

E-BUSINESS SUITE APPLICATIONS R12 (R12.2.5) ORDER MANAGEMENT (OLTP) BENCHMARK - USING ORACLE11g ON ORACLE'S DATABASE CLOUD SERVICE

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

This OLTP benchmark test was run on two 8-core servers.

Online Workload			
Number of Users		Average Response (Sec)	90 th Percentile Response Time (Sec)
250 Users Insert Order		2.26	3.26
125 Users Pick Release		1.0	1.88
125 Users Ship Order		1.28	3.0
125 Users Insert Manual Invoice		0.8	1.04
125 Users View Customer Trans. Sales		2.30	5.43
Customer Trans. Tax		1.79	4.30
125 Users Order Summary Report		0.56	1.06
Weighted Average		1.43	2.85

Many factors can influence performance and your results may differ.

BENCHMARK PROFILE

In July 2017 Oracle conducted a benchmark in Pleasanton CA to measure the online (OLTP) performance of the Oracle E-Business Order to Cash business flow in an environment running Oracle E-Business Suite R12 (12.2.5) using the Oracle Database 11g (11.2.0.4.0) running on Oracle's Public Cloud 16.2.2 Database Service with Oracle® Linux® 6.6 (64-bit) OS. Moreover, the instance of 8 OCPU, 16 threads, 120 GB used two of Oracle's Public Cloud Storage Latency Volumes for data storage and redo log storage.

The benchmark measured the Order to Cash OLTP business process response times for a Large/Extra-Large database model. Testing was conducted in a controlled environment with no other applications running. **The goal of this Benchmark was to obtain reference online response times for the Oracle E-Business Suite R12 Benchmark, on an Oracle's Database Cloud Service.**

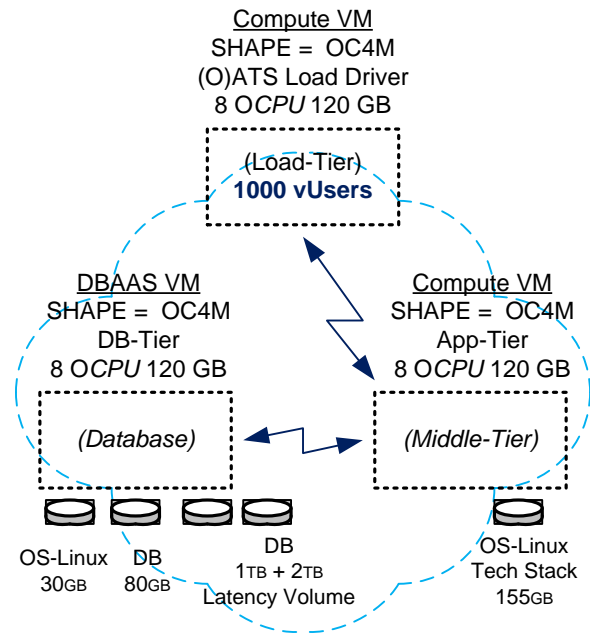


Figure 1: Oracle E-Business Suite Benchmark on Oracle Public Cloud

BENCHMARK METHODOLOGY

E-Business Suite 12 Benchmark 12.2.5 online processes can be initiated from a browser. For this benchmark, all runs used a browser to initiate the on-line user transactions.

Oracle® OATS® was used as the load driver, simulating concurrent users. It submitted transactions at an average rate of one every 2.5 - 5 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. Note that the measured response times may be shorter than a live user would experience as client and browser latency is not simulated by this load test system.

Figure 2 shows the configuration used for this benchmark run.

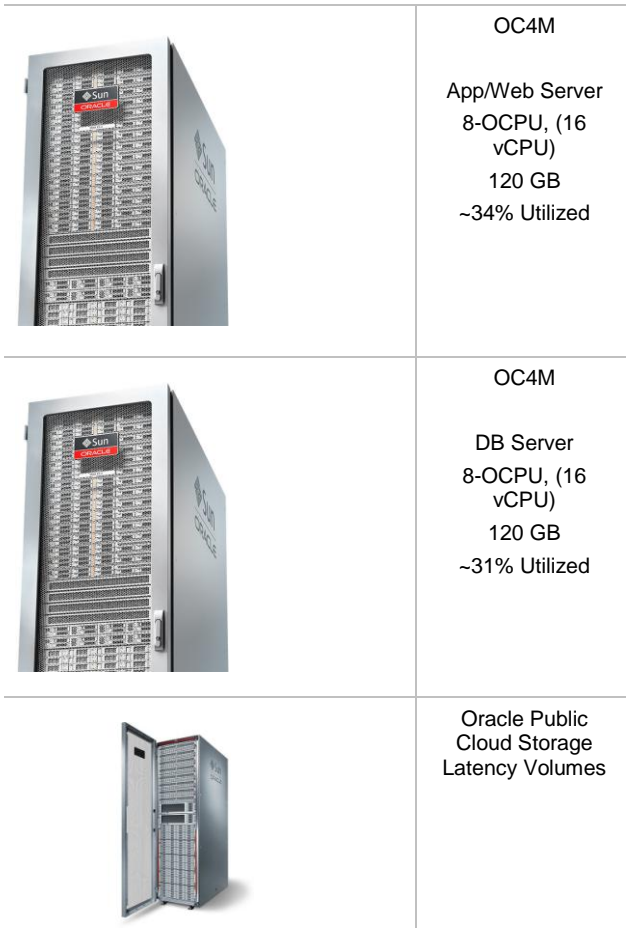


Figure 2: 3-Tier Configuration

This benchmark was run as a “Physical” 3-Tier configuration with discrete machines hosting the Database and Application/Web server instances on their respective OS images.

