

9880: Details of the System z Infrastructure and Support for Oracle Solutions, Including Oracle Database, E-Business Suite, PeopleSoft and Siebel

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DB2 Connect	IBM eServer	RACF*	z/OS*
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Complete Solutions, Collaborative Partners

Enduring Relationship

- Oracle 24 Years, PeopleSoft 24 Years, Siebel 14 Years
- Mission: Provide the strongest combination of solutions to maximize value of client investments

Mutual Executive Commitment

- Regular Senior Executive Reviews and Development & Sales interlocks
- Dedicated, executive-led IBM Alliance Team

Over 30,000 Joint Applications Customers Worldwide

- Hardware and Software support via Applications Unlimited

Market Leading Services Practice

- ~ 5,500 Successful Joint Services Projects
- > 10,000 IBM Consultants Worldwide dedicated to Oracle Solutions

Vibrant Technology Collaboration

- Substantial investment in skills and resources
- Dedicated International Competency Center

Unrivalled Joint Customer Support Process

- Dedicated On-Site Resources
- Significant Program Investments

Oracle on System z

Focusing on currency and parity

Delivered 2010 - LoZ Certifications & Product Currency

- Oracle Database 10.2.0.4.3 PSU (Q110)
- Oracle FMW 11 WebLogic Server 10.3.2 (Q110)
- Oracle FMW 11 WebLogic Portal 10.3.2 (Q110)
- Oracle Database 10.2.0.4.4 PSU, parity (Q210)
- Oracle FMW 11 WebLogic Server 10.3.3 (Q210)
- Oracle Haley Systems Policy Automation v10.1
 - On SLES10, (Complex Modeling)
- Oracle Database 10.2.0.4.5 PSU, parity (Q310)
- E-Business Suite Full Port Native 12.1.2 (Q310 – July 30th)
- E-Business Suite FMW 10gR3 10.1.2.3 External Certifications
 - 12.1.2 OCC: Internet Directory (OID) (Q310 – Aug 30th)
 - 12.1.2 OCC Single Sign On (SSO) (Q310 – Aug 30th)
 - 12.1.2 Portal 10g (10.1.4.2) (Q410 – Oct 5th)
 - 12.1.2 Containers for J2EE (OC4J) (Q410 - Oct 14th)
 - 10.1.3.5 BPEL Process Manager (Q410 - Nov 8th 2010)
 - 10.2.1.3 Web Cache 10g (Q410 – Dec 13th 2010)
- E-Business Suite 12.1.3 RUP (Q410 – Oct 28th)

Delivered 2011 - LoZ Certifications & Product Currency

- 10g 10.2.0.5 Database (Q111- Jan 3rd)
- 10g 10.2.0.4 PSU 7 (Q111- Jan 25th)
- 11g Release 2 11.2.0.2 (1Q11 – March 30th)
- 10g 10.2.0.4 PSU 8 (Q211- April 26th)
- 10g 10.2.0.5 Database PSU 3 (Q211- May 27th)
- 11g Release 2 11.2.0.2 PSU 2(1Q11 – June 3rd)
- E-Business Suite FMW 10gR3 External Certifications:
 - Oracle Discoverer (Q111 - Jan 20th)
- EBS 12.1.x on 10g 10.2.0.5 (CY11 – March 22nd)
- EBS 12.1.x on 11g Release 2 (11.2.0.2) Q111 – May 2nd)
- FMW 11gR1: WebLogic Server PS3 (Q111 - Jan 24th)
- FMW 11gR1: SOA PS3 (Q111 - Jan 24th)
- FMW 11gR1: WebCenter PS3 (Q111 - Jan 24th)
- FMW 11gR1: WebLogic Server PS4 (Q211 – May 12th)
- FMW 11gR1: SOA PS4 (Q211 – May 12th)
- FMW 11gR1: WebCenter PS4 (Q211 – May 12th)
- Tuxedo 11gR1 (Q11 – Jan 13th)

