

**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

DIRECT TESTIMONY OF

JOSEPH H. WEBER

ON BEHALF OF

QWEST CORPORATION

DECEMBER 22, 2003

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EXHIBITS

Exhibit JHW-2

Curriculum Vita of Joseph H. Weber

Exhibit JHW-3C

CLECs Claiming Compensation for Tandem Switching

1

I. INTRODUCTION

2 **Q. PLEASE STATE YOUR NAME AND ADDRESS**

3 A. My name is Joseph H. Weber. My address is P.O. Box 224, Convent Station, New
4 Jersey.

5 **Q. WHAT IS YOUR CURRENT BUSINESS AFFILIATION?**

6 A. I am Principal of Strategic Policy Research, Inc., a firm devoted to issues of
7 telecommunications regulatory policy, economics and technology.

8 **Q. WHAT IS YOUR BACKGROUND?**

9 A. I am a telecommunications engineer with over 30 years of experience in systems
10 engineering and network planning at AT&T and Bell Labs. For the past 15 years I have
11 been consulting on telecommunications matters for clients in the United States and
12 abroad, focusing on the impact of technology on policy issues. I have provided testimony
13 on telecommunications technology issues in a number of state proceedings. My vita is
14 attached as Exhibit JHW-2.

15 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

16 A. The purpose of my testimony is to show that CLECs can utilize modern
17 telecommunications transmission and switching technologies to provide service to mass
18 market customers without recourse to unbundled switching.

1 **II. SWITCH FUNCTIONALITY, CAPACITY AND AVAILABILITY**

2 **Q. WHAT IS A TELECOMMUNICATIONS SWITCH, AND WHAT ARE ITS**
3 **PRINCIPAL FUNCTIONS?**

4 **A.** A modern telecommunications switch is a digital electronic system designed to make
5 connections between people who want to communicate with each other. It is essentially a
6 special-purpose computer that has telephone lines connected to it. Its principal functions
7 are to:

- 8 ▪ Detect that someone wishes to make a call (provide dial tone);
- 9 ▪ Determine who the customer wants to call (detect and analyze the numbers
10 dialled);
- 11 ▪ Connect the call to the proper destination (another telephone line or a trunk line to
12 another switch);
- 13 ▪ Notify the recipient that he or she is being called (ring the telephone or signal the
14 next switch);
- 15 ▪ Determine when the called line has answered;
- 16 ▪ Monitor the call to determine when the customer has terminated the call; and
- 17 ▪ Take down the connection.

18 There are obviously many additional functions, such as billing and provision of ancillary
19 service, and much technical detail about issues such as interfaces, maintenance and
20 capacity, but the above list describes the essentials. If this is kept in mind, it will be clear
21 that a switch that serves one class of customer (enterprise) can also serve another (mass
22 market) because the functions required are the same.

1 **Q. HOW CAN A CLEC OBTAIN SWITCHING CAPACITY IF IT DOES NOT**
2 **HAVE ACCESS TO UNBUNDLED SWITCHING PROVIDED BY THE ILEC?**

3 A. As will be shown below, many CLECs already own switches capable of serving
4 customers throughout Washington. In addition, a wide variety of switches is available on
5 the open market from a number of manufacturers, and can readily be purchased by any
6 CLEC. Further, a CLEC may lease capacity from a third party, if available.

7 **Q. HOW MANY MANUFACTURERS OF CONVENTIONAL DIGITAL VOICE**
8 **SWITCHES SERVE THE NORTH AMERICAN MARKET?**

9 A. There are at least three major providers of conventional telephone switching equipment
10 for the North American market — Lucent, Northern Telecom and Siemens. Other
11 manufacturers, such as NEC, Ericsson and Alcatel, may provide opportunities for entry
12 level CLECs. Other companies, such as Cisco, provide a variety of specialized switches
13 or routers that tend to focus on data-intensive applications, packet switches and soft
14 switch technologies. With the maturing of Voice over IP technology, these technologies
15 can provide CLECs with additional opportunities to acquire switch functionality that can
16 be used to serve mass market customers.

17 **Q. DO ALL THESE MANUFACTURERS OFFER A FULL SPECTRUM OF**
18 **FEATURES AND SIZES FOR THEIR SWITCHES?**

19 A. Yes. Most operating features are standard in the industry, and must be provided if a
20 manufacturer is to remain competitive. Similarly, restrictions in the sizes of the systems
21 offered would put any vendor at a significant disadvantage, since carriers generally need

1 to obtain switches in a variety of sizes and grow them as their business grows. For
2 example, Northern Telecom offers its basic DMS switches in a number of incarnations —
3 including local, tandem and local/tandem. The two basic sizes are typified by the DMS-
4 100 family, that is advertised to grow to as many as 132,000 lines; and the DMS-10
5 family, designed for smaller systems under 20,000 lines. Other models, such as the
6 DMS-200 and DMS-500 utilize the DMS-100 platform and support both local and toll
7 services. Other manufacturers have similar product lines. The cost of a particular switch
8 generally has a fixed “getting started” cost, plus other costs that depend on the number of
9 users, the traffic levels and the particular features that are required. A CLEC can, if it
10 wishes, start with a small switch with minimum functionality and grow it and add
11 features over time to match its financial situation.

