



Playing well together: Trends in integrating with cloud SaaS applications

DEVELOPERS' DAY | ANZREG 2017 | MAY 2017
JOSH WEISMAN | VP DEVELOPMENT

As more of our business-critical software moves to the cloud, organizations have had to find new ways to provide services to users while data and workflows reside in cloud-based systems. We'll look at some trends and best practices for integrating with such systems, and how they apply to Ex Libris SaaS products.

KEY TRENDS IN INTEGRATING WITH CLOUD SAAS SYSTEMS

1

Cloud SaaS Systems

The move to the cloud is well reported

2

API All the Things

Transition from direct access to data and workflows to access via APIs

3

Adopt Standards

Standards allow turnkey interoperation between systems

4

Community, Community, Community

Living in the cloud together opens new opportunities for collaboration and sharing

5

Leverage the Public Cloud

Take advantage of low cost public cloud infrastructure to run local processes



Cloud SaaS Systems

Trends in SaaS Applications

- Mainstream adoption achieved
- Spreading to additional vertical markets
- Identified by Gartner as approaching the “plateau of productivity”

Gartner Hype Cycle for Cloud Computing, 2015

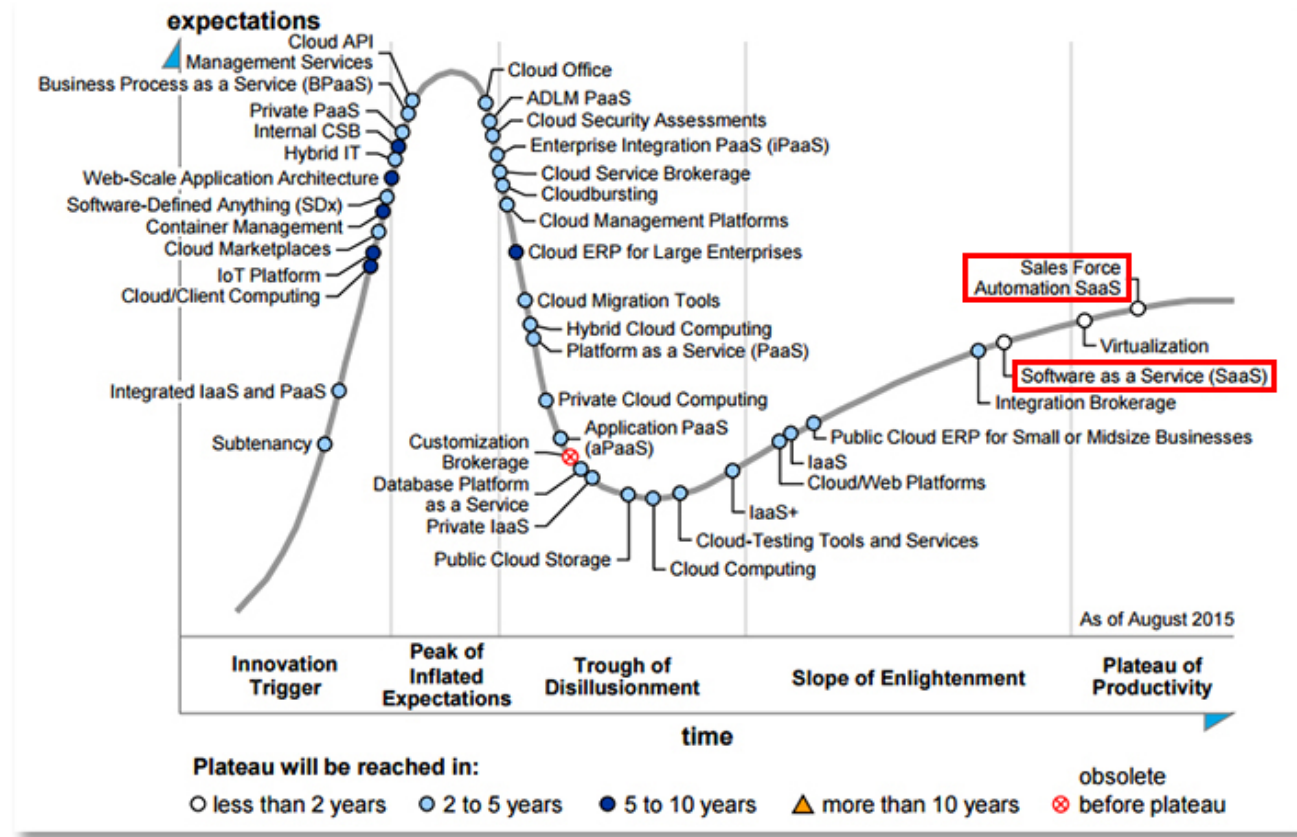
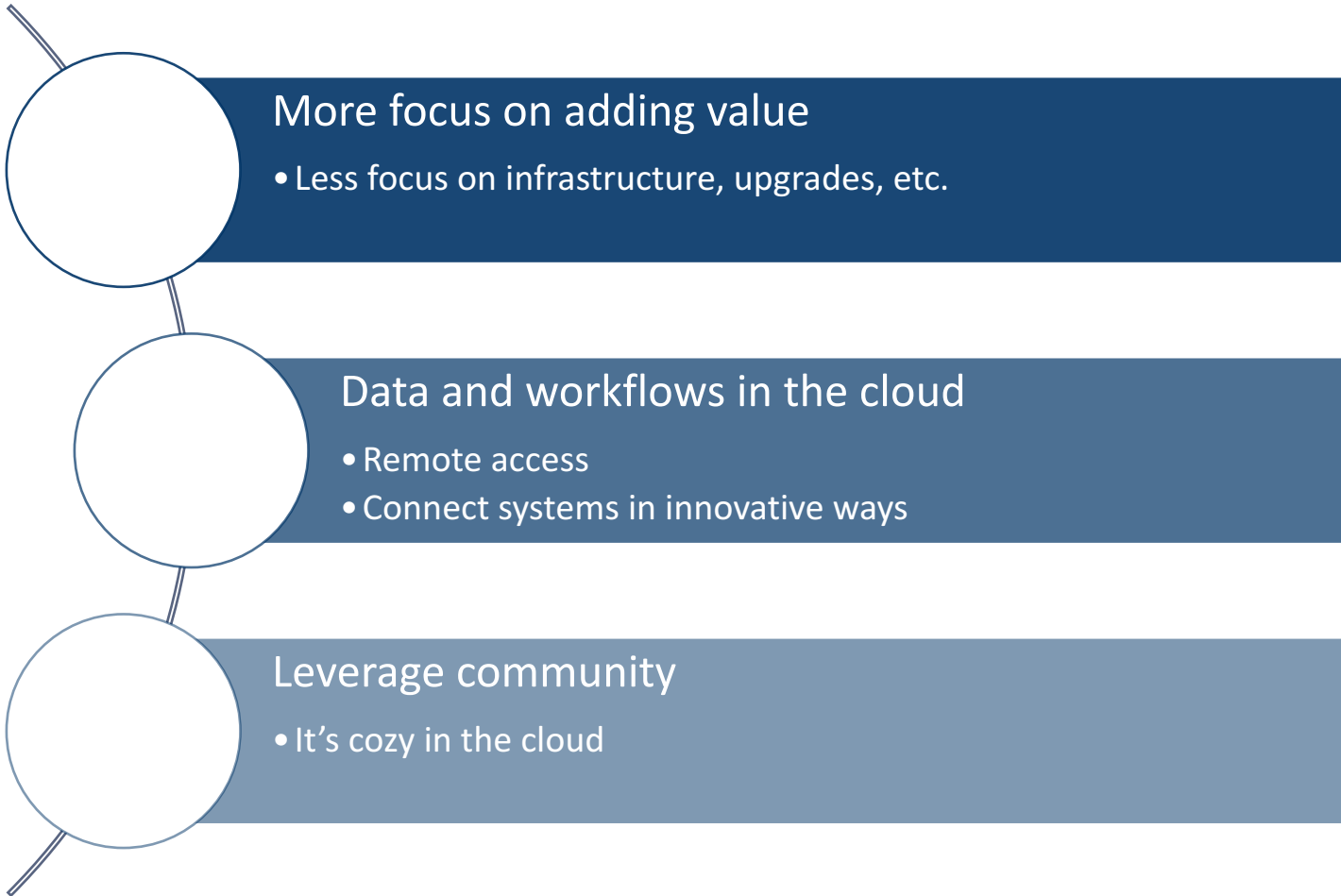


