

AWS re:Invent

NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

API201-R

The AWS Step Functions workshop

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AWS



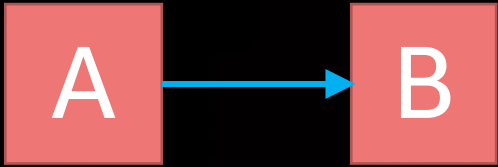
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You might need an orchestration service if your application...

- Spans multiple AWS services
- Sequences service interaction
- Manages state between calls
- Requires human intervention
- Contains workflow patterns

Common orchestration patterns

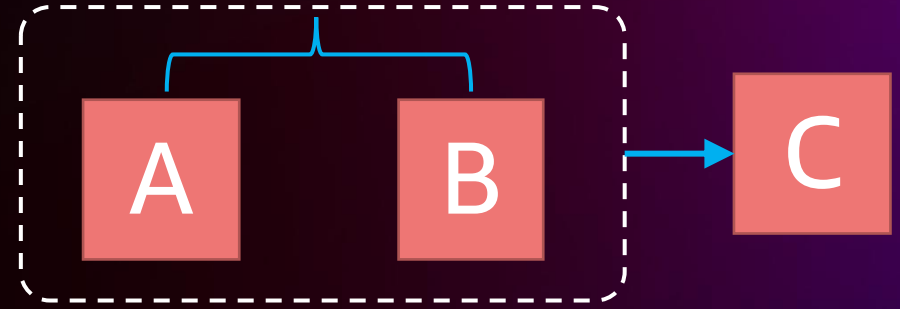
"I want to sequence tasks"



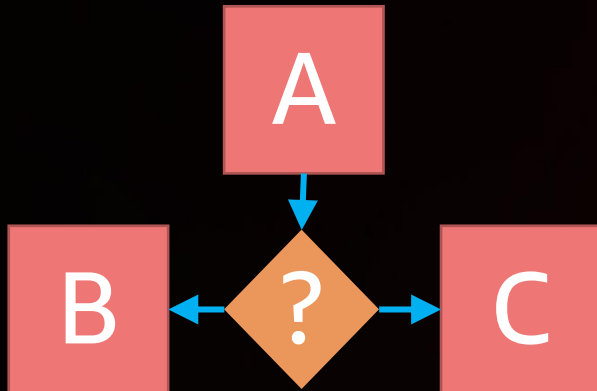
"I want to retry failed tasks"



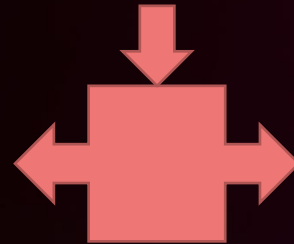
"I want to run tasks in parallel"



"I want to select tasks based on data"



"I want try/catch/finally"



