

Xqeeze API (C++) for xqML Processing

Version 1.0

Tahir Hashmi

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1 Introduction

Xqeeze Reference Implementation is an implementation of the Xqeeze API for xqML generation and parsing. The API is independent of the Reference Implementation in that implementations of the API may be provided by a vendor other than the Xqeeze Developer team. This documentation is for Xqeeze API version 1.0.

All symbols in Xqeeze API are contained in the namespace `xqML`. The location of headers for Xqeeze API is `xqml`. Thus, if you want to access a symbol `bar` (function, class etc.) declared in header `foo.h`, you would like to do this:

```
#include <xqml/foo.h>
using xqML::bar

// use bar now
```

Xqeeze API comprises the following components:

xqAGenerator This is an API for generating Xqeeze Associations from an XML Specification (DTD, Schema etc.; see section 3 for support). The Associations are necessary for generation and parsing of xqML documents or streams.

Writer This is the API for generating xqML documents or streams complying with a given Xqeeze Association specification

Parser This is the API for parsing an xqML document or stream against a related Xqeeze Association Specification.

xqMLSymbol This is the API for performing operations directly on xqML Symbols

Exceptions These are various exceptions thrown by the implementation

Each of the above shall be described in the following sections.

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The latest version of this document can be downloaded from WWW by pointing your browser to:

<http://xqeeze.sourceforge.net/Xqeeze-API-C++.pdf>

3 xqAGenerator

3.1 Headers

xqml/xqagen.h

3.2 Description

API for generating Xqeeze Associations from an XML Specification (DTD, Schema etc.). As of version 1.0 only DTDs are supported.

3.3 Methods

3.3.1 xqAGenerator

xqML::xqAGenerator::xqAGenerator (istream &, ostream &)

Constructor

The constructor takes an `std::istream` reference for the DTD and an `std::ostream` reference for xqA specification output.

3.3.2 generate

void xqML::xqAGenerator::generate (bool = false)

Generates the xqA specs for the given DTD.

The parameter “preprocess” should be set to true if the DTD has Parameter Entities (not yet supported). It is false by default.

4 Writer

4.1 Headers

xqml/writer.h

4.2 Description

Provides API to the client for generation of xqML Documents.

4.3 Methods

4.3.1 Writer

xqML::Writer::Writer (istream &, ostream &)

Constructor

Constructor takes an istream (default std::cin) for Xqueueze Association Specs and an ostream (default std::cout) for the generated output.

4.3.2 attribute

void xqML::Writer::attribute (const string &, const string &, bool = false)

Writes an attribute.

Write an attribute whose name and value are taken from the first and second arguments respectively. The third argument must be true if the attribute has a predefined value.

Requires: Document context should be “start tag” or “empty-element start tag”

Throws exception *xqML::IllegalContext* if attribute is not allowed at the point of invocation in the document or *xqML::IllegalIdentifier* if identifier look-up fails.

4.3.3 cdataSection

void xqML::Writer::cdataSection (const string &)

Writes a CDATA section that is passed as a string argument.

Requires: Document context should be “element”, “start tag” or “empty-element start tag”.

Side-effect: Document context is set to “element” if not already so.

Throws exception *xqML::IllegalContext* if CDATA is not allowed at the point of invocation in the document or *xqML::IllegalIdentifier* if identifier look-up fails.

4.3.4 characterReference

void xqML::Writer::characterReference (int)

Writes the character reference for the integer argument.

Requires: Document context should be “element” or “open attribute”.

Side-effect: Sets Document context to “element” if earlier it was “start tag” or “empty-element start tag”.

Throws exception *xqML::IllegalContext* if character reference is not allowed at the point of invocation in the document or *xqML::IllegalIdentifier* if identifier look-up fails.

4.3.5 comment

void xqML::Writer::comment (const string &)

Writes a comment.

Comments are deprecated and support for writing comments may be removed in future. The parser ignores comments if found.

Throws exception *xqML::IllegalContext* if comment is not allowed at the point of invocation in the document or *xqML::IllegalIdentifier* if identifier look-up fails.

4.3.6 endAttribute

void xqML::Writer::endAttribute ()

Closes an open attribute

Requires: Document context should be “open attribute”

Side-effects: Sets context to “start tag”

Throws exception *xqML::IllegalContext* if closing an attribute is not allowed at the point of invocation in the document or *xqML::IllegalIdentifier* if identifier look-up fails.

