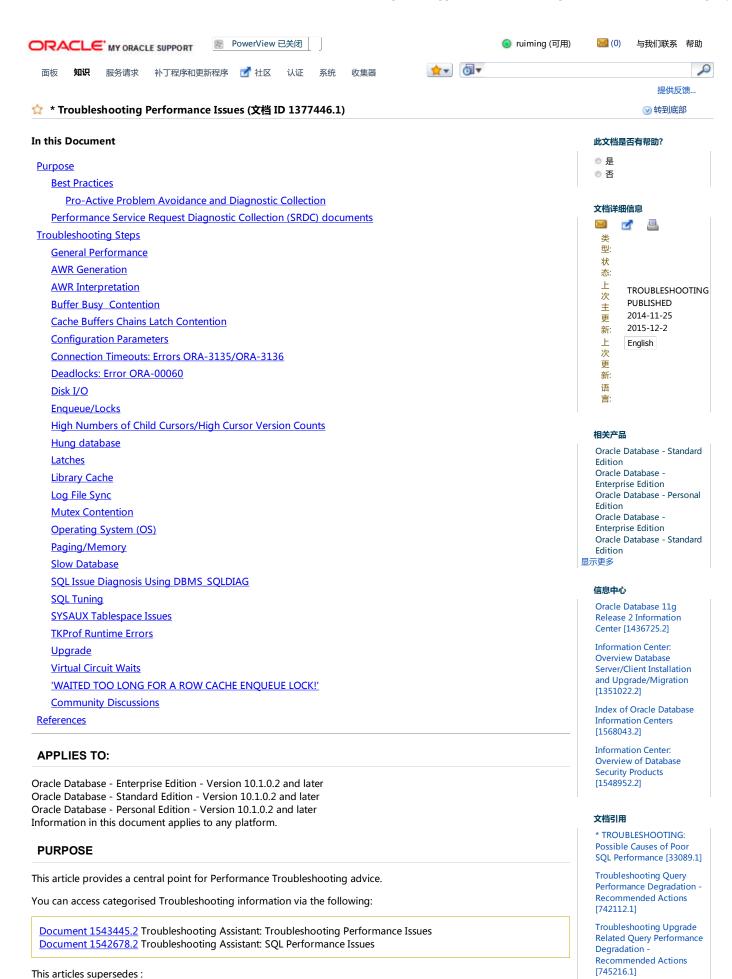
How to Diagnose High CPU Usage Problems to the

Module Level [352648.1]
* TROUBLESHOOTING:

Tuning a New Query [372431.1]



第1页 共6页 2016/12/22 15:19

Document 106285.1 TROUBLESHOOTING GUIDE: Common Performance Tuning Issues (ARCHIVED)

Best Practices

Pro-Active Problem Avoidance and Diagnostic Collection

Although some problems may be unforeseen, in many cases problems may be avoidable if signs are detected early enough. Additionally, if an issue does occur, it is no use collecting information about that issue after the event. For information on suggested preparations to avoid issues and in case diagnostics are required, see:

<u>Document 1482811.1</u> Best Practices: Proactively Avoiding Database and Query Performance Issues <u>Document 1477599.1</u> Best Practices Around Data Collection For Performance Issues

Performance Service Request Diagnostic Collection (SRDC) documents

Service Request Data Collection (SRDC) documents have been specially designed to provide the reader with the necessary instructions to provide a step by step guide to collecting information for a various common Database Performance Issues.

<u>Document 1938786.1</u> List of Available Database Performance Related SRDC Documents

TROUBLESHOOTING STEPS

General Performance

The following articles can help with the interpretation of diagnostics to troubleshoot various issues:

<u>Document 1362329.1</u> How To Investigate Slow Database Performance Issues <u>Document 390374.1</u> Oracle Performance Diagnostic Guide (OPDG)

AWR Generation

To troubleshoot the failure to collect AWR snapshots or reports, See:

<u>Document 1301503.1</u> Troubleshooting: AWR Snapshot Collection issues <u>Document 1363422.1</u> Automatic Workload Repository (AWR) Reports - Start Point

AWR Interpretation

How to troubleshoot performance issues using AWR snapshots or reports, See:

Document 1359094.1 FAQ: How to Use AWR reports to Diagnose Database Performance Issues

Buffer Busy Contention

To troubleshoot issues where Buffers have become Busy due to concurrent access, see:

<u>Document 155971.1</u> Resolving Intense and "Random" Buffer Busy Wait Performance Problems:

Cache Buffers Chains Latch Contention

To troubleshoot issues caused by contention due to multiple sessions waiting to read the same block, see:

Document 1342917.1 Troubleshooting 'latch: cache buffers chains' Wait Contention

Configuration Parameters

Database parameters are designed so that the default is appropriate for the majority of cases. The following article discusses Optimizer Specific Parameters:

<u>Document 1507909.1</u> What does it Mean if Disabling an Optimizer Specific Parameter Avoids a Performance Problem Detected After an Upgrade?

Connection Timeouts: Errors ORA-3135/ORA-3136

To troubleshoot issues caused by Connection Timeouts when errors such as ORA-3135 or ORA-3136 are seen, see:

<u>Document 730066.1</u> Troubleshooting ORA-3135/ORA-3136 Connection Timeouts Errors - Database Diagnostics

Deadlocks: Error ORA-00060

For issues related to Deadlocks, refer to:

<u>Document 60.1</u> Troubleshooting Assistant: Oracle Database ORA-00060 Errors on Single Instance (Non-RAC)

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Configuring TNSNAMES.ORA, SQLNET.ORA,and LISTENER.ORA in Net8 [69725.1]

An "ORA-17410: No More Data to Read From Socket" Error Has Been Signaled From An ODI Integration Interface [423982.1]

Oracle Parallel Server on IBM SP [117120.1]

ORA-07445: core dump [qcdlgcd()+70] for Union All Statement : No More Data To Read From Socket [2028777.1]

Troubleshooting ORA-3137 [12333] Errors Encountered When Using Oracle JDBC Driver [1361107.1]

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第2页 共6页

Diagnosing Using Deadlock Graphs in ORA-00060 Trace Files

Document 1509919.1 Master Note for Database Error ORA-00060

Disk I/O

For issues related to Disk Input/Ouput (I/O),refer to:

<u>Document 223117.1</u> Troubleshooting I/O-related waits <u>Document 1275596.1</u> How to Tell if the IO of the Database is Slow

Enqueue/Locks

For locking issues refer to:

Document 1392319.1 Master Note: Locks, Enqueues and Deadlocks

Document 15476.1 FAQ about Detecting and Resolving Locking Conflicts

High Numbers of Child Cursors/High Cursor Version Counts

When a SQL statement is executed, Oracle will try to match that statement up with an existing identical statement that has already been executed and attempt to reuse the stored parsed representation of it (which is stored within a cursor structure in the library cache). If the existing information in the cursor for that statement cannot be used, a new version of that statement will be created and used instead. If lots of versions of a particular statement are created, Oracle has to search through the versions to determine which (if any) can be shared. In extreme circumstances, this can cause mutex contention and other issue that degrade the database performance. In order to troubleshoot these issues and determine the cause, see:

Document 296377.1 Troubleshooting: High Version Count Issues

Hung database

To troubleshoot cases where the database appears to have hung, refer to :

<u>Document 1378583.1</u> Troubleshooting Database Hang Issues <u>Document 452358.1</u> How to Collect Diagnostics for Database Hanging Issues

Latches

To troubleshoot issues where there is contention on 'cache buffers chains' latches see:

<u>Document 1342917.1</u> Troubleshooting 'latch: cache buffers chains' Wait Contention

Library Cache

For issues related to contention in the Library Cache

<u>Document 62143.1</u> Troubleshooting: Tuning the Shared Pool and Tuning Library Cache Latch Contention

Log File Sync

To troubleshoot issues where 'log file sync' is a primary cause of session wait activity, see:

Document 1376916.1 Troubleshooting: "Log File Sync" Waits

Mutex Contention

For issues related to Mutex contention, refer to:

<u>Document 1377998.1</u> Troubleshooting: Waits for Mutex Type Events

<u>Document 1349387.1</u> Troubleshooting 'cursor: pin S wait on X' waits <u>Document 1357946.1</u> Troubleshooting 'library cache: mutex X' waits.

