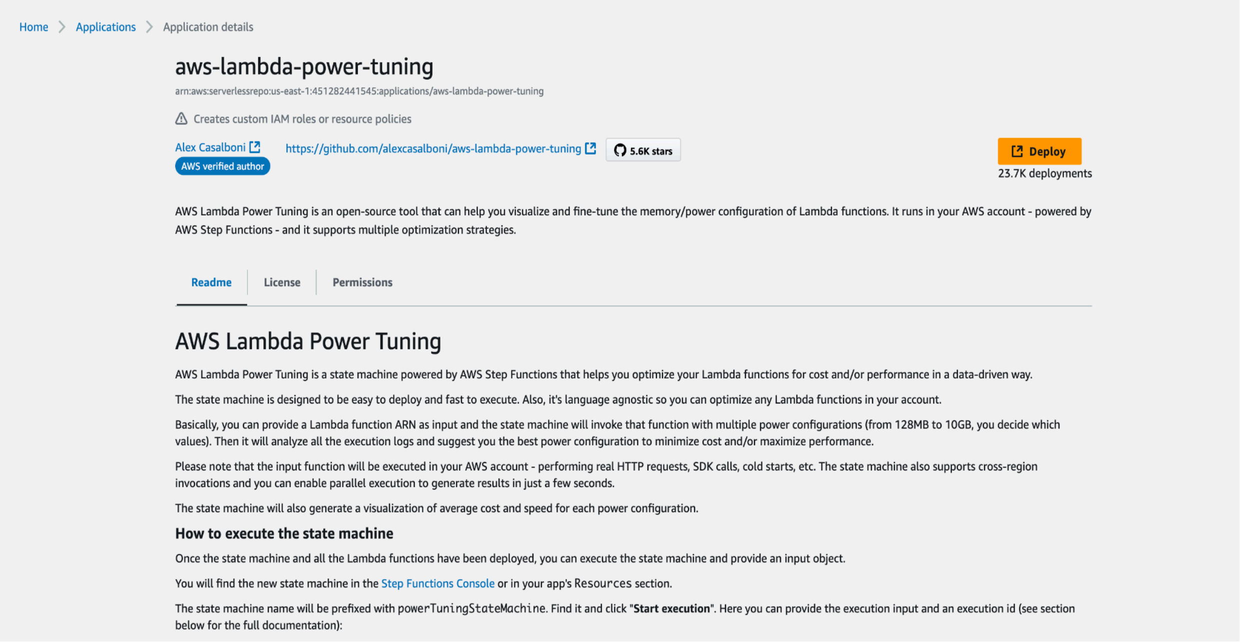
Lambda Power Tuner - Runbook

Deploy the Lambda Power Tuner by opening Power Tuner Deployment Link and then clicking the “Deploy” button on the page below.



aws-lambda-power-tuning

arn:aws:serverlessrepo:us-east-1:451282441545:applications/aws-lambda-power-tuning

⚠ Creates custom IAM roles or resource policies

AWS Lambda Power Tuning is an open-source tool that can help you visualize and fine-tune the memory/power configuration of Lambda functions. It runs in your AWS account - powered by AWS Step Functions - and it supports multiple optimization strategies.

AWS Lambda Power Tuning

AWS Lambda Power Tuning is a state machine powered by AWS Step Functions that helps you optimize your Lambda functions for cost and/or performance in a data-driven way.

The state machine is designed to be easy to deploy and fast to execute. Also, it's language agnostic so you can optimize any Lambda functions in your account.

Basically, you can provide a Lambda function ARN as input and the state machine will invoke that function with multiple power configurations (from 128MB to 10GB, you decide which values). Then it will analyze all the execution logs and suggest you the best power configuration to minimize cost and/or maximize performance.

Please note that the input function will be executed in your AWS account - performing real HTTP requests, SDK calls, cold starts, etc. The state machine also supports cross-region invocations and you can enable parallel execution to generate results in just a few seconds.

The state machine will also generate a visualization of average cost and speed for each power configuration.

