Open Infra Days
2018 - Korea

CloudEvents – Describing Events

이벤트 데이터 형식을 정의하는 새로운 표준

KOREA
OpenInfra Days

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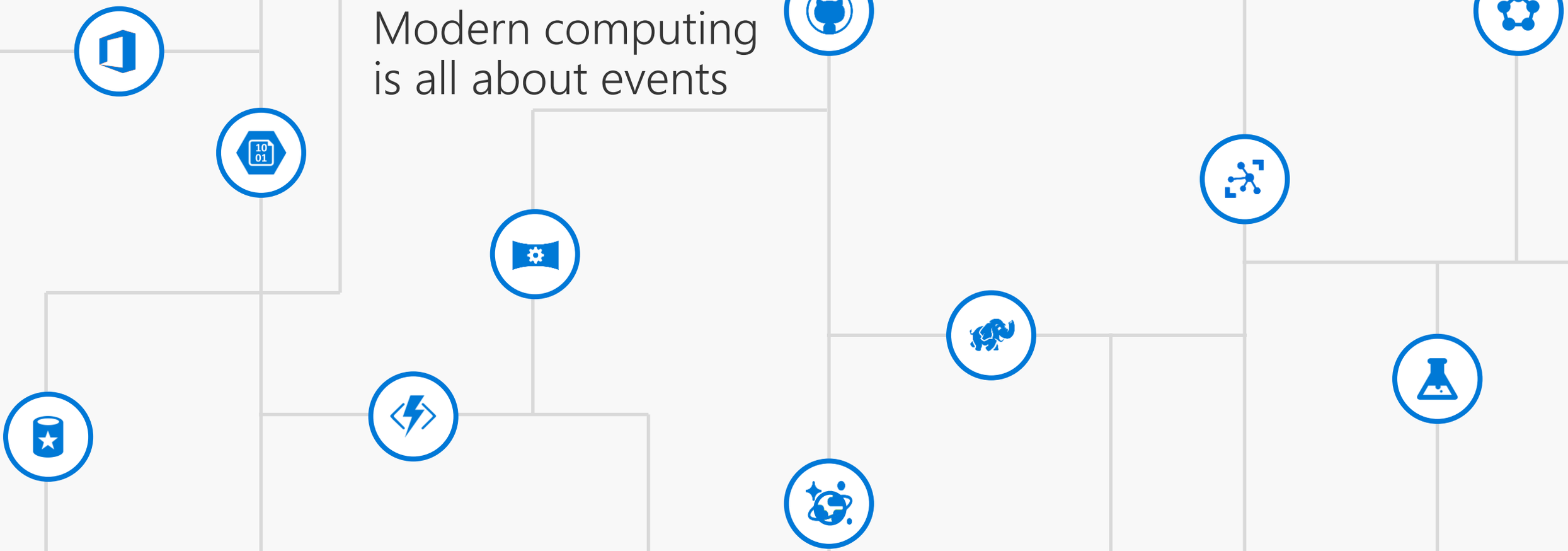
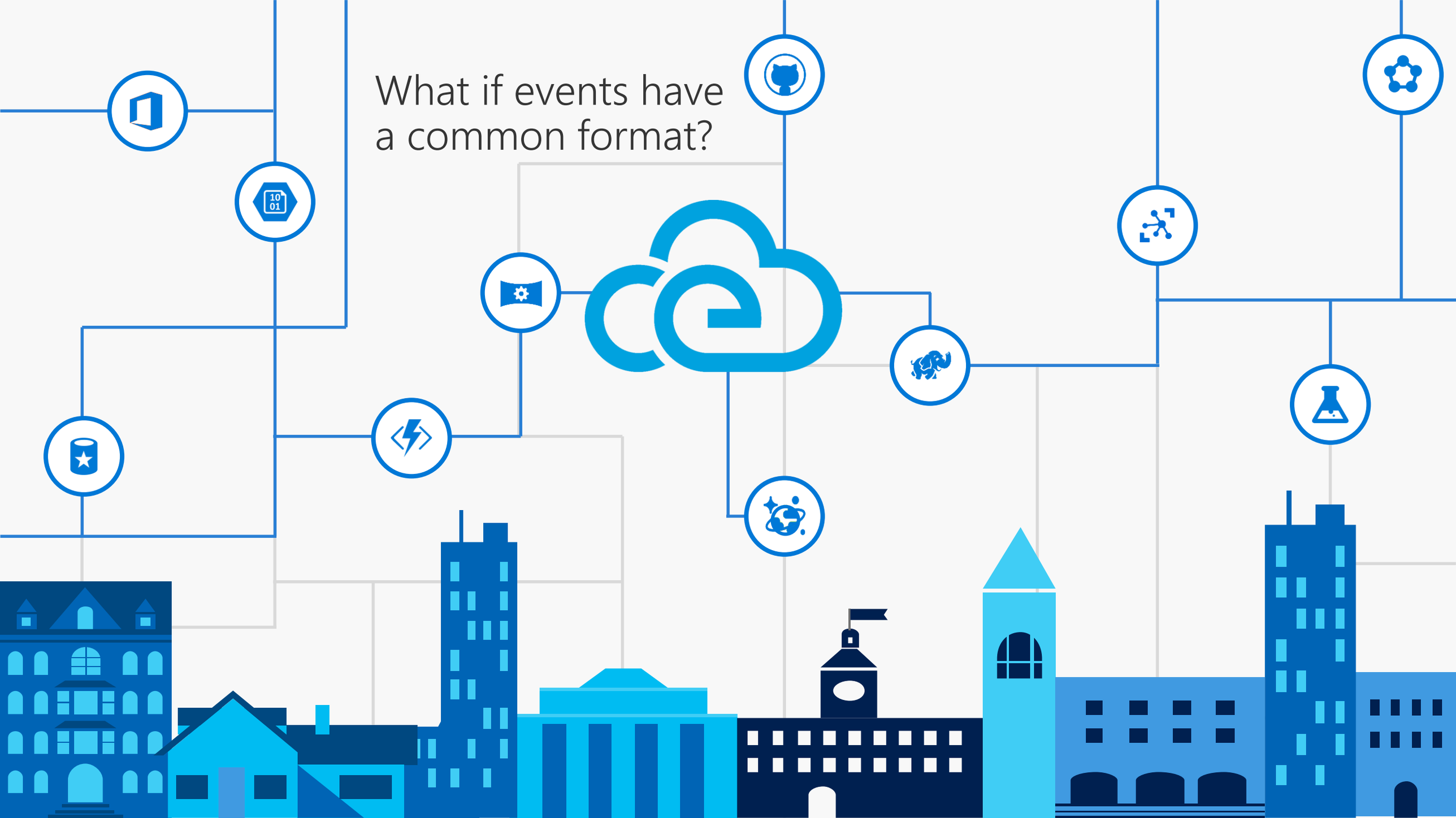
Modern computing is all about events



