Performance Test of Oracle 11g with Open-E DSS , Openfiler and Debian

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1. Introduction

This document is a report of conducted performance tests of Oracle 11g database in RAC technology with Open-E DSS, Openfiler and Debian support.

Test was performed to check team-work between Oracle 11g database in RAC technology witch Open-E DSS , Openfiler and Debian. The aim of the test was to evaluate the performance of such a solution and the stability of our product under this environment.

Test was performed in accordance with the specification on the Oracle site (http://www.oracle.com/technology/pub/articles/hunter_rac11gr1_iscsi.html).

The following points wil describe the hardware used for the test, the testing procedures as well as the results achieved, concluding with a short summary.

2. Hardware specification

The following hardware was used for testing:

a) SSR212MC2 (designation RAC 1) - with Redhat Linux server and Oracle 11g (first instance) installed,

b) SSR212MC2 (designation RAC 2) - with Redhat Linux server and Oracle 11g (second instance) installed,

c) SSR212MC2RSPP2 (Testing Server) – Open-E DSS , Openfiler , Debian

d) 4 x DELL DHM (designation DELL 1,2,3,4) with Windows XP installed; used as a client.

Detailed description of technical specification of the hardware used is displayed in the following tables:

Type	Server
Name	SSR212MC2
Designation	(RAC 1)
CPU	2 x quad (Xeon) 3 Ghz
RAM	3,5 GB
Controler	LSI LOGIC SAS

Type	Server
Name	SSR212MC2
Designation	(RAC 2)
CPU	2 x quad (Xeon) 2 Ghz
RAM	2 GB
Controler	LSI LOGIC SAS

Type	Server
Name	SSR212MC2RSPP2
Designation	Testing Server
CPU	1 x duo (Xeon) 1,86 Ghz
RAM	4 GB
Controler	LSI LOGIC SAS

Type	Client Desktop
Name	Dell : DHM
Designation	(Agent 1)
CPU	Pentium 4 CPU 2,26 GHZ
RAM	512 MB

Type	Client Desktop
Name	Dell : DHM
Designation	(Agent 2)
CPU	Pentium 4 CPU 2,26 GHZ
RAM	512 MB

Type	Client Desktop
Name	Dell : DHM
Designation	(Agent 3)
CPU	Pentium 4 CPU 2,26 GHZ
RAM	512 MB

Type	Client Desktop
Name	Dell : DHM
Designation	(Agent 4)
CPU	Pentium 4 CPU 2,26 GHZ
RAM	512 MB

