BeSA
Become a Solutions Architect

Serverless Specialist – Week 2





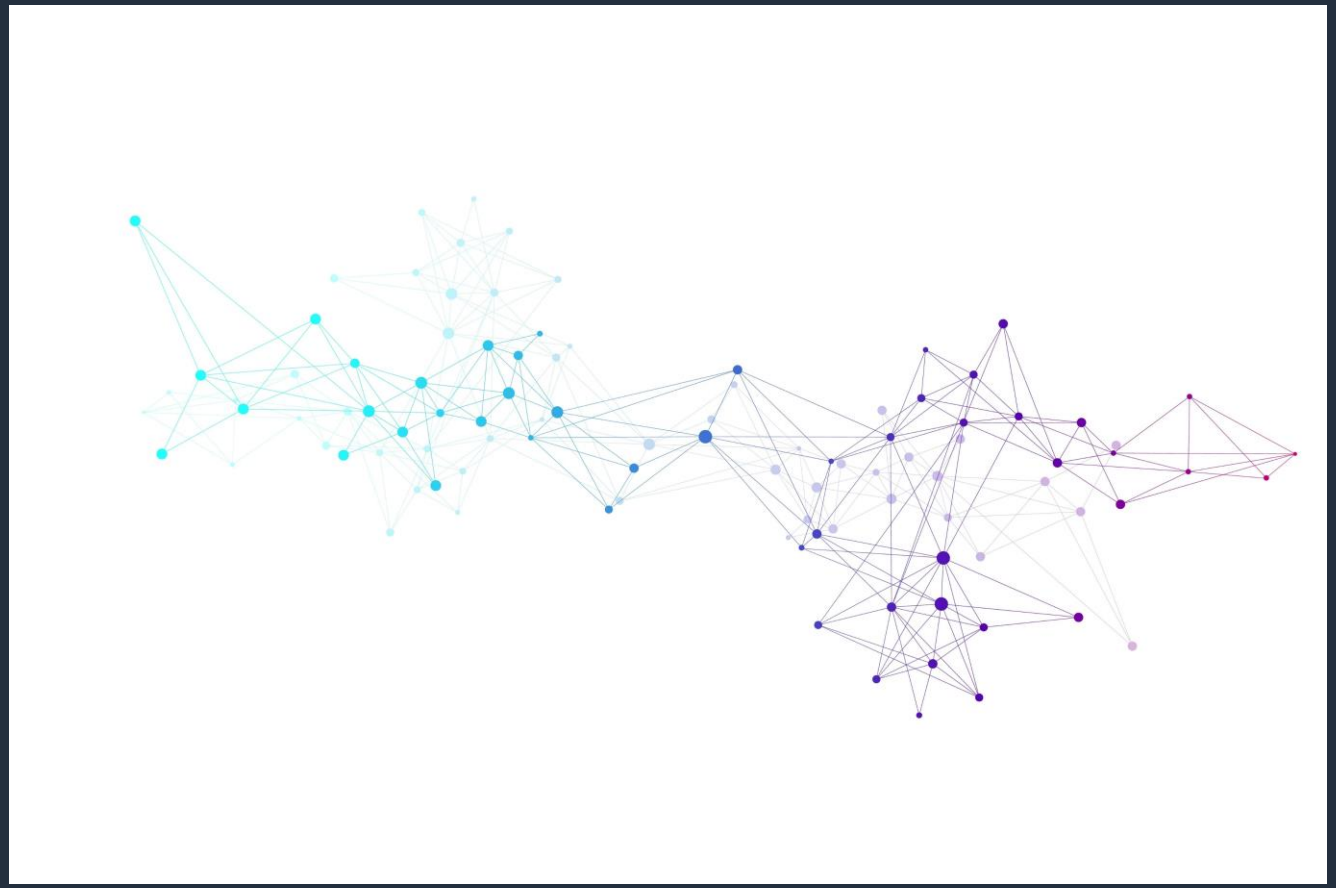


BESA SPECIALIST TRACK

Why an event driven architecture

The Fallacies of Distributed Computing

- **The network is reliable**
- **Latency is zero**
- Bandwidth is infinite
- **The network is secure**
- Topology doesn’t change
- There is one administrator
- **Transport cost is zero**
- **The network is homogenous**



Coupling

Coupling is a measure of independent variability between connected systems.

Decoupling has a cost, both at design and run-time.

Coupling isn’t binary.

Coupling isn’t one-dimensional.

