
AWS
re:Invent

SVS207

What's new in serverless

Chris Munns

Senior Manager/Principal Developer Advocate, Serverless

AWS

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Why are we here today?



© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

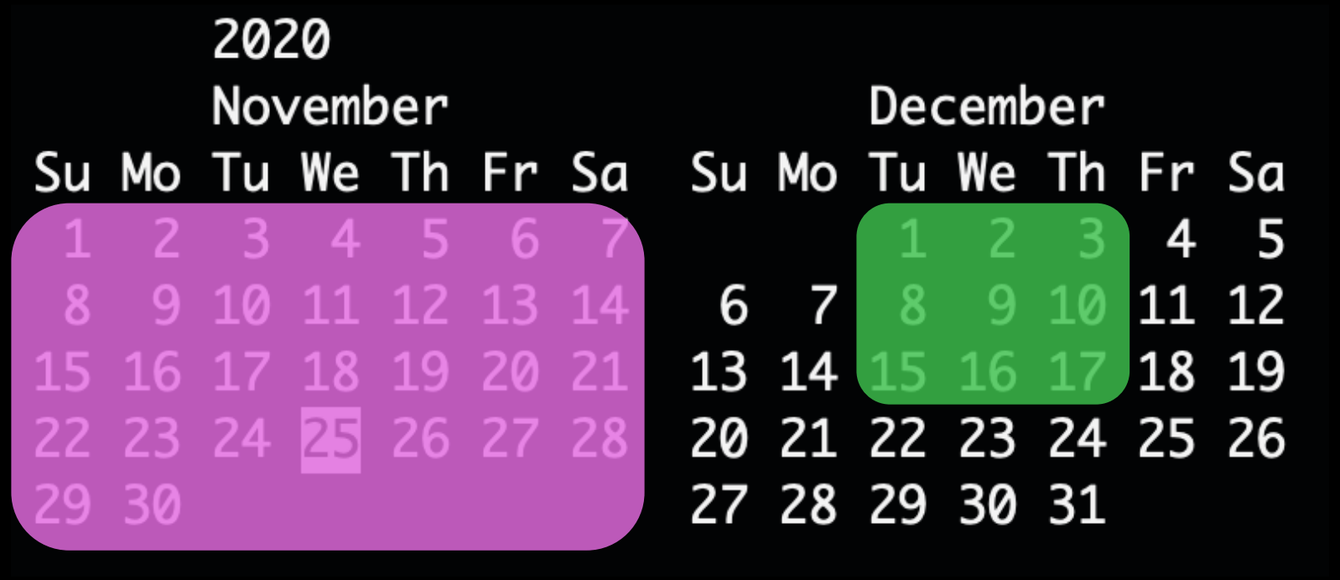
AWS re:Invent 2020

```
    December 2020
Su Mo Tu We Th Fr Sa
29 30  1  2  3  4  5
 6  7  8  9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31
```

AWS re:Invent 2020

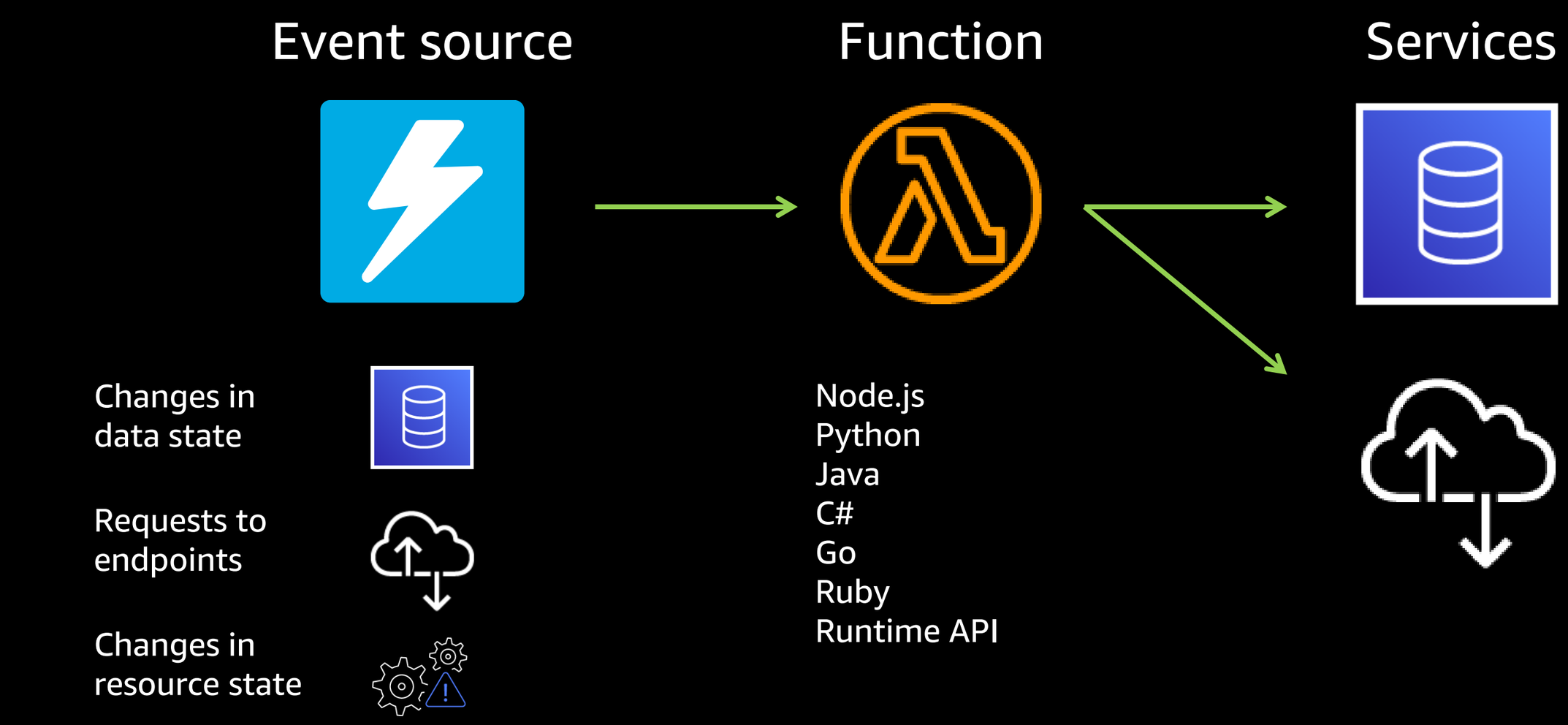


AWS re:Invent 2020



And we'll dip a bit into the pre:Invent releases you might have missed!

