F.   Test Results: Order Processing Systems Capacity Management Evaluation (O&P-6)

1.0   Description

The Order Processing Systems Capacity Management Evaluation entailed a detailed review of the methods and procedures in place to plan for and manage projected growth in the use of the Electronic Data Interchange (EDI), Telecommunications Access Gateway (TAG), Local Exchange Ordering (LEO), Local Exchange Service Order Generator (LESOG), Local Number Portability (LNP), and Service Order Control System (SOCS) order processing systems.

The objectives of this evaluation were to analyze the capabilities of BellSouth capacity management functions in relation to the order processing applications, and to determine whether the procedures were adequate to identify and implement capacity increments to satisfy projected customer business volumes on a timely basis.

2.0   Methodology

This section summarizes the test methodology.

2.1   Business Process Description

The EDI Gateway supports the transmission of orders, order receipt acknowledgements, and order notices. LEO performs formatting checks on orders and passes the Local Service Request (LSR) to LESOG. LESOG converts the LSR into a BellSouth internal service order and passes the order to SOCS. Orders for LNP are routed through the LNP Gateway, which performs edit checks and passes the order to SOCS for provisioning. SOCS receives and routes service orders to the appropriate downstream provisioning and billing systems. TAG, like EDI, provides the CLECs with order functionality including LSR submission, order status, and order notices. See Section V, "Ordering & Provisioning Overview," for a complete description of TAG, EDI, LEO, LESOG, LNP, and SOCS.

The capacity management process for the EDI, LEO, LESOG, LNP, SOCS, and TAG systems is distributed along various lines of responsibility. BellSouth has outsourced operation and application support for mainframe and mid-range systems.

The EDI, LEO, and SOCS systems operate in a mainframe environment. The mainframe operations groups manage the mainframe hardware, which includes Central Processing Unit (CPU), core memory, Direct Access Storage Device

(DASD), and tape library systems. The application teams manage the production software and databases.

The LESOG, LNP, and TAG systems operate in a mid-range environment. The midrange operations groups manage the midrange hardware. The application teams provide mid-range software support.

The BellSouth Transport Team manages day-to-day operations for the network and collects data on network performance.

2.2   Scenarios

Scenarios were not applicable to this test.

2.3   Test Targets & Measures

The test target was the order processing systems capacity management process. Sub-processes, functions, and evaluation criteria are summarized in the following table. The last column "Test Cross-Reference" indicates where the particular measures are addressed in section 3.1 "Results & Analysis."

Table V-6.1: Test Target Cross Reference

Sub-Process	Function	Evaluation Criteria	Test Cross-Reference
Order Processing Systems Capacity Management	Data collection and reporting of business volumes, resource utilization, and performance monitoring	Adequacy and Completeness of data collection and reporting	O&P-6-1-1, O&P-6-1-2, O&P-6-1-3, O&P-6-1-4, O&P-6-1-5, O&P-6-1-6
	Data verification and analysis of business volumes, resource utilization, and performance monitoring	Adequacy and Completeness of data verification and analysis	O&P-6-1-7, O&P-6-1-8, O&P-6-1-9, O&P-6-1-10, O&P-6-1-11
	Systems and capacity planning	Adequacy and Completeness of systems and capacity planning	O&P-6-1-12, O&P-6-1-13, O&P-6-1-14, O&P-6-1-15

2.4   Data Sources

The data collected for the test are summarized in the table below.

Table V-6.2: Data Sources for Order Processing Systems Capacity Management Evaluation

Document	File Name	Location in Work Papers	Source
EDI Overview, EDI In- & Out- Bound Processing, LEO, LEO – Test, TCIF Issue 7 EDI Map and Application File Format Design	Edi4KCL.ppt, ls7_42.xls	O&P-6-A-1	BLS
Telecommunications Access Gateway (TAG) Architecture/Detailed Design [Issue 1, September 1999, Release 3.1]	Design.doc	O&P-6-A-2	BLS
TAG Configurations	Tagconfig.doc	O&P-6-A-3	BLS
Tivoli Checklist, Tivoli for BLP, Tivoli for TAG, Tivoli Monitoring (15 November, 1999)	Tivcheck.doc, Tivmon.doc, Tivoli_blp.doc, Tivoli_tac.doc	O&P-6-A-4	BLS
Monthly Metric Data Summary (LENS, TAG)	No electronic copy	O&P-6-A-5	BLS
Interview Summary – TAG Administration	Interview_summary_110499.doc	O&P-6-A-6	KCI
Interview Summary – Encore Management	Interview_summary_120999.doc	O&P-6-A-7	KCI
Interview Summary – EDI Management	Interview_summary2_121099.doc	O&P-6-A-8	KCI
Interview Summary – EDI Project Team	Interview_summary_121499.doc	O&P-6-A-9	KCI
EDI Daily Monitoring and Help Guide	EDIMONIT.DOC	O&P-6-A-10	BLS
EDI Reports (Bytes by Month, Trading Partners, Trading Partner Relationships, EDI Bytes)	REPORT1B.XLS, REPORT2T.XLS, REPORT3R.XLS, REPORT4C.XLS	O&P-6-A-11	BLS
Interview Summary – Capacity Planner	Interview_summary3_03292000.doc	O&P-6-A-12	KCI
Interview Summary2 – Product Manager	Interview_summary_03292000.doc	O&P-6-A-13	KCI