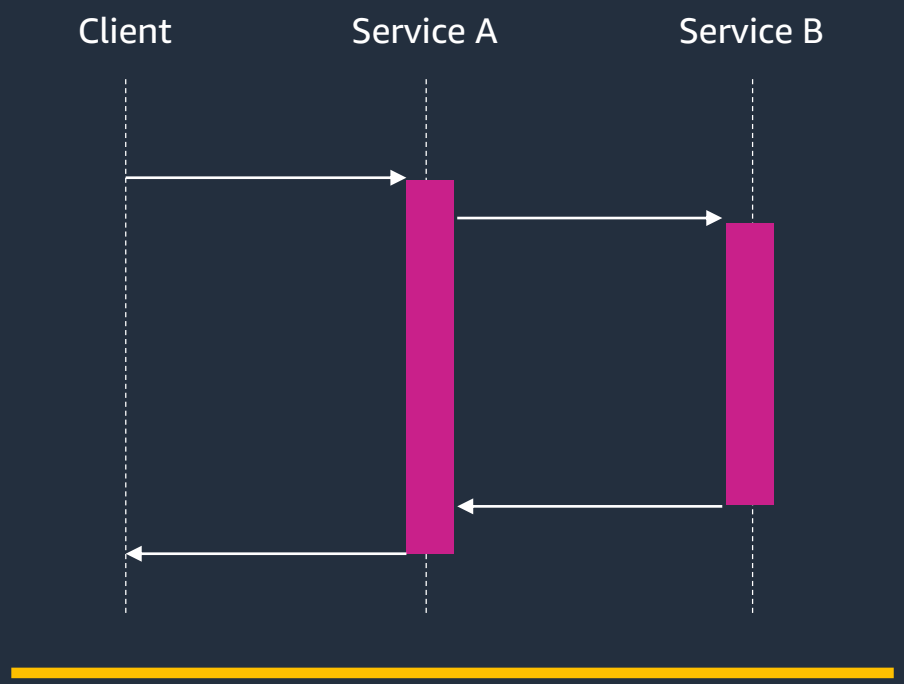
Source: EnterpriseIntegrationPatterns.com

“The appropriate level of coupling depends on the level of control you have over the endpoints”

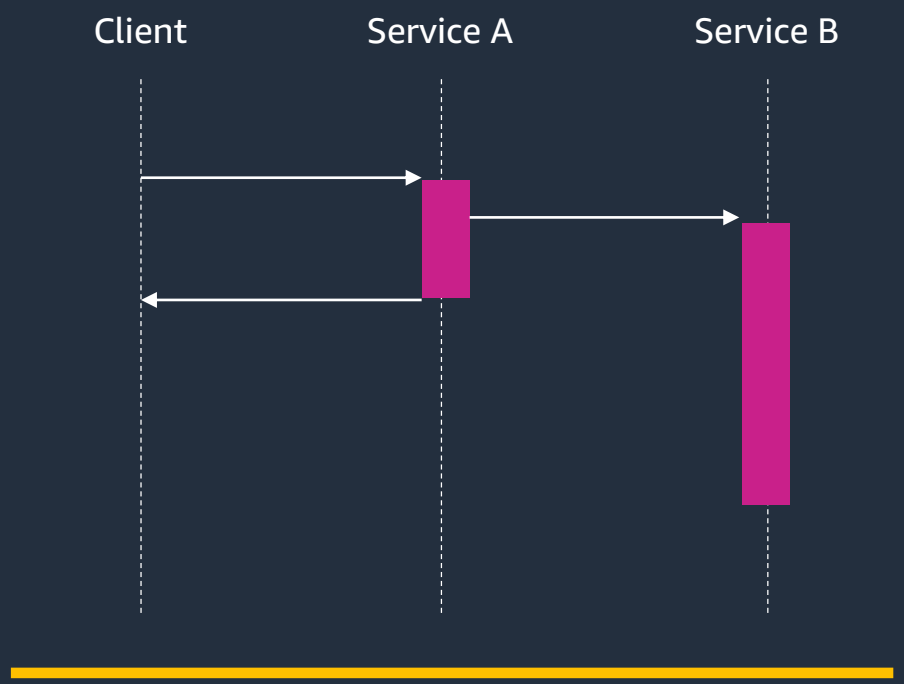
Gregor Hohpe

Enterprise Integration Patterns

Think async



Synchronous commands



Asynchronous events

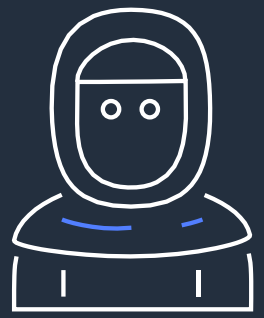
What is an Event Driven Architecture ?

