



FRB Hackathon - AWS Primer

12/2/2019 - By:

Sepehr Laal < sepehr.laal@stelligent.com >

Trevor Millner < trevor.millner@stelligent.com >

Murtuza Bohri < murtuza.bohri@mphasis.com >

In This Presentation...

- Introduction to AWS and Serverless
- Provision Cloud9 in AWS
- Node.JS hello-world Lambda app
- Summary and Q&A

What is Amazon Web Services (AWS)?

- A division of Amazon offering the world's most comprehensive cloud platform
- Operational since 2006 (very mature)
- Offers over 165 products across a wide range of technologies, industries and use case
- Available in 22 geographic regions and continually expanding
- 72 Price reductions to date
- Supports Hybrid Cloud solutions (in addition to On-premise & Cloud management solutions)

What are the benefits of using AWS?

- On demand resource allocation
- Pay as you go
- Depth and breadth of product offerings
- Security focused
- Scale
- Constant innovation and improvements
- Lower prices due to with economies of scale
- Flexibility

** Total Cost of Ownership (TCO) calculator is available to compare against on-premise or colocation environment with AWS, for the same resources.*

Cloud Computing Models

Infrastructure as a Service (IaaS)

Provides full access to networking and data storage

Example: EC2, EBS



Software as a Service (SaaS)

Provides a complete product, run and managed by the service provider

Example: AWS Marketplace offerings

Platform as a Service (PaaS)

Focuses on removing the need to manage underlying infrastructure

Example: Elastic Beanstalk





How can I develop on AWS with speed & scale?

Serverless



Benefits

Cost efficient

Scalable

Availability

Zero operational responsibility



Examples

Compute -> Lambda

Storage -> S3

DB -> Dynamo, Aurora

API -> API Gateway

Integration -> SNS, SQS

Orchestration -> Step Functions

Analytics -> Kinesis, Athena



Use Cases

Web applications

Chat bots

Notification systems

Data processing & analysis

ML classification

Lambda

Run code without provisioning or managing servers

Pay for compute time

Write code in Lambda code editor or upload code to AWS (S3)

Setup triggers from other services:

- S3 events
- HTTP endpoints
- Application activities



Requests:

- First 1 Million requests per month free.
- \$0.20 per Million requests thereafter

Duration of execution:

- First 400K GB-Seconds per month free.
- \$0.0000166 per GB-Second thereafter

API Gateway

Create, publish, maintain and monitor APIs at scale

- REST
- WebSocket APIs

Pay for what you use

Includes security controls for your APIs (IAM and Amazon Cognito)



Rest API Calls:

- \$3.50 per million for the first 333 million
- \$3.03 per million for the next 667 million

Rest API Caching:

- \$0.02 per hr for 0.5 GB
- \$0.038 per hr for 1.6 GB

WebSocket:

- Pay for messages sent & received (in 32 KB msg increments) and total # of connection mins; \$1.083 per Million for First billion, per month)

DynamoDB

NoSQL, Fully managed multi-region durable database

Security, backup & restore, caching support, transactions,

No servers = no provisioning, patching, or software maintenance on the DB

Encryption at rest via AWS KMS



OnDemand Capacity Pricing

Provisioned Capacity Pricing

- Read/Write requests
- Data storage
- Backup & restore
- Global tables
- DynamoDB Accelerator (DAX)
- DynamoDB streams
- Data transfer

