

Proactively Managing Space Using the Segment Advisor

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Purpose

This module describes how you can use the segment advisor to proactively manage space in your database.

Topics

This chapter discusses the following:

- ☒ [Overview](#)
- ☒ [Prerequisites](#)
- ☒ [Creating a Tablespace and a Table](#)
- ☒ [Triggering a Tablespace Space Usage Alert](#)
- ☒ [Resolving a Tablespace Space Usage Alert](#)

Overview

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With Oracle Database 10g, a tablespace's disk space utilization is proactively managed by the database. Proactive tablespace management is possible in the following ways:

Through the use of database alerts, you are informed when a tablespace runs low on available disk space. You can then provide the tablespace with more disk space, or reclaim space from the tablespace. That way, you can avoid out-of-space conditions. Information gathered is stored in the Automatic Workload Repository (AWR) and used to do growth trend analysis and capacity planning of the database.

Tablespace thresholds can be defined in terms of the fullness of the tablespace. Critical and warning thresholds are the two thresholds that apply to a tablespace. The DBMS_SERVER_ALERTS package contains procedures to set and get the threshold values. You can also use the EM interface to define the thresholds. When the tablespace fullness crosses either of these two limits, an appropriate alert is raised. The threshold is expressed in terms of a percentage of the tablespace size or in bytes.

Prerequisites

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Before starting this module, you should have:

1. Completed the [Configuring Linux for the Installation of Oracle Database 10g](#) lesson
2. Completed the [Installing the Oracle Database 10g on Linux](#) lesson

Creating a Tablespace and a Table

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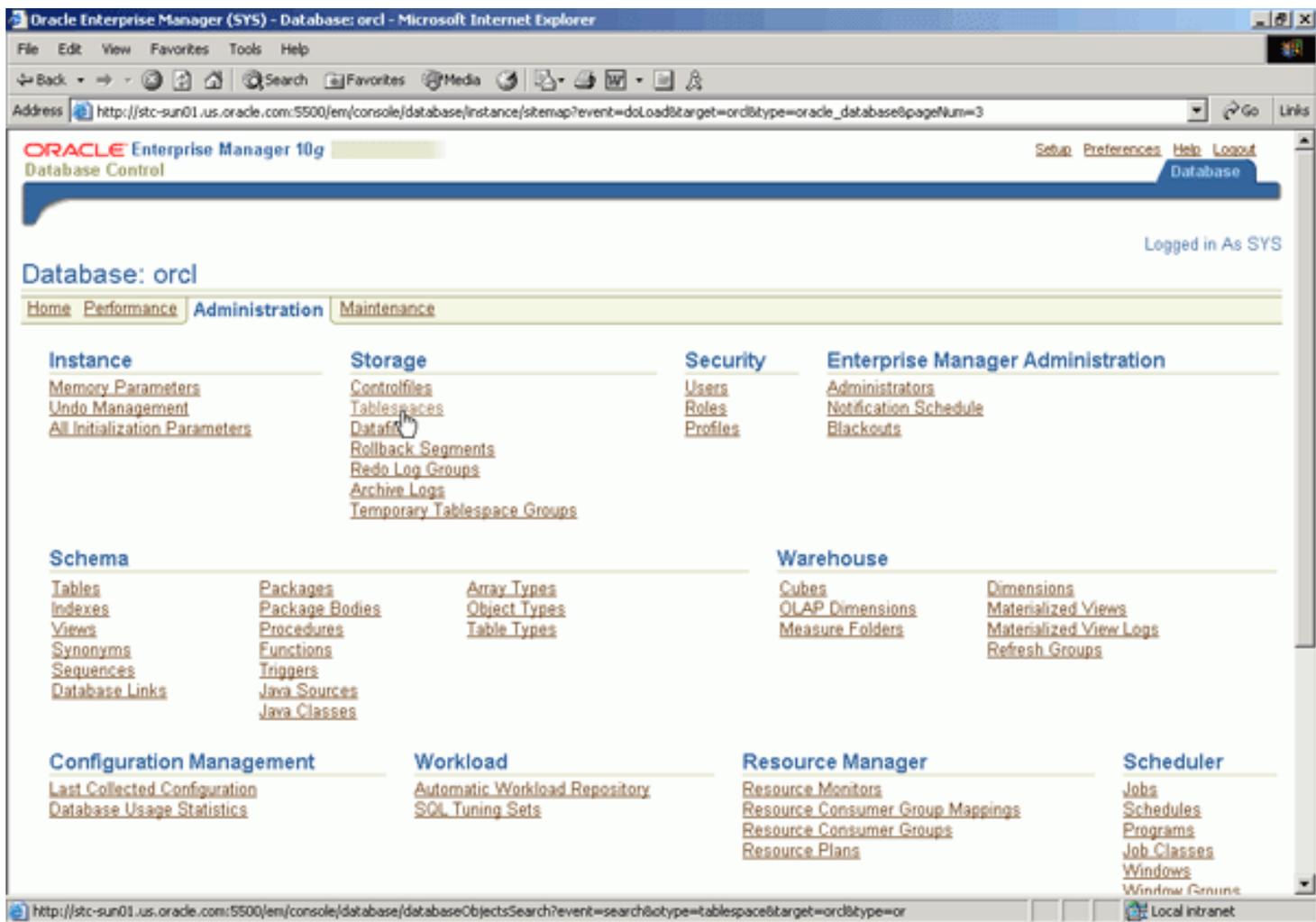
First, you need to create a new tablespace with a 20MB data file. This tablespace needs to be locally managed, and uses Automatic Segment Space Management (ASSM). Finally, a table needs to be created in this new tablespace. This table will have its Enable Row Movement option set to yes. Having this option turned on allows for space reclamation on this table. Perform the following:

1. From the Enterprise Manager Home page, click on the **Administration** tab.

The screenshot displays the Oracle Enterprise Manager 10g Database Control interface for the database 'orcl.us.oracle.com'. The 'Administration' tab is highlighted in the navigation menu. The interface shows various performance and configuration metrics:

- General:** Status is Up, Up Since Jan 4, 2004 6:38:41 PM, Time Zone PST, Availability 90.81% (Last 24 hours), Instance Name orcl, Version 10.1.0.2.0, Read Only No, Oracle Home /u01/app/oracle/product/10.1.0, Listener LISTENER_EDCDR26P1, Host edcdr26p1.us.oracle.com.
- Host CPU:** A bar chart showing CPU usage for 'Other' and 'orcl'.
- Active Sessions:** A pie chart showing session distribution: CPU (0.12), I/O (0.04), and Wait (0.48). Active Sessions: 0.64, SQL Response Time (%): Unavailable (compared to baseline).
- High Availability:** Instance Recovery Time (seconds) 12, Last Backup n/a, Archiving Disabled, Archive Area Used (%) n/a, Flashback Logging Disabled.
- Space Usage:** Database Size (GB) 1, Problem Tablespaces 0, Segment Findings Not Configured, Policy Violations 0, Dump Area Used (%) 58.
- Diagnostic Summary:** Performance Findings No ADDM run available, All Policy Violations 41, Alert Log No ORA- errors.

2. Click on the **Tablespaces** link.



3. Click on the **Create** button.

Oracle Enterprise Manager 10g Database Control

Database: orcl > Tablespaces

Search

Name

To run an exact match search or to run a case sensitive search, double quote the search criteria. The wildcard (%) symbol can still be used in a double quoted search string.

Results

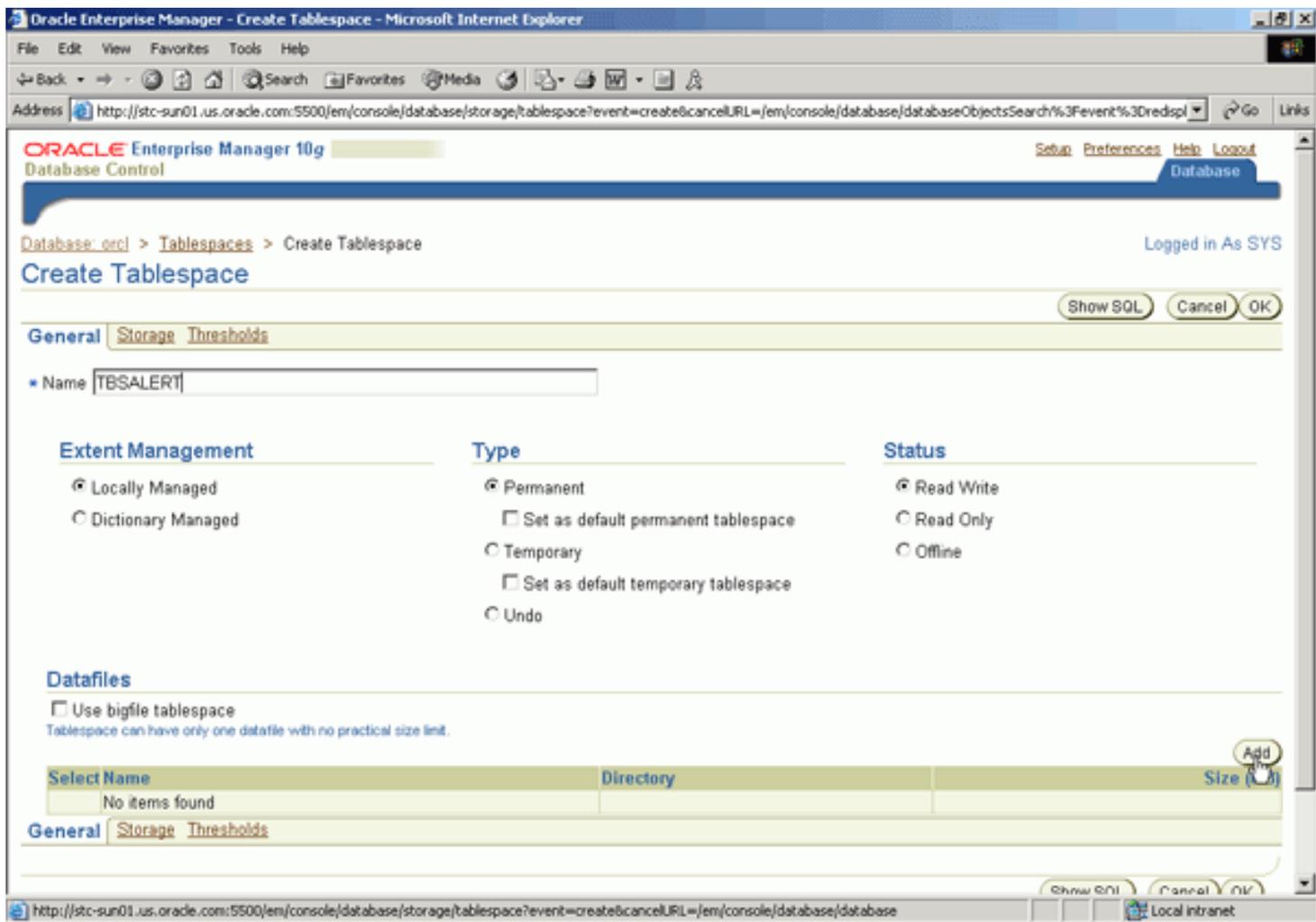
Actions

Select	Name	Type	Extent Management	Segment Management	Status	Size (MB)	Used (MB)	Used (%)
<input checked="" type="radio"/>	EXAMPLE	PERMANENT	LOCAL	AUTO	ONLINE	150.000	67.813	45.21
<input type="radio"/>	SYSAUX	PERMANENT	LOCAL	AUTO	ONLINE	210.000	203.625	96.96
<input type="radio"/>	SYSTEM	PERMANENT	LOCAL	MANUAL	ONLINE	440.000	430.875	97.93
<input type="radio"/>	TEMP	TEMPORARY	LOCAL	MANUAL	ONLINE	20.000	17.000	85.00
<input type="radio"/>	UNDOTBS1	UNDO	LOCAL	MANUAL	ONLINE	90.000	38.875	43.19
<input type="radio"/>	USERS	PERMANENT	LOCAL	AUTO	ONLINE	5.000	2.750	55.00

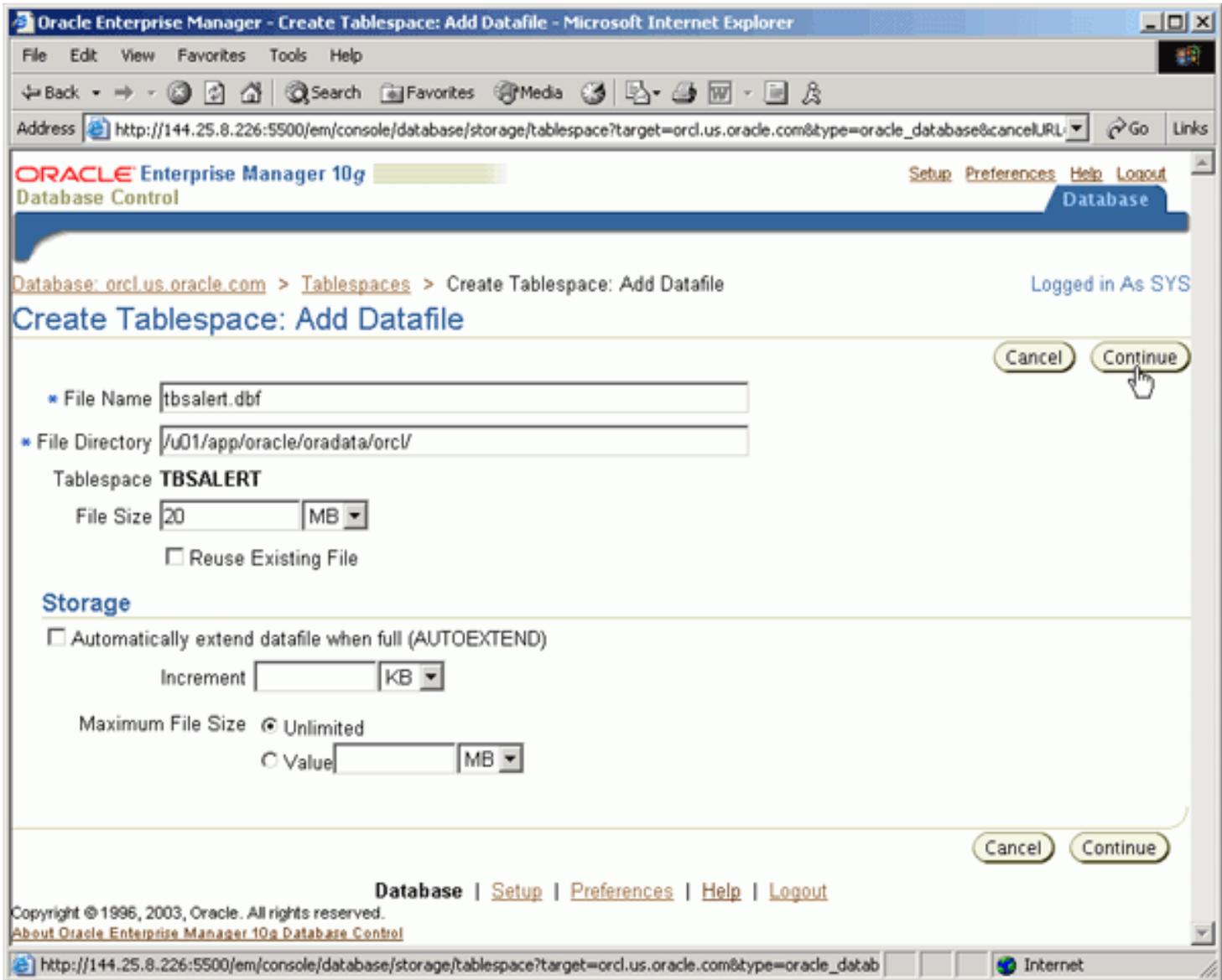
Database | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

