

xtpxlib-common

Common code and IDE support

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0 Xatapult XML Library - Common code



xtpxlib library - component **xtpxlib-common** - **v1.2** (2020-08-13)
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xtpxlib-common is part of the **xtpxlib** library. **xtpxlib** contains software for processing XML, using languages like XSLT and XProc. It consists of several separate components, all named **xtpxlib-***. Everything can be found on GitHub (<https://github.com/xatapult>).

xtpxlib-common is **xtpxlib**'s communal component. Most other **xtpxlib** components rely on it. It contains:

- XSLT libraries, with functionality for handling parameters, manipulating filenames/URIs, MIME types, etc.
- Parts of the functionality of the XSLT libraries were translated into XQuery.
- XProc (1.0) steps, implementing things like recursive directory lists, tee, creating ZIP files from directories, etc.
- Templates (empty XSLT, XProc, XQuery, etc. files) for use in the oXygen IDE.

Installation and usage information can be found on **xtpxlib**'s main website <https://www.xtpxlib.org>.

Technical information:

Component documentation: <https://common.xtpxlib.org>

License: GNU GENERAL PUBLIC LICENSE - Version 3, 29 June 2007

Git URI: [git@github.com:xatapult/xtpxlib-common.git](https://github.com:xatapult/xtpxlib-common.git)

Git site: <https://github.com/xatapult/xtpxlib-common>

1 Description

xtpxlib-common is xtpxlib's communal component. Most other components in xtpxlib are dependent on it. If you start using xtpxlib, you'll also use it a lot yourself.

1.1 Contents

xtpxlib-common consists of the following parts (by subdirectory):

Directory	Contents
data	XML data files. See [*** Unhandled element encountered: <xref linkend="chapter-xml-data-files" xml:id="d7899e164"> (phase: block)]
doc	Sources for the generation of the component's documentation. Internal use only.
docs	GitHub pages site for this component.
etc	Auxiliary files, mainly for use in the oXygen IDE.
template	Template files. These files contain XSLT, XQuery, XProc, etc. files with the main structure and headers filled in. Contain macros for use in the oXygen IDE. To install/use these files in oXygen, open its preferences dialogue (Options > Preferences...) and add the xtpxlib-common/template subdirectory to its Document templates section.
xplmod	General purpose XProc (1.0) modules. See [*** Unhandled element encountered: <xref linkend="chapter-xproc-libraries" xml:id="d7899e226"> (phase: block)] .
xqmod	General purpose XQuery modules. This is a partial translation of the XSLT module's functionality (especially from [*** Unhandled element encountered: <code xml:id="d7899e238"> (phase: block)]) into XQuery.
xsd	Schemas for some of the document types used in [*** Unhandled element encountered: <code xml:id="d7899e252"> (phase: block)] . See [*** Unhandled element encountered: <xref linkend="chapter-xml-schemas" xml:id="d7899e254"> (phase: block)] .
xsl	Some general purpose XSLT stylesheets. See [*** Unhandled element encountered: <xref linkend="chapter-xsl-stylesheets" xml:id="d7899e266"> (phase: block)] .
xslmod	General purpose XSLT modules. See [*** Unhandled element encountered: <xref linkend="chapter-xslt-modules" xml:id="d7899e278"> (phase: block)] .

1.2 Parameter handling in xtpplib-common

Parameters, as referred to here, are name/value pairs meant for customizing software's behavior. Things like prompts, URIs, etc. The `xtpplib-common` component's parameters have the following characteristics:

- Parameters in this component are handled by the XSLT module `parameteres.mod.xsl`. This includes:
 - Reading them from an XML document, either a document on its own or embedded into a bigger XML document. The result will be an XPath map(`xs:string`, `xs:string*`), which can be inspected and used.
 - Expanding parameter references in strings. Parameter references are constructions like `{ $parameter-name }` (or `${parameter-name}`, both will yield the same results).
- Parameters are specified within an XML element called `<parameters>`, the namespace does not matter. This element can be the root of a document on its own or embedded in a bigger (XML) document. For instance:

```
<parameters>
  <parameter name="greeting">
    <value>Hello!</value>
  </parameter>
</parameters>
```

There is a [schema](#) available for this.

- A single parameter is specified using a `<parameter name="...">` child element. The value of the `name` attribute will be normalized (whitespace collapsed to a single space character, leading/trailing whitespace removed) and space characters are replaced with an underscore (`_`). So `name=" a b "` will become parameter `a_b`.
- Values for a parameter are specified using `<value>` child element. A parameter can have multiple values. Parameter references inside values (either written as `{ $parameter-name }` or `${parameter-name}`) are expanded into their values (for multi-valued parameters only the first value is used).
- It is often useful to specify values for parameters based on different circumstances. For instance based on language (Hello in English or Bonjour in French), or system type (`https://www...` for production, `http://test...` for test). This is implemented as follows:
 - When initially reading the parameters you can specify a filter map (`map(xs:string, xs:string*)`).
 - The `<value>` elements can have any attributes. These attributes are handled as whitespace separated lists of values.
 - The name of such an attribute is held against the entries in filter map. If a filter entry with this name exists, one of the values of the attribute must be present in the filter map.

For instance, assume the parameters look like this:

```
<parameters>
  <parameter name="greeting">
    <value lang="en">Hello!</value>
    <value lang="nl de">Hallo!</value>
    <value lang="fr">Bonjour!</value>
  </parameter>
  <parameter name="number">
    <value>123</value>
  </parameter>
</parameters>
```

- Reading this with an empty (or absent) filter map, or a filter map that does not have a `lang` entry, will result in a `greeting` parameter with multiple values, `Hello!`, `Hallo!` and `Bonjour!`.
- Reading this with a filter map `map{ 'lang': 'en' }` will return the `greeting` parameter with value `Hello!`.
- Reading this with a filter map `map{ 'lang': 'fr' }` will return the `greeting` parameter with value `Bonjour!`.
- Reading this with a filter map `map{ 'lang': ('en', 'de') }` (not particularly useful) will return the `greeting` parameter with values `Hello!` and `Hallo!`.
- In all cases the `number` parameter will get value `123` (since it has no filtering attributes on its `<value>` element).

It is possible to combine multiple filter attributes on a `<value>` element.

