pass additional pieces of data (new FIDs) that are used to designate:

- the CLEC's identity;
- that this is a request for line sharing;
- the line that will be shared between the requesting CLEC and Qwest;
- the meet points for the service (the splitter and port location);

- the indication whether the meet points are in the central office or in the field; and
- the power density mask that the CLEC pre-specifies on the LSR.

In addition, the ordering and provisioning systems recognize the line sharing information and, based on that information, direct data and behaviors to other downstream systems. Many of these systems now store CLEC-specific records that correlate with the Qwest voice customer records. For example, correlation of CLEC data provider records and Qwest voice customer records is necessary to carry out functions relating to billing and repair. The inventory and assignment systems also recognizes the line sharing data, to handle additional inventory meet points from the CLEC and direct the inventory information to the appropriate systems.

Please see the attached Exhibit RA-16 Description of Line Sharing Modifications, for a complete description of the modifications that were made to support line sharing and diagrams of the systems flows that resulted.[12]

Q. PLEASE DESCRIBE THE ELECTRONIC INTERFACES AND OSS THAT QWEST USES TO PROVIDE CLECS ACCESS TO REPAIR FUNCTIONS.

A. To communicate with Qwest relating to issues involving repair, CLECs can use Qwest's electronic interfaces for maintenance and repair. Qwest provides CLECs

access to two electronic interfaces for the repair of resold services and unbundled network elements: CEMR[13] and EB/TA.

A CLEC's customer service representative can use the electronic interfaces to:

1) create trouble reports;

2) modify trouble reports;

3) receive proactive status notifications;

4) cancel trouble reports;

5) close trouble reports;

6) obtain trouble history; and

7) submit MLT (mechanized loop tests).

After a trouble report is submitted to Qwest, it is converted into a trouble ticket. Qwest converts trouble reports into trouble tickets electronically, and the trouble tickets are recognized by LMOS (loop maintenance operations system), NSDB (network and services and database), or WFA (work force administration).

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[12] The system flows in exhibit RA-16 should be viewed as a snapshot in time. They reflect a picture of the system flows at the time that the permanent line sharing solution was implemented in 2000. There have been a number of enhancements made to line sharing and other shared products since that time that may have resulted in changes in the system flows.

[13] In July 2000 the CEMR application replaced repair reporting functionality which originally existed as part of the IMA-GUI.

See Exhibit RA-15 Systems Descriptions, for a brief description of the above-mentioned Qwest systems.

Q. PLEASE DESCRIBE THE MODIFICATIONS TO ITS REPAIR SYSTEMS THAT QWEST IMPLEMENTED TO SUPPORT LINE SHARING.

A. As with the changes needed for ordering and provisioning, the modifications that Qwest implemented for its repair systems were driven primarily by the fact that, with line sharing, two local service providers (Qwest and a CLEC) serve one end-user customer. As a result, there are two line records, one for the voice portion of the line provided by Qwest and one for the data portion of the line provided by a CLEC. For repair, Qwest remains responsible for voice service and physical line problems between the network interface device (NID) at the end-user customer premises and the point of demarcation in the central office. The CLECs are responsible for data service problems. The voice response units that precede the repair systems must be able to "walk" the end-user customer through a series of questions and answers to determine if the repair problem can be isolated to either the voice or the data service. If it is a data service problem, there is a "soft" referral to the CLEC.

Please see the attached Exhibit RA-16 Description of Line Sharing Modifications, for a complete description of the modifications that were made to support line sharing and diagrams of the systems flows.

Q. PLEASE DESCRIBE THE ELECTRONIC INTERFACES AND OSS THAT QWEST USES TO PROVIDE CLECS ACCESS TO BILLING FUNCTIONS.

A. Qwest provides a monthly wholesale bill to a CLEC as a means of collecting wholesale charges. Depending on the products that a CLEC has ordered to offer service to its end-users, a CLEC could receive a summary bill from either the CRIS (Customer Records Information System) system or from IABS (Interexchange Access Billing System). The wholesale bill contains both usage and local service charges. For most resale and unbundled products, the billing system is CRIS. CRIS enables wholesale billing functions for resold recurring/non-recurring charges, and usage services such as intraLATA toll calls. CRIS produces the monthly bill and provides it to the CLEC using the industry-standard Electronic Data Interface (EDI) transaction set number 811. To prepare this bill for a CLEC, Qwest applies wholesale prices appropriate for the CLEC and runs CRIS bill-cycle processing. Qwest bills the CLEC at a summary account level. The bill information provided to the CLEC includes charges and account balances. Charges are broken down into categories, such as recurring charges, usage fees and taxes. As with retail bills, billing of recurring charges start and stop effective with the completion date of the related service orders.

See Exhibit RA-15 Systems Descriptions, for a brief description of the above-mentioned Qwest systems.

Q. PLEASE DESCRIBE THE MODIFICATIONS TO ITS BILLING SYSTEMS THAT QWEST IMPLEMENTED TO ADAPT ITS BILLING SYSTEMS TO ACCOMODATE LINE SHARING.

A. The account structure in CRIS was set up to allow for one customer and one provider. However, line sharing requires CRIS to bill two customers: 1) the end-user customer for the voice portion of the line; and 2) the CLEC as the customer for the upper spectrum of the line. As a result, two customer records are now modified/created each time a line sharing order is processed. In addition, the two customer records are correlated to ensure that subsequent order activity is performed accurately. The need to bill two customers for a single line gave rise to the need for significant modifications to Qwest's billing systems.

Please see the attached Exhibit RA-16 Description of Line Sharing Modifications, for a complete description of the modifications that were made to support line sharing and diagrams of the systems flows.

Q. ARE THERE DOCUMENTS THAT PROVIDE DETAILED DESCRIPTIONS OF THE LINE SHARING SPECIFIC MODIFICATIONS TO QWEST'S OSS?

A. Yes. After Qwest and the CLECs developed the business requirements, Qwest converted the business requirements into technical requirements that systems analysts relied upon to develop high-level designs and associated time and cost estimates for implementation. Because the descriptions of the modifications and the descriptions of the work needed to complete the modifications are very detailed, I will not attempt to provide that information in the body of this testimony. However, two exhibits to my testimony, Exhibit RA-16 Description of Line Sharing Modifications, and confidential Exhibit RA-13 Statement of Work for Shared Loop, describe in full the

modifications and the steps that were needed to implement them. Please refer to those exhibits.

Q. DO THE CLECS BENEFIT FROM THE ENHANCEMENTS TO OSS YOU HAVE DESCRIBED?

A. Yes. The modifications described above and in Exhibit RA-16 Description of Line Sharing Modifications, are essential for the CLECs to line share with Qwest. The foundation for these modifications was established in the exchange of information and discussions between Qwest and the CLECs that occurred over a period of one and a half months. The modifications represent Qwest's response to what it learned in those discussions about the OSS needs the CLECs have.

Q. ARE THE MODIFICATIONS TO THE OSS FOR LINE SHARING SOLELY AS A RESULT OF LINE SHARING?

A. The majority of the modifications needed for line sharing would not have been completed were it not for the requirements to provide line sharing to CLECs. All of the internal modifications were completed solely for line sharing. However, a small percentage of the modifications delivered by Telcordia in the line sharing solution support additional unbundled network elements. According to Telcordia, 15% of the Telcordia modifications were applicable to other UNEs, but 85% were solely attributable to the line sharing requirements agreed to between Qwest and the CLECs. The 85% share represents Telcordia's estimate of the percent of their total estimated costs that can be attributed solely to line sharing. This percentage is not based on the

functions that Telcordia performed. It is based on the share of the cost that Telcordia associated with work that represented system changes required for line sharing. It is important to note that the OSS modifications that Telcordia implemented were deployed throughout Qwest's entire 14-state region.

VIII. THE COST OF THE MODIFICATIONS TO QWEST'S OSS FOR LINE SHARING

Q. WHAT LINE SHARING MODIFICATION COSTS DOES QWEST SEEK TO RECOVER IN THIS PROCEEDING?

A. Qwest is requesting cost recovery for those modifications that were solely attributable to line sharing and that, but for line sharing, would not have been necessary. These costs include $870,720 for modifications to internal systems maintained by Qwest and $11,956,000 in direct expense that Qwest incurred. Telcordia's price for delivery of the long-term solution to support line sharing was $11.9 million.[14] Telcordia developed its price based on the statement of work that is attached as confidential Exhibit 13. The direct expense that Qwest will incur also includes $56,000 for project management functions provided by another company.

IX. CONCLUSION

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

[14] The total estimate for the Telcordia solution is $14 million - 85% of the $14 million is $11.9 million.

A. Recovery of OSS costs is allowed by the Federal Telecommunications Act of 1996.[15] Building of the interfaces was undertaken by Qwest in accordance with regulatory mandate for the sole benefit of CLECs. Therefore, Qwest is entitled to recover the OSS costs. Many changes to Qwest's OSS were needed to allow CLECs to compete in the local exchange markets. New interfaces were built to allow CLECs' employees to communicate with Qwest's OSS in the categories of pre-ordering, ordering, maintenance and repair. Together, the OSS and the new interfaces support CLEC operations.

Qwest has incurred and will continue to incur development costs and on-going operations costs to change its OSS and develop and enhance the electronic interfaces. This work is massive and time consuming. The electronic interfaces are up and running and have additional scheduled implementations which will provide additional functionality.

Along with general OSS cost recovery, in the Line Sharing Order the FCC specifically permitted recovery of "reasonable incremental costs of OSS modification[s] that are caused by the obligation to provide line sharing as an unbundled element."[16] Qwest has worked diligently and in good faith with the CLECs to identify their requirements for line sharing. In numerous sessions, Qwest and the CLECs worked together to define data needs, process needs, and systems

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[15] *Telecommunications Act § 252(d).*
[16] *Line Sharing Order ¶ 144* (emphasis added).

needs so that the CLECs could employ line sharing. Providing that functionality required extensive systems modifications.

Telcordia has ownership of the majority of the systems that need modification to support the long-term line sharing solution and allow for volume. The majority of the cost of implementing line sharing was a direct expense to Qwest. The only costs for which Qwest is requesting line sharing cost recovery are those that are solely attributable to line sharing, and are solely "caused by the obligation to provide line sharing as an unbundled element."[17] Therefore, Qwest is entitled to recover the OSS costs associated with line sharing.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

[17] *Id*.

