



Cloud Events: A Step Towards Serverless Interop

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CNCF Technical Oversight Committee initiated Serverless WG (mid-2017)

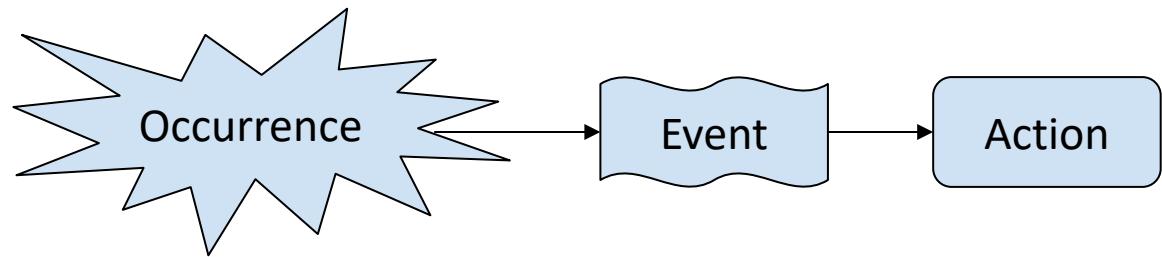
- Whitepaper
 - Overview of technology
 - State of ecosystem
 - Recommendations for possible CNCF next steps
- Landscape

CloudEvents

- Project started Dec 2017
- CNCF Sandbox project approved May 2018

What are Events?

- An **occurrence** is the capture of a statement of fact during the operation of a software system
- An **event** is a data record expressing an occurrence and its context
- An **action** is executed, when it is notified about the occurrence by receiving the event



The occurrence is decoupled from the action



CloudEvents: Why?



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Problem

- We live in a multi-cloud and multi-service world
- Events within a cloud are well known but going across clouds need more standardization on the messages

Use cases

- How do you transit events between clouds and services?
- Be able to route events efficiently without knowing the actual payload
- Well known format for transmitting metadata about events



CloudEvents: Goals

- **Interoperability** : Facilitate integrations across platforms
- First step towards portability and interop of functions

How?

- Define **minimal** common metadata across events
- Leave the event business logic format & processing to the application
 - **No sensitive data within the CloudEvents metadata**
- Define mapping for popular serializations and transports



CloudEvents: Overview

Specification - minimal/consistent metadata

- **ID**
- **Source**
- **SpecVersion**
- **Type**
- **DataContentEncoding** of the payload
- **DataContentType** of the payload
- Schema URL of the payload
- **Subject**
- **Time**

Transport bindings - how to serialize in JSON, HTTP, MQTT, ...

Just enough to help route to the consuming business processing logic

CloudEvents: Example

HTTP - Binary

```
POST /event HTTP/1.0
Host: example.com
Content-Type: application/json
ce-specversion: 0.3
ce-type: com.bigco newItem
ce-source: http://bigco.com/repo
ce-id: 610b6dd4-c85d-417b-b58f-3771e532

{
  "action": "newItem",
  "itemID": "93"
}
```

HTTP - Structured

```
POST /event HTTP/1.0
Host: example.com
Content-Type: application/cloudevents+json

{
  "specversion": "0.3",
  "type": "com.bigco newItem",
  "source": "http://bigco.com/repo",
  "id": "610b6dd4-c85d-417b-b58f-3771e532",
  "datacontenttype": "application/json",
  "data": {
    "action": "newItem",
    "itemID": "93"
  }
}
```



CloudEvents: New in v0.3

- V0.3 - released June 13, 2019
- New attribute: **subject**
- **contenttype** is renamed **datacontenttype**
- New extensions
 - **dataref** (claim check pattern)
- **Batching**
 - Is handled by transports
 - Added specification for batching with HTTP+JSON



