Experts

Discovering CloudEvents with Cloud Run

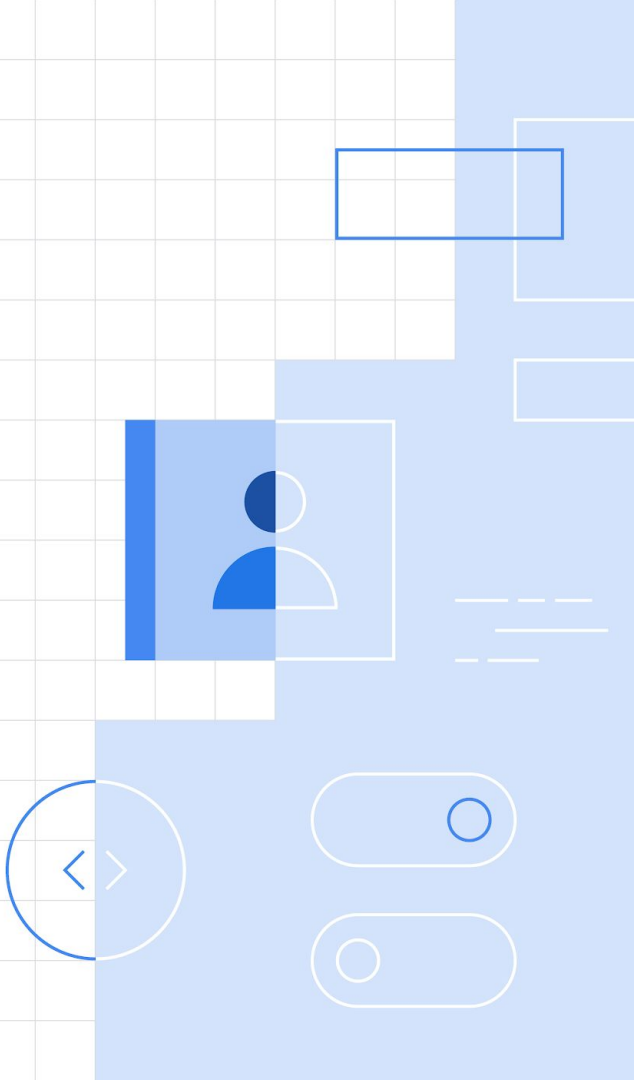
Cloud Run Week

Thursday 11th March 2021

GDG Cloud Nantes

GDG Cloud Abidjan

Google Developers



Experts

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CTO Group - Zenika

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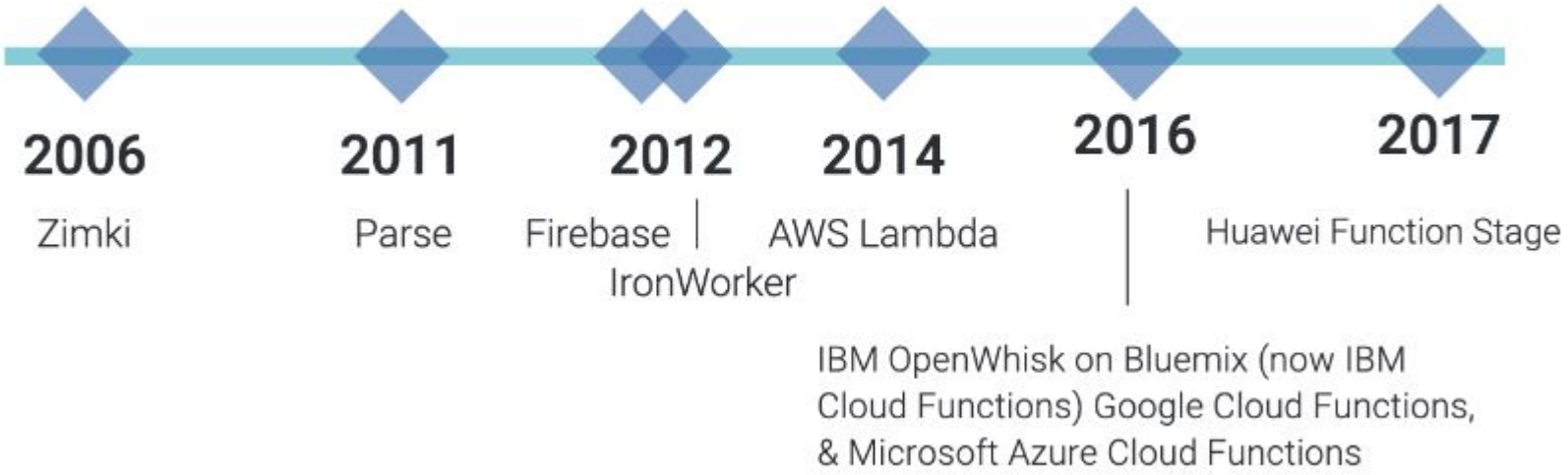
Back to the future...