Type	Switch
Name	Planet GSW2401
Designation	(SW 1)
Ports	24
Speed	10/100/1000

Type	Switch
Name	Planet GSW2401
Designation	(SW 2)
Ports	24
Speed	10/100/1000

System Specyfication

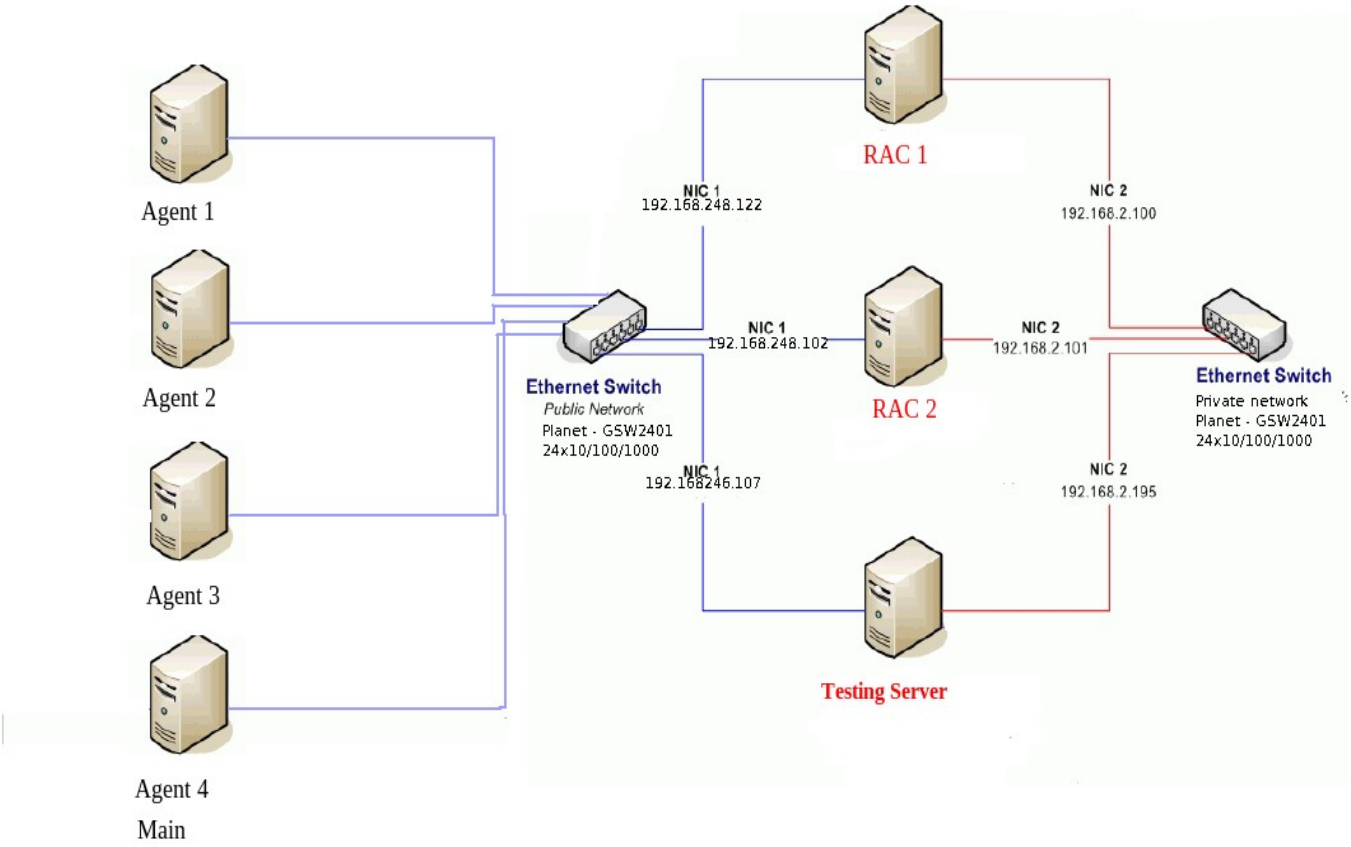
Type	DSS
Version	1.37.DB00000000.2922 (2.6.17-13-32bit)
Iscsitarget version	0.4.15

Type	Openfiler
Version	2.6.19.7-0.3.smp.gcc3.4.x86_64
Iscsitarget version	0.4.14

Type	Debian
Version	2.6.22-3-686#1 SMP
Iscsitarget version	0.4.15

Network topology

Network topology of connections between each hardware components is shown on picture 1.



Picture 1 Network topology

As is shown on above picture for tests were used four machines on which were run agents i.e. component for direct communication with database (generating of queries during the test). On machine number four was run main module of program, which in real time has received parts of information from running test. Communication with data base was done via RAC 1 on that was run so called listening proces. Simultaneously the proces comunicate with RAC 2 to pass transactions for execution.

3. Methods of testing

1. Benchmark description.

In accordance with recommendations we have performed tests using "Benchmark Factory For Database" ver. 5.5.