CloudEvents: Deliverables

CloudEvents Specification – define the metadata

Serialization Rules Specifications

- [JSON](#) event format
- [AMQP](#) event format
- [Protobuf](#) event format

Transport Bindings Specifications

- [HTTP](#) – binary and structured
- [MQTT](#), [AMQP](#), [NATS](#), [Web-hooks](#)
- Pointers to [proprietary transport bindings](#)

Primer

SDKs

- [Go-lang](#), [Javascript](#), [Python](#), [Java](#), [C-Sharp](#), [Ruby](#)

Extensions



CloudEvents: Status

Releases

- v0.3 - Released on June 13, 2019
- Don't let the version number fool you... It's more like v0.9
- Hoping for v1.0 within weeks/month(s)
- Will be asking for CNCF "incubator" status soon

Adoption

- Microsoft, Serverless.com, SAP and others have support
- Knative - basis for eventing infrastructure
 - Transport/data agnostic filtering
- Other BIG cloud providers have plans

After v1.0

- Shift focus back to Serverless WG / Workflow / other possible areas of interop

CloudEvents: Demo Time!

CloudEvents Timeline

IBM Cloud - 10 hours ago
Watson thinks this is a picture of a cat

A vacation is when you take a trip to some drab place with your mysterious family. Usually you go to some place that is near a/an marketing or up an a/an power.

CloudEvents Timeline interface showing a post from IBM Cloud. The post features a blue-toned cat image and a caption about vacationing with a mysterious family.

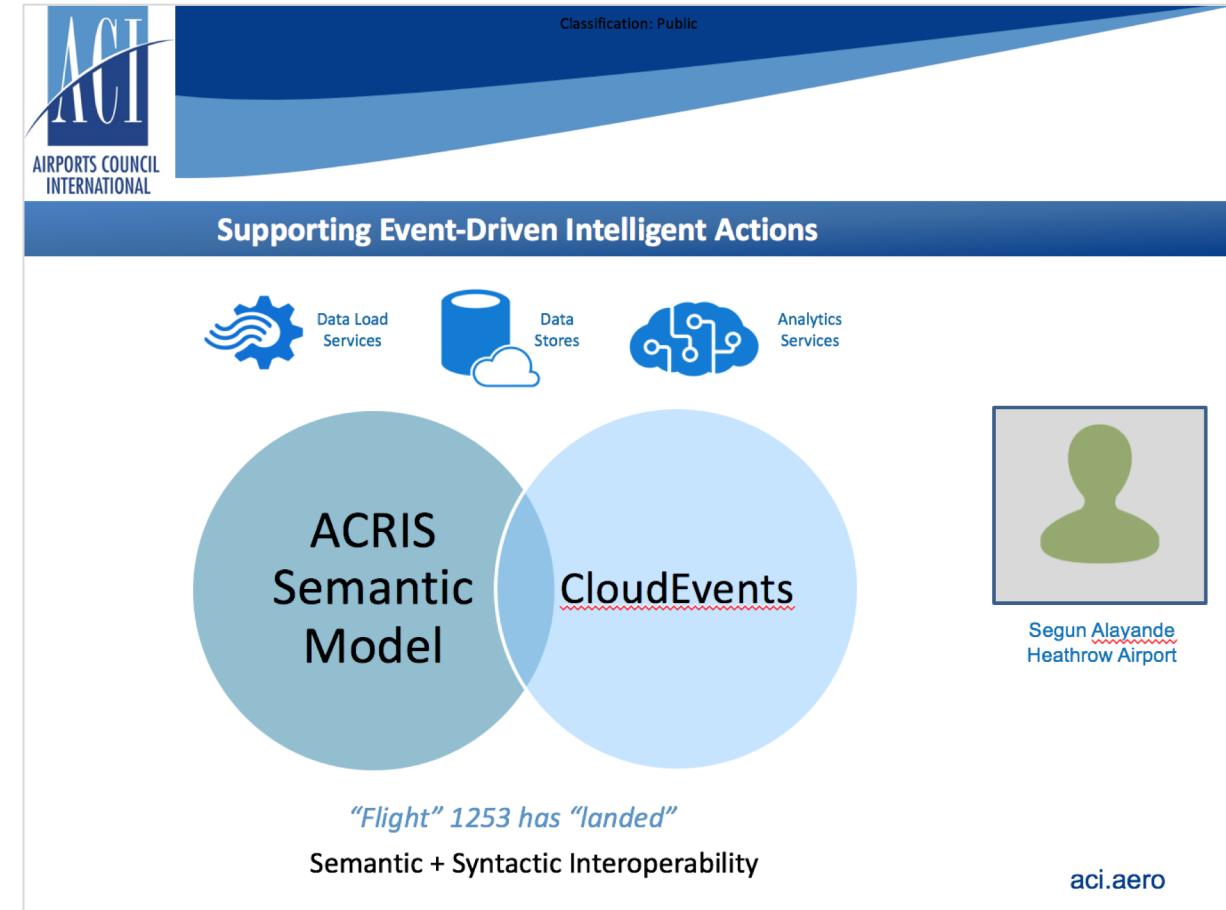
Surrounding icons represent various cloud services and concepts:

- aws lambda**: Careful putrid product thing
- aws s3**: Refined important marketing television
- Azure blob storage**: Round muscular office television
- aws s3**: Surplus progressive cash cash
- aws lambda**: Tall mysterious science power
- aws s3**: Drab curved freedom art
- Azure blob storage**: OpenFaaS logo
- aws lambda**: CloudEvents logo
- aws s3**: PayPal logo
- aws lambda**: GitHub logo

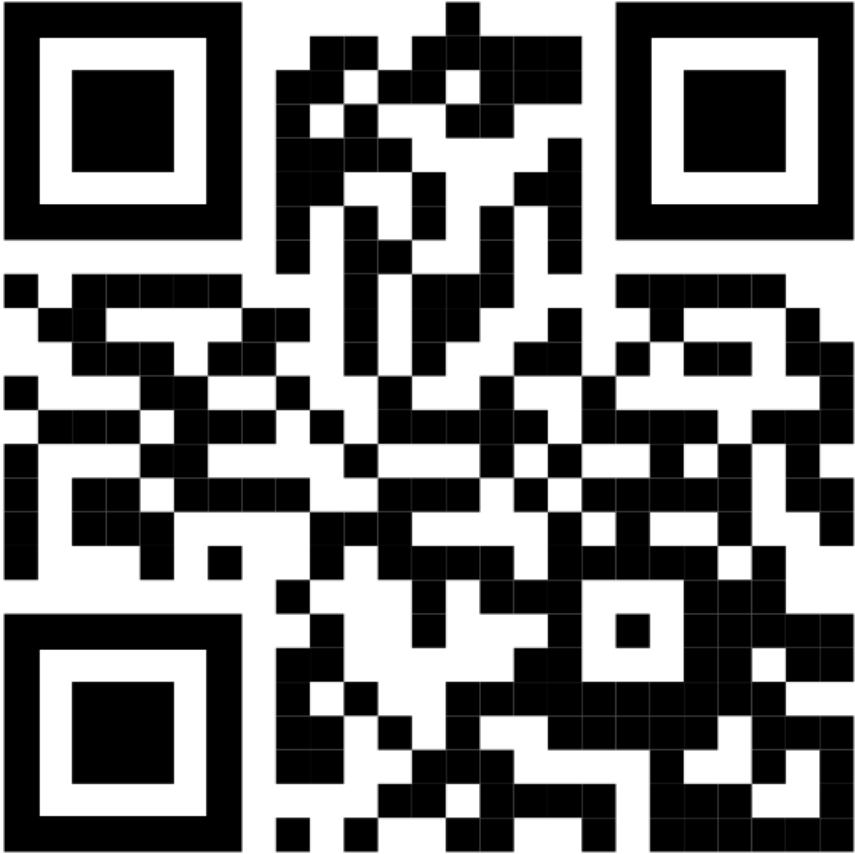
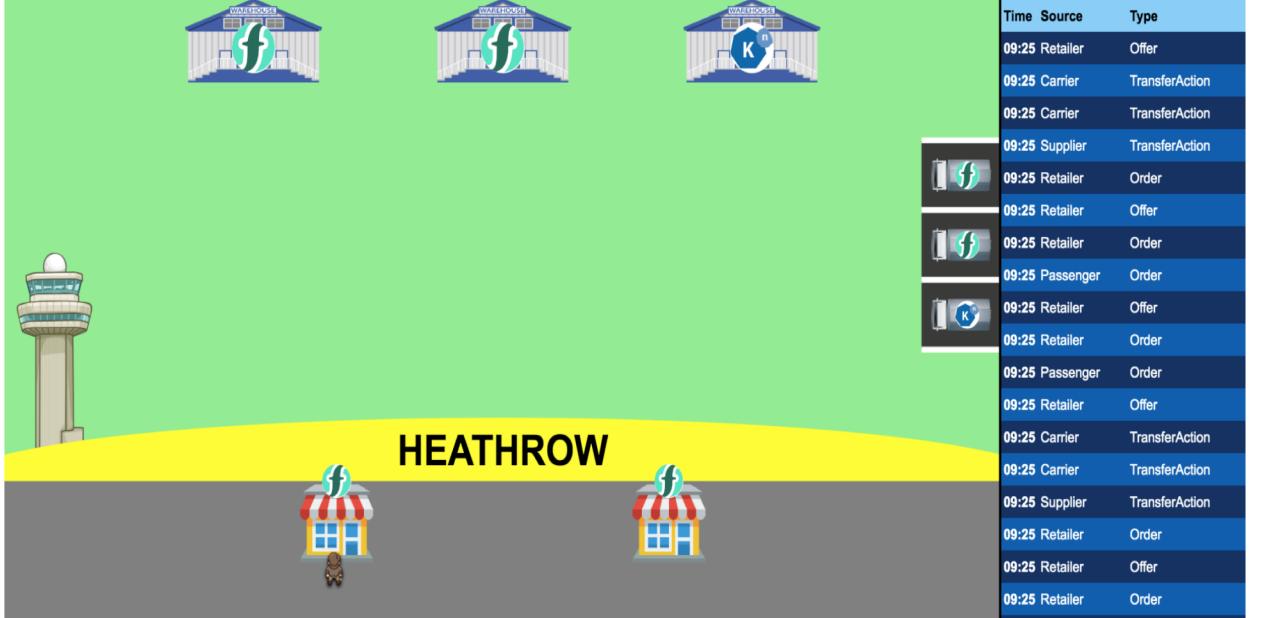
Demo: ACRIS Semantic Model

“The Semantic Model, coupled with the CloudEvents format, can support interoperable, event-driven systems that can re-act intelligently to real-time state changes such as an aircraft landing or fulfilled order. With the use of event brokers, edge-to-cloud computing and AI, these events can be detected faster and analyzed in greater detail.”

**Segun Alayande
Heathrow Airport**



CloudEvents: Airport Coffee



<http://srcdog.com/airport>



Thank You!

Serverless WG : <https://github.com/cncf/wg-serverless>

CloudEvents : <https://cloudevents.io/>

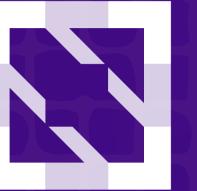
- Org : <https://github.com/cloudevents>
- Spec repo : <https://github.com/cloudevents/spec>
- SDKs : <https://github.com/cloudevents/sdk-...>
- [Weekly calls](#) (Thursdays at 12pm ET)

CNCF Serverless WG Session: Today 16:00 - 16:35 - this room

Questions?



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