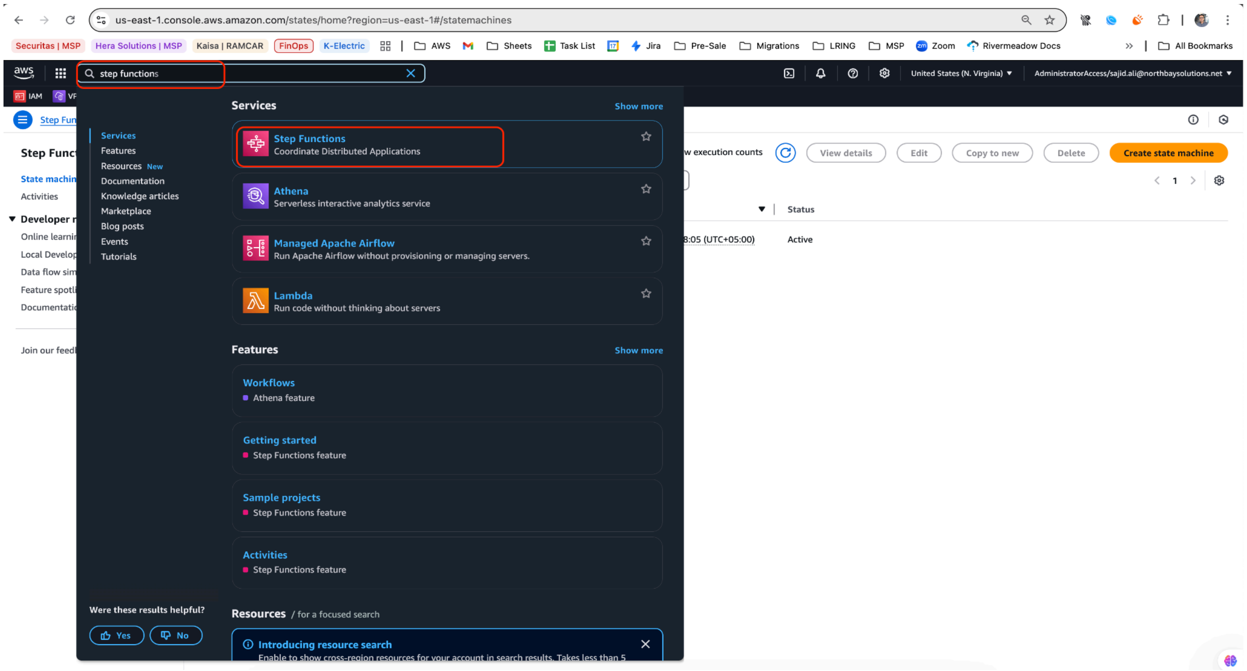
How to execute the state machine

Once the state machine and all the Lambda functions have been deployed, you can execute the state machine and provide an input object.

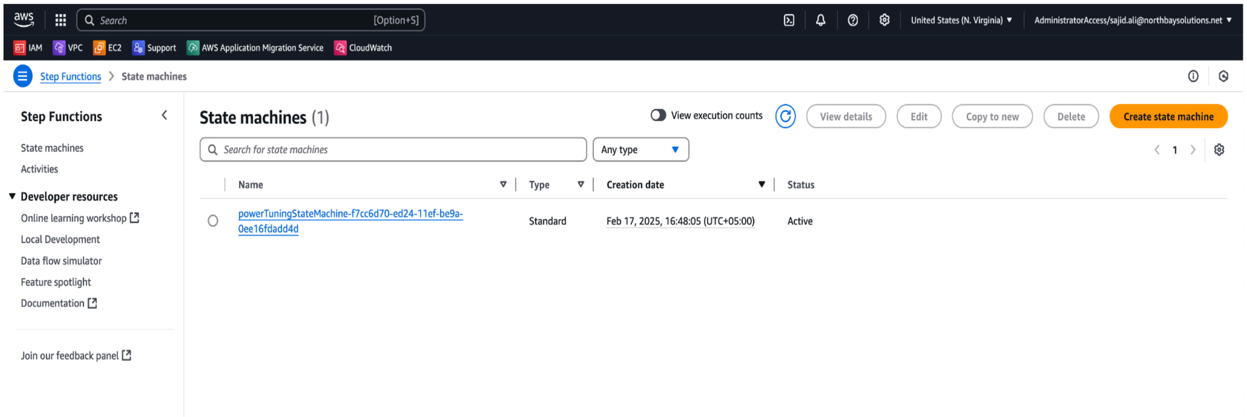
You will find the new state machine in the Step Functions Console or in your app's `Resources` section.

