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North America 2018

Introduction: CNCF Serverless WG & CloudEvents

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Agenda



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- **Serverless WG Overview**
- **CloudEvents Overview**
- **Demo**
- **SDKs**
- **Status of CloudEvents**
- **Q&A**

Serverless WG Overview



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- **Technical Oversight Committee** initiated (mid-2017)
 - Whitepaper
 - Overview of technology
 - State of ecosystem
 - Recommendations for possible CNCF next steps
 - Landscape
- CloudEvents - Minimal common attributes / shape of events
- Function workflow - orchestration of Functions

CloudEvents Overview



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- Project started Dec 2017
- CNCF Sandbox project approved May 2018
- Specification - minimal/consistent metadata
 - **CloudEvents Spec Version**
 - **Type**
 - **Source**
 - **ID**
 - **Time**
 - **ContentType** of the payload
 - **Schema URL** of the payload
- Transport bindings - how to serialize in JSON, HTTP, MQTT, ...

It's not about data.

It's about metadata !

CloudEvents Example



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HTTP - Binary

```
POST /event HTTP/1.0
Host: example.com
Content-Type: application/json
Ce-Specversion: 0.2
Ce-Type: repo.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": "0.2",
  "type": "repo.newItem",
  "source": "http://bigco.com/repo",
  "id": "610b6dd4-c85d-417b-b58f-3771e532",
  "contenttype": "application/json",
  "data": {
    "action": "newItem",
    "itemID": "93"
  }
}
```

CloudEvents Goals



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- Normalize events, web-hooks, across environments - interop!!
- Facilitate integrations across platforms
- Leave the event business logic processing to the application
- First step towards portability of functions

CloudEvents Deliverables



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- **CloudEvents Specification** – define the metadata
- **Serialization Rules Specifications**
 - **JSON** event format
 - **AMQP** event format
- **Transport Bindings Specifications**
 - **HTTP** – binary and structured
 - **MQTT, AMQP, NATS, Web-hooks**
- **Primer**
- **SDKs**



