ORACLE e-businesssuite

IBM®

ORACLE E-BUSINESS BENCHMARK REV. 1.1

E-BUSINESS APPLICATIONS 11*i* (11.5.10) TELCO BENCHMARK - USING ORACLE10*g* ON AN IBM SYSTEM p5 570 SERVER

As a global leader in e-business applications, Oracle is committed to delivering high performance solutions that meet our customers' expectations. Business software must deliver rich functionality with robust performance. This performance must be maintained at volumes that are representative of customer environments.

Oracle benchmarks demonstrate our software's performance characteristics for a range of processing volumes in a specific configuration. Customers and prospects can use this information to determine the software, hardware, and network configurations necessary to support their processing volumes.

The primary objective of our benchmarking effort is to provide as many data points as possible to support this important decision.

SUMMARY OF RESULTS

Online Workload		
Number of Users	**Avg. 'Save'. (Sec)**	**Extrapolated Transactions per Hour**
50 Concurrent Users	0.954	500
75 Concurrent Users	1.015	750

Many factors can influence performance and your results may differ.

BENCHMARK PROFILE

In March and April 2007, Oracle® and IBM® conducted a benchmark in Pleasanton, CA to measure the online performance of the Oracle Applications Telco processes in an environment running Oracle E-Business Suite 11*i* (11.5.10) with Oracle10*g*™ (10.2.0.2) for the IBM AIX® operating system on an 8-way IBM® System p5 570 database server-partition running AIX 5L™ V5.3 TL06 (64-bit) OS. One 4-way IBM System p 570 server-partition was used as the Application/Web server.

An IBM TotalStorage® DS4800 equipped with six disk arrays of 467 GB each (Total 2.6 Terabytes.) was used with a 4-Nodes SVC configuration – 2 Nodes are SVC 2145-F42s and 2 Nodes are SVC 2145-8F4s.

The benchmark measured the online user response times for representative Telco business processes for a small database model. Testing was conducted in a controlled environment with no other systems or processes running. **The goal of this Benchmark was to obtain reference response times for Oracle E-Business Suite 11*i* 'Telco' on an IBM System p5 570 server.**

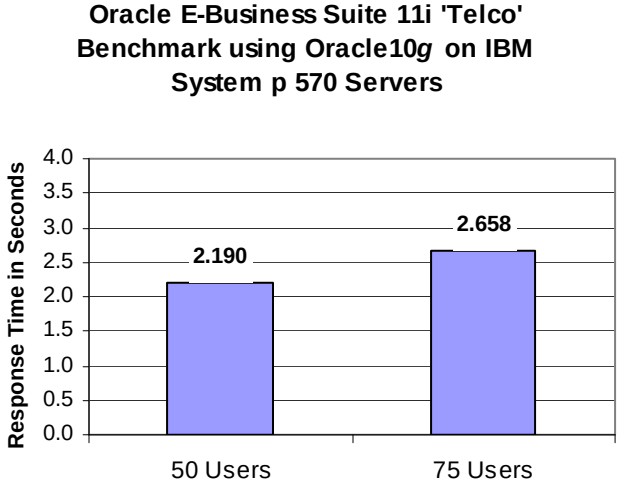

Figure 1: Overall Simple Average of LoadRunner Timers' Scalability

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BENCHMARK METHODOLOGY

E-Business Suite 11*i* Benchmark 11.5.10 online and batch processes can be initiated from a browser. For this benchmark, all runs used a browser to initiate the on-line user transactions.

Mercury® LoadRunner® was used as the load driver, simulating concurrent users. It submitted transactions at an average rate of one every 6 minutes for each concurrent user.

Measurements were recorded on all of the servers when the user load was attained and the environment reached a steady state.

Figure 2 shows the configuration used for this benchmark run.