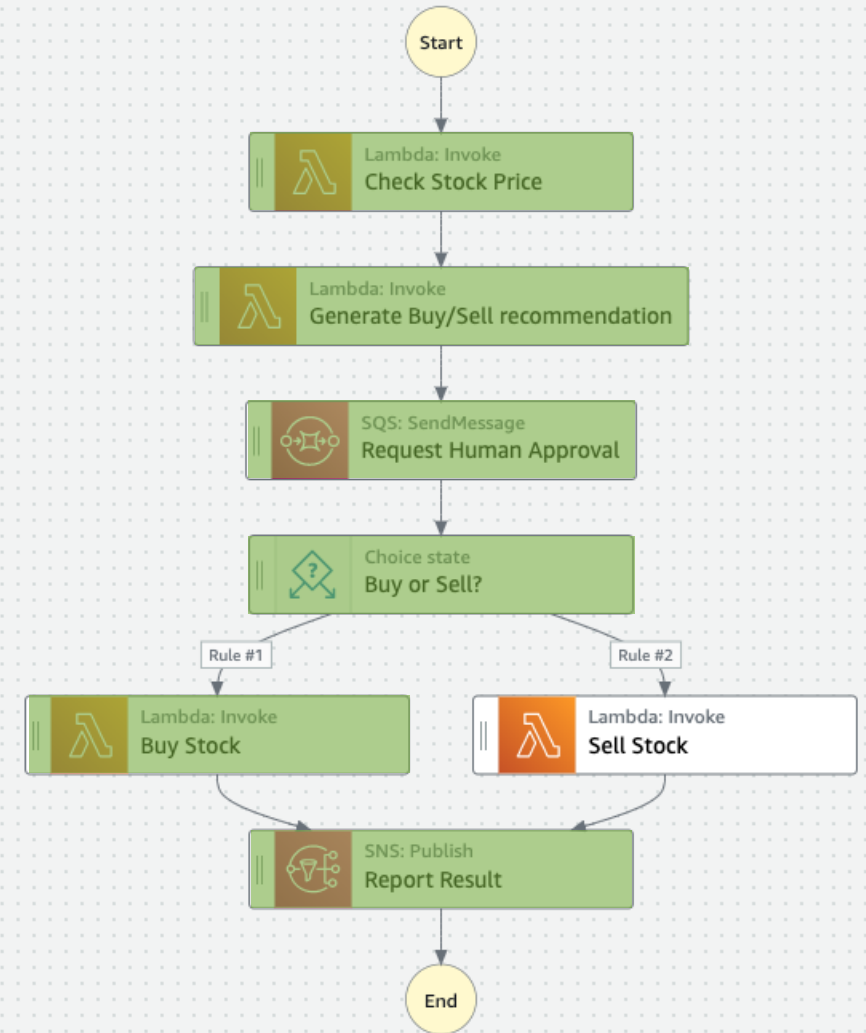


Introducing AWS Step Functions


- Low-code visual workflow service
- Provides orchestration for other AWS services
- Supports common workflow patterns
- Simplifies implementation of common tasks

Step Functions workflows


- Written using **Amazon States Language (ASL)**
- Referred to as **state machines**
- Are composed of **steps** called **states**




Step Functions states




Choice
Adds if-then-else logic.




Parallel
Adds parallel branches.




Map
Adds a for-each loop.




Wait
Delays for a specified time.



Pass
Transforms data or acts as placeholder.








Success
Stops and marks as success.

