

# 1 表空间数据字典视图

如图，展示了表空间相关的数据字典视图信息：

View	Description
V\$TABLESPACE	Name and number of all tablespaces from the control file.
V\$ENCRYPTED_TABLESPACES	Name and encryption algorithm of all encrypted tablespaces.
DBA_TABLESPACES, USER_TABLESPACES	Descriptions of all (or user accessible) tablespaces.
DBA_TABLESPACE_GROUPS	Displays the tablespace groups and the tablespaces that belong to them.
DBA_SEGMENTS, USER_SEGMENTS	Information about segments within all (or user accessible) tablespaces.
DBA_EXTENTS, USER_EXTENTS	Information about data extents within all (or user accessible) tablespaces.
DBA_FREE_SPACE, USER_FREE_SPACE	Information about free extents within all (or user accessible) tablespaces.
DBA_TEMP_FREE_SPACE	Displays the total allocated and free space in each temporary tablespace.
V\$DATAFILE	Information about all data files, including tablespace number of owning tablespace.
V\$TEMPFILE	Information about all temp files, including tablespace number of owning tablespace.
DBA_DATA_FILES	Shows files (data files) belonging to tablespaces.
DBA_TEMP_FILES	Shows files (temp files) belonging to temporary tablespaces.
V\$TEMP_EXTENT_MAP	Information for all extents in all locally managed temporary tablespaces.
V\$TEMP_EXTENT_POOL	For locally managed temporary tablespaces: the state of temporary space cached and used for by each instance.
V\$TEMP_SPACE_HEADER	Shows space used/free for each temp file.
DBA_USERS	Default and temporary tablespaces for all users.
DBA_TS_QUOTAS	Lists tablespace quotas for all users.
V\$SORT_SEGMENT	Information about every sort segment in a given instance. The view is only updated when the tablespace is of the TEMPORARY type.
V\$TEMPSEG_USAGE	Describes temporary (sort) segment usage by user for temporary or permanent tablespaces.

## 2 创建表空间

### 2.1 本地管理的表空间

```
SQL> set linesize 200
```

```
SQL> create tablespace test1 datafile '/u01/app/oracle/oradata/orcl/test01.dbf' size 50M;
```

Tablespace created.

```
SQL> select
```

```
tablespace_name,block_size,contents,extent_management,segment_space_management from  
dba_tablespaces;
```

```
TABLESPACE_NAME          BLOCK_SIZE CONTENTS  EXTENT_MAN  SEGMENT_MAN  
-----  
SYSTEM                   8192 PERMANENT LOCAL    MANUAL
```

SYSAUX	8192 PERMANENT LOCAL	AUTO
UNDOTBS1	8192 UNDO LOCAL	MANUAL
TEMP	8192 TEMPORARY LOCAL	MANUAL
USERS	8192 PERMANENT LOCAL	AUTO
EXAMPLE	8192 PERMANENT LOCAL	AUTO
TEST1	8192 PERMANENT LOCAL	AUTO

7 rows selected.

创建表空间方式不指定段、区管理方式，采用默认。

```
SQL> create tablespace test2 datafile '/u01/app/oracle/oradata/orcl/test02.dbf' size 100M
extent management local segment space management auto;
```

Tablespace created.

```
SQL> select
tablespace_name,block_size,contents,extent_management,segment_space_management from
dba_tablespaces;
```

TABLESPACE_NAME	BLOCK_SIZE	CONTENTS	EXTENT_MAN	SEGMENT
SYSTEM	8192 PERMANENT LOCAL	MANUAL		
SYSAUX	8192 PERMANENT LOCAL	AUTO		
UNDOTBS1	8192 UNDO LOCAL	MANUAL		
TEMP	8192 TEMPORARY LOCAL	MANUAL		
USERS	8192 PERMANENT LOCAL	AUTO		
EXAMPLE	8192 PERMANENT LOCAL	AUTO		
TEST1	8192 PERMANENT LOCAL	AUTO		
TEST2	8192 PERMANENT LOCAL	AUTO		

8 rows selected.

## 2.2 临时表空间

### 2.2.1 查看系统默认临时表空间

```
SQL> col property_name for a40
```

```
SQL> col property_value for a50
```

```
SQL> select property_name,property_value FROM database_properties where
property_name='DEFAULT_TEMP_TABLESPACE';
```

PROPERTY_NAME	PROPERTY_VALUE
---------------	----------------

DEFAULT_TEMP_TABLESPACE	TEMP
-------------------------	------

### 2.2.2 创建临时表空间

```
SQL> create temporary tablespace temp1 tempfile '/u01/app/oracle/oradata/orcl/test1_01.dbf'  
size 100M;
```

Tablespace created.

