

T-00000A-97-0238

ORIGINAL



de



0000023290

RECEIVED

2001 OCT -5 P 4: 33

AZ CORP COMMISSION  
DOCUMENT CONTROL

WILLIAM A. MUNDELL  
CHAIRMAN  
JIM IRVIN  
COMMISSIONER  
MARC SPITZER  
COMMISSIONER

ARIZONA CORPORATION COMMISSION

NOTICE

TO: All Parties On the Qwest Section 271  
Service List

FROM: Maureen A. Scott *MAS*  
Attorney, Legal Division

Arizona Corporation Commission  
DOCKETED

OCT 05 2001

DATE: October 5, 2001

DOCKETED BY *rac*

SUBJECT: Arizona OSS Test – Workshop on Final  
Capacity Test Report

The Workshop on Cap Gemini Ernst & Young Telecom Media & Network's ("CGE&Y") Final Capacity Test Report will be held on October 25 and 26, 2001. A copy of the Final Capacity Test Report is attached. The Workshop will be held at Qwest's facilities located at 5090 North 40<sup>th</sup> Street, Phoenix, Arizona. An agenda for the Workshop will be distributed later.

The underlying and supporting data for this Report, including the back-up reports by Hewlett-Packard ("HP") are available for inspection by any interested parties at CGE&Y's headquarters located at 1438 W. Broadway Road, Suite B-250, Tempe, Arizona. The hours of availability are from 8:00 a.m. to 5:00 p.m. Monday through Friday, by appointment only. Parties desiring to review the underlying data or make copies of it should call Twila Wright at 480-736-8500. Parties should submit their questions in writing in advance to CGE&Y and HP by October 15, 2001. A template for the questions is attached.

For parties unable to attend the Workshop in person, there will be a conference bridge available. The call-in number is (602) 542-9012. The State Conference Operator has asked us to inform parties who intend to participate telephonically, not to press any buttons on your phones after you dial in to the call or you will preclude other parties from being able to obtain access to the call.

We look forward to seeing everyone at the Workshop. If you have any questions or would like directions to the Qwest facility, please feel free to contact me at 602-542-6022 or my secretary, Vi Kizis, at 602-542-3402.

# Qwest 271 OSS Test Workshop Questions

Date Submitted

Question Number	Submitter (Company)	Interim Report (e.g. Retail Parity, Rel Mgmt, etc.)	Report Section Reference	Question	(one per row)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					



# Final Report Capacity Test

October 1, 2001

Version 1.0

Prepared For:

*Arizona Corporation Commission*

Cap Gemini Ernst & Young

2301 N. Greenville Av.

Suite 400

Richardson, TX 75082

**Document Control Sheet**

Version	Date	Reason
1.0	10/01/01	Version 1.0 distributed to the TAG for review

## Table of Contents

4. Capacity Test.....	3
4.1 System Capacity Test.....	9
4.1.1 Introduction.....	9
4.1.2 Scope.....	12
4.1.3 Process.....	15
4.1.4 Results.....	42
4.2 Systems Scalability.....	46
4.2.1 Introduction.....	46
4.2.2 Scope.....	46
4.2.3 Process.....	47
4.2.4 Results.....	57
4.3 Staff Scalability.....	59
4.3.1 Introduction.....	59
4.3.2 Scope.....	60
4.3.3 Process.....	60
4.3.4 Results and Recommendations.....	64
Appendix A – Glossary.....	66
Appendix B – Incident Work Order Summary.....	68
Appendix C – Source Documents.....	70
Appendix D – 12-Month Test PO-5 Results.....	71
Appendix E - Stress Test PO-5 Results.....	73
Appendix F – System Capacity Test Detailed Plan.....	75

## 4. Capacity Test

### Introduction

Prior to 1996, telecommunications was regulated by two primary entities. The Federal Communications Commission (FCC) regulated interstate services. Thus, it was responsible for regulating long distance calls that crossed state lines, as well as the rates local telephone companies charge long distance carriers when their customers make or receive long distance calls (access charges). State public service commissions, such as the Arizona Corporation Commission (ACC), regulated local or intrastate telecommunications services. For example, they oversaw the rates and quality of service local telephone companies provided to their retail customers.

In the early 1980s, a third source of telecommunications regulation became prominent. In 1984, AT&T, the monopoly provider of local and long distance telecommunications, was broken apart in a process call divestiture. The principal reason for divestiture was to promote long distance competition. The idea was that so long as one company, AT&T, controlled both local and long distance telecommunications, it could prevent (or at least would have strong incentive to prevent) competing long distance carriers from obtaining the access they needed to local telephone lines. Thus, AT&T was broken into a long distance entity (AT&T) and seven local companies, which were known as Regional Bell Operating Companies (RBOCs) or Bell Operating Companies (BOCs). And, a new legal source, called the Modification of Final Judgment (MFJ), prohibited the BOCs from offering certain services, including long distance services.

The Telecommunications Act of 1996 (the Act) made three key changes in telecommunications regulation. First, although some individual states had begun the process of opening local telecommunications to competition, the Act established a single set of requirements to ensure that such local telecommunications competition occurred nationwide. To do that, it imposed certain requirements on BOCs, which are found in Section 251 of the Act. To encourage BOCs to more fully open local telecommunications markets and to create additional long distance competition, it also provided a way for BOCs to mitigate the MFJ's prohibition on providing long distance services. Section 271 of the Act contains a list of requirements with which a BOC must comply before it is permitted to offer long distance services. That list is often referred to as "The 271 Checklist."

The 271 Checklist only provided a framework of those requirements; the Act required the FCC to fill in that framework by detailing the specific actions a BOC would have to take to demonstrate that it is in compliance with each item in the checklist. The FCC did that in a series of orders beginning in August 1996.

One of those FCC requirements is that a BOC must demonstrate to its state commission, and then to the FCC, that it has provided access to its operations support systems (OSS) on a nondiscriminatory basis to enable competitors (known as Competitive Local Exchange Carriers (CLECs), DSL Local Exchange Carriers (DLECs), etc.; hereinafter referred to as CLECs) to offer local telecommunications services. (OSS include the basic systems and functions that are part of pre-ordering, ordering, maintaining, repairing and billing for telecommunications services.) Because this demonstration is highly technical and complex, state commissions, like the ACC, have engaged consulting and/or auditing companies like Cap Gemini Ernst & Young (CGE&Y) to test and evaluate a BOC's OSS.

The state commission then considers the results of that test and evaluation along with the BOC's evidence of compliance with the other 271 Checklist Items, to determine whether it agrees that the BOC has met each item on the 271 Checklist. Once that determination has been made, the BOC files its application with the FCC to offer long distance services. The FCC considers the state commission's determination, along with the recommendation of the United States Department of Justice (DOJ), and decides whether to grant the BOCs' application. To date, the FCC has approved seven such applications: Verizon in New York, Pennsylvania, Connecticut and Massachusetts and Southwestern Bell Telephone Company (SBC) in Texas, Oklahoma and Kansas.

In its orders approving these BOCs to offer long distance services, the FCC has established certain standards that apply to the testing and evaluation of a BOC's OSS. There are three types of testing and evaluation that are required:

1. Functionality testing
2. Capacity testing
3. Performance measurement analysis

This report concentrates on the Capacity Test, whose purpose is to determine whether the BOC's OSS can handle not only current demand but reasonably foreseeable future volumes of pre-order (including access to loop qualification information) and order transactions while still meeting benchmarks intended to evaluate levels of performance. Capacity testing has two components: the first is the volume and stress test, which deliberately puts high volumes through the BOC's OSS to verify that the OSS can process expected future volume and still meet performance benchmarks and also to determine what volume at which OSS performance begins to deteriorate. The second is a scalability analysis which assesses the ability of the BOC to increase the capacity of its OSS to meet increasing demand.

### Executive Summary

As part of the Qwest Arizona 271 Certification Testing effort, CGE&Y conducted a Capacity Test and Scalability review to assess Qwest's ability to provide CLECs with non-discriminatory access to its OSS. The findings identified as a result of the test will assist the

ACC in determining the ability of Qwest's OSS to support the anticipated production capacity levels required by the CLECs. This test was performed in a manner so as to adhere to Section 6 of the Master Test Plan, Version 4.2 dated June 29, 2001 (MTP 4.2), and Section 5 of the Test Standards Document, Version 2.10, dated September 6, 2001 (TSD 2.10). As an entrance criteria to the Capacity Test, a detailed test plan was developed (see Section 5.2.4(a) of the TSD 2.10). A Capacity Sub-committee was formed as a sub-group of the Arizona Test Advisory Group (TAG) to deal with the technical issues associated with the Capacity Test and to take into consideration commercial conditions. Therefore, the System Capacity Test Detailed Plan, Version 2.02, dated July 25, 2001 (SCTDP 2.02), developed by CGE&Y, with input from the Arizona Capacity Sub-committee, is the governing document for the execution of the Capacity Test. Three main areas are covered by the Capacity Test which include the Capacity and Stress Test, a System Scalability review and a Staff Scalability review.

### Capacity and Stress Test

The System Capacity Test is designed to determine whether Qwest's current OSS are sufficient to process forecasted volume 12 months from the commencement date of the test. The test was conducted in a production environment supplementing existing production loads to arrive at anticipated forecasted volume. The Capacity Test extended over an eleven hour time frame, commencing at 7:00 a.m. Mountain Standard Time (MST) on August 10, 2001, and ending at 6:00 p.m. MST. A total of 21,500 pre-order transactions were executed consisting of 18,316 Electronic Data Interchange (EDI) and 3,184 Graphical User Interface (GUI) transactions. A total of 4,915 Local Service Requests (LSRs) were submitted of which 4,217 were submitted through EDI and 698 through GUI.

The Capacity Test also includes a stress test, which places an additional load equal to 150% of the 12-month test's busy hour load to current production volumes. These loads are incrementally increased over a short time period. The purpose of this test is to gather performance measurement data during each of these time periods to evaluate in order to determine the capacity at which Qwest's OSS performance begins to deteriorate. The stress test was performed over a four hour period, 9:00 a.m. MST through 1:00 p.m. MST, and was conducted on August 17, 2001. A total of 14,387 pre-order transactions were executed consisting of 12,053 EDI and 2,334 GUI transactions. A total of 3,121 LSRs were submitted of which 2,686 were submitted through EDI and 435 through GUI.

The Capacity Test was originally intended to evaluate whether Qwest's systems could meet benchmark standards set for pre-order transactions (PO-1), percent order flow-through (PO-2) and Firm Order Confirmations (FOCs) (PO-5) given the increased load. However, by definition, all Capacity Test orders are designed to flow through or are specifically intended to fall out for manual intervention, therefore by agreement of the sub-committee, the Capacity Test was limited in scope to evaluation of the PO-1 and PO-5 measures. Currently, Qwest does not measure actual CLEC pre-order transactions to report results for PO-1, but uses a simulated transaction system know as Interconnect Mediated Access (IMA) Response

Time Measurement (IRTM). An integral part of the Capacity Test is to collect actual response times experienced by the Pseudo-CLEC in order to compare results to those reported by Qwest during the Capacity Test using IRTM. This data will be utilized to facilitate a decision as to whether results generated from Qwest's simulated system is a true representation of pre-order transaction response times experienced by CLEC service representatives.

The first task of the Capacity Sub-committee was to determine the volumes to be used for the test. These volumes included expected demand for the entire Qwest 14-state region for those systems that support all 14 states. Regional systems were tested for volumes supporting that region. Once the committee agreed upon volumes they were submitted to the TAG for approval. Simultaneously, other aspects of the test plan were developed by the committee, which included order transaction mix, distribution between EDI and GUI, etc. Qwest provided CGE&Y the test accounts, which were then applied to the various scenarios. Once preparation activities for the test were complete, several Operational Readiness Tests (ORTs) were performed to insure that all orders would flow through as anticipated and that the necessary processes to perform the test and gather the data generated were in place and functional. Once Qwest's systems successfully passed the 12-month test, the busy hour volume was used as the base for the stress test. This volume was incremented in 15-minute intervals until a volume 50% higher than the base volume was reached. This higher volume was input at a sustained rate for two hours.

The System Capacity and Stress Test yielded the following results:

- The 12-month forecasted volume for pre-order queries transmitted to Qwest's OSS were processed satisfactorily. At no time during the test did the added test volumes, in addition to the normal production activity, cause Qwest's OSS to abnormally terminate or disrupt operations.
- The pre-order performance results (PO-1A (GUI) and PO-1B (EDI)) obtained from the 12-month Capacity Test are within the benchmarks required by the Arizona Performance Measurement Definitions, Version 6.3, dated May 1, 2001 (PID 6.3) for each query type (see Table 4.2.1a for a detailed list of the types of pre-order transactions along with the associated benchmark). This is true for the times reported by IRTM as well as times calculated from the test data provided by the Pseudo-CLEC.
- The FOC performance results (PO-5A (GUI) and PO-5B (EDI)) obtained from the 12-month Capacity Test are within the benchmarks required by PID 6.3, which is 95% of all FOCs received within 20 minutes for both GUI and EDI for all LSR product activity types. The only LSR that received a FOC time greater than the benchmark was an order intended to error out but was inadvertently handled manually by a Qwest employee. This order was excluded from the results since it was not handled in a mechanized environment as provided in Section 5.2.2.2 (b) of the TSD 2.10.

- ❑ P0-1A results obtained during the stress test are within the benchmarks required by PID 6.3 for all query types. This is true for the times reported by IRTM as well as times calculated from the test data provided by the Pseudo-CLEC.
- ❑ PO-1B results obtained during the stress test did not meet the benchmarks required by PID 6.3. During the third hour of the test, responses were delayed due to high transaction volumes. If EDI transaction intervals obtained during the third hour of the test are excluded from the results, as in CGE&Y's opinion should be the case (see discussion of AZIWO2119 in Section 4.1.3.1), the resultant average response times would then be within the PID benchmarks and comparable to results achieved by IRTM.
- ❑ PO-5A and PO-5B results obtained during the stress test are within the benchmarks required by PID 6.3 for all LSR product activity types. The three LSRs that received a FOC time greater than the established benchmark were manually handled and excluded from the results as provided in Section 5.2.2.2 (b) of the TSD 2.10.
- ❑ The level of performance for receiving pre-order responses from Qwest's OSS begins to deteriorate with loads in excess of 150% of the 12-month forecast.
- ❑ Data from the 12-month Capacity Test reflect that IRTM is an adequate tool for gauging pre-order response time intervals Qwest's OSS are providing to the CLECs. Once the timeout exclusion is applied to EDI results from the Stress Test; Stress Test results also support this conclusion.

Given the above findings it is CGE&Y's conclusion that Qwest's OSS passed the Capacity and Stress Test by continuing to provide a level of performance well within the benchmarks established during all phases of the System Capacity Test. See Section 4.1 of this report for a more detailed discussion of the System Capacity and Stress Test.

### System Scalability

The System Scalability review evaluates whether Qwest's processes, procedures and planning tools are in place to adequately manage the ability of its OSS to scale for anticipated larger workloads. The review includes the evaluation of Qwest's procedures for capacity expansion to determine if adequate procedures are in place for scaling Qwest's systems to provide sufficient capacity to handle future CLEC loads. This review also evaluates the backup, security, disaster recovery and procedures that guide Qwest's staff in executing the OSS interface data security processes.

As part of the System Scalability review, CGE&Y obtained Qwest's procedures for tracking OSS loads and capacities, forecasting future OSS loads and providing OSS computer growth in an effort to understand system architecture and gain knowledge of the capacity adjustment procedures used within Qwest. This information is necessary in order for CGE&Y to assess

whether Qwest's OSS interfaces can be made scalable to accommodate increases in CLEC volumes greater than those planned for in the Capacity Test within a timely manner.

CGE&Y's analysis of Qwest's processes, procedures and planning tools to support system scalability showed the following results:

- ❑ Procedures to adequately track OSS loads and capacities are in place and actively being utilized.
- ❑ Procedures for forecasting future OSS loads are adequately maintained and followed by Qwest's systems staff.
- ❑ Processes are in place and actively followed for managing and providing the necessary Central Processing Unit (CPU), memory and data storage requirements for OSS computer growth.
- ❑ Qwest has adequate procedures in place to facilitate its staff in executing OSS interface data security processes.
- ❑ Qwest has adequate system disaster recovery plans, but does not perform live tests of these plans.

In light of the above findings, CGE&Y's conclusion is that Qwest has adequate processes and procedures in place, that are well documented, to maintain system capacity sufficient to meet the required performance standards that have been established to provide a meaningful opportunity for an efficient competitor to compete. See Section 4.2 of this report for a detailed discussion of CGE&Y's System Scalability review.

### Staff Scalability

The Staff Scalability review evaluates whether Qwest has the capability to adjust its workforce to meet future CLEC order volumes requiring manual intervention. As part of the staff scalability review, CGE&Y assessed Qwest's staff planning process, in terms of the number of staff, the facilities in which to house the staff and the training necessary to bring new personnel up to the required level of productivity.

In conducting its evaluation, CGE&Y reviewed Qwest's support center workforce development modeling procedures and the link between future volume projections and workforce modeling procedures. Support centers were evaluated for their ability to respond to increased workloads and to provide adequate resources to handle the manual processing of non flow-through LSRs. Contingency plans to meet unforeseen increases in order volume and Qwest's disaster recovery plans to ensure continued CLEC support were also evaluated. The ability of Qwest's recruiting and training programs to provide staff with the necessary skills to perform the manual support functions was also reviewed by CGE&Y.

CGE&Y's analysis of Qwest's ability to increase personnel in order to process CLEC orders produced the following results:

- ❑ Sufficient CLEC support centers workforce development modeling procedure documentation is available
- ❑ In-place volume contingency plans to meet dramatic increases in CLEC order volumes are documented and available to Qwest staff
- ❑ Disaster recovery plans are well defined to ensure continued operations are in place and maintained
- ❑ Recruiting and training programs to provide for the availability of competent staff with the necessary skills to adequately process CLEC orders are sufficiently documented

CGE&Y concludes that Qwest maintains adequate forecasting procedures to identify the need for additional work force within a sufficient time frame that allows for appropriate training and placement. See Section 4.3 of this report for a detailed discussion of CGE&Y's Staff Scalability review.

## 4.1 System Capacity Test

### 4.1.1 Introduction

The System Capacity Test consists of two phases designed to test Qwest's systems: 1) a test of the OSS using forecasted loads of up to twelve months into the future and, 2) a stress test to test whether Qwest could process an additional load equal to 150% of the 12-month test's busy hour load.

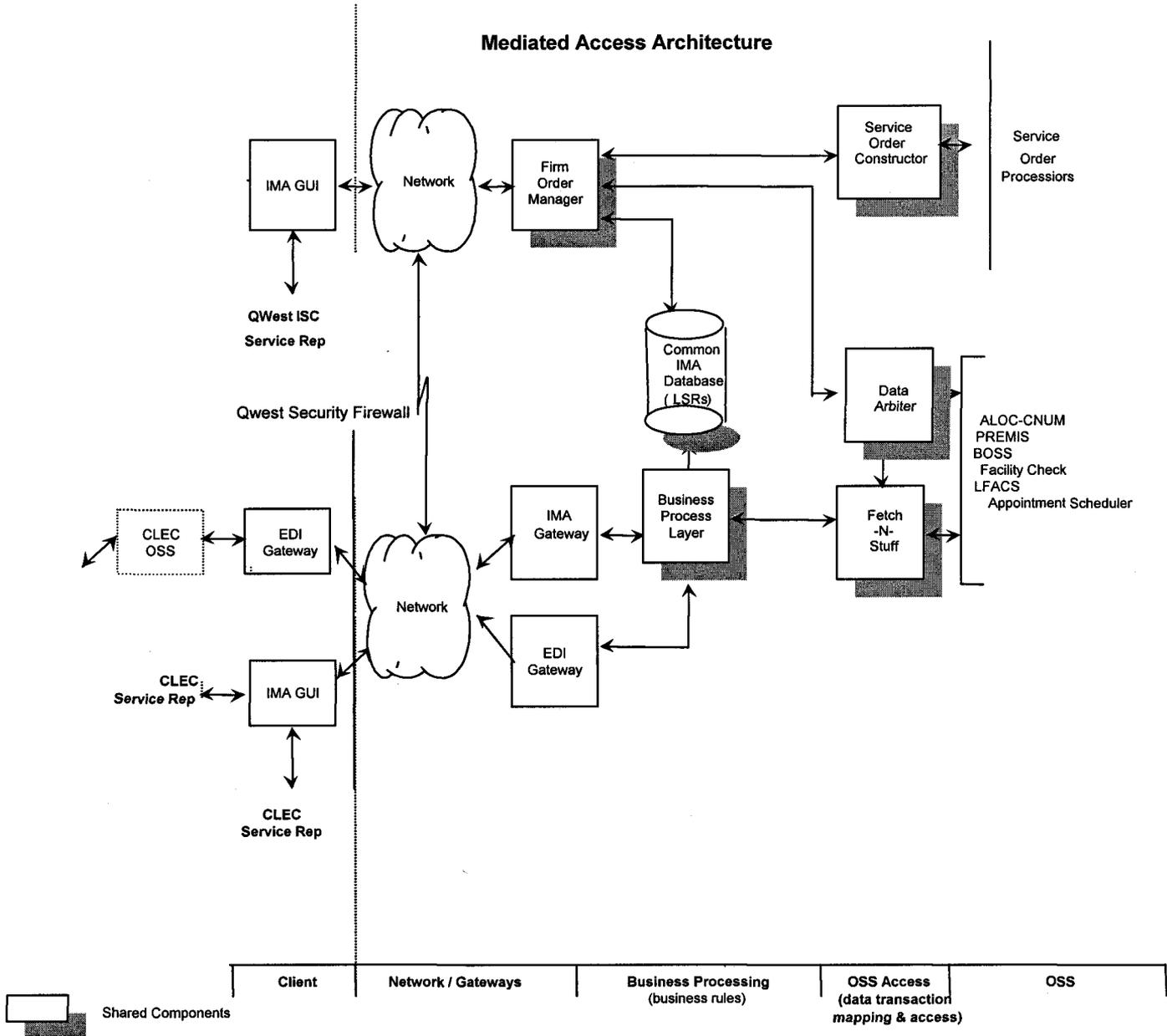
The System Capacity Test validates that Qwest's OSS, specifically the IMA-GUI and EDI interfaces, and processes can handle loads equal to or greater than estimated pre-order and order volumes projected one year from the date of the execution of the Capacity Test (while maintaining established performance measurement levels). The purpose of the System Capacity Test is to determine whether Qwest's systems have sufficient capacity to handle workload volumes required to support CLEC order and pre-order activities anticipated within 12 months from the date of test execution. This is accomplished by determining the forecasted 12-month volume and supplementing existing commercial volumes on the day of the test with Pseudo-CLEC transactions in order to generate the forecasted load. The Capacity Test validation evaluates the ability of Qwest's OSS and interfaces to perform in a stable manner under a specific defined workload and determines the level of order activity where the system's performance level begins to deteriorate during the stress test phase.

As stated above, the Capacity Test will generate a certain number of order and pre-order transactions during the time frame of the test. These transactions are to be input at the same proportion to reflect actual volume. For example, if 10% of the current daily load is input from 10 a.m. until 11 a.m., then 10% of the test load will also be input during the same time frame.

Originally, the TSD 2.10 separated Phase I of the Capacity Test into three separate tests consisting of a 6-month, 9-month and 12-month test. Each test was to evaluate the operation of Qwest's OSS under volumes anticipated for each time period. The 6-month test was to be performed initially with the 9-month commencing upon successful completion of the 6-month test and so on. However, the Capacity Sub-committee, at the recommendation of CGE&Y, made a decision to reverse the order of testing and begin with the 12-month test, thereby only performing the 9-month test should Qwest's systems fail to meet performance benchmarks given the 12-month volume.

In order to provide a common understanding of the OSS included in the Arizona third party Capacity Test, brief descriptions and schematic diagrams are provided in Figure 4.1.1a below of the IMA and EDI architectures for pre-ordering, ordering and provisioning. Figure 4.1.1a depicts the mediated access architecture currently provided by Qwest for the IMA and EDI interfaces. As shown, the CLEC OSS or workstations access the Qwest gateways through the security firewall. They communicate with the Qwest human-to-computer interface and/or the computer-to-computer interfaces to transmit and receive information.

Figure 4.1.1a



The System Capacity Test was modeled to reflect volumes needed to adequately test the Qwest systems that support the Arizona CLEC community. To perform the test, those systems that support all fourteen states in the Qwest region were

tested with the projected fourteen state volumes. Those systems that support a specific region were tested with the volumes anticipated only for that region. (For regional systems only the Central region data were evaluated). Those systems, that only support Arizona, were tested with Arizona volumes.

#### 4.1.2 Scope

The scope of the System Capacity Test was to evaluate whether the relevant Qwest systems have sufficient capacity to handle the defined workload volumes required to support CLEC pre-order and order activities at the performance benchmarks defined in the PID 6.3. Appendix C of the MTP 4.2 provides a list of performance measures that are to be evaluated during the Capacity Test. According to the MTP 4.2, CGE&Y was to monitor pre-order and order response times experienced by the Pseudo-CLEC to gather data to calculate results for PO-1, PO-2 and PO-5 and determine whether Qwest's systems still performed adequately given the increase in capacity. However, since the intent of the System Capacity Test is to validate system performance, not Qwest's ability to handle manual orders or to test flow-through capabilities, only flow-through eligible LSRs were used in the evaluation. Therefore, an agreement was reached between the parties that only PO-1 and PO-5 would be evaluated as part of the Capacity Test and this evaluation made no finding on Qwest's ability to handle volumes of LSRs that fell to manual processing.<sup>1</sup>

#### Capacity Test Performance Measurements

One of the success criteria for the Capacity Test is whether or not Qwest's performance continues to meet benchmark standards for certain performance measurements given the increased capacity. Therefore, it is vital to have a general understanding of the measures evaluated as part of the test.