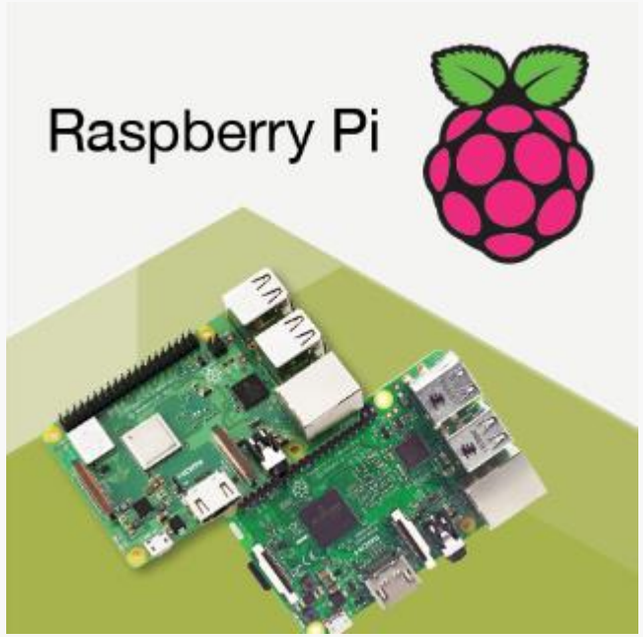
Managing events is important but cumbersome


What if events have
a common format?

CloudEvents

A Common Way Describing Events

Use Cases



```
{
  "temperature": 24,
  "room": 503,
  "floor": 16,
  "building": "blue"
}
```

