Now We're Talking... Two-way Communication with Alma Using Webhooks

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IGELU Developers Day 2016

Agenda

1. Introduction to Webhooks
2. Anatomy of a Webhook Listener
3. Building Your First Webhook Listener
4. In the Wild: Hosting a Webhook Listener in the Public Cloud
5. Wrap Up

Introduction to Webhooks

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What are Webhooks?

Webhooks are "user-defined HTTP callbacks".[2] They are usually triggered by some event, such as pushing code to a repository[3] or a comment being posted to a blog.[4] When that event occurs, the source site makes an HTTP request to the URI configured for the webhook. Users can configure them to cause events on one site to invoke behaviour on another.

Wikipedia
https://en.wikipedia.org/wiki/Webhook

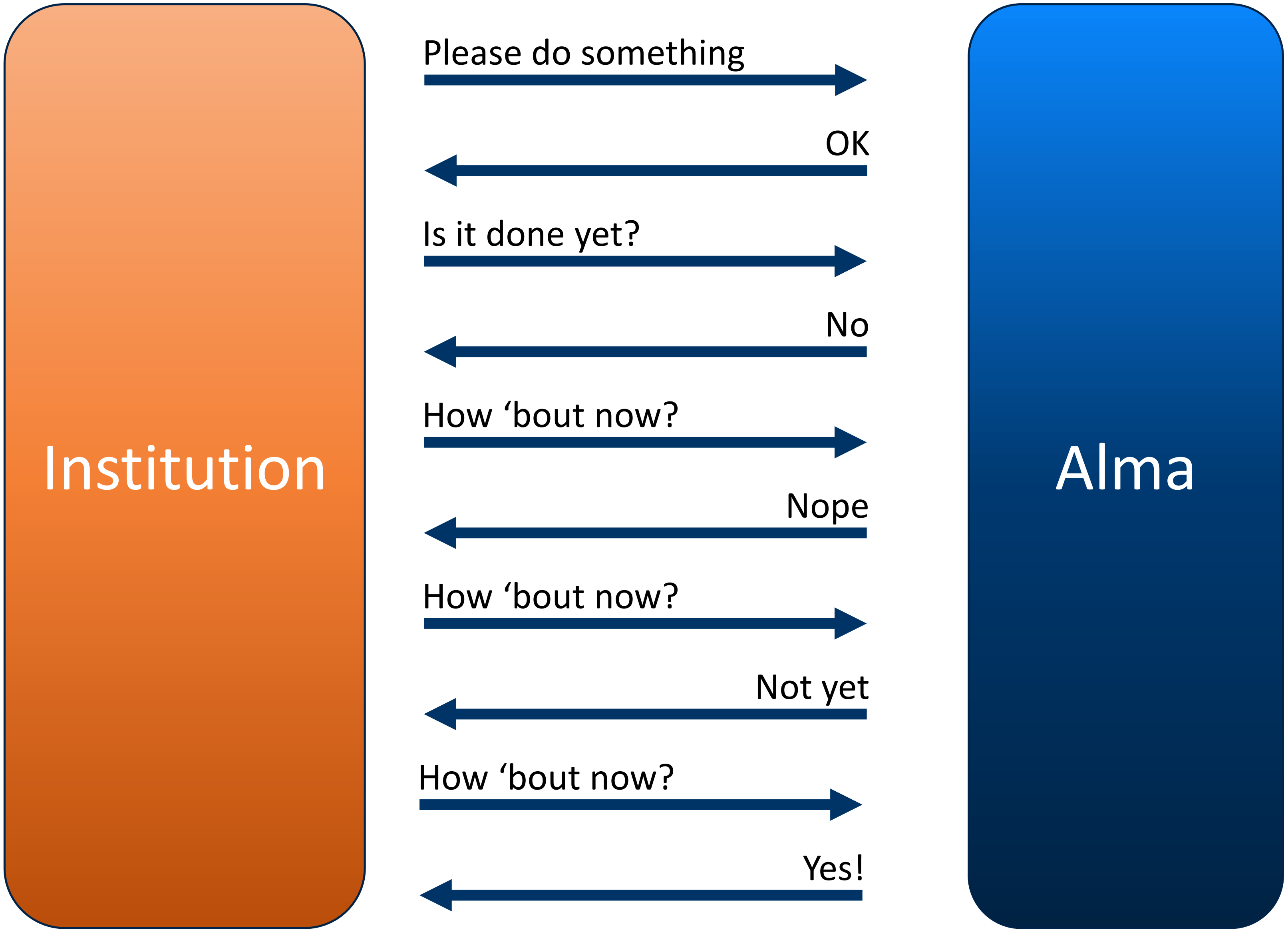
Webhook Benefits

- Alternative to “polling”- push rather than pull
- Respond to events in the system when they occur
- Asynchronous architecture
- Reduce API calls

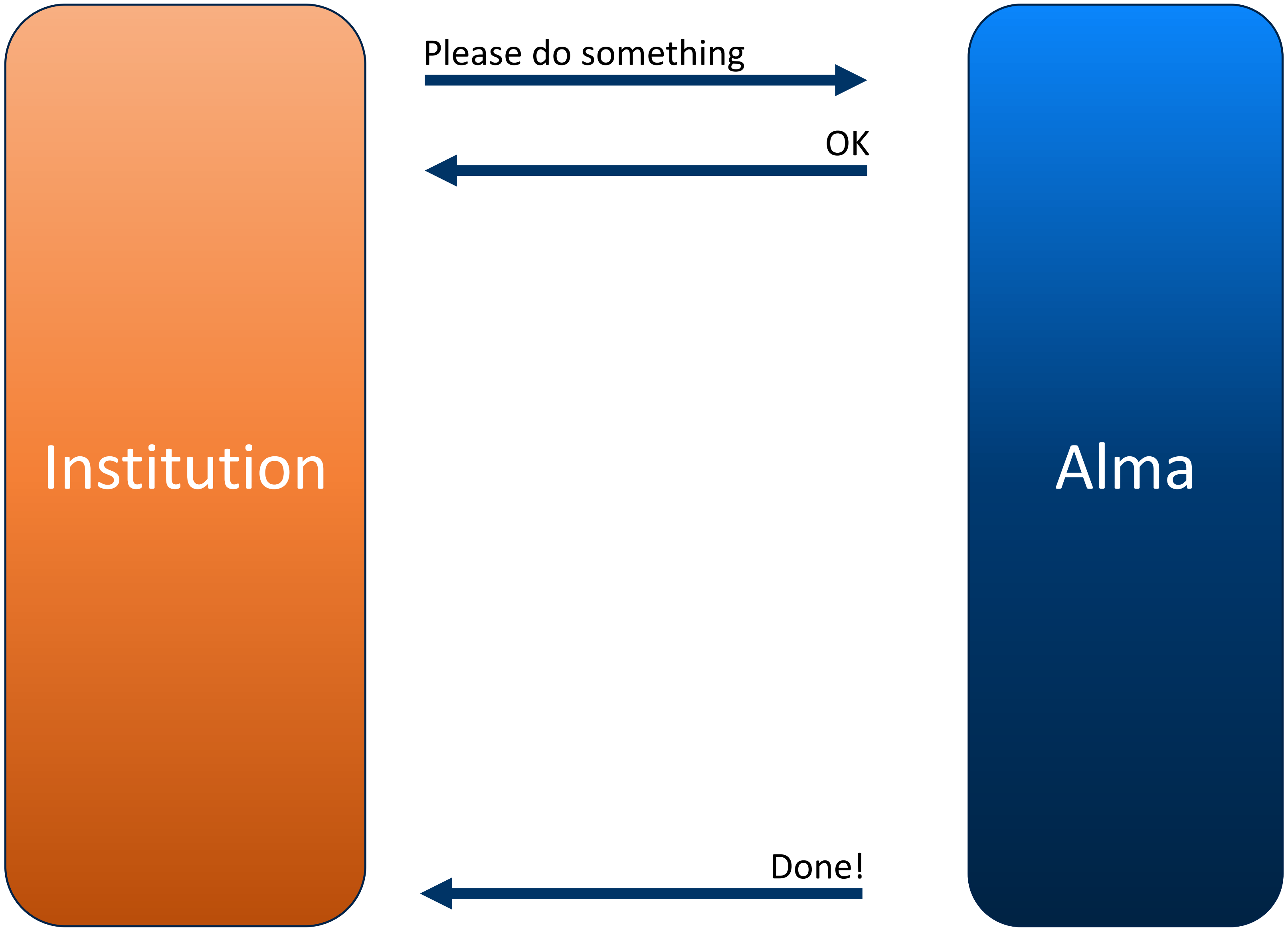
webhooks
building a more programmable web