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[About Oracle Enterprise Manager 10g Database Control](#)

4. Enter the tablespace name **TBSALERT** then click **Add** to define a datafile for the tablespace.



5. Enter the datafile name **tbsalert.dbf** and the size **20MB** then click **Continue** .



6. Click on **Thresholds** tab to specify the space used warning and critical threshold levels.

Oracle Enterprise Manager 10g
Database Control

Database: orcl.us.oracle.com > Tablespaces > Create Tablespace
Logged in As SYS

Create Tablespace

General **Storage Thresholds**

Name: TBSALERT

Extent Management

- Locally Managed
- Dictionary Managed

Type

- Permanent
 - Set as default permanent tablespace
- Temporary
 - Set as default temporary tablespace
- Undo

Status

- Read Write
- Read Only
- Offline

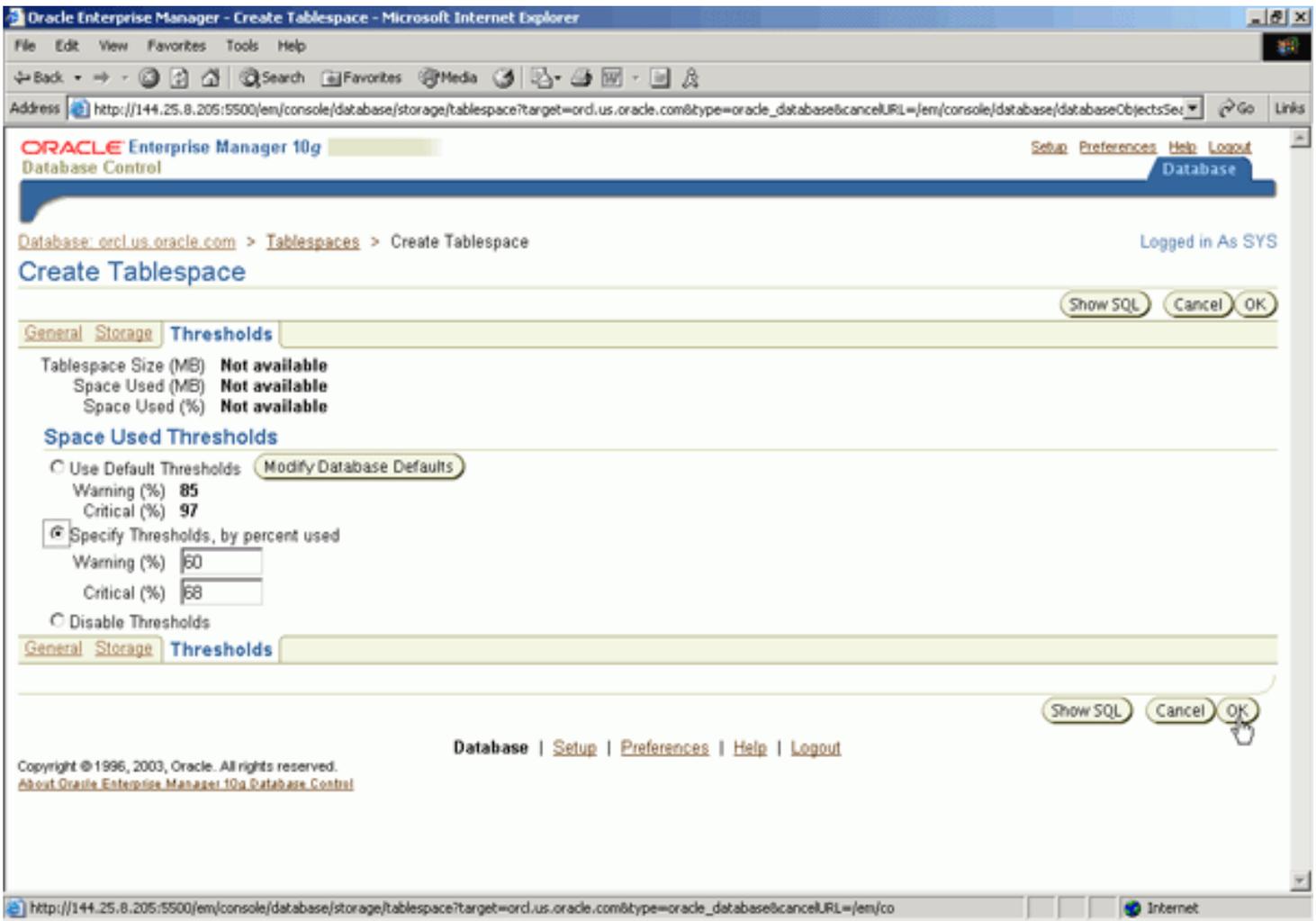
Datafiles

Use bigfile tablespace
Tablespace can have only one datafile with no practical size limit.

Select Name	Directory	Size (MB)
<input checked="" type="radio"/> tbsalert.dbf	/u01/app/oracle/oradata/orcl/	20.00

General **Storage Thresholds**

- Click **Specify Thresholds, by percent used** . Set the database wide default threshold values for space usage. Enter **60** for the Warning%, and **68** for the Critical%. Click **OK** .



8. Click the **Database** breadcrumb to go back to the **Administration** tab.

Oracle Enterprise Manager (SYS) - Tablespaces - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://stc-sun01.us.oracle.com:5500/em/console/database/databaseObjectsSearch?event=redisplay&lastEvent=create&target=oracle_database&otype=tablespace Go Links

ORACLE Enterprise Manager 10g Database Control [Setup](#) [Preferences](#) [Help](#) [Logout](#) Database

Database: orcl > Tablespaces Logged in As SYS

Tablespaces

Update Message
The object has been created successfully

Search

Name

To run an exact match search or to run a case sensitive search, double quote the search criteria. The wildcard (%) symbol can still be used in a double quoted search string.

Results

Select	Name	Type	Extent Management	Segment Management	Status	Size (MB)	Used (MB)	Used (%)
<input checked="" type="radio"/>	EXAMPLE	PERMANENT	LOCAL	AUTO	ONLINE	150.000	67.813	45.21
<input type="radio"/>	SYSAUX	PERMANENT	LOCAL	AUTO	ONLINE	210.000	203.625	96.96
<input type="radio"/>	SYSTEM	PERMANENT	LOCAL	MANUAL	ONLINE	440.000	430.875	97.93
<input type="radio"/>	TBSALERT	PERMANENT	LOCAL	AUTO	ONLINE	20.000	.063	0.31
<input type="radio"/>	TEMP	TEMPORARY	LOCAL	MANUAL	ONLINE	20.000	17.000	85.00
<input type="radio"/>	UNDOTBS1	UNDO	LOCAL	MANUAL	ONLINE	90.000	38.875	43.19
<input type="radio"/>	USERS	PERMANENT	LOCAL	AUTO	ONLINE	5.000	2.750	55.00

http://stc-sun01.us.oracle.com:5500/em/console/database/instance/sitemap?event=doLoad&target=oracle_database&pageNum= Local intranet

9. Click on the **Tables** link.

Oracle Enterprise Manager (SYS) - Database: orcl - Microsoft Internet Explorer

Address: http://stc-sun01.us.oracle.com:5500/em/console/database/instance/sitemap?event=doLoad&target=orcl&type=oracle_database&pageNum=3

ORACLE Enterprise Manager 10g Database Control

Database: orcl

Home Performance Administration Maintenance

Instance: Memory Parameters, Undo Management, All Initialization Parameters

Storage: Controlfiles, Tablespaces, Datafiles, Rollback Segments, Redo Log Groups, Archive Logs, Temporary Tablespace Groups

Security: Users, Roles, Profiles

Enterprise Manager Administration: Administrators, Notification Schedule, Blackouts

Schema: Tables, Indexes, Views, Synonyms, Sequences, Database Links

Packages: Package Bodies, Procedures, Functions, Triggers, Java Sources, Java Classes

Array Types: Object Types, Table Types

Warehouse: Cubes, OLAP Dimensions, Measure Folders

Dimensions: Materialized Views, Materialized View Logs, Refresh Groups

Configuration Management: Last Collected Configuration, Database Usage Statistics

Workload: Automatic Workload Repository, SQL Tuning Sets

Resource Manager: Resource Monitors, Resource Consumer Group Mappings, Resource Consumer Groups, Resource Plans

Scheduler: Jobs, Schedules, Programs, Job Classes, Windows

Windows Group: Local intranet

Click on the **Create** button.

10.

Oracle Enterprise Manager (SYS) - Tables - Microsoft Internet Explorer

Address: http://stc-sun01.us.oracle.com:5500/em/console/database/databaseObjectsSearch?event=noSearch&otype=schema&objectType=TABLE&target=orcl&type=oracle_database

ORACLE Enterprise Manager 10g Database Control

Database: orcl > Tables Logged in As SYS

Search

Select an object type and optionally enter a schema name and an object name to filter the data that is displayed in your results set.

Object Type: Table Schema: Object Name: Go

To run an exact match search or to run a case sensitive search, double quote the search criteria. The wildcard (%) symbol can still be used in a double quoted search string.

Results

Select Schema	Table Name	Tablespace	Partitioned	Rows Last Analyzed	Create
No search conducted					

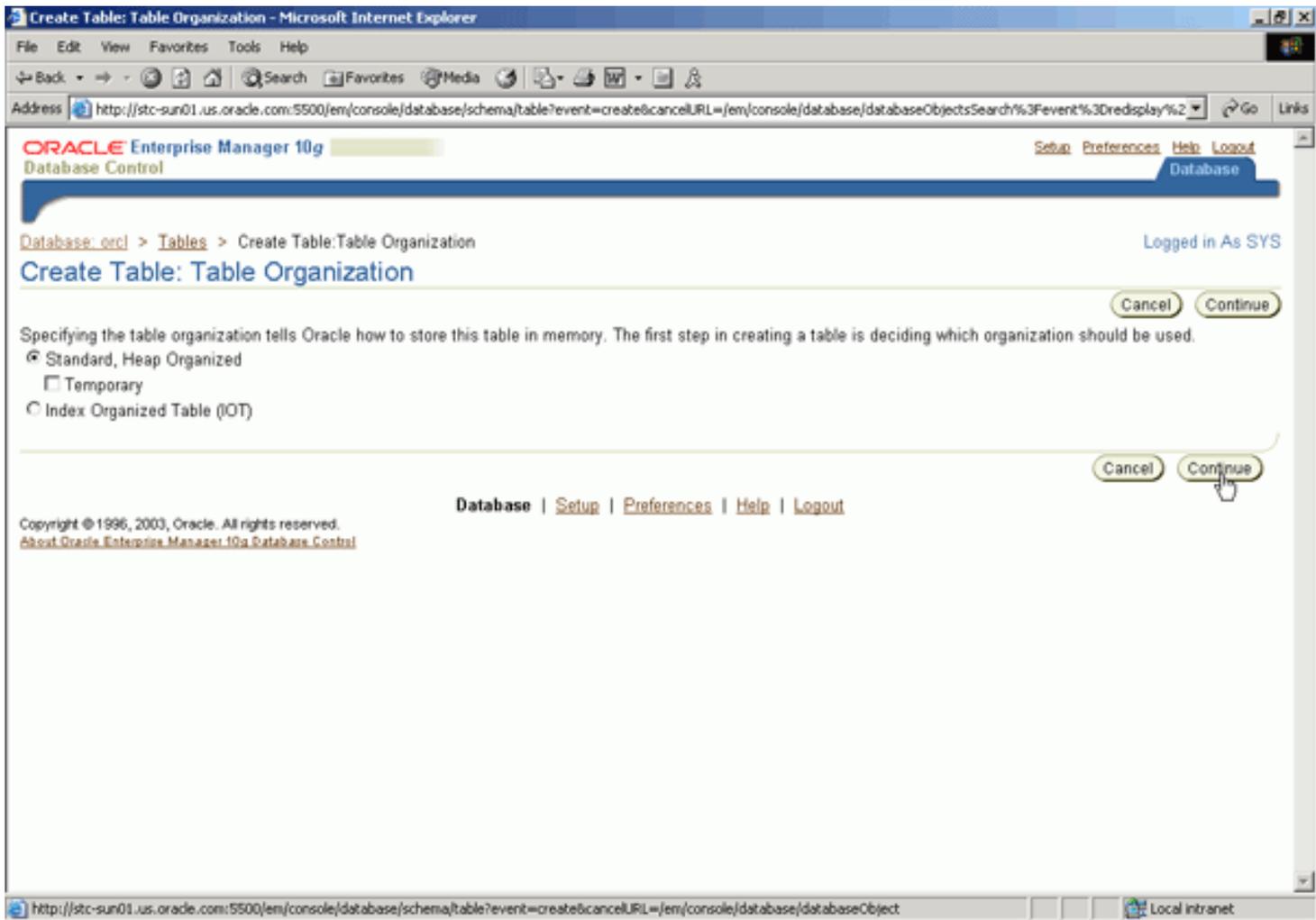
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Database | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

http://stc-sun01.us.oracle.com:5500/em/console/database/databaseObjectsSearch?event=noSearch&otype=schema&objectType=TABLE&target= Local intranet