What is an event?

```
{
  "source": "com.orders",
  "detail-type": “PizzaBaked",
  "detail": {
    "metadata": {
      "idempotency-key": "c1b95b88“,
      “callbackToken": “897bfeojnwj“,
    },
    "data": {
      "order-id": "1073459984"
    }
}
```

Start with business events

OrderCreated



PizzaPrepared

PizzaBaked

OrderDispatched

PaymentReceived

Events are observable, not directed

How do we build event driven architectures?

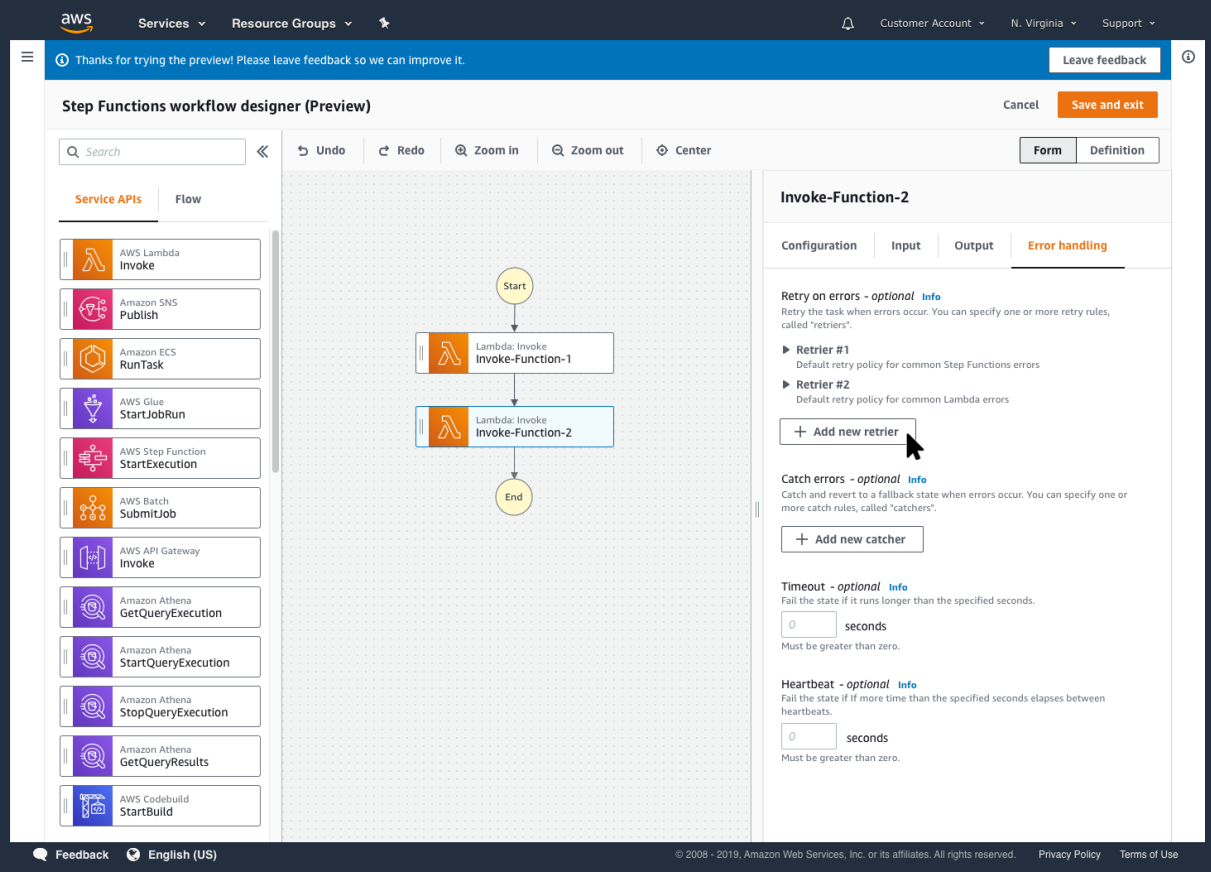
Orchestrate a business process within a domain, resulting in a published event

AWS Step Functions

The workflows you build with Step Functions are called state machines, and each step of your workflow is called a state.

When you execute your state machine, each move from one state to the next is called a state transition.

You can reuse components, easily edit the sequence of steps or swap out the code called by task states as your needs change.



