

# 16

## Undo Management

# Objectives

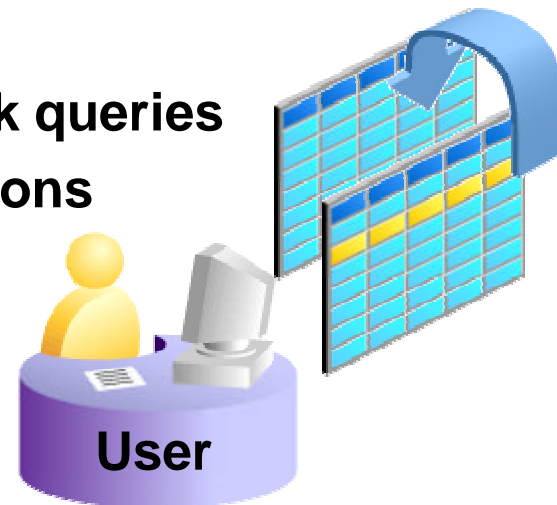
**After completing this lesson you should be able to do the following:**

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

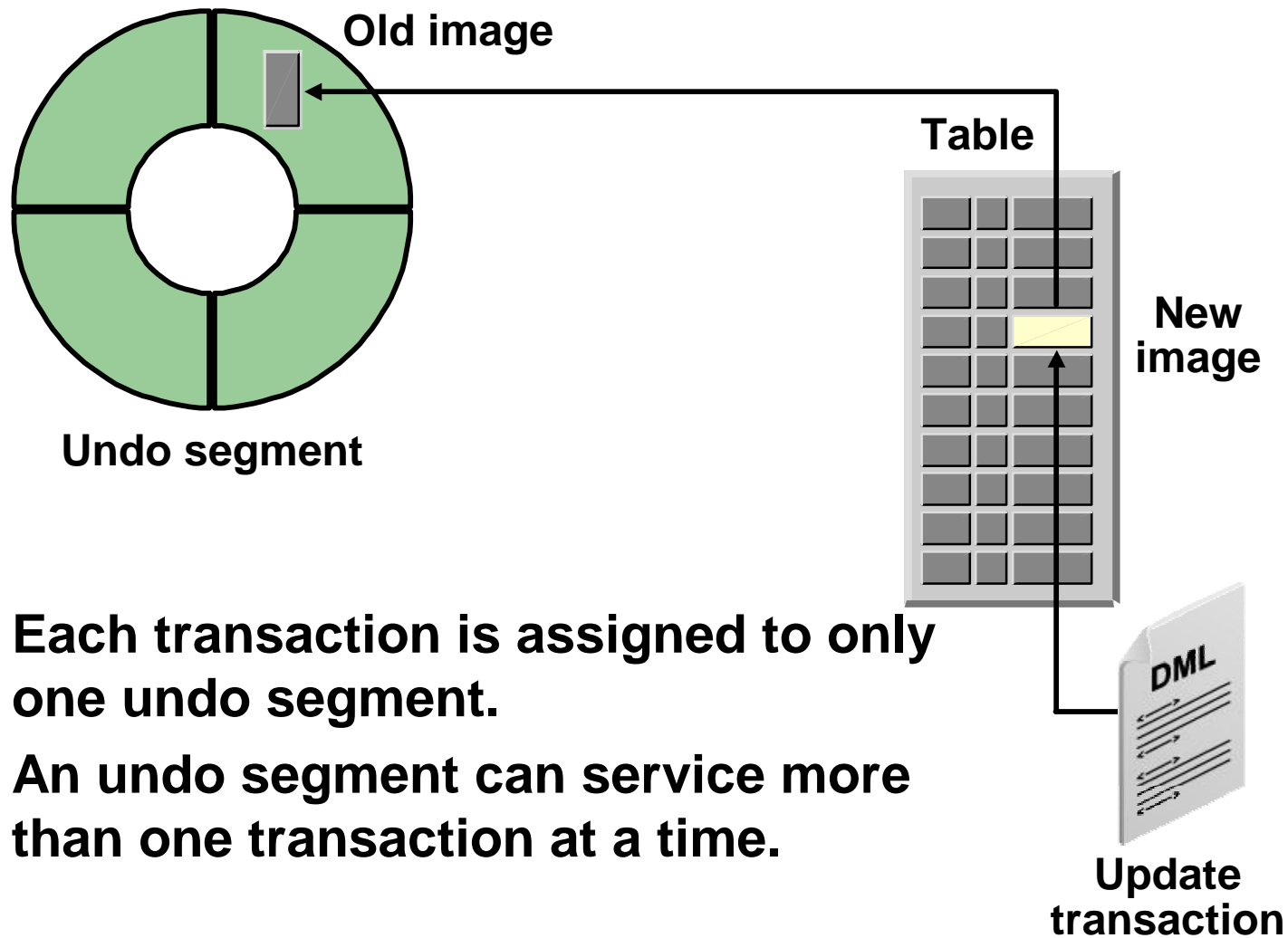
# Undo Data

**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

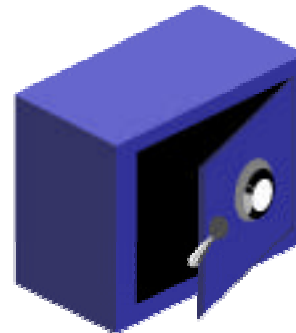


- Each transaction is assigned to only one undo segment.
- An undo segment can service more than one transaction at a time.