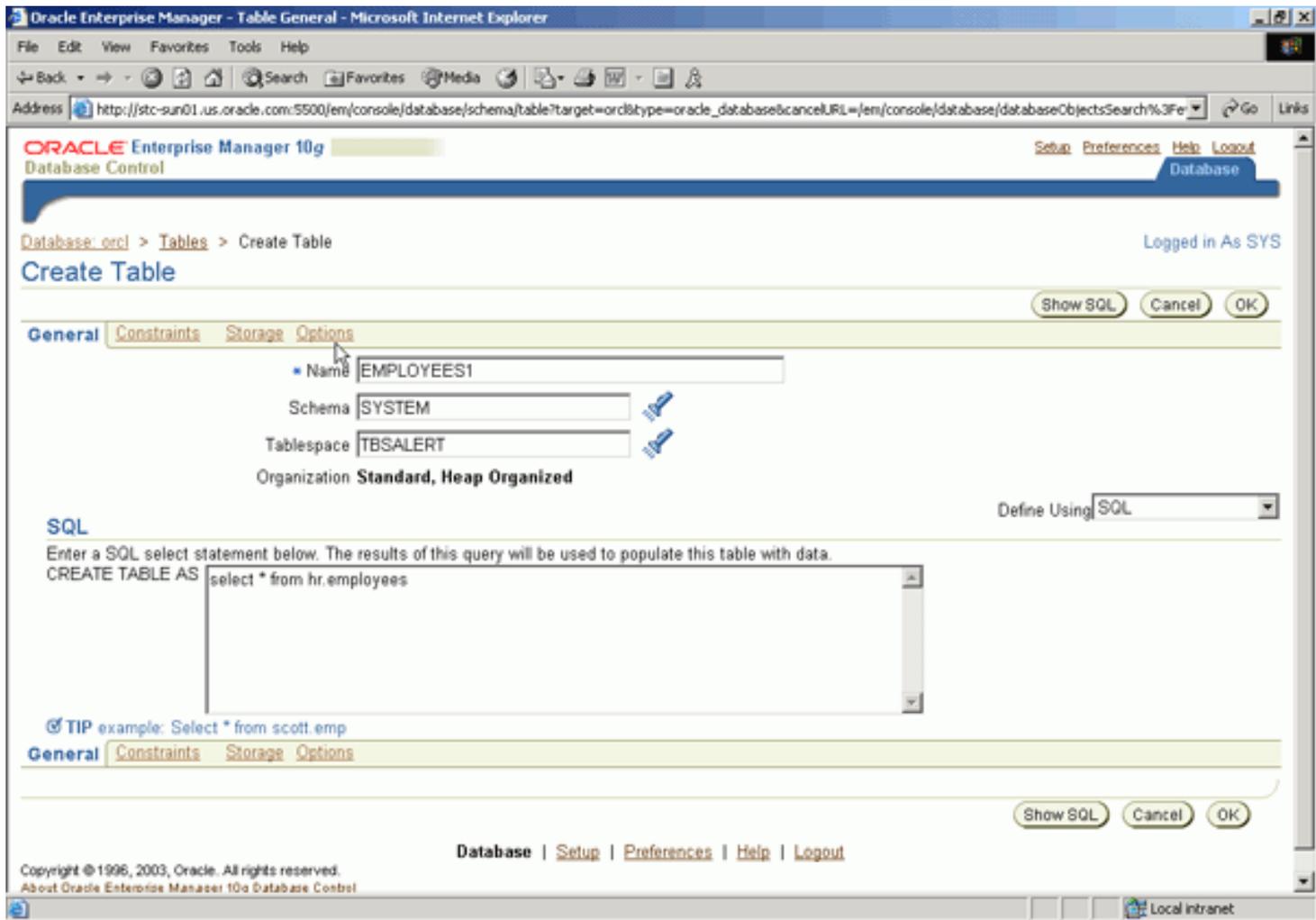
Click **Continue** .

11.



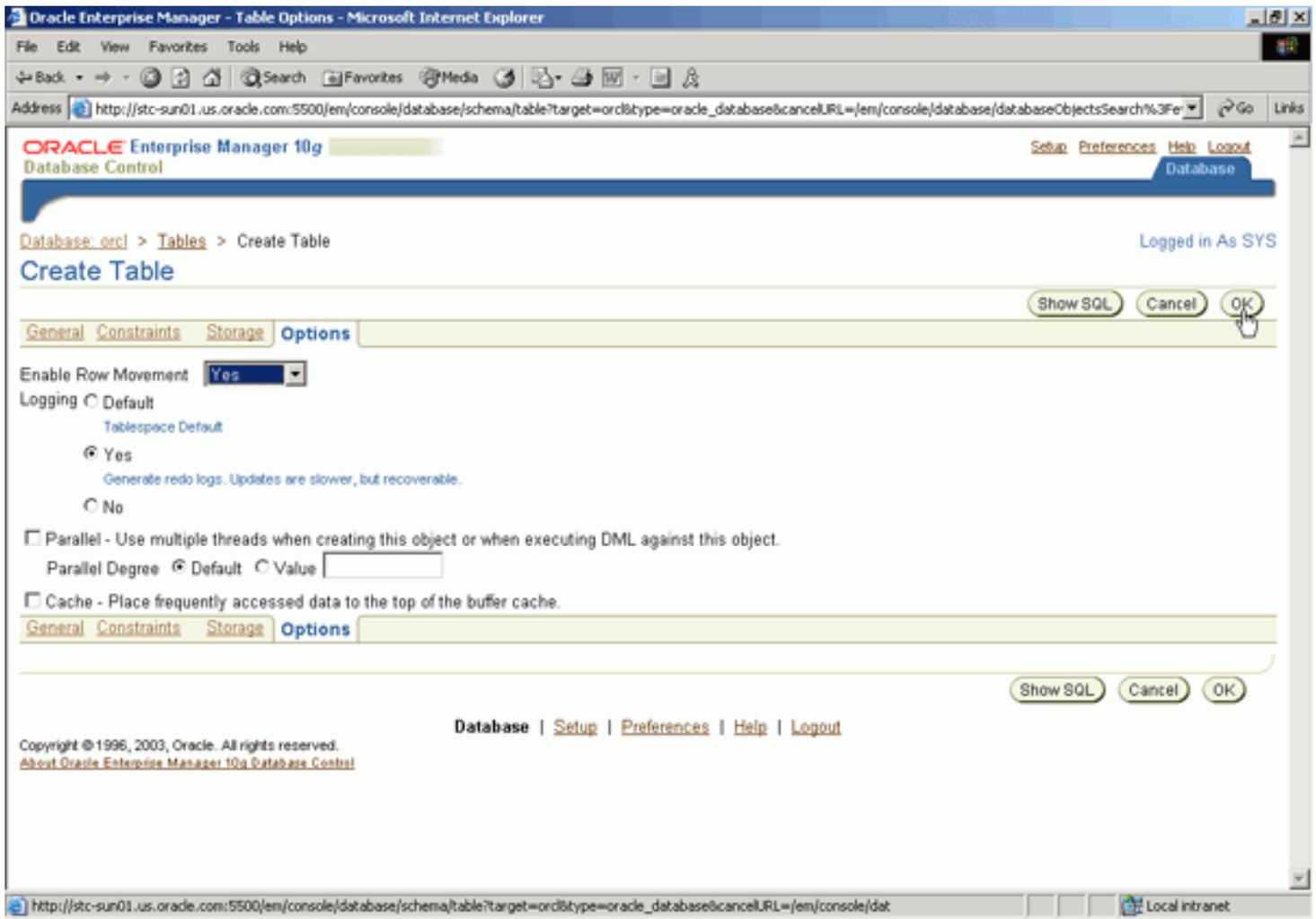
12.

Enter **employees1** in the Name field. Specify **SYSTEM** as the schema and **TBLALERT** as the tablespace. Click on the Define Using drop-down list and select **SQL** . Type **select * from hr.employees** in the Create Table As field, then click on the **Options** tab.



Select **Yes** for Enable Row Movement and click **OK** to complete creation of the table.

13.



Your table has been created. Click the **Database** breadcrumb.

14.

Oracle Enterprise Manager 10g
Database Control

Database: orcl > Tables
Logged in As SYS

Update Message
Table SYSTEM.EMPLOYEES1 has been created successfully

Search
Select an object type and optionally enter a schema name and an object name to filter the data that is displayed in your results set.

Object Type: Table
Schema: SYSTEM
Object Name:
Go

Results

Select	Schema	Table Name	Tablespace	Partitioned	Rows	Last Analyzed
<input checked="" type="radio"/>	SYSTEM	AQ\$_INTERNET_AGENTS	SYSTEM	NO	3	2003-12-17 18:00:31
<input type="radio"/>	SYSTEM	AQ\$_INTERNET_AGENT_PRIVS	SYSTEM	NO	2	2003-12-17 18:00:32
<input type="radio"/>	SYSTEM	AQ\$_QUEUES	SYSTEM	NO	19	2003-12-17 18:00:32
<input type="radio"/>	SYSTEM	AQ\$_QUEUE_TABLES	SYSTEM	NO	10	2003-12-17 18:00:32
<input type="radio"/>	SYSTEM	AQ\$_SCHEDULES	SYSTEM	NO	0	2003-12-17 18:00:32
<input type="radio"/>	SYSTEM	DEF\$_AQCALL	SYSTEM	NO	0	2003-12-17 18:00:33
<input type="radio"/>	SYSTEM	DEF\$_AQFERROR	SYSTEM	NO	0	2003-12-17 18:00:33

Triggering a Tablespace Space Usage Alert

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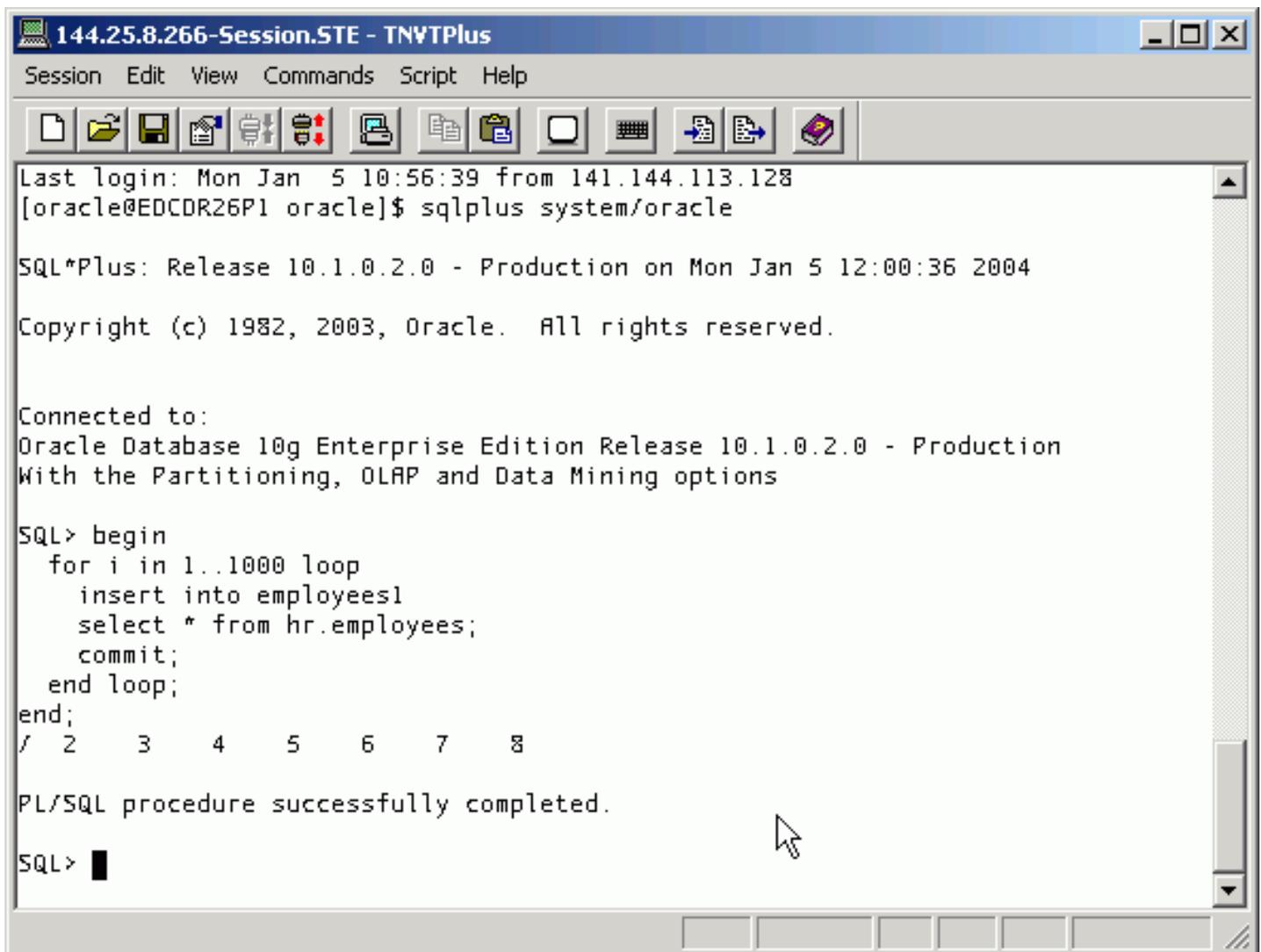
You will now perform some updates on the table to trigger a space utilization alert. Perform the following:

