EXHIBIT TPG-2

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Petition of Qwest Corporation to Initiate a Mass-Market Switching and Dedicated Transport Case Pursuant to the Triennial Review Order	**Docket No. UT-033044**

JOINT REBUTTAL TESTIMONY OF

SHERRY LICHTENBERG AND TIMOTHY GATES

Batch Hot Cut Process

ON BEHALF OF

WORLDCOM, INC. (MCI)

February 17, 2004

TABLE OF CONTENTS

EXHIBITS

I. INTRODUCTION

Q. MS. LICHTENBERG, PLEASE STATE YOUR NAME, OCCUPATION AND EMPLOYER FOR THE RECORD.

A. My name is Sherry Lichtenberg. I am currently employed by MCI as Senior Manager, Operational Support Systems Interfaces and Facilities Development.

Q. MR. GATES, PLEASE STATE YOUR NAME, OCCUPATION AND EMPLOYER FOR THE RECORD.

A. My name is Timothy J Gates. I am a Senior Vice President with QSI Consulting.

Q. ARE YOU THE SAME MS. LICHTENBERG AND MR. GATES WHO FILED DIRECT TESTIMONY IS THIS PROCEEDING?

A. Yes.

II. PURPOSE AND BACKGROUND

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of our rebuttal testimony is fourfold:

(1) We describe the FCC requirements for batch hot cut ("BHC") rates and show that Qwest's rates are excessive;

(2) We address the testimony of the Qwest witnesses and show that their claims are unsupported and that Qwest's batch hot cut proposal is insufficient to remove the finding of impairment;

(3) We recommend changes to Qwest's proposal that would permit the removal of the impairment finding under certain circumstances that we identify; and

(4) We recalculate the rates for the per loop install BHC process using more reasonable assumptions.

Mr. Gates will also focus on the Qwest cost studies and making adjustments to those studies such that the resulting rates are compliant with TELRIC principles.

III. SUMMARY OF CONCLUSIONS

Q. CAN YOU BRIEFLY SUMMARIZE YOUR PRIMARY CONCLUSIONS?

A. Yes. Our primary conclusions can be categorized and summarized as follows:

- MCI is pleased that Qwest that agreed to implement several of the CLEC suggestions emanating from the BHC Forum. The Commission must note, however, that these are agreements only and that the BHC process does not yet exist until the software is developed, installed and tested under commercial volumes;

- Qwest inappropriately includes the cost of disconnecting a customer in its cost study. If Qwest is allowed to impose such charges on CLECs, then CLECs must be allowed to impose those same charges on Qwest;

- Qwest inappropriately includes system enhancement costs in its calculation of nonrecurring costs and rates;

- Qwest fails to incorporate the efficiencies of available technologies in its cost studies and thereby overstates the cost of converting a UNE-P customer to UNE-Loop architecture;

- We recalculate the per loop rates based on TELRIC compliant assumptions and costs;

- We recommend a competitively neutral funding mechanism to allow Qwest to purchase and deploy the most efficient frame automation technologies that will ultimately allow loop portability sufficient to encourage effective competition in the absence of unbundled local switching ("ULS").

IV. BATCH HOT CUT PROCESS

Q. YOU MENTIONED THAT MCI IS PLEASED WITH QWEST'S AGREEMENTS TO MODIFY THE PROPOSED PROCESS. IS THAT AGREEMENT SUFFICIENT TO MEET THE REQUIREMENTS OF THE FCC?

A. No. At ¶ 460 of the *Triennial Review Order* the FCC provided the following direction to the states:

> In this section, we ask state commissions to take specific actions designed to alleviate impairment in markets over which they exercise jurisdiction. Because we find that operational and economic factors

> associated with the current hot cut process used to transfer a loop from one carrier's switch to another's serve as barriers to competitive entry in the absence of unbundled switching, state commissions must, within nine months from the effective date of this Order, approve and implement a batch cut process that will render the hot cut process more efficient and reduce per-line hot cut costs.

As such, it is not enough to simply agree to a "design" for the BHC process. The Commission must ensure that the process as ultimately approved is implemented and capable of operating under commercial volumes anticipated in the future.

Q. ARE YOU SUGGESTING THAT QWEST MIGHT NOT DEPLOY THE FEATURES AND SYSTEMS AGREED TO IN THE BHC FORUM?

A. No. The Commission should be aware, however, that these developmental activities take time and that they are competing with other change management priorities. For instance, the "Level of Effort" required for the BHC development change management requests have not yet been identified. SCR012204-01R "TRO BHC IMA changes and Appointment Scheduler Enhancements" and SCR012204-02R "TRO-Batch Hot Cut Status Tool" (CEMR impacting – not prioritized) are integral to Qwest's deployment of features agreed to in the BHC Forum. It is not clear whether Qwest will be able to update IMA and test the systems within the time frames identified by the FCC. Further, if the systems do not work as promised, then the effort was for naught.

Q. BUT THE TESTIMONY OF MS. BARRICK ON BEHALF OF QWEST INDICATES THAT THE BHC PROCESS HAS BEEN TESTED.[1] PLEASE COMMENT.

A. The proposed BHC process has not been tested. Indeed, neither the scheduling tool nor the web-based status tool have been developed, so the process as proposed could not have been tested. The Barrick Report is more properly considered, at best a stress test on the existing hot cut processes. The Commission should take no comfort – and make no conclusions on the proposed BHC process – based on the results of a limited test of Qwest's existing hot cut processes. Moreover, we have no indication whether the stress test was conducted on a "blind" basis so that Qwest employees were not aware a test was being conducted, nor do we know the name of the CLEC whose orders were tested, the nature of the orders submitted, nor whether any efforts were made to coordinate the use of the available hot cut processes between the CLEC and Qwest personnel.

Q. DOES THE BARRICK REPORT RECOGNIZE THAT THE SCHEDULER AND WEB-BASED STATUS TOOL WERE NOT BEING TESTED?

A. Yes. In the Conclusion of the report, it states, "We note however, that some portions of the process, such as the online status tool, are not yet available to test."[2] On that same page of the report, they conclude "The process improvements not available for testing will only serve to expedite the process and create additional efficiencies." Such an unsubstantiated assertion shows an amazing misunderstanding of OSS, the industry's history with OSS, and OSS testing that was conducted by the Regional

[1] See Direct Testimony of Lorraine Barrick; Report of Lorraine Barrick at page 21.

[2] Id. at page 42; footnote 12.

Oversight Committee and separately in Arizona. If the proposed systems do not work as promised, the results could dramatically impact the customer through outages and delays in provisioning.

Q. IF QWEST SHOULD FAIL TO MEET THE DEADLINES OR IF THE SYSTEMS AND PROCESSES DO NOT WORK AS PROPOSED OR APPROVED BY THIS COMMISSION, WHAT DO YOU RECOMMEND?

A. We recommend that the finding of impairment remain in place unless and until the Qwest systems are developed, implemented and properly tested.

Q. BASED ON YOUR REVIEW OF THE QWEST TESTIMONY, HAVE YOU REVISED YOUR OPINION ON THE QWEST BHC PROCESS AS DISCUSSED IN YOUR DIRECT TESTIMONY?

A. No. It does not appear that Qwest has changed or modified its original proposal in any material way. As such, our comments and conclusions regarding the Qwest BHC proposal remain.

Q. THROUGHOUT THE BHC FORUM AND IN ITS DIRECT TESTIMONY, QWEST REFERS TO THE FCC'S 271 APPROVAL AS PROOF THAT THE SYSTEMS ARE SUFFICIENT TO MEET CLEC NEEDS. PLEASE COMMENT.

A. Mr. Pappas and Ms. Notaranni discuss the 271 process at length. Simply because the FCC might have found the current hot cut process satisfactory in that proceeding does not indicate that Qwest's hot cut processes are sufficient in the absence of unbundled local switching. Indeed, the FCC *Triennial Review Order* addresses this point head on.

> [W]e find that the number of hot cuts performed by BOCs in connection with the section 271 process is not comparable to the number that incumbent LECs would need to perform if unbundled switching were not available for all customer locations service with voice grade loops. In the states where section 271 authorization has

> been granted, unbundled local circuit switching has been available and, accordingly, the BOCs' hot cut performance has generally been limited. Moreover, we find that the issue is not how well the process works currently with limited hot cut volumes, rather the issue identified by the record identified is an inherent limitation in the number of manual cut overs that can be performed, which poses a barrier to entry that is likely to make entry into a market uneconomic. Our finding is also corroborated by the comments of state commissions, most notably the New York Department, which concluded that "Verizon would need to dramatically increase the number of hot cut orders per month if UNE-P was terminated and CLEC customers were switched. The New York Department concluded that "it would take Verizon over 11 years to switch all the existing UNE-P customers to UNE-L. Indeed, the New York Department is currently examining ways to "migrate large volumes of customers from Verizon's switches to CLECs' switches more efficiently. For those reasons, **the Commission's prior findings in section 271 orders do not support a finding here that competitive carriers would not be impaired if they were required to rely on the hot cut process to serve all mass market customers.**[3] (footnotes omitted; emphasis added)

As such, Qwest cannot rely upon its 271 approval to indicate any approval of its hot cut process in the absence of unbundled local switching. Moreover, the FCC did not find that Qwest's hot cut processes that were available to CLECs when Qwest 271 applications were reviewed by the FCC were sufficient for purposes of its *Triennial Review Order*. In other words, Qwest was not excluded from the findings in paragraph 469 quoted above.

[3] See TRO at ¶ 469.

Q. DOESN'T THE CHANGE MANAGEMENT PROCESS PROVIDE SOME ASSURANCE THAT THE NEW SYSTEMS WILL BE PUT IN PLACE AND THAT THEY WILL WORK AS PROMISED?

A. No. As was noted during the BHC Forum, Qwest has significantly reduced the resources required to implement changes.[4] Further, simply because the change request ("CR") is presented as a "regulatory" CR means only that the CR will be given a higher priority, not that it will be implemented immediately unless the Commission directs Qwest to implement the CR by a certain date.[5] If a CR is approved, then Qwest can begin developing the business and system requirements. Finally, Qwest has apparently not begun developing the business or system requirements as of the date of this testimony.[6]

---

[4] See BHC Forum Transcript on January 8, 2004 at page 4. Mr. Zulevic noted that Qwest has reduced the number of IMA releases from three to two and that before that reduction only about 20 percent of requests were implemented because of time and resource constraints.

[5] See Qwest Wholesale Change Management Process Document, at sections 4.1 and 5.1, which can be found at http://www.qwest.com/wholesale/downloads/2003/031210/QwestWhslChgMgtDoc121103.doc and which describe a regulatory CR and the implementation of a regulatory CR. Also see Transcript dated January 6, 2004, from Batch Hot Cut Forum, page 157, line 17 through page 158, line 5, where it states:

> MS. LICHTENBERG: Let me see if I can do the one sentence wrap up to make sure. QWEST will provide a new Hot Cut field to indicate Batch Hot Cuts that will include the reservation number, time and date. That information will be included on the firm order confirmation. If an order is rejected the reservation is not lost, and when the order is resubmitted, the same reservation number and the same date and time can be used, or dates in batch window. Then, this is subject to an OSS change that would need to be prioritized as part of 16.0 release, and to the extent that that displaces other changes in the 16.0 release, that will need to be dealt with in change management.
>
> MR. UREVIG: That is true.

[6] See earlier discussion in this testimony regarding change requests SCR012204-01R "TRO BHC IMA changes and Appointment Scheduler Enhancements" and SCR012204-02R "TRO-Batch Hot Cut Status Tool" and Transcript dated January 6, 2004, from Batch Hot Cut Forum, page 27, beginning at line 2 where it is states:

> MS. NOTARIANNI: This is Lynn Notarianni from QWEST. I think -- Matt is certainly going to give the overview functionally of the status tool as well as the appointment scheduler. I want to clear up the misconception that we have something already developed to show you. There is nothing yet developed to show you. So as far as designing it at that level of detail, we have not yet developed it at that level of detail.

Q. ASSUMING THE BHC PROCESS WORKS AS ULTIMATELY APPROVED BY THIS COMMISSION, DOES THAT RESOLVE MCI'S ISSUES?

A. No. While Qwest is promising tools that may address CLEC needs, the actual and successful implementation of those tools is still to be demonstrated. Moreover, while Mr. Pappas suggests that the "scheduler" does away with the need to negotiate with Qwest[7] that is not the case. The CLEC must still engage in "transition planning" with Qwest and other CLECs, although that process is not defined in any way.[8] As discussed in MCI's direct BHC testimony, the "Transition Batch Hot Cut Process" is that part of the BHC process that is designed to transfer thousands of existing UNE-P customers (also referred to as the embedded base of customers) to UNE-L by cutting over unbundled loops in high volumes from Qwest to CLECs over a three year period.

When CLECs raised the uncertainties surrounding the "transition plan" during the BHC Forum, Mr. Frankel stated, "I think we're sort of jumping in two months past the end of the nine months docket and this isn't something that is part of the Batch Hot Cut process at all." The CLECs argued that we needed to understand the details of the Transition Plan in order to understand the impact of the proposed tools (the scheduler and web-based status tool).[9] Nevertheless, it appears that the CLEC must negotiate a list of central office conversions – by location, date and number of cuts – and somehow integrate its plan with those of other CLECs. Only when this

[7] See Joint Qwest Testimony of Mr. Pappas and Ms. Notaranni at page 50.

[8] See BHC Forum Transcript January 6, 2004 at pages 130-138.

[9] Id. at 141-142.

process is completed and due dates for CLEC transition orders "assigned " by the Qwest transition planning team, can CLECs select those due dates in the scheduler. The scheduler thus seems to be a due date tracking tool, not a tool CLECs can use to schedule their transition orders at a time suitable to themselves and their customers.

Q. WHAT IS YOUR RECOMMENDATION REGARDING TRANSITION PLANNING?

A. The Commission should require Qwest to specifically define the "transition planning" process that it intends to use as part of this proceeding. The *Triennial Review Order* says only "We therefore require competitive and incumbent LECs to jointly submit the details of their implementation plan to the appropriate state commission."[10] While the plans may be submitted later, it is important for Qwest to explain how it intends to handle scheduling of conversions, conflicts between CLECs, prioritization of central offices, etc. Qwest should be required to explain how conflicts would be dealt with, i.e., when two or more CLECs want to complete conversions in a particular central office at the same time. Would Qwest be willing to assign more than two technicians to the BHC task in a particular central office if CLEC demand warranted the assignment? What process would Qwest use to resolve multiple requests for conversions when the requests exceeded Qwest's resources? Mr. Pappas indicates, "the conversion dates agreed to as a part of CLECs' transition plans will be entered into the electronic tool, and capacity will be reserved accordingly."[11] Does this suggest a first come first served approach?

[10] See TRO at ¶ 531.

[11] Id. at page 51.

Q. AT PAGE 52 OF HIS TESTIMONY, MR. PAPPAS SAYS THAT THE CLEC CONCERNS REGARDING SCHEDULING HAVE BEEN RESOLVED BY VIRTUE OF THE "SCHEDULING" TOOL? DO YOU AGREE?

A. No. Obviously the transition planning process is absolutely critical to the successful conversion of CLEC UNE-P customers to a UNE-L architecture. Unless and until the CLECs understand the transition planning process and how it will impact scheduling, this issue will not be resolved. It is impossible to critique Qwest's proposed BHC process without understanding the transition plan process. It may be that Qwest's proposed volume limitation of 100 cuts per central office per day will be the center of controversies once CLECs sit down to negotiate with Qwest. Without understanding Qwest's intentions with respect to the transition plan, CLECs and the Commission are left in the dark as to how to evaluate Qwest's proposed BHC process.

V. BATCH HOT CUT PRICES

Q. HAVE YOU HAD AN OPPORTUNITY TO REVIEW QWEST'S PROPOSED RATES FOR ITS HOT CUT PROPOSAL?

A. Yes, we have reviewed Qwest's proposed rates as well as the *Batch Hot Cut Non-Recurring Cost Study ID* submitted by Qwest in support of its rates. Qwest is proposing a nonrecurring cost of $45.96 per loop. A comparison of the proposed rates with current rates is found in the table below:

Comparison of Qwest Proposed BHC Costs with Existing Rates						
State	Current 1st Loop	Current Add'l. Loop	SGAT Section	Proposed 1st Loop	Proposed Add'l Loop	
AZ	$ 53.86	$ 46.40	9.2.4.1	$ 45.96	$ 45.96	
CO	$ 55.72	$ 46.48	9.2.4.1	$ 45.96	$ 45.96	
IA	$ 46.01	$ 46.01	9.2.4.1	$ 45.96	$ 45.96	
MN	$ 4.33	$ 4.33	9.2.4.1	$ 45.96	$ 45.96	
NE	$ 65.00	$ 60.00	9.2.4.1	$ 45.96	$ 45.96	
NM	$ 51.94	$ 48.77	9.2.4.1	$ 45.96	$ 45.96	
ND	$ 55.27	$ 48.77	9.2.4.1	$ 45.96	$ 45.96	
OR	$ 47.75	$ 16.79	9.2.4.1	$ 45.97	$ 45.97	
UT	$ 47.66	$ 41.38	9.2.4.1-2	$ 45.96	$ 45.96	
WA	$ 72.21	$ 51.11	9.2.4.1	$ 45.96	$ 45.96	

Q. DO YOU BELIEVE QWEST'S PROPOSED RATES COMPLY WITH THE REQUIREMENTS OF FCC RULE §51.319(D)(2)(II)(A)(4)?

A. No, we do not.

Q. PLEASE DESCRIBE FCC RULE §51.319(D)(2)(II)(A)(4) AND ITS RELEVANCE TO QWEST'S PROPOSED BATCH HOT CUT RATES.

A. FCC rule §51.319(D)(2)(II)(A)(4) sets forth the manner by which Qwest must establish rates for its batch hot cut processes. It states as follows:

> (4) A state commission shall adopt rates for the batch cut activities it approves in accordance with the Commission's pricing rules for unbundled network elements. These rates shall reflect the efficiencies associated with batched migration of loops to a requesting telecommunications carrier's switch, either through a reduced per-line rate or through volume discounts as appropriate.

Q. WHEN THE FCC REFERENCES ITS "PRICING RULES FOR UNBUNDLED NETWORK ELEMENTS" IS IT REFERRING TO ITS TOTAL ELEMENT LONG RUN INCREMENTAL COST ("TELRIC") RULES?

A. Yes, it is. The FCC is referencing Subpart F of its rules at Part 51 – *Interconnection* (specifically §51.505 - §51.511). These are the TELRIC rules that govern the proper manner by which costs should be estimated for unbundled network elements, and subsequently, how rates should be applied.