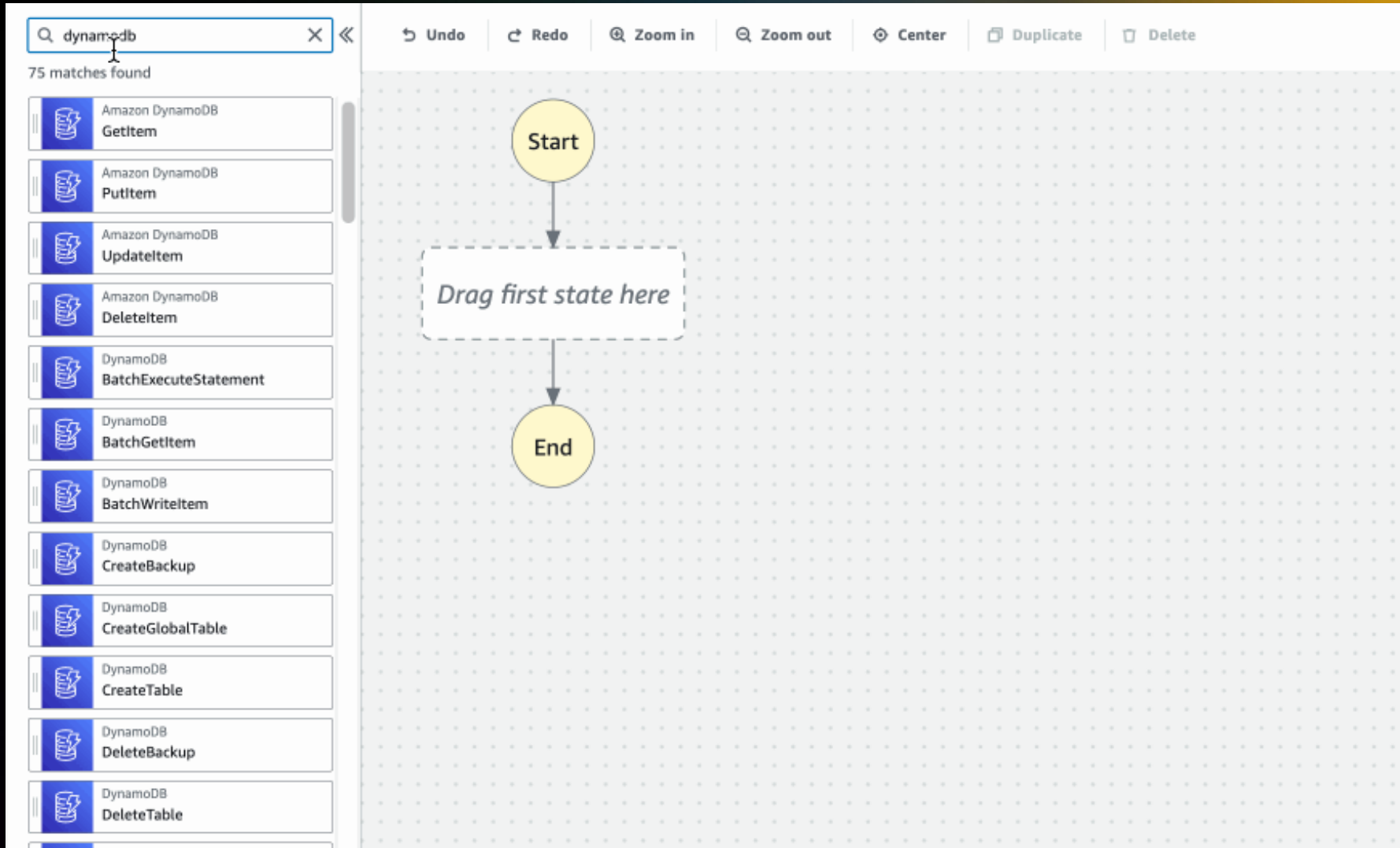


Fail
Stops and marks as failure.

Task

	AWS Lambda Invoke
	Amazon SNS Publish
	Amazon ECS RunTask
	AWS Step Functions StartExecution
	AWS Glue StartJobRun

