



Deploying, Building and Observing SDKs as a Service



Why do devs prefer app dark themes?

A dark, atmospheric photograph of a forest path. The path is covered in fallen leaves and leads into a dense forest of tall, thin trees. The lighting is dim, with a soft glow in the distance, suggesting a misty or foggy day. A blue speech bubble with a white border is positioned in the middle-right of the image, containing the word "NOPE!" in white capital letters.

NOPE!



Developer Steve Coochin

Lumigo Senior Developer Advocate

Dev/Maker/Geek/Speaker/streamer/ruralite



I <3 APIs

...dependencies...
...sources...
...loading sdk-tools-linux-4333796.zip...

% Received	% Xferd	Average Speed	Time			
		Dload	Upload	To		
100	147M	0	0	4682k	0	0:00

android-sdk.sh
android-sdk.csh
android-sdk.conf
license.html

...ing source files with sha1sums...
...706 zip ... Passed

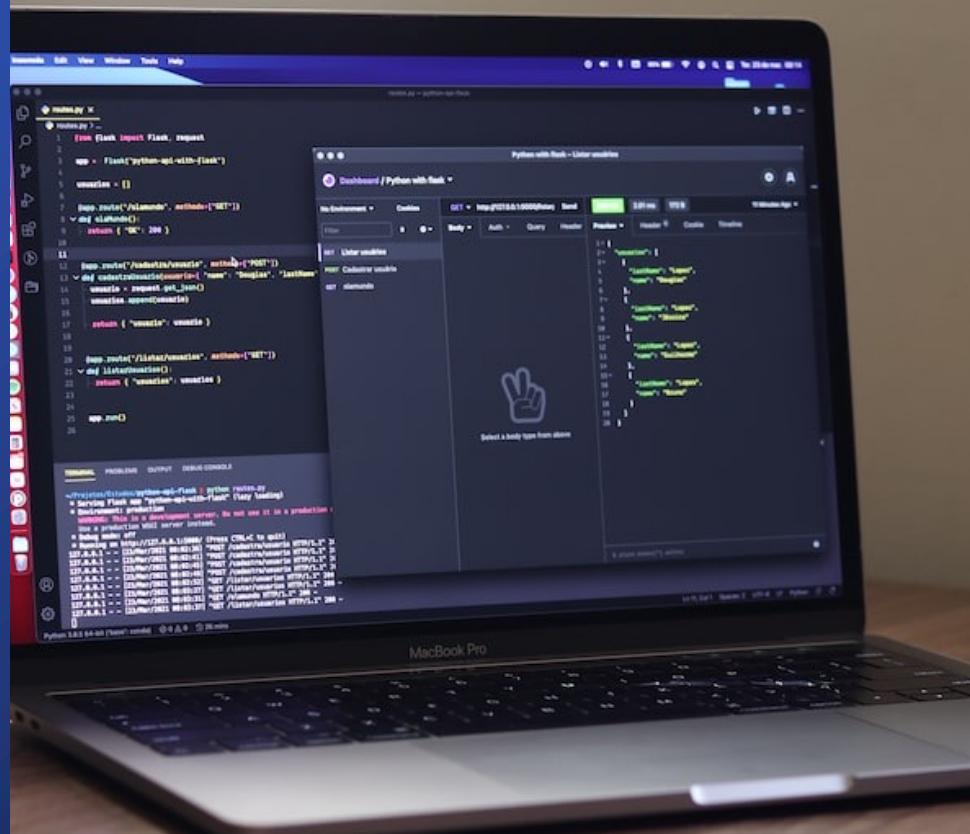
File Edit View Search Terminal Help

```
1 [
2 [
3 [
4 [ |
Mem [|||||] 2.8G/2.4G
Swp [|||||] 8G/2.4G
```

PID	USER	PR	NI	U	ST	TIME	COMMAND
31208	saikiran	20	0	2000	S	0:00	...
22651	saikiran	20	0	428	S	0:00	...
902	saikiran	20	0	428	S	0:00	...
472	root	20	0	276	S	0:00	...
21853	saikiran	20	0	428	S	0:00	...

A Good API needs to...