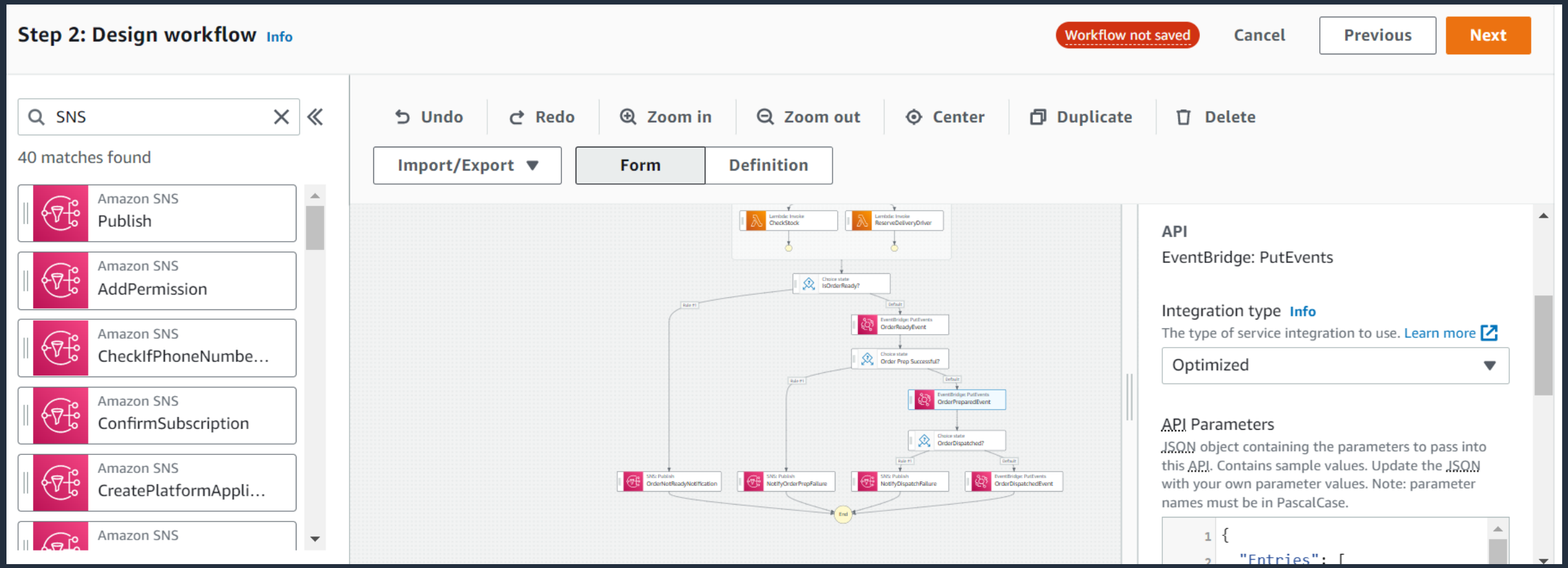
AWS STEP FUNCTIONS WORKFLOW STUDIO

Building Workflows

Code

```
{
  "Comment": "An AWL example using a choice state.",
  "StartAt": "FirstState",
  "States": {
    "FirstState": {
      "Type": "Task",
      "Resource": "arn:aws:lambda:REGION:ACCOUNT_ID:function:FUNCTION_NAME",
      "Next": "ChoiceState"
    },
    "ChoiceState": {
      "Type" : "Choice",
      "Choices": [
        {
```