BEFORE THE
PUBLIC UTILITIES COMMISSION
STATE OF SOUTH DAKOTA

IN THE MATTER OF DETERMINING PRICES FOR UNBUNDLED NETWORK ELEMENTS (UNEs) IN QWEST CORPORATION'S STATEMENT OF GENERALLY AVAILABLE TERMS (SGAT)	)))))	DOCKET No. TC01-098

QWEST CORPORATION'S

EXHIBITS

OF

RENÉE ALBERSHEIM

October 15, 2002

INDEX OF EXHIBITS

SYSTEM DESCRIPTIONS OF ELECTRONIC INTERFACES

Qwest provides Competitive Local Exchange Carriers (CLECs) access to two electronic interfaces for the pre-ordering, ordering, and provisioning of resale and unbundled network elements: Interconnect Mediated Access - Graphical User Interface (IMA-GUI) and Interconnect Mediated Access - Electronic Data Interchange (IMA-EDI).

Qwest provides CLECs access to two electronic interfaces for repair: Customer Electronic Maintenance and Repair (CEMR)[1] and Electronic Bonding and Trouble administration (EB/TA).

IMA-EDI – Interconnect Mediated Access - Electronic Data Interchange

Qwest has deployed a real-time, electronic interface called IMA-EDI. IMA-EDI gives CLECs access to the pre-ordering and ordering OSS functions through a computer-to-computer interface.

CLECs can use the same interface to send their pre-ordering and ordering transactions, which are processed by the same OSS providing these functions to Qwest's retail units. These transactions and their corresponding OSS are displayed in the table beginning on page 2 of this exhibit.

[1] CEMR recently replaced the IMA GUI interface for repair.

IMA-GUI - Interconnect Mediated Access-Graphical User Interface

Qwest has also deployed a real-time, human-to-computer, electronic interface called IMA-GUI, which allows CLECs access to each of the OSS functions necessary to support their customers' requests. IMA-GUI provides access to Qwest OSS functions through the use of a Graphic User Interface. In so doing, IMA-GUI allows the CLEC's customer service representative to perform real-time inquiry and selection functions and electronically transmit LSRs to Qwest for processing.

Like IMA-EDI, CLECs can use the same interface to send their pre-ordering and ordering transactions, which are processed by the same OSS providing these functions to Qwest's retail units. These transactions and their corresponding OSS are provided below:

Function	Capability Type	OSS Supporting Function
Address Validation	Pre-Ordering	PREMIS (Premises Information System)
Service Availability Query	Pre-Ordering and Ordering	SONAR (Service Order Negotiation and Retrieval System – Internal Table)
Customer Service Record	Pre-Ordering	BOSS (Billing and Order Support System)
Facility Availability Query	Pre-Ordering	LFACS (Loop Facility Assignment Control System)

Function	Capability Type	OSS Supporting Function
		via Facility Check.
Telephone Number Retrieval	Pre-Ordering and Ordering	PREMIS; CNUM (PREMises Information System, Customer NUMber Management System)
Telephone Number Selection	Pre-Ordering and Ordering	PREMIS; CNUM (PREMises Information System, Customer NUMber Management System)
Appointment Scheduling Retrieval	Pre-Ordering and Ordering	Appointment Scheduler
Appointment Scheduling Selection/Reservation	Pre-Ordering and Ordering	Appointment Scheduler
Carrier List	Pre-Ordering	SONAR (Service Order Negotiation and Retrieval System – Internal Table)
Product and Service Selection	Ordering	Not Applicable[2]
Customer Listing Creation	Ordering	Not Applicable
Billing Number Selection	Ordering	Not Applicable
Summary Information Review	Ordering	Not Applicable
Order Storage and Retrieval	Ordering	Not Applicable
Order Submission	Ordering	IMA-GUI/IMA-EDI Architecture
Firm Order Confirmation	Ordering	IMA-GUI/IMA-EDI Architecture
Supplemental Order Submission	Ordering	IMA-GUI/IMA-EDI Architecture

[2] The following transactions do not apply to Qwest's IMA-EDI interface because the CLEC's OSS contain the pertinent information and perform the desired functions: product and service selection, customer listing creation, billing number selection, summary information review, order storage and retrieval. In the case of pre-ordering transactions, Qwest provides the data in response to the pre-ordering query for use by the CLEC when performing ordering transactions.

Function	Capability Type	OSS Supporting Function
Order Inquiry	Ordering	IMA-GUI/IMA-EDI Architecture
Order Completion	Ordering	IMA-GUI/IMA-EDI Architecture

CEMR – Customer Electronic Maintenance and Repair

Qwest has deployed a real-time, human-to-computer electronic interface called CEMR for repair transactions. CEMR allows the CLEC's customer service representative to make inquiries, receive proactive status notifications, and electronically transmit trouble reports to Qwest for processing.

EB/TA – Electronic Bonding and Trouble Administration

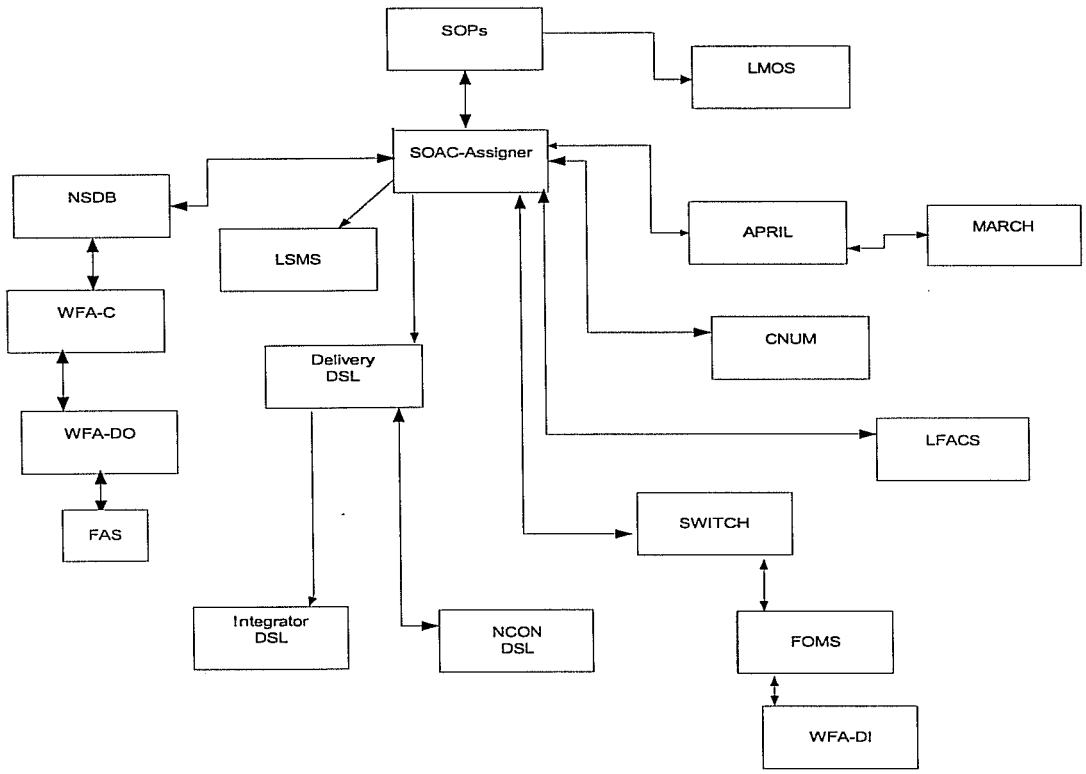
Qwest has deployed a real-time, computer-to-computer electronic interface called EB/TA for repair transactions. EB/TA allows the CLEC's customer service representative to make inquiries, receive proactive status notifications, and electronically transmit trouble reports to Qwest for processing. The CLECs' repair transactions can be submitted through either CEMR or EB/TA and are processed by the same OSS providing these functions to Qwest's retail units. These transactions and their corresponding OSS are provided below:

Function	OSS Supporting Function
Trouble Report Creation	MEDIACC (Mediated Access) – LMOS (POTS) or WFA (Designed Services or Unbundled Network Elements)
Trouble Report Modification	MEDIACC (Mediated Access) – LMOS (POTS)
Trouble Report Inquiry	MEDIACC (Mediated Access) – LMOS (POTS) or WFA (Designed Services or Unbundled Network Elements)
Active Notification of Status Change	MEDIACC (Mediated Access) – LMOS (POTS) or WFA (Designed Services or Unbundled Network Elements)
Trouble Report Cancellation	MEDIACC (Mediated Access) – LMOS (POTS) or WFA (Designed Services or Unbundled Network Elements)
Trouble Report Closure	MEDIACC (Mediated Access) – LMOS (POTS) or WFA (Designed Services or Unbundled Network Elements)
Trouble Report History	MEDIACC (Mediated Access) – LMOS (POTS) or WFA (Designed Services or Unbundled Network Elements)
Mechanized Loop Test Queries	MEDIACC (Mediated Access) – MLT (POTS)