- Provide a Valid Service
- Be Well Documented
- Integration options
- SDKs



OpenAPI Generator

- Local CLI
- Deployable service
- OpenAPI & Swagger support
- 50+ different languages
- Customizable SDK templates
- OSS with a HUGE community

API clients

ActionScript, Ada, Apex, Bash, C, C# (.net 2.0, 3.5 or later, .NET Standard 1.3 - 2.1, .NET Core 3.1, .NET 5.0. Libraries: RestSharp, GenericHost, HttpClient), **C++** (Arduino, cpp-restsdk, Qt5, Tizen, Unreal Engine 4), **Clojure, Crystal, Dart, Elixir, Elm, Eiffel, Erlang, Go, Groovy, Haskell** (http-client, Servant), **Java** (Apache HttpClient, Jersey1.x, Jersey2.x, OkHttp, Retrofit1.x, Retrofit2.x, Feign, RestTemplate, RESTEasy, Vertx, Google API Client Library for Java, Rest-assured, Spring 5 Web Client, MicroProfile Rest Client), **k6, Kotlin, Lua, Nim, Node.js/JavaScript** (ES5, ES6, AngularJS with Google Closure Compiler annotations, Flow types, Apollo GraphQL DataStore), **Objective-C, OCaml, Perl, PHP, PowerShell, Python, R, Ruby, Rust** (hyper, reqwest, rust-server), **Scala** (akka, http4s, scalaz, sttp, swagger-async-httpclient), **Swift** (2.x, 3.x, 4.x, 5.x), **Typescript** (AngularJS, Angular (2.x - 13.x), Aurelia, Axios, Fetch, Inversify, jQuery, Nestjs, Node, redux-query, Rxjs)









Server stubs

Ada, C# (ASP.NET Core, Azure Functions), **C++** (Pistache, Restbed, Qt5 QHTTPEngine), **Erlang, F#** (Giraffe), **Go** (net/http, Gin, Echo), **Haskell** (Servant, Yesod), **Java** (MSF4J, Spring, Undertow, JAX-RS: CDI, CXF, Inflector, Jersey, RestEasy, Play Framework, **PKMST, Vert.x, Apache Camel**), **Kotlin** (Spring Boot, Ktor, Vertx), **PHP** (Laravel, Lumen, **Mezzio (fka Zend Expressive)**, Slim, Silex, **Symfony**), **Python** (FastAPI, Flask), **NodeJS, Ruby** (Sinatra, Rails5), **Rust** (**rust-server**), **Scala** (Akka, **Finch, Lagom, Play, Scalatra**)

Generator CLI

- `openapi-generator-cli generate -g go --additional-properties=prependFormOrBodyParameters=true \ -o out -i petstore.yaml`

```
Executable File 67 Lines (52 sloc) 1.77 KB
1 #!/bin/bash
2 ## auto generating all the SDKs using swagger-codegen
3
4 folder="./../test"
5
6 for file in ../spec_config/*.json
7 do
8   if [
9
10
11
12
13
14
15
16 fl
17 done
18
19 for file
20 do
21 if [
22
23
24
25
26
27
28
```

 csharp.json	2.2.9 update including new response fields
 dart.json	2.2.9 update including new response fields
 haskell.json	2.2.9 update including new response fields
 java.json	2.2.9 update including new response fields
 javascript.json	2.2.9 update including new response fields
 perl.json	2.2.9 update including new response fields
 php.json	2.2.9 update including new response fields
 python.json	2.2.9 update including new response fields
 ruby.json	2.2.9 update including new response fields

`openapi-generator-cli help generate`

NAME

`openapi-generator-cli generate` - Generate code with the specified generator.

