INNOVATE

MODERN APPLICATIONS EDITION

20 October, 2022

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Building next-gen applications with event-driven architectures

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Enterprise Solutions Architect
Amazon Web Services

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Agenda

- Challenges with distributed systems
- Solving these challenges with event driven architecture
- Journey to event-driven architectures with AWS services
- Recap and what’s next

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Challenges with distributed systems

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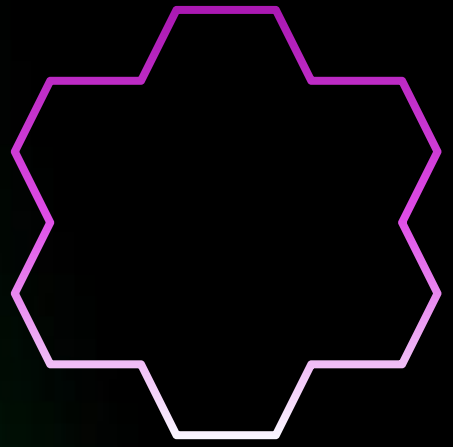
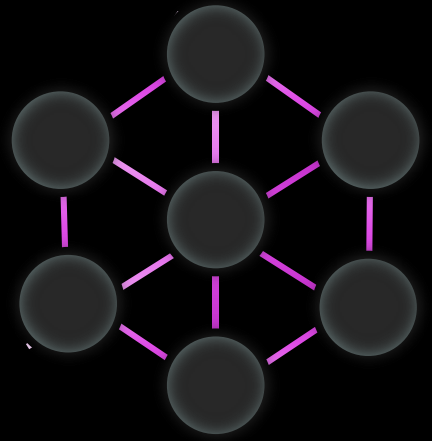
Moving from monoliths to microservices



Monolith

Does everything



Microservices

Do one thing

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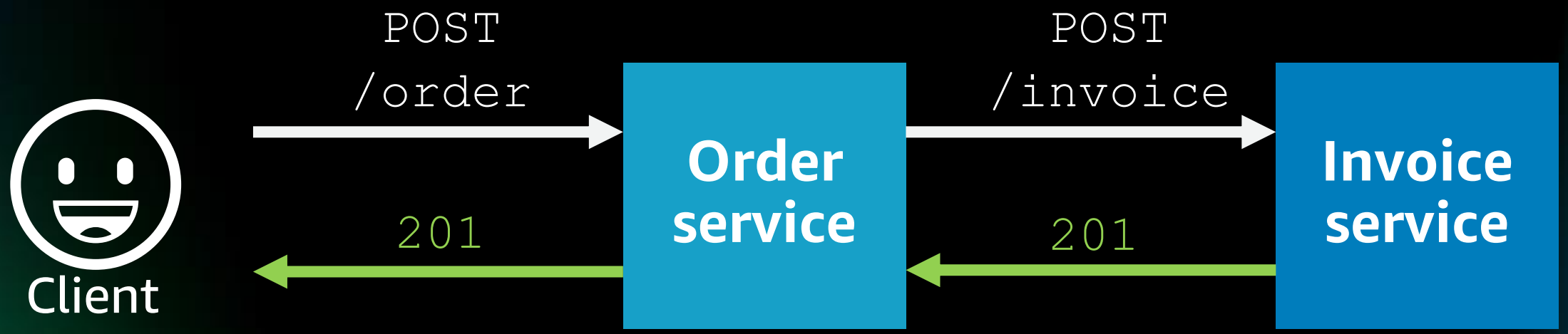
Microservices start simple



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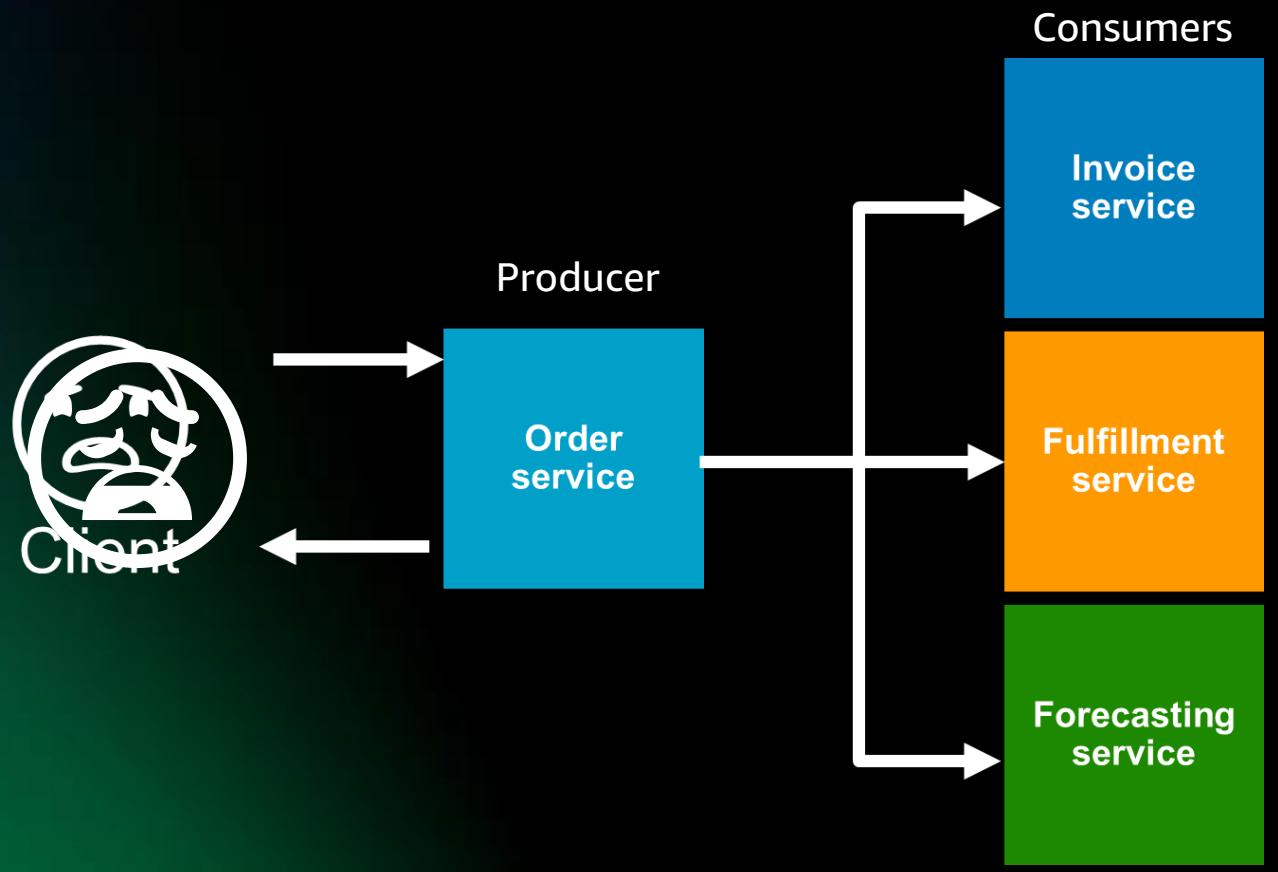
Synchronous API challenges over time



