Agenda – Flashback Data Archive

- Why we need Historical Data
- Pre-11g methods for Historical data
- Oracle Total Recall overview
- FDA Architecture
- Creating and Enabling FDA
- Managing FDA
- DDL Restrictions
- FDA Monitoring Views
- Q&A
Why we need to Historical Data?

- Laws and regulations mandate data for long retention periods - SOX, HIPAA, PCI...
- Non compliance can results
  - Fines
  - Loss of investor and customer confidence
  - Business reputation
- Historical data helps
  - Analysing Market Trends
  - Customer Behaviour like Month of Travel, Month of Shopping....
Historical Data Requirement?

- Should be Secure
- Should be Tamper proof
- Ease of Use - with no Application Code/Interface changes
- Should be captured with least performance overhead
- Efficient Storage Utilization like Compressed
- Should be easily manageable
  - Accessibility
  - Retention
  - Purging
Managing Historical Data - Options

- Application or Mid-tier level
  - Combines business logic and archive policies
  - Increases complexity
  - No centralized management
  - Data integrity issues if underlying data is updated directly
- Database level
  - Enabled using Triggers
  - Significant performance and maintenance overhead
- External or Third-party
  - Mine redo logs
  - History stored in separate database
  - Cannot seamlessly query OLTP and history data
- None of the above approaches meet all customer requirements
  - Customers are therefore forced to make significant compromises
Flashback Issue before Total Recall

SQL> SELECT ... AS OF TIMESTAMP ...
**ORA-01466**: unable to read data – table definition has changed

OR

**ORA-08180**: no snapshot found based on specified time

OR

**ORA-01555**: snapshot too old: rollback segment number 7 with name "_SYSSMU7$" too small

**Depends on Various parameters for UNDO and FLASHBACK**

**UNDO_RETENTION**
**DB_RECOVERY_FILE_DEST_SIZE**
**DB_RECOVERY_FILE_DEST**
Oracle Flashback Enhancements

Flashback Query → Flashback Version Query → Flashback Table → Flashback Database → Flashback Data Archive
Flashback Transaction Backout

What is **Oracle Total Recall**?

- Utilizing Flashback Data Archive (FDA) to retrieve historical data
- FDA is Repository created on top of Tablespace
- Tracks and Stores all transactional changes to a “tracked”
- Separate Licensed option in 11g

**Flexible - Retention Time**

**Logical Container - Stored in the Database**

**Automated data management - No Application Code Change and easy to configure**

**Secure - Tamper proof from update/Delete**

**Historical Data - Access using “AS OF” queries**

**Background process - Flashback Data Archive [ora_fbda_SID]**

**Apply to one or group of tables with simple ENABLE ARCHIVE Clause**

**Capture data asynchronously - Low Performance overhead**

**Keep the data Partitioned and Compressed**
Flashback Data Archive - Benefits

- Compliance
- Audit Reports
- Data Analysis
- Decision Support Systems
- Retention Policy Enforcement - Purge Older Records automatically
- Error Recovery

Benefits:
Audit, Compliance, Historical reports, Error Recovery
Flashback Data Archive - Architecture

- **DML Changes Used by FBDA**
- **UNDO Data**
- **UNDO Tablespace**
- **FBDA Slaves.....**

**Flashback Data Archive**
FBDA – New background process

FBDA Process

1. Captured row asynchronously
2. Run at Self - tuned Intervals
3. Default is every 5 Min
4. The entire base table row that is updated is stored in history table, no matter how many Columns are updated
5. Up to ten flashback archiver slaves can be called upon by the fbda process
6. If the flashback archive process and slaves are too busy, archiving may be performed inline, which significantly affects the user’s response time

UNDO Tablespace

Old Values

BUFFER CACHE

DML Changes Used by FBDA

UNDO Data

FBDA

HELP

FBDA Slaves.....