SYNOPSIS

`openapi-generator-cli generate`

```
[(--a <authorization> | --auth <authorization>)]
[--api-name-suffix <api name suffix>] [--api-package <api package>]
[--artifact-id <artifact id>] [--artifact-version <artifact version>]
[(--c <configuration file> | --config <configuration file>)] [--dry-run]
[(--e <templating engine> | --engine <templating engine>)]
[--enable-post-process-file]
[(--g <generator name> | --generator-name <generator name>)]
[--generate-alias-as-model] [--git-host <git host>]
[--git-repo-id <git repo id>] [--git-user-id <git user id>]
[--global-property <global properties>...] [--group-id <group id>]
[--http-user-agent <http user agent>]
[(--i <spec file> | --input-spec <spec file>)]
[--ignore-file-override <ignore file override location>]
[--import-mappings <import mappings>...]
[--instantiation-types <instantiation types>...]
[--invoker-package <invoker package>]
[--language-specific-primitives <language specific primitives>...]
[--legacy-discriminator-behavior] [--library <library>]
[--log-to-stderr] [--minimal-update]
[--model-name-prefix <model name prefix>]
[--model-name-suffix <model name suffix>]
[--model-package <model package>]
[(--o <output directory> | --output <output directory>)] [(--p <additional
properties> | --additional-properties <additional properties>)...]
[--package-name <package name>] [--release-note <release note>]
[--remove-operation-id-prefix]
[--reserved-words-mappings <reserved word mappings>...]
[(--s | --skip-overwrite)] [--server-variables <server variables>...]
[--skip-operation-example] [--skip-validate-spec]
[--strict-spec <true/false strict behavior>]
[(--t <template directory> | --template-dir <template directory>)]
[--type-mappings <type mappings>...] [(--v | --verbose)]
```