Q. PLEASE EXPLAIN WHY YOU BELIEVE QWEST'S PROPOSED RATES DO NOT COMPLY WITH THE FCC'S RULES IDENTIFIED ABOVE.

A. Qwest's rate proposal fails to comply with the rules identified above for the following reasons:

1. Rule §51.319(D)(2)(II)(A)(4) specifically requires that Qwest's rate proposal "reflect the efficiencies associated with batched migration of loops" either through (a) "a reduced per-line rate" when compared to the existing hot cut rate or (b) "through volume discounts as appropriate." Qwest's proposal does neither. Indeed, Qwest's proposed hot cut rates, if adopted, would result in CLECs paying more in the future for a batch hot cut than they do today in several states.

2. Qwest's cost model supporting its rate proposal conflicts with FCC rule §51.505(b)(1), which states as follows:

> §51.505 (1) Efficient *network configuration*. The total element long-run incremental cost of an element should be measured based on the use of the most efficient telecommunications technology currently available and the lowest cost network configuration, given the existing location of the incumbent LEC's wire centers.

Qwest's cost model does not employ the most efficient telecommunications technology currently available so as to arrive at the lowest cost network configuration. As we've described in detail below, Qwest's batch hot cut processes are overly manual in nature and do not take advantage of technology that is available to automate the wiring/frame components of its process. As such, the non-recurring activities and resultant costs included in Qwest's cost study substantially exceed TELRIC-compliant costs, resulting in rates in violation of the FCC's rules.

3. Qwest's cost study inappropriately includes costs ($14.57 per loop)[12] associated with removing the Qwest customer from the Qwest network, and thereby attempts to recover these costs from the CLEC "winning" the customer. In a competitive market, all carriers incur costs associated with removing customers from their networks when a customer chooses another carrier, yet to this point, only Qwest has

[12] See Utah Direct Testimony of Mr. Brigham at page 9. The disconnect portion of Qwest's proposed rates can be as much as $26.51 in Washington.

> suggested it must recover those costs from the carrier winning the customer. Those costs are incremental to having won the customer in the first place, and not appropriately recovered from another carrier who happens to win the customer's service. For purposes of proper reciprocity, the Commission must either remove these costs from Qwest's cost study and find that all carriers are responsible for their own costs in this regard, or it must allow CLECs to assess Qwest charges associated with these same types of costs for each successful Qwest "winback."

Q. DOES QWEST'S RATE PROPOSAL RESULT IN A RATE INCREASE FOR CLECS IN SEVERAL STATES INSTEAD OF THE RATE DECREASE REQUIRED BY THE FCC'S HOT CUT PRICING RULE [§51.319(D)(2)(II)(A)(4)]?

A. Amazingly it does. This is not the case in all states, but in some states, the proposed rates are higher than the existing rates. In fact, Qwest's proposed BHC rates are very similar to (within a dollar or two) the existing "additional loop" rates in most states. Qwest spends time in its testimony addressing the regulatory history behind its rates, in essence rearguing the issues and rates already established by the Commission for unbundled loop installation.

Q. IS QWEST'S PROPOSAL TO INCREASE ITS HOT CUT RATES OR TO KEEP THEM ESSENTIALLY CONSTANT WITH THE ADDITIONAL LOOP RATES, CONSISTENT WITH THE FCC'S RULE AND/OR ITS *TRIENNIAL REVIEW ORDER*?

A. No, not at all. The rule is unambiguous that the Commission must adopt rates reduced from their current levels, either through (a) "a reduced per-line rate" or (b) "through volume discounts as appropriate." The text of the *Triennial Review Order* which frames the rule couldn't be more clear (paragraph 460):

> In this section, we ask state commissions to take specific actions designed to alleviate impairment in markets over which they exercise jurisdiction. Because we find that operational and economic factors associated with the current hot cut process used to transfer a loop from

> one carrier's switch to another's serve as barriers to competitive entry in the absence of unbundled switching, state commissions must, within nine months from the effective date of this Order, approve and implement a batch cut process that will render the hot cut process more efficient **and reduce per-line hot cut costs**. [emphasis added]

Q. HAS QWEST INDICATED THAT IT WILL ACHIEVE EFFICIENCIES THROUGH ITS PROPOSED BHC PROCESS?

A. Yes. In its testimony and even in the video provided by Qwest, it refers to the BHC process as "significantly increasing efficiency." Unfortunately, these efficiencies are not reflected in rates proposed by Qwest. In addition, Ms. Barrick concludes: "Significant efficiencies over the existing hot cut process are created through front-end edit checks, process automation, and streamlining of manual processes." She also states that "We have measured the benefit of several of these differences. . . . and the differences we have measured save many hours per day at the projected volumes."[13] However, the proposed price compared to the current price does not reflect significant cost savings as we would expect if the new process is significantly more efficient and saves many hours per day at projected volumes.

Q. ABOVE YOU ALSO SUGGEST THAT QWEST'S PROPOSAL CONFLICTS WITH THE FCC'S TELRIC RULES, MORE SPECIFICALLY, RULE §51.505(1) WHICH DICTATES COSTS BASED UPON THE MOST EFFICIENT TECHNOLOGY AVAILABLE AND THE LEAST-COST NETWORK CONFIGURATION. PLEASE EXPLAIN.

A. FCC Rule §51.319(D)(2)(II)(A)(4) requires the Commission to adopt hot cut rates consistent with the FCC's TELRIC rules. A fundamental component of the FCC's TELRIC methodology is its requirement that costs be estimated assuming the most efficient technology currently available, employed in a network configuration

[13] See Direct testimony of Lorraine Barrick at page 4, lines 3-6.

specifically designed to minimize costs. Qwest's cost study supporting its proposed hot cut rates in this proceeding does not comply with this standard and as a result, its proposed rates are substantially overstated.

Q. PLEASE EXPLAIN THE FCC'S REQUIREMENT THAT TELRIC-BASED RATES RELY UPON THIS LEAST-COST, MOST EFFICIENT NETWORK ASSUMPTION.

A. The FCC itself provides adequate explanation of this requirement in its September 15, 2003 *TELRIC NPRM*.[14] Within its *TELRIC NPRM* the FCC provides it's most recent, and in some cases, most specific, explanation of its TELRIC methodology to date, including requirements related to forward looking technologies/networks. The FCC describes current requirements related to its forward-looking network assumption at paragraphs 16 and 17 as follows (footnotes omitted):

> TELRIC is based on the assumption that competition would constrain the value of an incumbent LEC network and the price that could be charged for use of that network. In other words, the "cost" of the element for purposes of section 252(d)(1) equals the price that an incumbent LEC would be able to charge for an element in a competitive market.
>
> The Commission's TELRIC pricing rules equate the incumbent LEC's cost of providing network elements with the cost today of building a local network that can provide all the services its current network provides, using the least-cost, most-efficient technology currently available. The Commission added one additional constraint on the design of this reconstructed network: the new network must take as given the existing wire center locations.

To paraphrase, the FCC requires a carrier when estimating its TELRIC costs to specifically ignore the process or technology it actually uses to provide a given

[14] *In the Matter of Review of the Commission's Rules Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers*, **Notice of Proposed Rulemaking**, WC Docket No. 03-173 (hereafter "*TELRIC NPRM*").

element or function, and instead, estimate its costs as if it had employed the most efficient, least cost technology and practices currently available. This exercise is not meant to provide costs reflective of those actually incurred by the carrier, but instead, to identify costs that would result in a competitive marketplace wherein carriers are provided proper incentives to continually modernize their processes/equipment and minimize costs at every opportunity.

Q. HOW CAN IT BE REASONABLE TO IGNORE QWEST'S ACTUAL COSTS?

A. Qwest operates in a very unique environment, an environment where it was literally bequeathed a massive customer base through legislative/regulatory intervention in the marketplace almost a century ago. Qwest has literally developed its network, its services and its customer base without competition, and it has no incentives to help its competitors. For example, if Qwest operated in a fully competitive environment, what would its network/processes look like if it were but one of the competitive carriers in the market providing unbundled loops?

Q. PLEASE EXPLAIN.

A. Assume, as the FCC requires, that Qwest had a twin, another company of equal size serving the same territory and with the capability to serve the same customers. Make the further rational assumption that Qwest's twin was continually modernizing its network so as to take advantage of currently available technology for purposes of reducing its costs (a process undertaken daily by companies in competitive markets where margins are thin and costs must be diligently controlled) and gaining a competitive pricing advantage (or simply keeping up with its competitors). Assume

that Qwest's twin used its modernized network to provision unbundled loops without dispatching a technician or requiring technicians to "lift & lay" wires or coordinate via the telephone with other provisioning personnel. Qwest's twin is able to provision unbundled loops using software-driven platforms and in some cases, automated frame technology that requires it to dispatch a technician only in rare circumstances when its automated processes do not function properly (i.e., "fallout"). Finally, assume, hypothetically, that for each loop it cuts for its UNE loop customers, it incurs approximately $1 per loop in underlying costs associated with its automated platform.

Q. HOW IS THIS SCENARIO RELEVANT TO QWEST'S ACTUAL COSTS?

A. If we compare this carrier and its least-cost, most efficient technology with Qwest, we quickly recognize that Qwest's manual process in this hypothetical is roughly 40 times more expensive. In this scenario no one looks skeptically at Qwest's cost estimates associated with its manual process as everyone understands that Qwest must pay its contracted hourly labor rates when its sends a technician to perform these manual functions.[15] What is important in this scenario is that it doesn't matter. If Qwest develops a hot cut cost of $45.96 based upon its actual costs, compared to its competitor's rate of $1, it is likely that Qwest will have very little business. However, what it will have is an overpowering incentive to modernize its processes and systems so as to more effectively compete. Arguments regarding labor contracts,

[15] As we explain in more detail later in this testimony, we not only believe that Qwest inappropriately excludes savings associated with more efficient technology, we also believe that Qwest has inappropriately exaggerated the costs that would result from a strictly manual process as well.

411 antiquated plant and recovery of costs associated with modernizing its network would
412 gain little traction with customers asked to pay $45.96 when they could simply call
413 Qwest's twin and pay $1. Likewise, consistent with the FCC's rules, those same
414 arguments should gain no traction here. It is the cost of an efficient process that is
415 relevant to the market, regardless of Qwest's actual costs to the contrary.

416 **Q. PLEASE EXPLAIN WHY YOU BELIEVE QWEST'S COST STUDY DOES**
417 **NOT ADEQUATELY INCORPORATE THE MOST EFFICIENT**
418 **TECHNOLOGY CURRENTLY AVAILABLE EMPLOYED IN A LEAST-**
419 **COST FASHION?**

420 A. Qwest's cost study assumes that in every circumstance wherein a hot cut is required,
421 a technician must be dispatched to first "pre-wire" the arrangement two days before
422 the actual cut takes place (i.e., due-date minus 2 or "DD-2"), and then return on the
423 due date ("DD") to coordinate with Qwest's provisioning personnel and the CLEC to
424 cut the loop (lift and lay) and remove all unnecessary cross connects. Qwest likewise
425 assumes that these same technicians will, in certain circumstances, be required to
426 spend a large amount of time (20 minutes) simply traveling to central offices to
427 perform these functions.[16] It is these manual work steps that generate the vast
428 majority of Qwest's proposed costs (and subsequent rates); functions that can, with
429 currently available technology, be performed without manual intervention).

430 **Q. PLEASE EXPLAIN THE AVAILABLE TECHNOLOGY YOU REFER TO**
431 **THAT CAN BE USED TO PERFORM THESE FUNCTIONS WITHOUT**
432 **MANUAL INTERVENTION.**

[16] It's remarkable, since most of Qwest's central offices are manned, that Qwest assumes a team of "2" central office technicians will travel half the time to accomplish a hot cut. In fact, Qwest assumes in its cost study that the technicians travel to the central offices twice – once to prewire, and again to perform the cut.

A. As we described earlier in this testimony specific to Qwest's retail provisioning process, Qwest and all incumbent local exchange carriers ("ILECs"), have spent nearly 100 years attempting to streamline retail provisioning processes so as to remove the very same manual work steps that plague its batch hot cut processes and consequent cost study. Qwest has accomplished this increased mechanization by continually improving its technology and systems so as to further mechanize the process.

Take for example the integrated digital loop carrier ("IDLC") systems that are at issue in this proceeding. IDLC systems integrate an incumbent carrier's loops directly into its switch without the need of a main distributing frame (the main distributing frame is the central office hardware wherein the pre-wiring and lift & lay activities of a hot cut are performed). A software matrix within the IDLC equipment serves the role of the main distributing frame and allows Qwest to "cut" a customer's IDLC loop without any manual intervention. Hence, when Qwest "turns up" a retail customer's service using IDLC, there is no need in most circumstances for Qwest to dispatch a technician at all. Indeed, with modern software platforms available from multiple IDLC vendors, a carrier can literally map any IDLC loop to nearly any port on its digital switch with the aid of nothing more than a mouse click. These same systems, with certain modifications, can be used to provide the same software-driven provisioning efficiency for loops being connected to another carrier's switch.

Q. QWEST INDICATES THAT A TRUCK ROLL IS REQUIRED FOR CONVERSION OF IDLC LOOPS AND THEREFORE, THEY ARE NOT INCLUDED IN THE BHC PROCESS.[17] PLEASE COMMENT.

A. Qwest's position assumes that a truck roll is required, but that assumption is incorrect. There are several technologies that would allow MCI to access unbundled loops within a Qwest IDLC system.

Q. PLEASE EXPLAIN THE SIGNIFICANCE OF THE TECHNOLOGIES AVAILABLE.

A. There are several technologies available.

The use of a demultiplexer to separate unbundled loops prior to connecting the remaining loops to the switch;

Multiple switch hosting through the use of GR-303;

Integrated network access ("INA"), whereby specific DS-0s are field groomed into specific INA groups as formatted DS-1s;

Digital Cross Connect ("DCS") grooming, whereby specific DS-0s are groomed onto DS-1s at the DCS; or

Side-door grooming (hairpinning).

Each of the technologies listed above is a means by which MCI can access unbundled loops within a Qwest IDLC system. Several of these techniques once perfected, would allow Qwest and MCI to cut a loop from the Qwest network to MCI's network without manual intervention, i.e., through software controlled mapping. Telcordia (a telecommunications consulting firm previously owned, in part, by Qwest), the party who developed the IDLC interface that makes these techniques possible (i.e., GR-303 and TR-008), explains each of these techniques and the advantages/disadvantages at Sections 12.13.2 and 12.13.3 of its *Notes on the LEC Network*, an accumulation of

[17] See Direct Testimony of Pappas and Notaranni at page 84.

network related discussions that serve as an industry technology standard. We have included the relevant excerpt with this testimony as Exhibit TJG-3.

Q. DO SIMILAR TECHNOLOGIES EXIST FOR COPPER FACILITIES?

A. Yes, however, keep in mind that in a forward looking network, copper facilities would be far less prevalent than they are today as IDLC facilities would be used to replace a very substantial component of the embedded copper base. Nonetheless, even in those few circumstances when copper would remain as the most efficient, least cost technology to be used in a forward-looking network design, existing technologies allow a carrier to provision services without manual lift & lay activities. Mechanized frame technology allows a carrier to connect copper pairs within a software driven environment, via numerous methods (robotic, electronic matrix, etc.) without dispatching a costly technician to perform the function.

Q. AT PAGE FOUR OF MR. BRIGHAM'S TESTIMONY HE SAYS THAT "A TELRIC STUDY MUST PROVIDE A REALISTIC ESTIMATE OF FORWARD-LOOKING COSTS. THEREFORE, QWEST'S TELRIC STUDIES FOCUS ON THE LATEST TECHNOLOGIES AND METHODS OF OPERATIONS THAT ARE CURRENTLY AVAILABLE." IS THIS "MECHANIZED FRAME" TECHNOLOGY BEING USED TODAY?

A. Yes, both IDLC technology and automated main frame technologies are in use by ILECs today. As we described above, nearly every ILEC, including Qwest, already uses IDLC technology to automate retail provisioning processes, thereby substantially reducing dispatch costs associated with completing retail service orders. While additional processes like those described above would be required to extend this functionality to unbundled loops, it is undisputable that technology aimed at accomplishing just that task has been made available by Telcordia and numerous

IDLC vendors. Likewise, automated frame technology is available and in use today. In Exhibit TJG-4 to this testimony we include a white paper from NHC Communications, Inc. (a vendor of numerous automated frame technologies) describing the nature of automated frames and their primary uses.

Q. ARE YOU AWARE OF ANY ILECS CURRENTLY USING AUTOMATED FRAME TECHNOLOGY TO DO THE TYPE OF FUNCTIONS REQUIRED FOR A HOT CUT?

A. Yes. For some time now we've known that Verizon is increasing its use of automated frame technology to service some of its unmanned central offices, both for retail as well as wholesale provisioning. In fact, Verizon uses the same NHC equipment described in the white paper attached to this testimony. Unfortunately, this information was provided to us under a protective agreement and could not be used outside the Verizon territory until recently when Verizon, in the public transcript in New York Case No. 02-1425, admitted to using automated frame technology, and further highlighted the fact that it intended to use this technology for purposes of accomplishing hot cuts for unbundled loops.[18]

Q. WHY IS IT SO IMPORTANT THAT HOT CUT COSTS BE MEASURED AS IF QWEST HAD EMPLOYED THIS MORE EFFICIENT, LEAST-COST TECHNOLOGY?

A. As explained in the example above, in the absence of a competitive marketplace, TELRIC-based rates provide the proper incentive for companies like Qwest to modernize their networks and employ more efficient processes, ***even for the benefit***

[18] Before the State of New York, Public Service Commission, *Proceeding on Motion of the Commission to Examine the Process, and Related Costs of Performing Loop Migrations on a More Streamlined (e.g., Bulk) Basis*, Case No. 02-C-1425, Public Transcript (pages 290-293), Testimony of Michael A. Nawrocki, On Behalf of Verizon New York, Inc.

of their unbundled loop customers. If Qwest is allowed to recover costs associated with an expensive, manual hot cut, and in the process increase the price its competitors must pay relative to its own automated retail processes, why would Qwest ever invest in new technology like unbundled IDLC or automated frames (technologies that reduce the costs of its competitors/wholesale customers)? The answer is easy, in the absence of some other incentive (like either competition or regulatory intervention), it wouldn't. Absent a competitive marketplace for unbundled loops, properly established TELRIC rates provide that incentive. If Qwest is allowed to recover only those costs incurred by an efficient provider using modern technology, it will be provided the proper incentive to achieve that level of efficiency, or, if it does not, it will lose real dollars on every hot cut it performs using its manual processes. This is exactly what the FCC intended in establishing UNE rates based upon forward-looking, least cost technology assumptions.