DOWNSTREAM SYSTEM FLOWS AND DESCRIPTIONS

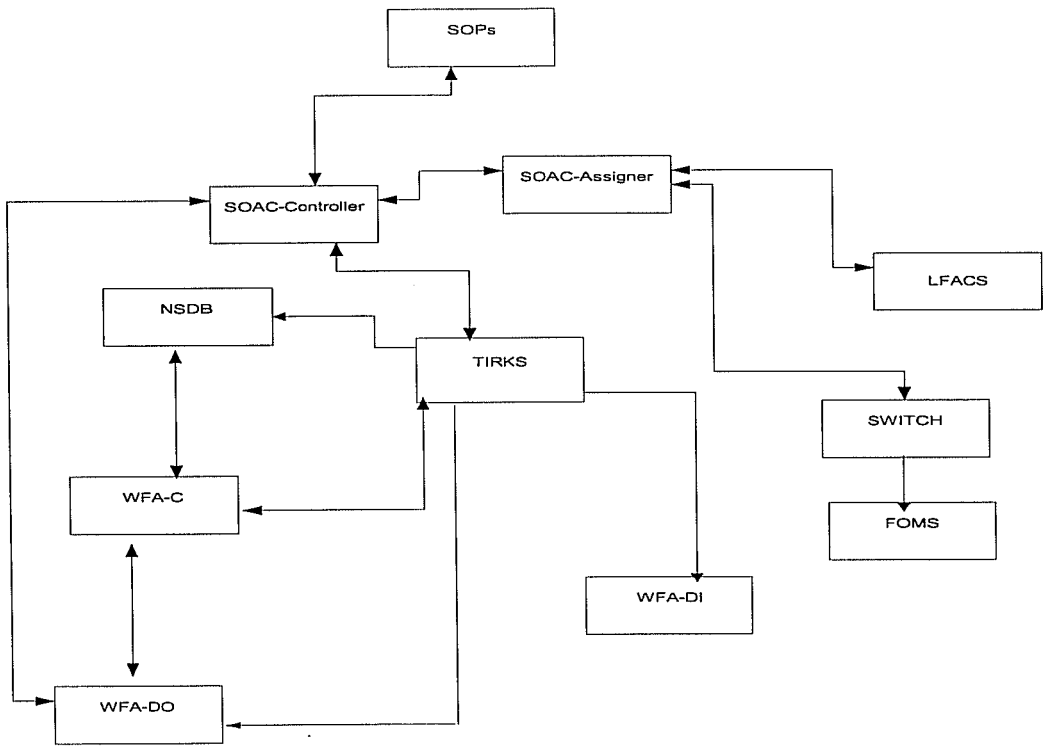
Provisioning System Flow for Non Design Products

The following diagram is for Non Design products in the Wholesale environment. Some of the systems in the flow are used only when a specific product has been ordered; for example, Delivery, NCON and !ntegrator are used when Unbundled Packet Switch Virtual Customer Channels are ordered. This flow represents all of the systems that could be used in the non-design flow.



Provisioning System Flow for Design Products

The following diagram is for design products in the Wholesale environment.



System Descriptions

APRIL	Switch translations for interfacing with switches.
CNUM	Customer Number system is responsible for the selection and administration of numbers associated with a customer's service. CNUM provides functionality comparable to the telephone number selection features in PREMIS. CNUM provides a single corporate database for the selection, assignment, and administration of telephone numbers and their associated data.
Delivery	Service activation for DSL services.
FAS	Field Access System allows technicians to obtain and close work items via WFA/DO.
FOMS	The Frame Operations Management System supports frame operations and provides information for the Recent Change Memory Administration Center (RCMAC) in a SWITCH System environment. FOMS provides for facility-based inquiries and other activities requiring a provisioning database. FOMS can print frame orders, manage various status indicators and completions, package work for the frame technicians, and generally manage the frame operation.
!ntegrator	The !ntegrator system supports the inventory and activation of Lucent DSLAM equipment used for DSL type services.
LFACS	Loop Facilities Assignment and Control Center System assigns outside plant facilities, based on the type of service (design vs. non-design) requested and the serving central office and its wire center. LFACS inventories outside plant loop facilities such as living units, terminals, cables, cable pairs, serving terminals and cross connection boxes.

LSMS Local Service Management System is a Qwest system that coordinates number portability activity with regional LLC (Limited Liability Company).

LMOS Loop Management Operations System is used to initiate, track and analyze customer trouble reports on Plain Old Telephone Service (POTS) type subscribers. LMOS front-end computers are used by the Maintenance Centers to access trouble testing and reporting for POTS accounts.

MARCH A Memory Administration of Recent Changes system is a computer system that translates line-related service order data into switch-provisioning messages and automatically transmits the messages to targeted Stored Program Control System (SPCS) switches.

NCON Network Configuration Manager is a GUI (Graphic User Interface) that:

- captures the network inventory of DSLAMs, including equipment at physical locations and the logical paths from the DSLAM to the ATM cloud;
- assigns DSL service requests to that inventory;
- provisions DSL service requests on the DSLAM equipment; and
- provides a database of circuit layout details from the DSLAM to the ATM cloud.

NSDB The Network and Services Database system stores customer and circuit data for special service, message, carrier and enhanced non-designed services. This data is received from the SOAC system during service order activity, and from the TIRKS system upon the issue or reissue of the Work Order Record and Details (WORD) document. NSDB also receives circuit and customer data updates and order completion notifications from WFA/C.

RSOLAR (SOP) Regional Service Order Logistics and Reference Service Ordering platform used in the Western region. Used to create, process, and distribute Service Orders.

SOAC	Service Order Analysis and Control is one of two systems under the FACS "suite" of systems (along with LFACS). Between both systems (LFACS and SOAC), it is a system that supports the entire Provisioning environment for Qwest. It maintains the inventory of Outside Plant records for over 25 million customers in all 14 states. It also processes millions of Service Orders each year and ensures that they are properly provisioned through the necessary systems (SWITCH, TIRKS, MARCH/APRIL, PAWS, etc). SOAC specifically is responsible for Service Order analysis, tracking of the order assignment process, and assignment output. SOAC Assigner is the part of the SOAC system that distributes work orders to SWITCH, APRIL, LFACS and CNUM. SOAC Controller is the part of the SOAC system that distributes design services orders to TIRKS and WFA.
SOLAR (SOP)	Service Order Logistics and Reference System enables the creation, maintenance, distribution, and updating of service orders for the Eastern region. Orders are received from various external order generator systems, like SONAR and IFE, as well as being entered through the SOLAR+ terminal network. Orders are distributed to numerous systems, like FACS, LMOS, and CRIS, via on-line, off-line, and batch processes.
SOPAD (SOP)	Service Order Processing and Distribution allows for online entry of service order information in the Central region. SOPAD is the counterpart to RSOLAR in the Western region and SOLAR in the Eastern Region.
SOPs	The Service Order Processor is the owner of the official version of the service order from origination to completion and posting in CRIS. The SOPs provide service order update, edit, distribute, resend and tracking. Three systems make up the SOPs, SOPAD for the Central region, SOLAR for the Eastern region and RSOLAR for the Western region.
SWITCH	SWITCH is an operation's system designed to inventory and assign central office switching equipment and related facilities. It allows Qwest to provision a network that is comprised of both digital and analog technologies.

TIRKS The TIRKS system provides for order control and integrated record keeping which allows for highly mechanized provisioning functionality. The TIRKS system is used specifically for designed services and the inventory (equipment and facilities) necessary to provide for the many complex designed services including such items as SONET, DS1, DS3 and Hicap services.

WFA-C The Work Flow Administration/Controller system optimizes and consolidates work assignments that presently exist in Complex Service Centers and Network Reliability and Operations Center (NROC's). WFA-C is used to assign, track and document the work activities for Complex service orders and maintenance tickets.

WFA-DI The Work Flow Administration/Design system is a mechanized system that significantly reduces the paper flow and support services needed to manage control centers. The WFA-DI system, with its TIRKS system interface and WFA-C interface capabilities, supports and simplifies the coordination, tracking, pricing and assigning of work requests for "designed" as well as certain "non-designed" services. WFA-DI is used by technical, clerical and management personnel associated with a control center. A control center is a term used to describe the work groups that administer the bulk of a central office's daily work.

WFA-DO The Work Flow Administration/Dispatch Out system automates the work assignments of technicians who work outside the Central Offices to install and maintain telephone services. It automates such tasks as loading and prioritizing work requests, estimating the time required to do jobs and scheduling the work. It provides on-line status tracking for work requests and helps track productivity of a work center for management use.

Qwest Corporation
Docket TC01-098
Exhibit to Testimony of
Renee Albersheim
Exhibit RA-03

CONFIDENTIAL
Qwest Corporation
Docket TC01-098
Exhibit to Testimony of
Renee Albersheim
Exhibit RA-04
CONFIDENTIAL

Qwest Corporation
Docket TC01-098
Exhibit to Testimony of
Renee Albersheim
Exhibit RA-05
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Qwest Corporation
Docket TC01-098
Exhibit to Testimony of
Renee Albersheim
Exhibit RA-06
CONFIDENTIAL

Qwest Corporation
Docket TC01-098
Exhibit to Testimony of
Renee Albersheim
Exhibit RA-07
CONFIDENTIAL

Qwest Corporation
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Exhibit to Testimony of
Renee Albersheim
Exhibit RA-08
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Qwest Corporation
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Exhibit to Testimony of
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Exhibit RA-09
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Docket TC01-098
Exhibit to Testimony of
Renee Albersheim
Exhibit RA-10
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[1]

TOTAL STARTUP COSTS

	PRODUCT	1997 Expense (000)	1997 Capital (000)	1998 Expense (000)	1998 Capital (000)	1999 Expense (000)	1999 Capital (000)	2000 Expense (000)	2000 Capital (000)
03	Unbundling	1,056,129	2,500	2,316,023	45,369	3,836,020	2,711	3,411,920	26,130
04	Rebundling	-	-	-	-	71,499	-	409,590	-
05	LIS	1,507,095	934,800	1,697	-	5,684,011	24,788	3,453,480	-
06	Collocation	118,554	-	562,912	-	230,329	-	646,260	-
07	Systems Access	15,668,781	3,085,100	28,285,356	2,677,350	52,420,529	2,719,315	57,393,970	2,674,080
08	Cross Product	-	-	3,705	1,472,194	3,787,724	9,524	6,286,080	754,560
09	Resale	3,381	138	8,396	12,530	8,519,601	420,231	6,538,010	27,770
10	Planning Allocation	1,342	209	4,666	6,251	4,856,319	22,721	-	-
	Total - OSS General	**$23,051,676**	**$4,368,200**	**$47,968,601**	**$4,213,694**	**$79,406,032**	**$3,199,290**	**$78,139,310**	**$3,482,540**
	Yearly Totals		**$ 27,419,876**		**$ 52,182,295**		**$ 82,605,322**		**$ 81,621,850**

Gaps	Applications Impacted	Specific Issue	Interim Solution[1]	Deployment Timeframe [1]	Long-term Solution [1]	Deployment Timeframe [1]
Gap 1: LSR Modification & transmission of service order in system	IMA	Need a mechanism to identify shared line order. (Meet point, "CFA, UCA UPR", CLEC ID, TN, ADSL indicator).	Proprietary LSR based on USW and DLEC agreement. This may be done via email, fax, or by faking IMA to use existing fields. A team of service order writers and OBF reps could accomplish this goal.	TBD	Make the long term changes through the OBF, such that, common rules sets are established	TBD
Gap 2: Order writing (between ICADS and SOP)	ICADS (creating automation).	Need business rules added to process shared-line orders, and to create SO.	No Interim Requirement	No Interim Requirement	Dependant on the standards within OBF establishing a rule set.	4Q2000
	Fetch-n-stuff and Data Arbiter	Enhancement to perform shared line facility availability queries. Later phases.	No Interim Requirement	No Interim Requirement	These changes are understood and can be worked independently from the OBF issues.	TBD
	SOPAD, SOLAR, RSOLAR (creating automation).	An Enhancement is necessary to accept shared line orders and manage the service order flow with automation between systems.	No Interim Requirement	No Interim Requirement	Establish transformation from the OBF forms to the Internal USOCs and FIDs.	4Q2000

[1] All timeframes and solution definitions are estimates based on pending requirements work and information to be provided by 3rd parties. These estimates should be considered as planning estimates, and are based on the current understanding of systems capabilities assessed during the operational impact review. For this reason, the estimates may be subject to change.

