Informix Product Family
Informix
Version 12.10

IBM Informix XML User's Guide

SC27-4539-00

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Note
Before using this information and the product it supports, read the information in "Notices" on page B-1.

Edition

Contents

Introduction

About this publication

This publication includes information about using built-in functions for XML publishing with IBM® Informix®.

You should be familiar with the *IBM Informix Guide to SQL: Syntax*, which contains all the syntax descriptions for SQL and stored procedure language (SPL). The *IBM Informix Guide to SQL: Tutorial* shows how to use basic and advanced SQL and SPL routines to access and manipulate the data in your databases. The *IBM Informix Database Design and Implementation Guide* shows how to use SQL to implement and manage your databases.

See the documentation notes files for a list of the publications in the documentation set of your IBM Informix database server.

Types of users

This publication is written for the following users:

- Database users
- Database administrators
- Database server administrators
- Database-application programmers

This publication assumes that you have the following background:

- A working knowledge of your computer, your operating system, and the utilities that your operating system provides
- Some experience working with relational databases or exposure to database concepts
- Some experience with computer programming and XML
- Some experience with database server administration, operating-system administration, or network administration

Assumptions about your locale

IBM Informix products can support many languages, cultures, and code sets. All the information related to character set, collation, and representation of numeric data, currency, date, and time is brought together in a single environment, called a Global Language Support (GLS) locale.

This publication assumes that your database uses the default locale. This default is en_us.8859-1 (ISO 8859-1) on UNIX platforms or en_us.1252 (Microsoft 1252) in Windows environments. This locale supports U.S. English format conventions for displaying and entering date, time, number, and currency values. It also supports the ISO 8859-1 (on UNIX and Linux) or Microsoft 1252 (on Windows) code set, which includes the ASCII code set plus many 8-bit characters such as é, è, and ñ.

If you plan to use nondefault characters in your data or in SQL identifiers, or if you plan to use other collation rules for sorting character data, you need to specify the appropriate nondefault locale.

For instructions on how to specify a nondefault locale, and for additional syntax and other considerations related to GLS locales, see the *IBM Informix GLS User's Guide*.

Example code conventions

Examples of SQL code occur throughout this publication. Except as noted, the code is not specific to any single IBM Informix application development tool.

If only SQL statements are listed in the example, they are not delimited by semicolons. For instance, you might see the code in the following example:

```
CONNECT TO stores_demo
...

DELETE FROM customer
   WHERE customer_num = 121
...

COMMIT WORK
DISCONNECT CURRENT
```

To use this SQL code for a specific product, you must apply the syntax rules for that product. For example, if you are using an SQL API, you must use EXEC SQL at the start of each statement and a semicolon (or other appropriate delimiter) at the end of the statement. If you are using DB–Access, you must delimit multiple statements with semicolons.

Tip: Ellipsis points in a code example indicate that more code would be added in a full application, but it is not necessary to show it to describe the concept being discussed.

For detailed directions on using SQL statements for a particular application development tool or SQL API, see the documentation for your product.

Additional documentation

Documentation about this release of IBM Informix products is available in various formats.

You can access Informix technical information such as information centers, technotes, white papers, and IBM Redbooks® publications online at http://www.ibm.com/software/data/sw-library/.

Compliance with industry standards

IBM Informix products are compliant with various standards.

IBM Informix SQL-based products are fully compliant with SQL-92 Entry Level (published as ANSI X3.135-1992), which is identical to ISO 9075:1992. In addition, many features of IBM Informix database servers comply with the SQL-92 Intermediate and Full Level and X/Open SQL Common Applications Environment (CAE) standards.

The IBM Informix Geodetic DataBlade® Module supports a subset of the data types from the *Spatial Data Transfer Standard (SDTS)—Federal Information Processing*

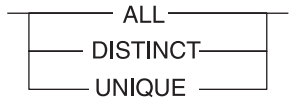
Standard 173, as referenced by the document *Content Standard for Geospatial Metadata*, Federal Geographic Data Committee, June 8, 1994 (FGDC Metadata Standard).

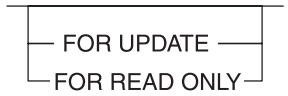
Syntax diagrams

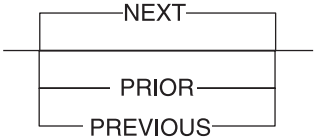
Syntax diagrams use special components to describe the syntax for statements and commands.

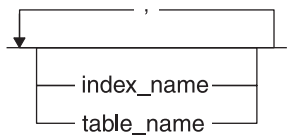
Table 1. Syntax Diagram Components

Component represented in PDF	Component represented in HTML	Meaning
	`>>----------`	Statement begins.
	`---------->`	Statement continues on next line.
	`>----------`	Statement continues from previous line.
	`----------><`	Statement ends.
	`--------SELECT----------`	Required item.
	`--+-----------------+---` `  '------LOCAL------'`	Optional item.