Document	File Name	Location in Work Papers	Source
Interview Summary3 – Second Capacity Planner	Interview_summary2_03292000.doc	O&P-6-A-14	KCI
Interview Summary – Product Support Manager	Interview_summary2_04132000.doc	O&P-6-A-15	KCI
Interview Summary2 – Forecast Manager	Interview_summary_04132000.doc	O&P-6-A-16	KCI
Interview Summary – Capacity Planning Project Manager	Interview_summary2_04182000.doc	O&P-6-A-17	KCI
Interview Summary2 – Capacity Planning Manager	Interview_summary_04182000.doc	O&P-6-A-18	KCI
Interview Summary – Support Manager	Interview_summary_04192000	O&P-6-A-19	KCI
BellSouth Telecommunications Information Technology – Capacity Planning Methodology, Practices and Requirements – July, 1999	Cap_methodology.doc	PRE-6-A-1	BLS
Mainframe Software Support Procedure Manual	ipsa5001.doc	BLG-3-A-3	BLS
BellSouth Mainframe CPU Configuration RAO's	hardware.txt RAO.ppt	BLG-3-A- 4	BLS
Framework and Column Descriptions for Mainframe Performance Reporting	PT.xls	BLG-3-A-9	BLS
Scratch Tape Statistics By Site, 10/01/99	SCRATCH TAPE STATISTICS BY SITE.doc	BLG-3-A-10	BLS
Active Tape Count By Site, 07/01/99-10/01/99	ACTT1099.doc	BLG-3-A-11	BLS
Strobe Performance Profile, 11/04/98	stbrtp.doc	BLG-3-A-12	BLS
StorageGUARD Pool Utilization	Stguard.doc	BLG-3-A-13	BLS
Concurrent Tape Drive Usage Report Card, September, 1999	CONC0999.XLS.xls	BLG-3-A-14	BLS

Document	File Name	Location in Work Papers	Source
StorageGUARD Pool Summary History	History.doc	BLG-3-A-15	BLS
InTune Report	Snap.txt	BLG-3-A-16	BLS
CPU Measurement Reports	CPU.xls	BLG-3-A-17	BLS
Interview Summary – Mainframe Operations	Interview_summary2_1 11699.doc	BLG-3-A-18	KCI
Interview Summary – Billing test team	Interview_summary2_1 12999.doc	BLG-3-A-20	KCI
Interview Summary – Database administration	Interview_summary1_1 12999.doc	BLG-3-A-21	KCI
Interview Summary – Mainframe Performance & Tuning	Interview_summary3_1 12999.doc	BLG-3-A-22	KCI
Mainframe Resource Utilization-- Top 10 (CPU, DASD, and Tape) Consumers	Top 10 Consumers Sept.xls	BLG-3-A-23	BLS
MIP Projections	MVS MIPS Projections.xls	BLG-3-A-27	BLS
Projected DASD Retirements for 2000	2000-DASD-Retirements.xls	BLG-3-A-28	BLS
B2SY-S2ST-G2SY Application Hours	Trend CPU_Corp.xls	BLG-3-A-29	BLS
A6SY Application Hours	Trend CPU-RAO.xls	BLG-3-A-30	BLS
Letter on Mainframe Asset Planning inputs	MF-capacity planning letter.doc	BLG-3-A-31	BLS
EDS Mainframe Requirements	EDS Mainframe reqs.doc	BLG-3-A-32	BLS
System Production Readiness Requirements	Readiness checklist.doc	BLG-3-A-33	BLS
Critical Application Availability (Andersen & EDS)	KCIdata.xls	BLG-3-A-34	BLS
Application Availability	GA2000SLAs.xls	BLG-3-A-35	BLS
Interview Summary – BCS Transport	Interview_summary_12 1599.doc	PRE-6-A-2	KCI
BOSIP Network Diagrams	Atlntadc.ppt Bosipcor.ppt Brmghmdc.ppt Chrltdc.ppt Jcksondc.ppt Miamidc.ppt Nsvlledc.ppt	PRE-6-A-3	BLS
Birmingham BayNet Protocol Distribution	Bay1.gif	PRE-6-A-4	BLS