SDK as a service

API



SDK gen



AWS ECS



Lambda



How Distributed Tracing can help

API

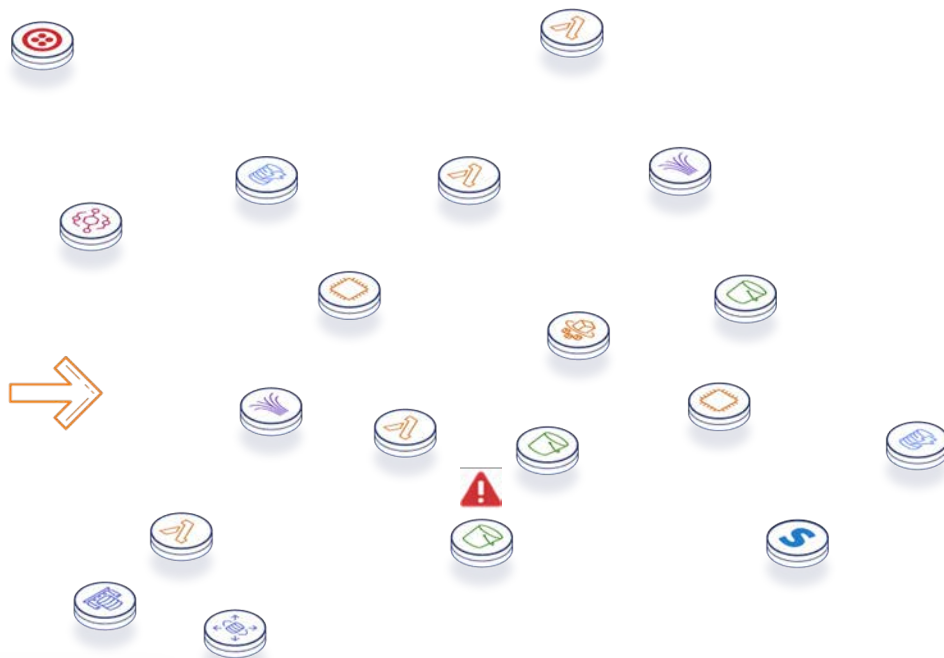


DISTRIBUTED TRACE

DK test

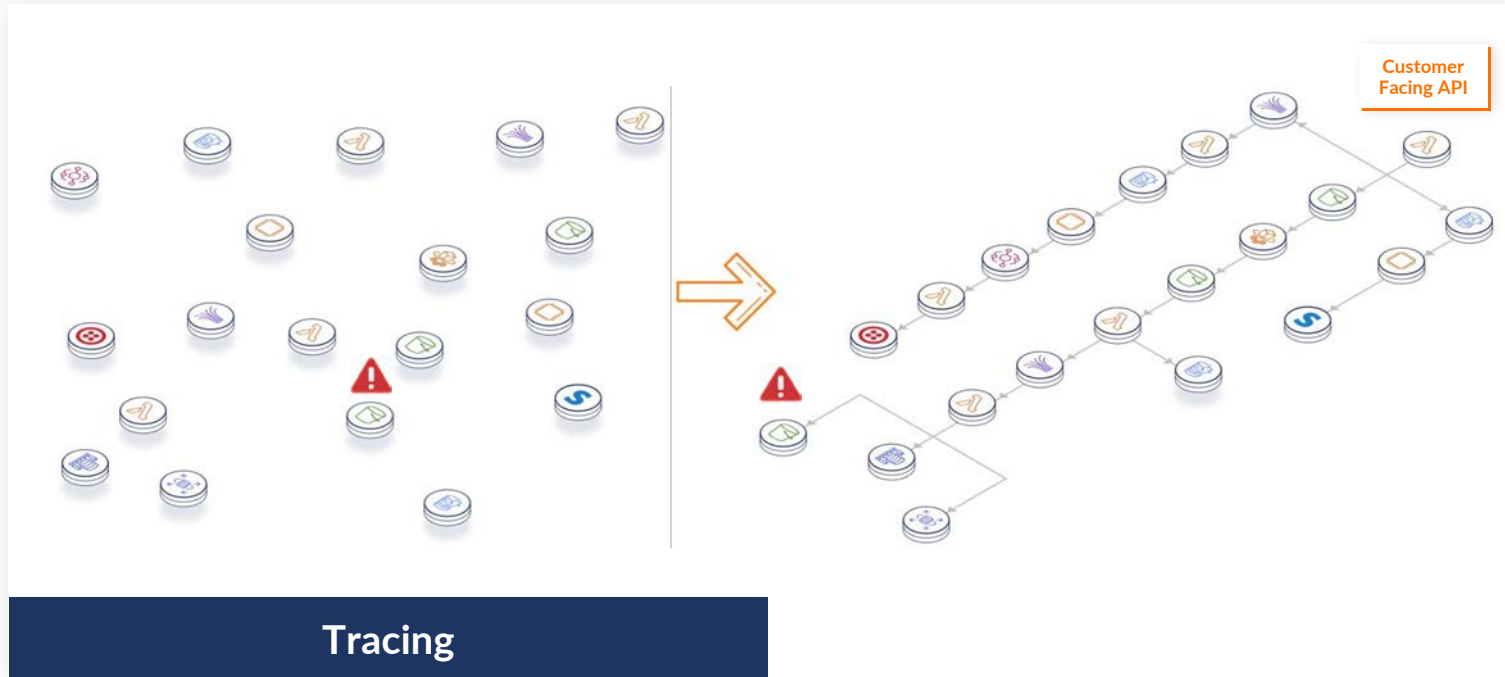


Cloud Native Applications are highly distributed with hundreds of ever-changing components