Serverless applications



But we only have 30 minutes this year …



AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What’s new in serverless

What’s new for:

- AWS Lambda
- Amazon API Gateway
- AWS Step Functions
- Amazon EventBridge
- AWS SAM CLI

Grab bag: New services and features that serverless application developers should check out



AWS Lambda: 1 ms billing



- Reduced billing granularity from 100 ms to 1 ms
- Affects all Lambda functions
- Automatic – no action needed
- Starts with December 2020 billing cycle

AWS Lambda: Larger Lambda functions

Developers can now configure Lambda functions for:

10 GB in memory with up to

6 vCPUs proportional to memory configuration

Build compute-intensive workloads:

- Machine learning, genomics, gaming, HPC applications

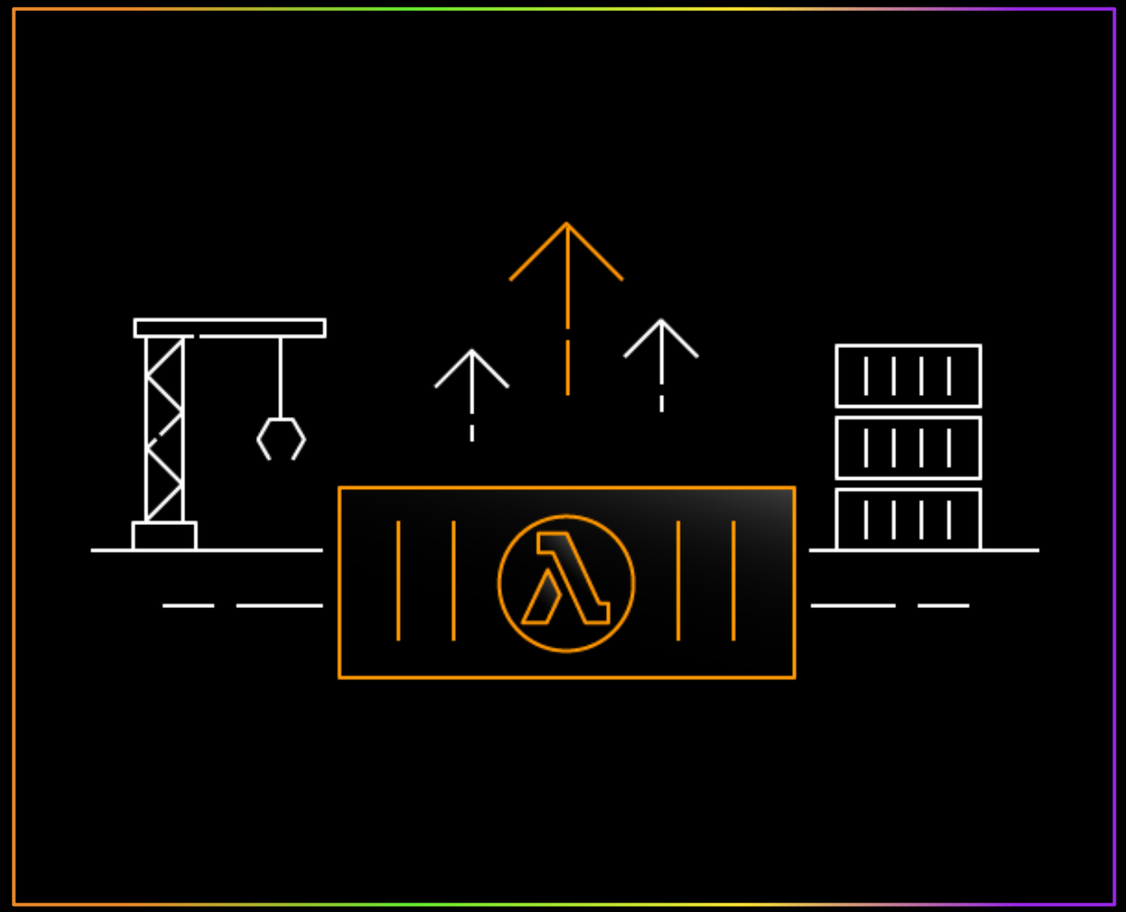
Build memory-intensive workloads:

- Batch, ETL, analytics, media processing

Configured memory (MB)	Allocated cores
128 – 1769	1
1770 – 3538	2
3539 – 5307	3
5308 – 7076	4
7077 – 8845	5
8846 – 10240	6