Image: Gartner

Source: <http://www.zdnet.com/article/saas-in-2016-the-key-trends/>

What does this mean to me?

What are the implications of this move?





API All the Things

When your application runs in the cloud, access to data and workflows via APIs is essential.

Ex Libris REST APIs standards are meant to provide a unified experience for developers.

Alma provides a rich set of APIs in major subject areas.

REST API Features

Modern REST Principles

- HTTP Verbs
- Status Codes

JSON/XML Support

- WADLs & XSDs
- Content-Type

Authentication & Authorization

- API Key
- Self-service via Dashboard
- Limit access by API Subject Area
- Specify read/write and environment access



Alma is the nerve center of your library.
Now leverage Alma data and workflows across the university.

APIs

Learn

In depth documentation of our APIs:

- [Getting Started](#)
- [Users](#)
- [BIBs](#)
- [Resource Sharing Partners](#)
- [Courses](#)
- [Acquisitions](#)
- [Configuration](#)
- [Analytics](#)
- [Tasks Lists](#)
- [Electronic](#)

Explore

Use our [API console](#) for a birds-eye view.

Get Help

Got questions? Get answers in our [forums](#).

Integrations



Alma is the backbone of your library, but it doesn't live in a vacuum. Alma has to integrate with your university financial software, identity management system, ERP, and more. Alma was built from the group up to play well with others. [Integrations overview...](#)

Quick links:

- [Overview](#)
- [Finance](#)
- [Digital](#)
- [SRU](#)
- [Authentication](#)
- [Publishing](#)
- [Self Check](#)
- [Z39.50](#)

Share

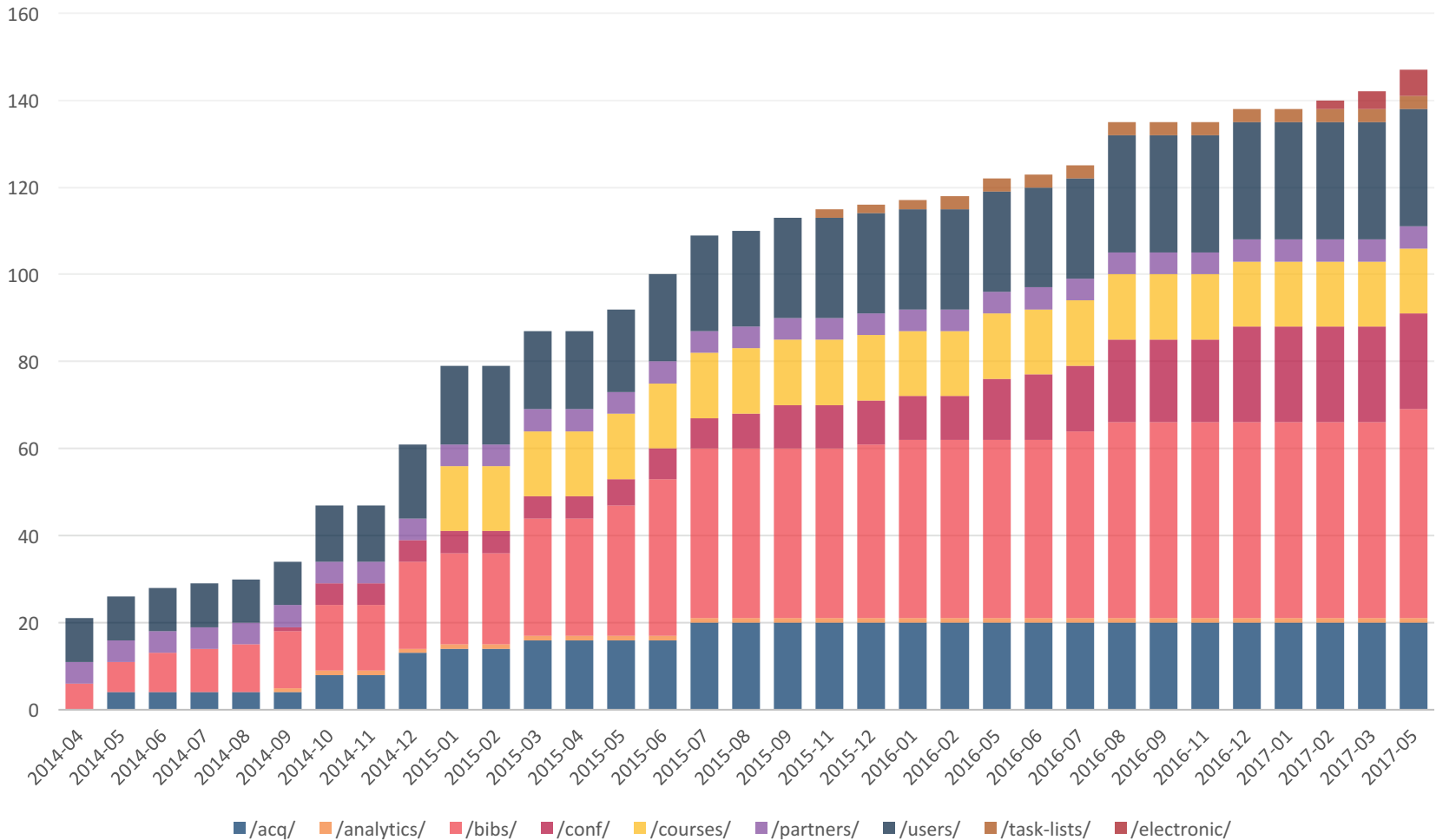
Share your experience and read other success stories at the [Alma Developers Blog](#)