12 **Q. HOW EASY IS IT FOR A CLEC TO OBTAIN A NEW SWITCH IF ONE IS NOT**
13 **ALREADY DEPLOYED AND AVAILABLE TO SERVE THE RELEVANT**
14 **MARKET?**

15 A. As noted above, telecommunications switches, using current technology, are widely
16 available from a number of manufacturers. Modern switches are comprised almost
17 entirely of digital equipment, much of it packaged as plug-ins and cabled together with
18 high-speed digital lines, often made of fiber optics. Thus, there is much more factory
19 assembly and less on-site installation work than was the case even a few years ago with
20 analog switches. This means that installation times are shorter. In addition, Nortel and
21 Lucent and some other manufacturers engineer, furnish and install the equipment they
22 sell for their customers. This essentially provides “one stop shopping” for CLECs.

1 **Q. HOW LONG DOES IT TAKE TO GET A SWITCH INSTALLED AND INTO**
2 **SERVICE?**

3 A. The average installation interval (from ordering to service) for large switch projects
4 undertaken by the ILECs is approximately four months. There is no reason to believe the
5 CLEC's lead time need be any longer.

6 **Q. AS CLECS ADD CUSTOMERS, CAN THEIR SWITCHES GROW LARGER**
7 **WITHOUT INCURRING LARGE COSTS?**

8 A. Yes. It must be recognized that these switches are designed for, among others,
9 incumbent telephone companies all over the world. Such operators typically have long-
10 term growth plans, and do not wish to pay a great deal of money for switch capacity they
11 do not use. The switches are therefore modular in nature, and capacity can be increased
12 within the same product family by adding switch units. If major changes are required,
13 such as upgrading a DMS-10 to a DMS-100, this can also be accomplished by upgrading
14 the central processor and other common units as well as adding switch units.

15 **Q. IT IS GENERALLY UNDERSTOOD THAT THE NEWEST SWITCHES, AND**
16 **CERTAINLY THE NEXT GENERATION OF SWITCHES, WILL BE BASED ON**
17 **PACKET TECHNOLOGY. HOW CAN PACKET SWITCHES BE USED TO**
18 **PROVIDE VOICE SERVICE?**

19 A. The most effective way for a packet switch to support voice service is via so-called Voice
20 over Internet Protocol ("VoIP").

21 **Q. HOW DOES VOIP WORK?**

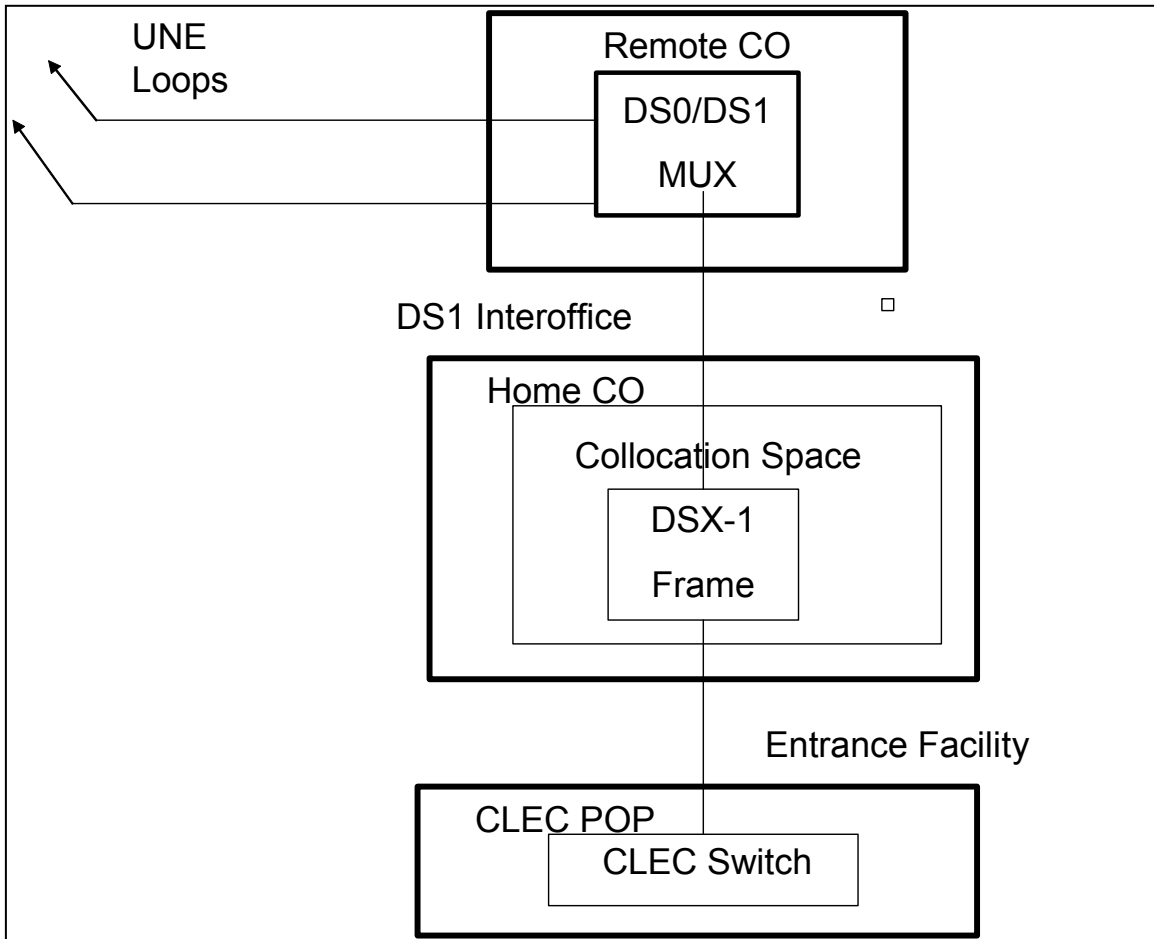
1 A. When a signal of any kind (voice, data, video, etc.), is to be carried over the Internet, it is
2 converted into a stream of data packets in a format commonly known as Internet Protocol
3 or IP. These packets each contain information as to their origin and destination as well as
4 data representing the original information. The packets are then independently routed
5 through the network. At their destination, they are reassembled to recreate the message
6 that was originally sent. An analog voice signal is therefore converted to packets of
7 digital information when it enters the network. It is transmitted across the network as
8 packets and emerges as a voice message. If the access facilities are broadband, then the
9 conversion to packet format can take place at the customer's premises. If not, a
10 conventional voice grade line can be used, and the packet conversion can take place at the
11 switch. Such switches are often referred to as soft switches or routers.