Serverless, just a buzzword? 🤔

Experts

https://youtu.be/P8pCWhPl9B4

A short history of serverless technology



https://github.com/cncf/wg-serverless/blob/master/whitepapers/serverless-overview/cncf_serverless_whitepaper_v1.0.pdf

Serverless definition

Serverless computing refers to the concept of building and running applications that **do not require server management**. It describes a finer-grained deployment model where **applications, bundled as one or more functions**, are uploaded to a platform and then **executed, scaled, and billed in response to the exact demand needed at the moment**.

https://github.com/cncf/wg-serverless/tree/master/whitepapers/serverless-overview

Serverless in 2021

https://landscape.cncf.io/serverless

The following example shows the structure of the JSON message. This example shows *version 2.2* of the event message JSON structure, which is the version that Amazon S3 currently uses.

```
{
   "Records":[
      {
         "eventVersion":"2.2",
         "eventSource":"aws:s3",
         "awsRegion":"us-west-2",
         "eventTime":"The time, in ISO-8601 format, for example, 1970-01-01T00
         "eventName":"event-type",
         "userIdentity":{
            "principalId":"Amazon-customer-ID-of-the-user-who-caused-the-event
         },
         "requestParameters":{
            "sourceIPAddress":"ip-address-where-request-came-from"
         },
         "responseElements":{
            "x-amz-request-id":"Amazon S3 generated request ID",
            "x-amz-id-2":"Amazon S3 host that processed the request"
         },
         "s3":{
            "s3SchemaVersion":"1.0",
            "configurationId":"ID found in the bucket notification configurati
            "bucket":{
               "name":"bucket-name",
               "ownerIdentity":{
                  "principalId":"Amazon-customer-ID-of-the-bucket-owner"
               },
               "arn":"bucket-ARN"
            },
            "object":{
               "key":"object-key",
               "size":"object-size",
               "eTag":"object eTag",
               "versionId":"object version if bucket is versioning-enabled, ot
               "sequencer": "a string representation of a hexadecimal value us
            }
         },
         "glacierEventData": {
            "restoreEventData": {
               "lifecycleRestorationExpiryTime": "The time, in ISO-8601 format
               "lifecycleRestoreStorageClass": "Source storage class for resto
```