Object storage service supporting scalability, availability and security

11 9's of durability, redundancy of data across multiple systems

Flexible management of data -- with lifecycle policies and access restrictions

Essential service facilitating many others

Encryption at rest and in-transit



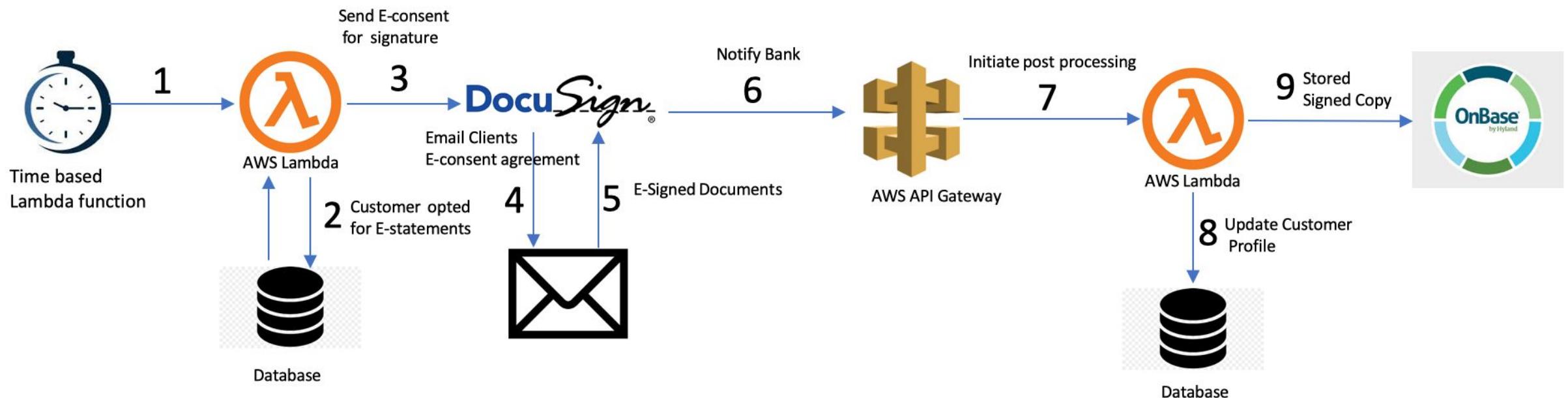
Standard Storage:

- First 50 TB / month \$0.023 per GB
- Next 450 TB / month \$0.024 per GB

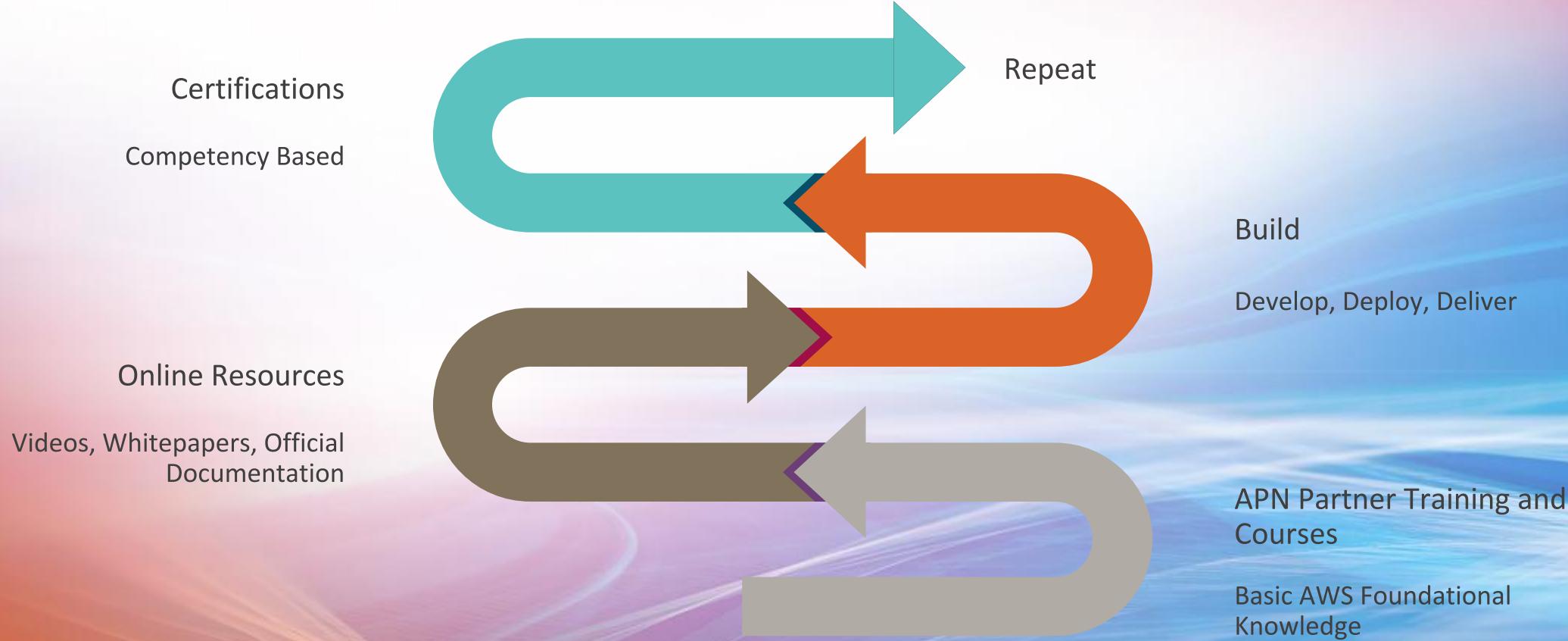
Standard Requests & Retrieval:

- \$0.005 per 1000 requests for PUT, COPY, POST, LIST requests
- \$0.0004 per 1000 requests for GET, SELECT requests

E-consent (Use Case)



Where can I go from here?



