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CloudNativeCon

Europe 2019

Deep Dive: CNCF Serverless WG/ CloudEvents

Agenda



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- CloudEvents demo
 - Deployment pipeline
- CloudEvents best practices



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Demo

Vlad Ionescu, Independent

Ownzones



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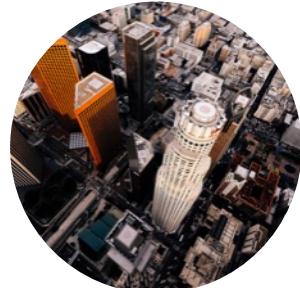


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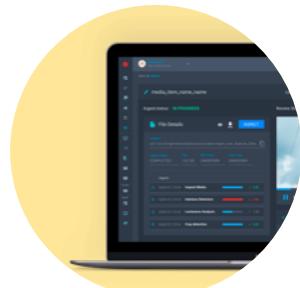
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75 cloud engineers
with 100+ years of accumulated experience



Cloud-based video supply chain solutions
provided with disruptive “pay-as-you-go” model



Component-based
video-workflow system

OWNZONES
PARTNERS



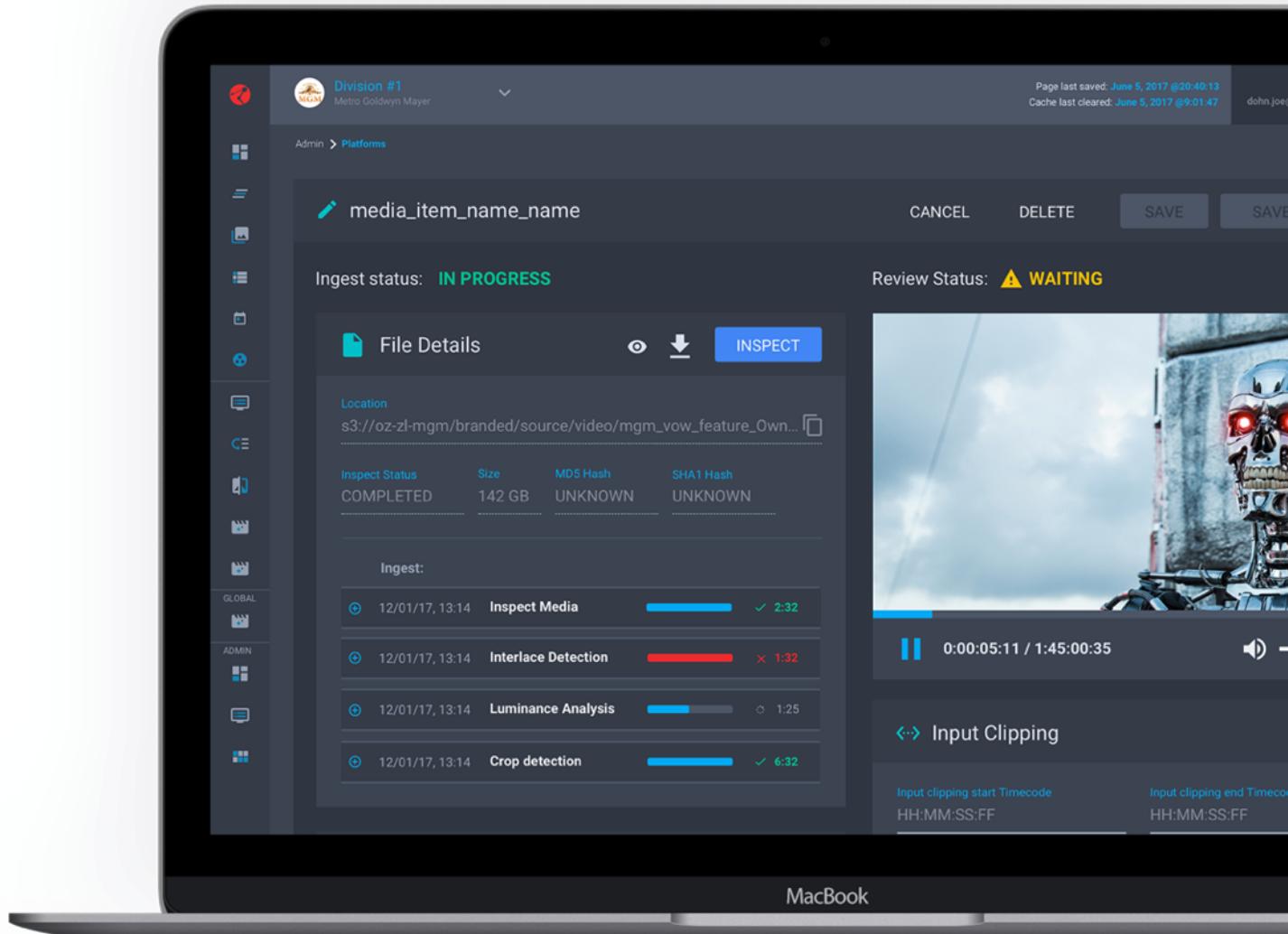
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PRODUCTS
DIGITAL SUPPLY CHAIN SOLUTION

OWNZONES CONNECT

Get full control of your digital supply chain.

- Media logistics
- Workflow automation
- Studio in the cloud



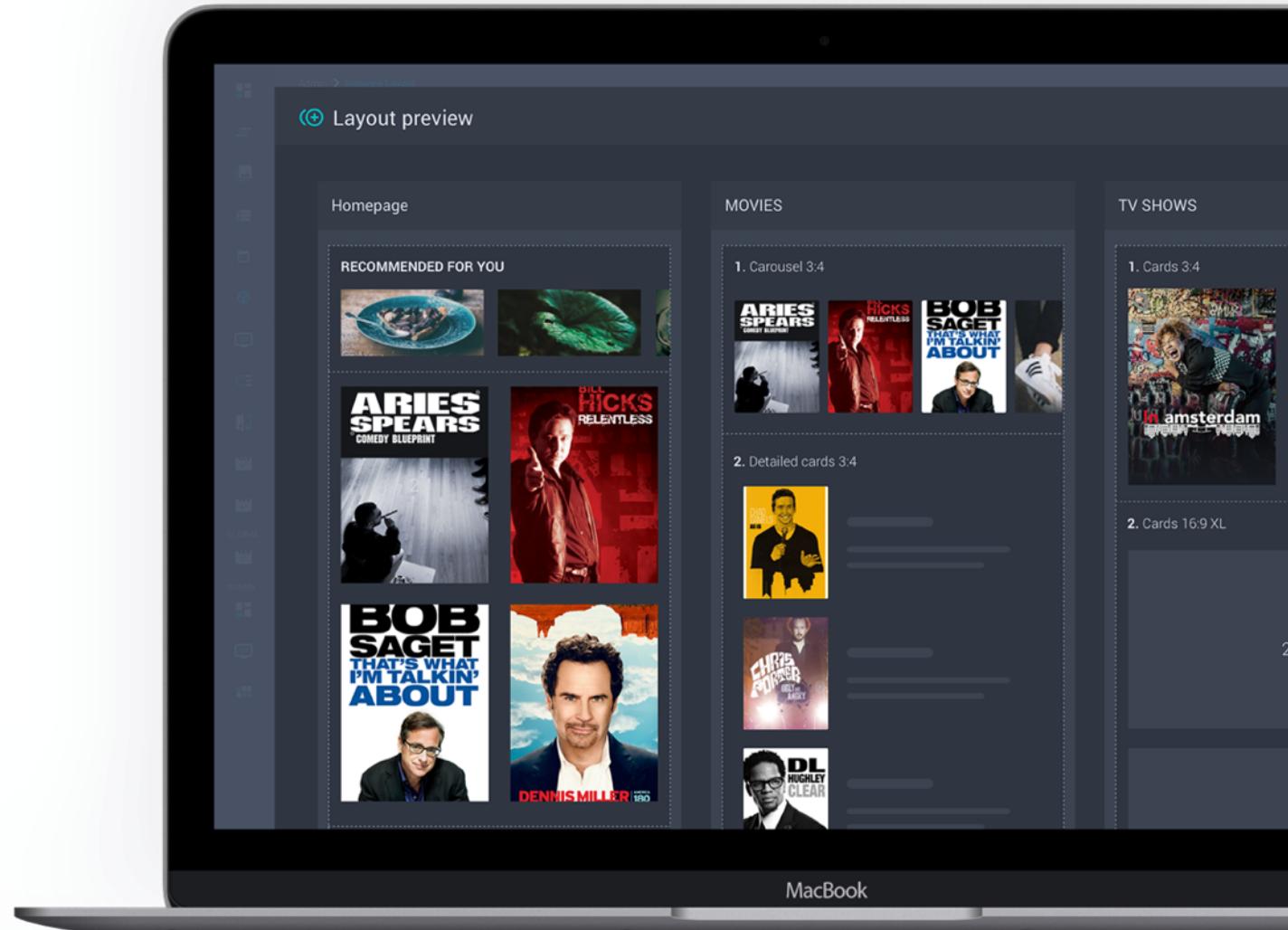
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PRODUCTS
REACH AND MONETIZATION