1. Open a **SQL*Plus** session and execute the following command:

```
sqlplus system/oracle
```

- Copy and paste the following SQL commands into your SQL*Plus session to simulate user activity on the EMPLOYEES1 table:

```
begin
  for i in 1..1000 loop
    insert into employees1
      select * from hr.employees;
    commit;
  end loop;
end;
/
```



```
144.25.8.266-Session.STE - TNYTPlus
Session Edit View Commands Script Help
Last login: Mon Jan  5 10:56:39 from 141.144.113.128
[oracle@EDCDR26P1 oracle]$ sqlplus system/oracle

SQL*Plus: Release 10.1.0.2.0 - Production on Mon Jan 5 12:00:36 2004

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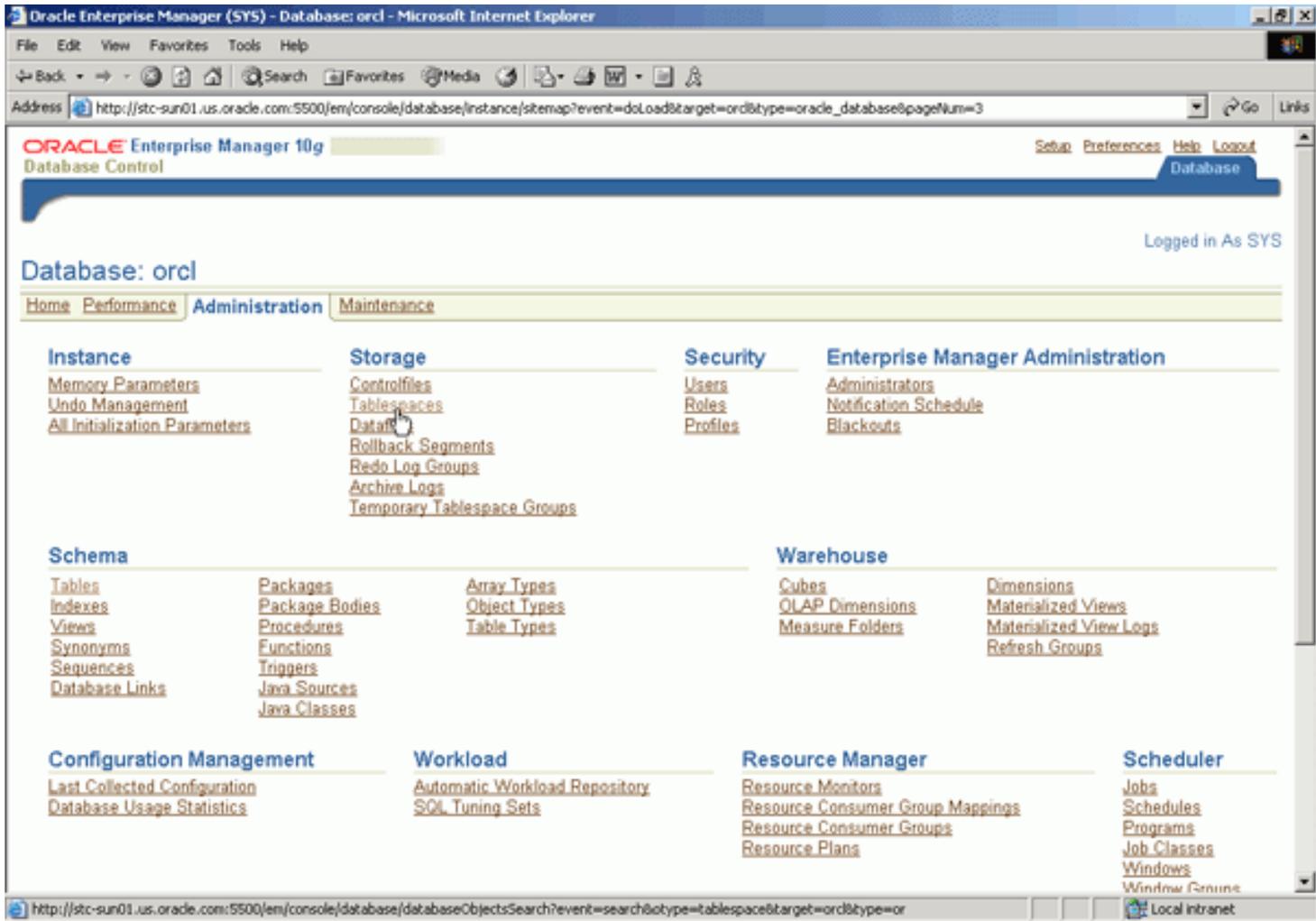
Connected to:
Oracle Database 10g Enterprise Edition Release 10.1.0.2.0 - Production
With the Partitioning, OLAP and Data Mining options

SQL> begin
  for i in 1..1000 loop
    insert into employees1
      select * from hr.employees;
    commit;
  end loop;
end;
/ 2      3      4      5      6      7      8

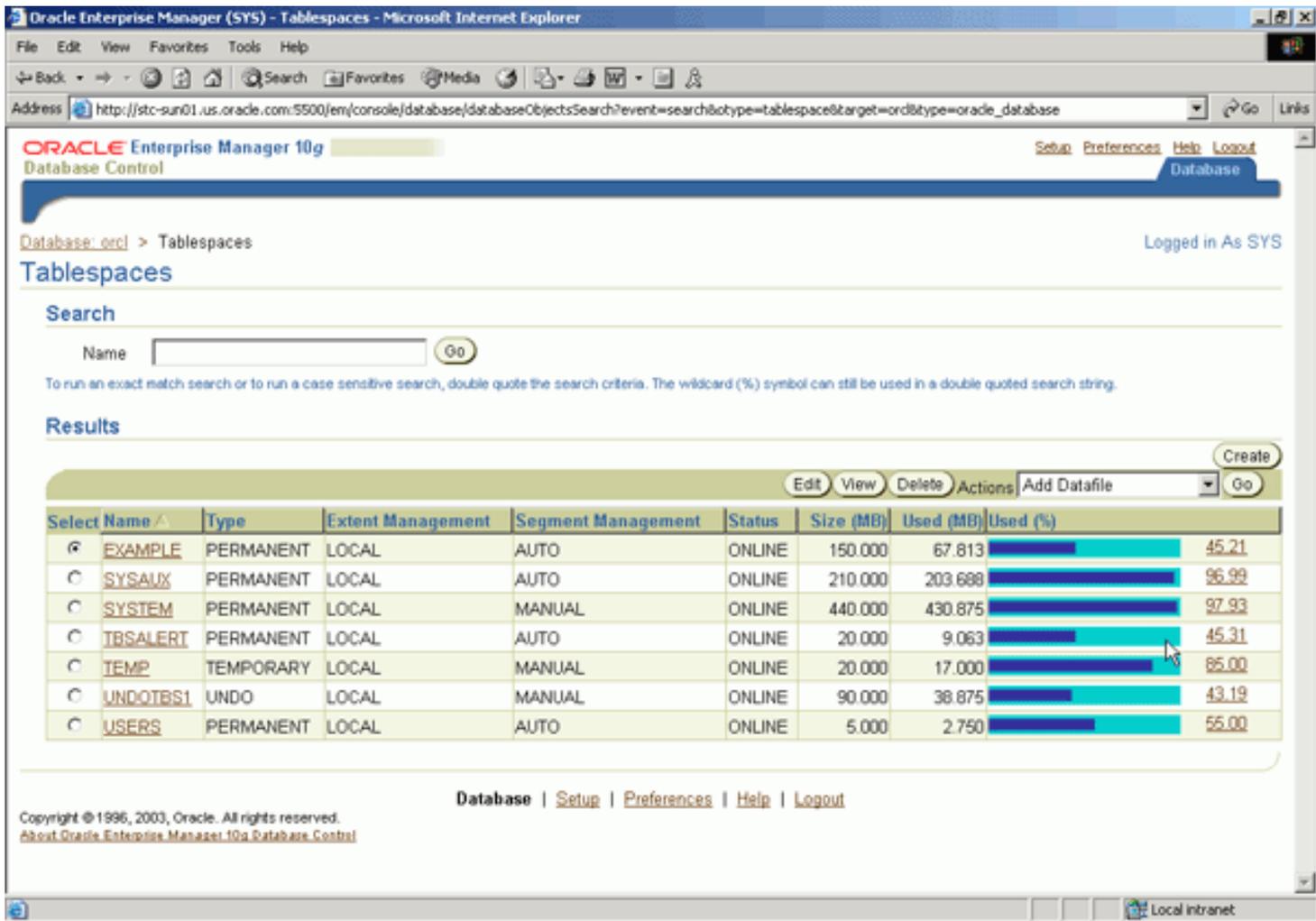
PL/SQL procedure successfully completed.

SQL> █
```

- Go to the **Enterprise Manager** window. Click on the **Database** breadcrumb to return to the **Administration** page then click on the **Tablespaces** link.



- Notice that the TBSALERT tablespace space used percentage has increased.



Oracle Enterprise Manager 10g Database Control

Database: orcl > Tablespaces

Tablespaces

Search

Name

To run an exact match search or to run a case sensitive search, double quote the search criteria. The wildcard (%) symbol can still be used in a double quoted search string.

Results

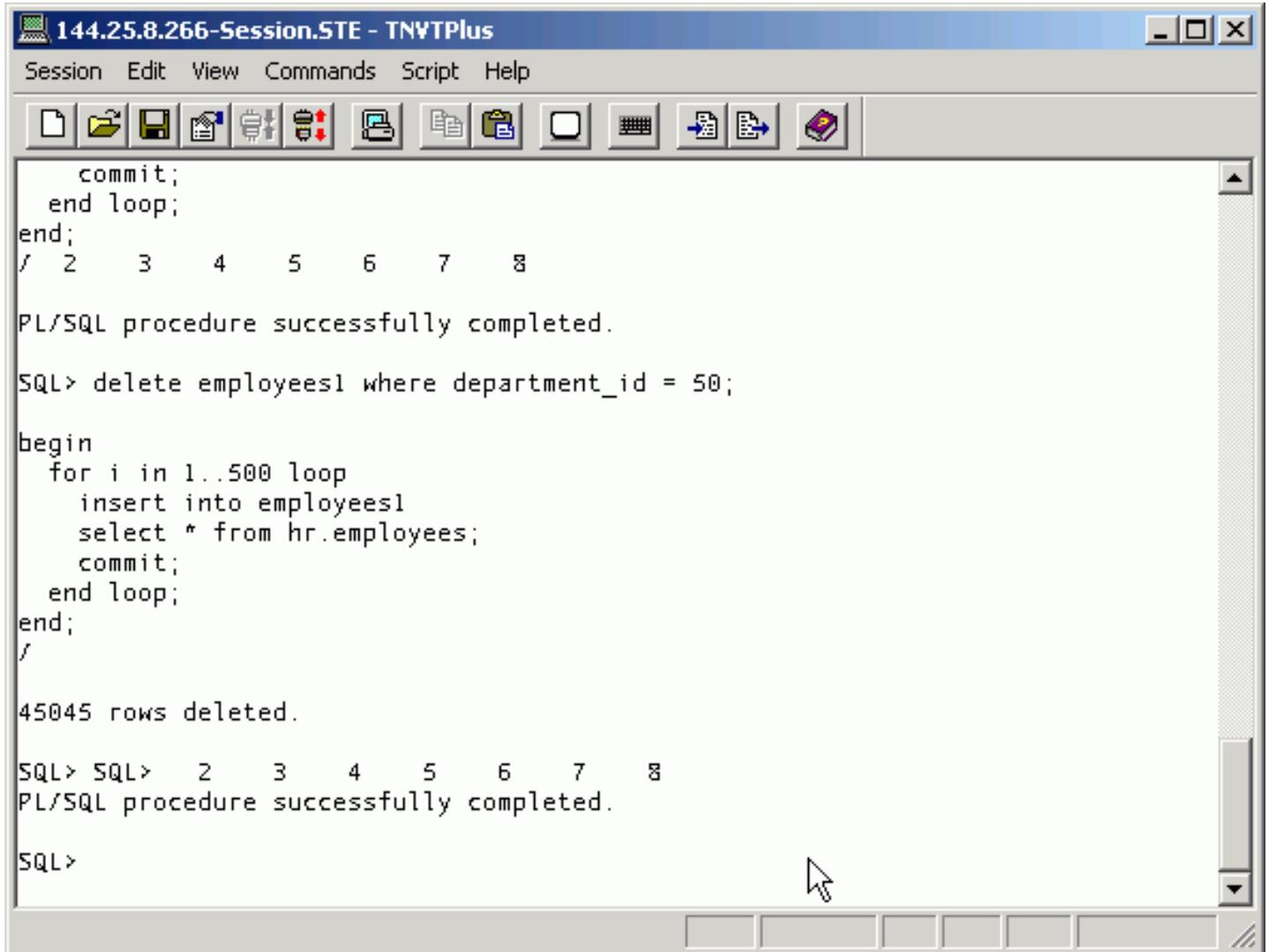
Select	Name	Type	Extent Management	Segment Management	Status	Size (MB)	Used (MB)	Used (%)
<input checked="" type="radio"/>	EXAMPLE	PERMANENT	LOCAL	AUTO	ONLINE	150,000	67,813	45.21
<input type="radio"/>	SYSAUX	PERMANENT	LOCAL	AUTO	ONLINE	210,000	203,698	96.99
<input type="radio"/>	SYSTEM	PERMANENT	LOCAL	MANUAL	ONLINE	440,000	430,875	97.93
<input type="radio"/>	TBSPALERT	PERMANENT	LOCAL	AUTO	ONLINE	20,000	9,063	45.31
<input type="radio"/>	TEMP	TEMPORARY	LOCAL	MANUAL	ONLINE	20,000	17,000	85.00
<input type="radio"/>	UNDOTBS1	UNDO	LOCAL	MANUAL	ONLINE	90,000	38,875	43.19
<input type="radio"/>	USERS	PERMANENT	LOCAL	AUTO	ONLINE	5,000	2,750	55.00

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About Oracle Enterprise Manager 10g Database Control

- Switch back to the **SQL*Plus** window and copy and paste the following commands into your SQL*Plus session to simulate more user activity on the `EMPLOYEES1` table:

```
delete employees1 where department_id = 50;
```

```
begin
  for i in 1..500 loop
    insert into employees1
      select * from hr.employees;
    commit;
  end loop;
end;
/
```



```
144.25.8.266-Session.STE - TNVPlus
Session Edit View Commands Script Help

commit;
end loop;
end;
/ 2 3 4 5 6 7 8

PL/SQL procedure successfully completed.

SQL> delete employees1 where department_id = 50;

begin
  for i in 1..500 loop
    insert into employees1
      select * from hr.employees;
    commit;
  end loop;
end;
/

45045 rows deleted.

SQL> SQL> 2 3 4 5 6 7 8
PL/SQL procedure successfully completed.

SQL>
```

6. Go to the **Enterprise Manager** window. Refresh your browser (for Linux Mozilla, select **View** from the menubar then select **Reload**). Notice that the TBSALERT tablespace space usage percentage has increased further.

Oracle Enterprise Manager 10g Database Control

Database: orcl.us.oracle.com > Tablespaces

Logged in As SYS

Tablespaces

Search

Name

To run an exact match search or to run a case sensitive search, double quote the search criteria. The wildcard (%) symbol can still be used in a double quoted search string.

Results

Actions

Select	Name	Type	Extent Management	Segment Management	Status	Size (MB)	Used (MB)	Used (%)
<input checked="" type="radio"/>	EXAMPLE	PERMANENT	LOCAL	AUTO	ONLINE	150.000	78.875	52.58
<input type="radio"/>	SYSAUX	PERMANENT	LOCAL	AUTO	ONLINE	210.000	201.250	95.83
<input type="radio"/>	SYSTEM	PERMANENT	LOCAL	MANUAL	ONLINE	430.000	427.188	99.35
<input type="radio"/>	TBSPALERT	PERMANENT	LOCAL	AUTO	ONLINE	20.000	10.063	50.31
<input type="radio"/>	TEMP	TEMPORARY	LOCAL	MANUAL	ONLINE	20.000	17.000	85.00
<input type="radio"/>	UNDOTBS1	UNDO	LOCAL	MANUAL	ONLINE	30.000	28.063	93.54
<input type="radio"/>	USERS	PERMANENT	LOCAL	AUTO	ONLINE	5.000	2.750	55.00

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 About Oracle Enterprise Manager 10g Database Control

