DEVCONNECT
ONLINE

An Introduction to OCLC APIs for Developers

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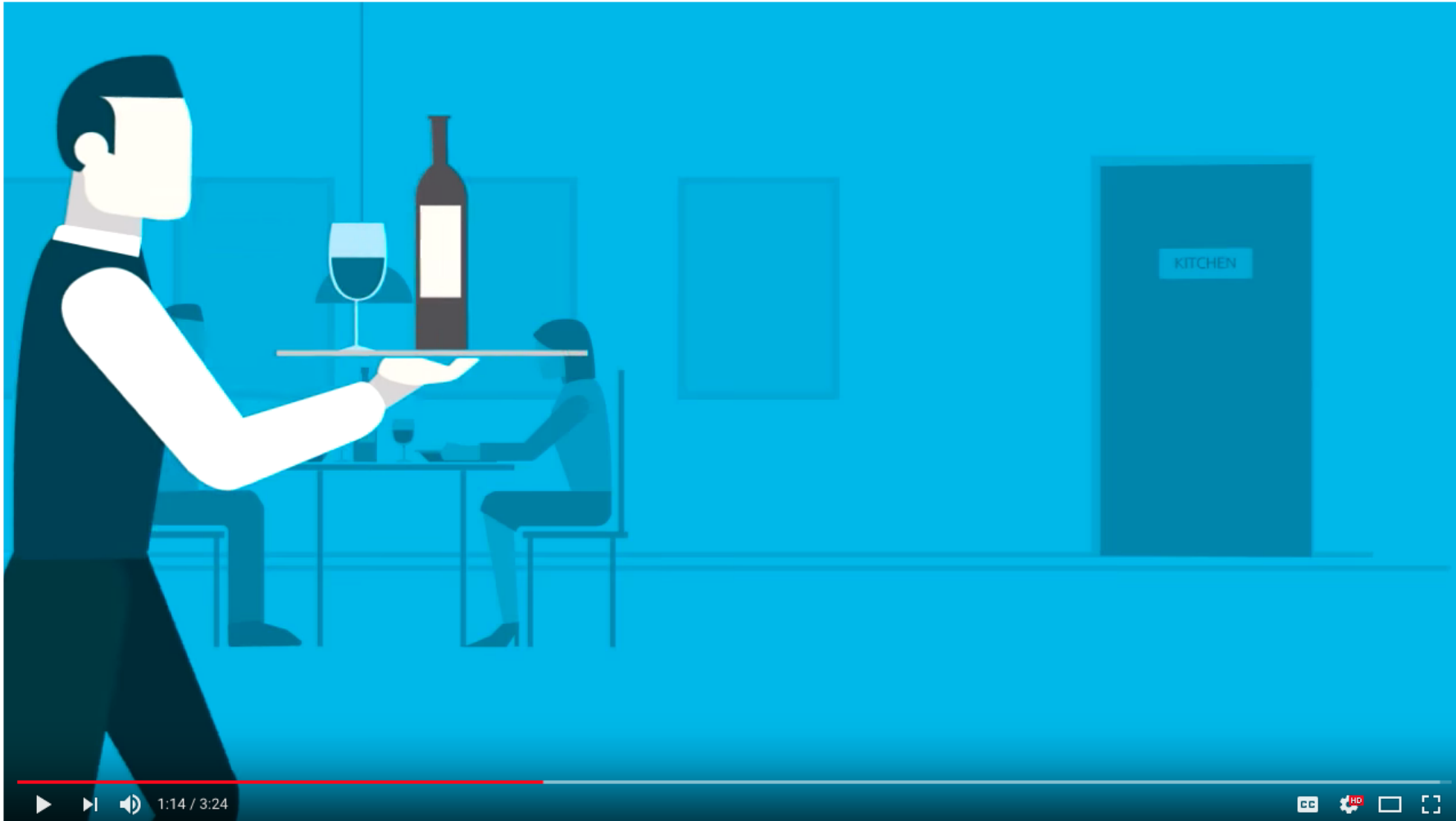Product Analyst

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Agenda

1. What is an API?
2. OCLC API Inventory
3. Solving Problems with OCLC APIs
4. Understanding HTTP
5. API Authentication
6. Examples & Demos!

What is an API?

