Unlocking Your Library with the Alma Open Platform

IGELU 2017 | St. Petersburg, Russia

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Agenda

• State of the Alma Open Platform
• Open Platform Highlights
• Wrap Up
State of the Alma Open Platform
Alma Open Platform

Integrations
• Widely adopted standards
• Configure integrations with other systems

REST APIs
• Sound REST practices
• Data
• Workflows

Community
• Blog
• Forum
The ABCs of Integrations

- CAS
- CMS
- EDI
- ERP
- LDAP
- JSON-LD
- NCIP
- OAI-PMH
- OAuth
- RDA/RDF
- RFID
- SAML2
- SIP2
- SIS
- SRU
- SWORD
- z39.50
Growth of REST APIs
Growth of REST API Usage
Growth of REST API Usage

• We’ve seen the slides- 2.3M+ REST API calls per day; more REST API calls than screen views in Alma, etc.

• Testament to the creativity and productivity of the Alma developer community

So congratulations to YOU!
Multi-Lingual Support for REST APIs

• New query-string parameter supported- `lang`

• Descriptions, error messages, etc. will be returned in specified language

• Applies to (almost) all fields which contain `desc` (XML) or `value/desc` (JSON) attributes

https://developers.exlibrisgroup.com/blog/Alma-APIs-Multilingual-Support
Multi-Lingual Support for REST APIs

GET /almaws/v1/bibs/9.../items/23212...1?lang=de

```json
"holding_data": {
  "holding_id": "2221229930000561",
  "call_number_type": {
    "value": "0",
    "desc": "Library of Congress - Klassifikation"
  },
  "call_number": "ISSN RECORD",
  "accession_number": "",
  "copy_id": "",
  "in_temp_location": false,
  "temp_library": {
    "value": "MAIN",
    "desc": "Hauptbibliothek"
  }
},
```
Active Community

- Highest frequency of blog posts - at least weekly
- ~ 50% contribution from the community

Active Blog

Active Forum

- 275+ forum discussions
- 900+ messages
DEMO

Developer Network
OPEN PLATFORM HIGHLIGHTS

1. **Tableau Web Data Connector**
   - Access library data in Tableau visualizations
   - Open source and open to everyone

2. **Digital Delivery and Deposit**
   - Alma’s DAM functionality continues to advance with new delivery and deposit features

3. **Webhooks**
   - Alma initiates calls when events happen
   - Sends payload to customer-hosted REST endpoint

4. **Login via Email**
   - Allows students to log in with a “magic link”, and without a password
   - Reduces password fatigue

5. **Process Orchestration**
   - APIs to manage processes and sets
   - Script maintenance jobs and chain activities together
Tableau Web Data Connector
Tableau Web Data Connector

• Tableau provides a way to visualize data from various sources
  • Many customers are already using Tableau
• Can aggregate and display data from various sources
  • How can we include library data as well?
• Tableau’s “Web Data Connector” technology can be used to import data from APIs

Announcing an Ex Libris web data connector for use by all Ex Libris customers! The connector is open source and available for everyone.
Tableau WDC: Open Source on GitHub

Ex Libris Tableau Web Data Connector

This project provides a way to access data from Ex Libris Analytics (Alma or Primo) with Tableau Desktop. To access your Ex Libris data in Tableau, you define a report in Analytics with the desired data. Then add a data source of web data connector to your Tableau workbook for each analytics report you’re interested in. Step by step instructions are available at this blog post.

For more information on Web Data Connectors, see the Tableau Online Help.
Tableau WDC: Configure Connection

Alma Tableau Web Data Connector

API Key: e.g. 17xx04fbc edfids88239xxd4323bxxxxx1

- Remember key

Report Path: e.g. /shared/Alma/Fulfillment/Reports/Count of Items Loaned by Patron Group

The path of the Analytics report. See this blog post for more information on how to retrieve the path.