The state machine name will be prefixed with `powerTuningStateMachine`. Find it and click "**Start execution**". Here you can provide the execution input and an execution id (see section below for the full documentation):

This will deploy a CloudFormation Stack, and create resources like lambda functions, Step Function as well as IAM Roles as well.
Search for Step Functions in AWS Services.


us-east-1.console.aws.amazon.com/states/home?region=us-east-1#/statemachines
step functions
United States (N. Virginia)
AdministratorAccess/sajid.ali@northbaysolutions.net
Services
Features
Resources New
Documentation
Knowledge articles
Marketplace
Blog posts
Events
Tutorials
Services
Show more
Step Functions
Coordinate Distributed Applications
Athena
Serverless interactive analytics service
Managed Apache Airflow
Run Apache Airflow without provisioning or managing servers.
Lambda
Run code without thinking about servers
Features
Show more
Workflows
Athena feature
Getting started
Step Functions feature
Sample projects
Step Functions feature
Activities
Step Functions feature
Were these results helpful?
Yes
No
Resources / for a focused search
Introducing resource search
Enable to show cross-region resources for your account in search results. Takes less than 5
View details
Edit
Copy to new
Delete
Create state machine
Status
Active

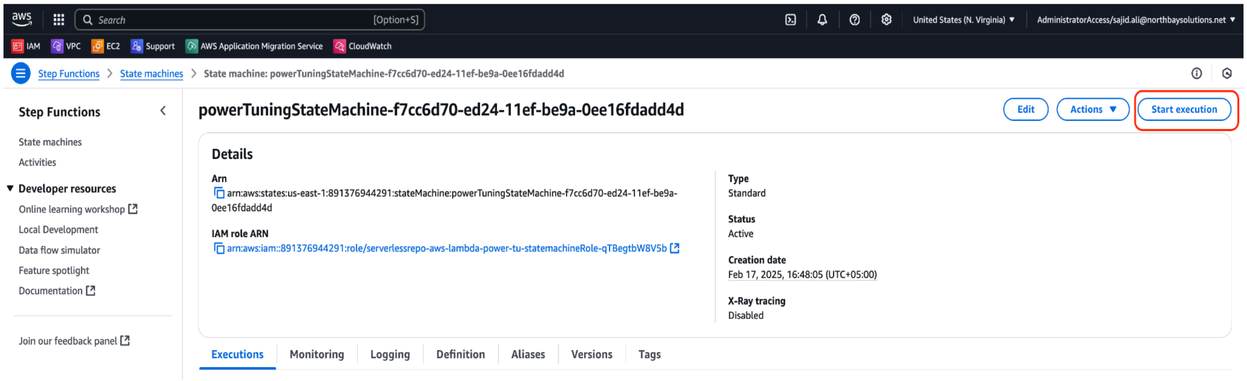
Click on the state machine available in step functions starting with “powerTuningStateMachine”



State machines (1)

Name	Type	Creation date	Status
powerTuningStateMachine-f7cc6d70-ed24-11ef-be9a-0ee16fdadd4d	Standard	Feb 17, 2025, 16:48:05 (UTC+05:00)	Active

Below page will appear and now click on “Start execution”



powerTuningStateMachine-f7cc6d70-ed24-11ef-be9a-0ee16fdadd4d

Details

Arn
arn:aws:states:us-east-1:891376944291:stateMachine:powerTuningStateMachine-f7cc6d70-ed24-11ef-be9a-0ee16fdadd4d

IAM role ARN
arn:aws:iam::891376944291:role/serverlessrepo-aws-lambda-power-tu-statemachineRole-qTBegtbW8V5b