2. Test Description.

The AS3AP benchmark is an American National Standards Institute (ANSI) Structured Query Language (SQL) relational database benchmark. The AS3AP benchmark provides the following features:

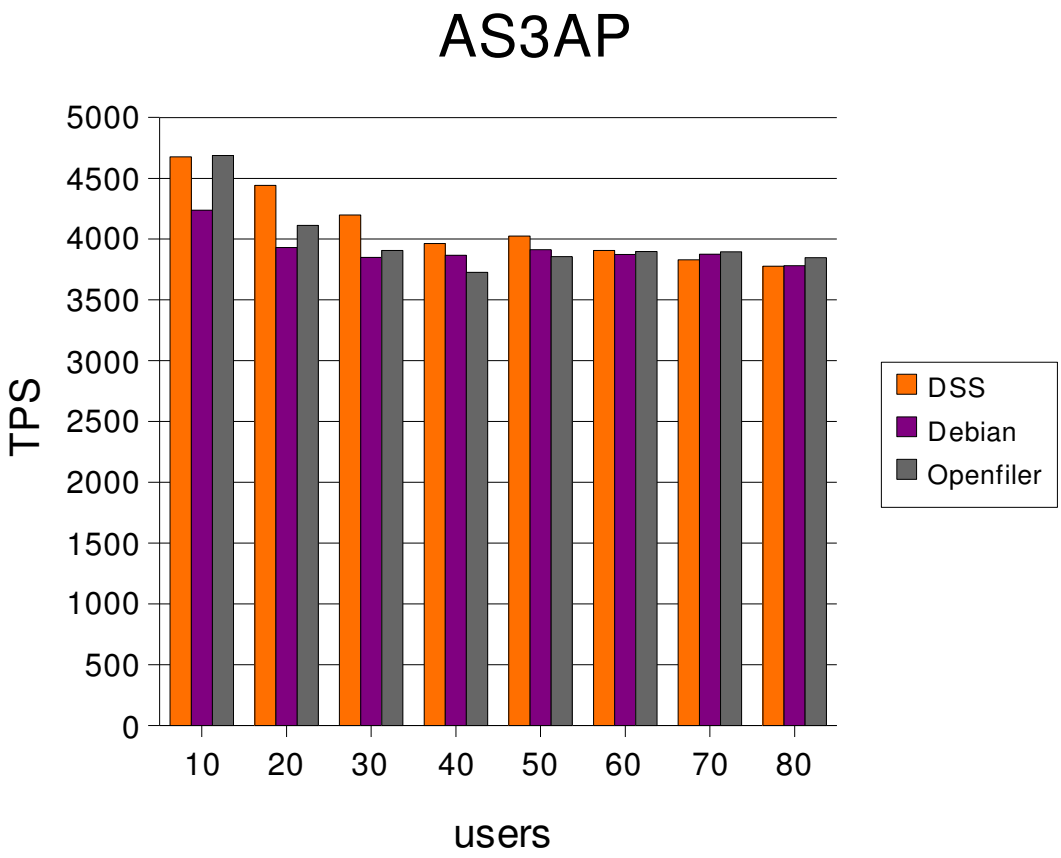
- Tests database processing power
- Built-in scalability and portability that tests a broad range of database systems
- Minimizes effort in implementing and running benchmark tests
- Provides a uniform metric and straight-forward interpretation of benchmark results