Region: NA

Max number of rows: 600

Get data
Tableau WDC: Retrieve Schema
### Tableau WDC: Retrieve Data

**ExLibris**

**Count of Items Loaned by Patron**

<table>
<thead>
<tr>
<th>#</th>
<th>Library Name</th>
<th>Loan Year</th>
<th>Patrons Loaned</th>
<th>Loans</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Law Library</td>
<td>2016</td>
<td>Carrel</td>
<td>2.00</td>
</tr>
<tr>
<td>0</td>
<td>Main Library</td>
<td>2015</td>
<td>Carrel</td>
<td>4.00</td>
</tr>
<tr>
<td>0</td>
<td>Main Library</td>
<td>2016</td>
<td>Carrel</td>
<td>8.00</td>
</tr>
<tr>
<td>0</td>
<td>Graduate Library</td>
<td>2015</td>
<td>Community Borrower</td>
<td>2.00</td>
</tr>
<tr>
<td>0</td>
<td>Graduate Library</td>
<td>2016</td>
<td>Community Borrower</td>
<td>2.00</td>
</tr>
<tr>
<td>0</td>
<td>Main Library</td>
<td>2001</td>
<td>Community Borrower</td>
<td>4.00</td>
</tr>
<tr>
<td>0</td>
<td>Main Library</td>
<td>2013</td>
<td>Community Borrower</td>
<td>2.00</td>
</tr>
<tr>
<td>0</td>
<td>Main Library</td>
<td>2015</td>
<td>Community Borrower</td>
<td>10.00</td>
</tr>
</tbody>
</table>
Tableau WDC Resources

• Blog post

• “How to use” presentation

• Github Project
Digital Delivery and Deposit
Digital Delivery and Deposit

• SWORD Digital Deposit Protocol
  • Deposit digital materials into Alma programmatically using Alma’s support for the SWORD protocol

• Advanced Delivery Features
  • IIIF Support
  • Custom Viewers Support
SWORD (Simple Web-service Offering Repository Deposit) is an interoperability standard that allows digital repositories to accept the deposit of content from multiple sources in different formats (such as XML documents) via a standardized protocol.

Wikipedia
SWORD Support in Alma

• Alma SWORD support enables an institution to create a custom deposit interface

• The workflow can be as basic or involved as desired
  • From only submitting a deposit to a full approval workflow including return edit

• Standard SWORD client toolkits can be used, such as:
  • Java: https://github.com/swordapp/JavaClient2.0
  • Ruby: https://github.com/swordapp/sword2ruby
  • Python: https://github.com/swordapp/python-client-sword2
  • PHP: https://github.com/swordapp/swordappv2-php-library/
## SWORD Support in Alma

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET /sd</td>
<td>Get Service Document</td>
</tr>
<tr>
<td>GET /edit/&lt;deposit-id&gt;</td>
<td>Get Deposit details</td>
</tr>
<tr>
<td>PUT /edit/&lt;deposit-id&gt;</td>
<td>Replace metadata</td>
</tr>
<tr>
<td>POST /collection/&lt;deposit_profile_id&gt;</td>
<td>Create resource</td>
</tr>
<tr>
<td>POST /edit-media/&lt;deposit_id&gt;</td>
<td>Add content</td>
</tr>
<tr>
<td>DELETE /edit-media/&lt;deposit_id&gt;/&lt;filename&gt;</td>
<td>Delete content</td>
</tr>
<tr>
<td>DELETE /edit/&lt;deposit-id&gt;</td>
<td>Withdraw deposit</td>
</tr>
<tr>
<td>PUT /edit/&lt;deposit-id&gt; &quot;In-Progress: false&quot;</td>
<td>Submit in progress deposit</td>
</tr>
</tbody>
</table>
“Email a file to Alma.... And other feats of wonder with the SWORD protocol”

Developers Day
Thursday 14 Sep.
11:00
SWORD Resources

- Developer Network Documentation
- SWORD blogs
Advanced Delivery Features - IIIF

• International Image Interoperability Framework
  • Series of APIs intended to allow easy integration among digital repositories

• Alma will support the IIIF presentation API (manifest) and bundle the Universal Viewer

