ORACLE问题排查之浅谈

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ORACLE问题排查之浅谈-之程咬金的三板斧

劈脑袋–获取日志系统信息
鬼剔牙–借助工具
掏耳朵–借助网络核实

劈脑袋-获取日志系统信息

- 数据库日志(alert_$SID.log)
- 监听日志（listener）
- 集群日志
- 操作系统日志

- 系统性能信息获取。

数据库日志(alert_$SID.log)

- ORACLE数据库alert日志位置：
  - 获取alert日志位置：show parameter dump;
  - SQL> show parameter background_dump_dest
  - NAME TYPE VALUE
  - ------------------------------ ------- ------------------------------
  - background_dump_dest string /oracle/app/admin/ngdb2/bdump
- 查看ORACLE数据库alert日志内容：
  - tail -n300 -f alert_sid.log |more

数据库日志(alert_$SID.log)

- 11g以上版本的alert日志发生了改变.可以通过视图查询
  - SQL> col name format a20;
  - SQL> col value format a40;
  - SQL> select name,value From v$diag_info;

  - NAME VALUE
  - ---------- ----------
  - Diag Enabled TRUE
  - ADR Base /u01/app
  - ADR Home /u01/app/diag/rdbms/ossdb/ossdb2
  - Diag Trace /u01/app/diag/rdbms/ossdb/ossdb2/trace
  - Diag Alert /u01/app/diag/rdbms/ossdb/ossdb2/alert
  - Diag Incident /u01/app/diag/rdbms/ossdb/ossdb2/inciden
  - t

  - Diag Cdump /u01/app/diag/rdbms/ossdb/ossdb2/cdump
  - Health Monitor /u01/app/diag/rdbms/ossdb/ossdb2/hm
  - Default Trace File /u01/app/diag/rdbms/ossdb/ossdb2/trace/o

  - NAME VALUE
  - ---------- ----------
  - ossdb2_ora_49296.trc

监听日志（listener）

- 11g之前（RAC与非RAC）
  - 通过oracle用户执行lsnrctl status listener_name获取监听日志文件
  - Listener Parameter File /oracle/app/product/10.2/db_2/network/admin/listener.ora
  - Listener Log File /oracle/app/product/10.2/db_2/network/log/listener_ngcrm_i1.log
- 11g（非RAC）
  - 通过oracle用户执行lsnrctl status listener_name获取监听日志文件

监听日志（listener）

- 11g(rac模式)
  - 通过grid用户执行lsnrctl status listener_name获取监听日志文件
  - Listener Parameter File /oracle/app/product/10.2/db_2/network/admin/listener.ora
  - Listener Log File /oracle/app/product/10.2/db_2/network/log/listener_ngcrm_i1.log