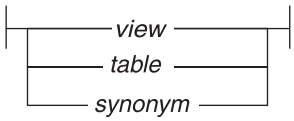
	`---+-----ALL-------+---`
	`   +--DISTINCT-----+`
	`   '---UNIQUE------'`
		Required item with choice. Only one item must be present.

	`---+------------------+---`
	`    +--FOR UPDATE-----+`
	`    '--FOR READ ONLY--'`
		Optional items with choice are shown below the main line, one of which you might specify.

	`    .---NEXT---------.`
	`----+----------------+---`
	`    +---PRIOR--------+`
	`    '---PREVIOUS-----'`
		The values below the main line are optional, one of which you might specify. If you do not specify an item, the value above the line is used by default.

	`  .-------,-----------.`
	`  V                   |`
	`---+-----------------+---`
	`    +---index_name---+`
	`    '---table_name---'`
		Optional items. Several items are allowed; a comma must precede each repetition.

	`>>-| Table Reference |-><`	Reference to a syntax segment.

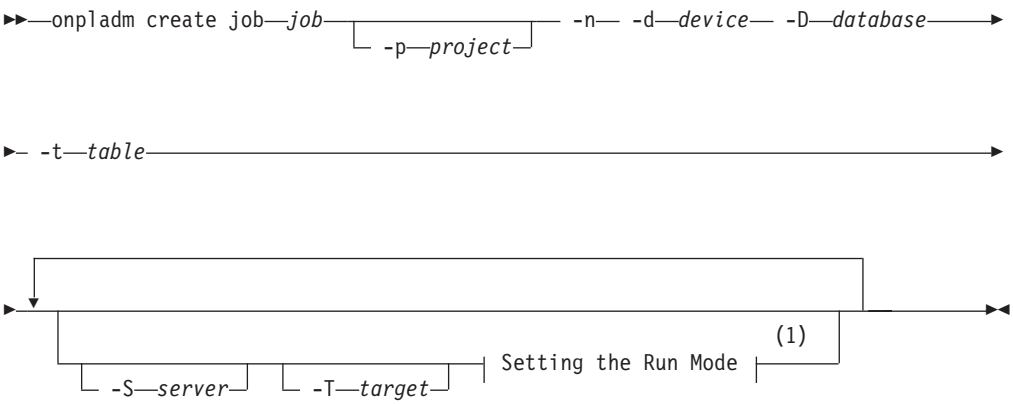
Table Reference
 
	`Table Reference`
	`|--+-----view--------+--|`
	`   +------table------+`
	`   '----synonym------'`
		Syntax segment.

How to read a command-line syntax diagram

Command-line syntax diagrams use similar elements to those of other syntax diagrams.

Some of the elements are listed in the table in Syntax Diagrams.

Creating a no-conversion job

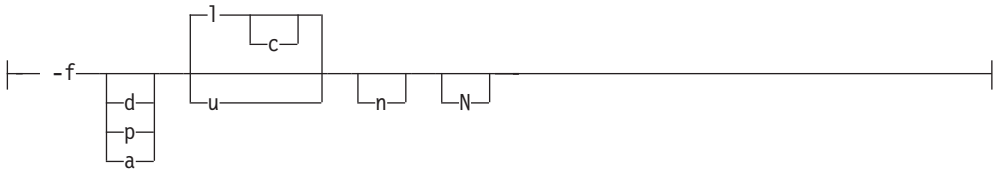


Notes:

1 See page Z-1

This diagram has a segment named "Setting the Run Mode," which according to the diagram footnote is on page Z-1. If this was an actual cross-reference, you would find this segment on the first page of Appendix Z. Instead, this segment is shown in the following segment diagram. Notice that the diagram uses segment start and end components.

Setting the run mode:



To see how to construct a command correctly, start at the upper left of the main diagram. Follow the diagram to the right, including the elements that you want. The elements in this diagram are case-sensitive because they illustrate utility syntax. Other types of syntax, such as SQL, are not case-sensitive.

The Creating a No-Conversion Job diagram illustrates the following steps:

1. Type **onpladm create job** and then the name of the job.
2. Optionally, type **-p** and then the name of the project.
3. Type the following required elements:
   - **-n**
   - **-d** and the name of the device
   - **-D** and the name of the database

- **-t** and the name of the table

4. Optionally, you can choose one or more of the following elements and repeat them an arbitrary number of times:
   - **-S** and the server name
   - **-T** and the target server name
   - The run mode. To set the run mode, follow the Setting the Run Mode segment diagram to type **-f**, optionally type **d**, **p**, or **a**, and then optionally type **l** or **u**.
5. Follow the diagram to the terminator.

Keywords and punctuation

Keywords are words reserved for statements and all commands except system-level commands.

When a keyword appears in a syntax diagram, it is shown in uppercase letters. When you use a keyword in a command, you can write it in uppercase or lowercase letters, but you must spell the keyword exactly as it appears in the syntax diagram.

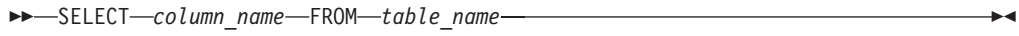
You must also use any punctuation in your statements and commands exactly as shown in the syntax diagrams.