AWS Lambda container image support

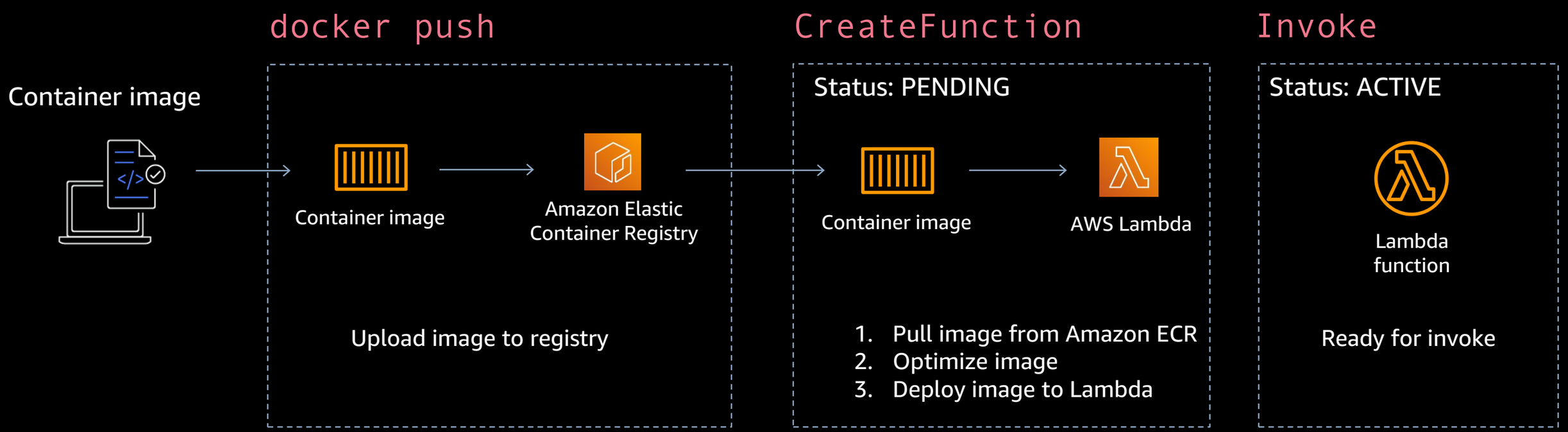
PACKAGE AND DEPLOY FUNCTIONS AS CONTAINER IMAGES



- Easier dependency management and application building with container images
- Use a consistent set of tools for containers and Lambda-based applications
- Deploy large applications with AWS provided or third-party images of up to 10 GB

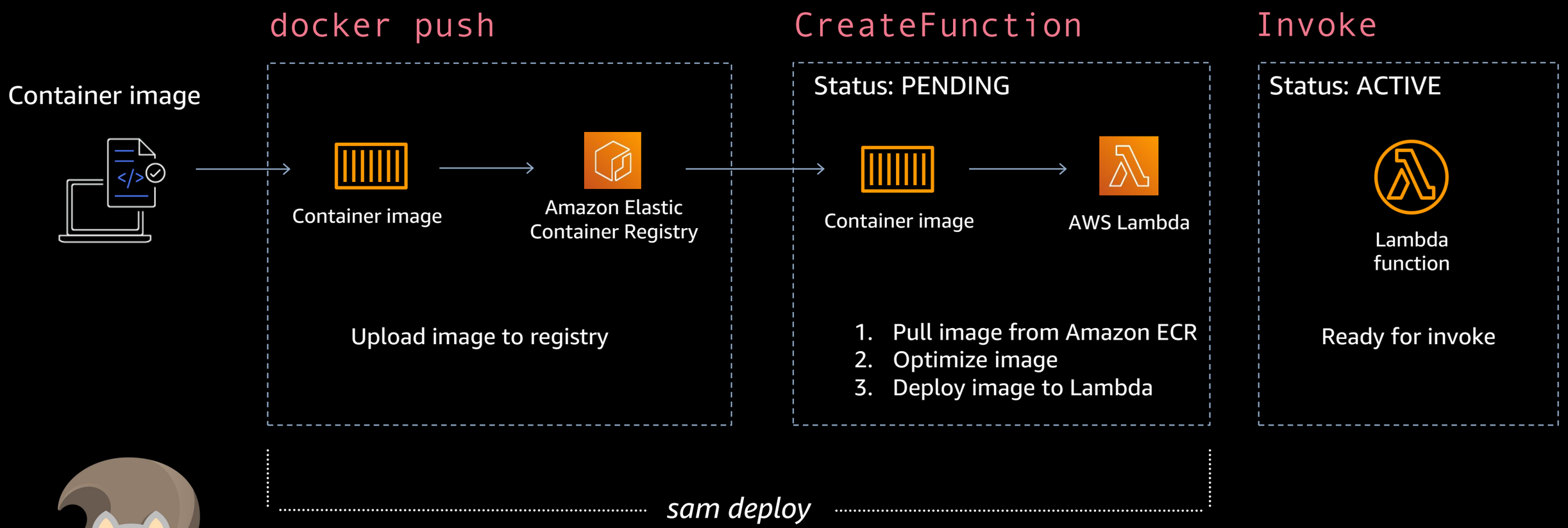
Simple developer experience

CREATE FUNCTION AS CONTAINER IMAGE



AWS SAM developer experience

CREATE FUNCTION AS CONTAINER IMAGE





AWS SAM will package the container, push it to a repository, and create or update the Lambda function with a single command

AWS Consulting Partners are here to help













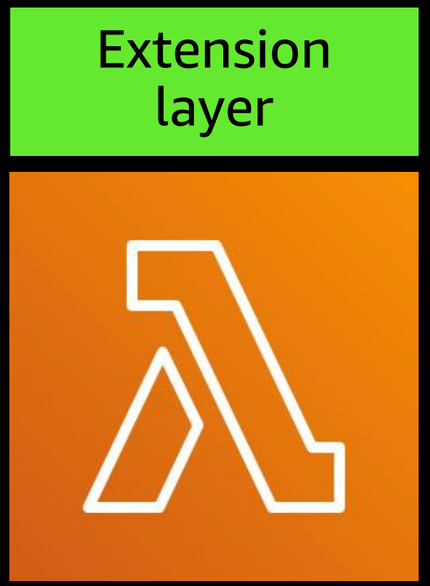
This is not a complete list. To view all AWS Lambda Delivery Partners, visit https://aws.amazon.com/lambda/partners