Provision Cloud9 in AWS

<https://github.com/stelligent/frb-hackathon-cloud9-demo>

Provision Cloud9 in AWS

- You have many options to provision a new Cloud9 IDE:
 - You may use the AWS web console (<https://console.aws.amazon.com/>)
 - You can use the AWS CLI and APIs (<https://aws.amazon.com/cli/>)
 - You can use CloudFormation (this presentation)

- Each method has its pros and cons:
 - The preferred provision method at Stelligent is to use CloudFormation
 - Using console and CLI is not easily “replicable”

CloudFormation - Stack | FRB Hackathon Demo - A | API Gateway | https://ni6aqj5wwg.execute-api.us-west-2.amazonaws.com/cloudformation/home?region=us-west-2#stacks?filteringText=&filteringStatus=active&viewNested=true&hideStacks=false

The previous console is being deprecated in favor of the new console
The previous console is being deprecated in favor of this new AWS CloudFormation Console, that we are continually improving based on customer feedback. There will be no new features added or improvements made to the previous console. We will continue to support bug fixes and patches until 03/31/2020 after which the previous console will no longer be accessible.

CloudFormation Services Resource Groups

CloudFormation Stacks StackSets Exports Designer

CloudFormation registry Resource types

Previous console Feedback

CloudFormation > Stacks

Stacks (12)

Filter by stack name Active View nested

Stack name	Status	Created time	Description
cloud9-demo	UPDATE_COMPLETE	2019-12-01 20:20:39 UTC-0800	An AWS Serverless Specification template describing your function.
aws-cloud9-FRB-Hackathon-Demo-a5...	CREATE_COMPLETE	2019-12-01 20:15:16 UTC-0800	-
FRB-hackathon-cloud9-demo	CREATE_COMPLETE	2019-12-01 20:14:30 UTC-0800	-
change-set-stack-name	DELETE_FAILED	2019-08-27 14:57:26 UTC-0700	-
nu-cfn-deploy-bucket-deploy	CREATE_COMPLETE	2019-08-26 23:57:30 UTC-0700	-
frb-loadbalancer-production	DELETE_FAILED	2019-07-20 20:59:17 UTC-0700	MU load balancer for an environment
frb-loadbalancer-acceptance	DELETE_FAILED	2019-07-20 20:58:52 UTC-0700	MU load balancer for an environment
frb-vpc-acceptance	CREATE_COMPLETE	2019-07-20 20:55:40 UTC-0700	MU VPC with network resources managed by mu
frb-vpc-production	CREATE_COMPLETE	2019-07-20 20:55:35 UTC-0700	MU VPC with network resources managed by mu
mh-lab122-nested	DELETE_FAILED	2019-06-27 09:33:33 UTC-0700	Create a DynamoDB table and access role
mu-pk-vpc-dev	DELETE_FAILED	2018-11-12 17:48:24 UTC-0800	MU VPC with network resources managed by mu
mu-eks-workshop-vpc-production	DELETE_FAILED	2018-11-07 14:18:44 UTC-0800	MU VPC with network resources managed by mu

Stack actions Create stack

With new resources (standard)
With existing resources (import resources)

Head over to CloudFormation's console and hit "Create stack" (with new resources)

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CloudFormation - Stack x FRB Hackathon Demo - A x API Gateway x https://ni6aqj5wwg.execute-api.us-west-2.amazonaws.com/cloudformation/home?region=us-west-2#stacks/create/template

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CloudFormation > Stacks > Create stack

Step 1 Specify template

Step 2 Specify stack details

Step 3 Configure stack options

Step 4 Review

Create stack

Prerequisite - Prepare template

Prepare template

Every stack is based on a template. A template is a JSON or YAML file that contains configuration information about the AWS resources you want to include in the stack.

Template is ready Use a sample template Create template in Designer

Specify template

A template is a JSON or YAML file that describes your stack's resources and properties.

Template source

Selecting a template generates an Amazon S3 URL where it will be stored.