### 2.2.3 修改默认临时表空间

```
SQL> alter database default temporary tablespace temp1;
```

Database altered.

```
SQL> select property_name,property_value FROM database_properties where  
property_name='DEFAULT_TEMP_TABLESPACE';
```

PROPERTY_NAME	PROPERTY_VALUE
---------------	----------------

DEFAULT_TEMP_TABLESPACE	TEMP1
-------------------------	-------

## 2.3 临时表空间组

### 2.3.1 创建临时表空间组

```
SQL> create temporary tablespace temp2 tempfile  
'/u01/app/oracle/oradata/orcl/temp2_01.dbf' size 100M tablespace group group1;
```

Tablespace created.

```
SQL> alter tablespace temp1 tablespace group group1;
```

Tablespace altered.

```
SQL> select * FROM dba_tablespace_groups;
```

GROUP_NAME	TABLESPACE_NAME
GROUP1	TEMP1
GROUP1	TEMP2

### 2.3.2 将表空间从表空间组移除

```
SQL> alter tablespace temp1 tablespace group '';
```

Tablespace altered.

```
SQL> select * FROM dba_tablespace_groups;
```

GROUP_NAME	TABLESPACE_NAME
GROUP1	TEMP2

### 2.3.3 指定临时表空间组作为默认的临时表空间

```
SQL> alter database default temporary tablespace group1;
```

Database altered.

```
SQL> select property_name,property_value FROM database_properties where
property_name='DEFAULT_TEMP_TABLESPACE';
```

PROPERTY_NAME	PROPERTY_VALUE
DEFAULT_TEMP_TABLESPACE	GROUP1

## 3 指定表空间非标准块大小

通过指定表空间非标准块大小这一特性可以在数据库之间传输不同块大小的表空间。

```
SQL> create tablespace test3 datafile '/u01/app/oracle/oradata/orcl/test3_01.dbf' size 50M
blocksize 16K;
create tablespace test3 datafile '/u01/app/oracle/oradata/orcl/test3_01.dbf' size 50M blocksize
16K
*
```

ERROR at line 1:

ORA-29339: tablespace block size 16384 does not match configured block sizes

```
SQL> alter system set db_16k_cache_size=16K;
```

System altered.

```
SQL> create tablespace test3 datafile '/u01/app/oracle/oradata/orcl/test3_01.dbf' size 50M
blocksize 16K;
```

Tablespace created.

```
SQL> select
tablespace_name,block_size,contents,extent_management,segment_space_management from
dba_tablespaces where tablespace_name='TEST3';
```

TABLESPACE_NAME	BLOCK_SIZE	CONTENTS	EXTENT_MAN	SEGMENT
TEST3	16384	PERMANENT	LOCAL	AUTO

默认情况下，标准块是8192，如果创建非标准块大小的表空间，需要指定DB\_nK\_CACHE\_SIZE初始化参数并且指定BLOCKSIZE，否则出错（ORA-29339: tablespace block size 16384 does not match configured block sizes）。

## 4 控制重做日志的写入

```
SQL> alter tablespace test3 nologging;
```

Tablespace altered.

```
SQL> select
tablespace_name,block_size,contents,extent_management,segment_space_management,logging
from dba_tablespaces where tablespace_name='TEST3';
```

TABLESPACE_NAME	BLOCK_SIZE	CONTENTS	EXTENT_MAN	SEGMENT	LOGGING
TEST3	16384	PERMANENT	LOCAL	AUTO	NOLOGGING

# 5 修改表空间的可用性

## 5.1 表空间离线

```
SQL> alter tablespace test2 offline;
```

Tablespace altered.

```
SQL> select  
tablespace_name,block_size,contents,extent_management,segment_space_management,status  
from dba_tablespaces where tablespace_name='TEST2';
```

```
TABLESPACE_NAME          BLOCK_SIZE CONTENTS  EXTENT_MAN  SEGMENT_SPACE_MANAGEMENT STATUS  
-----  
TEST2                    8192 PERMANENT LOCAL    AUTO  OFFLINE
```