Coupling between producers and consumers

Multiple points of failure

Varying degrees of quality of service

External dependencies

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Solving these challenges with event driven architecture

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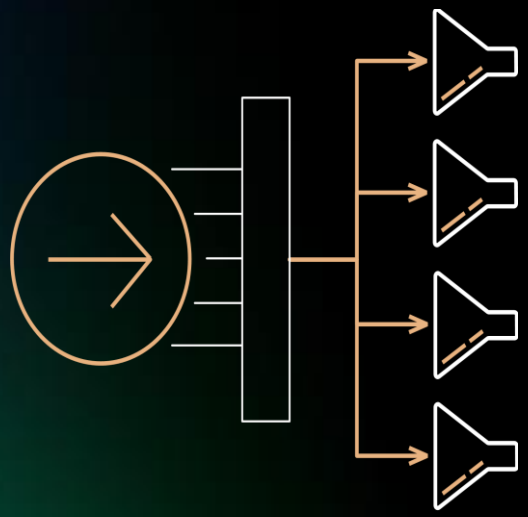
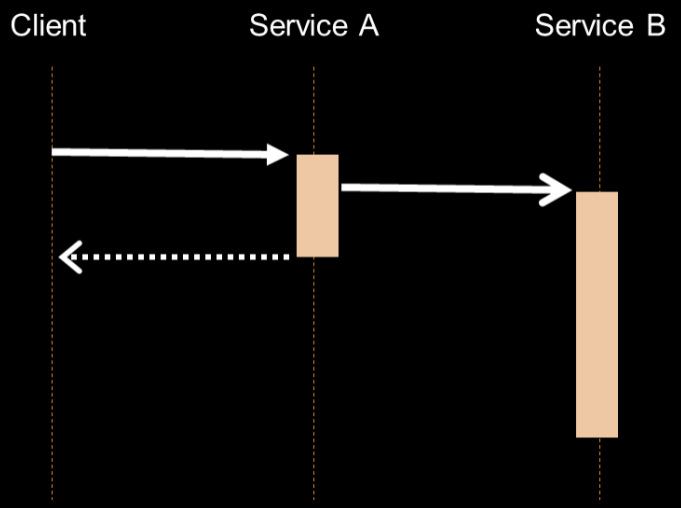
Event-driven architecture components



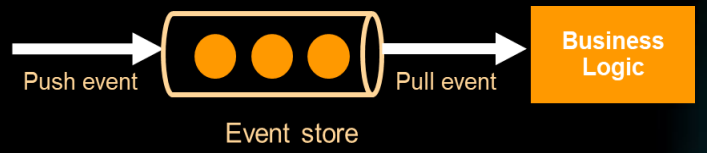
Event routers

Abstract producers and consumers from each other



Asynchronous events

Improve responsiveness and reduce dependencies



Event stores

Buffer messages until services are available to process

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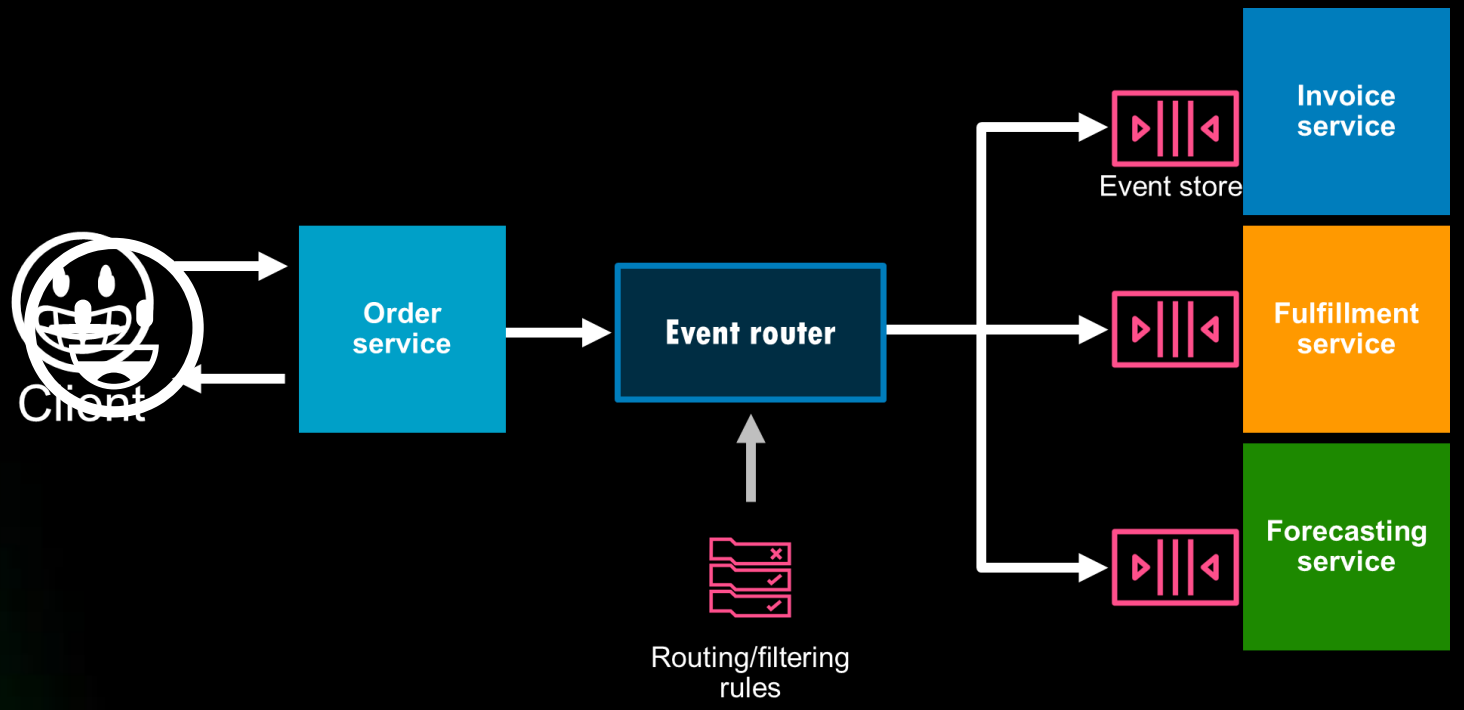
Reliable, resilient, and independently scalable



[Make generic statement from customers]

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Journey to event-driven architectures with AWS services

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Journey to event-driven architectures

STEP 1

Start with the domain

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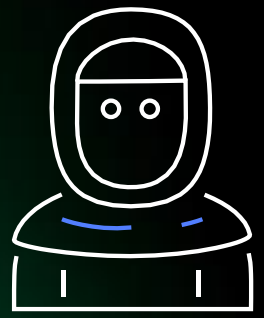
Map events to business domains using attributes, not entities

Retail

OrderCreated



Fulfillment

OrderPicked

OrderShipped

Support

ReturnRequested

ReturnReceived

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Journey to event-driven architectures