Gaps	Applications Impacted	Specific Issue	Interim Solution [1]	Deployment Timeframe [1]	Long-term Solution [1]	Deployment Timeframe [1]
	Manual SO Entry in SOPAD, SOLAR, RSOLAR	An Enhancement is necessary to accept shared line orders and manage the service order flow with a manual service order entry procedure.	Establish internal USOCs and FIDs for all systems within the Operational Support Systems environment.	1Q2000	See the automation items.	See the automation items.
Gap 3: Connecting Point Inventory	LFACS (All regions)	Current phase no impacts. Later phase, enhancements to allow for designated assignment locations (constrained loop assignment) and to reuse in place voice facilities.	Establish internal USOCs and FIDs. No substantial impacts to LFACS	1Q2000	Work any manual issues that may have been over sights.	2Q2000

Gaps	Applications Impacted	Specific Issue	Interim Solution [1]	Deployment Timeframe [1]	Long-term Solution [1]	Deployment Timeframe [1]
	SWITCH and APP	Enhancements to associate the customer's line with the connection points for the splitter, switch equipment, and ICDF, while reusing existing voice facilities.	Inventory the splitter in SWITCH as miscellaneous equipment. The resulting Manual assignments will fallout in the LPC. DLEC will pass ME FID on the LSR.	1Q2000 in limited volume.	Remove all the manual workarounds.	4Q2000 Telcordia offer.
			APP -- To simulate the transactions performed by the loop provisioning personnel to clear RMAs in SWITCH. This is required to support volume growth.	2Q2000 – APP, Automates portions of the manual process that falls out to the LPC.		

Gaps	Applications Impacted	Specific Issue	Interim Solution[1]	Deployment Timeframe [1]	Long-term Solution [1]	Deployment Timeframe [1]
	WFA/C	Table work for proper dispatch and workflow.	No known issue.	No known issue.	Establish internal USOCs and FIDs.	1Q2000
Gap 4: Repair Handling	NSDB/WFA	Repair tickets will flow through. NSDB for the design portion of the service.	No Interim Requirement		Line assignments are required as a part of NSDB for the design portion of the repair.	1Q2000
	LMOS	Repair tickets will flow through. LMOS for the POTS portion of the service.	No Interim Requirement		Line assignments are required as a part of LMOS for the POTS portion of the repair.	1Q2000
Gap 5: No interface between FOMS and WFA/DI	FOMS and WFA/DI	Interface bring up and testing between FOMS and WFA/DI.	No Interim Requirement		Test and turn up on the interface based on a WC rollout plan. Determination of DLECs intended Service offering allows for a smoother implementation.	1Q2000 (ongoing dependant on the DLEC Rollout.

Gaps	Applications Impacted	Specific Issue	Interim Solution[1]	Deployment Timeframe [1]	Long-term Solution [1]	Deployment Timeframe [1]
Gap 6: Single product, multiple customer (need 2 billing records to be created from a single order.)	Billing (CRIS)	Enhancements to bill the Co-Provider for shared line charges. Must have 2 CSRs that are related.	This is a Bulk bill solution (DLEC BAN per state). A DLEC will receive a bill that indicates that lines are shared, but to validate specific TN information requires that the CSR be reviewed. Back billing will be used to bring accounts up to date if service is provisioned before the interim solution can be implemented.	2Q2000	The interim billing mechanisms need to be modified to show TN detail, but this impact is unknown. Conversions will be needed once the billing systems are modified.	TBD
Gap 7: Need to identify accounts that are resold in IMA so that CLEC's cannot place orders against the line for line-sharing	IMA	Identify resold accounts and reject line sharing orders as appropriate. Similarly, identify line shared accounts and reject resale orders as appropriate.	CLECs will review CSRs prior to placing orders. U S WEST will also review CSRs as Service Orders are written.		Accounts will have the Line Sharing USOCs and FIDs on the CSRs. The handling of the End Customers and CLECs would then be handled via Methods.	See gap 6. Required concurrent with order automation long term solutions in Gap 2.

Gaps	Applications Impacted	Specific Issue	Interim Solution[1]	Deployment Timeframe [1]	Long-term Solution [1]	Deployment Timeframe [1]
Gap 8: Identify a method to cause an entry to the DLECs loss report for disconnected service	Loss and Completion	Depending on specific scenarios for a customer transfer between providers, modifications to the Loss and Completion reports must be made.	No Interim Requirement		Pending the scenario work identified in the meeting 10/29/99	TBD

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[2]

INTERIM LINE SHARING AGREEMENT

This Interim Line Sharing Agreement ("Agreement") between U S WEST Communications, Inc. ("ILEC") and @Link Networks, Inc., BridgeBand Communications, Inc., CDS Networks, Inc., Contact Communications, DIECA Communications, Inc. d/b/a Covad Communications Company, Jato Communications Corp. on behalf of its operating subsidiaries Jato Operating Corp. and Jato Operating Two Corp., Montana Wireless, Inc., MULTIBAND Communications, Inc., New Edge Network, Inc. d/b/a New Edge Networks, NorthPoint Communications, Inc., RHYTHMS LINKS, INC., and Western Telephone Integrated Communications, Inc. ("CLEC" or "CLECs") is entered into this 24th day of April, 2000, to govern deployment of line sharing in the states of Arizona, Colorado, Idaho, Iowa, Montana, Nebraska, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming. The Agreement is effective as of the date referenced in the preceding sentence and will terminate on a state-by-state, CLEC-by-CLEC basis when line sharing amendments to the interconnection agreements between ILEC and CLECs are approved by the relevant state public utility commissions as required by paragraph 36 below. ILEC and CLECs are referred to in this Agreement individually as a "Party" or collectively as the "Parties."

GENERAL

1. ILEC will provide CLEC with access to the frequency range above the voiceband on a copper loop facility used to carry analog circuit-switched voiceband transmissions. This frequency range will be referred to in this document as the "high frequency spectrum network element" or "HUNE". CLEC may use this access to provision any voice compatible xDSL technologies. Specifically permissible are ADSL, RADSL, G.lite and any other xDSL technology that is presumed to be acceptable for shared line deployment in accordance with FCC rules. Under this Agreement, "line sharing" is defined as the situation that exists when the CLEC has access to the HUNE and provides xDSL services on a loop that also carries ILEC POTS.

2. To order the HUNE, a CLEC must have a POTS splitter installed in the central office that serves the end-user of the loop. In addition, the CLEC must provide the end-user with, and is responsible for the installation of, a splitter, filter(s) and/or other equipment necessary for the end-user to receive separate voice and data services across the loop.

3. On or before June 6, 2000, ILEC will begin accepting orders for the HUNE on lines served out of every central office where CLEC has a POTS splitter installed.

4. Prior to July 31, 2000, the CLECs will not request conditioning of shared lines to remove load coils, bridged taps or electronics. If ILEC begins conditioning lines for its xDSL services, CLECs will have the same option. By July 31, 2000,

unless another date is agreed to by ILEC and CLEC in writing, the CLEC will be able to request conditioning of a shared line. ILEC will perform requested conditioning, including de-loading and removal of excess bridged taps, unless ILEC demonstrates in advance that conditioning that shared line will significantly degrade the end-user's analog voice service.

5. The CLECs initially will use ILEC's existing pre-qualification functionality and order processes to pre-qualify lines and order the HUNE. The CLECs will determine, in their sole discretion and at their risk, whether to order the HUNE across any specific loop. ILEC and the CLECs will continue to work together to modify these functionalities and processes to better support line sharing.

6. ILEC will initially provision the HUNE within the current standard unbundled loop provisioning interval at least 90% of the time. The Parties acknowledge that this interval may be subject to improvement based on systems mechanization and/or relevant state or federal regulatory orders.

POTS SPLITTER COLLOCATION AND OPERATION OF LINE SHARING EQUIPMENT

7. ILEC will provide CLEC with access to the shared line in one of the following ways, at the discretion of CLEC:

   (a) CLEC may place POTS splitters in ILEC central offices via Common Area Splitter Collocation. In this scenario, CLEC will have the option to either purchase the POTS splitter of its choosing or to have ILEC purchase the POTS splitter on the CLEC's behalf subject to full reimbursement. The CLEC will lease the POTS splitter to ILEC at no cost. Subject to agreed to or ordered pricing, ILEC will install and maintain the POTS splitter in the central office. ILEC will install the POTS splitter in one of three locations in the central office: (i) in a relay rack as close to the CLEC DSO termination points as possible; (ii) where an intermediate frame is used, on that frame; or (iii) where options (i) or (ii) are not available, or in central offices with network access line counts of less than 10,000, on the main distribution frame or in some other appropriate location, which may include an existing ILEC relay rack or bay.

   (b) CLEC may, at its option, place the POTS splitters in its own collocation area. ILEC will reclassify TIE cables, re-stencil framing, and perform any related work required to provision line sharing.

   (c) Under either option (a) or (b), the POTS splitter will be appropriately hard wired or pre-wired so that ILEC is required to inventory no more than two points of termination.