12 **Q. IS VOIP AN ECONOMICAL ARRANGEMENT?**

13 A. Yes, for two reasons. The first is technical. Packet switching has the characteristic that
14 packets are only generated when information needs to be transmitted. Thus, no packets
15 are sent during pauses in a voice conversation, or when the other party is speaking. This
16 property, known as statistical multiplexing, allows voice and data signals to be mixed and
17 makes for extremely efficient utilization of transmission facilities. The second reason is
18 regulatory. Currently, there are no access fees levied on calls carried over the Internet, as
19 opposed to conventional carriage. These two effects combine to make VoIP an
20 exceptionally economical arrangement.

1

Figure 1: EEL Arrangement



2

3 **Q. UNDER WHAT CIRCUMSTANCES IS THIS ARRANGEMENT MOST**
4 **EFFICIENT?**

5 A. This arrangement is most efficient when the demand—the number of lines served by the
6 CLEC—at the remote wire center is small. As these demands grow, the other
7 arrangements described below—DLC and RSU—become more efficient.

8 **Q. WHY IS THIS ARRANGEMENT MOST EFFICIENT FOR OFFICES WITH**
9 **LOW DEMAND?**

1 A. Primarily because, unlike the other two methods, it does not require collocation at the end
2 user's central office or investment in equipment such as DLC remote terminals or RSUs.

3 **Q. CAN THIS ARRANGEMENT BE USED ON ROUTES WHERE INTEROFFICE**
4 **FACILITIES ARE NOT AVAILABLE AT TELRIC PRICES?**

5 A. Yes, but this situation is not likely to arise. As mentioned above, EELs are most
6 economical in offices where the CLEC market is small. The only routes where facilities
7 are not available at TELRIC based prices will be those where there are CLEC owned
8 transmission facilities and the Commission has made a finding of non-impairment. These
9 will likely be routes where the CLEC demand is large, so the question would not arise.
10 If, however, a CLEC wished to use an EEL on such a route, it could provide its own
11 transport, lease it from a third party, or lease it from the ILEC at special access prices.