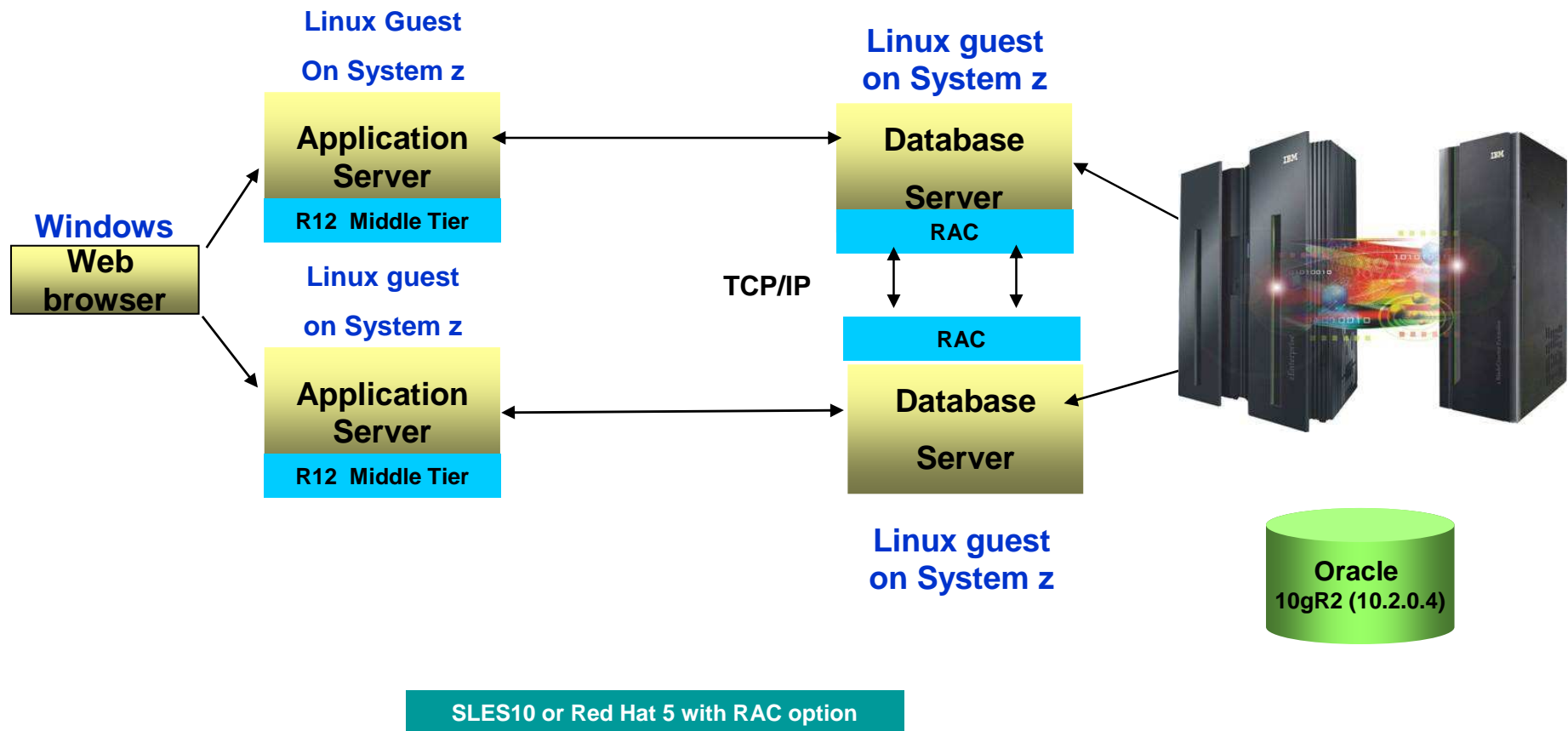
Delivered 2011 DB2 and z/OS Certifications

- PeopleTools v8.49, 8.50 & 8.51 with DB2 v9 and DB2 v8 certified on z/OS 1.12.(Q211 – April 6th)
- PeopleSoft Version 9.0 & 9.1 /PeopleTools 8.50 & 8.51 certified on DB2 z/OS Version 10 (Q211 – April 29th)