AWS Lambda Extensions

In preview

A new way for developer tools and third-party tools to integrate deeply into the Lambda environment

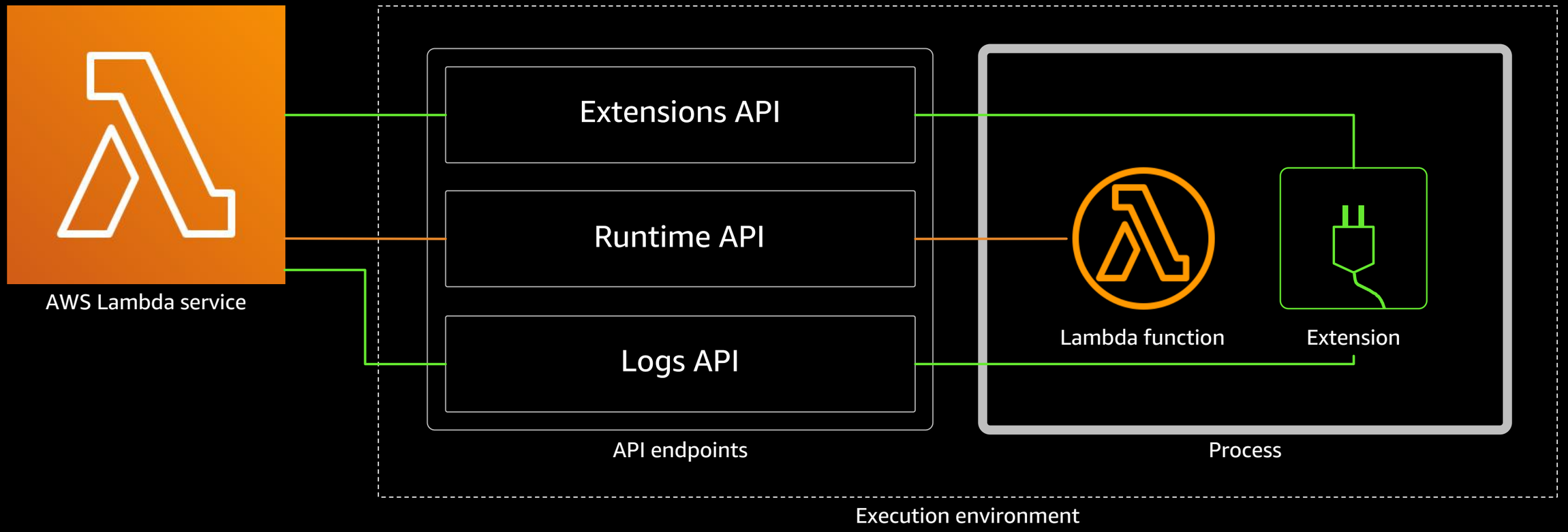




- Capturing diagnostics before, during, and after function invocation
- Instrumenting code without changing it
- Fetch configuration settings or secrets before function invocation
- Detect and alert on function activity through hardened security agents

