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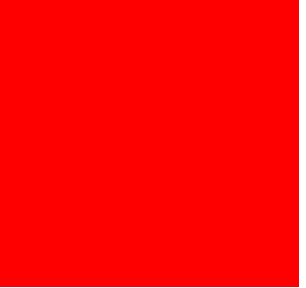
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Session 226 Oracle Support Update for Linux on System z

Collaborate13 April 7-11 2013, Denver, Colorado

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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 decisions.

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We thank you for your feedback!

This is session # 226

Agenda

- Philosophy review
- Tools
- Q&A
- Close



Philosophy Review

You'll remember from last year that we have a number of key points to consider when evaluating DBA or Server Admin tasks:

If you desire peace, prepare for war

Your aim should be 99% routine, boring tasks – 1% sheer terror 😊

Today I plan to show you tools and techniques to achieve or exceed that goal.

General Framework

- Use holistic methods
 - Oracle view
 - OS view
 - Disk view
 - Network view
 - Virtualisation/hypervisor view

General Framework

- Assemble your team
 - Developers
 - DBAs
 - System Admin
 - If someone isn't part of the solution, they're part of the problem

General Framework

- Train, train, train – actions in real situations must be automatic
- Document
- Analyze
- Review
- Have your tools installed, and be intimately familiar with them
 - Zero dark thirty on a Monday morning with year end batch overrun is NO time to be trying new stuff !!

Tools

- Oracle Tools
- Linux Tools
- Hypervisor / z/VM tools

Oracle Tools

- RDA
- AWR / Statspack
- OSWatcher
- LTOM
- SQLTexplain
- Real Application Testing
- Swingbench

Remote Diagnostic Agent (RDA)

- **Remote Diagnostic Agent (RDA) 4 - Getting Started [ID 314422.1]**
- **RDA 4 - Health Check / Validation Engine Guide [ID 250262.1]**

Remote Diagnostic Agent (RDA)

- Used principally to establish normality
- OS configuration
- Oracle configuration
- Optionally install Oracle Configuration Manager which works with OEM to provide up to date information to Oracle, with recommendations for patching.
- **OCM (Oracle Configuration Manager) and My Oracle Support : FAQ and Troubleshooting [ID 369619.1]**

Remote Diagnostic Agent (RDA)

- Can be extensively tailored for specific product data collection using profiles:
 - **Remote Diagnostic Agent (RDA) 4 - Profile Manual Pages [ID 391983.1]**
 - DB11g Oracle Database 11g-related problems
 - DB_Assessment Oracle Database assessment collections
 - DB_BackupRecovery Oracle Database backup and recovery-related problems
 - DB_Perf Oracle Database performance problems

RDA Health Check Validation Engine

- Performs a series of tests and checks to validate that the installation environment matches that recommended
- Very useful for identifying departures from standard practice – which is frequently a root cause of issues
- Should be run regularly as a kind of audit – exceptions should be investigated and documented

RDA HCVE Sample Output

Test "" executed at Sun Aug 25 22:16:55 2006

Test Results

ID NAME RESULT VALUE

=====

10 OS certified? PASSED Certified with 10g RDBMS

20 User in /etc/passwd? PASSED userOK

30 Group in /etc/group? PASSED GroupOK

40 Input ORACLE_HOME RECORD /home/oracle

50 ORACLE_HOME valid? PASSED OHexists

60 O_H perms OK? PASSED CorrectPerms

70 Umask set to 022? PASSED UmaskOK

80 LDLIBRARYPATH unset? FAILED IsSet

100 Other O_Hs in PATH? PASSED NoneFound

110 oraInventory perms PASSED oraInventoryOK

AWR / Statspack

- Active Workload Repository is a store of real time and historical data, collected by a background task in Oracle
- Contains Active Session History reports – very detailed for the last hour, less granular when flushed to the AWR.
- Requires a license for the Diagnostic pack
- Statspack still supported and enhanced with new releases, but a relatively basic report.

AWR Reports

- **FAQ: How to Use AWR Reports to Diagnose Database Performance Issues [ID 1359094.1]**
- Provides a delta between snapshots, typically one hour
- Longer durations **less useful due to averaging**
- Beware of tuning top 5 timed events – just because a wait is in the list doesn't mean it's worth investigating – make sure you have a meaningful amount of DB Time to save.

AWR Report types

- Main AWR
 - Summary report for the snapshot interval
- AWR SQL report
 - Report on the activity of a single SQLID
- AWR Global RAC report
 - Compare multiple nodes side by side, a very good way to investigate RAC/Cluster bottlenecks
- AWR Difference report
 - Compare 2 reports – yesterday vs today, for example

Automatic Database Diagnostic Monitor

- Provides an analysis of the AWR data for the snapshot range
- It is **ESSENTIAL** that whenever you produce an AWR report, you also produce the associated ADDM
- It is even more essential that you read the ADDM report before submitting it to an SR – typically all I'll do is read the report and tell you to do what it says 😊

Active Session History

- AWR works on snapshot intervals
- ASH works on a 1 minute granularity in the repository, 5 seconds in the recent circular buffer
- Reports on what active sessions were up to for a particular time period – typically 5 minute intervals

Lightweight Onboard Monitor (LTOM)