Document 1356828.1 FAQ: 'cursor: mutex ..' / 'cursor: pin ..' / 'library cache: mutex ..' Type Wait Events

Operating System (OS)

To troubleshoot Operating System (OS) related issues see:

 <u>Document 352648.1</u> How to Diagnose High CPU Usage Problems to the Module Level <u>Document 148176.1</u> Diagnosing hardware configuration induced performance problems

Paging/Memory

If heavy paging activity is seen and the database appears to be running more slowly than normal, refer to:

<u>Document 1195174.1</u> Heavy Paging Causes Slow Database Performance

Slow Database

To troubleshoot occasions where the database appears to be running more slowly than normal, refer to:

<u>Document 1362329.1</u> How To Investigate Slow Database Performance Issues

SQL Issue Diagnosis Using DBMS_SQLDIAG

An increasing number of issues can be detected, diagnosed and avoided using the DBMS_SQLDIAG package. For details see:

Document 1509192.1 How To Use DBMS_SQLDIAG To Diagnose Various Query Issues

SQL Tuning

For issues with individual queries, refer to the following troubleshooting documents:

<u>Document 742112.1</u> * Query Performance Degradation - Recommended Actions <u>Document 745216.1</u> * Query Performance Degradation - Upgrade Related - Recommended Actions

<u>Document 179668.1</u> * TROUBLESHOOTING: Tuning Slow Running Queries

<u>Document 33089.1</u> * TROUBLESHOOTING: Possible Causes of Poor SQL Performance

Document 372431.1 * TROUBLESHOOTING: Tuning a New Query

Document 122812.1 * TROUBLESHOOTING: Tuning Queries That Cannot be Modified

Document 163563.1 * TROUBLESHOOTING: Advanced Query Tuning

<u>Document 1386036.1</u> How To Diagnose Issues Where Plans Are Different From Different Clients

SYSAUX Tablespace Issues

Document 1399365.1 Troubleshooting Issues with the SYSAUX Tablespace

TKProf Runtime Errors

Document 1383275.1 Troubleshooting TKProf Runtime Errors

Upgrade

To troubleshoot issues encountered after upgrading a database see:

<u>Document 1528847.1</u> Troubleshooting: Avoiding and Resolving Database Performance Related Issues After Upgrade

<u>Document 160089.1</u> TROUBLESHOOTING: Server Upgrade Results in Slow Query Performance

For advice on how to avoid such issues before upgrading, see:

<u>Document 1482811.1</u> Best Practices: Proactively Avoiding Database and Query Performance Issues <u>Document 785351.1</u> Oracle 11gR2 Upgrade Companion

<u>Document 1645862.1</u> Things to Consider Before Upgrading to 11.2.0.4 to Avoid Poor Performance or Wrong Results

<u>Document 1392633.1</u> Things to Consider Before Upgrading to 11.2.0.3 to Avoid Poor Performance or Wrong Results

<u>Document 1320966.1</u> Things to Consider Before Upgrading to 11.2.0.2 to Avoid Poor Performance or Wrong Results

Virtual Circuit Waits

<u>Document 1415999.1</u> Troubleshooting: Virtual Circuit Waits

'WAITED TOO LONG FOR A ROW CACHE ENQUEUE LOCK!'

To troubleshoot issues when the database detects that a waiter has waited for a resource for longer than a particular threshold and he message "WAITED TOO LONG FOR A ROW CACHE ENQUEUE LOCK!" appears in the alert log, See:

Document 278316.1 Troubleshooting: "WAITED TOO LONG FOR A ROW CACHE ENQUEUE LOCK!"