STEP 1
Start with the domain

STEP 2
Coordinate events
with an event router

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event

[i–’vent] noun

A signal that a system’s state has changed

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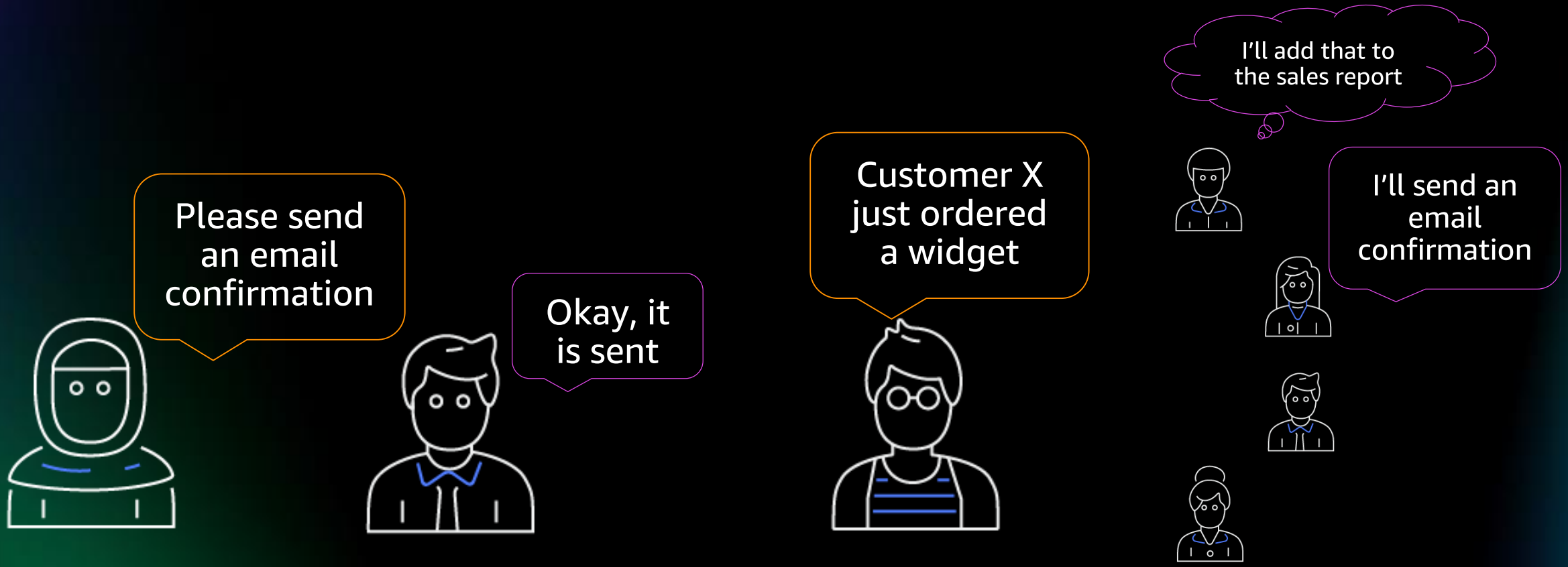
Events are observable, not directed



Directed commands

Observable events

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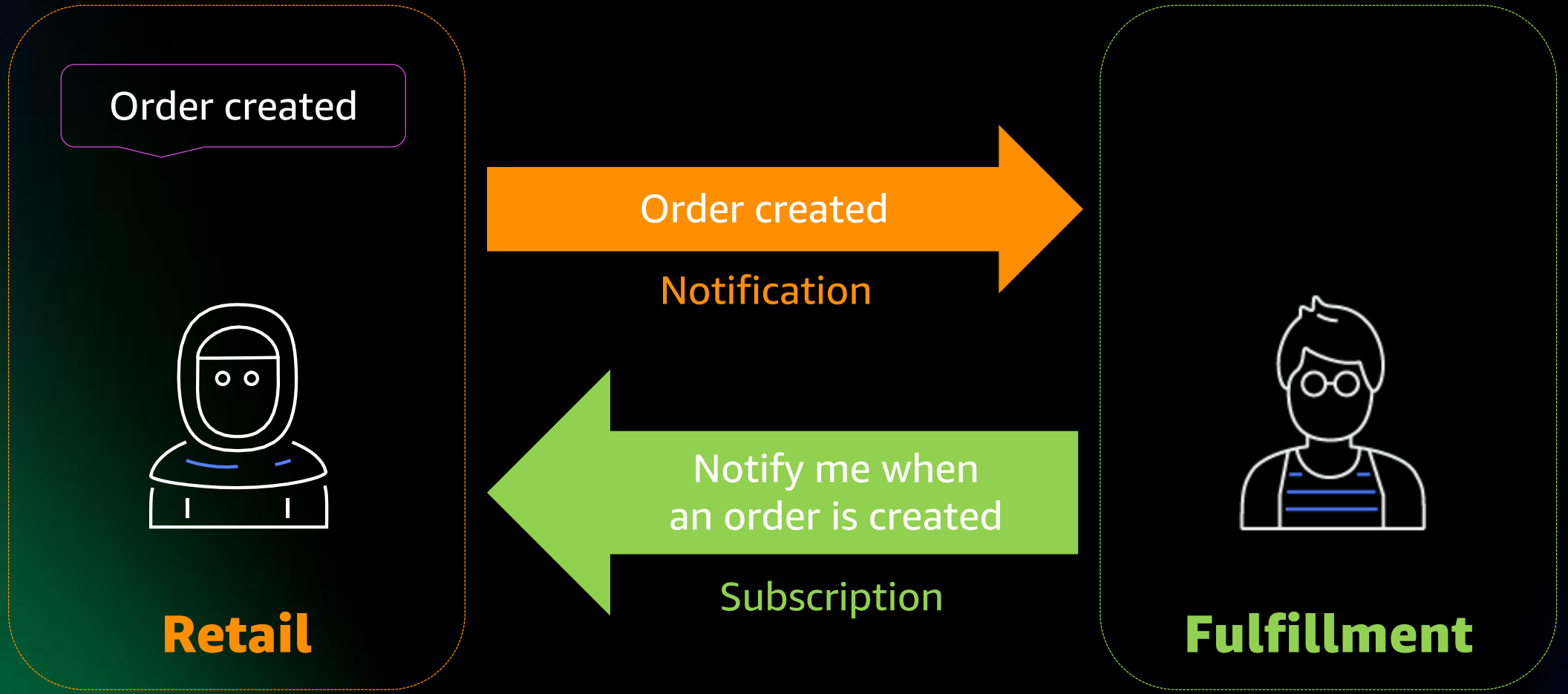
Choreograph events *between domains* using subscriptions



