AWS re:Invent

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API301

Building event-driven architectures

Alexander Vladimirov
Senior Solutions Architect, Serverless
AWS

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Journey to event-driven architecture

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Journey to event-driven architecture

STEP 1
Start with the domain



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event

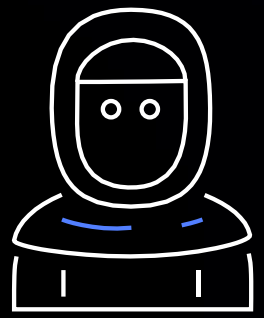
[i-’vent] **noun**

A signal that a system’s state has changed

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It all starts with business events

OrderCreated



OrderPicked

OrderShipped



ReturnRequested



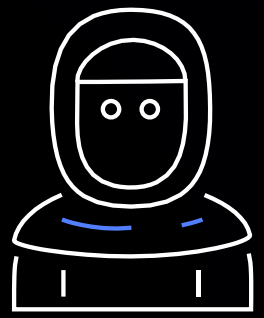
ReturnReceived



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Map events to business domains using attributes

OrderCreated



Retail

OrderPicked

OrderShipped



Fulfillment

ReturnRequested



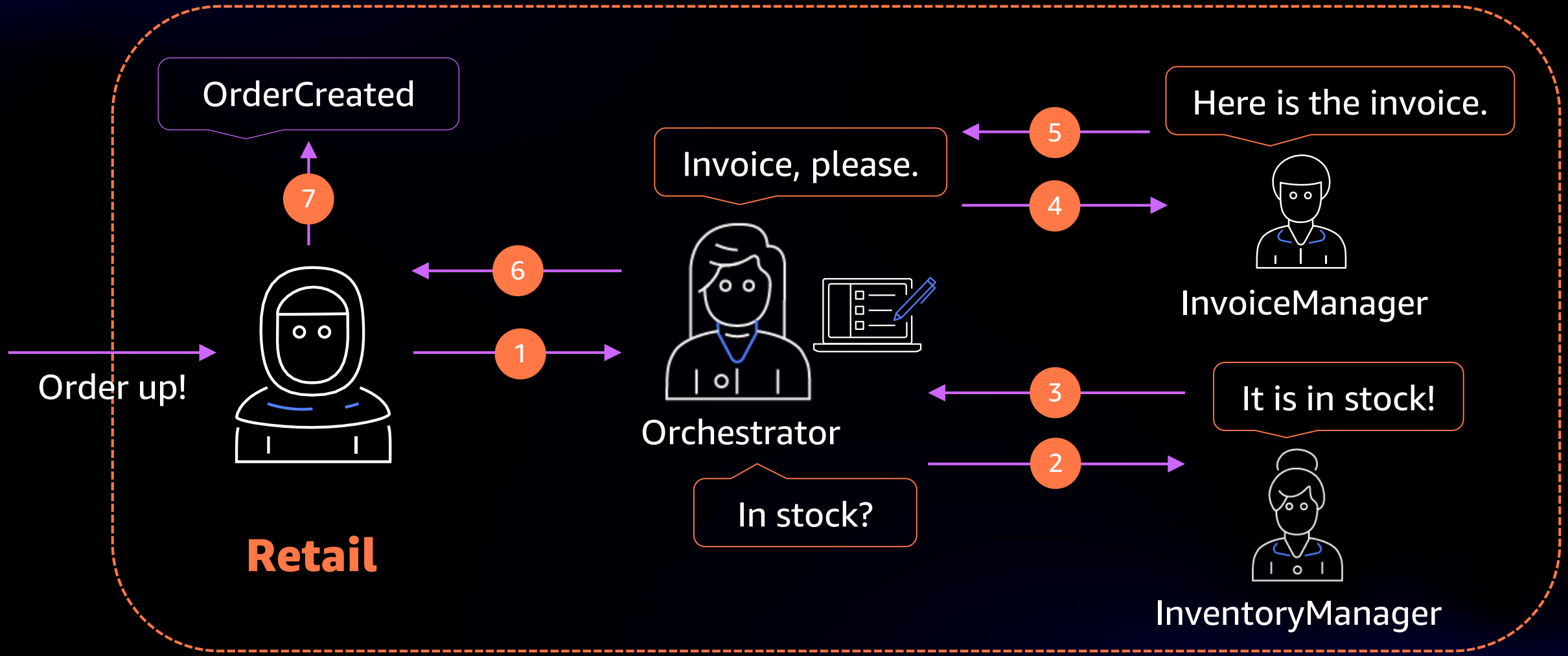
ReturnReceived



Support

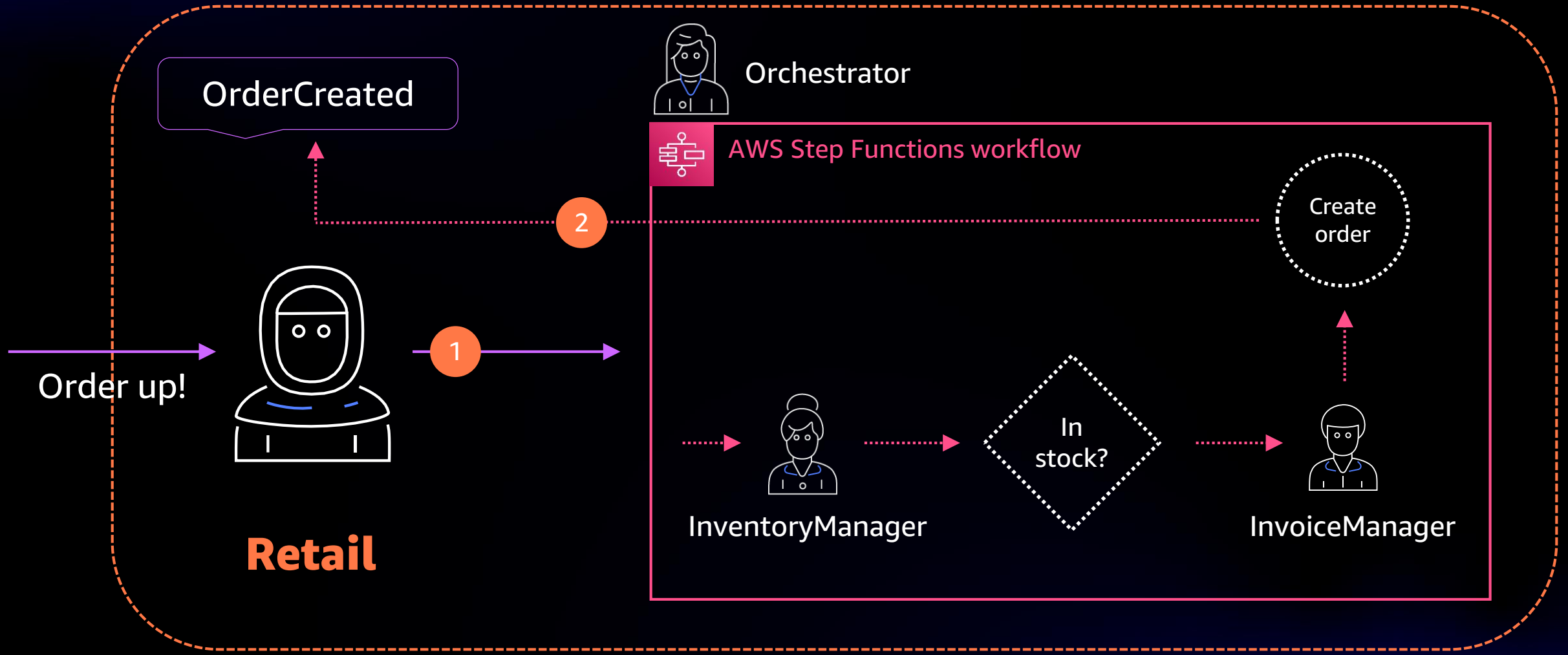
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Orchestrate a business process within a domain, resulting in a published event



