

Oracle 11g DBA Fundamentals Overview

Lesson 07: Managing the Undo
Tablespace

Objectives



After completing this lesson, you should be able to do the following:

- Explain DML and undo data generation
- Monitor and administer undo data
- Describe the difference between undo data and redo data
- Configure undo retention
- Guarantee undo retention
- Use the Undo Advisor





Data Manipulation

Data manipulation language (DML) consists of the following SQL statements:

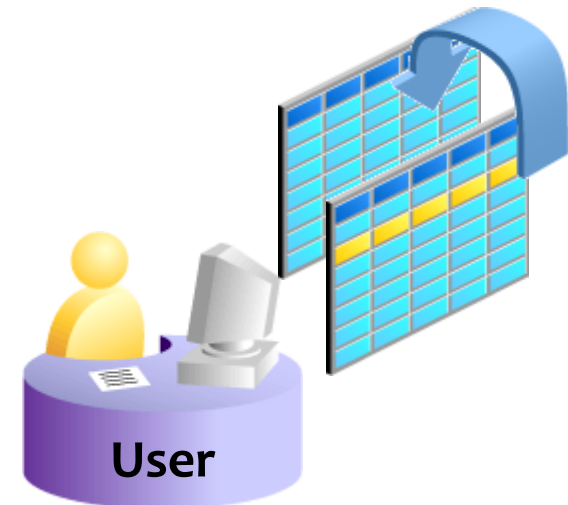
- INSERT
- UPDATE
- DELETE
- MERGE
- **DML always executes as part of a transaction, which can be:**
 - Rolled back, using the ROLLBACK command
 - Committed, using the COMMIT command



Undo Data

Undo data is:

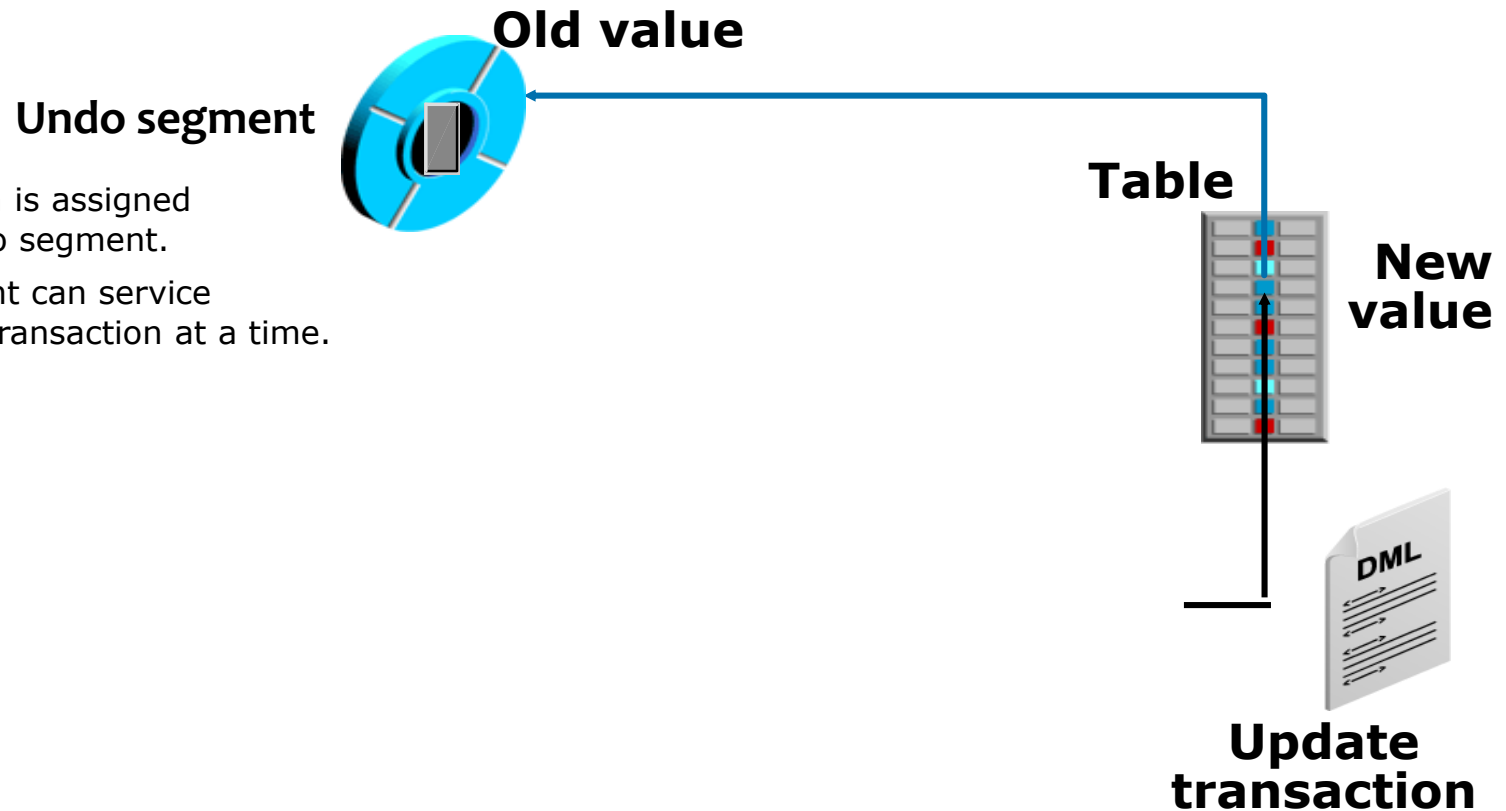
- A copy of original, premodified data
- Captured for every transaction that changes data
- Retained at least until the transaction is ended
- Used to support:
 - Rollback operations
 - Read-consistent and flashback queries
 - Recovery from failed transactions





