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# Repository Access Using RESOURCE_VIEW and PATH_VIEW

Predefined public views `RESOURCE_VIEW` and `PATH_VIEW` provide access to Oracle XML DB repository data. You can use Oracle SQL functions `under_path` and `equals_path` to query resources based on their path names, and functions `path` and `depth` to return resource path names and depths.

> **Note:**
>
> The Oracle XML DB Repository is deprecated with Oracle Database 23ai.

- Overview of Oracle XML DB RESOURCE_VIEW and PATH_VIEW
  Public views `RESOURCE_VIEW` and `PATH_VIEW` provide a mechanism for using SQL to access data stored in Oracle XML DB Repository. You can use these views to access data stored in the repository using Internet protocols such as FTP and WebDAV or using application program interfaces (APIs).
- Oracle SQL Functions That Use RESOURCE_VIEW and PATH_VIEW
  Oracle SQL functions used with public views `RESOURCE_VIEW` and `PATH_VIEW` include `under_path`, `equals_path`, `path`, and `depth`.
- Accessing Repository Data Paths, Resources and Links: Examples
  Examples here illustrate how to access Oracle XML DB Repository paths, resources, and link properties.
- Deleting Repository Resources: Examples
  Examples here illustrate how to delete Oracle XML DB Repository resources and paths.
- Updating Repository Resources: Examples
  Examples here illustrate how to update Oracle XML DB Repository resources and paths.
- Working with Multiple Oracle XML DB Resources
  To perform an operation on multiple Oracle XML DB resources, or to find one or more Oracle XML DB resources that meet a certain set of criteria, use SQL with `RESOURCE_VIEW` and `PATH_VIEW`.
- Performance Guidelines for Oracle XML DB Repository Operations
  Guidelines are presented for improving the performance of repository operations such as resource creation and querying.
- Searching for Resources Using Oracle Text
  Table `XDB$RESOURCE` in database schema `XDB` stores the metadata and content of repository resources. You can search for resources that contain a specific keyword by using Oracle SQL function `contains` with `RESOURCE_VIEW` or `PATH_VIEW`.

> **See Also:**
>
> - *Oracle Database Reference* for more information about view `PATH_VIEW`
> - *Oracle Database Reference* for more information about view `RESOURCE_VIEW`

# Overview of Oracle XML DB RESOURCE_VIEW and PATH_VIEW

Public views `RESOURCE_VIEW` and `PATH_VIEW` provide a mechanism for using SQL to access data stored in Oracle XML DB Repository. You can use these views to access data stored in the repository using Internet protocols such as FTP and WebDAV or using application program interfaces (APIs).

Figure 24-1 illustrates this.

`RESOURCE_VIEW` consists of a resource, itself an `XMLType` instance, that contains the name of the resource, its ACLs, and its properties, static or extensible.

- If the content of a resource is XML data stored somewhere in an `XMLType` table or view then the `RESOURCE_VIEW` points to the `XMLType` row that stores the content.
- If the content of a resource is not XML data then the `RESOURCE_VIEW` stores the content as a LOB.

> **Note:**
>
> As of Oracle Database Release 11.2.0.1.0, repository content stored in line as a LOB uses SecureFiles LOB storage. Prior to that, it used BasicFiles LOB storage.

Parent-child relationships between folders are maintained and traversed efficiently using the hierarchical repository index. Text indexes are available to search the properties of a resource, and internal B-tree indexes over names and ACLs speed up access to these attributes of the resource `XMLType` data.

`RESOURCE_VIEW` and `PATH_VIEW`, along with PL/SQL package `DBMS_XDB_REPOS`, provide all query-based access to Oracle XML DB and DML functionality that is available through the API.

The base table for `RESOURCE_VIEW` is `XDB.XDB$RESOURCE`. Access this table only using `RESOURCE_VIEW` or PL/SQL package `DBMS_XDB_REPOS`.

**Figure 24-1 Accessing Repository Resources Using RESOURCE_VIEW and PATH_VIEW**

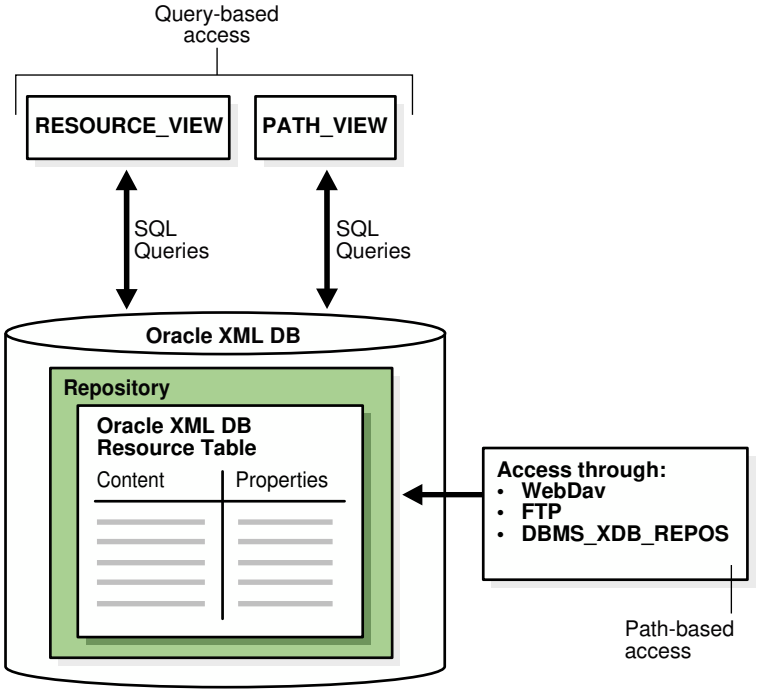
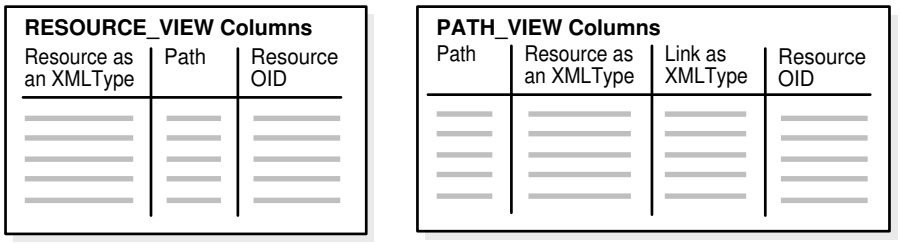



Figure 24-2 illustrates the structure of `RESOURCE_VIEW` and `PATH_VIEW`.