• Support for TIFF files

• Interoperate with other repositories

New Feature
August 2017
IIIF Support – Presentation Manifest

```json
{
   "@context": "http://iiif.io/api/presentation/2/context.json",
   "@id": "https://na01.alma.exlibrisgroup.com/view/delivery/TR_INTEGRATION_INST/1288029980000561",
   "@type": "sc:Manifest",
   "metadata": [
      {
        "label": "Title",
        "value": "NASA Space Images"
      },
      {
        "label": "Author",
        "value": "NASA"
      }
   ],
   "label": "NASA Space Images",
   "description": "",
   "viewingDirection": "left-to-right",
   "viewingHint": "individuals",
   "sequences": [
      {
        "@type": "sc:Sequence",
        "canvases": [
          {
            "@id": "1388029970000561",
            "@type": "sc:Canvas",
            "label": "Galaxy Abell 1689's "Gravitational Lens" Magnifies Light of Distant Galaxies",
            "width": 3853
          }
        ]
      }
   ]
}
```

https://na01.alma.exlibrisgroup.com/view/iiif/presentation/TR_INTEGRATION_INST/1288029980000561/manifest
IIIF Support – Universal Viewer
Advanced Delivery Features - Custom Viewers

• Integrate custom viewers with Alma
  • Allows flexibility for special content types, e.g. book viewer, photo album

• Define Viewers in Alma
  • URL with placeholder for representation ID
  • Rules for when the viewer appears in fulfillment

• Implement delivery service in viewer
  • Supports access rights
Viewers and Rules

IA Book Reader

Service Code: BookReader
Service Description: IA Book Reader

Service Details

Active: Active
Service Code: BookReader
Service Name: IA Book Reader
Service Description: IA Book Reader
Example: Internet Archive Book Reader

But the mice still had something more spectacular in mind, something they did every year in a large ball room underground. They got together from all different parts of the woodland, and celebrated into the night. The beautiful dresses and toadstools made a wonderful sight, and, I'll say so myself, lady mice look so much more beautiful in dresses than humans could ever do.

Tyler arrived at the door with his wife Muffy, just in time for the large banquet to begin. The door mice called Dobby, whose job that night was simple to stand at the door and welcome each mouse who arrived, gave them a little heap of warm and sweet honey, then he smiled and wished them a good evening.

They made their way down the long staircase and entered the hall, and soon began to sink into all the delightful fruits and nuts that lay spread over the long narrow table, as did all the other joyfully friendly mice.

The orchestra mice played happily on their tiny violins, which they had had restored by Susie spider earlier that morning. As the six mice mice voice their songs a perfect harmony, the sound they all created together was just perfect. Soon it was midnight at the ball and the mice all jumped around and celebrated cheerfully. Shortly after they all headed their separate ways home. Of course, Muffy and Tyler came to my cottage to tell us everything before they went home, and I Tyler learned to do was delicious bomb the Rice and Tyler was on jam.

"No jam, Miss Gracie... not one single spoonful of strawberry jam is left... not one!" He was not impressed. You see, like Freddy, Tyler had a terrible sweet tooth and loved the sticky and sweet taste of jam very much. Unfortunately out of all the wonderful food Freddy's butter made, he never once made strawberry jam and so Tyler never hardly got to taste any.

He did, however, know where he could find some, just outside the wood, in a small farmouse lived a farmer called Fradie. We had each other and lived alone, and made jam - not just any old jam, but strawberry, Tyler's favourite.

"MMMM... fresh strawberry jam!" Tyler said as he woke the next morning, he licked his tiny lips and thought of it. He then threw of his handchief, climbed out of his comfortable straw bed, opened his wardrobe and quickly threw a blue button up jumper and a red scarf dressing himself. He is a hurry, he then raced through the long narrow corridors towards the living room, as the excitement built up inside him.
DEMO

IIIF Universal Viewer

Custom Viewer
Delivery Resources

- Developer Network Documentation
- Blog: Use an External Viewer with the Digital Delivery Service
- August 2017 Release Notes
Webhooks
Alma Webhook

• Different paradigm for communicating with Alma - alternative to “polling” - push rather than pull

• When events happen in the system, Alma calls out to a customer’s REST endpoint with a defined payload

• Asynchronous architecture

• Reduce API calls

Source: http://www.webhooks.org
Alma Webhook Support

- Job End
- Notifications
- User update – **NEW** in June 2017
- Webhook Log – **NEW** in Sept 2017
- Others coming soon – Events, BIB Updates