#### PO-1 – Pre-order Response Time

PO-1 evaluates the timeliness of responses to specific pre-ordering/ordering queries for CLECs through the use of Qwest's OSS. Included in the measure is the time interval between query and response for transactions submitted either via GUI or EDI. Submeasure PO-1A measures response time for the GUI and PO-1B measures response time for EDI. Qwest does not collect data on actual CLEC pre-order transaction times but instead uses a system that simulates the transactions of requesting pre-ordering/ordering information from the underlying existing OSS. The time interval between query and response consists of the period from the time the transaction request was "sent" to the

---

<sup>1</sup> LSRs that triggered rejections that could be handled in a mechanized environment and LSRs that fell to the manual-handling queue were included in the test.

time it is "received" via the gateway interface. Table 4.1.2a reflects the different pre-order transactions and the benchmark for each.

**Table 4.1.2a Pre-Order Response Times**

Transaction:	GUI (PO-1A)*	EDI (PO-1B)
1. Appointment Scheduling	<10 seconds	<10 seconds
2. Service Availability Information	<25 seconds	<25 seconds
3. Facility Availability	<25 seconds	<25 seconds
4. Street Address Validation	<10 seconds	<10 seconds
5. Customer Service Records	<12.5 seconds	<12.5 seconds
6. Telephone Number	<10 seconds	<10 seconds
7. Loop Qualification	< 20 seconds**	< 20 seconds**

**Note:**  
 \* The Pseudo-CLEC's load generator will only track PO-1A part B (Transaction Response times). CGE&Y will add IRTM part A (May/June average as agreed by the Capacity Subcommittee and the TAG).  
 \*\* Benchmark applies to response time only. Request time and Total time will also be reported.

In addition to evaluating whether Qwest meets the above benchmark for the PO-1 measure to determine success, CGE&Y will also analyze IRTM results as compared to results calculated using Pseudo-CLEC collected data to determine if these simulated transactions are an accurate representation of the CLEC's actual pre-order response time.

PO-5 – Firm Order Confirmations on Time

PO-5A monitors the timeliness with which Qwest returns FOCs to CLECs in response to LSRs/Access Service Requests (ASRs) received. The interval measured is the period between the LSR received date/time and Qwest's response with a FOC notification. For purposes of the Capacity Test, PO-5 will be limited to an evaluation of PO-5A, the percent of fully electronic orders that flow through within 20 seconds. The Capacity Test will only evaluate flow-through orders that actually do flow through as in accordance with Section 5.2.2.2(b) of the TSD 2.10.

In addition to reporting on the above performance measurements, CGE&Y also issued a Transaction Report, which provides details of each LSR and was used mainly as a diagnostic tool to determine the status of LSRs that did not generate a FOC.

Capacity Test Orders

One of the major tasks of the Capacity Test involved arriving at the total number of transactions to be generated during the test. The number of proposed

transactions was to be determined by the Capacity Sub-committee and agreed to by the TAG. Discussions over the appropriate forecasted volumes began in February 2000 and finally reached agreement in July of 2000. The final number was determined by reviewing Qwest-provided historical data and forecasts to arrive at an educated estimate of CLEC volumes one year from the execution date of the Capacity Test.

The System Capacity Test was performed in Qwest's live production environment using existing commercial volume during normal business hours. The Pseudo-CLEC's load generator provided the necessary quantity of simulated activity for processing via Qwest's GUI and EDI gateways to supplement existing volume to generate total order activity as agreed to by the TAG. The Capacity Test orders went through the ordering process until the issuance of a FOC or the order was placed into the proper error queue. Per the TSD 2.10, Qwest's maintenance and repair (M&R) systems, billing and usage systems, and provisioning systems were out of scope for the purpose of the Capacity Test.

The Capacity Test orders were cancelled following receipt of the FOC or notification that the order had fallen out for manual processing. Any Capacity Test orders that fell into the manual intervention queue were also cancelled and were not to be processed by Qwest's Interconnection Service Centers (ISCs). Therefore, no FOC should have been generated for these LSRs. This cleanup effort of canceling the Capacity Test LSRs was to be performed during non-business hours so as not to affect live production. All Capacity Test POTS and Local Number Portability (LNP) LSRs issued by the Pseudo-CLEC had an extended LSR due date of up to 75 business days from the date of the test as an additional safeguard to prevent provisioning activities from accidentally being carried out by Qwest. Unbundled Network Elements – Loop (UNE-L) orders and UNE-L with LNP were processed with an extended due date up to 36 business days from the date of the test. , These dates are the maximum due dates that Qwest's business rules will allow for an LSR to flow through without special handling thereby not effecting normal processing of the order.

Finally, Qwest will provide CGE&Y with performance measurement data pertaining to the Capacity Test for PO-1 (IRTM), PO-2 and PO-5 along with a list of orders that fell out for manual intervention. Qwest will also provide system information, such as CPU, memory and disk utilization and the paging rate. CGE&Y will use the Pseudo-CLEC collected data along with the Qwest performance measurement data to evaluate the success level of the Capacity Test. CGE&Y will obtain pre-order response times experienced by the Pseudo-CLEC to compare against the simulated response times generated during the Capacity Test by IRTM to make a comparison and draw a conclusion as to

whether Qwest's simulated system is an adequate representation of the CLEC's actual pre-order response time experience.

#### **4.1.3 Process**

This section defines the test requirements and describes the overall process that was employed for conducting, administering and managing the Capacity Test as outlined by the TSD 2.10. The test requirements were developed by the Capacity Sub-committee, presented in the SCTDP 2.02 (see Appendix F) and in accordance with the TSD 2.10, reviewed with the TAG for approval prior to conducting the Capacity Test. To maintain fairness and blindness of the test, neither Qwest nor the CLECs knew, in advance, the actual date that the System Capacity Test was to be performed. All supporting documentation for this area of the Capacity Test may be found on a CD ROM located in CGE&Y's viewing room.

The SCTDP 2.02, as per the Section 5.2.4 of the TSD 2.10, specifies the scope, approach, entrance, exit and execution requirements for the Capacity Test. This plan was reviewed with the Pseudo-CLEC, the CLECs and Qwest prior to commencement of the test. TSD 2.10, along with the SCTDP 2.02 provides for the execution of as many as four test phases. The outcome of each phase determines whether the next phase will be executed. However, the TSD 2.10 and the SCTDP 2.02 differ on the order in which three of the phases are to be conducted. The TSD 2.10 first executes the 6-month test proceeding to the 9-month only upon the success of the 6-month test and so on continuing to test Qwest's system until there is a failure. The SCTDP 2.02 reverses the order and only tests the 12-month volume unless the systems fail to meet the test criteria. This change in testing methodology was agreed to by the TAG.

Phase 1 was performed with volumes that represented the forecast 12 months from the start of the System Capacity Test. Results were evaluated to determine whether benchmarks were met. Since the benchmarks were met, the Phase 4 test (stress test) was performed using volumes that represented 150% of the Phase 1 (12-month) test volume. If the benchmarks had not been met, the Phase 2 test would have then been performed.

Phase 2 was to be performed with volumes forecasted nine months from the date of the System Capacity Test. If evaluation of results indicated benchmarks had been met, the Phase 4 test (stress Test) would have been performed with volumes that represented 150% of the Phase 2 test volume. If benchmarks were not met, the Phase 3 test would be performed.

Phase 3 was to be performed with forecasted volumes six months from the start of the System Capacity Test. If the benchmarks were met, the Phase 4 test

(stress test) would be performed with volumes that represented 150% of the Phase 3 test volume. If Qwest failed to meet the benchmarks, CGE&Y would have issued an IWO and, Qwest would be provided an opportunity to review the results and make system changes before testing continued. Re-testing would have been performed if the six-month test was unsuccessful.

### Pre-Order Planning

Qwest's OSS provided functionality to seven different pre-order queries at the time of planning for the Capacity Test. These transactions are listed below and in Table 4.1.3.1a along with the number of planned transactions per query. Table 4.1.2a reflects the benchmark associated with each transaction type.

The mix was selected from the transactions shown below:

- Customer Service Record (CSR)
- Address Validation (AVQ)
- Request for Telephone Number (TNAQ)
- Feature and Service Availability (SAQ) (includes PIC/LPIC Query)
- Appointment Scheduler (AAQ)
- Facility Availability (FAQ)
- Loop Qualification (Loop)
- Connect Facility Availability (CFA)\*
- Meet Point\*
- DSL Resale\*

\*These transactions were developed by Qwest after the MTP and TSD were approved and were not included in the System Capacity Test. The volumes associated with these transactions were added to the Facility Availability transactions.

The pre-order process functions performed in the Capacity Test include the same query transactions as those performed during the Functionality Test with the exception of the Connecting Facilities Assignment (CFA) transaction. Neither CFA, Meet Point or DSL resale queries were available at the time plans for the Capacity Test were formulated. Meet Point and DSL resale did not have sufficient volume and their impact was minimal to justify the addition to the test. In addition, neither of these transactions had an associated PID benchmark in order to determine the pass/fail criteria. However, there was disagreement among the parties as to whether or not CFA should specifically be included in the test. The disagreement centered around whether the CFA transaction itself should be included or if it was sufficient to include the volume associated with that transaction within the Facility Availability transaction. Given the nature of

the Capacity Test, Qwest's position was that the FAQ query is comparable to the CFA query in terms of the number of steps, data inputs, and purpose of the outputs of the transaction. Qwest therefore argues that increasing the number of FAQ transactions is the appropriate method for accommodating the CFA transaction in the capacity test.

The CLECs pointed out that the CFA pre-order transaction became available with IMA Release 6.0. The CFA transaction currently represents about 3.0% of the pre-order transactions. The CFA transaction is different from most other pre-order transactions in that it accesses the TIRKs database to retrieve the requested information.

GE&Y agreed with Qwest on this matter.

The disagreement could not be resolved in either Capacity Sub-committee or the TAG, which resulted in the parties declaring an impasse.

The ACC resolved the impasse by agreeing with CGE&Y and Qwest that it was not necessary to design and include the CFA transaction in the Capacity Test. Since the purpose of the Capacity Test is to test the ability of Qwest systems to handle transaction volumes and does not test the functionality of the transactions, the CFA transaction could be accounted for by increasing the FAQ transaction volumes an amount equivalent to the projected CFA volumes.

The Pseudo-CLEC's load generator was expected to provide the additional pre-order volumes necessary to achieve the 12-month forecasted volumes. The total number of pre-order queries planned for each phase of the Capacity Test were as follows:

Phase	Total	EDI	GUI
Phase 1 (12 month)	20,083	17,071	3,012
Phase 2 (9 month)	10,443	8,877	1,566
Phase 2 (9 month)	7,000	5,950	1,050
Phase 4*(Stress)	8,422	7,159	1,263

\*Phase 4 volumes are dependent upon which previous phase of the test is successful. The above numbers represent the volumes that would be used if Phase 1 of the test is successful.

In order to arrive at the forecasted 12-month volume to use in the Capacity Test, input was obtained from all parties as to the number and types of service orders expected to materialize. Each specific order type is expected to result in an average number of pre-order transactions per order (see Table 4.1.3a for total

number of orders planned by service category along with the number of pre-order queries associated with each type of order). The formulae for determining how many pre-order queries are associated with each order type is defined in the SCTDP 2.02, Section 5.2.1, Table 5.2.1-1 (see Appendix F of this document). In addition to pre-order transactions forecasted associated with order volume, additional pre-order queries were forecasted based on the Qwest-provided Stand-alone pre-order transaction formula as per the SCTDP 2.02, Appendix B (see Appendix F, SCTDP 2.02, Appendix B). This formula suggests that the number of pre-order transactions performed that do not result in the creation of an LSR is directly proportional to the total number of LSRs submitted.

The following chart shows the pre-order queries by order type:

**Table 4.1.3a: Pre-Order Query for the System Capacity Test (Local Service Request)**

Pre-Order Query for each System Capacity Test Order Service Request (12 Month)								
Order Type/Activity Type	LSRs	CSR	AVQ	TNAQ*	SAQ	AAQ	FAQ	LOOP
<b>LNP Only</b>								
LNP (V)	319	319	319					
LNP (Z)	2014	2014	2014					
<b>UNE Loop with LNP</b>								
Retail to UNE Loop Conversion (V)	50	50	50		35		7	7
Retail to UNE Loop Conversion (Z)	191	191	191		133		29	29
<b>UNE Loop w/o LNP</b>								
Retail to UNE Loop Conversion (V)	41	41	41	6	29		6	6
UNE Loop – New (N)			866		866		866	866
UNE Loop – Disconnect (D)	204	204	204					
<b>Resale</b>								
Retail to Resale Conversion (W)	47	47	47					
Retail to Resale Conversion (V)	65	65	65		65	10	10	
Retail to Resale Conversion (Z)	112	112	112		112	17	17	
Resale – New (N)			47	47	47	47	47	47
Resale – Change ( C )	300	300	300	45	300	45	45	
Resale – Disconnect (D)	218	218	218					
<b>UNE-P</b>								
Retail to UNE-P Conversion (V)	12	12	12		12	2	2	
Retail to UNE-P Conversion (Z)	21	21	21		21	3	3	
UNE-P – New (N)			9	9	9	9	9	9
UNE-P – Change ( C )	57	57	57	9	57	9	9	
UNE-P – Disconnect (D)	41	41	41					
<b>TOTAL Psuedo CLEC</b>	<b>4566</b>	<b>3645</b>	<b>4567</b>	<b>151</b>	<b>1687</b>	<b>141</b>	<b>1049</b>	<b>964</b>
<b>Standalone</b>		<b>1971</b>	<b>2480</b>	<b>1303</b>	<b>254</b>	<b>64</b>	<b>286</b>	
<b>Total Pre-Order</b>		<b>5616</b>	<b>7046</b>	<b>1455</b>	<b>1941</b>	<b>204</b>	<b>2857</b>	<b>964</b>

Order Planning

The Capacity Test contained the following requirements pertaining to the LSRs submitted to arrive at Capacity Test volumes:

- The test consisted of LSRs that were eligible to flow through to the Qwest Service Order Processors (SOPs). However, LSRs that were expected to cause mechanized error rejects, and flow-through LSRs that fell to manual processing, were also included in the test. These errors were included to add a volume of simulated LSR errors to the test to simulate a production environment.
- Non flow-through eligible LSR types were not included in the test. However, the forecasted volumes for these LSRs were applied to flow-through eligible LSR volumes.
- Since the LSRs were to be cancelled before the provisioning process started, analysis of provisioning was not performed for the System Capacity Test as per the requirements of the TSD 2.10.
- The hourly volumes were based on the historical data patterns Qwest supports in its production environment. For example, if 10% of the daily order flow normally is experienced during the 8 a.m. to 9 a.m. time frame, then 10% of the test orders would also be generated during that time period.
- The Pseudo-CLEC load generator created the order volume, mix, and arrival rates as defined by CGE&Y.
- The total number of order transactions planned for the System Capacity Test was as follows:

Phase	Total	EDI	GUI
Phase 1 (12 month)	4,566	3,881	685
Phase 2 (9 month)	2,569	2,184	385
Phase 2 (9 month)	1,722	2,184	258
Phase 4*(Stress)	2,072	1,761	311

\*Phase 4 volumes are dependent upon which previous phase of the test is successful. The above numbers represent the volumes that will be used if the Phase 1 test is successful.

See Table 4.1.3.a above for a break down of planned order transaction mix for the 12-month Capacity Test.

The System Capacity Test input mix also included:

- Intentional error conditions that resulted in rejects in Qwest's IMA-GUI and EDI interfaces. Although a failed transaction requires no manual work for purposes of this test, ordinarily expected occurrences of error/reject messages have been integrated into the test process to simulate actual production environment.
- Replications of transactions created by the load generator by the Pseudo-CLEC in order to attain the required number of transactions. Qwest relaxed edits to allow duplicate LSRs to be created against the same test accounts for the purpose of the Capacity Test. Without this capability, execution of the test would have required a unique account for each LSR to be issued during the test. Allowing the replication of transactions had no effect on the operation or validity of the test.

#### System Capacity Test Phase 4 (Stress Test) Planning

The stress volumes were determined based on the formula described in TSD 2.10 and is as follows:

- The daily volume from the successful previous phase (Phase 1, 2 or 3) was increased by 50%.
- The busy hour load from the successful phase of the Capacity Test, which is generally 11.1% of the daily load was used as the baseline for the test.
- The stress test volume was 150% of the baseline volume.

The first hour of the stress test was executed using the baseline volume. During the second hour of the test the volume was increased in fifteen-minute increments until the stress volume was achieved. This was performed to observe the impact the increased volume had on Qwest's systems as the ultimate stress volume was approached. During the third and fourth hours, the stress volume was to be maintained at a constant rate. IRTM Telephone Number (TN) transaction volumes remained constant at the full stress level for the duration of the stress test.

Table 4.1.3b below reflects the **planned** stress test volumes during each specific test interval. The total order volume reflects the forecasted total expected during the third quarter of 2002. The next column reflects current CLEC demand and the incremental order volume is the number of test orders that must be generated by the Pseudo-CLEC in order to reach forecasted volume. The incremental pre-order volume is a factor of the test order volume and calculated as the capacity pre-order transactions were.

**Table 4.1.3b Stress test volumes (12-Month Test)**

Pre-order and Order Stress Volumes	Total Order Volume 3Q2002	Production Order Volume 3Q2001	Incremental Test Order Volume 3Q2001	Incremental Pre-Order Volume 3Q2001
Daily 3Q2001 Volume	11706	7050	4566	20083
50% Increase to Establish Peak Daily volume			2283	10042
Total Daily Volume			6849	30125
Highest Percent of Orders Sent during One Hour			11.1%	11.1%
Total Peak Hour Volume			760	3344
Hour 1 (Baseline for the Stress Test)			510	2229
Hour 2 (Stress hour volume) sent in the following 15 minute increments			760	3344
First 15 minutes (19% of Hour 2 volume)			144	535
Second 15 minutes (22% of Hour 2 volume)			167	736
Third 15 minutes (28% of Hour 2 volume)			213	936
Fourth 15 minutes (31% of Hour 2 volume)			236	1137
Hour 3 (Stress hour volume) sent evenly over the hour			760	3344
Hour 4 (Stress hour volume) sent evenly over the hour			760	3344

**4.1.3.1 Test Activities**

The following activities were performed during the Capacity Test:

- a) The Pseudo-CLEC executed the System Capacity Test according to the SCTDP 2.2.
- b) CGE&Y team members were on-site at both the Pseudo-CLEC site and the Qwest site to observe and monitor the test.

- c) All incidents observed during the preparation or execution of the test were documented using the Incident Work Order (IWO) Process as described in Appendix I of the TSD 2.10.
- d) CGE&Y validated that the test scripts were completed in the prescribed manner and that all results were recorded.
- e) Following the receipt of the FOC (or rejection notice) Qwest cancelled the orders. The cancellation process was performed during non-business hours in order not to adversely affect Qwest's systems. The cancellation of these orders had no impact on the test.
- f) CGE&Y calculated results for PO-1 and PO-5 from the data gathered by the Pseudo-CLEC for Phase I of the Capacity Test and the stress test to determine if Qwest's performance during the test met the applicable benchmarks associated with the measure.
- g) CGE&Y obtained IRTM results from Qwest for the day of the Capacity and Stress Test to compare with results calculated for PO-1 from the Pseudo-CLEC data. An analysis was performed to determine if IRTM accurately reflects actual pre-order response time.

#### Operational Readiness Test

Five ORTs were performed to verify that all of the components of the System Capacity Test were in place and working in a sufficient manner to enable the test to proceed.

- ◆ Since the IMA gateway is a regional gateway, test volumes were needed to simulate forecasted CLEC volumes for all fourteen states within the Qwest region.

In preparation for the ORT, Qwest provided CGE&Y with test accounts to be used for the test. These accounts were pseudo customers in all fourteen states. These accounts included:

- Retail accounts
- Resale accounts
- UNE-L accounts
- UNE-P accounts

- ◆ Qwest created pseudo connecting facilities and pseudo addresses for the test in order for the LSRs to flow through without manual intervention.
- ◆ CGE&Y verified the pseudo accounts by performing Address Validations, CSR queries, and CFA queries for the appropriate accounts. All discrepancies were reported to Qwest for resolution.
- ◆ CGE&Y matched the accounts with the appropriate test scripts and created a spreadsheet with the required information to create an LSR or perform a pre-order query. CGE&Y also created a spreadsheet that detailed the following:
  - Number of LSRs to be issued by product type, by state, by hour
  - Number of pre-order transactions by type, by state, by hour
- ◆ CGE&Y forwarded this spreadsheet to the Pseudo-CLEC to enable them to populate their load generator.

As stated earlier, five ORTs were performed. The initial three ORTs detected certain situations that needed to be corrected and verified by another ORT prior to actual testing. These included:

- Incorrect test scripts created by CGE&Y
- Incorrect templates created by the Pseudo-CLEC
- Incorrect test bed setup by Qwest
- Inconsistent reporting of times (e.g., minutes and seconds reported by Qwest, seconds reported by Pseudo-CLEC)

The June 25<sup>th</sup> ORT failed due to a Qwest system change made to accommodate a test in progress in another jurisdiction. This system change caused the LSRs issued in the Arizona ORT to automatically complete, prior to cancellation. Once this was brought to the attention of Qwest, Qwest reset their accounts and another ORT was run in order to verify the Qwest fix.

The July 16<sup>th</sup> ORT contained errors, many of which were related to the June ORT. These errors were left in the test to account for the "Planned" errors for the 12-Month Capacity Test and the stress test; therefore, no further ORTs were required for system verification.

The main activities involved in the ORT included:

- Qwest test accounts were provided to CGE&Y
- CGE&Y test scripts were provided to the Pseudo-CLEC
- Communication between the test parties during and after the test to verify successful operation of the communication process
- Verification that the Pseudo-CLEC's test transaction generators, both GUI and EDI, were operational
- Verification that the Pseudo-CLEC's result monitoring software and reports were functional
- Verification that Qwest's systems and interfaces were in place and functional
- Verification that Qwest's pre-order TN reservation scripts (AKA IRTM scripts) were in place
- Verification that Qwest's LSR and service order cancellation scripts were in place
- Verification that the reports produced and distributed by all parties involved in the test were functional
- Verification that the daily cleanup process for activities associated with the test were in place

For more details with regard to the ORT see Appendix F, SCDTP, Section 7.

Test Entrance Criteria

The following MTP and TSD entrance criteria were met for the System Capacity Test:

Criterion	Completed
The selection of CGE&Y as the Test Administrator for the test is approved and finalized by the ACC.	✓
The selection of HP as the Pseudo-CLEC for the test is approved and finalized by the ACC.	✓
The capacity test plan requirements are included in the TA's Test Execution Document.	✓

Criterion	Completed
A database has been developed to load all Qwest test bed accounts and address locations to support the generation of seed order test cases to be provided to HP.	✓
A live production test environment to conduct the pre-order and order tests has been validated by HP and the TA and determined to be operational.	✓
The scheduled dates for the Capacity Test are identified.	✓

System Capacity Test Results and Analysis

The System Capacity Test was first attempted on July 26, 2001. While the test appeared to run successfully, an analysis of the data indicated the Pseudo-CLEC EDI CSR template was incorrect.

The System Capacity Test was next attempted on August 2, 2001. At about 12:30 p.m. CGE&Y aborted the test when it became apparent that the transactions response times were extremely slow. Analysis of the problem by Qwest indicated that the “Code Red” virus had struck. It was reported that the problem prevented the messages from the gateways to be forwarded to the system support personnel. CGE&Y issued AWIWO1993.

The System Capacity Test was performed on August 10, 2001. CGE&Y monitored the test from the Qwest Data Center in Salt Lake City, Utah and the Pseudo-CLEC location in Tempe, Arizona. The test commenced at 7:00 a.m. MST and concluded at 6:00 p.m. MST.

Pre-order Test Results and Analysis

The actual volume of pre-order transactions executed during the 12-month test was 21,500 transactions as compared to the 20,083 that were proposed during the planning of the test. CGE&Y increased the initial numbers to take into account planned errors and to adjust the load to account for increased demand given the time delay in executing the test. Table 4.1.3.1a reflects the breakdown of total pre-order transactions by interface type. Of the 21,500 pre-order transactions,

18,316 were EDI transactions and 3,196 were GUI transactions resulting in a breakdown of 14.8% GUI and 85.2 % EDI transactions. Counts by various query transaction types are reflected in the rows under their associated GUI, EDI and total pre-orders column headings. Failed transactions are those that received error messages as opposed to a valid response.

**Table 4.1.3.1a Capacity Test Phase 1 Pre-Orders Processed**

Transaction Type	Capacity Test Pre-Order Volumes Processed									
	GUI			EDI			Total Pre-Orders			
	Successful	Failed	Total	Successful	Failed	Total	Successful	Failed	Total	%
Appointment Availability	32	0	32	242	0	242	274	0	274	1.3%
Appointment Selection	0	0	0	56	0	56	56	0	56	0.3%
Address Validation	1125	0	1125	6417	19	6436	7542	19	7561	35.2%
Customer Service Request	898	0	898	5012	74	5086	5910	74	5984	27.8%
Facility Address	428	0	428	2406	22	2428	2834	22	2856	13.3%
Loop	153	0	153	866	7	873	1019	7	1026	4.8%
Service Availability	310	0	310	1576	183	1759	1886	183	2069	9.6%
Telephone Number Assignment	238	0	238	1372	6	1378	1610	6	1616	7.5%
Telephone Number Select	0	0	0	58	0	58	58	0	58	0.3%
<b>Total</b>	3184	0	3184	18005	311	18316	21189	311	21500	100.0%
<b>Percent</b>	14.8%	0.0%	14.8%	83.7%	1.4%	85.2%	98.6%	1.4%	100.0%	

Of the 18,328 EDI transactions entered, 311 EDI transactions resulted in an error message. These were the planned errors mentioned previously in order to simulate actual production environment.

The average response times for the pre-order transactions were within the benchmarks for both GUI and EDI per PID 6.3 as reflected by Tables 4.1.3.1b and 4.1.3.1c.

Table 4.1.3.1b contains the pre-order response times that were achieved during the Capacity Test for IMA -GUI, (PO-1A). These results are reported as either calculated using IRTM or the Pseudo-CLEC data. The IRTM results were reported to CGE&Y by Qwest and the Pseudo-CLEC results were calculated by CGE&Y from the transaction data that was generated from the 12-month Capacity Test. "IRTM Result Part a" reflects the response time for the screen to become available to the user once the transaction is queried. "IRTM Result Part b" represents the time to receive the response for the specified transaction. These two calculations combined together provide the overall response time for the PO-1A measurement for each transaction type. Under the "Pseudo-CLEC Results" column, the time interval under "IRTM Result Part a" was provided to CGE&Y by Qwest since the Pseudo-CLEC software does not have the ability to measure the time for the screen to become available once requested.