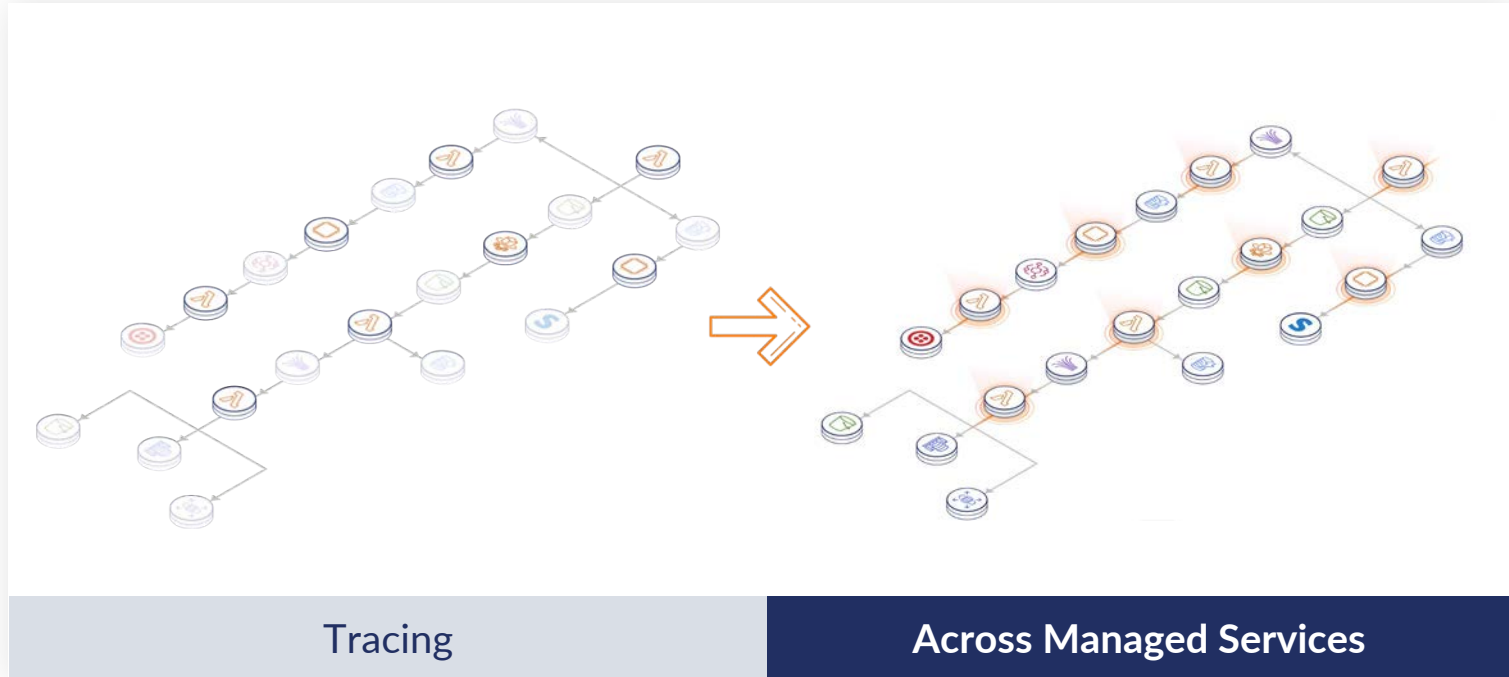


Hard to zoom-out and understand overall application health without understanding the context and connections between them

Distributed Tracing



Agentless Observability



Full Circle Observability



API Gateway Monitoring



Invocation

Dev-Env 4 ▾

- Dashboard
- Issues
- Functions
- ECS
- Transactions
- Live Tail
- Explore
- Resources
- System Map

Request Id: ffc40a31-39e2-4d29-8cc1-27edc2d88f2d

Start Time	Duration	Cost	Region	Issues
11:41:24 AM	160 ms	< \$0.01	us-east-1	0

GRAPH TIMELINE LOGS

Timeline



Help
Dark Mo

030a1870-d953-404...	11:41:32 AM	Success	12 ms	-	0	-
ffc40a31-39e2-4d29...	11:41:24 AM	Success	160 ms ❄️	-	1	-





Dashboard



Issues

Fx

Functions



ECS



Transactions



Live Tail



Explore



Resources



System Map

Alerts

Settings

Settings

What's New

Help

OpenAPI us-east-1

Status: **ACTIVE**
Tasks: Running: 1 | Pending: 0

[Go To AWS Console](#) [See Traces](#)

SERVICES **TASKS**

Tasks (7)

Task ID	Type	Status	Started...	CPU Un...	Memory ...	
arn:aws:ecs:us-east-1:413854491361:task/OpenAPI/1... us-east-1	FARGATE	RUNNING	Aug 23, 2022, ...	256 vCPU	512 MB	See Traces
arn:aws:ecs:us-east-1:413854491361:task/OpenAPI/4... us-east-1	FARGATE	RUNNING	Yesterday, 12:...	256 vCPU	512 MB	See Traces
arn:aws:ecs:us-east-1:413854491361:task/OpenAPI/7... us-east-1	FARGATE	RUNNING	Yesterday, 12:...	256 vCPU	512 MB	See Traces
arn:aws:ecs:us-east-1:413854491361:task/OpenAPI/7... us-east-1	FARGATE	PENDING		256 vCPU	512 MB	See Traces
arn:aws:ecs:us-east-1:413854491361:task/OpenAPI/7... us-east-1	FARGATE	RUNNING	Yesterday, 1:0...	256 vCPU	512 MB	See Traces
arn:aws:ecs:us-east-1:413854491361:task/OpenAPI/e... us-east-1	FARGATE	PENDING		256 vCPU	512 MB	See Traces
arn:aws:ecs:us-east-1:413854491361:task/OpenAPI/f... us-east-1	FARGATE	RUNNING	Yesterday, 1:0...	256 vCPU	512 MB	See Traces