Source: http://www.webhooks.org

Polling- “Pull”



Webhooks- “Push”



Webhooks in Alma

- Initial release includes support for job end
  - Scheduled or manual jobs
- Additional events coming- loans and requests in the mid term roadmap
- Configure with a webhook integration profile

Anatomy of a Webhook Listener

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Webhook Listener - GET

- Alma “challenges” the webhook listener when the integration profile is activated
- This ensures an active listener is available at the provided URI
- The listener should reply to the GET request with the challenge sent in the query string

```
GET /webhook?challenge=1234
```

```
                200 OK
{“challenge”:”1234”}
```

Webhook Listener - POST

- Alma sends a POST request to the listener each time the specified event occurs

- The listener processes the request and returns response to Alma

```
POST/webhook
X-Exl-Signature: g4njfSmb5BqPPh=

{"id":"1767426760000561","action":”job_end
","time":"2016-09-
07T08:48:45Z","job_instance":{"id":"176742
6760000561","name":"Add set
1767425500000561 to collections:
8182119880000561..”
...
```

```
200 OK
```

Webhook Listener - POST

```
POST /webhook
X-Exl-Signature: 0gFT8DgzoOCNyApuMvlz62bz9KIuhvr+r14nQw3rFJ0=

{
  "id":"1767426760000561",
  "action":"job_end",
  "time":"2016-09-07T08:48:45Z",
  "job_instance":{
    "id":"1767426760000561",
    "name":"Add set 1767425500000561 to collections: 8182..",
    "submit_time":"2016-09-07T08:48:14Z",
    "start_time":"2016-09-07T08:48:36Z",
    "end_time":"2016-09-07T08:48:45Z",
    "progress":100,
    "status":{
      "value":"COMPLETED_SUCCESS",
      "desc":"Completed Successfully"
    },
  }
}
```