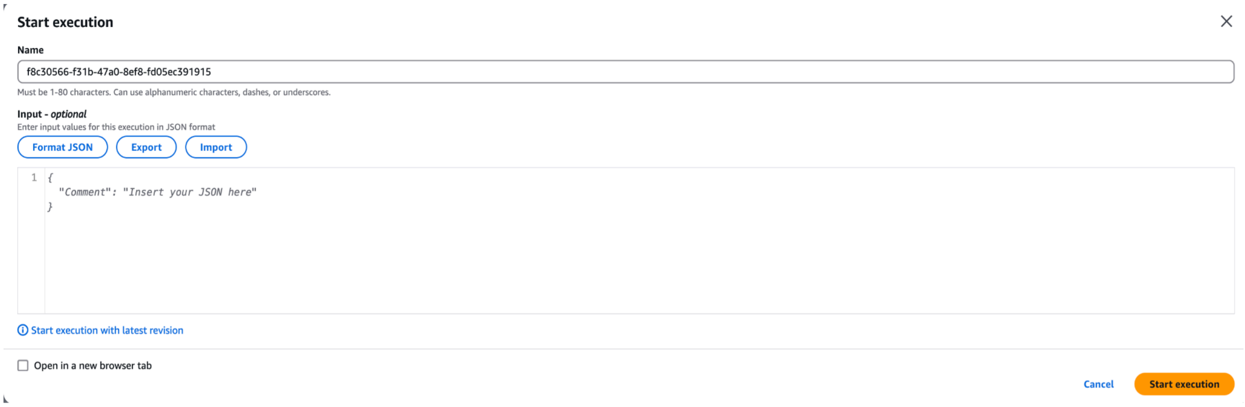
Type
Standard

Status
Active

Creation date
Feb 17, 2025, 16:48:05 (UTC+05:00)

X-Ray tracing
Disabled

This popup will appear



Start execution

Name
f8c30566-f31b-47a0-8ef8-fd05ec391915
Must be 1-80 characters. Can use alphanumeric characters, dashes, or underscores.

Input - *optional*
Enter input values for this execution in JSON format

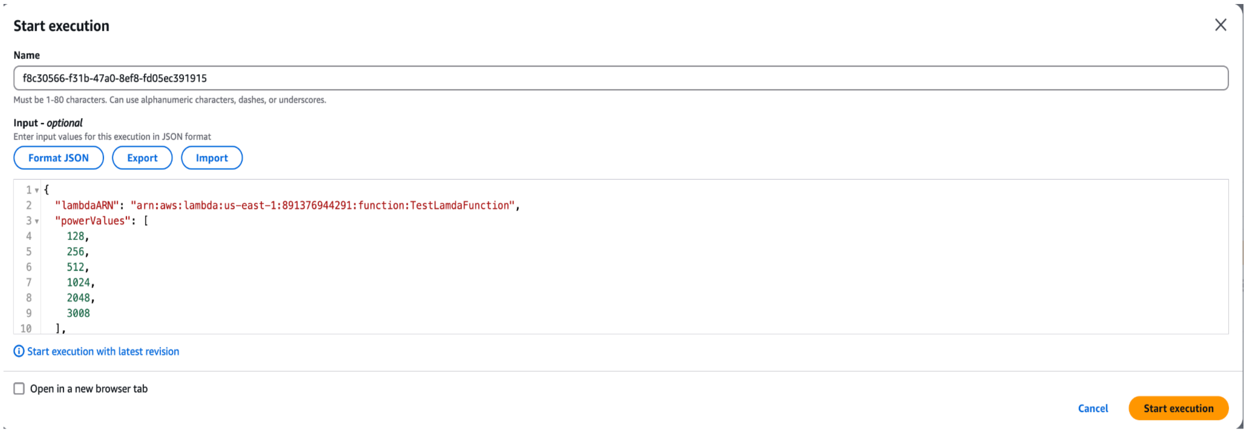
```
{
  "Comment": "Insert your JSON here"
}
```

□ Open in a new browser tab

Provide the blow input in the “input - optional” section.

Unset
```
{
    "lambdaARN": "your-lambda-function-arn",
    "powerValues": [128, 256, 512, 1024, 2048, 3008],
    "num": 10,
    "payload": "{}",
    "parallelInvocation": true,
    "strategy": "cost"
}
```

Update the lambda function ARN and click on “Start execution”



Name

f8c30566-f31b-47a0-8ef8-fd05ec391915

Must be 1-80 characters. Can use alphanumeric characters, dashes, or underscores.