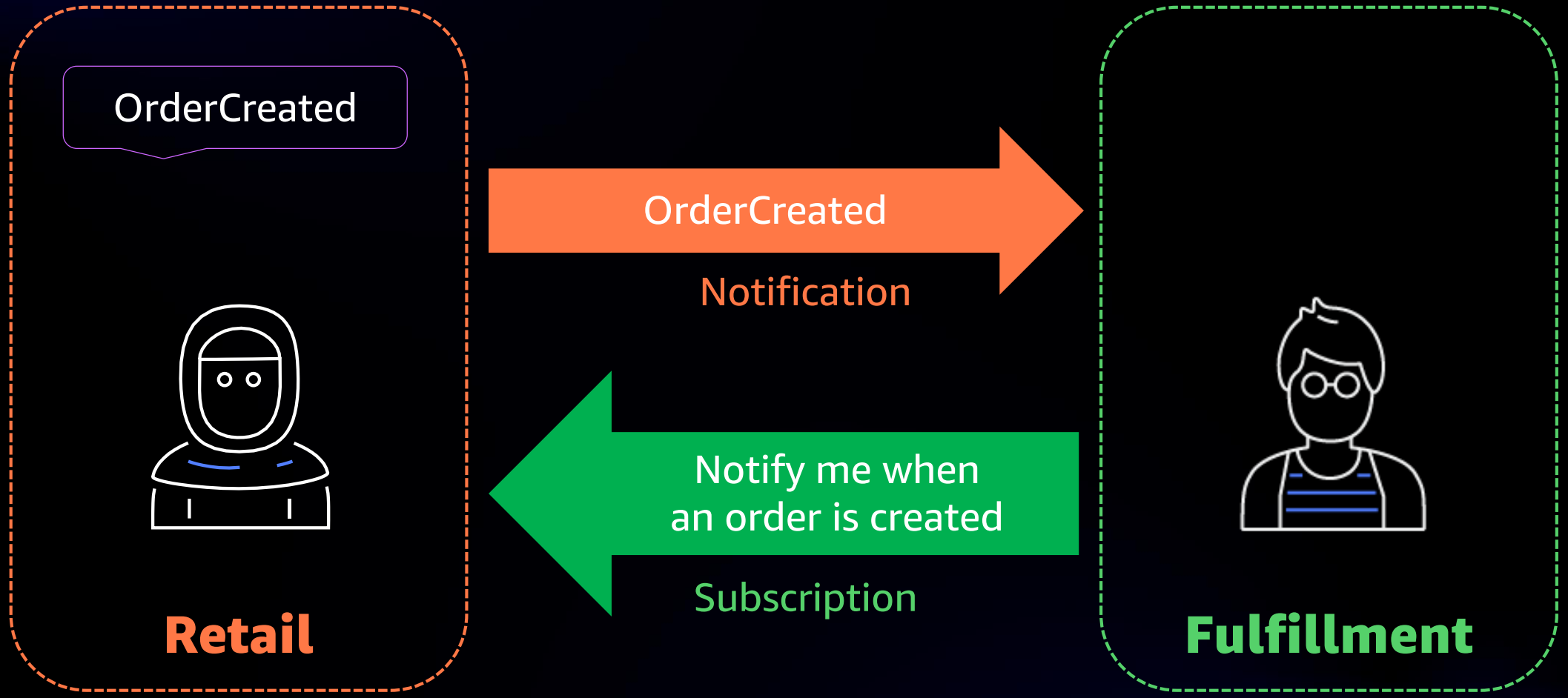
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Orchestrate a business process within a domain, resulting in a published event



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Choreograph events between domains using subscriptions



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Choreography vs. orchestration

Choreography

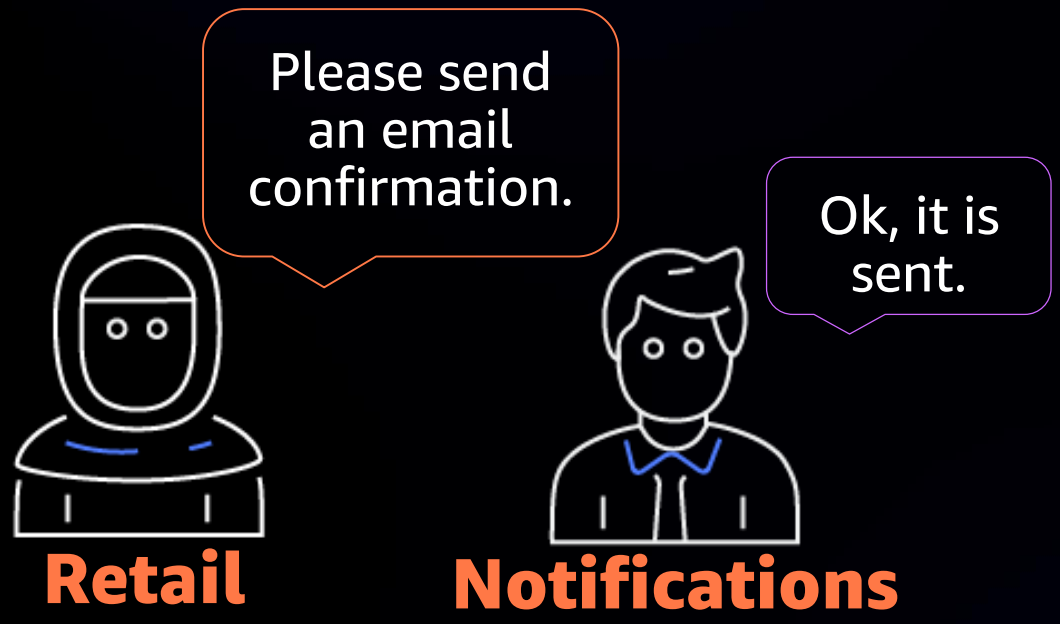
- Use choreography to coordinate different microservices
- For example, with Amazon EventBridge or Simple Notification Service (SNS)

Orchestration

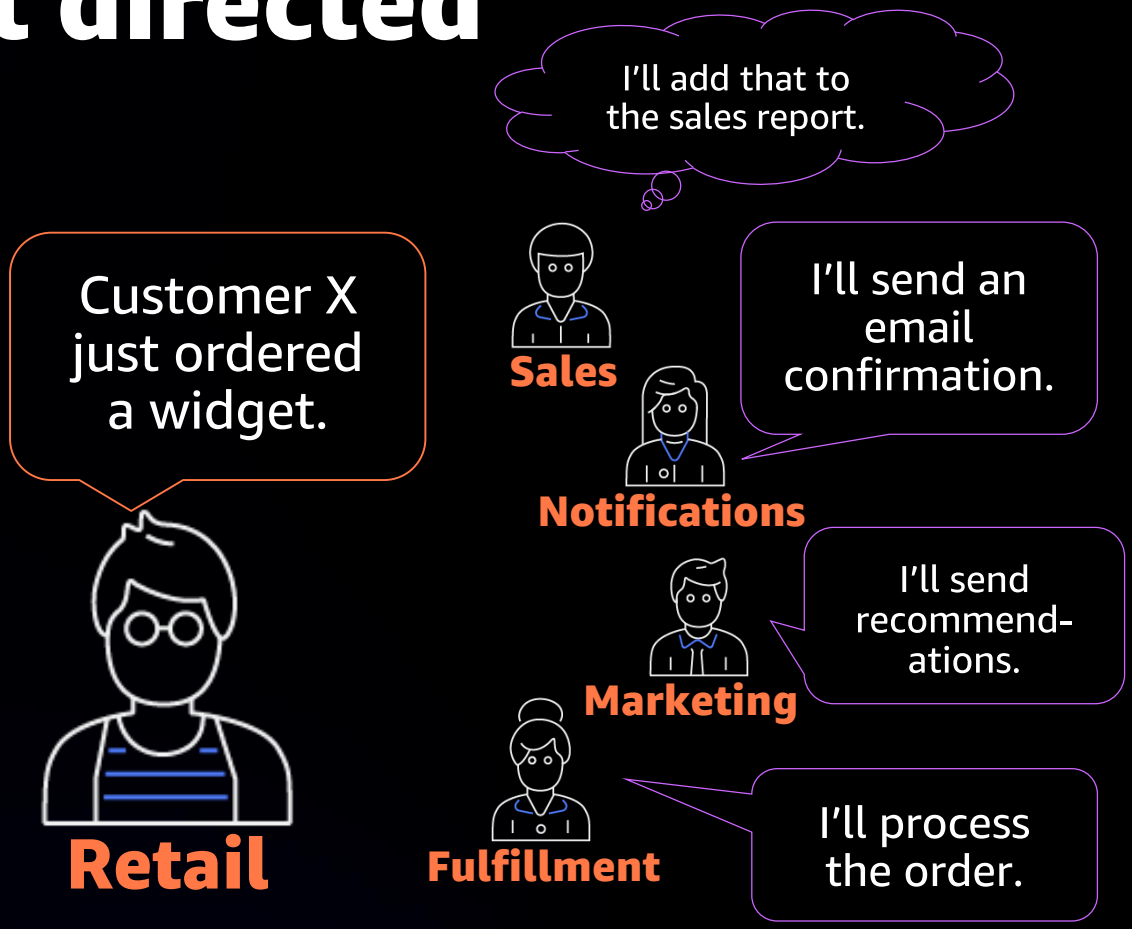
- Use orchestration inside microservices, or across different microservices if you need a distributed transaction
- For example, using AWS Step Functions

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Events are observable, not directed



Directed commands



Observable events

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Journey to event-driven architecture

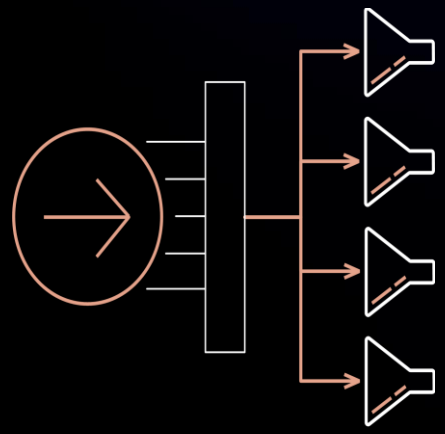
STEP 1
Start with the domain



STEP 2
Pick an event router

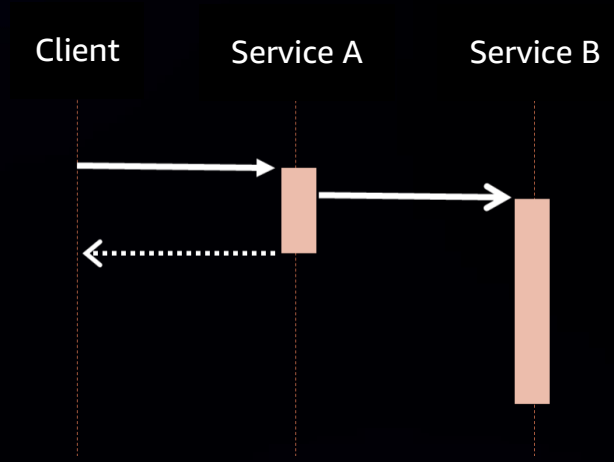
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Event-driven architectures drive reliability and scalability



