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Monitoring Transactions and Rollback

by Jeff Hunter, Sr. Database Administrator

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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?

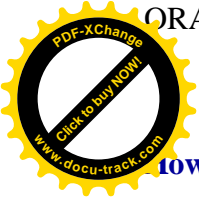
The details needed to answer these questions can be obtained from the v\$transaction dynamic performance view.

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.

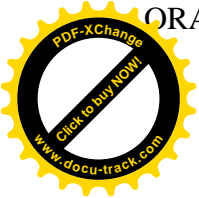
```
SELECT segment_name, header_file, header_block
FROM dba_segments
WHERE segment_type='ROLLBACK';
```

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

```

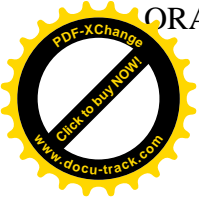
Notes on v\$transaction

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
XIDSLT	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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Last modified on
Saturday, 20-Apr-2002 00:00:00 EDT
Page Count: 38056