OWNZONES DISCOVER

Customizable, scalable turnkey white label
OTT platform.

- Rich CMS
- Built-in customization tools
- “Click-to-deploy” rapid application deployment system



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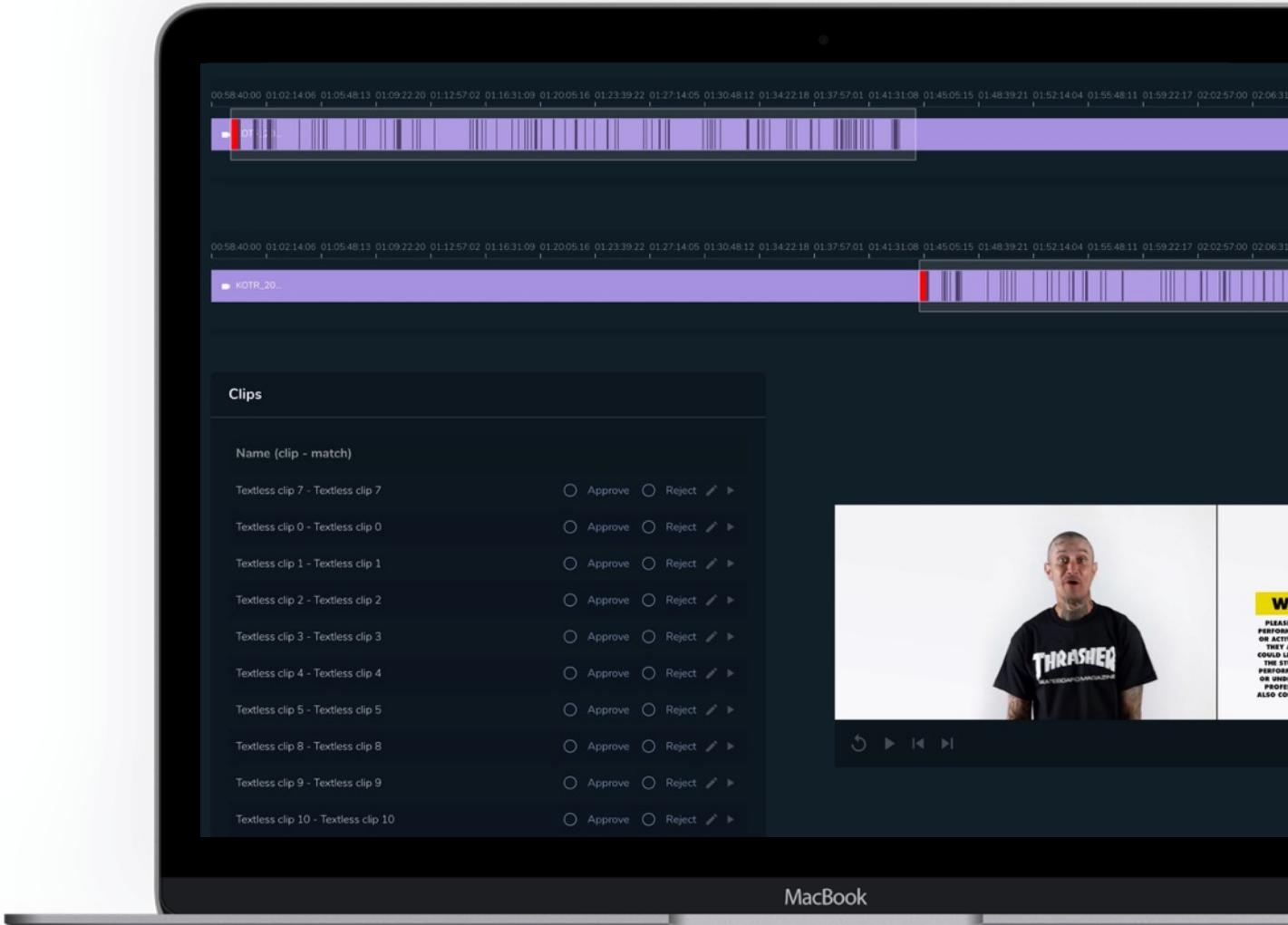
PRODUCTS

AI-POWERED DIGITAL SUPPLY CHAIN SOLUTION

OWNZONES FRAME DNA

Improve and automate your supply chain.

- AI-based tool within Connect
- Reduction in manual work
- Massive cost savings



Ownzones



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- Startup
- Focus on reliability

Deployment pipeline



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- Observable
- Compliant
- Fast
- Scalable