- Another thing that is often useful in specifying parameters is to *group* them. For this you can put a number of `<parameter>` elements inside a `<group name="...">` element. The name of the group is used as a prefix (with a dot (.) separator) for the parameters in the group. For instance:

```
<parameters>
  <group name="important">
    <parameter name="greeting">
      <value>Hello!</value>
    </parameter>
  </group>
</parameters>
```

This will result in a parameter called `important.greeting`.

2 XSLT Modules

The xtpxlib-common component contains the following XSLT modules. The ones used most frequently are [general.mod.xsl](#) and [href.mod.xsl](#).

Module/Pipeline	Description
compare.mod.xsl	XSL library module with support for comparing XML documents/elements:
date-time.mod.xsl	XSLT library module containing functions for working with dates and times.
format-output.mod.xsl	XSLT library with functions for formatting output/strings.
general.mod.xsl	XSLT library module with general constants and code.
href.mod.xsl	XSLT library module with functions for the generic handling of href-s (filenames/paths).
message.mod.xsl	Message related templates.
mimetypes.mod.xsl	MIME type conversion related functions.
parameters.mod.xsl	Takes an XML document with parameters and turns this into a parameter map.
uuid.mod.xsl	UUID related functions.

Table 2-1 - Module overview

2.1 XSLT (2.0): compare.mod.xsl

File: xslmod/compare.mod.xsl

XSL library module with support for comparing XML documents/elements:

Prefix	Namespace URI
xtlc	http://www.xtpxlib.nl/ns/common

Named template	Description
xtlc:compare-documents	Compares two XML documents with each other:

2.1.1 Named template: xtlc:compare-documents as element(xtlc:message)*

Compares two XML documents with each other:

- Comments and processing instructions are ignored
- Text nodes are normalized before comparison
- Empty text nodes (after normalization) are ignored
- The comparison stops after the first difference is encountered.
- The result is either:
 - An empty set, when no differences found
 - One or more xtlc:message elements, status="error" when differences were found (you can only get more than one message on attribute differences)

Parameter	Type	Rq?	Default	Description
doc1	document-node()	yes		First document to compare.
doc2	document-node()	yes		Second document to compare.

2.2 XSLT (2.0): date-time.mod.xsl

File: xslmod/date-time.mod.xsl

XSLT library module containing functions for working with dates and times.

When language based, it only distinguishes between Dutch and non-Dutch (usually English). Some functions will not work using Saxon HE (week-numbers for instance).

Prefix	Namespace URI
xtlc	http://www.xtpxlib.nl/ns/common

Variable	Type	Value	Description
xtlc:month-names-en	xs:string+	('January', 'February', 'March', 'April', 'May', 'June', 'July', 'August', 'September', 'October', 'November', 'December')	Sequence with the names of the months in English
xtlc:month-names-nl	xs:string+	('januari', 'februari', 'maart', 'april', 'mei', 'juni', 'juli', 'augustus', 'september', 'oktober', 'november', 'december')	Sequence with the names of the months in Dutch

Function	Description
<code>xtlc:days-in-month()</code>	Computes the number of days in a particular month. If values are out of range it returns 0.
<code>xtlc:format-date-as-text()</code>	Formats a date as a string with the month name in full.
<code>xtlc:format-date-as-text-short()</code>	Formats a date as a string with the month name in short.
<code>xtlc:is-leap-year()</code>	Returns true when a given year is a leap year
<code>xtlc:month-name()</code>	Returns the name of a month.
<code>xtlc:month-name-short()</code>	Returns the name of a month in short (abbreviated to 3 characters).
<code>xtlc:to-date()</code>	Creates a date from its components.
<code>xtlc:unix-epoch()</code>	Computes the UNIX "epoch" code (number of seconds since 1-1-1970) for a given date/time.
<code>xtlc:week-number()</code>	Computes the week number for a given date.
<code>xtlc:weekday-name()</code>	Computes the name of the weekday for a given language. Will be capitalized.
<code>xtlc:weekday-number()</code>	The number of the weekday (1=Monday, 7=Sunday).

2.2.1 Function: `xtlc:days-in-month()` as `xs:integer`

Computes the number of days in a particular month. If values are out of range it returns 0.

Parameter	Type	Description
month-number	xs:integer	The month to calculate the number of days for.
year	xs:integer	The year this month is in (important because of leap years).

2.2.2 Function: `xtlc:format-date-as-text()` as `xs:string`

Formats a date as a string with the month name in full.

Parameter	Type	Description
date	xs:date	The date to format.
lang	xs:string	The language for the conversion.

2.2.3 Function: `xtlc:format-date-as-text-short()` as `xs:string`

Formats a date as a string with the month name in short.

Parameter	Type	Description
date	xs:date	The date to format.
lang	xs:string	The language for the conversion.

2.2.4 Function: `xtlc:is-leap-year()` as `xs:boolean`

Returns true when a given year is a leap year

Parameter	Type	Description
year	xs:integer	The year to check.

2.2.5 Function: `xtlc:month-name()` as `xs:string`

Returns the name of a month.

Parameter	Type	Description
month-number	xs:integer	The month number (1-12).
lang	xs:string	The language you want the month name in.

2.2.6 Function: `xtlc:month-name-short()` as `xs:string`

Returns the name of a month in short (abbreviated to 3 characters).

Parameter	Type	Description
month-number	xs:integer	The month number (1-12).
lang	xs:string	The language you want the month name in.

2.2.7 Function: `xtlc:to-date()` as `xs:date`

Creates a date from its components.

Parameter	Type	Description
day	xs:integer	Day number to use.
month	xs:integer	Month number to use.
year	xs:integer	Year to use.

2.2.8 Function: `xtlc:unix-epoch()` as `xs:decimal`

Computes the UNIX "epoch" code (number of seconds since 1-1-1970) for a given date/time.

Parameter	Type	Description
datetime	xs:dateTime	The date/time to compute the epoch code for.

2.2.9 Function: `xtlc:week-number()` as `xs:integer`

Computes the week number for a given date.

Parameter	Type	Description
date	xs:date	Date to use.

2.2.10 Function: `xtlc:weekday-name()` as `xs:string`

Computes the name of the weekday for a given language. Will be capitalized.