**Figure 24-2 RESOURCE_VIEW and PATH_VIEW Structure**




> **Note:**
>
> Neither `RESOURCE_VIEW` nor `PATH_VIEW` contains the *root* folder (`/`) resource. All other repository resources are included.

A path in the `RESOURCE_VIEW` is an arbitrary one of the paths that can be used to access the given resource. Oracle SQL function `under_path` lets applications search for resources that are contained (recursively) within a particular folder, get the resource depth, and so on. Each row in the `PATH_VIEW` and `RESOURCE_VIEW` columns is of data type `XMLType`. DML on repository views can be used to insert, rename, delete, and update resource properties and contents. Programmatic APIs must be used for some operations, such as creating links to existing resources.

Paths in the ANY_PATH column of the RESOURCE_VIEW and the PATH column in the PATH_VIEW are *absolute* paths: they start at the root.

> **Note:**
>
> Test resource paths for equality using Oracle SQL function equals_path: equals_path('/my/path') = 1. Do *not* test ANY_PATH for equality against an absolute path: ANY_PATH = '/my/path'.

Paths returned by the path function are *relative* paths under the path name specified by function under_path. For example, if there are two resources referenced by path names /a/b/c and /a/d, respectively, then a path expression that retrieves paths under folder /a returns relative paths b/c and d.

When there are multiple hard links to the same resource, only paths under the path name specified by function under_path are returned. If /a/b/c, /a/b/d, and /a/e are all links to the same resource, then a query on PATH_VIEW that retrieves all of the paths under /a/b returns only /a/b/c and /a/b/d, not /a/e.

- RESOURCE_VIEW Definition and Structure
  Public view RESOURCE_VIEW contains one row for each resource in Oracle XML DB Repository (except for the root folder resource).
- PATH_VIEW Definition and Structure
  Public view PATH_VIEW contains one row for each unique path that accesses a resource in Oracle XML DB Repository (except for the root folder resource). Each resource can have multiple paths, also called **links**.
- The Difference Between RESOURCE_VIEW and PATH_VIEW
  PATH_VIEW includes *all* the path names to a particular resource. RESOURCE_VIEW includes *one* of the possible path names to the resource. PATH_VIEW also includes the link properties. For better performance, use RESOURCE_VIEW, not PATH_VIEW, whenever possible.
- Operations You Can Perform Using UNDER_PATH and EQUALS_PATH
  You can use Oracle SQL functions under_path and equals_path to get a resource or its OID; create, delete, or update a resource; or list a directory that corresponds to a path name.

**Related Topics**

- Overview of How To Use Oracle XML DB
  An overview of the various ways of using Oracle XML DB is presented.

# RESOURCE_VIEW Definition and Structure

Public view RESOURCE_VIEW contains one row for each resource in Oracle XML DB Repository (except for the root folder resource).

Table 24-1 describes the structure of RESOURCE_VIEW.

**Table 24-1 Structure of RESOURCE_VIEW**

| Column | Data Type | Description |
|---|---|---|
| RES | XMLType | A resource in the repository (except for the root folder resource) |
| ANY_PATH | VARCHAR2 | An (absolute) path to the resource |
| RESID | RAW | Resource OID, which is a unique handle to the resource |

## PATH_VIEW Definition and Structure

Public view PATH_VIEW contains one row for each unique path that accesses a resource in Oracle XML DB Repository (except for the root folder resource). Each resource can have multiple paths, also called **links**.

Table 24-2 describes the structure of PATH_VIEW.

**Table 24-2 Structure of PATH_VIEW**

| Column | Data Type | Description |
|---|---|---|
| PATH | VARCHAR2 | An (absolute) path to repository resource RES |
| RES | XMLType | The resource referred to by column PATH |
| LINK | XMLType | Link property |
| RESID | RAW | Resource OID |

## The Difference Between RESOURCE_VIEW and PATH_VIEW

PATH_VIEW includes *all* the path names to a particular resource. RESOURCE_VIEW includes *one* of the possible path names to the resource. PATH_VIEW also includes the link properties. For better performance, use RESOURCE_VIEW, not PATH_VIEW, whenever possible.

Figure 24-3 illustrates this difference.

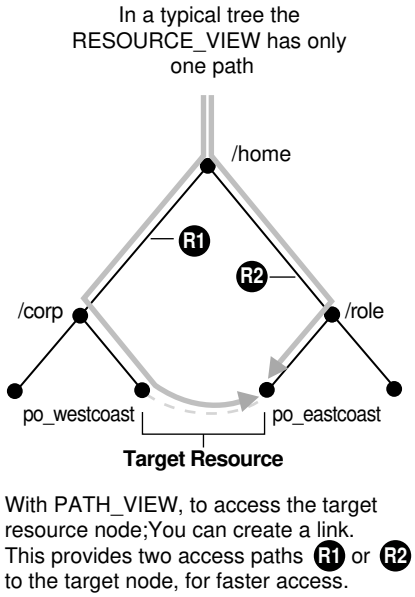
Because many Internet applications need only one URL to access a resource, RESOURCE_VIEW is widely applicable.

PATH_VIEW contains both *link* properties and resource properties, whereas the RESOURCE_VIEW contains only resource properties.

Because it handles the information for multiple paths, PATH_VIEW access can be slower. If you use RESOURCE_VIEWthen the database can take advantage of the fact that only one path is needed; the index can do less work to determine all the possible paths.