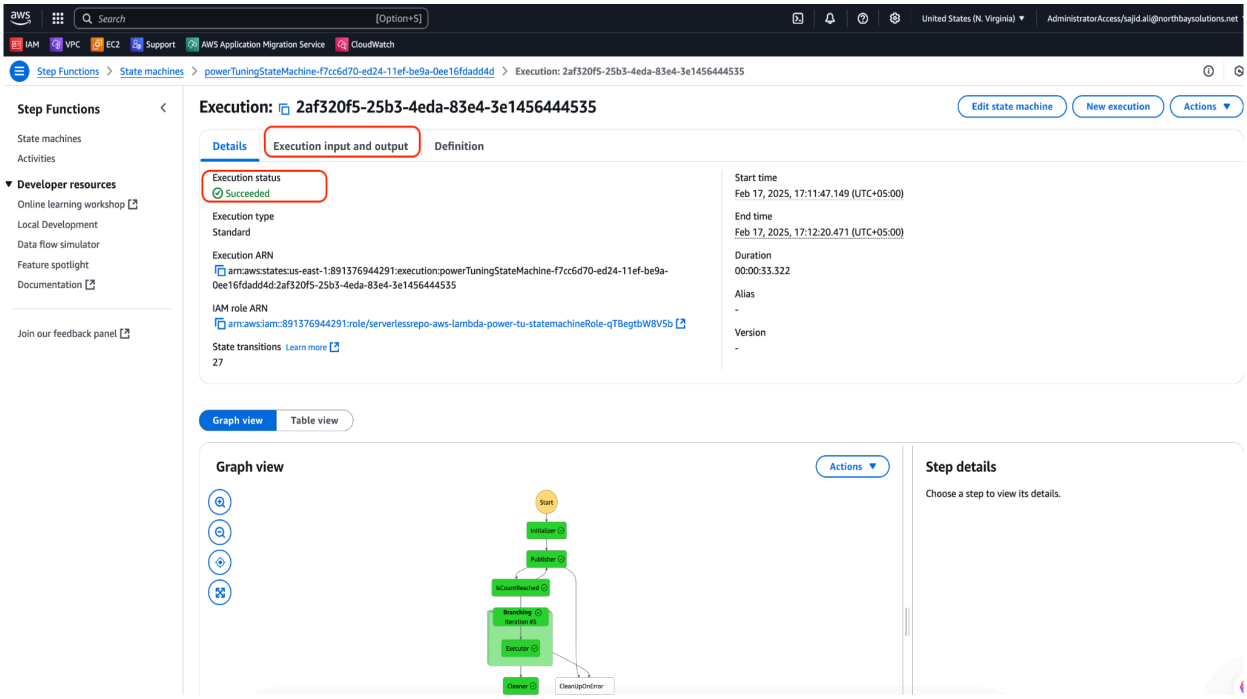
Input - *optional*

Enter input values for this execution in JSON format

```
{
  "lambdaARN": "arn:aws:lambda:us-east-1:891376944291:function:TestLamdaFunction",
  "powerValues": [
    128,
    256,
    512,
    1024,
    2048,
    3008
  ],
```

☐ Open in a new browser tab

Check the “execution status” if succeeded then click on “Execution input and output”



Execution: 2af320f5-25b3-4eda-83e4-3e1456444535

Execution status
Succeeded

Execution type
Standard

Execution ARN
arn:aws:states:us-east-1:891376944291:execution:powerTuningStateMachine-f7cc6d70-ed24-11ef-be9a-0ee16fdadd4d:2af320f5-25b3-4eda-83e4-3e1456444535

IAM role ARN
arn:aws:iam::891376944291:role/serverlessrepo-aws-lambda-power-tu-statemachineRole-qTBegtbW8V5b

State transitions Learn more
27

Start time
Feb 17, 2025, 17:11:47.149 (UTC+05:00)

End time
Feb 17, 2025, 17:12:20.471 (UTC+05:00)

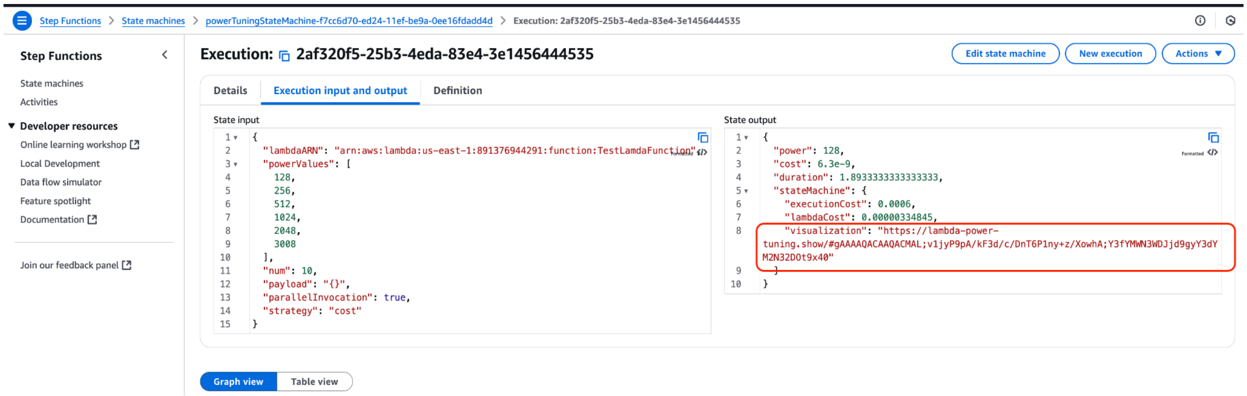
Duration
00:00:33.322

Alias
-

Version
-

Choose a step to view its details.