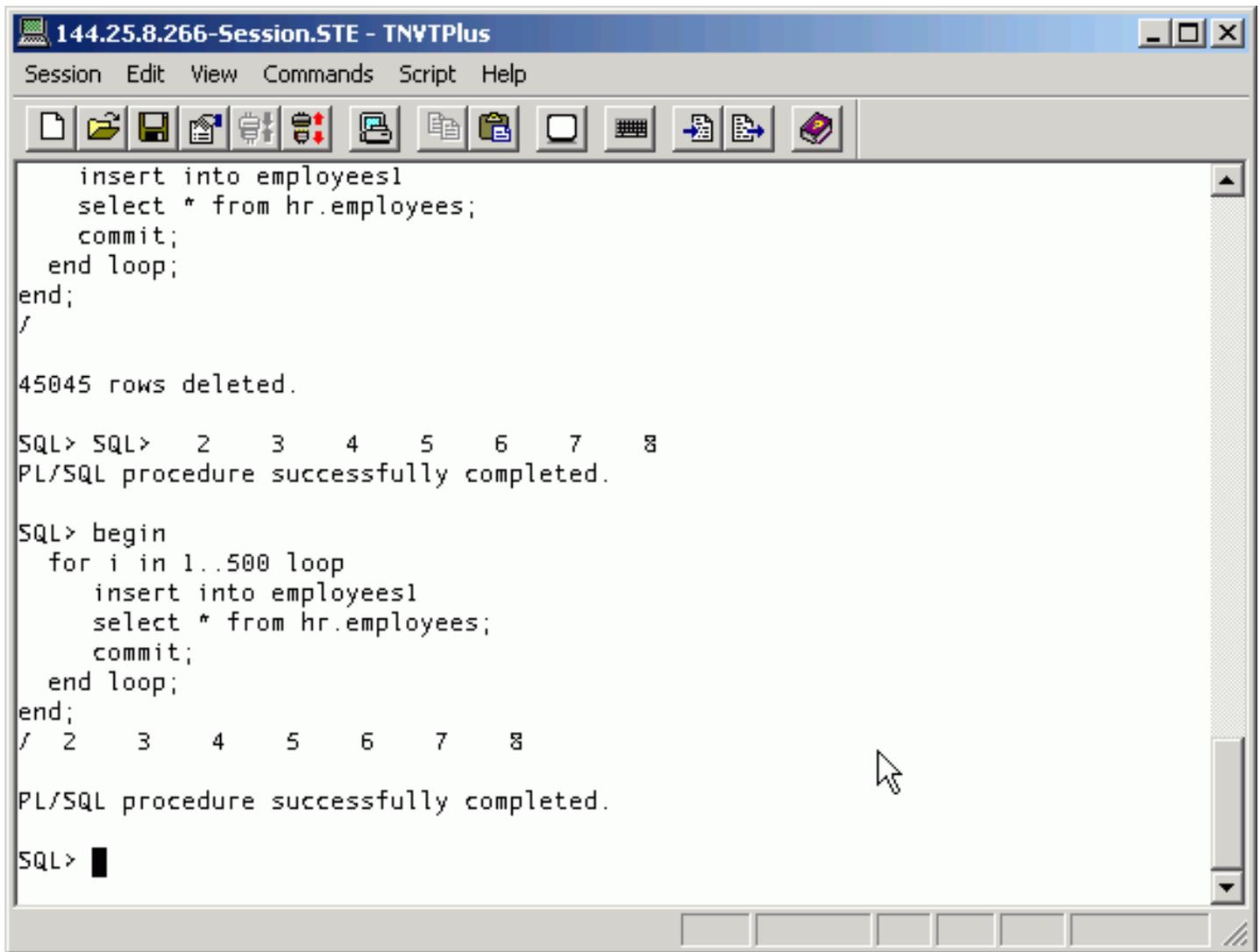
Database | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

- Switch back to the **SQL*Plus** window and copy and paste the following commands into your SQL*Plus session to simulate more user activity on the `EMPLOYEES1` table:

```

begin
  for i in 1..500 loop
    insert into employees1
      select * from hr.employees;
    commit;
  end loop;
end;
/

```



```
144.25.8.266-Session.STE - TNYTPlus
Session Edit View Commands Script Help

insert into employees1
select * from hr.employees;
commit;
end loop;
end;
/

45045 rows deleted.

SQL> SQL> 2 3 4 5 6 7 8
PL/SQL procedure successfully completed.

SQL> begin
for i in 1..500 loop
insert into employees1
select * from hr.employees;
commit;
end loop;
end;
/ 2 3 4 5 6 7 8

PL/SQL procedure successfully completed.

SQL> █
```

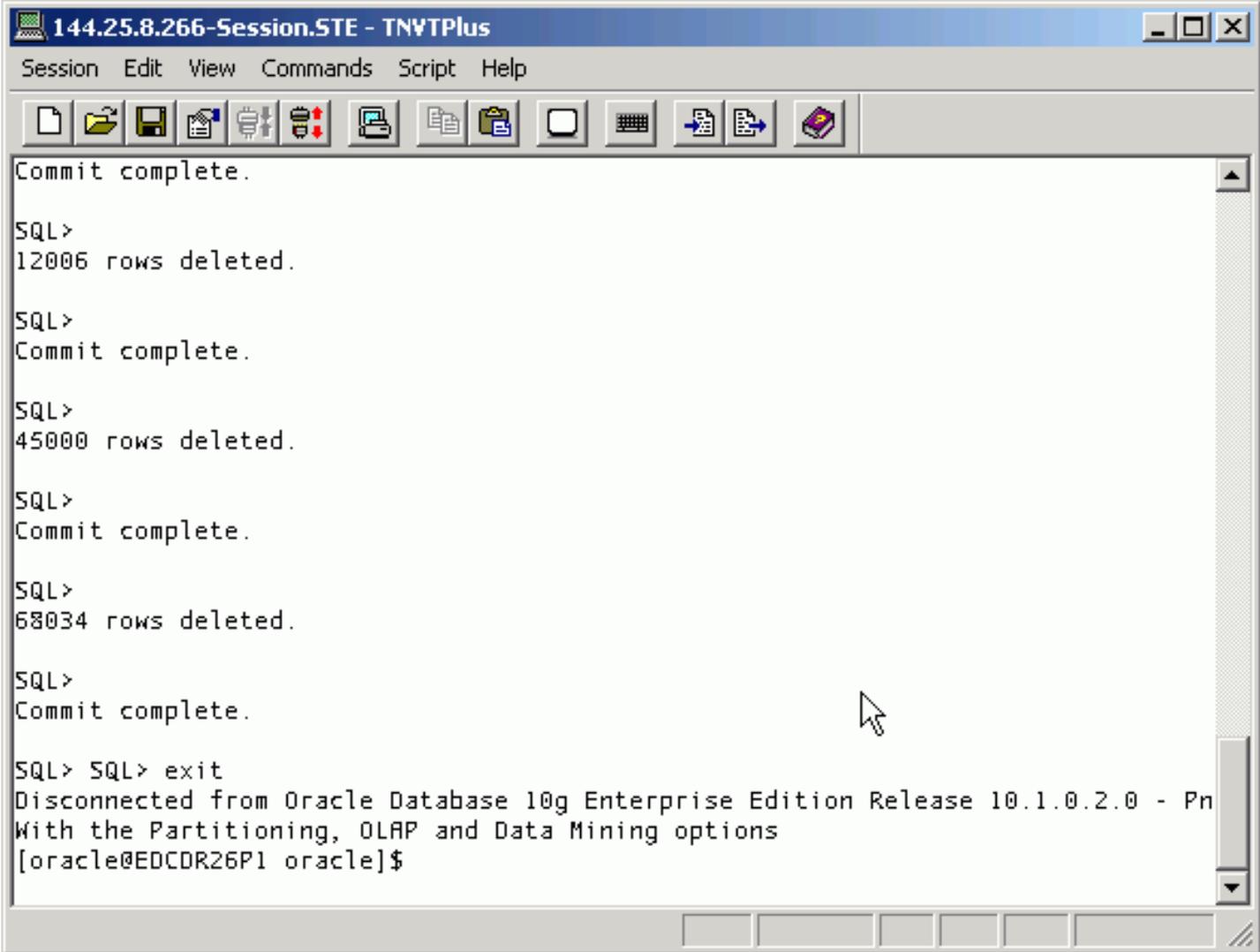
7. Copy and paste the following SQL commands into your SQL*Plus session to simulate user activity on the EMPLOYEES1 table:

```
delete employees1 where department_id = 30;
commit;
```

```
delete employees1 where department_id = 100;
commit;
```

```
delete employees1 where department_id = 50;
commit;
```

```
delete employees1 where department_id = 80;  
commit;  
  
exit
```

A screenshot of a terminal window titled "144.25.8.266-Session.STE - TNSPlus". The window has a menu bar with "Session", "Edit", "View", "Commands", "Script", and "Help". Below the menu bar is a toolbar with various icons for file operations and database management. The main area of the window displays the following text:

```
Commit complete.  
  
SQL>  
12006 rows deleted.  
  
SQL>  
Commit complete.  
  
SQL>  
45000 rows deleted.  
  
SQL>  
Commit complete.  
  
SQL>  
68034 rows deleted.  
  
SQL>  
Commit complete.  
  
SQL> SQL> exit  
Disconnected from Oracle Database 10g Enterprise Edition Release 10.1.0.2.0 - Pn  
With the Partitioning, OLAP and Data Mining options  
[oracle@EDCDR26P1 oracle]$
```

8. Go to the **Enterprise Manager** window. Refresh your browser (for Linux Mozilla, select **View** from the menubar then select **Reload**). Notice that the TBSALERT tablespace space usage percentage has now exceeded the critical threshold level of 68%.

The screenshot shows the Oracle Enterprise Manager 10g Database Control interface. The 'Tablespaces' page is displayed, showing a table of tablespace statistics. The TBSALERT tablespace is highlighted with a red bar, indicating its usage percentage (70.31%) has exceeded the critical threshold of 68%.

Select	Name	Type	Extent Management	Segment Management	Status	Size (MB)	Used (MB)	Used (%)
<input checked="" type="radio"/>	EXAMPLE	PERMANENT	LOCAL	AUTO	ONLINE	150.000	78.875	52.58
<input type="radio"/>	SYSAUX	PERMANENT	LOCAL	AUTO	ONLINE	210.000	201.250	95.83
<input type="radio"/>	SYSTEM	PERMANENT	LOCAL	MANUAL	ONLINE	430.000	427.250	99.36
<input type="radio"/>	TBSALERT	PERMANENT	LOCAL	AUTO	ONLINE	20.000	14.063	70.31
<input type="radio"/>	TEMP	TEMPORARY	LOCAL	MANUAL	ONLINE	20.000	17.000	85.00
<input type="radio"/>	UNDOTBS1	UNDO	LOCAL	MANUAL	ONLINE	45.000	44.375	98.61
<input type="radio"/>	USERS	PERMANENT	LOCAL	AUTO	ONLINE	5.000	2.750	55.00

9. While you are waiting for the space usage alert to be displayed on the Enterprise Manager home page, take a look at the table segment statistics. Click on the **Database** breadcrumb then click on the **Tables** link.

The screenshot shows the Oracle Enterprise Manager 10g Database Control interface for the database 'orcl'. The browser address bar indicates the URL: http://stc-sun01.us.oracle.com:5500/em/console/database/instance/sitemap?event=doLoad&target=orcl&type=oracle_database&pageNum=3. The interface is logged in as 'SYS'.

The main navigation tabs are: Home, Performance, Administration, and Maintenance. The 'Administration' tab is selected.

The 'Administration' tab is divided into several sections:

- Instance:** Memory Parameters, Undo Management, All Initialization Parameters
- Storage:** Controlfiles, Tablespaces, Datafiles, Rollback Segments, Redo Log Groups, Archive Logs, Temporary Tablespace Groups
- Security:** Users, Roles, Profiles
- Enterprise Manager Administration:** Administrators, Notification Schedule, Blackouts
- Schema:** Tables, Indexes, Views, Synonyms, Sequences, Database Links
- Warehouse:** Cubes, OLAP Dimensions, Measure Folders, Dimensions, Materialized Views, Materialized View Logs, Refresh Groups
- Configuration Management:** Last Collected Configuration, Database Usage Statistics
- Workload:** Automatic Workload Repository, SQL Tuning Sets
- Resource Manager:** Resource Monitors, Resource Consumer Group Mappings, Resource Consumer Groups, Resource Plans
- Scheduler:** Jobs, Schedules, Programs, Job Classes, Windows, Window Groups

The browser address bar at the bottom shows the URL: <http://stc-sun01.us.oracle.com:5500/em/console/database/databaseObjectsSearch?event=noSearch&otype=schema&objectType=TABLE&tag>.

10. To locate the SYSTEM.EMPLOYEES1 table, enter **system** in the **Schema** field and **emp** in the **Object Name** field then click **Go** .

Oracle Enterprise Manager (SYS) - Tables - Microsoft Internet Explorer

Address: http://stc-sun01.us.oracle.com:5500/em/console/database/databaseObjectsSearch?event=noSearch&otype=schema&objectType=TABLE&target=orcl&type=oracle_database

ORACLE Enterprise Manager 10g Database Control

Database: orcl > Tables Logged in As SYS

Tables

Search

Select an object type and optionally enter a schema name and an object name to filter the data that is displayed in your results set.

Object Type: Schema: Object Name:

To run an exact match search or to run a case sensitive search, double quote the search criteria. The wildcard (%) symbol can still be used in a double quoted search string.

Results

Select Schema	Table Name	Tablespace	Partitioned	Rows Last Analyzed
No search conducted				

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Database | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

Address: http://stc-sun01.us.oracle.com:5500/em/console/database/databaseObjectsSearch?event=noSearch&otype=schema&objectType=TABLE&target=orcl&type=oracle_database Local intranet

Click on the **EMPLOYEES1** link.

11.

Oracle Enterprise Manager (SYS) - Tables - Microsoft Internet Explorer

Address: http://stc-sun01.us.oracle.com:5500/em/console/database/databaseObjectsSearch?target=orcl&type=oracle_database&type=schema

ORACLE Enterprise Manager 10g Database Control

Database: orcl > Tables

Logged in As SYS

Search

Select an object type and optionally enter a schema name and an object name to filter the data that is displayed in your results set.

Object Type: Table Schema: SYSTEM Object Name: EMP

Results

Select	Schema	Table Name	Tablespace	Partitioned	Rows	Last Analyzed
<input type="checkbox"/>	SYSTEM	EMPLOYEES1	TBSALERT	NO		

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[About Oracle Enterprise Manager 10g Database Control](#)

Click on the **Segments** tab.

12.

Oracle Enterprise Manager 10g Database Control

Database: orcl > Tables > Edit Table: SYSTEM.EMPLOYEES1

Logged in As SYS

General Constraints Segments Storage Options Statistics

Name: EMPLOYEES1
 Schema: SYSTEM
 Tablespace: TBSALERT
 Organization: Standard, Heap Organized
 Number of Indexes: 0

Columns

Select	Name	Data Type	Size	Scale	Not NULL	Default Value
<input checked="" type="radio"/>	EMPLOYEE_ID	NUMBER	6		<input type="checkbox"/>	
<input type="radio"/>	FIRST_NAME	VARCHAR2	20		<input type="checkbox"/>	
<input type="radio"/>	LAST_NAME	VARCHAR2	25		<input checked="" type="checkbox"/>	
<input type="radio"/>	EMAIL	VARCHAR2	25		<input checked="" type="checkbox"/>	
<input type="radio"/>	PHONE_NUMBER	VARCHAR2	20		<input type="checkbox"/>	
<input type="radio"/>	HIRE_DATE	DATE			<input checked="" type="checkbox"/>	

13. Notice the percentage of wasted space in the EMPLOYEES1 table. You can very likely resolve the tablespace space usage alert by reclaiming the unused space in this table.

On this same screen, you can project the EMPLOYEES1 table's future space usage by specifying a date range for **Space Usage Trend** then click the **Refresh** button. Because there has not been a long enough history of activity on the EMPLOYEES1 table, you will not see very meaningful data in the space usage analysis graph. Click on the **Database** breadcrumb then click on the **Home** page tab.

Oracle Enterprise Manager - Space Usage Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://oracledatabase.com&type=oracle_database&cancelURL=/em/console/database/databaseObjectsSearch%3Fevent%3Dredisplay&name=SYSTEM&name=EMPLOYEES1&otype=TABLE Go Links

ORACLE Enterprise Manager 10g Database Control Setup Preferences Help Logout Database

Database: orcl.us.oracle.com > Tables > Edit Table: SYSTEM.EMPLOYEES1 Logged in As SYS

Edit Table: SYSTEM.EMPLOYEES1

Show SQL Revert Apply

General Constraints Segments Storage Options Statistics

Dependent Segments

Select	Schema	Segment Name	Type	Tablespace	Space Used(KB)	Space Allocated(KB)	Wasted Space(%)
<input checked="" type="checkbox"/>	SYSTEM	EMPLOYEES1	TABLE	TBSALERT	3919.07	14336.00	72.66

TIP Select a segment and click the 'Refresh' button to see the Space Usage Trend.