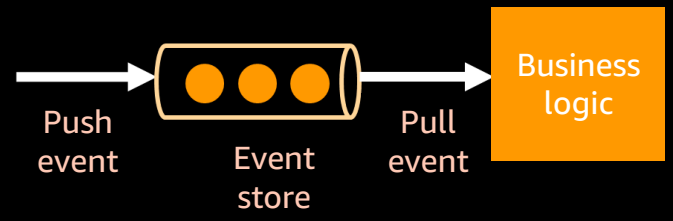
Event routers

Abstract producers and consumers from each other



Asynchronous events

Improve responsiveness and reduce dependencies



Event stores

Buffer messages until services are available to process

aws

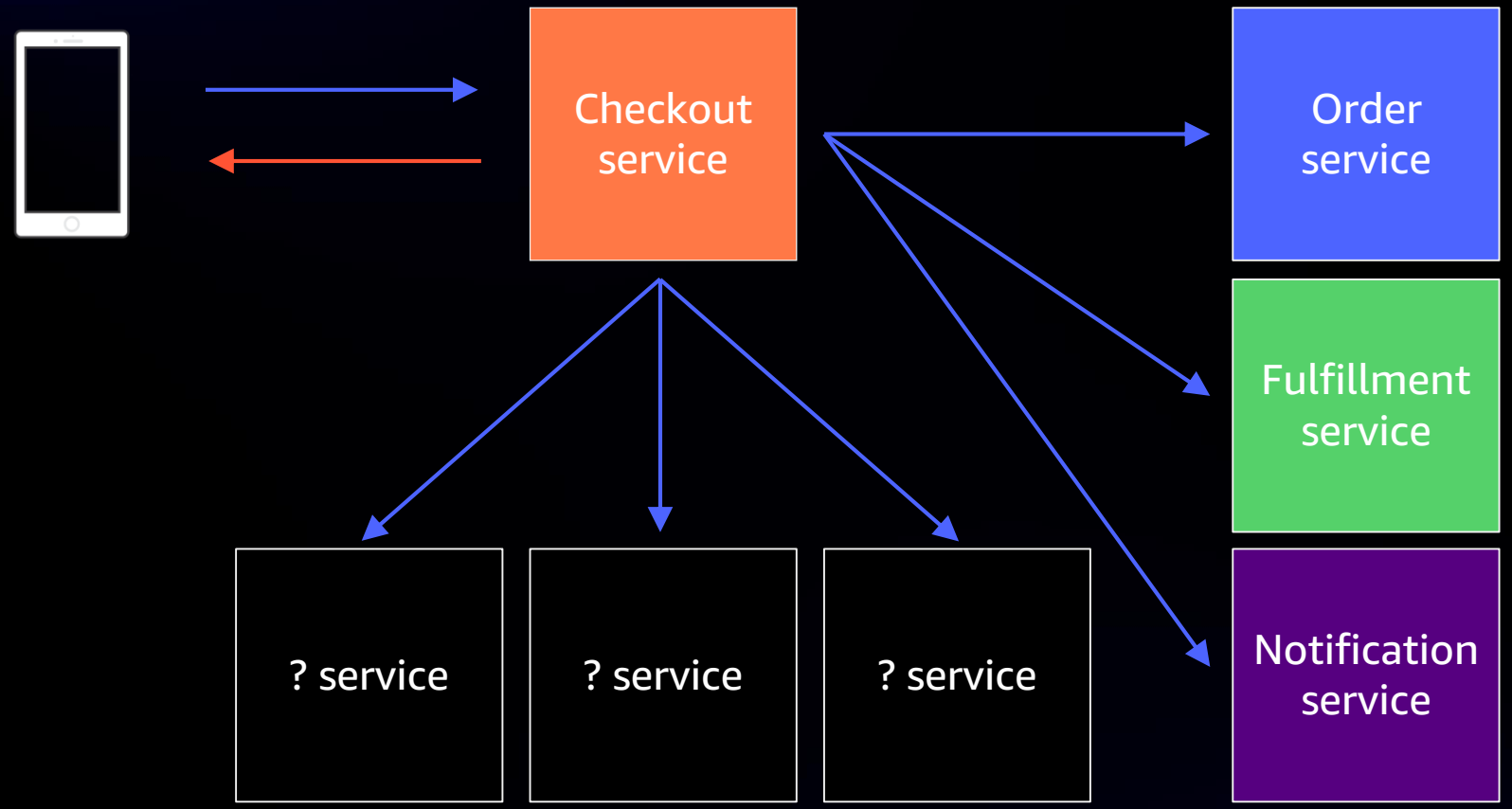
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Let’s launch an eCommerce site . . .



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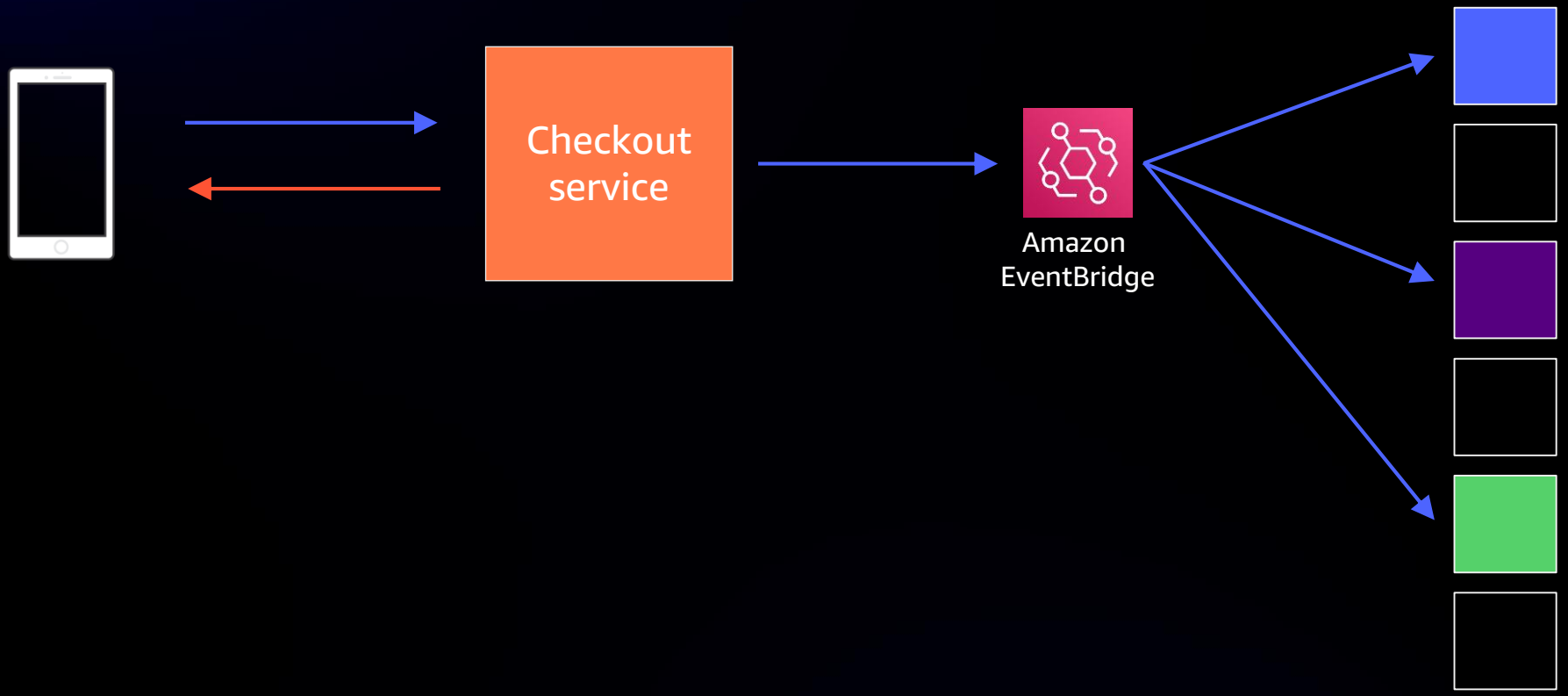
Growing our business . . .



aws

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Building an event-driven architecture



aws

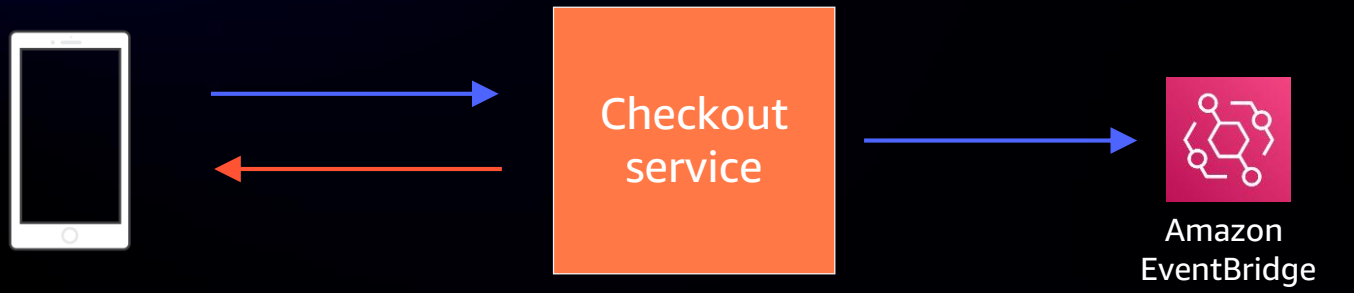
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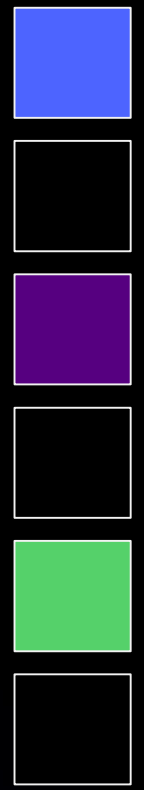
Anatomy of an EventBridge event