Latest entries:

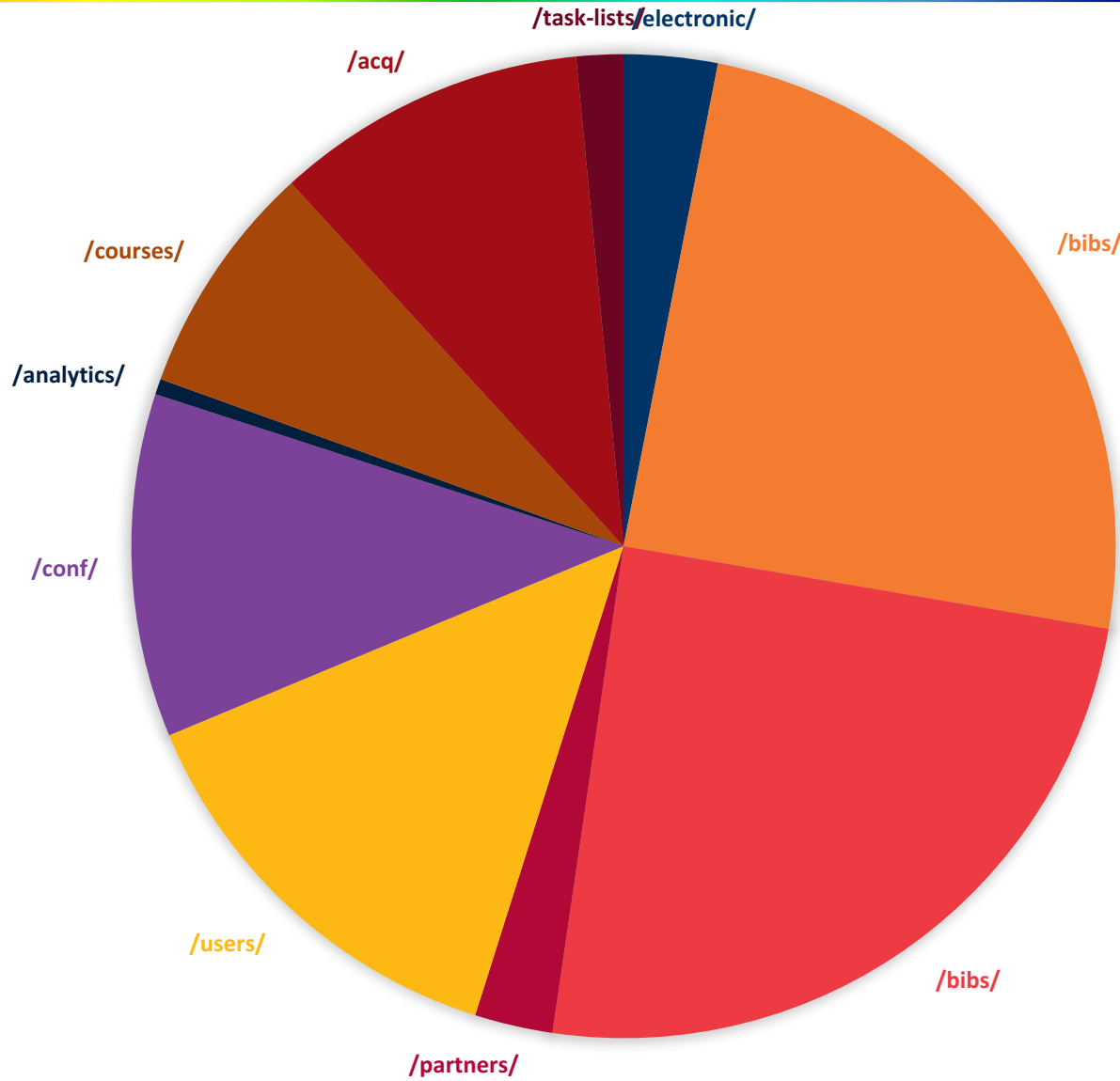
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[Real Time Notifications with Alma Webhooks](#)

