



XQuery
Modules in
BaseX

Rositsa
Shadura

Agenda

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Questions

XQuery Modules in BaseX

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- apart from the standard XQuery implementation, BaseX offers additional function modules
- during the last year we have extended our functionality with File, HTTP, ZIP, SQL and cryptographic module
- but this is not everything: we offer also a bunch of other useful libraries, e.g. for database management, JSON parsing, etc.
- all modules are statically bound

Database Module

- XQuery functions for handling databases
- Existing databases can be opened and listed, index structures can be directly accessed, documents can be added to and removed from collections, etc.

Index Module

- provides XQuery functions for displaying information stored in the database index structures, e.g. strings stored in the text index along with their number of occurrences



Database Module Demo

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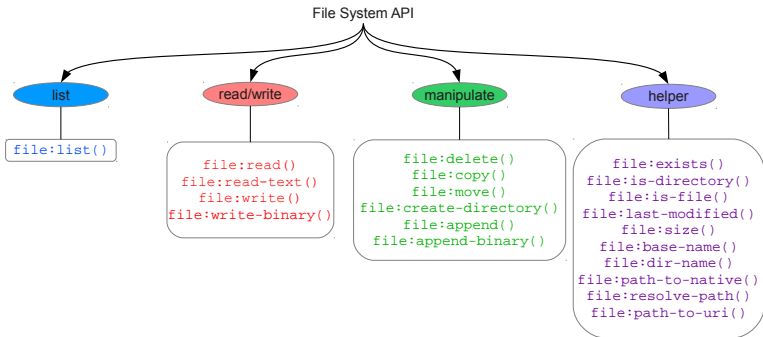
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- addresses the problem of missing portability
- defines libraries of extension functions unrelated to any single processor
- delivery unit is the module
- offers a standard way to install libraries

Extension functions to perform file system related operations such as listing, reading or writing files



- module for sending HTTP requests and handling the responses
- defines a single function `http:send-request()` with several possible signatures
- makes it possible to query REST services, Google Services, Web Services through SOAP, or simply retrieve resources on the web



HTTP Module Demo

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SQL Module

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- module for access to relational databases from XQuery
- allows execution of query, update and prepared statements
- EXPath specification is still in work

■ direct query

```
let $conn := sql:connect("jdbc:postgresql://localhost:5432/coffeehouse")
return sql:execute($conn, "SELECT * FROM coffees WHERE price < 10")
```



```
<sql:row xmlns:sql="http://www.basex.org/sql">
  <sql:column name="cof_name">French_Roast</sql:column>
  <sql:column name="sup_id">49</sql:column>
  <sql:column name="price">9.5</sql:column>
  <sql:column name="sales">15</sql:column>
  <sql:column name="total">30</sql:column>
</sql:row>
<sql:row xmlns:sql="http://www.basex.org/sql">
  <sql:column name="cof_name">French_Roast_Decaf</sql:column>
  <sql:column name="sup_id">49</sql:column>
  <sql:column name="price">7.5</sql:column>
  <sql:column name="sales">10</sql:column>
  <sql:column name="total">14</sql:column>
</sql:row>
<sql:row xmlns:sql="http://www.basex.org/sql">
  <sql:column name="cof_name">Colombian_Decaf</sql:column>
  <sql:column name="sup_id">101</sql:column>
  <sql:column name="price">8.75</sql:column>
  <sql:column name="sales">6</sql:column>
  <sql:column name="total">12</sql:column>
  <sql:column name="date">2010-10-10 13:56:11.0</sql:column>
</sql:row>
```

■ prepared statement

```
(: Establish a connection :)
let $conn := sql:connect("jdbc:postgresql://localhost:5432/coffeehouse")
(: Obtain a handle to a prepared statement :)
let $prep := sql:prepare($conn, "SELECT * FROM coffees WHERE price < ? AND cof_name = ?")
(: Values and types of prepared statement parameters :)
let $params := <sql:parameters>
  <sql:parameter type="double">10</sql:parameter>
  <sql:parameter type="string">French_Roast</sql:parameter>
</sql:parameters>
(: Execute prepared statement :)
return sql:execute($prep, $params)
```

ZIP Module

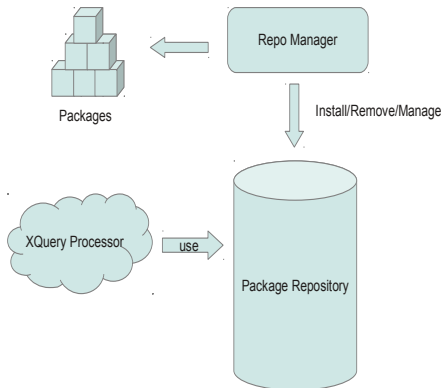
- XQuery functions to handle ZIP archives
- The contents of ZIP files can be extracted and listed, and new archives can be created, creation and validation of an XML Digital Signature

Cryptography Module

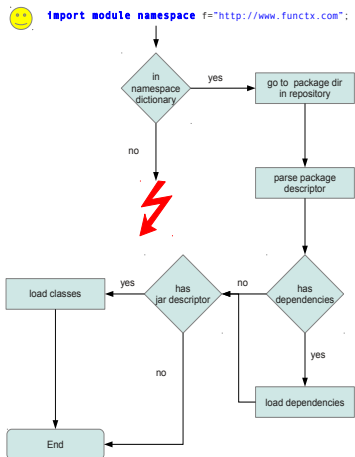
- module for performing cryptographic operations in XQuery
- creation of message authentication codes (HMAC), encryption and decryption

- offers a generic mechanism for extending an XQuery processor with packages
- a package is a zip archive encapsulating one or more extension libraries
- EXPath strictly defines the structure of a package, e.g.:

```
expath-pkg.xml } package descriptor  
func/x/        }  
  functx.xql  } package components  
  functx.xsl  }
```



- Commands
REPO INSTALL
REPO REMOVE
REPO LIST
- package repository:
BaseXRepo in home
directory
- supports extension with
java libraries



XSLT Module

- XQuery functions and variables to perform XSLT transformations
- by default uses Java's XSLT 1.0 Xalan implementation to transform documents. XSLT 2.0 is used instead if Version 9.x of the Saxon XSLT Processor is found in the classpath

JSON Module

- XQuery functions to parse and serialize JSON documents
- we offer two sets of functions



Questions?

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Thank you for your attention!