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On an “OrderCreated” event

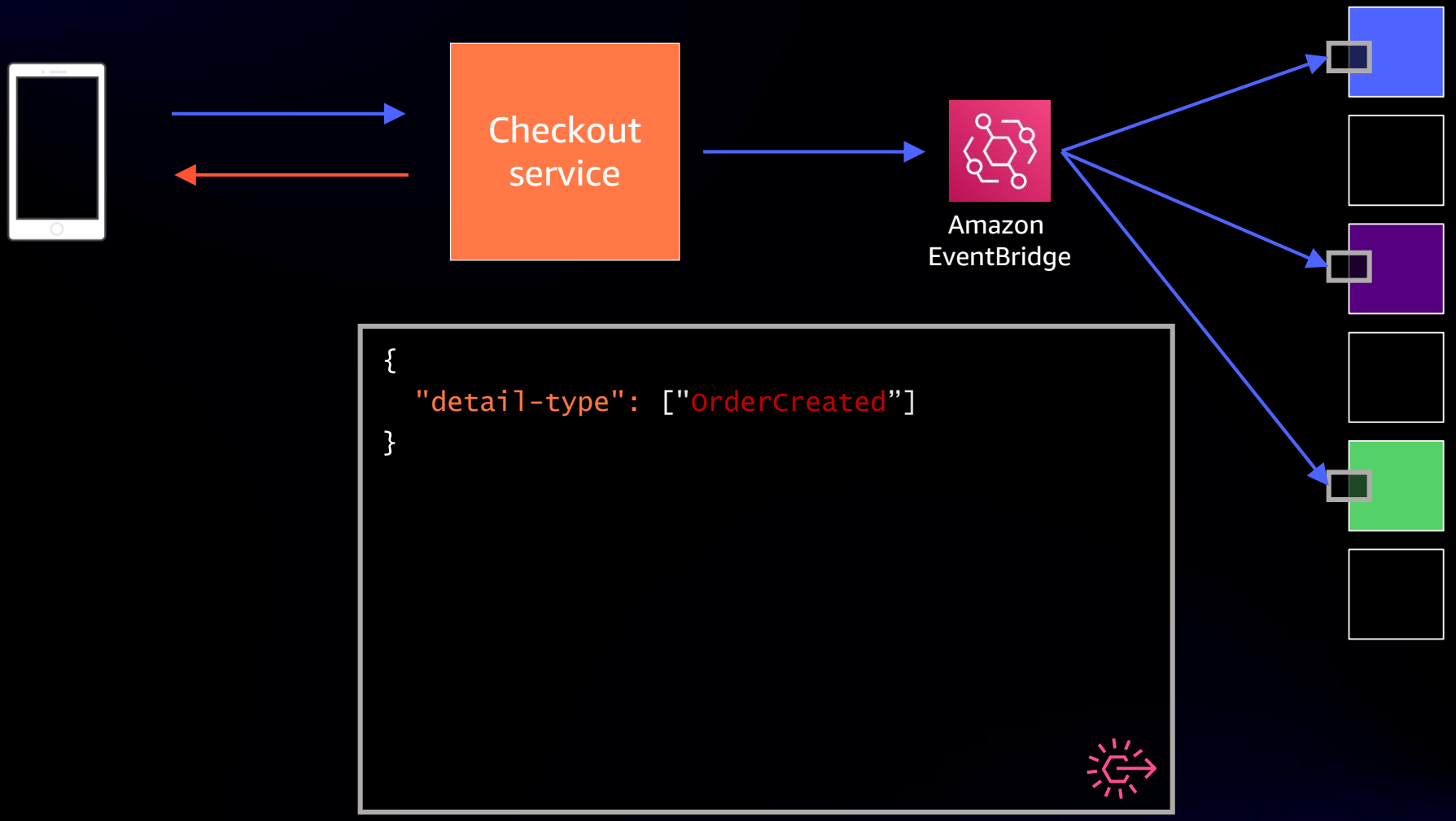




```
{
  "detail-type": "OrderCreated",
  "source": "com.orders",
  "detail": {
    "order_id": "1073459984",
    "created_at": "2020-08-28T14:17:09-05:00",
    "price": 24.62
    "currency": ”USD",
    ”memberId": ”USD",
    ...
  }
}
```

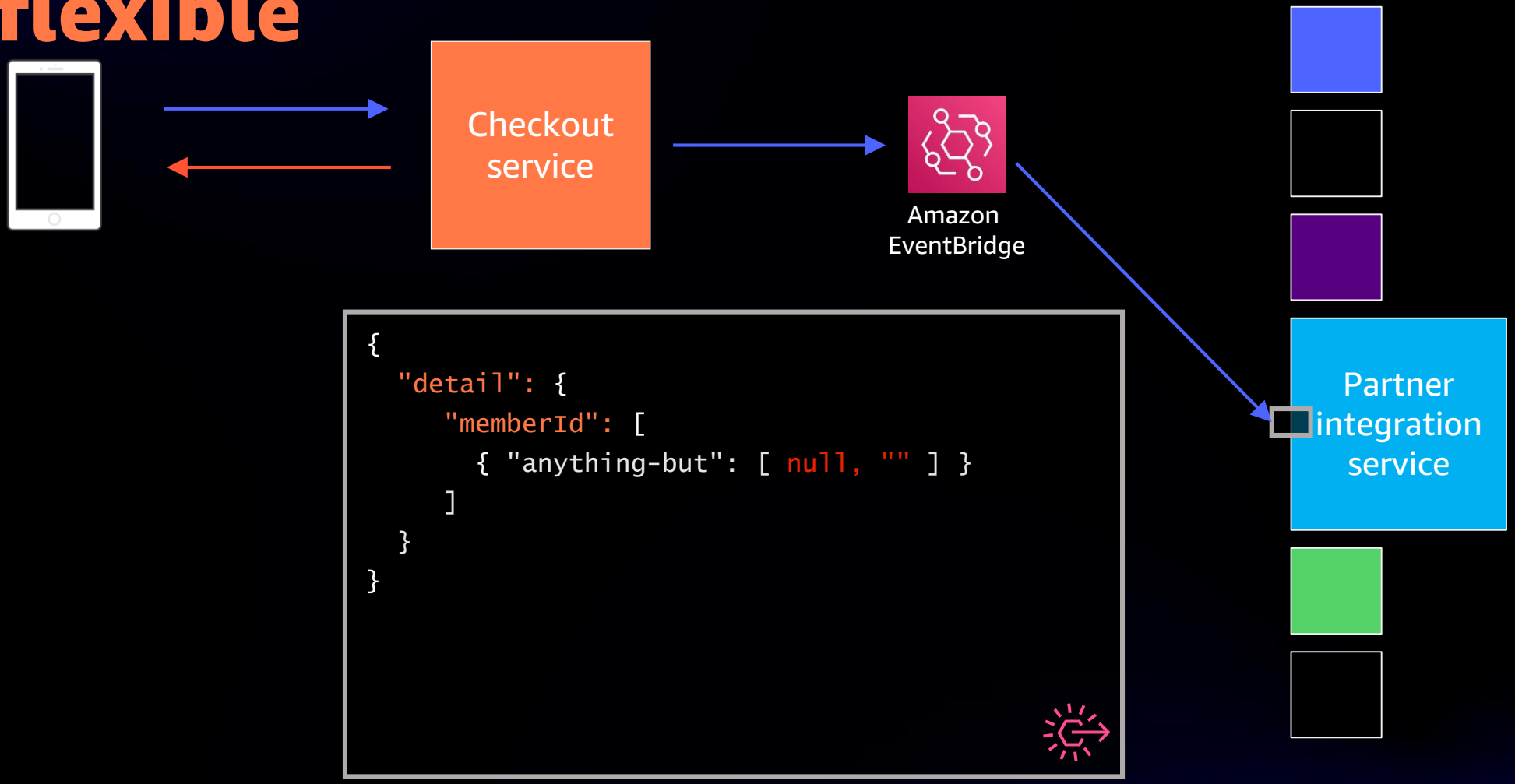
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Route orders to appropriate services



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Event-driven, serverless applications are flexible



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Events enable interaction between services

MANAGED SERVICES PROVIDE ROUTING, STORAGE, AND DISTRIBUTION OF EVENTS



Amazon SQS

Messaging

Durable and scalable
Fully managed
Comprehensive security



Amazon EventBridge

Choreography

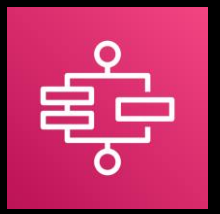
Event filtering
Managed and scalable
SaaS integration



