

Xqueue Specifications

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1 About this document

This document contains the specifications for xqML language (0.1.0), xqML Symbols, Xqueue Association format (0.1.0) and Xqueue Association algorithm (0.1.0) that together comprise the Xqueue package.

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2 xqML language (0.1.0)

xqML is the binary markup language that is used by Xqeeze to achieve compact document sizes as compared to XML documents. xqML is structurally very similar to XML. The greatest contributors to xqML's compact nature are the elimination of redundant

information and representation of XML identifiers (NMTOKENs) whose definitions are available in the DTD/Schema with binary *xqML Symbols*.

2.1 xqML Symbols

xqML Symbols are octet sequences that represent unsigned integers written in MSB (Most Significant Byte first) order. Additionally, the least significant bit of each octet of a symbol, except the last one, should be one. For example, the integer 256 can be a valid xqML Symbol since when written in MSB order, it's bit pattern is [00000001 00000000]. Thus the least significant bit of each octet in the symbol acts as a continuation flag. A 1 indicates that the next octet is a part of the symbol, a 0 indicates the end.

It is trivial that all xqML Symbols must be even numbers. Additionally, one bit of each octet is rendered unusable since it acts as a continuation flag. 16 bit xqML Symbols can represent 16384 different identifiers while 32 bit ones can represent over 268 million different identifiers. A conforming implementation is required to support at least 16 bit long symbols.

xqML Symbols start from 0x02 (decimal 2) and symbols up to 0xFE (decimal 254) are reserved for special purposes. Higher values are available for generating associations using the Xqeeze Association algorithm. While associating a symbol with an identifier, its type is also stored. Thus, a symbol represents not only the string literal, but also the type of an identifier.

2.2 Formal xqML (0.1.0) Grammar in EBNF notation

```
document ::= prolog element Misc *
prolog   ::= xqMLDecl? Misc * (doctypeddecl Misc*)?
xqMLDecl ::= '< {0x02}xqml -' Num
Misc     ::= Comment
doctypeddecl ::= '< {0x12}' DoctypeName '<' | xqA
element  ::= (EE_STag | STag) content ETag?
EE_STag  ::= '<' EESymbol (Attribute) *
STag     ::= '<' ELSymbol (Attribute) *
content  ::= CharData? ((element | Reference | CDSect | Comment) CharData?)*
Attribute ::= '<' ATSymbol CharData '<' | '<' APSymbol VASymbol
Reference ::= EntityRef | CharRef
EntityRef ::= '<' ENSymbol
CharRef   ::= '&{0x26}' Num;
CDSect   ::= CDDelim (. * - (. * CDDelim .) CDDelim
CDDelim  ::= '< {0x14}'
Comment  ::= '< {0x22}' CharData ETag?
ETag     ::= '< {0x3E}' ElementsToClose
Num      ::= [0 - 9.] +
CharData ::= [^&]*
```

Terminals:

Figures enclosed within braces ({}) are hex codes for the value of an xqML Symbol that should occur within.

DoctypeName is a string literal identifying a document type

xqA is the Xqueue Association (without preamble)

ELSymbol is an xqML Symbol of the type “element”

EESymbol is an xqML Symbol of the type “empty element”

ATSymbol is an xqML Symbol of the type “attribute”

APSymbol is an xqML Symbol of the type “attribute with predefined value”

VASymbol is an xqML Symbol of the type “attribute value”

ENSymbol is an xqML Symbol of the type “entity reference”

ElementsToClose is an octet to be interpreted as an unsigned integer.

3 Xqueue Association

Xqueue uses an association between symbols and their corresponding XML identifiers and types as defined in a specification (DTD/Schema). This enables representation of known identifiers in the markup with symbols. Associating the type of an identifier along with its name also makes it easy to various structural units of the document without having to use too many special characters and character-combinations.

3.1 Xqueue Association algorithm (0.1.0)

This is the algorithm that is used to map the identifiers found in a DTD/Schema to xqML Symbols. The steps of the algorithm are:

1. collect all Element identifiers together, discarding duplicates
2. collect all Empty Element identifiers together, discarding duplicates
3. collect all Attribute identifiers together, discarding duplicates
4. collect all identifiers together for Attributes that have predefined values, discarding duplicates
5. collect all Attribute Value identifiers together, discarding duplicates
6. collect all Entity References together, discarding duplicates
7. sort the above collections alphabetically and incrementally assign them symbols in the order enumerated in steps 1 to 6

This simple algorithm assures that the assignments would remain the same even if a particular specification (DTD/Schema) has slight variations in the way it's written in the generator's and consumer's copies, as long as both define the same things.

3.2 Xqueueze Association format (0.1.0)

Xqueueze associations are represented in a format that itself is quite compact and uses xqML Symbols themselves. The specification begins with an optional prolog that begins with the sequence $\langle \{0x02\}$. The prolog continues upto the next occurrence of \langle . It is followed by *sections* that are denoted by \langle , followed by an xqML Symbol. The symbols for various sections are:

0x04 Elements

0x06 Empty Elements

0x08 Attributes

0x0A Attributes with predefined values

0x0C Attribute values

0x0E Entity References

Within each section, individual entries are listed as \langle , followed by the a symbol, followed by the string that the symbol corresponds to. Thus the type of a symbol is determined by the section it is present in. A single association specification may have multiple sections of the same type and the ordering is not restricted. However, sections can't be nested.

The end of specifications is denoted by the sequence $\langle \{0x10\}$. This structure enables inline specification of the symbols associations, if required by a document.