SDK Testing

SDK test



Invocations



Request Id	Start Time ↓	Result	Duration
5a88f644-3064-4a0c-b036-63a4...	3:35:04 PM	● Success	184 ms
8baccf1e-c5ce-4aec-987b-311d...	3:35:04 PM	● Success	719 ms
a15a54bd-d87f-4f17-a33f-6c9d0...	3:32:53 PM	● Success	262 ms
d1825ce8-d68c-4e7c-8448-319c...	3:32:51 PM	● Success	1,598 ms ❄️

Invocations



Request Id	Start Time ↓	Result	Duration
57b30eb5-076a-49f5-9347-b805...	3:41:36 PM	● Success	76 ms
e2266667-cd13-4691-9368-466...	3:41:35 PM	● Success	951 ms ❄️

See the full trace picture

Transaction ID: 3baf76c02001737530c4cb70

Start Time	Duration	Cost	Region	Issues
12:15:16 PM	434 ms	< \$0.01	us-east-1	0

GRAPH | TIMELINE | LOGS

Expand

```
graph TD; A[GET /apigw-request-id] --> B[FuncIn-SNS]; B --> C[QueueEvent]; C --> D[Message]; C --> E[Topic A:1]; D --> F[ProcessSQSEvent]; E --> F; F --> G[ ]
```

Request id	Lumigo Tag	Memory Limit
3dc7725a-cd97-47fe-a...	sqg	128MB

Start Time	Duration
12:15:16 PM	234 ms

Execution Tags | Return Value | Event | Environment Variables | Log Entries

Execution Tags

apigw-request-id 3dc7725a-cd97-47fe-ab60-83bc02712d3e | method GET | path /favicon.ico

Return Value

Body

```
{
  statusCode: 200
  body: "invoked"
}
```

Event

Body

```
{
  version: 2.0
  routeKey: Hidden Information
  rawPath: "/favicon.ico"
  rawQueryString: ""
  requestContext: { 2 props }
  headers: { 3 props }
  isBase64Encoded: false
}
```

Take Aways

- Design APIs for Dev Consumption
- Rinse, Repeat and Refine
- Monitor and Trace Everything
 - APIs
 - SDKs
 - Deployed Code



Distributed Tracing made easy

Lumigo.io/blog



DeveloperSteve, Jan 18 2023

Monitoring AWS DynamoDB performance and latency

Amazon DynamoDB is a fully managed NoSQL database service provided by AWS and is tailor-made for serverless applications. As a...

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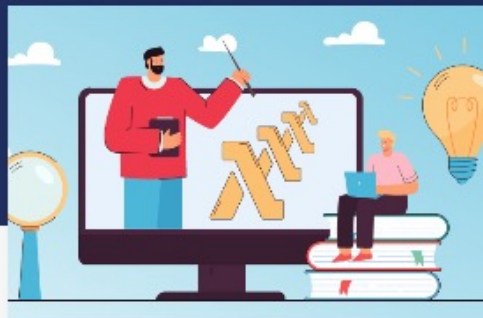


DeveloperSteve, Jan 12 2023

Comparing Amazon ECS launch types: EC2 vs. Fargate

Amazon Elastic Container Service (ECS) is a fully managed container orchestration service that enables users to easily run, manage and...

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Saar Tochner, Dec 22 2022

Zero-Friction AWS Lambda Instrumentation with external extensions

If you've been in the software business for some time, you've probably noticed that creating software isn't only about adding...

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USE YOUR
TECH SUPER
POWERS
FOR GOOD



"Be excellent to each other"



Thank You