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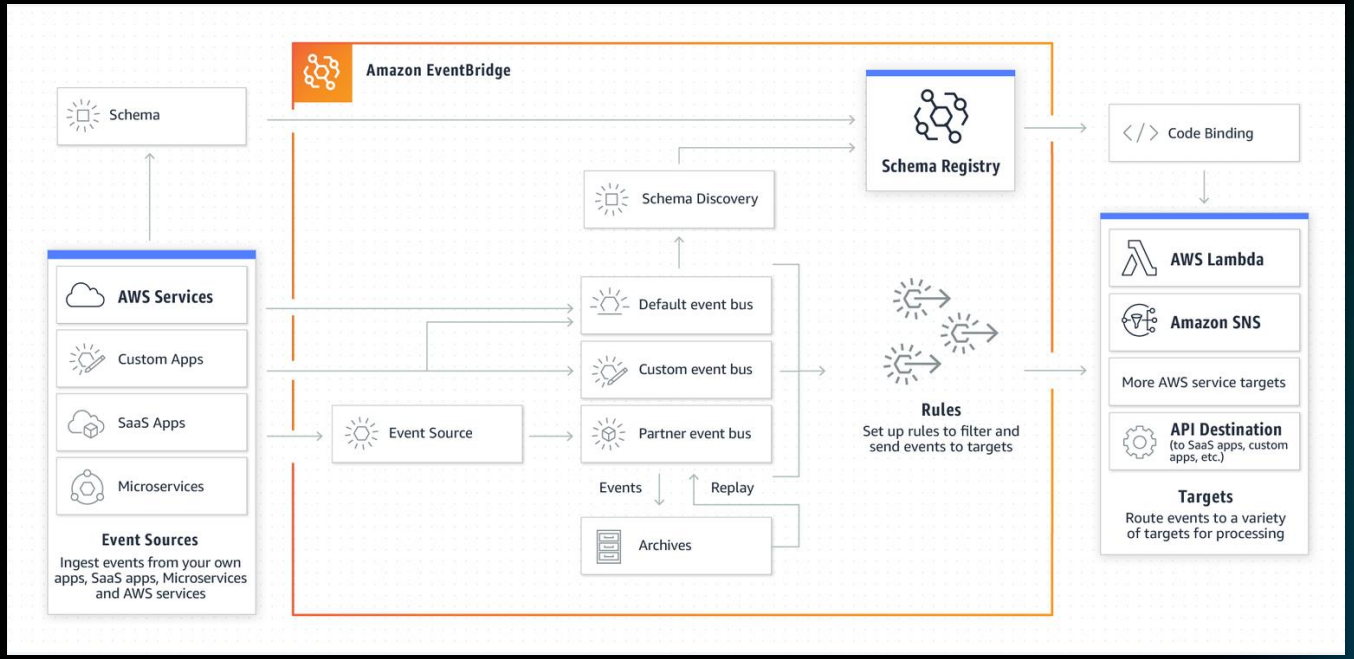
Amazon EventBridge - as an event router

Amazon EventBridge is a simple, flexible, fully managed, pay-as-you-go event bus service that makes it easy to ingest and process data from AWS services, your own applications, and SaaS applications.



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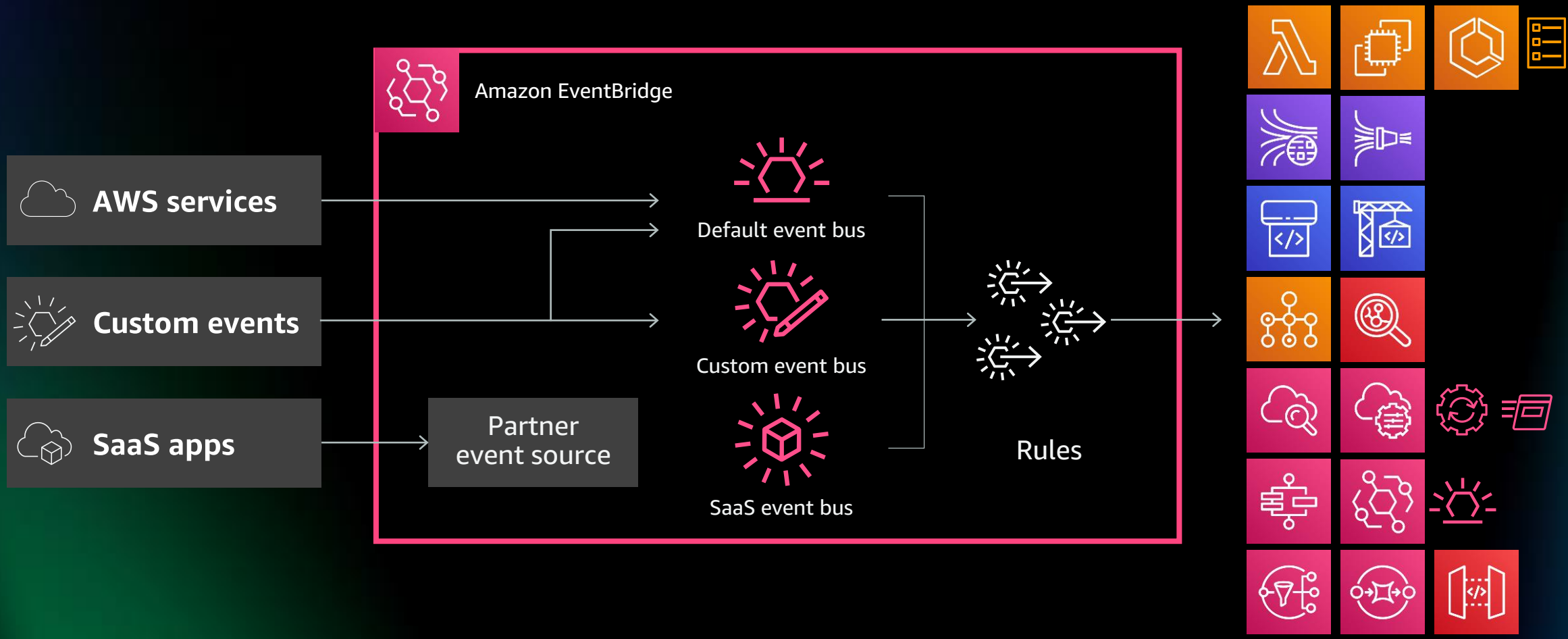
Amazon EventBridge architecture



