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Intro: CNCF Serverless WG / CloudEvents

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Serverless WG Overview



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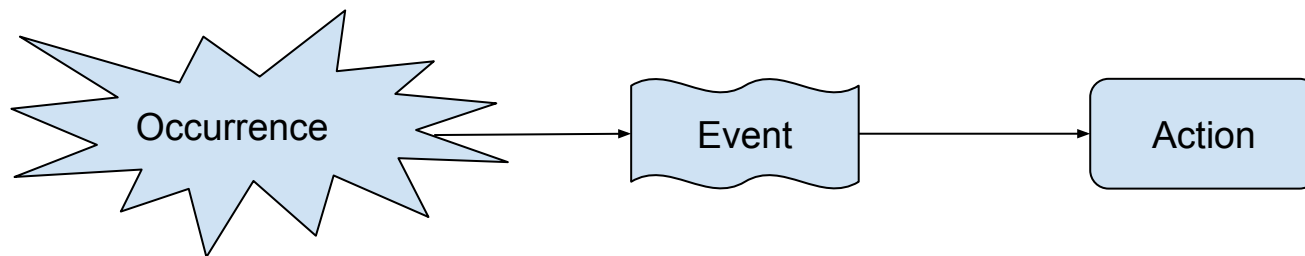
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- **Technical Oversight Committee** initiated (mid-2017)
 - Whitepaper
 - Overview of technology
 - State of ecosystem
 - Recommendations for possible CNCF next steps
 - Landscape
- **CloudEvents**
 - Project started Dec 2017
 - CNCF Sandbox project approved May 2018
- **Function workflow - orchestration of Functions**

- 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



Events in a Distributed System

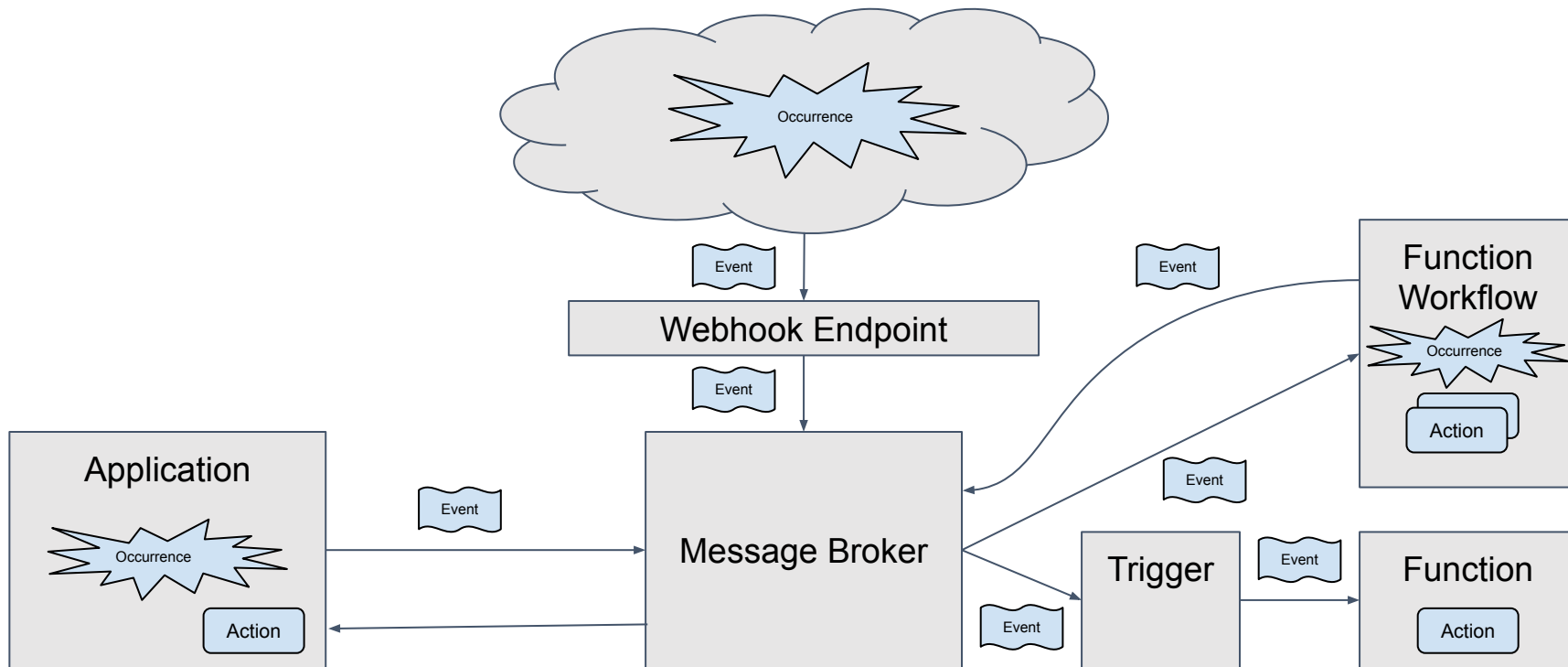


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The Role of CloudEvents and Serverless Application Workflows