# 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**

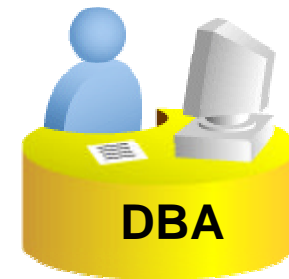


# Administering Undo

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
```

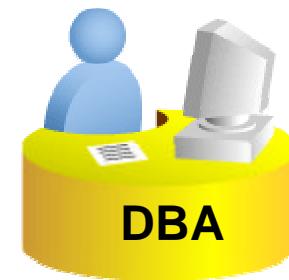


# Configuring Undo Retention

**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

## Undo Management

Undo Advisor

### Configuration

Automatic Undo Retention	Enabled	Undo Tablespace	UNDOTBS1	Change Tablespace
Undo Retention	Automatic	Size (MB)	485	
Undo Retention Guarantee	No	Auto-Extensible	Yes	

### 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 PeriodLast One HourUpdate Analysis

Selected Analysis Time Period11/23/03 11:00 AM - 11/23/03 12:00 PM

Potential ProblemsNo Problem Found

RecommendationsNo Recommendation

### System Activity and Tablespace Usage

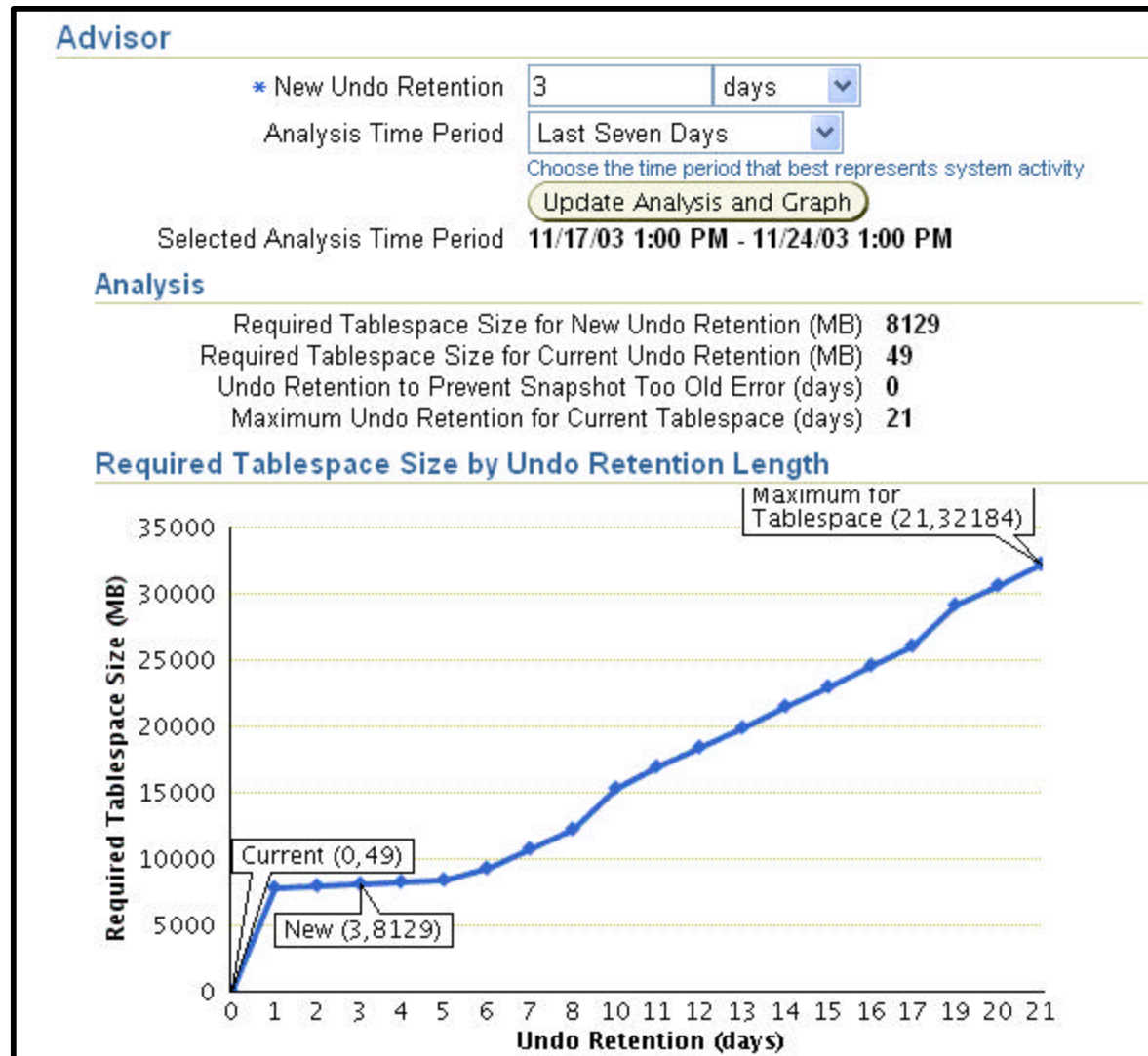
The recommendations are based on system activity and undo tablespace usage for the selected analysis time period.

Longest Running Query (seconds)	2
Average Undo Generation Rate (KB/minute)	29.0
Maximum Undo Generation Rate (KB/minute)	50.0

Current Tablespace Size

Undo Consumption Rate

# 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**