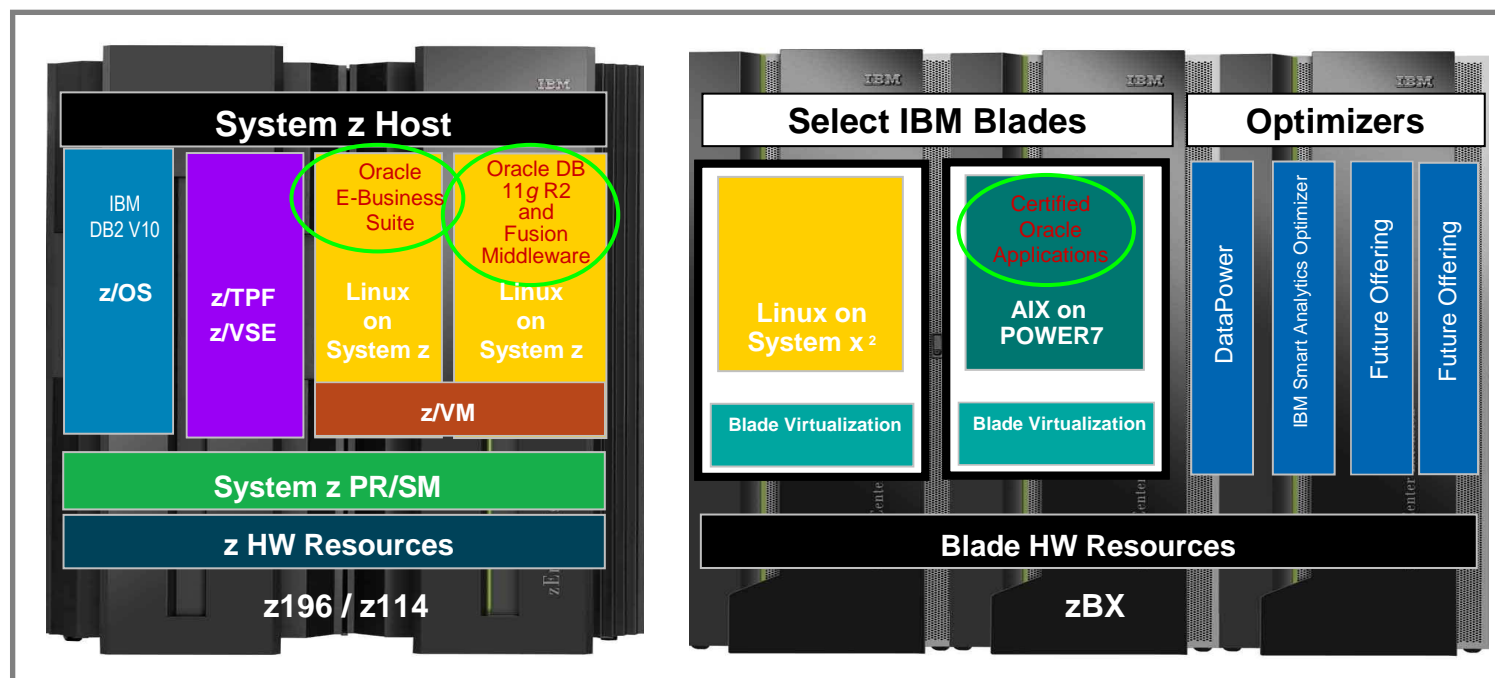


- In 1Q 2011 Oracle delivered as scheduled 11g Release 2 (11.2.0.2) Database for Linux on IBM System z Servers
 - Oracle Real Applications Clustering (RAC) is included
- Oracle has been delivered on Linux for System z since 2002 (9i, 10gR1 and 10gR2).
- Customers have implement both large and small databases on Linux for System z
- Oracle 11g Release 2, along with the standard features, has many new options that are detailed in the document Oracle® Database New Features Guide 11g Release 2 (11.2) E17128-04.
 - New features include:
 - Real Application Testing which provides the capability to capture live workloads and rerun them to access capacity needs, and consolidation benefits.
 - Huge page support, which provides more efficient operation of the Linux OS by reducing memory used by page tables.