The approach Qwest used to provide the missing time interval for the GUI PO-1A total response time interval was agreed to by the members of the Capacity sub-committee and presented to the TAG for approval. Qwest calculated the Part a component to provide CGE&Y by averaging PID results for the PO-1A measure for the months of May and June, 2001. The "CLEC Result Part b" column shows the actual

time interval once queried for the response to appear on the screen. This time was provided by the Pseudo-CLEC. The “Pseudo-CLEC Result” column represents the total time interval for the Pseudo-CLEC to receive the response to the query. This should be used to compare to the “IRTM Total.” Both the Pseudo-CLEC and IRTM results are well within the PID benchmarks for all the pre-order transaction types. While some IRTM results are of a shorter duration than that experienced by the Pseudo-CLEC, there are over twice as many transactions where the Pseudo-CLEC experienced shorter response times than those reported by IRTM. Most of the response times are fairly close, almost within a second or two, with the longest difference being experienced with the CSR pre-order query where IRTM results are over three seconds longer than that experienced by the Pseudo-CLEC.

**Table 4.1.3.1b Capacity Test Phase 1 IMA-GUI (PO-1A) Results**

Media	Category Description	IRTM Results			Pseudo-CLEC Results		
		IRTM Result Part a	IRTM Result Part b	IRTM Total Part c	IRTM Result Part a	IRTM Result Part b	CLEC Result
GUI	Appointment Availability	0.48	2.65	3.13	0.51	1.03	1.54
GUI	Address Validation	1.06	4.39	5.45	1.13	2.77	3.90
GUI	Customer Service Request	0.66	8.14	8.80	0.67	4.45	5.12
GUI	Facility Availability	0.62	13.12	13.74	0.63	12.37	13.00
GUI	Loop	0.59	7.42	8.01	0.65	9.11	9.76
GUI	Service Availability	0.48	4.78	5.26	0.51	6.31	6.82
GUI	Telephone Number Assignment	0.64	4.00	4.64	0.93	1.58	2.51

The performance results for pre-order response time for EDI (PO-1B) transactions are shown below in Table 4.1.3.1c. The table shows both the Qwest IRTM measurement results received and the Pseudo-CLEC results as calculated by CGE&Y. As displayed in the table, the results for each query category were within the PID measurement benchmarks regardless of whether using the IRTM or Pseudo-CLEC data. As reflected by the table, differences between IRTM and Pseudo-CLEC results are mostly within a one second time frame except for TN, Service Address and Loop Qualification, where the IRTM result is five seconds shorter than that experienced by the Pseudo-CLEC. It is also interesting to note that IRTM reports shorter response time intervals for every pre-order transaction except Facilities Availability.

**Table 4.1.3.1c Capacity Test Phase 1 PO-1B Results**

Category Description	Media	IRTM Result	Pseudo CLEC Result
Appointment Availability	EDI	5.86	5.91
Address Validation	EDI	4.31	5.24
Customer Service Request	EDI	6.86	7.48
Facility Availability	EDI	14.67	12.65
Loop	EDI	8.28	13.27
Service Availability	EDI	8.00	11.86
Telephone Number Assignment	EDI	3.24	5.93

Order Test Results and Analysis

Table 4.1.3.1d shows the test mix and number of orders that were executed and processed for the 12-month System Capacity Test. The product types included in the test are represented with the total number of each that were processed along with their associated percentages of total orders executed during the test. The GUI, EDI and Total columns show the counts and percentages for each scenario product type broken down by scenario included for that product.

There were a total of 4,915 orders processed during the 12-month System Capacity Test consisting of 698 orders submitted through the GUI interface and 4,217 orders submitted through EDI. Of these orders that were processed, there were 3,756 EDI and 637 GUI for a total of 4,393 orders that received a FOC. There were 234 LSRs that ended up as rejects, all of which were planned to reject. A total of 281 LSRs fell to manual intervention of which CGE&Y had expected 79 of these orders to FOC. Therefore, CGE&Y issued AZIWO1143 and Qwest responded confirming that 77 LSRs were valid but did not flow-through due to an intermittent read error by Fetch-N Stuff on some transactions returned from the downstream systems. Qwest made a configuration change in Fetch-N Stuff to enable Fetch-N Stuff to read all transactions. The other two orders that did not FOC also fell to manual intervention but according to Qwest these orders did not fall out due to Fetch-N Stuff. One was due to a formatting error on the part of the Pseudo-CLEC and the other was given a duplicate order number. The issue of duplicate order numbers was documented on AZIWO2105 as part of the Functionality Test.

The remaining seven LSRs were unaccounted for. These orders did not FOC, reject or fall out for manual intervention. CGE&Y issued AZIWO1144 to document this issue. Qwest confirmed that the seven LSRs did not receive a FOC but encountered an error in the Business

Processing Layer (BPL) process that was generated due to the increased volume on the system. Qwest made system enhancements to correct this error and forwarded a copy of the code change to CGE&Y for verification. Since this issue arose due to increased volumes being placed on these systems, of which normally would have increased gradually over a period of months giving Qwest an opportunity to scale its systems, and the impact is minimal, seven LSRs affected out of almost 5000 issued, CGE&Y determined not to re-do the Capacity Test.

Another issue that arose while evaluating the data produced by the System Capacity Test revealed that data was missing from the status file generated by the Pseudo-CLEC. Further research indicated that the Qwest Interactive Agent (IA) generated duplicate file names. It appeared at some point, the IA started reusing file names causing the new files to overwrite previously generated files. CGE&Y issued AZIWO3009 to document the finding and in response, Qwest agreed that duplicate file names were in fact generated and overwriting previous files; however, Qwest disagreed that the problem was with its IA. Qwest's response indicated that the problem is due to the design of the UNIX operating system on which Qwest's IA is running on the Pseudo-CLEC side of the interface. The limitation is not the fault of Qwest's IA or of the Pseudo-CLEC but is due simply to how that version of UNIX is designed. Any CLEC, BOC or other company in any other industry would encounter this same limitation in their applications (whether it was an IA or other application that relied on naming files) if it used a version of UNIX that had this limitation.

Review of the issue documented in AZIWO3009 revealed that the problem arose more as a function of the Capacity Test and would be highly unlikely to be duplicated during normal operations. It is unlikely that an actual CLEC would in fact save every single inbound transaction on its EDI interface but, would be more likely to save transactions to backend systems where actual work is performed. In addition, in normal production, the load generated during the Capacity Test would result from a multitude of CLECs doing business within Qwest's 14-state region and not one individual company, significantly reducing, if not eliminating, the chance of duplicate files. These two reasons alone make it highly unlikely that the 17,576 limitation would ever be encountered under normal operations.

PO-5 results indicate that 100% of the LSRs issued that received a FOC met the 20-minute benchmark. One LSR received a FOC in 21+ minutes, but this LSR was handled manually and therefore excluded

from the results as per TSD 2.10 (see Appendix D, 12-Month Test PO-5 Results). However, CGE&Y has issued AZIWO1140 which documents the inadequacy of the PO-5 measure in that an order must FOC in order to be included in the measurement calculation to determine whether or not Qwest meets the benchmark. If an order does not FOC, it is not included in the measurement calculation.

**Table 4.1.3.1d Capacity Test LSRs Processed**

Product	Product Count	% of Orders	Scenario Type by Product	Capacity Test Orders Processed					
				GUI		EDI		GUI-EDI Total	
				Total	%	Total	%	Total	% Product Type
LNP	3091	62.9%	Retail to LNP (V)	100	14.3%	566	13.4%	666	21.5%
			Retail to LNP (W)	364	52.1%	2061	48.9%	2425	78.5%
UNE Loop with LNP	37	0.8%	Retail to UNE Loop (V)	2	0.3%	9	0.2%	11	29.7%
			Retail to UNE Loop (Z)	4	0.6%	22	0.5%	26	70.3%
UNE Loop without LNP	855	17.4%	Retail to UNE Loop (V)	2	0.3%	9	0.2%	11	1.3%
			UNE Loop (D)	29	4.2%	176	4.2%	205	24.0%
			UNE Loop (N)	95	13.6%	544	12.9%	639	74.7%
Resale	794	16.2%	Resale (C)	45	6.4%	256	6.1%	301	37.9%
			Resale (D)	32	4.6%	186	4.4%	218	27.5%
			Resale (N)	5	0.7%	43	1.0%	48	6.0%
			Retail to Resale (V)		0.0%	66	1.6%	66	8.3%
			Retail to Resale (W)	9	1.3%	39	0.9%	48	6.0%
			Retail to Resale (Z)		0.0%	113	2.7%	113	14.2%
UNE-P	138	2.8%	Retail to UNE-P (V)		0.0%	11	0.3%	11	8.0%
			Retail to UNE-P (Z)		0.0%	20	0.5%	20	14.5%
			UNE-P (C)	10	1.4%	46	1.1%	56	1.1%
			UNE-P (D)		0.0%	42	1.0%	42	30.4%
			UNE-P (N)	1	0.1%	8	0.2%	9	6.5%
Totals	4915	100.0%		698	100.0%	4217	100.0%	4915	100.0%
Percent				14.2%		85.8%		100.0%	

The following provides a brief summary of the issues discussed above that were identified during the 12-month System Capacity Test.

- 79 LSRs that were expected to FOC did not (see AZIWO1143). In response to this IWO, Qwest made program changes that will be further evaluated during additional functionality testing and re-test to be certain the issue has been resolved.
- 7 LSRS were missing, in other words they were unaccounted for in that they did not FOC, reject, or fall out for manual intervention (see AZIWO1144). In response, Qwest made system enhancements and CGE&Y was able to evaluate the code change. The effectiveness will be determined by evaluating functionality re-test data.
- During the test duplicate file names were generated overwriting previously created files (see AZIWO3009). This issue developed

due to the nature of the System Capacity Test and would not occur under normal operations.

### System Capacity Test (Stress Test) Results and Analysis

The System Capacity stress test was performed on August 17, 2001. CGE&Y had monitors at the Qwest Data Center in Salt Lake City, Utah and the Pseudo-CLEC location in Tempe, Arizona. The test commenced at 9 a.m. MST and concluded at 1 p.m. MST.

### Pre-order Test Results and Analysis

The actual volume of pre-order transactions executed during the stress test was 14,387 transactions, as compared to the 8,422 that were proposed during the planning of the test. CGE&Y increased the initial numbers to take into account planned errors and to adjust the load to account for increased demand given the time delay in execution of the test. Table 4.1.3.1e reflects the breakdown of total pre-order transactions by interface type. Of the 14,387 pre-order transactions 12,053 were EDI transactions and 2,334 were GUI transactions resulting in a breakdown of 16.2% GUI (IMA) and 83.8 % EDI transactions. Counts by various query transaction types are reflected in the rows under their associated IMA, EDI and Total Pre-Orders column headings. Failed transactions are those that received error messages as opposed to a valid response.

**Table 4.1.3.1e Stress Test Pre-Order Transactions Processed**

Transaction Type	Capacity Stress Test Pre-Order Volumes Processed									
	GUI			EDI			Total Pre-Orders			
	Successful	Failed	Total	Successful	Failed	Total	Successful	Failed	Total	%
Appointment Availability	57	0	57	111	0	111	168	0	168	1.2%
Appointment Selection	0	0	0	0	0	0	0	0	0	0.0%
Address Validation	760	0	760	3950	31	3981	4710	31	4741	33.0%
Customer Service Request	576	0	576	3061	113	3174	3637	113	3750	26.1%
Facility Address	430	0	430	2323	29	2352	2753	29	2782	19.3%
Loop	98	0	98	539	4	543	637	4	641	4.5%
Service Availability	195	0	195	820	246	1066	1015	246	1261	8.8%
Telephone Number Assignment	187	0	187	814	12	826	1001	12	1013	7.0%
Telephone Number Select	31	0	31	0	0	0	31	0	31	0.2%
<b>Total</b>	<b>2334</b>	<b>0</b>	<b>2334</b>	<b>11618</b>	<b>435</b>	<b>12053</b>	<b>13952</b>	<b>435</b>	<b>14387</b>	<b>100.0%</b>
<b>Percent</b>	<b>16.2%</b>	<b>0.0%</b>	<b>16.2%</b>	<b>80.8%</b>	<b>3.0%</b>	<b>83.8%</b>	<b>97.0%</b>	<b>3.0%</b>	<b>100.0%</b>	

Table 4.1.3.1f reflects both IRTM results and results achieved by the Pseudo-CLEC for pre-order transactions submitted through the GUI (PO-1A). These results are reported as either calculated using IRTM or the Pseudo-CLEC data. The IRTM results were reported to CGE&Y

by Qwest and the Pseudo-CLEC results were calculated by CGE&Y from the transaction data that was generated from the 12-month Capacity Test. "IRTM Result Part a" reflects the response time for the screen to become available to the user once the transaction is queried. "IRTM Result Part b" represents the time to receive the response for the specified transaction. These two calculations combined together provide the overall response time for the PO-1A measurement for each transaction type. Under the "Pseudo-CLEC Results" heading, the time interval under "IRTM Result Part a" was provided to CGE&Y by Qwest since the Pseudo-CLEC software does not have the ability to measure the time for the screen to become available once requested.

The approach Qwest used to provide the missing time interval for the GUI PO-1A total response time interval was agreed to by the members of the Capacity Sub-committee and presented to the TAG for approval. Qwest calculated the Part a component to provide CGE&Y by averaging PID results for the PO-1A measure for the months of May and June, 2001. The "CLEC Result Part b" column shows the actual time interval once queried for the response to appear on the screen. This interval was arrived at from data captured by the Pseudo-CLEC. The "Pseudo-CLEC Result" column represents the total time interval for the Pseudo-CLEC to receive the response to the query. This should be used to compare to the "IRTM Total."

The average response time for the GUI pre-order transactions was within the benchmarks per PID 6.3 regardless of whether you look at IRTM or Pseudo-CLEC generated results. In fact, IRTM results are within plus or minus two seconds of the Pseudo-CLEC results for each transaction except GET CSR, where IRTM response times are almost twice as long as those experienced by the Pseudo-CLEC. However, any differences detected between IRTM and Pseudo-CLEC is immaterial given that no transaction results, IRTM or Pseudo-CLEC come any where close to exceeding the agreed to benchmarks.

**Table 4.1.3.1f Stress Test PO-1A Results**

GUI	Appointment Availability	0.51	2.94	3.45	0.51	1.03	1.54
GUI	Address Validation	1.06	4.7	5.76	1.13	2.90	4.03
GUI	Customer Service Request	0.67	8.48	9.15	0.67	4.78	5.45
GUI	Facility Availability	0.64	12.22	12.86	0.63	14.00	14.63
GUI	Loop	0.62	7.67	8.29	0.65	9.16	9.81
GUI	Service Availability	0.5	4.61	5.11	0.51	6.46	6.97
		<b>IRTM Results</b>			<b>Pseudo-CLEC Results</b>		
		<b>IRTM Result</b>	<b>IRTM Result</b>	<b>IRTM Total</b>	<b>IRTM Result</b>	<b>Pseudo-CLEC Result</b>	<b>Pseudo-CLEC Result</b>
<b>Media</b>	<b>Category</b>	<b>Part a</b>	<b>Part b</b>	<b>Total</b>	<b>Part a</b>	<b>Part b</b>	<b>Result</b>

Table 4.1.3.1g presents the pre-order transaction response time achieved during the stress test for transactions submitted over the EDI interface (PO-1B). The Pseudo-CLEC results include average transaction time for all pre-order transactions performed during the 4-hour stress test. As is evident from the table, Pseudo-CLEC response times are much greater and fail to meet the benchmark for all transaction types.

CGE&Y issued AZIWO2119 to document the failure of Qwest's OSS to achieve benchmark standards for EDI pre-order transactions submitted during the stress test and to document the discrepancy between IRTM and Pseudo-CLEC results. Qwest's response to this IWO and further analysis on the part of CGE&Y revealed that due to the heavy stress volume experienced during the third hour of the test, 11 a.m. MST to 12 p.m. MST, EDI pre-order response times were extraordinarily slow. Successful responses were received that exceeded the 200 second time out that is placed on IRTM. In fact one successful query response time exceeded 400 seconds in duration. As mentioned above and in the analysis section below comparing IRTM to actual test response times, IRTM is set to time out after 200 seconds if no response has been generated. These time outs are excluded from the calculation of pre-order response times. Therefore, in order to make an adequate comparison of results achieved through testing to IRTM response times, any transaction exceeding 200 seconds should be excluded as per PID 6.3 for the IRTM measure.

In addition, Qwest states in the response to AZIWO2119 that during the third hour of the stress test IRTM encountered an outage unrelated to the stress test.

Table 4.1.3.1h contains Pseudo-CLEC results that excluded the third hour of data from the PO-1B measurements. This analysis is relevant

in determining whether IRTM results are comparable to actual CLEC response times; however, in determining whether Qwest's OSS maintained an adequate level of performance while processing the volume of transactions during the third hour of the stress test the results in Table 4.1.3.1g should be used.

It is important to remember that the purpose of the stress test is to determine at what point while increasing volumes, the performance level of Qwest's OSS begin to deteriorate. The results of the stress tend to reflect that pre-order response times begin to suffer once volumes reach those achieved during the third hour of the stress test.

**Table 4.1.3.1g Stress Test PO-1B Results**

Media	Category Description	IRTM Result	Pseudo CLEC
EDI	Appointment Availability	6.00	24.49
EDI	Address Validation	4.60	22.7
EDI	Customer Service Request	6.50	24.95
EDI	Facility Availability	11.55	30.13
EDI	Loop	8.20	30.96
EDI	Service Availability	8.28	30.68
EDI	Telephone Number Assignment	3.44	23.76

**Table 4.1.3.1h Stress Test PO-1B Results With Hour 3 Volumes Removed**

Media	Category Description	IRTM Result	Pseudo CLEC
EDI	Appointment Availability	6.00	7.85
EDI	Address Validation	4.60	6.09
EDI	Customer Service Request	6.50	8.5
EDI	Facility Availability	11.55	13.66
EDI	Loop	8.20	14.38
EDI	Service Availability	8.28	13.92
EDI	Telephone Number Assignment	3.44	7.07

**Table 4.1.3i Stress Test PO-1B Results by Hour**

Media	Transaction Type	09:00 MST	10:00 MST	11:00 MST	12:00 MST	Total
EDI	Appointment Availability	21	30	32	28	111
EDI	Address Validation	746	1045	1159	1031	3981
EDI	Customer Service Request	595	833	924	822	3174
EDI	Facility Address	446	615	686	610	2357
EDI	Loop	102	141	159	141	543
EDI	Service Availability	200	280	310	276	1066
EDI	Telephone Number Assignment	155	216	240	215	826
	<b>Total</b>	<b>2265</b>	<b>2944</b>	<b>3510</b>	<b>3123</b>	<b>12058</b>

During the third 11 to 12 hour of the test, 11 a.m. MST to 12 p.m. MST, the EDI responses were slow. See AZIWO2119 discussed below and in the section titled “IRTM vs Pseudo-CLEC Pre-order Response Time.”

Order Test Results and Analysis

The actual volume of LSRs executed during the 12-month test as compared to the number that was proposed during the planning phase is as follows:

TOTAL                      EDI                      GUI

Stress Test                      3121                      2686                      435

The difference between the number of orders planned and that actually executed is to take into account the additional load that would have been experienced from the date the test was planned to run and the actual date of the test.

Table 4.1.3.1j shows the actual orders that were processed:

**Table 4.1.3.1j Stress Test LSRs Processed**

Stress Test Orders Processed						
Product	Product Count	% of Orders	Scenario Type by Product	GUI Total	EDI Total	Total
LNP	1711	54.8%	Retail to LNP (V)	45	265	310
			Retail to LNP (W)	209	1192	1401
UNE Loop with LNP	38	1.2%	Retail to UNE Loop (V)	1	11	12
			Retail to UNE Loop (Z)	4	22	26
UNE Loop without LNP	764	24.5%	Retail to UNE Loop (V)	3	25	28
			UNE Loop (D)	23	122	145
			UNE Loop (N)	88	503	591
Resale	511	16.4%	Resale (C)	30	175	205
			Resale (D)	22	128	150
			Resale (N)			0
			Retail to Resale (V)		45	45
			Retail to Resale (W)	3	30	33
UNE-P	97	3.1%	Retail to UNE-P (V)	2	13	15
			Retail to UNE-P (Z)		15	15
			UNE-P (C)	5	34	39
			UNE-P (D)		28	28
			UNE-P (N)			0
Totals	3121	100.0%		435	2686	3121
Percent				13.9%	86.1%	100.0%

Table 4.1.4.2-5 shows the test mix and number of orders that were executed and processed for the System Capacity stress test. The specific product types included in the test are represented along with their associated counts and the percentages of overall orders executed in the test. The GUI, EDI and total columns show the counts and percentages for each scenario product type broken down by scenario used for that product.

There were a total of 3,121 orders processed which consisted of 435 orders submitted through the GUI interface and 2,686 orders submitted through EDI. Of these orders that were processed, there were 2,347 EDI and 380 GUI for a total of 2,727 orders which received a FOC.

There were 193 LSRs that ended up as rejects, all of which were planned to reject. A total of 201 LSRs fell to manual intervention of which three of these were inadvertently processed and received a FOC but the results have been excluded from the calculation of PO-5 as per the requirements of the TSD.

PO-5 results for the System Capacity Stress Test indicate that 100% of the LSRs issued that received a FOC met the 20 minute benchmark. One LSR received a FOC in a little over 21 minutes, but this LSR was inadvertently handled manually and therefore excluded from Capacity Test results as per TSD 2.10 (see Appendix F, Stress Test PO-5 Results). However, CGE&Y has issued an IWO which documents the inadequacy of the PO-5 measure in that an order must FOC in order to be included in the measurement calculation of whether or not it met the benchmark. If it does not FOC, it is excluded from the measure.

The following provides a brief summary of the issues discussed above that were identified during the System Capacity Stress Test.

- During the third hour of the test, the EDI gateway experienced slow response times that failed to meet the PID benchmark. (see AZIWO2119)
- IRTM results for EDI response times were significantly different than the results calculated by using data collected by the Pseudo-CLEC (see AZIWO2119).

#### IRTM vs Pseudo-CLEC Pre-order Response Time

PO-1 measures response time, i.e., the interval between query and response, for seven different pre-order/order transaction types performed by the CLECs. The measure does not report actual CLEC results, but rather the results of simulations of CLEC queries. Qwest developed scripts for each type of transaction (e.g., appointment scheduling) whose steps (e.g., select “next” from a screen, choose a screen) were designed to reflect the activities performed by the CLECs. Qwest’s IRTM system performs simulations, and performance results are calculated from the simulations.

This measurement is intended to report against a “standard” response time that has been agreed to by the TAG and varies according to the specific transaction (above) and transmission medium (IMA vs. EDI).

According to Appendix C of the MTP, PO-1 is to be evaluated as part of the Functionality and Capacity Tests.

During the performance measurement audit of the PO-1 measure CGE&Y questioned whether IRTM response times were an adequate representation of true response times experienced by CLECs. The PID allows the exclusion of rejected requests, errors and those transactions which time out from the calculation of the PO-1 results. The IMA IRTM system has a time out of 230 seconds. Therefore, CGE&Y's assessment of IRTM during the Performance Measurement Audit was that only queries successfully processed in the normal course of doing business are used to calculate the PO-1 measurement, as opposed to what CLECs actually experience leading more to the conclusion that perhaps IRTM is not representative of pre-order response times experienced by the CLECs. CGE&Y issued AZIWO01 concerning this topic. CGE&Y further recommended that a method be developed to gather data for the PO-1 measure using actual CLEC response times. This issue was deferred with the position that CGE&Y would accumulate independent data on response times during the functionality and capacity portions of the OSS test to compare results to Qwest's IRTM results.

Data gathered early during the Functionality Test confirmed CGE&Y's initial evaluation of IRTM in regards to EDI transaction response times and resulted in the issuance of AZIWO1109. Qwest responded to this IWO stating its position that CGE&Y's data is inconsistent with IRTM's data and that the difference draws an apples-to-oranges comparison. Qwest believes that data gathered during functionality testing should not be used to evaluate IRTM because of decisions and actions on the part of the Pseudo-CLEC that have a significant effect on pre-order response times.

This IWO was discussed extensively between the parties during a TAG meeting. A general agreement was reached that actual CLEC pre-order response times will be gathered during the capacity portion of the OSS test and these results will be used to make the final determination of whether IRTM is a true representation of the response times experienced by the CLEC service representatives. Therefore, the functionality portion of the OSS test contains findings only on the functionality of Qwest's pre-order transactions and makes no conclusions as to whether or not the benchmark was achieved.

Results from the System Capacity Test reflect that performance benchmarks are met for the PO-1A and PO-1B measure regardless of whether the measurement tool is IRTM or actual CLEC data. For the most part, the results are very close but they are not identical; all are well within the benchmarks that have been agreed upon by the parties in Arizona.

The same analysis holds for comparing the IMA-GUI response times that were obtained during the System Capacity Stress Test to results obtained using IRTM. However, discrepancies arise when comparing stress test EDI results to that of IRTM. These discrepancies resulted in the issuance of AZIWO2119. Not only were IRTM results significantly different than results obtained using the Pseudo-CLEC data, but EDI failed to meet benchmarks for all the pre-order transaction types. Analysis of the Pseudo-CLEC data revealed that during the third hour of the stress test, nearly 500 responses were received with response times in excess of 200 seconds, the IRTM time out threshold. The inclusion of these time intervals in part explains the difference in results in calculating PO-1B using stress test generated data.

Qwest's response to AZIWO2119 acknowledged the 200 second time out associated with IRTM and argued that timeout thresholds are rarely experienced in the normal course of processing pre-order transactions, and that the result from the Capacity Stress Test could be due to the design of the EDI system. The design, coupled with the extraordinarily high volumes of transactions sent during the third hour of the stress test, placed the system in a condition that produced good transaction responses that exceeded the timeout threshold. However, IRTM results from the stress test did not reflect these long response time intervals.