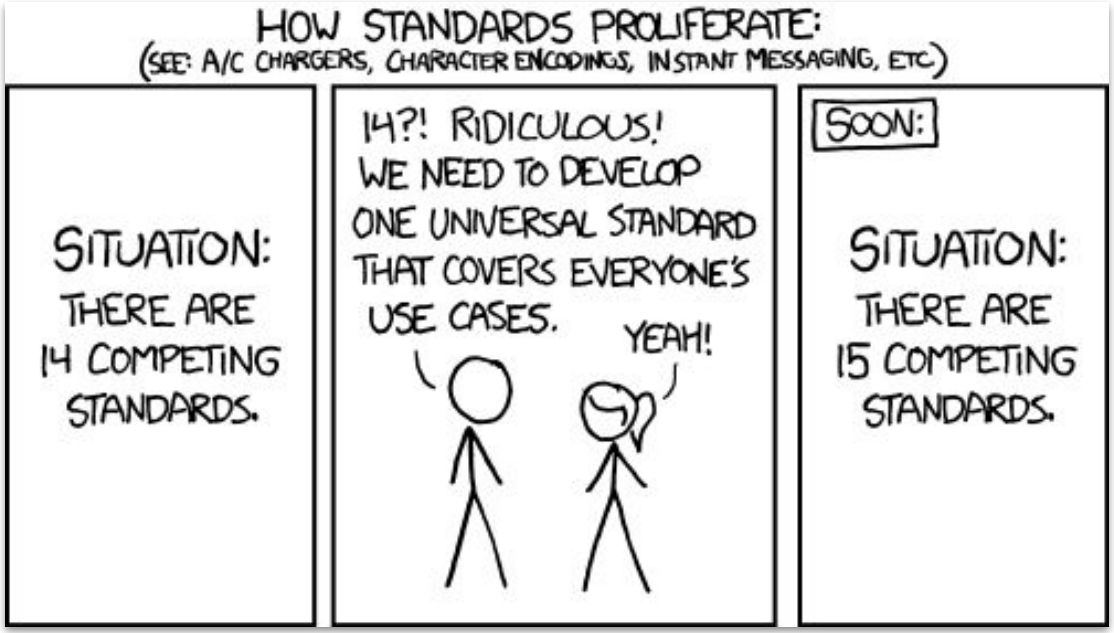
AWS

Resource representations

```
{
  "kind": "storage#object",
  "id": string,
  "selfLink": string,
  "name": string,
  "bucket": string,
  "generation": long,
  "metageneration": long,
  "contentType": string,
  "timeCreated": datetime,
  "updated": datetime,
  "customTime": datetime,
  "timeDeleted": datetime,
  "temporaryHold": boolean,
  "eventBasedHold": boolean,
  "retentionExpirationTime": datetime,
  "storageClass": string,
  "timeStorageClassUpdated": datetime,
  "size": unsigned long,
  "md5Hash": string,
  "mediaLink": string,
  "contentEncoding": string,
  "contentDisposition": string,
  "contentLanguage": string,
```

GCP

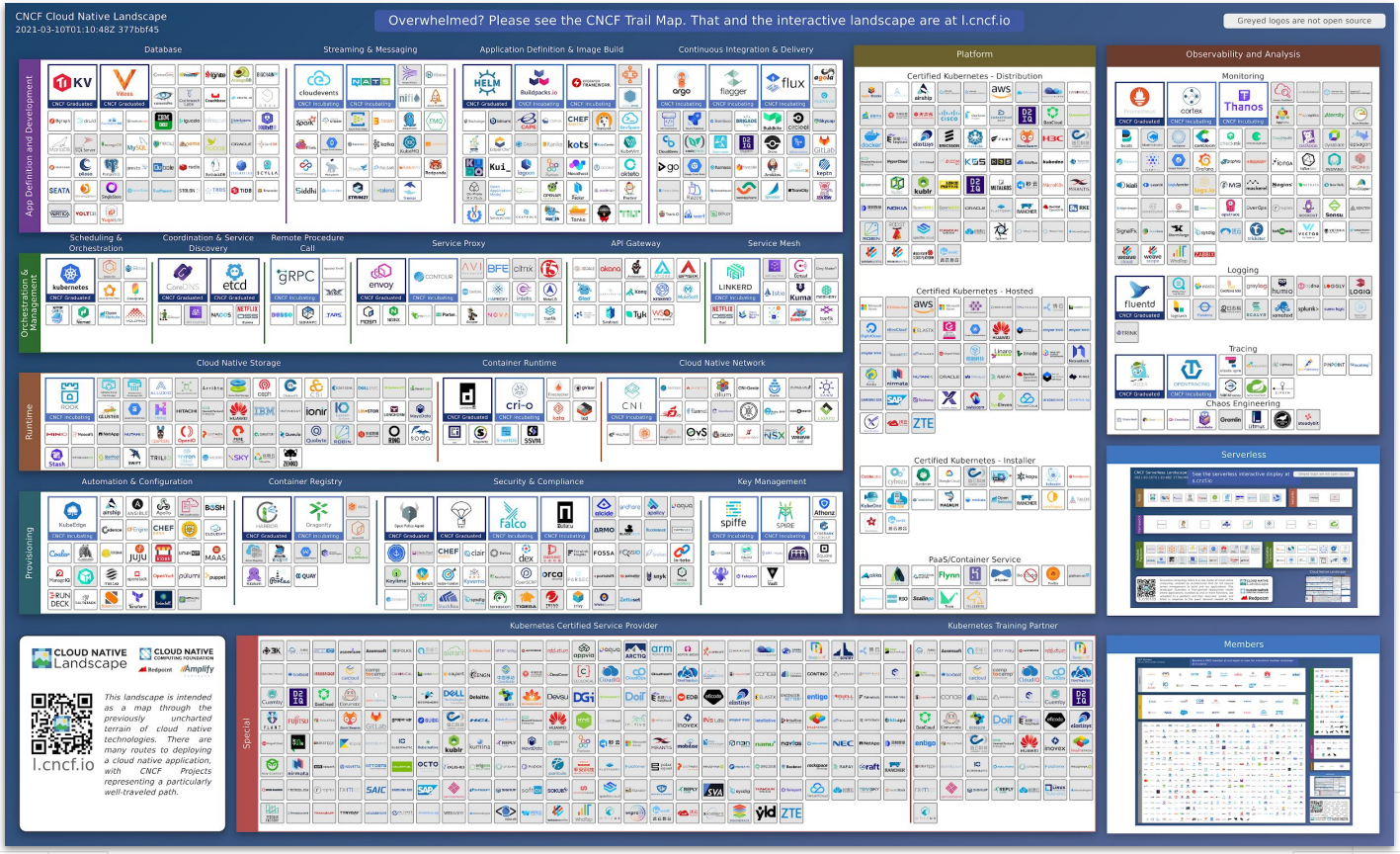
Property name	Value	Description	Notes
`acl[]`	`list`	Access controls on the object, containing one or more objectAccessControls Resources. Only requests that use the `"projection=full"` query parameter return this field in the response. If `iamConfiguration.uniformBucketLevelAccess.enabled` is set to `true`, this field does not apply, and requests that specify it fail.	writable
`bucket`	`string`	The name of the bucket containing this object.	
`cacheControl`	`string`	Cache-Control directive for the object data. If omitted, and the object is accessible to all anonymous users, the default will be `"public, max-age=3600"`.	writable