Growing Number of REST APIs

ALMA API GROWTH



Alma APIs Subject Areas



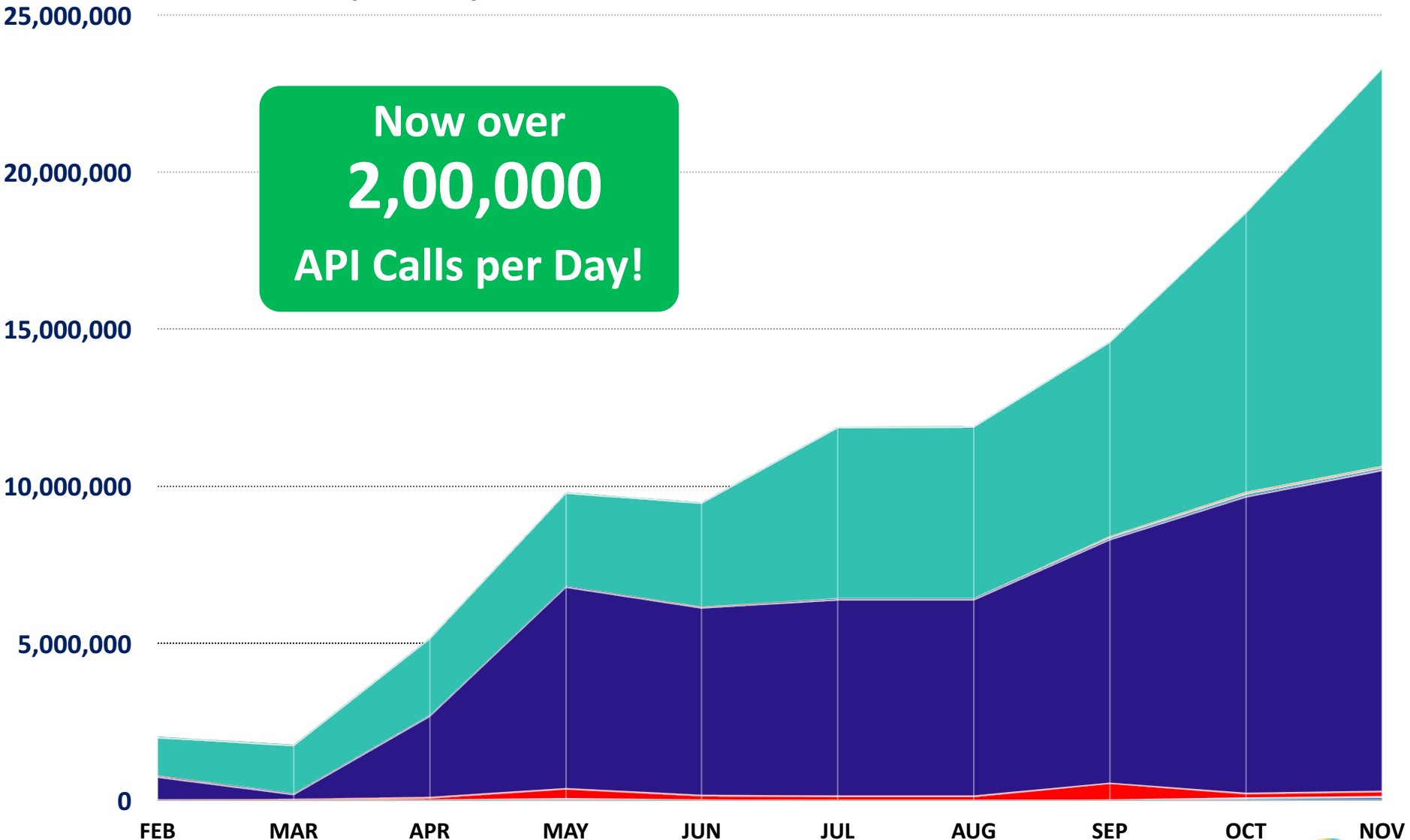
Alma APIs Subject Areas

- **Analytics** – run Alma analytics reports
- **BIBs** – catalog, inventory, fulfillment, collections, digital
- **Configuration** – jobs, sets, configuration
- **Courses** – reading lists, citations
- **Electronic Resources** – e-collection, portfolios
- **Users** – user data, loans, requests, fines, deposits

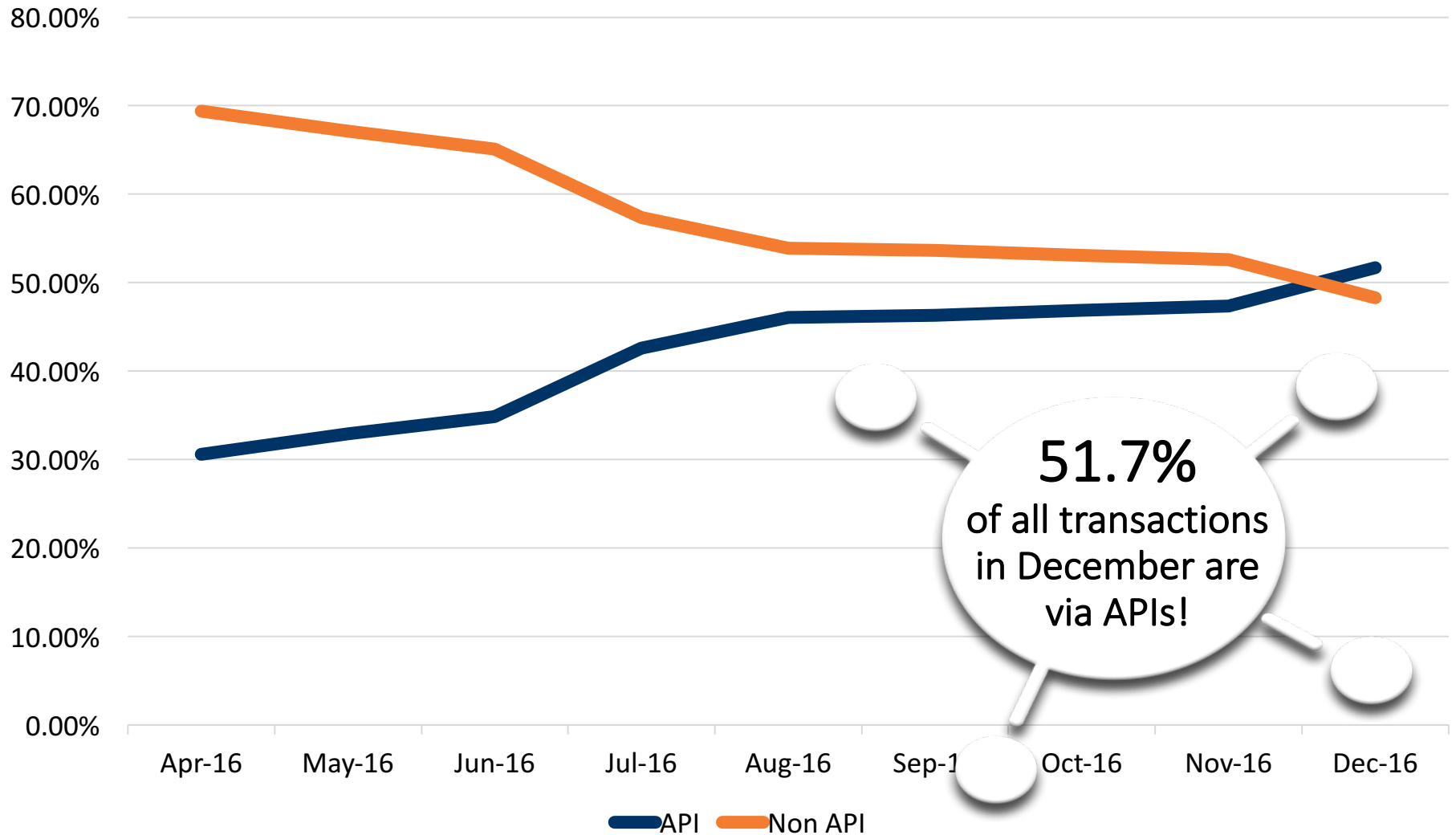
Continually Increasing USAGE

■ Acq ■ Analytics ■ Bib ■ Conf ■ Courses ■ Partners ■ Users

Now over
2,00,000
API Calls per Day!



APIs as a Proportion of Total System Usage



51.7%
of all transactions
in December are
via APIs!

Interactive Documentation

Query string Parameters

Body Parameters

Output

Possible Error Codes

This Web service returns a specific user's details.

Resource URL

```
GET /api/users/v1/users/{user_id}
```

[Try it now!](#)

The full WADL documentation is available [here](#).

URL Parameters

Parameter	Type	Description
user_id	xstring	A unique identifier for the user

Query string Parameters

user_id string. Max length: 255

The type of user record. Possible codes are listed in 'AddNewUserOptions' code table: Contact, Staff, Public. Mandatory in User API. On SIS load, this field is determined according to the SIS profile.

These are the values currently defined for our demo institution. Some code tables can be customized for your institution; please log in to the Developer Network to see the values for your institution.