Qwest further pointed out that the third hour of the stress test produced volumes far in excess of that originally planned, which was 150% of peak load from the 12-month Capacity Test. The actual load however during the third hour of the test was 220% of the peak hour load. Although the system did slow to the point of failing to meet benchmarks, all transactions were successfully processed under this extremely heavy load. The purpose of the stress test was to generate a heavy enough load to determine the point at which performance began to deteriorate. That point appears to be somewhere between 150% and 220% of the peak hour load. This load would never be realized in a production environment because Qwest's interfaces are scaled to support volumes on a minimal six month rolling basis. Qwest adds

hardware and software as these increased volumes begin to materialize. The relevance of this test is to determine that Qwest has sufficient capacity to support current load and that forecasted far enough in the future to allow time to ramp up.

For purposes of comparing IRTM to actual CLEC response time results, the two must be calculated the same. In other words, since IRTM excludes response intervals greater than 200 seconds, CGE&Y's calculated results using Pseudo-CLEC data must also exclude these transaction times. Table 4.1.3.1h provides Pseudo-CLEC results applying the timeout exclusion. Another factor that should be taken into consideration is that IRTM experienced an outage during the third hour of the stress test that appears to be unrelated to the stress test volumes. No data points were provided by IRTM from the 11 a.m. MST to 12 p.m. MST time frame which would also create differences between the Pseudo-CLEC and IRTM results. In order to make a valid comparison, all transaction times during this time period should be excluded from the calculation using Pseudo-CLEC collected data. Once this exclusion is applied, the EDI results obtained from the stress test are similar to those obtained from the 12-month Capacity Test.

CGE&Y finds that in spite of its earlier reservation dealing with IRTM, results tend to support that IRTM is an adequate measurement tool to gauge pre-order response times.

#### 4.1.4 Results

The System Capacity Test is designed to determine whether Qwest's current OSS are sufficient to process forecasted volume 12 months from the commencement date of the test. The test was conducted in a production environment supplementing existing production loads to arrive at anticipated forecasted volume. The Capacity Test extended over an eleven hour time frame, commencing at 7:00 a.m. MST on August 10, 2001, and ending at 6:00 p.m. MST. A total of 21,500 pre-order transactions were executed and reported consisting of 18,316 EDI and 3,184 GUI transactions. A total of 4,915 LSRs were submitted of which 4,217 were submitted through EDI and 698 through GUI.

The Capacity Test also includes a stress test, which places an additional load equal to 150% of the 12-month test's load to current production volumes. These loads are incrementally increased over a short time period. The purpose of this test is to gather performance measurement data during each of these time periods to evaluate in order to determine the capacity at which Qwest's OSS performance begins to deteriorate. The stress test was performed over a four-



hour period, 9:00 a.m. MST through 1:00 p.m. MST, and was conducted on August 17, 2001. A total of 14,387 pre-order transactions were executed consisting of 12,053 EDI and 2,334 GUI transactions. A total of 3,121 LSRs were submitted of which 2,686 were submitted through EDI and 435 through GUI.

The Capacity Test was originally intended to evaluate whether Qwest's systems could meet benchmark standards set for pre-order transactions (PO-1), percent order flow-through (PO-2) and firm order confirmations (FOCs) (PO-5) given the increased load. However, by definition, all Capacity Test orders are designed to flow through or are specifically intended to fall out for manual intervention, therefore by agreement of the sub-committee, the Capacity Test was limited in scope to evaluation of the PO-1 and PO-5 measures. Currently, Qwest does not measure actual CLEC pre-order transactions to report results for PO-1, but uses a simulated transaction system know as IRTM. An integral part of the Capacity Test is to collect actual response times experienced by the Pseudo-CLEC in order to compare results to those reported by Qwest during the Capacity Test using IRTM. This data will be utilized to facilitate a decision as to whether results generated from Qwest's simulated system is a true representation of pre-order transaction response times experienced by CLEC service representatives.

The first task of the Capacity Sub-committee was to determine the volumes to be used for the test. These volumes included expected demand for the entire Qwest 14-state region for those systems that support all 14 states. Regional systems were tested for volumes supporting that region. Once the committee agreed upon volumes they were submitted to the TAG for approval. Simultaneously, other aspects of the test plan were developed by the committee, which included order transaction mix, distribution between EDI and GUI, etc. Qwest provided CGE&Y the test accounts, which were then applied to the various scenarios. Once preparation activities for the test were complete, several ORTs were performed to ensure that all orders would flow through as anticipated and that the necessary processes to perform the test and gather the data generated were in place and functional. Once Qwest's systems successfully passed the 12-month test, the busy hour volume was used as the base for the stress test. This volume was incremented in fifteen-minute intervals until a volume 50% higher than the base volume was reached. This higher volume was input at a sustained rate for two hours.

The System Capacity and Stress Test yielded the following results:

- The 12-month forecasted volume for pre-order queries transmitted to Qwest's OSS were processed satisfactorily. At no time during the test did

the added test volumes, in addition to the normal production activity, cause Qwest's OSS to abnormally terminate or disrupt operations.

- ❑ The pre-order performance results (PO-1A (GUI) and PO-1B (EDI)) obtained from the 12-month Capacity Test are within the benchmarks required by the PID 6.3 for each query type (see Table 4.1.3.4-2 for a detailed list of the types of pre-order transactions along with the associated benchmark). This is true for the times reported by IRTM as well as times calculated from the test data provided by the Pseudo-CLEC.
- ❑ The FOC performance results (PO-5A (GUI) and PO-5B (EDI)) obtained from the 12-month Capacity Test are within the benchmarks required by PID 6.3, which is 95% of all FOCs received within twenty minutes for both GUI and EDI for all LSR product activity types. The only LSR that received a FOC time greater than the benchmark was an order intended to error out but was inadvertently handled manually by a Qwest employee. This order was excluded from the results since it was not handled in a mechanized environment as provided in Section 5.2.2.2 (b) of the TSD 2.10.
- ❑ PO-1A results obtained during the stress test are within the benchmarks required by PID 6.3 for all query types. This is true for the times reported by IRTM as well as times calculated from the test data provided by the Pseudo-CLEC.
- ❑ PO-1B results obtained during the stress test did not meet the benchmarks required by PID 6.3. During the third hour of the test, responses were delayed due to high transaction volumes. If EDI transaction intervals obtained during the third hour of the test are excluded from the results, as in CGE&Y's opinion should be the case (see discussion of AZIWO2119 in Section 4.1.4.2), the resultant average response times would then be within the PID benchmarks and comparable to results achieved by IRTM.
- ❑ PO-5A and PO-5B results obtained during the stress test are within the benchmarks required by PID 6.3 for all LSR product activity types. The three LSRs that received a FOC time greater than the established benchmark were manually handled and excluded from the results as provided in Section 5.2.2.2 (b) of the TSD.
- ❑ The level of performance for receiving pre-order responses from Qwest's OSS begins to deteriorate with loads in excess of 150% of the peak hour load.

- ❑ Data from the 12-month Capacity Test reflect that IRTM is an adequate tool for gauging pre-order response time intervals Qwest’s OSS are providing to the CLECs. Once the timeout exclusion is applied to EDI results from the stress test, stress test results also support this conclusion.

Given the above findings it is CGE&Y’s conclusion that Qwest’s OSS continued to provide a level of performance well within the benchmarks established during all phases of the System Capacity Test.

Exit Criteria

For the System Capacity Test to be considered completed, per the MTP and TSD, the following exit criteria needs to be satisfied:

Criterion	Completed
The pre-order and order System Capacity Test has been completed according to the plan	✓
All tests against the appropriate performance measurements including associated pre-ordering and ordering benchmarks have been completed	✓
All incidents that were opened in conjunction with the System Capacity Test have been resolved and/or closed	✓
All of the data associated with the System Capacity Test has been captured and retained by the Pseudo-CLEC	✓
The System Capacity Test evaluation and findings are included in the TA’s final report compiled for the ACC	✓
All documentation related to the System Capacity Test is verified as complete by the TA and stored in the master project file	✓
All orders have been cancelled prior to provisioning	✓

## 4.2 Systems Scalability

### 4.2.1 Introduction

Qwest's pre-order and order activities depend on the capabilities of its OSS. CGE&Y performed a System Scalability review to determine if Qwest has adequate procedures for scaling their systems so that they will have adequate capacity to handle CLEC loads. The System Scalability review includes an examination of the OSS interfaces, systems that support the interfaces, and databases that are accessed in order to provide the necessary information for the OSS function.

In this review, CGE&Y evaluated Qwest's

- procedures for tracking OSS load and capacity,
- procedures for forecasting future OSS load,
- process for providing OSS computer growth, and
- historical OSS load information.

System Scalability also evaluates the backup, security, disaster recovery and procedures that guide Qwest's staff in executing the OSS interface data security processes.

### 4.2.2 Scope

This section describes the scope of the System Scalability review. The first step was to gather all relevant documentation to review and gain an understanding of the processes and procedures in place to detect the need to, and, increase system capacity without affecting system performance. See Appendix C for a list of documentation that was reviewed as part of this evaluation. In addition to the review of documentation, CGE&Y conducted structured discussions with Qwest subject matter experts (SMEs). These discussions were used to gain clarification on sections of the received documentation, to better understand the Qwest system architecture, and in general, to gain knowledge of the capacity adjustment procedures used within Qwest to better determine the adequacy of these procedures.

A review of Qwest's procedure for tracking OSS loads and capacities was conducted (Capacity Analysis-IMA). Interface traffic, processing utilization, and industry performance measurements are included in the review.

An evaluation of the procedure for forecasting OSS loads was necessary in order to determine if this was performed in accordance with the documentation

received. This evaluation includes comparing previous forecasts against historical OSS load information for both Qwest and CLEC activity.

CGE&Y's architecture SMEs performed an assessment to determine if Qwest's OSS interfaces can quickly be made scalable to accommodate increases in CLEC volumes beyond the volume that was planned for the Capacity Test. (see section 4.1.3.1 for a comparison of planned pre-order and order volumes versus actual Capacity Test volumes) CGE&Y performed this analysis based on documentation provided by Qwest. The documentation details how Qwest has designed its OSS interfaces to be scalable for increased demand.

The scope of the System Scalability review is summarized as follows:

- Review procedures for tracking OSS loads and capacities (IMA Capacity Analysis)
- Evaluate procedures for forecasting future OSS loads /Wholesale CLEC Forecast/Projections
- Assess process for providing OSS computer growth /Comprehensive Mainframe Planning
- Conduct interviews with Qwest network managers
- Perform a review of the Qwest disaster recovery process

#### **4.2.3 Process**

CGE&Y met with Qwest management to review their processes and conduct interviews. During these meetings a number of questions as stipulated in the TSD and contained in Table 4.2.3a, were directed to the appropriate Qwest managers. In preparation for this meeting, CGE&Y reviewed Qwest's Capacity Planning Process document. The documentation included a description of the process and forecasting assumptions to support projected CPU demand, memory utilization and transfer rate used to determine future capacity requirements.

#### Test Results and Analysis

CGE&Y's overall analysis of Qwest's ability to ramp up system capacity to handle increased volume consisted of reviewing Qwest's documentation, conducting interviews and if possible, observing Qwest's ability to carry out procedures contained within the documentation. As part of its evaluation, CGE&Y reviewed Qwest's procedures for tracking OSS loads to determine when to implement a project to increase capacity and its process for forecasting CLEC demand for OSS functions. The planning and implementation for OSS growth was also analyzed along with a review of Qwest's disaster recovery process.

❖ Review procedures for tracking OSS loads and capacities

Information about Qwest's procedures for tracking OSS loads and capacities was gathered during the interview to supplement the information contained within the "Interconnect Mediated Access Capacity Analysis" documentation that was provided. The IMA production/test environment consists of two servers: the IMA web server and the IMA business server. Measurement tools contained within these servers are used to monitor the overall system utilization (global) as well as transaction based utilization.

❖ Evaluate procedures for forecasting future OSS loads/Wholesale CLEC Forecast/Projections

The "Wholesale CLEC Forecast/Projections" report was supplied to aid in CGE&Y's understanding of the processes in place within the Qwest wholesale organization to provide CLEC forecasting information. This information is developed through the combined organizational effort of the Finance, Service Delivery, Strategic Planning and Wholesale Interconnections Operations teams in order to provide anticipated volume outputs that support Product, Interconnection Operations and Network Centers, and personnel allocation planning efforts. The report also describes, in part, the ability for scalability changes and contingency planning in support of changing CLEC needs. Qwest employs a thorough and encompassing analysis on historical data, information they receive from the account management and product management teams. These data are then used to create trends, which are further refined into forecasts. For purposes of confidentiality, CGE&Y cannot detail the actual procedures that Qwest takes in order to produce their future OSS loads and CLEC forecasts. This data is also used to determine the necessary levels of support personnel required to maintain CLEC support as well as normal business requirements. CGE&Y was dually impressed with Qwest's contingency plans, which address dramatic increases in CLEC volume activities.

❖ Assess process for providing OSS computer growth /Comprehensive Mainframe Planning

CGE&Y referenced Qwest's "Comprehensive Mainframe Planning Process" documentation for information about Qwest's process for providing OSS computer growth and comprehensive mainframe planning. In the past, Qwest's planning for mainframe processor, memory, disk and tape sub-areas was done by groups responsible for each sub-area and was not totally integrated. Changes to the sub-area plans were not always coordinated, resulting in potentially unnecessary procurement and potential software unavailability resulting in increased licensing costs. Qwest recognized this area for improvement and

implemented a team of Information Technology (IT) professionals to reengineer this process. Now, Qwest's OSS computer growth and mainframe planning is conducted by a central team which has led to improved coordination of hardware changes and a reduction of unnecessary expenses.

❖ Conduct interviews with Qwest network managers

CGE&Y interviewed one of Qwest's data communications managers. He described Qwest's network architecture as it relates to the CLEC environment. CLECs can access IMA by dialup or private line. The manager described the network's redundancy, protocols and monitoring software in place to monitor the network.

Qwest's backbone network consists of high-speed links (T1 and above) between the data centers. In each data center Fiber Distributed Data Interface (FDDI) Local Area Networks (LANs) provide high speed communications between the multiple routers in each location and the OSS, gateways, and communications servers that provide CLEC access, via a firewall, to IMA which then routes the information (LSR or pre-order transactions) to the appropriate OSS.

Multiple high-speed links and multiple servers provide for disaster recovery and provide additional bandwidth for user traffic.

❖ Perform a review of the Qwest disaster recovery process

In addition to interviews with Qwest SMEs, CGE&Y referenced Qwest's "Disaster Recovery Plan" to gather information about Qwest's disaster recovery process. This process is designed to provide response resources commensurate with the magnitude and scope of any event or situation that would have a significant negative impact on Qwest, its employees or customers. Qwest has implemented teams at each level and across areas in order to react and deal with situations with a standard recovery process. Qwest has established procedures for guiding team members through issues to a successful recovery. Qwest also has documented guidelines to assist employees to the transition to normal operations and steps to resolve any gaps that were identified to improve the overall process. The disaster recovery plan outlines the roles and responsibilities of response teams, management teams, operations centers and staff.

The System Scalability review is to provide answers to certain questions detailed in Section 5.3.3 of the TSD 2.10. Table 4.2.3a describes these questions, which were asked during the interview process, along with the responses to those questions. Review of Qwest provided documentation along with information gathered during the interview process were the basis for

CGE&Y's findings contained within the Results section below. In addition, Qwest provided CGE&Y access to internal websites that provided information to augment the documentation and the interviews. Where feasible, CGE&Y made observations to ensure Qwest's current operations were capable to implement the scalability procedures described within the documentation.

**Table 4.2.3a System Scalability Questionnaire**

<b>Scalability Evaluation</b>			
<b>Item</b>	<b>Evaluation Criteria</b>	<b>Result</b>	<b>Comments</b>
<b>Mechanized Interfaces</b>			
1.	Is there a defined documented EDI migration path for CLECs to develop automated interfaces to connect to Qwest?	Yes	Qwest has documentation that supports the EDI APIs.
2.	Are Qwest's electronic interfaces scalable to support CLEC inter-connectivity to Qwest systems?	Yes	This is done through both network and systems planning.
3.	Is the WAN network backbone adequately sized to meet current and projected CLEC usage?	Yes	The Network Capacity Planning Group within Qwest is responsible to monitor the WAN, project future CLEC demand and timely plan for reinforcement to the network. Process and procedures are supported through documentation.
4.	Is network dial in access for CLEC dial in users sufficiently scalable to support increased network workloads?	Yes	Qwest's design was built to scale by number of access lines to terminating modem poles using Cisco equipment.
5.	Are appropriate network protocols for current and projected CLEC transaction activity utilized?	Yes	Qwest has various protocols for different access methods, including mail, e-mail, fax, dial-in, EDI and private T1 with web GUI. Protocols used are TCP/IP, Fax modem and standard modem protocol.
<b>Automated Systems</b>			
1.	Are processes for capacity planning and design in place, sufficient and effectively executed by Qwest?.	Yes	The Wholesale Interconnect Group has a staff of planners responsible for

Scalability Evaluation			
			capacity planning for automated systems. Qwest's documented processes adequately support this function and the process is well-defined through the IMA System Scalability Process Document and Process Flow Diagram which were reviewed by CGE&Y.
2.	Is there a documented process and methodology in place, which is used to analyze the scalability of systems gateways and interfaces?	Yes	The Capacity Planning Group is responsible for analyzing the scalability of both the system gateways and interfaces. The process and methodology are included in the IMA System Scalability Process Document and Process Flow Diagram.
3.	Do redundant sites exist for use in processing CLEC orders?	Yes	Thornton and Denver, Colorado are primary data centers for processing of CLEC orders with the Omaha, Nebraska Data Center responsible for back up. The change over to redundant servers is transparent to the co-provider in the case of hardware failure.
4.	Do the OSS and gateway interfaces in use adequately scale to support projected capacity growth? Will the Gateway and other architectures in use by Qwest scale quickly for unexpected CLEC growth?	Yes	Gateways scale by use of modular components in regards to operations support. Currently the Load and Performance Group certify that the OSSs and gateway interfaces will adequately support projected volume. The IMA System Scalability Process Document and Process Flow Diagram provide the supporting documentation for the Load and Performance Group to utilize in performing its



<b>Scalability Evaluation</b>			
			certification.
5.	Is the amount of disk storage per server actively monitored and managed?	Yes	The Capacity and Planning Group within the Communications and Information Services (CIS) organization is responsible for management of disk storage space. Qwest monitors each server with set parameters and paging for alarms
6.	Are the thresholds for acquiring additional disk storage sufficient to accommodate unexpected CLEC growth?	Yes	Qwest has dynamic storage systems (databases) which are connected to the enterprise shared storage systems. Logging systems with more than 100GB of storage will also be connected to enterprise shared storage.
7.	Is there an established disaster recovery planning process?	Yes	Qwest's Technical, Policy, Standards and Processes Group provides a document with a template to ensure every application is properly planned and documented. This is a Qwest regional standard. Every application is required to complete this document before going into production. Qwest tracks all information concerning the implementation of the application in order to be able to re-create the application in the case of a disaster.
8.	Is the disaster recovery process periodically tested to assess Qwest's ability to recover from a disaster?	No	At the time of the scalability evaluation Qwest did implement periodic walk-throughs to ensure anything that has changed is updated such as contacts, software, infrastructure, etc. However, as was determined during the second attempt of performing the Capacity

Scalability Evaluation			
			Test CGE&Y discovered that Qwest does not conduct actual disaster recovery tests to verify their procedures. AZIWO1193 was issued in response to this observation.
9.	Are tape backup procedures in place and actively utilized with archival procedures used to secure the backups?	Yes	Qwest provides backup for their systems using the IBM product ADSM. The backup is accomplished by a UNIX process (daemon) running locally on each box.
10.	Is there an established methodology for maintaining CLEC processing levels?	Yes	Currently there is an Interconnect Response Time Measurement (IRTM) tool that monitors pre-order response times. Any trending up of response times is investigated. However, Qwest has procedures in place to monitor every aspect of performance to its CLEC customers. One such mechanism is through its Performance Indicator Definitions which produces monthly results on 47 areas of performance. If a negative impact on processing levels is detected, the Capacity Planning Group investigates and if necessary, begins planning a relief project.
11.	Is there an established methodology for monitoring the ability to scale? Is sufficient monitoring done and is it effective to implement solutions that provide sufficient service levels to CLECs?	Yes	There is both a scope specific process for forecasting quarterly (forecast up to three quarters into the future) and actively for daily and hourly spikes (Capacity Planning System-CPS). The ability to scale is monitored on a daily/monthly basis. Data are collected to ensure that Qwest is operating within the limits of the forecast. If

<b>Scalability Evaluation</b>			
			actual volume appears to be exceeding the forecast, corrective steps are taken immediately.
12.	Is there a process in place to monitor transaction response times and are success ratios frequently reviewed to identify systems opportunities to improve them?	Yes	The project team, which implements the IRTM tool that monitors response times, is responsible for reviewing results and detecting trends in response intervals and failure rates. Any trending up of response times or time outs is investigated for potential corrective action.
<b>Capacity Planning Procedures</b>			
1.	Are there established processes for obtaining performance data to determine future growth patterns?	Yes	Data are collected and published on the Qwest Planning website which is an automated system. Qwest utilizes this data to develop a history in order to trend future growth.
2.	Is the performance data gathered in accordance with the processes to sufficiently allow proper forecasting of system growth for CLECs?	Yes	The Capacity Planning Group collects more than 75 data points every 10 minutes and stores that data for 45 days in an oracle RDBMS. The data are then rolled up to hourly averages for historical views (when the data is aged off after 45 days) and for forecasting (forecasting uses both 10 minute and roll-up data). Forecasting is now being done against actual business functions (from the Key Business Indicators Group) against the CPS utilization forecast and systems upgrades are engaged months before thresholds are realized.
3.	Are capacity planning procedures documented, in place, and executed by Qwest?	Yes	Qwest processes are currently evolving and documentation is constantly



<b>Scalability Evaluation</b>			
			updated to meet new business needs. Refer to the IMA System Scalability Process Document and Process Flow.
4.	Are capacity planning processes designed to provide an acceptable level of quality?	Yes	The acceptable level of quality is determined by specific pass/fail criteria given to the Load and Performance Team.
5.	Is there an established process for the development of capacity planning functions and procedures and its use in performing scalability?	Yes	Reference to this is located in the IMA Scalability Process Document.
6.	Is there an established process for budgeting funds and resources in the support of capacity planning?	Yes	The CIS-Capacity Planning and Provisioning Organization is responsible for forecasting the annual budget and need for additional resources and receive their input with regard to wholesale systems from the IT department. This department is responsible for monitoring the capacity and utilization of their systems.
7.	Is scalability monitoring and planning accounted for in capacity planning and are procedures and processes in place to support scalability?	Yes	Qwest has a process in place to determine what must be done to increase capacity in the case of unforeseen volume and the length of time that is required in order to provide this additional capacity. In addition to forecasting in order to plan for capacity expansions, Qwest monitors actual utilization as compared to that which is forecasted in order to determine as early as possible if forecasted volumes are insufficient to meet actual demand. Performance levels are also monitored to make certain performance does not deteriorate given increased



<b>Scalability Evaluation</b>			
			demand. The above processes and procedures for supporting scalability are contained within Qwest's IMA System Scalability Process Document.
8.	Is systems growth actively monitored and needs analysis performed?	Yes	The Midrange Capacity Planning performance design group collects data (10 minute intervals) for over 1400 midrange servers. This data is utilized to monitor system loads to detect the point at which a relief project must be implemented in order to be operational prior to exhaust of capacity given current forecasted growth. This process is contained within the IMA system Scalability Process Document.
9.	Is performance monitoring software installed and used at all site locations?	Yes	HP's ITO Measureware Perfview (system name for Performance View) and Glance (Glance Plus Pack) software is used at each site location to monitor performance.
10.	Is systems performance monitored at acceptable levels?	Yes	The IT group within Qwest is responsible for monitoring the critical components of each system (ex; CPU, disk utilization, etc.) for performance and notifying CIS-Capacity Planning & Provisioning when such performance drops to a level requiring the need for reinforcement.
11.	Are systems databases accounted for in the capacity planning process?	Yes	The database community uses multiple diagnostic tools and is standardized on BMC's patrol for performance monitoring. This is documented and available in Qwest's IMA

Scalability Evaluation			
			System Scalability Process Document.
12.	Is capacity planning methodology documentation updated and maintained and is it available to the staff to support the capacity planning process?	Yes	Qwest maintains the CIS Capacity Planning and Provisioning web site which deals with capacity planning and systems monitoring. All documentation concerning capacity planning is placed on this internal web site and updated on a regular basis. In addition, the TPSP web site also maintains technical, policy, standards and process documentation and is available to all staff responsible for the support of capacity planning.

#### 4.2.4 Results

The System Scalability review evaluated Qwest’s processes, procedures and planning tools currently in place to adequately monitor Qwest’s OSS to scale for anticipated larger workloads. The evaluation included the review of Qwest’s procedures for capacity expansion to determine if adequate procedures are in place for scaling Qwest’s systems to provide sufficient capacity to handle future CLEC loads. This review also evaluates the backup, security, disaster recovery and procedures that guide Qwest’s staff in executing the OSS interface data security processes.

In order to adequately evaluate Qwest’s ability to scale its operation, CGE&Y obtained Qwest’s procedures for tracking OSS loads and capacities, forecasting future OSS loads and providing OSS computer growth in an effort to understand system architecture and gain knowledge of the capacity adjustment procedures used within Qwest. This information is necessary in order for CGE&Y to assess whether Qwest’s OSS interfaces can be made scalable to accommodate increases in CLEC volumes greater than those planned for in the Capacity Test within a timely manner.

CGE&Y’s analysis of Qwest’s processes, procedures and planning tools to support its systems scalability produced the following results:

- Procedures for tracking OSS loads and capacities are in place, actively being utilized and sufficient to detect unexpected increases in volume in order to react appropriately.
- Procedures for forecasting future OSS loads are within industry standards for planning purposes and are adequately maintained and followed by Qwest's systems staff.
- Processes are in place and actively followed for managing and providing the necessary CPU, memory and data storage requirements for Qwest's OSS computer growth.
- Qwest has adequate procedures in place to facilitate its staff in executing OSS interface data security processes.