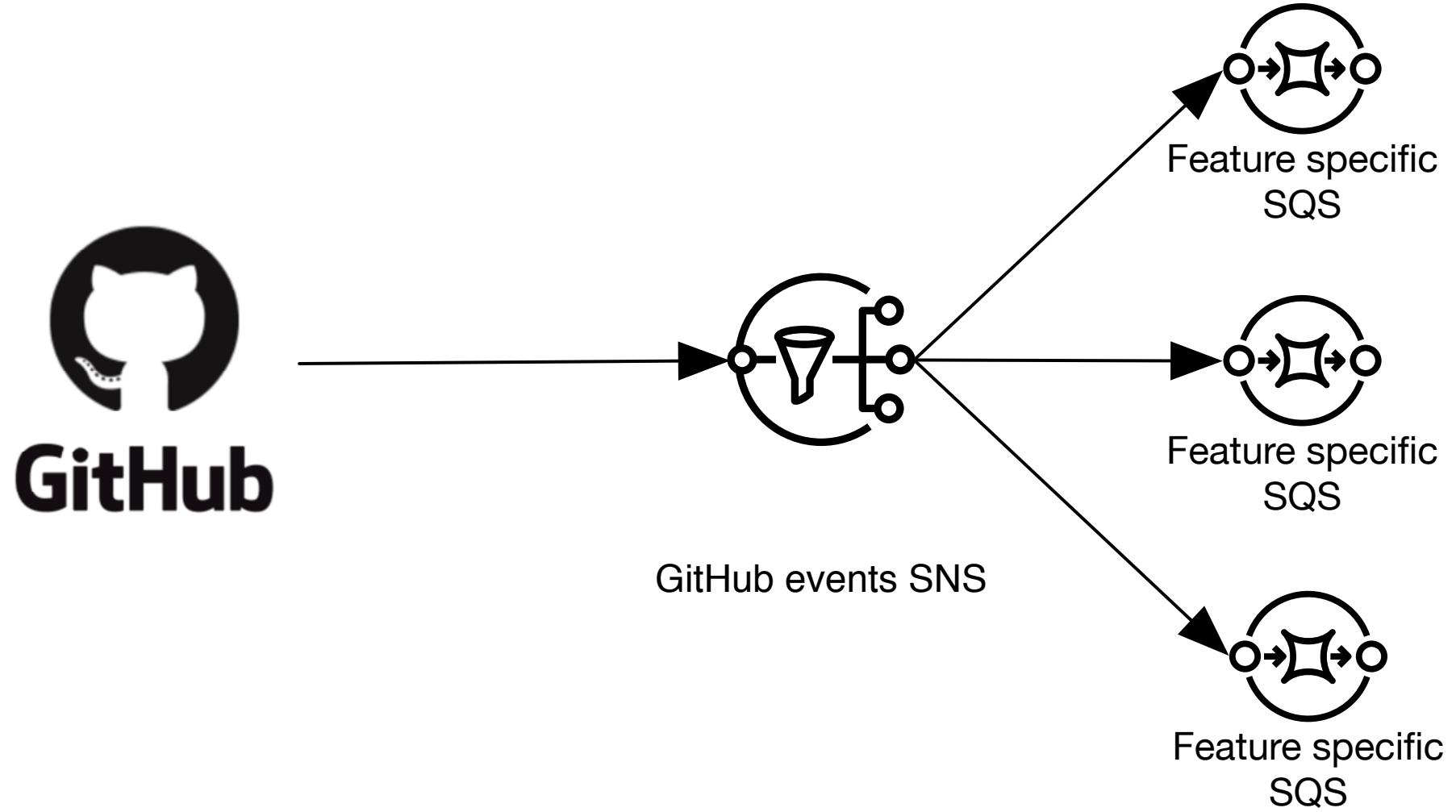
Deployment pipeline



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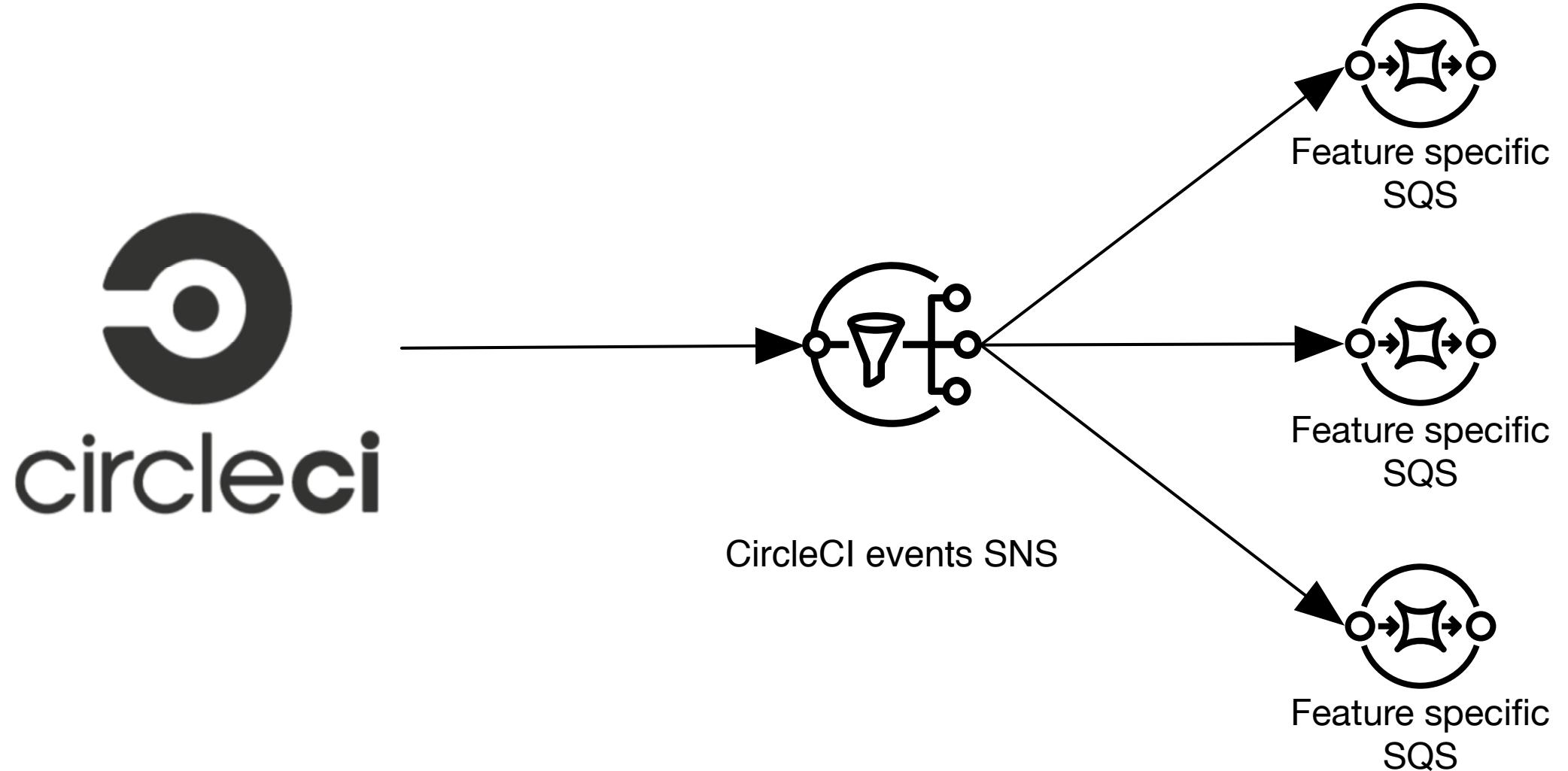
Deployment pipeline