Parameter	Type	Description
date	xs:date	Date to use.
lang	xs:string	The language you want the name in.

2.2.11 Function: `xtlc:weekday-number()` as `xs:integer`

The number of the weekday (1=Monday, 7=Sunday).

Parameter	Type	Description
date	xs:date	Date to use.

2.3 XSLT (2.0): format-output.mod.xsl

File: xslmod/format-output.mod.xsl

XSLT library with functions for formatting output/strings.

When language based, we only distinguish between Dutch and non-Dutch (usually English).

Prefix	Namespace URI
xtlc	http://www.xtpplib.nl/ns/common

Function	Description
<code>xtlc:duration2str()</code>	Turns a day/time duration into a more readable string, e.g. 1d3h40m12s
<code>xtlc:format-amount()</code>	Formats an amount by adding a € sign and always use double digits.
<code>xtlc:format-double()</code>	Formats a double as a string with a given amount of digits.
<code>xtlc:size2str()</code>	Turns an integer (e.g. a file size) into a (rounded) number using a Kb/Mb/Gb suffix.

2.3.1 Function: xtlc:duration2str() as xs:string

Turns a day/time duration into a more readable string, e.g. 1d3h40m12s

Parameter	Type	Description
duration	xs:dayTimeDuration	The duration to convert.
round-seconds	xs:boolean	Whether the seconds part must be rounded.

2.3.2 Function: xtlc:format-amount() as xs:string

Formats an amount by adding a € sign and always use double digits.

For the Dutch language, . and , are swapped.

Parameter	Type	Description
amount	xs:double	The amount to format.
lang	xs:string	The language for the conversion.

2.3.3 Function: xtlc:format-double() as xs:string

Formats a double as a string with a given amount of digits.

For the Dutch language, . and , are swapped.

Parameter	Type	Description
dbl	xs:double	Number to convert
digits	xs:integer	The number of digits to use. When < 0 this is left open.
lang	xs:string	The language for the conversion.

2.3.4 Function: xtlc:size2str() as xs:string

Turns an integer (e.g. a file size) into a (rounded) number using a Kb/Mb/Gb suffix.

Parameter	Type	Description
size	xs:integer	The size to convert.

2.4 XSLT (2.0): general.mod.xsl

File: xslmod/general.mod.xsl

XSLT library module with general constants and code.

Prefix	Namespace URI
xtlc	http://www.xtpxlib.nl/ns/common

Variable	Type	Value	Description
xtlc:default-dt-format	xs:string	'[Y]-[M01]-[D01][H01]:[m01]:[s01]'	Default date/time format string (yyyy-mm-dd ...).
xtlc:default-dt-format-en	xs:string	'[M01]-[D01]-[Y][H01]:[m01]:[s01]'	Date/time format string (English: mm-dd-yyyy ...).
xtlc:default-dt-format-nl	xs:string	'[D01]-[M01]-[Y][H01]:[m01]:[s01]'	Date/time format string (Dutch: dd-mm-yyyy ...).
xtlc:internal-error-prompt	xs:string	'Internal error: '	Add this in front of any internal error raised.
xtlc:language-en	xs:string	'en'	Language code for English
xtlc:language-nl	xs:string	'nl'	Language code for Dutch
xtlc:namespace-xtlc-common	xs:string	namespace-uri-for-prefix('xtlc', doc('')/*)	Namespace used for xtpxlib-common.
xtlc:status-codes	xs:string+	(\$xtlc:status-info, \$xtlc:status-warning, \$xtlc:status-error, \$xtlc:status-debug)	Sequence with all valid status codes.
xtlc:status-debug	xs:string	'debug'	Generic debug status/severity code.
xtlc:status-error	xs:string	'error'	Generic error status/severity code.
xtlc:status-info	xs:string	'info'	Generic info (a.k.a. OK) status/severity code.
xtlc:status-warning	xs:string	'warning'	Generic warning status/severity code.

Named template	Description
xtlc:raise-error	Stops any processing by raising an error.

Function	Description
xtlc:att2str()	Turns an attribute into a string representation, suitable for display (e.g. name="value").
xtlc:capitalize()	Capitalizes a string (makes the first character uppercase).
xtlc:char-repeat()	Returns a string with a single character repeated a given number of times.
xtlc:count-leading-whitespace()	Counts the number of whitespace characters at the beginning of a string
xtlc:elm2str()	Turns an element into a descriptive string (the element with all its attributes, excluding schema references).
xtlc:item2element()	Tries to find the element belonging to a given item.
xtlc:items2str()	Creates a string from a sequence of items.
xtlc:prefix-to-length()	Prefixes a string with a given character so it will get at least a given length.
xtlc:q()	Returns the input string quoted ("\$in")
xtlc:str2bln()	Safe conversion of a string into a boolean.
xtlc:str2id()	Turns a string into a valid identifier, adding a prefix.
xtlc:str2id()	Turns a string into a valid identifier.
xtlc:str2int()	Safe conversion of a string to an integer.
xtlc:str2regexp()	Turns a string into a regular expression that matches the input exactly. Optionally anchors the regular expression so the match will be on this string <i>only</i> (result starts with ^ and ends with \$).
xtlc:str2regexp()	Turns a string into a regular expression that matches the input exactly.
xtlc:str2seq()	Converts a string with a list of words into a sequence of words.
xtlc:text2lines()	Converts text into separate lines.

2.4.1 Named template: **xtlc:raise-error**

Stops any processing by raising an error.

Parameter	Type	Rq?	Default	Description
error-name	xs:string		\$xtlc:status-error	The (optional) name of the error. Must be an NCName.
msg-parts	item()+	yes		Error message to show (in parts, all parts will be concatenated by <code>xtlc:items2str()</code>).

2.4.2 Function: **xtlc:att2str()** as xs:string

Turns an attribute into a string representation, suitable for display (e.g. name="value").

Parameter	Type	Description
att	attribute()?	Attribute to convert.

2.4.3 Function: **xtlc:capitalize()** as xs:string

Capitalizes a string (makes the first character uppercase).

Parameter	Type	Description
in	xs:string	The string to work on.

2.4.4 Function: **xtlc:char-repeat()** as xs:string

Returns a string with a single character repeated a given number of times.

