LibX 2.0 - an Open Source, Community Platform for Delivering Library Services

Code4Lib 2009
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LibX 1.0

- Toolbar and right-click context menu
- Adaptive and user-configurable context menus
- OpenURL support
- Magic Button (Google Scholar support)
- Web Localization via Embedded Cues
- Autolinking
- Off-campus access via EZProxy or WAM
- Support for CiteULike
- Support for COinS
- Support for xISBN
- Show/Hide Hotkey
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The LibX Edition Builder

• A configuration management tool for creating customized versions of LibX
  – Customized version of LibX = LibX edition

• Edition configuration includes descriptions of community-local resources:
  – OPACs, OpenURL, Proxy, Databases, Links, Branding, ...

• Edition Builder is easy to use
  – Makes heavy use of OCLC registries
  – Uses sophisticated auto-detection techniques
  – Usable by librarians, not just programmers

• Anybody can create, share, and manage editions

• Over 550 edition as of now, new ones created at a pace of 20/month
  – Huge human investment
  – 10’s of thousands of end users
Where to go from here?

• A toolbar is great, but...

• Emerging technology trends
  – Service-oriented architectures, web services interfaces – soon even to ILS!
  – Data mash-ups; HTML widgets

• Educational trends: librarians, educators, and users create
  – Online tutorials, subject guides, visualizations
  – Social OPACs: tagging, reviews, recommender services
Library Resources and Web Services

LibX 2.0 plugin: executes Libapps, merging library information into pages.

Users: decide to which library services to subscribe, see expanded view of the web

Librarians: create or adapt Libapps from reusable, shareable modules

World Wide Web

But who will create those modules?
The LibApp Model

• How can the interaction of LibX with web content be modeled?
• Typical tasks involve
  – Examination of the page and extraction of information
  – Processing of information
  – Modification of the page
• A Module is a small piece of JavaScript code along with a metadata description of its input and/or output
• A Libapp is a group of modules
• A Package is a folder of libapps and packages
Modules

• Modules are named using a URL and published via REST/AtomPub
• Modules can reference JavaScript libraries (e.g., jQuery) and CSS stylesheets
  – Execute in a parallel environment to the client page
• Modules are trusted, with full access to LibX API, including edition configuration and user preferences
• Modules communicate with each other via tuple space
LibX Tuple Spaces

tuple = TAKE(template)

• If a tuple matching template exists in the tuple space, remove it and return it
• If no tuple exists, wait until a matching tuple is written, remove it and return it

WRITE (tuple)

• Write a tuple into the space
• If a TAKE is pending with a matching template, complete the TAKE

Tuples and Templates are JavaScript objects in JSON notation.
Tuple example:  { isbn: “0743226720” }  
Template example:  { isbn : * }  // any tuple with ‘isbn’ field
{ isbn: 2234532134 }

{ display: "ISBN 223.. is on the shelf" }

Tuple Space
Rationale for Tuple Spaces

Software Engineering
- Low coupling between modules
- Independent composition
- Simplicity
- Suitable for meta-programming

Handling Asynchrony
- User actions happen asynchronously
- Information arrives asynchronously from external sources
- Execution order independence
LIBAPP DEMO 1
CREATE A PRESENCE FOR THE LIBRARY
Step 1: Arrangement

Description: Display a Help icon on the ACM page that plays a video when clicked.
Include: /portal\acm\org.*/
Require: jquery

// Place the current edition's icon into the ACM portal page, next to the current search button.
libx.space.write ( {
    needsuserbutton: $('input[src="http://portal.acm.org/images/search_small.jpg"]'),
    image: libx.edition.options.icon,
    text: "Click for a short tutorial",
    action: function () {
        // When user clicks, offer to show a YouTube clip
        libx.space.write ( { youtube: "ehkfEcQ5YnQ"} );
    }
})
Step 2: Place UI Button

Description: Place a clickable image into a page
Include: /.*/
Guarded-By: { needsuserbutton: libx.space.WILDCARD, action: libx.space.WILDCARD }
Require: jquery

// Create a link with an embedded image
var a = $('"<a href='javascript:void(0);'/>"');
a.append('"<img border="0" src="" + tuple.image + "/"/>"');
a.attr('title', tuple.text || "");

// Insert link after element where a 'user button' is wanted
$(tuple.needsuserbutton).after(a);

// Associate onclick handler and animate
$(a).click(tuple.action).fadeOut("slow").fadeIn("slow");
Step 3: Create Youtube Clip

Description: Create a notification to play a YouTube video, based on Video ID
Include: /.*/
Guarded-By: { youtube: libx.space.WILDCARD }

// Create HTML based on tuple.youtube
libx.space.write ( { 
    notify : '<object width="425" height="344"><param name="movie" value="http://www.youtube.com/v/\'+tuple.youtube+'&hl=en&fs=1"></param><param name="allowFullScreen" value="true"></param><param name="allowscriptaccess" value="always"></param><embed src="http://www.youtube.com/v/\'+tuple.youtube+'&hl=en&fs=1" type="application/x-shockwave-flash" allowscriptaccess="always" allowfullscreen="true" width="425" height="344"></embed></object>',
    options: { width: '450px' }
} );
Step 4: Display HTML Notification

Description: Display HTML notifications via an embedded panel using jGrowl
Include: /*
Guarded-By: { notify: libx.space.WILDCARD }
Require: jquery
Require: jgrowl
Require: jgrowl.css

// Set sticky:true unless provided in tuple.options
var jGrowlOptions = $.extend({}, {sticky:true}, tuple.options);

// Display notification
$.jGrowl( tuple.notify, jGrowlOptions );
LIBAPP DEMO 2
“GET FULL TEXT LINKS FOR COINS”
Some recent papers posted to CitEULike - all mixed together.