TABLESPACE

TABLESPACE

TABLESPACE

FLASHBACK DATA ARCHIVE

History

Data

TABLESPACE

TABLESPACE

TABLESPACE
History or archive tables:

1. Compressed storage
2. Automatic Partitioned based on Time & Volume
3. Automatic Purging
4. Unrelated partitions skipped by Queries and so fast access to data
5. Tamper Proof
6. Efficient storage and retrieval of UNDO
7. View Data, Version of rows as of any time
8. Control data retention time
9. Each flashback archive partition is at least 1 day and 1 MB of data, partitioned on ENDSCN
10. Undo on tracked tables not recycled until history is archived
11. INSERTs do not generate history records
FDA Preparation Workflow

- Create Tablespace to Store the FDA history data - ASSM [Default]
- Assign Privileges
- Create Flashback Data Archive with
- Enable FDA at Table Level [ Default is DISABLED ]
- Monitor FDA
Create the Tablespace to be used by FDA history data
SQL> CREATE TABLESPACE fbda
    
    DATAFILE '/u01/oradata/TEST/tbsp_fdba01.dbf' SIZE 100M;

Grant SYSTEM Privileges to allow to create FDA
SQL> GRANT FLASHBACK ARCHIVE ADMINISTER TO FDA_ADMIN;
Or
SYSDBA is required

Grant OBJECT Privileges to allow to create FDA
SQL> GRANT FLASHBACK ARCHIVE ON <FBDA_FDA> TO <SCOTT>;;
FDA Workflow - Privileges

FLASHBACK ARCHIVE ADMINISTER

- New SYSTEM Privilege to manage FDA
- It allows
  - Create New FDA
  - Modify Existing FDA
  - Making a specific FDA as DEFAULT
  - Set the RETENTION time
  - Add/Remove Tablespaces
  - Ad-Hoc Purge of history Data
- Disable tracking for Tracked Tables
- Drop FDA

FLASHBACK ARCHIVE

- New OBJECT Privilege for enabling tracking on Tables for FDA
Create the FDA

SQL> CREATE FLASHBACK ARCHIVE fbda_1
    TABLESPACE fbda
    QUOTA 1M -- Can specify M | G | T | P
    RETENTION 5 DAY; -- Can specify DAY | MONTH | YEAR

You can optionally specify the default Flashback Data Archive for the system

SQL> ALTER FLASHBACK ARCHIVE fbda_1
    SET DEFAULT;

SQL> CREATE FLASHBACK ARCHIVE DEFAULT fbda_2
    TABLESPACE fbda
    RETENTION 5 YEAR;

SQL> SELECT FLASHBACK_ARCHIVE_NAME, STATUS FROM
    DBA_FLASHBACK_ARCHIVE;
FLASHBACK_ARCHIVE_NAME  Status
------------------------  ----------
FBDA_1                   DEFAULT
Grant FDA to Database user

```sql
SQL> GRANT FLASHBACK ARCHIVE ON fbda_1 TO SCOTT;
```