Document	File Name	Location in Work Papers	Source
Monthly Average Utilization - Birmingham	FDDI1.gif	PRE-6-A-5	BLS
LAN Interface With In Utilization over 20%	LAN~1.htm	PRE-6-A-6	BLS
Average Latency Between RDC's Originating from Birmingham	Monthl~1.gif	PRE-6-A-7	BLS
Monthly Maximum IP Routes Known to Core	Monthl~2.gif	PRE-6-A-8	BLS
WAN Interface With In Utilization over 30%	SMDS1.gif	PRE-6-A-9	BLS
Daily Interface Performance Statistics for PNSCGS04 to JCVLBA19	Pnscgs04.gif	PRE-6-A-10	BLS
Total Traffic Across Core	WAN~1.htm	PRE-6-A-11	BLS
Server Utilization Report	Viewar~1.csv	PRE-6-A-12	BLS
Interview Summary – Transport Solutions	Interview_summary1_121099.doc	PRE-6-A-13	KCI
Interview Summary – Asset Planning	Interview_summary1_01202000.doc	PRE-6-A-14	KCI
BSCN – DS3 Equivalent Capacity	Bscncap.ppt	PRE-6-A-15	BLS
BellSouth Official Communications Special Services Facility Forecast for 2000 – 2002 and Update to the 1999 Forecast (Cover Letter)	Ss99ltr.doc	PRE-6-A-16	BLS
BellSouth Telecommunications Official Communications Service Requirements And Special Service Forecast	Bscn1999.doc	PRE-6-A-17	BLS
Capacity Planning Metrics for BST Assets Managed by BCS	Capaci~1.doc	PRE-6-A-18	BLS
BellSouth Telecommunications Official Communications Service Requirements Mechanized Input Form	Bscnele.xls	PRE-6-A-19	BLS
Trunk Utilization Report	Rpdn_0110.doc	PRE-6-A-20	BLS
BellSouth Integrated Broadband Network Diagram	Ibtcp911.ppt	PRE-6-A-22	BLS
Transport Asset Planning – Infrastructures	Infraex.ppt	PRE-6-A-23	BLS
Interview Summary – Network Asset Planner	Interview_summary2_01202000.doc	PRE-6-A-24	KCI

Document	File Name	Location in Work Papers	Source
Questionnaire designed to aid Capacity Planner and/or Technical Architect in characterizing an application workload	Config.xls	PRE-6-A-25	BLS
Interview Summary – Midrange Performance Monitoring	Interview_summary_01252000.doc	PRE-6-A-26	KCI
Printouts from Midrange Performance Data Warehouse	No Electronic Copy	PRE-6-A-27	BLS
BGSCOLL Problem Resolution Guide for Collection of Nodes	Probres.doc	PRE-6-A-28	BLS
Data Collected 11/19/99 – (Status Report, by project, of Midrange data collection tool installation)	Perforn1.doc	PRE-6-A-29	BLS
Interview Summary – Capacity Planner	Interview_summary_01272000.doc	PRE-6-A-30	KCI
LNP Usage Report	LNP Usage.xls	PRE-6-A-32	BLS
TAG Usage Report	TAG Usage.xls	PRE-6-A-35	BLS
BOSIP Support Web Site Printouts – Homepage	No Electronic Copy	PRE-6-A-39	BLS
BOSIP Support Web Site Printouts – Shared BOSIP Network	No Electronic Copy	PRE-6-A-40	BLS
BOSIP Support Web Site Printouts – BCS Support	No Electronic Copy	PRE-6-A-41	BLS
BOSIP LAN and WAN Network Topology Overview	No Electronic Copy	PRE-6-A-42	BLS
Datakit Support Homepage and affiliated web pages	No Electronic Copy	PRE-6-A-43	BLS
ENCORE Successful Logins vs. Failed Logins	No Electronic Copy	PRE-6-A-44	BLS
TRENDview HTML Reports	No Electronic Copy	PRE-6-A-45	BLS
TRENDview HTML Reports – Overutilized/Underutilized WAN Interfaces	No Electronic Copy	PRE-6-A-46	BLS
TRENDview HTML Reports – WAN interface utilization graphed over time	No Electronic Copy	PRE-6-A-47	BLS
Printouts from EDS Midrange Performance Data Warehouse Web Site	No Electronic Copy	PRE-6-A-48	BLS
Project List	No Electronic Copy	PRE-6-A-49	BLS
ENCORE-LESOG Performance Data	No Electronic Copy	PRE-6-A-51	BLS