- Differential regulation of rasGAP and neurofibromatosis gene product activities.
  by G. Bollag, F. McCormick
  posted to citeulike group by polarmona on 2009-02-24 17:32:00 as ★★

- Detecting influenza epidemics using search engine query data
  Nature (19 November 2008)
  by Jeremy Ginsberg, Matthew Haebig, Rajan S Patel, Lynnette Brammer, Mark S Smolinski, Larry Brilliant
  posted to journalclub fun by pipe on 2009-02-24 17:31:56 as ★★ along with 8 people

- Coprostanol as sewage tracer in McMurdo Sound, Antarctica
  by M Venkatesan, F Mirsadeghi
  posted to no-tag by lbsz on 2009-02-24 17:31:31 as ★★

- Illuminations
  (04 October 2004)
  by Walter Benjamin
  posted to no-tag by gartouta on 2009-02-24 17:31:25 as ★★ along with 1 person

- Model-based clustering for longitudinal data
  by Rolando, Fernando A Quintana, Guillermo Marshall
  posted to longitudinal-data clustering by saqil on 2009-02-24 17:30:43 as ★★

- Path integral quantization of parametrized field theory
  by Machavan Varadarajan
  posted to gauge-choice-measure by RMaier on 2009-02-24 17:29:05 as ★★

- "Leading According to Need" in Self-Organizing Groups
  by L Conradt, T Krause, I D Coulson, T J Roper
  posted to school model leadership fun by adrianstrom on 2009-02-24 17:28:43 as ★★ along with 1 person

- Convection in the Earth's core driven by lateral variations in the geoid 2013 mantle boundary heat flux

COinS, the LibX 2.0 way

Include: /.*/
Description: Find COinS
Require: jquery

```javascript
$("span.Z3988").each(function () {
    libx.space.write({
        coins: this,
        contextobj: this.getAttribute('title')
    });
});
```


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COinS, the LibX 2.0 way

Include: /.*/
Description: Link COinS
Guarded-By: { coins: libx.space.WILDCARD }
Require: legacy-cues

var cue = new libx.cues.StandardCoins(tuple.contextobj);
cue.insertBefore(tuple.coins);
Some recent papers posted to CiteULike - all mixed together.

**Model-based clustering for longitudinal data**
by Rolando, Fernando A Quintana, Guillermo Marshall
posted to longitudinal-data-clustering by code4lib on 2009-02-24 17:30:43 as **

**Path integral quantization of parametrized field theory**
by Madhavan Varadarajan
posted to gauge-choice-measure by Rnaira on 2009-02-24 17:29:03 as **

** ”Leading According to Need” in Self-Organizing Groups**
by I. Conradly, J. Krause, D. Grauer, T. T. Rogers
posted to social-model-leadership by andrewmenrad on 2009-02-24 17:20:40 as ** along with 1 person

**Convection in the Earth’s core driven by lateral variations in the core& x2013;mantle boundary heat flux**
by Steven J Gibson, David Gubbins
posted to no-tag by gavinmorrard on 2009-02-24 17:27:18 as **

**Electric chips for rapid detection and quantification of nucleic acids**
by M Gabici-Ciminska
posted to redax easy eerald by JonD on 2009-02-24 17:27:18 as **

**Relative sensitivity to alfentanil and reliability of current perception threshold vs von Frey tactile stimulation and thermal sensory testing**
by Robert Ehrich, Mark S Wallace, Gery Schulz
posted to von threshold thermal therapy tests sensory sensitivity sensation reliability rehabilitation physical perception neurology measures free examination by DFieldNeuroPT to the group Neurology PhysicalTherapy on 2009-02-24 17:26:33 as **

**WATER AND WASTEWATER QUALITY MONITORING, McMurdo STATION, ANTARCTICA**
Add Link/360 direct link

```javascript
var link360 = libx.services.link360.getLink360(libx.edition);
if (link360)
    link360.getMetadata({
        query: tuple.contextobj,
        type: 'article',
        hasFullText: function (xmlDoc, url, databaseName) {
            cue.setAttribute('href', url);
            cue.setAttribute('title', "Users of " + libx.edition.links.primary.label + " click here for full text via " + databaseName);
            cue.setImageAttribute('src', 'http://www.lib.vt.edu/images/getvtext.gif');
            cue.animate();
        },
    });
```
Transitioning from LibX 1.0 to 2.0

• Complete redesign of LibX client code
• Browser-independent, strictly object-oriented JavaScript code with proper namespacing and encapsulation
• Provide full documentation (via jdoc, accessible in about:libx)
• Provide built-in interactive reflection of data structures
• Include unit tests (run via Rhino)
• Hot updatable
LibX 2.0 – Roles

LibX 2.0 Developers – make services available and write modules and libapps

LibX 2.0 Adapters – combine modules into libapps, reuse and adapt libapps, bundles and share libapps as packages

LibX 2.0 User Community - subscribes to packages or libapps they like
LibX 2.0 Community Repository

• Based on tuple space model, create metadata descriptions for modules
• Create a repository of modules, libapps, and packages
• Editable like a Wiki
• Integrate repository into Edition Builder
  – Include consistency checking

• This will be done during the next 2 years (but libapps can already be created now)
Call for Developers

• Launched Developer Website
  – http://developers.libx.org

• Launched mailing list
  – libx-dev@googlegroups.com

• Transition path: update from LibX 1.5

• Agile roll-out, no “releases”

• We invite you to try and play with it!
LibX Team

• Annette Bailey
• Godmar Back
• Kyrille Goldbeck
• Mike Doyle
• Arif Khokar
• Travis Webb
• Alumni
  – Nathan Baker
  – Tilottama Gaat
  – Tobias Wieschnowsky