Amazon SNS

Eventing

Performance at scale
Fully managed
Enterprise-ready



AWS Step Functions

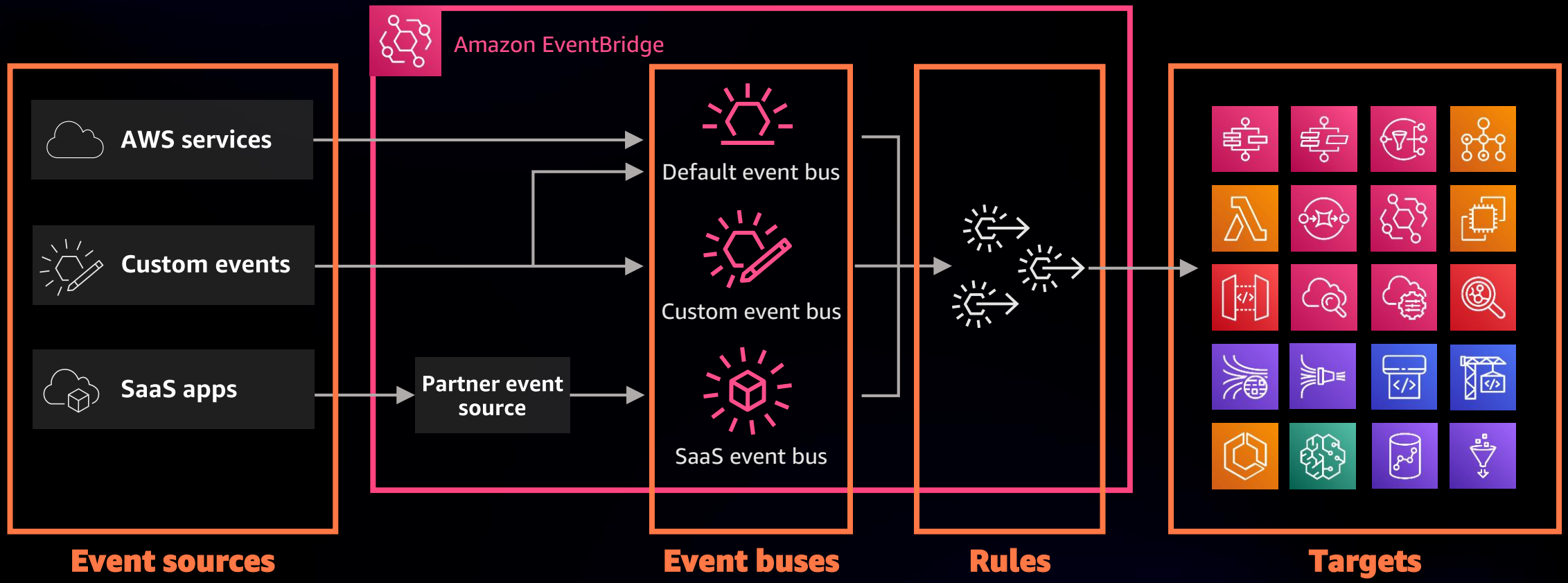
Orchestration

Sequencing
Parallel execution
State management

aws

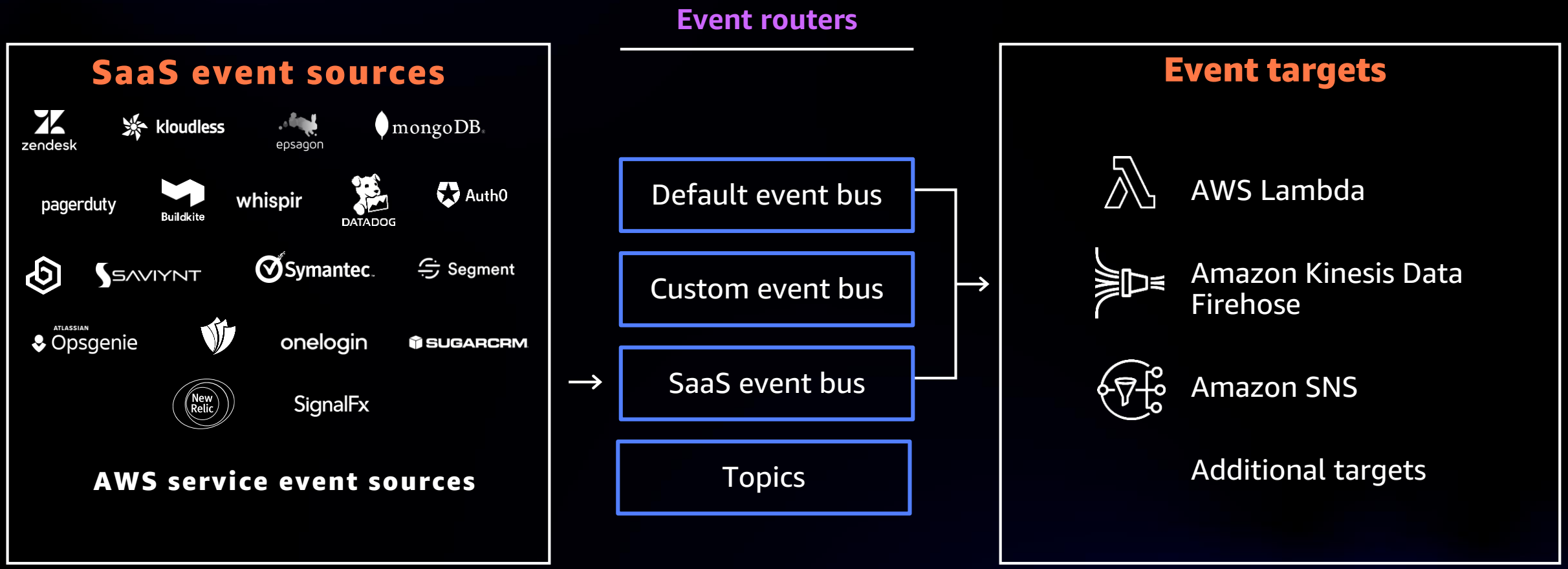
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Amazon EventBridge architecture



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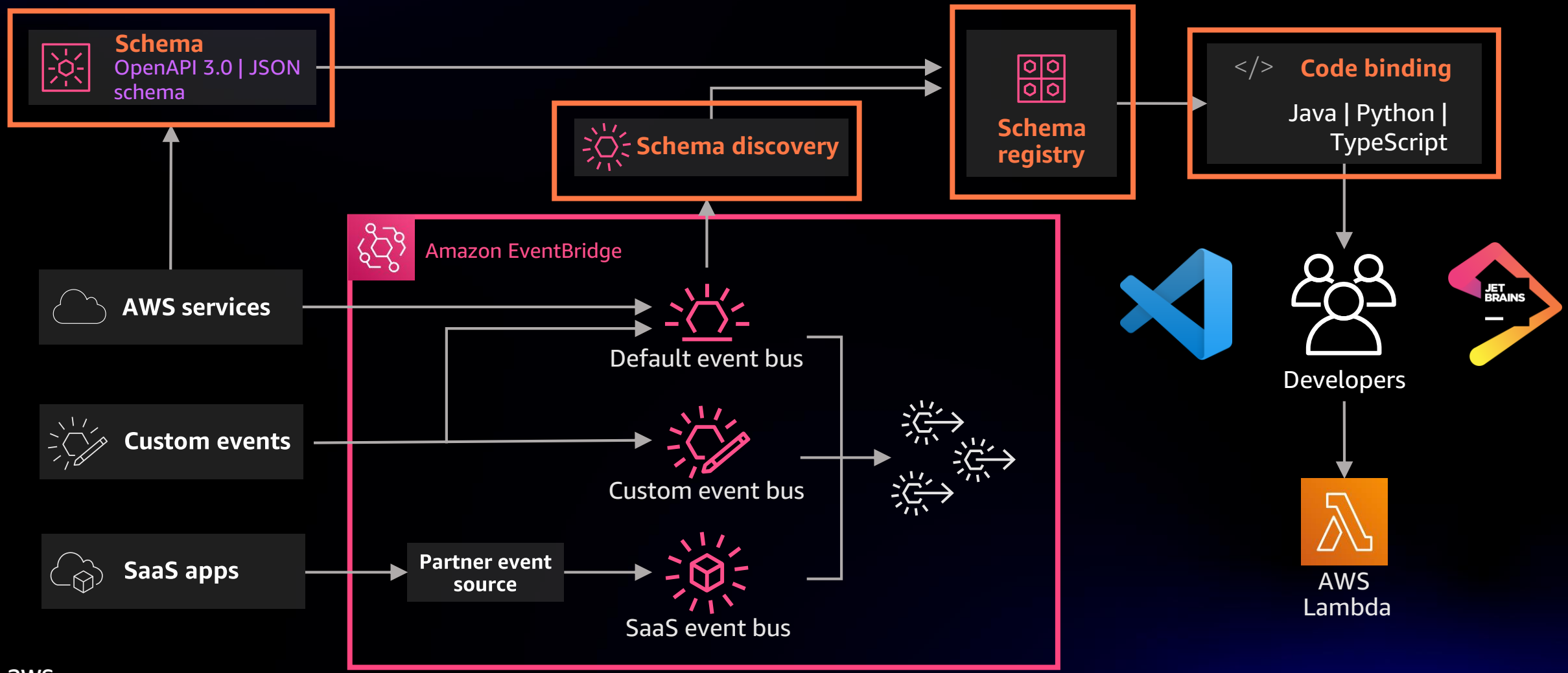
SaaS event sources supported by EventBridge



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Amazon EventBridge architecture

AMAZON EVENTBRIDGE SCHEMA REGISTRY



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Amazon SNS

What is it?

