16

Undo Management

Objectives

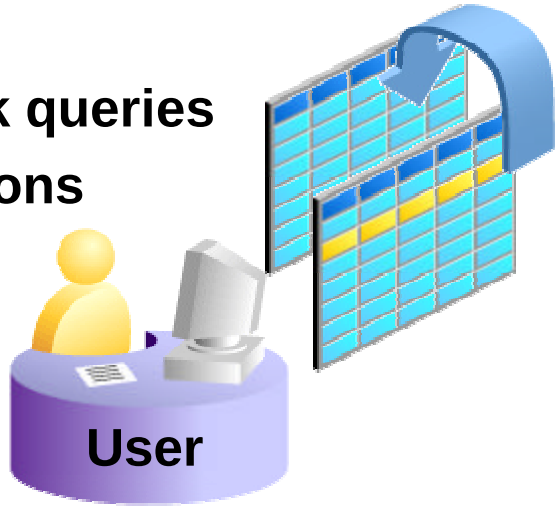
After completing this lesson you should be able to do the following:

- **Monitor and administer undo**
- **Configure undo retention**
- **Guarantee undo retention**
- **Use the Undo Advisor**

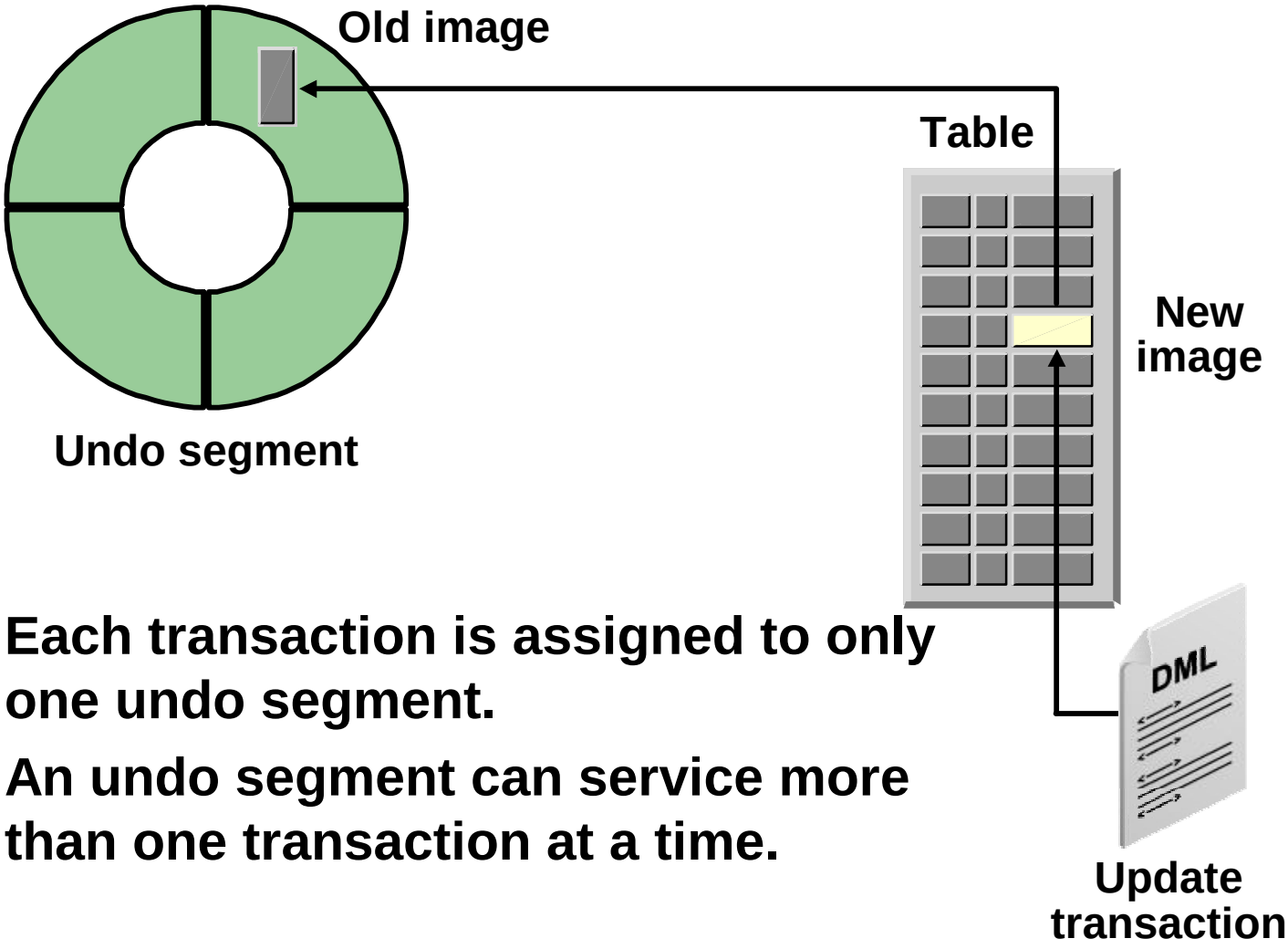
Undo Data

Undo data is:

- **A copy of original, premodification, 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

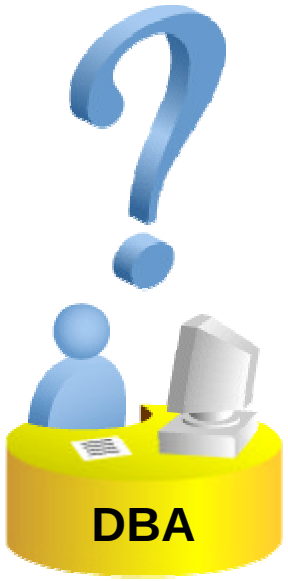
Undo information is stored in undo segments, which are in turn stored in an undo tablespace. Undo tablespaces:

- **Are only used for undo segments**
- **Have special recovery considerations**
- **May only be associated with a single instance, and an instance can only have one active undo tablespace at a time**

Monitoring Undo

Undo usually requires little management. Areas to monitor include:

- **Undo tablespace free space**
- **"Snapshot too old" errors**



Administering Undo

Administration of undo should include preventing:

- **Undo tablespace space errors**
  - **Size the undo tablespace properly**
  - **Ensure large transactions commit periodically**
- **"Snapshot too old" errors**
  - **Configure an appropriate undo retention interval**
  - **Size the undo tablespace properly**
  - **Consider guaranteeing undo retention**

```
UNDO_MANAGEMENT=AUTO
UNDO_TABLESPACE=UNDOTBS1
```

Configuring Undo Retention

Undo retention specifies (in seconds) the amount of already committed undo information to retain.

- **Default value is 0 (automatic).**
- **Maximum value is 2^{32} seconds (more than 187 years).**
- **A setting of 0 indicates automatic undo retention mode.**

```
UNDO_RETENTION=0
```