Base64-Encoded HMAC SHA256 Signature

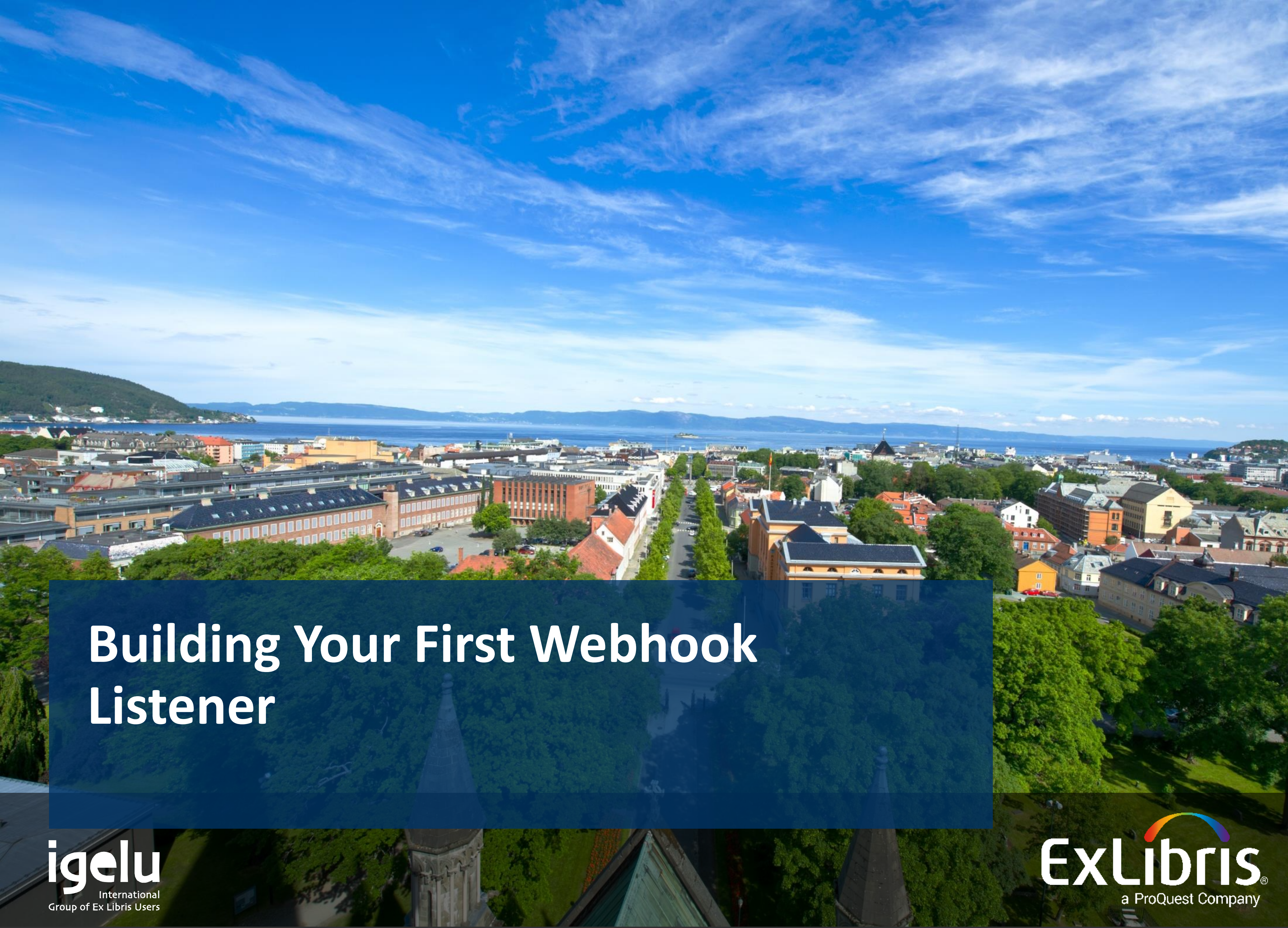
Webhook details

Action-specific payload
(eg. Job Instance)
JSON or XML

Signature

- Ensures message came from Alma and that it was not tampered with
- Listener can validate the signature (recommended, but not required)
- Base64 encoded HMAC SHA256

```
function validateSignature(body, secret, signature) {
  var hash = crypto.createHmac('SHA256', secret)
      .update(JSON.stringify(body))
      .digest('base64');
  return (hash === signature);
}
```



Building Your First Webhook Listener

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First Webhook Listener

- Node.js Application

- Handles challenge GET

- Receives incoming POST requests
  - Validates signature
  - Ready to call method based on event type/action