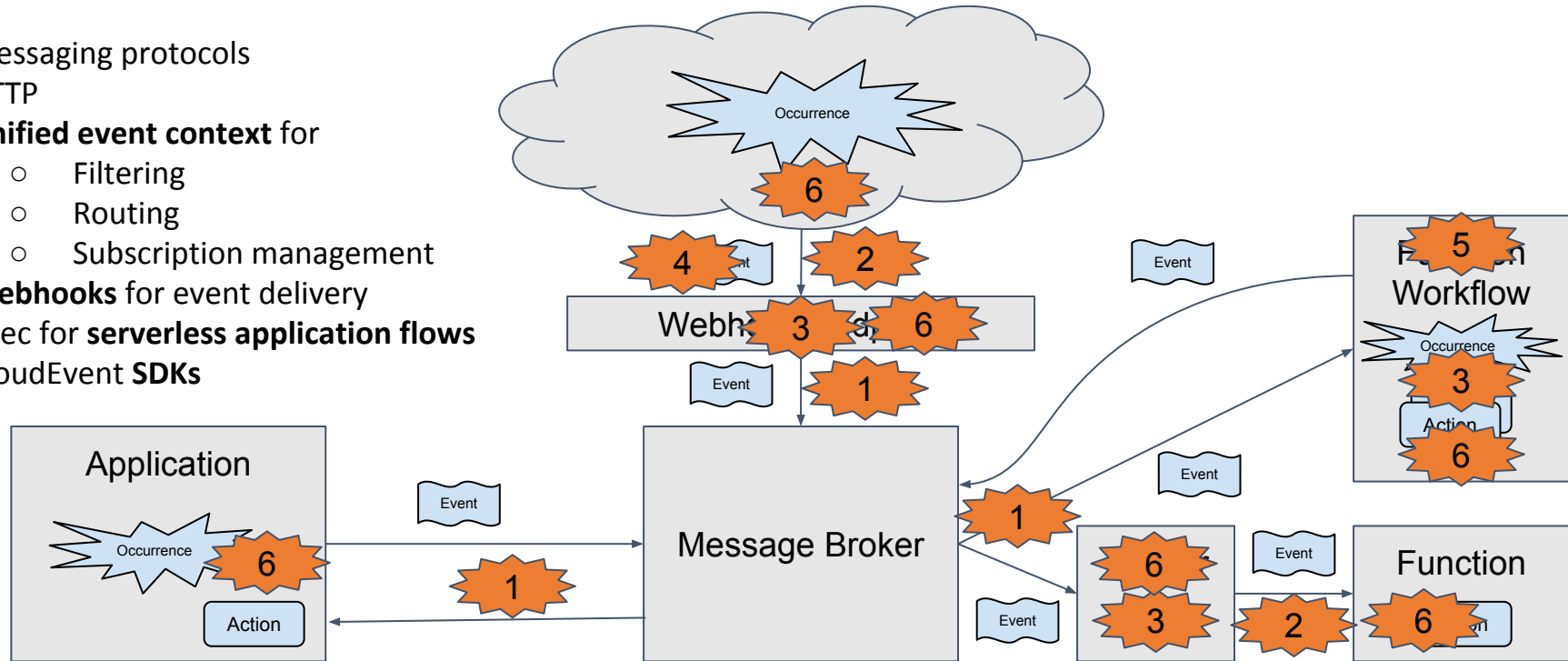
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1. Messaging protocols
2. HTTP
3. **Unified event context** for
 - Filtering
 - Routing
 - Subscription management
4. **Webhooks** for event delivery
5. Spec for **serverless application flows**
6. CloudEvent **SDKs**





- Specification - minimal/consistent metadata
 - **CloudEvents Spec Version**
 - **Type**
 - **Source**
 - **ID**
 - Subject
 - Time
 - ContentType of the payload
 - Content Encoding
 - Schema URL of the payload
 - <Extension>
- Transport bindings - how to serialize in JSON, HTTP, MQTT, ...