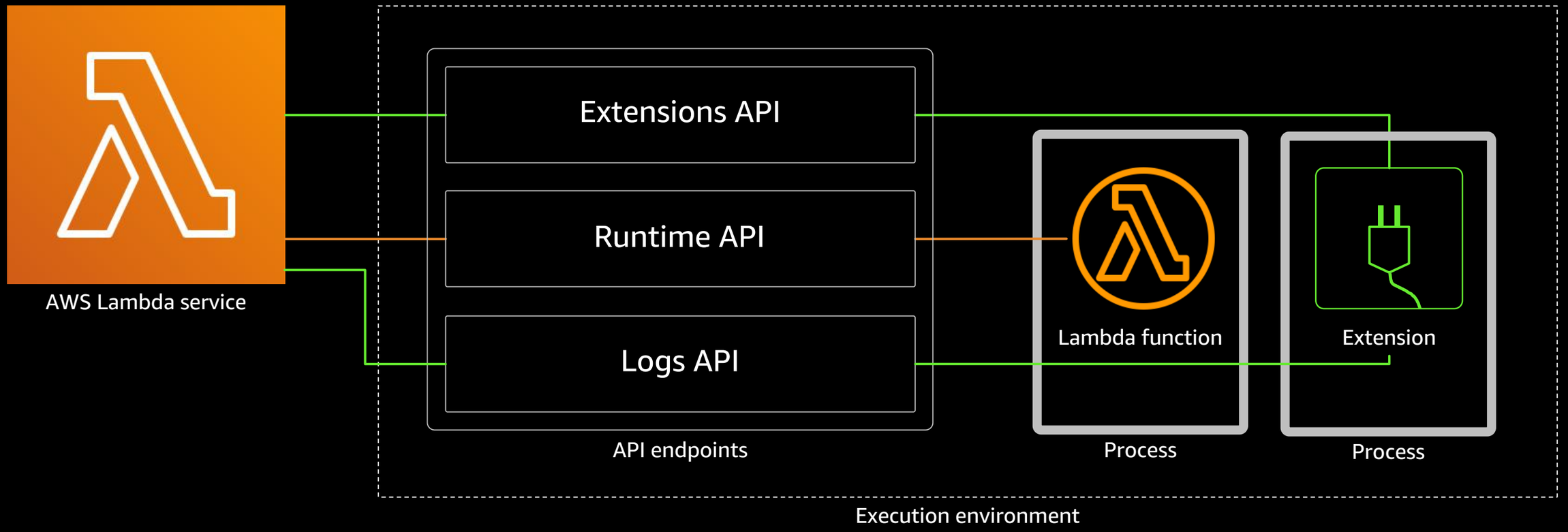
https://s12d.com/extensions-intro

Lambda Extensions – internal



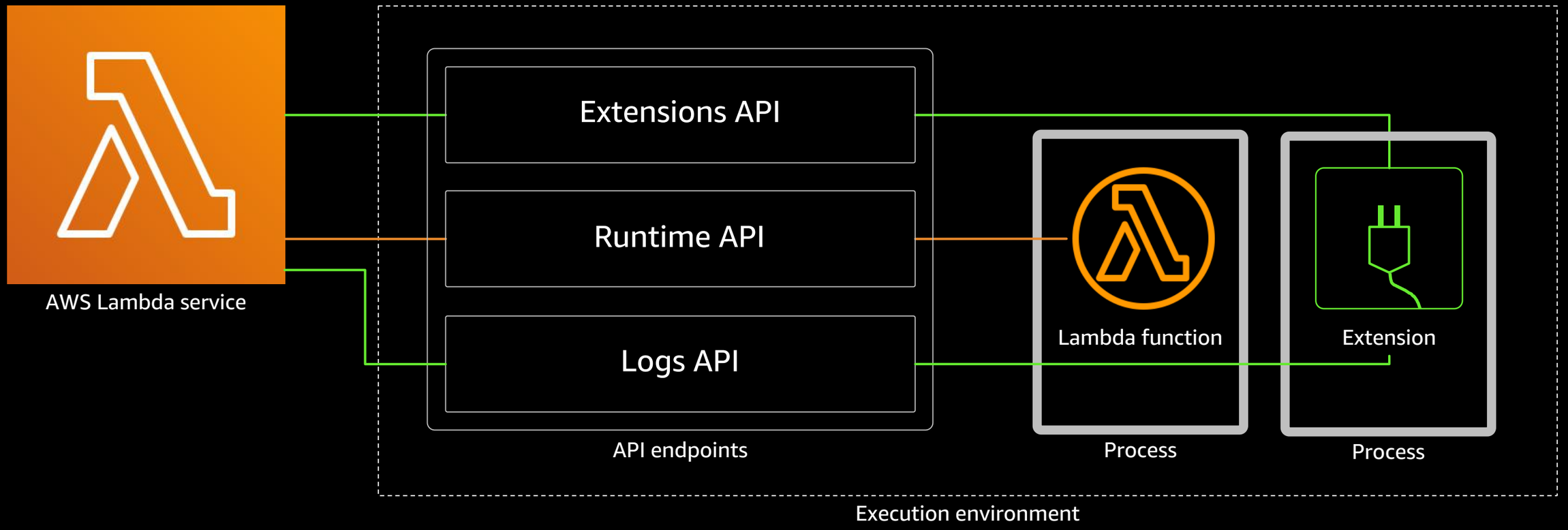
- Runs within the runtime, in-process with Lambda function code
- Allows modification of startup and runtime process
- Language-specific environment variables / wrapper scripts

Lambda Extensions – external



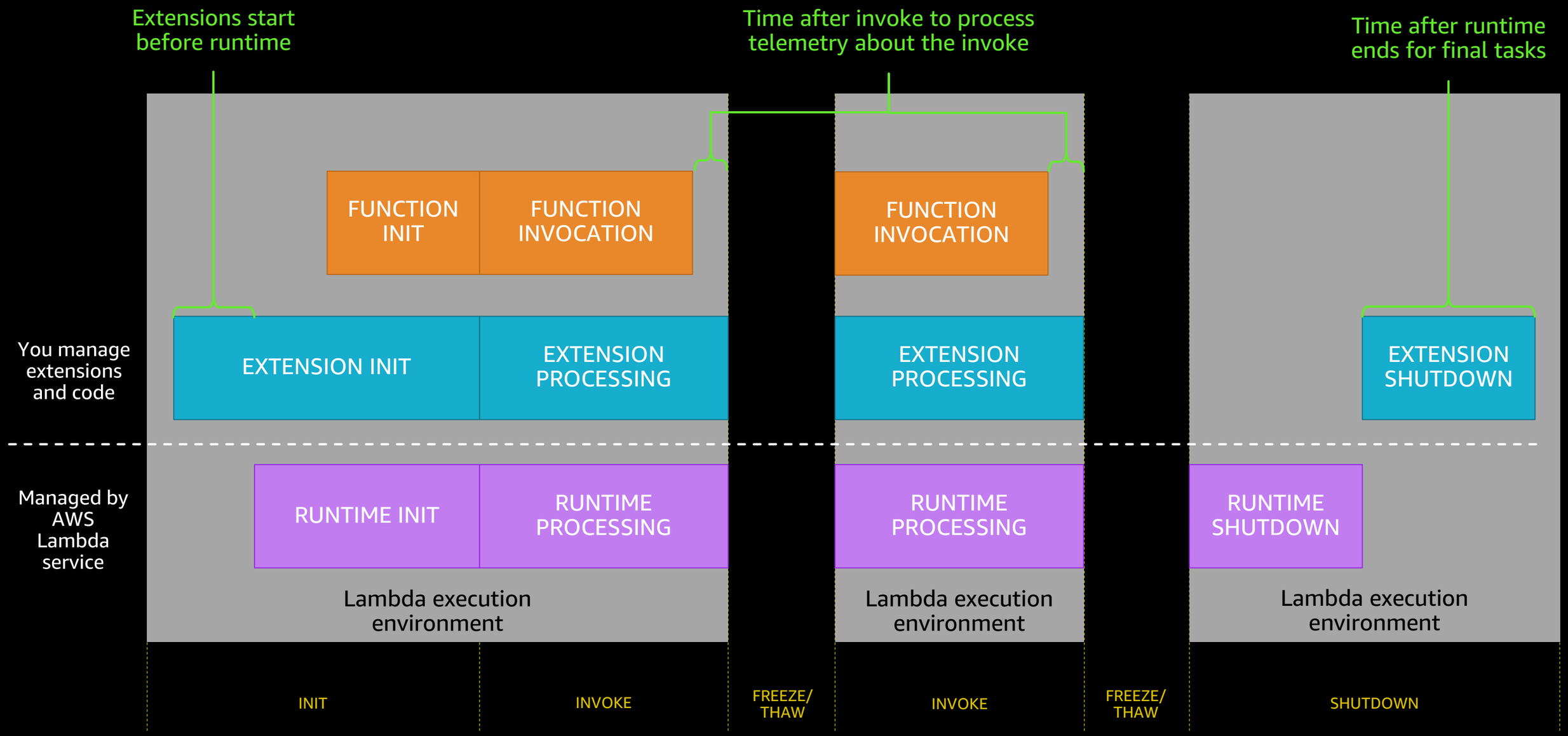
- Run outside the runtime as separate processes
- Can start before runtime process, continue after runtime shutdown