Space Usage Trend For Table SYSTEM.EMPLOYEES1

From To Refresh

TIP Putting in a future date will generate a prediction for the space usage on that date. Getting the Space Usage Trend is a time consuming operation and could take a while.

General Constraints Segments Storage Options Statistics

http://144.25.8.226:5500/em/console/database/instance/sitemap?event=doLoad&target=orcl.us.oracle.com&type=oracle_database&page# Internet

15. Click on the **Refresh** button a few times until you see a red **x** and the number **1** next to **Problem Tablespaces**. Scroll down to the **Alerts** table.

The screenshot displays the Oracle Enterprise Manager 10g Database Control interface for the database 'orcl.us.oracle.com'. The page is titled 'Database: orcl.us.oracle.com' and shows the user is logged in as 'SYS'. The interface includes a navigation menu with 'Home', 'Performance', 'Administration', and 'Maintenance'. The main content area is divided into several sections:

- General:** Shows the database status as 'Up' since Jan 5, 2004 11:46:30 AM. Availability is 100%. Instance Name is 'orcl', Version is '10.1.0.2.0', and Read Only is 'No'. Oracle Home is '/u01/app/oracle/product/10.1.0', Listener is 'LISTENER_EDCDR26P1', and Host is 'edcdr26p1.us.oracle.com'.
- Host CPU:** A bar chart showing CPU usage for 'Other' and 'orcl'. The 'orcl' bar is significantly higher than the 'Other' bar. Below the chart, 'Run Queue' is 0.3 and 'Paging (pages per second)' is 0.0.
- Active Sessions:** A pie chart showing session distribution: CPU (0.1), I/O (0.1), and Wait (0.1). Below the chart, 'Active Sessions' is 0.2 and 'SQL Response Time (%)' is 103.6 (compared to baseline).
- High Availability:** Shows 'Instance Recovery Time (seconds)' as 11, 'Last Backup' as n/a, 'Archiving' as Disabled, 'Archive Area Used (%)' as n/a, and 'Flashback Logging' as Disabled.
- Space Usage:** Shows 'Database Size (GB)' as 1, 'Problem Tablespaces' as 1 (with a red X), 'Segment Findings' as Not Configured, 'Policy Violations' as 0 (with a green checkmark), and 'Dump Area Used (%)' as Unavailable.
- Diagnostic Summary:** Shows 'Performance Findings' as 'No ADDM run available', 'All Policy Violations' as 42 (with a red X), and 'Alert Log' as 'No ORA- errors'.

You should see a **Tablespaces Full** alert. Click on the **Tablespace [TBSALERT] is [70 percent] full** link.

16.

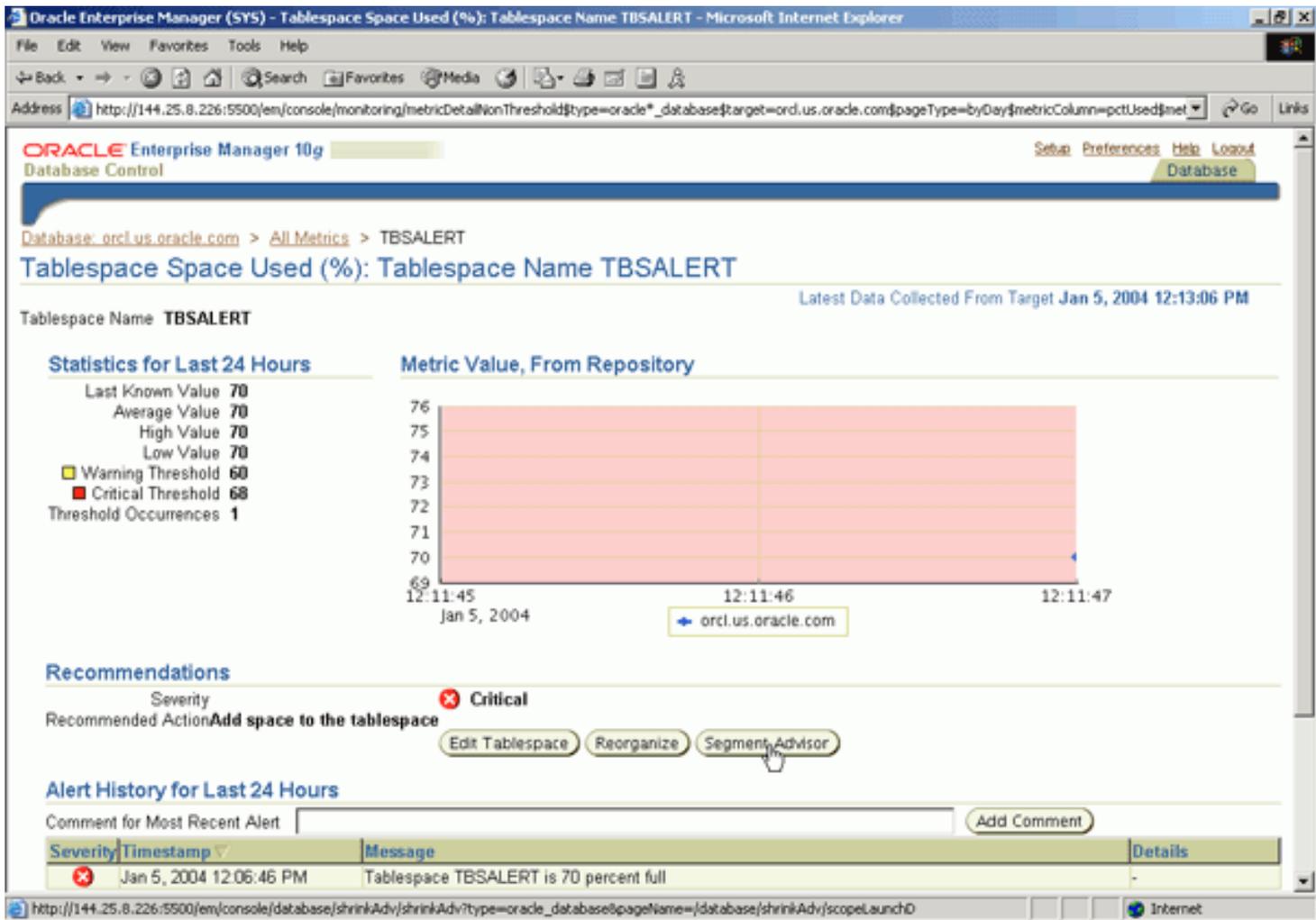
The screenshot displays the Oracle Enterprise Manager (SYS) console interface. At the top, the browser address bar shows the URL: `http://144.25.8.226:5500/em/console/database/instance/sitemap?event=doLoad&target=orcl.us.oracle.com&type=oracle_database&pageNum=1`. The main content area is divided into several sections:

- Database Metrics:** A grid showing various database health indicators. For example, 'Archiving' is 'Disabled', 'Flashback Logging' is 'Disabled', 'Segment Findings' is 'Not Configured', and 'Dump Area Used (%)' is 'Unavailable'.
- Alerts Summary:** Shows 'All Policy Violations' as 42 (with a red 'x' icon) and 'Alert Log' as 'No ORA_errors'. Below this, it indicates 'Critical' alerts as 1 (with a red 'x' icon) and 'Warnings' as 1 (with a yellow warning triangle icon).
- Alerts Table:** A table listing active alerts. The first alert is 'Tablespaces Full Tablespace Space Used (%)' with a severity of 'Critical' (red 'x'). The message is 'Tablespace [TBSA] is [70 percent] full'. It was triggered on Jan 5, 2004 at 12:06:46 PM. The second alert is 'User Audit Audited User' with a severity of 'Warning' (yellow triangle), triggered on Jan 5, 2004 at 12:01:00 PM.
- Related Alerts:** A table showing no related alerts are present.
- Job Activity:** Shows 'Jobs scheduled to start no more than 7 days ago'. It lists 'Scheduled Executions' as 0, 'Suspended Executions' as 0, 'Running Executions' as 0, and 'Problem Executions' as 0.
- Critical Patch Advisories:** Shows 0 patch advisories. A note states: 'Patch Advisory information may be stale. Oracle MetaLink refresh job has not run successfully in 72 hours.' A job 'RefreshFromMetalink' is listed.
- Home Navigation:** Includes links for 'Performance', 'Administration', and 'Maintenance'.
- Related Links:** A collection of links such as 'Advisor Central', 'Alert History', 'Alert Log Content', 'All Metrics', 'Blackouts', 'iSQL*Plus', 'Jobs', 'Manage Metrics', 'Metric Collection Errors', 'Monitoring Configuration', and 'User-Defined Metrics'.

The browser's address bar at the bottom shows the URL: `http://144.25.8.226:5500/em/console/monitoring/metricDetailNonThreshold?type=oracle*_database&target=orcl.us.oracle.com&pageTyp`.

17.

The Automatic Database Diagnostic Monitor (ADDM) advises to add more space. In the next section, you will resolve the tablespace full alert by reclaiming wasted space in the tablespace. Click the **Segment Advisor** button.

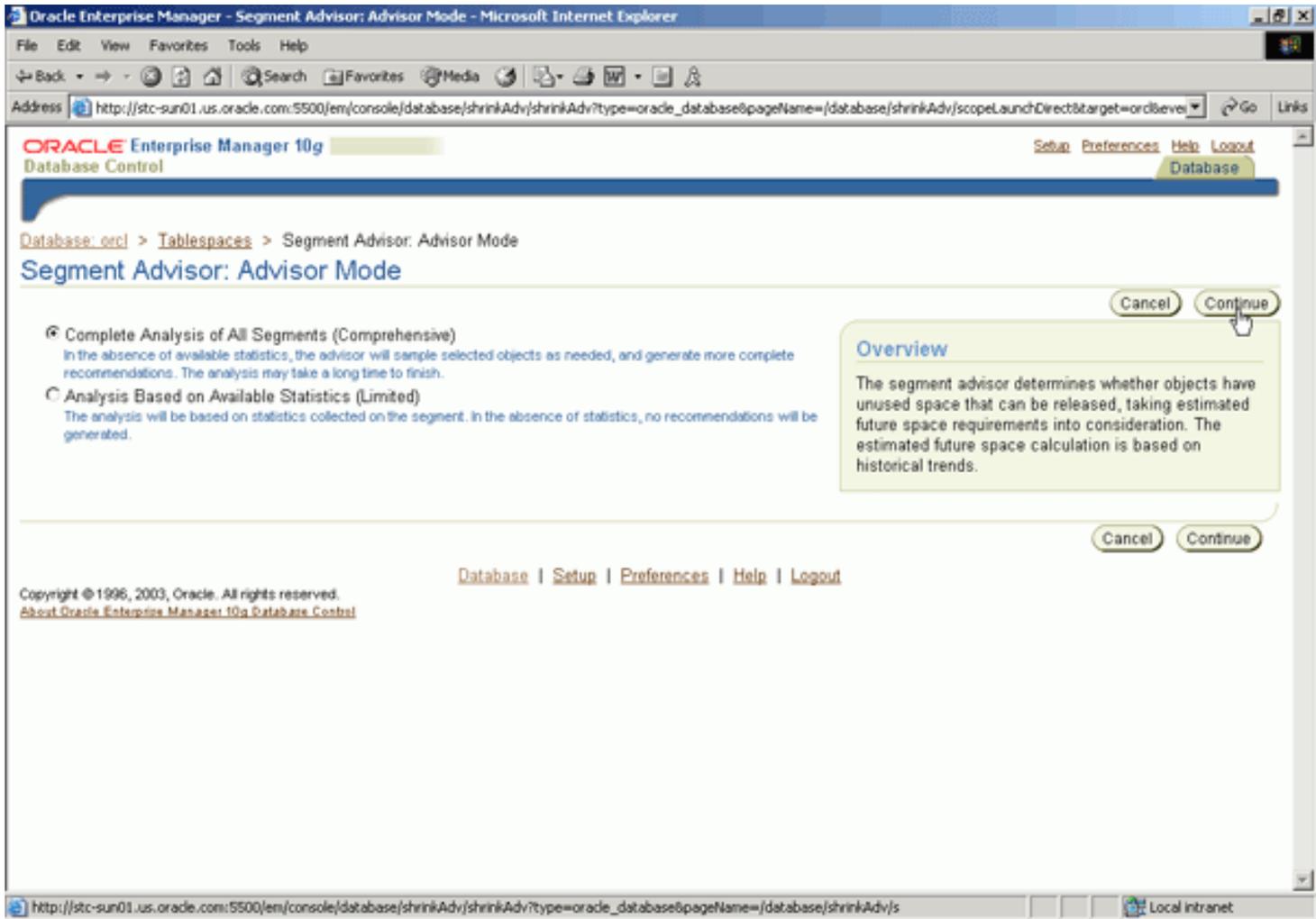


Resolving a Tablespace Space Usage Alert

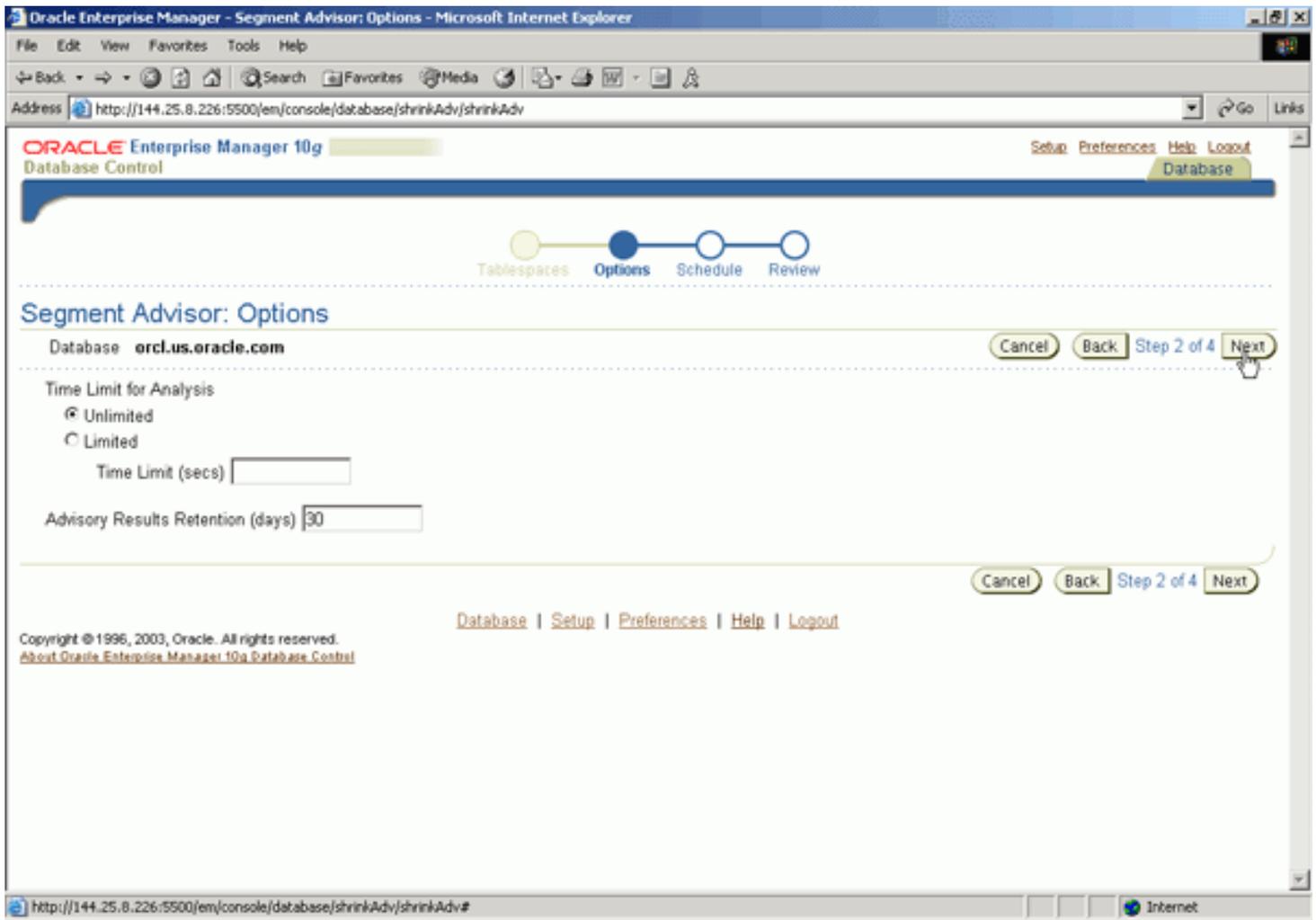
[Back to Topic List](#)