Parameter	Type	Description
char	xs:string	The first character of this string is the character to repeat. If empty, an empty string is returned.
repeat	xs:integer	The number of repeats. If ≤ 0 , an empty string is returned.

2.4.5 Function: **xtlc:count-leading-whitespace()** as xs:integer

Counts the number of whitespace characters at the beginning of a string

Parameter	Type	Description
text	xs:string	Text to work on.

2.4.6 Function: **xtlc:elm2str()** as xs:string

Turns an element into a descriptive string (the element with all its attributes, excluding schema references).

Parameter	Type	Description
elm	element()?	Element to convert

2.4.7 Function: **xtlc:item2element()** as element()?

Tries to find the element belonging to a given item.

- When the item is of type `xs:string` or `xs:anyURI`, it is assumed to be a document reference. The root element of this is returned.
- When the item is of type `document-node()`, the root element of this document is returned
- When the item is of type `element()`, this is returned

You can choose whether to produce an error message or `()` when the item cannot be resolved.

Parameter	Type	Description
item	item()	The item to work on
error-on-non-resolve	xs:boolean	Whether to generate an error when \$item could not be resolved. Otherwise, the function will return ().

2.4.8 Function: xtlc:items2str() as xs:string

Creates a string from a sequence of items.

Useful for easy creation of messages consisting of multiple parts and pieces.

Parameter	Type	Description
items	item()*	The message parts to combine

2.4.9 Function: xtlc:prefix-to-length() as xs:string

Prefixes a string with a given character so it will get at least a given length.

Parameter	Type	Description
in	xs:string	String to prefix
prefix-char	xs:string	String to prefix with. Only first character is used. If empty, * is used.
length	xs:integer	The length to reach.

2.4.10 Function: xtlc:q() as xs:string

Returns the input string quoted (" \$in ")

Parameter	Type	Description
in	xs:string?	String to convert.

2.4.11 Function: xtlc:str2bln() as xs:boolean

Safe conversion of a string into a boolean.

When \$in is empty or not convertible into a boolean, \$default is returned.

Parameter	Type	Description
in	xs:string?	String to convert.
default	xs:boolean	Default value to return when \$in is empty or cannot be converted.

2.4.12 Function: xtlc:str2id() as xs:string

Turns a string into a valid identifier, adding a prefix.

All characters that are not allowed in an identifier are converted into underscores.

When the result does not start with a letter or underscore, the prefix id- is added.

Parameter	Type	Description
in	xs:string	String to convert.
prefix	xs:string?	Prefix to apply.

2.4.13 Function: xtlc:str2int() as xs:string

Turns a string into a valid identifier.

All characters that are not allowed in an identifier are converted into underscores.

When the result does not start with a letter or underscore, the prefix id- is added.

Parameter	Type	Description
in	xs:string	String to convert.

2.4.14 Function: xtlc:str2int() as xs:integer

Safe conversion of a string to an integer.

When `$in` is empty or not convertible to an integer, `$default` is returned.

Parameter	Type	Description
<code>in</code>	<code>xs:string?</code>	String to convert.
<code>default</code>	<code>xs:integer</code>	Default value to return when <code>\$in</code> is empty or cannot be converted.

2.4.15 Function: `xtlc:str2regexp()` as `xs:string`

Turns a string into a regular expression that matches the input exactly. Optionally anchors the regular expression so the match will be on this string *only* (result starts with `^` and ends with `$`).

Parameter	Type	Description
<code>in</code>	<code>xs:string?</code>	String to convert
<code>anchor</code>	<code>xs:boolean</code>	If true, the resulting string will be anchored (start with <code>^</code> and ends with <code>\$</code>)

2.4.16 Function: `xtlc:str2regexp()` as `xs:string`

Turns a string into a regular expression that matches the input exactly.

Parameter	Type	Description
<code>in</code>	<code>xs:string?</code>	String to convert

2.4.17 Function: `xtlc:str2seq()` as `xs:string*`

Converts a string with a list of words into a sequence of words.

Parameter	Type	Description
<code>in</code>	<code>xs:string?</code>	String to convert.

2.4.18 Function: `xtlc:text2lines()` as `xs:string*`

Converts text into separate lines.

Uses the LF as separator; CRs are removed.

Parameter	Type	Description
<code>text</code>	<code>xs:string?</code>	The text to convert.
<code>remove-empty-start-end-lines</code>	<code>xs:boolean</code>	When true any empty (containing whitespace only) lines at the beginning and end are removed.
<code>normalize-indents</code>	<code>xs:boolean</code>	When true the indents of the lines are normalized: the indent of the non-whitespace line with the minimum leading whitespace is removed from all other lines. Lines that contain only whitespace will become zero length.

2.5 XSLT (2.0): `href.mod.xsl`

File: `xslmod/href.mod.xsl`

XSLT library module with functions for the generic handling of href-s (filenames/paths).

Prefix	Namespace URI
<code>xtlc</code>	<code>http://www.xtpxlib.nl/ns/common</code>

Variable	Type	Value	Description
<code>xtlc:protocol-file</code>	<code>xs:string</code>	<code>'file'</code>	File protocol specifier.

Function	Description
<code>xtlc:href-add-encoding()</code>	Percent encodes all "strange" characters (<code>%xx</code>). Any existing percentage encodings will be kept as is.
<code>xtlc:href-canonical()</code>	Makes an href canonical (remove any <code>..</code> and <code>.</code> directory specifiers).
<code>xtlc:href-concat()</code>	Performs a safe concatenation of href components:
<code>xtlc:href-decode-uri()</code>	Reverse function of <code>encode-fo-uri()</code> . Translates percent encodings (<code>%xx</code>) into their actual characters.
<code>xtlc:href-ext()</code>	Returns the extension part of an href.