https://xkcd.com/927/

CLOUD NATIVE
COMPUTING FOUNDATION

https://www.cncf.io/


CNCF Cloud Native Landscape
2021-03-10T01:10:48Z 377bbf45
Overwhelmed? Please see the CNCF Trail Map. That and the interactive landscape are at l.cncf.io
Greyed logos are not open source
App Definition and Development
Database
Streaming & Messaging
Application Definition & Image Build
Continuous Integration & Delivery
Orchestration & Management
Scheduling & Orchestration
Coordination & Service Discovery
Remote Procedure Call
Service Proxy
API Gateway
Service Mesh
Runtime
Cloud Native Storage
Container Runtime
Cloud Native Network
Provisioning
Automation & Configuration
Container Registry
Security & Compliance
Key Management
Platform
Certified Kubernetes - Distribution
Certified Kubernetes - Hosted
Certified Kubernetes - Installer
PaaS/Container Service
Observability and Analysis
Monitoring
Logging
Tracing
Chaos Engineering
Serverless
Members
Kubernetes Certified Service Provider
Kubernetes Training Partner
Special
CLOUD NATIVE Landscape
CLOUD NATIVE COMPUTING FOUNDATION
Redpoint
Amplify
l.cncf.io
This landscape is intended as a map through the previously uncharted terrain of cloud native technologies. There are many routes to deploying a cloud native application, with CNCF Projects representing a particularly well-traveled path.

CNCF Serverless WG

The original intent of the CNCF Serverless Working Group was to explore the intersection of cloud native and serverless technology. As a result of that work the following artifacts were produced:

- A Serverless Overview Whitepaper
- Landscape

Since then the CNCF TOC agreed to have the working group continue its work and develop the CloudEvents specification. That work is being done in a separate github repo: CloudEvents.

https://github.com/cncf/wg-serverless

cloudevents

https://cloudevents.io/

#Microservice
#Container
#Event-Driven

“Events are everywhere, yet event publishers tend to describe events differently.

Value proposition

- Normalizing Events Across Services & Platforms
- Facilitating Integrations Across Services & Platforms
- Increasing Portability of Functions-as-a-Service
- Improving Development & Testing of Event-Driven/Serverless Architectures
- Event Data Evolution
- Normalizing Webhooks
- Event Tracing / Event Correlation

Disclaimer : Do not try to specify any principle of Authorization, Data Integrity and Confidentiality

https://github.com/cloudevents/spec/blob/master/primer.md

Minimal metadata

- **Cloud Events spec version**
- **Type**
- **Source**
- **ID**
- Subject
- Time
- Data Content Type
- Content Encoding
- <Extensions>

```
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"
}
```

https://github.com/cloudevents/spec/blob/v1.0.1/spec.md

Transport

- Transport Bindings for Http, Kafka, NATS, AMQP, MQTT, Websocket **NEW!**
- Message size of 64KB
- Binary or text payload: JSON, AVRO or Protobuf
- No Sensitive information in the context attributes
- Domain specific event data SHOULD be encrypted

