Versioning

Oracle Workspace Manager

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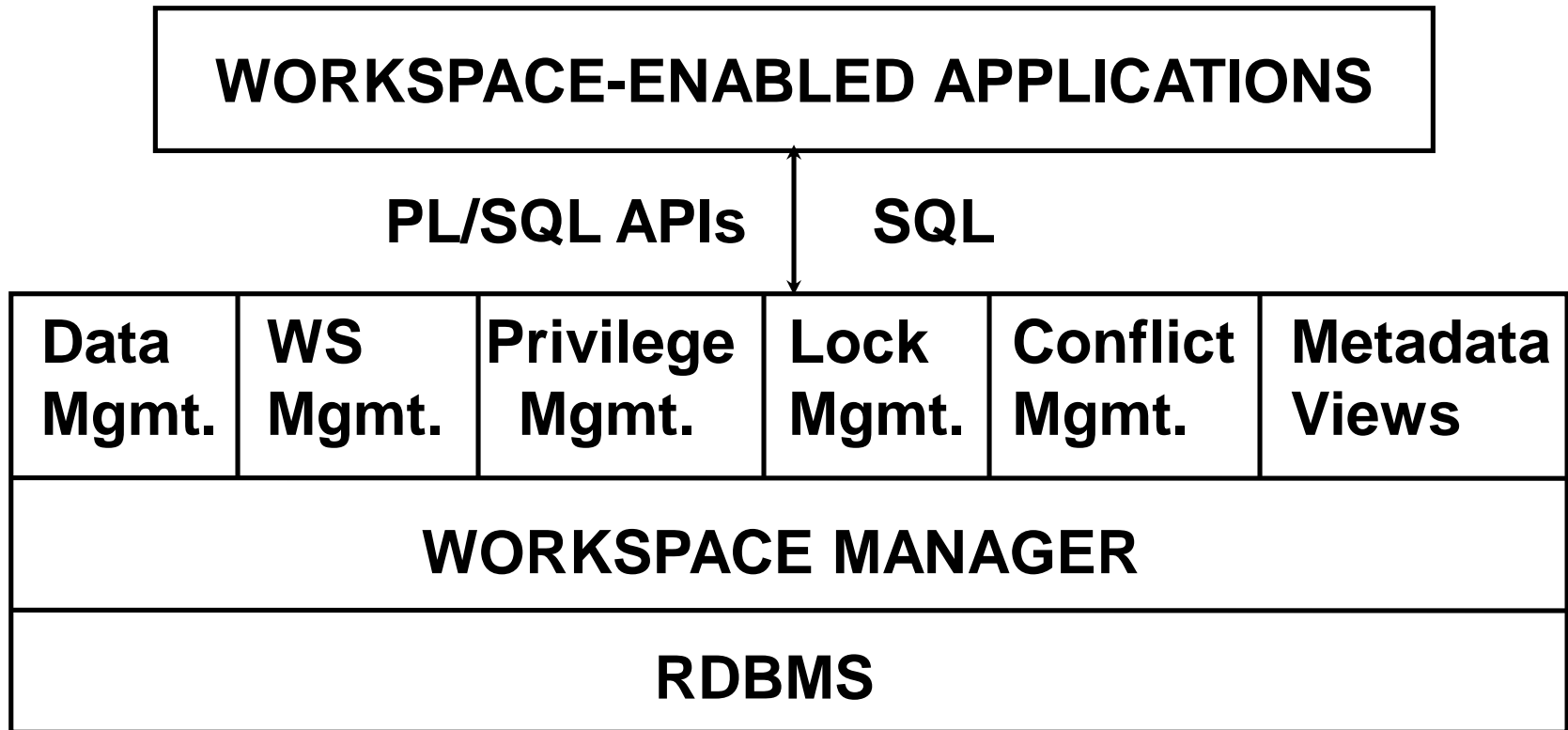16 December 2014

Introduction

▶ Feature of the Oracle Database (PL/SQL Package)