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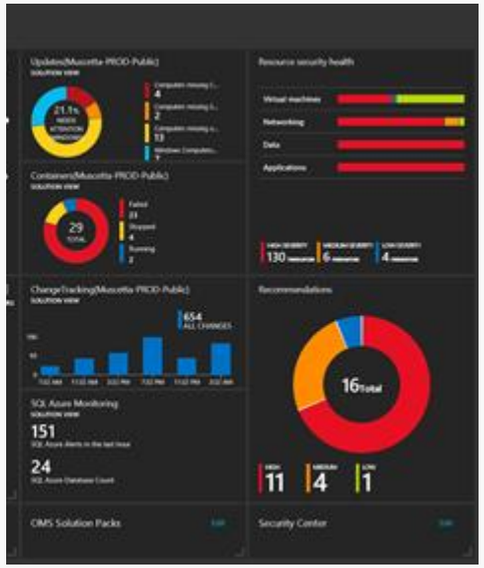
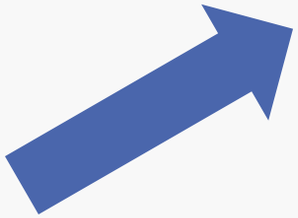
{
  "temperature": 24,
  "room": 503,
  "floor": 16,
  "building": "blue"
}
```





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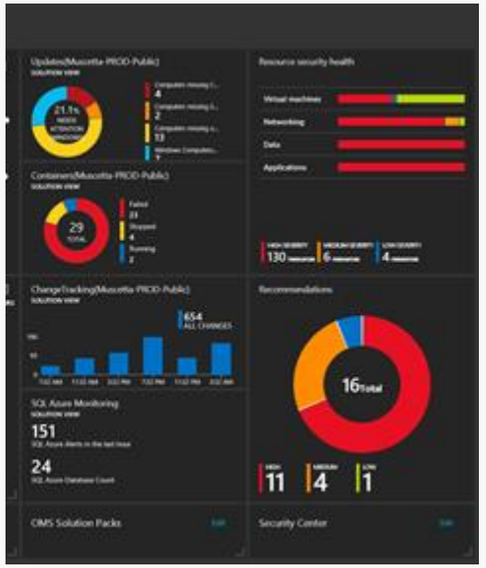
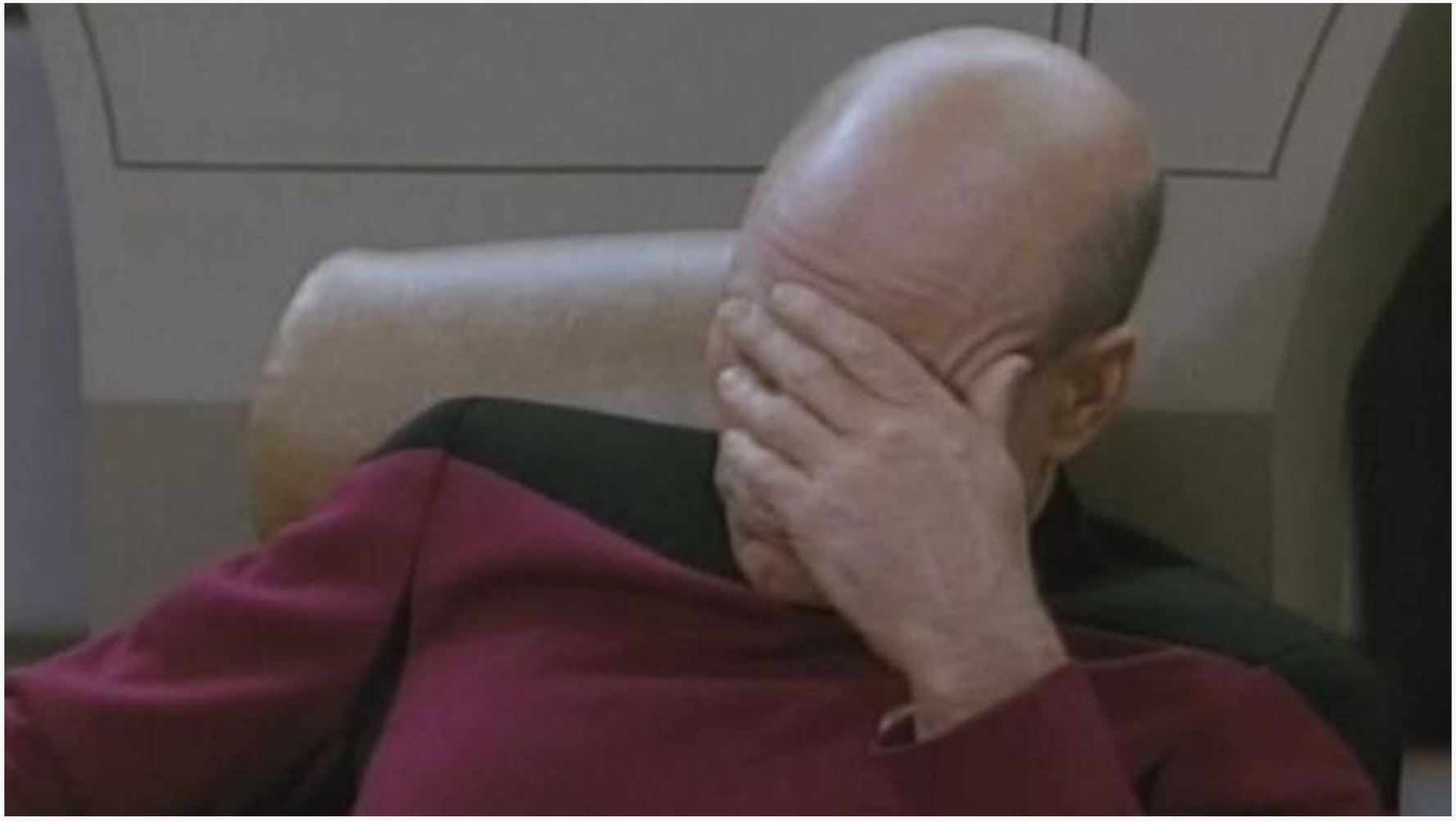
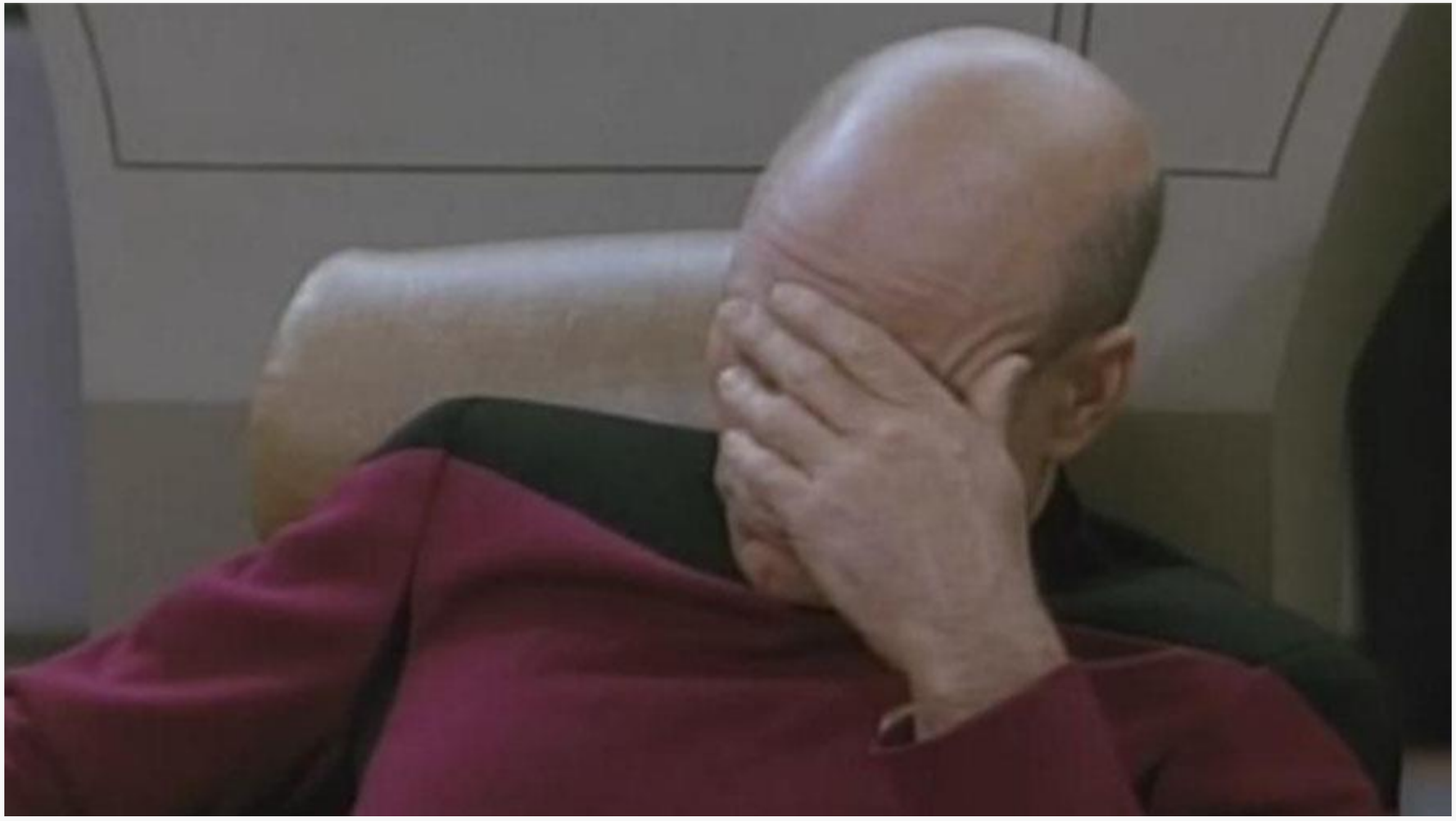


Each Event Source Has Its Own Format