4.3.7 endElement

void xqML::Writer::endElement (const string & = “”)

Ends an element. The string argument is redundant and defaults to blank.

Requires: The calls to endElement must match those of startElement and this function should never be called for empty elements.

4.3.8 entityReference

void xqML::Writer::entityReference (const string &)

Writes an Entity Reference that is passed as the string argument.

Requires: Document context should be “start tag”, “empty-element start tag”, “open attribute” or “element”.

Side-effect: Sets Document context to “element” if not already so.

Throws exception *xqML::IllegalContext* if an entity reference is not allowed at the point of invocation in the document or *xqML::IllegalIdentifier* if identifier look-up fails.

4.3.9 processingInstruction

void xqML::Writer::processingIntruction (const string &, const string &)

Writes a Processing instruction (yet to be implemented).

4.3.10 prolog

void xqML::Writer::prolog (const string &)

Writes a prolog, declaring the given string argument as doctype.

Writes a prolog, declaring the xqml version number (currently 0.2). It also declares the name provided as the argument to be the doctype.

4.3.11 startAttribute

void xqML::Writer::startAttribute (const string &)

Starts an Attribute.

Starts an attribute whose name is supplied as the argument. This method should not be called for attributes with enumerated values otherwise Writer would throw *xqML::IllegalIdentifier* exceptions.

Requires: Context should be “start tag” or “empty-element start tag”

Side-effects: Sets context to “open attribute”

Throws exception *xqML::IllegalContext* if attribute is not allowed at the point of invocation in the document or *xqML::IllegalIdentifier* if identifier look-up fails.

4.3.12 startElement

void xqML::Writer::startElement (const string &, bool = false)

Starts an Element.

Starts an element whose name is supplied as the first argument. The optional second argument must be set to true if the element is empty. It defaults to false.

Requires: Document context should be “start tag”, “empty-element start tag”, “element” or “preamble”.

Side-effects: Sets Document context to “start tag” if the second argument is not supplied or is false, otherwise sets Document context to “empty element start tag”.

Throws exception *xqML::IllegalContext* if starting an element is not allowed at the point of invocation in the document or *xqML::IllegalIdentifier* if identifier look-up fails.

5 Parser

5.1 Headers

xqml/parser.h

5.2 Description

Provides API to the client for parsing xqML Documents. As of Reference Implementation version 0.1, the parser only recognizes a single version of xqML – version 0.2.

5.3 Methods

5.3.1 Parser

xqML::Parser::Parser (istream &, istream &, ostream &)

Constructor

Constructor takes first `std::istream` for xqA specification, second `std::istream` for the document to be parsed and an `ostream` for the parsed output.

5.3.2 parseDocument

void xqML::Parser::parseDocument()

Parses the desired xqML document.

This method parses the whole document and only prints messages on the console stating what it found in the xqML document.

Throws exception *xqML::IllegalContext* when a parse error occurs due to malformed xqML constructs. Throws exception *xqML::IllegalIdentifier* when look-up for an unknown xqML Symbol is encountered.

6 xqMLSymbol

6.1 Headers

xqml/xqmlsymbol.h

6.2 Description

Provides a data type for xqML Symbols and operations on these.

6.3 Methods

6.3.1 xqMLSymbol

xqML::xqMLSymbol::xqMLSymbol (unsigned int = 0)

Constructor

Constructor sets the value of the Symbol to the (optional) argument or zero.

6.3.2 getCode

unsigned int xqML::xqMLSymbol::getCode () const

Returns numeric value of the Symbol.

6.3.3 Input

istream & xqML::operator>> (istream &, xqMLSymbol &)

Overloads operator>> for xqML Symbol input.

6.3.4 Output

ostream & xqML::operator<< (ostream &, xqMLSymbol)

Overloads operator<< for xqML Symbol output.

7 Exceptions

7.1 Headers

xqml/exceptions.h

7.2 Description

Various exceptions thrown by methods in Xqeeze API (C++).

7.3 IllegalContext

Exception thrown when document structure doesn't allow a Writer request or the Parser encounters bad document structure.

7.3.1 Members

string context

Name of the current context of the document.

string identifier

Name of the offending identifier.

string type

Type name of the identifier.

7.4 IllegalIdentifier

Exception thrown when lookup for an identifier or xqML symbol fails.

7.4.1 Members

string identifier

Name identifier that could not be found, or the value of the xqML Symbol that could not be found, converted to a decimal string.

string type

Type of the identifier or "xqMLSymbol" in case of an xqML Symbol.

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