318

UTL Streams Types

`UTL Streams Types` describe abstract types used with Oracle XML functionality.

Four abstract PL/SQL streams are introduced and defined within the '`SYS`' schema. The streams may be referenced by `PUBLIC` and are described in the following sections.

This chapter contains the following topics:

- Security Model
- Summary of UTL Binary Streams Types

> **See Also:**
>
> For more information, see Oracle XML DB Developer's Guide

UTL Streams Types Security Model

`EXECUTE` on UTL Streams Types is granted to `PUBLIC`.

Summary of UTL Binary Streams Types

This table lists the `UTL Binary Streams Types` and briefly describes them.

Table 318-1 UTL Streams Types

Type	Description
UTL_BINARYINPUTSTREAM Type	Reads bytes and closes a stream.
UTL_BINARYOUTPUTSTREAM Type	Writes bytes and closes a stream.
UTL_CHARACTERINPUTSTREAM Type	Reads chars and closes a stream.
UTL_CHARACTEROUTPUTSTREAM Type	Writes chars and closes a stream.

UTL_BINARYINPUTSTREAM Type

This type is similar to `java.io.InputStream` in that it can only read and close a stream.

Syntax

```
CREATE OR REPLACE TYPE Utl_BinaryInputStream AS OBJECT (

   MEMBER FUNCTION available (
```

```
      self    IN OUT NOCOPY  Utl_BinaryInputStream)
   RETURN INTEGER,

  MEMBER FUNCTION read (                                  -- #1
     self      IN OUT NOCOPY  Utl_BinaryInputStream,
     numBytes  IN             INTEGER DEFAULT 1)
   RETURN RAW,

  MEMBER PROCEDURE read (                                 -- #2
     self       IN OUT NOCOPY   Utl_BinaryInputStream,
     bytes      IN OUT NOCOPY  RAW,
     numBytes   IN OUT         INTEGER),

  MEMBER PROCEDURE read (                                 -- #3
     self       IN OUT NOCOPY   Utl_BinaryInputStream,
     bytes      IN OUT NOCOPY   RAW,
     offset     IN INTEGER,
     numBytes   IN OUT           INTEGER),

  member function close (
     self       In Out Nocopy   Utl_BinaryInputStream)

) NOT FINAL;
```

Attributes

Table 318-2 UTL_BINARYINPUTSTREAM Type Member Subprograms

Member Subprogram	Description
AVAILABLE	Returns the number of bytes available to be read
READ	• #1 - Reads the number of bytes specified by numBytes (default is 1) and returns the bytes as a RAW. If there are no remaining bytes a value of NULL is returned. • #2 - Reads the number of bytes specified in numBytes into the parameter bytes. Additionally, the actual number of bytes read is returned in parameter numBytes. If this parameter is set to 0 then there are no more bytes to be read. • #3 - Reads the number of bytes specified in numBytes into the parameter bytes, beginning at the offset specified by parameter offset. The actual number of bytes read is returned in parameter numBytes. If this value is 0, then there are no additional bytes to be read.
CLOSE	Releases all resources held on the node to support the stream

UTL_BINARYOUTPUTSTREAM Type

This type is similar to java.io.OutputStream in that it can only write and close a stream.

Syntax

```
CREATE OR REPLACE TYPE Utl_BinaryOutputStream AS OBJECT (

  MEMBER FUNCTION write (                                 -- #1
       self       IN OUT NOCOPY   sys.utl_BinaryOutputStream,
       bytes      IN              RAW,
       numBytes   IN              INTEGER DEFAULT 1)
  RETURN INTEGER,

  MEMBER PROCEDURE write (                                 -- #2
       self       IN OUT NOCOPY  sys.utl_BinaryOutputStream,
```

```
      bytes      IN NOCOPY      RAW,
      numBytes   IN OUT         INTEGER),

  MEMBER PROCEDURE write (                                  -- #3
      self       IN OUT NOCOPY  utl_BinaryOutputStream,        bytes      IN
NOCOPY      RAW,
      offset     IN             INTEGER,
      numBytes   IN OUT         INTEGER),

  MEMBER PROCEDURE flush (
      self       IN OUT NOCOPY  utl_BinaryOutputStream),

  MEMBER PROCEDURE close (
      self       IN OUT NOCOPY utl_BinaryOutputStream)

 ) NOT FINAL;
```

Attributes

Table 318-3 UTL_BINARYOUTPUTSTREAM Type Member Subprograms

Member Subprogram	Description
WRITE	• #1 - Writes the number of bytes specified by `numBytes` (default is 1) from `RAW` into the stream. The actual number of bytes written is returned. • #2 - Writes the number of bytes specified in parameter `numBytes` from parameter bytes to the stream. The actual number of bytes written is returned in parameter `numBytes`. • #3 - Writes the number of bytes specified by `numBytes` to the stream, beginning at the offset specified by parameter offset. The actual number of bytes written is returned in parameter `numBytes`.
FLUSH	Insures that any buffered bytes are copied to the node destination
CLOSE	Frees all resources associated with the stream

UTL_CHARACTERINPUTSTREAM Type

This type is similar to `java.io.Reader` in that it can only read characters (chars) and close a stream.