Because you do not want to add space to your tablespace, you want to determine which segments can be shrunk in order to reconstitute space to the tablespace. When space used by an object at steady state is much less than the amount of space allocated to it, it becomes necessary to reclaim the unused space. With previous releases of the Oracle server, space once allocated below the segment's HWM could only be freed by moving or redefining the segment. In Oracle Database 10g you can now shrink segments. When a segment is shrunk, its data is compacted, its HWM is pushed down, and unused space is released back to the tablespace containing the segment. A shrink operation is an **online** and **in-place** operation, and does not use extra database space to be executed. In-place means the shrink operation does not create a separate object but rather the shrink is done on the same object. Perform the following:

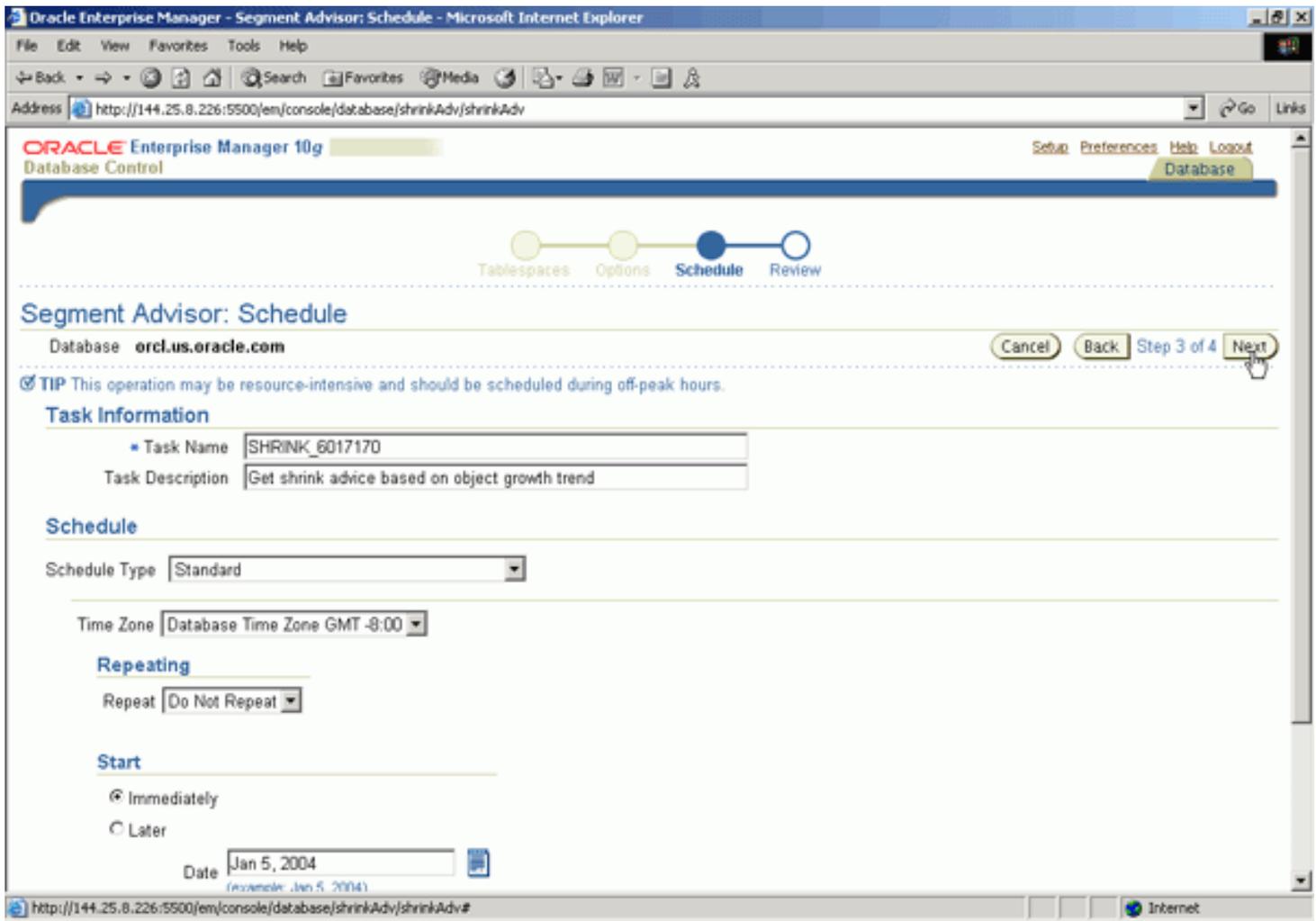
1. Accept the defaults and click **Continue** .



2. At the Options window, accept the defaults and click **Next** .



3. At the Schedule window, select the Schedule Type **Standard** and make sure **Immediately** is selected and click **Next**.



4. Click **Submit** .

Oracle Enterprise Manager 10g Database Control

Setup Preferences Help Logout Database

Tablespaces Options Schedule **Review**

Segment Advisor: Review

Database **orcl.us.oracle.com** Cancel Show SQL Back Step 4 of 4 Submit

Task Name **SHRINK_6017170**
Task Description **Get shrink advice based on object growth trend**
Advisor Mode **Complete Analysis of All Segments (Comprehensive)**
Time Limit for Analysis (secs) **Unlimited**
Advisor Results Retention (days) **30**

Selected Objects

Tablespace	Type
TBSALERT	PERMANENT

Cancel Show SQL Back Step 4 of 4 Submit

Database | Setup | Preferences | Help | Logout

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[About Oracle Enterprise Manager 10g Database Control](#)

http://144.25.8.226:5500/em/console/database/shrinkAdv/shrinkAdv# Internet

5. Click the **Refresh** button until the task is completed.

Oracle Enterprise Manager 10g
Database Control

Database: orcl.us.oracle.com > Advisor Central
Logged in As SYS

Advisor Central

Confirmation
Advisor task created successfully: SHRINK_6017170

Page Refreshed Jan 5, 2004 12:17:21 PM **Refresh**

Advisors

ADDM	Memory Advisor	Segment Advisor
SQL Tuning Advisor	MTTR Advisor	Undo Management
SQL Access Advisor		

Advisor Tasks [Change Default Expiration](#)

Search
Select an advisory type and optionally enter a task name to filter the data that is displayed in your results set.

Advisory Type	Task Name	Advisor Runs
All Types		Last Run

Results

Select	Advisory Type	Name	Description	User	Status	Start Time	End Time	Expires In (days)
<input checked="" type="checkbox"/>	Segment Advisor	SHRINK_6017170	Get shrink advice based on object growth trend	SYS	RUNNING	Jan 5, 2004 12:17:20 PM		30

6. Once the task is complete, click **View Results** .

Oracle Enterprise Manager 10g Database Control

Database: orcl.us.oracle.com > Advisor Central

Logged in As SYS

Page Refreshed Jan 5, 2004 12:17:28 PM Refresh

Advisors

[ADDM](#) [Memory Advisor](#) [Segment Advisor](#)
[SQL Tuning Advisor](#) [MTTR Advisor](#) [Undo Management](#)
[SQL Access Advisor](#)

Advisor Tasks Change Default Expiration

Search

Select an advisory type and optionally enter a task name to filter the data that is displayed in your results set.

Advisory Type: All Types Task Name: Advisor Runs: Last Run Go

Results

View Result Delete Actions Re-schedule Go

Select	Advisory Type	Name	Description	User	Status	Start Time	End Time	Expires In (days)
<input checked="" type="checkbox"/>	Segment Advisor	SHRINK_6017170	Get shrink advice based on object growth trend	SYS	COMPLETED	Jan 5, 2004 12:17:20 PM	Jan 5, 2004 12:17:24 PM	30

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About Oracle Enterprise Manager 10g Database Control

Database | Setup | Preferences | Help | Logout

7. You can see that the EMPLOYEES1 table is a good candidate for a shrink operation. Scrolling down to the bottom of the result page, you can choose which kind of shrink operation to do. Make sure that the first option is selected because it is the one that reclaims space. Then click **Show SQL** to see what statements will be executed.

Oracle Enterprise Manager - Segment Advisor Task: SHRINK_6017170 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://144.25.8.226:5500/em/console/database/shrinkAdv/shrinkAdv?task_id=1&event=view_result&advisoryCentralURL=/em/console/database/instance/advisorTasks%3Fdbf

ORACLE Enterprise Manager 10g Database Control

Setup Preferences Help Logout Database

Database: orcl.us.oracle.com > Advisor Central > Segment Advisor Task: SHRINK_6017170

Segment Advisor Task: SHRINK_6017170

The advisor has determined that the following objects have wasted space. Oracle recommends shrinking these segments to release wasted space. Select the objects to shrink and click Schedule Implementation to schedule the shrink.

Task Name **SHRINK_6017170** Started **Jan 5, 2004 12:17:20 PM**
 Status **COMPLETED** Ended **Jan 5, 2004 12:17:24 PM**
 Advisor Mode **COMPREHENSIVE** Running Time (seconds) **4**
 Time Limit (seconds) **UNLIMITED**

Recommendations

[Show SQL](#) [Schedule Implementation](#)

View Segments Recommended to Shrink
 View other Segments

[Select All](#) | [Select None](#)

Select	Tablespace	Schema	Segment	Partition	Segment Type	Allocated Space (MB)	Used Space (MB)	Reclaimable Space (MB)	Recommendation
<input checked="" type="checkbox"/>	TBSALERT	SYSTEM	EMPLOYEES1		TABLE	14.0	4.068	9.890	Perform shrink, estimated savings is 10370901 bytes.

Shrink Options

Compact Segments and Release Space
 This will first compact the segments and then release the recovered space to the tablespace. During the short space release phase, any cursors referencing this segment may be invalidated and queries on the segment could be disrupted.

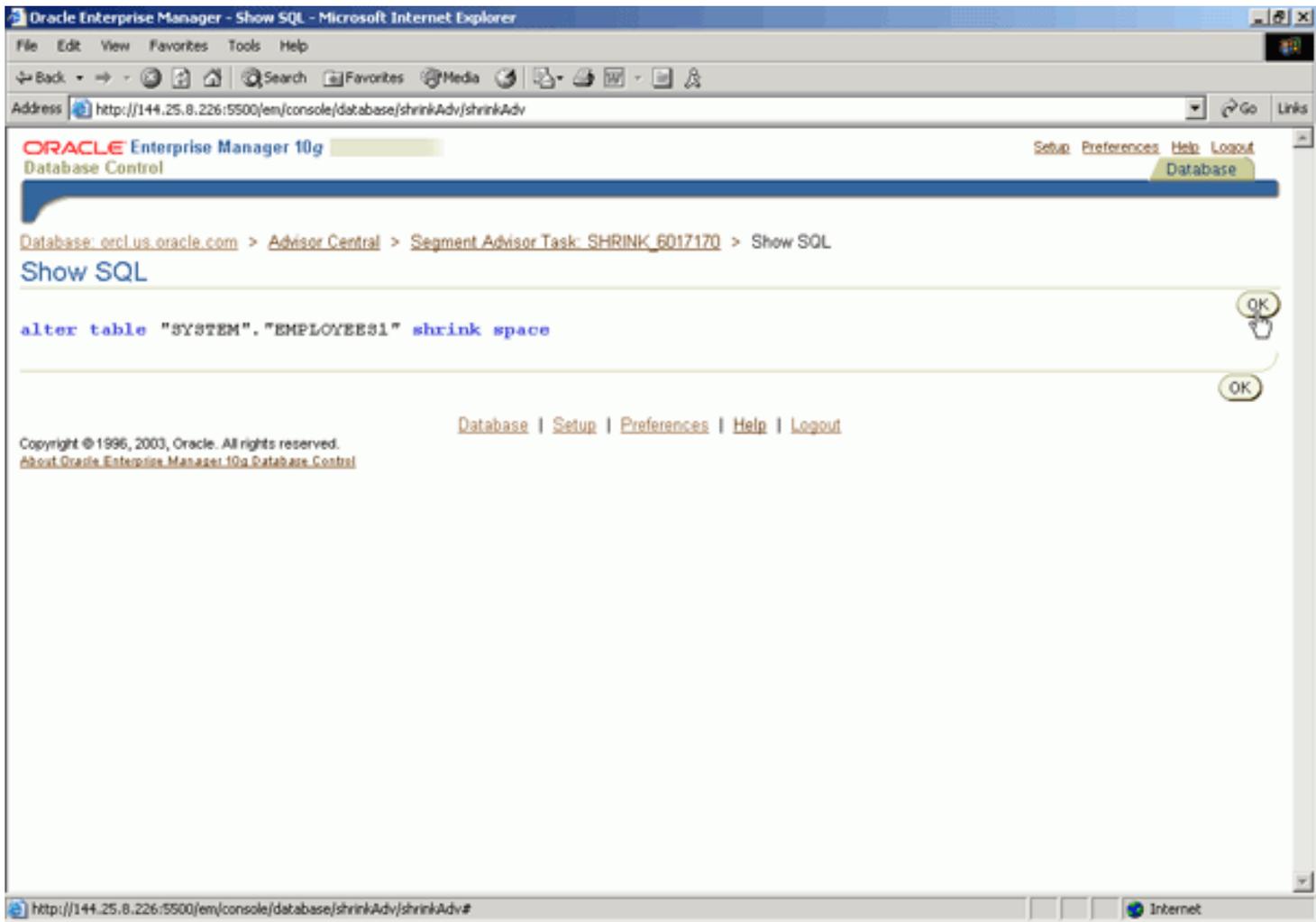
Compact Segments
 Compacting will compact segment data without releasing the recovered space. After compacting the data, the recovered space can be quickly released by running Compact Segments and Release Space.