Amazon S3 URL Upload a template file

Upload a template file

Choose file cloud9-cfn.yaml

JSON or YAML formatted file

S3 URL: https://s3-us-west-2.amazonaws.com/cf-templates-1u0akiux3pto4-us-west-2/201933631f-cloud9-cfn.yaml

View in Designer

Cancel Next

Download “cloud9-cfn.yaml” from the presentation’s repository and upload it to CloudFormation

<https://github.com/stelligent/frb-hackathon-cloud9-demo/blob/master/cloud9-cfn.yaml>

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CloudFormation - Stack x FRB Hackathon Demo - A x API Gateway x https://ni6aqj5wwg.execute-api.us-west-2.amazonaws.com/cloudformation/home?region=us-west-2#stacks/create/parameters Incognito

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CloudFormation > Stacks > Create stack

Step 1 Specify template

Step 2 Specify stack details

Step 3 Configure stack options

Step 4 Review

Specify stack details

Stack name 1

Stack name my-cloud9-ide

No parameters 2

Previous Next

Set your Stack's name

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CloudFormation - Stack x FRB Hackathon Demo - A x API Gateway x https://ni6aqj5wwg.execute-api.us-west-2.amazonaws.com/step 2#stacks/create/options

AWS Services Resource Groups

Step 2 Specify stack details

Step 3 Configure stack options

Step 4 Review

Tags
You can specify tags (key-value pairs) to apply to resources in your stack. You can add up to 50 unique tags for each stack. [Learn more](#)

Permissions
Choose an IAM role to explicitly define how CloudFormation can create, modify, or delete resources in the stack. If you don't choose a role, CloudFormation uses permissions based on your user credentials. [Learn more](#)

IAM role - optional
Choose the IAM role for CloudFormation to use for all operations performed on the stack.

Advanced options
You can set additional options for your stack, like notification options and a stack policy. [Learn more](#)

Stack policy
Defines the resources that you want to protect from unintentional updates during a stack update.

Rollback configuration
Specify alarms for CloudFormation to monitor when creating and updating the stack. If the operation breaches an alarm threshold, CloudFormation rolls it back. [Learn more](#)

Notification options

Stack creation options

Rollback on failure
Specifies whether the stack should be rolled back if stack creation fails.

Enabled
 Disabled

Timeout
The number of minutes before a stack creation times out.