Building Workflows



Step Functions Integrations

Optimised integrations

17 AWS Services

AWS SDK integrations

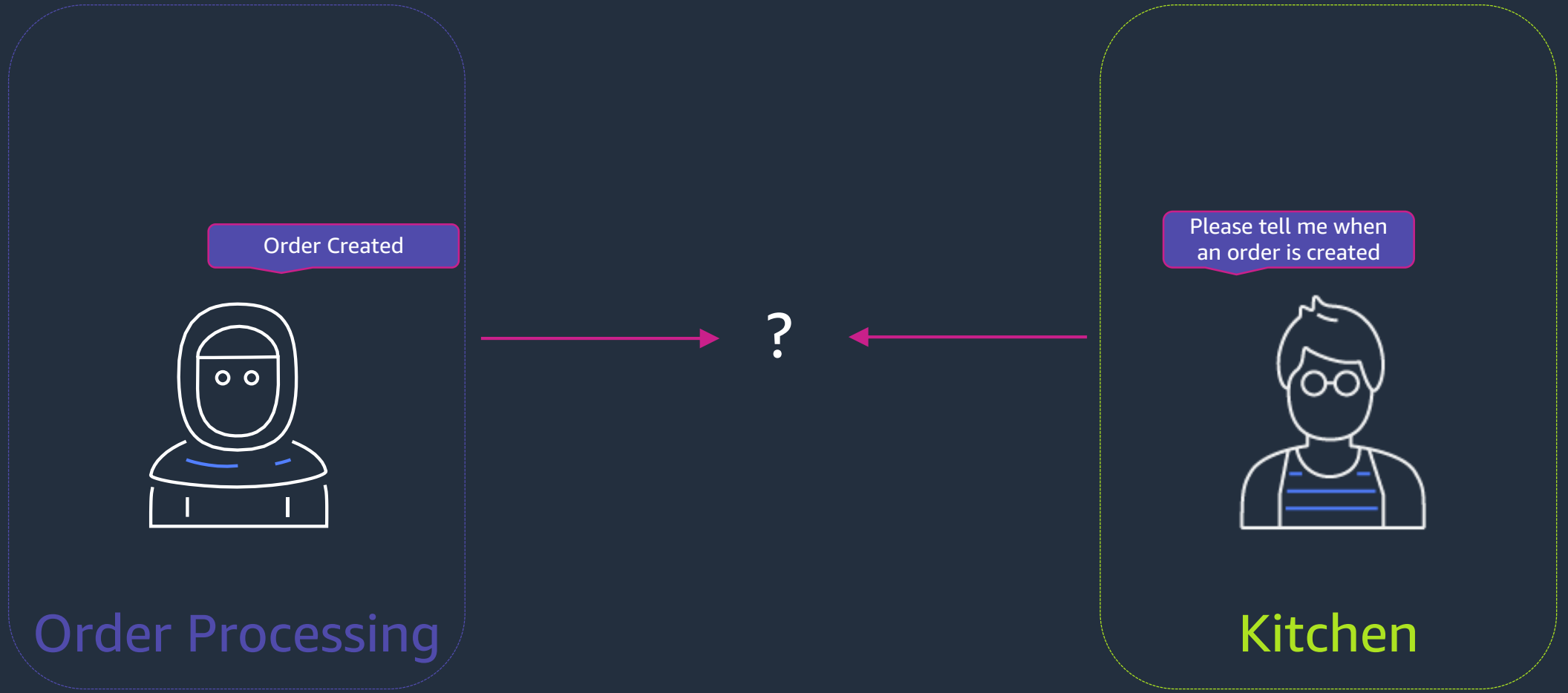
200 AWS Services

10,000+ API calls

Step Functions Intrinsic Functions

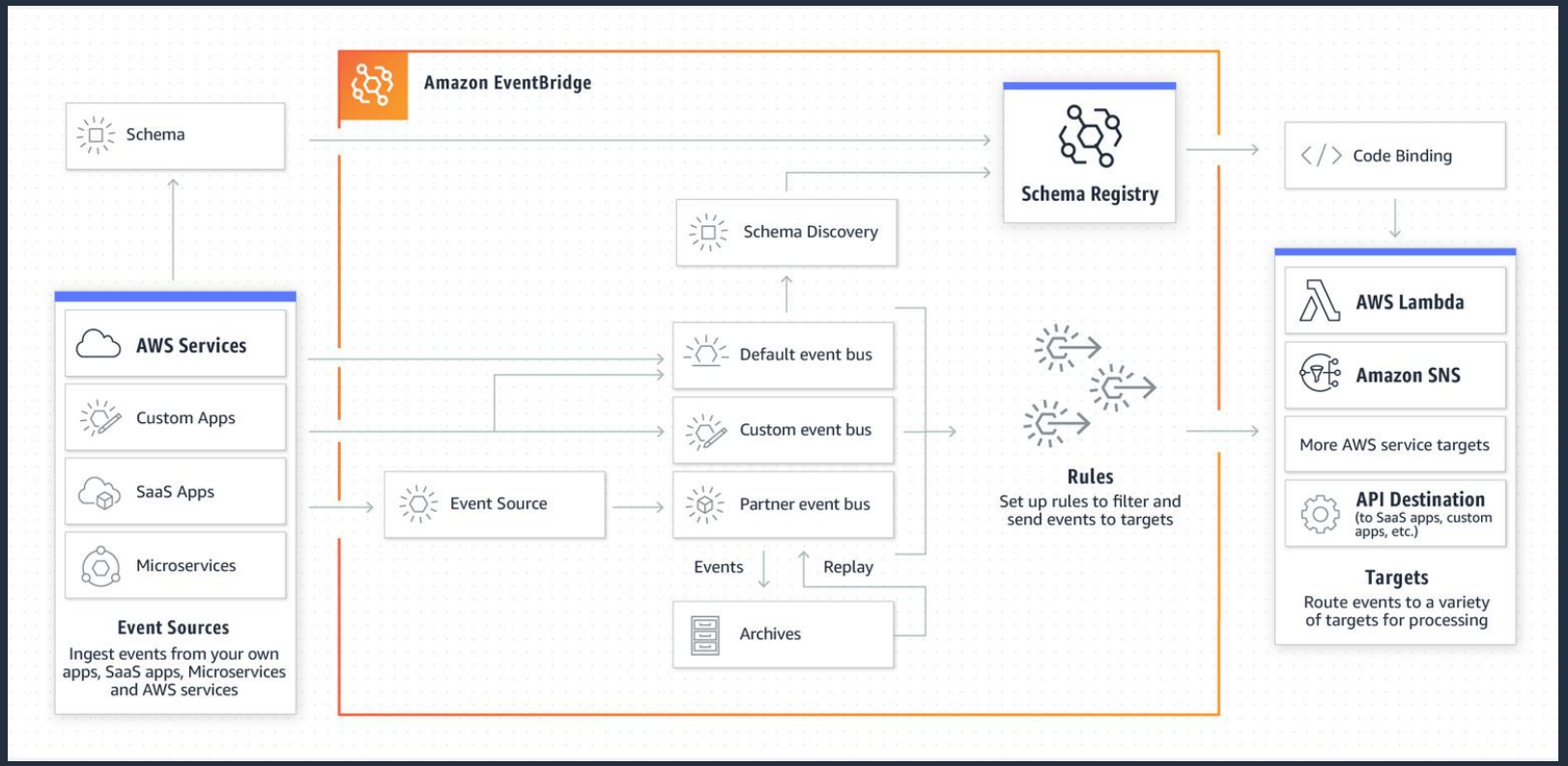
- **States.ArrayContains**
- States.ArrayGetItem
- **States.ArrayLength**
- States.ArrayUnique
- States.Base64Encode
- States.Hash
- **States.MathRandom**
- States.MathAdd
- States.StringSplit
- **States.UUID**
- States.JsonMerge
- States.MathAdd
- States.StringToJson
- States.JsonToString

