Oracle

Oracle DBA Tips Corner

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Monitoring Transactions and Rollback

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Overview

When performing large transactions, it is often necessary to monitor the rollback activity. Here is a list of the most popular questions regarding how to monitor a large transaction:

- Is the transaction moving forward or rolling back?
- Is it possible to monitor the rollback activity?
- Is the transaction hung or is it performing work?
- How long will the current transaction take to rollback?

The details needed to answer these questions can be obtained from the v$transaction dynamic performance view.

Oracle will insert an entry in v$transaction for each active transaction in the database. When the transaction is complete, (either COMMIT or ROLLBACK), the entry should go away.

Additionally, starting with Oracle V7.3, some columns were added to v$transaction view that will allow the DBA to monitor a transaction in greater detail.

Is the transaction moving forward or rolling back?

To determine if a transaction is doing work or rolling back, query v$transaction.used_urec (Number of Undo Records) several times and watch for a change in the value. If used_urec is increasing, the transaction is moving forward. If used_urec is decreasing, the transaction is rolling back.

How long will it take to rollback a transaction? (Oracle 8.x)

If the database HAS NOT been shutdown and restarted.

If the database has not been shutdown and restarted, look at look at v$transaction.used_urec and v$transaction.used_ublk. These fields are the number of undo records and undo blocks currently held by a transaction.

By querying v$transaction over a time interval, the number of records/blocks rolled back in a given time period can be calculated from this rate. Use the following to figure how long it will take to rollback the entire transaction.

v$session can be joined to v$transaction using the following query:

```
SELECT a.sid, a.username, b.xidusn, b.used_urec, b.used_ublk
FROM v$session a, v$transaction b
WHERE a.saddr = b.ses_addr;

       SID     USERNAME     XIDUSN  USED_UREC  USED_UBLK
---------- ------------ ---------- ---------- ----------
        18   TRUESOURCE          4      10000         82
```

The above shows that sid 18 is holding 10,000 undo records in rollback segment number 4.

If the database HAS been shutdown and restarted.

If the database has been shutdown *(abort)* and restarted, the information in v$transaction is reset and is not useful. To find out how long the rollback will take, dump the rollback segment header to find the number of undo blocks. Take two segment header dumps, calculate the number of undo blocks rolled back during the time interval, and then calculate how long to roll back the entire transaction.

If the database has been restarted it will be difficult to tell which rollback segment was being used so you will need to dump all the rollback segment headers initially.

To dump the file headers, first determine which block stores the file header.

```
SELECT segment_name, header_file, header_block
FROM dba_segments
WHERE segment_type='ROLLBACK';

SEGMENT_NAME    HEADER_FILE HEADER_BLOCK
--------------- ----------- ------------
SYSTEM                    1            2
RBS0                      2            2
RBS1                      2          514
RBS2                      2         1026
RBS3                      2         1538
```

Next, issue the following command in 8.x+ to dump the file header.

```
alter system dump datafile 2 block 1026;
```

This will generate a dump file in user_dump_dest. In the dump file look for the transaction table for the rollback segment. There will be a column called nub which

holds the number of undo blocks for the transaction.

```
-- Trace file snippet follows:

index  state cflags  wrap#    uel         scn            dba            pa
------------------------------------------------------------------------
 0x00   10    0xc0  0x1995  0x0007  0x0000.009dd0ac  0x00800193  0x0000.00
 0x01    9    0x80  0x1994  0x003c  0x0000.009dd007  0x00801f3f  0x0000.00
```

Notice that the first slot holds an uncommitted transaction (state=10) and the nub (number undo blocks) = 0x52 or decimal 82.

How long will it take to rollback a transaction? (Oracle 9.x)

The 8.x method should work for Oracle 9.i, however it has not been tested with the new undo tablespace in 9i.

If the database has been restarted in 9i, there is an easier way to determine the number of undo blocks required for rollback by using the following query:

```
SELECT DISTINCT ktuxesiz FROM x$ktuxe;

  KTUXESIZ
----------
         0
         1
         2
         3
       107
```

Notes on v$transaction

The information here contains the view description from the Oracle9i documentation

Earlier versions of Oracle may not include all columns.

The v$transaction view lists the active transactions in the system.

```
Column         Datatype       Description
-------------- -------------- ---------------------------------------
ADDR           RAW(4)         Address of transaction state object
XIDUSN         NUMBER         Undo segment number
XIDSLOT        NUMBER         Slot number
XIDSQN         NUMBER         Sequence number
UBAFIL         NUMBER         Undo block address (UBA) filenum
UBABLK         NUMBER         UBA block number
UBASQN         NUMBER         UBA sequence number
UBAREC         NUMBER         UBA record number
STATUS         VARCHAR2(16)   Status
START_TIME     VARCHAR2(20)   Start time (wall clock)
START_SCNB     NUMBER         Start system change number (SCN) base
START_SCNW     NUMBER         Start SCN wrap
START_UEXT     NUMBER         Start extent number
START_UBAFIL   NUMBER         Start UBA file number
START_UBABLK   NUMBER         Start UBA block number
START_UBASQN   NUMBER         Start UBA sequence number
START_UBAREC   NUMBER         Start UBA record number
SES_ADDR       RAW(4)         User session object address
FLAG           NUMBER         Flag
```

```
SPACE          VARCHAR2(3)    YES if a space transaction
RECURSIVE      VARCHAR2(3)    YES if a recursive transaction
NOUNDO         VARCHAR2(3)    YES if a no undo transaction
PTX            VARCHAR 2(3)   YES if parallel transaction
NAME           VARCHAR2(256)  Name of a named transaction
PRV_XIDUSN     NUMBER         Previous transaction undo segment number
PRV_XIDSLT     NUMBER         Previous transaction slot number
PRV_XIDSQN     NUMBER         Previous transaction sequence number
PTX_XIDUSN     NUMBER         Rollback segment number of the parent XID
PTX_XIDSLT     NUMBER         Slot number of the parent XID
PTX_XIDSQN     NUMBER         Sequence number of the parent XID
DSCN-B         NUMBER         Dependent SCN base
DSCN-W         NUMBER         Dependent SCN wrap
USED_UBLK      NUMBER         Number of undo blocks used
USED_UREC      NUMBER         Number of undo records used
LOG_IO         NUMBER         Logical I/O
PHY_IO         NUMBER         Physical I/O
CR_GET         NUMBER         Consistent gets
CR_CHANGE      NUMBER         Consistent changes

Comments on a few of the columns:
---------------------------------
XIDUSN          Rollback Segment ID       }  Transaction ID is
XIDSLOT         Slot in RBS TX table      }   USN.SLOT.SQN or
XIDSQN          Wrap of the entry         }  TX-USNxSLOT-SQNxxxxx

UBAFIL          File for last undo entry  }  Tail end of UNDO for
UBABLK          Block for last undo entry }  this transaction
UBASQN          Sequence no of last entry }
UBAREC          Record no in the block    }
```


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