```
function getLambdaEventSource(event) {
    if (event.Records && event.Records[0].cf) return 'isCloudfront';
    if (event.configRuleId && event.configRuleName && event.configRuleArn) return 'isAwsConfig';
    if (event.Records && (event.Records[0].eventSource === 'aws:codecommit')) return 'isCodeCommit';
    if (event.authorizationToken === "incoming-client-token") return 'isApiGatewayAuthorizer';
    if (event.StackId && event.RequestType && event.ResourceType) return 'isCloudFormation';
    if (event.Records && (event.Records[0].eventSource === 'aws:ses')) return 'isSes';
    if (event.pathParameters && event.pathParameters.proxy) return 'isApiGatewayAwsProxy';
    if (event.source === 'aws.events') return 'isScheduledEvent';
    if (event.awslogs && event.awslogs.data) return 'isCloudWatchLogs';
    if (event.Records && (event.Records[0].EventSource === 'aws:sns')) return 'isSns';
    if (event.Records && (event.Records[0].eventSource === 'aws:dynamodb')) return 'isDynamoDb';
    if (event.records && event.records[0].approximateArrivalTimestamp) return 'isKinesisFirehose';
    if (event.records && event.deliveryStreamArn && event.deliveryStreamArn.startsWith('arn:aws:kinesis:'))
return 'isKinesisFirehose';
    if (event.eventType === 'SyncTrigger' && event.identityId && event.identityPoolId) return
'isCognitoSyncTrigger';
    if (event.Records && event.Records[0].eventSource === 'aws:kinesis') return 'isKinesis';
    if (event.Records && event.Records[0].eventSource === 'aws:s3') return 'isS3';
    if (event.operation && event.message) return 'isMobileBackend';
}
```



New Event Type?



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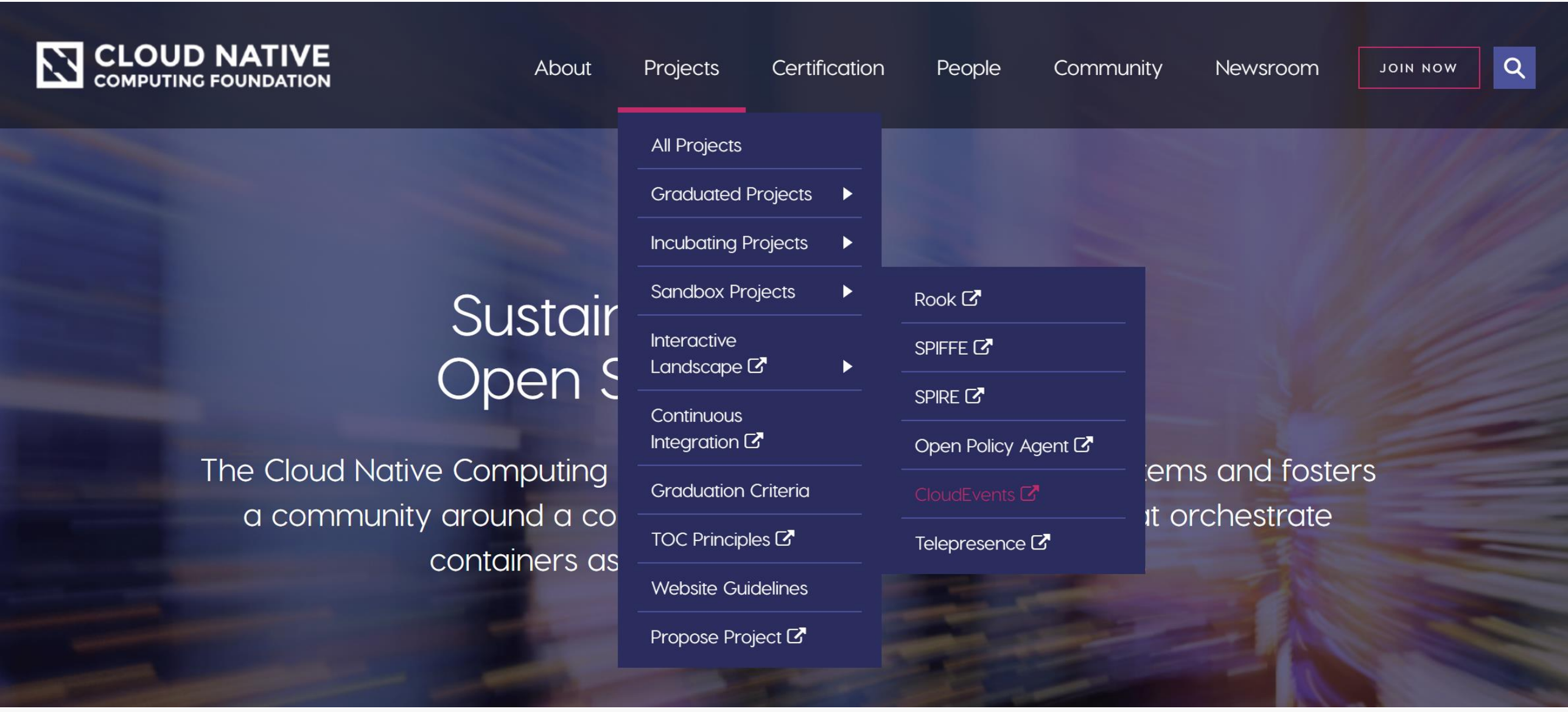

CLOUD NATIVE
COMPUTING FOUNDATION
About
Projects
Certification
People
Community
Newsroom
JOIN NOW
All Projects
Graduated Projects
Incubating Projects
Sandbox Projects
Interactive Landscape
Continuous Integration
Graduation Criteria
TOC Principles
Website Guidelines
Propose Project
Rook
SPIFFE
SPIRE
Open Policy Agent
CloudEvents
Telepresence
Sustain
Open S
The Cloud Native Computing
a community around a co
containers as
ems and fosters
t orchestrate

CNCF Serverless WG

github.com/cloudevents/spec

cloudevents / spec

Watch 82 | Unstar 442 | Fork 73