OFFLINE对应的选项有以下三种，分别为：

Clause	Description
NORMAL	A tablespace can be taken offline normally if no error conditions exist for any of the data files of the tablespace. No data file in the tablespace can be currently offline as the result of a write error. When you specify <code>OFFLINE NORMAL</code> , the database takes a checkpoint for all data files of the tablespace as it takes them offline. <code>NORMAL</code> is the default.
TEMPORARY	A tablespace can be taken offline temporarily, even if there are error conditions for one or more files of the tablespace. When you specify <code>OFFLINE TEMPORARY</code> , the database takes offline the data files that are not already offline, checkpointing them as it does so.  If no files are offline, but you use the temporary clause, media recovery is not required to bring the tablespace back online. However, if one or more files of the tablespace are offline because of write errors, and you take the tablespace offline temporarily, the tablespace requires recovery before you can bring it back online.
IMMEDIATE	A tablespace can be taken offline immediately, without the database taking a checkpoint on any of the data files. When you specify <code>OFFLINE IMMEDIATE</code> , media recovery for the tablespace is required before the tablespace can be brought online. You cannot take a tablespace offline immediately if the database is running in <code>NOARCHIVELOG</code> mode.

## 5.2 表空间在线

```
SQL> alter tablespace test2 online;
```

Tablespace altered.

```
SQL> select  
tablespace_name,block_size,contents,extent_management,segment_space_management,status  
from dba_tablespaces where tablespace_name='TEST2';
```

```
TABLESPACE_NAME          BLOCK_SIZE CONTENTS  EXTENT_MAN  SEGMENT_SPACE_MANAGEMENT STATUS  
-----
```

TEST2

8192 PERMANENT LOCAL AUTO ONLINE

## 6 只读表空间

### 6.1 设置表空间为只读

```
SQL> alter tablespace test2 read only;
```

Tablespace altered.

```
SQL> select  
tablespace_name,block_size,contents,extent_management,segment_space_management,status  
from dba_tablespaces where tablespace_name='TEST2';
```

TABLESPACE_NAME	BLOCK_SIZE	CONTENTS	EXTENT_MAN	SEGMENT_SPACE_MANAGEMENT	STATUS
TEST2	8192	PERMANENT LOCAL	AUTO	READ ONLY	

### 6.2 设置表空间为读写

```
SQL> alter tablespace test2 read write;
```

Tablespace altered.

```
SQL> select  
tablespace_name,block_size,contents,extent_management,segment_space_management,status  
from dba_tablespaces where tablespace_name='TEST2';
```

TABLESPACE_NAME	BLOCK_SIZE	CONTENTS	EXTENT_MAN	SEGMENT_SPACE_MANAGEMENT	STATUS
TEST2	8192	PERMANENT LOCAL	AUTO	ONLINE	

## 7 修改和维护表空间

### 7.1 增加表空间大小

增加表空间的大小主要通过增加数据文件的大小或者向其增加数据文件。

### 7.1.1 增加数据文件

```
SQL> alter tablespace test2 add datafile '/u01/app/oracle/oradata/orcl/test021.dbf' size 100M;
```

Tablespace altered.

```
SQL> SELECT TABLESPACE_NAME, BYTES / 1024 / 1024 SIZE_M FROM DBA_DATA_FILES;
```

TABLESPACE_NAME	SIZE_M
SYSTEM	800
SYSAUX	690
EXAMPLE	1243.75
USERS	5
TEST1	50
UNDOTBS1	155
TEST2	100
TEST3	50
TEST2	100

9 rows selected.

### 7.1.2 数据文件自动扩展

```
SQL> alter database datafile '/u01/app/oracle/oradata/orcl/test021.dbf' autoextend on;
```

Database altered.

### 7.1.3 重设数据文件大小

```
SQL> alter database datafile '/u01/app/oracle/oradata/orcl/test021.dbf' resize 200M;
```

Database altered.

```
SQL> SELECT TABLESPACE_NAME, BYTES / 1024 / 1024 SIZE_M FROM DBA_DATA_FILES;
```

TABLESPACE_NAME	SIZE_M
SYSTEM	800

SYSAUX	690
UNDOTBS1	155
USERS	5
EXAMPLE	1243.75
TEST1	50
TEST2	200
TEST2	100
TEST3	50

9 rows selected.

## 7.2 修改本地管理的表空间

主要有以下操作：

- 增加数据文件；
- 修改表空间可用性 (online/offline) ；
- 修改表空间的读写属性 (read-only/read write) ；
- 重命名数据文件以及修改数据文件的可扩展性 (Autoextend on/off) ；

## 7.3 修改本地管理的临时表空间

主要有以下操作：

- 增加临时文件；
- 修改表空间可用性 (online/offline) ；

### 7.3.1 增加临时文件

```
SQL> alter tablespace temp1 add tempfile '/u01/app/oracle/oradata/orcl/test1_02.dbf' size 100M;
```

Tablespace altered.

```
SQL> col file_name for a50
```

```
SQL> SELECT FILE_NAME, TABLESPACE_NAME, STATUS FROM DBA_TEMP_FILES;
```

FILE_NAME	TABLESPACE_NAME	STATUS
/u01/app/oracle/oradata/orcl/temp01.dbf	TEMP	ONLINE
/u01/app/oracle/oradata/orcl/test1_01.dbf	TEMP1	ONLINE
/u01/app/oracle/oradata/orcl/temp2_01.dbf	TEMP2	ONLINE

/u01/app/oracle/oradata/orcl/test1\_02.dbf    TEMP1                    ONLINE

### 7.3.2 临时表空间离线

```
SQL> alter tablespace temp1 tempfile offline;
```

Tablespace altered.