Code	Description
All	Choose type of user
CONTACT	Contact
STAFF	Staff
PUBLIC	Public

primary_id string. Max length: 255

The primary identifier of the user. Mandatory in User API. For new users in SIS load, if not supplied, the system will generate a default based on the first and the last name. Note that the primary_id is case insensitive.

first_name string. Max length: 255

The user's first name.

middle_name string. Max length: 255

The user's middle name.

category string. Max length: 255

The types of jobs the user performs in the library, such as Cataloger, Circulation Desk Operator, and so forth. Possible values are listed in 'Job Titles' code table. On SIS sync this field will not be replaced if it was updated manually for if empty in the incoming user record.

For external users in PUT action: this field will not be replaced if it was updated manually (or if empty in the incoming user record), unless 'override' parameter is sent with the field's name. See [link](#) for more details.

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Code	Description
AcquisitionManager	Acquisitions Manager
AcquisitionOperator	Acquisitions Operator
Cataloger	Cataloger
CatalogingAcquisitionsOperator	Cataloging + Acquisitions Operator

Authentication (API Key)

Execute Request

Method: GET

Request: Query Response

```
Date: Tue, 18 Apr 2017 12:28:15 GMT
Server: Apache/2.4.18
X-Frame-Options: SAMEORIGIN
Response-Status: HTTP/1.1 200 OK
Etag: c947c3c3391c0848e21124195a19d17d1
Vary: Accept-Encoding
X-Api-Api-Remaining: 499990
Content-Type: application/json; charset=UTF-8
Content-Length: 4011
Connection: close

{"gender": {"value": "", "desc": ""}, "password": "", "status": ""}
```

API Documentation

- For each API endpoint
- URL parameters
- Querystring parameters
- Error codes
- Input and return object types

Data dictionary

- Field description
- Data type
- Length/optional
- Special instructions

Institutional Data

- Institution- defined data
- Information in the hands of devs

Interactive Console

- Try API calls within minutes
- Code samples



Adopt Standards

Standards allow for turnkey integration between systems without custom development.

Standards promote interoperability.

Wherever industry standards exist Ex Libris prefers to adopt them rather than reinventing the wheel.



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Integrations

The screenshot displays the ExLibris Developer Network website. At the top, the ExLibris logo is on the left, and the user name 'Dani Smith' with a profile icon is on the right. Below the logo is the 'Developer Network' header with navigation links for 'Docs', 'Tech Blog', 'Code & Apps', 'Forum', and 'Dashboard'. A search bar is located on the right side of the header.

Below the header, a row of 'Resources' includes links for 'Primo', 'Alma', 'Rosetta', 'Leganto', 'bX', 'SFX', 'Aleph', and 'Voyager'. The 'Alma' link is highlighted with a white arrow.

The main content area is titled 'Ex Libris Developer Network / Alma / Integrations / Integration Videos'. On the left, there is a sidebar menu under the heading 'APIs' with a sub-heading 'Integrations'. The menu items include: Integration Videos, Bursar, Courses, Digital, EDI, Electronic Holdings, Finance, Linked Data, NCIP, OAI, Publishing, Remote Storage Facility, Resource Sharing, RFID, Self Check, SMS, SRU, Stunnel, SWORD, Users in Alma, Webhooks, Z39.50, and 3rd Party Discovery systems.

The main content area is titled 'Integration Videos' and features a grid of video thumbnails. The thumbnails are: 'EOD Import', 'EDI Integration', 'External Resources Search' (which includes a diagram showing connections to LSE, Harvard University, and The Royal Library), 'Repository Import', 'Self-Check Machines', 'Resolver Proxy', 'LDAP Authentication', and 'Student Information System' (which includes a diagram showing data flow from an SIS database through an FTP server and an integration profile to Alma).

At the bottom of the page, there is a footer with links for 'Terms of Use', 'Privacy Policy', and 'Report a problem', followed by the copyright notice: '© Copyright Ex Libris Ltd. 2017. All Rights Reserved'.

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



Community, Community, Community

Community

Using a SaaS system means everyone is on the same version. This encourages collaboration and cooperation.

Customers can share tips & tricks, code samples, workflows, integration scenarios, etc.

The Ex Libris Developer Network encourages community sharing. Ex Libris contributes to open source and works to facilitate the community.



Blog

for sharing
code, apps,
and
technical tips
& tricks



Login | Signup



Developer Network

Docs

Tech Blog

Code & Apps

Forum

Dashboard

Search



Resources:

Primo

Alma

Rosetta

Leganto

bX

SFX

Aleph

Voyager

Tech Blog



Publishing Full text From Rosetta to Primo

Keren Fux

April 6th, 2017

In this post we will show how to publish full-text content from Rosetta to Primo that is supported from version 5.2 of Rosetta. If you are new to the publishing process, here is a great place to start:

[Read More](#)

PRIMO ROSETTA

Tableau Web Data Connector for Ex Libris Analytics

Josh Weisman

April 4th, 2017

Many Ex Libris customers use Tableau Software for business intelligence. Tableau provides a way to visualize data from various sources, and offers special pricing for academic institutions, making it an attractive option for many university libraries. In

[Read More](#)

ALMA

Tag Cloud

Code & Apps Aleph Alma
bX MetaLib Primo Rosetta
Leganto SFX Voyager
DigiTool PDS SIS Printing
Publishing/Export Bursar
LDAP
SAML Finance Self-check
Stunnel SMS NCIP Digital
Resource-sharing Jobs
Social-Login Cloud-IDP
Webhooks
SWORD

Developer Network - Forum



Forum

for getting
help with
technical
integrations

ExLibris
A ProQuest Company

Developer Network Docs Tech Blog Code & Apps Forum Dashboard

Resources: [Primo](#) [Alma](#) [Rosetta](#) [Leganto](#) [bx](#) [SFX](#) [Aleph](#) [Voyager](#)