集群日志

- $ORACLE_HOME/log目录下（grid用户）
- Asm日志
- 1* select * from v$diag_info
- SQL> /

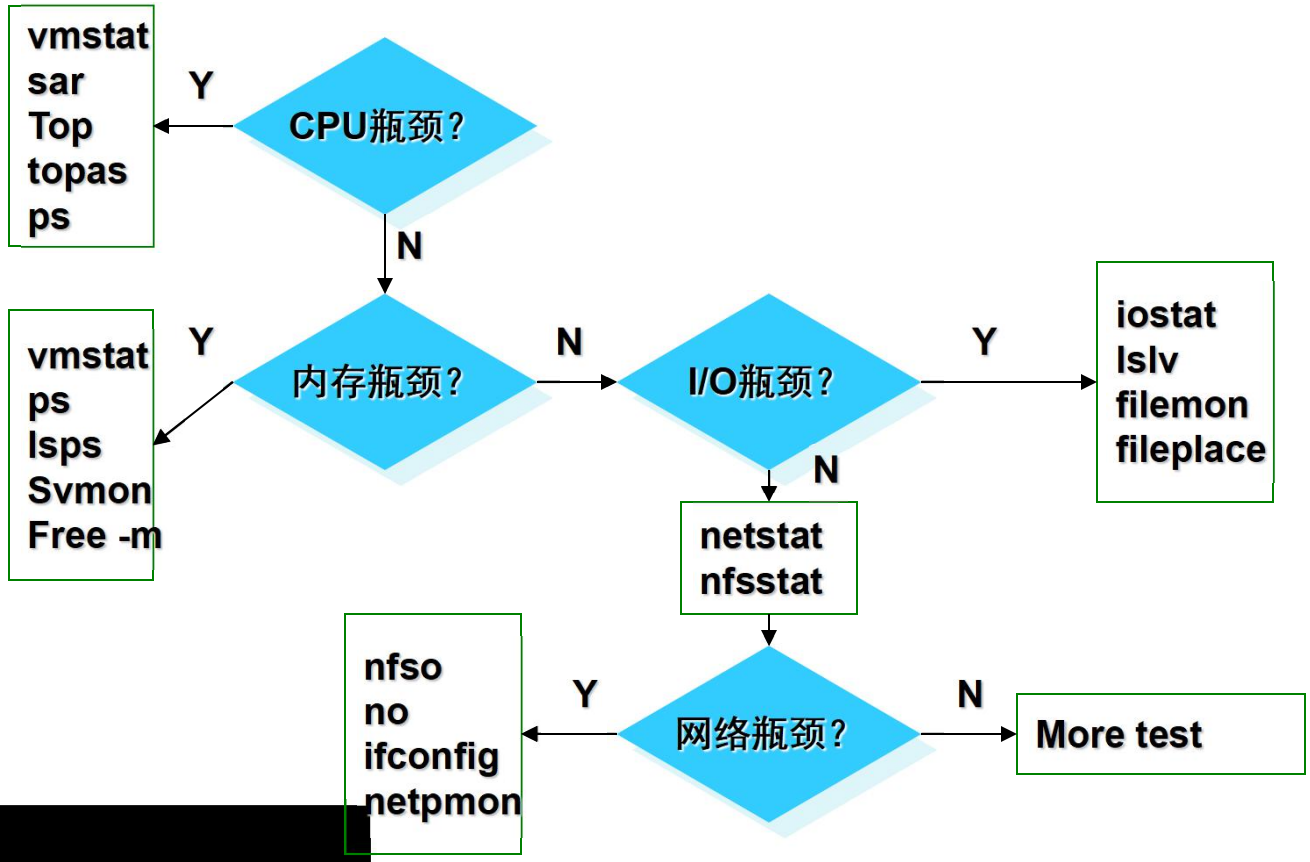
- INST_ID NAME VALUE
- ---------- ---------- ----------
- 1 Diag Enabled TRUE
- 1 ADR Base /g01/app/product/11.2.0/log
- 1 ADR Home /g01/app/product/11.2.0/log/diag/asm/+asm/+ASM1
- 1 Diag Trace /g01/app/product/11.2.0/log/diag/asm/+asm/+ASM1/trace
- 1 Diag Alert /g01/app/product/11.2.0/log/diag/asm/+asm/+ASM1/alert
- 1 Diag Incident /g01/app/product/11.2.0/log/diag/asm/+asm/+ASM1/incident
- 1 Diag Cdump /g01/app/product/11.2.0/log/diag/asm/+asm/+ASM1/cdump
- 1 Health Monitor /g01/app/product/11.2.0/log/diag/asm/+asm/+ASM1/hm
- 1 Default Trace File /g01/app/product/11.2.0/log/diag/asm/+asm/+ASM1/trace/+ASM1_
- ora_39430.trc

操作系统日志

- Linux:/var/log/messages
- HP-UX：/var/adm/syslog/syslog.log
- AIX:errpt
  - errpt -aj BFE4C025
- Windows:事件查看器‘面板中，点击左侧的’Windows日志