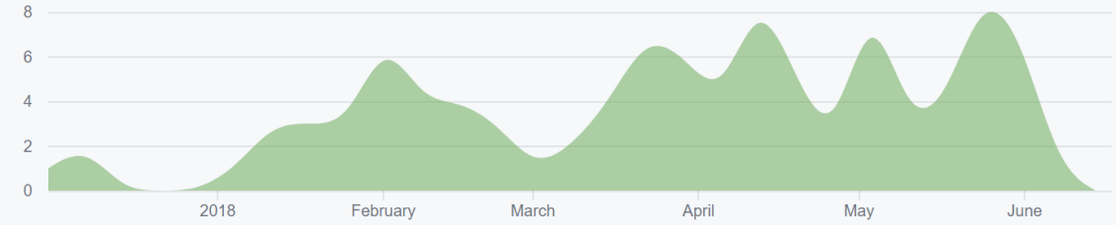
Code | Issues 31 | Pull requests 12 | Projects 0 | Insights

- Pulse
- **Contributors**
- Community
- Commits
- Code frequency
- Dependency graph
- Network
- Forks

Dec 3, 2017 – Jun 20, 2018

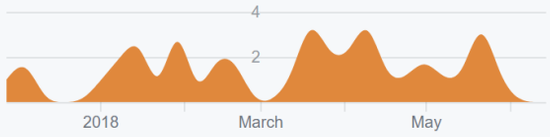
Contributions: Commits

Contributions to master, excluding merge commits



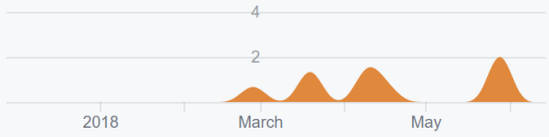
duglin #1

41 commits 2,110 ++ 640 --



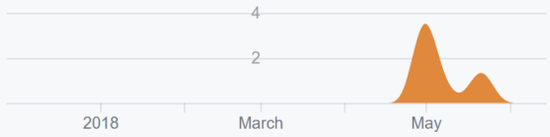
clemensv #2

9 commits 1,186 ++ 96 --



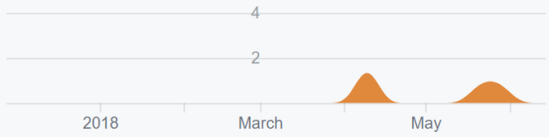
justinyoo #3

8 commits 30 ++ 20 --



inlined #4

4 commits 49 ++ 19 --



Version 0.1

Common Metadata

Flexible Event Semantics

Mappable to Various Encodings

Delivered over Various Protocols

Anatomy of Event

발생(發生) / 발현(發現)

A signal raised by a system
A signal observed by a system

State change
Timer elapsing
Any noticeable activity

Occurrence

발생(發生) / 발현(發現)

A signal raised by a system
A signal observed by a system

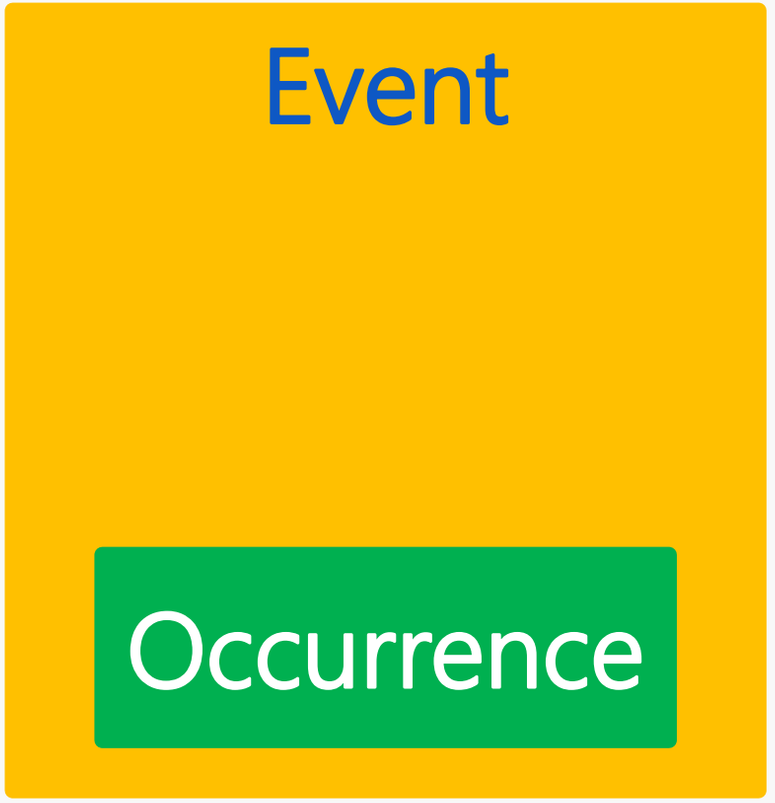
State change
Timer elapsing
Any noticeable activity

Battery is low
VM is about to reboot

Occurrence

Data record

To express Occurrence
Provided to interested parties
No destination information



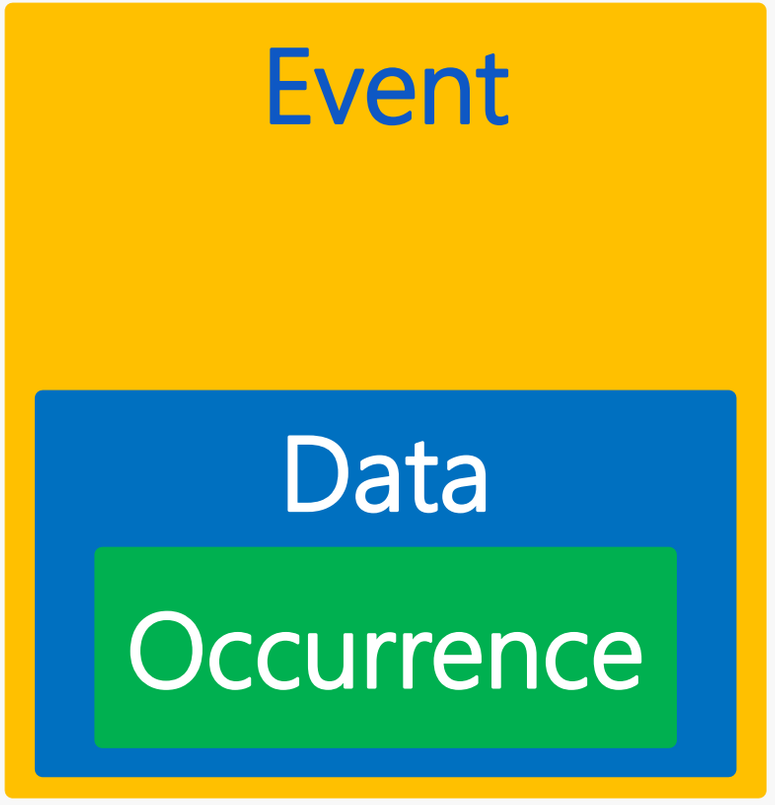
Data record

To express Occurrence

Provided to interested parties

No destination information

Domain specific information about occurrence



Data record

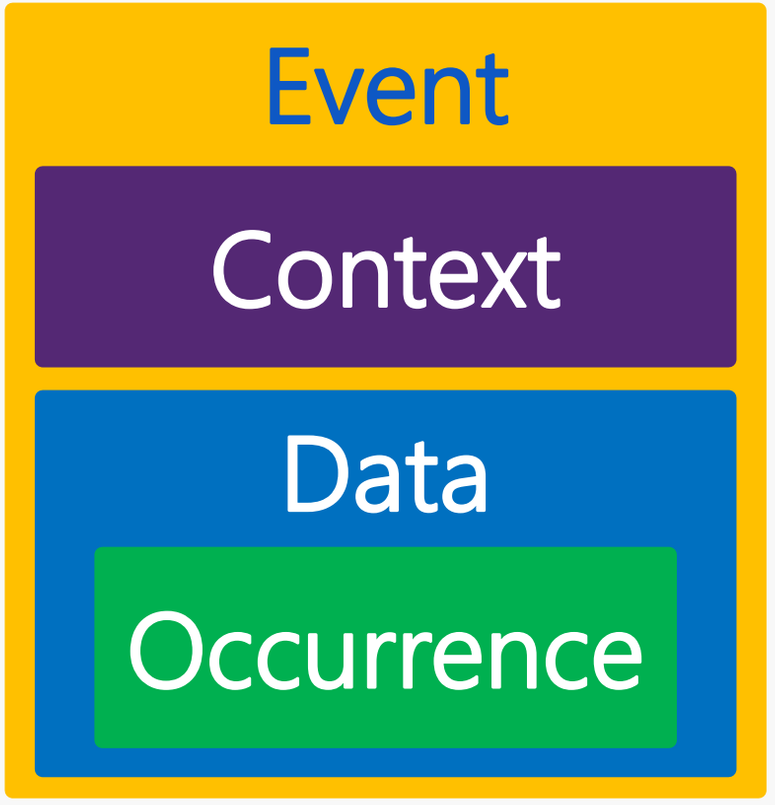
To express Occurrence

Provided to interested parties

No destination information

Domain specific information about occurrence

Metadata around occurrence



Data record

To express Occurrence

Provided to interested parties

No destination information

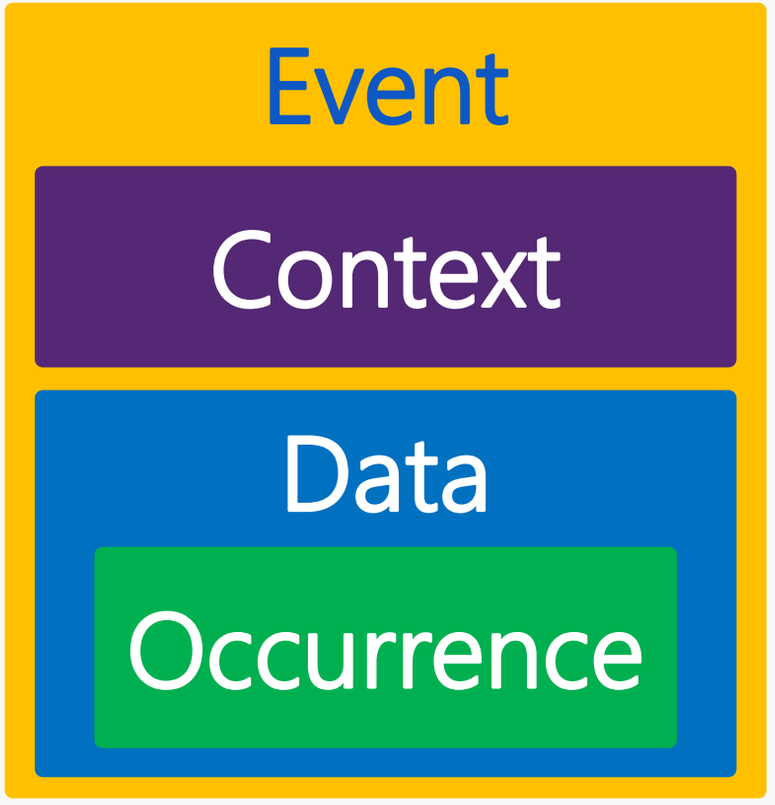
Domain specific information about occurrence

Metadata around occurrence

Where it is from

When it happened

What it is



Transportation from source to destination

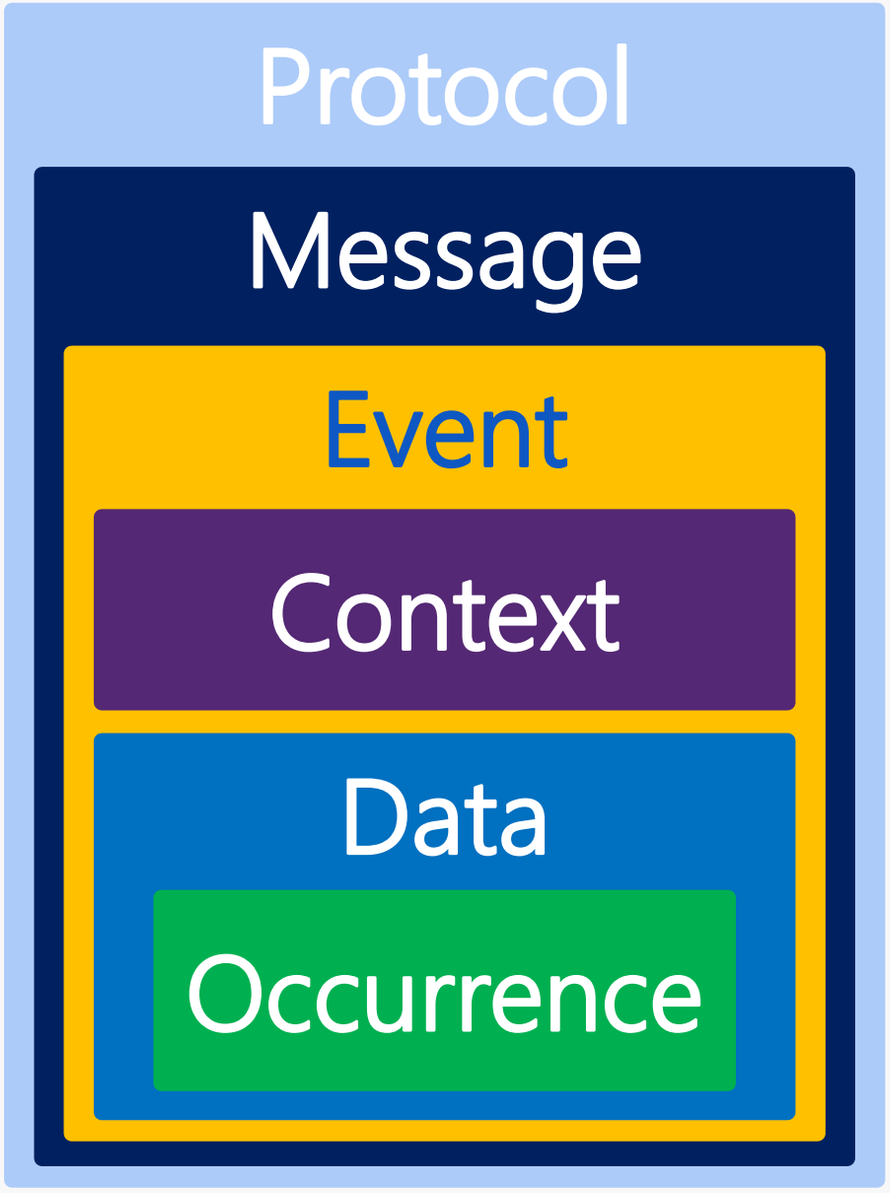
Encoded to

- JSON
- Avro
- Protobuf
- etc

Message delivery

Industry standard

HTTP, MQTT, AMQP, SMTP



Message delivery

Industry standard

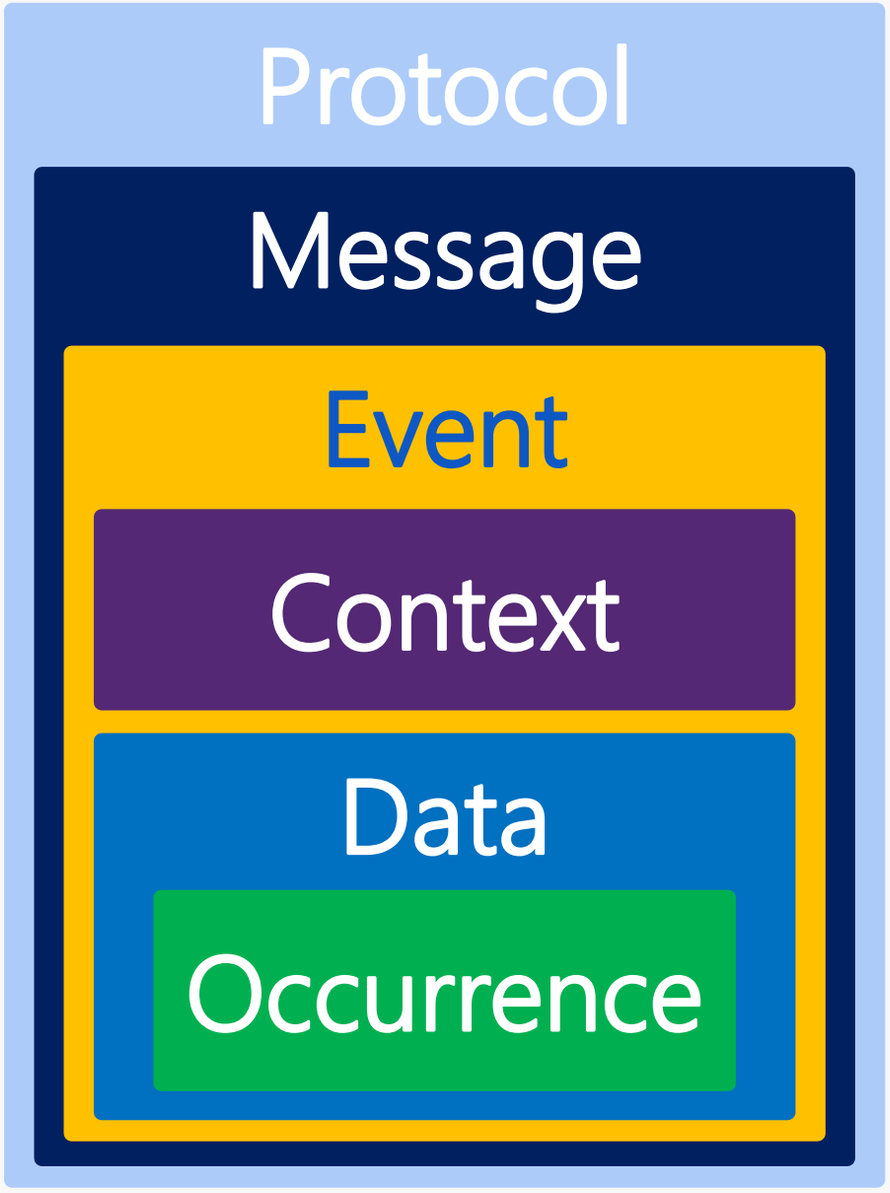
HTTP, MQTT, AMQP, SMTP

Open-source

Kafka, NATS

Vendor-specific

AWS Kinesis, Azure Event Grid



How It Looks Like…