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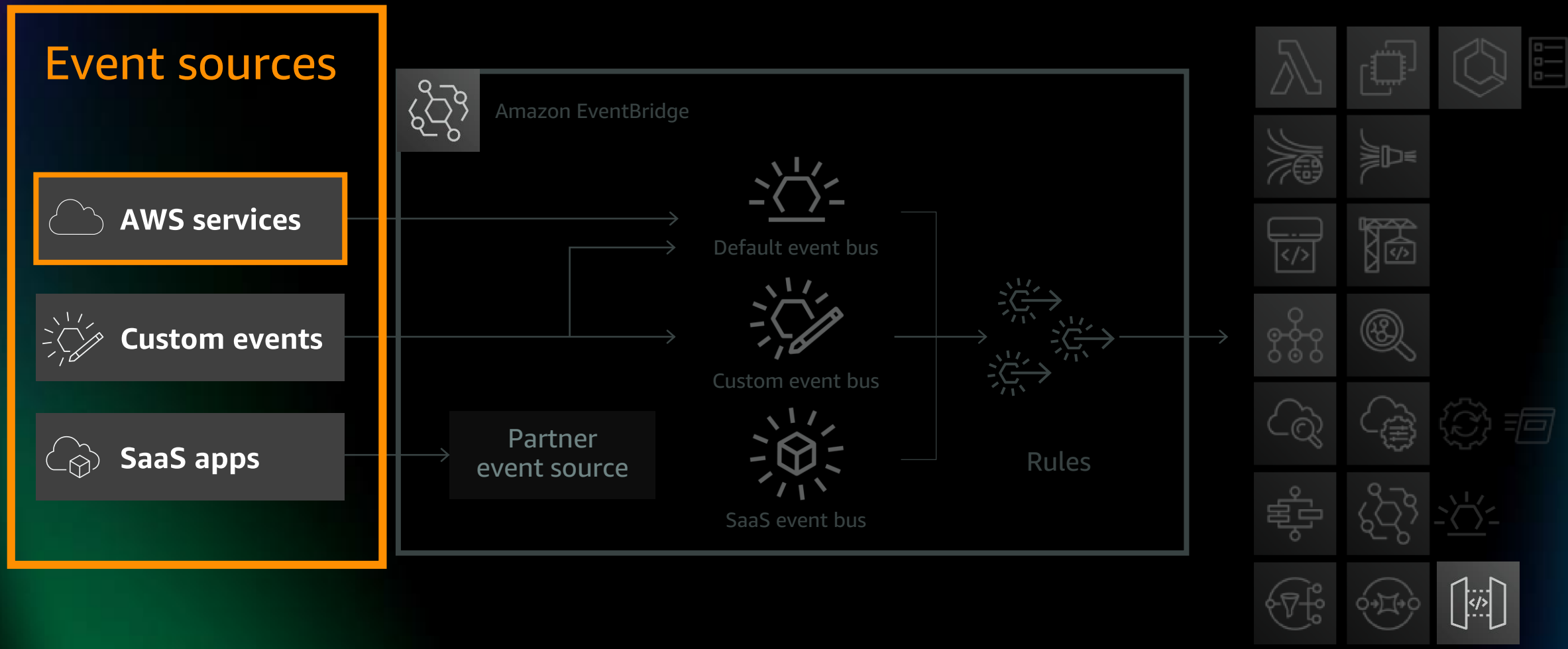
Amazon EventBridge architecture



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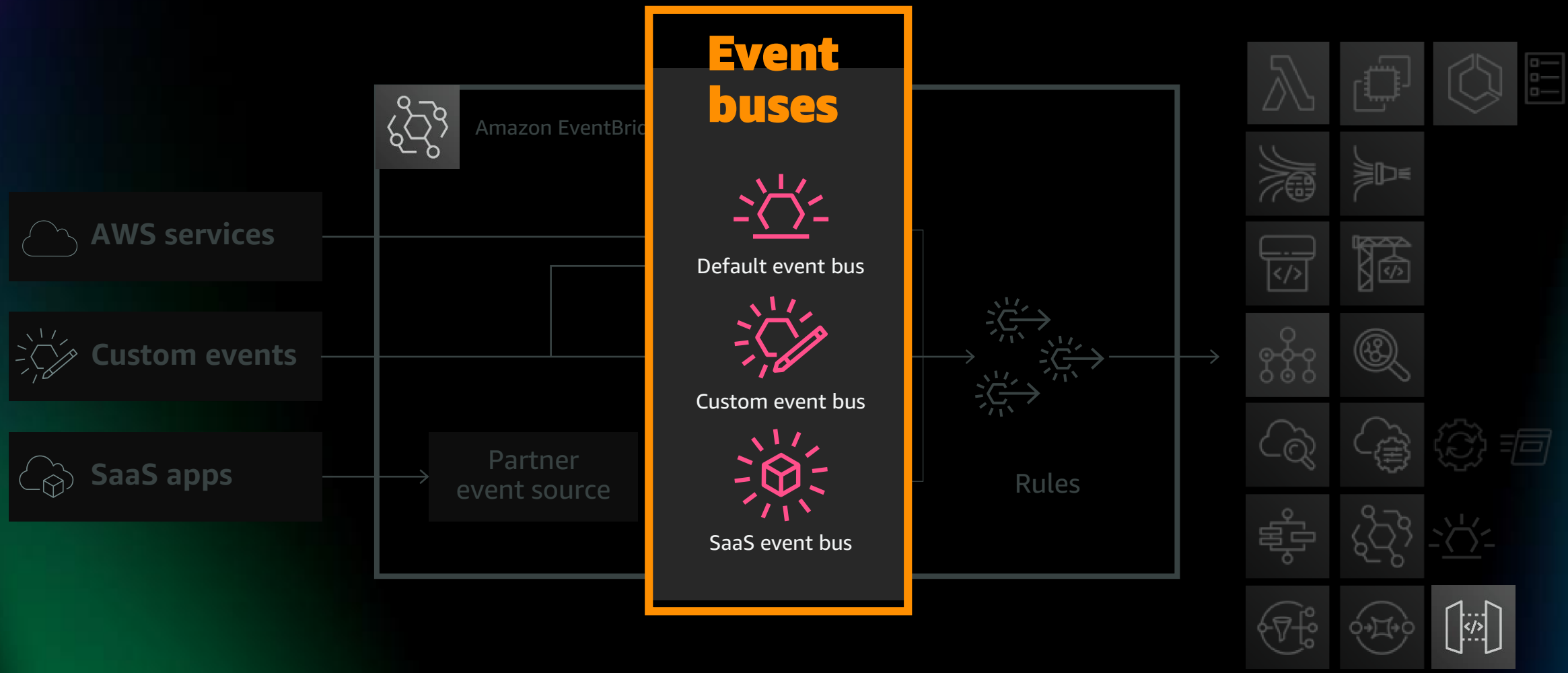
Amazon EventBridge



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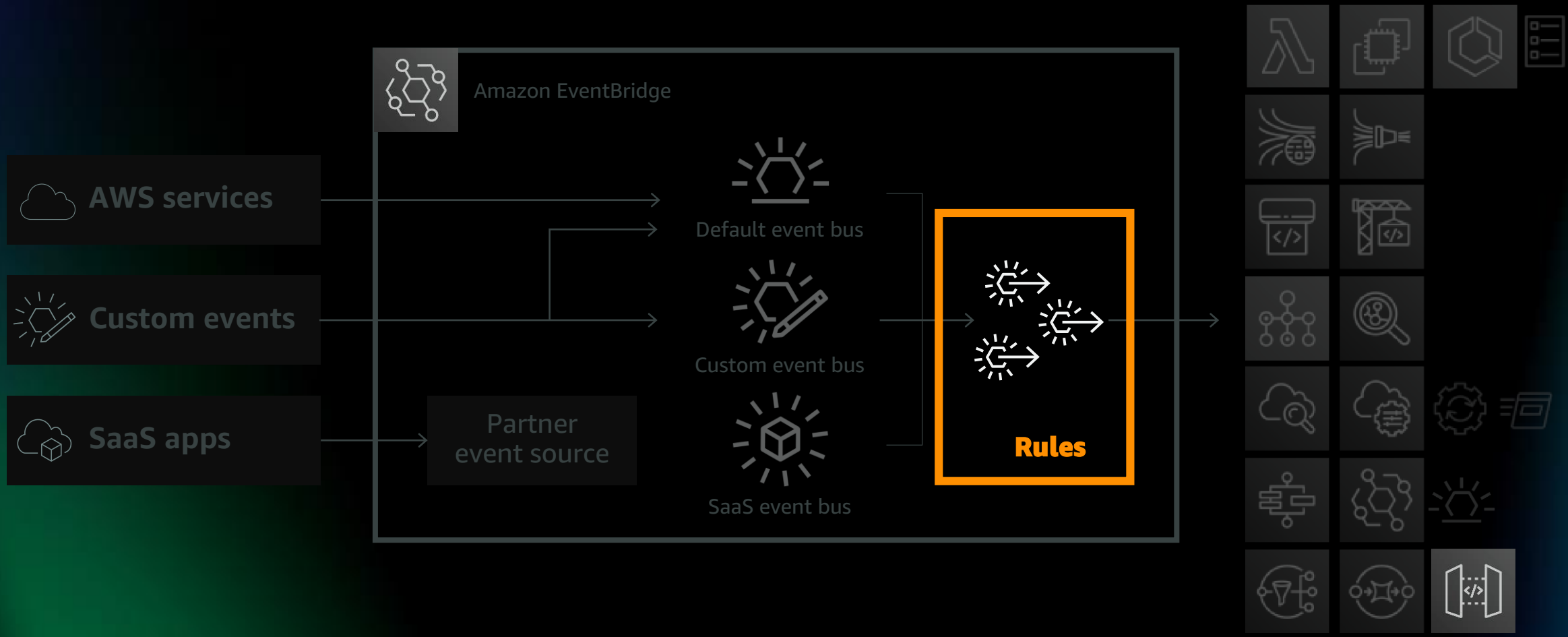
Amazon EventBridge