Function	Description
<code>xtlc:href-is-absolute()</code>	Returns <code>true</code> if the href is considered absolute.
<code>xtlc:href-name()</code>	Returns the (file)name part of an href.
<code>xtlc:href-name-noext()</code>	Returns the (file)name part of an href without its extension.
<code>xtlc:href-noext()</code>	Returns the complete href path without its extension.
<code>xtlc:href-path()</code>	Returns the path part of an href.
<code>xtlc:href-protocol()</code>	Returns the protocol part of an href (without the <code>://</code>).
<code>xtlc:href-protocol()</code>	Returns the protocol part of an href (without the <code>://</code>) or a default value when none present.
<code>xtlc:href-protocol-add()</code>	Adds a protocol specifier (written without the trailing <code>://</code> , e.g. <code>http</code>) to an href.
<code>xtlc:href-protocol-present()</code>	Returns true when an href has a protocol specifier (e.g. <code>file://</code> or <code>http://</code>).
<code>xtlc:href-protocol-remove()</code>	Removes the protocol part from an href.
<code>xtlc:href-relative()</code>	Computes a relative href from one document to another.
<code>xtlc:href-relative-from-path()</code>	Computes a relative href from a directory path to a document.
<code>xtlc:href-result-doc()</code>	Transforms an href into something <code>xsl:result-document/@href</code> can use.

2.5.1 Function: `xtlc:href-add-encoding()` as `xs:string`

Percent encodes all "strange" characters (`%xx`). Any existing percentage encodings will be kept as is.

Parameter	Type	Description
<code>href</code>	<code>xs:string</code>	href to work on.

2.5.2 Function: `xtlc:href-canonical()` as `xs:string`

Makes an href canonical (remove any `..` and `.` directory specifiers).

Examples:

- `href-canonical('a/b/..c') ==> 'a/c'`

Parameter	Type	Description
<code>href</code>	<code>xs:string</code>	href to work on.

2.5.3 Function: `xtlc:href-concat()` as `xs:string`

Performs a safe concatenation of href components:

- Translates all backslashes into slashes
- Makes sure that all components are separated with a single slash
- If somewhere in the list is an absolute path, the concatenation stops.

Examples:

- `xtlc:href-concat(('a', 'b', 'c')) ==> 'a/b/c'`
- `xtlc:href-concat(('a', '/b', 'c')) ==> '/b/c'`

Parameter	Type	Description
<code>href-path-components</code>	<code>xs:string*</code>	The path components to concatenate into a full href.

2.5.4 Function: `xtlc:href-decode-uri()` as `xs:string`

Reverse function of `encode-fo-uri()`. Translates percent encodings (`%xx`) into their actual characters.

Parameter	Type	Description
href	xs:string	href to work on.

2.5.5 Function: xtlc:href-ext() as xs:string

Returns the extension part of an href.

Examples:

- `xtlc:href-ext('a/b/c.xml') ==> 'xml'`
- `xtlc:href-ext('a/b/c') ==> ''`

Parameter	Type	Description
href	xs:string	href to work on.

2.5.6 Function: xtlc:href-is-absolute() as xs:boolean

Returns `true` if the href is considered absolute.

An href is considered absolute when it starts with a `/` or `\`, contains a protocol specifier (e.g. `file://`) or starts with a Windows drive letter (e.g. `C:`).

Parameter	Type	Description
href	xs:string	href to work on.

2.5.7 Function: xtlc:href-name() as xs:string

Returns the (file)name part of an href.

Examples:

- `xtlc:href-name('a/b/c') ==> 'c'`
- `xtlc:href-name('c') ==> 'c'`

Parameter	Type	Description
href	xs:string	href to work on.

2.5.8 Function: xtlc:href-name-noext() as xs:string

Returns the (file)name part of an href without its extension.

Examples:

- `xtlc:href-name-noext('a/b/c.xml') ==> 'c'`
- `xtlc:href-name-noext('a/b/c') ==> 'c'`

Parameter	Type	Description
href	xs:string	href to work on.

2.5.9 Function: xtlc:href-noext() as xs:string

Returns the complete href path without its extension.

Examples:

- `xtlc:href-noext('a/b/c.xml') ==> 'a/b/c'`
- `xtlc:href-noext('a/b/c') ==> 'a/b/c'`

Parameter	Type	Description
href	xs:string	href to work on.

2.5.10 Function: xtlc:href-path() as xs:string

Returns the path part of an href.

Examples:

- `xtlc:href-path('a/b/c') ==> 'a/b'`
- `xtlc:href-path('c') ==> ''`

Parameter	Type	Description
href	xs:string	href to work on.

2.5.11 Function: xtlc:href-protocol() as xs:string

Returns the protocol part of an href (without the ://).

Examples:

- `xtlc:href-protocol('http://...') ==> 'http'`

Parameter	Type	Description
href	xs:string	href to work on.

2.5.12 Function: xtlc:href-protocol() as xs:string

Returns the protocol part of an href (without the ://) or a default value when none present.

Examples:

- `xtlc:href-protocol('http://...', 'file') ==> 'http'`
- `xtlc:href-protocol('/a/b/c', 'file') ==> 'file'`

Parameter	Type	Description
href	xs:string	href to work on.
default-protocol	xs:string	Default protocol to return when \$ref contains none.

2.5.13 Function: xtlc:href-protocol-add() as xs:string

Adds a protocol specifier (written without the trailing ://, e.g. http) to an href.

Parameter	Type	Description
href	xs:string	href to work on.
protocol	xs:string	The protocol to add, without a leading :// part (e.g. just file or http).
force	xs:boolean	When true an existing protocol is removed first. When false, a reference with an existing protocol is left unchanged.

2.5.14 Function: xtlc:href-protocol-present() as xs:boolean

Returns true when an href has a protocol specifier (e.g. file:// or http://).

Parameter	Type	Description
href	xs:string	href to work on.

2.5.15 Function: xtlc:href-protocol-remove() as xs:string

Removes the protocol part from an href.

Examples:

- `xtlc:protocol-remove('file:///a/b/c') ==> '/a/b/c'`

Weird exceptions:

- `xtlc:protocol-remove('file:/a/b/c') ==> '/a/b/c'`
- `xtlc:protocol-remove('file:/C:/a/b/c') ==> 'C:/a/b/c'`

Parameter	Type	Description
href	xs:string	href to work on.

2.5.16 Function: xtlc:href-relative() as xs:string

Computes a relative href from one document to another.

Examples:

- `href-relative('a/b/c/from.xml', 'a/b/to.xml') ==> '../to.xml'`
- `href-relative('a/b/c/from.xml', 'a/b/d/to.xml') ==> '../d/to.xml'`

Parameter	Type	Description
from-href	xs:string	href (of a document) of the starting point.
to-href	xs:string	href (of a document) of the target.