Syntax

```
CREATE OR REPLACE TYPE Utl_CharacterInputStream AS OBJECT (

   MEMBER FUNCTION available (
       self       IN OUT NOCOPY   utl_CharacterInputStream)
   RETURN INTEGER,

   MEMBER FUNCTION read (                                   -- #1
       self       IN OUT NOCOPY   utl_CharacterInputStream,
       numChars   IN              INTEGER DEFAULT 1,
       lineFeed   IN              BOOLEAN DEFAULT FALSE)
   RETURN VARCHAR2,

   MEMBER PROCEDURE read (                                  -- #2
       self       IN OUT NOCOPY    utl_CharacterInputStream,
       chars      IN OUT NOCOPY    VARCHAR2,
       numChars   IN OUT           INTEGER,
```

```
      lineFeed   IN BOOLEAN DEFAULT FALSE),

   MEMBER PROCEDURE read (                                  -- #3
      self       IN OUT NOCOPY   utl_CharacterInputStream,
      chars      IN OUT NOCOPY    VARCHAR2,
      offset     IN               INTEGER,
      numChars   IN OUT           INTEGER,
      lineFeed   IN               BOOLEAN DEFAULT FALSE),

   MEMBER PROCEDURE close (
      self       IN OUT NOCOPY    utl_CharacterInputStream)
) NOT FINAL;
```

Attributes

Table 318-4 UTL_CHARACTERINPUTSTREAM Type Member Subprograms

Member Subprogram	Description
AVAILABLE	Returns the number of bytes available to be read
READ	• #1 - Returns the number of characters remaining to be read • #2 - Reads the number of characters specified by numChars (default value is 1) and returns the characters as a VARCHAR2. If the value of lineFeed is true (default value is FALSE) then the reading stops if a linefeed character is found. If there are no remaining characters a value of NULL is returned. • #3 - Reads reads the number of characters specified by parameter numChars into the parameter chars. Additionally, the actual number of characters read is returned in parameter numChars. If this value is 0, then there are no more characters to be read. If the value of lineFeed is TRUE (default is FALSE), then reading stops if a linefeed character is encountered.
CLOSE	Releases all resources held by the stream

UTL_CHARACTEROUTPUTSTREAM Type

This type is similar to java.io.Reader in that it can only read characters (chars) and close a stream.

Syntax

```
CREATE OR REPLACE TYPE utl_CharacterOutputStream  AS OBJECT (

 MEMBER FUNCTION write (                                  -- #1
     self      IN OUT NOCOPY   utl_CharacterOutputStream,
     chars     IN              VARCHAR2,
     numChars  IN              INTEGER DEFAULT 1,
     lineFeed  IN              BOOLEAN DEFAULT FALSE)
  RETURN INTEGER,

 MEMBER PROCEDURE write (                                  -- #2
     self      IN OUT NOCOPY   utl_CharacterOutputStream,
     chars     IN OUT NOCOPY   VARCHAR2,
     numChars  IN OUT          INTEGER,
     lineFeed  IN              BOOLEAN DEFAULT FALSE),

 member procedure write (                                  -- #3
     self     IN OUT NOCOPY    utl_CharacterOutputStream,
     chars    IN  NOCOPY       varchar2,
```

```
    offset   IN              integer,
    numChars IN OUT          integer,
   lineFeed  IN              boolean default false),

 MEMBER PROCEDURE flush (
    self     IN OUT NOCOPY    utl_CharacterOutputStream),

MEMBER PROCEDURE close (
    self     IN OUT NOCOPY utl_CharacterOutputStream)

 ) NOT FINAL;
```

Attributes

Table 318-5 UTL_CHARACTEROUTPUTSTREAM Type Member Subprograms

Member Subprogram	Description
WRITE	• #1 - Writes the number of characters specified by numChars (default is 1) from parameter chars into the stream and returns the actual number of characters written. If the value of lineFeed is TRUE (default is FALSE) a lineFeed character is inserted after the last character. • #2 - writes the number of characters specified by parameter numChars, from parameter chars into the stream. The actual number of characters written is returned in parameter numChars. If the value of lineFeed is true (default is FALSE) a lineFeed character is inserted after the last character. • #3 - Writes the number of characters specified by parameter numChars, from parameter chars, beginning at offset specified by parameter offset. The actual number of characters written is returned in parameter numChars. If the value of lineFeed is true (default is FALSE) a lineFeed character is inserted after the last character .
FLUSH	Copies all characters that may be contained within buffers to the node value
CLOSE	Releases all resources held by the stream