### 7.3.3 临时表空间在线

```
SQL> alter tablespace temp1 tempfile online;
```

Tablespace altered.

不能将临时表空间离线或在线，只能将表空间的文件在线或离线。

### 7.3.4 临时文件离线

```
SQL> alter database tempfile '/u01/app/oracle/oradata/orcl/test1_02.dbf' offline;
```

Database altered.

```
SQL> SELECT FILE_NAME, TABLESPACE_NAME, STATUS FROM DBA_TEMP_FILES;
```

FILE_NAME	TABLESPACE_NAME	STATUS
/u01/app/oracle/oradata/orcl/temp01.dbf	TEMP	ONLINE
/u01/app/oracle/oradata/orcl/test1_01.dbf	TEMP1	ONLINE
/u01/app/oracle/oradata/orcl/temp2_01.dbf	TEMP2	ONLINE
/u01/app/oracle/oradata/orcl/test1_02.dbf	TEMP1	OFFLINE

### 7.3.5 临时文件在线

```
SQL> alter database tempfile '/u01/app/oracle/oradata/orcl/test1_02.dbf' online;
```

Database altered.

### 7.3.6 重置临时文件大小

```
SQL> alter database tempfile '/u01/app/oracle/oradata/orcl/test1_02.dbf' resize 50M;
```

Database altered.

### 7.3.7 删除临时文件

```
SQL> alter database tempfile '/u01/app/oracle/oradata/orcl/test1_02.dbf' drop including
datafiles;
```

Database altered.

```
SQL> SELECT FILE_NAME, TABLESPACE_NAME, STATUS FROM DBA_TEMP_FILES;
```

FILE_NAME	TABLESPACE_NAME	STATUS
/u01/app/oracle/oradata/orcl/temp01.dbf	TEMP	ONLINE
/u01/app/oracle/oradata/orcl/test1_01.dbf	TEMP1	ONLINE
/u01/app/oracle/oradata/orcl/temp2_01.dbf	TEMP2	ONLINE

## 7.4 收缩本地管理的临时表空间

### 7.4.1 收缩表空间

```
SQL> alter tablespace temp1 shrink space keep 50M;
```

Tablespace altered.

### 7.4.2 收缩临时文件

```
SQL> alter tablespace temp1 shrink tempfile '/u01/app/oracle/oradata/orcl/test1_01.dbf';
```

Tablespace altered.

## 8 重命名表空间

### 8.1 重命名永久表空间

```
SQL> alter tablespace test2 rename to test2_R;
```

Tablespace altered.

## 8.2 重命名临时表空间

```
SQL> alter tablespace temp1 rename to temp11;
```

Tablespace altered.

## 9 删除表空间

```
SQL> create table test(id number,name varchar2(100)) tablespace test2_r;
```

Table created.

```
SQL> drop tablespace test2_r;
```

```
drop tablespace test2_r
```

```
*
```

```
ERROR at line 1:
```

```
ORA-01549: tablespace not empty, use INCLUDING CONTENTS option
```

```
SQL> drop tablespace test2_r including contents;
```

Tablespace dropped.

如果表空间中有对应的对象时，需指定INCLUDING CONTENTS，否则出错，如上所示，这种方式只是删除数据字典信息，数据文件依然存在，需手动删除。

```
SQL> create tablespace test2 datafile '/u01/app/oracle/oradata/orcl/test20.dbf' size 50M;
```

Tablespace created.

```
SQL> create table test(id number,name varchar2(100)) tablespace test2;
```

Table created.

```
SQL> ho ls /u01/app/oracle/oradata/orcl/test20.dbf
```

```
/u01/app/oracle/oradata/orcl/test20.dbf
```

```
SQL> drop tablespace test2 including contents and datafiles;
```

Tablespace dropped.

```
SQL> ho ls /u01/app/oracle/oradata/orcl/test20.dbf
```

```
ls: cannot access /u01/app/oracle/oradata/orcl/test20.dbf: No such file or directory
```

使用including contents and datafiles可以删除数据字典的同时，删除数据文件。