Document	File Name	Location in Work Papers	Source
LNP Performance Data	No Electronic Copy	PRE-6-A-54	BLS
LNPIT Performance Data	No Electronic Copy	PRE-6-A-55	BLS
LNPTAG Performance Data	No Electronic Copy	PRE-6-A-56	BLS
LSOG (LESOG – sp) Performance Data	No Electronic Copy	PRE-6-A-57	BLS
TAG Performance Data	No Electronic Copy	PRE-6-A-60	BLS
Capacity Planning & Management Playbook (What we do & How we do it) Working Draft – Not Approved	No Electronic Copy	O&P-6-C-1	BLS
BST Product Forecasts	No Electronic Copy	PRE-6-A-61	BLS
N&CS Forecasting Process	Foreca~1.ppt	PRE-6-A-62	BLS
Network & Carrier Service Forecasting	No Electronic Copy	PRE-6-A-63	BLS
The Forecast Process	No Electronic Copy	PRE-6-A-64	BLS
Capacity Management Notification Process	Capnot1.doc	PRE-6-A-65	BLS
Capacity Forecasts Contacts for Encore & LNP Applications	Capconts.doc	PRE-6-A-66	BLS
LSR Actuals & Forecast Report (1998 – 2004)	No Electronic Copy	PRE-6-A-67	BLS
Monthly Capacity Report – Network Summary – March 2000	Network summary.xls	PRE-6-A-68	BLS
LSR Volume Report by data source for 3/2000	Totals.gif	PRE-6-A-69	BLS
LCSC Center Activity Report (3/2000)	Resale.doc	PRE-6-A-70	BLS
LCSC Center Activity Report (4/2000)	April car.doc	PRE-6-C-1	BLS
LCSC Center Activity Report (NON Reqtyp E + NON Reqtyp J)	Non-E-J.doc	PRE-6-C-2	BLS
LCSC Center Activity Report (Reqtyp M Only)	TypeM.doc	PRE-6-C-3	BLS
LCSC Center Activity Report (Reqtyp J Only)	TypeJ.doc	PRE-6-C-4	BLS
Daily LCSC Order Flow Summaries	Lesog.doc	PRE-6-C-5	BLS

Document	File Name	Location in Work Papers	Source
Third Party Testing Forecast of Volumes – EOY 2001	No Electronic Copy	PRE-6-C-6	BLS
Numbers Ported per Day (Week of 3/1/99 – 9/20/99)	No Electronic Copy	PRE-6-C-7	BLS
Maximum Number of Ports Per Day Per Week and Projection through 2001	No Electronic Copy	PRE-6-C-8	BLS
Number of LSRs Process Per Day (Week of 3/1/99 – 9/20/99)	No Electronic Copy	PRE-6-C-9	BLS
Maximum Number of LSRs Per Day Per Week and Projections through 2001	No Electronic Copy	PRE-6-C-10	BLS
Transaction to System Activity Map	No Electronic Copy	PRE-6-C-11	BLS
Business Drivers Form	No Electronic Copy	PRE-6-C-12	BLS
Email with LCSC Service Rep Headcount Forecast	No Electronic Copy	PRE-6-C-13	BLS
Electronic Interface Trends	Nov99T~1.ppt Trends.ppt Trends1.ppt FEBLSR.ppt MARLSR.ppt	PRE-6-C-14	BLS
Server Usage Report (LSOG)	LSOGUsage.xls	PRE-6-C-15	BLS
Encore Forecasts	Encore Forecasts.xls	PRE-6-C-16	BLS
Encore Capacity Analysis Assumptions	Encore capacity analysis assumptions.doc	PRE-6-C-17	BLS
Capacity Analysis Report Encore Systems	Encore.doc	PRE-6-C-18	BLS
Selective Carrier Routing, Full Deployment, Decision Package for Interconnection	No electronic copy	PRE-6-C-19	BLS
Memorandum to EDS Centralized System Administrators re: BTSI Capacity Planning	CSA Performance Letter.doc	PRE-6-C-20	BLS
BTSI Capacity Upgrade Request / EDS Performance Analysis Workflow	BTSI Performance Process.doc	PRE-6-C-21	BLS
Project Charter: Encore SLA Performance	ProjCharter063000.doc	PRE-6-C-22	BLS

Document	File Name	Location in Work Papers	Source
Memo to Capacity Planners re: CLEC SQM Performance information availability via the PMAP website	CapPlanmemo0700.doc	PRE-6-C-23	BLS

2.4.1 Data Generation/Volumes

This test relied on documentation reviews and interviews with BellSouth personnel.