[https://developers.exlibrisgroup.com/blog/tag/Webhooks](https://developers.exlibrisgroup.com/blog/tag/Webhooks)
## Webhook Log

### Webhooks Logs List

<table>
<thead>
<tr>
<th>Profile Code</th>
<th>Create Date</th>
<th>Action Time</th>
<th>Action Type</th>
<th>Attempt</th>
<th>Request Body</th>
<th>Request Headers</th>
<th>Response Body</th>
<th>Response Status</th>
<th>Response Time</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notifications-WH</td>
<td>12/05/2017 06:07:33 CDT</td>
<td>12/05/2017 04:06:56 CDT</td>
<td>JOB_END</td>
<td>3</td>
<td>'{&quot;id&quot;:28712...'</td>
<td>-</td>
<td>-</td>
<td>500</td>
<td>7870</td>
<td>http://alma_/notifications</td>
</tr>
<tr>
<td>Notifications-WH</td>
<td>12/05/2017 05:07:22 CDT</td>
<td>12/05/2017 04:06:56 CDT</td>
<td>JOB_END</td>
<td>2</td>
<td>'{&quot;id&quot;:28712...'</td>
<td>-</td>
<td>-</td>
<td>500</td>
<td>9223</td>
<td>http://alma_/notifications</td>
</tr>
<tr>
<td>Notifications-WH</td>
<td>12/05/2017 04:07:10 CDT</td>
<td>12/05/2017 04:06:56 CDT</td>
<td>JOB_END</td>
<td>1</td>
<td>'{&quot;id&quot;:28712...'</td>
<td>-</td>
<td>-</td>
<td>500</td>
<td>8136</td>
<td>http://alma_/notifications</td>
</tr>
<tr>
<td>Notifications-WH</td>
<td>11/05/2017 06:16:20 CDT</td>
<td>11/05/2017 04:15:55 CDT</td>
<td>JOB_END</td>
<td>3</td>
<td>'{&quot;id&quot;:28711...'</td>
<td>-</td>
<td>-</td>
<td>500</td>
<td>8006</td>
<td>http://alma_/notifications</td>
</tr>
<tr>
<td>Notifications-WH</td>
<td>11/05/2017 05:16:10 CDT</td>
<td>11/05/2017 04:15:55 CDT</td>
<td>JOB_END</td>
<td>2</td>
<td>'{&quot;id&quot;:28711...'</td>
<td>-</td>
<td>-</td>
<td>500</td>
<td>8067</td>
<td>http://alma_/notifications</td>
</tr>
</tbody>
</table>
Implementing a Webhook Listener

• **Challenge- GET**
  - Called when webhook listener is registered in Alma

• **Webhook hander- POST**
  - Called each time a particular event happens
  - Provides general information along with an event-specific payload
  - Includes a signature header to ensure the request came from Alma
DEMO

Webhook listener
Webhooks Resources

• **Developer Network Documentation**

• **Webhooks blogs**
Login via Email
Login via Email

- Users are registered in Alma with an email address by the circulation desk (or by the RESTF APIs)
- When users wish to login to Primo, they select the “login via email” option and provide their registered email address
Login via Email

- An email with a “magic link” is sent to the user. The user can click the link within 30 minutes and is automatically logged in to Primo. No password required.
- The link is cryptographically signed to prevent spoofing.
Login with Email
Process Orchestration
Process Orchestration Explained

**Orchestration** is the automated arrangement, coordination, and management of computer systems, **middleware and services**.


- Alma performs bulk work on sets of various types (bibliographic records, users, items, etc.)

- The work to be performed is defined in jobs of many types (bibliographic record export, remote storage, metadata import, etc.)

- Alma facilitates orchestration workflows with APIs to manage jobs and sets
Key APIs

• Jobs
  • GET jobs, job details
  • POST to run a job (scheduled or manual)

• Job instances
  • GET job instance details (status, outcomes, etc.)

• Sets
  • GET sets, set details
  • Create/delete itemized or logical set
  • Add/remove members from sets
Create a Set

Resource URL

URL Parameters

Query string Parameters

Body Parameters

Output

Possible Error Codes

Web service for creating a set.