2.5.17 Function: `xtlc:href-relative-from-path()` as `xs:string`

Computes a relative href from a directory path to a document.

Examples:

- `href-relative-from-path('a/b/c', 'a/b/to.xml') ==> '../to.xml'`
- `href-relative-from-path('a/b/c', 'a/b/d/to.xml') ==> '../d/to.xml'`

Parameter	Type	Description
from-href-path	xs:string	href (of a directory) of the starting point.
to-href	xs:string	href (of a document) of the target.

2.5.18 Function: `xtlc:href-result-doc()` as `xs:string`

Transforms an href into something `xsl:result-document/@href` can use.

`xsl:result-document/@href` needs a `file://` in front and has some strict rules about the formatting. The input to this function *must* be an absolute href!

Parameter	Type	Description
href	xs:string	href to work on. Must be absolute!

2.6 XSLT (2.0): `message.mod.xsl`

File: `xslmod/message.mod.xsl`

Message related templates.

A [message](#) is a standardized piece of XML used for inserting (error, debug, etc.) messages into XML documents.

Prefix	Namespace URI
xtlc	http://www.xtpplib.nl/ns/common

Named template	Description
xtlc:msg-create	Generates a standard <code>xtlc:message</code> element.

2.6.1 Named template: `xtlc:msg-create` as `element(xtlc:message)`

Generates a standard `xtlc:message` element.

Parameter	Type	Rq?	Default	Description
extra-attributes	<code>attribute()*</code>		<code>()</code>	Any extra attributes to add to the message.
extra-contents	<code>element()*</code>		<code>()</code>	Any extra elements to add to the message.
msg-parts	<code>item()+</code>	yes		Message to show (parts will be concatenated by <code>xtlc:items2str()</code>).
status	xs:string	yes		The status of the message. Must be one of the <code>\$xtlc:status-*</code> constants as defined in general.mod.xsl .

2.7 XSLT (2.0): `mimetypes.mod.xsl`

File: `xslmod/mimetypes.mod.xsl`

MIME type conversion related functions.

These conversions work with an [external MIME type/extension table](#).

Prefix	Namespace URI
xtlc	http://www.xtpxlib.nl/ns/common

Function	Description
<code>xtlc:ext2mimetype()</code>	Turns an href extension (e.g. <code>xml</code> ') into the correct MIME type (<code>'text/xml'</code>).
<code>xtlc:mimetype2ext()</code>	Turns a MIME type (e.g. <code>'text/xml'</code>) into a corresponding href extension (<code>'xml'</code>).

2.7.1 Function: `xtlc:ext2mimetype()` as `xs:string`

Turns an href extension (e.g. `xml` ') into the correct MIME type (`'text/xml'`).

When it cannot find an appropriate MIME type it returns the empty string.

Parameter	Type	Description
ext	<code>xs:string</code>	The extension to convert.

2.7.2 Function: `xtlc:mimetype2ext()` as `xs:string`

Turns a MIME type (e.g. `'text/xml'`) into a corresponding href extension (`'xml'`).

When it doesn't recognize the MIME type it returns the empty string.

Parameter	Type	Description
mimetype	<code>xs:string</code>	The MIME type to convert.

2.8 XSLT (3.0): `parameters.mod.xsl`

File: `xslmod/parameters.mod.xsl`

Takes an XML document with parameters and turns this into a parameter map.

More information [here](#).

Prefix	Namespace URI
xtlc	http://www.xtpxlib.nl/ns/common

Variable	Type	Value	Description
<code>xtlc:parameter-group-separator</code>	<code>xs:string</code>	<code>'.'</code>	When a <code><group></code> element is encountered, this character is used as a separator after the group's name.
<code>xtlc:parameter-main-trigger-character</code>	<code>xs:string</code>	<code>'\$'</code>	Use this variable for a quick check on whether something might contain a parameter: <code>contains(..., \$xtlc:parameter-main-trigger-character)</code>

Function	Description
<code>xtlc:expand-text-against-parameters()</code>	Expands parameter references in <code>\$text</code> (either <code>{...}</code> or <code>\${...}</code>) against the parameters in <code>\$parameter-map</code> . If a parameter has multiple values, only the first one is used.
<code>xtlc:parameters-get()</code>	Tries to locate a <code><parameters></code> element (in any namespace) underneath <code>\$root-item</code> and processes the child <code><parameter></code> and <code><group></code> elements in here into a parameter map.

2.8.1 Function: `xtlc:expand-text-against-parameters()` as `xs:string`

Expands parameter references in `$text` (either `{...}` or `${...}`) against the parameters in `$parameter-map`. If a parameter has multiple values, only the first one is used.

Parameter	Type	Description
text	xs:string	Text to expand.
parameter-map	map(xs:string, xs:string*)	Map with parameter values.

2.8.2 Function: `xtlc:parameters-get()` as `map(xs:string, xs:string*)`

Tries to locate a `<parameters>` element (in any namespace) underneath `$root-item` and processes the child `<parameter>` and `<group>` elements in here into a parameter map.

The `<value>` elements are filtered according to the entries in `$filters`.

Parameter references in values (either `{...}` or `${...}`). are expanded. If a parameter has multiple values, only the first one is used.

Parameter	Type	Description
root-item	item()	Root item under which the first <code><parameters></code> element is processed. Can be an href, a document node or an element. See <code>xtlc:item2element()</code> on how this is processed.
filters	map(xs:string, xs:string*)?	Any filters for the parameter's <code><value></code> elements.

2.9 XSLT (2.0): `uuid.mod.xsl`

File: `xslmod/uuid.mod.xsl`

UUID related functions.

Works only in Saxon PE or EE (not in the free HE), because we are calling an underlying Java function.

Prefix	Namespace URI
xtlc	<code>http://www.xtpplib.nl/ns/common</code>

Function	Description
<code>xtlc:get-uuid()</code>	Returns a random unique UUID (by calling an underlying Java function)
<code>xtlc:is-real-uuid()</code>	Checks whether a string contains a "real" UUID (conforms to the UUID formatting rules).

2.9.1 Function: `xtlc:get-uuid()` as `xs:string`

Returns a random unique UUID (by calling an underlying Java function)

2.9.2 Function: `xtlc:is-real-uuid()` as `xs:boolean`

Checks whether a string contains a "real" UUID (conforms to the UUID formatting rules).

