157
DBMS_QOPATCH

The `DBMS_QOPATCH` package provides an interface to view the installed database patches.

This chapter contains the following topics:

DBMS_QOPATCH Overview

The `DBMS_QOPATCH` package provides a PLSQL/SQL interface to view the installed database patches. The interface provides all the patch information available as part of the `OPATCH LSINVENTORY -XML` command. The package accesses the OUI patch inventory in real time to provide patch and meta-information.

DBMS_QOPATCH Security Model

The `DBMS_QOPATCH` package is created as part of SYS schema and SYS is the only user who can execute these subprograms.

DBMS_QOPATCH Operational Notes

The following operational notes apply to DBMS_QOPATCH.

- The package will work only if the database is `OPEN`.
- In an Oracle Real Application Clusters (RAC) environment, if the subprogram requires to fetch data from other RAC nodes it spawns a job in the other node(s) to get the data. In this case `JOB_QUEUE_PROCESSES` needs to be `>0` for the package to fetch the data from other RAC nodes.
- If there is a delay in the job execution, the package returns `ORA-20008` error.

DBMS_QOPATCH Exceptions

This table lists the exceptions raised by the `DBMS_QOPATCH` package.

Table 157-1   DBMS_QOPATCH Error Messages

Error Code	Description
`ORA-20001`	Latest XML inventory is not loaded into table.

Table 157-1   (Cont.) DBMS_QOPATCH Error Messages

Error Code	Description
ORA-20002	Directory creation failed.
ORA-20003	Configuration of a job on a node failed.
ORA-20004	Job configuration failed as node is inactive.
ORA-20005	Job is not configured with given node, instance name.
ORA-20006	Number of RAC active instances and opatch jobs configured are not same.
ORA-20007	Job configuration failed as node or instance is not active.
ORA-20008	Timed out - job execution time is more than 120Secs.
ORA-20009	Job execution failed.
ORA-20010	Node is inactive and job cannot be executed.
ORA-20011	Job name is `NULL` and inventory cannot be loaded.
ORA-20012	`JOB_QUEUE_PROCESSES` is set to zero and the inventory cannot be loaded.
ORA-20013	`DBMS_QOPATCH` ran mostly in non-install area.
ORA-20014	Database is not opened.
ORA-20015	Database opened as read-only.

Summary of DBMS_QOPATCH Subprograms

This table lists and briefly describes the `DBMS_QOPATCH` package subprograms.

Table 157-2   DBMS_QOPATCH Package Subprograms

Subprogram	Description
CHECK_PATCH_INSTALLED Function	Checks if a patch is installed.
GET_OPATCH_BUGS Function	Provides a bugs list for a patch in XML format if the patch number is given. If patch is not given then it lists all the bugs installed in all the patches in XML format.
GET_OPATCH_COUNT Function	Provides the total number of installed patches in XML format
GET_OPATCH_DATA Function	Provides top level patch information for the patch (such as Patch ID, patch creation time) in the XML element
GET_OPATCH_FILES Function	Provides the list of files modified in the given patch number in XML format
GET_OPATCH_INSTALL_INFO Function	Returns the XML element containing the `ORACLE_HOME` details such as patch and inventory location
GET_OPATCH_LIST Function	Provides list of patches installed as an XML element from the XML inventory
GET_OPATCH_LSINVENTORY	Returns whole opatch inventory as XML instance document.
GET_OPATCH_OLAYS Function	Provides overlay patches for a given patch as XML element

Table 157-2   (Cont.) DBMS_QOPATCH Package Subprograms

Subprogram	Description
GET_OPATCH_PREQS Function	Provides prerequisite patches for a given patch as XML element
GET_OPATCH_XSLT	Returns the style-sheet for the opatch XML inventory presentation
GET_PATCH_DETAILS Function	Displays the detailed patch information from `opatch lsinventory`.
GET_SQLPATCH_STATUS Procedure	Displays the SQL patch status by querying from SQL patch registry to produce complete patch level information
IS_PATCH_INSTALLED Function	Provides information (such as patchID, application date, and SQL patch information) on the installed patch as XML node by querying the XML inventory
OPATCH_COMPARE_CURRENT Function	Compares the current database with a list of bugs.
OPATCH_COMPARE_NODES Function	Compares the given RAC node(s) with the instance to the present connected node with current node. The return value indicates whether the data was refreshed or not.
SET_CURRENT_OPINST Procedure	Sets the node name and instance to get the inventory details specific to it in an Oracle Real Application Clusters (RAC) environment

CHECK_PATCH_INSTALLED Function

Checks if the patch is installed.

Syntax

```
DBMS_QOPATCH.CHECK_PATCH_INSTALLED (
   bugs     IN QOPATCH_LIST);
 RETURN VARCHAR2;
```

Parameters

Table 157-3   CHECK_PATCH_INSTALLED Parameters

Parameter	Description
bugs	List of patches to be checked.

GET_OPATCH_BUGS Function

This function provides a bugs list in a patch if the patch number is given. If a patch number is not given, it lists all the bugs in the specified XML format.

Syntax

```
DBMS_QOPATCH.GET_OPATCH_BUGS (
   patchnum IN VARCHAR2 DEFAULT NULL);
 RETURN XMLTYPE;
```

Parameters

Table 157-4   GET_OPATCH_BUGS Function Parameters

Parameter	Description
patchnum	Patch number

GET_OPATCH_COUNT Function

This function provides the total number of installed patches in XML format.