Principles of CloudEvents



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- Transport bindings are not another layer
 - Describe how to use a protocol without hiding it
 - Batching of events is handled by the transport
- Context attributes
 - As few as possible
 - As many as needed
 - No sensitive information in the context attributes!
- Goal: **Interoperability**

New in CloudEvents in 0.3



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- New attribute: **subject**
- contenttype is now **datacontenttype**
- New extensions
 - **dataref** (claim check pattern)
- **Batching**
 - Is handled by transports
 - Added specification for batching with HTTP+JSON



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CloudEvents Golang SDK

→ *Coding Demo*

@n3wscott

CloudEvents Golang SDK

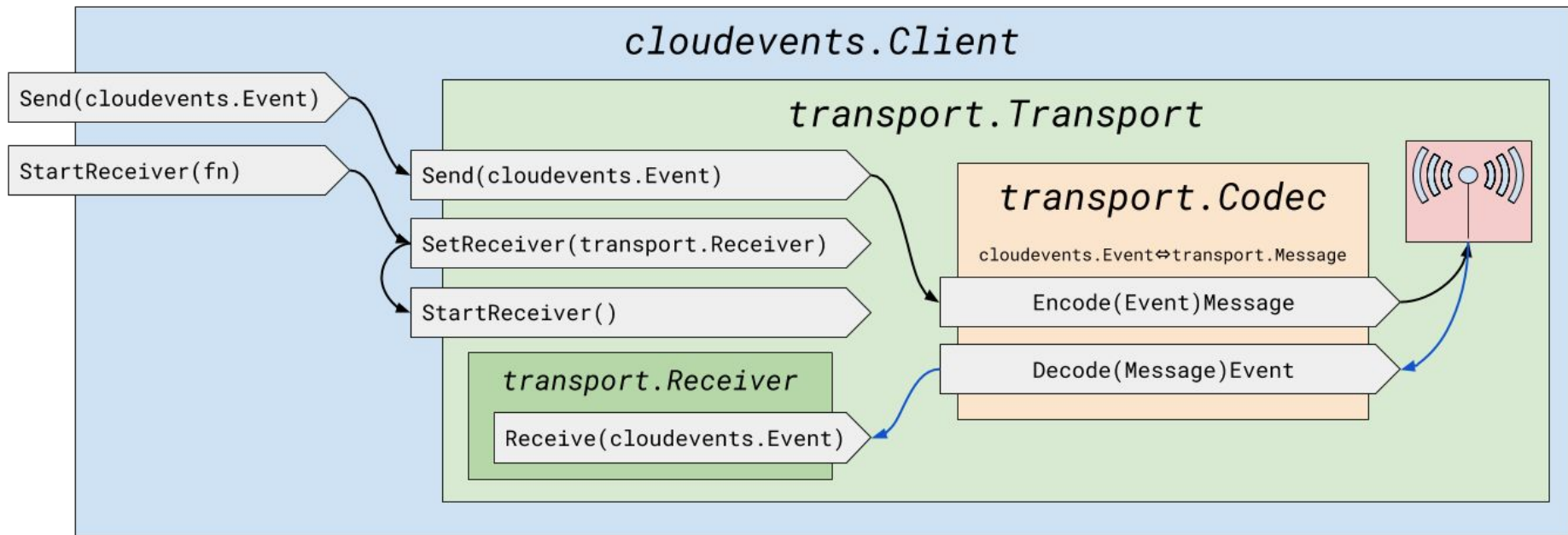


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Hello, World! Sending...



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```
import cloudevents "github.com/cloudevents/sdk-go"

func main() {
    client, _ := cloudevents.NewDefaultClient()

    event := cloudevents.NewEvent()
    event.SetSource("/kubcon/demo/barcelona-2019")
    event.SetType("com.n3wscott.hello")
    event.SetData(&Hello{Name: "n3wScott"})

    ctx := cloudevents.ContextWithTarget(context.Background(), "http://localhost:8080")
    client.Send(ctx, event)
}
```

Hello, World! Receiving...



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```
import cloudevents "github.com/cloudevents/sdk-go"

func main() {
    client, _ := cloudevents.NewDefaultClient()
    client.StartReceiver(context.Background(), receive)
}

func receive(event cloudevents.Event) {
    data := &Hello{}
    event.DataAs(data)
    fmt.Printf("Hello, %s!\n", data.Name)
}
```


Hello, World! Receiving NATS...