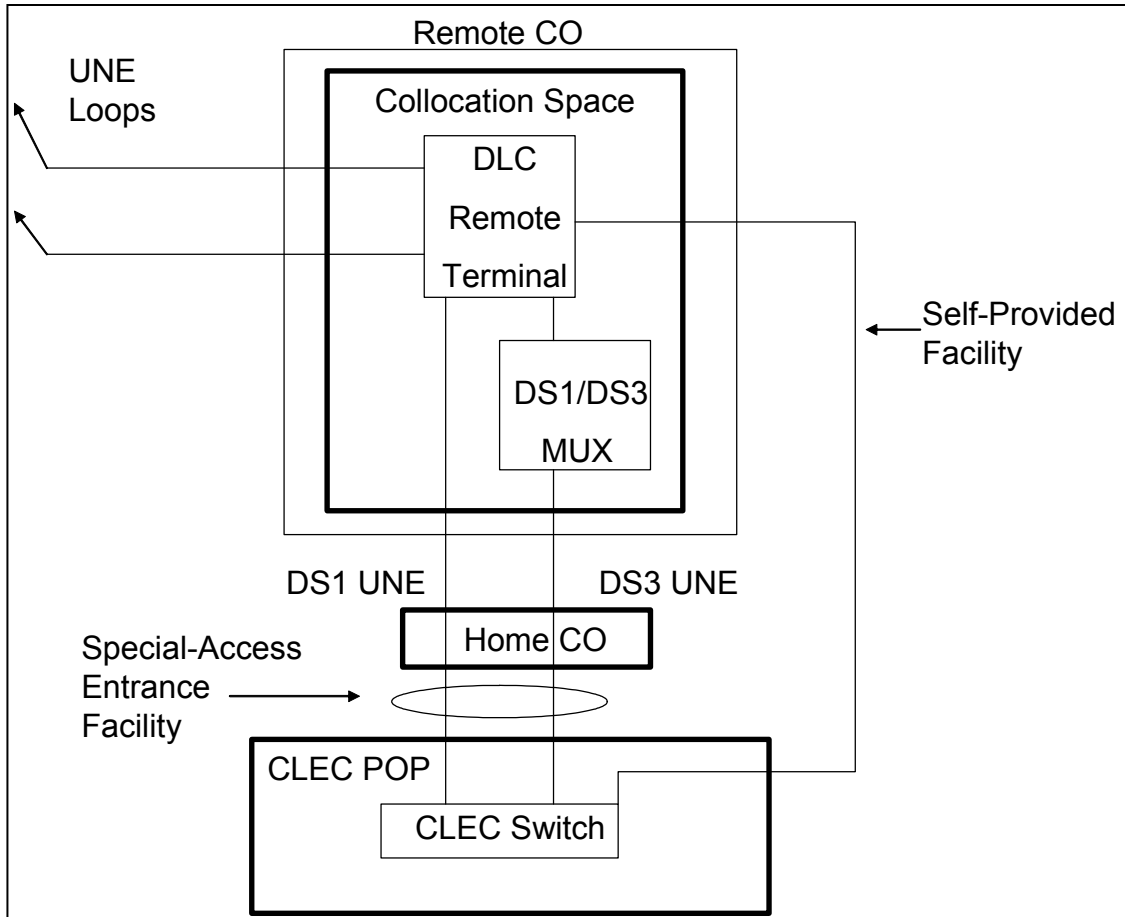
12 **Q. PLEASE DESCRIBE THE WAY IN WHICH DIGITAL LOOP CARRIER**
13 **EQUIPMENT CAN BE USED TO SERVE CUSTOMERS AT REMOTE WIRE**
14 **CENTERS.**

15 A. Digital Loop Carrier ("DLC") systems are digital systems that collect a group of analog
16 telephone lines and efficiently convert them to digital transmission formats. They were
17 originally designed to allow telephone companies to utilize their loop plant more
18 efficiently and are widely used for that purpose in the ILEC networks. They basically
19 concentrate mass market telephone lines by taking advantage of the statistical properties
20 of telephone usage (everybody does not use the phone at the same time) and allow the
21 calls to be carried to the switch using efficient digital transmission systems. A CLEC

1 would use a DLC system by placing a remote terminal (“RT”) in collocation space at the
2 central office that serves the customer (the Remote CO), where the mass market loops
3 would be concentrated by a factor of four to one or more, and converted to digital signals
4 to be efficiently transported across the network at DS1 (24 channel) or DS3 (672 channel)
5 rates. The transmission facilities can be unbundled interoffice facilities leased from the
6 ILEC, self provided transport, or transmission systems leased from a third party. Such
7 facilities may or may not transit the home CO, but need not go through another
8 collocation arrangement. At the CLEC POP, the DS1 lines can be connected directly to
9 the CLEC switch. This arrangement is shown in Figure 2.

1

Figure 2: DLC Arrangement



2

3 **Q. UNDER WHAT CIRCUMSTANCES IS THIS AN EFFICIENT**
4 **ARRANGEMENT?**

5 A. This arrangement is efficient for any office where the transport savings resulting from
6 concentration outweigh the fixed costs of collocation and the fixed cost of the DLC
7 equipment. As is shown in Peter Copeland's testimony, both DLC equipment and
8 collocation space rental have a fixed cost plus a cost per circuit. Plainly, the more lines
9 that are served, the less the total cost per line since these fixed costs get spread over more

1 lines. Therefore, the larger the office, the more attractive the DLC solution. There is no
2 maximum size for this configuration.