系统性能信息获取

- 一般性能分析过程



系统性能信息获取

- 性能分析工具：
  - iostat
  - Vmstat
  - sar
  - topas
  - OSWatcher（oracle）
  - NMON（AIX）
  - GlancePlus (HP-UX)

topas


Topas Monitor for host: e30
Wed Jun 4 17:21:03 2003 Interval: 2
Kernel 10.0 |### |
User 3.0 |# |
Wait 0.0 | |
Idle 87.0 |######################## |
Network KBPS I-Pack O-Pack KB-In KB-Out
en0 24.3 153.5 153.5 10.7 13.6
lo0 1.6 3.0 3.0 0.8 0.8
et0 0.0 0.0 0.0 0.0 0.0
Disk Busy% KBPS TPS KB-Read KB-Writ
hdisk0 0.0 0.0 0.0 0.0 0.0
Name PID CPU% PgSp Owner
dtwm 12580 7.0 2.8 root
topas 10704 1.5 1.8 root
dtterm 10464 1.5 2.4 root
ttsession 5116 0.5 1.9 root
dtgreet 3922 0.0 2.5 root
X 3128 0.0 2.7 root
gil 1548 0.0 0.0 root
哪个进程使用CPU最多
EVENTS/QUEUES
Cswitch 324
Syscall 919
Reads 291
Writes 152
Forks 0
Execs 0
Runqueue 0.0
Waitqueue 0.0
PAGING
Faults 0
Steals 0
PgspIn 0
PgspOut 0
PageIn 0
PageOut 0
Sios 0
NFS (calls/sec)
ServerV2 0
ClientV2 0
ServerV3 0
ClientV3 0
FILE/TTY
Readch 5789
Writech 6479
Rawin 0
Ttyout 0
Igets 0
Namei 0
Dirblk 0
MEMORY
Real,MB 63
% Comp 79.0
% Noncomp 18.4
% Client 0.5
PAGING SPACE
Size,MB 128
% Used 30.7
% Free 69.2
Press:
"h" for help
"q" to quit

鬼剔牙-借助工具

- 数据库自带工具
  - STATSPACK(10g之前）
  - ASH, AWR, ADDM（10g之后）
- OEM
  - 故障、优化、配置、管理、备份
- 数据库自身数据字典：
- V$SYSSTAT V$SESSION V$SESSTAT V$SGASTAT
- V$FILESTAT V$UNDOSTAT V$ROLLSTAT V$WAITSTAT
- V$LOCK V$LATCH V$SQL V$SQLAREA V$SQLTEXT
- V$PROCESS V$LIBRARYCACHE V$ROWCACHE dba_hist_active_sess_history V$ACTIVE_SESSION_HISTORY

数据库自带工具

- 数据库自带工具使用方法：
  - STATSPACK使用方式
    - STATSPACK（通过statscre.sql）
    - execute statspack.snap;
    - spauto.sql 自动执行
    - spreport.sql生成报告
  - ASH, AWR, ADDM使用方式
    - Awrrpt.sql/awrrpti.sql
    - ashrpt.sql/ ashrpti.sql
    - addmrpt.sql/ addmrpti.sql

性能报告-等待事件

- v$system_event/v$session_event/$session_wait
- 竞争即等待
- 寻找第一眼的感觉
- 从v$system_event中发现系统问题
- 从v$session_event中发现会话问题
- 从v$session_wait的参数中找到竞争对象

Top 5 Timed Events

Event	Waits	Time(s)	Avg Wait(ms)	% Total Call Time	Wait Class
CPU time		45,766		28.2	
gc buffer busy	1,938,074	22,115	11	13.6	Cluster
gc current block 2-way	3,654,065	17,839	5	11.0	Cluster
gc cr block 2-way	2,804,955	13,480	5	8.3	Cluster
db file sequential read	4,139,209	13,385	3	8.3	User I/O

