234 DBMS_XMLGEN

The DBMS_XMLGEN package converts the results of a SQL query to a canonical XML format.

> **Note:**
>
> The PL/SQL package DBMS_XMLGEN is deprecated in Oracle Database 23ai.
>
> DBMS_XMLGEN is a non-standard Oracle-proprietary package that is provided to generate and convert XML documents from SQL queries or with PL/SQL. This package is deprecated, and can be desupported in a future release. Oracle recommends that you use SQL/XML operators to generate XML from relational columns instead. Using ANSI SQL/XML operators for any generation and modification of XML documents provides a standardized and future-proof way to work with XML documents.

The package takes an arbitrary SQL query as input, converts it to XML format, and returns the result as a CLOB. This package is similar to the DBMS_XMLQUERY package, except that it is written in C and compiled into the kernel. This package can only be run on the database.

This chapter contains the following topic:

- Security Model
- Summary of DBMS_XMLGEN Subprograms

> **See Also:**
>
> *Oracle XML DB Developer's Guide,* or more information on XML support and on examples of using DBMS_XMLGEN

DBMS_XMLGEN Security Model

Owned by XDB, the DBMS_XMLGEN package must be created by SYS or XDB. The EXECUTE privilege is granted to PUBLIC. Subprograms in this package are executed using the privileges of the current user.

Summary of DBMS_XMLGEN Subprograms

This table lists the DBMS_XMLGEN subprograms and briefly describes them.

Table 234-1 Summary of DBMS_XMLGEN Package Subprograms

Subprogram	Description
CLOSECONTEXT Procedure	Closes the context and releases all resources
CONVERT Functions	Converts the XML into the escaped or unescaped XML equivalent
GETNUMROWSPROCESSED Function	Gets the number of SQL rows that were processed in the last call to GETXML Functions
GETXML Functions	Gets the XML document
GETXMLTYPE Functions	Gets the XML document and returns it as `XMLType`
NEWCONTEXT Functions	Creates a new context handle
NEWCONTEXTFROMHIERARCHY Function	Obtains a handle to use in the GETXML Functions and other functions to get a hierarchical XML with recursive elements from the result
RESTARTQUERY Procedure	Restarts the query to start fetching from the beginning
SETCONVERTSPECIALCHARS Procedure	Sets whether special characters such as `$`, which are non-XML characters, should be converted or not to their escaped representation
SETMAXROWS Procedure	Sets the maximum number of rows to be fetched each time
SETNULLHANDLING Procedure	Sets `NULL` handling options
SETROWSETTAG Procedure	Sets the name of the element enclosing the entire result
SETROWTAG Procedure	Sets the name of the element enclosing each row of the result
SETSKIPROWS Procedure	Sets the number of rows to skip every time before generating the XML.
USEITEMTAGSFORCOLL Procedure	Forces the use of the collection column name appended with the tag `_ITEM` for collection elements
USENULLATTRIBUTEINDICATOR Procedure	Specifies whether to use an XML attribute to indicate `NULL`ness, or to do it by omitting the inclusion of the particular entity in the XML document.

CLOSECONTEXT Procedure

This procedure closes a given context and releases all resources associated with it, including the SQL cursor and bind and define buffers. After this call, the handle cannot be used for a subsequent function call.

Syntax

```
DBMS_XMLGEN.CLOSECONTEXT (
   ctx   IN ctxHandle);
```

Parameters

Table 234-2 CLOSECONTEXT Procedure Parameters

Parameter	Description
`ctx`	The context handle to close.

CONVERT Functions

This function converts the XML data into the escaped or unescapes XML equivalent, and returns XML CLOB data in encoded or decoded format. There are several version of the function.

Syntax

Uses XMLDATA in string form (VARCHAR2):

```
DBMS_XMLGEN.CONVERT (
   xmlData IN VARCHAR2,
   flag    IN NUMBER := ENTITY_ENCODE)
RETURN VARCHAR2;
```

Uses XMLDATA in CLOB form:

```
DBMS_XMLGEN.CONVERT (
   xmlData IN CLOB,
   flag    IN NUMBER := ENTITY_ENCODE)
 RETURN CLOB;
```

Parameters

Table 234-3 CONVERT Function Parameters

Parameter	Description
xmlData	The XML CLOB data to be encoded or decoded.
flag	The flag setting; ENTITY_ENCODE (default) for encode, and ENTITY_DECODE for decode.