> **Note:**
>
> When using RESOURCE_VIEW, if you specify a path using function under_path or equals_path, the function finds the resource regardless of whether or not the specified path is the arbitrary one chosen to normally appear with that resource using RESOURCE_VIEW.

**Figure 24-3 RESOURCE_VIEW and PATH_VIEW Explained**




**RESOURCE_VIEW Example:**
select path(1) from RESOURCE_VIEW where under_path(res, '/sys',1);
displays one path to the resource:
/home/corp/po_westcoast

**PATH_VIEW Example:**
select path from PATH_VIEW;
displays all pathnames to the resource:
/home/corp/po_westcoast
/home/role/po_eastcoast

## Operations You Can Perform Using UNDER_PATH and EQUALS_PATH

You can use Oracle SQL functions `under_path` and `equals_path` to get a resource or its OID; create, delete, or update a resource; or list a directory that corresponds to a path name.

- Given a path name, you can:
  - Get a resource or its OID
  - List the directory given by the path name
  - Create a resource
  - Delete a resource
  - Update a resource
- Given a condition that uses `under_path` or other SQL functions, you can:
  - Update resources
  - Delete resources
  - Get resources or their OID

# Oracle SQL Functions That Use RESOURCE_VIEW and PATH_VIEW

Oracle SQL functions used with public views `RESOURCE_VIEW` and `PATH_VIEW` include `under_path`, `equals_path`, `path`, and `depth`.

- UNDER_PATH SQL Function
  Oracle SQL function `under_path` uses the hierarchical index of Oracle XML DB Repository to return the paths to all hard links under a particular path. This index is designed to speed access when traversing a path (the most common usage).

- EQUALS_PATH SQL Function
  You use Oracle SQL function `equals_path` to find a resource that has a given path name. It is functionally equivalent to `under_path` with a depth restriction of zero.
- PATH SQL Function
  Oracle SQL function `path` returns the relative path name of the resource under a given *`pathname`* argument to function `under_path` or `equal_path`.
- DEPTH SQL Function
  Oracle SQL function `depth` returns the folder depth of the resource under the specified starting path.

# UNDER_PATH SQL Function

Oracle SQL function `under_path` uses the hierarchical index of Oracle XML DB Repository to return the paths to all hard links under a particular path. This index is designed to speed access when traversing a path (the most common usage).

If the other parts of a query predicate are very selective, however, then a functional implementation of `under_path` can be chosen that walks back up the repository. This can be more efficient, because fewer links must be traversed. Figure 24-4 shows the `under_path` syntax.

**Figure 24-4 UNDER_PATH Syntax**

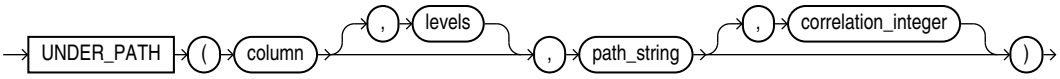



Table 24-3 details the signature of Oracle SQL function `under_path`.

**Table 24-3 UNDER_PATH SQL Function Signature**

| Syntax | Description |
|---|---|
| `under_path(`*`resource_column`*`, `*`pathname`*`);` | Determines whether a resource is under a specified path.<br>Parameters:<br>• *`resource_column`* –The column name or column alias of the `RESOURCE` column in the `PATH_VIEW` or `RESOURCE_VIEW`.<br>• *`pathname`* – The path name to resolve. |
| `under_path(`*`resource_column`*`, `*`depth`*`, `*`pathname`*`);` | Determines whether a resource is under a specified path, with a depth argument to restrict the number of levels to search.<br>Parameters:<br>• *`resource_column`* – The column name or column alias of the `RESOURCE` column in the `PATH_VIEW` or `RESOURCE_VIEW`.<br>• `depth` – The maximum depth to search. A nonnegative integer.<br>• *`pathname`* – The path name to resolve. |

**Table 24-3 (Cont.) UNDER_PATH SQL Function Signature**

| Syntax | Description |
|---|---|
| `under_path(resource_column, pathname, correlation);` | Determines if a resource is under a specified path, with a correlation argument for related SQL functions.<br>Parameters:<br>• *resource_column* – The column name or column alias of the RESOURCE column in the PATH_VIEW or RESOURCE_VIEW.<br>• *pathname* – The path name to resolve.<br>• *correlation* – An integer that can be used to correlate under_path with related SQL functions (path and depth). |
| `under_path(resource_column, depth, pathname, correlation);` | Determines if a resource is under a specified path with a depth argument to restrict the number of levels to search, and with a correlation argument for related SQL functions.<br>Parameters:<br>• *resource_column* – The column name or column alias of the RESOURCE column in the PATH_VIEW or RESOURCE_VIEW.<br>• *depth* – The maximum depth to search. A nonnegative integer.<br>• *pathname* – The path name to resolve.<br>• *correlation* – An integer that can be used to correlate under_path with related SQL functions (path and depth).<br>For a resource to be returned, only one of the accessible paths to the resource must be under the *pathname* argument. If no such path is under argument *pathname* then a NULL value is returned. |

> **Note:**
>
> Function under_path does not follow weak links, because such traversal could lead to cycles. A weak-link argument to under_path is resolved correctly, but weak links are not followed when traversing resources under that path.

# EQUALS_PATH SQL Function

You use Oracle SQL function equals_path to find a resource that has a given path name. It is functionally equivalent to under_path with a depth restriction of zero.

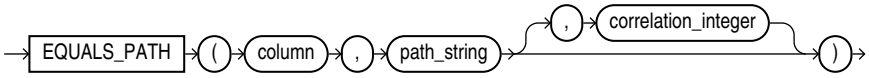
```
equals_path(resource_column, pathname);
```

where:

- resource_column is the column name or column alias of the RESOURCE column in PATH_VIEW or RESOURCE_VIEW.
- pathname is the (absolute) path name to resolve. This can contain components that are hard or weak resource links.

Figure 24-5 illustrates the complete equals_path syntax.