性能报告-等待事件

- buffer busy waits(数据高速缓存忙等待)
- db file scattered read(数据文件离散读取)
- db file sequential read(数据文件顺序读)
- direct path read(直接路径读取)
- direct path write(直接路径写出)
- enqueue(队列)
- free buffer waits(空闲缓冲区等待)
- latch free(锁存器空闲)
- log buffer space(日志缓冲区空间分配)
- log file switch(archiving needed)
- log file switch(checkpoint incomplete)
- log file sync(日志文件同步)

分析ADDM报告

ADDM Report for Task 'TASK_57428'

Analysis Period

AWR snapshot range from 18576 to 18577.
Time period starts at 14-NOV-17 11.00.34 AM
Time period ends at 14-NOV-17 12.00.37 PM
--以上部分为分析的时间范围，用于限定特定的时间范围有助于诊断特定故障 --本addm报告的时间周期为at 14-NOV-17 11.00.34 AM - 14-NOV-17 12.00.37 PM

分析ADDM报告

Analysis Target

Database 'DZFPMX' with DB ID 405219595.
Database version 11.2.0.4.0.
ADDM performed an analysis of instance dzfpmx_1, numbered 1 and hosted at cls1-node9.
-以上信息为数据库的版本，库名，实例等信息
Activity During the Analysis Period

Total database time was 174 seconds.
The average number of active sessions was .05.
-以上部分为分析期间的总的数据库耗用时间以及每个会话的平均时间 --当前分析的期间内，自然流逝的时间为1*3600<3600<<DB time(174), 数据库异常繁忙 --每秒平均的活动会话数位0.5个

分析ADDM报告

Activity During the Analysis Period

Total database time was 13726 seconds.
The average number of active sessions was 3.79.

Summary of Findings

	Description	Active Sessions Percent of Activity	Recommendations
1	Top SQL Statements	2.28 | 60.18	4
2	"User I/O" wait Class	.37 | 9.65	0