- **LTOM - The On-Board Monitor User Guide [ID 352363.1]**
- Operates in 1 of 3 modes
 - System Profiler
 - Automatic Hang Detection
 - Automatic Session Tracing

System Profiler

- The most commonly used mode
 - Collects OS stats
 - vmstat
 - top
 - Collects Oracle wait information
 - Locks, latches, waits
- Permits graphical representation on a timeline permitting comparison of OS and Oracle info in the same report

Automatic Hang Detection

- Rules based
 - define a hang condition, for example any session waiting on 'Row Cache Enqueue Lock' for more than 1 second
 - Define diagnostics to gather, typically multiple hanganalyze and systemstate dumps
- Less used, as 11GR2 has this capability natively now with the diagnostic event capture process

Automatic Session Tracing

- Rules based, as hang detection
- Traces to an in memory buffer, flushed to a file when the flush threshold is reached
- Enables tracing when a significant event occurs – much faster than waiting for the phone to ring with an irate user
- 10046 level 12 trace, waits and binds

SQLTXplain

What is SQLTXplain?

- SQLT (SQLTXPLAIN) - Tool that helps to diagnose a SQL statement performing poorly or one that produces wrong results (Doc ID 215187.1)
- It does what it says on the tin 😊

SQLTXplain

SQLT connects to the database and collects execution plans, Cost-based Optimizer CBO statistics, schema objects metadata, performance statistics, configuration parameters, and similar elements that influence the performance of the SQL being analyzed.

SQLTexplain

- It also leverages the diagnostic and tuning packs, if licenced,
- by extracting plan history from the AWR
- By generating SQL Tuning Advisor tasks to determine if better plans are available
- To advise on architecture changes to increase performance, e.g addition indices, parallelism
- By generating the SQL to create a baseline for the best available plan

SQLTXplain

A number of webcasts covering SQLT have been recorded outlining various aspects of SQLT usage including topics such as:

"Using SQLTXPLAIN to diagnose SQL statements performing poorly"

"How to create in 5 minutes a SQL Tuning Test Case using SQLTXPLAIN".

The webinars can be found, along with many other recorded webcasts, here:

[Document 740964.1](#) Advisor Webcast Archived Recordings

SQLTXplain

- Additionally a FAQ for the SQLT tool can be found here:

[Document 1454160.1 FAQ: SQLT \(SQLTXPLAIN\)](#)
Frequently Asked Questions

- A blog on SQLTXPLAIN can be found here:

Oracle SQL Tuning Notepad: <http://carlos-sierra.net>

Real Application Testing

- **Master Note for Real Application Testing Option [ID 1464274.1]**
- Licensable
- Permits real workload capture and replay in a new environment
 - New release, patchset, patch
 - New hardware
- With the SQL Performance analyzer allows indepth tuning of queries

Swingbench

- Swingbench - a universal load generator that can run in standalone or RAC mode, which provides a repeatable load test with multiple transaction type modelled on real world OLTP systems
(<http://www.dominicgiles.com/swingbench.html>)
- Modeled on a standard OLTP transaction set

Linux Tools

- Sysstat
- OSWatcher
- Ksar
- nmon

Sysstat

- Usually installed by default
- Very low overhead
- Collects CPU, memory, disk stats
- Provides reports

- Ksar can be used to graph the report data

OSWatcher

- Collects stats by running a subset of systat commands
 - Memory
 - Cpu
 - Disk
- Black Box Analyzer can be used to diagnose issues in the raw data

NMON

- Again, collects OS stats into a binary file
- <http://nmon.sourceforge.net/pmwiki.php>
- Has a real time display
- Additional graphical facilities provided by a spreadsheet downloadable from IBM Developerworks
- http://www.ibm.com/developerworks/aix/library/aunmon_analyser/

VM tools

- IBM Performance Toolkit
- Velocity zPRO

Performance Toolkit

- <http://www.vm.ibm.com/related/perfkit/>
- The functions provided by the Performance Toolkit for VM include:
 - Operation of the system operator console in full-screen mode
 - Management of multiple z/VM systems (local or remote)
 - Post-processing of Performance Toolkit for VM history files and VM monitor data captured by the MONWRITE utility
 - Viewing of performance monitor data using either Web browsers or PC-based 3270 emulator graphics
 - TCP/IP performance reporting

zPRO

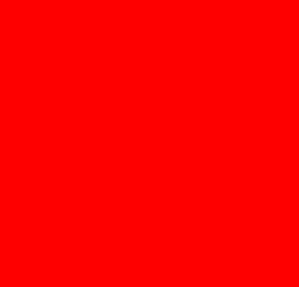
- <http://www.velocity-software.com/zpro.html>
- Collects z/VM (LPAR and guest) performance data
- Collects Linux process performance data
- Demo of zView available:
 - <http://demo.velocitysoftware.com/zview/zview.cgi>

So, what next ?

- Define a test Linux
- Install a db
- Install Swingbench
- Install the tools
 - All the free ones, for sure
- Kick the tyres
- Train, document
- Deploy, and enjoy !!

Remember

- Your personal target is a quiet life
- That target requires more and harder work than any other
- You have the philosophy
- You have the tools
- Make it so !!



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