Forum Index » Alma

Please Log in to post Search this forum... Search

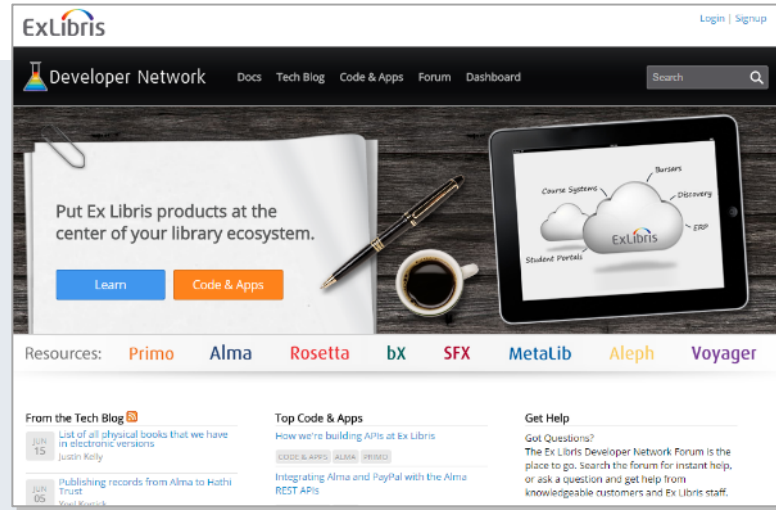
Topic	Answers	Author	Views	Last message
Editing CZ records in MarcEdit Alma integration - not working	1	paulinesmith	16	17/04/2017 19:15:58 reese →
SIP2 message	3	852JULAC_EDUHK	29	13/04/2017 19:57:24 orim →
INTERNAL SERVER ERROR: using "Update User Details" API	4	01CAL_SJO	35	07/04/2017 14:35:17 rpatil →
SRU production credentials	2	helper2424	27	08/04/2017 07:24:30 helper2424 →
Cannot retrieve all members of an itemized set	2	paulinesmith	18	04/04/2017 17:37:29 paulinesmith →
How to read the Alma API Error XML	3	UTKJoe	23	04/04/2017 14:19:38 orim →
How to parse the xml object returned from analytics API using python?	3	paulinesmith	45	29/03/2017 15:27:22 paulinesmith →
API-returns	2	86CUHKSZ_INST	20	29/03/2017 07:52:58 86CUHKSZ_INST →
"Authenticate user" API (op=auth): op parameter is not valid	2	01CAL_SJO	36	17/03/2017 19:59:42 01CAL_SJO →
Get full patron records with Blocks	2	852JULAC_HKBU	41	17/03/2017 02:22:54 852JULAC_HKBU →
Acquisitions API	0	lwini	40	09/03/2017 11:23:35 lwini →
Analytics REST API: Logical AND in filter	1	61CSIRO_INST	24	07/03/2017 21:53:54 61CSIRO_INST →
API Key Limit?	4	acoope5	60	07/03/2017 20:15:26 orim →
Staff Login Report API	2	acoope5	38	03/03/2017 19:31:39 acoope5 →
500 error E01-2702152718-1YZ&J-UPE32162980	4	folcan	37	28/02/2017 15:33:03 folcan →

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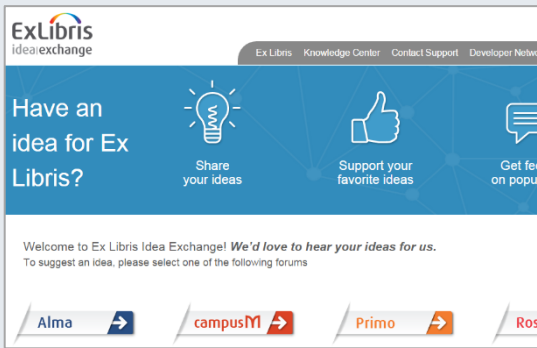
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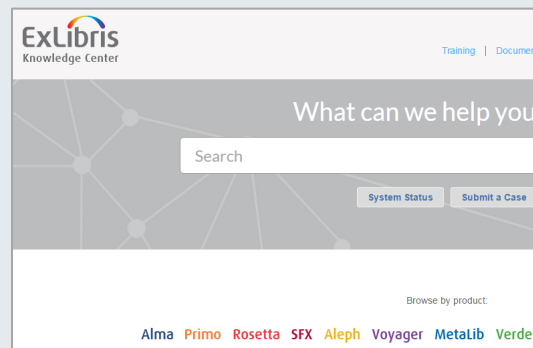
Transparency at Ex Libris