Identify the user who has Flashback data Archive privileges

```sql
SQL> SELECT FA#, USER# FROM SYS_FBA_USERS;
FA# USER#
---------- -------
1          86
1          87

SQL> SELECT a.username, b.flashback_archive_name
FROM dba_users a, dba_flashback_archive b, SYS_FBA_USERS c
WHERE a.user_id=c.USER# AND
b.FLASHBACK_ARCHIVE#=c.fa#;
USERNAME             FLASHBACK_ARCHIVE_NAME
----------------------- -----------------------
INDY               FBDA_1
FDA_USER           FBDA_1
Create Table syntax to enable the Flashback Data Archive
SQL> CREATE TABLE TEST_TBL1
    (        
     Ename VARCHAR2(20)
    )
FLASHBACK ARCHIVE;

ALTER CREATE Table syntax to enable the Flashback Data Archive
SQL> ALTER TABLE TEST_TBL2
FLASHBACK ARCHIVE fbda_1;

Default Flashback Data Archive is used if it is not Specified
SQL> ALTER TABLE TEST_TBL3
FLASHBACK ARCHIVE;

If there is no Default Flashback Data Archive
SQL> ALTER TABLE TEST_TBL3 FLASHBACK ARCHIVE;
ORA-55608: Default Flashback Archive does not exist
History Table assigned for FDA Enable Tables

SQL> SELECT TABLE_NAME,
         FLASHBACK_ARCHIVE_NAME,
         ARCHIVE_TABLE_NAME
         FROM USER_FLASHBACK_ARCHIVE_TABLES
         WHERE TABLE_NAME='TEST_TBL1';

<table>
<thead>
<tr>
<th>TABLE_NAME</th>
<th>FLASHBACK_ARCHIVE_NAME</th>
<th>ARCHIVE_TABLE_NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST_TBL1</td>
<td>FBDA_2</td>
<td>SYS_FBA_HIST_73535</td>
</tr>
</tbody>
</table>

SQL> SELECT TABLE_NAME FROM USER_TABLES;

<table>
<thead>
<tr>
<th>TABLE_NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST_TBL1</td>
</tr>
</tbody>
</table>
Perform DML on Table until Flashback Archive tables are Created

After the UNDO is pushed to flashback archive, or after you issue a command do query past data, Oracle will create all the physical objects shown in next page

History Tables/Indexes create for FDA Enable Tables

SQL> SELECT OBJECT_NAME.OBJECT_TYPE, OBJECT_ID FROM USER_OBJECTS
OBJECT_NAME                  OBJECT_TYPE  OBJECT_ID
------------------------------ -------------------- =============
TEST_TBL1                     TABLE        73414
SYS_FBA_DDL_COLMAP_73414      TABLE        73415
SYS_FBA_HIST_73414           TABLE PARTITION 73417
SYS_FBA_HIST_73414           TABLE        73416
SYS_FBA_TCRV_73414           TABLE        73420
SYS_FBA_TCRV_IDX_73414       INDEX        73421
### FDA – INTERNALS

SQL> SELECT owner, tablespace_name, table_name, temporary
    FROM dba_tables WHERE table_name LIKE '%FBA%'

<table>
<thead>
<tr>
<th>OWNER</th>
<th>TABLESPACE</th>
<th>TABLE_NAME</th>
<th>TEMPORARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYS</td>
<td>SYSTEM</td>
<td>SYS_FBA_FA</td>
<td>N</td>
</tr>
<tr>
<td>SYS</td>
<td>SYSTEM</td>
<td>SYS_FBA_TSFA</td>
<td>N</td>
</tr>
<tr>
<td>SYS</td>
<td>SYSTEM</td>
<td>SYS_FBA_BARRIERSCN</td>
<td>N</td>
</tr>
<tr>
<td>SYS</td>
<td>SYSTEM</td>
<td>SYS_FBA_TRACKEDTABLES</td>
<td>N</td>
</tr>
<tr>
<td>SYS</td>
<td>SYSTEM</td>
<td>SYS_FBA_PARTITIONS</td>
<td>N</td>
</tr>
<tr>
<td>SYS</td>
<td>SYSTEM</td>
<td>SYS_FBA_USERS</td>
<td>N</td>
</tr>
<tr>
<td>SYS</td>
<td>SYSTEM</td>
<td>SYS_FBA_DL</td>
<td>N</td>
</tr>
<tr>
<td>INDY</td>
<td>FBDA</td>
<td>SYS_FBA_DDL_COLMAP_73519</td>
<td>N</td>
</tr>
<tr>
<td>INDY</td>
<td>FBDA</td>
<td>SYS_FBA_TCRV_73519</td>
<td>N</td>
</tr>
<tr>
<td>INDY</td>
<td></td>
<td>SYS_FBA_HIST_73519</td>
<td>N</td>
</tr>
<tr>
<td>SYS</td>
<td></td>
<td>SYS_MFBA_NHIST_73519</td>
<td>Y</td>
</tr>
<tr>
<td>SYS</td>
<td></td>
<td>SYS_MFBA_STAGE_RID</td>
<td>Y</td>
</tr>
<tr>
<td>SYS</td>
<td></td>
<td>SYS_MFBA_TRACKED_TXN</td>
<td>Y</td>
</tr>
<tr>
<td>SYS</td>
<td></td>
<td>SYS_MFBA_NROW</td>
<td>Y</td>
</tr>
<tr>
<td>SYS</td>
<td></td>
<td>SYS_MFBA_NCHANGE</td>
<td>Y</td>
</tr>
<tr>
<td>SYS</td>
<td></td>
<td>SYS_MFBA_NTCRV</td>