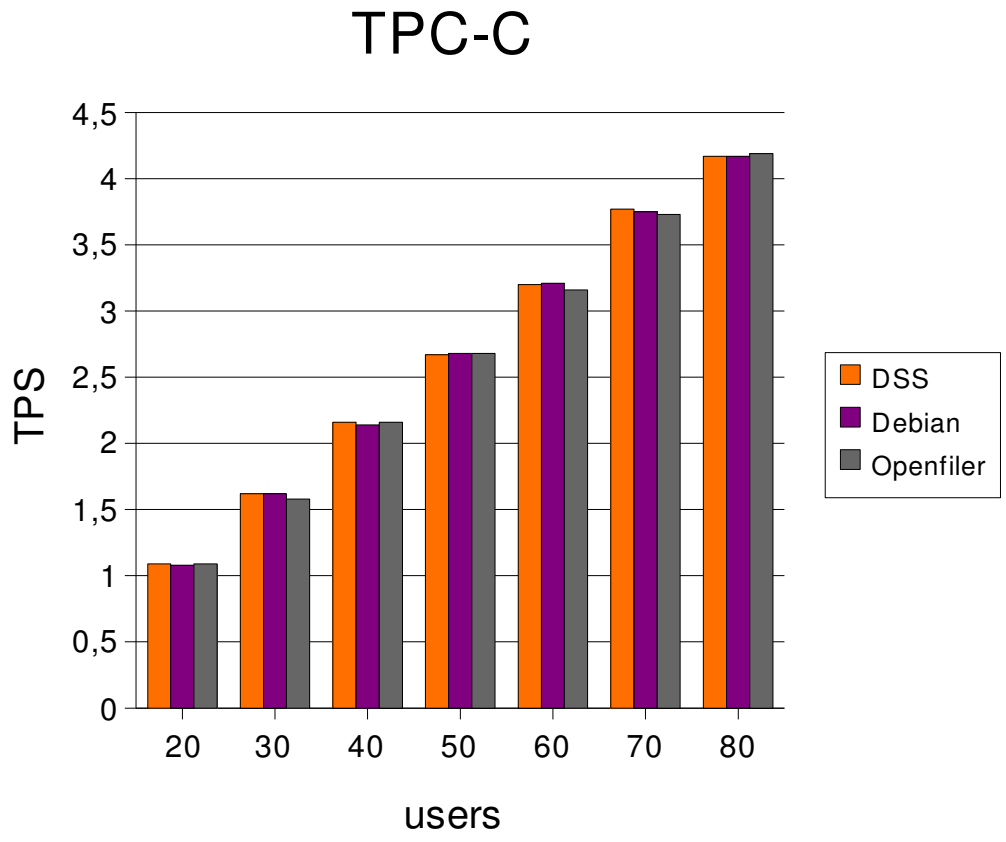
Systems tested with the AS3AP benchmark must support common data types and provide a complete relational interface with basic integrity, consistency, and recovery mechanisms. The AS3AP tests systems ranging from a single-user microcomputer Database Management System (DBMS) to a high-performance parallel or distributed database.