2.5   Evaluation Methods

The capacity management evaluation began with a review of systems documentation and process flows for order processing.   Interviews were conducted with system administration personnel responsible for the operation of EDI, LEO, LESOG, LNP, SOCS, and TAG order processing systems. These interviews were supplemented with an analysis of BellSouth capacity management procedures as well as collection of evidence of related activities such as: periodic capacity management reviews; system reconfiguration/load balancing; load increase induced upgrades; and, resource utilization and performance management reporting.

2.6   Analysis Methods

The Order Processing Systems Capacity Management Evaluation included a checklist of evaluation criteria developed by KCI during the initial phase of the BellSouth - Georgia OSS Evaluation. These evaluation criteria, provided the framework of norms, standards, and guidelines for the Order Processing Systems Capacity Management Evaluation.

The data collected from inspections and interviews were analyzed employing the evaluation criteria referenced above.

3.0   Results Summary

This section identifies the evaluation criteria and test results.

3.1   Results & Analysis

The results of this test are presented in the table below.   Definitions of evaluation criteria, possible results, and exceptions are provided in Section II.

Table V-6.3: O&P-6 Evaluation Criteria and Results

Test Cross-Reference	Evaluation Criteria	Result	Comments
O&P-6-1-1	There is an established process for capturing business and transaction volumes	Satisfied	For EDI, the Harbinger tool provides the capability to measure and track business transaction volumes. Data is currently collected on EDI monthly volumes. The Tools & Support Team can identify the number of transaction sets, types of transactions, etc. Reports are created with historical trending of monthly transaction volumes in the mainframe environment.

For TAG, the LSR Volume Report, from the BLS ICOPS (Interconnection Operations) Web site, provides a listing of TAG LSRs received from LEO and LNP. LSRs in this report are organized by Service/Activity Type (e.g., Loop, Loop with INP, BLS Retail, Resale, etc.).

The LCSC Center Activity Reports provide a monthly view of (Resale and UNE) LSRs received from BLS customers via FAX, EDI, LENS, and TAG. LEO, LESOG, and SOCS order information is also referenced within the LCSC Center Activity Reports.

Collection and reporting of transaction volumes was discussed during interviews with the application managers. KCI was provided copies of the EDI and LCSC reports. |
| O&P-6-1-2 | There is an established process for capturing resource utilization | Satisfied | The EDI translator is a mainframe application. EDI system resource utilization and performance monitoring are covered under the efforts in the mainframe operations groups. Mainframe resource utilization data is collected and reported monthly.

Midrange and network resource utilization data is tracked and reported on the Midrange |

Test Cross-Reference	Evaluation Criteria	Result	Comments
			Performance Monitoring Web site and the BellSouth Open System Interconnect Protocol (BOSIP) home page respectively. These Web sites are available to and accessed by the resources responsible for monitoring the performance of systems and networks.

The processes for capturing resource utilization were described during interviews with members of the groups responsible for these activities. In addition, KCI reviewed the BOSIP home page and the Mid-range Performance Monitoring Web site. Sample resource utilization reports were collected and reviewed. |

Test Cross-Reference	Evaluation Criteria	Result	Comments
O&P-6-1-3	Resource utilization is monitored for system components and elements	Satisfied	The Performance and Tuning Group monitors Multiple Virtual Storage (MVS) mainframe components such as storage utilization (central storage), memory paging rates, batch jobs, Time Sharing Option (TSO) sessions, Direct Access Storage Device (DASD) response times, tape drives allocated, Central Processing Unit (CPU) percentage busy, etc. Sample mainframe resource utilization reports were collected during the test.

For midrange systems, Disk input/output (I/O), Network I/O, as well as resource utilization for CPUs, memory, and file systems are tracked and reported.

BLS also collects resource utilization data on CPU, buffer and memory utilization for the routers, circuits utilization of the routers, LAN interfaces on routers, hubs and the Fiber Distributed Data Interface (FDDI) rings. For the circuits and LAN interfaces, reports are generated for the devices with the highest utilization.