With Oracle Middle Tier and Database Tiers both on Linux on System z Servers



Examples of Oracle Solutions on IBM System zEnterprise



Oracle solution landscape on a single zEnterprise System

- Run Oracle database and Oracle E-Business Suite on highly available and reliable zEnterprise 196 (z196) or zEnterprise z114 (z114)
- Run additional Oracle applications on AIX on zEnterprise BladeCenter (zBX)
- Fully benefit from zEnterprise, the first hybrid system, and manage all your Oracle solution servers with the zEnterprise Unified Resource Manager

Workshops – WSC

- **LXOR6 (Wildfire Workshops)**
- **Customizing Linux and the Mainframe for Oracle DB Applications**
 - For clients considering a move of Oracle to Linux on System z
 - Topics include hardware technologies, software components, best practices, performance and tuning, performance tools, linux distributions, tools and services for sizing

- **No charge, Client Team Registration**
- **Offered in Various Cities across North America**
 - August 23 – 25, Jacksonville
 - Oct 11 - 13, New York
 - Oct 25 - 27, Ottawa
- **2.5 days, Attendees responsible for travel expenses**
- **Combination Lectures and Lab Exercises**

Oracle and IBM System z Coverage

- **SHARE (Orlando, August 2011)**
 - IBM Oracle Sessions – Installation Experiences and Recommendations
 - Oracle Support for IBM System z
 - User Experiences

- **Oracle OpenWorld (San Francisco, October 2011)**
 - Oracle on Linux on IBM System z
 - PeopleSoft on System z
 - Siebel on IBM System z
 - IBM Booth (Server/System z Ped)

- **Oracle Collaborate (Las Vegas, April 2012)**
 - Oracle on Linux on System z Sessions
 - zSeries Oracle SIG Sessions
 - Oracle on Linux System z Install Bootcamp
 - Oracle E-Business Suite on Linux on System z Install Bootcamp



International zSeries Oracle SIG

- **Independent User Organization**
 - **President, Mike Zechman**
 - **Worldwide user participation**
 - **No cost to be a member**
 - **Oracle and IBM Participation**

- **Annual Conference**
 - **Next is April, 2012, Las Vegas**

- **Communicates requirements and priorities to Oracle and IBM**

- **Longest running still active Oracle User Group**

- **Website www.zseriesoraclesig.org**
 - **Presentations, Links, Bulletin Board**

Customers running Oracle on Linux on IBM System z



- ✓ **Hundreds of customers running Oracle on Linux on IBM System z**
 - ✓ Various sizes and deployments
 - ✓ Across industries
 - ✓ Active volunteer led System z Oracle User Group (www.zseriesoraclesig.org)
- ✓ **Small System z Customer Example**
 - ✓ Oil & Gas Industry Services Provider
 - ✓ Serves 4,200 Companies, 44,000 Users, \$80B in transaction detail yearly
 - ✓ Was Windows, Dell, Linux
 - ✓ ISSUES – Rapid Company Growth, Server Sprawl, Cost Control, Hardware Outages
 - ✓ **SOLUTION – z10BC, 3 IFL's, 24 GB**
 - ✓ SLES10, Oracle 10g EE
 - ✓ Databases: 7 production, 400 GB – 3 TB, 7 virtual servers/database
- ✓ **Medium Size System z Customer Example**
 - ✓ Scientific Equipment Retailer
 - ✓ Oracle Database on mostly UNIX (also z890 legacy, was considering 'move off mainframe')
 - ✓ ISSUES – Availability on UNIX, growth (without additional footprints), strong UNIX team
 - ✓ POC – Linux on z, revealed 3X performance increase over UNIX
 - ✓ **SOLUTION – z10BC, 7 IFL's, 76GB**
 - ✓ Global DW, Oracle DB on Loz
 - ✓ Migrated two more databases onto Loz
 - ✓ COGNOS, home grown applications accessing the databases
 - ✓ In process of upgrading for additional Oracle database workloads

Customers running Oracle on Linux on IBM System z



- ✓ **Large System z Customer Example**
 - ✓ **Large Government Installation**
 - ✓ **100 IFL's, z10 Oracle RAC Environment across 2 z10's with Oracle ASM**
 - ✓ **35TB Database and 45TB Flash Recovery Area**
 - ✓ **Project is getting very high I/O throughput inserting 5.79 billion records in a 7 hour window and updating another 320 million records (exceeds 5 year SLA's)**

