XCC Speed Talk

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Agenda

- Introduction to XCC
- Address common issues
- Current investigations
- Questions

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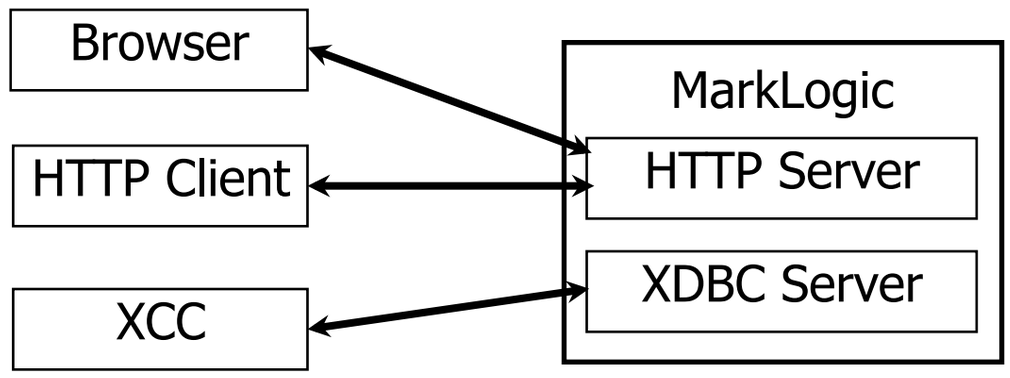
What is XCC?



- Client library for Java and .NET apps to talk to MarkLogic server
  - Roughly equivalent to a JDBC/ODBC driver
  - Proprietary XDBC protocol; talks to XDBC server

- .NET version is a thin C# layer
  - Java classes converted to CLR by IKVM (also used by Saxon.net)
  - IKVM upgrade in 4.2; much faster, with .NET 4.0 support

Why should I use XCC?

- Great for adding MarkLogic to existing Java or .NET architecture
  - Maps to traditional persistence and search modules
  - Language, Datatypes, Internal/External, Aggregation, Expertise, Control
- Some features you may care about
  - Manages connections and handles errors
  - Marshals data to/from scalar or DOM types
  - Streaming content insertion with System Entity Resolution
  - Transactional multi-document inserts
  - Java version supports SSL
- Future
  - Client-side transaction control in 5.0

Why might I not use XCC?

- Access to MarkLogic from platforms other than Java and .NET
- Direct SOA integration of MarkLogic
- Load management requirements
- The alternative; single-tier web services over HTTP
  - REST or SOAP services are common
  - JSON support in server
  - ml-json library used from JavaScript for conference app
  - Active Document library exposes MarkLogic to Ruby
  - There are other open source libraries out there

Load Balancing

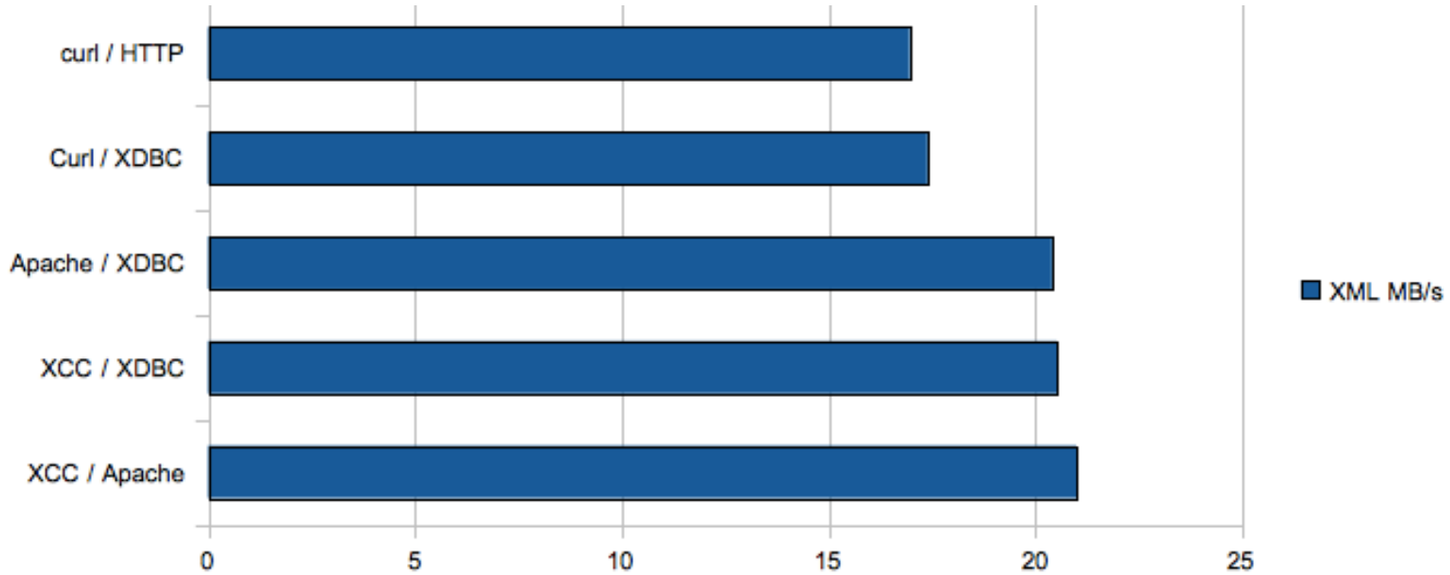
- Protocol is HTTP-like but not fully compliant
  - Callbacks for System Entity resolution
  - Connection management can result in isolation failure
  - No support for cookies