Transactions and Undo Data

- Each transaction is assigned to only one undo segment.
- An undo segment can service more than one transaction at a time.

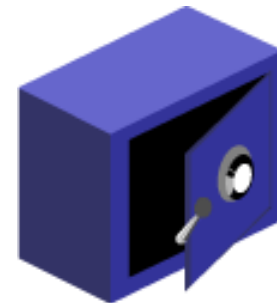




Storing Undo Information

Undo information is stored in undo segments, which are, in turn, stored in an undo tablespace. Undo tablespaces:

- Are used only for undo segments
- Have special recovery considerations
- May be associated with only a single instance
- Require that only one of them be the current writable undo tablespace for a given instance at any given time





Undo Data Versus Redo Data

	Undo	Redo
Record of	How to undo a change	How to reproduce a change
Used for	Rollback, read-consistency	Rolling forward database changes
Stored in	Undo segments	Redo log files
Protects against	Inconsistent reads in multiuser systems	Data loss



Monitoring Undo

Undo usually requires little management. The areas to monitor include:

- Free space in an undo tablespace
- “Snapshot too old” errors





Administering Undo

Administration of undo should include preventing:

- Space errors in an undo tablespace:
 - Size the undo tablespace properly.
 - Ensure that large transactions commit periodically.
- “Snapshot too old” errors:
 - Configure an appropriate undo retention interval.
 - Size the undo tablespace properly.
 - Consider guaranteeing undo retention.

Use automatic undo management:

```
UNDO_MANAGEMENT=AUTO  
UNDO_TABLESPACE=UNDOTBS  
1
```