- ✓ **Large System z Customer Example**
 - ✓ **Leading Systems Integrator and IT Consulting Firm**
 - ✓ **Z990 x 2, Z9 S54 x 4, z10 E64 x 1 (192GB to 256GB per box)**
 - ✓ **32 IFL's per z990, 54 per z9, 64 per z10**
 - ✓ **All Linux**
 - ✓ **5 LPAR's per CEC (4 for Oracle, 1 for Management)**
 - ✓ **16 shared IFL's per LPAR, 45 GB Memory per LPAR**
 - ✓ **4 nodes RAC running on same CEC with Hipersocket interconnect**
 - ✓ **2,000 – 3,000 transactions per second at peak**
 - ✓ **Response time less than 1 sec (threshold 5 sec)**
 - ✓ **DB Size – >5 TB for online & ~50 TB for DWH**
 - ✓ **Benefits – TCO, Extreme high availability, scalability**
 - ✓ **Planning z196 upgrade**

- <http://www.ibm.com/redbooks>
 - SG24-6482-00 Experiences with Oracle Database 10g on Linux for zSeries
 - SG24-7191-00 Experiences with Oracle 10gR2 Solutions on Linux for System z
 - SG24-7573-00 Using Oracle Solutions on Linux on System z
 - SG24-7634-00 Experiences with Oracle Solutions on Linux for IBM System z
 - 11gR2 based redbooks are in the works

- <http://otn.oracle.com>
 - (Select “Downloads”)

- <http://www.vm.ibm.com/perf/tips>
 - General z/VM Tuning Tips

- <http://www-124.ibm.com/developerworks/oss/linux390/index.shtml>
 - Lot’s of information on Linux for System z

- <http://www-128.ibm.com/developerworks/linux/linux390/perf/index.html>
 - Hints and Tips for tuning Linux on System z

- <http://www.zseriesoraclesig.org>
 - Special Interest Group of Oracle users on the mainframe (z/OS and Linux)

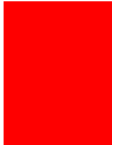
- <http://www.mail-archive.com/linux-390%40vm.marist.edu/>
 - Marist List Server

My Oracle Support Notes

- 1306465.1 - Getting Started - 11gR2 Grid Infrastructure, ASM and DB (IBM: Linux on System z)
- 1290644.1 - Requirements for Installing Oracle 11gR2 on SLES11 on IBM: Linux on System z (s390x)
- 1306889.1 - Requirements for Installing Oracle 11gR2 on RHEL 5 on IBM: Linux on System z (s390x)
- 1308859.1 - Requirements for Installing Oracle 11gR2 RDBMS on SLES 10 SP3 on IBM: Linux on System z (s390x)
- 1086769.1 - Ensure you have prerequisite rpms to install Oracle Database and AS10g(midtier) on IBM: Linux on System z (s390x)



Thank
You



ORACLE®





Support Update for Linux on System z

Donald Frano
Principal Support Engineer,
Oracle on IBM System Z Support
Database Gateway Support

Damian Gallagher
Senior Technical Lead,
Oracle on IBM System Z
Support



Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decision. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.




AGENDA

Oracle RDBMS

Oracle E-Business Suite

Virtual memory issues



Linux on Z Oracle RDBMS 11G Release 2 (11.2)

Became available towards the end of 1st Quarter
2011


Large number of downloads and installations

Very few problems reported so far

Installs very cleanly (more later)

Several installs now in production

July PSU 11.2.0.2.3 available



Linux on Z Oracle RDBMS 10G Release 2 (10.2)

10.2.0.5.0 patchset available, and the July PSU (10.2.0.5.4) also.

Requires a 10.2.0.2.0 base installation – you install 10.2.0.5.0 over the top (for a fresh installation)

We strongly recommend that the 10.2.0.5.4 Patch Set Update is applied in conjunction with the 10.2.0.5.0 Patch Set, as there are a number of performance related patches in the PSU.



Patchset release

There was an unfortunate release timing issue, which we had addressed – this affected both 10.2.0.5.3 and 11.2.0.2.2.

Base Development builds patchsets, Sustaining Engineering builds PatchSet Updates, and they can't start until the first team has completed, and it's 6-8 weeks work to build and QA a PSU. Once the first one is complete, later PSUs are on schedule.

Principally the development environment for future releases has been overhauled to provide a more streamlined, automated process to reduce the effort required to produce releases and patchsets.