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```
import (  
    cloudevents "github.com/cloudevents/sdk-go"  
    "github.com/cloudevents/sdk-go/pkg/cloudevents/transport/nats"  
)  
  
func main() {  
    t, _ := nats.New("localhost:4222", "hello")  
    client, _ := cloudevents.NewClient(t)  
    client.StartReceiver(context.Background(), receive)  
}  
  
func receive(event cloudevents.Event) {  
    data := &Hello{}  
    event.DataAs(data)  
    fmt.Printf("Hello, %s!\n", data.Name)  
}
```

Hello, World! Forwarding



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```
import (  
    cloudevents "github.com/cloudevents/sdk-go"  
    "github.com/cloudevents/sdk-go/pkg/cloudevents/transport/nats"  
)  
  
func main() {  
    inbound, _ := cloudevents.NewDefaultClient()  
  
    t, _ := nats.New("localhost:4222", "hello")  
    outbound, _ := cloudevents.NewClient(t)  
  
    forward := func(event cloudevents.Event) {  
        fmt.Printf("forwarding %s\n", event.ID())  
        _, _ = outbound.Send(context.Background(), event)  
    }  
  
    inbound.StartReceiver(context.Background(), forward)  
}
```

Transports Supported (sdk-go)*



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- **HTTP**
 - **Structured**
 - **Binary**
- **AMQP (1.0)**
 - **Structured**
 - **Binary**
- **NATS**
 - **Structured**

`golang sdk` → <https://github.com/cloudevents/sdk-go/>
`this code` → <https://github.com/n3wscott/kubecon/>

*Come add more.

Airport Demo - ACRIS Semantic Model



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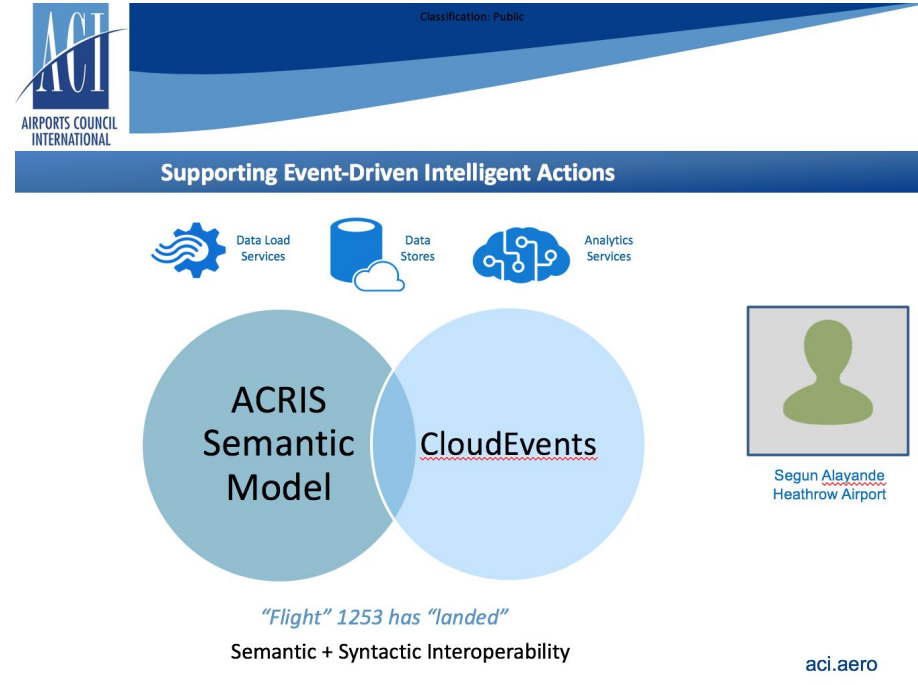


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“The Semantic Model, coupled with the CloudEvents format, can support interoperable, event-driven systems that can re-act intelligently to real-time state changes such as an aircraft landing or fulfilled order. With the use of event brokers, edge-to-cloud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

Segun Alayande
Heathrow Airport



Airport Demo



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Scan this code to get FREE coffee* →



*the coffee is virtual.

<http://srcdog.com/airport>

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-...>
- **Other KubeCon Sessions**
 - **Deep Dive: CNCF Serverless WG/CloudEvents: Wed, 11:55 - 12:30, Hall 8.0 E4**
 - **Intro + Deep Dive: Serverless WG: Thu, 14:00 - 15:25, Hall 8.1 G3**
- Questions?