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Demo

MadLibs Demo



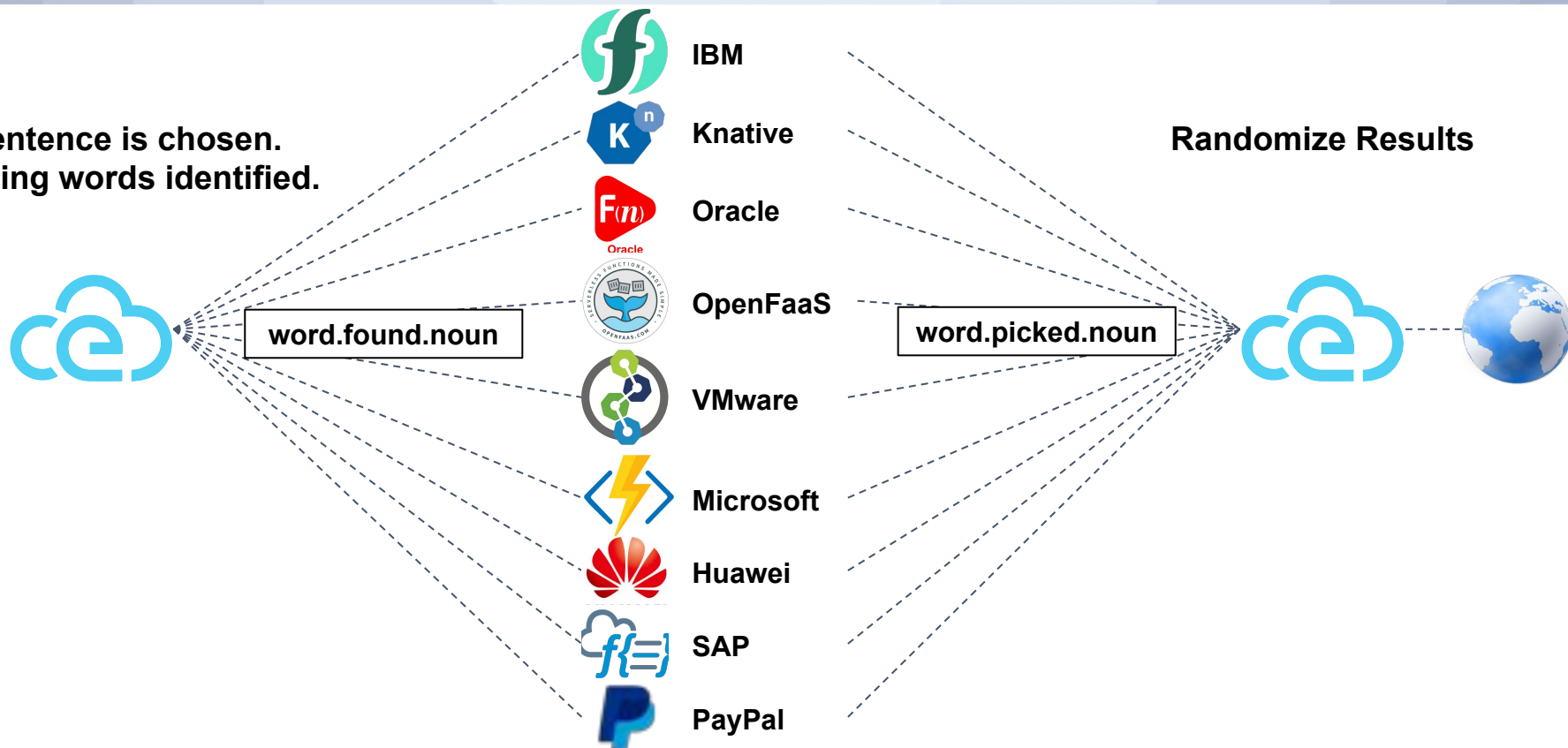
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Sentence is chosen.
Missing words identified.



MadLibs Demo



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Just show it!

Sample Function

```
// inEvent.Type = "word.found.***"  
// words is 2-D array: "kind of word" x "list"
```

```
kind := inEvent.Type[11:]  
list := words[kind]  
word := list[ rand.Intn( len(list) ) ]
```

Business Logic

```
outEvent := v02.Event{  
    Type:      "word.picked." + kind,  
    Source:    "http://example.com/cedemo/wordPicker",  
    ID:        uuid.New().String(),  
    ContentType: "application/json",  
    Extensions: map[string]string{"relatedID": `` + inEvent.ID + ``},  
    Data:      []byte(`{"word": "` + word + `"}`)  
}
```

CE & HTTP Logic

```
bodyReader := bytes.NewReader( outEvent.Data )  
req, _ := http.NewRequest("POST", r.Header.Get("X-Callback-URL", bodyReader))  
outEvent.GenerateHeaders( req.Header ) // Sending in binary mode
```

```
client := &http.Client{}  
client.Do(req)
```

CloudEvents SDKs



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- (De)Serializer for CloudEvents on various transports - at least http
- Provide consistency across SDK / languages
 - Common design doc PR: <https://github.com/cloudevents/spec/pull/356>
- Alpha level
 - Go
 - Java
 - Javascript
 - CSharp
 - Python
 - Ruby
- Looking for feedback

CloudEvents SDK - Samples



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CSharp

```
var cloudEvent = new CloudEvent(this.Type, new Uri(this.Source)) {
    ContentType = new ContentType(MediaTypeNames.Application.Json),
    Data = JsonConvert.SerializeObject("hey there!")
};
```

```
var content = new CloudEventContent(cloudEvent, ContentMode.Structured, new JsonEventFormatter());
var httpClient = new HttpClient();
var result = (await httpClient.PostAsync(this.Url, content));
```