Q. YOU ALSO MENTION ABOVE THAT QWEST'S COST STUDIES INCLUDE WORKSTEPS ASSOCIATED WITH REMOVING THE CUSTOMER'S SERVICE FROM THE QWEST NETWORK. YOU SUGGEST THAT THIS IS INAPPROPRIATE ABSENT SOME MECHANISM FOR "RECIPROCITY." PLEASE EXPLAIN.

A. There are a number of work steps included in Qwest's hot cut cost studies associated with removing the service imprint of its retail customer from the Qwest network.[19] For example, Qwest includes within its cost study expenses associated with "18a. Translation Work Performed." This work step identifies Qwest's need to remove from its switch, the customer's telephone number and other switch-related

[19] These are the "disconnect" costs that Qwest would like to include in the cost study. Such costs are inappropriate and should not be included as a TELRIC cost of the BHC process.

instructions (i.e., "translations") specific to that customer, as Qwest's switch will have no further obligations related to that customer's service. These are not work activities incremental to a request for a hot cut, but are instead incremental to the wishes of Qwest's customer to cancel his/her service with Qwest.

Q. IS THERE A DIFFERENCE?

A. Yes, there is a big difference. Consider a scenario when a customer simply cancels his/her service from Qwest without identifying another provider. No hot cut is required in this scenario; yet, Qwest will be required to perform the exact same "Translation Work Performed" function that it attributes to the CLEC in its hot cut cost study. In this situation, it is obvious that these work steps are not incremental to a hot cut, as no hot cut is performed. Instead, it is obvious that Qwest is performing these functions because its customer has decided to leave its network, for any reason. Likewise, in this scenario, it is rational to assume that Qwest has already recovered its costs associated with removing the customer's service imprint from its network when it first acquired the customer as its opportunity to recover additional costs from this customer no longer exists (the customer has left its network). If this is the case, which seems logical, Qwest's attempt to recover these same costs from its competitors via its hot cut rates is not only misplaced as a matter of cost-causality, it is also an unmitigated attempt at double recovery.

Q. DON'T ALL SERVICE PROVIDERS INCUR THESE TYPES OF COSTS WHEN THEY LOSE A CUSTOMER?

A. Yes, they do. These types of activities are required of any service provider (including CLECs) that loses a customer. For example, were an MCI customer to cancel his/her

service with MCI and return to Qwest, MCI would need to clear its switch of the customer's translations and modify its records to reflect the customer's departure. MCI does not now attempt to recover these costs from Qwest. However, if Qwest is allowed to inappropriately maintain these types of costs in its hot cut rates, it is incumbent upon the Commission, to likewise allow carriers like MCI to assess similar charges to Qwest in situations where Qwest is successful in a winback attempt. That being said, it is in our opinion a more rationale course of action to simply remove these expenses from the Qwest cost study and require that each carrier recover these types of costs from their customers, not from other carriers.

Q. DOES QWEST'S COST STUDY INCLUDE OTHER WORKSTEPS (BEYOND THE REMOVAL OF SWITCH TRANSLATIONS) THAT ARE MORE APPROPRIATELY INCREMENTAL TO LOSING A CUSTOMER, NOT TO A HOT CUT?

A. Yes, there are several such steps. For example, after Qwest technicians have performed the lift & lay associated with cutting the customer to the CLEC's network, Qwest's cost study includes time associated with the technician removing the old jumpers that had heretofore supported the customer's retail service with Qwest. Again, these are functions required of Qwest when it loses a customer regardless of whether a hot cut is performed or not, and as such, they are not appropriately incremental to a hot cut request (they are incremental to losing a customer) and should not be part of a study meant to measure only those costs that are incremental to a hot cut.

Q. IN YOUR TESTIMONY ABOVE, YOU'VE HIGHLIGHTED A NUMBER OF PROBLEMS WITH QWEST'S PROPOSED RATES AND THE COST STUDIES THAT SUPPORT THEM. IF QWEST'S RATES ARE SO FATALLY FLAWED, HOW SHOULD THE COMMISSION PROCEED IN SETTING RATES CONSISTENT WITH FCC RULE §51.319(D)(2)(II)(A)(4)?

A. Most importantly, the Commission must diligently apply the FCC's TELRIC rules as required by FCC Rule §51.319(D)(2)(II)(A)(4). More specifically, it must largely ignore Qwest's cost studies that rely upon extensive manual intervention, and instead, set rates assuming that Qwest has employed the most efficient technology currently available, configured in a least cost manner. As we've described above, it is undisputed that technology exists which would allow Qwest to perform the hot cut activities identified in its cost studies on a largely automated basis, negating the need for the substantial manual intervention modeled by Qwest. It is likewise clear that the adoption of such technology would substantially reduce the non-recurring costs Qwest would incur in performing hot cuts as implied by Ms. Barrick, and as such, this assumption is singularly compliant with the "least cost" requirements of the FCC's TELRIC rules. Further, it is clear that transition from an environment dominated by UNE-P to a market wherein carriers provide services using their own switching (e.g., UNE-L) will require a more mechanized hot cut process (as we discuss above) to achieve the seamlessness and scalability required by the FCC. Further, a successful transition from UNE-P to UNE-L will likewise require hot cut rates that approach the least-cost nature of existing UNE-P migration charges. All of these objectives are aided by a diligent application of the FCC's TELRIC rules and a rejection of Qwest's cost studies based largely upon manual work activities.

Q. HOW CAN THE COMMISSION DILIGENTLY APPLY THE FCC'S TELRIC METHODOLOGY IN THIS CIRCUMSTANCE?

A. Qwest's hot cut cost studies deal only with those costs that result ***after*** an order has been placed by the CLEC, verified, accepted and processed through Qwest's OSS (costs associated with these activities are recovered in Qwest's *Service Order Charge* which is assessed in addition to its various hot cut rates). Hence, Qwest's hot cut cost studies estimate costs that result after appropriate work orders have been issued and Qwest's downstream OSS systems have already been populated. In essence, Qwest's studies analyze only the time associated with Qwest's technicians preparing and actually performing the various manual frame activities (i.e., pre-wire, coordination and the actual lift & lay on the day of the cut).[20] Hence, if we were to properly assume that Qwest had employed the latest automation technology, the costs Qwest has identified in its cost studies would reflect those costs that result when an order "falls out" of the automated process. Orders that "flow through" the automated process would generate none of these costs.

Q. WHY IS THIS IMPORTANT?

A. In setting its existing non-recurring charges associated with a UNE-P migration, some state commissions have adopted a fallout percentage equal to 2%. That is, the ILEC's non-recurring costs were set based on the expectation that orders will flow through on an automated basis, without the need for manual intervention, 98% of the time. If we use that same assumption here, assuming consistent with the FCC's TELRIC rules

[20] See Direct of Ms. Million at page 12, wherein she states, "The Qwest BHC cost study only includes the nonrecurring cost for manual work activities that are likely to be performed by its employees as part of the process."

that Qwest has employed technology that would allow it to largely automate its loop provisioning activities, we can generate rates that are roughly TELRIC compliant using Qwest's cost studies as the basis for fallout costs.

Q. HOW WOULD THAT BE ACCOMPLISHED?

A. First, we would remove work steps that are associated with removing the customer's service imprint from the Qwest network. After we've removed those costs, we should then assume that the costs that remain occur in only 2% of all orders when those orders are expected to "fallout" of the mechanized process. The resultant rate should provide a solid reflection of Qwest's TELRIC-based costs for a hot cut.

Q. HAVE YOU UNDERTAKEN THAT EXERCISE AND CALCULATED WHAT YOU BELIEVE TO BE TELRIC-COMPLIANT RATES RELATIVE TO QWEST'S VARIOUS HOT CUT PROPOSALS?

A. Yes, we have. After having performed the steps described above, we arrive at a per loop install rate of $5.46. Included with this testimony as Exhibit TJG-5 is a copy of Qwest's cost study that has been adjusted to include our proposed modifications that support the $5.46 per loop rates.[21] MCI recommends that the Commission adopt this rate as Qwest's true TELRIC-based batch hot cut rate.

Q. PLEASE SUMMARIZE THE CHANGES YOU MADE TO THE QWEST COST STUDY.

A. The first change was to remove the "system enhancement" costs. These costs are addressed in Ms. Million's testimony at page 19, and total almost $1,000,000.

[21] The Qwest study that we have revised was the Utah BHC NRC Study filed with Mr. Brigham's Direct Testimony. More specifically, we have modified the "Details Output" sheet in that study to develop the proposed rate. As such, the resulting rate should be viewed as the proposed Utah rate. The same changes should be made to each state's cost study.

Traditionally, such development costs have been recovered in recurring rates through the application of factors. As the FCC noted at paragraph 194 of its *UNE Remand Order*, the charges ILECs impose for sunk costs to CLECs may constitute a barrier to entry. Instead, Qwest should recover the costs associated with that investment over the economic life of the investment via a monthly recurring rate. In the alternative, the Commission should consider MCI's recommendation for a competitively neutral cost recovery mechanism discussed later in this testimony.

The other major change was to reflect the 2% fallout rate in Interconnect Service Center activities and in the Central Office Technician activities. We make these adjustments in the "Mechanization Adjustment" column that have been inserted between the "Applied Time" and "Labor/Hour" columns in Qwest's original study.

Q. DO YOU CONSIDER THESE ADJUSTMENTS TO BE CONSERVATIVE?

A. Yes. As an example, we did not change – other than through the mechanization adjustment – the assumption made by Ms. Million that the team of central office technicians would need to travel 50% of the time.[22] This is clearly an excessive assumption that increases the costs dramatically. Indeed, this amount alone is almost identical to the charge Qwest recommends for recovering the System Enhancement costs. We also did not address the expense factors, annual cost factors, time estimates for labor, probability factors or other regularly challenged inputs. Instead, we have

[22] See Direct Testimony of Ms. Million at page 29. See also Qwest Response to MCI Request 021 in Arizona Docket No. T-00000A-03-0369 wherein it states in pertinent part, "The BHC cost study assumes that teams of two COTs will travel to central offices 50% of the time and that the travel will take 20 minutes. This travel is assumed to occur on the due date as well as on the day the pre-wiring is done."

678 focused on the most important change – that of assuming forward-looking technology
679 that is currently available to mechanize the heretofore manual activities of the hot cut.

680 **Q. DO YOU HAVE OTHER COMMENTS REGARDING QWEST'S PROPOSED**
681 **RATES?**

682 A. Yes. In our testimony we have highlighted the fact that Qwest's proposed hot cut
683 processes do not accommodate certain types of orders that we believe are
684 inappropriately excluded (i.e., IDLC, UNE-L to UNE-L, line sharing, line spitting
685 and EEL-related orders). We want to make clear that the rates we propose above
686 would apply to all hot cuts, including those specifically excluded by Qwest (with one
687 exception). That means that if the Commission accepts our recommendation and
688 requires Qwest to include these various order-types within its hot cut processes, the
689 rates we've proposed above would be equally applicable to those order types as well.
690 There would be no need for additional or different charges for these specific order
691 types.

692 **Q. YOU MENTION ABOVE THAT THERE IS ONE EXCEPTION. PLEASE**
693 **EXPLAIN.**

694 A. We note that an order involving an EEL in the manner in which we've recommended
695 it be provided, could require additional work steps in the case of manual provisioning
696 (i.e., in a fallout scenario), beyond those included by Qwest in its cost studies. This
697 results from the fact that during the pre-wiring phase of a "cut-to-EEL" scenario,
698 Qwest would need to ready the interoffice DSO circuit connecting the CLEC's distant
699 collocation arrangement to the central office within which the cut will take place.
700 This is likely to take additional time beyond that required for the other hot cut

scenarios. Until more information is available, we have assumed that these activities will require twice the amount of time Qwest has identified relative to pre-wiring in a normal hot cut scenario. With that assumption, we would recommend a rate of $5.69 per loop install for a "cut-to-EEL" scenario.

Q. INHERENT IN YOUR RECOMMENDATIONS ABOVE IS AN ASSUMPTION THAT QWEST WILL EMPLOY TECHNOLOGY THAT ALLOWS IT TO PROVISION UNBUNDLED LOOPS IN A HOT CUT SCENARIO WITHOUT MANUAL INTERVENTION. WILL QWEST BE ABLE TO ACHIEVE THAT TYPE OF AUTOMATED PROVISIONING CAPABILITY WITHOUT INVESTING IN ADDITIONAL EQUIPMENT?

A. No. Qwest will need to invest in additional equipment and process engineering assets in order to achieve the type of flow through we've assumed in the cost study supporting our proposed rates.

Q. SHOULD THE COMMISSION TAKE THAT REQUIRED INVESTMENT INTO ACCOUNT WHEN IT SETS QWEST'S NON-RECURRING CHARGES AT ISSUE IN THIS PROCEEDING?

A. No, it should not. Though it is perhaps somewhat anti-intuitive (though nonetheless economically rational), consistent with the FCC's rules, Qwest is entitled, ***on a non-recurring basis***, only to those non-recurring costs that would be generated in a network optimally configured using the latest, most efficient technology. We've described the rationale behind the FCC's intentions in that regard earlier in this testimony.

Q. SHOULD QWEST BE ALLOWED TO RECOVER THOSE INVESTMENTS?

A. Yes, it should; through recurring rates that recognize the value of the assets over time. Throughout this testimony we've discussed the urgent need to improve the ILEC hot cut processes such that they are comparable in seamlessness, efficiency, scalability

and cost to UNE-P migration processes that have, in large part, fueled the tremendous success of UNE-P. We've stated that UNE-L will never effectively replace UNE-P until, at a minimum, the hot cut process provides the same type of quick, efficient and transparent customer transition as does a UNE-P migration. Toward that end, we are recommending that Commission's establish the proper incentives by which Qwest will employ technologies like IDLC unbundling and automated frames in order to mechanize the hot cut process to the extent possible. We've stated above that we believe setting proper non-recurring rates based upon a diligent application of the FCC's TELRIC principles is a critical incentive in that regard. We also believe that a competitively neutral mechanism that allows Qwest to recover the investments required to make this type of automation a reality is another critical incentive.

Q. PLEASE EXPLAIN.

A. Qwest has not, to date, deployed large numbers of automated frames or IDLC technology that will support hot cuts in a mechanized fashion. As such, it will need to invest aggressively in these technologies before an effective, mechanized hot cut process can become a reality. And, while these investments are likely to enhance its own retail provisioning capabilities as well, it is fair to say that the FCC's dramatic policy shift away from UNE combinations in favor of services provided over CLEC switching is a major factor in the need for this type of equipment. Examples exist in the recent past when investments required to fundamentally shift the nature of the local exchange network, for purposes of accommodating pro-competitive policies,

were recovered by all carriers via competitively neutral surcharges. It seems logical that the investments described above could be recovered in much the same way.

As the FCC points out in its *Triennial Review Order*, the ILEC networks were originally built to accommodate a single carrier; they were not built to facilitate a wholesale platform upon which multiple carriers could easily provide services. UNE-P allowed carriers to largely bypass this problem because they were provided the opportunity to rely upon the integrated nature of the ILEC's network that it had built to effectively accommodate its retail services. In a scenario where the CLEC must use its own switch, unfortunately, the shortcomings of the ILEC network as a wholesale platform becomes more obvious. Modifications like those we've discussed above will be required to the network to facilitate the FCC's objectives in its *Triennial Review Order*.

Q. YOU SPEAK ABOVE OF PRECEDENT REGARDING SUCH A COMPETITIVELY NEUTRAL SURCHARGE. PLEASE ELABORATE.

A. Almost immediately following the FCC's *First Report and Order and Further Notice of Proposed Rulemaking* in CC Docket No. 96-98 (hereafter "*Local Competition Order*"), carriers were required to implement a number portability platform relying upon advanced SS7 signaling capabilities of the network and a centralized local number portability ("LNP") database. The purpose of the LNP platform was to provide customers freedom to take their telephone number with them when they moved from one local exchange carrier to another. The technology and equipment required to make LNP a reality was substantial, as was the coordination required amongst carriers to make the system work. Costs incurred by all carriers in order to

build and interface with the LNP database were recovered through a competitively neutral surcharge assessed (if the carrier so desired) upon its local customers.

Q. IS THE INDUSTRY'S EXPERIENCE WITH LNP INSTRUCTIVE IN THIS CIRCUMSTANCE?

A. Absolutely. Much like number portability was a requirement springing directly from the local competition initiatives of the FCC's *Local Competition Order*, the FCC's Triennial Order calls for a similar concept related to a customer's loop, i.e., "loop portability." If UNE-L is to achieve the success of UNE-P, customers must be able to literally move their loop from one carrier to another (including to and from Qwest), without the fear of service disruption, substantially increased costs and notable delay. In our opinion, the only way to achieve that type of "loop portability" is to develop the type of automated processes that support both LNP and UNE-P, for unbundled loops (as we've described above). Likewise, the most rational way to recover investments associated with making such a process reality is to employ the same type of competitively neutral funding mechanism employed by the FCC for LNP, i.e., we are recommending a "loop portability" funding mechanism.

Q. YOU SAY ABOVE THAT ALL CARRIERS SHOULD BE ABLE TO RECOVER COSTS FROM THIS MECHANISM. CAN YOU BE MORE SPECIFIC?

A. Yes. The costs/investment required to make loop portability a reality will be incurred by, and should be recovered in a competitively neutral fashion by, the ILECs. Nonetheless, CLECs will also be required to develop systems that interface with software driven provisioning systems employed by the ILECs and will need to modify their own internal provisioning technology. In many cases, those costs should

also be recoverable from the funding mechanism just as it was for LNP. We do not, however, intend to suggest that CLECs would be allowed to recover any collocation, transport or other costs associated with extending their networks to reach unbundled loops. We would support cost recovery by CLECs primarily for systems and interface investments needed to effectively integrate their UNE-L provisioning processes with the newly enabled automated functionality of the ILEC loop network.

Q. HOW WOULD SUCH A MECHANISM BE DEVELOPED?

A. We would recommend that the proper course action proceed as follows: (1) the Commission should first comply with the FCC's TELRIC requirements and, as a result of this proceeding, adopt the TELRIC-compliant nonrecurring charges we've recommended above, and then (2) the Commission should host a collaborative forum, much like the collaborative efforts employed specific to the process component of Qwest's hot cut process, for purposes of discussing the most expeditious manner by which to employ automated technology as well as the proper form of cost recovery.

Q. THE FCC HAS SUGGESTED THAT THE TYPE OF "ELECTRONIC LOOP PROVISIONING" ("ELP") YOU ARE DISCUSSING COULD COST HUNDREDS OF MILLIONS OF DOLLARS. DO YOU THINK THAT IS ACCURATE?