Simple, flexible, fully managed publish/subscribe messaging and mobile push notification service for high throughput, highly reliable message delivery

Use case

Push messages to a variety of endpoints and clients in distributed systems, microservices, and serverless applications, and enable event-driven architecture

Cool capabilities

Highly reliable delivery of any volume of messages to any number of recipients across multiple protocols

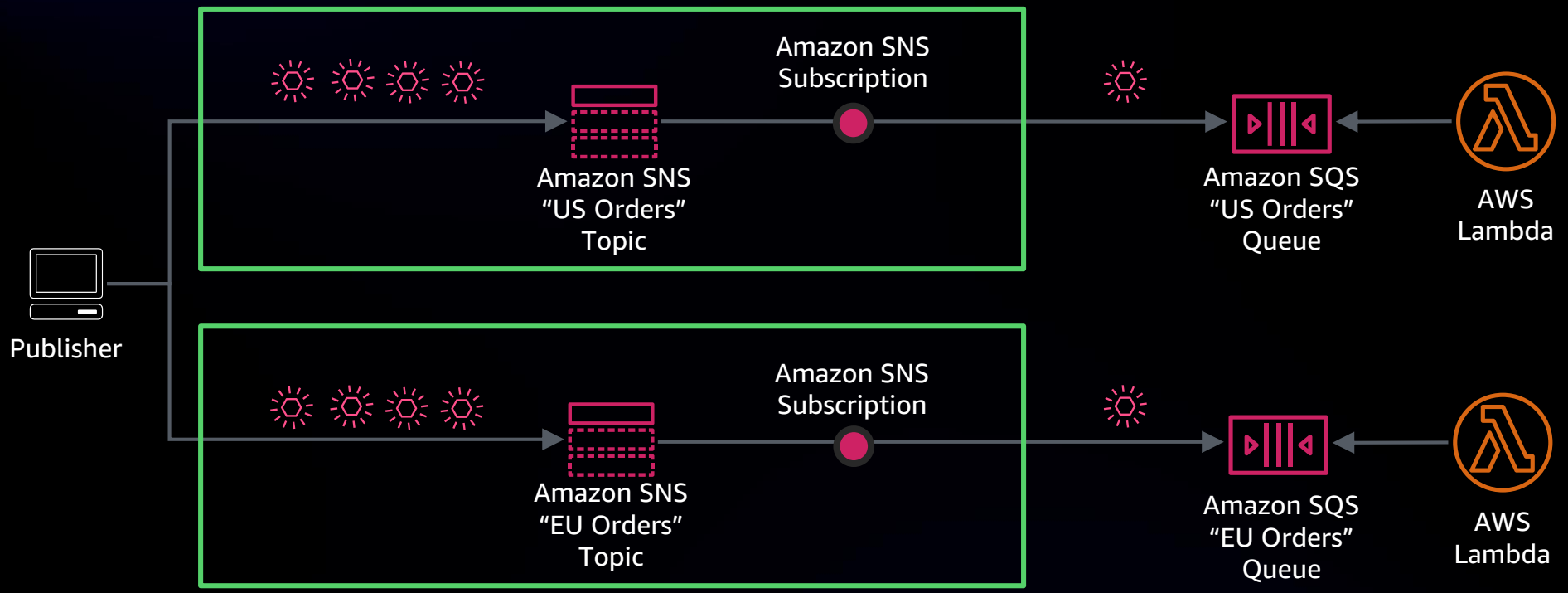
```
> aws sns create-topic --name my-topic
```



aws

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Mapping events to topics

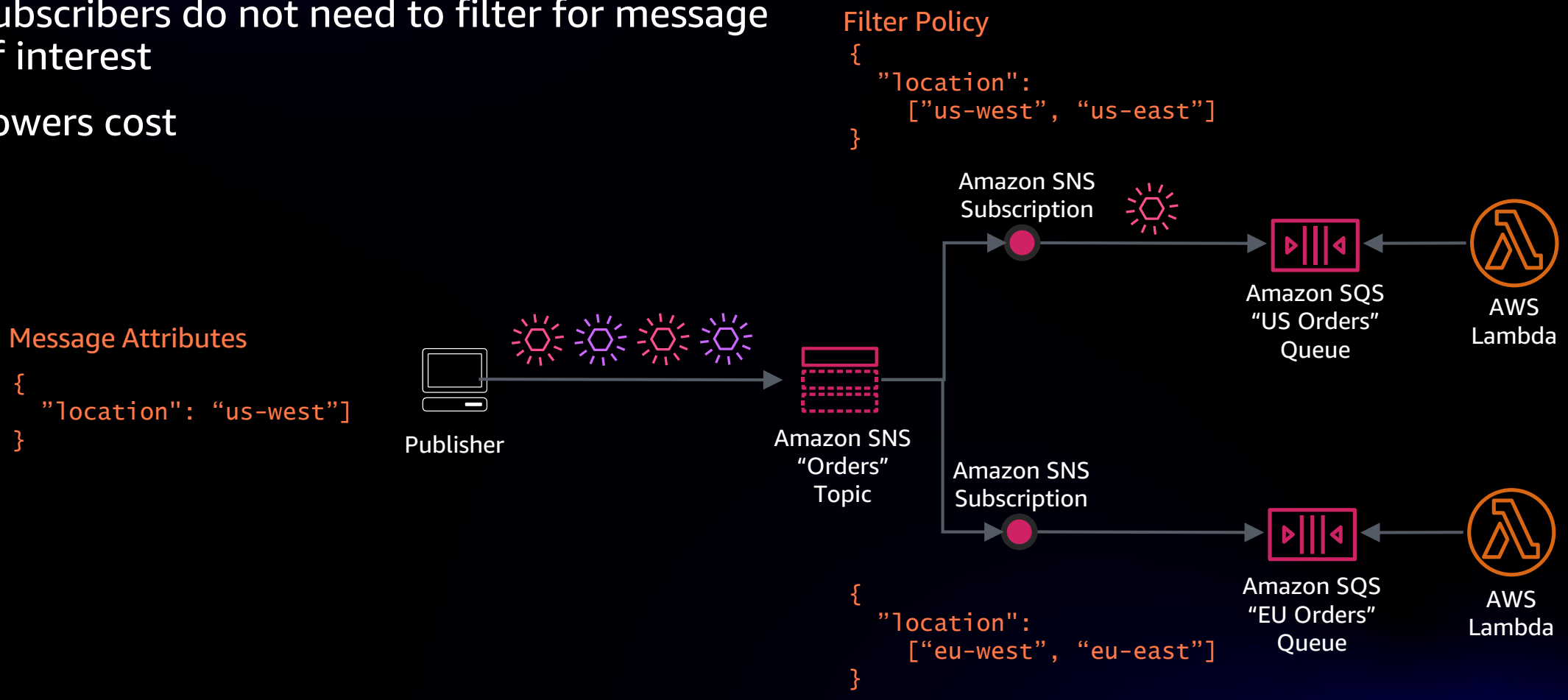


Each message type is mapped to logical destination

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Amazon SNS message filters

- Publishers do not need to route message
- Subscribers do not need to filter for message of interest
- Lowers cost



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Journey to event-driven architecture

STEP 1
Start with the domain

STEP 3
Pick an event store



STEP 2
Pick an event router

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Improve resiliency and scalability with event stores



Buffer messages until services are available to process

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Journey to event-driven architecture

STEP 1
Start with the domain

STEP 2
Pick an event router

STEP 3
Pick an event store

STEP 4
Structure events



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Events vs. full-state descriptions

Order 123 was created at 10:47 AM by customer 456.



Events

Order 123 was created at 10:47 AM by customer 456. The current status is Open, the total was $237.51, the items were . . .



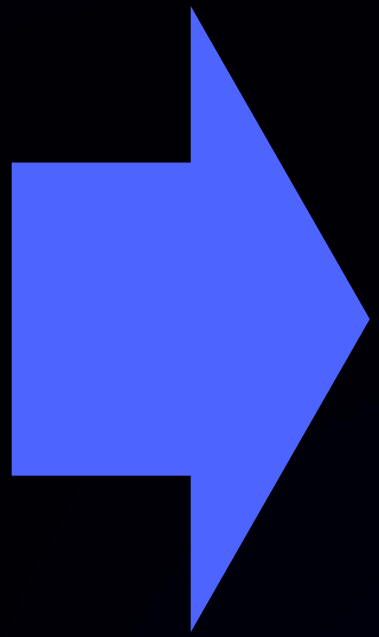
Full-state description

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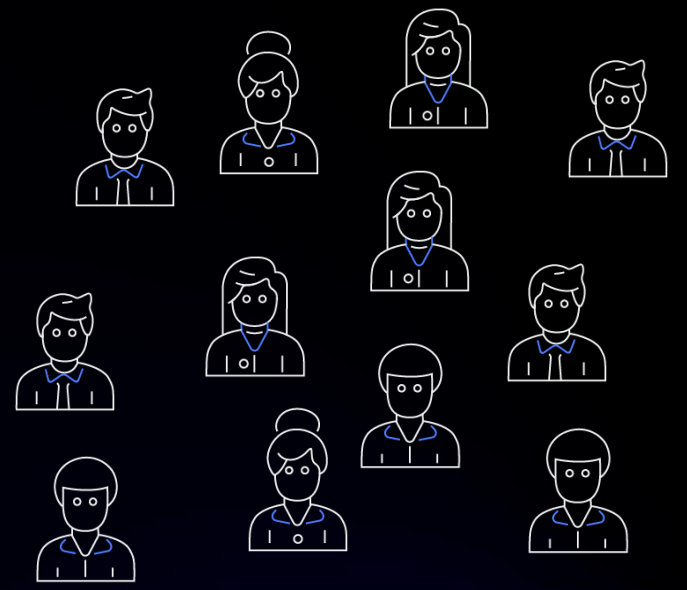
Considerations with sparse events

Order 123 was created by customer 456.





What are the details for order 123?