Golang

```
event := v02.Event{
    Type: "com.example.file.created",
    Source: "/providers/Example.COM/storage/account#fileServices/default/{new-file}",
    ID: "ea35b24ede421",
}
marshaller := v02.NewDefaultHTTPMarshaller()
var req *http.Request
err := marshaller.ToRequest(req)
```

CloudEvents SDK - Samples



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JS

```
var cloudevent02 = new Cloudevent(Cloudevent.specs['0.2']);
cloudevent02.type("com.github.pull.create").source("urn:event:from:myapi/resource/123");
var config = {
  method: 'POST',
  url    : 'https://mywebhook.com'
};

var binding = Cloudevent.bindings['http-structured0.1'](config);
binding.emit(cloudevent02).then(response => {
  console.log(response.data);
}).catch(err => {
  console.error(err);
});
```

Status of CloudEvents

- Current version: v0.2 - Released Dec 6, 2018
- What's left for CloudEvents v1.0?
 - Finalize the core Event Attributes
 - Finalize the set of protocol and serialization mappings
 - Documentation, developer and/or user guide.
 - Interop demos & verification through implementations and testing
 - Complete SDKs and any additional tooling (e.g. conformance tester?)
- After CloudEvents 1.0?
 - Serverless WG will examine next item for possible interop
 - Workflow - Chaining and orchestrating functions

Serverless WG: Workflow

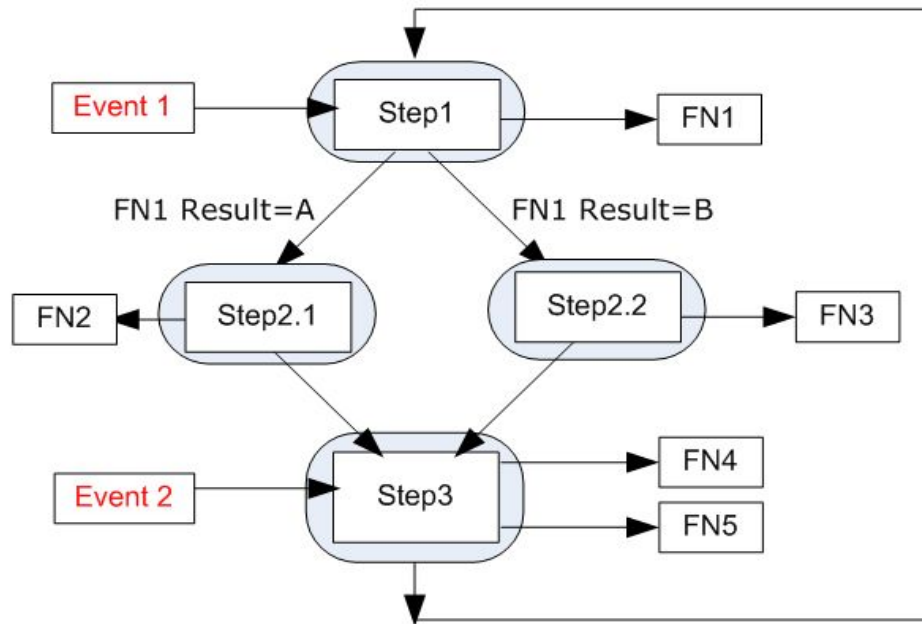


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Thank You!



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- Serverless WG : <https://github.com/cncf/wg-serverless>
 - Workflow: <https://github.com/cncf/wg-serverless/tree/master/workflow/spec>
- CloudEvents : <https://cloudevents.io/>
 - Org : <https://github.com/cloudevents>
 - Spec repo : <https://github.com/cloudevents/spec>
 - SDKs : <https://github.com/cloudevents/sdk-...>
- **Deep-Dive Session**
 - **Wednesday December 12 - 4:30-5:05**
 - **Tahoma 5 @ TCC/The Conference Center**
- Questions? STICKERS!



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