Choreograph events *between domains* using subscriptions



Amazon EventBridge

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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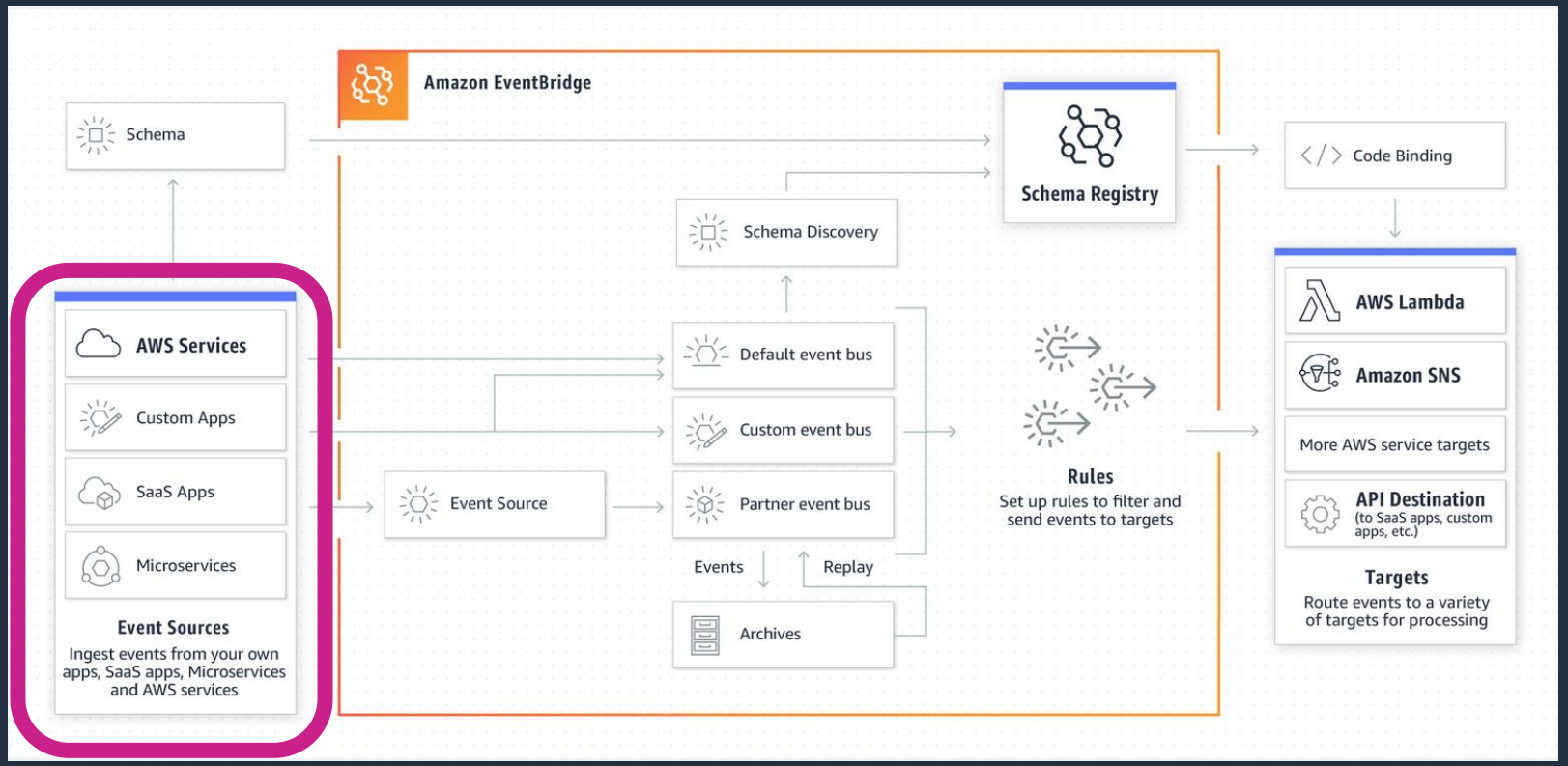

