Capgemini

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:

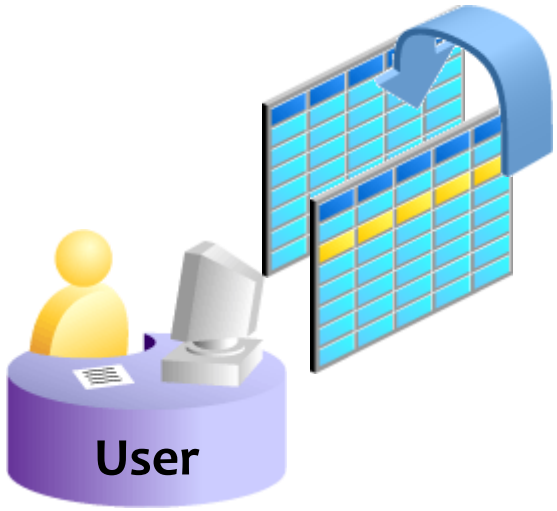
- INSERT
- UPDATE
- DELETE
- MERGE

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

Undo Data

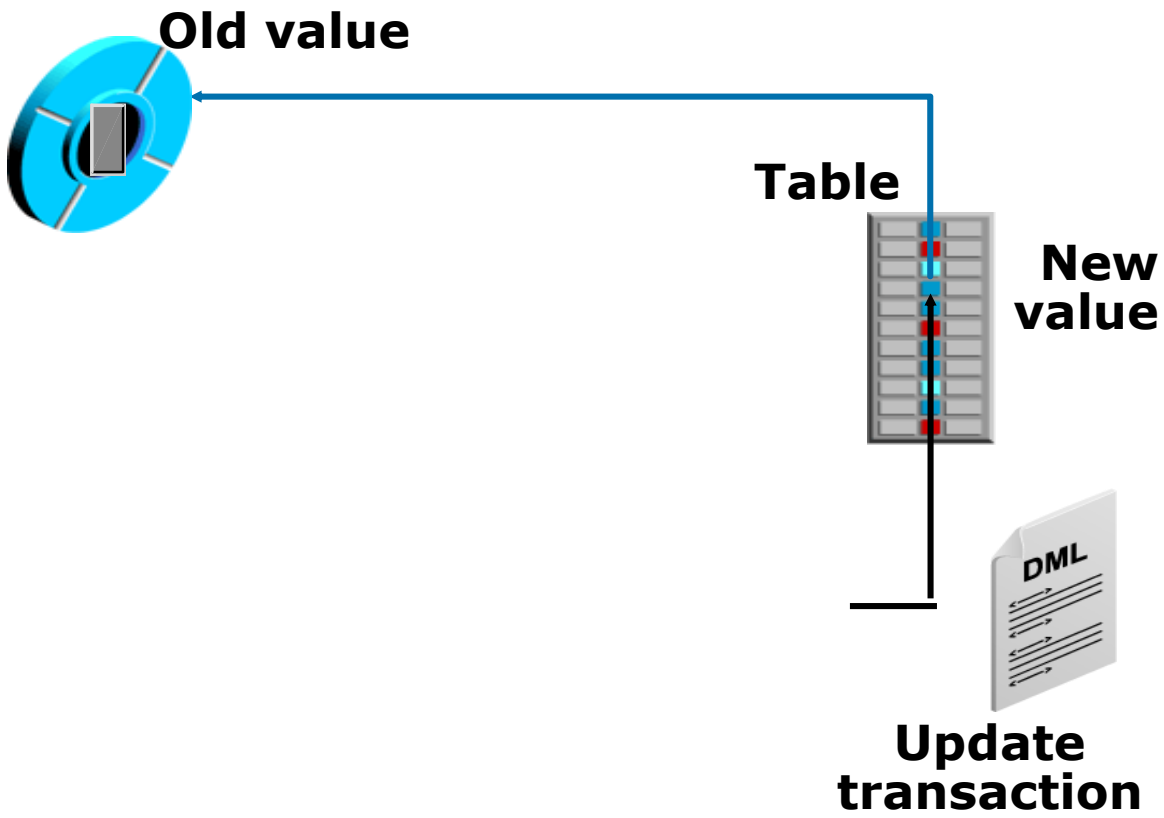
Undo data is:

- 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:

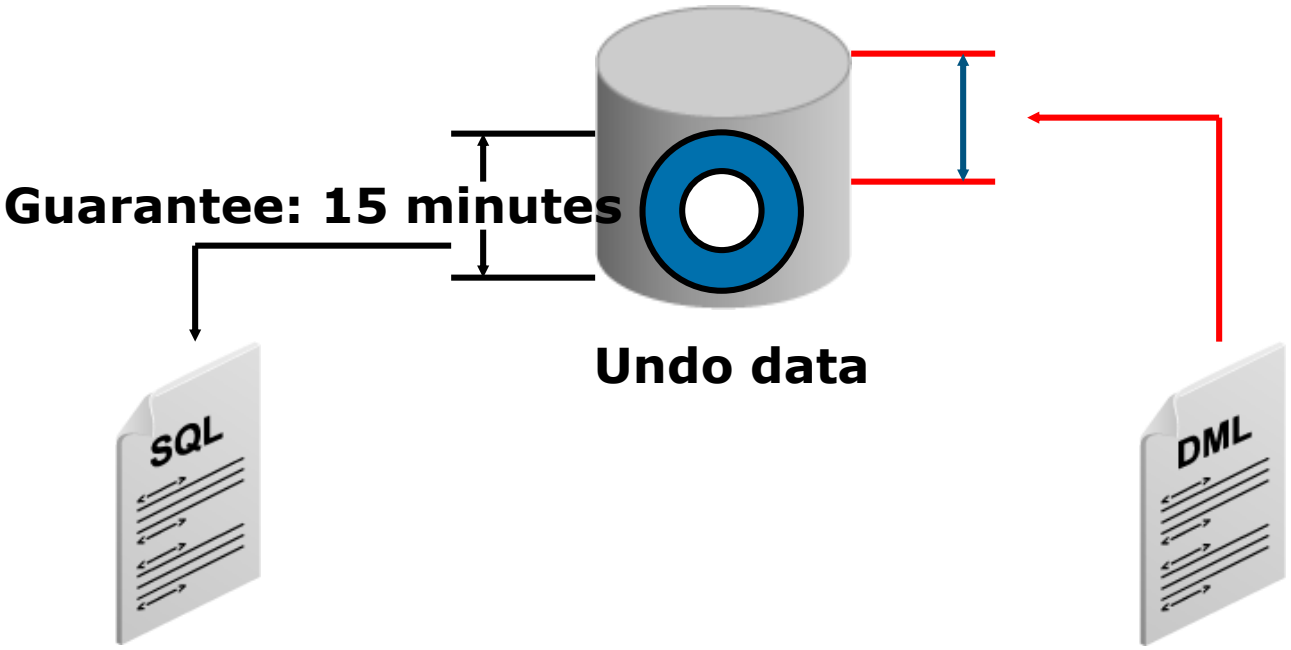
```
UNDO_MANAGEMENT=AUTO
UNDO_TABLESPACE=UNDOTBS
1
```