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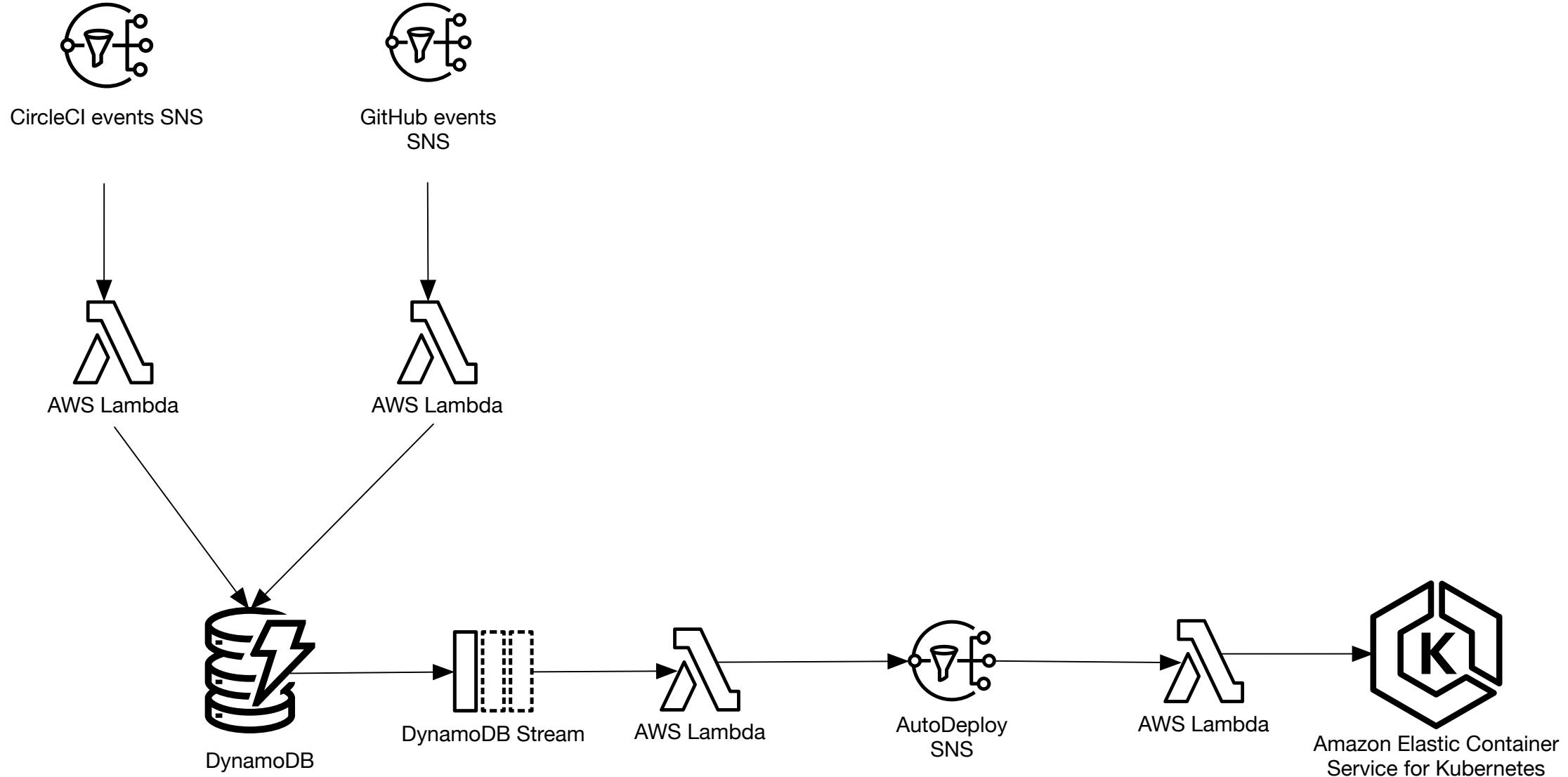
Deployment pipeline