A. First, we should distinguish the technology we've described above from AT&T's ELP proposal made to the FCC. Our understanding is that AT&T's ELP proposal required a fundamental shift from circuit switched technology (i.e., IDLC and automated frame technology) to a packet-based platform (i.e., ATM). We are not advocating the packet-based platform described by AT&T, but instead, a technological solution that can rely upon the circuit-switched nature of the existing

infrastructure. As such, the costs of our approach are likely to be substantially smaller than those attributed to the AT&T approach. Further, the Commission should understand that our approach could be implemented on a central office-by-central office basis, and need not be constructed or funded across Qwest's entire network immediately. For example, consider a central office (or wire center) wherein a substantial number of UNE-P customers exist, and the Commission may, in the future, consider lifting the ULS requirement. Before lifting the ULS requirement, the Commission could require Qwest to implement the type of automated technology we've discussed above, just for that wire center, and likewise craft a cost recovery mechanism specific to that wire center. In this way, both the Commission and the industry could move forward with this solution incrementally, thereby perfecting the solution over time, and investing in new technology only in those areas wherein it is required to meet the underlying objective, i.e., to increase the likelihood of success for a UNE-L delivery strategy.

Q. WOULD IT BE APPROPRIATE FOR QWEST TO RECOVER ITS SYSTEM ENHANCEMENT COSTS IN THIS FASHION AS WELL?

A. Yes.

Q. DOES THIS CONCLUDE YOU TESTIMONY?

A. Yes, it does.

Telcordia™ Technologies

Performance from Experience

Telcordia Notes on the Networks

Telcordia Technologies Special Report
SR-2275
Issue 4
October 2000

An SAIC Company

Telcordia Notes on the Networks

SR-2275 replaces SR-2275, *Bellcore Notes on the Networks*, Issue 3, December 1997.

Related documents:

SR-NOTES-SERIES-01, *Telcordia Notes on the Synchronous Optical Network (SONET)*
SR-NOTES-SERIES-02, *Telcordia Notes on Dense Wavelength-Division Multiplexing (DWDM) and Optical Networking*
SR-NOTES-SERIES-03, *Telcordia Notes on Number Portability and Number Pooling*
SR-NOTES-SERIES-04, *Telcordia Notes on the Evolution of Enhanced Emergency Services.*

To obtain copies of this document, contact your company's document coordinator or your Telcordia account manager, or call +1 800.521.2673 (from the USA and Canada) or +1 732.699.5800 (all others), or visit our Web site at www.telcordia.com. Telcordia employees should call +1 732.699.5802.

Trademark Acknowledgments

Telcordia is a trademark of Telcordia Technologies, Inc.
CLCI, CLEI, CLFI, CLLI, ISCP, NMA, and SEAS are trademarks of Telcordia Technologies, Inc.
COMMON LANGUAGE, SPACE, TELEGATE, AIRBOSS, and TIRKS are registered trademarks of Telcordia Technologies, Inc.
CLASS is a service mark of Telcordia Technologies, Inc.
Appletalk is a registered trademark of Apple Computer, Inc.
DECNet is a trademark of Digital Equipment Corporation.
1/1AESS, 4ESS, 5ESS, Dataphone, and SLC are registered trademarks of Lucent Technologies, Inc.
DMS-10, DMS-100F, DATAPATH, and TOPS are trademarks of Nortel.
DMS-100 is a registered trademark of Nortel.
NEAX-61E is a trademark of NEC America, Inc.
EWSD is a registered trademark of Siemens AG.

Any other companies and products not specifically mentioned herein are trademarks or service marks of their respective trademark and service mark owners.

Telcordia Technologies Special Report Notice of Disclaimer

This Special Report is published by Telcordia Technologies to inform the industry of the topics discussed in *Telcordia Notes on the Networks.*

Telcordia reserves the right to revise this document for any reason, including but not limited to, conformity with standards promulgated by various agencies, utilization of advances in the state of the technical arts, or the reflection of changes in the design of any equipment, techniques, or procedures described or referred to herein.

Telcordia specifically advises the reader that this Special Report does not directly or indirectly address any Year-2000 ("Y2K") issues that might be raised by the services, systems, equipment, specifications, descriptions, or interfaces addressed or referred to herein. As an example, and not a limitation, neither this Special Report nor Telcordia is directly or indirectly assessing or determining whether specific services, systems, or equipment, individually or together, in their current form or as they may be implemented, modified, or augmented in the future, will accurately process dates and date-related data within or between the twentieth and twenty-first centuries, in either direction, including elapsed time, time difference, and/or leap year calculations.

LOCAL CONDITIONS MAY GIVE RISE TO A NEED FOR ADDITIONAL PROFESSIONAL INVESTIGATIONS, MODIFICATIONS, OR SAFEGUARDS TO MEET SITE, EQUIPMENT, ENVIRONMENTAL SAFETY OR COMPANY-SPECIFIC REQUIREMENTS. IN NO EVENT IS THIS INFORMATION INTENDED TO REPLACE FEDERAL, STATE, LOCAL, OR OTHER APPLICABLE CODES, LAWS, OR REGULATIONS. SPECIFIC APPLICATIONS WILL CONTAIN VARIABLES UNKNOWN TO OR BEYOND THE CONTROL OF TELCORDIA. AS A RESULT, TELCORDIA CANNOT WARRANT THAT THE APPLICATION OF THIS INFORMATION WILL PRODUCE THE TECHNICAL RESULT OR SAFETY ORIGINALLY INTENDED.

TELCORDIA MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE SUFFICIENCY, ACCURACY, OR UTILITY OF ANY INFORMATION OR OPINION CONTAINED HEREIN. TELCORDIA EXPRESSLY ADVISES THAT ANY USE OF OR RELIANCE UPON SAID INFORMATION OR OPINION IS AT THE RISK OF THE USER AND THAT TELCORDIA SHALL NOT BE LIABLE FOR ANY DAMAGE OR INJURY INCURRED BY ANY PERSON ARISING OUT OF THE SUFFICIENCY, ACCURACY, OR UTILITY OF ANY INFORMATION OR OPINION CONTAINED HEREIN.

This Special Report is not to be construed as a suggestion to anyone to modify or change any product or service, nor does this Special Report represent any commitment by anyone, including but not limited to Telcordia or any funder of this Telcordia Special Report, to purchase, manufacture, or sell any product with the described characteristics.

Readers are specifically advised that any entity may have needs, specifications, or requirements different from the generic descriptions herein. Therefore, anyone

wishing to know any entity's needs, specifications, or requirements should communicate directly with that entity.

Nothing contained herein shall be construed as conferring by implication, estoppel, or otherwise any license or right under any patent, whether or not the use of any information herein necessarily employs an invention of any existing or later issued patent.

TELCORDIA DOES NOT HEREBY RECOMMEND, APPROVE, CERTIFY, WARRANT, GUARANTEE, OR ENDORSE ANY PRODUCTS, PROCESSES, OR SERVICES, AND NOTHING CONTAINED HEREIN IS INTENDED OR SHOULD BE UNDERSTOOD AS ANY SUCH RECOMMENDATION, APPROVAL, CERTIFICATION, WARRANTY, GUARANTY, OR ENDORSEMENT TO ANYONE.

If further information regarding technical content is required, please contact:

Don M. Tow
Telcordia Technologies
331 Newman Springs Road, Room 3Z-207
Red Bank, NJ 07701-5699

For general information about this or any other Telcordia documents, please contact:

Telcordia Technologies Customer Service
Piscataway, New Jersey 08854-4156
1-800-521-2673 (US and Canada)
1-732-699-5800 (all others)
1-732-336-2559 (FAX)
http://www.telcordia.com

Subsequent to the passing of the Telecommunications Act of 1996, the ILECs sought judicial relief and won an appeal at the U.S. Eighth Circuit Court to repeal the UNE mandates. Upon appeal by the FCC and CLECs, the U.S. Supreme Court issued its "FCC Remand Order," which required the FCC to re-examine all seven UNEs and justify/explain the rationale for each UNE that the FCC considers necessary.

In November 1999, the FCC released its Docket 99-238, which eliminated the Operator/Directory Services UNE, but retained the other six UNEs. In addition, the FCC added a new UNE called "Sub-Loop". A sub-loop unbundled network element refers to any portion of the ILEC's whole loop which is outside the central office and that a CLEC can access and make interconnection to offer service to a customer.

In December 1999, the FCC released its Docket 99-355, which mandated another UNE, this one relating to the high-frequency portion of the loop. The mandate requires line sharing arrangements between an ILEC and a CLEC for both whole loop and sub-loop unbundling configurations. Line sharing, which is also known as spectrum unbundling, refers to the same twisted copper pair being used by more than one carrier. The ILEC can carry traditional voice-switched telephone service within the 0- to 3-Khz spectrum, and the CLEC can provide DSL services over the spectrum above 3 Khz. All ILECs must begin line sharing implementations by mid-year 2000.

12.13.2 Loop Unbundling

There are two main types of loop unbundling. The first is called "whole loop" unbundling, which is the unbundling of a whole loop from the MDF in the ILEC's central office to the customer premises. The second type is called "sub-loop" unbundling, which refers to a portion of the ILEC's whole loop being offered to a CLEC. This section provides more information about each type of loop unbundling.

12.13.2.1 Whole Loop Unbundling Configurations

Typically, when a customer requests dial tone service from a CLEC, the ILEC removes the wired connection to the ILEC switch in the central office and rewires the customer's loop to a CLEC "meet" point in the central office. Figure 12-32 depicts whole loop transfers in the ILEC central office when the customer is served by copper facilities or by a UDLC system. In most cases, there is an analog handoff to the CLEC. If the CLEC requests a digital handoff, the ILEC may utilize a D4 channel bank to digitize the circuits. Most CLECs transport the unbundled loops back to their central offices (switches) using GR-303 IDLC systems. To do this, the CLECs deploy GR-303 RDTs within their collocation cages in the ILEC's central offices.

The most critical factor associated with unbundling a customer loop is the type of loop facility that the customer is already utilizing for service, such as all-copper, UDLC system, or IDLC system.

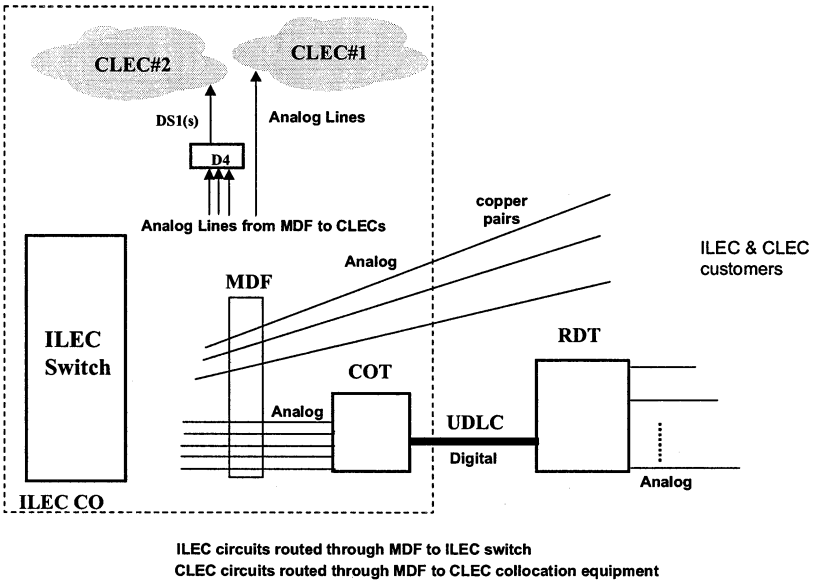


Figure 12-32. Unbundling Loops Served by Copper or UDLC Systems

- If the customer is receiving service over all-copper facilities, the transfer of the whole loop is straightforward as indicated in Figure 12-32. The ILEC removes the central office connection to its switch and places a jumper from the MDF to the meet point at the CLEC's collocation cage. There is no need to rewire the outside plant or visit the customer premises.
- If the customer is receiving service over a UDLC system, the transfer of the whole loop can be straightforward as shown in Figure 12-32. The ILEC removes the central office connection to its switch and places a jumper from the MDF to the meet point at the CLEC's collocation cage. Again, there is no need to rewire the outside plant or visit the customer premises.
- However, if the customer is served by an IDLC system, the loop is digitally transmitted to the ILEC switch. There are a variety of "technically feasible" options available to the ILEC to unbundle the loop. Each ILEC has established its own set of approved unbundling options along with the corresponding methods, procedures, and practices needed for implementing these options. Numerous unbundling options are possible because many of today's RDTs support multiple kinds of interfaces such as: GR-303, TR-08, UDLC, and D4 DS1. Also, some RDTs are capable of supporting multiple GR-303 Interface Groups, thereby permitting a single RDT to connect to multiple switches.

  Some common IDLC unbundling options are:

  1. Bypass the IDLC system and transfer the loop to an all-copper pair

     If there are available spare copper facilities serving the customer's neighborhood, transferring the IDLC customer to a spare all-copper circuit may be a viable option for the ILEC, as shown in Figure 12-33. Although this

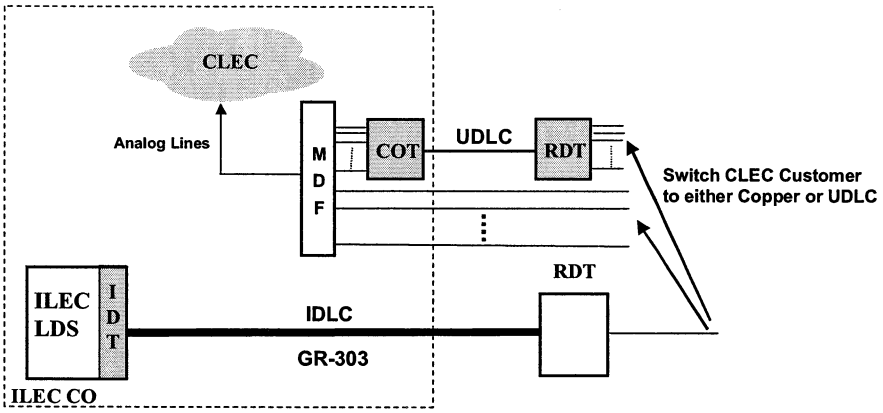


Figure 12-33. IDLC Unbundling - Bypass the IDLC System

procedure is relatively simple, it requires central office and outside plant rewiring to complete the new circuit from the MDF to the customer. The all-copper unbundled loop is the easiest unbundling architecture for the ILEC to perform maintenance and testing.

Some ILECs serve new neighborhoods/housing developments with DLC systems and install a very limited number of copper pairs to support certain services. In these areas, spare copper facilities can be quickly exhausted if used for unbundled loops.

2. Bypass the IDLC system and transfer the loop to a UDLC system

   If there are no spare copper facilities in the customer's neighborhood, the ILEC may transfer the customer's circuit from the IDLC system to a UDLC system (see Figure 12-33). This transfer will also involve both central and outside plant work activity.

   The customer fill rates at IDLC/UDLC CEV sites are typically 50 to 70%. There is a moderate amount of spare capacity on the UDLC systems to support transfers from IDLC systems.

3. Utilize the UDLC capability of the IDLC system

   If the IDLC system is equipped to support UDLC functionality, the ILEC can electronically re-provision the circuit from IDLC to UDLC (see Figure 12-34). No outside plant work activity is needed. Central office work activity is needed to run jumpers from the MDF to the collocation cage and, if necessary, place a UDLC plug-in at the COT.

4. Utilize a separate GR-303 Interface Group for the CLEC customers

   Figure 12-35 shows the use of separate GR-303 Interface Groups to carry ILEC and CLEC traffic. The RDT must support the MIG (Multiple Interface Group) capability defined in the GR-303 specification. This configuration allows a CLEC switch to connect to the ILEC's RDT at the GR-303 interface level.

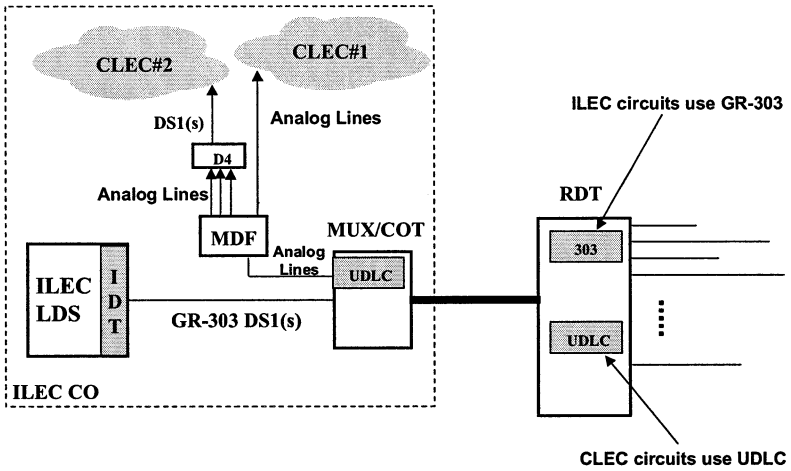


Figure 12-34. IDLC Unbundling Using the UDLC Capability of RDT

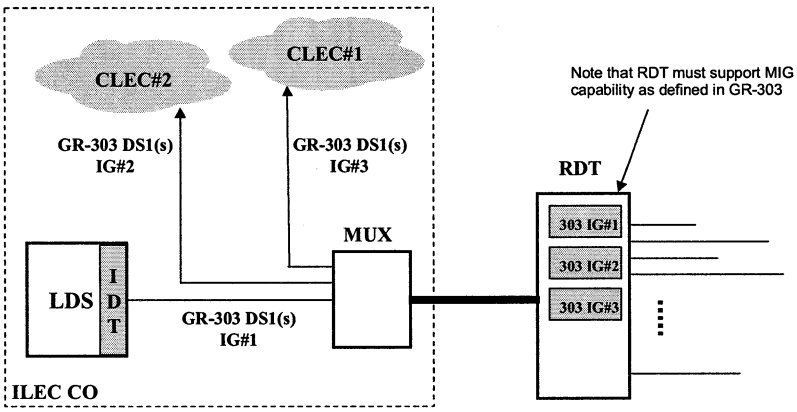


Figure 12-35. IDLC Unbundling Using Separate GR-303 Interface Groups

This arrangement may be cost effective for those CLECs having a "critical mass" of subscribers served by the RDT or group of RDTs in a CEV. Since the GR-303 Interface Group supports operations functionality, there are a variety of issues (provisioning, alarm reporting, sharing of test resources, etc.) that are currently being addressed by the industry.

In response to the Telecommunications Act of 1996, GR-303 requirements were changed in 1997 to permit a single DS1 to be called a 303 Interface Group. A minimum of two DS1s was previously required. This change allows a CLEC to serve a small base of customers at an RDT more economically (but at the risk of lower service availability and reliability).