▶ Manages current, proposed and historical values for data in the same database

  ▶ Isolate a collection of changes to production data

  ▶ Keep a history of changes to data

  ▶ Perform "what if" analysis

▶ Saves Money, Time and Labor

▶ Creates virtual workspaces and savepoints

Source: White Paper - Oracle Database 12c: Workspace Manager

Workspace Manager Architecture

WORKSPACE-ENABLED APPLICATIONS					

PL/SQL APIs   SQL

Data Mgmt.	WS Mgmt.	Privilege Mgmt.	Lock Mgmt.	Conflict Mgmt.	Metadata Views
WORKSPACE MANAGER					
RDBMS					

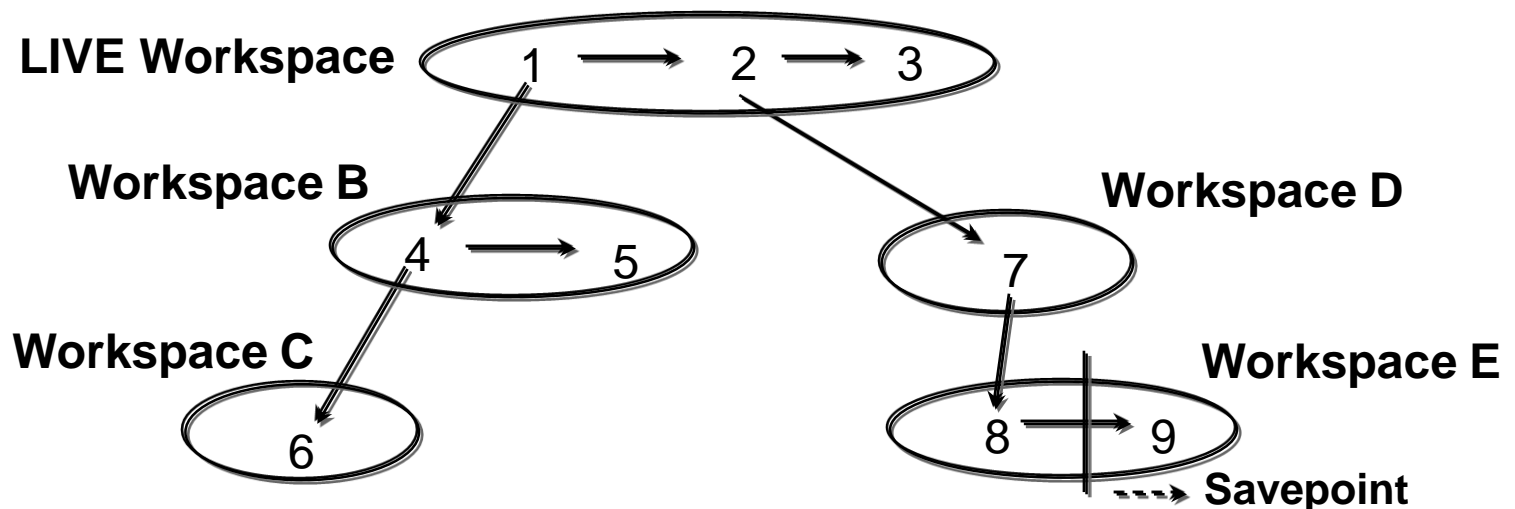Source: White Paper - Oracle Database 12c: Workspace Manager

Version-enabling a table

► Workspace manager can version-enable one or more user tables

► The unit of versioning is row.

► Workspace manager implementation
- All row versions are stored in the _LT table
- Additional columns in the _LT table store versioning metadata
- A new view on the _LT table with the original table name is created
- Define INSTEAD OF trigger on the view for SQL DML operations (insert, update and delete)

Source: White Paper - Oracle Database 12c: Workspace Manager

Workspace

- ► WS is a logical view (not physical storage) that can be shared by users
- ► A WS isolates one or more changes (row versions) from one or more version enabled tables
- ► The LIVE WS is automatically created at installation time
- ► By default, a workspace is created as a child of LIVE
- ► Workspace hierarchies can be of any depth and width
- ► Changes in the child WS can be merged with parent WS

LIVE Workspace 1 → 2 → 3

Workspace B 4 → 5

Workspace D 7

Workspace C 6

Workspace E 8 → 9

Savepoint

Source: White Paper - Oracle Database 12c: Workspace Manager

Savepoint

► A savepoint causes a new version to be created

► A savepoint groups changes within a workspace

► Two types of savepoints: Explicit and Implicit

- Explicit savepoint is created and named by a user
- Implicit savepoint created automatically in parent WS when child WS is created