Syntax

```
DBMS_QOPATCH.GET_OPATCH_COUNT (
   patchnum IN VARCHAR2);
 RETURN XMLTYPE;
```

Parameters

Table 157-5   GET_OPATCH_COUNT Function Parameters

Parameter	Description
patchnum	Patch number

GET_OPATCH_DATA Function

This function provides top level patch information for the patch (such as Patch ID, patch creation time) in the XML element.

Syntax

```
DBMS_QOPATCH.GET_OPATCH_DATA (
   patchnum IN VARCHAR2);
 RETURN XMLTYPE;
```

Parameters

Table 157-6   GET_OPATCH_DATA Function Parameters

Parameter	Description
patchnum	Patch number

GET_OPATCH_FILES Function

This function provides the list of files modified in the given patch number in XML format.

Syntax

```
DBMS_QOPATCH.GET_OPATCH_FILES (
   patchnum IN VARCHAR2);
 RETURN XMLTYPE;
```

Parameters

Table 157-7   GET_OPATCH_FILES Function Parameters

Parameter	Description
patchnum	Patch number

GET_OPATCH_INSTALL_INFO Function

This function returns the XML element containing the `ORACLE_HOME` details such as patch and inventory location.

Syntax

```
DBMS_QOPATCH.GET_OPATCH_INSTALL_INFO
 RETURNS XMLTYPE;
```

GET_OPATCH_LIST Function

This function provides list of patches installed as an XML element from the XML inventory.

Syntax

```
DBMS_QOPATCH.GET_OPATCH_LIST
 RETURN XMLTYPE;
```

GET_OPATCH_LSINVENTORY

This function returns whole opatch inventory as XML instance document.

Syntax

```
DBMS_QOPATCH.GET_OPATCH_LSINVENTORY
 RETURN XMLTYPE;
```

GET_OPATCH_OLAYS Function

This function provides overlay patches for a given patch as XML element.

Syntax

```
DBMS_QOPATCH.GET_OPATCH_OLAYS (
   patchnum IN VARCHAR2);
 RETURN XMLTYPE;
```

Parameters

Table 157-8   GET_OPATCH_OLAYS Function Parameters

Parameter	Description
patchnum	Patch number

GET_OPATCH_PREQS Function

This function provides prerequisite patches for a given patch as XML element.

Syntax

```
DBMS_QOPATCH.GET_OPATCH_PREQS (
   patchnum IN VARCHAR2);
 RETURN XMLTYPE;
```

Parameters

Table 157-9   GET_OPATCH_PREQS Function Parameters

Parameter	Description
patchnum	Patch number

GET_OPATCH_XSLT

This function returns the style-sheet for the opatch XML inventory presentation. You can use the return type of this subprogram to perform XMLTRANSFORM and the transformed result has the same appearance as opatch text output.

Syntax

```
DBMS_QOPATCH.GET_OPATCH_XSLT
 RETURN XMLTYPE;
```

GET_PATCH_DETAILS Function

Displays the detailed patch information from `opatch lsinventory`.

Syntax

```
DBMS_QOPATCH.GET_PATCH_DETAILS (
   patch    IN VARCHAR2);
 RETURN XMLTYPE;
```

Parameters

Table 157-10   GET_PATCH_DETAILS Function Parameters

Parameter	Description
patch	The patch number.

GET_SQLPATCH_STATUS Procedure

This procedure displays the SQL patch status by querying from SQL patch registry to produce complete patch level information. If the patch number is given, it displays the information specific to the given SQL patch, otherwise information for all SQL patches.

Syntax

```
DBMS_QOPATCH.GET_SQLPATCH_STATUS (
   patchnum IN VARCHAR2 DEFAULT NULL);
```

Parameters

Table 157-11   GET_SQLPATCH_STATUS Procedure Parameters

Parameter	Description
patchnum	Patch number

IS_PATCH_INSTALLED Function

This function provides information (such as patchID, application date, and SQL patch information) on the installed patch as XML node by querying the XML inventory.

Syntax

```
DBMS_QOPATCH.IS_PATCH_INSTALLED (
   patchnum IN VARCHAR2);
 RETURN XMLTYPE;
```

Parameters

Table 157-12   IS_PATCH_INSTALLED Function Parameters

Parameter	Description
patchnum	Patch number

OPATCH_COMPARE_CURRENT Function

Compares the current database with a list of bugs.

Syntax

```
DBMS_QOPATCH.OPATCH_COMPARE_CURRENT Function (
   bugs     IN QOPATCH_LIST);
 RETURN VARCHAR2;
```

Parameters

Table 157-13   OPATCH_COMPARE_CURRENT Function Parameters

Parameter	Description
bugs	List of bugs to compare with the current database.

OPATCH_COMPARE_NODES Function

Compares the given RAC node(s) with the instance to the present connected node with current node. The return value indicates whether the data was refreshed or not.

Syntax

```
DBMS_QOPATCH.OPATCH_COMPARE_NODES (
   node      IN VARCHAR2 DEFAULT NULL,
   inst      IN VARCHAR2 DEFAULT NULL);
 RETURN VARCHAR2;
```

Parameters

Table 157-14   OPATCH_COMPARE_NODES Function Parameters

Parameter	Description
node	Node name
inst	Instance name

SET_CURRENT_OPINST Procedure

This procedure sets the node name and instance to get the inventory details specific to it in an Oracle Real Application Clusters (RAC) environment.

Syntax

```
DBMS_QOPATCH.SET_CURRENT_OPINST (
   node_name   IN VARCHAR2 DEFAULT NULL,
   inst_name   IN VARCHAR2 DEFAULT NULL);
```

Parameters

Table 157-15   SET_CURRENT_OPINST Procedure Parameters

Parameter	Description
node_name	Name of node
inst_name	Name of instance

ORACLE