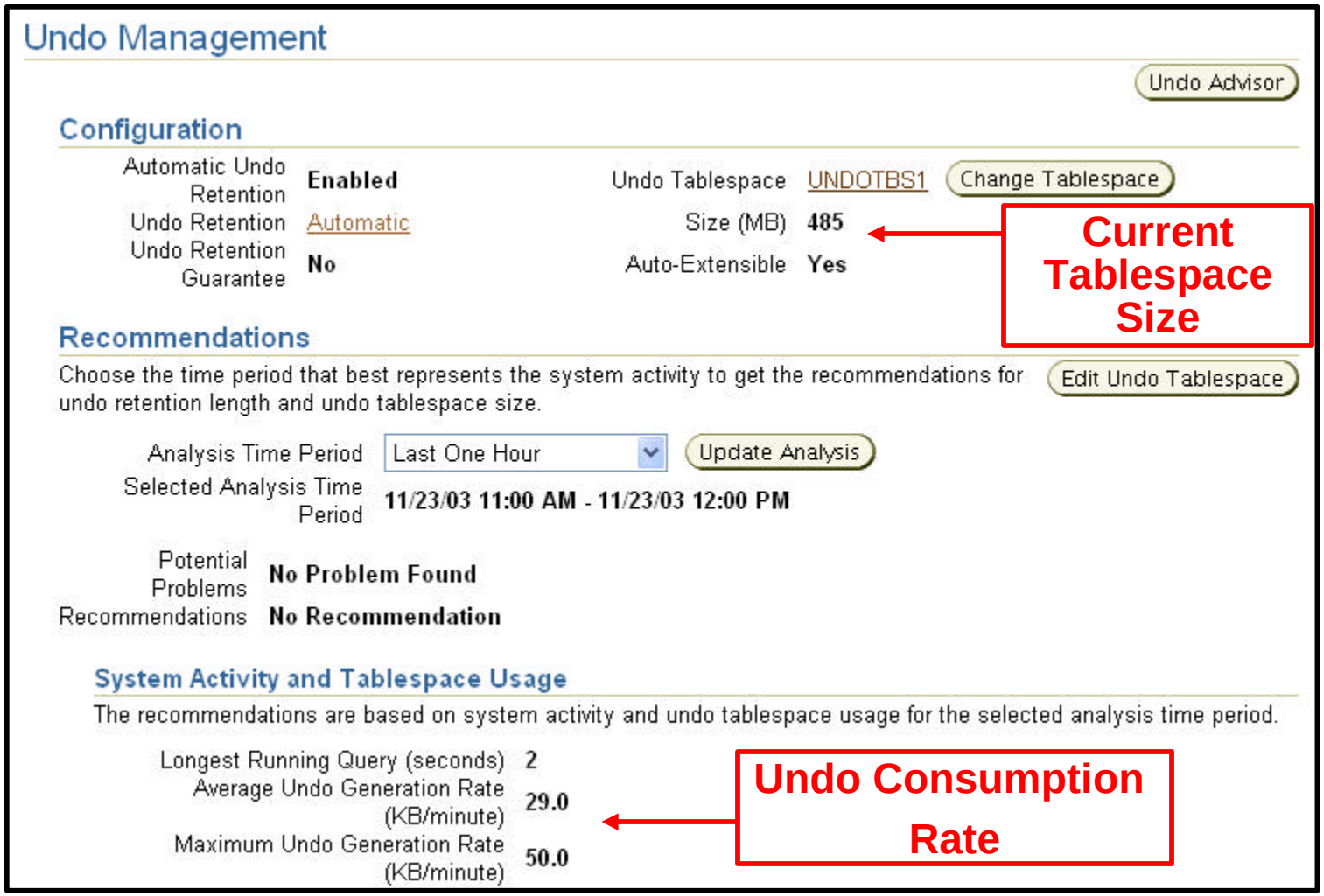
Guaranteeing Undo Retention

Committed undo information will be overwritten rather than cause transactions to fail for lack of undo space *unless* undo retention is "guaranteed."