In light of the above findings, CGE&Y's conclusion is that Qwest has adequate processes and procedures in place that are well documented to maintain system capacity sufficient to meet the required performance levels that have been established in order to provide a meaningful opportunity for an efficient CLEC to compete.

## 4.3 Staff Scalability

### 4.3.1 Introduction

The Staffing Scalability review involved determining whether processes were in place for Qwest to provide continued support to the CLECs for extraordinary events such as disaster or increased CLEC volumes. CGE&Y reviewed Qwest provided documentation and interviewed Qwest staff personnel for this review.

In addition to disaster recovery, Qwest pre-order and order activities depend in many cases on manual processes to adequately meet their CLEC customer's demand. CGE&Y performed a Staff Scalability review to determine if Qwest has the ability to increase the number of personnel available to perform these manual functions in a timely manner. The review includes evaluation of the following:

- Procedural framework that Qwest has in place to develop force models for its CLEC support centers (Qwest's support center workforce development modeling procedures)
- Linkages between Qwest's future volume projections and Qwest's workforce development modeling procedures
- Volume contingency plans that Qwest has in place to meet dramatic increases in CLEC order volume
- Disaster recovery plans that Qwest has in place to assure continued operations and
- Scalability of recruiting and training programs that Qwest has in place to provide for the availability of staff with the necessary skills to adequately perform the manual support functions

To support future workloads, the amount of Qwest staff needed to provide for the level of CLEC service agreed upon, as reflected in the Service Level Agreements (SLAs) and Performance Indicator Definitions (see Appendix B of the MTP), must be appropriately planned. The Staff Scalability review does not directly determine that Qwest currently employs the appropriate amount of staff, as it is not feasible to train and hire staff at this point in time. However, the planning process to add additional staff as the need is identified, in terms of the number of additional staff, the facilities in which to house the staff, and the required training, are assessed through this evaluation.

The Staff Scalability review includes:

- ❑ Review of Qwest provided documentation to gain an understanding of the processes and procedures in place to detect the need to reinforce existing

staff to keep pace with CLEC demand. See Appendix C for a list of documentation that was reviewed as part of this evaluation.

- ❑ Structured discussions between CGE&Y and Qwest SMEs to gain clarification on sections of the received documentation and in general, to gain knowledge of the practical procedures used by Qwest to supplement its staff
- ❑ Assessment of the support centers' ability to respond to increased workload and provide satisfactory resources to complete the manual intervention of non flow-through LSRs
- ❑ Examination of the support centers' workforce modeling procedures and baseline assumptions used to create the resource capacity requirements
- ❑ An analysis to evaluate the scalability of staffing, workstation capacity, training, forecasting, and responsiveness

#### 4.3.2 Scope

CGE&Y performed a staff scalability review to determine if Qwest has the ability to increase the number of personnel available to meet unexpected demand. This review included evaluation of the following:

- Procedural framework that Qwest has in place to develop force models for its CLEC support centers
- Volume contingency plans that Qwest has in place to meet dramatic increases in CLEC order volume
- Disaster recovery plans that Qwest has in place to assure continued operations
- Scalability of recruiting and training programs that Qwest has in place to provide for the availability of staff with the necessary skills to adequately perform the manual support functions

#### 4.3.3 Process

CGE&Y met with Qwest to review existing processes in relationship to staff scalability. The interviews were conducted at the Qwest offices in Denver, Colorado. Much of the discussion centered on the documents/processes that had been provided in advance of the interview process. Those documents were:

- A. Qwest Disaster Recovery Process
- B. Wholesale Markets ISC Business Continuity Plan
- C. Wholesale CLEC Forecast/Projections

To support future workloads, the amount of Qwest staff needed to provide for the level of CLEC service agreed upon, as reflected in the PID (see Appendix B of the MTP 4.2), must be appropriately planned. The results of the Staff Scalability review will not directly determine that Qwest currently employs the appropriate amount of staff, as it is not feasible to train and hire staff at this point in time to perform future work that may or may not materialize. However, the staff planning process, in terms of the number of staff, the facilities in which to house the staff, and the required training, are assessed through this evaluation.

CGE&Y reviewed Qwest’s documentation, listed above, pertaining to staff scalability and conducted interviews with Qwest SMEs. These discussions were used to gain clarification on sections of the received documentation and in general, to gain knowledge of the practical procedures used. As part of the evaluation, CGE&Y assessed the support centers’ ability to respond to increased workload in a timely manner and provide satisfactory resources to complete the manual intervention of non flow-through LSRs. In addition, an examination of the support centers’ workforce modeling procedures was conducted to determine if the baseline assumptions used to create the resource capacity requirements were sufficient. CGE&Y also performed an analysis to evaluate Qwest’s ability to increase staffing and workstation capacity and to provide adequate training. The adequacy of Qwest’s forecasting, in order to react in sufficient time to provide the necessary personnel to handle the increased volume, was also evaluated.

Test Results and Analysis

The Staff Scalability review is to provide answers to certain questions detailed in Section 5.4.3 of the TSD 2.10. Table 4.3.3a describes these questions, which were used during the interview process, along with the responses to those questions. Review of Qwest provided documentation along with information gathered during the interview process were the basis for CGE&Y’s findings contained within the Results section below. In addition, Qwest provided CGE&Y access to internal websites that provided information to augment the documentation and the interviews. Where feasible, CGE&Y made observations to ensure Qwest’s current operations were capable to implement the scalability procedures described within the documentation.

**Table 4.3.3a Staff Scalability Questionnaire**

	Staff Planning and Support	Satisfied	Comments
1.	Is there a process in place to temporarily increase staff for large-scale projects outside of the normal workflow environment?	Yes	Qwest is capable of outsourcing to a vendor currently under contract, which operates out of Dallas, Texas and Sierra Vista, Arizona for either a

	Staff Planning and Support	Satisfied	Comments
			short or long duration. During interviews, Qwest stated its satisfaction with its vendor's ability to provide staff support possessing a satisfactory level of competency in the telecommunications industry. Removing training issues and improving response times associated with hiring new staff to support short term peaks in volume enhances the value to Qwest.
2.	Is there a plans in place to train not only the staff but emergency overflow staff as well? Are estimated personnel orientation and training times reasonable and do they support the requirements for rapid change in the event of unexpected CLEC volume increases?	Yes	Qwest can provide center support through multiple channels to cover high increases in volume of a short duration. This is achieved through support from non-affected centers and the outsourcing reflected previously with the vendor located in Dallas and Sierra Vista.
3.	Is there a risk management plan in place that addresses how to handle the loss of key personnel and to cover contingencies for required personnel increases in support of unexpected CLEC growth?	Yes	This is reflected in Qwest's Disaster Recovery Process and in the event of unexpected growth each center can be supported from the balance of centers with outsourcing to provide temporary coverage. Qwest also maintains insurance coverage on key management personnel in order to provide for timely replacement.
4.	Is the number and timing of shifts for each working day consistent and adequate for the workload?	Yes	Qwest determines this through monitoring and maintaining histories of the work load in order to properly plan for and schedule the number of personnel required to cover the forecasted work load in a timely fashion. Qwest balances the workload through workload management, additional outsource partnering, employee overtime and temporary employees to allow for increases in volumes that occur either suddenly or gradually over time.
5.	Are physical limitations for future and temporary staffing such as office space and equipment addressed in scalability planning?	Yes	When current forecasts reflect exhaust of current office space, Qwest's Real Estate Department, which keeps track of all available office space, is alerted and prepares a plan to convert existing space to handle staff requirements. In the case of temporary staffing, Qwest outsources and has no need for

	Staff Planning and Support	Satisfied	Comments
			additional office space.
6.	Is training of the staff performed as an ongoing process?	Yes	Qwest maintains an internal training web site, which contains a training path for each job title. Each manager is responsible to ensure employees training profiles are kept up to date and employees are scheduled for additional training as appropriate.
7.	Are all staff job functions and descriptions clearly documented?	Yes	The web site mentioned above also contains a list of all management and non-management positions within Qwest. Included is a job description detailing each position's responsibility and function along with the skills and knowledge required to perform the job.
8.	Is the ISC/AMSC force model procedures and methodology documented and followed by the management and staff?	Yes	This is documented in the Wholesale CLEC Forecast/Projections, which is used to support product planning and network interconnection operations personnel allocation.
	<b>Manual Processes</b>		
1.	Can Qwest scale their workforce to confirm receipt to the CLEC of all paper source documents?	Yes	Personnel are assigned in each center to address this work function and performance measurements exist to evaluate Qwest's responsiveness.
2.	Can Qwest scale their workforce to provide sufficient personnel for collecting and distributing CLEC faxes?	Yes	Specific personnel in each work center are assigned this particular task and their performance is rated by the timeliness in which these faxes are distributed to the appropriate personnel in order for Qwest to provide a timely response.
3.	Is Qwest capable of scaling their workforce to manage and handle fall-out exception processing.	Yes	This is done through normal office requirements with volume contingencies covered through supporting centers and outsourcing.
4.	Is Qwest capable of scaling their workforce to provide adequate staff to support call center CLEC information requirements?	No	There is no evidence provided that Qwest monitors call center response times for CLEC support functions in order to determine whether adequate staffing exists to handle calls in a timely fashion and handle CLEC information requirements. This has been documented in AZIWO1194.
5.	Is Qwest capable of scaling their workforce to provide sufficient personnel for performing data entry through the CLEC access system for manual orders?	Yes	Qwest personnel do not use the CLEC assess system to input manual orders but inputs these orders the same as they would any retail service order. These orders are subjected to

	Staff Planning and Support	Satisfied	Comments
			the same performance measures as those electronically processed and the time the fax is received is used in determining whether Qwest meets its commitment for processing the order. Qwest actively monitors time delays in the input of these orders and takes appropriate action to increase work force either on a permanent or temporary basis when needed.
6.	Is there an established process in place for forecasting expected growth of CLEC business and unexpected growth?	Yes	Qwest maintains a mechanized forecasting process which is used to assist Qwest with determining personnel requirements. This allows the ISC to determine in advance, a reasonable expectation of future staffing requirements. This process is documented in the Wholesale CLEC Forecasting/Projections. Unexpected growth is identified early in the process through comparing existing volume with forecasted volume.
7.	Is there an established process in place for reviewing workload forecasts to determine their validity and accuracy?	Yes	Processes are in place to provide comparisons of current workloads to projected workloads. Documentation is in place and contained in the Wholesale CLEC Forecasting/Projections. According to this documentation, Qwest determines the number of employees required to complete certain tasks and then maintains a forecast for expected level of activity. This forecast determines the number of employees required to cover the expected work load. Once the forecast is prepared, current volume is compared to the forecast and adjustments to personnel are determined based on this comparison.

**4.3.4 Results and Recommendations**

As part of the Staff Scalability review, CGE&Y assessed Qwest’s staff planning process, in terms of the number of staff, the facilities in which to house the staff and the training necessary to bring new personnel up to the required level of productivity.

In conducting its evaluation, CGE&Y reviewed Qwest's support center workforce development modeling procedures and the link between future volume projections and workforce modeling procedures. Support centers were evaluated for their ability to respond to increased workloads and to provide adequate resources to handle the manual processing of non flow-through LSRs. Contingency plans to meet unforeseen increases in order volume, and Qwest's disaster recovery plans to assure continued CLEC support, were also evaluated. The ability of Qwest's recruiting and training programs to provide staff with the necessary skills to perform the manual support functions was also reviewed by CGE&Y.

CGE&Y's evaluation of Qwest's ability to increase personnel in order to process CLEC orders produced the following results:

- ❑ Sufficient CLEC support centers workforce development modeling procedure documentation is available.
- ❑ In-place volume contingency plans to meet dramatic increases in CLEC order volumes through either re-routing work to supporting ISC offices or outsource to a vendor are documented and available to Qwest staff and are sufficient to cover the daily work load.
- ❑ Disaster recovery plans are well defined to assure continued operations are in place and maintained.
- ❑ Recruiting and training programs to provide for the availability of competent staff with the necessary skills to adequately process CLEC orders are sufficiently documented.

Based on the above findings, CGE&Y concludes that Qwest maintains adequate forecasting procedures to identify the need for additional work force within a sufficient time frame that allows for appropriate training and placement.

## Appendix A – Glossary

ACC	Arizona Corporation Commission
Act	Telecommunications Act of 1996
ASR	Access Service Request
BOC	Bell Operating Company
BPL	Business Processing Layer
CFA	Connecting Facilities Assignment
CGE&Y	Cap Gemini Ernst & Young
CLEC	Competitive Local Exchange Carrier
CPU	Central Processing Unit
CSR	Customer Service Record
DLEC	DSL Local Exchange Competitor
DOJ	Department of Justice
EDI	Electronic Data Interchange
FCC	Federal Communications Commission
FDDI	Fiber Distributed Data Interface
FOC	Firm Order Confirmation
GUI	Graphical User Interface
IA	Interactive Agent
IMA	Interconnect Mediated Access
IRTM	IMA Response Time Measurement
ISC	Interconnection Service Center
IT	Information Technologies
IWO	Incident Work Order
LAN	Local Area Network
LNP	Local Number Portability
LSR	Local Service Request
M&R	Maintenance and Repair
MFJ	Modification of Final Judgement
MST	Mountain Standard Time
MTP	Master Test Plan
ORT	Operational Readiness Test
OSS	Operations Support Systems
PID	Performance Indicator Definitions
POTS	Plain Old Telephone Service
RBOC	Regional Bell Operating Company
SBC	Southwestern Bell Telephone Company
SCTDP	System Capacity Test Detailed Plan
SLA	Service Level Agreement

SME	Subject Matter Expert
SOP	Service Order Processor
TAG	Test Advisory Group
TN	Telephone Number
TSD	Test Standards Document
UNE-L	Unbundled Network Elements – Loop

### Appendix B – Incident Work Order Summary

IWO #	Incident Work Order	Qwest's Response	Results
AZIWO1128 <b>Withdrawn</b>	Qwest truncated leading zeros in the Functional Acknowledgement (FA) field (AK102) in Release 7.0. Therefore they could not match their inbound and their outbound transactions	Qwest stated that Qwest's implementation of the FA field is consistent with X.12 standards.	Not Applicable
AZIWO1143 <b>Closed</b>	Orders that were expected to receive a FOC did not receive one.	Qwest confirmed that 77 LSRs were valid but did not flow-through due to an intermittent read error by Fetch-N Stuff on some transactions returned from the downstream systems. Qwest made a configuration change in Fetch-N Stuff to enable Fetch-N Stuff to read all transactions. This will be evaluated as part of the Functionality Re-test.	System Improvement
AZIWO1144 <b>Closed</b>	7 LSRs are missing (LSR did not FOC or error)	Qwest confirmed that the seven LSRs did not receive a FOC but encountered an error in the BPL process. Qwest made system enhancements to correct this error and forwarded a copy of the code change to CGE&Y for verification	System Improvement
AZIWO1193 <b>Open</b>	System support personnel did not receive system alarms that were generated due to the Code Red Virus. If Qwest had performed regular disaster recovery tests this problem may have been detected.	IWO issued 9/26/01 and no response as of 9/27/01	
AZIWO1194 <b>Open</b>	There is no evidence provided that Qwest monitors call center response times for CLEC support functions in order to determine whether adequate staffing exists to handle calls in a timely fashion and handle CLEC information requirements.	IWO issued 9/27/01 and no response as of 10/1/01	
AZIWO2119 <b>Closed</b>	IRTM EDI results for the Stress Test were significantly different from the results generated using the HPC provided test data. The Stress Test generated over 500 Pre-Order Transactions with response times greater than 200 seconds. IRTM has none as responses greater than 200 seconds time out in IRTM and are therefore excluded from the performance measurement	IRTM excludes responses greater than 200 seconds resulting in the discrepancy in EDI response times. The long response times were due to delays caused by the extremely high volumes generated during the Stress Test. These volumes will not occur in the production environment given Qwest's current capacity planning and scalability procedures unless a CLEC experiences a failure on its EDI components.	Not Applicable



<b>IWO #</b>	<b>Incident Work Order</b>	<b>Qwest's Response</b>	<b>Results</b>
AZIWO3009 <b>Closed</b>	calculation.. Qwest IA issued duplicate file names causing new files to overwrite old files.	Qwest stated the the duplicate file names were created because the UNIX Operating System, not the Qwest IA had reached a limit due to the nature of the Capacity Test.	Not Applicable

## Appendix C – Source Documents

The following table contains the documents provided by Qwest and reviewed by CGE&Y as part of the Systems Scalability and Staff Scalability reviews.

Document Title	Source	Date Updated
Comprehensive Mainframe Planning Process	Hard Copy	October 20, 1997
Capacity Analysis Mediated Access	Hard Copy	April 1, 1997
Major Outage Process 9/99 Update	Hard Copy	September 22, 2000
Wholesale CLEC/Forecast/Projections	Hard Copy	September 22, 2000
USWEST Disaster Recovery Plan	Hard Copy	December 6, 1999
Wholesale Markets Business Continuity Disaster Recovery Plan	Hard Copy	June 9, 2000
Service Delivery Training and Development	Hard Copy	June 7, 2000

### Appendix D – 12-Month Test PO-5 Results

100% of the LSRs that received a FOC during the execution of the 8/10 System Capacity Test, received the FOC within 20 minutes.

STATE	Prod Type	Media	NUMERATOR	DENOMINATOR	RESULT	STD DEV
AZ	LNP	IMA	114	114	100%	0
CO	LNP	IMA	118	118	100%	0
MN	LNP	IMA	49	49	100%	0
ND	LNP	IMA	19	19	100%	0
OR	LNP	IMA	20	20	100%	0
UT	LNP	IMA	86	86	100%	0
WA	LNP	IMA	16	16	100%	0
AZ	UNE	IMA	24	24	100%	0
CO	UNE	IMA	10	10	100%	0
IA	UNE	IMA	3	3	100%	0
ID	UNE	IMA	6	6	100%	0
MN	UNE	IMA	10	10	100%	0
MT	UNE	IMA	8	8	100%	0
ND	UNE	IMA	1	1	100%	0
NE	UNE	IMA	11	11	100%	0
NM	UNE	IMA	7	7	100%	0
OR	UNE	IMA	1	1	100%	0
SD	UNE	IMA	1	1	100%	0
UT	UNE	IMA	18	18	100%	0
WA	UNE	IMA	14	14	100%	0
AZ	Resale	IMA	14	14	100%	0
CO	Resale	IMA	10	10	100%	0
IA	Resale	IMA	5	5	100%	0
ID	Resale	IMA	5	5	100%	0
MN	Resale	IMA	20	20	100%	0
MT	Resale	IMA	16	16	100%	0
NE	Resale	IMA	11	11	100%	0
UT	Resale	IMA	20	20	100%	0
AZ	LNP	EDI	124	124	100%	0
CO	LNP	EDI	499	499	100%	0
IA	LNP	EDI	82	82	100%	0
ID	LNP	EDI	33	33	100%	0
MN	LNP	EDI	342	342	100%	0
MT	LNP	EDI	62	62	100%	0
ND	LNP	EDI	56	56	100%	0
NE	LNP	EDI	70	70	100%	0
NM	LNP	EDI	80	80	100%	0
OR	LNP	EDI	24	24	100%	0
SD	LNP	EDI	53	53	100%	0
UT	LNP	EDI	350	350	100%	0

100% of the LSRs that received a FOC during the execution of the 8/10 System Capacity Test, received the FOC within 20 minutes.

STATE	Prod Type	Media	NUMERATOR	DENOMINATOR	RESULT	STD DEV
WA	LNP	EDI	660	660	100%	0
WY	LNP	EDI	13	13	100%	0
AZ	UNE	EDI	50	50	100%	0
CO	UNE	EDI	151	151	100%	0
IA	UNE	EDI	32	32	100%	0
ID	UNE	EDI	18	18	100%	0
MN	UNE	EDI	91	91	100%	0
MT	UNE	EDI	28	28	100%	0
ND	UNE	EDI	26	26	100%	0
NE	UNE	EDI	17	17	100%	0
NM	UNE	EDI	14	14	100%	0
OR	UNE	EDI	27	27	100%	0
SD	UNE	EDI	3	3	100%	0
UT	UNE	EDI	82	82	100%	0
WA	UNE	EDI	138	138	100%	0
AZ	Resale	EDI	28	28	100%	0
CO	Resale	EDI	138	138	100%	0
IA	Resale	EDI	26	26	100%	0
ID	Resale	EDI	13	13	100%	0
MN	Resale	EDI	86	86	100%	0
MT	Resale	EDI	19	19	100%	0
ND	Resale	EDI	37	37	100%	0
NE	Resale	EDI	19	19	100%	0
NM	Resale	EDI	28	28	100%	0
OR	Resale	EDI	26	26	100%	0
SD	Resale	EDI	21	21	100%	0
UT	Resale	EDI	68	68	100%	0
WA	Resale	EDI	122	122	100%	0
<b>Total</b>			<b>4393</b>	<b>4393</b>	<b>100%</b>	

### Appendix E - Stress Test PO-5 Results

100% of the LSRs that received a FOC during the execution of the 8/10 System Capacity Test, received the FOC within 20 minutes.						
STATE	Prod Type	Media	NUMERATOR	DENOMINATOR	RESULT	STD DEV
AZ	LNP	IMA	61	61	100%	0
CO	LNP	IMA	66	66	100%	0
MN	LNP	IMA	30	30	100%	0
ND	LNP	IMA	9	9	100%	0
OR	LNP	IMA	9	9	100%	0
UT	LNP	IMA	37	37	100%	0
WA	LNP	IMA	9	9	100%	0
AZ	UNE	IMA	21	21	100%	0
CO	UNE	IMA	11	11	100%	0
IA	UNE	IMA	3	3	100%	0
ID	UNE	IMA	6	6	100%	0
MN	UNE	IMA	8	8	100%	0
MT	UNE	IMA	8	8	100%	0
ND	UNE	IMA	1	1	100%	0
NE	UNE	IMA	7	7	100%	0
NM	UNE	IMA	7	7	100%	0
OR	UNE	IMA	1	1	100%	0
SD	UNE	IMA	1	1	100%	0
UT	UNE	IMA	17	17	100%	0
WA	UNE	IMA	9	9	100%	0
AZ	Resale	IMA	4	4	100%	0
CO	Resale	IMA	8	8	100%	0
IA	Resale	IMA	2	2	100%	0
ID	Resale	IMA	2	2	100%	0
MN	Resale	IMA	14	14	100%	0
MT	Resale	IMA	8	8	100%	0
NE	Resale	IMA	7	7	100%	0
UT	Resale	IMA	14	14	100%	0
AZ	LNP	EDI	75	75	100%	0
CO	LNP	EDI	281	281	100%	0
IA	LNP	EDI	45	45	100%	0
ID	LNP	EDI	16	16	100%	0
MN	LNP	EDI	189	189	100%	0
MT	LNP	EDI	34	34	100%	0
ND	LNP	EDI	31	31	100%	0
NE	LNP	EDI	37	37	100%	0
NM	LNP	EDI	43	43	100%	0

100% of the LSRs that received a FOC during the execution of the 8/10 System Capacity Test, received the FOC within 20 minutes.						
STATE	Prod Type	Media	NUMERATOR	DENOMINATOR	RESULT	STD DEV
OR	LNP	EDI	14	14	100%	0
SD	LNP	EDI	26	26	100%	0
UT	LNP	EDI	191	191	100%	0
WA	LNP	EDI	368	368	100%	0
WY	LNP	EDI	8	8	100%	0
AZ	UNE	EDI	49	49	100%	0
CO	UNE	EDI	116	116	100%	0
IA	UNE	EDI	27	27	100%	0
ID	UNE	EDI	14	14	100%	0
MN	UNE	EDI	87	87	100%	0
MT	UNE	EDI	26	26	100%	0
ND	UNE	EDI	21	21	100%	0
NE	UNE	EDI	14	14	100%	0
NM	UNE	EDI	13	13	100%	0
OR	UNE	EDI	28	28	100%	0
SD	UNE	EDI	3	3	100%	0
UT	UNE	EDI	71	71	100%	0
WA	UNE	EDI	110	110	100%	0
AZ	Resale	EDI	19	19	100%	0
CO	Resale	EDI	84	84	100%	0
IA	Resale	EDI	18	18	100%	0
ID	Resale	EDI	8	8	100%	0
MN	Resale	EDI	59	59	100%	0
MT	Resale	EDI	14	14	100%	0
ND	Resale	EDI	26	26	100%	0
NE	Resale	EDI	13	13	100%	0
NM	Resale	EDI	19	19	100%	0
OR	Resale	EDI	18	18	100%	0
SD	Resale	EDI	15	15	100%	0
UT	Resale	EDI	46	46	100%	0
WA	Resale	EDI	71	71	100%	0
<b>Total</b>			<b>2727</b>	<b>2727</b>	<b>100%</b>	

## **Appendix F – System Capacity Test Detailed Plan**



# Cap Gemini Ernst & Young Telecom Media & Networks

**July 25, 2001**

**System Capacity Test Detailed Plan**

**Prepared For:**

*Arizona Corporation Commission*

**Cap Gemini Ernst and Young  
2301 N Greenville Ave Suite 400  
Richardson, TX 75082**

1.	Introduction .....	3
1.1.	Purpose .....	3
1.2.	Scope of the Document .....	3
2.	Roles and Responsibilities.....	4
2.1.	Qwest.....	4
2.2.	CGE&Y – Test Administrator (TA).....	4
2.3.	Pseudo-CLEC – Test Generator (TG).....	4
2.4.	ACC/DCI.....	5
3.	System Capacity Test Architecture and Interface Overview.....	6
3.1.	Pseudo-CLEC Proprietary Notice .....	6
4.	System Capacity Test Assumptions .....	7
4.1.	General .....	7
4.2.	Pre-Order .....	7
4.3.	Order.....	7
5.	System Capacity Test Overview.....	8
5.1.	Scope .....	9
5.2.	Approach.....	10
5.2.1.	Pre-Ordering.....	10
5.2.2.	Ordering.....	12
5.2.3.	System Capacity Test Phase 4 (Stress Test).....	14
5.3.	System Capacity Test Performance Measures.....	14
5.4.	Test Mix .....	16
5.5.	Exit Criteria .....	16
6.	Activities Prior to the Test.....	18
6.1.	Entrance Criteria.....	18
6.2.	Activities .....	18
6.3.	Test Script Validation.....	19
6.4.	Certification Testing.....	19
7.	Operational Readiness Test (ORT).....	20
7.1.	Purpose of the Operational Readiness Test .....	20
7.2.	Objective of the Operational Readiness Test.....	20
7.3.	Scope of the Operational Readiness Test .....	20
7.4.	Operational Readiness Test Logistics and Dependencies.....	20
7.5.	Operational Readiness Test Execution Guidelines.....	21
7.6.	Test Check Items .....	23
7.7.	Exit Criteria .....	23
8.	System Capacity Test.....	24
8.1.	System Capacity Test Purpose .....	24
8.2.	Objective of the System Capacity Test.....	24
8.3.	System Capacity Test Logistics and Dependencies.....	24
8.4.	System Capacity Test Execution Guidelines.....	26
8.5.	System Capacity Test Deliverable Items.....	27
8.6.	Exit Criteria .....	27
8.7.	Test Analysis .....	28
9.	Cleanup Process .....	29
10.	Operational Readiness Test Execution Time Line .....	30
10.1.	Operational Readiness Test Time Line.....	30
11.	Test Execution Time Line .....	33
11.1.	System Capacity Test Time Line.....	33
12.	Report Formats.....	35
13.	APPENDIX A Communications and Problem Notification Plans .....	1
13.1.	Observation of Qwest operations by TA .....	1
13.2.	Normal Processing Procedures During Testing.....	1
13.3.	Extraordinary Processing Procedures.....	1

13.4	Time Intervals for Delivering Test Reports.....	1
13.4.1	Qwest Provided Reports.....	2
13.4.1.1	Performance Measure Reports.....	2
13.4.1.2	System Reports.....	2
13.4.1.3	LSR Report.....	2
13.4.2	TA/TG Provided Reports.....	2
13.4.2.1	General Reports.....	2
13.4.2.2	Performance Measure Reports.....	3
13.4.3	Pseudo-CLEC provided Data.....	3
13.4.4	Report Contacts.....	3
14	APPENDIX B Stand Alone Pre-Order Transactions.....	4
15	APPENDIX C System Capacity Test LSR Mix.....	5
16	APPENDIX D System Capacity Test Pre-Order MIX.....	8
17	APPENDIX E System Capacity Test Transaction Distribution.....	11
18	APPENDIX F Incident Work Order Form Example.....	12

# **1. Introduction**

## **1.1. Purpose**

This document describes the procedural framework for the planning, preparation, execution, reporting and required clean-up efforts prior, during and after the execution of the System Capacity Test component of the Capacity Test for the Arizona 3<sup>rd</sup> party testing effort. General issues related to ramp-up, interaction and communication among the involved parties, reporting burdens and clean-up and ramp-down activities are presented to ensure that an overall framework is established and agreed upon.