**Figure 24-5 EQUALS_PATH Syntax**




> **Note:**
>
> - Test resource paths for equality using Oracle SQL function `equals_path`: `equals_path('/my/path') = 1`. Do *not* test `ANY_PATH` for equality against an absolute path: `ANY_PATH = '/my/path'`.
> - Use bind variables, instead of hard-coded strings, with `equals_path`.

# PATH SQL Function

Oracle SQL function `path` returns the relative path name of the resource under a given *`pathname`* argument to function `under_path` or `equal_path`.

The path column in the `RESOURCE_VIEW` always contains the absolute path of the resource. The syntax of function `path` is:

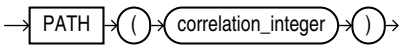
```
path(correlation);
```

where:

- *`correlation`* is an integer that can be used to correlate `path` with under_path or `equals_path`.

Figure 24-6 illustrates the syntax for function `path`.

**Figure 24-6 PATH Syntax**




# DEPTH SQL Function

Oracle SQL function `depth` returns the folder depth of the resource under the specified starting path.

```
depth(correlation);
```

where:

*`correlation`* is an integer that can be used to correlate `depth` with `path` with under_path or `equals_path`.

# Accessing Repository Data Paths, Resources and Links: Examples

Examples here illustrate how to access Oracle XML DB Repository paths, resources, and link properties.

The first few examples use resources specified by the following paths:

```
/a/b/c
/a/b/c/d
/a/e/c
/a/e/c/d
```

Example 24-1 uses Oracle SQL function `path` to retrieve the *relative* paths under path `/a/b`.

Example 24-2 uses `ANY_PATH` to retrieve the *absolute* paths under path `/a/b`.

Example 24-3 is the same as Example 24-2, except that the test is *not*-equals (`!=`) instead of equals (`=`). The query in Example 24-3 finds *all paths in the repository* that are *not* under path `/a/b`.

Example 24-4 shows the relative paths that are under repository folders `a/b` and `/a/e`, respectively. The expression `path(1)` represents the paths that are under folder `a/b`, since it uses the same correlation number, `1`, as the expression `under_path(RES, '/a/b', 1)`, which specifies folder `a/b`. Similarly for `path(2)` and folder `/a/e`. Expression `ANY_PATH` returns the corresponding absolute paths.

**Example 24-1 Determining Paths Under a Path: Relative**

```
SELECT path(1) FROM RESOURCE_VIEW WHERE under_path(RES, '/a/b', 1) = 1;


PATH(1)
-------
c
c/d

2 rows selected.
```

**Example 24-2 Determining Paths Under a Path: Absolute**

```
SELECT ANY_PATH FROM RESOURCE_VIEW WHERE under_path(RES, '/a/b') = 1;


ANY_PATH
--------
/a/b/c
/a/b/c/d

2 rows selected.
```

### Example 24-3 Determining Paths Not Under a Path

```
SELECT ANY_PATH FROM RESOURCE_VIEW WHERE under_path(RES, '/a/b') != 1


ANY_PATH
--------
/a
/a/b
/a/e
/a/e/c
/a/e/c/d
/home
/home/OE
/home/OE/PurchaseOrders
/home/OE/PurchaseOrders/2002
/home/OE/PurchaseOrders/2002/Apr
/home/OE/PurchaseOrders/2002/Apr/AMCEWEN-20021009123336171PDT.xml
/home/OE/PurchaseOrders/2002/Apr/AMCEWEN-20021009123336271PDT.xml
/home/OE/PurchaseOrders/2002/Apr/EABEL-20021009123336251PDT.xml
. . .
/public
/sys
/sys/acls
/sys/acls/all_all_acl.xml
/sys/acls/all_owner_acl.xml
/sys/acls/bootstrap_acl.xml
/sys/acls/ro_all_acl.xml
/sys/apps
/sys/apps/plsql
/sys/apps/plsql/xs
/sys/apps/plsql/xs/netaclrc.xml
/sys/apps/plsql/xs/netaclsc.xml
/sys/databaseSummary.xml
/sys/log
/sys/schemas
/sys/schemas/OE
/sys/schemas/OE/localhost:8080
. . .

326 rows selected.
```

### Example 24-4 Determining Paths Using Multiple Correlations

```
SELECT ANY_PATH, path(1), path(2)
  FROM RESOURCE_VIEW
  WHERE under_path(RES, '/a/b', 1) = 1 OR under_path(RES, '/a/e', 2) = 1;


ANY_PATH   PATH(1)  PATH(2)
---------- -------- --------
/a/b/c     c
/a/b/c/d   c/d
/a/e/c              c
/a/e/c/d            c/d
```

```
4 rows selected.
```

### Example 24-5 Relative Path Names for Three Levels of Resources

```
SELECT path(1) FROM RESOURCE_VIEW WHERE under_path(RES, 3, '/sys', 1) = 1;
```

This produces a result similar to the following.

```
PATH(1)
-------
acls
acls/all_all_acl.xml
acls/all_owner_acl.xml
acls/bootstrap_acl.xml
acls/ro_all_acl.xml
apps
apps/plsql
apps/plsql/xs
databaseSummary.xml
log
schemas
schemas/OE
schemas/OE/localhost:8080
schemas/PUBLIC
schemas/PUBLIC/www.w3.org
schemas/PUBLIC/xmlns.oracle.com

93 rows selected.
```

### Example 24-6 Extracting Resource Metadata Using UNDER_PATH

```
SELECT ANY_PATH,
       XMLQuery('declare namespace ns = "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                 $r/ns:Resource' PASSING RES AS "r" RETURNING CONTENT)
  FROM RESOURCE_VIEW WHERE under_path(RES, '/sys') = 1;
```