5. Share a GR-303 Interface Group and use the sidedoor port of the switch to transport CLEC traffic out of the ILEC switch

Figure 12-36 shows the use of a GR-303 Interface Group sharing ILEC and CLEC traffic where all CLEC traffic is routed through sidedoor port DS1s out of the ILEC's switch.

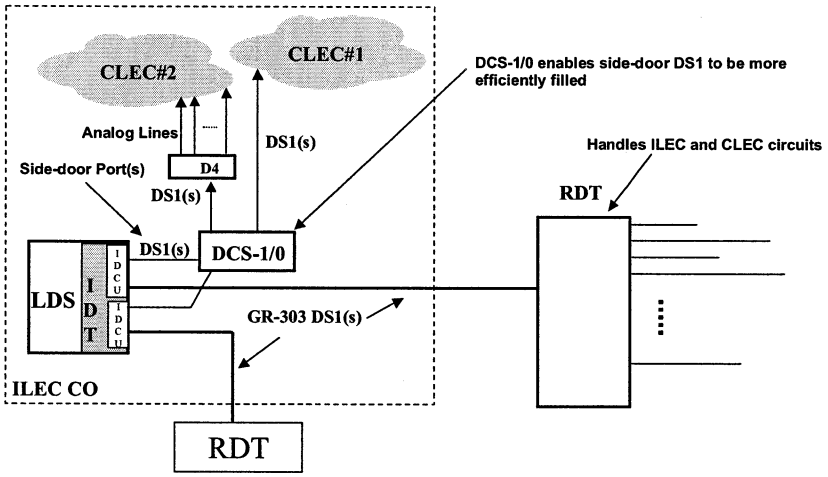


Figure 12-36. IDLC Unbundling Using Sidedoor Port

CLEC circuits are provisioned as non-switched, non-locally switched circuits within the IDLC system. While the DCS-1/0 is shown in the figure, it is not a requirement of this architecture. The advantage of using a DCS-1/0 is realized if the CLEC is not fully utilizing a DS1 from the ILEC LDS to the CLEC, and multiple switch modules with IDCUs are used by the ILEC. If a DCS-1/0 is placed between the LDS DS1 sidedoor port and the CLEC DS1s, it would permit full utilization of the sidedoor LDS/IDCU hardware by enabling CLEC DS0s to be rearranged in the DCS-1/0 and placed on the individual CLEC DS1s.

The ILEC must address the following issues associated with the sidedoor port arrangement:

A. The cost of a DS1 switch termination for a sidedoor port is about ten times the cost for a DS1 line card on a RDT.

B. Since each CLEC circuit requires a nailed up DS0, the ILEC may encounter blocking over the IDLC system as other circuits compete for DS0 channels.

C. The number of sidedoor ports that can be engineered varies depending on the LDS supplier.

D. There is limited support in existing special services design systems and databases to support sidedoor port circuits.

E. The ILEC may need field visits to install special service D4 channel units at the RDT.

6. Utilize separate TR-08 Interface Groups to transport CLEC traffic

   Figure 12-37 shows the use of separate TR-08 Interface Groups to carry CLEC traffic while utilizing the GR-303 Interface for ILEC traffic. In the figure, the RDT supports both GR-303 and TR-08 generic interface capabilities. CLEC switches can interconnect with the ILEC's RDT utilizing the DS1 handoff from the TR-08 interface.

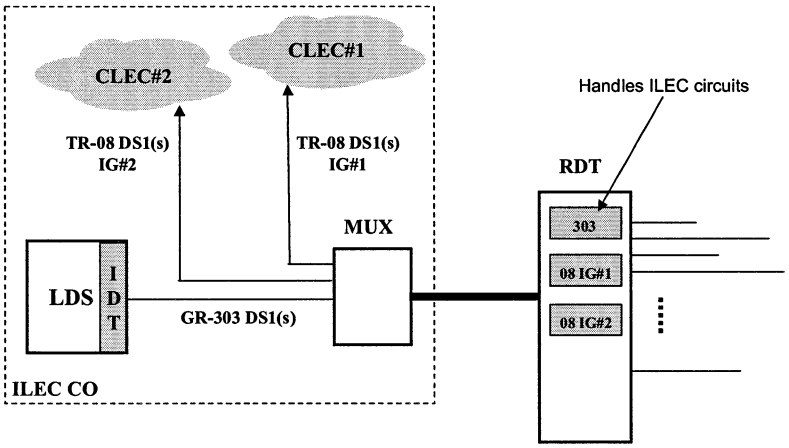


Figure 12-37. IDLC Unbundling Using Separate TR-08 Interface Groups

7. CLEC leases entire RDT

   Figure 12-38 shows the configuration when a CLEC leases an entire RDT from the ILEC.

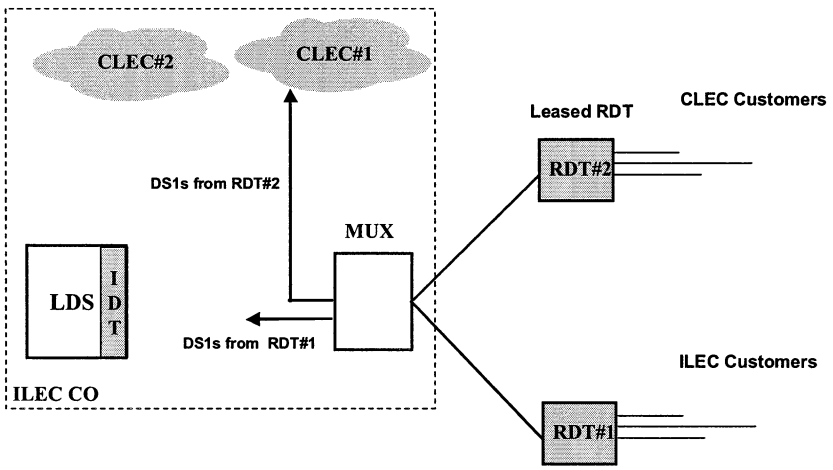


Figure 12-38. IDLC Unbundling - CLEC Leases Entire RDT

RDT#1 serves the ILEC customers, and RDT#2 serves the CLEC customers. This unbundling option may be cost-effective for the CLEC if the CLEC has a significant number of residential customers in the neighborhood or is serving a business park or campus.

12.13.2.2 Sub-Loop Unbundling Configurations

Sub-loop unbundling occurs when a CLEC interconnects to a loop facility at a point outside the ILEC's central office. The Sub-Loop UNE is defined by the FCC as portions of the loop that can be accessed at terminals in the ILEC's outside plant. An accessible terminal is a point on the loop where technicians can access the wire or fiber within the cable without removing a splice case to reach the wire or fiber within. Examples of access terminals are: poles, pedestals, the NID, the Minimum Point Of Entry (MPOE) to the customer premises, the MDF, and the Feeder/ Distribution Interface (including CEVs, utility rooms, and DLC Remote Terminals). Figure12-39 shows sub-loop unbundling at a GR-303 Remote Terminal (RDT) where a CLEC interconnects at the ILEC's RDT using its own GR-303 Interface Group facilities to provide service to its customers. In this configuration, the CLEC leases from the ILEC the RDT equipment and the RDT line facilities to each of its customer premises.

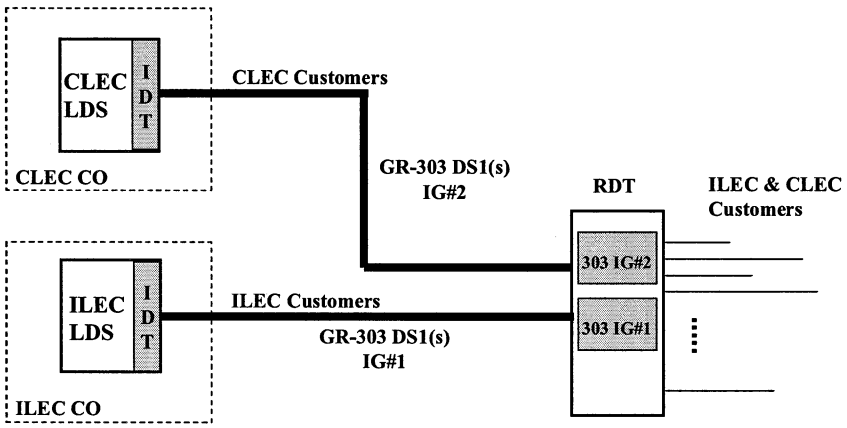


Figure 12-39. Sub-Loop Unbundling at an RDT

The FCC mandate on sub-loop network elements places the burden on each state regulatory commission to determine whether specific interconnection points in the outside plant are "technically feasible". The law directs the state commission to examine the ILEC's specific architecture and the specific technology used over the loop to determine whether it is really technically feasible to unbundle the sub-loop at a potential access point where a competing carrier requests access. Two key factors that are considered in this "technically feasible" determination are whether there is adequate space for collocated CLEC equipment to be installed and if the site has sufficient security safeguards to prevent mischief or sabotage. The FCC has

indicated that its central office collocation rules are also applicable to collocation in outside plant locations.

Since the FCC sub-loop unbundling mandate was announced in 1999, there has been little time for ILECs, CLECs, and state commissions to deal with this UNE. Sub-loop UNEs are an emerging market and, at this time, it is not clear which portions of the ILEC outside plant will be aggressively pursued by CLECs.

Numerous sub-loop unbundling configurations are possible. A CLEC may lease facilities from multiple carriers to create circuits, or it may deploy some of its own facilities and lease other facilities to extend its network to reach a greater customer base. Depending on the CLEC's network architecture, some of the transmission and technical issues associated with IDLC and UDLC configurations (described in Section 12.13.3) may be observed.

12.13.3 Unbundling Issues Associated with UDLC and IDLC Systems

There are various transmission and other technical issues associated with the use of UDLC and IDLC systems in the unbundling environment. In many loop unbundling configurations, the CLEC utilizes an IDLC system to economically transport unbundled loops from the ILEC's central office to the CLEC's central office. Issues arise when the ILEC terminates long length all-copper loops or DLC-transported loops to the CLEC's RDT (meet points at the collocation cage).

When an unbundled all-copper loop greater than 900 ohms or 12 Kft long is terminated at the CLEC's RDT, the customer may encounter degraded voice frequency transmission. To maintain the POTS grade of service, the CLEC may need to install an RDT line unit with a higher DC supervisory range to accommodate the long loop.

When an unbundled UDLC loop is terminated at the CLEC's RDT, the following impacts may be observed:

— Increased dial tone delay

— Degradation of on-hook transmission services, such as caller ID (due to delays)

— Degradation of signal quality (as a result of multiple A/D and D/A conversions)

— Reduction in analog modem operation speed (connection speed depends on loop length, number of A/D conversions, local switch type, and interoffice facility type).

Figure 12-40 shows the back-to-back DLC configuration.

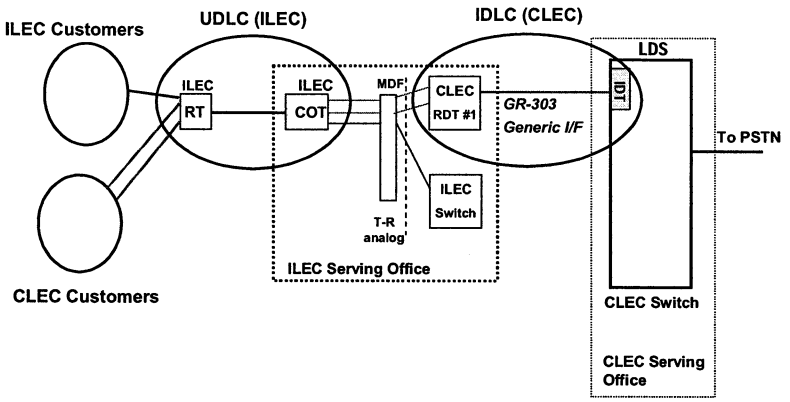


Figure 12-40. ILEC/CLEC Back-To-Back DLC Configuration

12.13.4 The Evolving Loop Unbundling Environment

Initially, ILECs offered and provided unbundled circuits to CLECs as analog handoffs to the collocation cages of the CLECs. Many ILECs now offer DS-0 digital connectivity to the CLEC collocation cages. DS-1 interconnection is emerging. Less than 2% of all access lines in the U.S. are currently unbundled, but this may rise to as much as 30% in the next 5 to 10 years. The factors that will significantly impact the potential growth in unbundled loops are: additional FCC regulatory/court changes, rate of implementation of ILEC/CLEC line sharing, and decisions by individual state commissions.

In the current loop unbundling environment, CLECs are largely focusing on unbundling ILEC business customers. The drivers behind this approach are economics and scalability. Provisioning and maintaining multiple unbundled loops from a single business customer lets the CLEC use digital subscriber lines over ILEC facilities. CLECs are requesting copper unbundled pairs and placing DSL equipment on these pairs to provide multiple POTS lines over no more than two unbundled copper pairs. The residence unbundling architecture presents a greater economic challenge to the CLEC because residential customers will generally request a single unbundled loop. CLECs find serving business customers much more profitable than serving residential customers. The FCC mandates on sub-loop unbundling and line sharing are expected to have a significant impact on CLEC expansion into the xDSL marketplace because CLECs will no longer be forced to incur the full cost of a separate copper line to serve customers.

The FCC orders mandating sub-loop unbundling and line sharing will likely be challenged in the courts. While this process evolves, CLECs will press for access to the local loop at the interconnection point nearest to the customer. When DLC systems are used to provide ILEC services, the CLEC will want to interconnect at the RDT. The reasoning for gaining access to the RDT on the analog customer side is to have the ability to provide all of the offered ILEC services without the

transmission impairments and operational issues associated with interconnection at any other location.

When these RDTs are within 3,000 feet of the customer, either the ILEC or CLEC can have the ability to use xDSL technology to offer high-speed data access as well as video services. The CLEC may also choose to offer traditional telephone services using "voice over IP" technology. With this technology, it is possible to have the ILEC owning the 0- to 3-khz bandwidth on a twisted pair from the RDT to the customer NID and having no services connected at the customer premises. The CLEC utilizes the frequency above 3 kHz (xDSL) and provides voice, data, and video services.

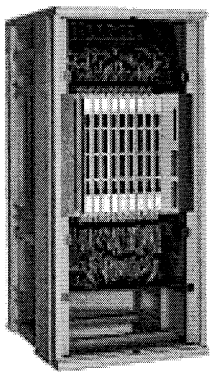
The evolution of the loop plant is shifting toward greater fiber deployment. When fiber systems advance to the situation where a significant number of residences are served using FTTC systems, CLECs will request access to some of the interconnection points in the fiber network.

White Paper on MDF Management

ControlPoint™

MDF/IDF Line Management
in an ILEC Central Office or Remote Environment

February 2001



nhc

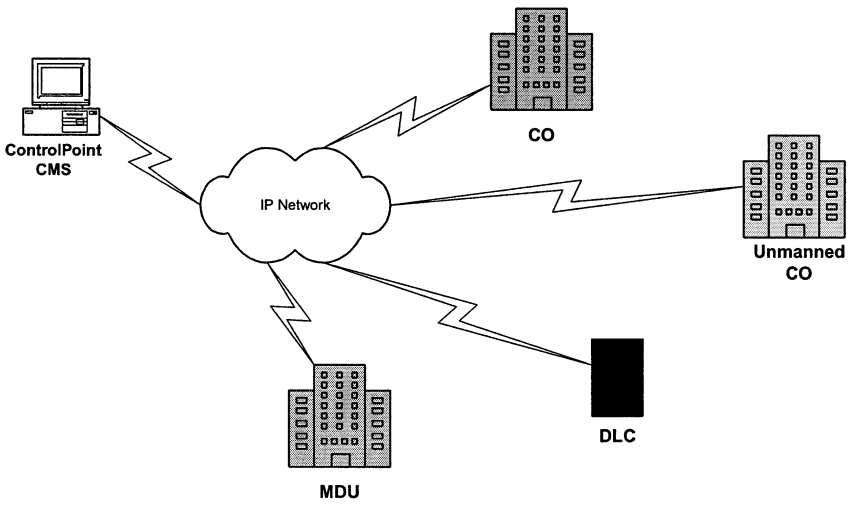
Introduction

The deregulation of telecommunications services and recent FCC rulings has changed the dynamics of the local loop. Collocation is an everyday reality in most central offices and potentially in many remotes. Connection management, as customers migrate between providers, is challenging and presents a "service strain" to the service provider. "Line sharing" rulings are expected to accelerate demand and pose new line-qualification challenges to the ILEC.

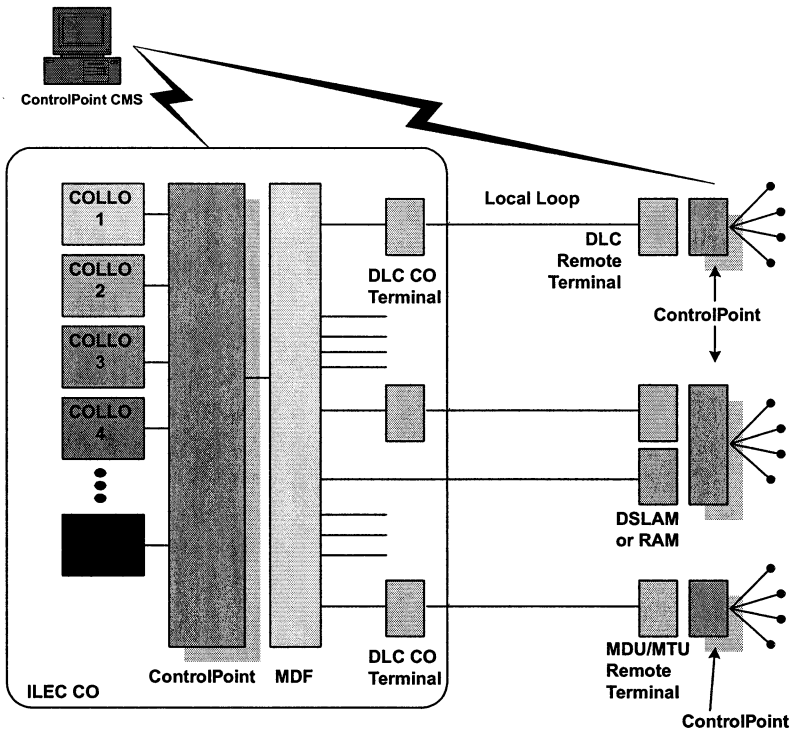
The dramatic increase in competition for the local loop increased the level of activity centering on connection, maintenance, and management of copper wire and wireline services. Given these high levels of activity in the loop, the traditional labor-intensive manual approach to cross-connect management is no longer viable via manual labor and processes. "Truck rolls" are too slow and expensive to be effective in today's competitive industry. The obvious answer: automate the provisioning process and provide intelligent wireline management at the physical layer.