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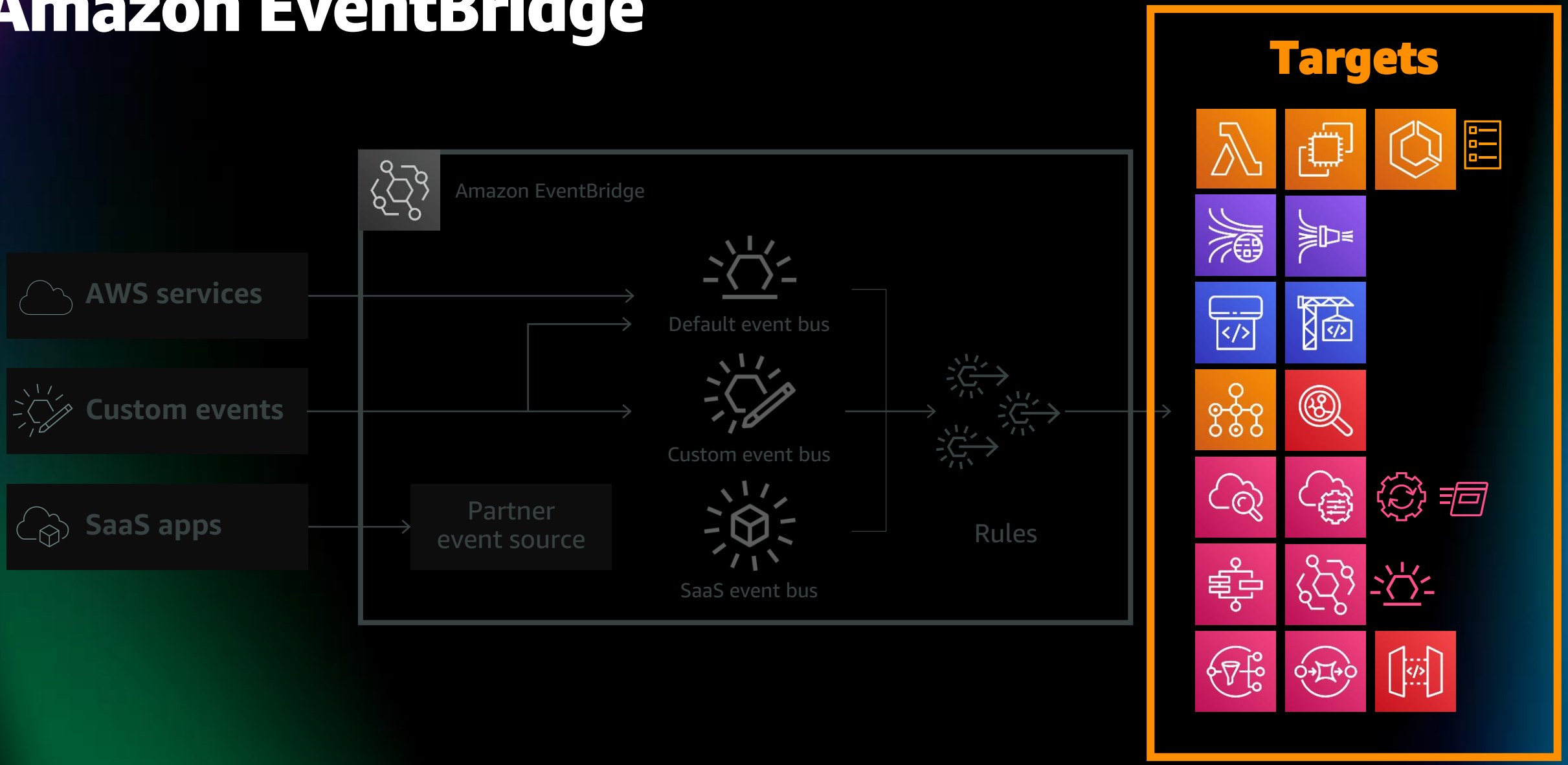
Amazon EventBridge



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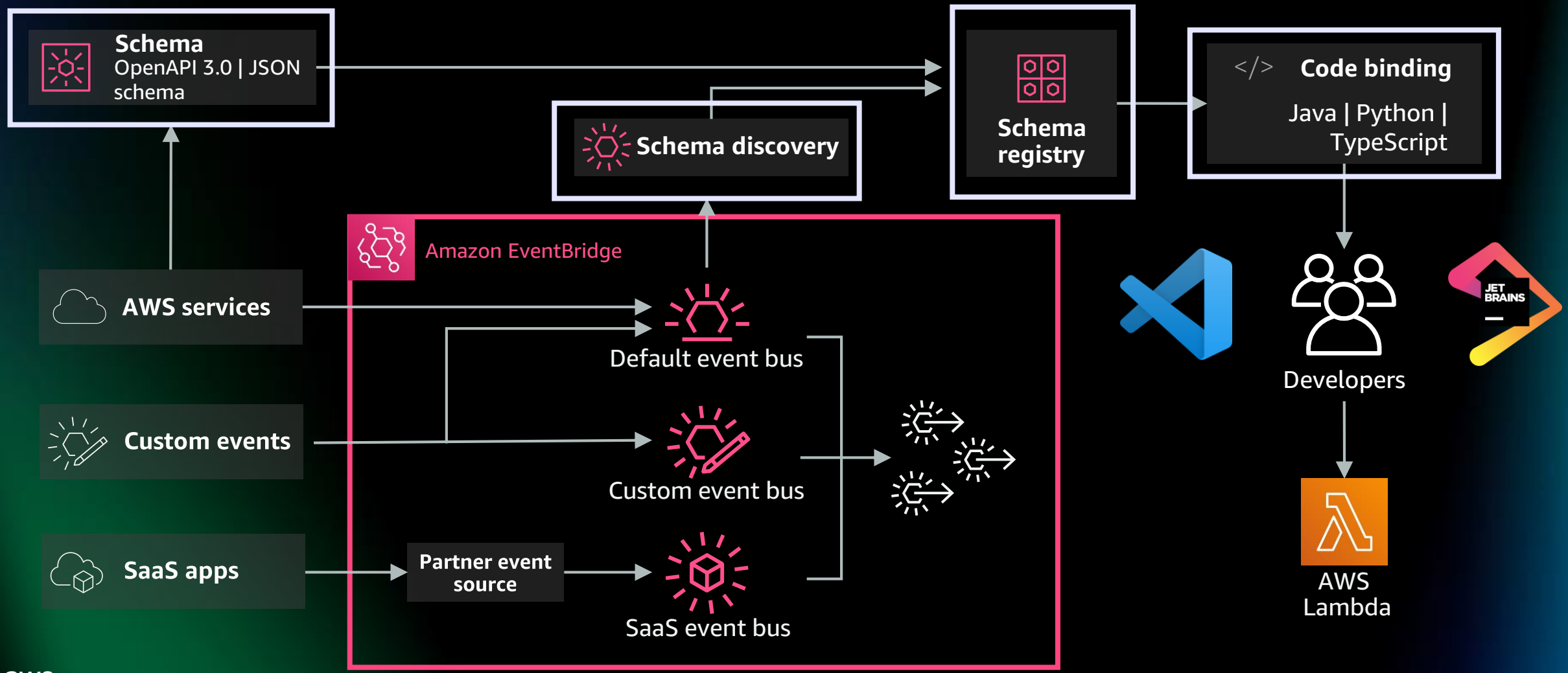
Amazon EventBridge Schema Registry