This produces a result similar to the following:

```
ANY_PATH
--------
XMLQUERY('DECLARENAMESPACENS="HTTP://XMLNS.ORACLE.COM/XDB/XDBRESOURCE.XSD";
--------------------------------------------------------------------------------
/sys/acls
<Resource xmlns="http://xmlns.oracle.com/xdb/XDBResource.xsd">
  <CreationDate>2008-06-25T13:17:45.164662</CreationDate>
  <ModificationDate>2008-06-25T13:17:47.865163</ModificationDate>
  <DisplayName>acls</DisplayName>
  <Language>en-US</Language>
  <CharacterSet>UTF-8</CharacterSet>
  <ContentType>application/octet-stream</ContentType>
  <RefCount>1</RefCount>
</Resource>
```

```
/sys/acls/all_all_acl.xml
<Resource xmlns="http://xmlns.oracle.com/xdb/XDBResource.xsd">
  <CreationDate>2008-06-25T13:17:47.759806</CreationDate>
  <ModificationDate>2008-06-25T13:17:47.759806</ModificationDate>
  <DisplayName>all_all_acl.xml</DisplayName>
  <Language>en-US</Language>
  <CharacterSet>UTF-8</CharacterSet>
  <ContentType>text/xml</ContentType>
  <RefCount>1</RefCount>
</Resource>
. . .
41 rows selected.
```

### Example 24-7 Using Functions PATH and DEPTH with PATH_VIEW

```
SELECT path(1) path, depth(1) depth FROM PATH_VIEW
  WHERE under_path(RES, 3, '/sys', 1) = 1;
```

This produces a result similar to the following:

```
PATH                                     DEPTH
----                                     -----
acls                                     1
acls/all_all_acl.xml                     2
acls/all_owner_acl.xml                   2
acls/bootstrap_acl.xml                   2
acls/ro_all_acl.xml                      2
apps                                     1
apps/plsql                               2
apps/plsql/xs                            3
databaseSummary.xml                      1
log                                      1
schemas                                  1
schemas/OE                               2
schemas/OE/localhost:8080                3
schemas/PUBLIC                           2
schemas/PUBLIC/www.w3.org                3
schemas/PUBLIC/xmlns.oracle.com          3
. . .
```

### Example 24-8 Extracting Link and Resource Information from PATH_VIEW

```
SELECT PATH,
       XMLCast(XMLQuery(
                 'declare namespace ns =
                          "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                  $l/ns:LINK/ns:Name' PASSING LINK AS "l" RETURNING CONTENT)
                AS VARCHAR2(256)),
       XMLCast(XMLQuery(
                 'declare namespace ns =
                          "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                  $l/ns:LINK/ns:ParentName' PASSING LINK AS "l" RETURNING CONTENT)
                AS VARCHAR2(256)),
       XMLCast(XMLQuery(
                 'declare namespace ns =
                          "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
```

```
              $l/ns:LINK/ns:ChildName' PASSING LINK AS "l" RETURNING CONTENT)
            AS VARCHAR2(256)),
     XMLCast(XMLQuery(
               'declare namespace ns =
                        "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                $r/ns:Resource/ns:DisplayName'
                  PASSING RES AS "r" RETURNING CONTENT)
            AS VARCHAR2(128))
FROM PATH_VIEW WHERE PATH LIKE '/sys%';
```

This produces a result similar to the following:

```
/sys/schemas/PUBLIC/www.w3.org/1999/xlink.xsd
xlink.xsd

/sys/schemas/PUBLIC/www.w3.org/1999/xlink
xlink

/sys/schemas/PUBLIC/www.w3.org/1999/csx.xlink.xsd
csx.xlink.xsd

. . .

118 rows selected.
```

### Example 24-9 All Repository Paths to a Certain Depth Under a Path

```
SELECT path(1) FROM PATH_VIEW WHERE under_path(RES, 3, '/sys', 1) > 0;
```

This produces a result similar to the following:

```
PATH(1)
-------
acls
acls/all_all_acl.xml
acls/all_owner_acl.xml
acls/bootstrap_acl.xml
acls/ro_all_acl.xml
apps
apps/plsql
apps/plsql/xs
databaseSummary.xml
log
principals
principals/groups
principals/users
schemas
schemas/PUBLIC
schemas/PUBLIC/www.opengis.net
schemas/PUBLIC/www.w3.org
schemas/PUBLIC/xmlns.oracle.com
workspaces
. . .

43 rows selected.
```

### Example 24-10 Locating a Repository Path Using EQUALS_PATH

```
SELECT ANY_PATH FROM RESOURCE_VIEW WHERE equals_path(RES, '/sys') > 0;


ANY_PATH
--------
/sys

1 row selected.
```

### Example 24-11 Retrieve RESID of a Given Resource

```
SELECT RESID FROM RESOURCE_VIEW
  WHERE XMLCast(XMLQuery(
                  'declare namespace ns =
                     "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                   $r/ns:Resource/ns:DisplayName'
                  PASSING RES AS "r" RETURNING CONTENT)
                AS VARCHAR2(128))
        = 'example';
```

This produces a result similar to the following:

```
RESID
--------------------------------
F301A10152470252E030578CB00B432B

1 row selected.
```

### Example 24-12 Obtaining the Path Name of a Resource from its RESID

```
DECLARE
  resid_example RAW(16);
  path          VARCHAR2(4000);
BEGIN
  SELECT RESID INTO resid_example FROM RESOURCE_VIEW
    WHERE XMLCast(XMLQuery(
                    'declare namespace ns =
                       "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                     $r/ns:Resource/ns:DisplayName'
                    PASSING RES AS "r" RETURNING CONTENT)
                  AS VARCHAR2(128))

          = 'example';
  SELECT ANY_PATH INTO path FROM RESOURCE_VIEW WHERE RESID = resid_example;
  DBMS_OUTPUT.put_line('The path is: ' || path);
END;
/
The path is: /public/example

PL/SQL procedure successfully completed.
```

### Example 24-13 Folders Under a Given Path

```
SELECT ANY_PATH FROM RESOURCE_VIEW
  WHERE under_path(RES, 1, '/sys') = 1
    AND XMLExists('declare namespace ns =
                     "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                   $r/ns:Resource[@Container = xs:boolean("true")]'
                  PASSING RES AS "r");
```