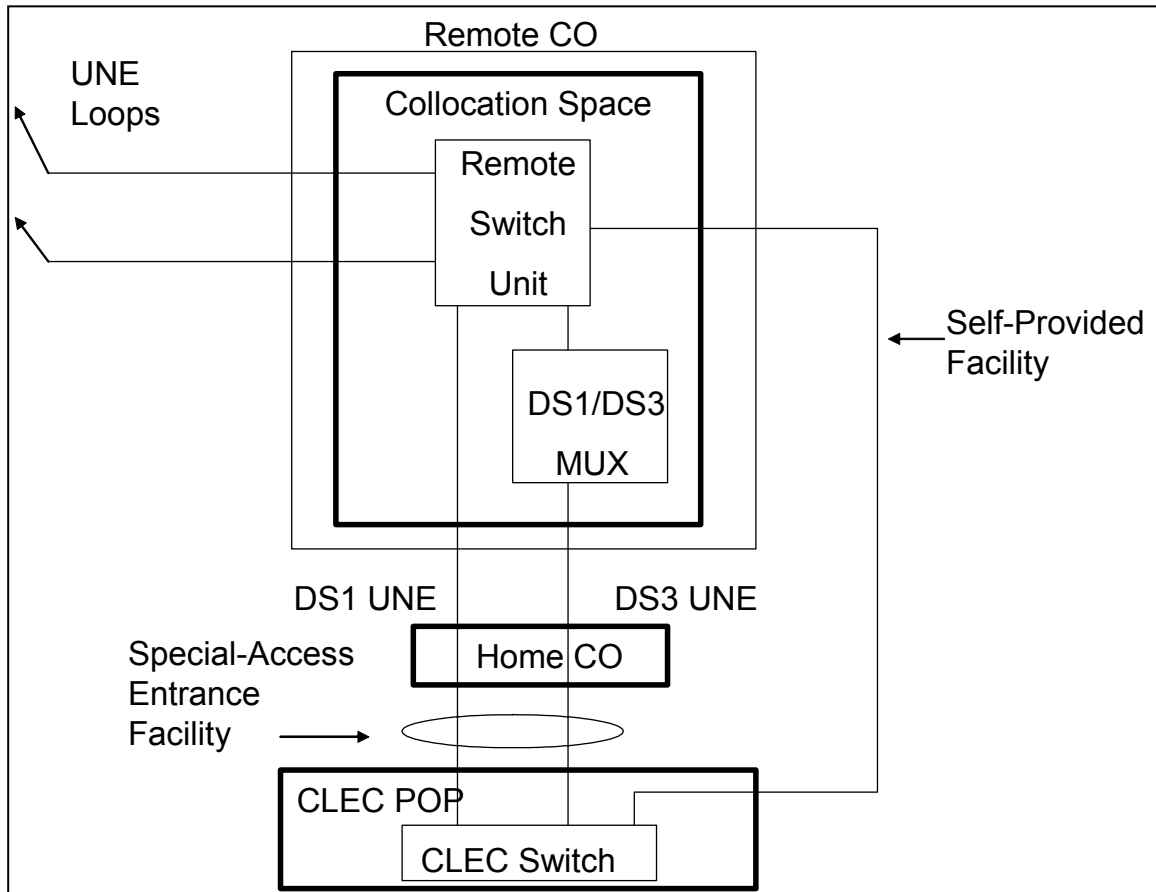
3 **Q. PLEASE DESCRIBE THE MANNER IN WHICH A REMOTE SWITCHING**
4 **UNIT CAN BE USED TO ENABLE THE CLEC TO REACH CUSTOMERS AT**
5 **DISTANT WIRE CENTERS.**

6 A. A Remote Switching Unit (“RSU”) is essentially a module of a switch that is placed in a
7 remote location instead of being installed as part of the switch. It performs some, but not
8 all, of the functions of the switch. It will allow line concentration in the same manner as
9 DLC equipment, and it allows intra-RSU traffic to be served without taking the call back
10 to the host switch. It also supports certain CLASS functions.¹ All other traffic must be
11 carried back to the host before being routed to its destination. It also will allow intra-
12 module traffic to be carried even if the line back to the host is cut. That is, the RSU
13 contains enough processing intelligence to connect calls that originate and terminate
14 within the RSU, independent of whether or not it is connected to the host. Only calls that
15 terminate elsewhere in the network need be carried back to the host, which, of course,
16 cannot be done if the line is cut. This arrangement is shown in Figure 3.

¹ Caller ID, Call Waiting, Three-way calling, Call Forwarding, etc.

1

Figure 3: RSU Arrangement



2

3 **Q. DOES THIS ARRANGEMENT REQUIRE COLLOCATION AT THE REMOTE**
4 **CO?**

5 A. Yes.

6 **Q. WHAT ARE THE ADVANTAGES OF THIS ARRANGEMENT AS OPPOSED TO**
7 **DLC EQUIPMENT?**

8 A. The decision to use DLC or RSU is largely an economic one. The economics will be
9 more favorable to RSUs as the demands at the remote CO grow larger. This is partly the

1 nature of the equipment — the RSU has more common cost and less per-line cost than the
2 DLC — and partly because the RSU requires less transmission capacity because it does
3 not need to transport traffic that both originates and terminates in the same CO back to
4 the host switch. This advantage is more pronounced for larger COs with substantial local
5 community of interest. The other principal advantage, as discussed above, is the ability to
6 continue service in the event of a transmission line failure.