<td>Y</td>
</tr>
</tbody>
</table>

SQL> SELECT message FROM V$SESSION_LONGOPS
Table Scan: SYS.SYS_MFBA_STAGE_RID: 346365 out of 393834 Blocks done
SQL> SELECT TABLE_NAME FROM USER_TABLES
2 WHERE TABLE_NAME LIKE '%FBA%';

<table>
<thead>
<tr>
<th>TABLE_NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYS_FBA_DDL_COLMAP_73527</td>
</tr>
<tr>
<td>SYS_FBA_TCRV_73527</td>
</tr>
<tr>
<td>SYS_FBA_HIST_73527</td>
</tr>
</tbody>
</table>

SQL> SELECT TABLE_NAME, PARTITION_NAME, COMPRESSION
FROM USER_TAB_PARTITIONS;

<table>
<thead>
<tr>
<th>TABLE_NAME</th>
<th>PARTITION_NAME</th>
<th>COMPRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYS_FBA_HIST_73527</td>
<td>HIGH_PART</td>
<td>ENABLED</td>
</tr>
</tbody>
</table>

SQL> SELECT TABLE_NAME, PARTITIONING_TYPE, PARTITION_COUNT
FROM USER_PART_TABLES;

<table>
<thead>
<tr>
<th>TABLE_NAME</th>
<th>PARTITIONING_TYPE</th>
<th>PARTITION_COUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYS_FBA_HIST_73527</td>
<td>RANGE</td>
<td>1</td>
</tr>
</tbody>
</table>
Monitoring the FDA Data

SQL> SELECT ... AS OF TIMESTAMP ......
SQL> SELECT ... AS OF SCN ....
SQL> SELECT ... VERSIONS BETWEEN TIMESTAMP and TIMESTAMP......

SQL> SELECT count(*) FROM TEST_TBL
    AS OF TIMESTAMP
to_timestamp ('2009-12-17 11:10:00', 'yyyy-mm-dd hh24:mi:ss');

SQL> SELECT * FROM TEST_TBL2
    VERSIONS BETWEEN TIMESTAMP
TO_TIMESTAMP('2010-01-01 01:08', 'yyyy-mm-dd h24:mi') AND
TO_TIMESTAMP('2010-02-27 01:08', 'yyyy-mm-dd hh24:mi')
Adding Space
SQL> ALTER FLASHBACK ARCHIVE fla1
    ADD TABLESPACE tbs3 QUOTA 5G;

Removing Space
SQL> ALTER FLASHBACK ARCHIVE fla1  REMOVE TABLESPACE tbs3;
   - Cannot Remove Last Tablespace
   - If contains any History Table within Retention period, then data will be dropped as well

SQL> ALTER FLASHBACK ARCHIVE fba1
    MODIFY TABLESPACE his_data_1
         QUOTA 250M;
Flashback archive altered.

SQL> ALTER FLASHBACK ARCHIVE fba1 MODIFY RETENTION 1 DAY;
Flashback archive altered.

SQL> DROP FLASHBACK ARCHIVE fba1;
Flashback archive dropped.
FDA – Purging

- Automatic purging happens one day after retention expiry
  - Manual purging can also be performed by a user with FLASHBACK ADMINISTER privilege
- Purge all historical data from Flashback Data Archive fda1:
  SQL> ALTER FLASHBACK ARCHIVE fda1 PURGE ALL;

- Purge all historical data older than one day from Flashback Data Archive fda1:
  SQL> ALTER FLASHBACK ARCHIVE fda1 PURGE BEFORE TIMESTAMP (SYSTIMESTAMP - INTERVAL '1' DAY);

  PURGE ALL | PURGE BEFORE SCN | PURGE BEFORE TIMESTAMP

- Purge all historical data older than SCN 528967 from Flashback Data Archive fda1:
  SQL> ALTER FLASHBACK ARCHIVE fda1 PURGE BEFORE SCN 528967
  SQL> SELECT COUNT(*) FROM sys_fba_hist_70537;
FDA – Space Management

What happens when your flashback data archive gets full?

- Raise either an ORA-55617 or ORA-55623 error
  55623, 00000, "Flashback Archive "%s\" is blocking and tracking on all tables is suspended"
  // *Cause: Flashback archive tablespace has run out of space.
  // *Action: Add tablespace or increase tablespace quota for the flashback archive.

  55617, 00000, "Flashback Archive "%s\" runs out of space and tracking on "%s\" is suspended"
  // *Cause: Flashback archive tablespace quota is running out.
  // *Action: Add tablespace or increase tablespace quota for the flashback archive.

- An alert log entry is added, stating that “Flashback archive XXX is full, and Archiving/Tracking is suspended

- Tracking suspended when 90% of the assigned space has been used

Resolution

- Increase the FBDA’s QUOTA for underlying tablespace
- Increase the tablespace with RESIZE or ADD DATAFILE
DDL on FDA enabled Tables

Supported DDL Statements

- Adds | Drops | Renames | Modifies a Column
- Adds | Drops | Renames a Constraint