```
{
  "cloudEventsVersion": "0.1",
  "eventType": "com.example.someevent",
  "eventTypeVersion": "1.0",
  "source": "/mycontext",
  "eventID": "A234-1234-1234",
  "eventTime": "2018-06-28T13:20:00Z",
  "extensions": {
    "comExampleExtension": "value"
  },
  "contentType": "application/json",
  "data": {
    "exampleKey": "value"
  }
}
```

Context

Data

```
{
  "cloudEventsVersion": "0.1",
  "eventType": "com.example.someevent",
  "eventTypeVersion": "1.0",
  "source": "/mycontext",
  "eventID": "A234-1234-1234",
  "eventTime": "2018-06-28T13:20:00Z",
  "extensions": {
    "comExampleExtension": "value"
  },
  "contentType": "text/xml",
  "data": "<node \"type\"=\"number\" />"
}
```

Context

Data

{
"cloudEventsVersion": "0.1",
"eventType": "com.example.someevent",
"eventTypeVersion": "1.0",
"source": "/mycontext",
"eventID": "A234-1234-1234",
"eventTime": "2018-06-28T13:20:00Z",
"extensions": {
"comExampleExtension": "value"
},
"contentType": "application/octet-stream",
"data": "T3BlbkluZnJhRGF5cyBLb3JlYSAyMDE4"
}
Context
Data

Transport over HTTP

Request/Response Header

All Context except “extensions”

Prefix of CE-

- CE-EventType
- CE-Source
- etc

“extensions”

Prefix of CE-X-*

Binary Mode

Text or Binary Event

Only Data into Payload