8. In the event CLEC, or ILEC acting as purchasing agent for CLEC, is unable to procure line sharing equipment (i.e., POTS splitters, cabling, etc.) for Common Area Splitter Collocation in a timely manner, ILEC will proceed with the line sharing deployment schedules set forth in paragraphs 12 and 13 below and install the delayed equipment once the deployment for the subject state is completed. If the delayed equipment still is not available once the deployment for the subject state is completed, ILEC and CLEC will work together to establish an alternate deployment schedule for the affected central offices.

   (a) If the ILEC, acting as purchasing agent for the CLEC, is unable to procure line sharing equipment for Common Area Splitter Collocation in a timely manner, then the CLEC may provide ILEC with the missing equipment. However, the deployment schedules set forth in this Agreement may be impacted. If impacted, the deployment will follow the terms and conditions described above.

   (b) If ILEC is acting as purchasing agent for more than one CLEC in a central office and is unable to procure line sharing equipment for one or more of the CLECs in a timely manner, then none of the CLECs using the ILEC as purchasing agent will be able to order the HUNE in that central office until the equipment is installed for all such CLECs. This requirement does not apply to a CLEC that, upon being contacted by the ILEC of the equipment shortage, provides its own equipment to ILEC for installation. The CLEC will be notified by the ILEC of the required material on-site date for that central office and will have 2 business days to determine if the CLEC will be able to provide its own equipment.

9. CLEC and ILEC may use any POTS splitter that meets the requirements for central office equipment collocation set by the FCC in its March 31, 1999 order in CC Docket No. 98-147.

10. If a CLEC requests that a central office where it is not currently collocated be provisioned for line sharing, the CLEC will indicate its request on the collocation application for that central office.

11. CLEC will provide ILEC with applications for placement of POTS splitters in central offices based on the order set forth on the confidential Central Office Deployment List agreed to jointly by the CLECs and the ILEC and on the schedule set forth below. If the application date is missed by any CLEC, ILEC will accept the CLEC's late applications and install the POTS splitter within 30 days of the end of the schedule for the state where the central office is located or the normal interval for collocation under the CLEC's interconnection agreement, whichever is later. ILEC and CLEC will work together to resolve any problems with order-related data included on the applications within 5 business days of the CLEC receiving notification of the problems from ILEC. If the

Parties are unable to resolve the problems after 5 business days, the application will be treated as a late application as defined above. Any changes received from the CLEC after 5 business days of the initial application date will also result in the application be treated as a late application.

First 145 Central Offices	March 24, 2000
Next 85 Central Offices	March 29, 2000
Next 65 Central Offices	April 3, 2000
Remaining Central Offices	April 10, 2000

12. Assuming CLEC reuses existing TIE cable capacity, ILEC will complete the TIE cable reclassification necessary to permit a CLEC to complete placement of POTS splitters in its own collocation areas in the central offices identified on the Central Office Deployment List based on the following schedule:

DATE	TOTAL NUMBER OF CUMULATIVE CENTRAL OFFICES
May 15, 2000	40-50
May 29, 2000	130-150
June 6, 2000	All remaining central offices identified on the Central Office Deployment List

Additional TIE cables will be installed in accordance with the standard intervals and processes set forth in the interconnection agreements between ILEC and CLECs at the completion of this deployment schedule or under an installation schedule mutually agreed upon by CLEC and ILEC. In situations where a CLEC places POTS splitters in its collocation areas, CLEC may begin placing orders for the HUNE in the central offices identified on the Central Office Deployment List in accordance with the above schedule.

13. ILEC will complete Common Area Splitter Collocation in the central offices identified on the Central Office Deployment List based on the following schedule:

DATE	TOTAL NUMBER OF CUMULATIVE CENTRAL OFFICES
May 15, 2000	40-50
May 29, 2000	130-150
June 6, 2000	165-180
June 26, 2000	230-260
July 31, 2000	All remaining central offices identified on the Central Office Deployment List

If a CLEC chooses to have POTS splitters placed in central offices via Common Area Splitter Collocation, CLEC may begin placing orders for the HUNE in the central offices identified on the Central Office Deployment List in accordance with the above schedule.

14. To deploy POTS splitters in a central office identified on the Central Office Deployment List, the CLEC must either: (a) have an existing collocation presence in the central office; or (b) have pending applications for collocation in the central office as of March 10, 2000.

15. If ILEC receives an application for new collocation in a central office that does not appear on the Central Office Deployment List, or where the applying CLEC does not meet the requirements of the preceding paragraph, ILEC will treat the application as a standard collocation application under the terms and conditions of the applicable interconnection agreement. CLEC will be able to order the HUNE in such offices beginning on the date the collocation installation is completed or July 31, 2000, whichever is later.

16. ILEC and the CLECs agree to work together to address and, where necessary and possible, find solutions for the following "Line Sharing Implementation Issues": (a) the implementation of an effective phased process to handle CLEC orders for the HUNE; (b) ILEC's ability to handle the existing and forecasted volume of CLEC orders for the HUNE; (c) ILEC's ability to make central office loop assignments for the existing and forecasted volume of CLEC orders for the HUNE; (d) the ability of ILEC and CLEC to coordinate repairs; (e) the experience and education of the shared line end-user; (f) the CLEC's forecasts of shared line orders; and (g) the process for conditioning loops for line sharing.

17. Beginning on April 1, 2000, the CLECs will provide ILEC with non-binding, good-faith rolling quarterly forecasts for shared line volumes on a state-by-state, central office-by-central office basis. Additionally, CLEC will provide a 1.5 year non-binding, good-faith forecast by quarter to ILEC by June 1, 2000. ILEC will keep CLEC forecasts confidential and will not share such forecasts with any person involved in ILEC retail operations, product planning or marketing.

REPAIR AND MAINTENANCE

18. ILEC will allow the CLECs to access the combined voice and data line at the point where it is cross-connected to the POTS splitter. Under the scenario described in paragraph 7(a) above, the point of demarcation will be at the place where the data loop leaves the POTS splitter on its way to the CLEC's collocated equipment. Under the scenario described in paragraph 7(b) above, the point of demarcation will be where the shared line is cross-connected to the POTS splitter.

19. ILEC will be responsible for repairing voice services provided over the shared line and the physical line between the network interface device at the end-user premise and the point of demarcation in the central office. ILEC also will be responsible for inside wiring in accordance with the terms and conditions of inside wire maintenance agreements, if any, between ILEC and the end-users. CLECs will be responsible for repairing data services provided over the HUNE portion of the shared line. Each Party will be responsible for maintaining its own equipment. The Party that controls the POTS splitter will be responsible for maintaining it.

20. ILEC and CLEC are continuing to develop repair and maintenance procedures and agree to document final agreed-to procedures in a methods and procedures document that will be available on ILEC's web site. In the interim, ILEC and CLEC agree that the following general principles will guide the repair and maintenance process:

    (a) If an end-user complains of a voice problem that may be related to the use of the shared line for data services, CLEC and ILEC will work together and with the end-user to solve the problem to the satisfaction of the end-user. ILEC will not disconnect the data service without the written permission of the CLEC unless the end-user's voice service is so degraded that the end-user cannot originate or receive voice grade calls.

    (b) Each Party is responsible for its own end-user base and will have the responsibility for resolution of any service trouble report(s) from its end-users. ILEC will test for electrical faults (i.e., opens, shorts, and/or foreign voltage) on the shared line in response to trouble tickets initiated by the CLEC.

(c) When trouble has been reported by CLEC, and such trouble is not an electrical fault in ILEC's network, ILEC will charge CLEC any applicable charges approved by the relevant state public utility commission.

(d) When trouble reported by CLEC is not isolated or identified by tests for electrical faults, ILEC may perform additional testing as requested by CLEC on a case-by-case basis. If this additional testing uncovers electrical fault trouble in the portion of the network for which the ILEC is responsible under this Agreement, the CLEC will not be charged for the testing. If the additional testing uncovers a problem in the portion of the network for which the CLEC is responsible under this Agreement, the CLEC will be charged any applicable charges set forth in interconnection agreements between ILEC and CLECs or by the relevant state public utility commissions. Where no such charges exist, CLEC will pay for such testing on a time and materials basis.

21. When the POTS splitter is placed in the central office via Common Area Splitter Collocation, CLEC will order and install additional splitter cards as necessary to increase POTS splitter capacity from the initial installation. CLEC will leave one empty card in every shelf to be used for repair and maintenance until such time as the card must be used to fill the shelf to capacity.

22. When the POTS splitter is located in the CLEC collocation area, CLEC may install test access equipment in its collocation area for the purpose of testing the shared line. This equipment must comply with the safety requirements set forth in any applicable FCC rules. When the POTS splitter is placed in the central office via Common Area Splitter Collocation, CLEC will have the ability to perform intrusive testing at the test access point on a line-by-line basis.

PRICING

23. ILEC and the CLECs agree to the following negotiated, interim prices for shared lines, splitter collocation and other elements noted in the following table:

Category	Element	Interim Price
Shared Line Non-Recurring	Installation option is basic installation – lift and lay	IA* price for basic installation – lift and lay
Shared Line Recurring	HUNE	Paragraph 25
	2 ITP/EICT – Interconnection Tie Pairs or Expanded Interconnection Channel Terminations	IA price
Common Area Splitter Collocation Non-Recurring	Installation	$5,000.00 per shelf
Common Area Splitter Collocation Recurring	Equipment bay – per shelf	$4.85 per shelf

Cost of POTS splitters if provided by ILEC	POTS splitter	Market cost – in addition to the $5,000.00 flat rate
Non-recurring for TIE cable reclassification	TIE cables	Time and material for engineering and labor
Repair and Maintenance	Trouble Isolation and Additional Testing	Paragraph 20 (c) and (d)
Line Conditioning	Load Coil and Excess Bridged Tap Removal	IA price

* The relevant interconnection agreement between ILEC and CLEC.

24. ILEC and CLECs will continue work to arrive at appropriate cost recovery for operational support systems upgrades related to the shared line.

25. CLECs may choose from either of the following options for an interim recurring shared line rate:

(a) A rate of $5.40 per month per shared line; or

(b) A rate of $0 per month per shared line until January 1, 2001. On January 1, 2001, the interim recurring shared line rate will change to $8.25 unless ILEC continues to charge a rate of $0 per month per shared line to one or more CLECs as of that date. In the event ILEC continues to charge a rate of $0 per month per shared line to one or more CLECs as of January 1, 2001, ILEC will continue to charge all CLECs that selected this interim recurring shared line rate option a rate of $0 per month per shared line until such time as it begins to charge all CLECs $8.25 per month per shared line.