Example: `5EAE5C68-7394-48d7-A50B-1669E8D3A6C9` (upper/lower-case both admitted)

Parameter	Type	Description
id	xs:string?	UUID to check.

3 XProc 1.0 Libraries

The xtpxlib-common component contains the following XProc (1.0) library module:

Module/Pipeline	Description
common.mod.xpl	XProc (1.0) library with generic steps.

Table 3-1 - Module overview

3.1 XProc (1.0) library: common.mod.xpl

File: `xplmod/common.mod/common.mod.xpl`

XProc (1.0) library with generic steps.

Prefix	Namespace URI
<code>xtlc</code>	<code>http://www.xtpxlib.nl/ns/common</code>

Step	Description
xtlc:copy-directory	Copies a full directory structure.
xtlc:copy-file	Copies a file, if necessary from inside a zip file.
xtlc:log	Writes a message to a log file.
xtlc:recursive-directory-list	Returns the contents of a directory, going into sub-directories recursively. When the requested directory does not exist, it returns only a <code>c:directory</code> root element with an <code>error="true"</code> attribute.
xtlc:remove-dir	Removes a full directory. When the directory does not exist, everything continues without error.
xtlc:tee	Tees the input to a file and passes it unchanged (like the Unix tee command).
xtlc:zip-directory	Zips a directory and its sub-directories into a single zip file.

3.1.1 Step: [xtlc:copy-directory](#)

Copies a full directory structure.

Port	Type	Primary?	Description
<code>source</code>	<code>in</code>	yes	Input, will be passed unchanged.
<code>result</code>	<code>out</code>	yes	The input unchanged.

Option	Rq?	Default	Description
<code>href-source-dir</code>	yes		Reference to the directory to copy from (must have a leading <code>file:/</code> specifier!).
<code>href-target-dir</code>	yes		Reference to the directory to copy to (must have a leading <code>file:/</code> specifier!). If it does not exist the step will try to create it.

3.1.2 Step: [xtlc:copy-file](#)

Copies a file, if necessary from inside a zip file.

Port	Type	Primary?	Description
<code>source</code>	<code>in</code>	yes	Input, will be passed unchanged.
<code>result</code>	<code>out</code>	yes	The input unchanged.

Option	Rq?	Default	Description
<code>enable</code>		<code>true()</code>	Whether the copying is done at all.
<code>href-source</code>	yes		Reference to the source file to copy (must have a leading <code>file:/</code> specifier!).
<code>href-source-zip</code>		<code>''</code>	Document reference to a zip file (must have a leading <code>file:/</code> specifier!). When filled, <code>\$href-source</code> is assumed to be a path inside this zip.
<code>href-target</code>	yes		Reference to the target.

3.1.3 Step: xtlc:log

Writes a message to a log file.

Port	Type	Primary?	Description
source	in	yes	Input to the logging, will be passed unchanged to the output
result	out	yes	The input unchanged.

Option	Rq?	Default	Description
enable		true()	Whether the logging will be done at all.
href-log	yes		Name of the file to write the log messages to (must have a leading file:/ specifier!).
keep-messages		100	The number of messages to keep in the logfile. If le 0, all messages are kept. Set by default to 100 to prevent overflowing files...
message	yes		The actual log message to write.
status		'ok'	Status of the message. Must be ok, warning, error or debug.

3.1.4 Step: xtlc:recursive-directory-list

Returns the contents of a directory, going into sub-directories recursively. When the requested directory does not exist, it returns only a `c:directory` root element with an `error="true"` attribute.

Adapted from Norman Walsh's [example code](#).

Port	Type	Primary?	Description
result	out	yes	The resulting directory structure listing in XML format.

Option	Rq?	Default	Description
depth		-1	The sub-directory depth to go. When le 0, all sub-directories are processed.
exclude-filter			An optional regular expression exclude filter.
flatten		false()	When true, the list will be "flattened": All <code>c:file</code> children will be direct children of the root's <code>c:directory</code> element. These <code>c:file</code> elements get a <code>@name</code> , <code>@href-abs</code> (absolute filename) and <code>@href-rel</code> (relative filename) attribute.
include-filter			An optional regular expression include filter.
path	yes		The path to get the directory listing from.

3.1.5 Step: xtlc:remove-dir

Removes a full directory When the directory does not exist, everything continues without error.

Port	Type	Primary?	Description
source	in	yes	Input, will be passed unchanged.
result	out	yes	The input unchanged.

Option	Rq?	Default	Description
enable		true()	Whether the removal is done at all.
href-dir	yes		Reference to the directory to remove (must have a leading file:/ specifier!).

3.1.6 Step: xtlc:tee

Tees the input to a file and passes it unchanged (like the Unix tee command).

Port	Type	Primary?	Description
source	in	yes	Input to the tee.
result	out	yes	The input unchanged (unless a <code>\$root-attribute-href</code> was specified).

Option	Rq?	Default	Description
enable		true()	Whether to actually do the write. When <code>false</code> , nothing happens.
href	yes		Name of the file to write to (must have a leading <code>file:/</code> specifier!)
root-attribute-href		' '	If filled, <code>\$href</code> is recorded as an attribute with this name on the root element of the original input. Must be a valid attribute name.

3.1.7 Step: xtlc:zip-directory

Zips a directory and its sub-directories into a single zip file.

Port	Type	Primary?	Description
result	out	yes	The output of the actual zip step, listing all the files that went in.

Option	Rq?	Default	Description
base-path	yes		Directory which contents will be stored in the zip (must have a leading <code>file:/</code> specifier!)
href-target-zip	yes		Document reference for the zip file to produce (must have a leading <code>file:/</code> specifier!)
include-base		true()	When true, the last part of <code>\$base-path</code> (e.g. <code>a/b/c ==> c</code>) is used as the root directory in the zip file.

4 XProc 3.0 Support

The xtpplib-common component contains the following support (pipelines and/or libraries) for XProc 3.0:

Module/Pipeline	Description
recursive-directory-list.xpl	Extension of standard the <code>p:directory-list</code> step. Returns the contents of a directory, going into sub-directories recursively. Adds the possibility to "flatten" the list.
zip-directory.xpl	Zips a directory into a single zip file.