The midrange and network resource utilization data collection processes were described during interviews and verified through a review of the BOSIP home page, review of the Midrange Performance Monitoring Web site and through the collection of sample reports. |
| O&P-6-1-4 | Instrumentation and other tools are used to collect resource utilization data | Satisfied | InTune and Strobe are mainframe MVS tools used to provide information on where applications are spending CPU cycles, wait times, DASD volumes and tracks accessed, etc. These application-profiling tools operate on IMS and DB2 databases. Storage Guard is an on-line system that takes a snapshot of DASD |

KPMG Consulting

March 20, 2001   *V-F-13*
Published by KPMG Consulting, Inc. Confidential. For BellSouth, KCI, and Georgia Public Service Commission use.

Test Cross-Reference	Evaluation Criteria	Result	Comments
			storage (each VTOC) every 30 minutes. Through the on-line facility it is possible to view the capacity and utilization of each storage pool. DFSMS is a hierarchical storage manager that checks for previous messages. Targets are set for storage utilization. If a device is over the utilization target, then the utility searches for old data (past period set for retention for all data types) that can be moved to a lower priority stage. These tools were identified through interviews with the mainframe operation group, and sample reports were provided to KCI.
			The data used to produce midrange system resource utilization reports are gathered through a variety of tools and utilities including Best/1, BGSCOLL, GlancePlus, System Activity Recorder (SAR), Unicenter TNG, and Tivoli. The Best/1 modeling and simulation capacity planning tool is used for monitoring of mid-range system resources. The BGSCOLL tool collects data in 15-minute intervals daily. The data is compiled into daily and monthly averages. Three months of data are stored for trending. The tools used to collect midrange resource utilization data were described during interviews and sample reports were collected and reviewed.
			Tools running to collect network resource utilization data include TRENDsnmp (from DeskTalk), Spectrum Enterprise Manager, OpenView, Nerve Center for BOSIP (the router network), and Starkeeper (for the Datakit networks). These tools were described during interviews with the BOSIP Support manager and sample reports were provided to KCI.

KPMG Consulting

March 20, 2001   *V-F-14*
Published by KPMG Consulting, Inc. Confidential. For BellSouth, KCI, and Georgia Public Service Commission use.

Test Cross-Reference	Evaluation Criteria	Result	Comments
O&P-6-1-5	Performance is monitored at all applicable levels (e.g. network, database server, application server, client, etc.)	Satisfied	The Performance and Tuning Group monitors system resources for mainframe computers [i.e., MVS mainframe components such as storage utilization (central storage), memory paging rates, batch jobs, TSO sessions, DASD response times, tape drives allocated, CPU percentage busy, etc.] The site manager ensures that DFSMS is running, checks for previous messages, and checks tape drive status. The performance of the (midrange) application servers is monitored daily by the midrange operations groups. The BLS Transport Team is responsible for day-to-day operations of the networks (comprised of components such as routers, ATM switches, and hubs.). The team is comprised of three groups: PACS, which provides support and problem resolution for escalated network performance issues; Proactive Performance Analysis, which looks at the networks to prevent problems; and the Tools Group. This team collects the data on network performance. Homegrown scripts have been written to collect data such as latency and packet loss across the BOSIP core. These activities were described during interviews with the Application Support Teams, Midrange Operations Group, and Network Support Team. In addition, sample performance reports were collected.

Test Cross-Reference	Evaluation Criteria	Result	Comments
O&P-6-1-6	Instrumentation and other tools are used to monitor performance	Satisfied	The CMF tool looks at system logs to collect mainframe performance data. MainView (a graphical user interface for CMF) presents the performance data collected by CMF in a graphical format so that trending can be performed. The Mid-Range Performance Monitoring and the BOSIP Web sites are available to and accessed by the resources responsible for monitoring the performance of (midrange) systems and network elements. Best/1, GlancePlus, SAR, Unicenter TNG, and Tivoli are tools used to monitor mid-range performance. TRENDsnmp (from DeskTalk), Spectrum Enterprise Manager, OpenView, Nerve Center for BOSIP (the router network), and Starkeeper (for the Datakit networks) are tools used to monitor network performance. Performance monitoring activities were described during interviews and sample reports were provided to KCI. The Midrange Performance Monitoring Web site and the BOSIP home page were reviewed.
O&P-6-1-7	There is an established process for forecasting business volumes and transactions	Satisfied	During initial testing, no established, ongoing process for forecasting business volumes and transactions was observed for BLS's order processing systems. See Exception 25 for additional information on this issue. KCI conducted additional interviews and gathered further process documentation during retest activities. KCI observed that the product managers prepare a five-year LSR forecast, which is provided to the capacity planners. The product managers also provide information on changes in the percentage of