NHC's innovative ControlPoint Cross-Connect System replaces labor intensive wiring, reducing operating costs and maintenance, improving service delivery cycles. ControlPoint dramatically reduces labor, space, and time of service versus conventional MDF/IDF and OSP distribution frames that require on-site wiring by experienced technicians. The NHC solution provides the ILEC with complete control over the entire service deployment cycle, and ensures quality of service (QoS) via fallback switching. ControlPoint works with all copper based services including POTS, ISDN, T1, xDSL and other voice and data protocols. The ControlPoint Cross-Connect Systems is deployable in:

- Manned central offices (CO).
- Small unmanned COs under 5,000 lines.
- Remote Terminal Cabinets housing Digital Loop Carriers (DLC).
- Multi-Dwelling and Multi-Tenant Units (MDU/MTU)
- OSP Feeder/Distribution Cross-Connect Frames



NHC's ControlPoint solution addresses the problem of automating the basic cross-connect function of provisioning, test access, service migration and fallback switching, in each of these locations. The purpose of this document is to show how NHC's ControlPoint Cross-Connect System can help the ILEC manage its MDFs more effectively.



The MDF marks the point at which the local loop meets the Telco's access service equipment. The myriad of connections that need to be made and remade due to new deployment and churn, are putting greater manpower pressures on the ILEC. Compounded by the fact that the ILEC must manage not only its own telecom lines but also the lines feeding to multiple co-locations (COLLOs), the ILEC is forced to look for new ways to automate some of the service provisioning and migration task.

The problem with subscriber churn is prompting ILEC's to seriously look at new technologies to control MDF management costs and improve quality of service (QoS). The following quotation from Telecommunications Magazine provides a idea of the scope of the problem.

".... the average U.S. churn rate now hovers around 40 percent for most providers, with customer acquisition costs at about $400 per subscriber."....

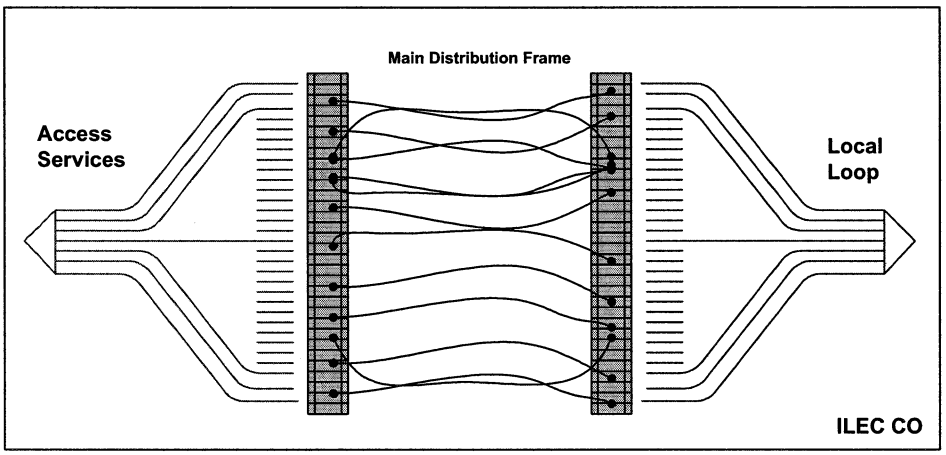
"But Europe also leads its New World counterparts in less positive statistical measurements. Subscriber churn in many markets now exceeds 3 percent a month, rising to near-disastrous rates of 35 percent to 50 percent on an annual basis. The expense of acquiring new European customers, which can cost up to $700 each, makes these high churn rates even more painful."....

"Churn now costs European and U.S. telcos close to $4 billion each year, and the global cost of customer defection may well approach a staggering $10 billion."

Source: Telecommunications Magazine. February 1999. Jean Schmitt, chief executive officer of SLP InfoWare, a provider of churn-management and customer-retention software applications.

Services To Be Managed at the MDF

The MDF is the point of cross-connection for a wide array of telecom and datacom services. The type of services that require cross-connect management include POTS, ISDN, Centrex, T1, SDSL, ADSL, HDSL, HDSL2, TIE lines and dry copper pairs originating from residential and business users, MTU/MDU, Digital Loop Carrier (DLC) remote terminals and other CPE equipment. These lines terminate on the Main Distribution Frame and are then cross-connected to various equipment such as Class 5 switches, multiplexers, digital access cross-connects (DACs), DLC CO terminals, add/drop multiplexers, routers, POTS splitters and DSLAMs. The MDF provides the facility by which each copper subscriber pair gets connected to the correct carrier and service.



Manual Reconnection Work

Currently each connection requires a frame technician to manually re-terminate a patch cable between the subscriber line and the access equipment. A large taskforce is often reserved only for this task. In some unmanned COs, a technician must be sent on site every time a re-connection is required. As the number of COLLOs grows, the rate of churn increases, putting more pressure on the ILECs to connect and re-connect subscribers to high-speed services. ILECs are being forced to increase their manpower simply to move connections at the MDF. Consequently, they are searching for ways to offset this cost by automating some of the work. The type of connections being performed at the MDF include:

- Connecting the local user to a new access service.
- Migrating a subscriber to a new service.
- Re-connecting a subscriber from a faulty line card to a spare.
- Connecting subscriber lines to COLLO distribution frames.
- Connecting test equipment to the local loop.

Which Lines to Automate First

While the objective is to use ControlPoint to manage the entire MDF, from a logistics point of view it may be necessary to proceed in phases, beginning with the lines that have the highest churn rate.

Therefore the main problem facing the ILEC in deploying an automated MDF is identifying which lines and services to automate first. The main criteria in determining this is the rate of subscriber churn.

T1 or DSL subscriber loops that migrate several times per year present a higher priority to the ILEC in terms of managing them through ControlPoint. POTS lines on the other hand in general have a lower churn rate and therefore may not seem be immediate candidates for ControlPoint. However, the ILEC could elect to terminate large blocks of POTS lines immediately onto to ControlPoint in anticipation that they will migrate to higher speed services.

Therefore, the first task of the ILEC is to rank its local loop segments, services and carriers by "churn rate" and to assess whether any POTS loops should be pre-terminated onto an automated cross-connect for future service migration. Churn is usually measured as the percentage of lines that are moved or disconnected each month. This exercise provides an indication of where to focus efforts in automating the MDF.

As an illustration, the following table shows how this ranking might look for a particular CO. In the example, if the Sector D portion of the local loop is a prime candidate for migration to highspeed service (ie; because of its location, etc), then it could be pre-terminated earlier than other sectors that do not have this expectation for service migration.

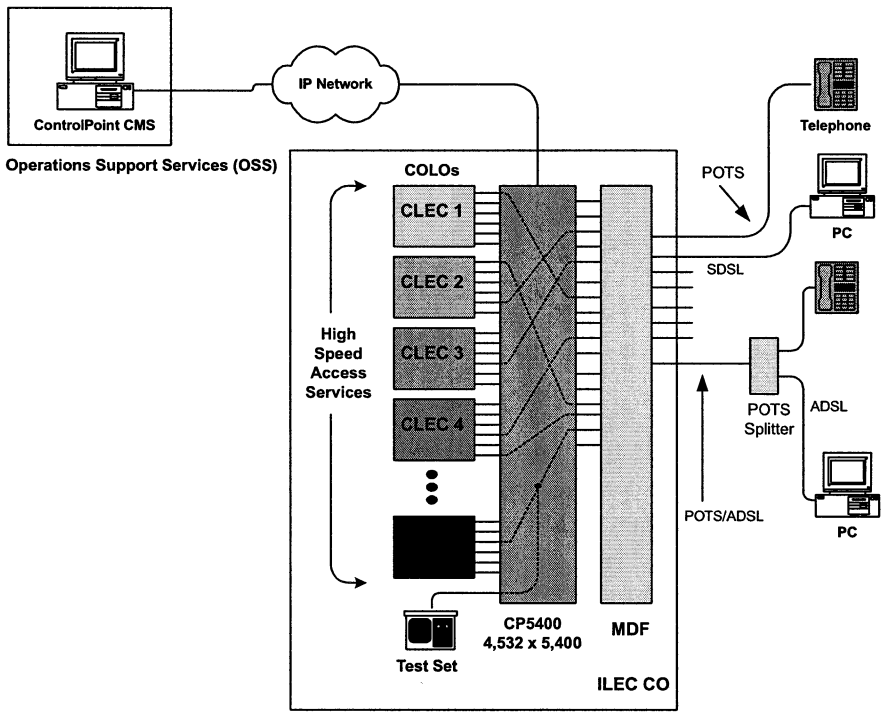
CO A - Monthly Churn Rates					
Carrier	% churn	Service	% churn	Local Loop	% churn
CLEC C	3%	T1	2.5%	Sector B	2.0%
CLEC B	2.5%	ADSL	2.0%	Sector A	1.9%
CLEC D	2%	HDSL	1.5%	Sector C	1.8%
CLEC E	1.3%	Centrex	1.0%	Sector D*	1.3%
ISP A	1.2%	POTS	.6%		
ILEC	1.0%				

*anticipate shift to DSL

From the above table, one approach would be for the ILEC to prioritize lines and services with churn rates of 2% per month or higher. Thus, CLEC C, B, E and services T1, ADSL and local loop sector B would be connected to ControlPoint first.

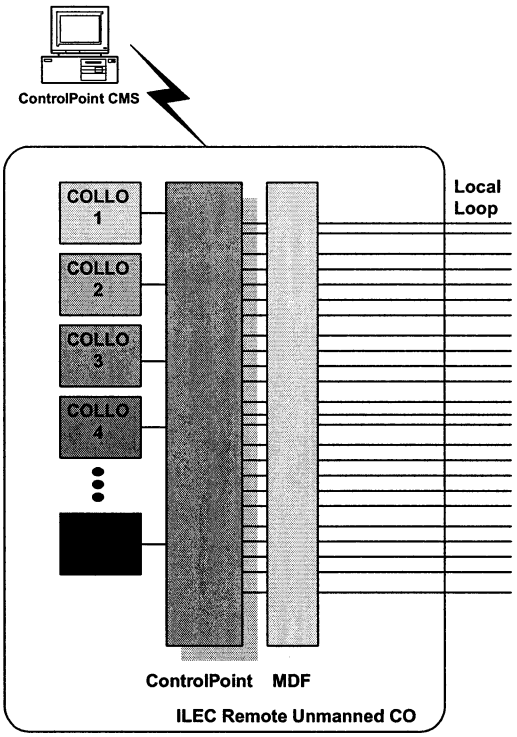
Managing High Speed Data Lines

In determining which part of a CO's MDF operation to automate first, the ILEC may choose to prioritize service connections that exhibit the highest overall churn rate, such as high speed data lines. These services would include T1, SDSL, ADSL, G.Lite, HDSL and HDSL2 among others. These services may be terminated on ILEC equipment or on CLEC distribution frames and may originate from multiple COLLOs or from the ILEC's own equipment. The following diagram shows how NHC's ControlPoint 5400 Crossconnect Switch (CP-5400) could handle the cross-connect function between multiple high-speed services.



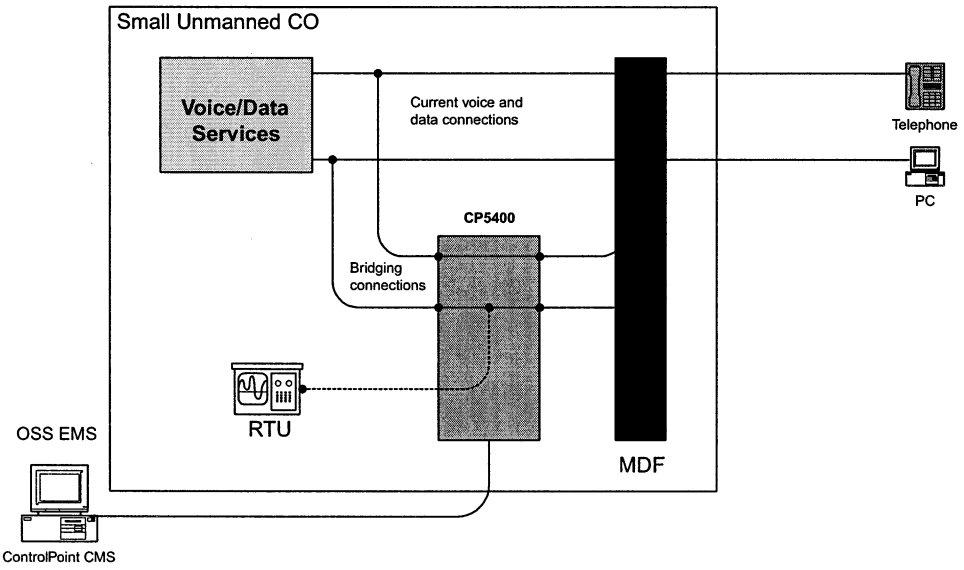
Small Unmanned COs Under 5,000 Lines

One of the ILEC's major problems is how to manage the numerous small unmanned COs in its territory. Large enough to require a facility-based MDF but not large enough to require a full-time on-site frame technician, these unmanned COs are often located far from the main CO and support under 5,000 lines, mainly simple dial tone offices with little or no COLLO. Consequently whenever a re-connection is needed, a technician has to travel significant distances to make a simple re-connection. Using ControlPoint, the ILEC could manage these MDFs remotely without having to send a frame technician on-site.

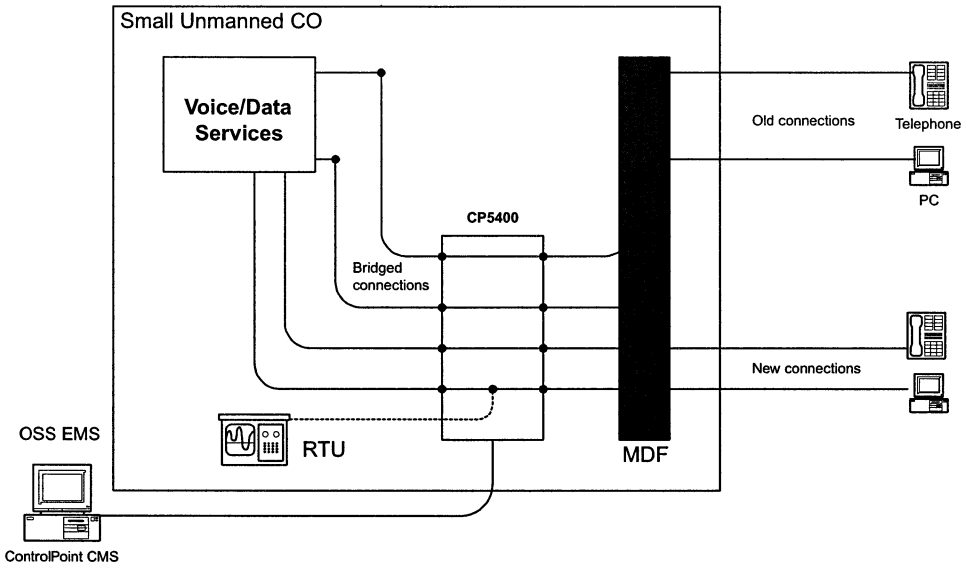


The cut-over would take place by first bridging the ControlPoint 5400 to the existing MDF. Once testing is completed and the CP5400 has been put into service, the MDF would be removed. New lines would be terminated directly onto the CP5400. The following diagrams show the cutover process.

The first stage would be to attach bridging adapters between existing voice/data services and the CP5400. An RTU connected to ControlPoint could be used to verify the lines before final cutover.

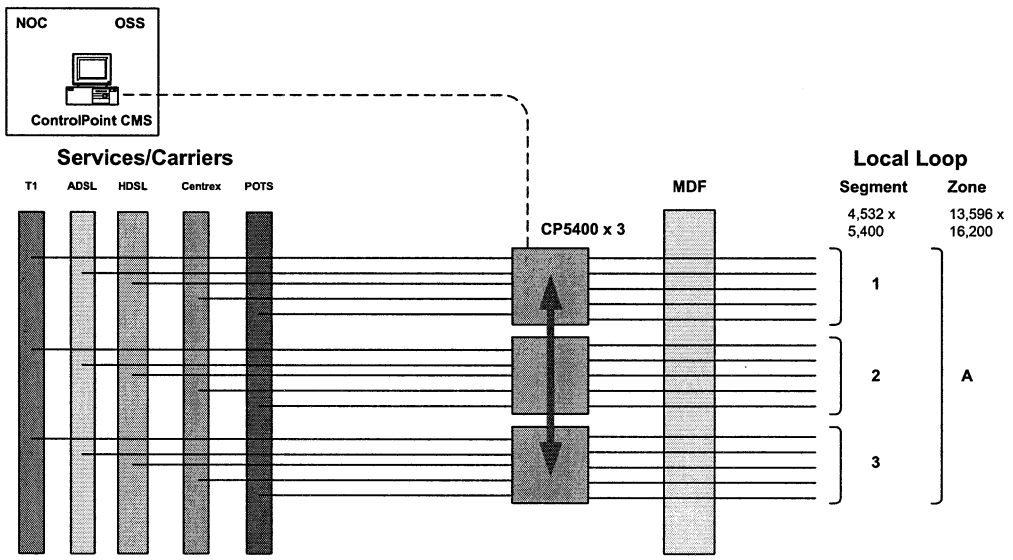


Once testing is complete the connections would be switched over to ControlPoint. The old connections would be removed. Subsequent connections would be managed exclusively via ControlPoint and all new services would be terminated directly onto ControlPoint, bypassing the conventional MDF.