Usage Notes

This function escapes the XML data if the ENTITY_ENCODE is specified. For example, the escaped form of the character < is &lt;. Unescaping is the reverse transformation.

GETNUMROWSPROCESSED Function

This function retrieves the number of SQL rows processed when generating the XML using the GETXML Functions call. This count does not include the number of rows skipped before generating the XML.

Note that GETXML Functions always generates an XML document, even if there are no rows present.

Syntax

```
DBMS_XMLGEN.GETNUMROWSPROCESSED (
   ctx      IN    ctxHandle)
RETURN NUMBER;
```

Parameters

Table 234-4 GETNUMROWSPROCESSED Function Parameters

Parameter	Description
ctx	The context handle obtained from the NEWCONTEXT Functions call.

Usage Notes

This function is used to determine the terminating condition if calling GETXML Functions in a loop.

Related Topics

- GETXML Functions
  This function gets the XML document. The function is overloaded.

GETXML Functions

This function gets the XML document. The function is overloaded.

Syntax

Gets the XML document by fetching the maximum number of rows specified. It appends the XML document to the CLOB passed in. Use this version of GETXML Functions to avoid any extra CLOB copies and to reuse the same CLOB for subsequent calls. Because of the CLOB reuse, this GETXML Functionscall is potentially more efficient:

```
DBMS_XMLGEN.GETXML (
   ctx           IN ctxHandle,
   tmpclob       IN OUT NCOPY CLOB,
   dtdOrSchema   IN number := NONE)
 RETURN BOOLEAN;
```

Generates the XML document and returns it as a temporary CLOB. The temporary CLOB obtained from this function must be freed using the DBMS_LOB.FREETEMPORARY call:

```
DBMS_XMLGEN.GETXML (
   ctx           IN ctxHandle,
   dtdOrSchema   IN number := NONE)
 RETURN CLOB;
```

Converts the results from the SQL query string to XML format, and returns the XML as a temporary CLOB, which must be subsequently freed using the DBMS_LOB.FREETEMPORARY call:

```
DBMS_XMLGEN.GETXML (
   sqlQuery      IN VARCHAR2,
   dtdOrSchema   IN number := NONE)
 RETURN CLOB;
```

Parameters

Table 234-5 GETXML Function Parameters

Parameter	Description
`ctx`	The context handle obtained from the `newContext` call.
`tmpclob`	The `CLOB` to which the XML document is appended.
`sqlQuery`	The SQL query string.
`dtdOrSchema`	Generate a DTD or a schema? Only `NONE` is supported.

Usage Notes

When the rows indicated by the SETSKIPROWS Procedure call are skipped, the maximum number of rows as specified by the SETMAXROWS Procedure call (or the entire result if not specified) is fetched and converted to XML. Use the GETNUMROWSPROCESSED Function to check if any rows were retrieved.

GETXMLTYPE Functions

This function gets the XML document and returns it as an `XMLTYPE`. `XMLTYPE` operations can be performed on the results. This function is overloaded.

Syntax

Generates the XML document and returns it as a `sys.XMLType`:

```
DBMS_XMLGEN.GETXMLTYPE (
   ctx           IN ctxhandle,
   dtdOrSchema   IN number := NONE)
 RETURN sys.XMLType;
```

Converts the results from the SQL query string to XML format, and returns the XML as a `sys.XMLType`:

```
DBMS_XMLGEN.GETXMLTYPE (
   sqlQuery     IN VARCHAR2,
   dtdOrSchema  IN number := NONE)
 RETURN sys.XMLType
```

Parameters

Table 234-6 GETXMLTYPE Function Parameters

Parameter	Description
`ctx`	The context handle obtained from the `newContext` call.
`sqlQuery`	The SQL query string.
`dtdOrSchema`	Generate a DTD or a schema? Only `NONE` is supported.

