

Web Services for Libraries

Jason A. Clark

Head of Digital Access and Web Services
Montana State University Libraries

A quick look ahead...

- An overview of the different web services protocols
- Wading through the acronym soup and major terms associated with web services
- A discussion of the benefits of web services for libraries
- Walkthrough of the code that makes it happen

Questions?

- Ask anytime during the presentation
- This can be heady stuff

Getting to know you

- About me
- About you
 - Introductions – name, institution, goal
 - Who knows XML?
 - Who knows javascript and DOM?
 - Who knows PHP?
 - Goals for workshop?
 - Examples?

Terms: API

What is an API?

An application programming interface (or API) is a way for developers to access parts of a remote web site and integrate it with their own site.

MSU Libraries Resources Example

<http://www.lib.montana.edu/resources/read.php?form=json&limit=25>

Terms: Web Service

What is a Web Service?

- Broader term
- Public interface (API)
- Provides access to data and/or procedures
- On a remote/external system (usually)
- Use structured data for data exchange (often XML)

Terms: Structured Data

Structured data = XML and JSON

- Extensible Mark-up Language and Javascript Object Notation
- Flexible mark-up languages
- Lightweight and easy to parse
- Allow communication between disparate systems

Terms: POST and GET

Two primary verbs for web services actions

- POST data to a web service
- GET data from a web service
- Read and Write actions

Why use Web Services?

- Access to content/data stores you could not otherwise provide (zip codes, news, pictures, reviews, etc.)
- Enhance site with a service that is not feasible for you to provide (maps, search, products, etc.)
- Combine these services into a seamless service you provide (mash-ups)

Provide Web Services?

- You have a service that benefits your users best if they can get to their data from outside the application
- You want others to use your data store in their applications

Available Web Services

- Google
- Yahoo!
- Amazon
- eBay
- Flickr
- del.icio.us
- Google App Engine <http://code.google.com/appengine/>
- Amazon s3
- Many more...

You'd be surprised...

- AllCDCovers.com <http://www.allcdcovers.com/api>
- ISBNdb.com <http://isbndb.com/docs/api/index.html>
- OpenDOAR <http://www.opendoar.org/tools/api.html>
- arXiv.org http://export.arxiv.org/api_help/

* See ProgrammableWeb

<http://www.programmableweb.com/apis/directory>

Types of Web Services

- SOAP
- XML-RPC
- REST

What is SOAP?

- An acronym for Simple Object Access Protocol
- Version 1.2 of the W3C recommendation
- dropped the acronym
- Specification maintained at w3.org
- There's nothing simple about SOAP!

Using SOAP

- Send a message specifying an action to take, including data for the action
- Receive a return value from the action
- Most SOAP services provide a WSDL file to describe the actions provided by the service

What's WSDL?

- Web Services Description Language
- XML mark-up for describing the functionality provided by a SOAP service

SOAP Example

EBAY wsdI

<http://api.google.com/GoogleSearch.wsdl>

```
<?xml version="1.0" encoding="UTF-8"?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.
org/soap/envelope/"
xmlns:ns1="urn:ebay:apis:eBLBaseComponents">
<SOAP-ENV:Header>
...
</SOAP-ENV:Header>
<SOAP-ENV:Body>
<ns1:GetSearchResultsRequest>
<ns1:Version>425</ns1:Version>
<ns1:Query>*</ns1:Query>
<ns1:TotalOnly>>true</ns1:TotalOnly>
</ns1:GetSearchResultsRequest>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

SOAP: Final Thoughts

- Complex
- Messaging and Data mingled
- Usually seen in software APIs, but many scripting languages have libraries
- Google API has moved away from it

What is XML-RPC

- XML Remote Procedure Call
- Specification maintained at xmlrpc.com
- Provides a means to call methods/procedures on a remote server and make changes and/or retrieve data
- An early specification

Using XML-RPC

- Most common implementation of XML-RPC used today is that of blog ping services
- Technorati, Flickr, FeedBurner, others?

XML-RPC: Final Thoughts

- An updating protocol
- Early adoption, but little recent development

What is REST?

- The greatest thing since sliced...
- Representational State Transfer
- Unique data resources with addresses

Theory of REST

- Focus on diversity of resources (nouns), not actions (verbs)
- Every resource is uniquely addressable
- All resources share the same constrained interface for transfer of state (actions)
- Must be stateless, cacheable, and layered

REST = Web Protocol

Web As Prime Example

- URLs uniquely address resources
- HTTP methods (GET, POST, HEAD, etc.) and content types provide a constrained interface
- All transactions are atomic
- HTTP provides cache control

REST: Final Thoughts

- Similarity to web - easy to understand
- URL is the method
- Most popular type of web service

Web Services in Libraries

- Plymouth State: Scriblio
- Repository66: mash-up of OpenDOAR data with Google Maps and repository growth charts from ROAR, developed by Stuart Lewis of the University of Aberystwyth, Wales
<http://maps.repository66.org/>
- LibraryThing
- IofiAPI: MSU Libraries (ETD, RMT)
- MSU Library Lifestream: RSS services (Twitter, del.icio.us, last.fm, MSU Library Blog)
- TERRApod Youtube admin
- Google Booksearch
- Samples from the crowd...

Workshop Examples

[Web Services - Google Ajax Search API](#)

[Web Services - Amazon Reviews & Thumbnails \(PHP\)](#)

[Web Services - Flickr API - Display Photos \(JSON\)](#)

Under the hood...

Making the examples work... a closer look at the web services handout.

What I've Learned

- Web services are closed source software
- Documentation and online support is vital
- Debugging can be hard
- Similarities to common protocols are important
- Practice and finding your development kit is essential

Last thoughts...

- This stuff is just beginning...
- Worldcat API
- Digital Library Federation API recommendation
- Library mashups are coming - there's just too much good data out there

Contact Information

Jason A. Clark

Head of Digital Access and Web Services
Montana State University Libraries

jaclark@montana.edu

www.jasonclark.info

406-994-6801