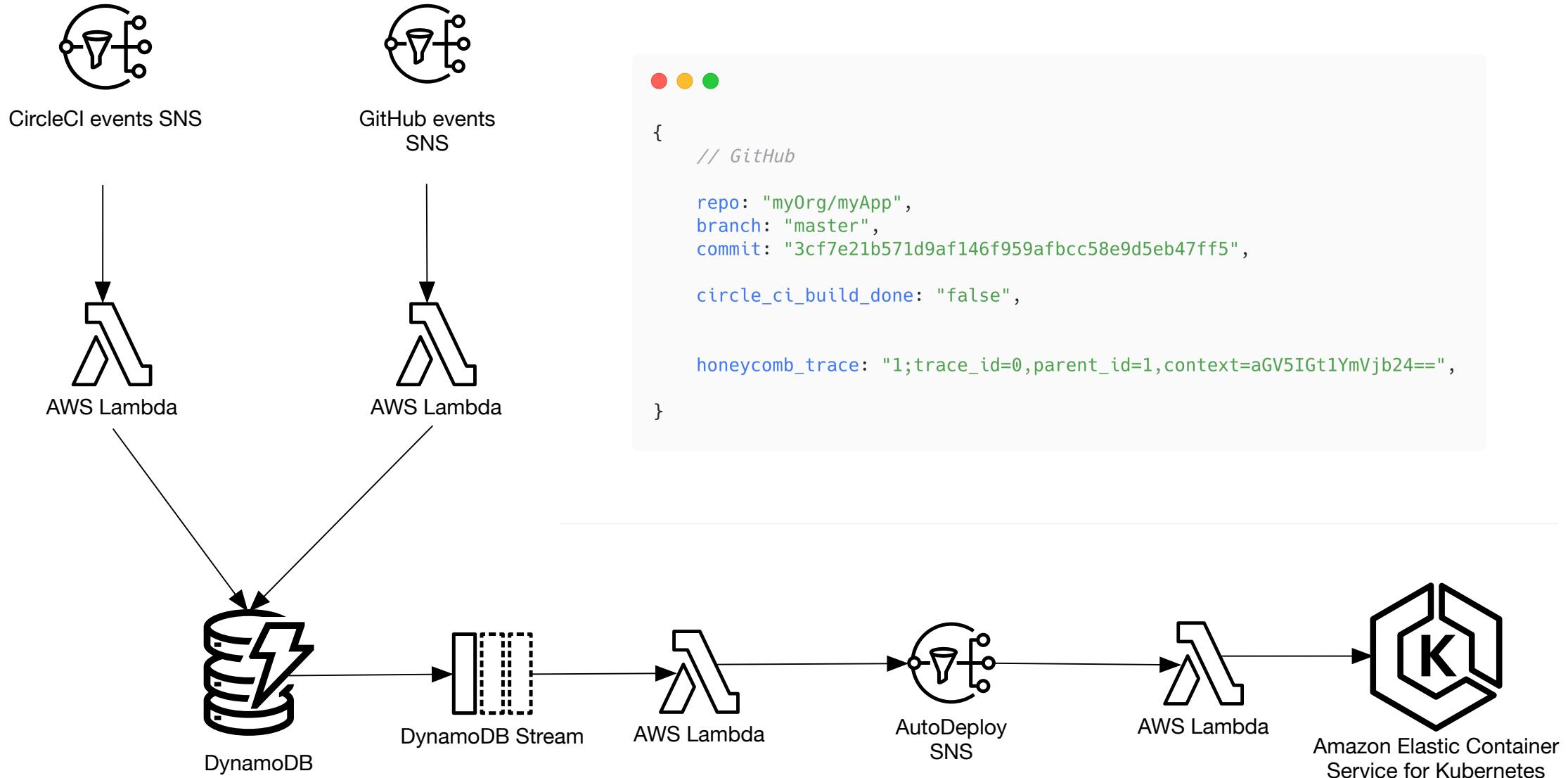
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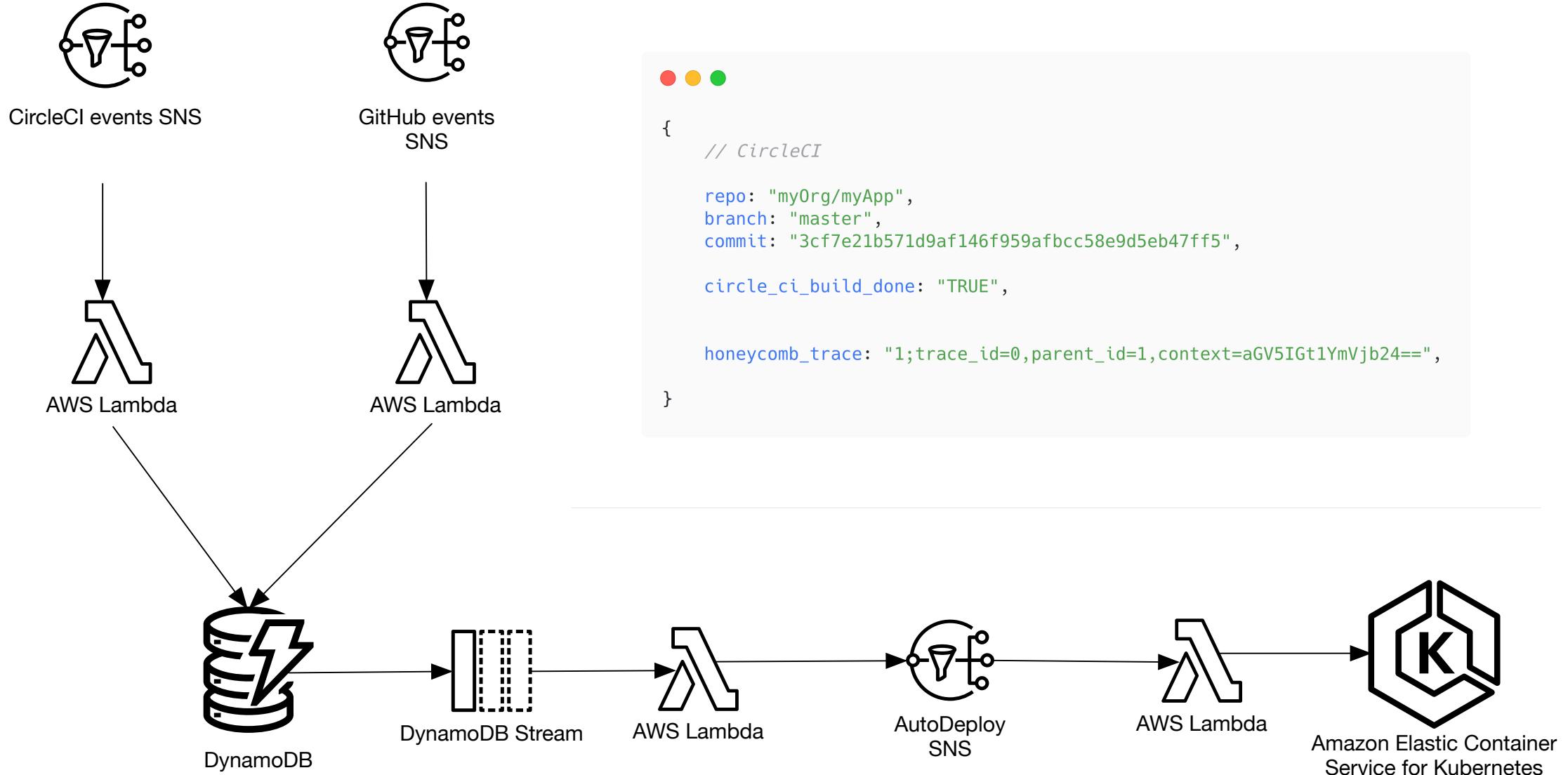
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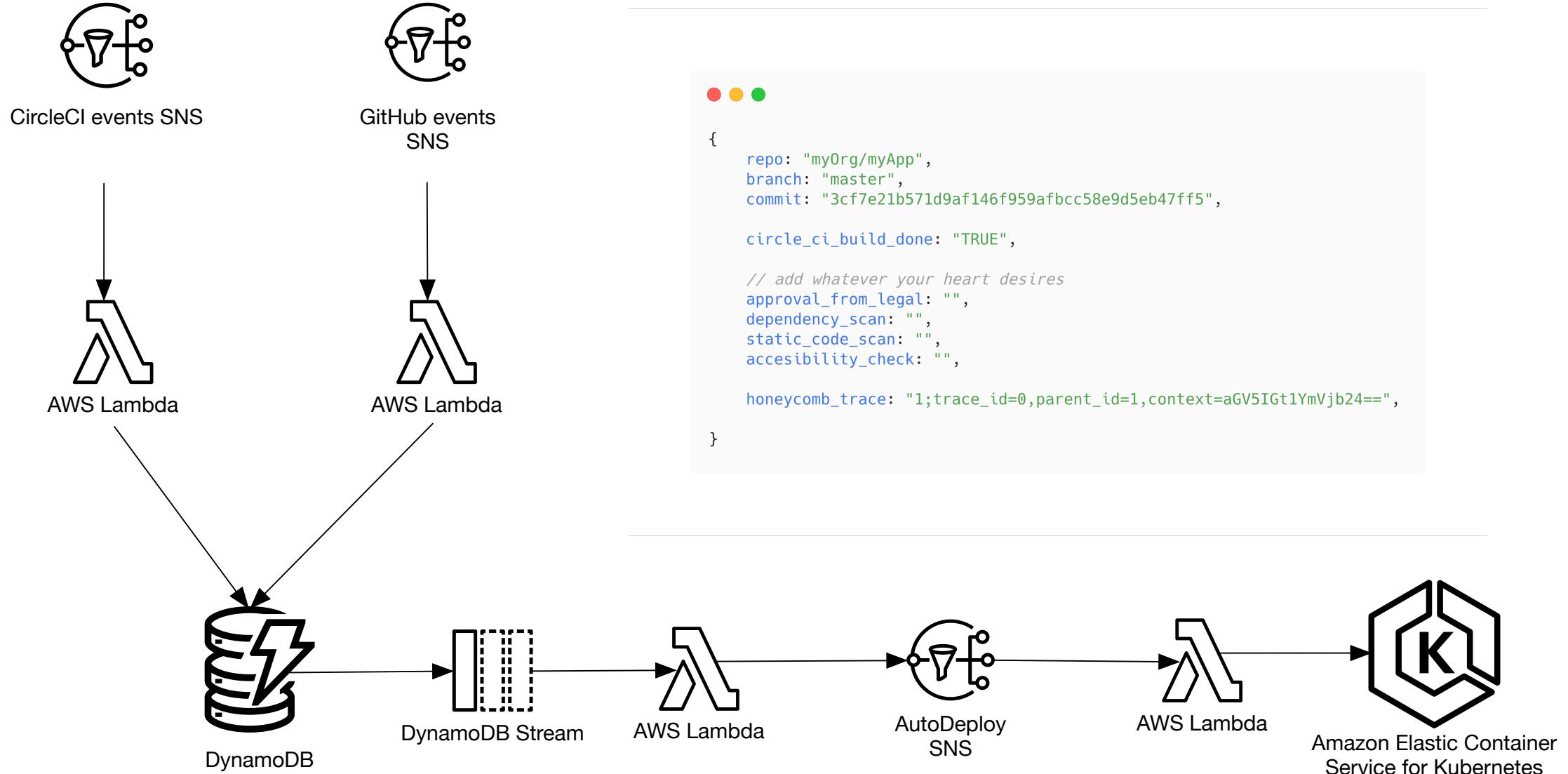
Deployment pipeline - DynamoDB