RPM Checker

Designed to reduce the installation issues caused by having incomplete/incorrect packages installed – the documentation and installation notes are a little confusing, supplying as they do a list of packages.

Vendors don't help by changing the way functions are packaged or provided – even in service packs J

Doesn't install any code

Be sure to get the latest as the RPM checker via MOS is updated as needed, and should always be current



RPM Checker

Available for Database 10.2.0.4 on Red Hat EL5 and SuSE SLES10 SP2+ and SLES11 SP1

Available for Application Server 10gR2 for Red Hat EL5 and SuSE SLES 10.

Available for Database 11gR2 on Red Hat EL 5 Update 5, Suse SLES10 SP3+ and SLES11 SP1+.



Installation Notes

Always do a software only install

10.2.0.2.0 + 10.2.0.5.0 + 10.2.0.5.4

Only then DBCA etc – creating a DB at 10.2.0.2 and then upgrading is pointless.



Installation Notes (10.2)

The 10.2.0.2 OUI does not recognise SLES-11 as a valid OS version. Therefore, you must invoke OUI as:

```
%./runInstaller -ignoreSysPrereqs
```

Ignore any link errors

Apply 10.2.0.5.0 over the top – this does recognise SLES 11



Installation notes

A recent trend with install problems that originates from installing too many RPMs.

For example: installing your own JDK version (prior to beginning the Oracle Software runInstaller) is not needed on Linux, and is not recommended on Linux. A pre-existing JDK often interferes with the correct JDK that the Linux Oracle Software runInstaller will place and use - usually because only the 64-bit JDK has been installed, and OUI needs the 31-bit.



Installation Notes

No extra patch is required for the DIRECTIO support for zLinux.

Other platforms require a patch for DIRECTIO support



Installation Notes

You may receive the following message:

```
"Checking monitor: must be configured to display at  
least 256 colors
```

```
>>> Could not execute auto check for display colors  
using command /usr/X11R6/bin/xdpyinfo. Check if the  
DISPLAY variable is set. Failed <<<<"
```

This can be corrected by adding a symbolic link as follows: " ln -s /usr/bin/xdpyinfo /usr/X11R6/bin/xdpyinfo"



Installation Notes

You may receive the following WARNING - "libxcb: WARNING! Program tries to lock an already locked connection..." this can be safely ignored. You may also receive this WARNING when running dbca, netca.



11.2 Installation Notes

Operating system distributions:

Red Hat RHEL5 (update 4 or later) - Note RH4 U8 is supported - but RH5 recommended

SUSE SLES10 (SP3)

SUSE SLES11 (SP1)



11.2 Installation Notes

Storage requirements:

Disk space

5.5 GB Oracle Grid Infrastructure for a Grid Home for Cluster and ASM Home 1GB /tmp directory.

4.6 GB database software.

1.7 GB of disk space for a preconfigured database that uses file system storage (optional)



11.2 Installation Notes

Memory requirements

OUI and manuals insist on 4GB

Since Linux reserves 64Mb, even if you have 4GB, the OUI will still complain requiring an override of the OUI checks

However, will still install in 2GB or less – we're doing tests to determine the actual limits and will update the MOS notes when complete



11.2 Installation Notes

ASMLib available for Red Hat 5.6 – refer to My Oracle Support Note: Oracle ASMLIB - Support for RedHat Enterprise Linux 5 AS on IBM zSeries [ID 821652.1]

Library and tools from Oracle Technet

Kernel driver availability differs:

Ships with SuSE 11 on DVD1



References

Patch 8202632 – 10.2.0.5.0 Patch Set

Patch 12419392 – 10.2.0.5.4 DB Patch Set Update

Patch 12419331 - 11.2.0.2.3 DB Patch Set Update

Patch xxxxxxxx - 11.2.0.2.3 GI Patch Set Update

Note 1086769.1 – RPM Checker

Note 1082253.1 – Requirements for Installing
Oracle 10gR2 RDBMS on SUSE SLES 10 on zLinux

Note 741646.1 – Requirements for Installing
Oracle 10gR2 RDBMS on RHEL 5 on zLinux

Note 1290360.1 – Requirements for Installing
Oracle 10gR2 RDBMS on SLES 11 on zLinux