This produces a result like the following:

```
ANY_PATH
--------
/sys/acls
/sys/apps
/sys/log
/sys/schemas

4 rows selected.
```

### Example 24-14 Joining RESOURCE_VIEW with an XMLType Table

```
SELECT ANY_PATH, XMLQuery('$p/PurchaseOrder/LineItems'
                       PASSING po.OBJECT_VALUE AS "p" RETURNING CONTENT)
  FROM purchaseorder po, RESOURCE_VIEW rv
  WHERE ref(po)
        = XMLCast(XMLQuery('declare default element namespace
                            "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                            fn:data(/Resource/XMLRef)'
                           PASSING rv.RES RETURNING CONTENT)
                  AS REF XMLType)
    AND ROWNUM < 2;

ANY_PATH
--------
XMLQUERY('$P/PURCHASEORDER/LINEITEMS'PASSINGPO.OBJECT_VALUEAS"P"RET
--------------------------------------------------------------------
/home/OE/PurchaseOrders/2002/Apr/AMCEWEN-20021009123336171PDT.xml
<LineItems>
  <LineItem ItemNumber="1">
    <Description>Salesman</Description>
    <Part Id="37429158920" UnitPrice="39.95" Quantity="2"/>
  </LineItem>
  <LineItem ItemNumber="2">
    <Description>Big Deal on Madonna Street</Description>
    <Part Id="37429155424" UnitPrice="29.95" Quantity="1"/>
  </LineItem>
  <LineItem ItemNumber="3">
    <Description>Hearts and Minds</Description>
    <Part Id="37429166321" UnitPrice="39.95" Quantity="1"/>
  </LineItem>

. . .

  <LineItem ItemNumber="23">
    <Description>Great Expectations</Description>
    <Part Id="37429128022" UnitPrice="39.95" Quantity="4"/>
  </LineItem>
</LineItems>

1 row selected.
```

# Deleting Repository Resources: Examples

Examples here illustrate how to delete Oracle XML DB Repository resources and paths.

If you delete only *leaf* resources, then you can use `DELETE FROM RESOURCE_VIEW`, as in Example 24-15.

For multiple links to the same resource, deleting from `RESOURCE_VIEW` deletes the resource together with *all* of its links. Deleting from `PATH_VIEW` deletes only the link with the specified path.

Example 24-16 illustrates this.

**Example 24-15 Deleting Resources**

```
DELETE FROM RESOURCE_VIEW WHERE equals_path(RES, '/public/myfile') = 1';
```

**Example 24-16 Deleting Links to Resources**

Suppose that `'/home/myfile1'` is a link to `'/public/myfile'`:

```
CALL DBMS_XDB_REPOS.link('/public/myfile', '/home', 'myfile1');
```

The following SQL DML statement deletes everything in Oracle XML DB Repository that is found at path `/home/myfile1` – both the link and the resource:

```
DELETE FROM RESOURCE_VIEW WHERE equals_path(RES, '/home/myfile1') = 1;
```

The following DML statement deletes *only the link* with path `/home/file1`:

```
DELETE FROM PATH_VIEW WHERE equals_path(RES, '/home/file1') = 1;
```

- Deleting Nonempty Folder Resources
  The `DELETE` DML operator is not allowed on a nonempty folder. If you try to delete a nonempty folder, you must first delete its contents and then delete the resulting empty folder. This rule must be applied recursively to any folders contained in the target folder.

## Deleting Nonempty Folder Resources

The `DELETE` DML operator is not allowed on a nonempty folder. If you try to delete a nonempty folder, you must first delete its contents and then delete the resulting empty folder. This rule must be applied recursively to any folders contained in the target folder.

However, the order of the paths returned from a `WHERE` clause is not guaranteed, and the `DELETE` operator does not allow an `ORDER BY` clause in its table-expression subclause. You *cannot* do the following:

```
DELETE FROM (SELECT 1 FROM RESOURCE_VIEW
               WHERE under_path(RES, '/public', 1) = 1
               ORDER BY depth(1) DESCENDING);
```

Example 24-17 illustrates how to delete a nonempty folder: folder `example` is deleted, along with its subfolder `example1`.

> **Note:**
>
> As always, take care to avoid deadlocks with concurrent transactions when operating on multiple rows.

**Example 24-17 Deleting a Nonempty Folder**

```
SELECT PATH FROM PATH_VIEW WHERE under_path(RES, '/home/US1') = 1;

PATH
-------------------------
/home/US1/example
/home/US1/example/example1

2 rows selected.

DECLARE
  CURSOR c1 IS
    SELECT ANY_PATH p FROM RESOURCE_VIEW
      WHERE under_path(RES, '/home/US1', 1) = 1
        AND XMLExists('declare namespace ns =
                       "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                       $r/ns:Resource[ns:Owner="US1"]'
                      PASSING RES AS "r")
      ORDER BY depth(1) DESC;
  del_stmt VARCHAR2(500) :=
    'DELETE FROM RESOURCE_VIEW WHERE equals_path(RES, :1)=1';
BEGIN
  FOR r1 IN c1 LOOP
    EXECUTE IMMEDIATE del_stmt USING r1.p;
  END LOOP;
END;
/

PL/SQL procedure successfully completed.

SELECT PATH FROM PATH_VIEW WHERE under_path(RES, '/home/US1') = 1;

no rows selected
```

# Updating Repository Resources: Examples

Examples here illustrate how to update Oracle XML DB Repository resources and paths.

Example 24-18 changes the resource at path `/test/HR/example/paper`.

> **See Also:**
>
> User-Defined Repository Metadata for additional examples of updating resource metadata

By default, the `DisplayName` element content, `paper`, was the same text as the last location step of the resource path, `/test/HR/example/paper`. This is only the default value, however. The `DisplayName` is independent of the resource path, so updating it does not change the path.

