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Europe 2019

Serverless WG

Serverless Update & BoF Session

Agenda



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Welcome!

Overview/update of Serverless WG

Serverless Considerations

- When is Serverless appropriate?

BoF community discussion

- Where should Serverless WG go next?

Serverless WG - Overview



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- **CNCF Technical Oversight Committee** initiated (mid-2017)
 - Whitepaper
 - Overview of technology
 - State of ecosystem
 - Recommendations for possible CNCF next steps
 - Landscape
- First step toward interop: CloudEvents

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 - In a nutshell



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- Define common metadata across events
- Define well known formats for metadata w/o concern for exact event payload
 - For popular formats and transports
- Leave the event business logic format & processing to the application
- Facilitate integrations across platforms
- First step towards portability and interop of functions

Project started Dec 2017

CNCF Sandbox project approved May 2018

Version 0.3 coming soon... really more like a v0.8

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 - Deliverables



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- **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**



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Beyond CloudEvents



- Define format/primitives to describe serverless application flow:
 - Includes: steps/states, event triggers(reference to events), reference to functions, how information is passed and filtered
 - Excludes: function signature, event format and metadata definition
- Facilitate portability across platforms
- Second step towards portability and interop of functions

Working draft version: 0.1

Workflow - Example

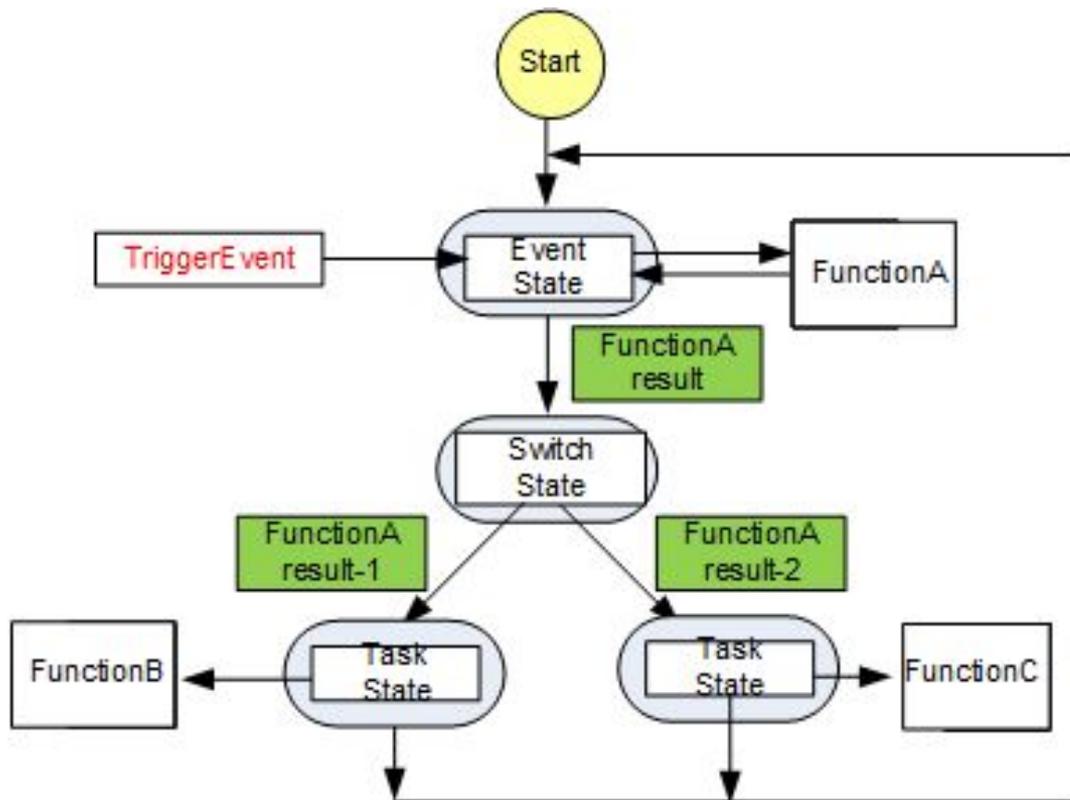


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Other Proposals



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- Proposed work streams
 - APIs for accessing CloudEvents
 - Event Orchestration / Chaining
 - Common Function Model
 - Common Serverless Benchmark framework
 - Common function logging, observing and monitoring
 - Function Signatures

- Subscription API



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Serverless Functions Considerations

Serverless Functions - When to use?



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- Similarity between the Object Oriented paradigm
 - High cohesion
 - Loose coupling
- No dependency on other function(s)
- Easy to unit test
- Easily portable
 - Not tied to a particular cloud operator
- Examples
 - Automating workflows
 - MapReduce
 - Parallel workloads (video encoding, thumbnail generation)
 - The CheckTODO app

Serverless Functions - Good use case



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<> Code Issues 11 Pull requests 1 Projects 2 Insights

[do not merge] Match container lifecycle to that of asyncy/platform-bootstrap. #128

Open judepereira wants to merge 1 commit into master from container_lifecycle

Conversation 0 Commits 1 Checks 1 Files changed 2 +101 -34

bff37d8 — WIP: Match container lifecycle to that of... 1 failing check

Check TODO
Failed — a minute ago Re-run all

Added/edited TODO items found

Failure Re-run

built a minute ago in less than 5 seconds

bff37d8 by Jude Pereira

container_lifecycle

Check TODO

5 added/edited TODO item(s) were found

DETAILS

Added/edited TODO items found:

- asyncy/App.py#L71: # TODO also shutdown auto spawned services
- asyncy/Containers.py#L37: # TODO
- asyncy/Containers.py#L42: # TODO
- asyncy/Containers.py#L47: # TODO
- asyncy/Containers.py#L155: # TODO use chain

View more details on Check TODO

Serverless Functions - Considerations



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- No clear visibility of the flow of data
- Carefully evaluate your runtime
 - Example: some might work by running a command (think stdout/stderr)
 - Not scalable, just a PoC
 - Expensive to scale out \$\$\$
- How are resources managed?
 - Database
 - Persistent connections
- Measure
 - 100s of function replicas vs 2 microservice replicas



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Community Input BoF Time!



Questions for the community:

- Who is using Serverless in production today?
 - Main usecases / workloads?
 - What's holding people back from using it?
- What are the pain points you are experiencing w.r.t. Serverless?
 - Interop? Portability? Tooling? Debugging?
- Are there certain workloads that aren't well supported today but you'd like to see?
- Is the split between PaaS, CaaS and FaaS/Serverless confusing?
Meaningful?

Thank You!



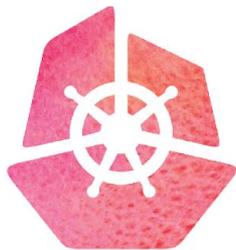
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- Serverless WG : <https://github.com/cncf/wg-serverless>
 - Workflow: <https://github.com/cncf/wg-serverless/tree/master/workflow/spec>
- CloudEvents : <https://cloudevents.io/>
 - Org : <https://github.com/cloudevents>
 - Spec repo : <https://github.com/cloudevents/spec>
 - SDKs : <https://github.com/cloudevents/sdk-...>
- Questions?
 - Knative: <https://github.com/knative>



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