You can use this API to create 2 types of sets:

1. Itemized set
2. Logical set

Creating logical sets is supported for inventory related entities (not supported for PO-Lines, Users etc).

It is possible to create an itemized set and populate it from a logical set by setting the logical set id in the from_logical_set parameter.

It is also possible to create an itemized set which is based on MD import job by providing job instance id and population.

For more details about MD import itemized set: click here

Details regarding the syntax for creating Logical Sets can be found here

Logical Set Query Reference

Introduction

The Create a Set API can be used to create logical sets for Resource Management content types (Bibs, Items, Portfolios, Digital representations, etc.).

The exact syntax which is needed for creating a set using the API can be determined by first creating a set using the UI, running the 'Retrieve a Set' API to view the syntax, and then use the provided syntax as a template for creating other similar logical sets using the API. An example and detailed explanation can be found in this blog post.

Examples

A set of Physical Items can be created using criteria from the Bib record, the Holdings record and the Item record. This example shows a search for Items using fields from the related Bib record and the location (which is stored under the Holdings record):

```sql
ITEM WHERE BIB.MMS (title CONTAIN "history") and HOLDING (holding_library OUTER_EQUAL "ART")
```

The syntax begins with the type of set, in this case ITEM. Then it lists the limiting criteria - first the level, followed by triplets of field code, operator, and value.

The next example demonstrates a search for titles which contain either 'history' or 'writing' in the title:

```sql
BIB.MMS WHERE BIB.MMS (title CONTAIN "history" OR title CONTAIN "writing")
```

Here the two criteria triplets are separated by the Boolean operator 'OR'.

List of Fields and Operators

The below table provides a reference of all indexes for the relevant Resource Management entities in Alma, as configured for the Guest Sandbox. For each index, the level, field code, and supported operators are listed.

<table>
<thead>
<tr>
<th>Level</th>
<th>Field</th>
<th>Code</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIB.MMS</td>
<td>Content type code</td>
<td>content_type_code</td>
<td>NOT_EQUAL, OUTER_EQUAL, EMPTY</td>
</tr>
<tr>
<td>BIB.MMS</td>
<td>Collection fields</td>
<td>carrier_type_code</td>
<td>NOT_EQUAL, OUTER_EQUAL, EMPTY</td>
</tr>
<tr>
<td>BIB.MMS</td>
<td>Title</td>
<td>title</td>
<td>NOT_EQUAL, OUTER_EQUAL, EMPTY</td>
</tr>
<tr>
<td>BIB.MMS</td>
<td>Originating System</td>
<td>mms_originatingSystem</td>
<td>CONTAIN, EQUAL, EMPTY</td>
</tr>
<tr>
<td>BIB.MMS</td>
<td>dc_resource</td>
<td>dc_resource</td>
<td>NOT_EQUAL, OUTER_EQUAL, EMPTY</td>
</tr>
<tr>
<td>BIB.MMS</td>
<td>type</td>
<td>type</td>
<td>CONTAIN, EQUAL, OUTER_EQUAL</td>
</tr>
</tbody>
</table>
DEMO

Build a logical set

Run a manual job

https://gist.github.com/jweisman/5b0c5e7fb92416cfa25086ffc9a2c79e
Process Orchestration Resources

- **Jobs & Sets APIs** on the Developer Network
- Blog: [Process Orchestration with the Set and Job APIs](#)
- Blog: [Working with the Alma Jobs API](#)
- Other [blog posts](#) on Jobs
Wrap Up
Developer Network Tips & Tricks

• Blog RSS
• Google is your friend
• Configuring Apps- environment, APIs, and permissions
• The forum is the place to get help
Important Resources

• **Getting started**
• Demos/samples:
  • [General](#)
  • [C#](#)
  • [Java](#)
  • [Angular](#)
  • [Ruby](#)
• **API Thresholds**
• **Working with the APIs in a network**
Summary

• APIs and integration protocols allow you to extend Alma beyond its built-in features

• Documentation, samples, and standards allow your developers to focus on your specific requirements and not on “plumbing”

• You’re a critical part of the community- share your efforts on the Developer Network!
THANK YOU

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