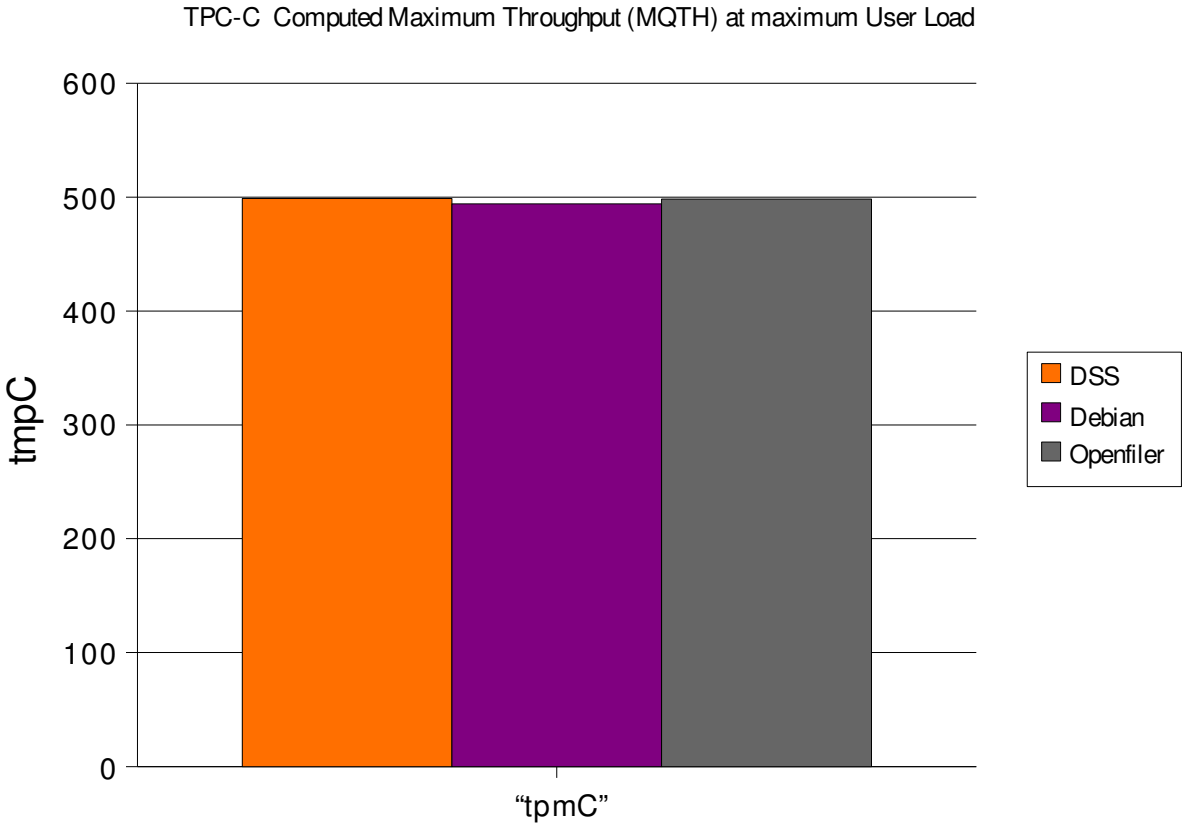
TPC-C simulates a complete computing environment where a population of users executes transactions against a database. The benchmark is centered around the principal activities (transactions) of an order-entry environment. These transactions include entering and delivering orders, recording payments, checking the status of orders, and monitoring the level of stock at the warehouses. While the benchmark portrays the activity of a wholesale supplier, TPC-C is not limited to the activity of any particular business segment, but, rather represents any industry that must manage, sell, or distribute a product or service.

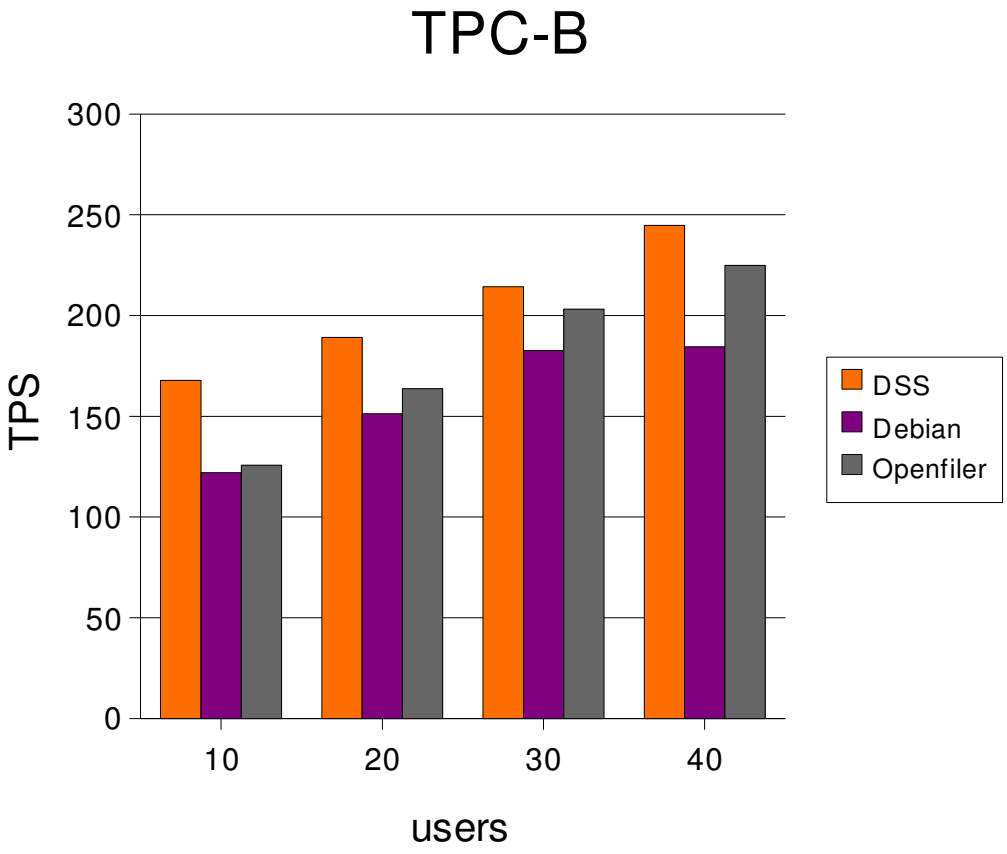
TPC Benchmark B is targeted at database management systems (DBMS) batch applications and the back-end database server market segment, either stand-alone or client-server. It can be used to measure how many total simultaneous transactions a system can handle. There are no "users," no communication lines, and no terminals used or priced other than the few needed to run the benchmark. This is analogous to electronic data processing (EDP) batch processing applications which run overnight when no customer users are logged on. Transactions are submitted by programs all executing concurrently. Each program submits one transaction, waits for its completion, and then submits another one. There is no human t hink time, so each program goes as fast as possible serially. Many benchmark programs can be started simultaneously, loading the system up with as many transactions as it can handle, subject to a constraining residence time (the maximum time transactions can take to run in the system). TPC-B may be used wherever simultaneous multiplexed transactions are present, and the maximum throughput performance value is to be measured.