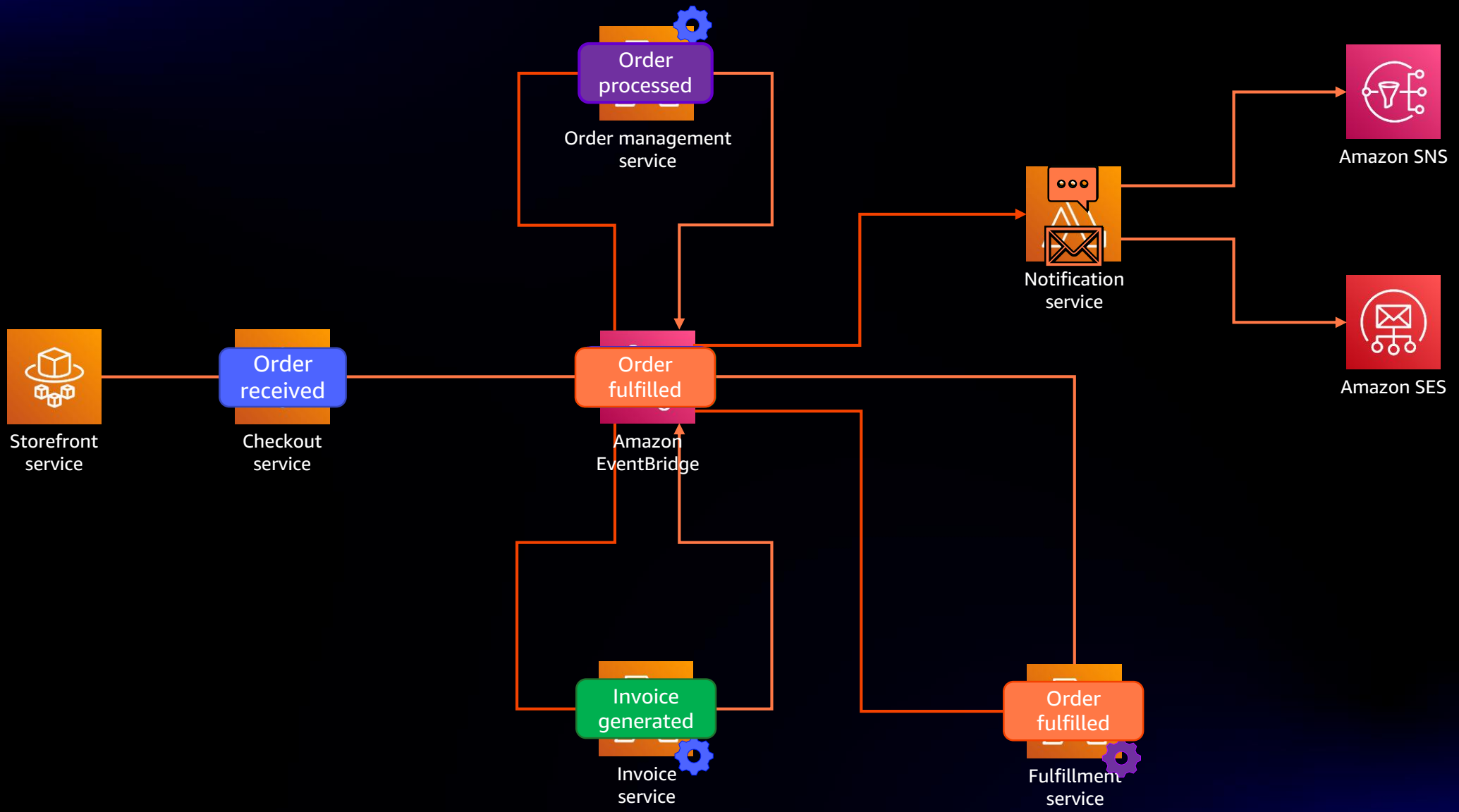


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Event-driven architecture example

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Demo of event-driven architecture



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Workshop

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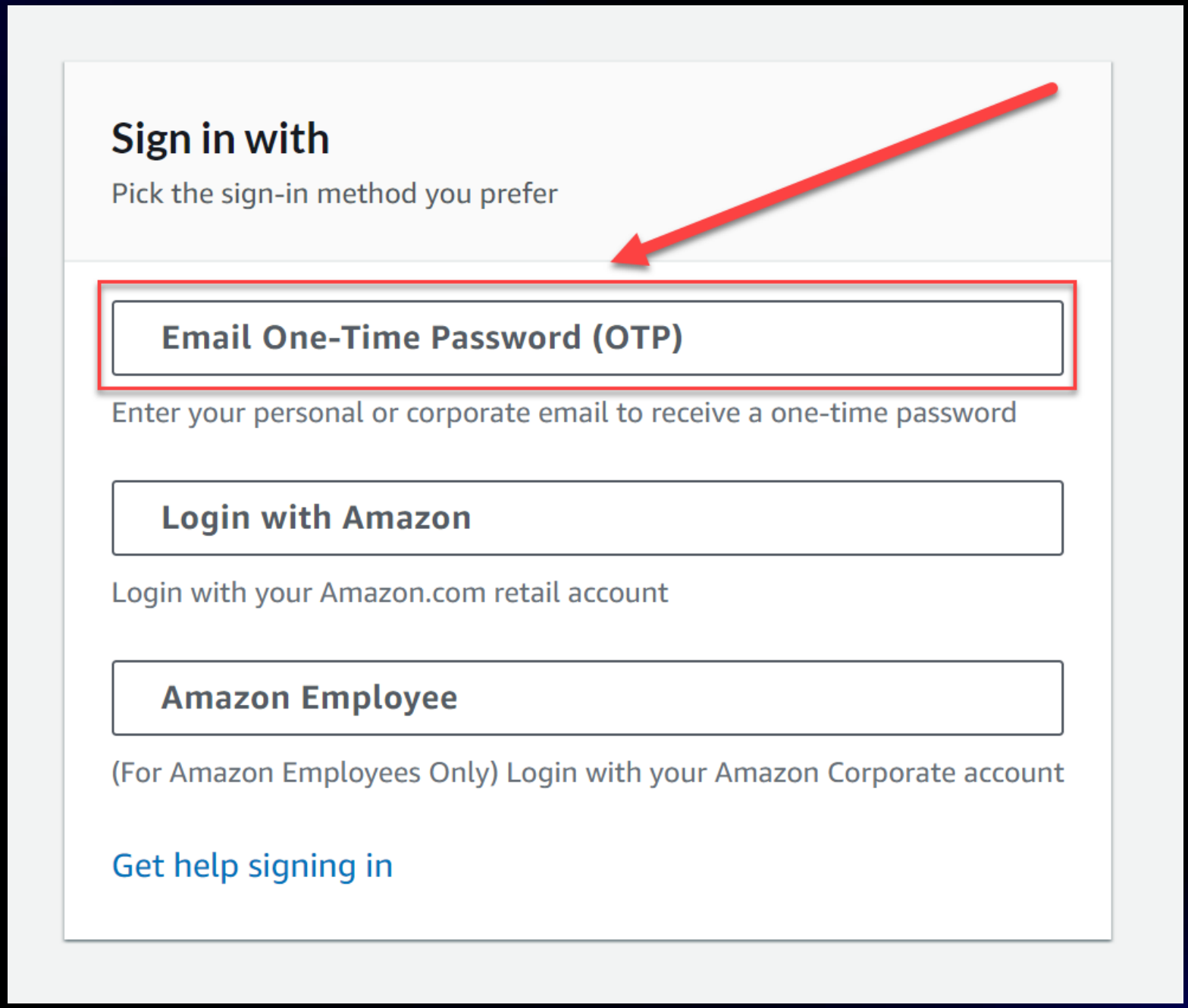
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One-time email passcode

We sent a passcode to [redacted]. You should receive it within 5 minutes.

Passcode (9-digit) Resend passcode

[redacted]