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Amazon Simple Notification Service (Amazon SNS)

Fully managed pub/sub messaging for microservices, distributed systems, and serverless applications

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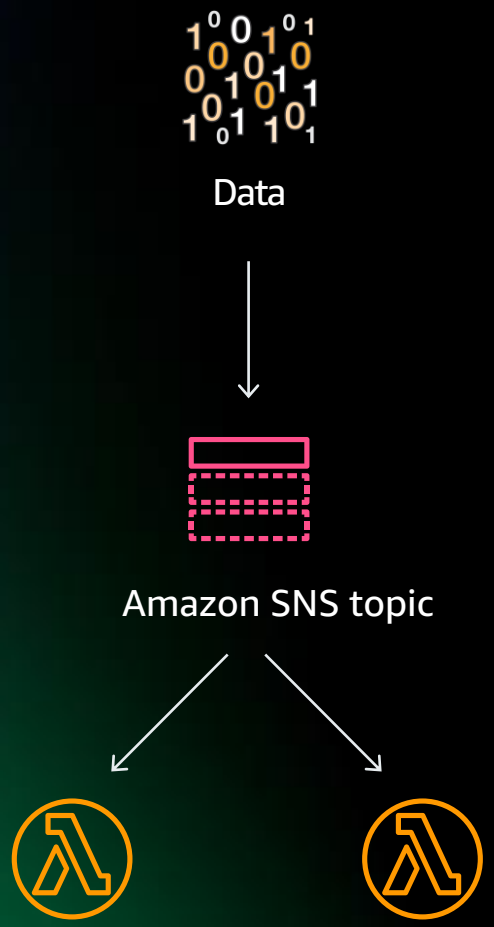
Amazon Simple Notification Service (Amazon SNS)



- Publish / subscribe messaging
- Messages are published to a Topic with multiple subscribers – “fan out”
- High throughput, highly reliable message delivery
- Messages can be filtered and only sent to certain subscribers

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Journey to event-driven architectures

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Start with the domain

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Pick an event store

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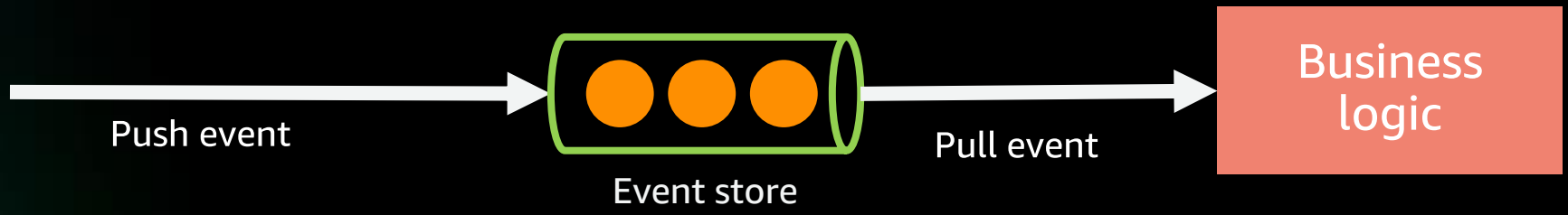
Improve resiliency and scalability with event stores



Buffer messages until services are available to process them

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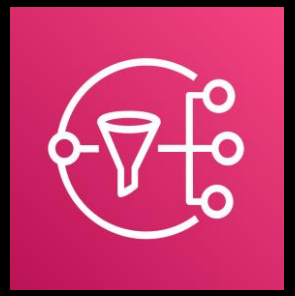

Amazon Simple Queue Service (Amazon SQS)

Fully managed message queuing service that enables you to decouple and scale microservices, distributed systems, and serverless applications

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Amazon Simple Queue Service (Amazon SQS)

- Any volume of messages
- Messages processed in batches
- At least once delivery with standard queues, exactly once with SQS FIFO queues
- Visibility timeout allows handling failures
- Service long-polls queues

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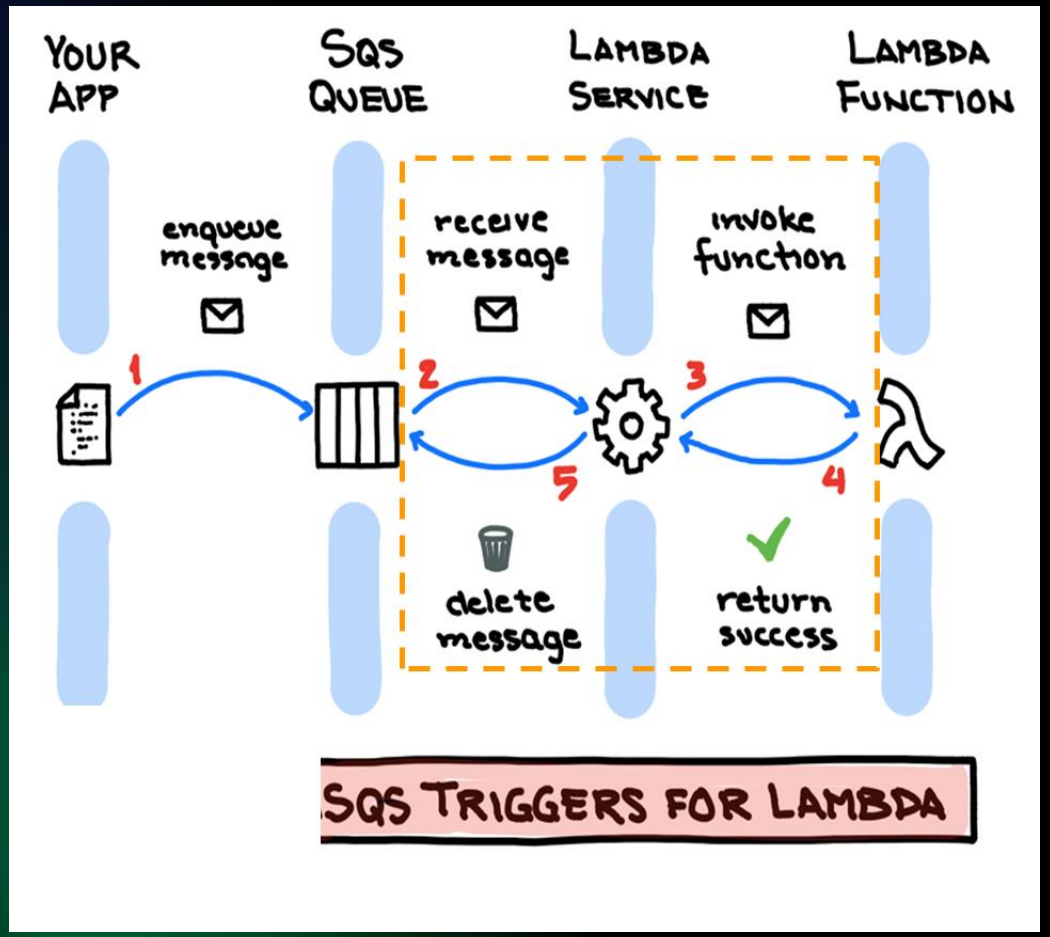
Amazon SQS as an AWS Lambda event source



