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Support Update for Linux and z/OS on System z

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# Safe Harbor Statement

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# AGENDA

- Oracle RDBMS
- Oracle E-Business Suite
- Virtual memory issues

# Oracle on z/OS

- We continue to supply CPU and updates to OSDI
- We're seeing a lot of client installations – we have roadmaps for support for the client products going out for more than 5 years, as we fully appreciate how important these components are.
- Still a strong customer base, with a lot of upgrades to the latest patchset occurring
- Our primary goal is stability.

# Linux on Z Oracle RDBMS

- 10.2.0.5.0 patchset now available, and the January PSU (10.2.0.5.2) 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 10.2.0.5.2 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 are addressing – this affects both 10.2.0.5.2 and 11.2.0.2.2.
- Base Development build patchsets, Sustaining Engineering build 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 PSU 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 😊
- Doesn't install any code

# 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 Hae 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 + 10.2.0.5.2
- Only then DBCA etc – creating a DB at 10.2.0.2 and then upgrading is pointless.

# Installation Notes (10g)

- 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.

# 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.

# 11Gr2 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)
-

# 11Gr2 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)
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# 11Gr2 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

# 11Gr2 Installation Notes

- Library and tools from Oracle Technet
- Kernel driver availability differs:
- 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]
- Ships with SuSE 11 on DVD1

# References

- Patch 8202632 – 10.2.0.5.0 Patch Set
- Patch 10248542 – 10.2.0.5.2 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, which will cheer up some people in the room 😊

# 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

# 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 😊

# Indicators: Load

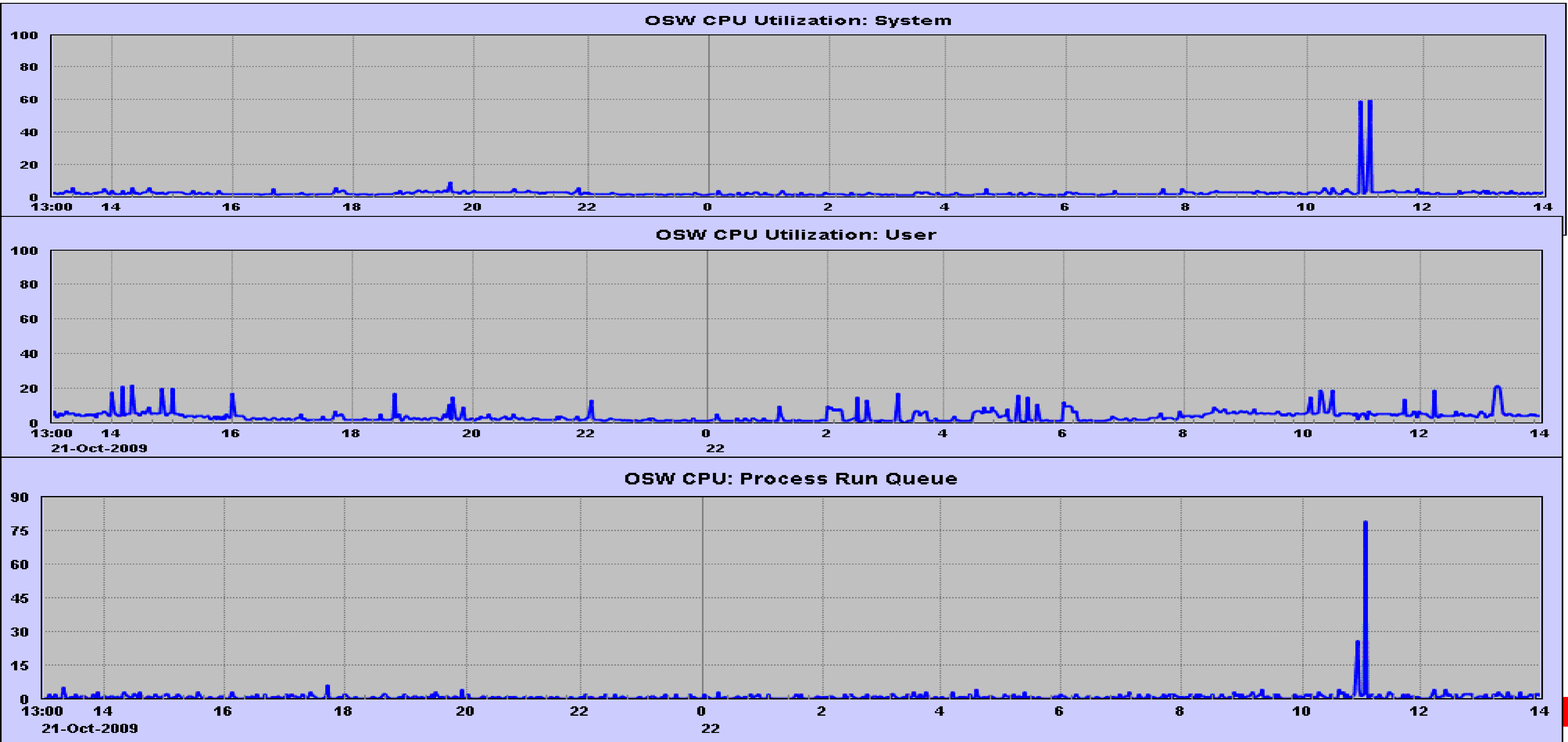
- **Load Profile**
- From 3,069 Executes per second
- To 2,345
  
- i.e reduced throughput

# Indicators: CPU Wait

- **Top 5 Timed Events (AWR)**

<b>Event</b>	<b>%Total Call Time</b>
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
<b>Sum:</b>	<b>70.4</b>
<b>CPU Wait:</b>	<b>29.6</b>

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

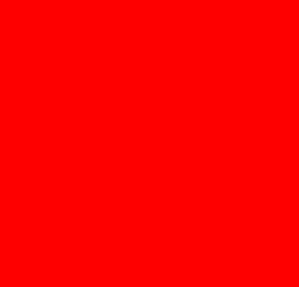
# Remedies

- 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 area for contiguous pages to swap for a new process allocation
- Oom-killer, obviously, is really bad news, as it targets the biggest memory user

- Hugepages available from 11GR2
- 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.



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