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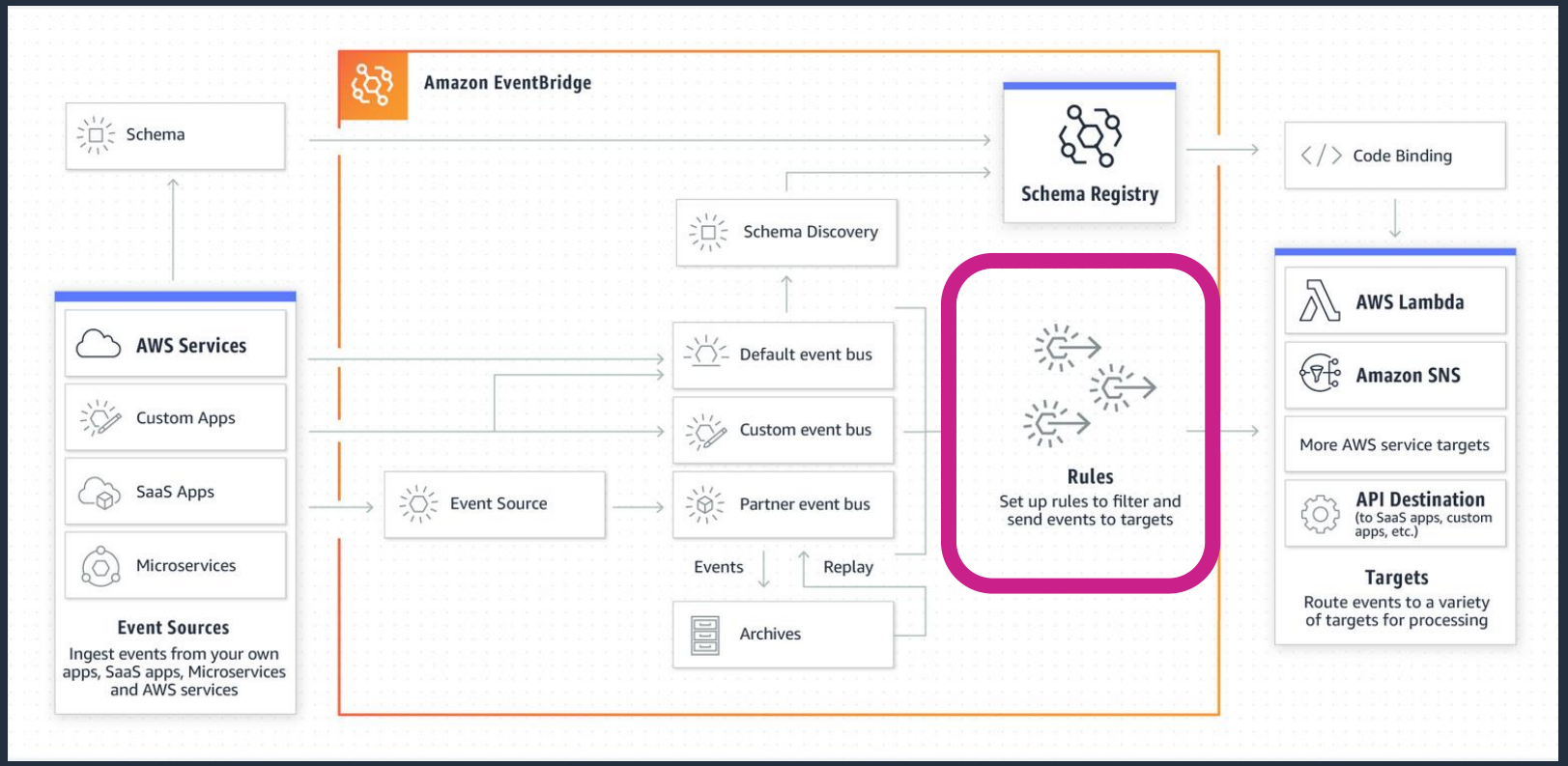