Level-set

- [MuleSoft video](#) (pre-viewed)

Waiter Analogy

- Takes your order
- Conveys it to the kitchen
- Returns with your food

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Waiter Analogy - APIs

- Takes your ~~order~~ request
- Conveys it to the ~~kitchen~~ external system
- Returns with your ~~food~~ response

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OCLC API Inventory

OCLC API Inventory

- OCLC Developer Network: the [full list](#)

- Categories:
  - Discovery
 - Library Management Systems
  - Metadata
  - Resource Sharing

Discovery

- WorldCat Search API
    - Developer-level access to WorldCat
   - Library Locations data

Library Management Systems

- WorldShare Management Services APIs
  - Acquisitions
  - Availability
  - Circulation
  - Collection Management
  - License Management
  - NCIP
  - Vendor Information
- WorldShare Identity Management API (new!)
  - User profile data – WMS, Tipasa
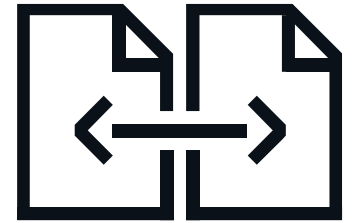
WorldShare®

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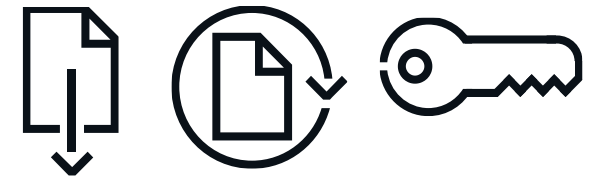
Metadata

- WorldCat Metadata API
    - Read / write access to WorldCat
    - Add / update bibliographic records
    - Maintain holdings information
    - Work with local bibliographic data
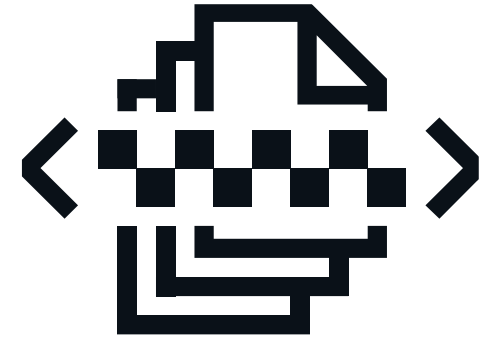
Resource Sharing

- Article Exchange API
  - Upload / download files for document sharing
- Tipasa API (upcoming!)
  - Create / update ILL requests
  - Manage request queues

Solving Problems with OCLC APIs
1. Acquisitions

Campus Payment Systems

Problem

Time-consuming workflows for paying invoices

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Campus Payment Systems

Problem

Time-consuming workflows for paying invoices

Solution

Use **WMS Acquisitions API** with custom scripts to

- pull list of invoices to be paid

- pay them in campus system

- mark as paid in WMS

Solving Problems with OCLC APIs
2. Cataloging & Metadata

Institutional Repository Materials

Problem

Time-consuming workflows for ~~paying invoices~~

↰ contributing digital collections metadata to WorldCat

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Institutional Repository Materials Dartmouth College

Problem

Time-consuming workflows for contributing digital collections metadata to WC

Solution

Use **WorldCat Metadata API** to load and sync data from institution repository

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Holdings Maintenance

Problem

Removing holdings in WorldCat for the massive number of titles in NYU's collection that were destroyed in Hurricane Sandy

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Holdings Maintenance

Problem

Removing holdings in WorldCat for the massive number of titles in NYU's collection that were destroyed in Hurricane Sandy

Solution

Use **WorldCat Metadata API** to unset holdings and LHR data from a list of OCLC control numbers (OCNs).

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Solving Problems with OCLC APIs

3. Collections

Problem

Changing location information for a large number of items in the collection

Holding & Item Management

Problem

Changing location information for a large number of items in the collection

Solution

Use **WMS Collection Management API** to bulk update shelf location information

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Label Creation

Problem

Printing customized spine labels for acquisitions / materials

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Label Creation

Problem

Printing customized spine labels for acquisitions / materials

Solution

Use **WMS Collection Management API** to look up item by barcode and retrieve information to create custom labels

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Mobile Pull Lists

Problem

Need a way to get a real-time list of materials to be retrieved from offsite storage on a mobile device

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Mobile Pull Lists

Problem

Need a way to get a real-time list of materials to be retrieved from offsite storage on a mobile device

Solution

OCLC's Digby app uses **WMS Circulation API** to get a list of items to be pulled and mark each item as "pulled"