## **1.2. Scope of the Document**

This document describes the procedures that will be employed by the various organizations involved in the performance of the Capacity Test. The main components of this document include:

- Capacity Test Overview
- Roles and Responsibilities
- Test Assumptions
- Test Preparation
- Operational Readiness Test
- Test Execution
- Test Analysis
- Communication between parties before, during and after the test
- Reporting responsibilities of all involved parties
- Cleanup activities associated with the test

## **2. Roles and Responsibilities**

This section outlines the roles and responsibilities of the parties involved during the planning, pretest, test, and post-test stages of the Capacity Test. The parties involved in this test are:

- Qwest
- CGE&Y (Test Administrator)
- Pseudo-CLEC (Test Generator)
- ACC/DCI

### **2.1. Qwest**

Qwest is responsible for the following:

- a) Preparing the Test Accounts to be used for the Capacity Test
- b) Providing the TA with Qwest's LSR volume forecasts
- c) Supporting Pseudo-CLEC's installation of the Qwest IA
- d) Monitoring the IMA-GUI and IMA-EDI Gateways during the Test
- e) Providing the reports specified in the Test Standards Document and The Test Communications Document to the TA
- f) Canceling the LSRs and Service Orders after each Test
- g) Returning reserved Telephone Numbers after each test

### **2.2. CGE&Y – Test Administrator (TA)**

CGE&Y is responsible for the following:

- a) Providing a detailed Test Plan
- b) Designing The Capacity Test and determining order volume mix and arrival rates
- c) Preparing test scripts for the pre-order and order Capacity Tests
- d) Validating Test Accounts
- e) Monitoring Test Execution
- f) Analyzing the results of the Capacity Test
- g) Providing Reports, specified in the Communications Document, to Qwest
- h) Providing Final Report to the ACC

### **2.3. Pseudo-CLEC – Test Generator (TG)**

Pseudo-CLEC is responsible for the following:

- a) Developing a test harness that will generate the order volume, mix, and arrival rates defined by the TA
- b) Updating EDI to conform with EDI Release 7.0 for the products that are in the scope of the capacity test
- c) Updating IMA Logger and Loader to conform with IMA Release 7.0
- d) Developing and testing the multi-server environment
- e) Replacing the Templar Interactive Agent (IA) with the Qwest provided IA

- f) Inputting Test Scripts to the EDI form tool and the IMA loader
- g) Validating Test Scripts
- h) Capturing and logging test information and providing that information to the TA

#### **2.4. ACC/DCI**

The ACC and DCI have oversight responsibility for the Capacity test.

### **3. System Capacity Test Architecture and Interface Overview**

To perform the Capacity Test it was necessary to change the Interactive Agent (IA) from the Templar IA to the Qwest IA. In addition, Pseudo-CLEC developed a multi-server environment. This environment will allow the TG to submit the volumes required for the test.

#### **3.1. Pseudo-CLEC Proprietary Notice**

The information contained in this section constitutes a trade secret and/or information that are commercial or financial and confidential or privileged, prior to the Report's release by the Arizona Corporation Commission. This restriction does not limit the right to use or disclose this information if obtained from another source without restriction. Hewlett-Packard Consulting makes no warranties, guarantees or commitments to any party with regard to the information disclosed herein.

**[The remainder of section 3 has been redacted as confidential]**

## 4. System Capacity Test Assumptions

### 4.1. General

The general assumptions pertaining to the Capacity Test are:

- a) The Capacity Test will be performed between the hours of 7AM to 6 PM MST (AZ time)
- b) Pseudo-CLEC will generate 85% of the LSRs and Pre-Order transactions via EDI and 15% via GUI
- c) Transactions will approximate the percentages by hour as stated in the tables in APPENDIX E
- d) The Capacity Test will be performed using IMA-EDI version 7.0 and IMA-GUI version 7.0
- e) Test Accounts used for EDI and GUI transactions will be mutually exclusive

### 4.2. Pre-Order

- a) Pre-Order Transactions will be distributed in the same pattern as the LSRs will be distributed. (See Appendix E)
- b) The same Pre-Order Transactions(e.g. multiple Review CSR transactions) will not be replicated against the same account in intervals of less than 15 minutes
- c) 15% of Conversion Orders will add a line, therefore:
  - For Appointment scheduling, and Facility availability, 15% additional transactions will be added to account for these new lines
  - IRTM transactions will account for the additional TN Reservation transactions for new connects, change orders adding lines and converting orders adding lines.
- d) 70% of UNE orders will generate a Feature Availability transaction

### 4.3. Order

- a) LSRs will not be replicated against the same account in intervals of less than twenty minutes
- b) Orders will be spread across Product Activity Type in the same percentage as the overall LSR percentage (see Appendix C)Accounts will be distributed in such a way as to provide maximum geographic dispersion and minimum replication
- c) Resale and UNE – P new orders will be entered manually during the Capacity Test to accommodate Release 7 EDI changes that require a TN Reservation and a Appointment Schedule transaction prior to submitting an LSR.

## 5 System Capacity Test Overview

The System Capacity Test will validate that Qwest's OSS and processes can handle loads equal to or greater than estimated Pre-order and Order volumes projected one year from the date of the running of the Capacity Test (3Q 2002). The test is currently scheduled to be performed in 3Q 2001.

The test will be performed in four phases. The transactions will be entered at the same proportionate rate as the historical transactions, which will be provided by Qwest. That is, if 10% of the current daily load is input from 10AM – 11AM, then 10% of the test load will be input in the same timeframe. Appendix E shows the distribution.

Prior to performing Phase 1 of the Test, an Operational Readiness Test (ORT) will be performed to ensure that implementing the Capacity Test will not adversely affect Qwest's production environment. The ORT will also ensure that the test bed of test accounts to be submitted during the system capacity test are all capable of being processed by Qwest without falling out for manual handling.

Phase 1 test will be performed with volumes that represent the forecast volumes twelve months after the start of the System Capacity Test. Results will be evaluated to determine whether the benchmarks have been met.<sup>2</sup> Incident Work Orders (IWOs) will be issued as necessary and in a timely manner. If the benchmarks are met, Phase 4 test (Stress Test) will be performed with volumes that represent the forecast of peak volumes twelve months into the future. If the benchmarks are not met, the Phase 2 test will be performed.

Phase 2 test will be performed with volumes that represent the forecast volumes nine months after the start of the test. Results will be evaluated to determine whether the benchmarks have been met.<sup>3</sup> IWOs will be issued as necessary and in a timely manner. If the benchmarks are met, the Phase 4 Test will be performed with volumes that represent the forecast of peak volumes nine months into the future. If the benchmarks are not met, the Phase 3 test will be performed.

Phase 3 test will be performed with volumes that represent the forecast volumes six months after the start of the test. Results will be evaluated to determine whether the benchmarks have been met.<sup>4</sup> IWOs will be issued as necessary and in a timely manner. If the benchmarks are met, Phase 4 test will be performed with volumes that represent the forecast of peak volumes six months into the future. If the benchmarks are not met, Qwest will be provided an opportunity review the results and make system changes before continuing testing. Re-testing will be performed if the six-month test is not passed.

Phase 4 is designed to stress Qwest systems and will be performed over a four-hour period. The busy hour volume from the successful Phase 1, 2 or 3 tests will be the base for the Phase 4 test. This volume will be incremented in fifteen-minute intervals until a volume 50% higher than the base volume is reached. This higher volume will be input entered at a sustained rate for two hours. Re-testing will be performed if the six-month peak volume test is not passed.

---

<sup>3</sup> Success criteria for the twelve month volume level are either passing the PO-1 and PO-5a benchmarks or passing the scalability evaluation.

<sup>3</sup> Success criteria for the nine month volume level are either passing the PO-1 and PO-5a benchmarks or passing the scalability evaluation.

<sup>4</sup> Success criteria for the six month volume level are either passing the PO-1 and PO-5a benchmarks or passing the scalability evaluation.

The Capacity Test will focus on the systems and interfaces in Qwest's processing flow up to and including processing into Qwest's service order system. (The service order processor must receive the order for it to cause IMA to provide FOCs.) Evaluation of Qwest systems beyond the service order system is outside the scope of the System Capacity Test.

The Capacity test is not designed to test manual processes. Therefore, only LSRs, which are eligible for flow-through to the service order system or LSRs containing known errors that will be processed electronically, will be submitted during the test. If any known errors do fall to manual processing, the ISCs have been instructed not to process the errors. Given the extensive efforts during the ORT to ensure that the test accounts only include orders that flow through (with the exception of the LSRs that contain intentional errors), an excessive amount of LSRs that fall to manual processing may result in an IWO being created or may result in the need for retesting.

The test will include:

- Standalone Pre-Order transactions
- Pre-Order transactions associated with LSRs
- LSRs

The LSR volumes have been determined by analyzing current actual data and Qwest forecasts that have been agreed-upon by the parties. The forecast was provided by product type, and non flow-through volumes have been applied to flow-through products.

The Pre-Order volumes will be determined by reviewing the pre-order transactions associated with creating an LSR (See table 5.2.1-1) and calculating the stand-alone transactions from the formula (See Appendix B) Qwest provided to the Capacity sub-committee and presented to the TAG.. Pre-Order volumes are shown in Appendix D.

## 5.1 Scope

The scope of the System Capacity Test is to evaluate whether the relevant Qwest systems have sufficient capacity to handle the defined workload volumes required to support CLEC pre-order and order activities at the currently defined performance benchmarks. This evaluation will make no finding on Qwest's ability to handle volumes of LSRs that fall to manual processing. The defined workload volumes, as approved by the TAG, was determined by a review of historical data and forecasts to reflect typical operations for one year into the future (3Q 2002). The CTTG will generate necessary quantities of simulated activity for processing via Qwest's GUI and EDI gateways.

Since the intent of the System Capacity Test is to validate the performance capacity of the systems, LSRs that will flow-through to the Qwest Ordering processors, including LSRs that will trigger errors and rejections that can be handled in a mechanized environment, will be used.

The System Capacity Test will be run in Qwest's live production environment. The capacity tests for orders will go through the ordering process until the issuance of a FOC or the order is placed into the proper error queue. Qwest's Maintenance & Repair, Electronic Bonding Interface (EBTA), (CEMR), billing and usage, and CRIS systems are out of scope for the purposes of this test.

Following receipt of FOCs or reports providing information that rejected orders were placed into the proper error queues, the orders are eligible to be cancelled. Any capacity test orders that fall into the error queue will also be cancelled and will not be processed by Qwest's ISCs. This cleanup effort will be done during non-business hours and will not be tracked for the System Capacity Test. As an additional

safeguard against provisioning activities being accidentally carried out by Qwest, an extended LSR due date of a maximum of 75 business days in the future will be used for POTS and LNP LSRs. For UNE Loop Orders and UNE Loop with LNP, the extended due date will be a maximum due date of 36 business days into the future. These are the maximum due dates Qwest's business rules will allow LSRs to flow through without special handling.

## 5.2 Approach

The following sections define the test requirements and detail the overall process for conducting, administering and managing the System Capacity Test as required by the MTP. The test requirements and specification plan for the test will be reviewed with the , TAG prior to conducting the System Capacity Test. To maintain fairness and blindness of the test, Qwest and the CLECs will not know, in advance, the actual dates that the System Capacity Tests will be performed.

### 5.2.1 Pre-Ordering

The pre-order process functions included within the Capacity Test will include the same activities as the Functionality Test with the exception of the CFA transaction.

The Test Generator will provide pre-ordering volumes sufficient to cover the planned test workload over periods expressed in hours. The total number of queries required for the pre-order tests will be as follows:

Phase	TOTALEDI	GUI	
Phase 1	20083	17071	3012
Phase 2	10443	8877	1566
Phase 3	7000	5950	1050
Phase 4	*	8422	7159
			1263

\*Phase 4 volumes will depend upon which previous phase of the test is successful. The above numbers represent the volumes that will be used if the Phase 1 test is successful.

The mix of pre-order queries will be established on the basis of ratios of pre-order to order transactions that will be used in the ordering capacity test. The processing of these queries will follow the same hourly volume patterns as specified for the order tests as defined in Table 5.2.2.-3 in this document. This mix will be selected from the transactions shown below:

- a) CSR
- b) Address Validation
- c) Request for telephone number (TN)
- d) Feature and Service availability
- e) Appointment Scheduler
- f) Facility availability
- g) Loop Qualification
- h) Connect Facility Availability\*
- i) Meet Point\*
- j) DSL Resale\*

\* These transactions were developed after the MTP and TSD were developed and will not be included in the System Capacity Test. The volumes associated with these transactions will be added to the FAQ transactions.

The following chart shows the pre-order queries by order type.

**Table 5.2.1-1: Pre-Order Query for each System Capacity Test (Local Service Request)**

Order Type	Local Service Request – Product-Activity	CSR	Add Val	TN Rqst	Serv Avail	Appt Sched (Dispatch Only)	Facil Avail	Loop Qual
LNP Only	LNP (V)	X	X					
	LNP (Z)	X	X					
UNE Loop with LNP								
	Retail to Loop Conversion (V)	X	X		.70X		.15X	.15X
	Retail to Loop Conversion (Z)	X	X		.70X		.15X	.15X
UNE – Loop								
	Retail to Loop Conversion (V)	X	X		.70X		.15X	.15X
	UNE Loop – New (N)		X				X	X
	UNE Loop – Disconnect (D)	X	X					
Resale								
	Retail to Resale Conversion (W)	X	X					
	Retail to Resale Conversion (V)	X	X	.15X*	X	.15X	.15X	
	Retail to Resale Conversion (Z)	X	X	.15X*	X	.15X	.15X	
	Resale – New (N)		X	X	X	X	X	X
	Resale – Change (C)	X	X	.15X*	X	.15X	.15X	
	Resale – Disconnect (D)	X	X					
UNE-P								
	Retail to UNE-P Conversion (V)	X	X	.15X*	X	.15X	.15X	
	Retail to UNE-P Conversion (Z)	X	X	.15X*	X	.15X	.15X	
	UNE-P – New (N)		X	X	X	X	X	X
	UNE-P – Change (C)	X	X	.15X*	X	.15X	.15X	
	UNE-P – Disconnect (D)	X	X					

**Key for Table 5.2. 1-1**

	Explanation
X	This Pre-Order transaction will be used for the product type listed in column two. The actual number of iterations is listed in attachment D.
*	IRTM will input the TN Reservation transactions.
.15X	15% of the LSR volume will be the volume used for this transaction.
.70X	70% of the LSR volume will be the volume used for this transaction.

### 5.2.2 Ordering

For the purpose of this test, the following will apply:

- a) The test will consist primarily of LSRs that are eligible to flow-through to the Qwest Service Order processors. However, LSRs that are expected to cause mechanized error rejects, which do not involve manual processes, and orders that may fall to manual processing, but will not be processed will also be included to test the systems' ability to process rejects within the volume defined and according to the performance measurements.
- b) Non-flow-through order types (i.e. order types that are not eligible to flow through according to Qwest) will not be included (Forecasted non-flow-through volumes will be applied to flow-through volumes). Analysis of Qwest's ability to process volumes of manually handled orders will not be included in this test.
- c) Since the LSRs are to be cancelled before provisioning starts, analysis of provisioning will not be included in the capacity test.
- d) The hourly volumes will be based on the historical patterns Qwest currently supports in its production environment, augmented by the volumes projected by the CLECs for operations in 3Q02.
- e) The CTTG will generate the order volume, mix, and arrival rates defined by the TA
- f) The Test Generator will provide pre-ordering volume sufficient to cover the planned test workload over periods expressed in hours. The total number of transactions required for the order tests will be as follows:

<b>Phase</b>	<b>TOTAL</b>	<b>EDI</b>	<b>GUI</b>
Phase 1	4566	3881	685
Phase 2	2569	2184	385
Phase 3	1722	1464	258
Phase 4*	2072	1761	311

\*Phase 4 volumes will depend upon which previous phase of the test is successful. The above numbers represent the volumes that will be used if the Phase 1 test is successful.

**Table 5.2.2-2: Core Set of LSRs for System Capacity Test (12 Month Test)**

	% of Orders (approximate)	Scenario Types by Product/Activity	% of Orders (approximate)
		<b>Scenario Types by</b>	<b>% of Orders</b>
		<b>Product/Activity</b>	<b>(approximate)</b>
<b>LNP Only</b>	<b>51.08%</b>		
		LNP (V)	13.64%
		LNP (Z)	86.34%
<b>UNE Loop with LNP</b>	<b>5.26%</b>		
		Retail to Loop Conversion (V)	20.67%
		Retail to Loop Conversion (Z)	79.33%
<b>UNE Loop without LNP</b>	<b>24.34%</b>		
		Retail to Loop Conversion (V)	3.70%
		UNE Loop – New (N)	76.94%
		UNE Loop – Disconnect (D)	16.24%
<b>Resale</b>	<b>16.25%</b>		
		Retail to Resale Conversion (W)	6.30%
		Retail to Resale Conversion (V)	2.50%
		Retail to Resale Conversion (Z)	15.10%
		Resale – New (N)	6.30%
		Resale – Change ( C )	40.40%
		Resale – Disconnects (D)	29.40%
<b>UNE-P</b>	<b>3.09%</b>		
		Retail to UNEP Conversion (V)	8.8%
		Retail to UNEP Conversion (Z)	15.10%
		UNEP – New (N)	6.30%
		UNEP – Change ( C )	40.40%
		UNEP – Disconnects (D)	29.40%
<b>Totals</b>	<b>100.02%</b>	<b>Totals</b>	

The System Capacity Test input mix will have these additional properties:

- a) It must create intentional error conditions that result in rejects in Qwest’s IMA-GUI and EDI interfaces. Although a failed transaction requires no manual work in this test, the ordinarily expected occurrence of error/reject messages will be integrated into the test process.
- b) To attain a satisfactory volume of transactions, the mix will contain replications of transactions that will be created by the load generator provided by the TG. For the purpose of the System Capacity Test, Qwest will relax edits to allow duplicate LSRs to be created against the same test account.

### 5.2.3 System Capacity Test Phase 4 (Stress Test)

The stress volume will be determined as follows. The daily volume from the successful previous phase (Phase 1,2 or 3) will be increased by 50%. The busy hour load (11% of the daily load) will be used as the baseline for the test. The stress test volume will be 150% of the baseline volume.

The first hour of the test will be run using this baseline volume. During the second hour the volume will be increased in fifteen-minute increments until the stress volume is reached. This will be done to observe the impact the increased transactions have on Qwest's systems as the stress volume is approached. During the third and fourth hours the stress volume will be maintained at a constant rate. IRTM TN transaction volumes will be constant at the full stress level for the duration of the Phase 4 test.

**Table 5.2.3-1 Stress test volumes (12-Month Test)**

Pre-order and Order Stress Volumes	Total Order Volume 3Q2002	Total Pre-Order Volume 3Q2002	Production Order Volume 3Q2001	Production Pre-Order Volume 3Q2001	Incremental Test Order Volume 3Q2001	Production Pre-Order Volume 3Q2001
Daily 3Q2001 Volume	11706		7050		4566	20083
50% Increase to Establish Peak Daily volume					2283	10042
Total Daily Volume					6849	30125
Highest Percent of Orders Sent during One Hour					11.1%	11.1%
Total Peak Hour Volume					760	3344
Hour 1 (Baseline for the Stress Test)					510	2229
Hour 2 (Stress hour volume) sent in the following 15 minute increments					760	760
First 15 minutes (19% of Hour 2 volume)					144	535
Second 15 minutes (22% of Hour 2 volume)					167	736
Third 15 minutes (28% of Hour 2 volume)					213	936
Fourth 15 minutes (31% of Hour 2 volume)					236	1137
Hour 3 (Stress hour volume) sent evenly over the hour					760	3344
Hour 4 (Stress hour volume) sent evenly over the hour					760	3344

### 5.3 System Capacity Test Performance Measures

The System Capacity Test performance measures identified in the MTP (Appendix B) will be used as the success criteria for the System Capacity Test. These measures, listed in the table below, will be applied to evaluate Qwest's systems' ability to handle the forecasted volume.

The applicable System Capacity Test related Performance Measures are defined in the matrix below. The evaluation column indicates the performance measures for which there will be a parity/benchmark comparison made during the tests.

**Table 5.3-1 Performance Measures**

Perf Meas. #	Performance Measures	Track	Evaluate	Performance Measurement
PO-1	Average Response Time (to OSS Pre-Order Queries)	Y	Y	See Table 5.3-2
	Transaction Report	Y	N	Diagnostic : Review and determine cause of LSRs that do not generate FOCs
PO-5	FOC Interval	Y	Y	95% within 20 minutes (GUI/EDI fully electronic )

**Key for Table 5.3. -1**

Term	Definition
Track	Data will be gathered and reported
Evaluate	Data will be evaluated for parity performance or compliance with a benchmark
Y	The measure will be tracked or evaluated as a part of the results
N	The measure will not be evaluated as a part of the results

**Table 5.3-2 Pre-Order Response Times**

Total Response Time:	IMA <sup>1</sup>	EDI
1. Appointment Scheduling	<10 seconds	<10 seconds
2. Service Availability Information	25 seconds	25 seconds
3. Facility Availability	<25 seconds	<25 seconds
4. Street Address Validation	<10 seconds	<10 seconds
5. Customer Service Records	<12.5 seconds	<12.5 seconds
6. Telephone Number	<10 seconds	<10 seconds
7. Loop Qualification	= 20 seconds <sup>2</sup>	= 20 seconds <sup>2</sup>

**Note:**

1. CTTG will only track PO-1A part two (Transaction Response times). CGE&Y will add IRTM part one (May/June average as agreed by the Capacity Sub-committee.)
2. Benchmark applies to response time only. Request time and Total time will also be reported.

**5.4 Test Mix**

When the System Capacity Test execution begins, the activities will be:

- a) The TG will conduct the System Capacity Test according to the detailed test plan
- b) The TA will be on-site at both the TG site and the Qwest site to observe and monitor the test
- c) Any issues or failures resulting from the processing of the scripts will be documented through the Testing Incidents process. See Attachment F.
- d) If the TA believes that there are a significant number of fatal errors, then the test will be aborted and another test will be run after the cause of the errors have been resolved. Such an event will be documented in the Exception/Incident Work Order Process. The TA, Qwest and TG will plan for the necessary load and cancellation transactions to conduct these tests
- e) The TA will validate that the test scripts are completed in the prescribed manner and that all results are recorded.
- f) Following FOC (or rejection) receipt for all test orders, Qwest will cancel those orders. The cancellation orders will be done during non-business hours and will not be tracked as part of the System Capacity Test
- g) The TA will validate the performance measurement calculations using the definition of the performance measures (MTP Appendix B) and the captured test data. Failure to meet the thresholds agreed upon for benchmarks at the six-month level will result in retest. The retest will be handled in accordance with the process defined in Section 7.3.5 of the Test Specifications Document.

**5.5 Exit Criteria**

For the System Capacity Test to be considered completed, the following exit criteria will need to be satisfied:

- a) The pre-order and order System Capacity Test has been completed according to the plan

- b) All tests against the appropriate performance measurements including associated pre-ordering and ordering benchmarks have been completed
- c) All incidents that were opened in conjunction with the System Capacity Test have been resolved and/or closed
- d) All of the data associated with the System Capacity Test has been captured and retained by the TG
- e) The System Capacity Test evaluation and findings are included in the TA's final report compiled for the ACC
- f) All documentation related to the System Capacity Test is verified as complete by the TA and stored in the master project file
- g) All orders have been cancelled prior to provisioning

## 6 Activities Prior to the Test

This section provides details of the activities required to prepare for the System Capacity Test for the Arizona 3<sup>rd</sup> party testing effort.