Test Cross-Reference	Evaluation Criteria	Result	Comments
			manual work and the distribution of the LSR volume between the various electronic interfaces.
			Exception 25 is closed.
O&P-6-1-8	The business volume tracking and forecasting data is at an appropriate level of detail to use for capacity management	Satisfied	Mainframe (EDI) business volumes and transactions are tracked and reported monthly. The MVS Storage Management Group receives data from the Mainframe Tower Management Group on expected growth, by site. These data are analyzed to determine how much of the forecast growth can be absorbed by current storage capacity and this information is brought to the Triad/Quarterly meetings. During these meetings, decisions are made on how much storage capacity to purchase for each site.
			During initial testing, no process was observed for the collection of mid-range (LESOG, LNP, and TAG) business and transaction volumes, and no established, ongoing process for forecasting business and transaction volumes was observed for BLS's EDI or TAG interfaces. See Exception 25 for additional information on this issue.
			As retest activities, KCI conducted additional interviews and gathered further documentation of BLS's capacity management processes. KCI also observed the capacity planning process and was provided with a copy of the Capacity Analysis Report, ENCORE Systems. (The ENCORE environment includes LENS, LEO, LESOG, LNP, TAG and EDI.)
			Historical data is collected and analyzed to develop/confirm assumptions used in the capacity planning process. For example, pre-order to order transaction ratios and

KPMG Consulting

March 20, 2001   *V-F-17*
Published by KPMG Consulting, Inc. Confidential. For BellSouth, KCI, and Georgia Public Service Commission use.

Test Cross-Reference	Evaluation Criteria	Result	Comments
			peak hourly daily volume are determined from reports of transaction volumes. In the capacity planning model, LSR forecast data is used to modify the system(s) workload over time to assess the impact of changes in transaction volume on system resources and capacity.
			For BLS's network, capacity planning is done annually as part of the budgeting process and also for each application release. Application development, system administration, and production support resources participate in the capacity planning process. The planning process takes as input the Network Carrier Services (NCS) Marketing Group forecast, current volumes, trend data and anticipated volume changes that may result from new system functionality. This information is used to project future hardware and software needs. If additional capacity is needed, the request is brought to BLS (Delivery and Customer Service Managers) for approval, equipment purchase and installation.
			Exception 25 is closed.
O&P-6-1-9	There is an established process for reviewing the performance of the business and transaction volume forecasting process	Satisfied	During initial testing, no established, ongoing process for reviewing the performance of the mainframe, mid-range, or network business and transaction volume forecasting process was observed. See Exception 25 for additional information on this issue.
			KCI interviewed a Network & Carrier Service (N&CS) forecast manager and reviewed the forecasting process and capacity management process documentation. The N&CS forecasting process outlines steps to compare actuals to the forecast on a

March 20, 2001   V-F-18

Published by KPMG Consulting, Inc. Confidential. For BellSouth, KCI, and Georgia Public Service Commission use.

Test Cross-Reference	Evaluation Criteria	Result	Comments
			monthly and year-to-date basis, to identify reasons for significant differences and to revise the forecast, as necessary. The BLS Capacity Planning Methodology, Practices and Requirements defines ongoing Forecast Business Application Activities, which includes steps to review the accuracy of the most recent forecast, identify large variances, and prioritize improvements in the forecast cycle methodology.
			Exception 25 is closed.
O&P-6-1-10	There is an established process for verification and validation of performance data	Satisfied	Mainframe hardware performance is monitored daily. Any anomalies detected are reported, investigated and resolved. The performance monitoring, database administration, and application support groups participate in this process of verification and validation of performance data.
			Data from the system hardware resources are downloaded for personal computer access. This information is formatted into PC reports and is analyzed and/or reviewed periodically by the team members responsible for mainframe performance and tuning analysis. These data are retained for a minimum of one year.
			In the midrange and network environments, performance data are verified and validated by System Administrators and the Transport Group. Performance reports are reviewed regularly on the Midrange Performance Monitoring Web site, on the BOSIP home page, and through on-line tools. The reports and tools define thresholds for utilization of system and network resources. Any values exceeding the established threshold are highlighted in the