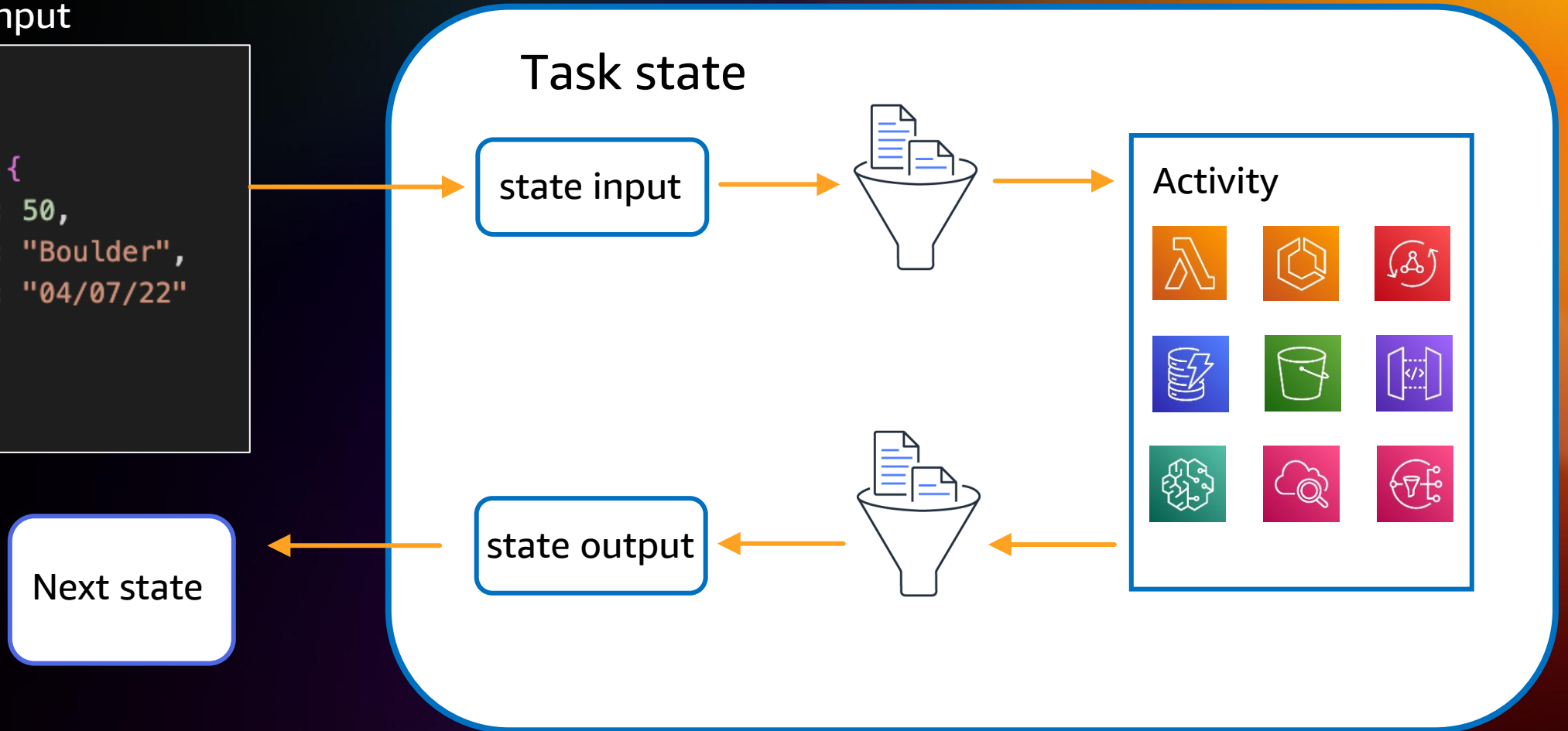
Workflow studio



Input and output processing






Example JSON input

```
{  
  "id": "1",  
  "details": {  
    "cost": 50,  
    "city": "Boulder",  
    "date": "04/07/22"  
  }  
}
```



AWS SDK integrations

- Step Functions integrates with **220+ supported AWS services**
- Step Functions supports **10,000+ API actions**

MOST POPULAR	
	AWS Lambda Invoke
	Amazon SNS Publish
	Amazon ECS RunTask
	AWS Step Functions StartExecution
	AWS Glue StartJobRun

Integration syntax:

```
arn:aws:states::aws-sdk:serviceName:apiAction.[serviceIntegrationPattern]
```

Example integration:

```
arn:aws:states::aws-sdk:ec2:describeInstances
```

Standard vs. express workflows

	Standard	Express
Use cases	Ideal for long-running , durable, and auditable workflows	Ideal for high-volume event-processing workloads
Maximum duration	365 days	5 minutes
State transitions	5,000 initial bucket with 1,500 per second refill rate	Unlimited
Patterns	Supports all patterns	Does not support Job-run (.sync) or Callback (.wait For Callback)
Invocation	Asynchronous invocation only	Asynchronous and synchronous invocation
Pricing	\$0.025 per 1,000 state transitions	\$1.00 per 1M requests + \$0.06 per GB-hour (tiered)

Task patterns

Request response

Step Functions will call a service integration and **proceed immediately** without waiting for the service to complete its job

Sync polling

Step Functions will call a service integration and **wait until its job is complete**

Callback

Step functions will call a service with a task token and **proceed after the token is returned**

Example use cases

- Data processing (file, video, image; ETL)
- Machine learning (fraud detection, recommendations, data enrichment)
- Microservice orchestration (synchronous workflows, container orchestration)
- IT and security automation (incident management, auto-remediation, human approval scenarios)
- High performance computing (HPC)

Workshop agenda

1. Group session [cover the basics]
2. Self-paced session [more advanced features]
3. Wrap-up [additional resources, related sessions]

Dashboard login

<https://s12d.com/api201-login>




Accessing workshop content

[Dashboard](#)

[Logout](#)

Team Dashboard

 Event

[AWS Console](#)[SSH Key](#)[View Content Guide](#)

Event: re:Invent Example
Team Name: (Team Name Not Set Yet)

Event ID: c7a9c8624a394121b7735472296cb3cc
Team ID: ae780702d1734637b0ce70952eca6b3e

Additional resources

<https://s12d.com/api201-resources>



Related sessions

ID	Title	Type
API314	What's possible with AWS Step Functions	Chalk Talk
SVS306	Serverlesspresso: Building an event-driven application from the ground up	Workshop
SVS312	Building Serverlesspresso: Creating event-driven architectures	Breakout

Thank you!

Dan Fox

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