Identifiers and names

Variables serve as placeholders for identifiers and names in the syntax diagrams and examples.

You can replace a variable with an arbitrary name, identifier, or literal, depending on the context. Variables are also used to represent complex syntax elements that are expanded in additional syntax diagrams. When a variable appears in a syntax diagram, an example, or text, it is shown in *lowercase italic*.

The following syntax diagram uses variables to illustrate the general form of a simple SELECT statement.



When you write a SELECT statement of this form, you replace the variables *column_name* and *table_name* with the name of a specific column and table.

How to provide documentation feedback

You are encouraged to send your comments about IBM Informix user documentation.

Use one of the following methods:

- Send email to docinf@us.ibm.com.
- In the Informix information center, which is available online at http://www.ibm.com/software/data/sw-library/, open the topic that you want to comment on. Click the feedback link at the bottom of the page, fill out the form, and submit your feedback.
- Add comments to topics directly in the information center and read comments that were added by other users. Share information about the product documentation, participate in discussions with other users, rate topics, and more!

Feedback from all methods is monitored by the team that maintains the user documentation. The feedback methods are reserved for reporting errors and omissions in the documentation. For immediate help with a technical problem, contact IBM Technical Support at http://www.ibm.com/planetwide/.

We appreciate your suggestions.

Chapter 1. Publishing SQL result sets in XML

Several functions let you publish XML from SQL queries.

There are two of XML functions for each action depending on the size of total result set after adding all the tags necessary to publish it in XML format:

- One that returns a maximum of LVARCHAR(32739)
- One that returns a CLOB data type

The input XML must include every value inside an element, not as an attribute. For example:

```
<employee>
  <givenname>Roy</givenname>
  <familyname>Connor</familyname>
  <address>
    <address1>123 First Street</address1>
    <city>Denver</city>
    <state/>CO</state>
    <zipcode>80111</zipcode>
  </address>
  <phone>303-555-1212</phone>
</employee>
```

The XML functions are summarized in the following table.

Table 1-1. XML publishing functions

Action	Function	Comments
Return rows of SQL results as XML elements.	"The genxml() and genxmlclob() XML functions" on page 1-6	Similar to FOR XML RAW in Microsoft SQL Server
Return each column value as separate elements.	"The genxmlelem() and genxmlelemclob() XML functions" on page 1-7	Similar to FOR XML AUTO, ELEMENTS in Microsoft SQL Server
Return an XML schema and result in XML format.	"The genxmlschema() and genxmlschemaclob() XML functions" on page 1-10	Similar to FOR XML AUTO, XMLSCHEMA in Microsoft SQL Server
Returns the result set of a query in XML format.	"The genxmlquery() and genxmlqueryclob() XML functions" on page 1-10	These functions accept a SQL query as a parameter.
Returns the result set of a query in XML with the XML header.	"The genxmlqueryhdr() and genxmlqueryhdrclob() XML functions" on page 1-9	Every XML document must have a header. These functions provide a quick method of generating a header.
Evaluates an XPATH expression on an XML column, document, or string.	"The extract() and extractclob() XML functions" on page 1-3	Similar to the Oracle **extract()** function.
Returns the value of the XML node	"The extractvalue() and extractvalueclob() XML functions" on page 1-5	Similar to the Oracle **extractvalue()** function.

Table 1-1. XML publishing functions (continued)

Action	Function	Comments
Verify whether a specific node exists in an XML document.	"The existsnode() XML function" on page 1-4	Similar to the Oracle **exists()** function.
Parse an XML document to determine whether it is well formed.	"The idsxmlparse() XML function" on page 1-11	

XML publishing

XML publishing provides a way to transform results of SQL queries into XML structures.

When you publish an XML document using the built-in XML publishing functions, you transform the result set of an SQL query into an XML structure, optionally including an XML schema and header. You can store the XML in the database server for use in XML-based applications.

The input XML must be in nested elements within an XML document, with each column being an XML element rather than an attribute. This format is sometimes called the FOR XML AUTO, ELEMENTS format.

The **genxmlschema** function and other XML publishing functions cannot publish BYTE or TEXT columns into an XML document. These functions take the input column as ROW types and then publish them. BYTE and TEXT are not allowed in ROW types, so cannot be used in these publishing functions.

ROW types are unsupported in distributed queries. These functions use ROW types. As a result, these publishing functions cannot be used in distributed queries or use a synonym referring to a non-local object.

Before you run XML functions, run the following statement to allow multiple lines:

```
EXECUTE PROCEDURE ifx_allow_newline('t');
```

Run the following statements on the database server before running the examples in this book. The CREATE DATABASE statement uses a dbspace named `datadbs`. You must either create a dbspace named `datadbs` or substitute `datadbs` with the name of an existing dbspace.

```
EXECUTE PROCEDURE ifx_allow_newline('t');
CREATE DATABASE demo_xml IN datadbs with log;
CREATE TABLE tab (col2 lvarchar);
INSERT INTO tab VALUES ('
 <personnel>
  <person id="Jason.Ma">
  <name>
    <family>Ma</family>
    <given>Jason</given>
  </name>
  </person>
 </personnel>');
```

The idsxmlvp virtual processor class

The XML functions that IBM Informix provides run in a virtual processor class named **idsxmlvp**.