Before:
- Customer wrote a service to poll an Amazon SQS queue including logic to back off polling, delete message, etc.
- Customer monitored, scaled, and maintained

After:
- AWS Lambda service is managing message polling, scaling of consumers, receiving messages, passing on to AWS Lambda function, and deleting messages

Result:
- Customers write and manage less code
- Customers leverage Amazon SQS and AWS Lambda together to automate functions

Facts:
- Amazon SQS is the #1 event source for AWS Lambda

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Journey to event-driven architectures

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STEP 4
Structure events

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Sparse events vs. full state descriptions

Order 123 was created at 10:47 by customer 456

Events

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

Full-state description

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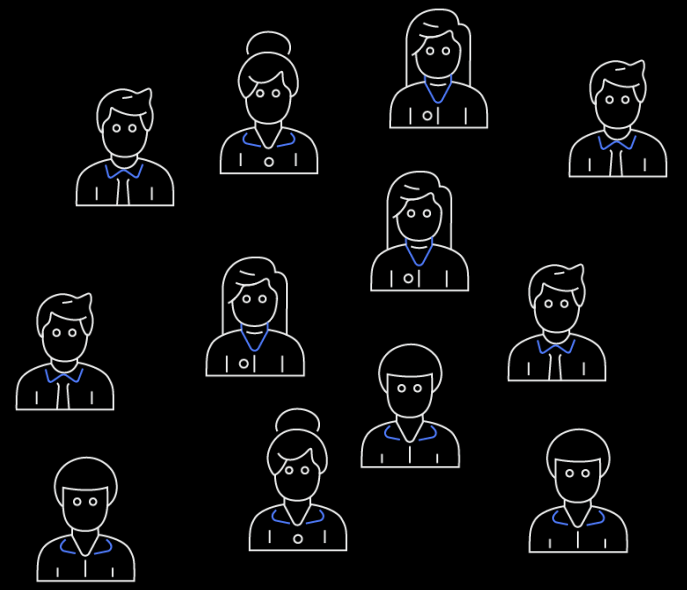
Considerations with sparse events

What are the details for order 123?

Order 123 was created by customer 456



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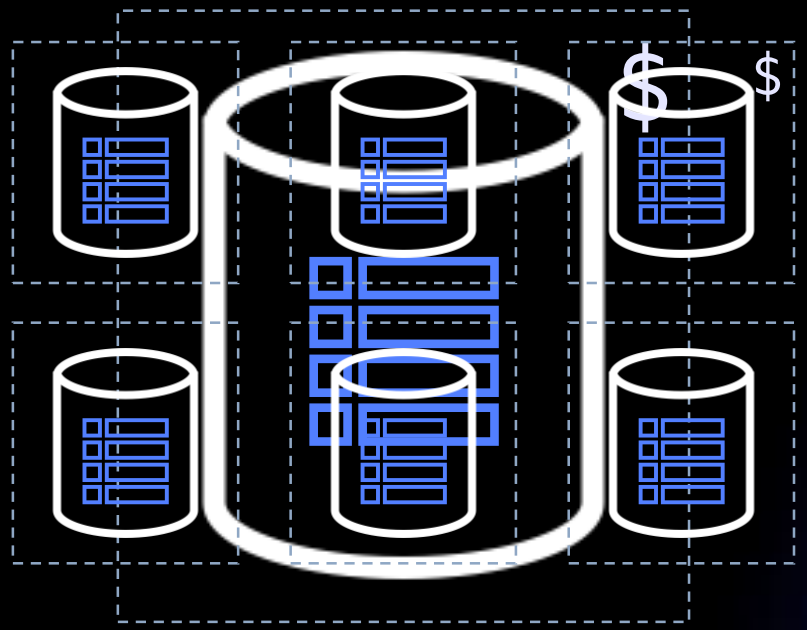
Considerations with full-state descriptions

```
{
  "source": "com.orders",
  "detail-type": "OrderCreated",
  "detail": {
    "metadata": {
      "idempotency-key": "c1b95b88"
    },
    "data": {
      "order-id": "1073459984",
      "status": "Open",
      "total": "237.51"
    }
}
```

- Event schemas should be backwards compatible
- Cost to calculate values can increase over time



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Review

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STEP 4
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Useful links

- Event Driven Architecture hub - https://aws.amazon.com/event-driven-architecture/

- Getting started blog post - https://aws.amazon.com/blogs/compute/getting-started-with-event-driven-architecture/

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Visit the Modern Applications resource hub

Dive deeper with these resources to help you develop an effective plan for your modernization journey.

- Build modern applications on AWS
- Business value of cloud modernization
- An introduction to event-driven architectures
- Accelerate full-stack web and mobile app development
- Determining the total cost of ownership: Comparing serverless and server-based technologies
- Building event-driven architectures with AWS
- Continuous learning, continuous modernization

https://tinyurl.com/modern-apps-aws

Visit resource hub

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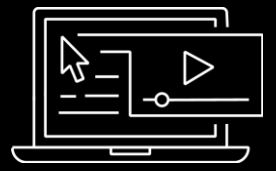

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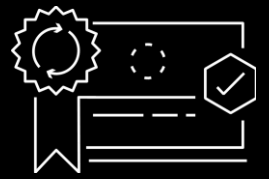

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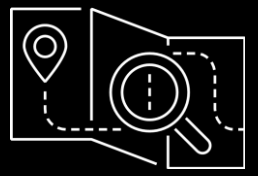
AWS Certified DevOps – Professional



Create a self-paced learning roadmap
AWS ramp-up guide - Developer
AWS ramp-up guide - DevOps

aws

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