### 6.1 Entrance Criteria

Prior to commencement of the System Capacity Test, the following entrance criteria need to be satisfied and will be verified by the Pretest:

- a) CTTG IMA-GUI and EDI transaction generators are operationally certified by Qwest and ready to be tested. This includes the ability of the CTTG to isolate the performance results for the performance measurements identified in Table 5.3-1 during the test.
- b) A production environment to conduct the pre-order and order tests has been validated by the TG and the TA to be operational
- c) The scheduled dates for the System Capacity Test have been identified
- d) The TA has provided the TG with the test scripts to use for generating the load volumes for the test
- e) The Performance Measurement process evaluation has been successfully passed
- f) The processes used to collect, analyze and report performance data have been validated for adequacy and compliance and Qwest calculations have been determined to be accurate
- g) The quantitative point at which the system performance is deemed to be unacceptable has been identified for each of the test phases. The quantitative point will be described in terms of the performance measurements identified in Table 5.3-1.
- h) Qwest is able to separately report results for the performance measurements identified in Table 5.3-1 during the execution of the tests.

### 6.2 Activities

The Pretest activities that will occur prior to the test execution beginning are:

- a) A detailed plan specifying the scope, approach, entrance, exit, and execution requirements for the System Capacity Test will be provided and reviewed with the TG, the CLECs, and Qwest. The TA will amend and finalize the plan as needed.
- b) The TA will prepare test scripts for the pre-order and order System Capacity Tests
- c) The System Capacity Test will be conducted from the TG's test site. The TG's system interfaces will be designed and tested to support interface transaction volumes for Qwest's GUI and EDI gateways and back-end pre-order and order systems.

- d) The test generator will be designed to support the replication of the appropriate volume of test transactions from the required mix of test cases needed to support a valid System Capacity Test
- e) The TA will obtain the hourly historical production volume distribution for Qwest's GUI and EDI systems from Qwest. The test volumes during the System Capacity Test will be patterned to follow the same hourly transaction rates as those in Qwest's production environment. The TA will provide the TG with the required hourly mix of test transaction volumes needed for the pre-order and order System Capacity Test
- f) The TG will stage the hourly mix of transactions in the test generator for the pre-order and order tests validated by the TA
- g) Based on the Qwest and CLEC forecasts for 3Q02, the TA will determine the test load for the pre-order and order test
- h) The TA and TG will convene a review session to ensure that a complete set of verified test scripts for the pre-order and order tests are prepared and ready for the System Capacity Test.

### **6.3 Test Script Validation**

CGE&Y will validate the test accounts by retrieving the CSRs for each of the accounts and compare the information with the information received from Qwest. Additionally, the TA will insure that the Test Accounts contain all required data to perform the test. Errors and/or omissions will be returned to Qwest for correction.

CGE&Y will create test scripts from the test accounts and forward them to Pseudo-CLEC. These scripts will be copies of the appropriate scripts used in the Functionality Test. Pseudo-CLEC will input these scripts into the test harness using EDI form tool for the EDI transactions and The IMA loader for the GUI transactions.

Pseudo-CLEC will test these scripts by inputting an LSR into the appropriate gateway for each iteration of a unique test script (Order Activity type). Qwest will cancel the LSRs by noon of the following day.

Pseudo-CLEC will test the pre-order scripts by inputting the pre-order request into the appropriate gateway for each pre-order type (i.e. CSR FAQ) for each state.

### **6.4 Certification Testing**

For the System Capacity Test, Pseudo-CLEC will develop a multi-server environment, using the Qwest developed Interactive Agent (IA) software. Pseudo-CLEC will test this interface internally with Qwest support as needed. Once developed, Pseudo-CLEC and Qwest will certify the new interface. This test consists of Pseudo-CLEC pinging Qwest and Qwest pinging Pseudo-CLEC to prove that connectivity exists between the two entities.

## **7 Operational Readiness Test (ORT)**

### **7.1 Purpose of the Operational Readiness Test**

This section provides details of the plan for an operational readiness test of the System Capacity Test for the Arizona 3<sup>rd</sup> party testing effort. The objectives and guidelines of the operational readiness test are presented to ensure that an overall framework is established and agreed upon.

### **7.2 Objective of the Operational Readiness Test**

The overall objective of the operational readiness test is to verify that all of the components of the System Capacity Test are in place and working in a sufficient manner to enable the test to proceed after evaluation of the results of the operational readiness test.

### **7.3 Scope of the Operational Readiness Test**

This section describes the procedures that will be used during the execution of the operational readiness test as well as the components that will be evaluated as part of the operational readiness test. The main components of the operational readiness test include:

- Qwest provided Test Accounts
- TA provided Test Scripts
- Communication between the test parties during and after the test
- TG Test Transaction Generators – both GUI and EDI
- TG result monitoring software and reports
- Qwest systems and interfaces
- Qwest Pre-order TN Reservation Scripts (AKA IRTM Scripts)
- Qwest LSR and Service Order Cancellation Scripts
- The reports produced and distributed by all involved parties
- Daily cleanup activities associated with the test

### **7.4 Operational Readiness Test Logistics and Dependencies**

The System Capacity Test shall not be executed until at least three weeks after the start of the Operational Readiness Test. This is necessary to give all involved parties sufficient time to conduct root cause analysis of any anomalies that may be discovered that are related to the test components and to rectify any flaws in test design, test tools or testing methodology. Operational readiness testing will be conducted in much the same fashion as the System Capacity Test: pre-order transactions and LSRs will be generated and the pre-order and order transactions selected for the operational readiness test are processed to the conclusion point. In the case of LSRs, either an FOC will be produced by the LSR or the LSR will be reflected in the non-flow-through LSR queue report produced daily by Qwest. To be a complete test, the operational readiness test must also contain transactions that cause multiple pending orders to be placed against the same account at the same time, so that the modification of the BPL edit to allow multiple pending orders against a single account may be exercised.

The operational readiness test will be held in several stages. The detailed time line is currently being prepared by the TA and will be discussed and agreed upon by all parties prior to the test.

The following dependencies must be satisfied prior to the beginning of the operational readiness test:

- a) The test transaction generator(s) must be available and ready for the test.
- b) The CTTG's ability to measure and report response times for transactions sent via the IMA-GUI and IMA-EDI must be established.
- c) The TA's reports that will be provided to Qwest must be developed, reviewed by Qwest, approved by the Capacity Sub-committee of the TAG, and be ready for production. They are as follows:
  - 1. Pre-Order Response Time Report. This report shows pre-order transactions separated into EDI and GUI portions. This report will be compared to the results captured by Qwest and any anomalies will be discussed with the test administrator.
  - 2. Transaction Report for LSRs – including breakdowns for successful orders, unsuccessful orders, and missing or late FOCs. This report also contains daily summary totals.
  - 3. Appointments Mistakenly Reserved – This report will only be provided when the situation occurs that Appointments for Technician Dispatch are mistakenly reserved. As part of the test, the CTTG will be reserving appointments, however the dates of those appointments should be 36 business days from the date of the order for UNE-L and 75 business days for all other product type. This report would contain only those appointments that were scheduled closer to the date of the order. Qwest would use the report to return those appointments to an available status without delay.
  - 4. Telephone Numbers Mistakenly Reserved - This report will only be provided when the situation occurs that Telephone Number resources are mistakenly reserved.
- d) Test accounts provided by Qwest have been received and validated by the TA/TG.
- e) The Qwest reports that will be provided to the TA must be developed by Qwest and reviewed by the TA and be ready for production.
  - 1. Response times for Pre-Order transactions (P01 report)
  - 2. FOC Times for LSRs (P05 report)
  - 3. CPU Utilization Report
  - 4. Memory Usage Report
  - 5. Disk I/O Utilization Report
  - 6. Non-flow-through LSR Queue Report

## 7.5 Operational Readiness Test Execution Guidelines

The following procedures will be utilized during the execution of the operational readiness test:

- a) The CTTG will issue at least one pre-order transaction of each type to be executed during the test in each of Qwest's three regions, preferably in each state.
- b) The CTTG will issue a combination of the activity types to be executed during the test in each of Qwest's three regions.
- c) The CTTG will issue one LSR for each test account created for the test with the following exception:

- d) To ensure that the revision of the BPL edit is properly exercised, some orders during the operational readiness test will be issued consecutively.
- e) The TG will issue the LSRs over a three day period, inputting about a third of the test accounts each day.
- f) The TA/TG will make a call to Qwest per the plan created in case of normal problems and one call per the plan created in case of extraordinary problems. See Appendix A for details of these plans. These calls will be made at times prescribed by the ORT timeline.
- g) The TG will issue all agreed upon reports to Qwest at the prescribed time intervals detailed in the plan in Appendix A.
- h) Qwest will increase the frequency of IRTM pre-order transactions for the TN reservation transaction to the incremental six month level prior to the operational readiness test. This increase will remain in place until the completion of Phase I of the System Capacity Test. Qwest shall be given 48 hours notice to complete this activity. Qwest will notify the TA when this task is complete. This notice window is consistent with the notice to be given during the System Capacity Test for increasing the IRTM volumes between phases. Qwest will submit all agreed upon reports to the TA at the prescribed time intervals detailed in the plan in Appendix A.
- i) Qwest will make a call to the TA/TG per the plan created in case of normal problems and a separate call per the plan created in case of extraordinary problems. See Appendix A for details of these plans.
- j) Qwest will complete all clean-up activities, including returning resources (TN, appointments) and cancellations of the test LSRs and resultant Service Orders in the Service Order Processors.

## 7.6 Test Check Items

The following items will be verified in the operational readiness test:

- a) That the test generator can issue the types of independent pre-order transactions and LSRs that are needed for the System Capacity Test.
- b) As in the System Capacity Test, all orders will be of the type that would be eligible for electronic flow-through to FOC. If an acceptable level of flow-through is not achieved, root cause analysis shall be undertaken in order to determine if any corrective action on the part of any of the involved parties is appropriate.
- c) That the CTTG can measure the response time for PO1 and PO5. Comparisons between measures gathered and Qwest gathered measurements will be conducted and if the results do not agree, root cause analysis will be undertaken in order to determine if there is a flaw in any of the applicable algorithms.
- d) That communication lines between Qwest, the TA, and the TG are established and work correctly for the communication of both normal and extraordinary events.
- e) That the Qwest Interconnect Service Centers (ISC) do not process any orders generated during the operational readiness test.
- f) The ISC will have instructions not to work the orders with the specified RSID.
- g) The due dates for the orders are set far enough in the future to help ensure that they don't get worked.
- h) That the reports can be produced and distributed by Qwest in the proper time frames.
- i) That the reports can be produced and distributed by the TG/TA in the proper time frames.
- j) That cleanup activities can be properly performed by Qwest
  1. Purge LSRs in the IMA system and the associated service orders from the Service Order Processor and downstream systems
  2. Return reservations (both appointments and TNs) to the available pool.

## 7.7 Exit Criteria

The Operational Readiness Test will be considered complete when:

- a) All the items in 7.6 have been checked and verified
- b) All incidents that were opened in conjunction with the Operational Readiness Test have been resolved and/or closed
- c) Any changes that are required for the System Capacity Test have been made, and have been retested.

## **8 System Capacity Test**

### **8.1 System Capacity Test Purpose**

This section provides details of the plan for the System Capacity Test for the Arizona 3<sup>rd</sup> party testing effort. The objectives and guidelines of the System Capacity Test are presented to ensure that an overall framework is established and agreed upon.

### **8.2 Objective of the System Capacity Test**

The overall objective of the System Capacity Test is to validate that Qwest's OSS and processes can handle loads equal to or greater than estimated Pre-order and Order volumes projected one year from the date of the running of the System Capacity Test (2Q 2002 at the established performance measures levels).

### **8.3 System Capacity Test Logistics and Dependencies**

The System Capacity Test will be executed in four phases Test. This is necessary to insure that the System Capacity Test does not adversely affect the Qwest production systems. The System Capacity Test will be conducted as follows: pre-order transactions and LSRs will be generated and the pre-order and order transactions will be processed to the conclusion point. In the case of LSRs, either an FOC will be produced by the LSR or the LSR will be reflected in the non-flow-through LSR queue report produced daily by Qwest. In the case of the Pre-Order transaction, a response to the request will be received. Requests with no responses will be listed and reported as an observation.

The System Capacity Test Time line is detailed in section 12.

The following dependencies must be satisfied prior to the beginning of the System Capacity Test:

- a) The test transaction generator(s) must be available and ready for the test.
- b) The CTTG's ability to measure and report response times for transactions sent via the IMA-GUI and IMA-EDI must be established.
- c) The TA's reports that will be provided to Qwest must be developed by the TA, reviewed by Qwest, approved by the Capacity Sub-committee of the TAG, and be ready for production. They are as follows:
  1. Pre-Order Response Time Report. This report shows pre-order transactions separated into EDI and GUI portions. This report will be compared to the results captured by Qwest and any anomalies will be discussed with the test administrator.
  2. Transaction Report for LSRs – including breakdowns for successful orders, unsuccessful orders, and missing or late FOCs. This report also contains daily summary totals.
  3. Appointments Mistakenly Reserved – This report will only be provided when the situation occurs that Appointments for Technician Dispatch are mistakenly reserved. As part of the test, the CTTG will be reserving appointments, however the dates of those appointments should be 36 days from the date of the order for UNE-L and 75 days for POTS and other product/service types in the System Capacity Test. CGE&Y will provide Qwest with the Due Dates used in the test at close of business on the day of the test. This report would contain only those appointments that

were scheduled for Due Dates other than the above. Qwest would use the report to return those appointments to an available status without delay.

4. Telephone Numbers Mistakenly Reserved - This report will only be provided if Telephone Number resources are mistakenly reserved.
- d) Test accounts provided by Qwest have been received and validated by the TA/TG.
  - e) The Qwest reports that will be provided to the TA must be developed by Qwest, reviewed and approved by the TA, and be ready for production.
    1. Response times for Pre-Order transactions (P01 report)
    2. FOC Times for LSRs (P05 report)
    3. CPU Utilization Report
    4. Memory Usage Report
    5. Disk I/O Utilization Report
    6. Non-flow-through LSR Queue Report

#### 8.4 System Capacity Test Execution Guidelines

The following procedures will be utilized during the execution of the Capacity Test:

- a) All orders will be of the type that would be eligible for electronic flow-through to FOC. If an acceptable level of flow-through is not achieved, root cause analysis shall be undertaken in order to determine if any corrective action on the part of any of the involved parties is appropriate. An unacceptably low percentage of flow-through orders may require additional LSRs to be submitted in order to achieve the required volumes of flow-through orders or a complete retest may be necessary.
- b) The TA will issue all agreed upon reports to Qwest at the prescribed time intervals detailed in the plan in Appendix A.
- c) Qwest will issue all agreed upon reports to the TA at the prescribed time intervals detailed in the plan in Appendix A.
- d) The TA will analyze the System Reports to determine whether to continue to the next phase
- e) The TA will inform Qwest to increase the frequency of IRTM pre-order transactions for the TN reservation transaction to the incremental next level prior. Qwest shall be given notice to complete this activity a business day before the adjustment to IRTM is required.
- f) Qwest will complete all clean-up activities, including returning resources (TN, appointments) and cancellations of the test LSRs and resultant Service Orders in the Service Order Processors at the end of the day for each test phase.
- g) Pseudo-CLEC will issue pre-orders and orders through the test harness (IMA and EDI) to Qwest from 7: 00am – 6: 00pm MST (AZ time) on the day of the test.
- h) CGE&Y will have a representative in Salt Lake City, Utah and Phoenix, AZ (Pseudo-CLEC site) to monitor the System Capacity Test.
- i) Pseudo-CLEC will have an automated process ready to kick off the pre-order and order transaction based on CGE&Y specified times.
- j) Pseudo-CLEC and CGE&Y will have all templates loaded for both EDI and IMA GUI orders and pre-orders with the correct volume ready for whatever phase the System Capacity Test is running.
- k) Pseudo-CLEC will record all response times electronically and not manually.
- l) EDI FOCs will be kept electronically by Pseudo-CLEC and the IMA GUI FOCs received by email will also be tracked electronically by Pseudo-CLEC.
- m) Pseudo-CLEC will provide Qwest and CGE&Y a list of all LSR IDs and PONs that ran for the System Capacity Test the following day by 12:00pm. The purpose for this is to allow Qwest the proper time to go back in their systems and cancel all FOCs.
- n) All reports required from Pseudo-CLEC will be provided to CGE&Y within 24 hours after the System Capacity Test has finished.
- o) Pseudo-CLEC will not start resetting anything for the next System Capacity Test until a confirmation email is received from CGE&Y to start preparing for the next phase of the System Capacity Test.
- p) Pseudo-CLEC will require 5 business days to reset everything necessary to continue with the next phase of the System Capacity Test.

## **8.5 System Capacity Test Deliverable Items**

- a) All volume requirements for all phases of the System Capacity Test loaded and ready at the times specified by CGE&Y.
- b) All response times measured (not calculated) for EDI and IMA pre-order and LSR transactions recorded by Pseudo-CLEC and sent to CGE&Y for calculation.
- c) All FOC and rejection receipt times recorded electronically for EDI and GUI orders by Pseudo-CLEC and sent to CGE&Y.
- d) All PONs given to Qwest and CGE&Y so that Qwest can cancel all LSRs.
- e) All PONs that did not receive a FOC or a rejection notice
- f) All reports as outlined in Appendix A

## **8.6 Exit Criteria**

The System Capacity Test will be considered complete when

- a) The pre-order and order System Capacity Test has been completed according to the plan
- b) Phase 1,2 or 3 testing results meet the PO-1a and b and PO-5a Performance Measure Benchmark at the required volume transactions
- c) All incidents (IWOs) that were opened in conjunction with the System Capacity Test have been resolved and/or closed
- d) Any changes that had to be made as a result of incidents against the 6-month test deemed necessary, have been retested
- e) The Phase 4 Test (Stress Test) has been completed, providing the System Reports indicate that performing the Stress Test will not adversely affect the Qwest production environment
- f) All of the data associated with the System Capacity Test has been captured and retained by the CTTG
- g) The System Capacity Test evaluation and findings are included in the TA's final report compiled for the ACC
- h) All documentation related to the System Capacity Test is verified as complete by the TA and stored in the master project file
- i) Pseudo-CLEC and Qwest have completed their respective clean-up process

## 8.7 Test Analysis

After each test execution:

- a) Pseudo-CLEC and Qwest will forward the data to CGE&Y for analysis.
- b) CGE&Y will analyze and report on the Performance Measures PO-1a and b, and PO-5a as defined by the PID.
- c) CGE&Y will track PO-2, the purpose for validating the test only
- d) CGE&Y will compare the data provided by Pseudo-CLEC with the data provided with Qwest
- e) CGE&Y will compare the system data captured during the System Capacity Test with the system data Qwest supplied to CGE&Y on a daily basis starting March 12, 2001 to establish a baseline to use as a comparison with the results of the System Capacity Test
- f) CGE&Y will provide the Reports to Capacity Sub-committee of the TAG during of each phase of the test

## 9 Cleanup Process

At the end of each test phase Qwest and Pseudo-CLEC will perform clean-up operations on LSRs and/or service orders.

- a) Cleanup activities performed by Qwest
  1. Purge LSRs in the IMA system and the associated service orders from the Service Order Processor.
  2. Return reservations (both appointments and TNs) to the available pool.
  3. Make sure all LSRs and service orders are cancelled.
  4. Make sure all FOCs are cancelled.
  
- b) Cleanup activities performed by Pseudo-CLEC
  - 4 Clean and reset all databases for the next test.
  
- c) Final cleanup operations on LSR and/or service orders.

Once the TA has notified Qwest that the System Capacity Test is complete, in addition to the above activities, the IRTM scripts which had been put in place to produce additional pre-order transaction volumes will be reduced to their normal levels.

## 10 Operational Readiness Test Execution Time Line

This section details the daily activities and deliverables during each day of the Operational Readiness Test.

### 10.1 Operational Readiness Test Time Line

#### Day 1 – Run Operational Readiness Test GUI LSRs Only (9 – 1) MST

- CGE&Y monitors test from Phoenix
- Qwest/Pseudo-CLEC/CGE&Y exercise normal Processing Procedures simulating a TG Concern (Hour 4)
- Qwest to cancel LSRs
- Qwest/Pseudo-CLEC/CGE&Y convene Test review at 2PM MST
- Reconvene at Time TBD if necessary

#### Day 2 – Qwest sends the following reports to CGE&Y:

CPU Utilization (for each 10 minute interval)  
Memory Usage (for each 10 minute interval)  
Disk I/O Utilization (for each 10-minute interval)  
Response Time for Pre-Order transactions PO-1

- Pseudo-CLEC sends Status File to CGE&Y
  - **CGE&Y sends the following reports to Qwest:**
    - Total LSRs Sent
    - List of LSRs (By LSR number (when available) and PON) EDI
    - Response times for Pre-Order Transactions (for each 15 minute interval)
    - List of TNs mistakenly reserved (Should be null)
    - List of appointments reserved
    - Total FOCs Returned
  - **CGE&Y/Pseudo-CLEC/Qwest review Previous days run:**
    - Identify any problems associated with day 1 test execution
    - Create action plan for error correction
    - Make go/no go decision for next test
    - CGE&Y notifies Pseudo-CLEC to prepare for next test<sup>5</sup>
    - CGE&Y notifies Qwest to update IRTM<sup>6</sup>

#### Day 3 - Run Operational Readiness Test (LSRs and associated Pre-Order Transactions) GUI & EDI (9 – 1) MST

- Qwest provides PO-5 Report from Day 1 Test
- CGE&Y to monitor test from Phoenix
- Qwest/Pseudo-CLEC/CGE&Y exercise normal Processing Procedures simulating a SYAD concern (Hour 1)
- Qwest/Pseudo-CLEC/CGE&Y exercise Extraordinary Processing Procedures simulating a Pseudo-CLEC concern (hour 4)

<sup>5</sup> To test HP internal process. This iteration Only

<sup>6</sup> To test Qwest internal process. This iteration Only

- Qwest to cancel LSRs
- Qwest/Pseudo-CLEC/CGE&Y convene Test review at 2PM MST
- Reconvene at Time TBD if necessary

**Day 4 - Qwest sends to CGE&Y the following reports:**

Report CPU Utilization (for each 10-minute interval)  
 Memory Usage (for each 10 minute interval)  
 Disk I/O Utilization (for each 10-minute interval)  
 Response Time for Pre-Order transactions (for each 15 minute interval) PO-1

- Pseudo-CLEC sends Status File to CGE&Y
- CGE&Y sends the following reports to Qwest:
  - Total LSRs Sent
  - List of LSRs (By LSR number (when available) and PON) EDI
  - Response times for Pre-Order Transactions
  - List of TNs mistakenly reserved (Should be null)
  - List of appointments reserved
  - Total FOCs Returned
- CGE&Y/Pseudo-CLEC/Qwest review Previous days run
  - Identify any problems associated with day 8-test execution
  - Plan of action for error correction created
  - Make go/no go decision for next test
  - CGE&Y notifies Pseudo-CLEC to prepare for next test

**Day 5- Run Operational Readiness Test (100% of LSRs and associated Pre-Order Transactions) EDI & GUI Only (9 – 1) MST**

- CGE&Y to monitor test from Phoenix
- Qwest/Pseudo-CLEC/CGE&Y exercise Extraordinary Processing Procedures simulating a SYAD concern (Hour 4)
- Qwest cancels LSRs
- QWEST cancels TN reservations
- Qwest/Pseudo-CLEC/CGE&Y convene Test review at 2PM MST
- Reconvene at Time TBD if necessary

**Day 6 - Qwest sends the following reports to CGE&Y:**

- CPU Utilization (for each 10 minute interval)  
 Memory Usage (for each 10 minute interval)  
 Disk I/O Utilization (for each 10 minute interval)  
 Response Time for Pre-Order transactions PO-1
- Pseudo-CLEC sends Status Log to CGE&Y
  - CGE&Y sends the following reports to Qwest:
    - Total LSRs Sent
    - List of LSRs (By LSR number (when available) and PON) EDI
    - Response times for Pre-Order Transactions (for each 15 minute interval)
    - List of TNs mistakenly reserved (Should be null)
    - List of appointments reserved
    - Total FOCs Returned
  - CGE&Y/Pseudo-CLEC/Qwest review Previous days run
  - Identify problems associated with day 10 test execution

- Plan of action for error correction created
- Make go/no go decision for next test
- CGE&Y notifies Pseudo-CLEC to prepare for next test

Day 7 - Qwest provides PO-5 Report from Day 5 Test

- CGE&Y/Qwest/Pseudo-CLEC determine if EDI phase of the Operational Readiness Test is complete

## 11 Test Execution Time Line

This section details the daily activities and deliverables during each day of the System Capacity Test.

### 11.1 System Capacity Test Time Line

#### Day 1 – Run System Capacity Test Phase 1

#### Day 2 - Qwest sends the following reports to CGE&Y:

CPU Utilization (for each 10 minute interval)

Memory Usage (for each 10 minute interval)

Disk I/O Utilization (for each 10 minute interval)

LSR # and/or PON # of orders (on a daily basis) for which FOCs were not sent. These would include

LSRs that had gone to an error queue or to the ISC for manual handling.