Table 4-1 - Module overview

4.1 XProc (3.0) pipeline: recursive-directory-list.xpl

File: `xpl3mod/recursive-directory-list/recursive-directory-list.xpl`

Type: `xtlc:recursive-directory-list`

Extension of standard the `p:directory-list` step. Returns the contents of a directory, going into sub-directories recursively. Adds the possibility to "flatten" the list.

Port	Type	Primary?	Description
result	out	yes	The resulting directory structure in XML format. See the standard <code>p:directory-list</code> step for a more detailed description.

Option	Type	Rq?	Default	Description
add-decoded	xs:boolean		false()	When true and \$flatten is true, attributes <code>@href-rel-decoded</code> and <code>@href-abs-decoded</code> are added in which any percent encoded characters are decoded.
depth	xs:integer		-1	The sub-directory depth to go. When lt 0, all sub-directories are processed.
detailed	xs:boolean		false()	Whether to add detailed information.
exclude-filter	xs:string*		'\ .git/ '	Optional regular expression exclude filters. By default, git directories are excluded.
flatten	xs:boolean		false()	When true, the list will be "flattened": All <code>c:file</code> children will be direct children of the root's <code>c:directory</code> element. These <code>c:file</code> elements get a <code>@name</code> , <code>@href-abs</code> (absolute filename) and <code>@href-rel</code> (relative filename) attribute.
include-filter	xs:string*			Optional regular expression include filters.
override-content-types	array(array(xs:string))?		()	Override content types specification (see description of <code>p:directory-list</code>).
path	xs:string	yes		The path to get the directory listing from.

4.2 XProc (3.0) pipeline: zip-directory.xpl

File: `xpl3mod/zip-directory/zip-directory.xpl`

Type: `xtlc:zip-directory`

Zips a directory into a single zip file.

Port	Type	Primary?	Description
result	out	yes	The archive manifest of the created zip file.

Option	Type	Rq?	Default	Description
base-path	xs:string	yes		URI of the directory which contents will be stored in the zip.
depth	xs:integer		-1	The sub-directory depth to go. When lt 0, all sub-directories are processed.
exclude-filter	xs:string*		'\ .git/ '	Optional regular expression exclude filters. By default, git directories are excluded.
href-target-zip	xs:string	yes		URI for the zip file to produce.
include-base	xs:boolean		true()	When true, the last part of \$base-path (for instance a/b/c ==> c) is used as root directory for entries in the zip file.
include-filter	xs:string*			Optional regular expression include filters.

5 XSLT Stylesheets

The xtpxlib-common component contains the following XSLT Stylesheets:

Module/Pipeline	Description
get-system-properties.xsl	Gets all the XSLT available system properties (as returned by <code>system-property()</code>).
xslmod2xqmod-stub.xsl	This stylesheet translates an XSLT module (in xtpxlib "style") into a stub for an XQuery Module. After this you still need to hand-edit it to make it all work.

Table 5-1 - Module overview

5.1 XSLT (2.0): get-system-properties.xsl

File: `xsl/get-system-properties.xsl`

Gets all the XSLT available system properties (as returned by `system-property()`).

5.2 XSLT (2.0): xslmod2xqmod-stub.xsl

File: `xsl/xslmod2xqmod-stub.xsl`

This stylesheet translates an XSLT module (in xtpxlib "style") into a stub for an XQuery Module. After this you still need to hand-edit it to make it all work.

See as an example [href.mod.xsl](#). Large parts of this module were turned into XQuery by this stylesheet. The result (edited after this initial conversion) is in the `xqmod` directory of this component.

6 XML Data Files

The xtpxlib-common component contains the following XML data files:

Module/Pipeline	Description
dummy.xml	Dummy file to use as input for processes that require an XML input document but the input is ignored.
fop-default-config.xml	Default configuration file for the FOP XSL-FO renderer.
mimetypes-table.xml	Table used for transforming file extensions into a MIME type and vice versa.

Table 6-1 - Module overview

6.1 XML document: dummy.xml

File: `data/dummy.xml`

Root element: `<dummy>`

Dummy file to use as input for processes that require an XML input document but the input is ignored.

6.2 XML document: fop-default-config.xml

File: `data/fop-default-config.xml`

Root element: `<fop>`

Default configuration file for the FOP XSL-FO renderer.

The only thing this configuration file does is set the font handling to "auto-detect" (meaning it will try the use the system fonts).

6.3 XML document: mimetypes-table.xml

File: `data/mimetypes-table.xml`

Root element: `<mimetypes>` (namespace: `http://www.xtpxlib.nl/ns/mimetypes`)

Table used for transforming file extensions into a MIME type and vice versa.

Follows the [mimetypes.xsd](#) schema. Used internally by the [mimetypes.mod.xsl](#) module, but might also be useful in other situations.

7 XML Schemas

The xtpplib-common component contains the following XML Schemas:

Module/Pipeline	Description
message.xsd	Schema for messages used and created by this component.
mimetypes.xsd	Schema for the MIME type association datafile.
parameters.xsd	Schema for sets of parameters as used by this library.

Table 7-1 - Module overview

7.1 XML Schema: message.xsd

File: `xsd/message.xsd`

Target namespace: `http://www.xtpplib.nl/ns/common`

Schema for messages used and created by this component.

See also [message.mod.xsl](#).

Element	Description
message	A message generated by this component.

7.2 XML Schema: mimetypes.xsd

File: `xsd/mimetypes.xsd`

Target namespace: `http://www.xtpplib.nl/ns/mimetypes`

Schema for the MIME type association datafile.

See also [mimetypes-table.xml](#) and [mimetypes.mod.xsl](#).

Element	Description
mimetypes	Root element of the MIME types associaton list.

7.3 XML Schema: parameters.xsd

File: `xsd/parameters.xsd`

Schema for sets of parameters as used by this library.

Use [parameters.mod.xsl](#) for turning these lists into maps. An explanation of the parameter mechanism can be found [here](#).

Although this is schema for no namespace, parameters can be in *any* namespace (if you use [parameters.mod.xsl](#) for processing them).

Element	Description
parameters	Root element for a set of parameters (either in a document on its own or embedded).