DEMO: Building Your First Webhook Listener

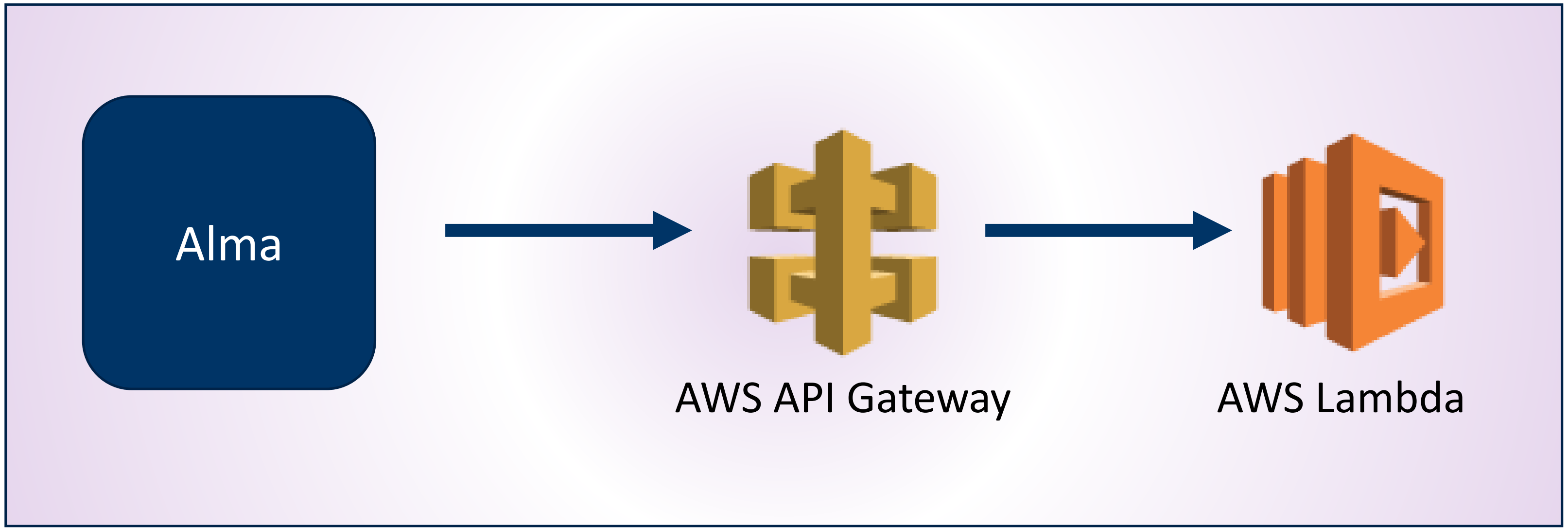
In the Wild: Hosting a Webhook Listener in the Public Cloud

Webhook Listeners in the Cloud

- Webhook listeners require a certain amount of infrastructure
- Prefer not to host the infrastructure locally
- Public cloud infrastructure allows hosting of webhook listeners for a very low cost (“almost free”)