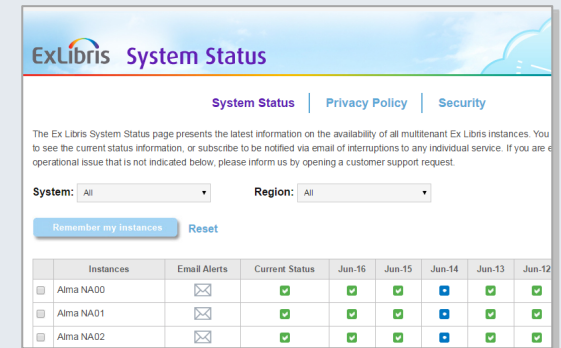
Developers Network



Ideas

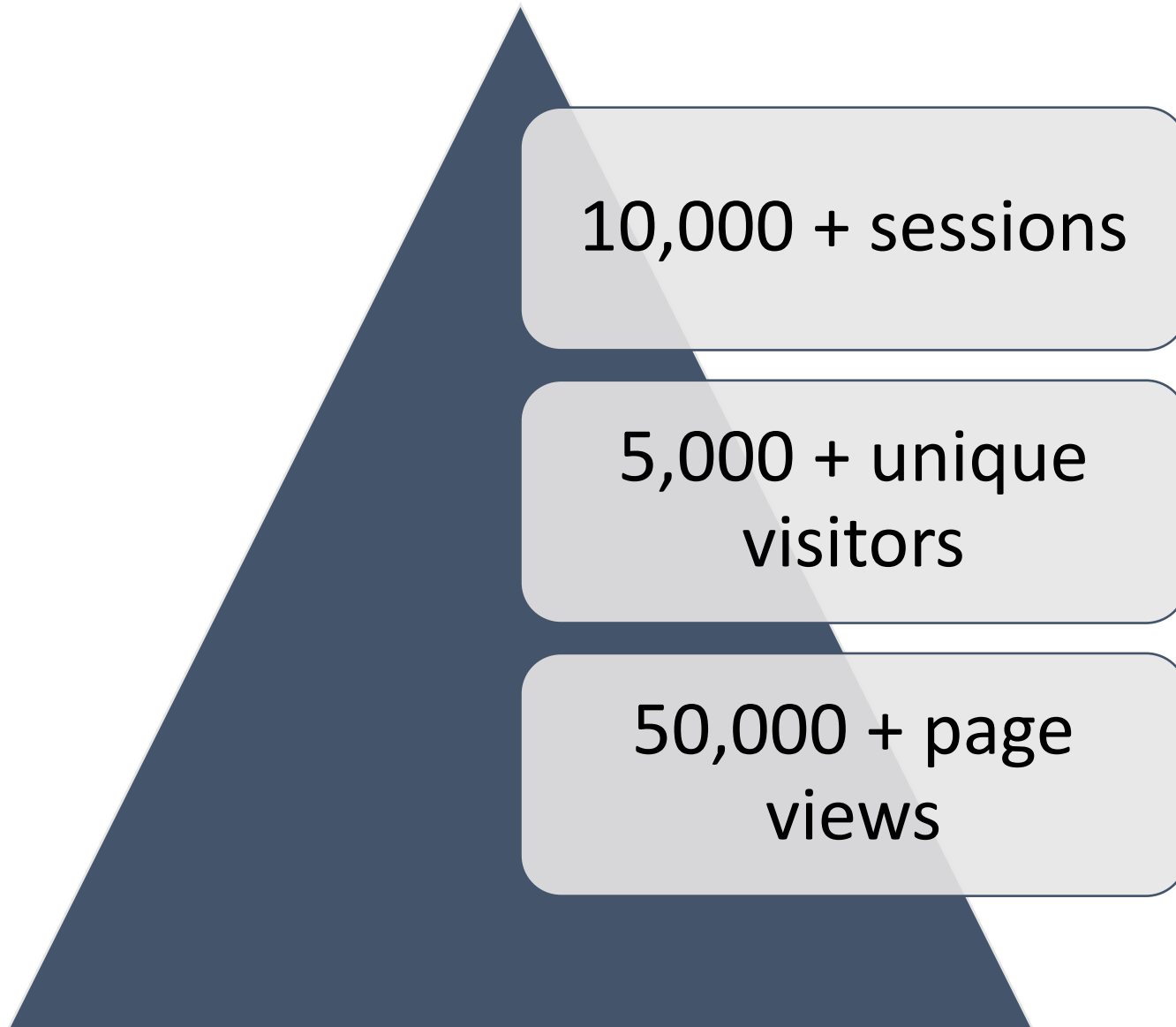


Knowledge



Status

Developer Network Active Usage



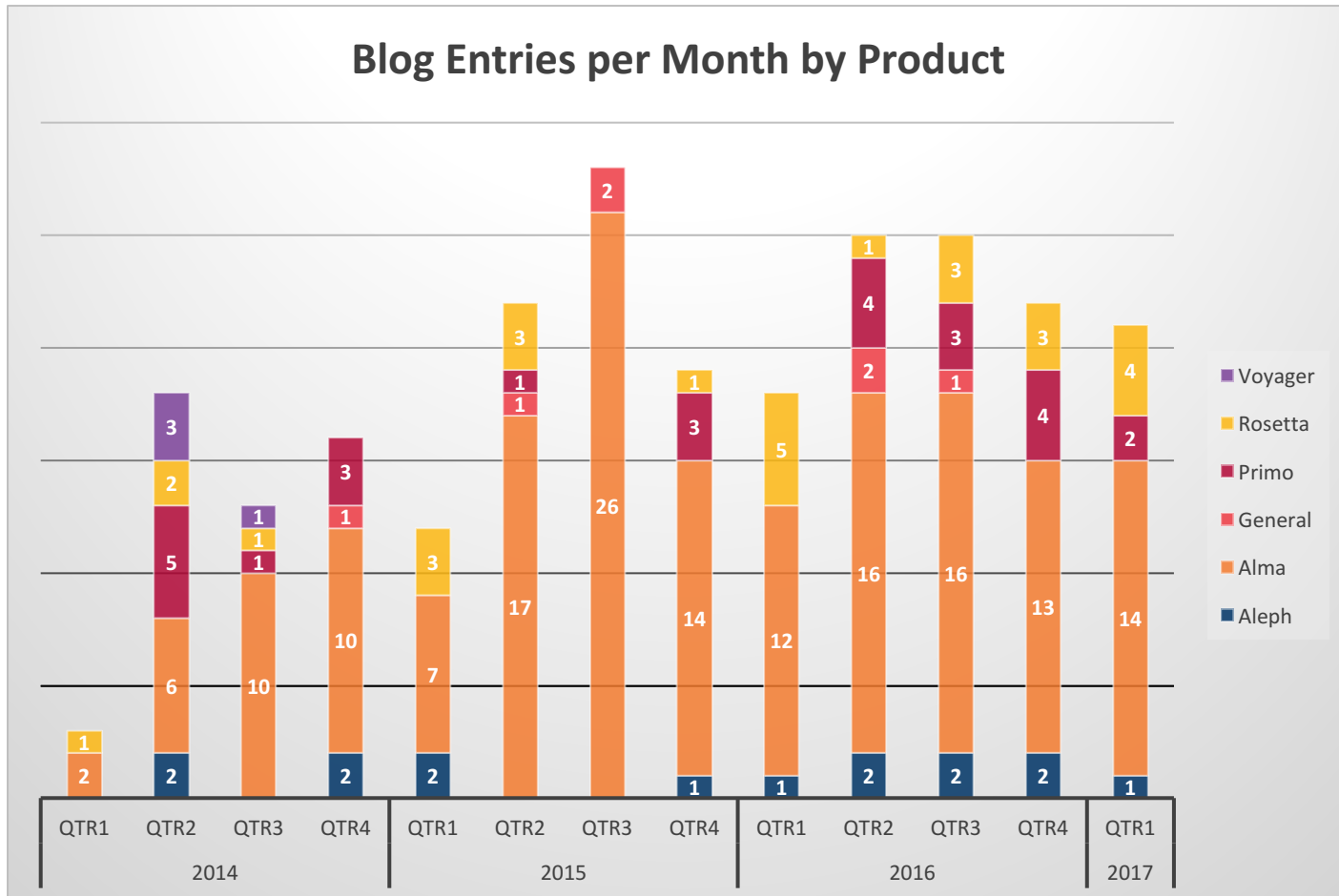
10,000 + sessions

5,000 + unique
visitors

50,000 + page
views

Developer Community

- Active blog & forum
 - 6-8 per month
 - 50% by community



Ex Libris Github

- Ex Libris maintains a presence on Github to share integration demos, code samples, plugins, and collaborative projects
- Notable examples- Primo new UI toolkit, Rosetta plugins, Alma migration tools, Alma/Blacklight sample integration, Tableau Web Data Connector



GitHub

Ex Libris Github

The screenshot displays the GitHub organization page for Ex Libris, Ltd. At the top, there is a navigation bar with the GitHub logo, a search bar for the organization, and links for Pull requests, Issues, and Gist. The organization's profile includes the Ex Libris logo, the name "Ex Libris, Ltd.", a description as a leading provider of cloud-based solutions for library operations, and location information (Jerusalem, Israel) and a website link (http://www.exlibrisgroup.com/).

Below the profile, there are navigation tabs for "Repositories", "People 12", "Teams 5", and "Settings". A search bar for repositories is present, along with a "New repository" button. The main content area lists three repositories:

- primo-explore-devenv**: JavaScript, 20 stars, 7 forks. Description: A node.js, gulp based development environment for Primo's new UI customizations (css, images, html and javascript). Updated 17 days ago.
- primo-explore-package**: HTML, 8 stars, 2 forks. Description: The Template package for Primo new UI customizations. Updated 28 days ago.
- Rosetta.CMS_Sync_Tool**: Java, 0 stars, 0 forks. Description: Rosetta.CMS_Sync_Tool. Updated 29 days ago.

On the right side, there is a "People" section showing 12 team members with their profile pictures and avatars. An "Invite someone" button is located at the bottom of this section.

<https://github.com/ExLibrisGroup>



Leverage the Public Cloud

Leveraging the Public Cloud

Even when enterprise systems move to the SaaS model, local applications and integrations need to be hosted.