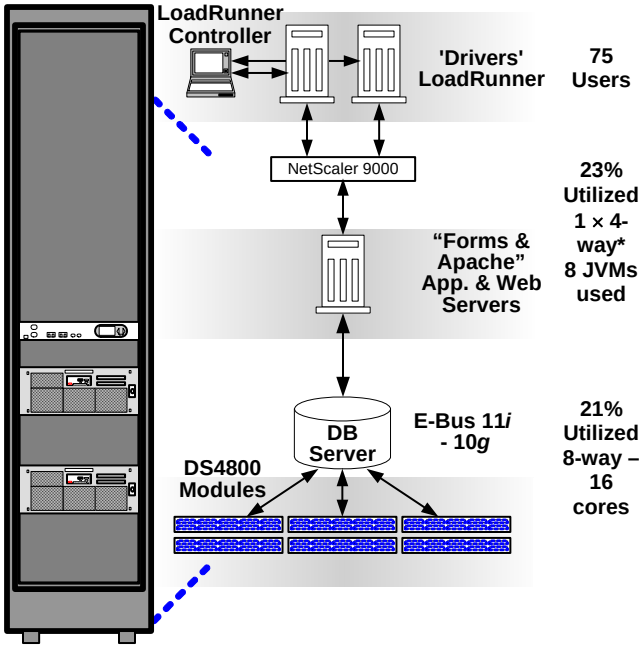

Figure 2: 3-Tier Configuration

This benchmark was run as a "Physical" 3-Tier configuration with discrete machines hosting all of the Database and Application server instances. The load across the multiple mid-tiers was balanced using a Citrix® NetScaler™ Application Switch 9000 platform device.

BENCHMARK BUSINESS PROCESSES

Add New PSTN Line: The Service Center user logs on and navigates to the Order page. They enter various information specific to creating a new order, supply customer details, add an order line, then hit the Configure button to open the browser page to complete the rest of the PSTN transactions in Configurator. When finished, the order is saved.

The following table describes the on-line transactions included in the benchmark run.

Oracle Application Product Flow	% Overall	Pacing in Min
Add Orders (100%)		
Add New PSTN Line	100%	6
	100%	

Table 1: Online Transaction Mix

BENCHMARK RESULTS

Online Business Metrics	Single User	50 Users	75 Users
ADD_Login	6.637	0.99	1.025
clickcontactcenter	7.293	5.144	5.501
entercustid	0.413	0.494	0.629
ADD_Clickorderstab	0.362	0.228	0.229
ADD_Clicknewbutton	1.529	1.342	1.377
ADD_ClickLineItemsTab	0.857	0.666	0.68
ADD_ClickConfigButton	2.702	2.998	4.007
ADD_ClickConfigButton _forms	0.219	0.216	0.215
ADD_ClickNEWGeneric	1.995	2.022	2.62
ADD_addcontractinfo	1.234	1.638	2.226
ADD_ClickOK	0.864	0.861	0.879
ADD_ClickWireType	0.8	1.131	1.489
ADD_AddLocation	4.031	5.302	7.141
ADD_ClickApply1	1.817	2.497	3.314
ADD_Addphno	3.541	4.783	6.348
ADD_Clickapply2	1.901	2.495	3.277
ADD_addrate	1.214	1.627	2.217
ADD_clickapply3	1.24	1.736	2.293
ADD_Finish	6.84	7.3	8.11
ADD_Finish_All	6.953	7.362	8.437
ADD_Finish_Form	0.113	0.062	0.328
ADD_SaveOrder	1.215	0.954	1.015
ADD_Bookorder	2.799	2.347	2.538
ADD_clearform	0.274	0.235	0.241
ADD_Closeform	0.317	0.326	0.326

Table 2: Online Transaction Response Times

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SERVER PERFORMANCE

Figure 6 shows the average CPU utilization for each process. The value shown is the average across the eight processors (eight cores) in the database server and the eight processors (16 cores) in each application server.