- Drops | Truncates a Partition or Subpartition
- TRUNCATE TABLE statement
- RENAME TABLE statement
- Performs a PARTITION or SUBPARTITION operation

UN-Supported DDL Statements

- ALTER TABLE statement that moves or exchanges a partition or subpartition
- DROP TABLE statement
Comparing DDL on 11g R1 vs R2

SQL> TRUNCATE TABLE test_tbl;
ORA-55610: Invalid DDL statement on history-tracked table

SQL> TRUNCATE TABLE test_tbl;
Table truncated.

SQL> ALTER TABLE test_tbl MODIFY (name VARCHAR2(10));
ORA-55610: Invalid DDL statement on history-tracked table

SQL> ALTER TABLE test_tbl MODIFY (name VARCHAR2(20));
Table altered.

Same on Both Version
SQL> DROP TABLE ht_emp;
ORA-55610: Invalid DDL statement on history-tracked table
Use **DISASSOCIATE_FBA** procedure - To disable FDA to allow complex DDL like split tables

Execute changes to both the base table and the corresponding archive.

User **REASSOCIATE_FBA** procedure - To reassociate the Flashback Data Archive with the base table

Make sure the schemas must be the same for the base and the history table

Require **FLASHBACK ARCHIVE ADMINISTER** privilege

Used with care as re-enabling FDA can no longer be immutable as history could have been altered during the time of disassociation
### FDA – DBMS_FLASHBACK_ARCHIVE

SQL> desc dbms_flashback_archive
PROCEDURE DISASSOCIATE_FBA

<table>
<thead>
<tr>
<th>Argument Name</th>
<th>Type</th>
<th>In/Out</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>OWNER_NAME</td>
<td>VARCHAR2</td>
<td>IN</td>
<td></td>
</tr>
<tr>
<td>TABLE_NAME</td>
<td>VARCHAR2</td>
<td>IN</td>
<td></td>
</tr>
</tbody>
</table>

PROCEDURE REASSOCIATE_FBA

<table>
<thead>
<tr>
<th>Argument Name</th>
<th>Type</th>
<th>In/Out</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>OWNER_NAME</td>
<td>VARCHAR2</td>
<td>IN</td>
<td></td>
</tr>
<tr>
<td>TABLE_NAME</td>
<td>VARCHAR2</td>
<td>IN</td>
<td></td>
</tr>
</tbody>
</table>

SQL> exec dbms_flashback_archive.disassociate_fba('HR','TEST_TBL1');

SQL> << make the change to the fba table not currently Supported >>

SQL> exec dbms_flashback_archive.reassociate_fba('HR','TEST_TBL1');
### FDA – Monitoring views

**SQL> desc DBA_FLASHBACK_ARCHIVE_TS**

<table>
<thead>
<tr>
<th>Name</th>
<th>Null?</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLASHBACK_ARCHIVE_NAME</td>
<td>NOT NULL</td>
<td>VARCHAR2(255)</td>
</tr>
<tr>
<td>FLASHBACK_ARCHIVE#</td>
<td>NOT NULL</td>
<td>NUMBER</td>
</tr>
<tr>
<td>TABLESPACE_NAME</td>
<td>NOT NULL</td>
<td>VARCHAR2(30)</td>
</tr>
<tr>
<td>QUOTA_IN_MB</td>
<td>NOT NULL</td>
<td>VARCHAR2(40)</td>
</tr>
</tbody>
</table>

**SQL> desc DBA_FLASHBACK_ARCHIVE**

<table>
<thead>
<tr>
<th>Name</th>
<th>Null?</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>OWNER_NAME</td>
<td></td>
<td>VARCHAR2(30)</td>
</tr>
<tr>
<td>FLASHBACK_ARCHIVE_NAME</td>
<td>NOT NULL</td>
<td>VARCHAR2(255)</td>
</tr>
<tr>
<td>FLASHBACK_ARCHIVE#</td>
<td>NOT NULL</td>
<td>NUMBER</td>
</tr>
<tr>
<td>RETENTION_IN_DAYS</td>
<td>NOT NULL</td>
<td>NUMBER</td>
</tr>
<tr>
<td>CREATE_TIME</td>
<td></td>
<td>TIMESTAMP(9)</td>
</tr>
<tr>
<td>LAST_PURGE_TIME</td>
<td></td>
<td>TIMESTAMP(9)</td>
</tr>
<tr>
<td>STATUS</td>
<td></td>
<td>VARCHAR2(7)</td>
</tr>
</tbody>
</table>

**SQL> desc DBA_FLASHBACK_ARCHIVE_TABLES**

<table>
<thead>
<tr>
<th>Name</th>
<th>Null?</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABLE_NAME</td>
<td>NOT NULL</td>
<td>VARCHAR2(30)</td>
</tr>
<tr>
<td>OWNER_NAME</td>
<td>NOT NULL</td>
<td>VARCHAR2(30)</td>
</tr>
<tr>
<td>FLASHBACK_ARCHIVE_NAME</td>
<td>NOT NULL</td>
<td>VARCHAR2(255)</td>
</tr>
<tr>
<td>ARCHIVE_TABLE_NAME</td>
<td>NOT NULL</td>
<td>VARCHAR2(53)</td>
</tr>
<tr>
<td>STATUS</td>
<td></td>
<td>VARCHAR2(8)</td>
</tr>
</tbody>
</table>
### FDA – Monitoring views