Test Cross-Reference	Evaluation Criteria	Result	Comments
			reports, investigated, and resolved.
			Performance monitoring activities were described during interviews. KCI reviewed and collected sample performance and resource utilization reports.
O&P-6-1-11	Performance monitoring results are compared to service level agreements and other metrics	Satisfied	BLS and the third party managing the systems operations have contracts in place governing system performance. These contracts define targets for system availability for EDI, TAG, LEO, LESOG, LNP and SOCS. KCI was provided with the targets for sytsem availability and copies of reports on vendor performance, by system.
			Service Quality Measurements are defined for availability of the TAG, LEO, LESOG, SOCS, and EDI interfaces [OSS-2. Interface Availability (Pre-Ordering)], for EDI and TAG reject intervals (O-6. Reject Interval), for EDI and TAG confirmation intervals (O-7. Firm Order Confirmation Timeliness), for LNP reject intervals (O-10. LNP-Reject Interval Distribution & Average Reject Interval), and for LNP confirmation intervals (O-11. LNP – Firm Order Confirmation Timeliness Interval Distribution & Firm Order Confirmation Average Interval). (See BellSouth Service Quality Measurements Plan document dated 07/2000.) Performance results for these metrics are reported through the Performance Monitoring and Analysis Platform (PMAP). BLS's capacity planning process identifies PMAP data as an input for the midrange capacity planning process.
			BLS monitors its own network performance results. Network availability (i.e., trunk and node availability) results are tracked

Test Cross-Reference	Evaluation Criteria	Result	Comments
			against established performance targets/objectives. The Transport Group works with the BLS Architecture & Standards (A&S) Group to address any network performance issues. Network performance activities were described during interviews with the BOSIP Support Manager.
O&P-6-1-12	The Capacity Management process is defined and documented	Satisfied	The processes that are executed for performance monitoring and capacity planning activities are defined and documented. The document, BLS Telecommunications Information Technology Capacity Planning Methodology, Practices, and Requirements July 1999, outlines a capacity planning process for the mainframe, midrange, and network environments. BLS's capacity planning process is part of the IT Engagement Process (ITEP). Process flows for the new capacity planning process have been developed and are posted on the BLS IT Web site. These flows are also contained in a document entitled Capacity Planning & Management Playbook. The capacity planning process has been communicated within the Engineering & Design group. The links within the Asset Management group and the interfaces to other organizations are defined in the process documentation. BLS is refining the definition of process links between the remaining functional groups. Documentation depicting the current mainframe performance monitoring process was provided to KCI. Midrange and network performance monitoring is addressed in the capacity planning and management documentation.

Test Cross-Reference	Evaluation Criteria	Result	Comments
O&P-6-1-13	Resource usage and capacity is considered in the planning process for capacity management	Satisfied	On a monthly basis, the mainframe operations management group uses data collected for each mainframe box to 1) fit a trend line through the monthly utilization data points; 2) estimate, based on trends and rates of growth, when upgrades or new purchases must occur; and 3) purchase additional capacity, as needed. If anomalies in CPU utilization, DASD, etc. occur, the operations group will contact the appropriate application support group to determine the root cause of the anomaly. In addition, TRIAD meetings are held every three months. TRIAD meetings include representatives from hardware procurement, mainframe performance monitoring, and customer representatives for the applications running in the mainframe environment with the largest DASD usage. Customer representatives provide input on changes to applications and how they may impact various components of system capacity. Resource utilization reports are examined on an ongoing basis and as part of the quarterly capacity planning process. Server usage reports and LAN/WAN interface and FDDI utilization reports are examined on an ongoing basis as part of the midrange and network capacity planning processes. These capacity planning activities were described during interviews.

Test Cross-Reference	Evaluation Criteria	Result	Comments
O&P-6-1-14	Performance monitoring results are considered in the planning process for capacity management	Satisfied	Mainframe and midrange performance monitoring reports are examined on an ongoing basis and as part of the quarterly capacity planning process. The BLS Architecture & Standards (A&S) Group is responsible for network capacity planning. The BLS Transport Team analyzes network performance data and resolves capacity issues. If unable to resolve capacity issues, the Transport Team alerts the A&S Group, which purchases equipment or makes architecture changes in order to increase or adjust system capacity. These capacity planning activities were described during interviews.
O&P-6-1-15	Capacity Management procedures define performance metrics that trigger the addition of capacity, load re-balancing or system tuning	Satisfied	Mainframe application hours are tracked monthly. Historical growth trends of these hours are tracked against known thresholds and used to estimate future growth and determine when upgrades or new purchases must occur. Scratch tape counts and scratch tape thresholds are tracked monthly by site. These counts and thresholds are used to assist in determining when additional tapes should be ordered. Active tape counts and corresponding Average Growth per Month are tracked monthly. Thresholds have been set for resource utilization and performance measures in both mainframe and midrange environments. Values that exceed the established thresholds are flagged and investigated. In the network environment, WAN interface utilization is tracked to identify opportunities for load balancing. Procedures for performance

Test Cross-Reference	Evaluation Criteria	Result	Comments
			management were described during interviews. In addition, KCI viewed and collected sample reports.