```
{
  "cloudEventsVersion": "0.1",
  "eventType": "com.example.someevent",
  "eventTypeVersion": "1.0",
  "source": "/mycontext",
  "eventID": "A234-1234-1234",
  "eventTime": "2018-06-28T13:20:00Z",
  "extensions": {
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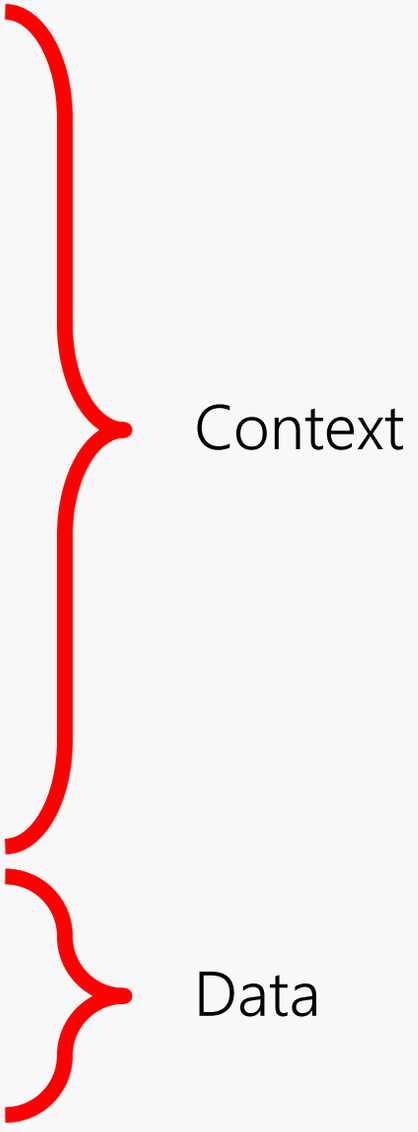
}
```



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"extensions": {
"comExampleExtension": "value"
},
"contentType": "application/octet-stream",
"data": "T3BlbkluZnJhRGF5cyBLb3JlYSAyMDE4"
}
Context
Data

Structured Mode

JSON Object Event

Whole Event into Payload