7 **Q. IS THERE A MAXIMUM ALLOWABLE DISTANCE BETWEEN A CUSTOMER**
8 **AND THE SERVING SWITCH FOR ANY OF THESE ARRANGEMENTS?**

9 A. The maximum distance is principally a function of the signal propagation delay.²
10 Generally, the distance between the remote CO and the host switch should not exceed
11 600 miles, regardless of the serving arrangement being used. From a technical
12 standpoint, therefore, any CLEC would be able to serve mass market customers
13 throughout Washington from a single switch, assuming the switch has adequate capacity.

14 **Q. IS THERE ANY EVIDENCE THAT CLECS ACTUALLY SERVE CUSTOMERS**
15 **AT LONG DISTANCES?**

16 A. Yes. There are many places in the country where CLECs provide service from switches
17 that may not even be in the same state as the customer. In Washington, according to the
18 Local Exchange Routing Guide (“LERG”), six CLECs provide service in the Spokane

² Signals do not travel across the network instantaneously, and the remote unit, whether it be a multiplexer, a DLC remote terminal, or an RSU, must send signals to the switch conveying information about the traffic being carried. The switch in turn must respond, and systems are usually designed to tolerate a delay of about 13 milliseconds (ms) before they decide there is no answer. This delay corresponds to about 600 miles. It is possible to design equipment that will work at longer distances, but the 13 ms standard has been adopted and published by Telcordia as a standard arrangement.

1 LATA from switches in the Seattle LATA. Seattle and Spokane are 228 miles apart.
2 Portions of the Spokane LATA are closer to Seattle than 228 miles, but most of the
3 potential customers are in or near the city of Spokane. All the CLEC switches in the
4 Seattle LATA are quite close to Seattle and about the same distance from Spokane.

5 **Q. THE ILECS DEPLOY SWITCHES AT EVERY CENTRAL OFFICE IN THEIR**
6 **NETWORK. IF THE CLECS ARE TO COMPETE EFFECTIVELY, DON'T**
7 **THEY NEED ACCESS TO THIS WIDELY DISPERSED SWITCHING**
8 **CAPABILITY?**

9 A. No. The arrangements described above provide the CLECs with the most efficient
10 arrangements appropriate to their scale of operations. The ILECs established their wire
11 centers many years ago, when technology did not permit long distances between the
12 customer and the switch. Their scale is now such that most of the ILEC central offices
13 can economically support one or more full standalone switches. Even the ILECs,
14 however, use remote switches in their smaller wire centers—arrangements quite similar
15 to the RSU scenario described above. As the CLECs grow, they may also find it
16 economical to deploy more switches, and the three arrangements described above will
17 allow them an orderly and economical growth path. By using centralized switches, the
18 CLECs can obtain virtually all the efficiencies of scale available in switching systems,
19 even when their market share is quite small.

1 **Q. ARE THERE ANY DIFFERENCES IN TECHNICAL CHARACTERISTICS**
2 **BETWEEN SERVING ARRANGEMENTS FOR ENTERPRISE AND MASS**
3 **MARKET CUSTOMERS?**

4 A. No. As discussed above, mass market loops are connected to digital interoffice facilities
5 to reach the CLEC switch, as is the case with enterprise loops. This is true regardless of
6 whether EELs, DLC equipment, or RSUs are used. Once the lines reach the switch, they
7 are switched and routed in the same manner, regardless of whether they are mass market
8 or enterprise lines. The switch and the interoffice facilities are the same, regardless of the
9 origin of the line.

10 **Q. CAN A CLEC SWITCH CURRENTLY SERVING ONLY ENTERPRISE**
11 **CUSTOMERS BE USED TO SERVE MASS MARKET CUSTOMERS?**

12 A. Yes. The technical capabilities of switches configured to serve voice traffic (or voice and
13 data traffic) allow them to be used for these purposes regardless of whether the customers
14 have high (enterprise) or low (mass market) traffic density. The only constraint is the
15 capacity of the switch, which relates to the volume of traffic, not the type of customer.

16 **Q. DO SWITCHES DEPLOYED TO SERVE ENTERPRISE CUSTOMERS NEED**
17 **TO BE RECONFIGURED TO SERVE MASS MARKET CUSTOMERS?**

18 A. No. Enterprise customers typically utilize digital loop and interoffice facilities operating
19 at DS1 or higher data rates. If lines reach the switch at these line rates, it is uneconomical
20 to demultiplex such lines back to DS0, and they will typically be connected to the switch
21 using a DS1 interface. Mass market customers (or enterprise customers that do not use

1 DS1 loops) using any of the serving arrangements described above access the switch in
2 exactly the same way. No analog interfaces need be built, since all access lines are
3 multiplexed up to at least a DS1 data rate for transmission across the network, where they
4 will naturally appear at the switch as digital signals.

5 **Q. DO ENTERPRISE CUSTOMERS USUALLY HAVE MORE SOPHISTICATED**
6 **CUSTOMER PREMISES EQUIPMENT THAN MASS MARKET CUSTOMERS?**

7 A. Enterprise customers sometimes have PBXs or other systems that perform certain
8 functions, such as conferencing, intra-office calling, call forwarding, etc., on the
9 customer's premises.