Lambda Extensions – Logs API



- Take logs from the execution environment and send to extensions for local processing or shipping to outside destinations

Lambda Extensions – Lambda lifecycle



Extensions available today

AWS LAMBDA READY PARTNER, AWS PARTNER, AND AWS TOOLS USING LAMBDA EXTENSIONS





















Amazon CloudWatch
Lambda Insights



AWS AppConfig





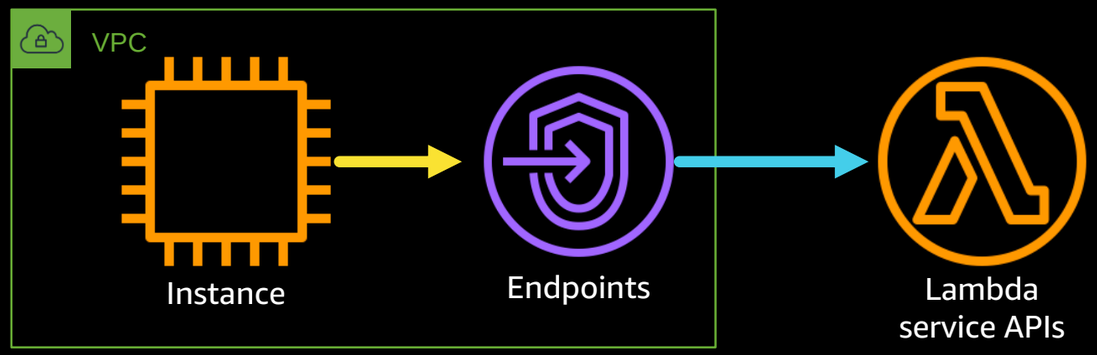






VPC endpoints for AWS Lambda

Create, manage, and invoke Lambda functions securely from inside your virtual private cloud (VPC) or on-premises data centers without exposing traffic to the public internet



- Invoke Lambda functions without leaving the AWS private network
- Uses AWS PrivateLink
- Removes need for network address translation (NAT) gateways

AWS Lambda – AVX2 support

ADVANCED VECTOR EXTENSIONS 2

Allows CPUs to perform a higher number of integer and floating-point operations per clock cycle



- Python – libraries can be compiled with the AVX2 flag or linked with MKL to take advantage of AVX2
- Java – Java's JIT compiler can auto-vectorize code to run with AVX2 instructions
- Golang – use the gcc compiler for Go, gccgo
- Node – use the AVX2-enabled or MKL-enabled versions of libraries

AWS Lambda – AVX2 support

For vectorizable algorithms, this can enhance performance, resulting in lower latencies and higher throughput

Filter	No AVX2	With AVX2	Performance improvement
Bilinear	105 ms	71 ms	32%
Bicubic	122 ms	73 ms	40%
Lanczos	136 ms	77 ms	43%