The complete E-Business Suite benchmark consists of a mix of on-line transactions and batch processes running in parallel. This test utilized a single flow of OLTP transactions. The following table describes the on-line transactions included in the benchmark run.

Oracle Application Product Flow	% Overall	Pacing in Min
Order to Cash (Order Management)		
Create & Book Order	25	5
Pick Release	12.5	2.5
Ship Confirm / ITS	12.5	2.5
Receivables – Invoice	12.5	2.5
Receivables – Customer Tran	12.5	2.5
Receivables – Customer Rep.	12.5	2.5
Order Summary Report	12.5	2.5
	100%	

Table 1: Online Transaction Mix

Order to Cash OLTP Processes

Create & Book Order: The user navigates to the “Orders” page, enters customer information and creates a 5-line order. Finally, the user clicks on “Book Order” to enter the completed order. The response time is to ‘save’ the entry.

Pick Release: The user navigates to the “Shipping/Release Sales Orders” page and enters the order number and clicks on “Execute Now.” Finally, the user clicks on “OK” to acknowledge that “Pick Release Only” has completed. The response time is to ‘save’ the entry.

Ship Confirm: The user navigates to the “Shipping/Transactions” page and enters “From Order Number” and “To Order Number” before clicking on “Find.” Finally, the user clicks through the confirmation steps and then clicks on “OK” to acknowledge that “ship Confirm” has completed. The response time is to ‘save’ the entry.

Receivables – Insert Invoice: The user navigates to the “Transactions/Transactions” page and enters Source, Reference Number, and Line Item information. After entering 5 items, the user save the form. The response time is to ‘save’ the entry.

BENCHMARK RESULTS

Online Business Metrics	Achieved Output
Self-Service	
Number of Order Lines Created	28,300
Number of Invoice Lines Created	116,600
Number of Order Summary Reports	2,830

Table 2: Online Transactions Completed (1,000 Users)

	1,000 Users	
	Avg.	90 th %
Order to Cash		
250 Concurrent Users Insert Order	2.258	3.258
125 Concurrent Users Pick Release	1.003	1.885
125 Concurrent Users Ship Order	1.277	2.997
125 Concurrent Users Insert Manual Invoice	0.796	1.043
125 Users View Customer Trans. Sales	2.304	5.432
Customer Trans. Tax	1.795	4.297
125 Concurrent Users Order Summary Report	0.564	1.065
Weighted Average	1.43	2.85
Transactions/min	~318	

Table 3: Detailed Online Transaction Response Times

The transaction rate is estimated by dividing the number of running users by the average pacing.

R12 Application changes, data model additions and test methodology improvements render direct comparison to previous Oracle E-Business release 11.5.10 and 11.5.9 results invalid.

SERVER PERFORMANCE

Figure 3 shows the running load on the Database and App/Web servers. The plot shown is the average across the processors in the Database server (a total of 8 cores) and the processors (8 cores) in the Application server. Consequently, not all cores were utilized for much of the test.

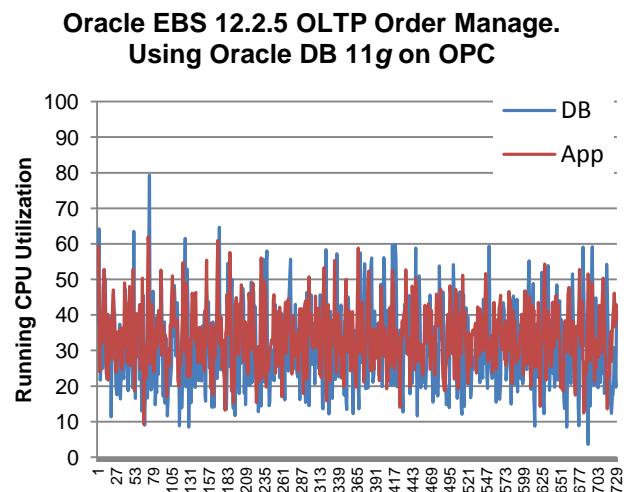


Figure 3: Monitored CPU Utilization

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

Online Workload	% User	% System	% I/O Wait	% Idle
Database Server	28.4	2.4	1.9	67.3
App/Web Server	33.1	1.1	0.1	65.7

Table 4: Average CPU Utilization Breakout

Average GB Used	1,000 Users
DB Server	109
App/Web	84

Table 5: Average Memory Utilization Breakout

I/O PERFORMANCE

Two of Oracle's Public Cloud Storage Latency Volumes were used for storage. The workload requires optimal I/O performance.