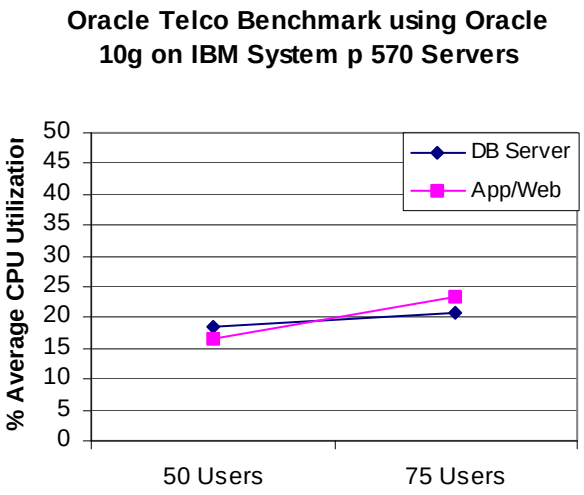

Figure 3: Average CPU Utilization

Each server scaled smoothly as users were added, keeping the batch load constant over the steady state period.

Online Workload		User	System	I/O Wait	Idle
DB 50 Users		17.71	0.72	0.37	81.20
DB 75 Users		19.99	0.92	1.11	77.98
App/Web 50 Users		15.60	1.08	0.07	83.24
App/Web 75 Users		22.05	1.34	0.08	76.53

Table 3: Average CPU Utilization

Online Workload		50 Users	75 Users
DB Server (24 GB)		11	9
App/Web Server (24 GB)		7	7

Table 4: Average Memory Utilization (Gigabytes)

I/O PERFORMANCE

One IBM TotalStorage DS4800system with six disk arrays was used for storage. I/O performance is crucial to batch performance and is summarized as follows:

		50 Users	75 Users
Transfers/Sec Avg.		45.71	77.06
Peak		327.4	355.6
Writes/Sec Avg. (kb)		710.33	951.04
Peak		4,084	3,758
Reads/Sec Avg. (kb)		54.44	158.89
Peak		345.8	829.3

Table 5: I/O Subsystem Metrics

DATA COMPOSITION DESCRIPTION

Major data components for the model under test are summarized in the following table.

Database Requirement	Average	Value
Customers	1,000,000	
Locations	1	1 Location per Customer
Products	2	
Orders/Day	50,000	1 Order Line per Order
Order Lines/Order	5 to 10	
Price Lists	1	
History Order Headers/Subscription	2 to 3	For 1M subscriptions; 2 – 3 M orders

Table 6: Data Composition

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PATCHES

The following patches were applied to the benchmark environment on top of Oracle Applications 11.5.10.

APPLICATION SETTINGS

Database:

Tech. Stack Configuration:

1. In jserv.properties file the following properties were changed:
   # XML Gateway Parameters
   wrapper.bin.parameters=-DOXTALogDebugMsg=false
   # OA Framework
   wrapper.bin.parameters=-Djbo.323.compatible=true
   # JMS & WF
   wrapper.bin.parameters=-DLONG_RUNNING_JVM=true
   # STO
   wrapper.bin.parameters=-DCACHEMODE=DISTRIBUTED
2. jserv.conf
   ApJServVMTimeout set from 90 to 120
3. httpd.conf
   KeepAliveTimeout set from 15 to 45
4. VIS_appx.env:
   FORMS60_TIMEOUT set from 5 to 60

Sales & Marketing:

1. Update 'Launch On Date' to current date if 3 months passed after Campaign Schedule created.
2. The profile options ASO: Calculate Price' and 'ASO: Calculate Tax' were set to "Manual".
3. The profile option 'ASO: Use Network Container' was set to 'No'.

Service:

1. Business event subscriptions were disabled.
2. For iSupport, the type of Alert bin was changed to Java.
   Content Source Type : Java Object
   Content Source Name: oracle.apps.ibu.homepage.AlertBinRenderer

APPLICATION TUNING

OPERATING SYSTEM TUNING

1. Large Page option was enabled with entire SGA in Large pages. The SGA does not page out under Large Page setting. To enable Large Pages, perform the following:

   # chuser "capabilities=CAP_PROPAGATE, CAP_BYPASS_RAC_VMM" <oracle_userid>
   # vmo –p –o v_pinshm=1
   # vmo –p –o maxpin%=90
   # vmo –p –o lgpg_regions=704 –o lgpg_size=16777216
   # bosboot –ad /dev/ipldevice
   Oracle init.ora changes: lock_sga=true

2. AIO servers was set to 20 (Database server)
   # chdev –p –l aio –a maxservers=20

3. AIX_THREADSCOPE=S
   In .profile for database and apps login

4. Multiple page size
   Cd $ORACLE_HOME/bin
   Export LDR_CNTRL=DATAPSIZE=64K@TEXTPSIZE=64K@STACKPSIZE=64K oracle
5. Reliability, Availability, Serviceability (RAS) option was disabled
   # ctctrl -P memtraceoff
   # errctrl -P errcheckoff
   # raso -r -o mtrc_enabled=0
   Do a bosboot after executing the above commands.

For more AIX/Oracle tuning, please refer to the document "Tuning IBM AIX5L for an Oracle Database." Available at http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP100883

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BENCHMARK ENVIRONMENT

HARDWARE CONFIGURATION

An IBM System p 570 server was used as the batch/database server. The system was equipped with the following:

- 16 × Core SMP implemented on eight Dual-core IBM POWER5+™ processor chips each 2.2 GHz with L2 Cache of 8 × 1.9MB and L3 Cache of 36MB per SCM (SMT-enabled).
- Total Memory: 24 GB
- Network: Gigabit full duplex.
- Operating system: IBM AIX 5L V5.3 TL06
- For more details on System p 570, please visit TBD
- Storage: DS4800 with 6 arrays of 467 GB each (Total 2.6 Terabytes.). A 4-Node SVC Configuration featured 2 Nodes as SVC 2145-F42s with 4GB Cache Memory and 2 Nodes as SVC 2145-8F4s with 8GB Cache Memory. Each array has 14 physical disks --- RAID 0, two controllers - one exclusively for redo logs.
- For more details on DS4800, please visit http://www.ibm.com/servers/storage/disk/ds4000/ds4800/index.html

Application Server(s):

1 × IBM System p5 570 was used as application and web server. Each system was equipped with the following:

- 8 × Core SMP implemented on four Dual-core IBM POWER5+™ processor chips each 2.2 GHz with L2 Cache of 8 × 1.9MB and L3 Cache of 36MB per SCM (SMT-enabled).
- Total Memory: 24 GB.
- Network: Gigabit full duplex.
- Operating system: IBM AIX 5L V5.3 TL05

Application Traffic Management Devices

1 × Citrix® NetScaler™ Application Switch 9000 platform was used to distribute the LoadRunner traffic across the Web and application servers.

For more details on NetScaler 9000, please refer to: http://www.citrix.fr/REPOSITORY/docRepository/id_1584_1125922815011718.pdf

Load Driver(s):

2 × IBM xSeries® 336 servers were used as load drivers. Each system was equipped with the following:

- 2 × 3.6 GHz Intel® Xeon® processors
- Total Memory: 8 GB.

SOFTWARE VERSIONS

Oracle's E-Business Suite (eBS Kit) 11.5.10

Oracle10*g*™ 10.2.0.2 (64-bit)

IBM AIX 5L for POWER V5.3.3 with the 5300-06 Technology Level (on the database and Application /Web/CM servers)

Mercury® LoadRunner® 8.0

For more details on Mercury's LoadRunner, please refer to http://www.mercury.com/us/products/performance-center/loadrunner/

Apache WebServer 1.3.19 with JServ 1.1.2

Java™ 2 Runtime Environment, Standard Edition (build 1.4.2). Classic VM (build 1.4.2, J2RE 1.4.2 IBM AIX build ca142-20061124 (SR7) (JIT enabled: jitc))

Citrix NetScaler NS7.0: Build 50.2, Date: Jan. 31, 2007

Glossary and Acronyms:

ATP	Available to Promise
BEE	Batch Element Entries
HVOP	High Volume Order Processing
OASB	Oracle Applications Standard Benchmark
RAC	Real Applications Clusters

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