The **idsxmlvp** virtual processor is created automatically the first time you use an XML function. If you want to increase the number of **idsxmlvp** virtual processors, use one of the following methods:

- Add the following line to your `onconfig` file, substituting *n* with the number of virtual processors you want to start, and restart the database server: `VPCLASS idsxmlvp,num=n`
- As user **informix**, run the following command while the database server is running, substituting *n* with the number of virtual processors you want to start: `onmode -p +n idsxmlvp`

Special characters in XML functions

The XML functions of the database server automatically handle special characters.

When a SQL result set contains special characters, the XML function will automatically handle it. These special characters are listed in the following table.

Table 1-2. Special characters handled by XML functions

Character	Resolved in XML as
Less than (<)	<
Greater than (>)	>
Double quote (")	"
Apostrophe (`)	'
Ampersand (&)	&

The extract() and extractclob() XML functions

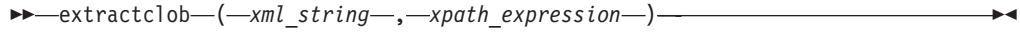
Evaluates an XPATH expression on an XML column, document, or string. These functions are identical except that **extractclob()** returns a CLOB instead of LVARCHAR.

Purpose

Returns an XML fragment of the evaluated XML column, document, or string. For details on XPATH, see http://www.w3.org/TR/xpath.

The extract() syntax

The extractclob() syntax



Parameters

xml_string
The XML string or document to evaluate.

xpath_expression
An XPATH expression. For **extract()**, the string or document size cannot exceed 32739. For larger strings or documents, use **extractclob()**.

Specify an absolute XPath_string with an initial slash. Omit the initial slash to indicate a path relative to the root node. If no match is found, these functions return an empty string.

Example 1

This example evaluates the XML contained in column col2 of table tab and returns the given name for Jason Ma.

```
SELECT extract(col2, '/personnel/person[@id="Jason.Ma"]/name/given')
FROM tab;
```

```
<given>Jason</given>
```

Example 2

This example is similar to the first, except the entire name is returned.

```
SELECT extract(col2, '/personnel/person[@id="Jason.Ma"]/name')
FROM tab;
```

```
<name>
<family>Ma</family>
<given>Jason</given>
</name>
```

Example 3

In this example, only the second column contains XML.

```
SELECT warehouse_name, extract(warehouse_spec, '/Warehouse/Docks')::lvarchar(256)
"Number of Docks"
FROM warehouses
WHERE warehouse_spec IS NOT NULL;
```

```
WAREHOUSE_NAME           Number of Docks
-------------------      -------------------
Liverpool, England       <Docks>2</Docks>
Taipei, Taiwan           <Docks>1</Docks>
Buenos Aires, Argentina  <Docks>4</Docks>
Seattle, USA             <Docks>3</Docks>
```

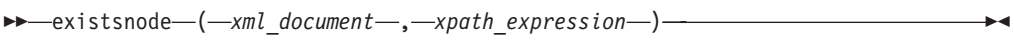
The existsnode() XML function

Determines whether the XPath evaluation results in at least one XML element.

Purpose

Determines whether traversal of an XML document using a specified path results in any nodes. Returns 1 if one or more nodes are found; otherwise, returns 0.

The existsnode() syntax



Parameters

xml_document
The XML document or fragment to evaluate. The document can be of type LVARCHAR or CLOB.

xpath_expression
The XPATH expression to search for XML nodes.

Specify an absolute XPath_string with an initial slash. Omit the initial slash to indicate a path relative to the root node. If no match is found, these functions return an empty string.

Example 1

This example query returns a list of warehouse IDs and names for every warehouse that has an associated dock.

```
SELECT warehouse_id, warehouse_name
FROM warehouses
WHERE existsnode(warehouse_spec, '/Warehouse/Docks') = 1;
```

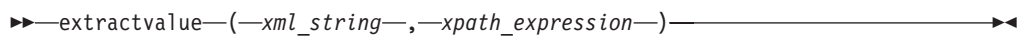
The extractvalue() and extractvalueclob() XML functions

Returns the value of the XML node in contrast to **extract()**, which returns the XML node.

Purpose

Returns a value from evaluated XML column, document, or string. For details on XPATH, see http://www.w3.org/TR/xpath.

The extractvalue() syntax



The extractvalueclob() syntax

Parameters

xml_string
The XML string or document to evaluate.

xpath_expression
An XPATH expression. For **extractvalue()**, the string or document size cannot exceed 32739. For larger strings or documents, use **extractvalueclob()**.