- If you need LBFO, do it in your Java/.NET application
  - External LBFO (F5, etc) is discouraged
  - Managing multiple ContentSource objects is a common solution

- Possible futures:
  - Full HTTP-compliance to support external LBFO
  - Built-in client LBFO management of multiple servers

Is XCC fast?

- Document retrieval speed comparison; local on slow Linux box



- Slower if parsed to DOM
  - Experimented with compressed trees
  - XML parsing *very* fast these days
- Looking at moving from NIO to single-threaded sockets.

Writing fast XCC applications

- Use the latest package
- Use streaming result sequences

```
request.setCacheResult(false)
```

  - Careful to read fully and close Session objects to avoid leaking sockets

Writing fast XCC applications

- Always reuse ContentSource, reuse Session when convenient.

```
// THIS

ContentSource cs = ContentSourceFactory.newContentSource(“xcc://localhost:8888”);
Session session = cs.newSession();

for (...) {
  AdhocQuery rq = session.newAdhocQuery(query);
  session.submitRequest(rq);
  ...
}

// NOT THIS !!

for () {
  ContentSource cs = ContentSourceFactory.newContentSource(“xcc://localhost:8888”);
  Session session = cs.newSession();
  AdhocQuery rq = session.newAdhocQuery(query);
  session.submitRequest(rq);
  ...
}
```

Writing fast XCC applications

- Reuse DocumentBuilder

```
// THIS

DocumentBuilder db = DocumentBuilderFactory.newInstance().newDocumentBuilder();
while (rs.hasNext()) {
  Element el = ((XdmElement)rs.next().getItem()).asW3c(db);
}

// NOT THIS

while (rs.hasNext()) {
  Element el = ((XdmElement)rs.next().getItem()).asW3c();
}
```

Compact Sequences

- Implementation detail!
- Before / After

```
(1, 2.0, 'three') =>

--f41610d7053f1eac
Content-Type: text/plain
X-Primitive: integer

1
--f41610d7053f1eac
Content-Type: text/plain
X-Primitive: float

2.0
--f41610d7053f1eac
Content-Type: text/xml
X-Primitive: string

three
--f41610d7053f1eac--
```

```
(1, 2.0, 'three') =>

--f41610d7053f1eac
Content-Type: application/vnd.marklogic.sequence

i1
f2.0
s5:three
--f41610d7053f1eac
```

Result Type Support

- In 4.0 (2008) some changes were made to align with XQuery 1.0
- Currently all nodes are returned as Element (even documents)
- Hadoop Connector uses XCC, drives some new requirements
- A few possibilities for 5.0:
  - Broader and differentiated support of node types (e.g. Attribute)
  - Geo types (Point, Polygon, etc.)
  - Maps (map:map to java.util.Map)
  - Query and other types as XML

Version Compatibility

- Objective is universal forwards and backwards compatibility
- Always use the latest from your major version if possible
- Testing focuses on matching versions; keep server up to date too!
- Maven repository can help you keep your XCC client up to date
  - http://developer.marklogic.com/maven2/

- XCC 4.2
  - Java 1.5+ / .NET runtime 3.0+
  - Support for .NET framework 4.0

- XCC 4.1
  - Java 1.5+ / .NET runtime 1.1+