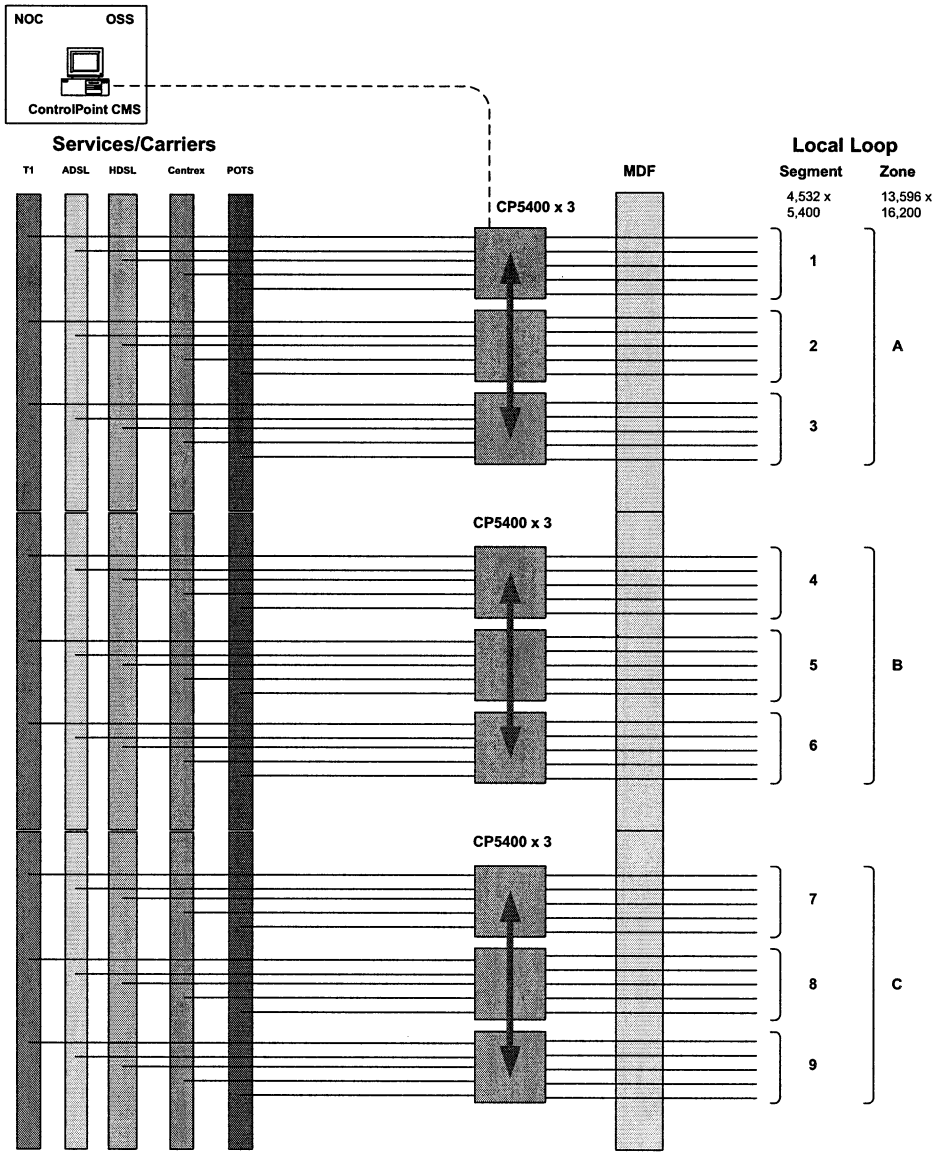


Managing an MDF of 50,000 lines

The management of larger MDFs would follow a process similar to an unmanned CO. The difference would be that in smaller COs, a single CP5400 (4532x5400) would be sufficient to handle all terminated lines and service access ports. On the other hand, in the larger COs where the number of lines exceeds the capacity of the CP5400, it would be necessary to partition the MDF into "zones" so that service access ports are available to any subscriber loop that is terminated onto any ControlPoint switch. Thus subscriber lines could be connected to any service regardless of which cross-connect switch they are connected to. The allocation of access ports to each switch would depend on the local loop subscriber profile of the CO. In the diagram below each ControlPoint is connected to a group of local loop pairs constituting a "segment".



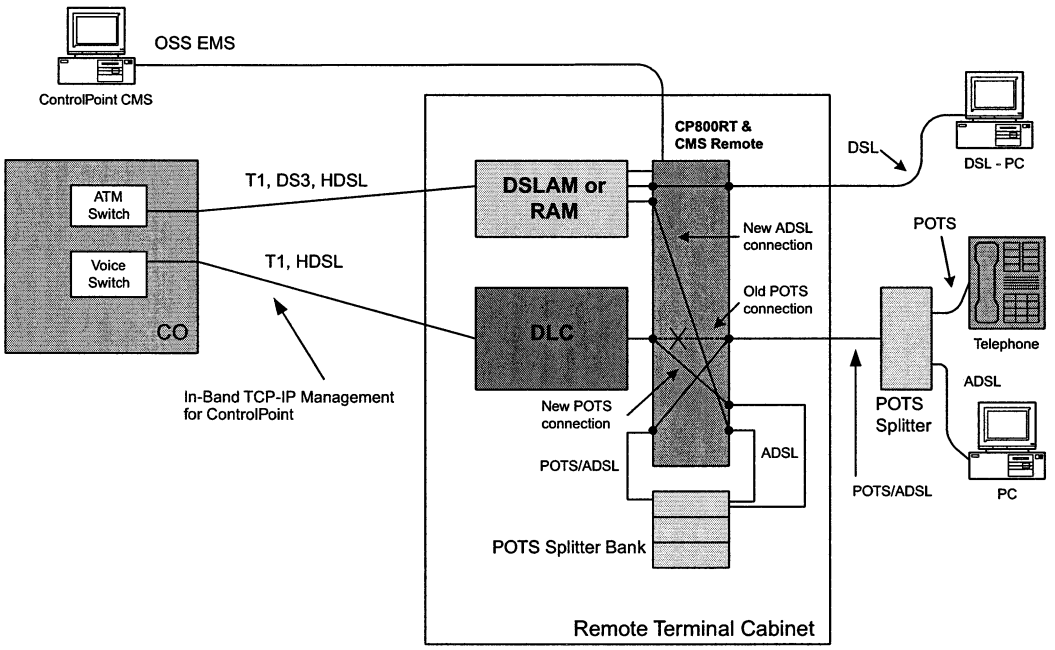
In order to handle matrices larger than 5,000, the CP5400 has the capability of being able to be cascaded to another CP5400 in order to create a larger, "any-to-any" blocking matrix. For example three CP5400s can be cascaded to form a matrix of 13,596 x 16,200, of which 950 lines may be connected anywhere within a zone. These 16,200 lines would constitute an MDF "zone". Once these 950 lines are used up, the matrix is blocked and the cross-connect switch may need to be "reset" to free up some of these 950 cross-connect points. These 950 lines are basically to handle the disproportionate distribution of services versus subscribers. For example, if a subscriber needs access to a T1 line and there are no more allocated to the switch that he is connected to, then it would be possible to connect him to a different switch within the same zone. The following diagram illustrates the zoned approach.



Using a zoned approach, MDFs of even greater size could be managed in a similar way. The main problem is how to allocate subscribers and services to each MDF so that most cross-connections are handled within a given zone. This should be determined by gathering data about what the service profile is for each segment of the MDF. This information helps to determine how many service ports of each service class to allocate to each CP5400.

Remote Outside Plant Application - RT and MDU/MTU

The outside plant is another area in which ControlPoint could be used for local loop management. This includes Remote Terminals and MDU/MTUs. The Outside Plant Serving Area Cross-connects (SAC) contain DLC equipment that is traditionally used only for voice. Today, the RT's are being expanded to support highspeed data service and additional equipment such as DSLAMs, Remote Access Multiplexers (RAMs) RTUs, and POTS splitters are being installed. Tasks such as line qualification, service migration and fallback switching could be handled remotely with ControlPoint, eliminating the need to send a trained field service technician to the RT.



DEDICATED COPPER LINE

The ControlPoint switch would sit between the DLC/DSLAM and the termination frame. All local loops, DSLAM ports, DLC ports and POTS splitter ports would be pre-terminated on the switch. In the case where the CLEC owns the DSLAM, it would issue a request to the ILEC to provision a new copper pair to its DSLAM. The ILEC ControlPoint Operator could connect a remote test unit to the line via ControlPoint to qualify the line for highspeed data. Once the line was qualified, the ILEC could hand off the connection to the collocated DSLAM via ControlPoint. Depending on the number of lines to be managed, the appropriate size ControlPoint switch would be deployed; from the CP800RT (800 lines) up to the CP5400 (5400 lines).

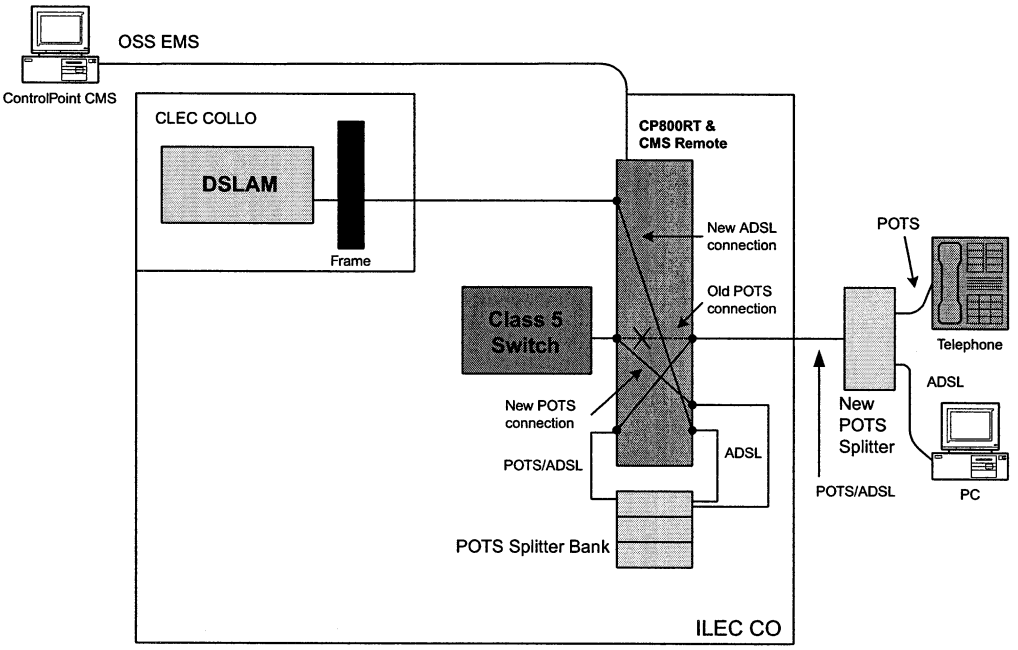
SHARED-LINE

In the case where the line is to be shared, the CLEC would install a POTS/DSL splitter at the CP. The ILEC would switch the CP's POTS service over to a POTS/DSL splitter located in the RT. The CP800RT would remotely make the necessary connection between the splitter, DLC and the local loop. Once the CLEC was ready, the ILEC would cut-over the data portion of the splitter to the CLEC's DSLAM or RAM. Pre-qualification could be handled by the ILEC in the same way as an unshared line, depending on the COLLO agreement.

Shared-Line Environment

In an unshared line environment there are dedicated copper pairs for POTS service and separate dedicated pairs for data. Mass deployment of ADSL has led to further FCC deregulation whereby the ILEC must allow a CLEC to share the ILEC's existing POTS lines in order that the CLEC can provide high-speed data service to the subscriber. This means that the ILEC (or CLEC) must install POTS/ADSL splitters that allow the data portion of the line to be handed off to a CLEC (or to the ILEC's own DSLAM) and the POTS service to be connected to the ILEC's Class 5 voice switch.

If the splitters are installed in the ILEC's wiring area, then connections to and from the splitter would need to be managed by ControlPoint in order to automate the cut-over from POTS-only service to POTS/ADSL service. The following diagram shows how this cut-over would take place.



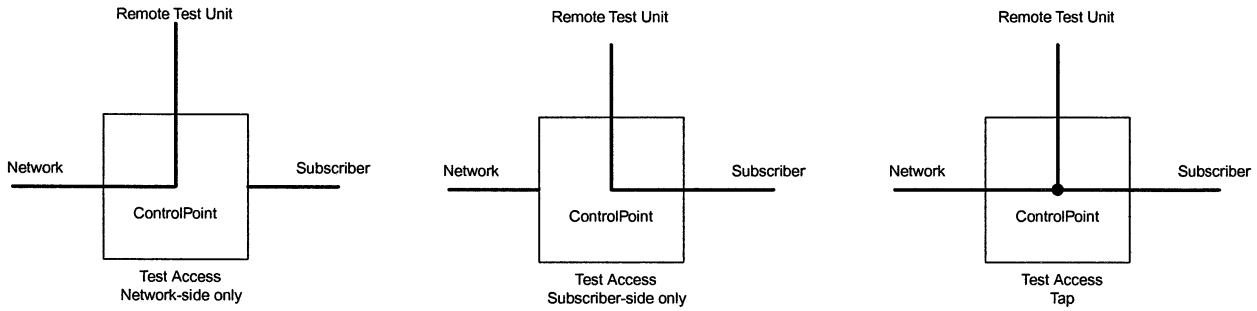
The provisioning process might be handled in the following way:

1. CLEC receives a service request from a subscriber to connect to its ADSL service.
2. CLEC requests ILEC to terminate the data portion of the subscriber's line on the CLEC's frame.
3. ILEC connects the subscriber's copper pair to a spare loop port on ControlPoint.
4. POTS/xDSL splitters pre-terminated on ControlPoint and on the Class 5 switch waiting for cutover.
5. ILEC performs full-spectrum line-testing and reports to CLEC (depending on COLLO agreement).
6. Class 5 Switch re-programmed to allow the subscriber to maintain current POTS service and number.
7. ControlPoint connects the subscriber to the POTS/xDSL port on the splitter.
8. ControlPoint connects the xDSL port on splitter to the CLEC data line terminating on the CLEC frame.
9. CLEC terminates the subscriber line on its DSLAM and commissions service.

Test Access

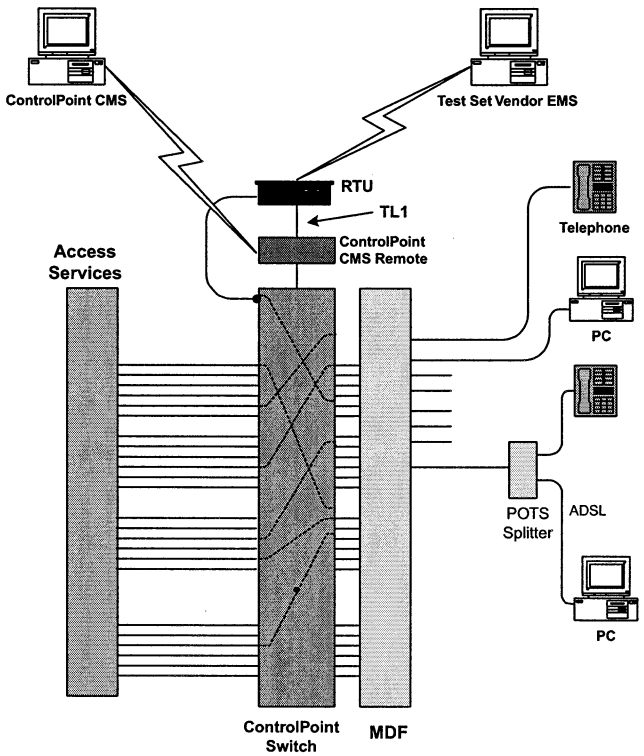
ControlPoint also operates as a metallic test access unit (MTAU) to allow the ILEC to conduct local loop line qualification at the MDF or remote terminal. ControlPoint features subscriber-side loopback and multipoint capability enabling the switch to support a variety of test configurations, including;

a) test access on subscriber-side only
b) test access on network-side only and
c) test access via center tap



ControlPoint will work in conjunction with third part test set vendors such as Hekimian, Tollgrade, Sunrise and Harris to support a variety of single-ended or dual-ended tests, providing a complete test access solution. In the current state, ControlPoint and third party test sets would be controlled via each vendor's respective EMS. Depending on the ILEC's needs custom APIs could be developed to further integrate the ControlPoint with the ILEC's preferred test set vendor.

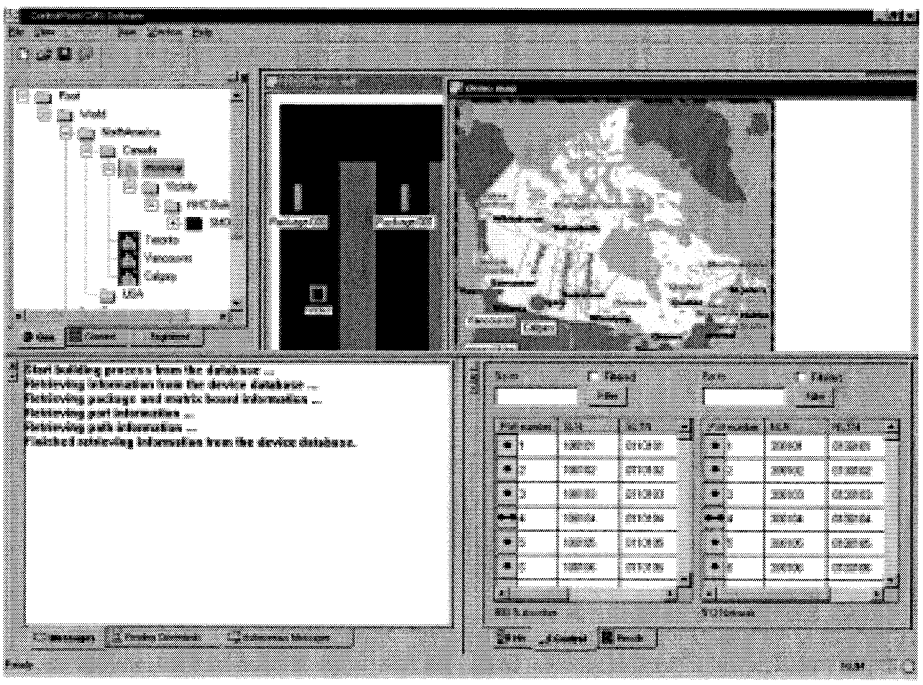
NHC is currently developing a TL1 interface to allow any third party RTU to control the ControlPoint Switch via its own EMS.



Software Capabilities

Initially, ControlPoint would be managed via NHC's ControlPoint Connection Management System (CMS) Software. The CMS Software is a Windows-based GUI interface that communicates with ControlPoint via NHC's ControlPoint CMS Remote SNMP Controller. The OSS would generate a work order that says "Connect subscriber line A to access service point B". A CO-based ControlPoint operator would call up the CMS software and instruct ControlPoint to make the changeover.