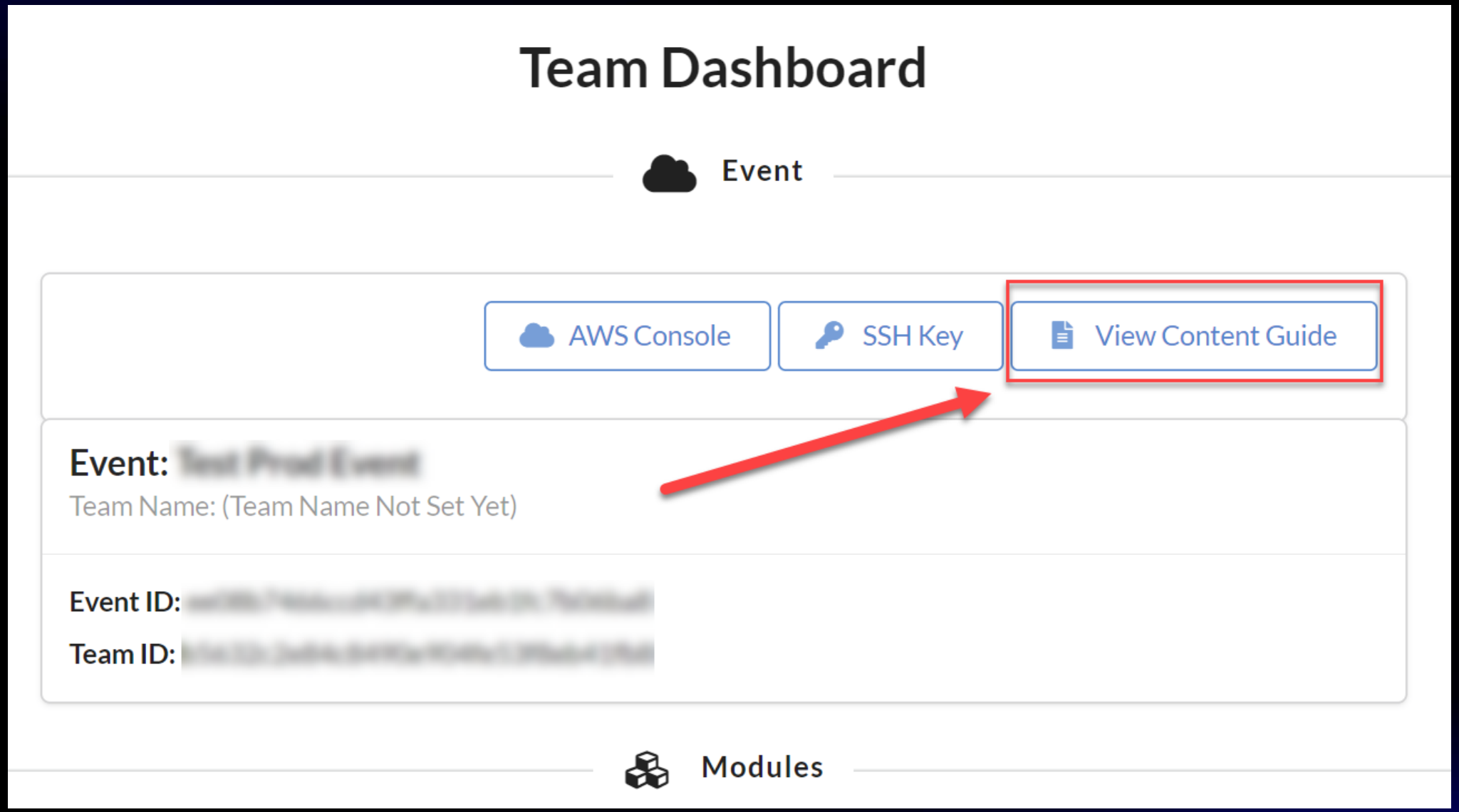
Back Sign in

Get help signing in



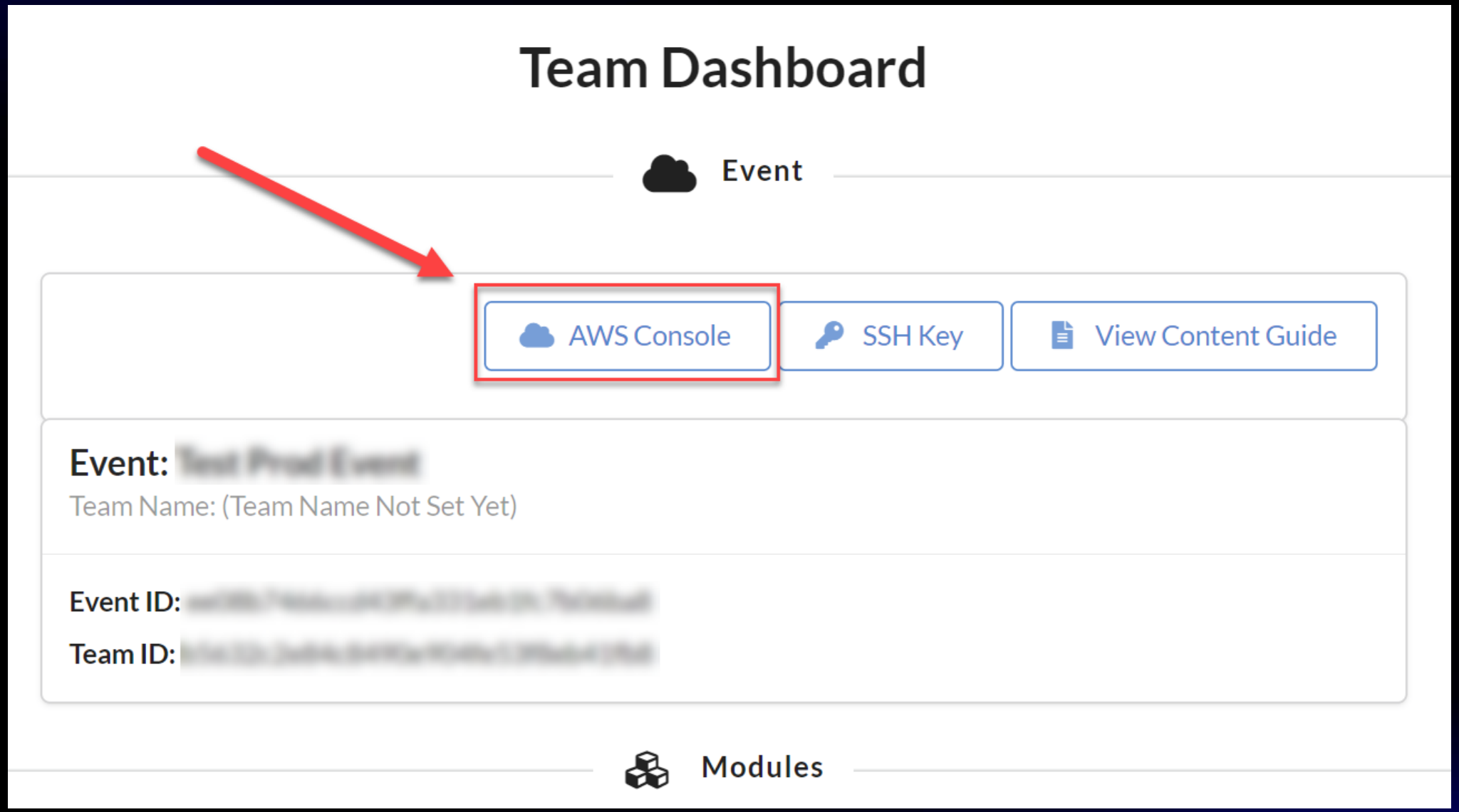
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Lab instructions



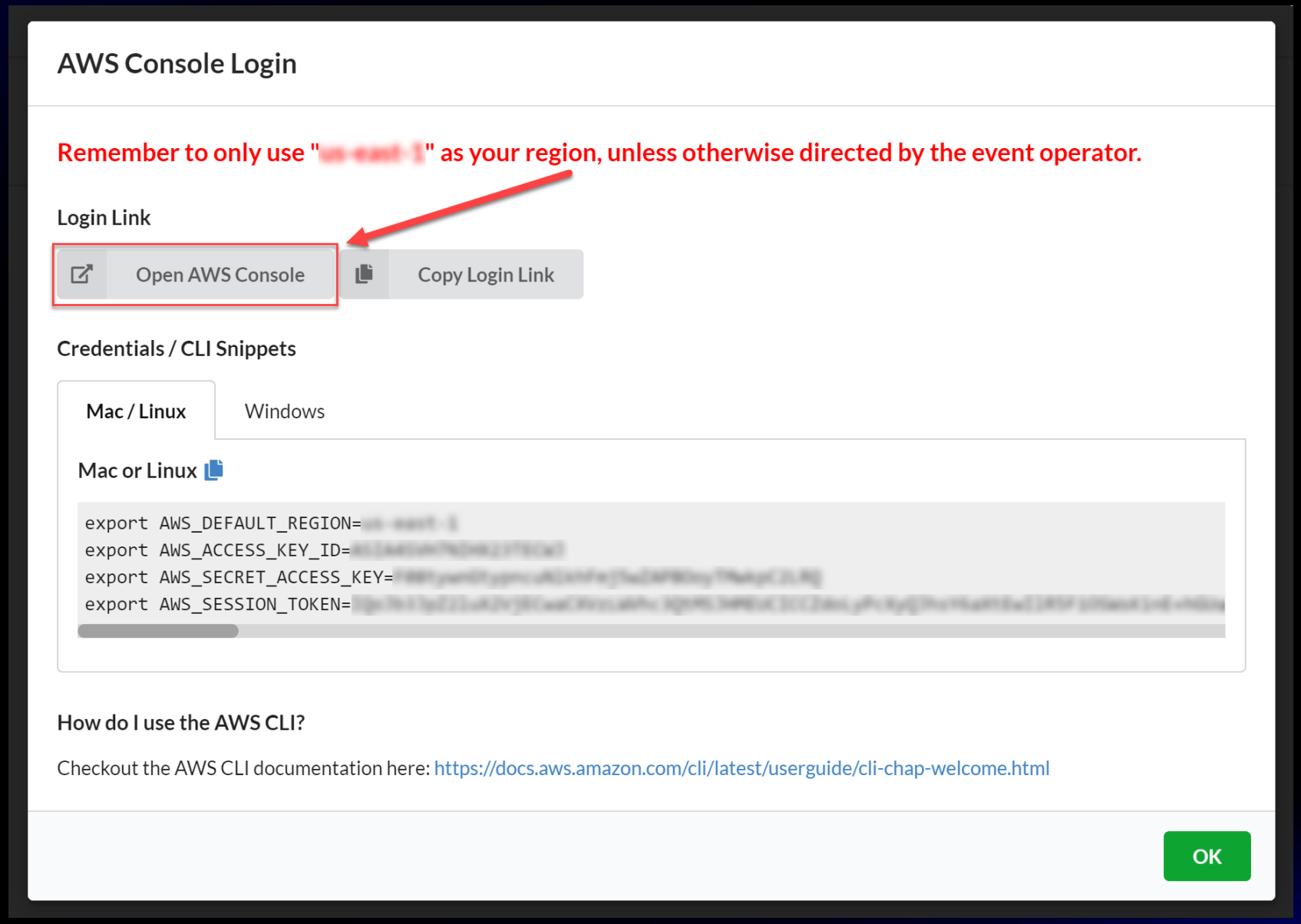
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Lab environment



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Lab environment



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Getting started

Instructions: https://bit.ly/2ZDQUC0



Lab environment: https://bit.ly/3rlW558

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Thank you!

Alexander Vladimirov

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