Specify an absolute XPath_string with an initial slash. Omit the initial slash to indicate a path relative to the root node. If no match is found, these functions return an empty string.

Example 1

This example returns the value given name of the person who is identified in the XPATH expression. No XML tags are returned.

```
SELECT extractvalue(col2, '/personnel/person[3]/name/given') FROM tab;
```

The output is the given name: `Jason`

Example 2

This example returns the number of docks in several cities.

```
SELECT warehouse_name,
extractvalue(e.warehouse_spec, '/Warehouse/Docks')
"Docks"
FROM warehouses e
WHERE warehouse_spec IS NOT NULL;

WAREHOUSE_NAME          Docks
--------------------    ------------
Liverpool, England      2
Taipei, Taiwan          1
Buenos Aires, Argentina
Seattle, USA            3
```

The genxml() and genxmlclob() XML functions

Return rows of SQL results as XML elements. Use **genxmlclob** if the returned row is greater than LVARCHAR(32739).

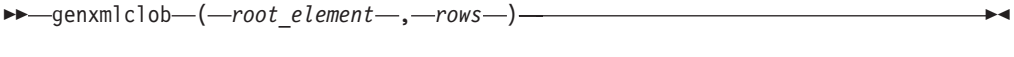
Purpose

Use these functions to create an XML row element for each row that is returned from an SQL query. Each column is an attribute of the row element. Use **genxml** for returned row values that are LVARCHAR(32739) or less. For larger values, use **genxmlclob**, which returns a CLOB.

These aggregate functions process the rows before an ORDER BY is completed. If order is important, use the derived table queries to get the result set in the correct order, and then apply the function on the result set. See "Enforcing order" on page 1-7 for details.

The genxml() syntax

The genxmlclob() syntax



Parameters

root_element
The table name or names of columns to return. To return all columns, specify the table name.

rows
The name given to the XML element of the returned row.

Example 1

This example shows how to retrieve XML rows from an SQL query on the following table:

Table 1-3. The classes table

classid	class	subject
1	125	Chemistry
2	250	Physics

Table 1-3. The classes table (continued)

classid	class	subject
3	375	Mathematics
4	500	Biology

The first parameter, *classes*, is the name of the table, which indicates to return all rows. The second parameter, *row*, is the name of the XML element that contains each returned row.

```
SELECT genxml(classes, "row") from classes;
```

The following lines show the results of the query in XML. The attributes in the rows are the names of the table columns.

```
<row classid="1" class="125" subject="Chemistry"/>
<row classid="2" class="250" subject="Physics"/>
<row classid="3" class="375" subject="Mathematics"/>
<row classid="4" class="500" subject="Biology"/>
```

Example 2

From the same table as Example 1, this example returns only the columns *classid* and *class*.

```
SELECT genxml(row(classid, class), "row") from classes;
```

```
<row classid="1" class="125" />
<row classid="2" class="250"/>
<row classid="3" class="375" />
<row classid="4" class="500" />
```

Example 3

This example uses **genxmlclob()** because a large result set is expected.

```
SELECT genxmlclob(row(Customers.Customid, Orders.Orderid,
       Customers.ContactName), "row")
From Customers, Orders
Where Customers.CustomerID = Orders.orderid;
```

This sample output shows only the first three rows:

```
<row Customerid="ALFKI" Orderid="10643" ContactName="Maria Anders"/>
<row Customerid="ALFKI" Orderid="10692" ContactName="Maria Anders"/>
<row Customerid="ALFKI" Orderid="10702" ContactName="Maria Anders"/>
.
.
.
```

Enforcing order

You can enforce the order of elements in XML document

```
SELECT genxml(row(c1, c2, c3), row)
FROM (SELECT a, b, c from t order by c, d)
AS vt(c1, c2, c3);
```

The genxmlelem() and genxmlelemclob() XML functions

These functions publish each element in the document separately.

Purpose

These functions return each column value as separate elements, in contrast to genxml(), which returns column values as attributes of the row element.

The genxmlelem() syntax

The genxmlelemclob() syntax

Parameters

row
The rows and columns to return.

element
The name of the element that contains the result set.

Example 1

This example uses the table Table 1-3 on page 1-6. The first parameter specifies the table name to retrieve all columns from the table. The second parameter specifies to place the output in an XML tag, *classes*.

```
SELECT genxmlelem(classes, "classes") from classes where classid = 1;
```

The query returns one row:

```
<classes>
<row>
<classid>1</classid>
<class>125</class>
<subject>Chemistry</subject>
</row>
</classes>
```

Example 2

This query returns a list of all employees from the employee table.

```
SELECT genxmlelemclob(employee, "employee") FROM employee;
```

```
<employee>
<row>
<givenname>Roy</givenname>
<familyname>Connor</familyname>
<address>
<address1>123 First Street</address1>
<city>Denver</city>
<state/>CO</state>
<zipcode>80111</zipcode>
</address>
<phone>303-555-1212</phone>
</row>
.
.
.
</employee>
```

The genxmlqueryhdr() and genxmlqueryhdrclob() XML functions

Returns the result set of a query in XML with the XML header.