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REFERENCES

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NOTE:33089.1 - * TROUBLESHOOTING: Possible Causes of Poor SQL Performance
NOTE:742112.1 - Troubleshooting Query Performance Degradation - Recommended Actions
NOTE:745216.1 - Troubleshooting Upgrade Related Query Performance Degradation - Recommended Actions
NOTE:352648.1 - How to Diagnose High CPU Usage Problems to the Module Level
NOTE:372431.1 - * TROUBLESHOOTING: Tuning a New Query
NOTE:1415999.1 - Troubleshooting: Virtual Circuit Waits
NOTE:15476.1 - FAQ: Detecting and Resolving Locking Conflicts and Ora-00060 errors
NOTE:155971.1 - Resolving Intense and "Random" Buffer Busy Wait Performance Problems
NOTE:160089.1 - Troubleshooting a Server Upgrade Resulting in Slow Query Performance
NOTE:1509919.1 - Master Note for Database Error ORA-00060 "deadlock detected while waiting for resource"
NOTE:1528847.1 - Avoiding and Resolving Database Performance Related Issues After Upgrade
NOTE:1357946.1 - Troubleshooting 'library cache: mutex X' Waits.
NOTE:1383275.1 - Troubleshooting TKProf Runtime Errors
NOTE:1399365.1 - Troubleshooting Issues with SYSAUX Usage by the Automatic Workload Repository (AWR)
NOTE:1386036.1 - How to Diagnose Issues Where Plans are Different From Different Clients
NOTE:1392319.1 - Master Note: Locks, Enqueues and Deadlocks
NOTE:1392633.1 - Things to Consider Before Upgrading to 11.2.0.3 to Avoid Poor Performance or Wrong Results
NOTE:1507909.1 - What does it Mean if Disabling an Optimizer Specific Parameter Avoids a Performance Problem
Detected After an Upgrade?
NOTE:1376916.1 - Troubleshooting: 'Log file sync' Waits
NOTE:223117.1 - Troubleshooting I/O Related Waits
NOTE:1477599.1 - Best Practices: Proactive Data Collection for Performance Issues
NOTE:296377.1 - Troubleshooting: High Version Count Issues
NOTE:1195174.1 - Heavy Paging Causes Slow Database Performance
NOTE:1509192.1 - How To Use DBMS_SQLDIAG To Diagnose Various Query Issues
NOTE:1482811.1 - Best Practices: Proactively Avoiding Database and Query Performance Issues
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第5页 共6页 2016/12/22 15:19

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NOTE:1377998.1 - Troubleshooting: Waits for Mutex Type Events
NOTE:1378583.1 - Troubleshooting Database Hang Issues
NOTE:1275596.1 - How to Tell if the I/O of the Database is Slow
NOTE:1301503.1 - Troubleshooting: Missing Automatic Workload Repository (AWR) Snapshots and Other Collection
Issues
NOTE:1320966.1 - Things to Consider Before Upgrading to 11.2.0.2 to Avoid Poor Performance or Wrong Results
NOTE:1342917.1 - Troubleshooting 'latch: cache buffers chains' Wait Contention
NOTE:106285.1 - Legacy Troubleshooting Guide: Common Performance Tuning Issues
NOTE:1349387.1 - Troubleshooting 'cursor: pin S wait on X' waits.
NOTE:1356828.1 - FAQ: 'cursor: mutex ..' / 'cursor: pin ..' / 'library cache: mutex ..' Type Wait Events
NOTE:390374.1 - Oracle Performance Diagnostic Guide (OPDG)
NOTE:452358.1 - How to Collect Diagnostics for Database Hanging Issues
NOTE:122812.1 - * TROUBLESHOOTING: Tuning Queries That Cannot be Modified (10g and below)
NOTE:163563.1 - * TROUBLESHOOTING: Advanced Query Tuning
NOTE:730066.1 - Troubleshooting ORA-3135/ORA-3136 Connection Timeouts Errors - Database Diagnostics
NOTE:1362329.1 - How to Investigate Slow or Hanging Database Performance Issues
NOTE:1363422.1 - Automatic Workload Repository (AWR) Reports - Main Information Sources
NOTE:61552.1 - Oracle 9i and Below: Exhaustive Troubleshooting Steps for Oracle Database Hanging Issues
NOTE:179668.1 - TROUBLESHOOTING: Tuning Slow Running Queries
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DATABASE PERFORMANCE; PERFORMANCE; PERFORMANCE ISSUE; PERFORMANCE PROBLEMS; PERFORMANCE TUNING; QUERY PERFORMANCE; TROUBLESHOOT

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ORA-3135; ORA-3136

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