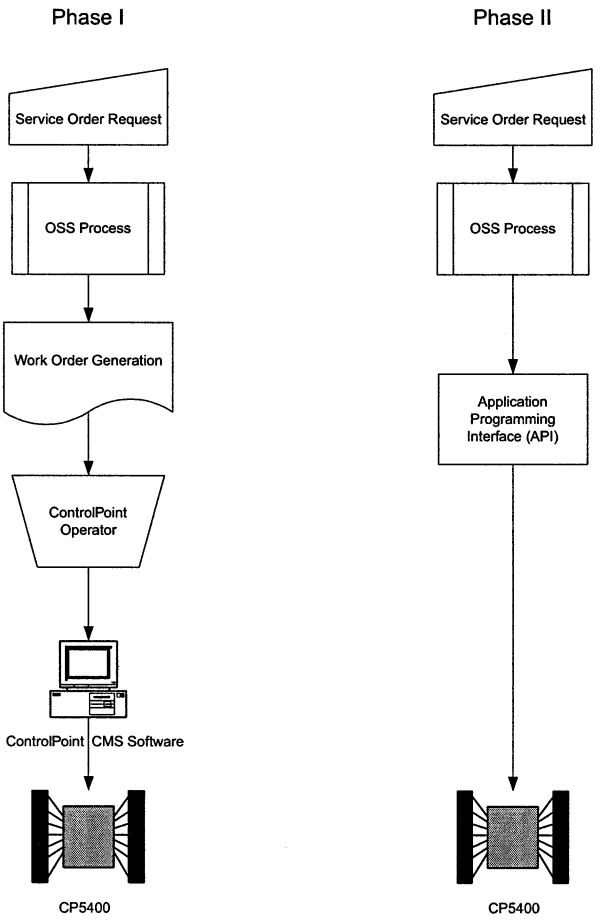
CMS provides real-time cable/connection records and communicates over an Ethernet 10/100 LAN via SNMP. Connecting and disconnecting ports using CMS is a simple drag & drop operation, providing all the controls required to manage the matrix switch. Locating and taking control of any matrix switch in a multi-switch configuration is handled graphically by clicking on switch icons or by clicking on leaves of a tree representing switches. In fact, the CMS software allows an operator to create multi-level geographical views of any installation, detailing countries, cities and buildings and represent them with icons and backdrop bit maps. By clicking on these icons the user can easily drill-down to locate and take control of any matrix switch on the associated network.



During the initial installation phase an operator can totally configure and test the matrix switch before installing the unit in its final location. Connection changes may be pre- programmed and saved for later execution. Once executed, a pre-programmed connectivity file can be left unattended, while the process continues until complete. In addition, the system allows the operator to interrupt this process to accommodate additions, deletions and changes. A backup procedure, allows connectivity and database information to be stored for later recovery should a failure occur.

Flow-Through Provisioning

Initially, ControlPoint would integrate with the ILEC's OSS through its usual service order process. When a service order is received, work orders would be issued and the ControlPoint operator would process the connection order as any other work order. ControlPoint CMS would be treated as a standalone Element Management System (EMS). Once this phase is operational, the second phase would be to streamline the flow-through provisioning process and have the ILEC OSS control the switch directly via a TMN-based Application Program Interface (API). This would allow the paper-based work orders process to be bypassed and connection changes made on-line. This interface may be developed with the ILEC directly or with one of the third party OSS vendors. The following diagrams illustrate the two phases.



Conclusion

With the dramatic increase in competition for the local access market, there is a significant increase in the level of activity focussed on connection, maintenance, and management of the copper wire and the services running over it. Given these high levels of activity in the loop, the traditional management approach is not viable;using manual labor and processes. Rolling trucks with trained technicians, is too slow and expensive to be effective in today's competitive industry. The obvious answer is to automate the provisioning process and provide intelligent wireline management in the physical layer.

The deregulation of services and recent FCC rulings has changed the dynamics of the local loop. Collocation is an everyday reality in most central offices and potentially in many remotes. Connection management, as customers migrate between providers, is challenging and presents a "service strain" to
the service provider. "Line sharing" rulings are expected to fuel demand and pose serious challenges to the ILEC.

NHC's innovative ControlPoint Cross-Connect System replaces labor intensive wiring, reduces operating costs and maintenance, while greatly improving service delivery cycles. ControlPoint dramatically reduces labor, space, and time of service versus conventional MDF/IDF frames and OSP distribution frames, that require on-site wiring by experienced technicians. The NHC solution provides the ILEC with complete
control over the entire service deployment cycle, and ensures quality of service (QoS) via fallback switching. ControlPoint works with all copper based services including POTS, ISDN, T1, xDSL and others voice and data protocols. For more information, please contact NHC at 800-361-1965, 888-831-2077 or visit NHC at www.nhc.com.

Head Office
NHC Communications Inc.

5450 Cote de Liesse
Mount Royal, Quebec
Canada
H4P 1A5

Tel.: (514)735-2741
Toll Free: (800) 361-1965
Fax: (514) 735-2558

NHC Communications USA Inc.

Battlefield Business Park
10364, Battleview Parkway
Manassas, VA 20109-2338

Tel.: (703) 330-4000
Toll Free: (888) 831-2077
Fax: (703) 330-4039

NHC Europe S.A.

18, rue Kleber
92400 Courbevoie
France

Tel.: 33 (1)41 99 99 20
Fax: 33 (1)41 99 99 21

State: Utah

Work Item	Time Minutes	Prob #1	Prob #2	Prob #3	Prob #4	Applied Time (Minutes)	Mechanization Adjustment	Labor /Hour	Cost
A	B	C	D	E	F	G		H	I
						B * (C Thru F)			H * (G/60)
BATCH HOT CUT - PER LOOP INSTALL									
ADD									
-SYSTEMS ENHANCEMENTS									
SYSTEMS ENHANCEMENTS									$0.00
Subtotal - SYSTEMS ENHANCEMENTS						**0.00**			**$0.00**
-INTERCONNECT SERVICE CENTER (ISC)									
Probability 1 column (.05, .5, .6, .08) probabilities are percents of time this activity will occur when manual activity is required.									
Probability 2 column (.02) is percent orders that will fall out of IMA for manual handling.									
# preceding work item description is reference to Batch Hot Cut provisioning flow chart									
#3 Review LSR for completeness and accuracy, contractual entries	1	1.000	0.020			0.02		$42.45	$0.01
#4 Verify Connecting Facility Assignment (CFA) for facility/circuit availability	1	0.050	0.020			0.00		$42.45	$0.00
#4 Exchange info, obtain CO, name, address, office type. Access Telephone Address Guide to	3	1.000	0.020			0.06		$42.45	$0.04
#4 CPPD look-up billing USOC's for co-provider	1	0.050	0.020			0.00		$42.45	$0.00
#4 Summary Bill List-Look up Billing Telephone Number, tax code, and bill date	2	1.000	0.020			0.04		$42.45	$0.03
#5 Analyze request to determine co-provider, type of order, and installation option	1	0.050	0.020			0.00		$42.45	$0.00
#5 Determine critical dates	1	1.000	0.020			0.02		$42.45	$0.01
#5 If directory advertising or retail contract or both, issue order to remove information from accou	3	0.500	0.020			0.03		$42.45	$0.02
#5 Populate required fields	3	1.000	0.020			0.06		$42.45	$0.04
#6 Type, review the Firm Order Confirmation (FOC)	2	0.500	0.020			0.02		$42.45	$0.01
#6 Submit to customer Firm Order Confirmation (FOC)	1	1.000	0.020			0.02		$42.45	$0.01
#5 Input order into service order processor. Type and format order for billing and provisioning	10	1.000	0.020			0.20		$42.45	$0.14
#5 Ensure order is successfully distributed to the systems and is ready for provisioning	3	1.000	0.020			0.06		$42.45	$0.04
Handle calls from other departments working the order	5	0.500	0.020			0.05		$42.45	$0.04
Handle calls from CLEC with questions about errored or rejected LSR's	5	0.100	0.020			0.01		$42.45	$0.01
Handle issues including facility, cable&pair	5	0.080	0.020			0.01		$42.45	$0.01
IF SUPPLEMENT ORDER DUE TO CFA CHANGE:									
Probability 1 column (.2) is percent of time no dial tone on DVA will occur.									
Probability 2 column (.5) is percent of time a CFA change will occur if no dial tone on DVA									
#3 Review LSR for completeness and accuracy	0.5	0.200	0.500			0.05		$42.45	$0.04
#4 Verify Connecting Facility Assignment (CFA) for facility/circuit availability	0.5	0.200	0.500			0.05		$42.45	$0.04
#6 Type, review the Firm Order Confirmation (FOC)	2	0.200	0.500			0.20		$42.45	$0.14
#6 Submit to customer Firm Order Confirmation (FOC)	1	0.200	0.500			0.10		$42.45	$0.07

State: Utah

Work Item	Time Minutes	Prob #1	Prob #2	Prob #3	Prob #4	Applied Time (Minutes)	Mechanization Adjustment	Labor /Hour	Cost
A	B	C	D	E	F	G		H	I
						B * (C Thru F)			H * (G/60)
BATCH HOT CUT - PER LOOP INSTALL (con't)									
#11 Input order into service order processor.	3	0.200	0.500			0.30		$42.45	$0.21
#12 Ensure order is successfully distributed to the systems and is ready for provisioning	3	0.200	0.500			0.30		$42.45	$0.21
#14 Handle calls from other departments working the order	2	0.200	0.500			0.20		$42.45	$0.14
Subtotal - INTERCONNECT SERVICE CENTER (ISC)						**1.80**			**$1.27**
-LOOP PROVISIONING CENTER (LPC)									
Probability 1 column is percent of time manual work required.									
# preceding work item description is reference to Batch Hot Cut provisioning flow chart									
#8 Clear RMA (Request for manual assistance)	11.25	0.050				0.56		$41.82	$0.39
Subtotal - LOOP PROVISIONING CENTER (LPC)						**0.56**			**$0.39**
-DESIGN									
Probability 1 column (.02, .01, .03, .05) is percent of time manual work required.									
# preceding work item description is reference to Batch Hot Cut provisioning flow chart									
#9 Order handling/screening	3	0.020				0.06		$44.25	$0.04
#9 GOC (Generic Order Control) order log	2	0.020				0.04		$44.25	$0.03
#9 Enter WA (Work Authorization) mask	2	0.010				0.02		$44.25	$0.01
#9 Prepare loop input/DRI (Design Related Information)	2	0.020				0.04		$44.25	$0.03
#9 Circuit design	5	0.030				0.15		$44.25	$0.11
#9 Distribute WORD (Work Order Record Detail) document	1	0.050				0.05		$44.25	$0.04
IF SUPPLEMENT ORDER DUE TO CFA CHANGE:									
Probability 1 column (.2) is percent of time no dial tone on DVA will occur.									
Probability 2 column (.5) is percent of time a CFA change will occur if no dial tone on DVA									
#9 Enter WA (Work Authorization) mask	0.25	0.200	0.500			0.03		$44.25	$0.02
#9 Prepare loop input/DRI (Design Related Information)	0.25	0.200	0.500			0.03		$44.25	$0.02
#9 Circuit design	5	0.200	0.500			0.50		$44.25	$0.37
#9 Distribute WORD (Work Order Record Detail) document	1	0.200	0.500			0.10		$44.25	$0.07
Subtotal - DESIGN						**1.01**			**$0.74**
-CENTRAL OFFICE RESOURCE ADMINISTRATION CENTER									
Probability 1 column (2) is activity occuring on prewire and due dates.									
Probability 1 column (.05) is percent of time this activity will occur.									
Probability 4 column (.04) probability is percentage based on 25 loops per batch - 1/25. Activity is per batch.									
# preceding work item description is reference to Batch Hot Cut provisioning flow chart									
#10c Verify CO tech availabiity to work spreadsheet on pre-wire and due date	1	2.000			0.040	0.08		$41.82	$0.06
#10c Create prewire, lift&lay, and disconnect spreadsheet entries	3	0.050				0.15		$41.82	$0.10
Subtotal - CENTRAL OFFICE RESOURCE ADMINISTRATION CENTER						**0.23**			**$0.16**
-CENTRAL OFFICE TECHNICIAN									

State: Utah

Work Item	Time Minutes	Prob #1	Prob #2	Prob #3	Prob #4	Applied Time (Minutes)	Mechanization Adjustment	Labor /Hour	Cost
A	B	C	D	E	F	G		H	I
						B * (C Thru F)			H * (G/60)
BATCH HOT CUT - PER LOOP INSTALL (con't)									
Probability 1 column is percent of time activity estimated to occur									
Probability 2 column is number of techs performing task									
Probability 3 column is average number of jumpers removed									
Probability 4 (.04) probability is percentage based on 25 loops per batch - 1/25. Activity is per batch.									
Mechanization Adjustment Assumes only Fallout Orders (2% of Total)									
# preceding work item description is reference to Batch Hot Cut provisioning flow chart									
PRE-WIRE DATE WORK ACTIVITIES									
#11.1 Travel to Central Office	20	0.500	2.000		0.040	0.80	0.02	$46.78	$0.01
#11.2 Analyze spreadsheet	12.5	1.000	1.000		0.040	0.50	0.02	$46.78	$0.01
#11.3 Travel to Intermediate Distribution Frame (IDF)	1.5	1.000	2.000		0.040	0.12	0.02	$46.78	$0.00
#11.4 Prewire at IDF	2.5	1.000	2.000			5.00	0.02	$46.78	$0.08
#11.5 Travel to Main Distribution Frame/COSMIC (MDF)	1.5	1.000	2.000		0.040	0.12	0.02	$46.78	$0.00
#11.6 Prewire at MDF/COSMIC	2.5	1.000	2.000			5.00	0.02	$46.78	$0.08
#11.7 Perform dial tone check	0.5	1.000	1.000			0.50	0.02	$46.78	$0.01
#11.8.1 If no dial tone travel to IDF	1.5	0.200	1.000		0.040	0.01	0.02	$46.78	$0.00
#11.8.2 Perform dial tone check	0.5	0.200	1.000			0.10	0.02	$46.78	$0.00
#11.8.3 Log note in OSSLOG	1	1.000	1.000			1.00	0.02	$46.78	$0.02
#11A If Supplement order due to Connecting Facility Arrangement (CFA) change.....									
#11.a.1 Travel to IDF	1.5	0.100	2.000		0.040	0.01	0.02	$46.78	$0.00
#11.a.2 Redo prewire for new CFA	2.5	0.100	2.000			0.50	0.02	$46.78	$0.01
DUE DATE WORK ACTIVITIES									
#12.1 Travel to Central Office	20	0.500	2.000		0.040	0.80	0.02	$46.78	$0.00
#12.2 Analyze spreadsheet	12.5	1.000	1.000		0.040	0.50	0.02	$46.78	$0.01
#12.3 Travel to MDF/COSMIC	1.5	1.000	2.000		0.040	0.12	0.02	$46.78	$0.00
#12.4 Due Date dial tone check	0.5	1.000	1.000			0.50	0.02	$46.78	$0.01
#12.5 Check Qwest dial tone	0.5	1.000	1.000			0.50	0.02	$46.78	$0.01
#16.1 Lift and lay cross-connect	0.5	1.000	2.000			1.00	0.02	$46.78	$0.02
#16.2 Log start time in Work Force Administratin (WFA), terminal-enter-return	1.5	1.000	1.000		0.040	0.06	0.02	$46.78	$0.00
#16.3 Check CLEC dial tone	0.5	1.000	1.000			0.50	0.02	$46.78	$0.01
#16.4 Log completion or jeopardy	1	1.000	1.000			1.00	0.02	$46.78	$0.02
#18 Remove jumper of previous service	1	1.000	1.000	1.250		1.25	0.02	$46.78	$0.02
IF THROW BACK REQUIRED									
Probability 1 column is percent of time a throw back will occur									
17d Throw back, travel to MDF/COSMIC	1.5	0.050	1.000		0.040	0.00	0.02	$46.78	$0.00
17d Rewire to Qwest CO equipment	5	0.050	1.000			0.25	0.02	$46.78	$0.00
17d Lift and lay cross-connect	1	0.050	1.000			0.05	0.02	$46.78	$0.00
17d Check dial tone	0.5	0.050	1.000			0.03	0.02	$46.78	$0.00
Subtotal - CENTRAL OFFICE TECHNICIAN						**20.22**			**$0.30**

-PROJECT COORDINATOR

Probability 1 column (.1, .2) is percent of time manual activity will occur.
Probability 2 column (.5) is percent of time manual activity for CFA change will occur
Probability 4 (.04) probability is percentage based on 25 loops per batch - 1/25. Activity is per batch.

State: Utah

Work Item	Time Minutes	Prob #1	Prob #2	Prob #3	Prob #4	Applied Time (Minutes)	Mechanization Adjustment	Labor /Hour	Cost
A	B	C	D	E	F	G		H	I
						B * (C Thru F)			H * (G/60)
BATCH HOT CUT - PER LOOP INSTALL (con't)									
# preceding work item description is reference to Batch Hot Cut provisioning flow chart									
#10 Screen order in Work Force Administration (WFA-C)	5	1.000			0.040	0.20		$46.78	$0.16
#10 Jeop orders (reject batch) if fewer than 20	1	0.100			0.040	0.00		$46.78	$0.00
#10a Create spreadsheet, email spreadsheet to CORAC	1	1.000			0.040	0.04		$46.78	$0.03
#11a Check for jeop status, check for No Dial Tone status (after DVA)	1	0.200				0.20		$46.78	$0.16
#11a If supplemental order, call design	2	0.200	0.500			0.20		$46.78	$0.16
#17 Monitor status tool and monitor email from CLEC	0.5	1.000				0.50		$46.78	$0.39
IF THROW BACK TO QWEST DIAL TONE REQUESTED									
Probability 1 column is percent of time a cutback/throw back will occur									
Probability 2 column (.9, .1) are percents of time a throw back/cutback email or call from CLEC will occur									
#17d Start cutback per email from CLEC, document OSSLOG	5	0.050	0.900			0.23		$46.78	$0.18
#17d Start cutback per call from CLEC, document OSSLOG	7	0.050	0.100			0.04		$46.78	$0.03
Subtotal - PROJECT COORDINATOR						**1.40**			**$1.09**
Total For Service:						**25.23**			**$3.97**

State: Utah

	Work Item	Time Minutes	Prob #1	Prob #2	Prob #3	Prob #4	Applied Time (Minutes)	Mechanization Adjustment	Labor /Hour	Cost
	A	B	C	D	E	F	G		H	I
							B * (C Thru F)			H * (G/60)

BATCH HOT CUT - PER LOOP INSTALL (con't)

183	**Direct Cost**				$3.97
183					
184					
185		Cost Calculation		Cost Factor	Cost
186		B	C	D	E
187					
188	***Marketing***				
189	Product Management Expense	**D189*E182**		0.016357	$0.06
190	Sales Expense	**D190*E182**		0.013750	$0.05
191	Product Advertising Expense	**D191*E182**		0.000000	$0.00
192					
193	**Support Assets Expense**	**D193*(E182+SUM(E**		0.173446	$0.71
194					
195	**Uncollectible**	**D195*(E182+E199+**		0.022663	$0.12
196					
197	*TELRIC*	**E182+SUM(E189:E195)**			$4.92
198					
199	Common	**D199*(E182+SUM(E**		0.112556	$0.54
200					
201	*TELRIC + Common Costs*	**E197+E199**			$5.46