NEWCONTEXT Functions

This function generates and returns a new context handle.

This context handle is used in GETXML Functions and other functions to get XML back from the result. There are several version of the function.

Syntax

Generates a new context handle from a query:

```
DBMS_XMLGEN.NEWCONTEXT (
      query     IN VARCHAR2)
 RETURN ctxHandle;
```

Generates a new context handle from a query string in the form of a PL/SQL ref cursor:

```
DBMS_XMLGEN.NEWCONTEXT (
   queryString  IN SYS_REFCURSOR)
 RETURN ctxHandle;
```

Parameters

Table 234-7   NEWCONTEXT Function Parameters

Parameter	Description
`query`	The query, in the form of a `VARCHAR`, the result of which must be converted to XML.
`queryString`	The query string in the form of a PL/SQL ref cursor, the result of which must be converted to XML.

NEWCONTEXTFROMHIERARCHY Function

This function obtains a handle to use in the GETXML Functions and other functions to get a hierarchical XML with recursive elements from the result.

Syntax

```
DBMS_XMLGEN.NEWCONTEXTFROMHIERARCHY (
   queryString IN VARCHAR2)
 RETURN ctxHandle;
```

Parameters

Table 234-8   NEWCONTEXTFROMHIERARCHY Function Parameters

Parameter	Description
`queryString`	The query string, the result of which must be converted to XML. The query is a hierarchical query typically formed using a `CONNECT BY` clause, and the result must have the same property as the result set generated by a `CONNECT BY` query. The result set must have only two columns, the level number and an XML value. The level number is used to determine the hierarchical position of the XML value within the result XML document.

Related Topics

- GETXML Functions
  This function gets the XML document. The function is overloaded.

RESTARTQUERY Procedure

This procedure restarts the query and generates the XML from the first row.

It can be used to start executing the query again, without having to create a new context.

Syntax

```
DBMS_XMLGEN.RESTARTQUERY (
ctx   IN ctxHandle);
```

Parameters

Table 234-9   RESTARTQUERY Procedure Parameters

Parameter	Description
`ctx`	The context handle corresponding to the current query.

SETCONVERTSPECIALCHARS Procedure

This procedure sets whether or not special characters in the XML data must be converted into their escaped XML equivalent. For example, the < sign is converted to `&lt;`.

The default is to perform conversions.

This function improves performance of XML processing when the input data cannot contain any special characters such as <, >, `"`, `'`, which must be escaped. It is expensive to scan the character data to replace the special characters, particularly if it involves a lot of data.

Syntax

```
DBMS_XMLGEN.SETCONVERTSPECIALCHARS (
ctx    IN ctxHandle,
conv   IN BOOLEAN);
```

Parameters

Table 234-10   SETCONVERTSPECIALCHARS Procedure Parameters

Parameter	Description
`ctx`	The context handle obtained from one of the NEWCONTEXT Functions call.
`conv`	`TRUE` indicates that conversion is needed.

SETMAXROWS Procedure

This procedure sets the maximum number of rows to fetch from the SQL query result for every invocation of the GETXML Functions call.

It is used when generating paginated results. For example, when generating a page of XML or HTML data, restrict the number of rows converted to XML or HTML by setting the `maxrows` parameter.

Syntax

```
DBMS_XMLGEN.SETMAXROWS (
ctx       IN ctxHandle,
maxRows   IN NUMBER);
```

Parameters

Table 234-11 SETMAXROWS Procedure Parameters

Parameter	Description
`ctx`	The context handle corresponding to the query executed.
`maxRows`	The maximum number of rows to get for each call to GETXML Functions

Related Topics

- GETXML Functions
  This function gets the XML document. The function is overloaded.

SETNULLHANDLING Procedure

This procedure sets `NULL` handling options, handled through the `flag` parameter setting.