► A savepoint is usually created to mark a unit of work

► Subsequent changes are made to the current version until another savepoint is created

► Changes made in a WS can be rolled back to a savepoint

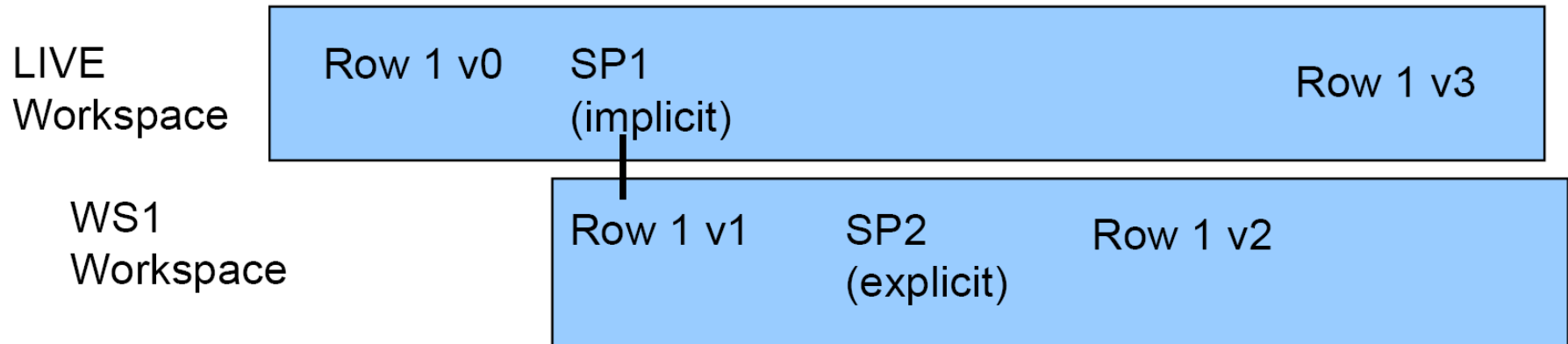Source: White Paper - Oracle Database 12c: Workspace Manager

Example

PARCELS table:

Row 1 (V0) –present when (or inserted after) PARCELS table is versioned

Row 1 (V1) – 1st update in WS1 (since implicit SP1 was created)

Row 1 (V2) –1st update in WS1 after explicit SP2 is created

Row 1 (V3) –1st update in LIVE after WS1 / SP1 created (it creates a conflict)

LIVE Workspace	Row 1 v0	SP1 (implicit)		Row 1 v3
WS1 Workspace		Row 1 v1	SP2 (explicit)	Row 1 v2

Source: White Paper - Oracle Database 12c: Workspace Manager

Conflict Resolution

- ► A conflict is created between a child and parent if a row is modified in both after the common base version

- ► Unit of conflict detection is a row

- ► Conflicts must be resolved before merge or refresh

- ► Conflicts automatically detected when a Merge or Refresh is attempted or when SetConflictWorkspace is called

- ► Workflow to resolve conflicts:, BeginResolve, ResolveConflicts, CommitResolve, RollbackResolve

Source: White Paper - Oracle Database 12c: Workspace Manager

Other features

► ## History of changes

- ● Workspace manager adds a transaction timestamp, every time the row is changed.
- ● Hence, provides a history of changes made to each new version created by savepoint

► ## Valid Time

- ● Workspace manager adds an extra column to hold the valid from and till period associated with the row
- ● It can encompass the past, present and the future

Source: White Paper - Oracle Database 12c: Workspace Manager

Workspace Manager Operations

► **Table**: EnableVersioning, DisableVersioning

► **Workspace**: create, refresh, merge, rollback, remove, goto, compress, alter

► **Savepoints** (persistent): create, alter, goto

► **History**: goto date

► **Privileges**: access, create, delete, rollback, merge

► **Access Modes**: read, write, management, none

► **Locks** (persistent): exclusive and shared

► **Differences**: compares savepoints and workspaces

► **Detect / Resolve Conflicts**: choose version to merge

Source: White Paper - Oracle Database 12c: Workspace Manager