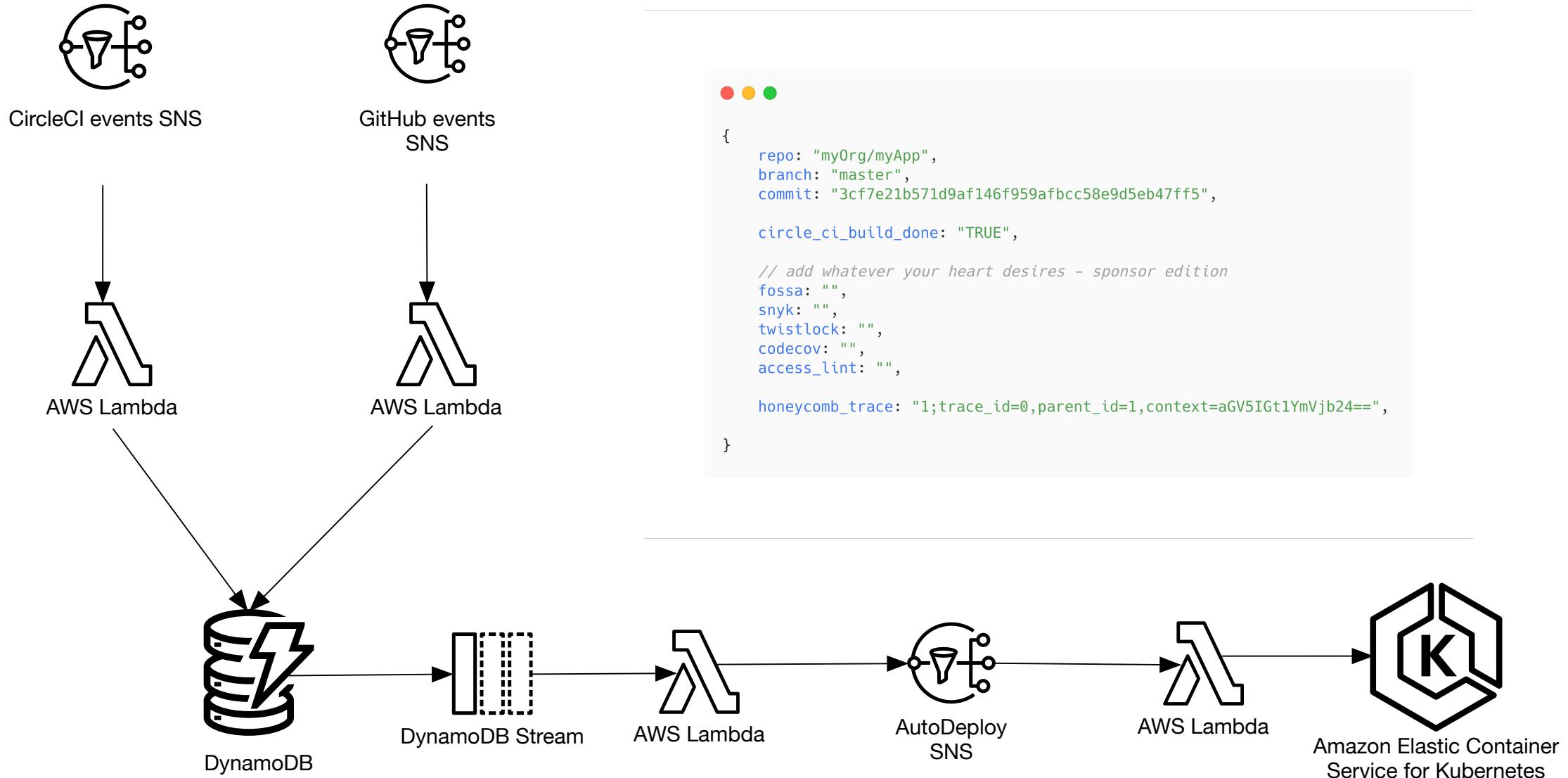
Deployment pipeline - DynamoDB



Deployment pipeline - DynamoDB



Deployment pipeline - DynamoDB



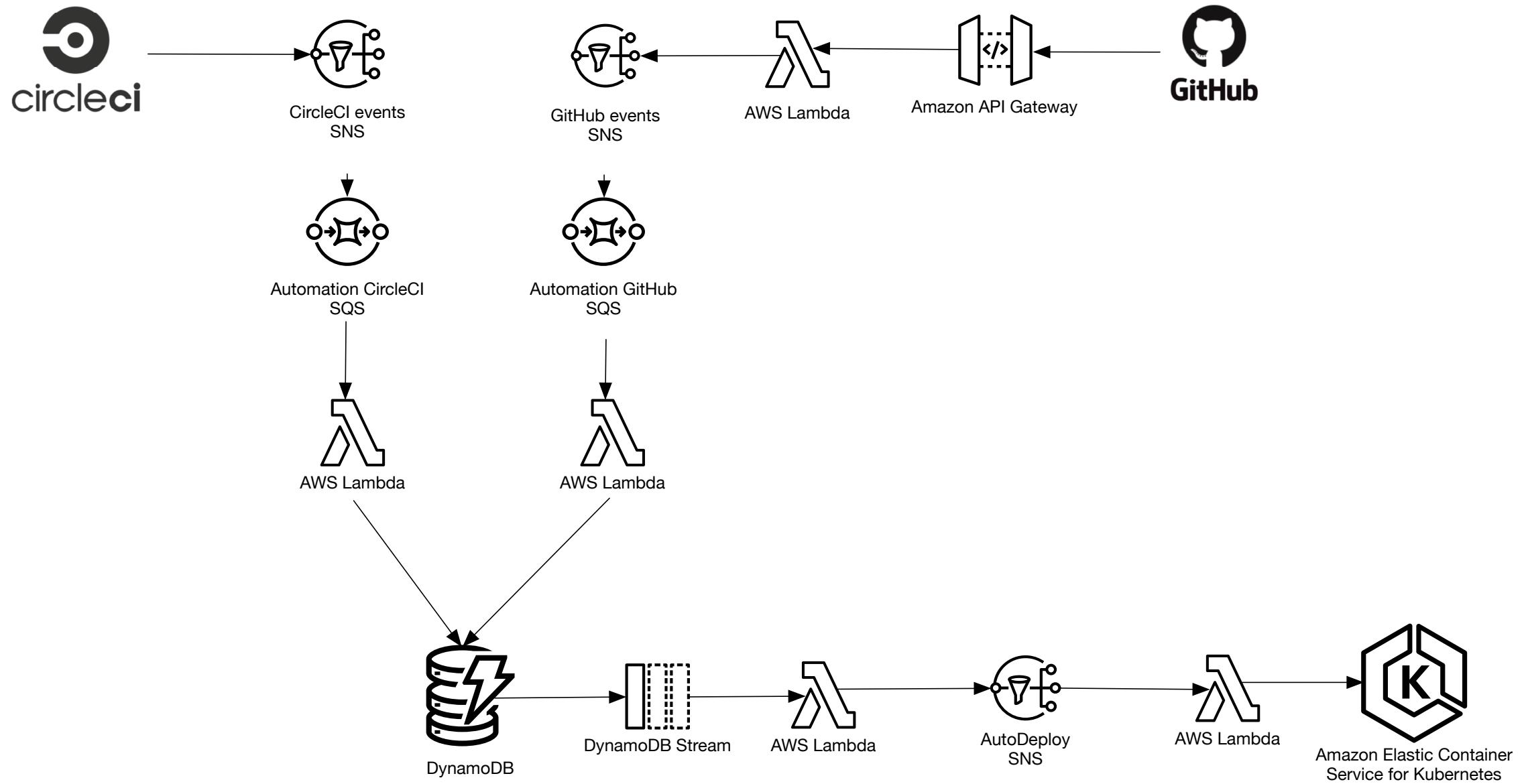
Deployment pipeline



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Event design

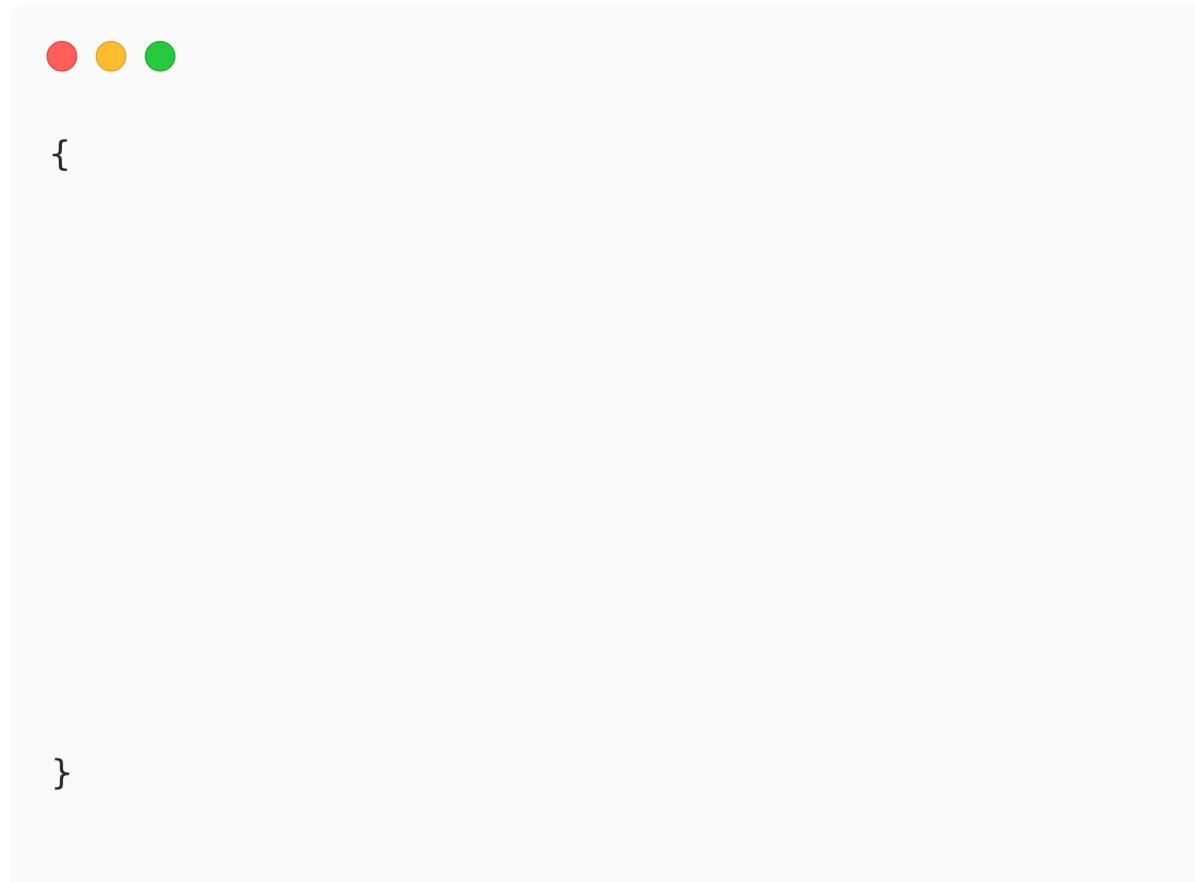


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Event design



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{

Type
Source

Branch
SHA

}

Event design



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{

Type