Element `DisplayName` is defined by the WebDAV standard, and it is recognized by WebDAV applications. Applications, such as an FTP client, that are not WebDAV-based do not recognize the `DisplayName` of a resource. An FTP client lists the resource as `paper` (using FTP command `ls`, for example) even after the `UPDATE` operation.

Example 24-19 changes the path for the resource from `/test/HR/example/paper` to `/test/myexample`. It is analogous to using the UNIX or Linux command `mv /test/HR/example/paper /test/myexample`.

> **See Also:**
>
> Table 21-3 for additional examples that use SQL functions that apply to `RESOURCE_VIEW` and `PATH_VIEW`

### Example 24-18 Updating a Resource

This is the complete resource before the update operation:

```
SELECT XMLSerialize(DOCUMENT r.RES AS CLOB)
  FROM RESOURCE_VIEW r WHERE equals_path(r.RES, '/test/HR/example/paper') = 1;

XMLSERIALIZE(DOCUMENTR.RESASCLOB)
--------------------------------------------------------------------------------
<Resource xmlns="http://xmlns.oracle.com/xdb/XDBResource.xsd" Hidden="false" Inv
alid="false" Container="false" CustomRslv="false" VersionHistory="false" StickyR
ef="true">
  <CreationDate>2005-04-29T16:30:01.588835</CreationDate>
  <ModificationDate>2005-04-29T16:30:01.588835</ModificationDate>
  <DisplayName>paper</DisplayName>
  <Language>en-US</Language>
  <CharacterSet>UTF-8</CharacterSet>
  <ContentType>application/octet-stream</ContentType>
  <RefCount>1</RefCount>
  <ACL>
    <acl description="Public:All privileges to PUBLIC" xmlns="http://xmlns.oracl
e.com/xdb/acl.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:sch
emaLocation="http://xmlns.oracle.com/xdb/acl.xsd                          http:
//xmlns.oracle.com/xdb/acl.xsd">
      <ace>
        <principal>PUBLIC</principal>
        <grant>true</grant>
        <privilege>
          <all/>
        </privilege>
      </ace>
    </acl>
  </ACL>
  <Owner>TESTUSER1</Owner>
  <Creator>TESTUSER1</Creator>
  <LastModifier>TESTUSER1</LastModifier>
  <SchemaElement>http://xmlns.oracle.com/xdb/XDBSchema.xsd#binary</SchemaElement>
  <Contents>
    <binary>4F7261636C65206F7220554E4958</binary>
  </Contents>
</Resource>

1 row selected.
```

All of the XML elements shown here are resource *metadata* elements, with the exception of `Contents`, which contains the resource *content*.

This `UPDATE` statement updates (only) the `DisplayName` metadata element.

```
UPDATE RESOURCE_VIEW r
  SET r.RES =
    XMLQuery('copy $i := $p1 modify
                (for $j in $i/Resource/DisplayName
                 return replace value of node $j with $p2)
              return $i'
             PASSING r.RES AS "p1", 'My New Paper' AS "p2"
             RETURNING CONTENT)
    WHERE equals_path(r.RES, '/test/HR/example/paper') = 1;

1 row updated.

SELECT XMLSerialize(DOCUMENT r.RES AS CLOB)
  FROM RESOURCE_VIEW r WHERE equals_path(r.RES, '/test/HR/example/paper') = 1;

XMLSERIALIZE(DOCUMENTR.RESASCLOB)
--------------------------------------------------------------------------------
<Resource xmlns="http://xmlns.oracle.com/xdb/XDBResource.xsd" Hidden="false" Inv
alid="false" Container="false" CustomRslv="false" VersionHistory="false" StickyR
ef="true">
  <CreationDate>2005-04-29T16:30:01.588835</CreationDate>
  <ModificationDate>2005-04-29T16:30:01.883838</ModificationDate>
  <DisplayName>My New Paper</DisplayName>
  <Language>en-US</Language>

  . . .

  <Contents>
    <binary>4F7261636C65206F7220554E4958</binary>
  </Contents>
</Resource>

1 row selected.
```

### Example 24-19 Updating a Path in the PATH_VIEW

```
SELECT ANY_PATH FROM RESOURCE_VIEW WHERE under_path(RES, '/test') = 1;

ANY_PATH
--------
/test/HR
/test/HR/example
/test/HR/example/paper

3 rows selected.

UPDATE PATH_VIEW
  SET PATH = '/test/myexample' WHERE PATH = '/test/HR/example/paper';

ANY_PATH
--------
/test/HR
/test/HR/example
/test/myexample

3 rows selected.
```

# Working with Multiple Oracle XML DB Resources

To perform an operation on multiple Oracle XML DB resources, or to find one or more Oracle XML DB resources that meet a certain set of criteria, use SQL with `RESOURCE_VIEW` and `PATH_VIEW`.

For example, you can perform the following operations:

- Update resources based on attributes – see Example 24-20
- Finding resources inside a folder – see Example 24-21
- Copy a set of Oracle XML DB resources – see Example 24-22

The SQL DML statement in Example 24-22 copies all of the resources in folder `public` to folder `newlocation`. It is analogous to the UNIX or Linux command `cp /public/* /newlocation`. Target folder `newlocation` must exist before the copy.

**Example 24-20 Updating Resources Based on Attributes**

```
UPDATE RESOURCE_VIEW
  SET RES =
    XMLQuery('copy $i := $p1 modify
                (for $j in $i/Resource/DisplayName
                 return replace value of node $j with $p2)
               return $i'
              PASSING RES AS "p1", 'My New Paper' AS "p2"
              RETURNING CONTENT)
  WHERE XMLCast(XMLQuery('declare namespace ns =
                          "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                          $r/ns:Resource/ns:DisplayName'
                         PASSING RES AS "r" RETURNING CONTENT)
                 AS VARCHAR2(128))
        = 'My Paper';

1 row updated.

SELECT ANY_PATH FROM RESOURCE_VIEW
  WHERE XMLCast(XMLQuery('declare namespace ns =
                            "http://xmlns.oracle.com/xdb/XDBResource.xsd"; (: :)
                           $r/ns:Resource/ns:DisplayName'
                          PASSING RES AS "r" RETURNING CONTENT)
                 AS VARCHAR2(128))
          = 'My New Paper';

ANY_PATH
---------------
/test/myexample

1 row selected.
```