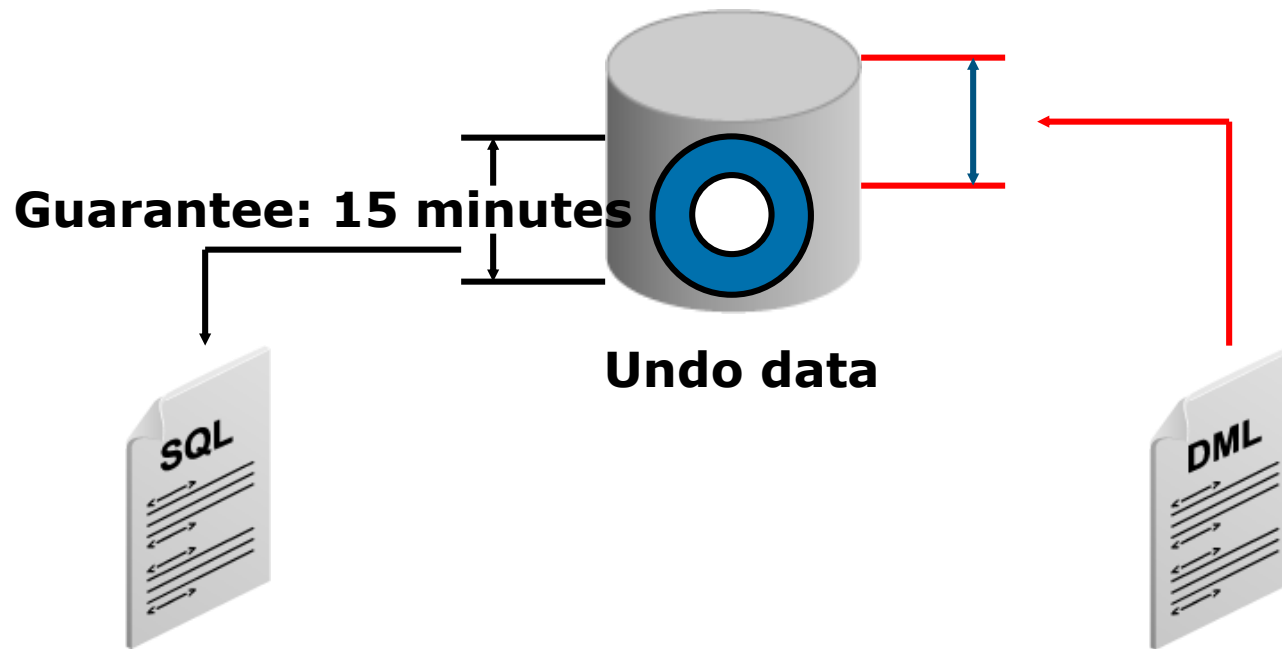
Configuring Undo Retention

UNDO_RETENTION specifies (in seconds) the amount of already committed undo information that is to be retained. The only time you must set this parameter is when:

- The undo tablespace has the AUTOEXTEND option enabled
- You want to set undo retention for LOBs
- You want to guarantee retention



Guaranteeing Undo Retention



SELECT statements running 15 minutes or less are always satisfied.

A transaction that generates more undo than what there is space for will fail.



Sizing the Undo Tablespace

Undo Management

Undo Advisor

Configuration

Auto-tuned Undo Retention (minutes) **15**
Minimum Undo Retention (minutes) 15
Guarantee Minimum Undo Retention No

Undo Tablespace UNDOTBS1 [Change Tablespace](#)
Size (MB) **35**
Auto-Extensible Yes

**Current table-
space size**

Recommendations

Choose the time period that best represents the system activity to get the recommendations for undo retention length and undo tablespace size. [Edit Undo Tablespace](#)

Analysis Time Period

[Update Analysis](#)