Source

Branch
SHA

Trace Header

}

Event design



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```
● ● ●  
{  
  Type  
  Source  
  
  Branch  
  SHA  
  
  Trace Header ⌚  
}  
}
```

Event design



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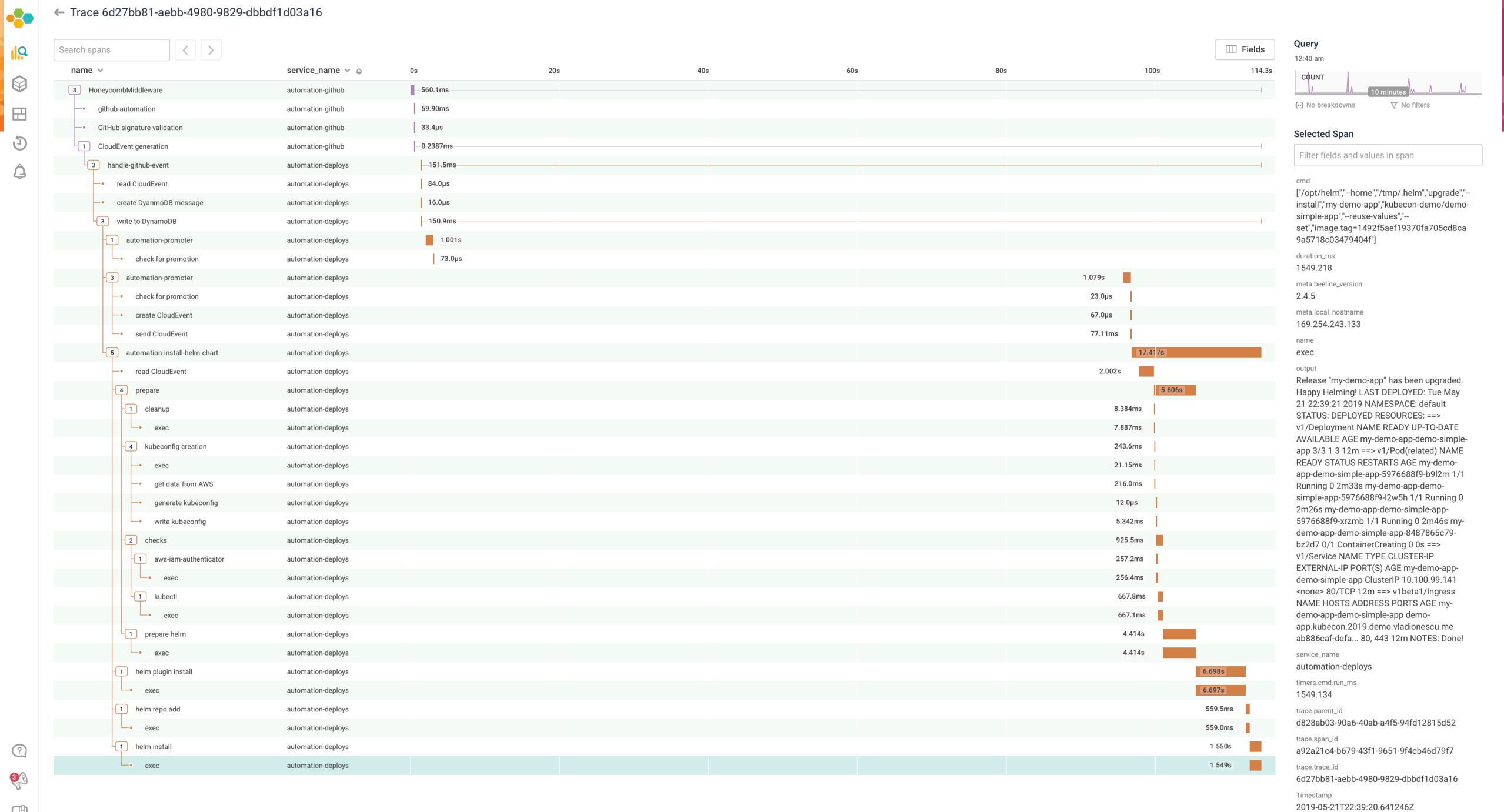
```
{  
  "specversion": "0.2",  
  "id": "D7D7C8B1-44AA-4CD5-9F1B-61A1AFB484C1",  
  "time": "2019-05-16T14:51:07+03:00",  
  "type": "com.circleci.buildsuccess",  
  "source": "myOrg/myRepo",  
  "contenttype": "application/json",  
  