CLECs must select one of the foregoing options for an interim recurring shared line rate by May 1, 2000, and must notify ILEC of their selection through their account teams. Once a selection is made, a CLEC cannot change its selection.

26. All interim prices will be subject to true up based on either mutually agreed to permanent pricing or permanent pricing established in a line sharing cost proceeding conducted by state public utility commissions. In the event interim prices are established by state public utility commissions before permanent prices are established, either through arbitration or some other mechanism, the interim prices established in this Agreement will be changed to reflect the interim prices mandated by the state public utility commissions; however, no true up will be performed until mutually agreed to permanent prices are established or permanent prices are established by state public utility commissions.

27. During the 60 day period immediately following the effective date of this Agreement, the Parties agree to negotiate in good faith in an effort to arrive at mutually agreed to permanent pricing for all of the elements listed in paragraph

23 above and operational support system upgrades related to line sharing. If at the conclusion of this 60 day period, the Parties have been unable to mutually agree to permanent pricing for some or all of such elements and/or operational support system upgrades related to line sharing, the Parties agree to ask the state public utility commissions for each of the states listed in the introductory paragraph of this Agreement to initiate a line sharing cost proceeding to establish permanent pricing for all elements, potentially including operational support system upgrades related to line sharing, still in dispute at that time.

OTHER

28. This Agreement constitutes the entire agreement between the Parties and supersedes all prior oral or written agreements, representations, statements, negotiations, understandings, proposals, and undertakings with respect to the subject matter hereof.

29. ILEC and CLEC enter into this Agreement without waiving current or future relevant legal rights and without prejudicing any position ILEC or CLEC may take on relevant issues before state or federal regulatory or legislative bodies or courts of competent jurisdiction. This clause specifically contemplates but is not limited to: (a) the positions ILEC or CLEC may take in any cost docket related to the terms and conditions of line sharing; and (b) the positions that ILEC or CLEC might take before the FCC or any state public utility commission related to the terms and conditions under which ILEC must provide CLEC with access to the HUNE.

30. The provisions in this Agreement are based, in large part, on the existing state of applicable law, rules, and regulations ("Existing Rules"). Among the Existing Rules are certain FCC orders, including the FCC's Third Report and Order in CC Docket No. 98-147 and Fourth Report and Order in CC Docket No. 96-98 released on December 9, 1999, which currently are being challenged. To the extent the Existing Rules are changed, vacated, dismissed, stayed or modified, the Parties shall amend this Agreement to reflect such change, vacation, dismissal, stay, or modification. Where the Parties fail to agree upon such an amendment, all disputed issues will be resolved in accordance with the dispute resolution provisions of the interconnection agreements between ILEC and CLECs incorporated by reference into this Agreement.

31. In addition to those provisions specifically referenced elsewhere in this Agreement, the provisions in the interconnection agreements between ILEC and CLECs related to the following are incorporated by reference into this Agreement: (a) limitation of liability; (b) indemnification; (c) force majeure; (d) warranties; and (e) dispute resolution. These provisions are incorporated on a state-by-state, CLEC-by-CLEC basis.

32. This Agreement is the joint work product of the Parties, has been negotiated by the Parties and shall be interpreted fairly in accordance with its terms and conditions. In the event of any ambiguities, no inferences shall be drawn against any Party.

33. This Agreement only may be amended in writing executed by all Parties to be bound by the amendment.

34. During the term of this Agreement, if ILEC either (a) enters into an agreement with any Party that modifies the rates, terms, and conditions of this Agreement as applied to that Party, or (b) enters into any other agreement for line sharing with any party containing rates, terms, and conditions different from those in this Agreement, ILEC will make such modified or different rates, terms, and conditions available to any interested Party. To the extent the modified or different rates, terms, and conditions are provided by ILEC only in certain locations or pursuant to some other limitation, then the modified or different rates, terms, and conditions only will be made available to interested Parties in those locations or subject to those same limitations. Unless otherwise agreed to by the Parties, this paragraph will not be incorporated into any interconnection agreement amendments entered into between ILEC and CLECs pursuant to paragraph 36 below.

35. This Agreement may be executed in multiple counterparts, each of which shall be deemed an original, but all of which shall together constitute but one and the same document. This Agreement may be executed where indicated below either by an original signature of a duly authorized representative of each Party or by a facsimile of such a signature.

36. ILEC and CLECs acknowledge the need to execute amendments to their interconnection agreements by June 6, 2000, to govern line sharing. The Parties further acknowledge that the rates, terms, and conditions of this Agreement will form the basis for the negotiation of the amendment. This Agreement will terminate upon execution of such amendments and will be replaced by the amendments. ILEC and CLEC further agree that any applicable window for petitioning a state public utility commission for arbitration of an interconnection agreement amendment for line sharing that would expire before June 6, 2000 is extended to June 16, 2000.

37. The Parties will work together to schedule a conference call with the state public utility commissions for each state listed in the introductory paragraph to this Agreement to explain this Agreement and answer any questions related to the Agreement. The Parties agree to work together to schedule and provide notice of the call in the most efficient and expeditious manner possible. The Parties further agree to respond to any questions or information requests from state public utility

commissions in a joint manner and, in so doing, take all reasonable steps to preserve the confidentiality of the Central Office Deployment List.

38. The Parties will work together in good faith to address any problems that may arise in the execution of any part of this Agreement.

39. Any CLEC that is not a party to this Agreement may opt into this Agreement at any time prior to its expiration. CLECs must notify ILEC of which of the two options for interim shared line rates outlined in paragraph 25 above it selects at the time it opts into this Agreement or by May 1, 2000, whichever is later.

U S WEST, Inc.		**@Link Networks, Inc.**
John A. Kelley		Tim O'Neill
President – Wholesale Markets		Chief Network Officer
Date		Date

BridgeBand Communications, Inc.		**CDS Networks, Inc.**
Jon M. Hesse		Cleve Tooker
Chief Operating Officer and In-House Counsel		President
Date		Date

Contact Communications		**DIECA Communications, Inc.**
Arlen Taggart		Dhruv Khanna
Vice President		General Counsel
Date		Date

Jato Communications Corp.

Patrick M. Green	
Vice President – Carrier Relations	
Date	

Montana Wireless, Inc.

Joan Mandeville	
Vice President – Administration	
Date	

MULTIBAND Communications, Inc.

Tim Dodge	
Executive Vice President	
Date	

New Edge Network, Inc.

Robert Y. McMillin	
Director – Interconnection	
Date	

NorthPoint Communications, Inc.

Steve Gorosh	
Vice President and General Counsel	
Date	

RHYTHMS LINKS, INC.

Eric Geis	
Senior Vice President of Regulatory Affairs and Development	
Date	

Western Telephone Integrated Communications, Inc.

Cleve Tooker	
President	
Date	

System Descriptions

Appointment Scheduler

Appointment Scheduler is a management system for technician schedules. Ordering systems, such as SONAR, IMA, electronically interface with Appointment Scheduler to reserve technician time slots.

APRIL (Automatic Provisioning Infrastructure Layer)

APRIL receives and views all Service Orders for special service activation. These services include, but are not limited to SS7, POTS, ISDN and AIN services.

BOSS (Billing and Order Support System)

BOSS is a Customer Service Record (CSR) management system. CSRs contain account status, billing, listing and services and equipment information. This system serves Qwest's central and eastern regions.

CARS (Customer Account Retrieval System)

CARS is a Customer Service Record (CSR) management system. CSRs contain account status, billing, listing and services and equipment information. This system serves Qwest's western region.

CEMR (Customer Electronic Maintenance and Repair)

CEMR is a GUI interface for trouble reporting and Mechanized Loop Testing results. CEMR allows the CLEC's customer service representative to make inquiries, receive proactive status notifications, and electronically transmit trouble reports to Qwest for processing.

CNUM (Customer NUMber Management System)

CNUM is a Telcordia system designed to support telephone number administration, service negotiation, and service activation. CNUM provides a single repository for number administration that is technology and service independent. Along with ALOC, CNUM will replace PREMIS.

CRIS (Customer Records Information System)

CRIS is a billing system for the majority of residence and business account bills for exchange services. It calculates, prints, and mails bills to individual retail end-user customers for retail products, and CLECs for some interconnect (wholesale) products. After rating usage, CRIS posts service order processing updates, provisioning information, rating data, tolls, cash treatments, bills, payments, journal entries or adjustments, rate changes, message processing and other billing related information to the CSRs.

Data Arbiter

This system provides access from UNIX-based systems to PREMIS, BOSS/CARS, TIRKS, LFACS, and LMOS.

DELIVER/C (DELIVER/CONTROL)

DELIVER/C is a graphical user interface (GUI) which allows its Qwest's repair representatives to communicate with WFA/C for design services.

EB/TA (Electronic Bonding / Trouble Administration)

EB/TA is an interface for trouble reporting and Mechanized Loop Testing results. EB/TA allows the CLEC's customer service representative to make inquiries, receive proactive status notifications, and electronically transmit trouble reports to Qwest for processing.

Facility Check

Facility Check is a Netscape-based interface used to access LFACS to determine whether loop facilities will be available for new service to a specific customer site.

FACS (Facility Assignment and Control System)

FACS is an "umbrella" term for LFACS, SWITCH, and SOAC.

FnS (Fetch "n" Stuff)

This system provides a common point of access to Qwest's OSS using a standard application programmer interface (API) to simplify data access. Fetch "n" Stuff accesses Appointment Scheduler, BOSS/CARS, CNUM, PREMIS, Facility Check, and WFA/DO.

FOM (Firm Order Manager)

The FOM manages LSRs and is part of the IMA architecture.

FOMS (Frames Operation Management System)

FOMS is a dispatch-in system for central office wiring instructions used by central office technicians.

IABS (Integrated Access Billing System)

IABS is a billing system, focused on access or facility driven billing, whose functionality includes switched and special service orders, meet point billing, mechanized adjustments for interexchange carriers and other facilities based CLEC accounts.

IMA-GUI and IMA-EDI (Interconnect Mediated Access- Graphical User Interface and Interconnect Mediated Access- Electronic Data Interchange)

These two electronic interfaces provide CLECs with access to all of the functions necessary for the pre-ordering, ordering, and provisioning of resale and unbundled network elements.