**Example 24-21 Finding Resources Inside a Folder**

```
SELECT ANY_PATH FROM RESOURCE_VIEW
  WHERE under_path(resource, '/sys/schemas/PUBLIC/xmlns.oracle.com/xdb') = 1;
```

```
ANY_PATH
------------------------------------------------------------
/sys/schemas/PUBLIC/xmlns.oracle.com/xdb/XDBResource.xsd
/sys/schemas/PUBLIC/xmlns.oracle.com/xdb/XDBSchema.xsd
/sys/schemas/PUBLIC/xmlns.oracle.com/xdb/XDBStandard.xsd
/sys/schemas/PUBLIC/xmlns.oracle.com/xdb/acl.xsd
/sys/schemas/PUBLIC/xmlns.oracle.com/xdb/dav.xsd
/sys/schemas/PUBLIC/xmlns.oracle.com/xdb/log
/sys/schemas/PUBLIC/xmlns.oracle.com/xdb/log/xdblog.xsd
/sys/schemas/PUBLIC/xmlns.oracle.com/xdb/stats.xsd
/sys/schemas/PUBLIC/xmlns.oracle.com/xdb/xdbconfig.xsd

12 rows selected.
```

**Example 24-22 Copying Resources**

```
SELECT PATH FROM PATH_VIEW WHERE under_path(RES, '/test') = 1;

PATH
-----------------
/test/HR
/test/HR/example
/test/myexample

3 rows selected.

INSERT INTO PATH_VIEW
  SELECT '/newlocation/' || path(1), RES, LINK, NULL FROM PATH_VIEW
    WHERE under_path(RES, '/test', 1) = 1
    ORDER BY depth(1);

3 rows created.

SELECT PATH FROM PATH_VIEW WHERE under_path(RES, '/newlocation') = 1;

PATH
-----------------------
/newlocation/HR
/newlocation/HR/example
/newlocation/myexample

3 rows selected.
```

# Performance Guidelines for Oracle XML DB Repository Operations

Guidelines are presented for improving the performance of repository operations such as resource creation and querying.

Folders that contain a large number of resources can negatively affect concurrency, particularly when many resources are created or deleted. As a rule of thumb, do not have folders that contain more than 10,000 resources. This empirical limit is based on the database block size and the average filename length.

If you create resources in bulk, perform a `COMMIT` operation at least every 1,000 resources. Performance can be negatively impacted if you commit very often or you commit less often than every 1,000 resource creations.

When creating a file resource that is an XML Schema-based document for which the XML schema is known, specify the XML schema URL as a parameter to PL/SQL function `DBMS_XDB_REPOS.createResource`. This saves preparsing the document to determine the XML schema.

Oracle XML DB uses configuration file `xdbconfig.xml` for configuring the system and protocol environment. This file includes an element parameter, `resource-view-cache-size`, that defines the size in dynamic memory of the `RESOURCE_VIEW` cache. The default value is `1048576`.

The performance of some queries on `RESOURCE_VIEW` and `PATH_VIEW` can be improved by tuning `resource-view-cache-size`. In general, the bigger the cache size, the faster the query. The default `resource-view-cache-size` is appropriate for most cases, but you may want to enlarge your `resource-view-cache-size` element when querying a sizable `RESOURCE_VIEW`.

The default limits for the following elements are soft limits. The system automatically adapts when these limits are exceeded.

- `xdbcore-loadableunit-size` – This element indicates the maximum size to which a loadable unit (partition) can grow in Kilobytes. When a partition is read into memory or a partition is built while consuming a new document, the partition is built until it reaches the maximum size. The default value is 16 KB.
- `xdbcore-xobmem-bound` – This element indicates the maximum memory in kilobytes that a document is allowed to occupy. The default value is 1024 KB. Once the document exceeds this number, some loadable units (partitions) are swapped out.

**Related Topics**

- Administration of Oracle XML DB
  Administration of Oracle XML DB includes installing, upgrading, and configuring it.

> **See Also:**
>
> *Oracle Database PL/SQL Packages and Types Reference* for information about PL/SQL function `DBMS_XDB_REPOS.createResource`

# Searching for Resources Using Oracle Text

Table `XDB$RESOURCE` in database schema `XDB` stores the metadata and content of repository resources. You can search for resources that contain a specific keyword by using Oracle SQL function `contains` with `RESOURCE_VIEW` or `PATH_VIEW`.

To evaluate such queries, you must first create a context index on the `XDB$RESOURCE` table. Depending on the type of documents stored in Oracle XML DB, choose one of the following options for creating your context index:

- *If Oracle XML DB contains only XML documents*, that is, no binary data, then a regular Context Index can be created on the `XDB$RESOURCE` table. This is the case for Example 24-24.

```
CREATE INDEX xdb$resource_ctx_i ON XDB.XDB$RESOURCE(OBJECT_VALUE)
  INDEXTYPE IS CTXSYS.CONTEXT;
```

**Example 24-23 Find All Resources Containing "Paper"**

```
SELECT PATH FROM PATH_VIEW WHERE contains(RES, 'Paper') > 0;

PATH
-----------------------
/newlocation/myexample
/test/myexample

2 rows selected.
```

**Example 24-24 Find All Resources Containing "Paper" that are Under a Specified Path**

```
SELECT ANY_PATH FROM RESOURCE_VIEW
   WHERE contains(RES, 'Paper') > 0 AND under_path(RES, '/test') > 0;

ANY_PATH
---------------
/test/myexample

1 row selected.
```

**Related Topics**

- Query and Update of XML Data
  There are many ways for applications to query and update XML data that is in Oracle Database, both XML schema-based and non-schema-based.
- PL/SQL APIs for XMLType: References
  The PL/SQL Application Programming Interfaces (APIs) for `XMLType` are described.