In the state output section we have “visualization” link that has the detail about the lambda function cost and performance.



Execution: 2af320f5-25b3-4eda-83e4-3e1456444535

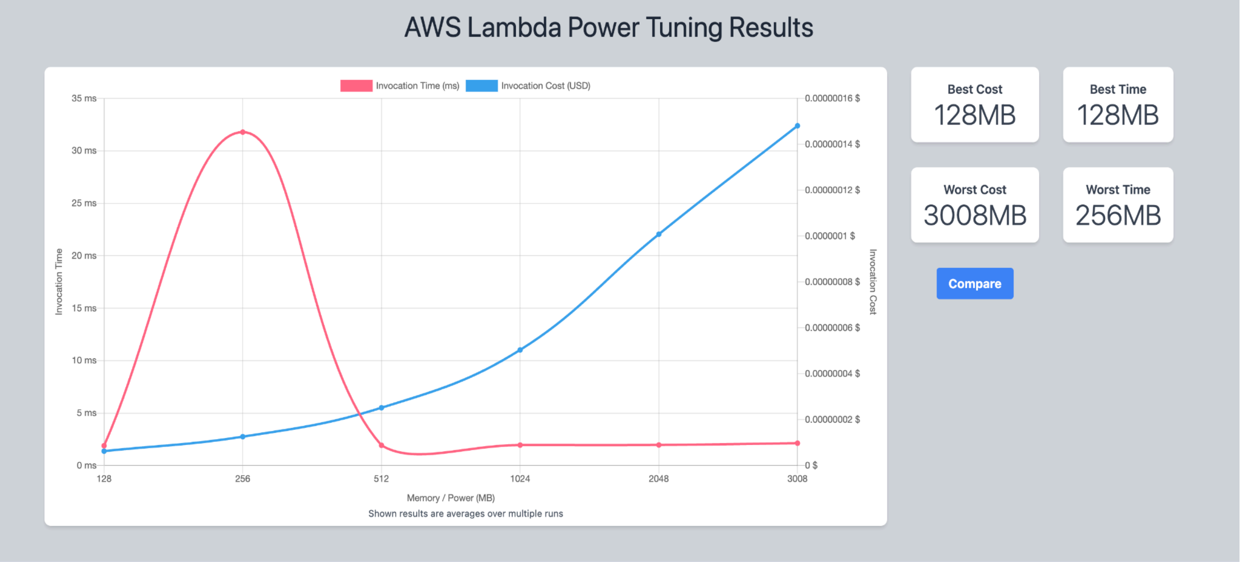
State input

```
{
  "lambdaARN": "arn:aws:lambda:us-east-1:891376944291:function:TestLamdaFunction",
  "powerValues": [
    128,
    256,
    512,
    1024,
    2048,
    3008
  ],
  "num": 10,
  "payload": "{}",
  "parallelInvocation": true,
  "strategy": "cost"
}
```

State output

```
{
  "power": 128,
  "cost": 6.3e-9,
  "duration": 1.8933333333333333,
  "stateMachine": {
    "executionCost": 0.0006,
    "lambdaCost": 0.00000334845,
    "visualization": "https://lambda-power-
tuning.show/#gAAAAQACAAQACMAL;v1jyP9pA/kF3d/c/DnT6P1ny+z/XowhA;Y3fYMWN3WDJjd9gyY3dY
M2N32DOt9x40"
  }
}
```

Information in the visualization link.


AWS Lambda Power Tuning Results
Invocation Time (ms)
Invocation Cost (USD)
35 ms
30 ms
25 ms
20 ms
15 ms
10 ms
5 ms
0 ms
Invocation Time
0.00000016 $
0.00000014 $
0.00000012 $
0.0000001 $
0.00000008 $
0.00000006 $
0.00000004 $
0.00000002 $
0 $
Invocation Cost
Memory / Power (MB)
Shown results are averages over multiple runs
Best Cost
128MB
Best Time
128MB
Worst Cost
3008MB
Worst Time
256MB
Compare