LEIS (Loop Engineering Information System)

LEIS is a downstream system of LFACS, with LFACS-equivalent data. The primary function of LEIS is to offload queries that would normally go to LFACS so that LFACS may perform its primary functions.

LFACS (Loop Facility Assignment and Control System)

LFACS is a component of FACS which maintains a mechanized inventory of outside plant facilities, (e.g., facility addresses, cables, cable pairs, serving terminals, cross connection devices, loops, etc.) and assigns the outside plant facilities to assignment requests received from SOAC as a result of customer service order activity.

LMOS (Loop Maintenance Operations System)

LMOS is a repair system for POTS services for trouble entry, tracking and work status. LMOS Host stores detailed line record information and maintains historical data of closed troubles.

LSMS (Local Service Management System)

LSMS is the local service provider's network database which holds downloaded ported number information.

MARCH (Memory Administration of Recent Changes)

MARCH provides an automated means of passing service-defining line-side switching machine translations to stored program controlled switches.

MEDIACC (MEDIated ACCess)

MECIACC is a system providing a common electronic gateway for processing repair requests, created by external entities. MEDIACC supports repair reports for both Interexchange Carriers and CLECs.

MLT (Mechanized Loop Testing)

This system tests and analyzes the condition of customer loops. MLT provides test results for assisting in decisions regarding trouble flow.

NSDB (Network and Services DataBase)

NSDB stores customer and circuit data for special service, message, carrier, and enhanced nondesigned services. This data is received from the Service

Order Analysis and Control (SOAC) system during service order activity, and from the Telcordia TIRKS system upon the issue or reissue of the Work Order Record and Details (WORD) document. NSDB also receives circuit and customer data updates and order completion notifications from WFA/C.

PAWS (Provisioning Analyst Workstation System)

PAWS manages requests for manual assistance (RMA) work and assigns them to the loop provisioning center according to the type of error as recognized by LFACS for correction. PAWS also serves a similar function for errors which fall out as RMAs for SWITCH.

PREMIS (PREMises Information System)

PREMIS is a legacy system supporting service negotiation for residence and small business. PREMIS provides address validation, telephone number selection, and interexchange carrier selection. A suite of systems-ALOC, CNUM, and PIC Selection will replace PREMIS.

RCE (Repair Call Expert)

RCE assists a Repair Service Agent (RSA) in handling customer repair calls. RCE supports the customer interview process by providing the RSA with an appropriate sequence of questions along with hints to guide the interaction with the customer. A primary goal of RCE is to enable the front-end closing of a significantly higher percentage of reported troubles than is

typically achieved without such assistance. For troubles requiring additional handling, RCE generates trouble-reporting details in a consistent manner. This allows for more effective performance for the downstream processing.

SMS (Service Management System)

SMS is a hardware and software platform supporting the porting of telephone numbers. In concert with the Number Portability Administration Center (NPAC), SMS receives customer information from the old and new service providers (including the new location routing number). It validates the information received, and downloads the new routing information when an "activate" message is received indicating the customer has been physically connected to the new service provider's network. NPAC/SMS also contains a record of all ported numbers and a history file of all transactions relating to the porting of a number.

SOAC (Service Order Analysis and Control)

SOAC is a Telcordia system controlling the flow of service orders activity from Qwest service order processors (SOPs) to other downstream systems. Based on the service order input, SOAC determines which operations systems need to be involved in activating service, and provides instructions and sequencing to those operations systems.

SONAR (Service Order Negotiation and Retrieval)

SONAR is a system used to create and submit service orders for non-designed services for residential and small business customers.

SOP (Service Order Processors)

SOLAR (Service Order Logistics and Reference), SOPAD (Service Order Processor and Distribution), and RSOLAR (Regional SOLAR). Within each region, the corresponding SOP directs and processes service orders for all product types. SOPAD is the SOP in the central region. SOPAD distributes the order to necessary systems such as directory listings, E911, and billing systems. SOLAR is the SOP in Qwest's eastern region; RSOLAR is the SOP in the western region.

SWITCH

SWITCH is a central office inventory system. With cable pair data from LFACS and telephone number inventory information from CNUM, SWITCH completes the initial step in designing the circuit package. SWITCH supports line-side and trunk-side central office provisioning of digital, analog, and packet switching facilities by providing connection information for central office personnel.

WFA (Work Force Administration)

This is an umbrella term for three subsystems: WFA/C, WFA/DI and WFA/DO. WFA/C (Work Force Administration/Control) mechanizes the administration of the installation and maintenance of designed and non-designed circuits. WFA/C directs the flow of work items to WFA/DO and WFA/DI. WFA/DI automates the work assignments of the technicians

working within the central offices. WFA/DO automates the support of the dispatch function for outside plant installation, maintenance and routine work. WFA/DO provides screening, pricing, mapping, routing, scheduling and loading functions within a dispatch center.

DESCRIPTIONS OF MODIFICATIONS

Line sharing was implemented in two phases. The first phase addressed the modifications necessary to accomplish line sharing in the central office - either in the CLEC's collocation area or in the common area. The second phase allows the splitter to be placed in a remote terminal.

To accommodate line sharing, systems and processes were modified. It was also necessary to introduce new data elements. These data elements are communicated between the companies involved in sharing the line and stored in new or existing databases. This document describes first, the additional data that was required to support line sharing. Second, it describes the systems used for pre-ordering, ordering, and provisioning, as well as the changes that were needed to support line sharing. The document also includes a diagram depicting the relationship between these systems. Further, this document describes the systems used for repair, the changes that were needed to support line sharing, and displays a diagram depicting the relationship between these systems at the time these changes were implemented. Finally, there is a description of the billing system and modifications that were needed to support line sharing.

NEW DATA ELEMENTS

Three new field identifiers (FIDs) were introduced. The data needed consisted of:

- UNN = Data CLEC identifier (RSID, ZCID, DLEC equivalent),
- UNE = Data CLEC circuit ID (currently, the end-user's telephone number), and
- UCP = Cable & pair equivalent comprised of the following fields (Type, Meet Point (point of termination to the splitter), Central office or Field indicator, and Optional (power spectrum density mask).

PRE-ORDERING

CLECs use IMA, either GUI or EDI, to determine if a line is qualified for ADSL service. To further support line sharing, particularly in regards to CLECs' acquisition of customer loop information, Qwest provided CLECs with electronic batch files containing loop information on a per wire center basis. The batch files Qwest provided to CLECs contained listings of all active telephone numbers within a particular wire center as well as additional loop information for each telephone number listed. CLECs accessed these batch loop files through a Qwest web site. The batch files were refreshed monthly on a rolling basis.

ORDERING

The IMA (GUI/EDI) gateway is comprised of two electronic interfaces, which provide CLECs access to pre-ordering, ordering, provisioning, and repair functionality of resale and unbundled network elements. To support line sharing,

the IMA gateway was modified to allow for additional data elements, including, but not limited to 1) request type (a request for line sharing); 2) TOS (type of service); 3) circuit ID (UNE FID); and 4) meet point (UCP FID). IMA includes edits for syntax and cross-edit requirements for all of the new data elements. The LSR was modified to allow the new line sharing data elements to be passed to Qwest. The LSR modifications were introduced to the Ordering and Billing Forum (OBF) in early February 2000 by Qwest with the concurrence of the participating CLECs.

SONAR is the system used to create and submit service orders for nondesigned services for residential and small business customers. SONAR was modified to recognize the order, and associated account being issued as a shared line. This ensures the voice products/services are compatible with data services.

There are three service order processors, collectively called the SOPs. SOLAR (service order logistics and reference) is the SOP in Qwest's eastern region, SOPAD (service order processor and distribution) is the SOP in Qwest's central region, and RSOLAR (Regional SOLAR) is the SOP in Qwest's western region. To support line sharing, these SOPs were also modified to accept the new FIDs and to exhibit specific behavior based on the presence of those FIDs. To support

line sharing, the SOPs must create and distribute one record to LMOS for repair purposes and two records to CRIS for billing purposes.

SOAC controls the flow of service order activity from the SOPs to the downstream systems. Based on the type of service order, SOAC determines which downstream systems need to be involved in activating service, and provides instructions and sequencing to those systems. To support line sharing, SOAC was changed so that it can recognize a shared line order, perform proper telephone number treatment within CNUM, and create and distribute one record to NSDB for repair. In addition, SOAC was changed so it can interpret the UCP FID and splitter location (e.g., central office or remote terminal) information. If the splitter is placed in the central office, SOAC will send the information to SWITCH for assignment. If the splitter is placed at a remote terminal, SOAC will send the information to LFACS for assignment.

PROVISIONING

LFACS maintains a mechanized inventory of outside plant facilities and assigns the outside plant facilities to assignment requests received from SOAC. It also provides cable & pair information, addresses, and terminal locations to SOAC. To support line sharing, LFACS was changed to recognize and receive the meet point

information from the UCP FID and inventory it as a cable & pair assignment when a remote line sharing request is made. LFACS was also changed to recognize when the line sharing request is to be a central office solution and ignore the connection information and allow SWITCH to perform the assignment function. In addition, it must designate the line can not be line station transferred. This ensures the end-user's line is not replaced with a non DSL-capable loop.

SWITCH is a central office inventory system. It takes the telephone number information and the cable & pair information from LFACS and guides the information to the correct network location. SWITCH supports line-side and trunk-side central office provisioning of digital, analog, and packet switching facilities by providing connection information for central office personnel. To support line sharing, SWITCH was changed so it could recognize and receive the meet point information from the UCP FID and inventory it as miscellaneous equipment. In addition, there are conversion activities associated with this new functionality. Before the changes to SWITCH, Qwest supported line sharing in a quasi-manual mode and the original inventory information was input as free flow text behind a FID. With the line sharing solution, Qwest built the line sharing inventory into SWITCH by parsing the free flow text, analyzing it and populating the database.

MARCH and APRIL receive and review all orders for special service activation. To support line sharing on a finished voice service, APRIL was changed to pass the service order without errors. In the event a data CLEC wishes to share a loop with Qwest, these systems change the telephone number / office equipment (voice switch location) relationship. In addition, two meet points are inventoried and assigned: one for Qwest and one for the data CLEC's splitter port location.