Response Time for Pre-Order transactions

- CGE&Y/Qwest make go/no go decision for next phase of test
- If yes, Qwest updates IRTM with next test load for TN Reservation transaction (Qwest requires one business day)
- Pseudo-CLEC sends Status Log to CGE&Y
- CGE&Y sends the following reports to Qwest:
  - Total LSRs Sent
  - List of LSRs (By LSR number (when available) and PON) EDI
  - List of LSRs (By PON) GUI
  - Response times for Pre-Order Transactions
  - List of TNs mistakenly reserved (Should be null)
  - List of appointments reserved
- CGE&Y begins to analyze data

**Day 3 - Pseudo-CLEC sends to CGE&Y list of FOCs returned via Email (FOCs for LSRs issued via IMA)**

- CGE&Y sends to Qwest the following report  
Total FOCs Returned  
List of FOCs (By PON and LSR number)
- CGE&Y continues to analyze data
- CGE&Y informs Pseudo-CLEC to prepare for next test (Pseudo-CLEC requires 5 days to reset harness)
- Qwest sends to CGE&Y FOC report (PO-5)

**Day 4 - Test preparation (Pseudo-CLEC)**

**Day 5 - Test preparation (Pseudo-CLEC)**

**Day 6 – Ready to run next phase of System Capacity Test**

**Repeat for days 6 –11 (Phase 2 or Phase 4)**

**Repeat for days 12 –17 (Phase 3 or Phase 4 if necessary)**

**Repeat for day 18 –23 (Phase 4 if necessary)**

## 12 Report Formats

Following are the report formats that will be produced during the System Capacity Test.

### Transaction Report for Arizona System Capacity Test

Reporting Date: April 1, 2001 (This is the date the Test Was Executed)  
 Report Generation Date: April 1, 2001 (This is the date the Report was generated)  
 Report Generator: CGE&Y  
 Test Start Time: Test End Time:

2295 LSRs – IMA-EDI (Issued through IMA-EDI) 2295 FOCs – IMA-EDI (received for orders issued through IMA-EDI)  
 405 LSRs – IMA-GUI (Issued through IMA-GUI) 405 FOCs – IMA-GUI (received for orders issued through IMA-GUI)

EDI/GUI	LSR #	PON	Successful Orders	LSR Issue Time	FOC Received Time	Elapsed Time
EDI	123456	[Redacted]101	FOC			
EDI	123458	[Redacted]103	FOC			
EDI	123459	[Redacted]104	FOC			
GUI	123460	[Redacted]101	FOC			
GUI	123461	[Redacted]103	FOC			
GUI	123462	[Redacted]104	FOC			

LSR #	PON	Unsuccessful Orders	LSR Issue Time	Error Received Time
EDI	[Redacted]105	Error Message		
EDI	[Redacted]106	Error Message		
EDI	[Redacted]107	Error Message		
GUI	[Redacted]108	Error Message		
GUI	[Redacted]109	Error Message		
GUI	[Redacted]110	Error Message		

EDI/GUI	LSR #	PON	Missing/Late FOCs*	LSR Issue Time
EDI	[Redacted]111	No FOC		
EDI	[Redacted]112	No FOC		
EDI	[Redacted]113	No FOC		
GUI	[Redacted]114	No FOC		
GUI	[Redacted]115	No FOC		
GUI	[Redacted]116	No FOC		

\*Will be reconciled with Qwest provided Error Queue Report (Report of Orders that fell into the manual handling queue)  
**Pre-order Response Times for Arizona System Capacity Test**  
**Reporting Date: April 1, 2001** (This is the date the Test Was Executed)  
**Capacity Test PO-1 Report\***

**Report Generation Date: April 1, 2001** (This is the date the Report was generated)  
**Report Generator: CGE&Y**  
**Test Start Time:** **Test End Time:**

Media	Category	Month	Day	Numerator	Denominator	CLEC Result	Standard Deviation
EDI	AAQ						
EDI	AVQ						
EDI	CSR						
EDI	FAQ						
EDI	Loop Qual						
EDI	SAQ						
EDI	TNAQ						
IMA	AAQ						
IMA	AVQ						
IMA	CSR						
IMA	FAQ						
IMA	Loop Qual						
IMA	SAQ						
IMA	TNAQ						

TN AQ generated by Test Generator for Resale and UNE-P New orders only

* Response Times will be calculated according to PO -1			
Pre-Order Response Times (Appt. Scheduler) (Avg. Sec) IMA Accept (PO-1 A-1(c))			
Date	Numerator	Denominator	Standard Dev
Pre-order Response	1164.81	947	0.01
		1.23	

## **13 APPENDIX A Communications and Problem Notification Plans**

### **13.1 Observation of Qwest operations by TA**

The Test Administrator (TA) will be monitoring from Qwest's IMA Operations Center (located in Salt Lake City, Utah) to observe Qwest's ability to handle the additional load due to the System Capacity Test with their existing hardware. There will also be observation by the TA from the Test Generator (TG) designated location to ensure that the test is being performed to the test specification. The dates on which the observations will occur will not be announced in advance to Qwest. Upon the arrival of the TA representatives at the Qwest IMA Operations Center, they will call the Qwest IMA Application System Administrators (SYADs) by telephone and the SYADs will assist the TA representatives to gain entry into the Operations Center to conduct the observation.

While on-site, the TA will refrain from asking questions so as not to impair normal operations. Any questions, clarifications, or request for documentation will be provided in writing to the Qwest Core Testing Team after the observations.

### **13.2 Normal Processing Procedures During Testing**

Qwest system administration will follow normal practices during the System Capacity Test. At any time during the third-party testing effort, if the actions of the TG begin to cause system impacts of concern to the SYADs, the TA will be contacted using the telephone number and/or pager number supplied below in the Normal Processing Procedures section.

The Qwest number for problems that the TG would call seeking assistance with problems determined to be "normal" problems is the Wholesale Systems Help Desk at [Redacted].

The Pseudo-CLEC contact that Qwest SYADs will call to discuss "normal" trouble situations is: [Redacted] at [Redacted] or email [Redacted] or fax [Redacted]

### **13.3 Extraordinary Processing Procedures**

If Qwest SYADs or other Qwest testing personnel determine that it is necessary to inform the TG that there is the need to halt the orders being issued for the test due to extraordinary circumstances, Qwest will contact the TG and determine the appropriate action including cessation of the test.

Likewise, if the necessity arises for the TG or TA to contact Qwest, either party may do so.

The Qwest number for extraordinary events is [Redacted]. If this telephone number is busy, the caller is rolled to voicemail. Alternate numbers to use are the Client Services Hotline at [Redacted]. Contact names at the Salt Lake Center are [Redacted] (pager [Redacted]) and [Redacted] (pager [Redacted]).

The Pseudo-CLEC number for extraordinary events is [Redacted] ([Redacted])  
A backup pager number is [Redacted] ([Redacted])

### **13.4 Time Intervals for Delivering Test Reports**

The TA will notify Qwest when to increase the IRTM scripts to account for the Reserve Telephone Number Pre-order transaction. The revised scripts will be put in place by the Qwest IRTM team. Such notification to Qwest will be made two weeks in advance of the first test and 48 hours in advance of each subsequent test phase. Notification to Qwest of the days on which System Capacity Tests are run will be

made on each of the days after testing stops. Qwest will produce the Performance Measure Reports promised to the TA only for those days. Additionally, Qwest will provide System Reports on a daily basis beginning March 12, 2001. Likewise, the TA will produce the reports promised to Qwest on those days. All reports will be transmitted by electronic mail and transmitted as an Excel spreadsheet with the exception of the LSR Report, which will be transmitted as an Excel spreadsheet as well as a text file.

#### **13.4.1 Qwest Provided Reports**

When Qwest is given notification, it will provide the following reports to the TA. These reports will be delivered to the TA on the next business day following the day of the request for reports.

##### **13.4.1.1 Performance Measure Reports**

- Response Time for Pre-Order transactions
- FOC times for LSRs (% within 20 minutes)<sup>7</sup>

##### **13.4.1.2 System Reports**

- CPU Utilization (for each 10 minute interval)
- Memory Usage (for each 10 minute interval)
- Disk I/O Utilization (for each 10 minute interval)

##### **13.4.1.3 LSR Report**

LSR # and/or PON # of orders (on a daily basis) for which FOCs were not sent. These would include LSRs that had gone to an error queue or to the ISC for manual handling.

#### **13.4.2 TA/TG Provided Reports**

The TG will provide to the TA with the raw data and the TA will provide to Qwest the following reports. The reports (unless otherwise specified) will be delivered to Qwest on the day after the System Capacity Test:

##### **13.4.2.1 General Reports**

- Total FOCs returned<sup>8</sup>
- Response times for Pre-Order transactions
- List of LSRs (LSR # and PON) with total number of transactions. The TA will provide to Qwest a list of LSRs (by LSR # and PON) for which the TA has received an FOC or has otherwise accounted for (for example they saw the LSR on the LSR Report that Qwest provides). This report will give

---

<sup>7</sup> The PO-5 Reports will be delivered 2 business days after test execution.

<sup>8</sup> GUI FOCs will be delivered within 48 hours after test execution.

Qwest notification that it may cancel/purge these LSRs in the IMA system and the associated service orders (SO) from the service order processor.<sup>9</sup>

- List of Appointments reserved by the TG and of TNs that were mistakenly reserved. These reservations need to be returned to the available pool as soon as possible to avoid impacts to customers.

#### 13.4.2.2 Performance Measure Reports

- Response Time for Pre-Order transactions
- FOC times for LSRs (% within 20 minutes)<sup>10</sup>

#### 13.4.3 Pseudo-CLEC provided Data

Pseudo-CLEC will provide the following information to CGE&Y within 48 hours after test execution:

- All response times measured (not calculated) for EDI and IMA pre-order transactions and sent to CGE&Y for calculation. (within 24 hours)
- All FOC times recorded electronically for EDI orders. (within 24 hours)
- All FOC times recorded electronically for IMA responses. being sent from (within 24 hours)
- All PONs given to CGE&Y so that Qwest can cancel all FOCs. (within 24 hours)
- LSR information for CGE&Y reports to Qwest. (within 24 hours)

#### 13.4.4 Report Contacts

The reporting contact for the Qwest organization will be Merrill Bennett. He may be reached at (303)-965-4357 or by email at [mxbenn3@qwest.com](mailto:mxbenn3@qwest.com). The reporting contact for the TA will be Jerry Stroud. He may be reached at 480-736-8500.

---

<sup>9</sup> Partial List will be delivered within 24 hours, full report will be issued within 48 hours after test execution.

<sup>10</sup> The PO-5 Report will be delivered 5 business days after test execution

## 14 APPENDIX B Stand Alone Pre-Order Transactions

Below is the formula to calculate the number of standalone pre-order transactions that Pseudo-CLEC needs to execute, description of the steps involved and an illustrative calculation:

Daily Incremental LSR Vol.	(1)	1721	
<u>X Ratio of 5.8152</u>	(2)	<u>x 5.8152</u>	
Total Incremental LSR Vol.	(3)	10,008	
-- IMA Pre-Order	(4)	<u>-3012</u>	(1) * 1.75 -- Pseudo-
<u>CLEC Generated</u>	(5)		
Total Stand Alone PO Trans.	(6)		
x Percentage Per	(7)		
PO Transaction			

- 1) This represents the daily incremental volumes of LSRs at the 6, 9 and 12-month levels. The calculation will need to be done for the necessary hourly increments related to 6, 9 and 12 month increments. The illustration shows that 1721 incremental LSRs are to be executed in a day.
- 2) This is the ratio of pre-order transactions to an order. It accounts for all pre-order transactions: those issued as standalone transactions by CLECs, those related to an order and those executed downstream by IMA. It was determined using all of 1999 and 2000 data.
- 3) This is the total incremental pre-order transaction volumes that is calculated by multiplying (1) x (2).
- 4) This is the IMA-generated pre-order transactions by order type.
  - a) An address validation is executed for every incremental LSR that Pseudo-CLEC will execute.
  - b) A customer service record (CSR) is generated for 75% of the incremental LSRs. The reason for this is that CSR's are NOT needed for New Connects, Order Type "N", and they make up approximately 25% of total LSRs based on actual numbers from Jan-00 thru Jun-00.

Therefore, the daily incremental LSR volume (1) needs to be multiplied by 1.75 to arrive at the number of IMA-generated pre-order transactions. This result needs to be subtracted from the total incremental pre-order transaction volumes (3) because the IMA-generated transactions is part of the pre-order transaction ratio. To avoid double dipping, the number of IMA-generated transactions needs to be subtracted.
- 5) This represents the total number of Pseudo-CLEC-generated pre-order transactions. It is calculated by taking the number of pre-order transactions by order type contained in the TSD x the volumes of orders by order type.
- 6) This is the total number of stand alone pre-order transactions that Pseudo-CLEC needs to submit. It is derived by subtracting the number of IMA pre-order transactions (4) and Pseudo-CLEC-generated transactions associated with an order (5) from the total incremental LSR volume (3).
- 7) This represents percentage frequency of pre-order transactions by transaction type. It was determined by using actual percentages. The following percentages need to be applied against the total number of stand alone pre-order transactions that Pseudo-CLEC needs to submit (6) to determine the hourly number of pre-order transaction by transaction type.

The percentages are:

- a) Address validation = 39% of total PO Transactions
- b) CSR Retrieval = 31% of total PO Transactions
- c) Appointment Retrieval/Reservation = 1% of total PO Transactions
- d) Service Availability = 4% of total PO Transactions
- e) Facility Availability = 4.5% of total PO Transactions
- f) TN Reservations = 20.5% of total PO Transactions

## 15 APPENDIX C System Capacity Test LSR Mix

<b>Core Set of LSRs for System Capacity Test (12 Month)</b>				
		<b>Scenario Types by</b>	<b>% of Orders</b>	<b>#of Orders</b>
	<b>% of Orders</b>	<b>Product/Activity</b>	<b>(approximate)</b>	<b>(approximate)</b>
<b>LNP Only</b>	<b>51.08%</b>			<b>2332</b>
		LNP (V)	13.66%	319
		LNP (Z)	86.34%	2014
			<b>100.00%</b>	
<b>UNE Loop with LNP</b>	<b>5.26%</b>			<b>240</b>
		Retail to UNE Loop Conversion (V)	20.67%	50
		Retail to UNE Loop Conversion (Z)	79.33%	191
			<b>100.00%</b>	
<b>UNE Loop without LNP</b>	<b>24.34%</b>			<b>1111</b>
		Retail to UNE Loop Conversion (V)	3.70%	41
		UNE Loop – New (N)	77.94%	866
		UNE Loop – Disconnect (D)	18.36%	204
			<b>100.00%</b>	
<b>Resale</b>	<b>16.25%</b>			<b>742</b>
		Retail to Resale Conversion (V)	8.80%	65
		Retail to Resale Conversion (Z)	15.10%	112
		Resale – New (N)	6.30%	47
		Resale – Change ( C )	40.40%	300
		Resale – Disconnect (D)	29.40%	218
			<b>100.00%</b>	
<b>UNE-P</b>	<b>3.09%</b>			<b>141</b>
		Retail to UNE-P Conversion (V)	8.80%	12
		Retail to UNE-P Conversion (Z)	15.10%	21
		UNE-P – New (N)	6.30%	9
		UNE-P – Change ( C )	40.40%	57
		UNE-P – Disconnect (D)	29.40%	41
			<b>100.00%</b>	
<b>Totals</b>	<b>100.02%</b>	<b>Totals</b>		<b>4566</b>

### Core Set of LSRs for System Capacity Test (9 Month)

		Scenario Types by	% of Orders	#of Orders
	% of Orders	Product/Activity	(approximate)	(approximate)
<b>LNP Only</b>	<b>60.82%</b>			<b>1562</b>
		LNP (V)	13.67%	214
		LNP (Z)	86.33%	1349
			<b>100.00%</b>	
<b>UNE Loop with LNP</b>	<b>5.28%</b>			<b>136</b>
		Retail to UNE Loop Conversion (V)	20.67%	28
		Retail to UNE Loop Conversion (Z)	79.33%	108
			<b>100.00%</b>	
<b>UNE Loop without LNP</b>	<b>16.64%</b>			<b>427</b>
		Retail to UNE Loop Conversion (V)	3.70%	16
		UNE Loop – New (N)	77.94%	333
		UNE Loop – Disconnect (D)	18.36%	78
			<b>100.00%</b>	
<b>Resale</b>	<b>14.50%</b>			<b>373</b>
		Retail to Resale Conversion (W)	6.30%	23
		Retail to Resale Conversion (V)	2.50%	9
		Retail to Resale Conversion (Z)	15.10%	56
		Resale – New (N)	6.30%	23
		Resale – Change ( C )	40.40%	150
		Resale – Disconnect (D)	29.40%	110
<b>UNE-P</b>	<b>2.76%</b>		<b>100.00%</b>	<b>71</b>
		Retail to UNE-P Conversion (V)	8.80%	6
		Retail to UNE-P Conversion (Z)	15.10%	11
		UNE-P – New (N)	6.30%	4
		UNE-P – Change ( C )	40.40%	29
		UNE-P – Disconnect (D)	29.40%	21
			<b>100.00%</b>	
<b>Totals</b>	<b>100.00%</b>	<b>Totals</b>		<b>2569</b>

<b>Core Set of LSRs for System Capacity Test (6 Month)</b>				
		<b>Scenario Types by</b>	<b>% of Orders</b>	<b>#of Orders</b>
	<b>% of Orders</b>	<b>Product/Activity</b>	<b>(approximate)</b>	<b>(approximate)</b>
<b>LNP Only</b>	<b>54.30%</b>			<b>935</b>
		LNP (V)	13.67%	128
		LNP (Z)	86.33%	807
			<b>100.00%</b>	
<b>UNE Loop with LNP</b>	<b>5.77%</b>			<b>99</b>
		Retail to UNE Loop Conversion (V)	20.67%	21
		Retail to UNE Loop Conversion (Z)	79.33%	79
			<b>100.00%</b>	
<b>UNE Loop without LNP</b>	<b>15.18%</b>			<b>261</b>
		Retail to UNE Loop Conversion (V)	3.70%	10
		UNE Loop – New (N)	77.94%	204
		UNE Loop – Disconnect (D)	18.36%	48
			<b>100.00%</b>	
<b>Resale</b>	<b>20.76%</b>			<b>357</b>
		Retail to Resale Conversion (W)	6.30%	23
		Retail to Resale Conversion (V)	2.50%	9
		Retail to Resale Conversion (Z)	15.10%	54
		Resale – New (N)	6.30%	23
		Resale – Change ( C )	40.40%	144
		Resale – Disconnect (D)	29.40%	105
			<b>100.00%</b>	
<b>UNE-P</b>	<b>3.96%</b>			<b>68</b>
		Retail to UNE-P Conversion (V)	8.80%	6
		Retail to UNE-P Conversion (Z)	15.10%	10
		UNE-P – New (N)	6.30%	4
		UNE-P – Change ( C )	40.40%	28
		UNE-P – Disconnect (D)	29.40%	20
			<b>100.00%</b>	
<b>Totals</b>	<b>99.97%</b>	<b>Totals</b>		<b>1722</b>

## 16 APPENDIX D System Capacity Test Pre-Order MIX

Pre-Order Query for each System Capacity Test Order Service Request (12 Month)								
Order Type	Service Request – Activity / Product	CSR	Addr Val	TN Rqst*	Serv Avail	Appt Sched (Dispatch)	Facil Avail	Loop Qual
<b>LNP Only</b>								
	LNP (V)	319	319					
	LNP (Z)	2014	2014					
<b>UNE Loop with LNP</b>								
	Retail to UNE Loop Conversion (V)	50	50	7	35		7	7
	Retail to UNE Loop Conversion (Z)	191	191	29	133		29	29
<b>UNE Loop w/o LNP</b>								
	Retail to UNE Loop Conversion (V)	41	41	6	29		6	6
	UNE Loop – New (N)		866		866		866	866
	UNE Loop – Disconnect (D)	204	204					
<b>Resale</b>								
	Retail to Resale Conversion (W)	0	0					
	Retail to Resale Conversion (V)	65	65		65	10	10	
	Retail to Resale Conversion (Z)	112	112		112	17	17	
	Resale – New (N)		47	47	47	47	47	47
	Resale – Change (C)	300	300	45	300	45	45	
	Resale – Disconnect (D)	218	218					
<b>UNE-P</b>								
	Retail to UNE-P Conversion (V)	12	12		12	2	2	
	Retail to UNE-P Conversion (Z)	21	21		21	3	3	
	UNE-P – New (N)		9	9	9	9	9	9
	UNE-P – Change (C)	57	57	9	57	9	9	
	UNE-P – Disconnect (D)	41	41					
<b>TOTAL Pseudo-CLEC</b>		<b>3645</b>	<b>4567</b>	<b>151</b>	<b>1687</b>	<b>141</b>	<b>1049</b>	<b>964</b>
<b>Standalone</b>		<b>1971</b>	<b>2480</b>	<b>1303</b>	<b>254</b>	<b>64</b>	<b>286</b>	
<b>Total Pre-Order</b>		<b>5616</b>	<b>7046</b>	<b>1455</b>	<b>1941</b>	<b>204</b>	<b>2857</b>	<b>964</b>

Pre-Order Query for each System Capacity Test Order Service Request (9 Month)

Order Type	Service Request – Activity / Product	CSR	Addr Val	TN Rqst*	Serv Avail	Appt Sched (Dispatch)	Facil Avail	Loop Qual
<b>LNP Only</b>								
	LNP (V)	214	214					
	LNP (Z)	1349	1349					
<b>UNE Loop with LNP</b>								
	Retail to UNE Loop Conversion (V)	28	28		28		4	4
	Retail to UNE Loop Conversion (Z)	108	108		108		16	16
<b>UNE Loop w/o LNP</b>								
	Retail to UNE Loop Conversion (V)	16	16		16		2	2
	UNE Loop – New (N)		333		333		333	333
	UNE Loop – Disconnect (D)	78	78					
<b>Resale</b>								
	Retail to Resale Conversion (W)	23	23					
	Retail to Resale Conversion (V)	9	9		9	1	1	
	Retail to Resale Conversion (Z)	56	56		56	8	8	
	Resale – New (N)		23	23	23	23	23	23
	Resale – Change (C)	150	150		150	23	23	
	Resale – Disconnect (D)	110	110					
<b>UNE-P</b>								
	Retail to UNE-P Conversion (V)	6	6		6	1	1	
	Retail to UNE-P Conversion (Z)	11	11		11	2	2	
	UNE-P – New (N)		4	4	4	4	4	4
	UNE-P – Change (C)	29	29		29	4	4	
	UNE-P – Disconnect (D)	21	21					
<b>TOTAL Pseudo-CLEC</b>		<b>2208</b>	<b>2569</b>	<b>28</b>	<b>774</b>	<b>67</b>	<b>423</b>	<b>384</b>
<b>Standalone</b>		<b>1237</b>	<b>1556</b>	<b>818</b>	<b>160</b>	<b>40</b>	<b>180</b>	
<b>Total Pre-Order</b>		<b>3445</b>	<b>4125</b>	<b>846</b>	<b>934</b>	<b>107</b>	<b>603</b>	<b>384</b>

Pre-Order Query for each System Capacity Test Order Service Request (6 Month)								
Order Type	Service Request – Activity / Product	CSR	Addr Val	TN Rqst*	Serv Avail	Appt Sched (Dispatch Only)	Facil Avail	Loop Qual
<b>LNP Only</b>	LNP (V)	128	128					
	LNP (Z)	807	807					
<b>UNE Loop with LNP</b>								
	Retail to UNE Loop Conversion (V)	21	21		21		3	21
	Retail to UNE Loop Conversion (Z)	79	79		79		12	79
	Retail to UNE Loop Conversion (V)	10	10		10		1	10
<b>UNE Loop without LNP</b>	UNE Loop – New (N)		204		204		204	204
	UNE Loop – Disconnect (D)	48	48					
<b>Resale</b>								
	Retail to Resale Conversion (W)	23	23			23		
	Retail to Resale Conversion (V)	9	9		9	9	1	
	Retail to Resale Conversion (Z)	54	54		54	54	8	
	Resale – New (N)		23	23	23	23	23	23
	Resale – Change (C)	144	144		144	144	22	
	Resale – Disconnect (D)	105	144					
<b>UNE-P</b>								
	Retail to Resale Conversion (V)	6	6		6	6	1	
	Retail to Resale Conversion (Z)	10	10		10	10	2	
	Resale – New (N)		4	4	4	4	4	4
	Resale – Change (C)	28	28		28	28	4	
	Resale – Disconnect (D)	20	28					
<b>TOTAL Pseudo-CLEC</b>		<b>1491</b>	<b>1768</b>	<b>27</b>	<b>591</b>	<b>301</b>	<b>285</b>	<b>340</b>
<b>Standalone</b>		<b>682</b>	<b>858</b>	<b>451</b>	<b>88</b>	<b>22</b>	<b>99</b>	
<b>Total Pre-Order</b>		<b>2173</b>	<b>2626</b>	<b>478</b>	<b>679</b>	<b>323</b>	<b>384</b>	<b>340</b>

\* TN Requests will be input by IRTM

---

## 17 APPENDIX E System Capacity Test Transaction Distribution

State	Percent of Total (Approximate)
Arizona	9.9%
Utah	13.8%
Colorado	23.0%
Iowa	3.0%
Idaho	1.2%
Minnesota	13.8%
Montana	3.7%
North Dakota	2.0%
Nebraska	1.3%
New Mexico	1.6%
Oregon	4.7%
South Dakota	0.5%
Washington	21.5%
Wyoming	0.2%
Sum of Incremental	100.00%

Hour MST	% per hour (Approximate)
7:00 AM	8.81%
8:00 AM	9.95%
9:00 AM	11.11%
10:00 AM	10.06%
11:00 PM	9.66%
12:00 PM	10.05%
1:00 PM	10.13%
2:00 PM	8.57%
3:00 PM	7.30%
4:00 PM	6.66%
5:00 PM	7.69%
TOTAL	100%

## 18 APPENDIX F Incident Work Order Form Example

### INCIDENT WORK ORDER FORM

<b>Tracking Number</b>	
<b>PON</b> (Optional)	
<b>Date/Time of Incident</b>	
<b>Initiator</b>	
<b>Initiator's Email</b>	
<b>Initiator's Number</b>	
<b>Severity Level</b>	
<b>Date /Time CGE&amp;Y advised of Incident</b>	
<b>Qwest SPOC Referred Time</b>	
<b>Date/Time Referred to TAG</b>	

**Description of Incident**

Detail description of the incident
------------------------------------

**Qwest SPOC**                      **Qwest estimated completion date**

--	--

**Qwest Proposed Resolution**

--

**DATE Referred to TAG:**

(TAG Comments or Objections)

--

**Date Closed:**

(Closing remarks)

--