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--以上部分是诊断结果的摘要部分，列出重要的诊断结果及百分比，建议条数 --
如第一行为TopSQL部分，受影响活动会话数2.28 ，占据整个DB Time
60.18 。。4条建议
第二 ss IO等待类型。0条建议
~~~~~~

分析ADDM报告

--这部分内容主要有多个不同的Finding组成，且每个Finding均包含以下内容：
--1、在Finding标题中列出相应的Findings名称，如TopSQL，或者相关等待事件如Free Buffer Waits
--2、描述受影响的活动会话数，以及占用总活动的百分比
--3、给出优化建议，采取的行动，以及理论依据
Findings and Recommendations

Finding 1: Top SQL Statements
Impact is 2.28 active sessions, 60.18% of total activity.

SQL statements consuming significant database time were found. These statements offer a good opportunity for performance improvement.
--上面部分描述了Top SQL影响了2.28个活动会话，占用总活动数目60.18%
--并且描述通过SQL优化能够提升性能，可能会包含多条SQL

分析ADDM报告

Recommendation 1: SQL Tuning
  Estimated benefit is 1.07 active sessions, 28.18% of total activity.

  Action
    Run SQL Tuning Advisor on the SELECT statement with SQL_ID
    "05wnt9qfx4hd2".
    Related Object
      SQL statement with SQL_ID 05wnt9qfx4hd2.
      SELECT tmp.*, ROWNUM FROM (SELECT oaci.id FROM
      order_accept_crm_interface oaci WHERE oaci.status = 1 AND
      oaci.local_net_id = :1 AND oaci.send_num <= :2 order by oaci.id)
      tmp WHERE rownum < :3
  Rationale
    The SQL spent 100% of its database time on CPU, I/O and Cluster waits.
    This part of database time may be improved by the SQL Tuning Advisor.
  Rationale
    Database time for this SQL was divided as follows: 100% for SQL
    execution, 0% for parsing, 0% for PL/SQL execution and 0% for Java
    execution.
-- 此SQL数据库时间被分割为SQL 执行占 100%, 语法分析占 0%,
-- PL/SQL执行占0%, Java执行占0%，也就是全部为执行时间，其他部分难以优化
  Rationale
    [redacted]5wnt9qfx4hd2" was executed 43156 times and
    had an a[redacted]of 0.091 seconds.

分析ADDM报告

Recommendation 2: SQL Tuning
Estimated benefit is .99 active sessions, 26.13% of total activity.

Action
Run SQL Tuning Advisor on the SELECT statement with SQL_ID "bvk49mu1m5bpy".
Related Object
SQL statement with SQL_ID bvk49mu1m5bpy.
SELECT tmp.id, ROWNUM FROM (SELECT oai.id FROM order_accept_interface oai WHERE 1=1 AND oai.local_net_id = :1 AND oai.status = :2 AND oai.turn_wo_order_num <= :3) tmp WHERE rownum <= :4
Rationale
The SQL spent 100% of its database time on CPU, I/O and Cluster waits. This part of database time may be improved by the SQL Tuning Advisor.
Rationale
Database time for this SQL was divided as follows: 100% for SQL execution, 0% for parsing, 0% for PL/SQL execution and 0% for Java execution.
Rationale
SQL statement with SQL_ID "bvk49mu1m5bpy" was executed 43219 times and had an average elapsed time of 0.083 seconds.

分析ADDM报告

- --上面是针对select SQL语句(SQL_ID为bvk49mu1m5bpy)给出的一些调整建议
- --包含完整的SQL语句，执行的次数，以及执行的平均时间
- --同时也给出了该SQL相关的等待事件，如I/O and Cluster waits
- --最后还给出了一个顶级的调用为一个包调用了该SQL语句
- --从上面的描述来看，SQL改进的余地很小，可以通过减少等待事件等待时间来改善

掏耳朵-借助网络核实

- MOS ： https://support.oracle.com
- Oracle 中文论坛：https://blogs.oracle.com/Database4CN/
- Oracle一体机用户组：
- http://www.cnxdug.org/
- Oracle官方手册下载地址：
- https://docs.oracle.com/database/121/NEWFT/booklist.htm#NEWFT518

案例分享1： ORA-00257处理

- 报错信息：ORA-00257: archiver error. Connect internal only, until freed.
- **处理：**
- 检查数据库归档参数
  - SQL> show parameter log_archive_desc_1
- 归档路径为/arch
- 检查文件系统
- root@jszg_p595_0:/dev>mount
- node mounted mounted over vfs date options
- -------- --------------- --------------- ------ ------------ -------------
- /dev/hd4 / jfs2 Aug 26 16:55 rw,log=/dev/hd8
- /dev/hd2 /usr jfs2 Aug 26 16:55 rw,log=/dev/hd8
- /dev/hd9var /var jfs2 Aug 26 16:55 rw,log=/dev/hd8
- /dev/hd3 /tmp jfs2 Aug 26 16:55 rw,log=/dev/hd8
- /dev/hd1 /home jfs2 Aug 26 16:56 rw,log=/dev/hd8
- /proc /proc procfs Aug 26 16:56 rw
- /dev/hd10opt /opt jfs2 Aug 26 16:56 rw,log=/dev/hd8
- /dev/lv00 /var/adm/csd jfs Aug 26 16:56 rw,log=/dev/loglv00
- jfs2 Aug 26 16:56 rw,log=/dev/hd8
- /arch文件系

案例分享1： ORA-00257处理

- 检查/etc/filesystems文件，关于/arch文件系统的定义
- /arch:
- dev = /dev/fslv01
- vfs = jfs2
- log = /dev/loglv01
- mount = false
- options = rw
- account = false
- /arch不是重启后自动mount状态
-
-
- 故障原因：由于Oracle归档路径使用的文件系统没有挂载，导致客户端无法连接

关于挂起（Pending）状态事务处理的步骤