Want to avoid maintaining infrastructure, patching, upgrading.

The public cloud provides a cost-effective, secure and robust platform on which to build integrations.

Ex Libris is committed to ensuring its SaaS applications “play nicely” in this environment.

A few Public Cloud options

- **Amazon Web Services (AWS):** The “big gorilla” in the industry, provides both infrastructure-as-a-service (IaaS) and platform-as-a-service (PaaS)
- **Microsoft Azure:** strong competitor to AWS, supports both Windows and Linux and many languages
- **Heroku:** A subsidiary of Salesforce, interesting platform-as-a-service option



Serverless Computing (PaaS)

Serverless computing ... is a [cloud computing](#) code [execution](#) model in which ... requests are billed by an abstract measure of the resources required to satisfy the request, rather than per virtual machine, per hour.

Despite the name, it does not actually involve running code without servers.^[1] The name "serverless computing" is used because the business or person that owns the system does not have to purchase, rent or provision servers or virtual machines for the [back-end](#) code to run on.

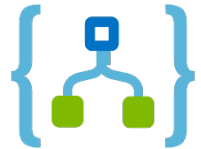


https://en.wikipedia.org/wiki/Serverless_computing

Image: <http://blog.form.io/what-are-serverless-apps-and-what-do-they-mean-for-developers>

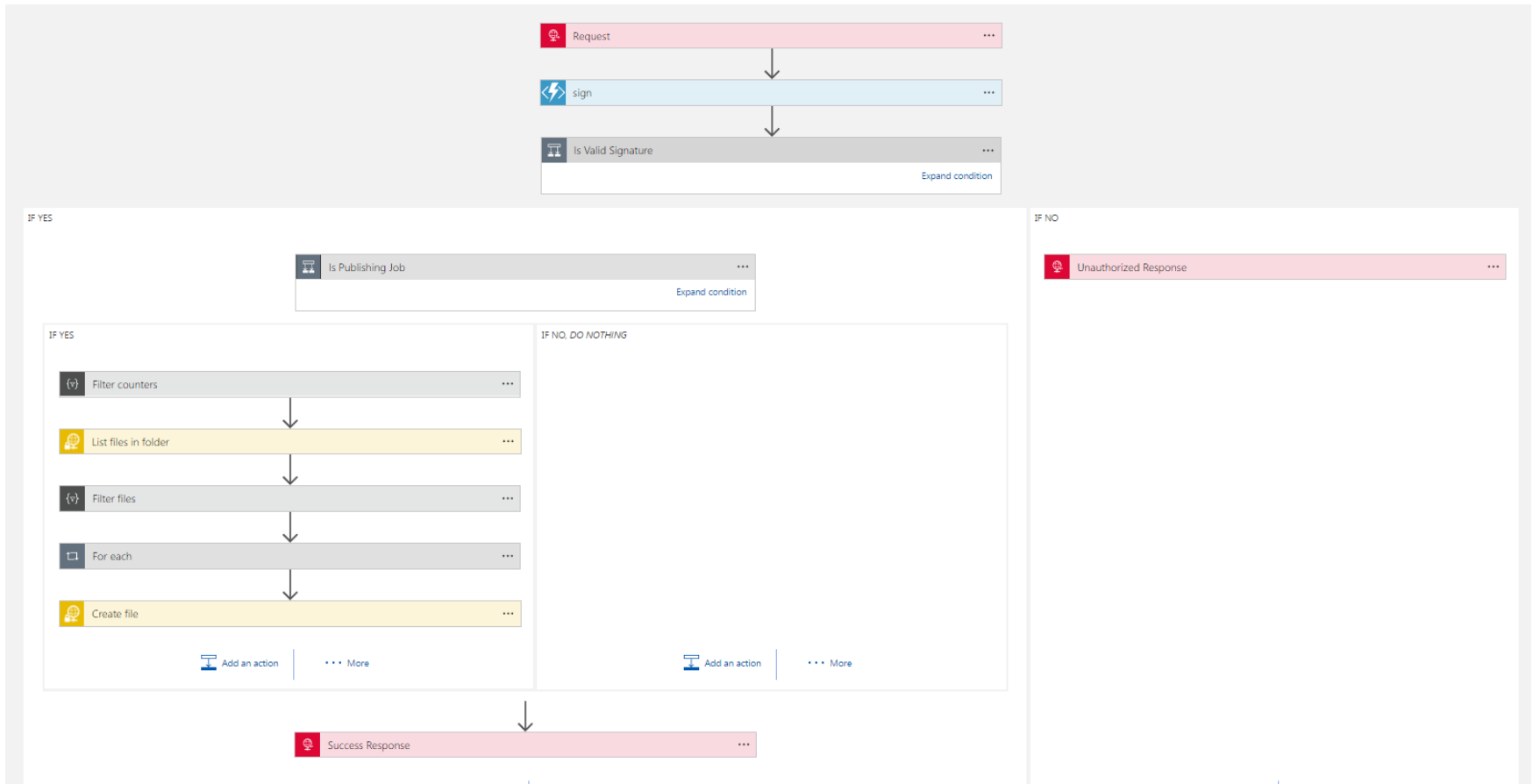
Serverless Computing (PaaS)

- **AWS Lambda:** Deploy and run functions (i.e. Node or Java code)
- **AWS Elastic Beanstalk:** Deploy and run applications (i.e. Ruby on Rails or Java/Tomcat)
- **Heroku Dynos:** Deploy and run applications (i.e. Node.js)
- **Azure Logic Apps:** Deploy and run functions (i.e. C# or Node code)
- **Azure Web Apps:** Deploy and run applications (i.e. ASP.NET MVC or ASP.NET Core)



- [Leveraging the public cloud: Sending notifications to patrons](#)
AWS Lambda
- [Getting Started with Webhooks in Alma](#)
Heroku
- [Hosting a Webhook Listener in AWS](#)
AWS Lambda, AWS API Gateway
- [Hosting a C# Webhook Listener in Azure](#)
Azure Web App
- [Real Time Notifications with Alma Webhooks](#)
Heroku, Mongo

More on the Way...



Azure Logic Apps



Summary

Linked Data Support in Alma

- Exposing millions of records in linked data format
- Automatic enrichment

Webhooks

- Changes programming paradigm from pull to push
- Enabling real-time interaction with Alma

Tableau Web Data Connector

- Access Alma data in Tableau
- Collaboration with the community
- Combine with data from other sources

To sum it up....

The move to the cloud provides us with some challenges but many opportunities to increase **efficiency, collaboration**, and continue to **add value** to our organizations.

Ex Libris provides support for **standard protocols** and **REST APIs** to allow customers to **extend** its solutions and continue to create innovative **integrations**.



THANK YOU!

josh.weisman@exlibrisgroup.com