WFA/DO automates the support of the dispatch function for outside plant installation, repair, and routine work. WFA-DO provides screening, pricing, mapping, routing, scheduling, and loading functions within a dispatch center. To support line sharing, WFA/DO now recognizes line sharing orders when dispatching for installation and repair. In addition, it recognizes a line sharing order when performing the service order complete process.

WFA/DI automates the work assignments of the technicians working within the central offices. To support line sharing, WFA/DI now interfaces with FOMS, which is a dispatch-in system for central office wiring instructions used by central office technicians. In addition, WFA/DI recognizes a line sharing orders when performing the SOP auto-complete process.

NSDB stores customer and circuit data for special service, message, carrier, and enhanced nondesigned services. The NSDB line record now has descriptive indicators to inform the technician of a line share situation. This is necessary because in the event repair is required, the technician must understand the condition of the line. To support line sharing, NSDB now recognizes a shared line when it stores the record for repair purposes.

WFA/C mechanizes the administration of the installation and maintenance of designed and nondesigned circuits. It also directs the flow of the work items to WFA/DO and WFA/DI. To support line sharing, WFA/C now recognizes a shared line, accepts the new data, and allows for auto-completion of line sharing orders.

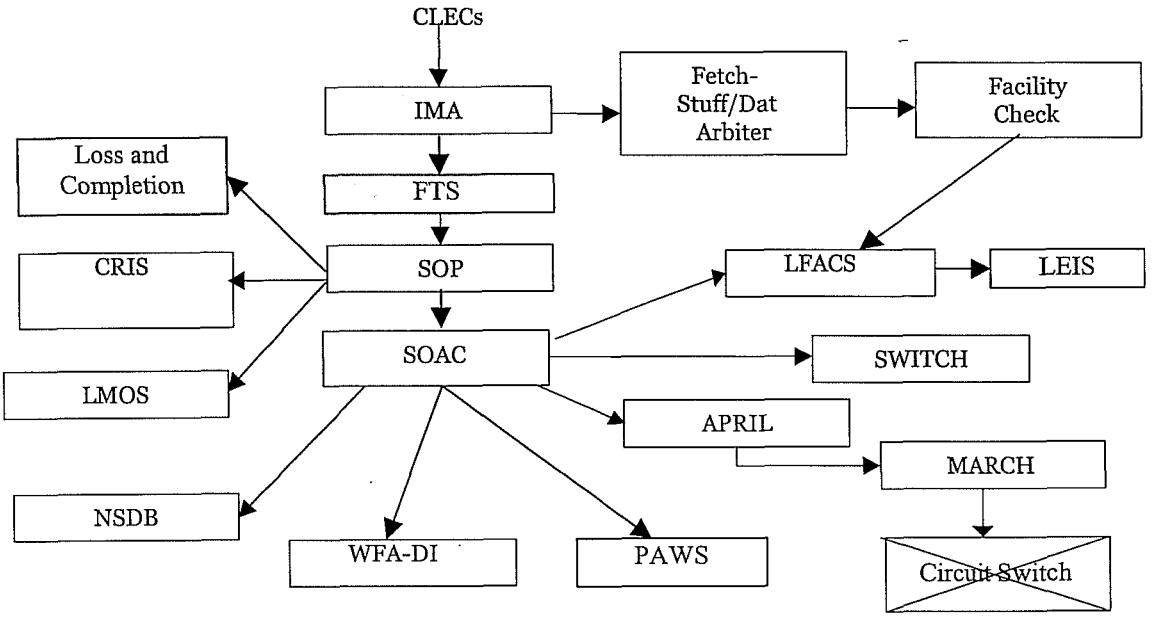
LMOS is a repair system for POTS services providing trouble entry, tracking and work status. LMOS now receivew the completed service order and records the line record as a shared line. A designed services technician typically performs the additional tasks required to repair a more complex wiring arrangement such as line sharing. Modifying both the NSDB and LMOS systems allows both the POTS and Design technicians to have knowledge of the condition of the line.

PAWS (Provisioning Analyst Workstation System) is a downstream system from SOAC and LFACS. Service orders containing errors (e.g. incorrectly entered loop data) sometimes make their way partially through the downstream systems without the SOPS recognizing the errors. A service order with this type of error can drop out of either SOAC or LFACS as a request for manual assistance (RMA). The RMA is sent to PAWS. PAWS manages the RMA work list and assigns them to the appropriate loop provisioning center (LPC) according to the type of error as recognized by LFACS for correction. PAWS also serves a similar function for errors that fall out as RMAs for SWITCH. To support line sharing, PAWS now recognizes incorrect splitter location requests based on information contained in SWITCH or LFACS, depending on the type of line sharing requested. In addition, PAWS now recognizes the three FIDs associated with orders for line sharing. PAWS also recognize a line shared order to properly route the RMA to the appropriate technicians with the skills to remedy errors specific to line sharing orders.

LEIS (Loop Engineering Information System) is a downstream system of LFACS, with LFACS-equivalent data. The primary function of LEIS is to offload normal queries from LFACS in order for LFACS to perform its primary functions. To support line sharing, LEIS now recognizes and receives the meet point information

from the field identifier (FID) and inventories this as a cable & pair assignment when a remote line sharing request is made.

Line Sharing Ordering and Provisioning Flow On Completion of the Line Sharing Solution

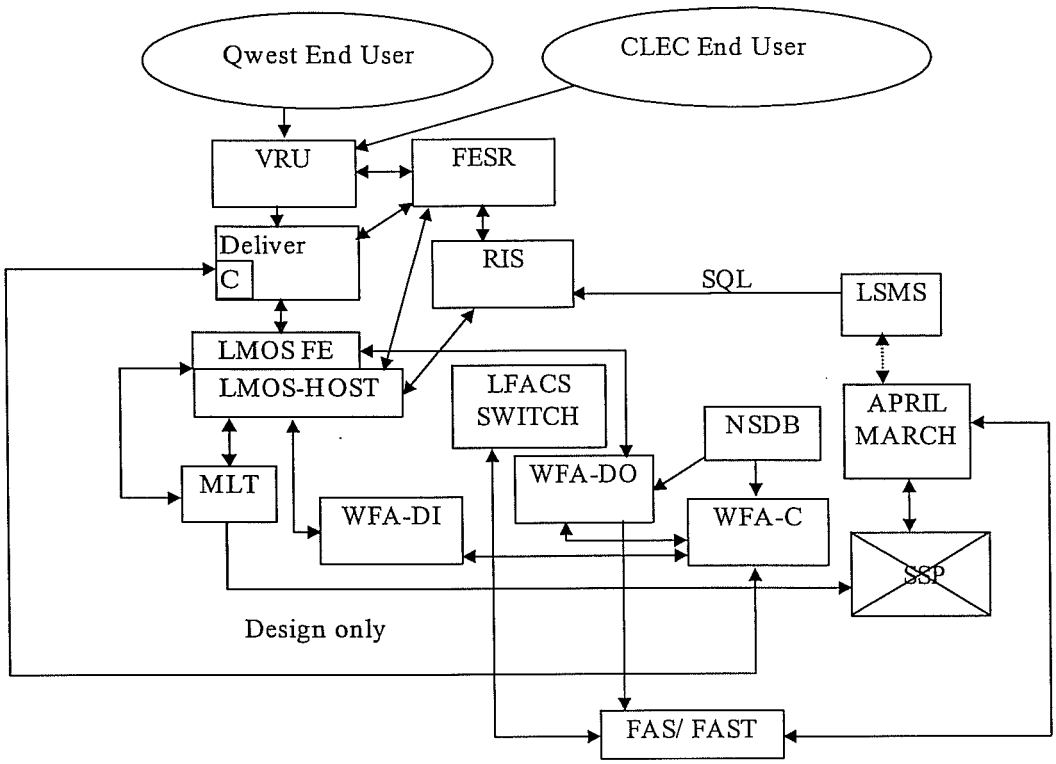


REPAIR

VRU and FESR are collectively the voice response units containing a script of the repair scenarios. These scripts allow an end-user to walk through the VRU and through associated button-tone responses by the end-user will direct the customer inquiry to the appropriate repair function.

- To support line sharing, all of the scenarios were first be defined, the scripts coded into the VRU, and the systems modified to react appropriately to the button-tone responses described in the script for the line sharing scenarios.
- Repair for data issues is deferred to the CLEC, while voice repair remains with Qwest. This is very different from the other resale and unbundled network elements because those records are marked as belonging to one LEC - the CLEC. Line sharing results in single records having two owners (Qwest and the CLEC). Specialized markings and logic were required to support this condition in the VRU/FESR, LMOS, and NSDB systems.
- Test access was also considered. The access now allows for voice testing and data testing based on the location of the meet points. The records in LMOS and NSDB provide this information. This information allows the technician to understand the test access and responsibility.

Line Sharing Repair System Flow on Completion of the Line Sharing Solution



BILLING

CRIS is a billing system for the majority of residence and business account bills for exchange services. It calculates, prints, and mails bills to individual retail end-user customers for retail products, and CLECs for some interconnect (wholesale) products. After rating usage, CRIS posts service order processing updates, provisioning information, rating data, tolls, cash treatments, bills, payments,

journal entries or adjustments, rate changes, message processing and other billing related information to the CSRs.

To support line sharing, CRIS was modified to create/modify two customer service records (CSRs) for one product - line sharing. The end-user's account is updated to reflect a shared line. A new summary bill for the CLEC is created to establish the relationship to the end-user's telephone number. In addition, CRIS bills the CLEC on a wholesale summary bill for any charges associated with line sharing.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 14th day of October, 2002, the foregoing **Direct Testimony of Renee Albersheim and public exhibits** were filed and served upon the parties shown below. Nine confidential exhibits (**Exhibits 3, 4, 5, 6, 7, 8, 9, 10 and 13**) were served only on the Commission and those executing the protective agreement:

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Harlan Best, Staff Analyst South Dakota Public Utilities Commission 500 East Capitol Avenue Pierre, SD 57501 Telephone: (605) 773-3201 Facsimile: (605) 773-3809 harlan.best@state.sd.us *Protective Agreement Executed*	____ ____ [X] ____ [X]	Hand Delivery U. S. Mail Overnight Delivery Facsimile Email to : harlan.best@state.sd.us
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