Purpose

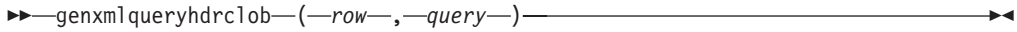
These functions are exactly the same as **genxmlquery()** and **genxmlqueryclob()**, except they include an XML header. An XML header specifies document properties such as the document encoding, the document type definition (DTD), and XML stylesheet (XSL). The following example shows a typical XML header:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE Server SYSTEM "opt/pdos/etc/pdoslrd.dtd">
```

The encoding that is returned is the same as that of the operating system.

The genxmlqueryhdr() syntax

The genxmlqueryhdrclob() syntax



Parameters

row
The rows and columns to return

query
The SQL query whose result set will be returned as an XML document with a header.

Example 1

```
 EXECUTE FUNCTION genxmlqueryhdr('manufact_set','SELECT * FROM manufact');
<?xml version="1.0" encoding="ISO-8859-1" ?>
<!DOCTYPE manufact_set SYSTEM "../manufact_set.dtd">
<?xml-stylesheet type="text/xsl" href="../manufact_set.xsl" ?>
<manufact_set>
<row>
<manu_code>SMT</manu_code>
<manu_name>Smith          </manu_name>
<lead_time>3</lead_time>
</row>
<row>
<manu_code>ANZ</manu_code>
<manu_name>Anza           </manu_name>
<lead_time>5</lead_time>
</row>
<row>
<manu_code>NRG</manu_code>
<manu_name>Norge          </manu_name>
<lead_time>7</lead_time>
</row>
<row>
<manu_code>HSK</manu_code>
```

```
<manu_name>Husky          </manu_name>
<lead_time>5</lead_time>
</row>
</manufact_set>
```

The genxmlquery() and genxmlqueryclob() XML functions

These functions take a SQL query as a parameter and return the result set in XML.

Purpose

Use these functions to retrieve results with each column in an element.

The genxmlquery() syntax

The genxmlclobelemclob() syntax

Parameters

row
The rows and columns to return.

query
The SQL query whose result set will be returned as XML.

Example 1

```
 EXECUTE FUNCTION genxmlquery('manufact_set','SELECT * FROM manufact');
<manufact_set>
<row>
  <manu_code>SMT</manu_code>
  <manu_name>Smith</manu_name>
  <lead_time>3</lead_time>
</row>
</manufact_set>
```

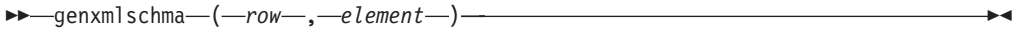
The genxmlschema() and genxmlschemaclob() XML functions

These functions generate an XML schema and result in XML format.

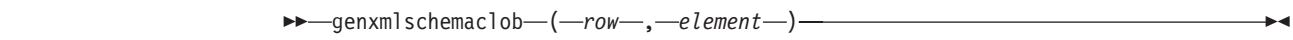
Purpose

These functions are identical to **genxml()** and **genxmlclob()**, but they also generate an XML schema.

The genxmlschema() syntax



The genxmlschemaclob() syntax



Parameters

row
The rows and columns to return.

element
The name of the element that contains the result set.

Example 1

```
SELECT genxmlschema(customer, "customer")  FROM customers;
```

```
<?xml version="1.0" encoding="en_US.819" ?>
xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"\
targetNamespace="http://www.ibm.com"\
xmlns="http://www.ibm.com"\
ElementFormDefault="qualified">
<xs:element name="customer">
<xs:complexType>
<xs:sequence>
<xs:element name="customer_num" type="xs:serial"/>
<xs:element name="fname" type="xs:char(15)"/>
<xs:element name="lname" type="xs:char(15)"/>
<xs:element name="company" type="xs:char(20)"/>
<xs:element name="address1" type="xs:char(20)"/>
<xs:element name="city" type="xs:char(15)"/>
<xs:element name="state" type="xs:char(2)"/>
<xs:element name="zipcode" type="xs:char(5)"/>
<xs:element name="phone" type="xs:char(18)"/>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:schema>
<customer>
<row>
<customer_num>101</customer_num>
<fname>Ludwig </fname>
<lname>Pauli </lname>
<company>All Sports Supplies </company>
<address1>213 Erstwild Court </address1>
<city>Sunnyvale </city>
<state>CA</state>
<zipcode>94086</zipcode>
<phone>408-789-8075 </phone>
</row>
```

The idsxmlparse() XML function

Parse an XML document or fragment to determine whether it is well formed.

Purpose

This function returns an XML document or fragment if the input XML is well formed.

The idsxmlparse() syntax

Parameters

xml_document
The XML document or fragment to parse to determine whether it is well formed.

Example 1

```
SELECT idsxmlparse(
'<purchaseOrder poNo="124356">
<customerName>ABC Enterprises</customerName>
<itemNo>F123456</itemNo>
</purchaseOrder>')
AS PO FROM systables where tabid = 1;
```