```sql
SQL> SELECT FLASHBACK_ARCHIVE_NAME, TABLESPACE_NAME, QUOTA_IN_MB
       2 FROM DBA_FLASHBACK_ARCHIVE_TS;

<table>
<thead>
<tr>
<th>FLASHBACK_ARCHIVE_NAME</th>
<th>TABLESPACE_NAME</th>
<th>QUOTA_IN_MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBDA1</td>
<td>FBDA_1</td>
<td></td>
</tr>
<tr>
<td>FBDA2</td>
<td>FBDA_1</td>
<td>200</td>
</tr>
</tbody>
</table>
```

```sql
SQL> SELECT FLASHBACK_ARCHIVE_NAME, to_char(CREATE_TIME,'dd-mon-yyyy') Created, RETENTION_IN_DAYS, STATUS FROM DBA_FLASHBACK_ARCHIVE;

<table>
<thead>
<tr>
<th>FLASHBACK_ARCHIVE_NAME</th>
<th>Created</th>
<th>RETENTION_IN_DAYS</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBDA1</td>
<td>12-feb-2009</td>
<td>7</td>
<td>DEFAULT</td>
</tr>
<tr>
<td>FBDA2</td>
<td>12-feb-2009</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
```

```sql
SQL> SELECT TABLE_NAME, FLASHBACK_ARCHIVE_NAME, ARCHIVE_TABLE_NAME, STATUS
       2 FROM DBA_FLASHBACK_ARCHIVE_TABLES;

<table>
<thead>
<tr>
<th>TABLE_NAME</th>
<th>FLASHBACK_ARCHIVE_NAME</th>
<th>ARCHIVE_TABLE_NAME</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMP</td>
<td>FBDA1</td>
<td>SYS_FBA_HIST_72413</td>
<td>ENABLED</td>
</tr>
<tr>
<td>SALES</td>
<td>FBDA2</td>
<td>SYS_FBA_HIST_71341</td>
<td>ENABLED</td>
</tr>
</tbody>
</table>
```
DROPPING HISTORY TABLES