```
{
  "cloudEventsVersion": "0.1",
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  "eventID": "A234-1234-1234",
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  "extensions": {
    "comExampleExtension": "value"
  },
  "contentType": "application/json",
  "data": {
    "exampleKey": "value"
  }
}
```

Context

Data

Implementations

Open-source Implementations

CloudEvents.NET

github.com/aliencube/CloudEvents.NET

jCloudEvents

github.com/project-streamzi/jcloudevents

Industry Implementations

Azure Event Grid

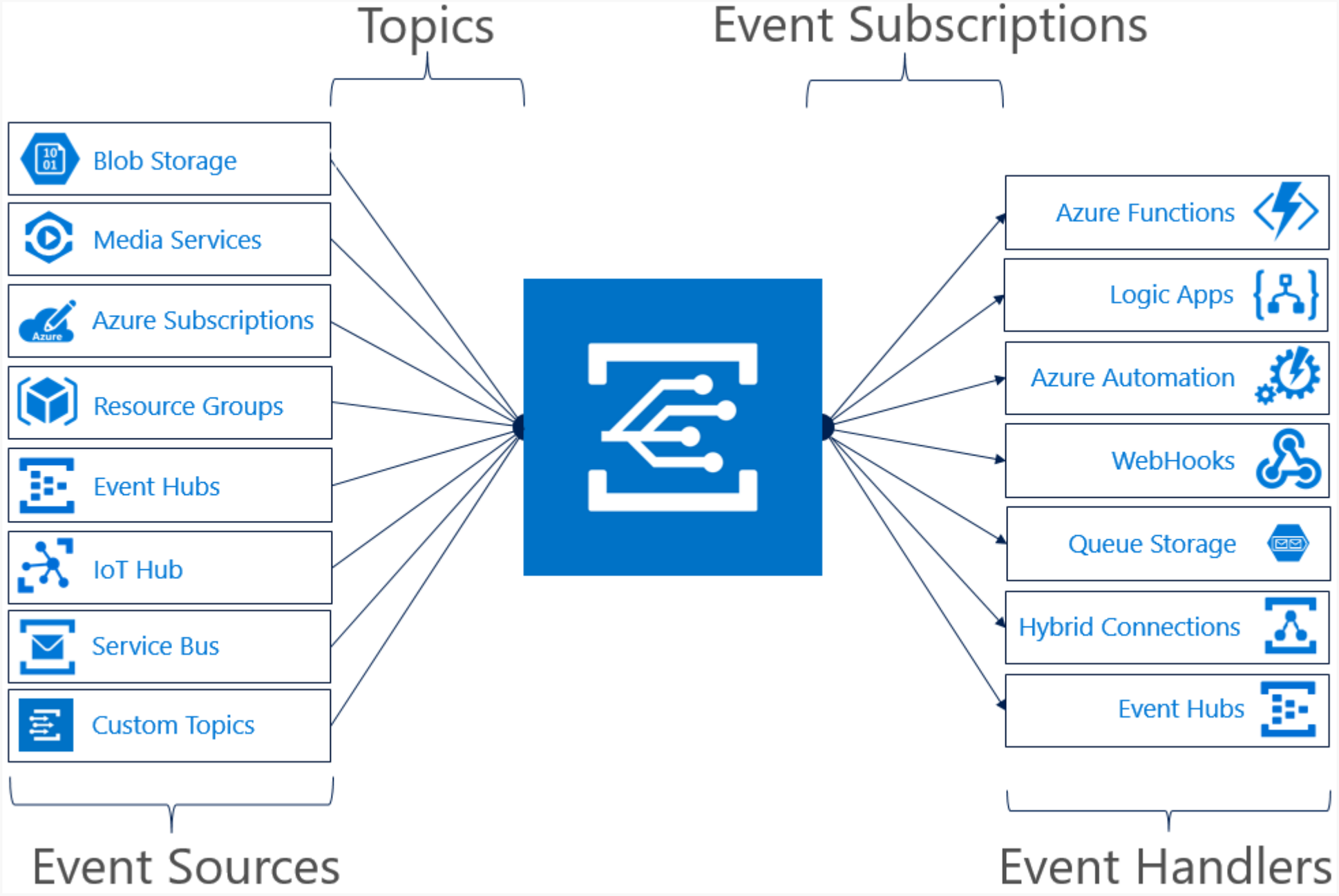
azure.microsoft.com/ko-kr/services/event-grid

Event Gateway

serverless.com/event-gateway

Capturing CloudEvents on Azure Event Grid

Push Mechanism Only


Topics
Event Subscriptions
Blob Storage
Media Services
Azure Subscriptions
Resource Groups
Event Hubs
IoT Hub
Service Bus
Custom Topics
Azure Functions
Logic Apps
Azure Automation
WebHooks
Queue Storage
Hybrid Connections
Event Hubs
Event Sources
Event Handlers

Cloud Native by Design

High Available & Scalable

Near Real-time (< 1s E2E)

Platform Agnostic (Webhook)

Language Agnostic (HTTP)

Serverless Friendly

Demo: Capturing CloudEvents on Azure Event Grid

Blob Storage

Demo: Converting to CloudEvents on Azure Event Grid

GitHub Push

Summary

Summary

What CloudEvents Is

How CloudEvents Looks Like

How CloudEvents Works on Azure Event Grid

How Events to Be Converted to CloudEvents

Questions?

Microsoft Partner
Microsoft
Gold Cloud Platform
Gold Application Integration
Gold Application Development
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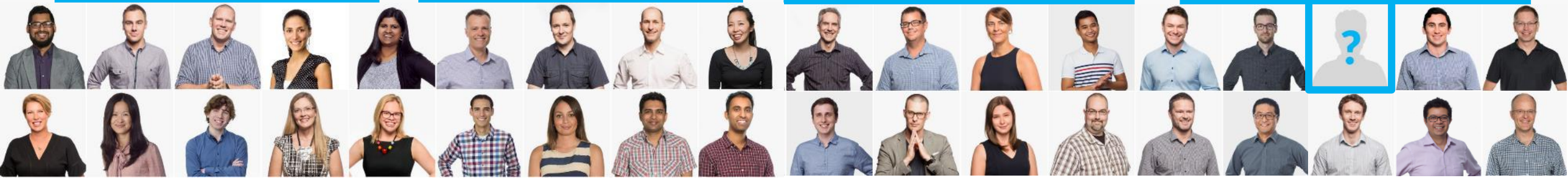

Thank You!

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Microsoft MVP – Azure & Visual Studio

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