Note 1306465.1 - Getting Started - 11gR2 Grid Infrastructure, ASM and DB (IBM: Linux on System z)

Note 1290644.1 - Requirements for Installing Oracle 11gR2 on SLES11 on IBM: Linux on System z (s390x)

Note 1306889.1 - Requirements for Installing Oracle 11gR2 on RHEL 5 on IBM: Linux on System z (s390x)

Note 1308859.1 - Requirements for Installing Oracle 11gR2 RDBMS on SLES 10 SP3 on IBM: Linux on System z (s390x)

Note 169706.1 - Oracle Database on Unix AIX, HP-UX, Linux, Mac OS X, Solaris, Tru64 Unix Operating Systems Installation and Configuration Requirements Quick Reference



Oracle Enterprise Manager

If you use Grid Control (OMS) 10.2.0.5 and Grid Agent 10.2.0.5 you can monitor a 11.2.0.2 database . See My Oracle Support note 953846.1 Grid Control 10.2.0.5.0 now Supports DB 11.2.0.



Product notes

11gR2 on Linux on Z is a full product – all the standard features are included - Real Application Testing, for example.

Oracle Messaging Gateway fully supported



Oracle Applications News

E-Business Suite

12.1.3 (RUP) now available

Fusion Middleware certifications: Web Cache, BPEL,
Discoverer 10.1.2.3

Oracle E-Business Intelligence is now available

Oracle Embedded Data Warehouse now available

Certified with Database 11.2.0.2

Complete product stack supported on Linux on Z
(12.1.2+)

Split tier (12.0.4+), i.e the Application Server on
distributed platform



References

Oracle E-Business Suite Installation and Upgrade
Notes Release 12 (12.1.2) for IBM: Linux on
System z (Doc ID 1116895.1)



Virtual Memory Management

This is probably the single highest generator of service requests to the Linux on Z support team

Symptoms range from high CPU utilization through to guest 'hangs' and CRS node reboots

Linux doesn't handle memory shortage issues very well, or rather, not very politely J