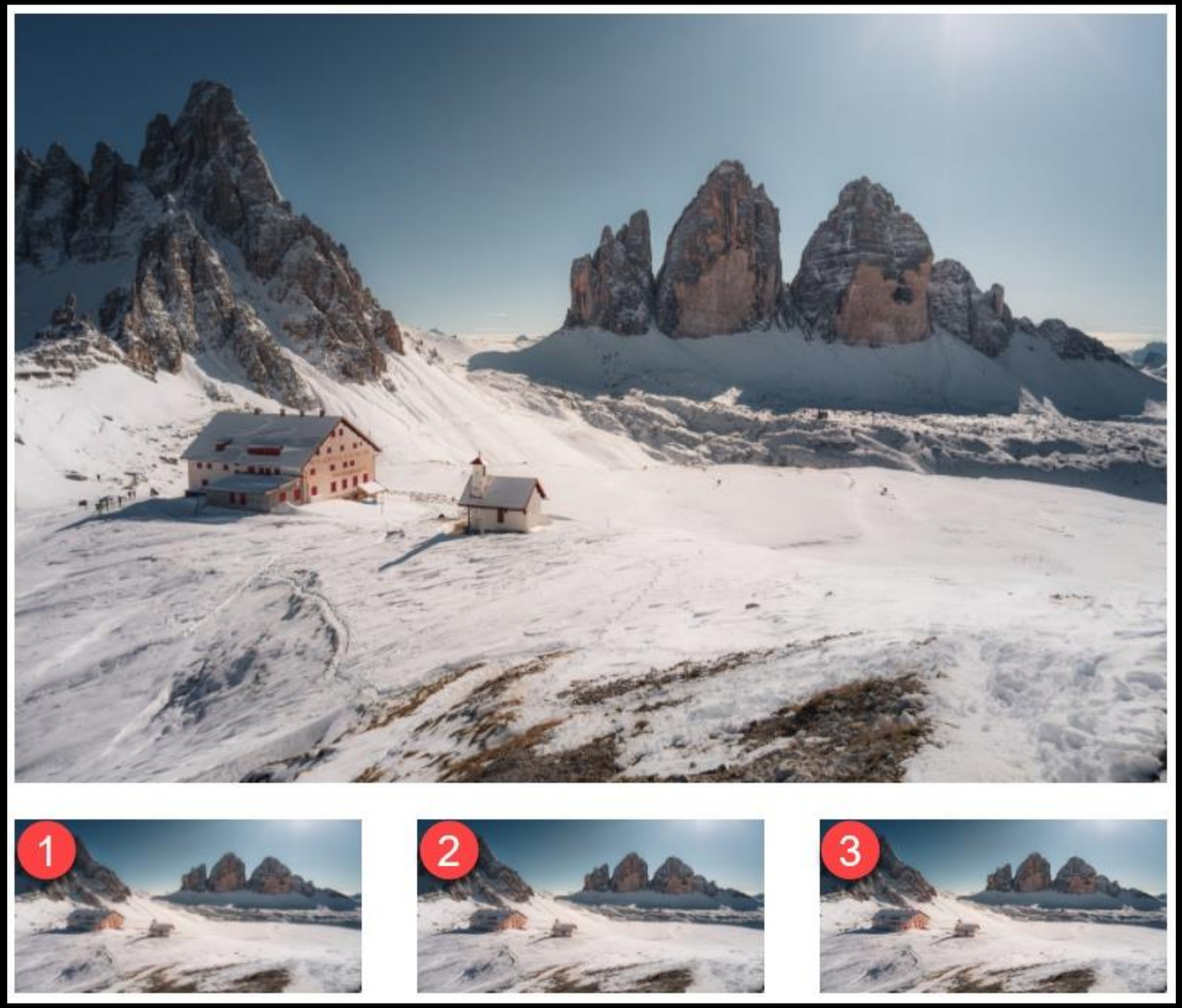


Image source: https://unsplash.com/photos/IMXhx6qhvf0. Photo credit: Daniel Seßler.

Amazon CloudWatch Lambda Insights

Now generally available

- Gives you deep insight into how your Lambda-based applications are performing
- Works with CloudWatch and AWS X-Ray to show a complete picture
- Single-page view of costs, cold starts, performance, and more critical information