Solving Problems with OCLC APIs

4. User-focused Services

Library Info in the Student Portal

Problem

Library account information not present in key campus UI for students

Library Info in the Student Portal

Problem

Library account information not present in key campus UI for students

Solution

Use **WMS NCIP API – Patron Profile** to retrieve loans, holds, bills for a student

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Solving Problems with OCLC APIs

5. Patron Data **(new!)**

Self-Service Account Creation

Problem

Need to allow patrons to create library accounts for themselves

Self-Service Account Creation

Problem

Need to allow patrons to create library accounts for themselves

Solution

Use **WorldShare Identity Management API** to allow patrons to enter basic data and get an account

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Sync Patron Data Between Systems

Problem

Need to update patron data in WMS or Tipasa based on changes made to campus system

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Sync Patron Data Between Systems

Problem

Need to update patron data in WMS or Tipasa based on changes made to campus system

Solution

Use **WorldShare Identity Management API** to update specific patron records with changed data

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Understanding HTTP

HTTP Basics

- Dialog between client and server
- Client sends **request**
- Server sends **response**
- Browser uses HTTP to load web pages
  - Try it out: browser Developer Tools > Network

VIAF
Virtual International Authority File

Search

Select Field: Select Index: Search Terms:
All Headings All VIAF Coombs, Karen A., 1976 Search

OPEN SOURCE WEB APPLICATIONS for Libraries

Coombs, Karen A.
Coombs, Karen A., 1976-
VIAF ID: 75785466 (Personal)
Permalink: http://viaf.org/viaf/75785466
ISNI: 0000 0000 3699 6955

| | Inspector | Console | Debugger | Style Editor | Performance | Memory | Network |

🗑 All | HTML CSS JS XHR Fonts Images Media Flash WS Other   13 requests, 870.05 KB, 1.42 s   Filter URLs

Status	Method	File	Domain	Cause	Type	Transfer...	Size	0 ms	640 ms	1.28 s
⚠ 303	GET	75785466	viaf.org	document	html	53.77 KB	0 B	→ 133 ms		
200	GET	/viaf/75785466/	viaf.org	document	html	cached	53.68 KB			
200	GET	raphael.js	viaf.org	script	js	cached	289.17 KB			
200	GET	jquery.min.js	viaf.org	script	js	cached	82.30 KB			
200	GET	viaf.js	viaf.org	script	js	cached	13.65 KB			
200	GET	viaf.css	viaf.org	stylesheet	css	cached	26.55 KB			
200	GET	jquery-ui.css	viaf.org	stylesheet	css	cached	31.65 KB			
200	GET	jquery-ui.min.js	viaf.org	script	js	cached	223.12 KB			
200	GET	jquery.columnizer.js	viaf.org	script	js	cached	20.78 KB			
200	GET	jquery.dataTables.min.js	viaf.org	script	js	cached	74.14 KB			
200	GET	jquery.dataTables.min.css	viaf.org	stylesheet	css	cached	12.89 KB			
200	GET	ga.js	www.google-analytics.com	script	js	cached	42.07 KB			
200	GET	__utm.gif?utmwv=5.6.7&utms=9&utmn=1997343215&utmhn=viaf.org&ut...	www.google-analytics.com	img	gif	35 B	35 B	→ 82 ms		

Headers | Cookies | Params | Response | Timings | Preview

Request URL: http://viaf.org/viaf/75785466/
Request method: GET
Status code: ● 200 OK   Edit and Resend Raw headers
Version: HTTP/1.1

Filter headers

▼ Response headers (0 KB)
Access-Control-Allow-Methods: "GET"
Access-Control-Allow-Origin: "*"
Cache-Control: "max-age=604800"
Content-Location: "viaf.html"
Content-Type: "text/html"
Date: "Fri, 24 Feb 2017 20:45:51 GMT"
Expires: "Fri, 03 Mar 2017 20:45:52 GMT"
Server: "Apache-Coyote/1.1"

▼ Request headers (0 KB)
Host: "viaf.org"
User-Agent: "Mozilla/5.0 (Macintosh; Intel Mac OS X 10.12; rv:51.0) Gecko/20100101 Firefox/51.0"
Accept: "text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8"
Accept-Language: "en-US,en;q=0.5"
Accept-Encoding: "gzip, deflate"
Cookie: "__utma=103468551.1114275767.1486667289...1487968969; __utmc=103468551; __utmt=1"
Connection: "keep-alive"