Indicators: Load

Load Profile

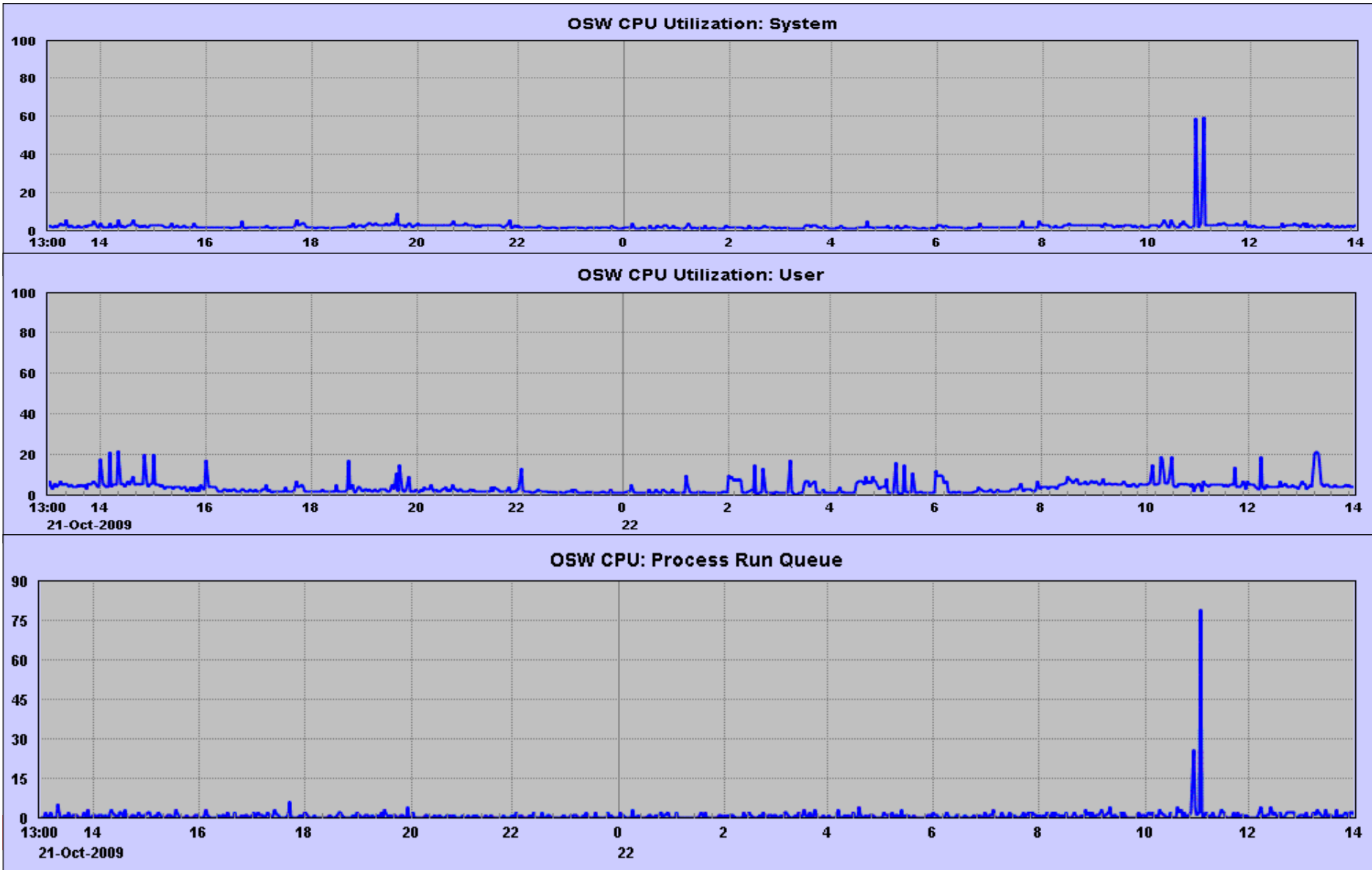
From 3,069 Executes per second
To 2,345

i.e reduced throughput

Top 5 Timed Events (AWR)

Event	%Total Call Time	
db file sequential read	17.5	
latch: cache buffers chains		16.5
log file sync	16.0	
latch: library cache	11.1	
read by other session		9.3
Sum:	70.4	
CPU Wait:	29.6	

Indicators: Load spike





Indicators: Anomalies

*** 2009-02-31 14:02:26.487

Warning: log write time 4500ms, size 4KB

*** 2009-02-31 14:03:00.576

Warning: log write time 610ms, size 16KB

*** 2009-02-31 14:03:44.949

Warning: log write time 690ms, size 4KB

*** 2009-02-31 14:04:24.765

Warning: log write time 780ms, size 4KB

*** 2009-02-31 14:04:54.096

Warning: log write time 4050ms, size 4KB

Indicators: memory use

MemTotal:	5138052	LowFree:	119928 kB
kB		SwapTotal:	4988856 kB
MemFree:	119928	SwapFree:	4609940 kB
kB		Dirty:	604 kB
Buffers:	186252	Writeback:	12 kB
kB		AnonPages:	1647708 kB
Cached:	2593492	Mapped:	1786944 kB
kB		Slab:	167372 kB
SwapCached:	94376	CommitLimit:	7557880 kB
kB		Committed_AS:	4820648 kB
Active:	3662612	PageTables:	372424 kB
kB			
Inactive:	768628		
kB			
HighTotal:	0		
kB			
HighFree:	0		
kB			
LowTotal:	5138052		
kB			



Remedies

Major SGA components not very swap friendly – Oracle will use the LRU pages at the same time as the memory manager wants to swap them.

With high user process volumes comes higher page table use - so more memory 'fixed'

Workload spikes can force a machine into memory scavenge mode - kswapd looking through a large allocated memory are for contiguous pages to swap for a new process allocation

Oom-killer, obviously, is really bad news, as it targets the biggest memory user

Avoid CMM/CMMA until SLES 11 (which needs 10.2.0.5 min)



Hugepages available from 11.2

On a 1MB boundary, previously 4KB page

This reduces page table space, and hence overhead
And thus reduction in system cycles, especially when
under memory pressure.

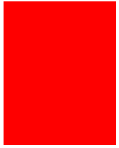


A bit about Support


Support specialist organisation for Linux on Z
ZLUG – UK based user group Oracle regularly attends

Zseriesoraclesig.org

Communities



ORA



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