Selected Analysis Time Period **5/11/05 4:18 PM - 5/11/05 5:18 PM**

Potential Problems **No Problem Found**
Recommendations **No Recommendation**

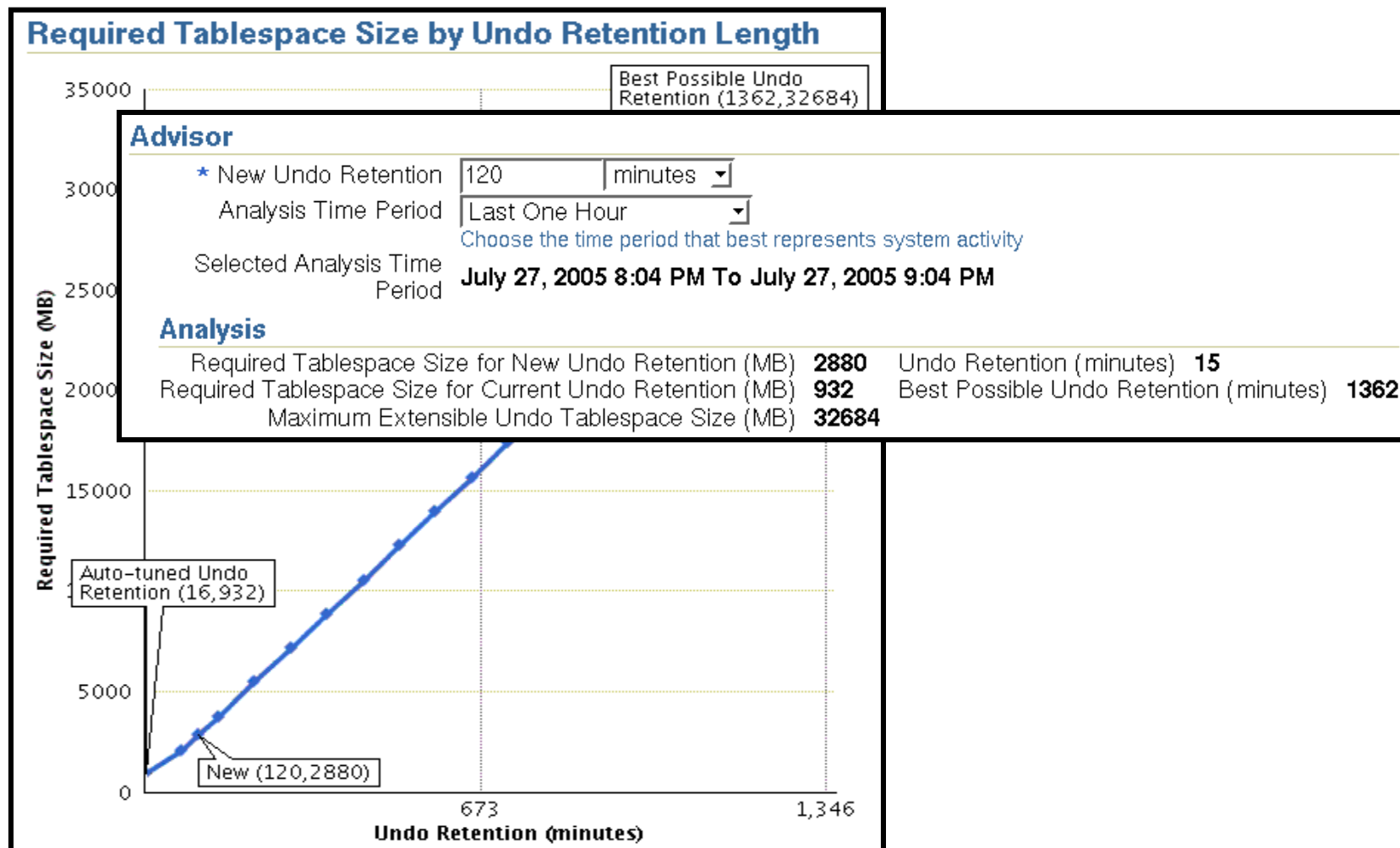
System Activity and Tablespace Usage

The recommendations are based on system activity and undo tablespace usage for the selected analysis time period.

Longest Running Query (seconds) **333**
Average Undo Generation Rate (KB/minute) **24.0**
Maximum Undo Generation Rate (KB/minute) **63.0**

Undo consumption rate

Using the Undo Advisor



SUMMARY

- In this lesson, you should have learned how to:
 - Explain DML and undo data generation
 - Monitor and administer undo segments
 - Describe the difference between undo data and redo data
 - Configure undo retention
 - Guarantee undo retention
 - Use the Undo Advisor