```sql
SQL> ALTER TABLE TEST_TBL2 NO FLASHBACK ARCHIVE;
SQL> SELECT table_name,archive_table_name,status
    FROM USER_FLASHBACK_ARCHIVE_TABLES
    WHERE TABLE_NAME='TEST_TBL2';
```

<table>
<thead>
<tr>
<th>TABLE_NAME</th>
<th>ARCHIVE_TABLE_NAME</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST_TBL_2</td>
<td>SYS_FBA_HIST_73527</td>
<td>DISABLED</td>
</tr>
</tbody>
</table>

```sql
SQL> SELECT TABLE_NAME FROM USER_TABLES
    WHERE TABLE_NAME LIKE '%FBA%';
```

<table>
<thead>
<tr>
<th>TABLE_NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYS_FBA_DDL_COLMAP_73527</td>
</tr>
<tr>
<td>SYS_FBA_TCRV_73527</td>
</tr>
<tr>
<td>SYS_FBA_HIST_73527</td>
</tr>
</tbody>
</table>

```sql
SQL> drop table SYS_FBA_HIST_73527;
ORA-55622: DML, ALTER and CREATE UNIQUE INDEX operations are not allowed on table "INDY"."SYS_FBA_HIST_73527"

SQL> select count(*) from SYS_FBA_HIST_73527;
9741
```
DROPPING HISTORY TABLES - Workaround

SELECT o.object_id, o.owner, o.object_name, t.property
FROM dba_objects o, tab$ t
WHERE o.object_type = 'TABLE'
AND o.object_id = t.obj#
AND t.property = 9126805504;

If the object returned is the one you are trying to drop then:
UPDATE tab$
SET property = 536870912
WHERE property = 9126805504;
COMMIT;

SQL> SELECT TABLE_NAME FROM USER_TABLES WHERE TABLE_NAME LIKE '%$FBA$';

TABLE_NAME
------------------------
SYS_FBA_DDL_COLMAP_73527
SYS_FBA_TCRV_73527
SYS_FBA_HIST_73527

You will then be able to drop the table. For example:
DROP TABLE SYS_FBA_TCRV_73527;
DROP TABLE SYS_FBA_DDL_COLMAP_73527;
Created INDY schema with one table and flashback archive.

exp file=test.dmp owner=INDY
about to export TKRIM's tables via Conventional Path ...
  EXP-00008: ORACLE error 1455 encountered
  ORA-01455: converting column overflows integer datatype
  EXP-00000: Export terminated unsuccessfully

exp seem not be working with Oracle flashback archive.

expdp schemas=TKRIM dumpfile=test.dp

datapump expdp works. But it does not export the history
impdp schemas=INDY dumpfile=test.dp TABLE_EXISTS_ACTION=replace

Processing object type SCHEMA_EXPORT/TABLE/TABLE
ORA-39121: Table "INDY"."DEMO" can't be replaced, data will be skipped. Failing error is:

ORA-55610: Invalid DDL statement on history-tracked table
ORA-00955: name is already used by an existing object
Processing object type SCHEMA_EXPORT/TABLE/TABLE_DATA
Job "SYSTEM"."SYS_IMPORT_SCHEMA_01" completed with 2 error(s) at 09:22:03

Disabling flashback archive on the table does the trick.

ALTER TABLE INDY.demo NO FLASHBACK ARCHIVE;
drop table indy.demo;

Processing object type SCHEMA_EXPORT/TABLE/TABLE_DATA
. . imported "TKRIM"."DEMO":"E1" 5.421 KB 2 rows
. . imported "TKRIM"."DEMO":"E2" 5.429 KB 2 rows
Job "SYSTEM"."SYS_IMPORT_SCHEMA_01" completed with 1 error(s) at 09:24:05

but the table stays without flashback archiving enable. a query to the flashback archive still works.

select * from INDY.demo as of scn 827813;
ALTER TABLE INDY.demo FLASHBACK ARCHIVE flal ;
QUESTIONS & ANSWERS
THANKS