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

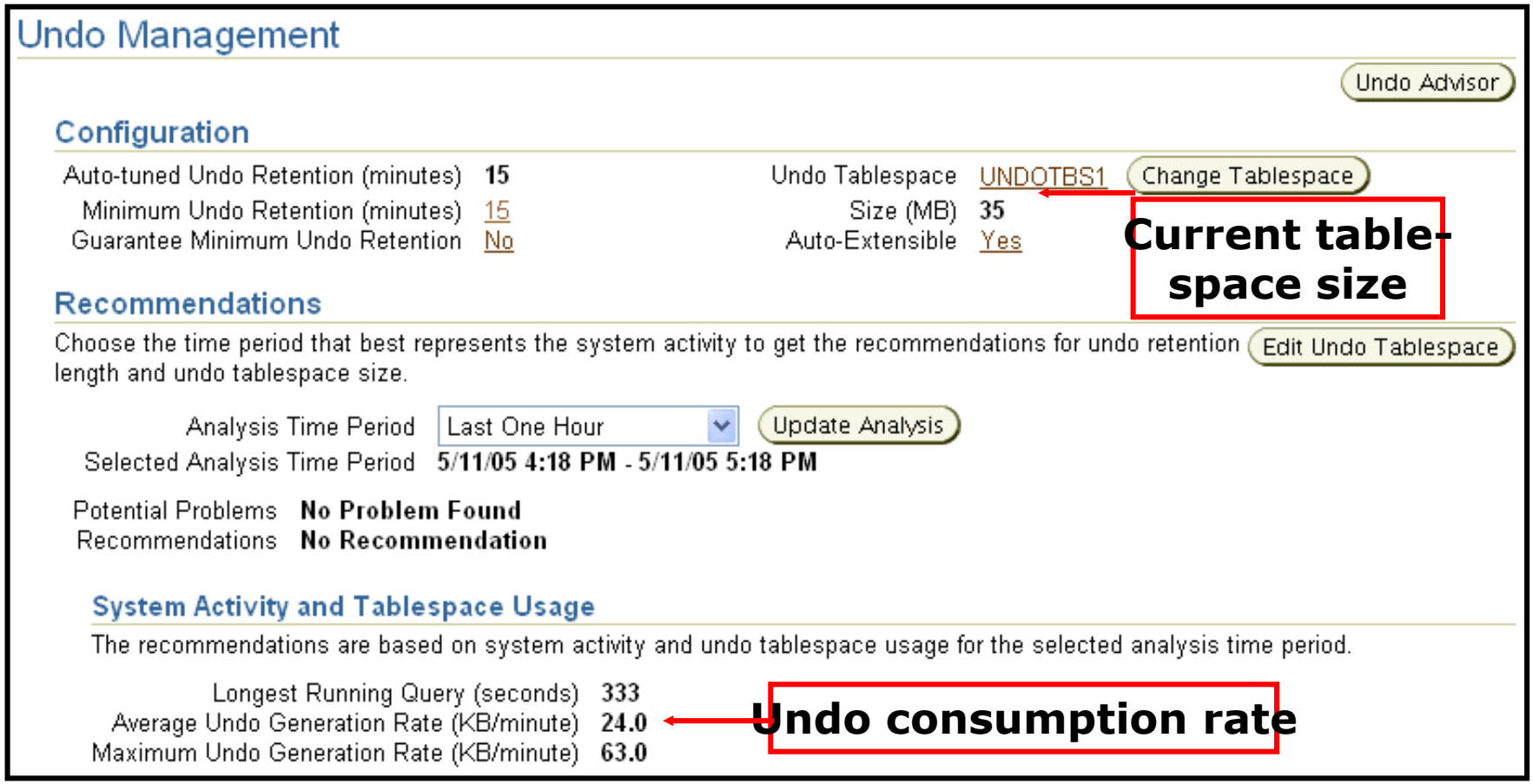
Guaranteeing Undo Retention



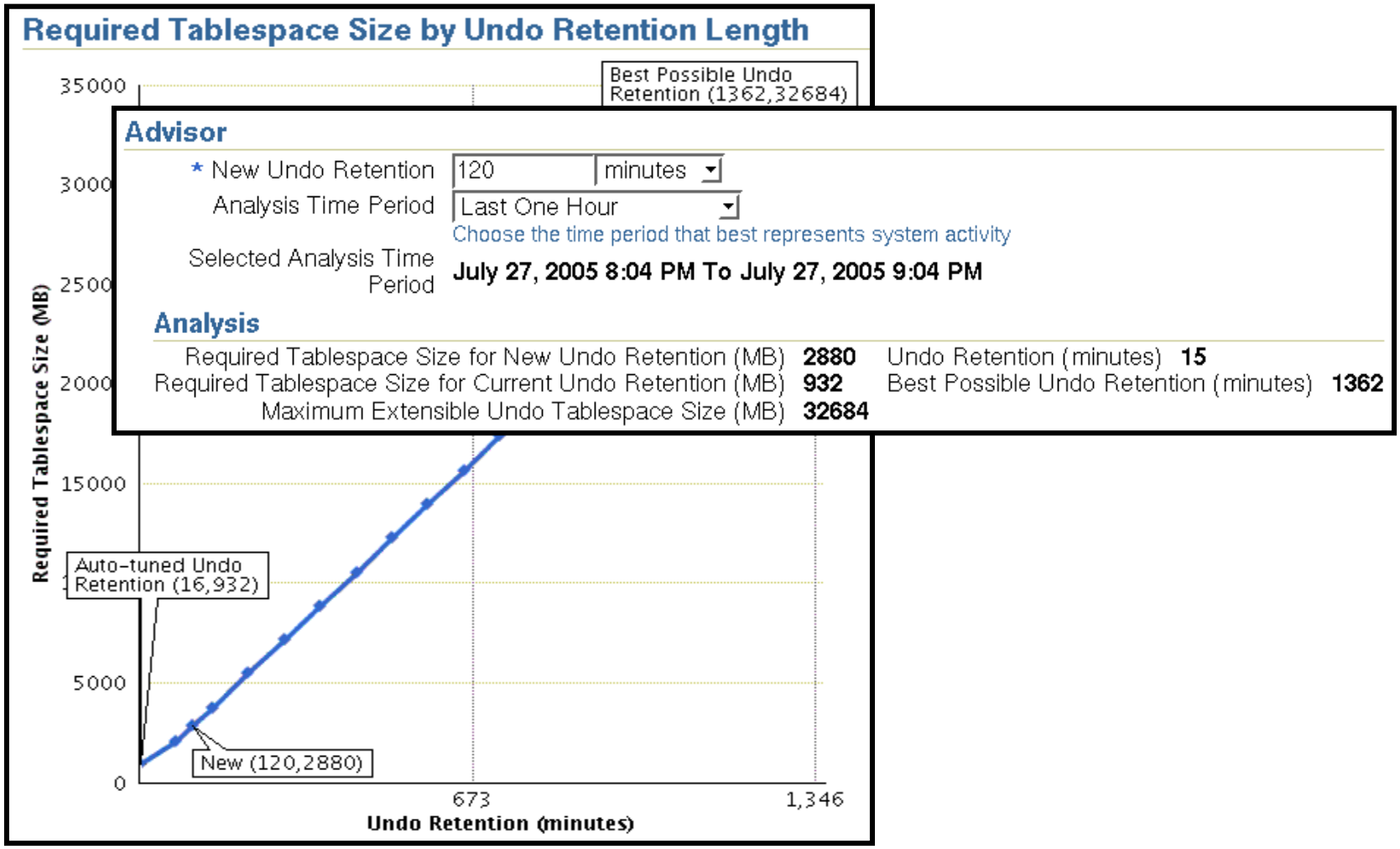
SELECT statements running 15 minutes or less are always satisfied.

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

Sizing the Undo Tablespace



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