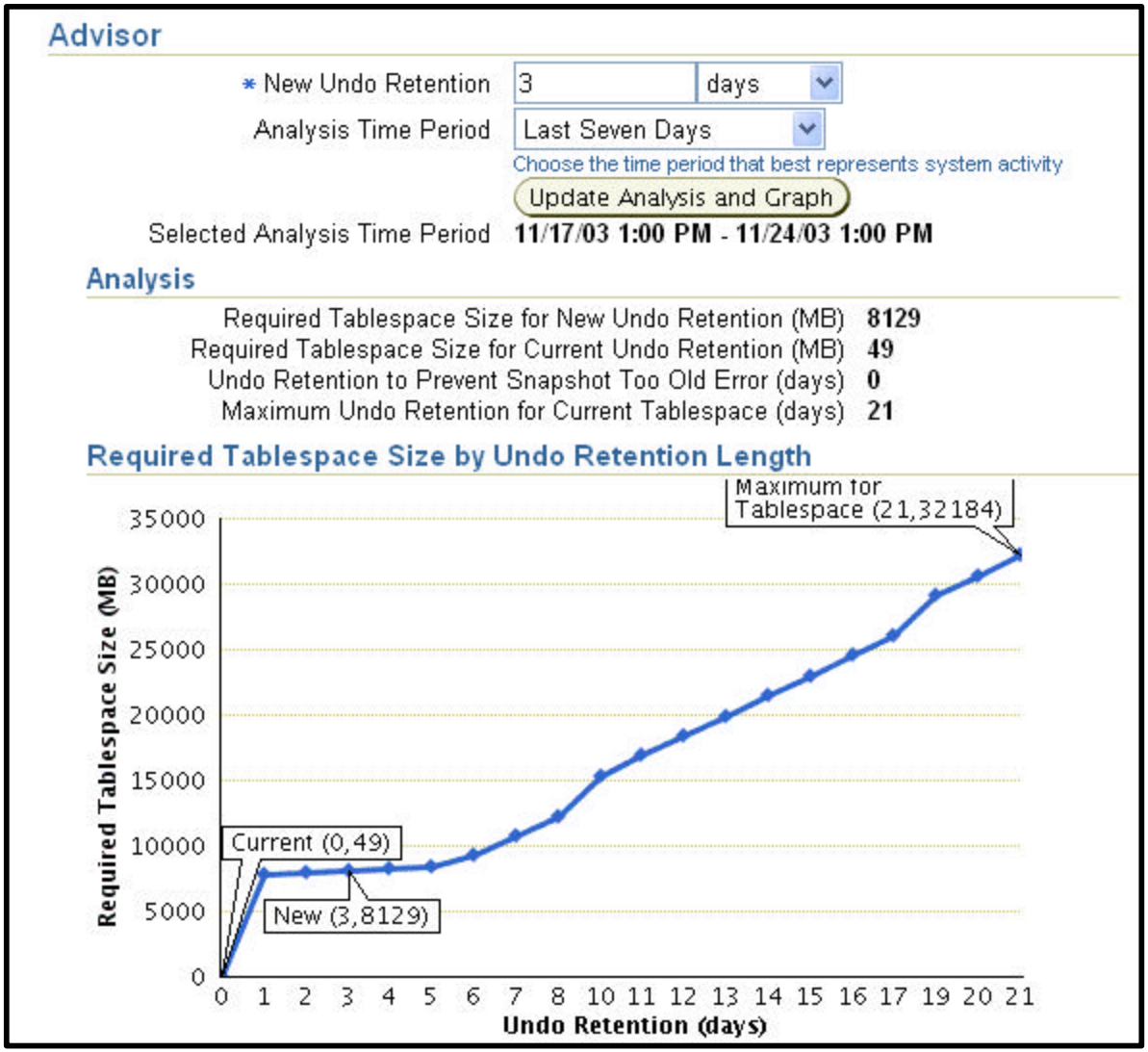
```
SQL> ALTER TABLESPACE undotbs1 RETENTION
GUARANTEE;
Tablespace altered.

SQL> SELECT contents, retention
  2  FROM dba_tablespaces
  3  WHERE TABLESPACE_NAME='UNDOTBS1';
CONTENTS  RETENTION
--------- -----------
UNDO      GUARANTEE
```

Sizing the Undo Tablespace



Using the Undo Advisor



Summary

In this lesson you should have learned how to:

- **Monitor and administer undo**
- **Configure undo retention**
- **Guarantee undo retention**
- **Use the Undo Advisor**

Practice 16: Managing Undo

This practice covers performing typical undo management tasks including:

- **Calculating undo tablespace sizing to support a 48-hour retention interval**
- **Modifying undo tablespace to support a 48-hour retention interval**