Target 20+ AWS services and API destinations


AWS Lambda


AWS Step Functions


Amazon Kinesis Streams


Amazon CloudWatch


AWS CodePipeline


Amazon ECS

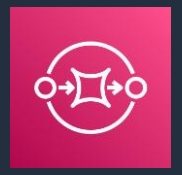

Amazon SNS


Amazon Kinesis Firehose


AWS Systems Manager


AWS CodeBuild


Amazon EC2


Amazon SQS


AWS Glue


AWS Incident Manager


Amazon Sagemaker


AWS Batch

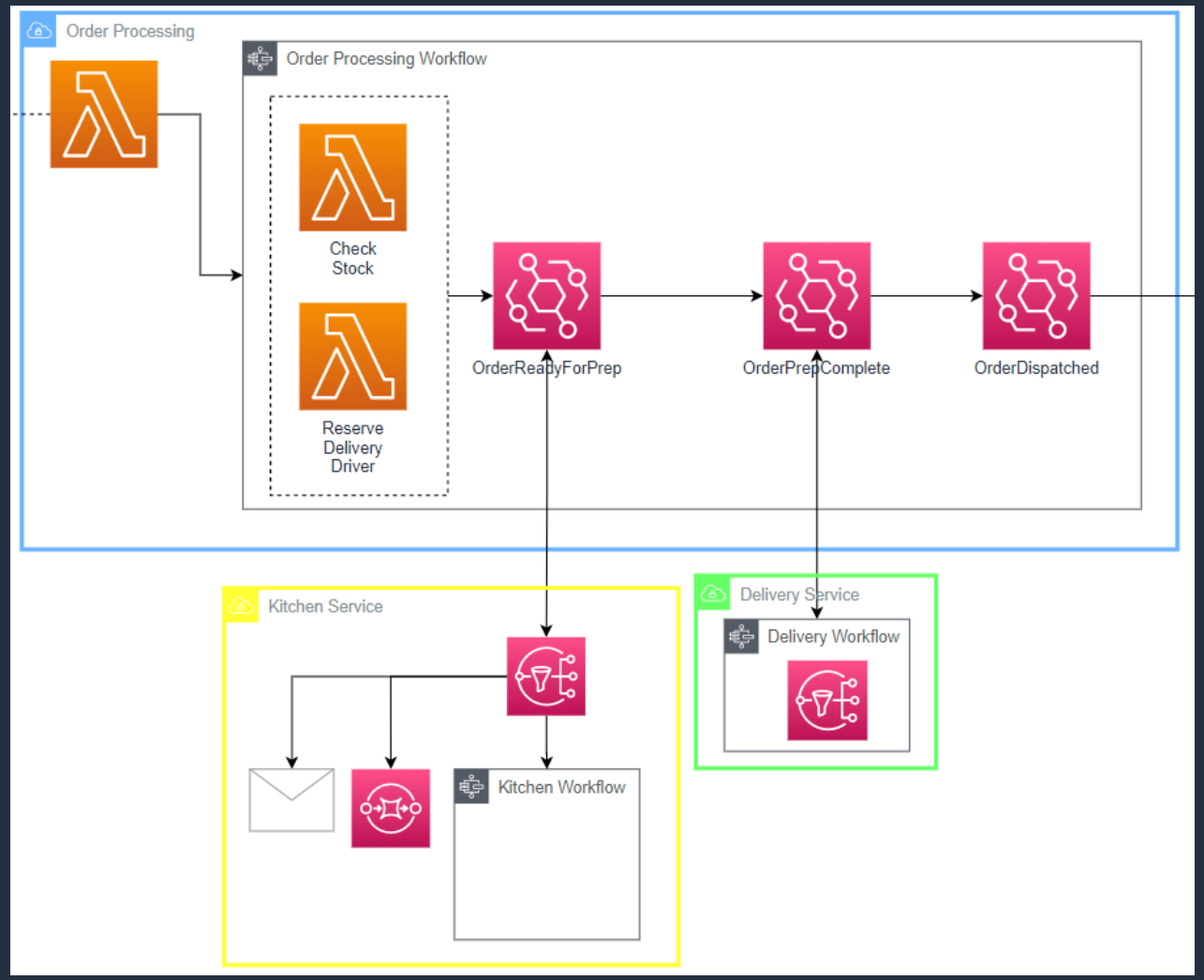

Amazon API Gateway


Amazon Redshift


Amazon Inspector


API Destinations

Better together: Orchestration + Choreography



Let’s Talk About Consistency

Strong Consistency

Eventual Consistency