Public Cloud Webhook Listener: AWS

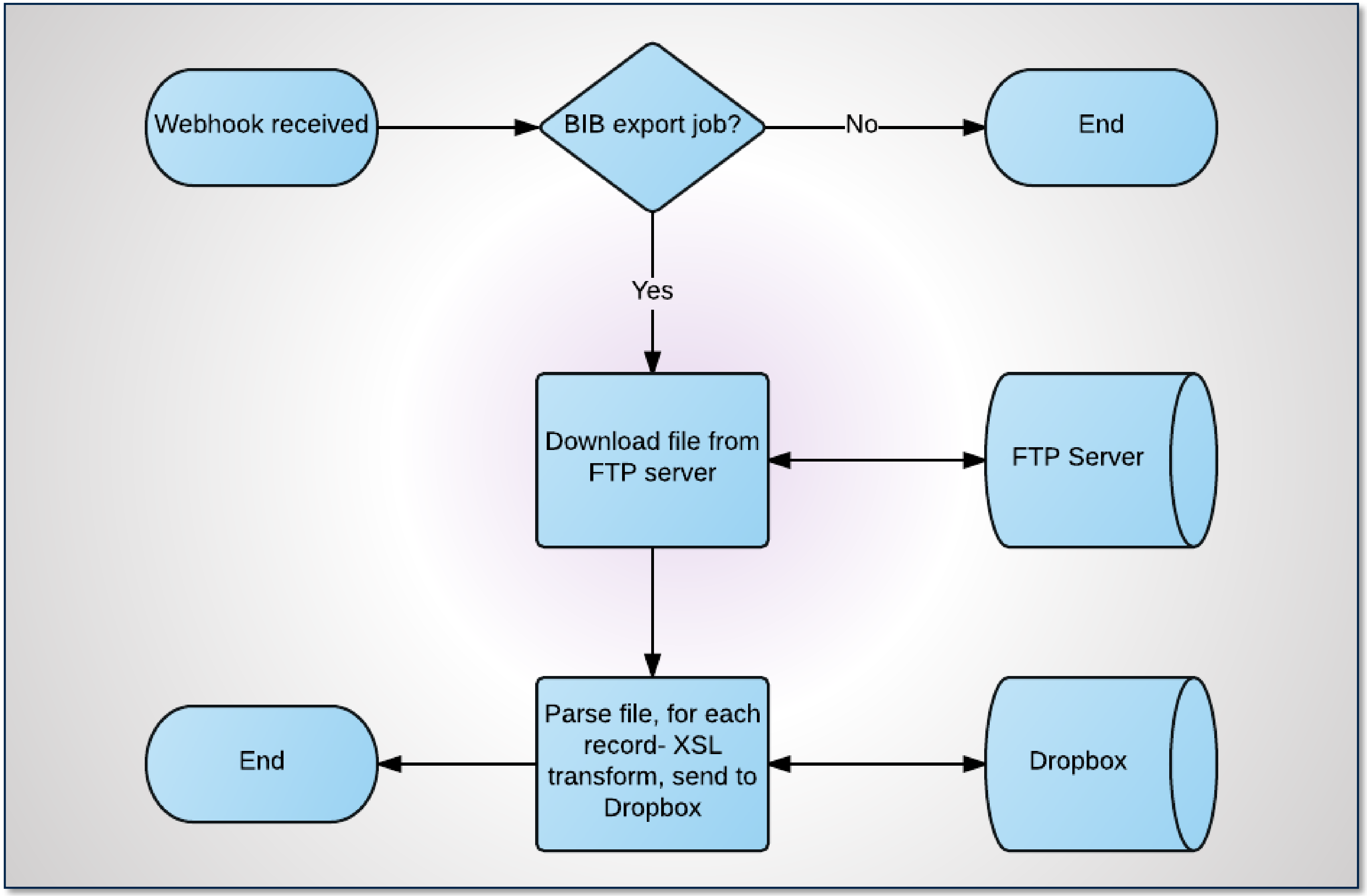
- Lambda Microservice in Node.js
- API Gateway
- Demo: Send SMS to job initiator when job is complete



Public Cloud Webhook Listener: Azure

- ASP.NET 4.6 MVC Web API application in C#
- Deployed as Web App on Azure
- Demo: Download exported file, parse, transform each record, upload to Dropbox
  - Represents use case where records exported from Alma need to be sent to another system

Public Cloud Webhook Listener: Azure


Webhook received
BIB export job?
No
End
Yes
Download file from FTP server
FTP Server
Parse file, for each record- XSL transform, send to Dropbox
Dropbox
End

DEMO:
Hosting a Webhook Listener in the Public Cloud

Wrapping Up

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Webhook Tips

- Listener Error Codes
  - 200 OK
  - 400 Logged as error
  - 500 Retry 3 times each hour
- Short timeout
  - Use asynchronous patterns for long running tasks

Wrap Up

- Start thinking about how the webhook model can change your integrations with Alma
- Add your event type requests to the Idea Exchange
- Ask questions on the Developer Network Forum

Have fun!

THANK YOU

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