I/O Performance		1,000 Users
IO/Sec	Avg	2,029
	Peak	16,582
KB Written/Sec	Avg	33,575
	Peak	288,645
KB Read/Sec	Avg	13,004
	Peak	307,093

Table 6: Average I/O Utilization Breakout

DATA COMPOSITION DESCRIPTION

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

Application	Business Objects	Extra-Large Model
TCA	Organizations	1,100,000
	Contacts	4,900,000
	Contact Points	3,700,000
	Accounts	1,100,000
	Account Sites	1,090,000
	Account Site Uses	2,180,000
Contracts	Contracts	222,000
Install Base	Instances	1,300,000
	Trackable Items	5
HR	Managers	800
	Employees	250,000
	Payroll Users	250,000
	Users	20,000
	Credit Card Entries	4,000,000
	Supplier(s)	10,000
Assets	Asset Categories	984
General Ledger	GL Code Combinations	93,417

Table 7: Data Composition

TUNING

```
exec fnd_stats.gather_schema_stats (schemaname=>
'WSH',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'HZ',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'FND',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'RA',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'APPL',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'AR',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'IEX',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'XLE',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'APPLSYS',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'OWF_MGR',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'GL',estimate_percent => 100,degree => 8);
exec fnd_stats.gather_schema_stats (schemaname=>
'JTF',estimate_percent => 100,degree => 8);
exec
apps.fnd_stats.gather_table_stats('ZX','ZX_RATES_B',PERCENT
T=>DBMS_STATS.AUTO_SAMPLE_SIZE);
exec
apps.fnd_stats.gather_table_stats('APPLSYS','FND_LOOKUP_
VALUES',PERCENT=>DBMS_STATS.AUTO_SAMPLE_SIZ
E);
exec
apps.fnd_stats.gather_table_stats('APPLSYS','WF_ITEM_ACTI
VITY_STATUSES',PERCENT=>DBMS_STATS.AUTO_SAM
PLE_SIZE);

create index oe_items_mv_t on oe_items_mv(item);
create index oe_items_mv_x1 on oe_items_mv(upper(item));

drop index applsys.wf_items_n6;
create index applsys.wf_items_n6 on applsys.wf_items
(owner_role,root_activity,item_type,end_date);

drop index inv.MTL_SYSTEM_ITEMS_B_tn18;
create index inv.MTL_SYSTEM_ITEMS_B_tn18 on
inv.MTL_SYSTEM_ITEMS_B(upper(segment1));

exec
fnd_stats.gather_table_stats('applsys','wf_items',percent=>dbms_
stats.auto_sample_size);
```

BENCHMARK ENVIRONMENT

HARDWARE CONFIGURATION

DATABASE SERVER

A single DBaaS instance version 16.2.2 on Oracle Database Cloud Service with Shape OC4M (8 OCPU as 16 vCPU) was used. It was equipped with the following:

- 8 OCPU (16vcpu) running on 2.29 GHz Intel® Xeon™ E5-2699 v3
- 120 Gigabytes of Memory (~109 GB used at peak load)
- Two Oracle Public Storage Volumes for a total of 110 GB were used to host Linux and Oracle 11g Database software.

APPLICATION/WEB SERVER(S)

A single COMPUTE Instance of Oracle's Public Cloud 16.2.2 was used for this test. 1 × Oracle Linux COMPUTE Instance with Shape OC4M was used as an application server to host the Concurrent Manager.

- 8 OCPU (16vcpu) running on 2.29 GHz Intel® Xeon™ E5-2699 v3
- 120 Gigabytes of Memory (~84 GB used at peak load)
- One Oracle Public Storage Volume for a total of 155 GB was used to host Linux and the Application Tier software.

LOAD DRIVER SERVER(S)

A single COMPUTE Instance of Oracle's Public Cloud 16.2.2 was used for this test. 1 × Oracle Linux COMPUTE Instance with Shape OC4M was used to host the load controller and agents.

- 8 OCPU (16vcpu) running on 2.29 GHz Intel® Xeon™ E5-2699 v3
- 120 Gigabytes of Memory (~60 GB used at peak load)
- One Oracle Public Storage Volume for a total of 155 GB was used to host Linux and the Application Test Suite Tier software.

SOFTWARE VERSIONS

Oracle's E-Business Suite (E-Business Suite Kit) R12.2.5

Oracle11g 11.2.0.4.0 (64-bit)

Oracle Linux 6.6 (64-bit) on the database server, app-tier server and ATS server.

Xen 4.3.1 OVM

Java HotSpot™ 64-bit server VM (build 14.3-b01), mixed mode

The following Java™ Standard Edition (SE) versions have all been used in the Oracle Apps environment:

- Java 1.6.0_17-b04

Oracle® Application Test Suite 12.5.2.537 (OATS)

Glossary and Acronyms:

DBaaS Database as a Service

OASB Oracle Applications Standard Benchmark

OATS Oracle Application Test Suite

OCPU Oracle CPU (1 physical core, for 2 execution threads with Hyper threading enabled)

OLTP On Line Transaction Processing



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