1.5. CloudEvents Subprotocols

This specification maps a WebSocket subprotocol to each defined event format in the CloudEvents specification, following the guidelines discussed in the RFC6455. For each subprotocol, senders MUST use the specified WebSocket frame type:

Subprotocol	Event format	Frame Type
`cloudevents.json`	JSON event format	Text
`cloudevents.avro`	AVRO event format	Binary
`cloudevents.proto`	Protobuf event format	Binary

Integrations

Google Cloud Eventarc

Eventarc is a managed infrastructure that allows you to build event-driven architectures with loosely coupled services that react to state changes.

Knative Eventing

All event data produced and consumed by Knative Eventing services is CloudEvents compliant

Alibaba Cloud EventBridge

A serverless event bus that receives CloudEvents compliant events from cloud services, SaaS/custom apps, and routes to various targets

Azure Event Grid

Event Grid natively supports events in the JSON implementation of CloudEvents v1.0 and the HTTP protocol binding

Debezium

Debezium, a distributed open-source change data capture platform, can emit change data events in the CloudEvents format

Tekton Pipelines

Tekton is a cloud native framework for creating CI/CD systems that can emit cloud events as pipelines and tasks execute.

OpenFaaS

CloudEvent events are one of the many available triggers for OpenFaaS functions

Falco

Falco is a threat detection engine for Kubernetes that can emit cloud events for security policy violations at runtime.

Oracle Cloud

The Oracle Cloud Infrastructure Events service implements CloudEvents

Demo 🤞

Google Cloud Focus

Google Cloud Serverless compute

Cloud Functions

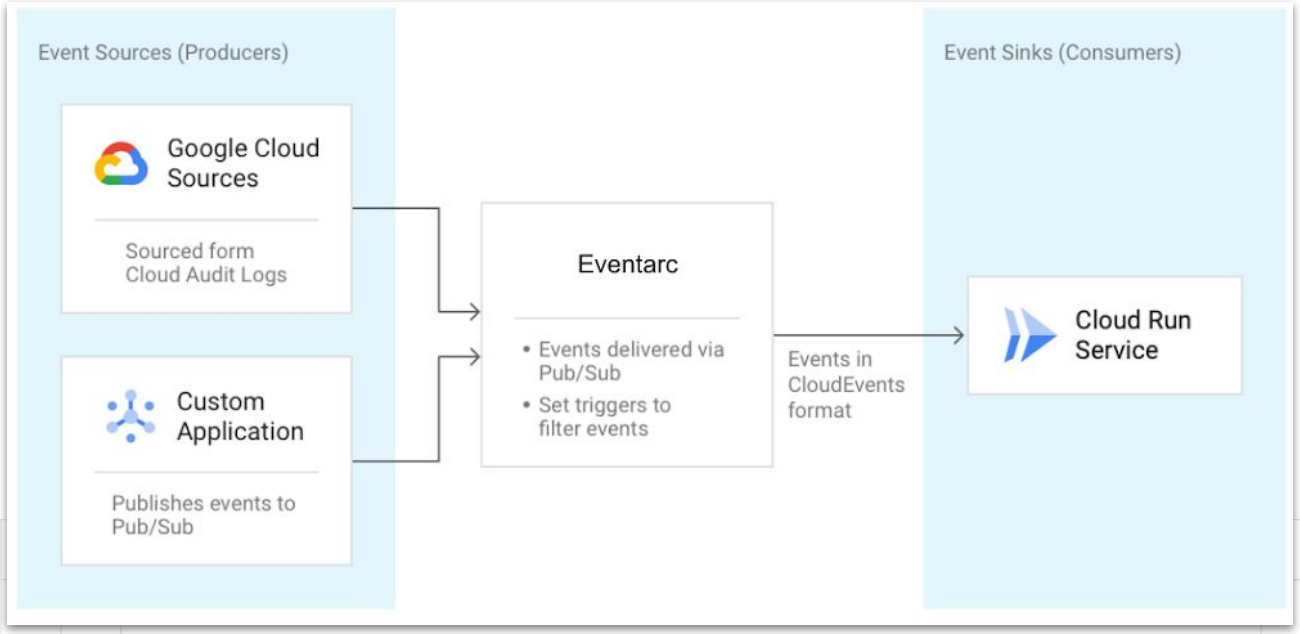
App Engine

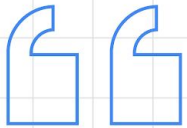
Cloud Run

Eventarc A unified eventing experience

How does it work?