10 **Q. CAN A CLEC PROVIDE SUCH SERVICES, IF DESIRED, FOR MASS MARKET**
11 **CUSTOMERS?**

12 A. A CLEC can provide at least the same features and functions to a mass market customer
13 that an ILEC can, since in most cases it uses the same types of switching equipment as
14 the ILEC does.

15 **Q. WHAT ARE THE ECONOMIC IMPLICATIONS OF ADDING MASS MARKET**
16 **CUSTOMERS TO A SWITCH DEPLOYED TO SERVE ENTERPRISE**
17 **CUSTOMERS?**

18 A. Generally, telecommunications equipment demonstrates substantial economies of scale.
19 Therefore, if enterprise and mass market customers are served by the same switch, it is
20 likely to increase the efficiency and lower the unit cost of both operations. The same
21 effects exist for interoffice transmission, where higher traffic concentrations can allow

1 the use of larger scale, more efficient transmission facilities (e.g., DS3 instead of DS1, or
2 OC3 versus DS3). In addition, if collocation arrangements are in place to support the
3 enterprise market, they can be expanded to serve the mass market at small additional cost.

4 **IV. SWITCH AVAILABILITY IN WASHINGTON**

5 **Q. HOW MANY CLEC DIGITAL SWITCHES SERVE CUSTOMERS IN THE**
6 **STATE OF WASHINGTON?**

7 A. The LERG shows that there are 34 Lucent 5ESS switches, Nortel DMS switches, or
8 switches simply labeled DSS or Digital Switching System with no type specified
9 operated by 25 CLECs in the Seattle LATA. Certainly the Lucent and Nortel switches,
10 and probably the DSS switches, are large fully functional voice switching systems,
11 designed to serve large numbers of customers. A similar analysis in the Spokane LATA
12 shows there are nine such switches operated by nine CLECs. There are also four CLECs
13 serving customers in Spokane who are utilizing digital switches of these types that are
14 located in the Seattle LATA. One CLEC also utilizes a digital switch of this type in the
15 Seattle LATA to serve customers in the Portland, Oregon LATA.

16 **Q. ARE THERE ADDITIONAL SWITCHES IN THESE THREE LATAS THAT CAN**
17 **BE USED TO PROVIDE VOICE SERVICES TO THE MASS MARKET?**

18 A. Yes. Again according to the LERG, there are 12 switches of other types in Seattle,
19 operated by ten CLECs, some of which also operate conventional digital switches. These
20 include a number of packet switches and soft switches which were designed to support
21 data traffic, but can certainly be used to serve voice traffic. Indeed, their presence in the

1 LERG indicates that they are receiving voice traffic originating at other points in the
2 network. Four CLECs in Spokane also rely on other types of switches, and one utilizes
3 such a switch located in the Seattle LATA. Three CLECs use switches of these types
4 located in the Seattle LATA to serve customers in the Portland, Oregon LATA. As the
5 FCC noted in footnote 1549 of the TRO, these switches must be considered when
6 determining whether a CLEC is impaired absent access to ILEC unbundled switching.³

7 **Q. WHAT IS THE LERG? WHO PROVIDES THE INFORMATION AND WHAT IS**
8 **IT USED FOR?**

9 A. The LERG is the database that is used to actually route traffic in the network. It
10 identifies the switch that each telephone number (actually each three digit NXX code) is
11 associated with. If someone makes a call, the translation of the dialed number to the
12 actual physical location of the switch is made based on information in the LERG. The
13 LERG is populated using information provided by the carriers, and is maintained by
14 Telcordia.

15 **Q. IF A SWITCH IS IDENTIFIED IN THE LERG, DOES THIS MEAN THAT**
16 **CUSTOMERS SERVED BY THAT SWITCH CAN MAKE CALLS TO**
17 **ANYWHERE?**

18 A. It actually means that customers served by that switch can be reached by callers
19 anywhere in the world. In most cases, it can reasonably be inferred that customers that

³ Footnote 1549 provides, in relevant part, that “states shall also consider carriers that provide intermodal voice service using their own switch facilities (including packet and soft switches) that meet the requirements of these triggers and Part V above. . . . In applying the triggers, states must consider packet switches to the extent they are used to provide local voice service in the mass market.”

1 receive calls also make them. The principal exceptions are lines with 800 numbers, and
2 lines used by Internet Service Providers (“ISPs”) for Internet access.

3 **Q. IS THERE ANY EVIDENCE THAT THE CLEC SWITCHES IN WASHINGTON**
4 **ARE ALSO USED FOR ORIGINATING TRAFFIC?**

5 A. Yes. Trunks to the 911 tandem are used only to originate 911 calls. In all, 21 carriers in
6 the Seattle LATA and seven in the Spokane LATA are identified as having trunks going
7 to a 911 tandem. Therefore, at least those carriers must be serving customers that
8 originate traffic. The others may be serving only terminating traffic, or, more likely, are
9 routing their 911 traffic directly to the Public Safety Answering Point (PSAP).