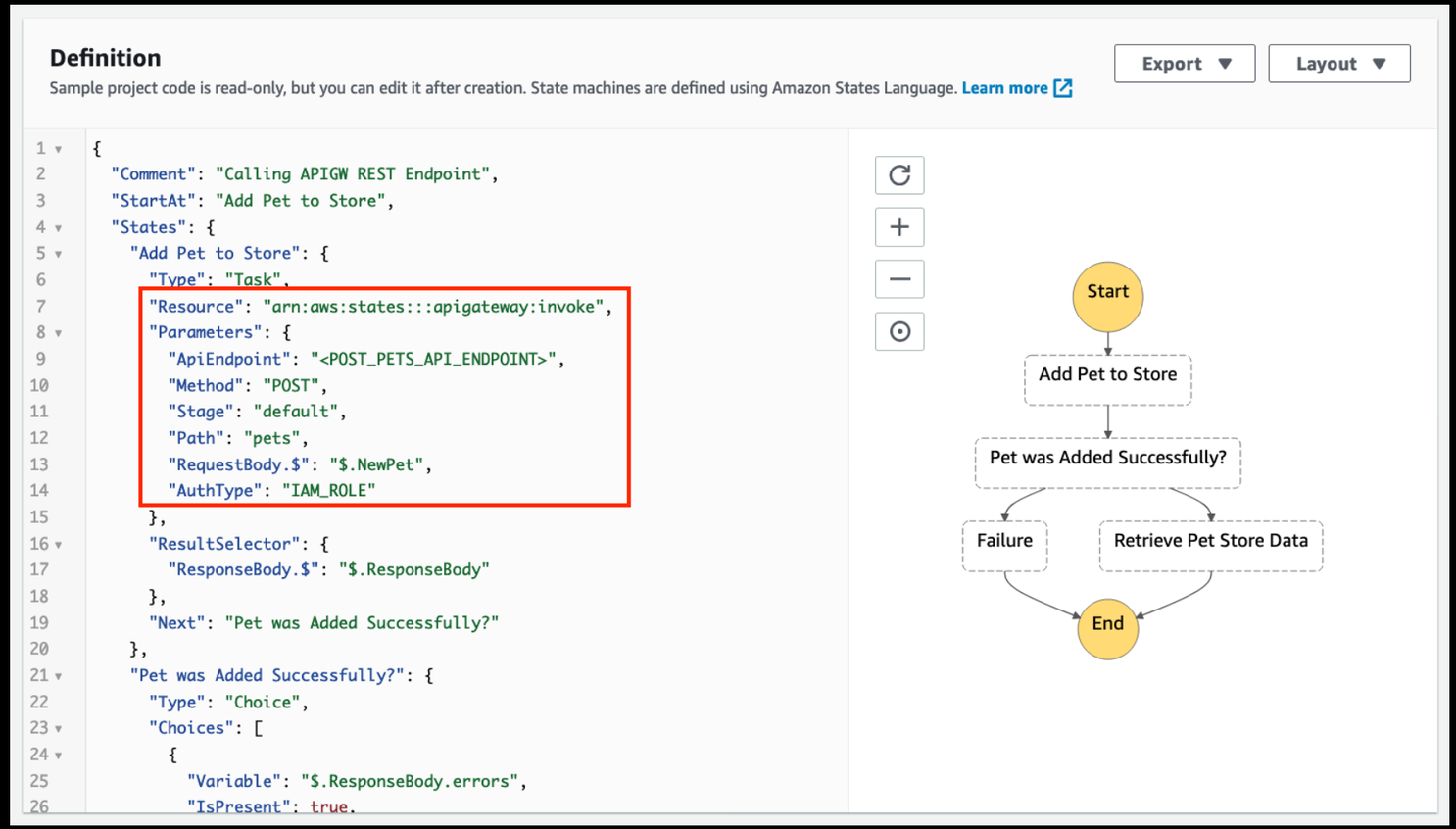
AWS Step Functions + Amazon API Gateway

You can now add Amazon API Gateway actions to your Step Functions workflows

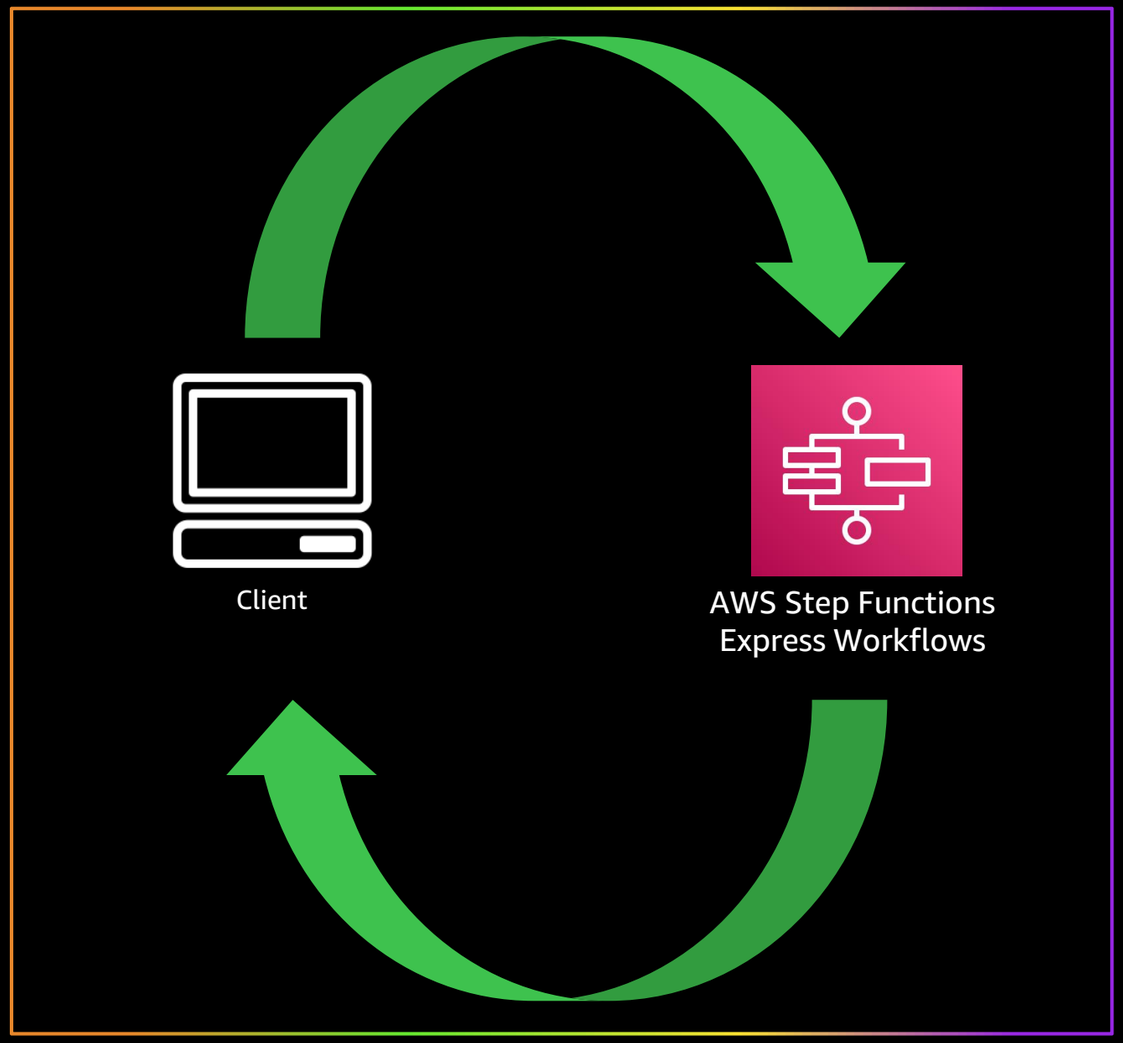
- Request response

Or

- Wait for callback
- AWS Identity and Access Management (IAM) for access controls
  - Supports tag-based and API-GW resource policies



Step Functions Synchronous Express Workflows



Synchronous “blocking” calls to Express Workflows

- No need to poll for response
- Great for:
  - High-volume microservice orchestration
  - Fast compute tasks that communicate via HTTPS

Amazon EventBridge replay and archiving

Create and replay an encrypted archive of the events published to an event bus



- Record and store events processed by any type of event bus
- Filter archived events using event pattern matching
- Replay stored events to all rules defined for the event bus (excluding managed rules created by other AWS services)

SAM CLI updates

- Local testing of AWS Lambda Extensions
- Container image support
- HTTP APIs in SAM local
- AmazonMQ as an event source for AWS Lambda
- Mutual TLS (mTLS) for REST and HTTP APIs
- Cached and parallel builds
- Logs API for AWS Lambda Extensions
- AWS Lambda Code Signer



Grab bag: Check these out!

Aurora Serverless V2 – improved scalability, performance, multi-AZ support, read replicas, and global database support

Amazon DevOps Guru – managed operations service that provides guidance on potential operational issues, trained on years of data from Amazon and AWS

Amazon Lookout for Metrics – detect business anomalies, pulling data from potentially numerous AWS services and AWS Partner products

AWS Proton – automate and manage infrastructure provisioning and code deployments for serverless and container-based applications

FIN / ACK

There are so many new capabilities to make your serverless applications:

- Faster
- Lower cost
- Larger scale
- More easily deployed
- Easier to debug and troubleshoot
- More resilient
- Have even less code

So much more here:

https://s12d.com/svs207



Thank you!

Chris Munns

munns@amazon.com
@chrismunns

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.



Please complete the session survey

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.