Syntax

```
DBMS_XMLGEN.SETNULLHANDLING(
ctx  IN ctx,
flag IN NUMBER);
```

Parameters

Table 234-12 SETNULLHANDLING Procedure Parameters

Parameter	Description
`ctx`	The context handle corresponding to the query executed.
`flag`	The `NULL` handling option set. • `DROP_NULLS CONSTANT NUMBER:= 0;` (Default) Leaves out the tag for `NULL` elements. • `NULL_ATTR CONSTANT NUMBER:= 1`; Sets `xsi:nil="true"`. • `EMPTY_TAG CONSTANT NUMBER:= 2;` Sets, for example, `<foo/>`.

SETROWSETTAG Procedure

This procedure sets the name of the root element of the document. The default name is ROWSET.

Syntax

```
DBMS_XMLGEN.SETROWSETTAG (
ctx            IN ctxHandle,
rowSetTagName  IN VARCHAR2);
```

Parameters

Table 234-13 SETROWSETTAG Procedure Parameters

Parameter	Description
ctx	The context handle obtained from the NEWCONTEXT Functions call.
rowSetTagName	The name of the document element. Passing NULL indicates that you do not want the ROWSET element present.

Usage Notes

The user can set the rowSetTag to NULL to suppress the printing of this element. However, an error is produced if both the row and the rowset are NULL and there is more than one column or row in the output. This is because the generated XML would not have a top-level enclosing tag, and so would be invalid.

SETROWTAG Procedure

This procedure sets the name of the element separating all the rows. The default name is ROW.

Syntax

```
DBMS_XMLGEN.SETROWTAG (
ctx         IN ctxHandle,
rowTagName  IN VARCHAR2);
```

Parameters

Table 234-14 SETROWTAG Procedure Parameters

Parameter	Description
ctx	The context handle obtained from the NEWCONTEXT Functions call.
rowTagName	The name of the ROW element. Passing NULL indicates that you do not want the ROW element present.

Usage Notes

The user can set the name of the element to NULL to suppress the ROW element itself. However, an error is produced if both the row and the rowset are NULL and there is more than one column or row in the output. This is because the generated XML would not have a top-level enclosing tag, and so would be invalid.

SETSKIPROWS Procedure

This procedure skips a given number of rows before generating the XML output for every call to the GETXML Functions. It is used when generating paginated results for stateless Web pages using this utility.

For example, when generating the first page of XML or HTML data, set skiprows to zero. For the next set, set the skiprows to the number of rows obtained in the first case. See GETNUMROWSPROCESSED Function.

Syntax

```
DBMS_XMLGEN.SETSKIPROWS (
ctx        IN ctxHandle,
skipRows   IN NUMBER);
```

Parameters

Table 234-15 SETSKIPROWS Procedure Parameters

Parameter	Description
ctx	The context handle corresponding to the query executed.
skipRows	The number of rows to skip for each call to getXML.

Related Topics

- GETXML Functions
  This function gets the XML document. The function is overloaded.

USEITEMTAGSFORCOLL Procedure

This procedure overrides the default name of the collection elements. The default name for collection elements is the type name itself.

Syntax

```
DBMS_XMLGEN.USEITEMTAGSFORCOLL (
   ctx   IN ctxHandle);
```

Parameters

Table 234-16 USEITEMTAGSFORCOLL Procedure Parameters

Parameter	Description
ctx	The context handle.

Usage Notes

Using this procedure, you can override the default to use the name of the column with the _ITEM tag appended to it. If there is a collection of NUMBER, the default tag name for the collection elements is NUMBER.

USENULLATTRIBUTEINDICATOR Procedure

This procedure specifies whether to use an XML attribute to indicate NULL, or to do it by omitting the inclusion of the particular entity in the XML document.

It is used as a shortcut for the SETNULLHANDLING Procedure.

Syntax

```
DBMS_XMLGEN.USENULLATTRIBUTEINDICATOR(
ctx        IN    ctxType,
attrind    IN    BOOLEAN := TRUE);
```

Parameters

Table 234-17   USENULLATTRIBUTEINDICATOR Procedure Parameters

Parameter	Description
ctx	Context handle.
attrind	Use attribute to indicate NULL?