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Anatomy of a Request

- URL
- Method
- Headers
- Body (optional)

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Request URLs

- Example from WMS Acquisitions API

https://institution.share.worldcat.org/acquisitions/invoice/search?q={query}

Request URLs

- Example from WMS Acquisitions API

https://institution.share.worldcat.org/acquisitions/invoice/search?q={query}

Protocol

Request URLs

- Example from WMS Acquisitions API

https://institution.share.worldcat.org/acquisitions/invoice/search?q={query}

Domain / Host

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Request URLs

- Example from WMS Acquisitions API

https://institution.share.worldcat.org/acquisitions/invoice/search?q={query}

Path

Request URLs

- Example from WMS Acquisitions API

https://institution.share.worldcat.org/acquisitions/invoice/search**?q={query}**

Parameter(s)
key/value pair

Method

- The HTTP "verb" that corresponds to the task you want to perform
  - GET – **read** a particular resource or collection of resources
  - POST – **create** a particular resource
  - PUT – **update** a particular resource
  - DELETE – **remove** a particular resource

Request Headers

- Additional information used by the web service to perform the task
  - Accept – requested media type for response
  - Authorization – authentication credentials
  - Content-Type – media type of data sent (in request body)

Headers	Cookies	Params	Response	Timings	Preview

Request URL: `http://viaf.org/viaf/75785466/`
Request method: GET

Edit and Resend   Raw headers

Status code: ○ 200 OK
Version: HTTP/1.1

▽ Filter headers

▶ Response headers (0 KB)

▽ Request headers (0 KB)

Host: "viaf.org"

User-Agent: "Mozilla/5.0 (Macintosh; Intel Mac OS X 10.12; rv:51.0) Gecko/20100101 Firefox/51.0"

Accept: "text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8"

Accept-Language: "en-US,en;q=0.5"

Accept-Encoding: "gzip, deflate"

Cookie: "__utma=103468551.1114275767.1486667289.1486667289...8551.8.10.1487968969; __utmc=103468551; __utmt=1"

Connection: "keep-alive"

Upgrade-Insecure-Requests: "1"

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Request Body

- Optional
- Structured data to add to or update in the system
- "Form field data"
  - Key / value pairs, or parameters
- Specify media type in Content-Type header
  - XML (eXtensible Markup Language)
  - JSON (JavaScript Object Notation)

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Anatomy of a Response

- Status
- Headers
- Body

Status

- 2xx – Success
  - 200: OK
- 3xx – Redirect
  - 301: Moved Permanently
- 4xx – Client error
  - You did something wrong in your code
  - 403: Forbidden
- 5xx – Server error
  - Something is wrong with the API
  - 500: Internal Server Error

Response Headers

- Etag
- Content-Location
- Location
- Date
- Expires
- Content-Type

Request URL: http://viaf.org/viaf/75785466/
Request method: GET
Status code: ◯ 200 OK
Version: HTTP/1.1

Edit and Resend   Raw headers

⛛ Filter headers

▼ Response headers (0 KB)

Access-Control-Allow-Methods: "GET"

Access-Control-Allow-Origin: "*"

Cache-Control: "max-age=604800"

Content-Location: "viaf.html"

Content-Type: "text/html"

Date: "Fri, 24 Feb 2017 20:45:51 GMT"

Expires: "Fri, 03 Mar 2017 20:45:52 GMT"

Server: "Apache-Coyote/1.1"

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Response Body

- Structured data
- Web pages – HTML
- APIs – XML or JSON
  - Flexible data exchange formats
  - Lightweight, easy to parse
  - Allow communication between disparate systems