```
<purchaseOrder poNo="124356">
<customerName>ABC Enterprises</customerName>
<itemNo>F123456</itemNo>
</purchaseOrder>
```

Chapter 2. Transforming documents with XSLT functions

Apply XSL stylesheets and transforms to XML documents.

Extensible Stylesheet Language (XSL) uses XML elements to describe the format of a document. You can use the XSLT functions that IBM Informix provides to apply XSL transformations (XSLT) to XML documents, resulting in a document in a different XML schema, HTML, PDF, or any defined type. XSL and XSLT are standards defined by the World Wide Web Consortium, which you can find at http://www.w3.org/TR/xslt.

IBM Informix supports the XSLT version 1.0 standard for style sheets and uses the Xalan XSLT processor and the Xerces Java™ parser.

The documents take arguments of an XML file and a stylesheet. The output is a new document whose type is determined by the XSLT transform. The input arguments can be lvarchar, clob, or blob.

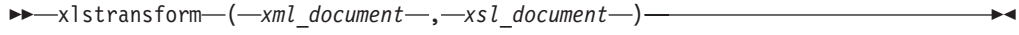
The xsltransform function

Use this function to return a document up to 32,739 bytes.

Purpose

The **xsltransform** function transforms an XML document with an XSL stylesheet and XSLT parameter. The returned document is of type LVARCHAR.

The xsltransform syntax



Parameters

xml_document
The XML document or fragment to transform. The document can be of type LVARCHAR, CLOB, or BLOB.

xsl_document
The XSL stylesheet document that is applied to the XML document. The XSL stylesheet can be of type LVARCHAR, CLOB, or BLOB.

Sample

Column **info** contains an XML document, and column **style** contains an XSL stylesheet:

Table 2-1. A row in table xmldocs

id	info	style
1	<?xml version='1.0' encoding='ISO-889–1' ?> <doc>Hello world!</doc>	<?xml version='1.0'?> <xsl:stylesheet xmlns:xsl='http://www.w3.org/1999/XSL/Transform' version='1.0'> <xsl:output encoding='US-ASCII'/> <xsl:template match='doc'> <out> <xsl:value-of select='.'/> </out> </xsl:template> </xsl:stylesheet>

The XML document is transformed by the XSL stylesheet by calling **xsltrasform**:

```
select xsltransform(info, style) from xmldocs where id = 1
```

The following XML document is returned:

```
<?xml version='1.0' encoding="US-ASCII"?> <out>Hello world!</out>
```

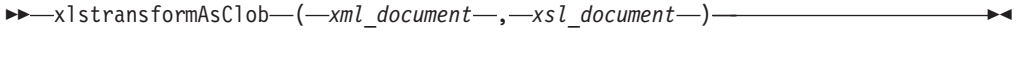
The xsltransformAsClob function

Use this function to return a CLOB document resulting from an XSL transform.

Purpose

The **xsltransformAsClob** function transforms an XML document with an XSL stylesheet and XSLT parameter. The returned document is of type CLOB.

The xsltransformAsClob syntax



Parameters

xml_document
The XML document or fragment to transform. The document can be of type LVARCHAR or CLOB.

xsl_document
The XSL stylesheet document that is applied to the XML document. The XSL stylesheet can be of type LVARCHAR or CLOB.

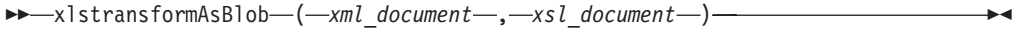
The xsltransformAsBlob function

Use this function to return a BLOB document resulting from an XSL transform.

Purpose

The **xsltransformAsBlob** function transforms an XML document with an XSL stylesheet and XSLT parameter. The returned document is of type BLOB.

The xsltransformAsBlob syntax



Parameters

xml_document
The XML document or fragment to transform. The document can be of type LVARCHAR or BLOB.

xsl_document
The XSL stylesheet document that is applied to the XML document. The XSL stylesheet can be of type LVARCHAR or BLOB.

Appendix. Accessibility

IBM strives to provide products with usable access for everyone, regardless of age or ability.

Accessibility features for IBM Informix products

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features

The following list includes the major accessibility features in IBM Informix products. These features support:

- Keyboard-only operation.
- Interfaces that are commonly used by screen readers.
- The attachment of alternative input and output devices.

Keyboard navigation

This product uses standard Microsoft Windows navigation keys.

Related accessibility information

IBM is committed to making our documentation accessible to persons with disabilities. Our publications are available in HTML format so that they can be accessed with assistive technology such as screen reader software.

IBM and accessibility

See the *IBM Accessibility Center* at http://www.ibm.com/able for more information about the IBM commitment to accessibility.

Dotted decimal syntax diagrams

The syntax diagrams in our publications are available in dotted decimal format, which is an accessible format that is available only if you are using a screen reader.

In dotted decimal format, each syntax element is written on a separate line. If two or more syntax elements are always present together (or always absent together), the elements can appear on the same line, because they can be considered as a single compound syntax element.

Each line starts with a dotted decimal number; for example, 3 or 3.1 or 3.1.1. To hear these numbers correctly, make sure that your screen reader is set to read punctuation. All syntax elements that have the same dotted decimal number (for example, all syntax elements that have the number 3.1) are mutually exclusive alternatives. If you hear the lines 3.1 USERID and 3.1 SYSTEMID, your syntax can include either USERID or SYSTEMID, but not both.

The dotted decimal numbering level denotes the level of nesting. For example, if a syntax element with dotted decimal number 3 is followed by a series of syntax elements with dotted decimal number 3.1, all the syntax elements numbered 3.1 are subordinate to the syntax element numbered 3.

Certain words and symbols are used next to the dotted decimal numbers to add information about the syntax elements. Occasionally, these words and symbols might occur at the beginning of the element itself. For ease of identification, if the word or symbol is a part of the syntax element, the word or symbol is preceded by the backslash (\) character. The * symbol can be used next to a dotted decimal number to indicate that the syntax element repeats. For example, syntax element *FILE with dotted decimal number 3 is read as 3 * FILE. Format 3* FILE indicates that syntax element FILE repeats. Format 3* * FILE indicates that syntax element * FILE repeats.

Characters such as commas, which are used to separate a string of syntax elements, are shown in the syntax just before the items they separate. These characters can appear on the same line as each item, or on a separate line with the same dotted decimal number as the relevant items. The line can also show another symbol that provides information about the syntax elements. For example, the lines 5.1*, 5.1 LASTRUN, and 5.1 DELETE mean that if you use more than one of the LASTRUN and DELETE syntax elements, the elements must be separated by a comma. If no separator is given, assume that you use a blank to separate each syntax element.

If a syntax element is preceded by the % symbol, that element is defined elsewhere. The string following the % symbol is the name of a syntax fragment rather than a literal. For example, the line 2.1 %OP1 refers to a separate syntax fragment OP1.

The following words and symbols are used next to the dotted decimal numbers:

? Specifies an optional syntax element. A dotted decimal number followed by the ? symbol indicates that all the syntax elements with a corresponding dotted decimal number, and any subordinate syntax elements, are optional. If there is only one syntax element with a dotted decimal number, the ? symbol is displayed on the same line as the syntax element (for example, 5? NOTIFY). If there is more than one syntax element with a dotted decimal number, the ? symbol is displayed on a line by itself, followed by the syntax elements that are optional. For example, if you hear the lines 5 ?, 5 NOTIFY, and 5 UPDATE, you know that syntax elements NOTIFY and UPDATE are optional; that is, you can choose one or none of them. The ? symbol is equivalent to a bypass line in a railroad diagram.

! Specifies a default syntax element. A dotted decimal number followed by the ! symbol and a syntax element indicates that the syntax element is the default option for all syntax elements that share the same dotted decimal number. Only one of the syntax elements that share the same dotted decimal number can specify a ! symbol. For example, if you hear the lines 2? FILE, 2.1! (KEEP), and 2.1 (DELETE), you know that (KEEP) is the default option for the FILE keyword. In this example, if you include the FILE keyword but do not specify an option, default option KEEP is applied. A default option also applies to the next higher dotted decimal number. In this example, if the FILE keyword is omitted, default FILE(KEEP) is used. However, if you hear the lines 2? FILE, 2.1, 2.1.1! (KEEP), and 2.1.1 (DELETE), the default option KEEP only applies to the next higher dotted decimal number, 2.1 (which does not have an associated keyword), and does not apply to 2? FILE. Nothing is used if the keyword FILE is omitted.

***** Specifies a syntax element that can be repeated zero or more times. A dotted decimal number followed by the * symbol indicates that this syntax element can be used zero or more times; that is, it is optional and can be

repeated. For example, if you hear the line `5.1* data-area`, you know that you can include more than one data area or you can include none. If you hear the lines `3*, 3 HOST`, and `3 STATE`, you know that you can include `HOST`, `STATE`, both together, or nothing.

Notes:

1. If a dotted decimal number has an asterisk (*) next to it and there is only one item with that dotted decimal number, you can repeat that same item more than once.
2. If a dotted decimal number has an asterisk next to it and several items have that dotted decimal number, you can use more than one item from the list, but you cannot use the items more than once each. In the previous example, you can write `HOST STATE`, but you cannot write `HOST HOST`.
3. The `*` symbol is equivalent to a loop-back line in a railroad syntax diagram.

`+` Specifies a syntax element that must be included one or more times. A dotted decimal number followed by the + symbol indicates that this syntax element must be included one or more times. For example, if you hear the line `6.1+ data-area`, you must include at least one data area. If you hear the lines `2+`, `2 HOST`, and `2 STATE`, you know that you must include `HOST`, `STATE`, or both. As for the * symbol, you can repeat a particular item if it is the only item with that dotted decimal number. The `+` symbol, like the `*` symbol, is equivalent to a loop-back line in a railroad syntax diagram.

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