- More than 60 sources, based on Cloud Audit Logs



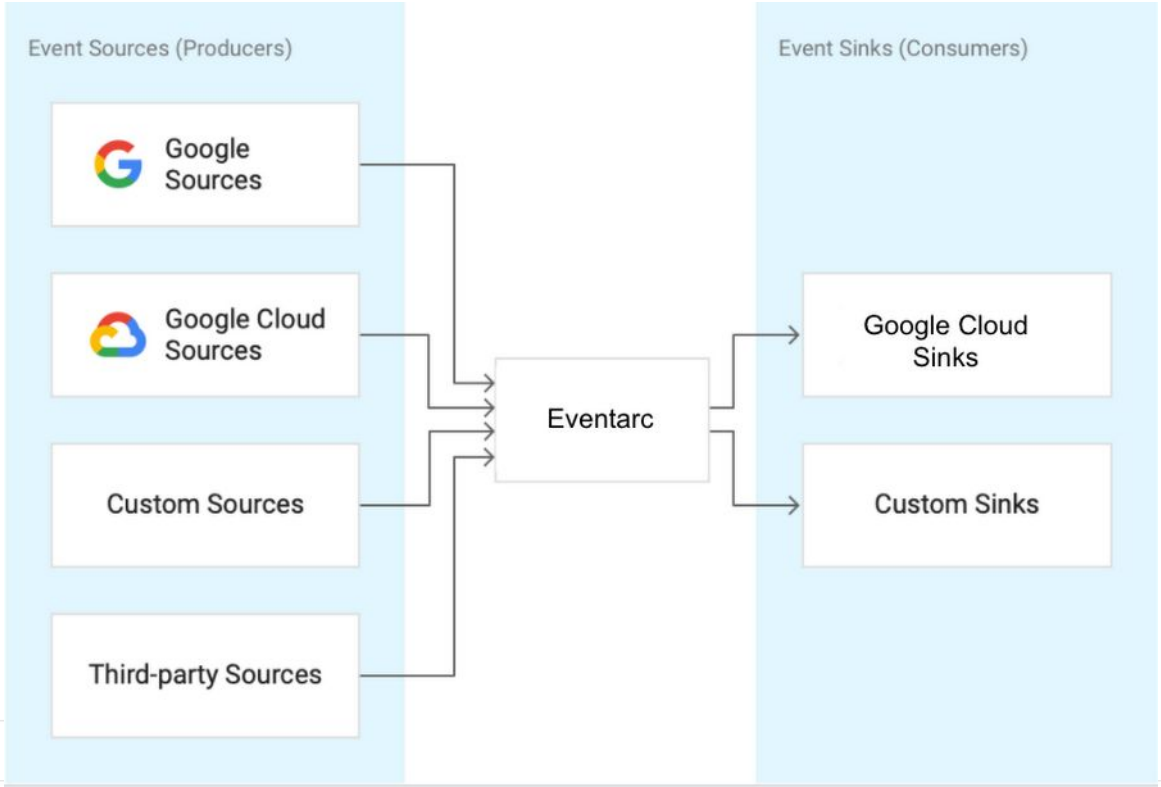


“Eventarc provides an easier path to receive events. You don’t have to worry about the underlying infrastructure with Eventarc. It is a managed service with no clusters to set up or maintain. ”

Mete Atamel, Developer Advocate Google Cloud

January 15, 2021

Long-term Vision



Demo 🤞

Our point of view

- Open Source Standard but quite new...
- CNCF healthy project: Spec (format & protocol) + SDKs + Integrations
- Good idea to define connectors (source & sink)
- Interoperable (supported by Knative/eventing)
- Superior Dev Experience thanks to a predictable format message
- Decouple apps (from infrastructure and configuration)
- Discoverability of event sources

Next steps

- 👍 No longer lock-in with the supported trigger
- 😱 No news from AWS in this project

  “It is very similar to AWS’s CloudWatch Events functionality”
- 💪 Wide range of usage (Kafka, AMQP, Webhook)
- 🤔 Future of the Working Group
- 🚧 New goal: get a global vision of our event-driven system thanks to Workflow https://github.com/serverlessworkflow/specification/

Experts

Thank You!

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