  "honeycomb-trace": "1;trace_id=0,parent_id=1,context=aGV5IGt1YmVjb24==",  
  
  "data": {  
    "branch": "master",  
    "sha": "3cf7e21b571d9af146f959afbcc58e9d5eb47ff5"  
  }  
}
```

Demo time?



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- Special thanks:
 - Ileana Andreea Preda
- Queue for demo



CloudEvents experience



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- Simplified design process
- Encoding/ decoding are taken care of
- SDKs
- Sane defaults
- Does not restrict *data* in any way!

CloudEvents experience



CloudEvents

They're here, they're boring, use them!

CloudEvents experience



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But...



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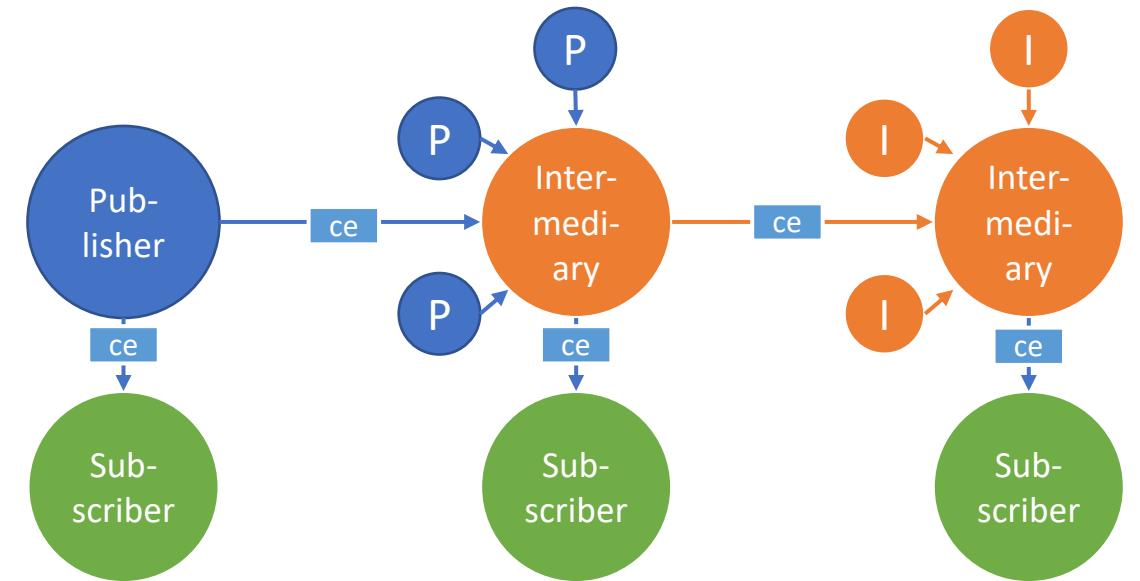
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Architectural considerations

Clemens Vasters, Microsoft

CloudEvents is Eventing

- Carry facts: “Something happened”
- Publish/subscribe distribution
 - Subscribe at source or distributor
- Some publish/subscribe principles:
 - Publishers don’t know/care who will subscribe or is currently subscribed
 - Subscribers might tap into single-sourced or consolidated event streams
 - Event flow is unidirectional
 - network or disk
 - one or more routing intermediaries
 - radio broadcast
 - ...



Eventing vs. Messaging



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- Events and messages are both mailing envelopes for data, decorated by metadata – but they are different.
 - Events carry facts. They report things that have happened.
 - State transitions, observed conditions, objects having been created, ...
 - Messages carry intents. The sender expects something to happen.
 - Command execution, job handling, workflow progress, ...
- Events are published as an information option for interested subscribers. Audience size may be zero or many.
- Messages are directed to handlers. There may be delivery and handling status feedback, replies, conversations, or complex control flows like Workflows and Sagas. Audience size is often one handler per message.

Attributes CloudEvents does not define



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- “to”
 - There’s no “to” attribute because events aren’t aimed at and routed to a specific consumer. Subscribers get to decide which events they pick.
- “reply-to”
 - There’s no “reply-to” attribute because events aren’t job assignments that ought to require a reply *and* because a subscriber can’t be expected to be capable of reaching any given reply destination
- “topic” / “queue”
 - CloudEvents defines the origin context as “source”, but does not include the name of any specific intermediary construct in the event metadata because events might travel through multiple intermediary hops

Things that are harder than they appear



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Signatures

Symmetric: Who holds the signing keys?

Asymmetric: Who distributes the verification keys?

Whose directory/directories/vaults is the subscriber trusting?

Which subscribers does a directory/vault grant access?

How/when does who rotate signing keys? How do subscribers know?

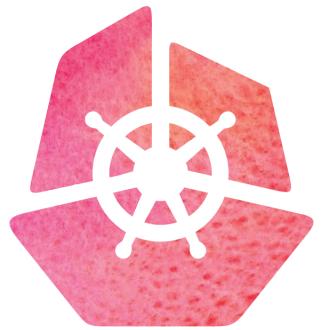
How to keep track of key history (archived events, events in logs)?

End-to-End Encryption

Same as above but with encryption keys

Encrypting/signing multicast datagrams doesn't allow for peer-to-peer session keys, which means that "master" keys must be rotated far more frequently than when those are only used for session-key exchange

Hardest: Agree on **ONE WAY OF DOING ALL THIS:** APIs, Algos, Hints, Versioning



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