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Database | Setup | Preferences | Help | Logout

http://144.25.8.226:5500/em/console/database/shrinkAdv/shrinkAdv?task_id=1&event=view_result&advisoryCentralURL=/em/console/dot Internet

8. Click **OK**.



9. Click **Schedule Implementation** .

Oracle Enterprise Manager - Segment Advisor Task: SHRINK_6017170 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://144.25.8.226:5500/em/console/database/shrinkAdv/shrinkAdv>

ORACLE Enterprise Manager 10g Database Control

Setup Preferences Help Logout Database

Database: orcl.us.oracle.com > Advisor Central > Segment Advisor Task: SHRINK_6017170

Segment Advisor Task: SHRINK_6017170

The advisor has determined that the following objects have wasted space. Oracle recommends shrinking these segments to release wasted space. Select the objects to shrink and click Schedule Implementation to schedule the shrink.

Task Name **SHRINK_6017170** Started **Jan 5, 2004 12:17:20 PM**
 Status **COMPLETED** Ended **Jan 5, 2004 12:17:24 PM**
 Advisor Mode **COMPREHENSIVE** Running Time (seconds) **4**
 Time Limit (seconds) **UNLIMITED**

Recommendations

[Show SQL](#) [Schedule Implementation](#)

View Segments Recommended to Shrink
 View other Segments

[Select All](#) | [Select None](#)

Select	Tablespace	Schema	Segment	Partition	Segment Type	Allocated Space (MB)	Used Space (MB)	Reclaimable Space (MB)	Recommendation
<input checked="" type="checkbox"/>	TBSALERT	SYSTEM	EMPLOYEES1		TABLE	14.0	4.068	9.890	Perform shrink, estimated savings is 10370901 bytes.

Shrink Options

Compact Segments and Release Space
 This will first compact the segments and then release the recovered space to the tablespace. During the short space release phase, any cursors referencing this segment may be invalidated and queries on the segment could be disrupted.

Compact Segments
 Compacting will compact segment data without releasing the recovered space. After compacting the data, the recovered space can be quickly released by running Compact Segments and Release Space.

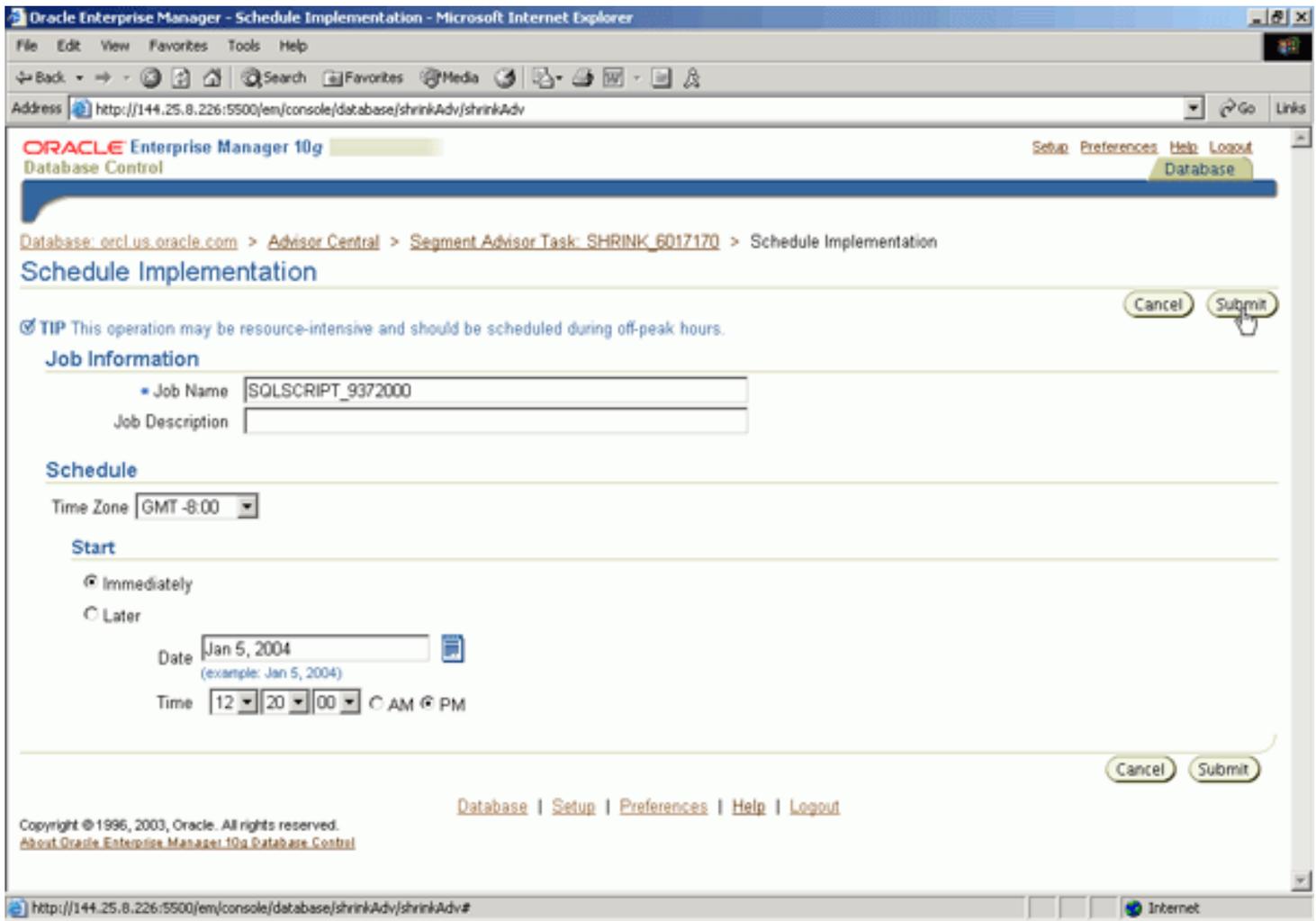
Copyright © 1996, 2003, Oracle. All rights reserved.

Database | Setup | Preferences | Help | Logout

<http://144.25.8.226:5500/em/console/database/shrinkAdv/shrinkAdv#> Internet

Click **Submit**.

10.



Click the **Run History** tab.

11.

Oracle Enterprise Manager (SYS) - Scheduler Jobs - Microsoft Internet Explorer

Address: http://144.25.8.226:5500/em/console/database/instance/schr/jobs?name=SYS&pageName=running&name=SQLSCRIPT_9372000&event=create_ok

ORACLE Enterprise Manager 10g Database Control

Database: orcl.us.oracle.com > Scheduler Jobs Logged in As SYS

Confirmation
Job SYS.SQLSCRIPT_9372000 has been created successfully

Scheduler Jobs Page Refreshed Jan 5, 2004 12:22:03 PM Refresh Create

Scheduled Running Disabled Run History

Edit View Stop Delete

Select	Name	Owner	Start Date	Elapsed Time (seconds)	CPU Used (seconds)	Session ID	Resource Consumer Group	Previous Runs
<input checked="" type="checkbox"/>	SQLSCRIPT_9372000	SYS	Jan 5, 2004 12:22:03 PM -08:00	.64	0	142		0

Scheduled Running Disabled Run History

Database | Setup | Preferences | Help | Logout

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About Oracle Enterprise Manager 10g Database Control

http://144.25.8.226:5500/em/console/database/instance/schr/jobs?pageName=history

The job ended successfully.

12.

The screenshot shows the Oracle Enterprise Manager 10g interface in a Microsoft Internet Explorer browser. The page title is "Oracle Enterprise Manager (SYS) - Scheduler Jobs". The breadcrumb trail is "Database Control > Database > Scheduler Jobs". The page is logged in as SYS. The page was refreshed on Jan 5, 2004 at 12:22:35 PM. There are buttons for "Refresh" and "Create". Below the breadcrumb trail, there are tabs for "Scheduled", "Running", "Disabled", and "Run History". The "Run History" tab is selected. There are buttons for "Purge All Logs", "View", and "Purge Log". The main content area displays a table with the following data:

Select	Name	Owner	Status	Completion Date	Run Duration (minutes)
<input checked="" type="radio"/>	ADV_SHRINK_6017170	SYS	SUCCEEDED	Jan 5, 2004 12:17:24 PM -08:00	0.06
<input type="radio"/>	PURGE_LOG	SYS	SUCCEEDED	Jan 5, 2004 11:42:10 AM -08:00	0.06

At the bottom of the page, there is a footer with the text "Copyright © 1996, 2003, Oracle. All rights reserved. About Oracle Enterprise Manager 10g Database Control". There are also links for "Database", "Setup", "Preferences", "Help", and "Logout".

13. Check to see how much space was actually freed from the tablespace. Click the **Database** breadcrumb then click on the **Tablespaces** link.

The screenshot displays the Oracle Enterprise Manager 10g Database Control interface in a Microsoft Internet Explorer browser window. The browser title is "Oracle Enterprise Manager (SYS) - Database: orcl.us.oracle.com - Microsoft Internet Explorer". The address bar shows the URL: http://144.25.8.226:5500/em/console/database/instance/sitemap?event=doLoad&target=orcl.us.oracle.com&type=oracle_database&pageNum=3. The page header includes "ORACLE Enterprise Manager 10g Database Control" and "Database". The user is logged in as "SYS".

The main navigation menu is expanded to show the "Administration" section, which includes the following categories and links:

- Instance**
 - [Memory Parameters](#)
 - [Undo Management](#)
 - [All Initialization Parameters](#)
- Storage**
 - [Controlfiles](#)
 - [Tablespaces](#)
 - [Datafiles](#)
 - [Rollback Segments](#)
 - [Redo Log Groups](#)
 - [Archive Logs](#)
 - [Temporary Tablespace Groups](#)
- Security**
 - [Users](#)
 - [Roles](#)
 - [Profiles](#)
- Enterprise Manager Administration**
 - [Administrators](#)
 - [Notification Schedule](#)
 - [Blackouts](#)
- Schema**
 - [Tables](#)
 - [Indexes](#)
 - [Views](#)
 - [Synonyms](#)
 - [Sequences](#)
 - [Database Links](#)
 - [Packages](#)
 - [Package Bodies](#)
 - [Procedures](#)
 - [Functions](#)
 - [Triggers](#)
 - [Java Sources](#)
 - [Java Classes](#)
 - [Array Types](#)
 - [Object Types](#)
 - [Table Types](#)
- Warehouse**
 - [Cubes](#)
 - [OLAP Dimensions](#)
 - [Measure Folders](#)
 - [Dimensions](#)
 - [Materialized Views](#)
 - [Materialized View Logs](#)
 - [Refresh Groups](#)
- Configuration Management**
 - [Last Collected Configuration](#)
 - [Database Usage Statistics](#)
- Workload**
 - [Automatic Workload Repository](#)
 - [SQL Tuning Sets](#)
- Resource Manager**
 - [Resource Monitors](#)
 - [Resource Consumer Group Mappings](#)
 - [Resource Consumer Groups](#)
 - [Resource Plans](#)
- Scheduler**
 - [Jobs](#)
 - [Schedules](#)
 - [Programs](#)
 - [Job Classes](#)
 - [Windows](#)
 - [Window Groups](#)

The browser address bar at the bottom shows the URL: <http://144.25.8.226:5500/em/console/database/databaseObjectsSearch?event=search&otype=tablespace&target=orcl.us.oracle.com&type>.

Notice that the TBSALERT tablespace's space usage level has been greatly reduced.

14.

Oracle Enterprise Manager 10g Database Control

Database: orcl.us.oracle.com > Tablespaces

Logged in As SYS

Tablespaces

Search

Name

To run an exact match search or to run a case sensitive search, double quote the search criteria. The wildcard (%) symbol can still be used in a double quoted search string.

Results

Actions

Select	Name	Type	Extent Management	Segment Management	Status	Size (MB)	Used (MB)	Used (%)
<input checked="" type="radio"/>	EXAMPLE	PERMANENT	LOCAL	AUTO	ONLINE	150.000	78.875	52.58
<input type="radio"/>	SYSAUX	PERMANENT	LOCAL	AUTO	ONLINE	230.000	221.313	96.22
<input type="radio"/>	SYSTEM	PERMANENT	LOCAL	MANUAL	ONLINE	440.000	433.188	98.45
<input type="radio"/>	TBSPALERT	PERMANENT	LOCAL	AUTO	ONLINE	20.000	2.563	12.81
<input type="radio"/>	TEMP	TEMPORARY	LOCAL	MANUAL	ONLINE	20.000	17.000	85.00
<input type="radio"/>	UNDOTBS1	UNDO	LOCAL	MANUAL	ONLINE	90.000	50.438	56.04
<input type="radio"/>	USERS	PERMANENT	LOCAL	AUTO	ONLINE	5.000	3.000	60.00

Database | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

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[About Oracle Enterprise Manager 10g Database Control](#)

15. Within about 10 minutes, the tablespace full alert should be removed from the Alerts table on the Home page. To return to the Home page, click on the **Database** breadcrumb then click the **Home** tab. Click the **Refresh** button a few times until the **Tablespace Full** alert is removed.

Oracle Enterprise Manager (SYS) - Database: orcl.us.oracle.com - Microsoft Internet Explorer

Address: http://144.25.8.226:5500/em/console/database/instance/sitemap?event=doLoad&target=orcl.us.oracle.com&type=oracle_database&pageNum=1

ORACLE Enterprise Manager 10g Database Control

Database: orcl.us.oracle.com

Home Performance Administration Maintenance

Page Refreshed Jan 6, 2004 8:37:45 AM Refresh

View Data Manually

General

Status **Up** Shutdown

Up Since **Jan 5, 2004 11:46:30 AM**

Time Zone **Unavailable**

Availability (%) **100**
(Last 24 hours)

Instance Name **orcl**

Version **10.1.0.2.0**

Read Only **No**

Oracle Home [/u01/app/oracle/product/10.1.0](#)

Listener [LISTENER_EDCDR26P1](#)

Host [edcdr26p1.us.oracle.com](#)

Host CPU

Run Queue **0.2**

Paging (pages per second) **0.0**

Active Sessions

No data is currently available.

Active Sessions **Unavailable**

SQL Response Time (%) **93.17**
(compared to baseline)

High Availability

Instance Recovery Time (seconds) **11**

Last Backup **n/a**

Archiving **Disabled**

Archive Area Used (%) **n/a**

Flashback Logging **Disabled**

Space Usage

Database Size (GB) **1**

Problem Tablespaces **0**

Segment Findings **Not Configured**

Policy Violations **0**

Dump Area Used (%) **Unavailable**

Diagnostic Summary

Performance Findings **0**

All Policy Violations **61**

Alert Log **No ORA_errors**

Alerts

Critical **0**