10 **Q. IS THERE ANY OTHER EVIDENCE THAT CLEC SWITCHES IN**
11 **WASHINGTON ARE BEING USED FOR OUTGOING TRAFFIC?**

12 A. Yes. Some carriers utilize Qwest’s Operator Services (“OS”) or Directory Assistance
13 (“DA”) services. The systems providing these services are reached via specific tandems.
14 Qwest data shows that 11 CLECs in the Seattle LATA and four in the Spokane LATA
15 utilize such services. Others may provide the services themselves or obtain it from third-
16 party vendors.

17 **Q. IF A CLEC WITH A SWITCH IN WASHINGTON IS NOT CURRENTLY**
18 **SERVING MASS MARKET CUSTOMERS, WHAT WILL BE REQUIRED FOR**
19 **IT TO DO SO?**

20 A. All switches are designed to accommodate growth, and since, as discussed above, there is
21 no technical distinction between a mass market and enterprise lines at the switch, it

1 would merely be necessary to add capacity to accommodate the additional demand
2 assuming the CLEC's switch is already operating at full capacity. In those cases where
3 the CLEC business is so large as to exhaust the switch, then another one can be added.

4 **Q. DO YOU HAVE ANY EVIDENCE THAT CLECS ARE IN FACT USING THEIR**
5 **SWITCHES TO SERVE CUSTOMERS THROUGHOUT A LATA OR MSA?**

6 A. Yes. Five CLECs have requested compensation from Qwest for completing local calls
7 originated by Qwest customers on the basis that their switch be treated as a tandem.⁴
8 Compensation for connection to a tandem switch includes the cost of the tandem switch,
9 the cost of the transmission facility from the tandem switch to the end office, and the cost
10 of the end office switch. Tandem switches ordinarily can route calls anywhere within the
11 LATA. If these carriers, all of which have switches serving customers in Seattle, and
12 four of which have switches serving customers in Spokane, are to receive compensation
13 based on having a tandem switch, they presumably are serving, or are capable of serving,
14 customers anywhere in the LATA. As discussed above, even if they are serving only
15 enterprise customers, they can certainly serve mass market customers in the same wire
16 centers. The five carriers, and the type of equipment they are using are listed in
17 Confidential Exhibit JHW-3C.

18 It is clear from Confidential Exhibit JHW-3C that all of these carriers have digital
19 switches serving the LATA in question. As has been demonstrated above, they are
20 certainly capable of using these switches to serve customers in the entire LATA, and the

⁴ Generally, tandem switches are used to route traffic between local switchers. As such, a line connected to a tandem switch can be connected to any office to which the tandem connects.

1 fact that they are claiming compensation for tandem connections, indicates that they are
2 almost certainly doing so.

3 **Q. DOES THE FACT THAT OTHER CARRIERS ARE NOT CLAIMING**
4 **COMPENSATION FOR TANDEM SWITCHING INDICATE THAT THEY ARE**
5 **NOT SERVING CUSTOMERS THROUGHOUT THE LATA?**

6 A. No. It merely indicates that they have negotiated other compensation arrangements. In
7 particular, AT&T and MCI, among the largest of the CLECs, use a bill-and-keep
8 arrangement for intercarrier compensation. This is a straightforward arrangement where
9 each carrier keeps the revenues it collects from its customers and no intercarrier
10 compensation is paid. This says nothing at all about the size of the area within which
11 they provide service. Moreover, as discussed by Mr. Reynolds, AT&T has asserted in a
12 recent arbitration hearing in Washington State⁵ that if it wished to change the intercarrier
13 compensation arrangements, it is entitled to compensation appropriate to a tandem
14 switch, as its switches are capable of serving customers “within geographic areas
15 comparable to Qwest’s tandem switches.” As mentioned above, calls that traverse
16 Qwest’s tandem switches can terminate at any Qwest switch in the LATA that the tandem
17 serves.

18 **Q. DO YOU CONCLUDE FROM THIS ANALYSIS THAT THE SWITCHING**
19 **TRIGGERS, AS SPECIFIED IN THE TRIENNIAL REVIEW ORDER, HAVE**
20 **BEEN MET IN WASHINGTON?**

⁵ *In the Matter of the Petition for Arbitration of AT&T Communications of the Pacific Northwest and TCG Seattle, with Qwest Corporation, Pursuant to 47 U.S.C. Section 252(b)*, Docket No. UT-033035.

1 A. I do not make that specific finding. It appears likely, however, that they will be met in
2 many areas. Mr. Reynolds will provide detailed testimony as to which MSAs clearly
3 qualify as meeting the triggers.

4 **V. CONCLUSION**

5 **Q. IN LIGHT OF ALL THESE CONSIDERATIONS, ARE CLECS ABLE TO**
6 **OBTAIN SWITCHING IF THE ILEC DOES NOT PROVIDE IT ON AN**
7 **UNBUNDLED BASIS?**

8 A. Yes. If a CLEC has a switch within 600 miles of a customer location, it is capable of
9 using that switch to serve that customer, and many CLECs have switches in the state of
10 Washington within range of every potential customer in the state. Any CLEC that does
11 not have a switch can readily obtain and install one.

12 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

13 A. Yes.