4. Results


AS3AP
TPS
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
10
20
30
40
50
60
70
80
users
DSS
Debian
Openfiler


TPC-C
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
TPS
20
30
40
50
60
70
80
users
DSS
Debian
Openfiler


TPC-C Computed Maximum Throughput (MQTH) at maximum User Load
600
500
400
300
200
100
0
tmpC
"tpmC"
DSS
Debian
Openfiler

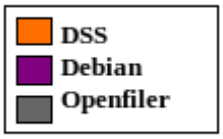

TPC-B
300
250
200
150
100
50
0
TPS
10
20
30
40
users
DSS
Debian
Openfiler

AS3AP			
Users	DSS	Debian	Openfiler
10	4676,31	4237,79	4686,91
20	4442,17	3930,61	4112,51
30	4197,73	3849,19	3907,17
40	3962,68	3868,07	3726,09
50	4024,81	3913,19	3855,87
60	3907,33	3873,67	3898,46
70	3829,44	3875,87	3896,44
80	3776,82	3781,65	3848,45
total points	32817,29	31330,04	31931,9

TPC-C			
Users	DSS	Debian	Openfiler
20	1,09	1,08	1,09
30	1,62	1,62	1,58
40	2,16	2,14	2,16
50	2,67	2,68	2,68
60	3,2	3,21	3,16
70	3,77	3,75	3,73
80	4,17	4,17	4,19
total points	18,68	18,65	18,59

TPC-B			
Users	DSS	Debian	Openfiler
10	167,79	122,01	125,77
20	189,14	151,31	163,75
30	214,4	182,69	203,19
40	244,71	184,46	224,9
total points	571,33	456,01	492,71

The best results are markt by corresponding colour



5. Conclusions

In our tests results, our products has achieved in most of the tests, are better than competitions. In tests that have forced to highest load (TCP-B) our system achieved large dominance. In this with lower load results were comparable because of not using all system resources. Results from above tests are reccurent. All the tests were done with the same database configuartion. In our configuation Storage systems were essential elements of work of Oracle as a cluster because software uses not only common database files, but also uses one of the volumes as disk for storing configuration and voting of CRS service that is responsible for co-operation of stage.