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```html
1
2  <!DOCTYPE html
3      PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd
4  <html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
5      <head>
6          <meta content="IE=edge" http-equiv="X-UA-Compatible"/>
7          <meta content="text/html; charset=UTF-8" http-equiv="Content-Type"/>
8          <meta name="viewport" content="width=device-width, initial-scale=1"/>
9          <meta name="referrer" content="origin"/>
10         <script type="text/javascript" src="/viaf/scripts/raphael.js">//</script>
11         <script type="text/javascript" src="/viaf/webjars/jquery/2.1.1/jquery.min.js">//</script
12         <script type="text/javascript" src="/viaf/scripts/viaf.js">//</script>
13         <link type="text/css" rel="stylesheet" href="/viaf/css/viaf.css"/>
14         <link href="/viaf/webjars/jquery-ui/1.10.4/themes/base/jquery-ui.css"
15               rel="stylesheet"
16               type="text/css"/>
17         <script type="text/javascript"
18                 src="/viaf/webjars/jquery-ui/1.10.4/ui/minified/jquery-ui.min.js">//</script>
19         <script type="text/javascript" src="/viaf/scripts/jquery.columnizer.js">//</script>
20         <script type="text/javascript" src="/viaf/scripts/jquery.dataTables.min.js">//</script>
21         <link rel="shortcut icon" href="/viaf/images/viaf.ico"/>
22         <link rel="search" title="VIAF Search" type="application/opensearchdescription+xml"
23               href="http://viaf.org/allFieldsSearch.xml"/>
```

```xml
<schema:name>INV-2012-3</schema:name>
<schema:dateCreated>2012-06-29T12:57:40.000-04:00</schema:dateCreated>
<schema:dateModified>2012-07-02T14:51:50.000-04:00</schema:dateModified>
<acq:id>
  https://acq.sd00.worldcat.org/acquisitions/invoice/data/INV-2012-3
</acq:id>
<acq:taxCalculationMethod>
  <acq:TaxCalculationMethod>EXCLUDE_ADDITIONAL_COSTS</acq:TaxCalculationMethod>
</acq:taxCalculationMethod>
<acq:itemCount>3</acq:itemCount>
<acq:grandTotal>
  <schema:PriceSpecification>
    <schema:price>49.07</schema:price>
    <schema:priceCurrency>USD</schema:priceCurrency>
  </schema:PriceSpecification>
</acq:grandTotal>
<acq:totalDiscount>
  <schema:PriceSpecification>
    <schema:price>0.00</schema:price>
    <schema:priceCurrency>USD</schema:priceCurrency>
  </schema:PriceSpecification>
</acq:totalDiscount>
```

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```json
{
  "myBlog": {
    "pageViews": "4720",
    "subscribers": "1711",
    "numberOfPosts": "37",
    "mostRecentPost": "2013-01-04",
  }
}
```

API Authentication

Web Service Keys (WSKeys)

- Application-level authentication and authorization
- Issued to a specific institution
- Limit access by:
  - Institution data
  - Service
- 80-character string, looks like:
  - b6zdaUhizJHpkZ35YvFQlW30ZSDZ7csXkGa6U3kZM4q8tl0OGVQo82sAL6KWaA7TLVSvbrTiHJEp8754
- Each WSKey has an associated Secret
  - WSKey : Secret :: username : password

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User Level Authentication

- Authenticate and authorize the specific user performing the API request
  - Library staff member paying an invoice via the WMS Acquisitions API
  - Library patron requesting "my account" information via the WMS NCIP API
- Increased security for write operations
- Requires principalID & principalIDNS

Authentication Methods

- Several ways to send your WSKey and user credentials to OCLC APIs for authentication
- [WSKey Lite](#)
  - WSKey in a URL parameter
  - http://www.worldcat.org/webservices/catalog/search/opensearch?q=civil%20war&wskey=jdfRzYZb...
- [Access Tokens](#) & [HMAC Signature](#)
  - Signed values supplied in the Authorization HTTP request header
  - Access Token example:
  - Authorization: Bearer tk_Yebz4BpEp9dAsghA7KpWx6dYD1OZKWBlHjqW

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Authentication Code Libraries

- [OCLC Developer Network GitHub](#)
- Code that makes OCLC API authentication easier!
- Available in:
    - [NodeJS](#)
    - [PHP](#)
    - [Python](#)
    - [Ruby](#)

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Examples & Demos!

Examples & Demos!

- HTTP basics
  - [Examples](#) for use with the [OCLC API Explorer](#)
- Basic web app that calls the **WorldCat Metadata API**
  - [Tutorial](#) on the [OCLC Developer Network GitHub](#)

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Slack Channel

Keep the conversation going!
oclcdevnet.slack.com
#oclcapis101

Get your all-access pass to the new WorldShare Identity Management API

Getting practical techniques for processing MARC (and MARC-adjacent) record data for updates into OCLC

Using Wikibase as a platform for library linked data management and discovery

Incorporating IIIF content in your website

A beginner's guide to Cordova

Register at oc.lc/devconnect-workshops

thank you

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