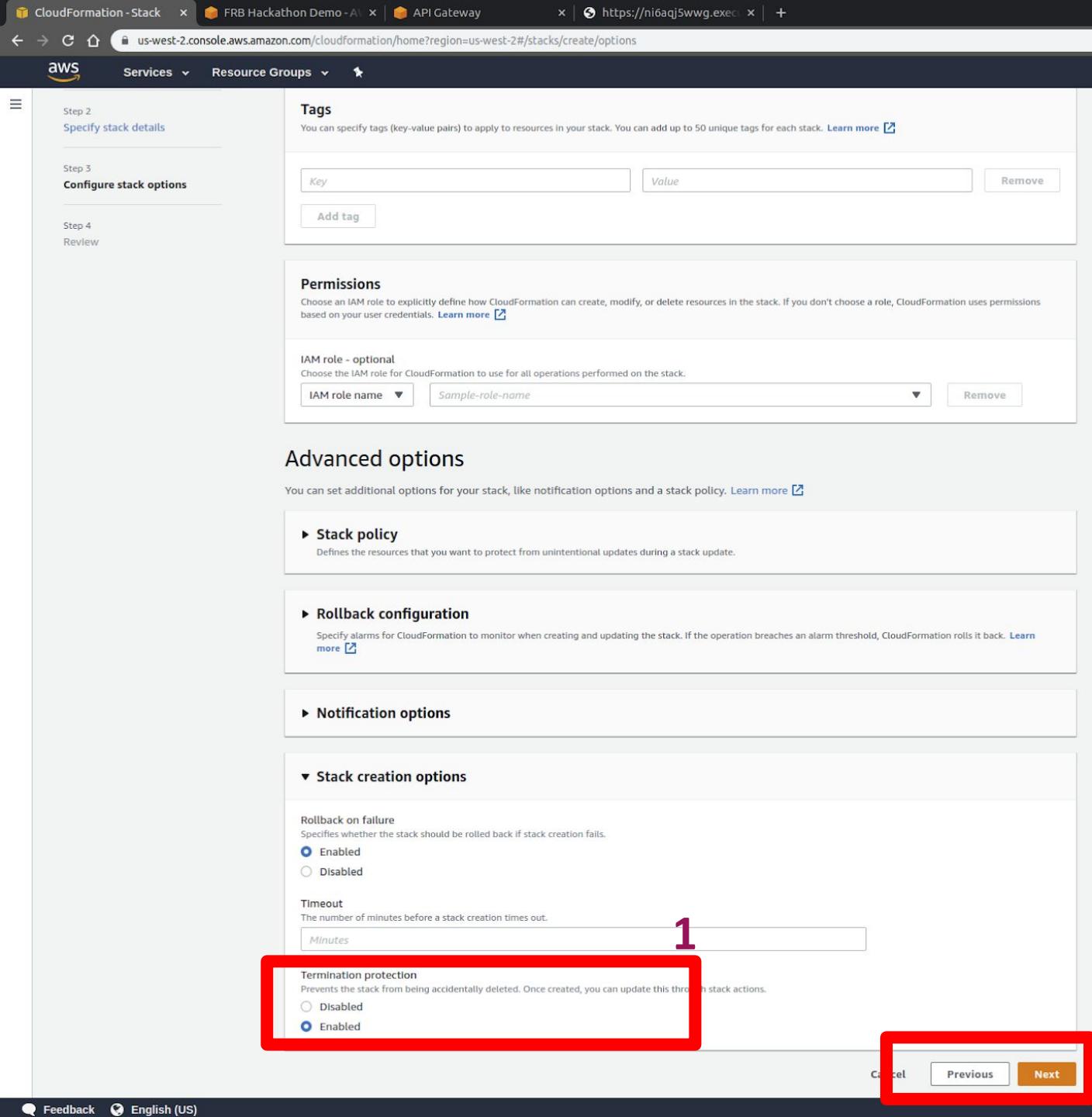
Minutes

Termination protection
Prevents the stack from being accidentally deleted. Once created, you can update this through stack actions.

Disabled
 Enabled

Cancel Previous Next

Scroll all the way down to enable termination protection for your Cloud9 IDE



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CloudFormation - Stack | FRB Hackathon Demo - A | API Gateway | https://ni6aqj5wwg.execute-api.us-west-2.amazonaws.com | Incognito

AWS Services Resource Groups

No tags
There are no tags defined for this stack

Permissions
No permissions
There is no IAM role associated with this stack

Stack policy
No stack policy
There is no stack policy defined

Rollback configuration
Monitoring time
-
CloudWatch alarm ARN
-

Notification options
No notification options
There are no notification options defined

Stack creation options
Rollback on failure
Enabled
Timeout
-
Termination protection
Enabled

Quick-create link

Create stack

Review and scroll all the way down and hit “Create stack”

CloudFormation - Stack F1 | FRB Hackathon Demo - A | API Gateway | https://ni6aqj5wwg.execute-api.us-west-2.amazonaws.com/cloudformation/home?region=us-west-2#stacks/outputs?filteringText=&filteringStatus=active&viewNested=true&hideStacks=false&stackId=arn%3Aaws%3Acloudformation%3Aus-west-2%3A324320755747%3Astack%2FFRB-hackathon-cloud9-demo%2F3ce5d7f0-14ba-11ea-a934-02bc0b348... | Incognito

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CloudFormation > Stacks > FRB-hackathon-cloud9-demo

Stacks (12)

Filter by stack name Active View nested

cloud9-demo 2019-12-01 20:20:39 UTC-0800 UPDATE_COMPLETE

aws-cloud9-FRB-Hackathon-Demo-a5600646d 2f749f8981df61be6bd6b30 2019-12-01 20:15:16 UTC-0800 CREATE_COMPLETE

FRB-hackathon-cloud9-demo 1 2019-12-01 20:14:30 UTC-0800 CREATE_COMPLETE

change-set-stack-name 2019-08-27 14:57:26 UTC-0700 DELETE_FAILED

nu-cfn-deploy-bucket-deploy 2019-08-26 23:37:30 UTC-0700 CREATE_COMPLETE

frb-loadbalancer-production 2019-07-20 20:59:17 UTC-0700 DELETE_FAILED

frb-loadbalancer-acceptance 2019-07-20 20:58:52 UTC-0700 DELETE_FAILED

frb-vpc-acceptance 2019-07-20 20:55:40 UTC-0700 CREATE_COMPLETE

frb-vpc-production 2019-07-20 20:55:35 UTC-0700 CREATE_COMPLETE

mh-lab122-nested 2019-06-27 09:33:33 UTC-0700 DELETE_FAILED

mu-pk-vpc-dev 2018-11-12 17:48:24 UTC-0800 DELETE_FAILED

FRB-hackathon-cloud9-demo 2

Stack info Events Resources Outputs Parameters Template Change sets

Outputs (1)

Search outputs

Cloud9Endpoint https://us-west-2.console.aws.amazon.com/cloud9/home/environments/a5600646d2f749f8981df61be6bd6b30?permissions=owner 3 Description Use this URL to access your Cloud9 IDE in a browser Export name -

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Simple Node.JS hello-world Lambda app

<https://github.com/stelligent/frb-hackathon-cloud9-demo>

stelligent/frb-hackathon-x FRB Hackathon Demo - A + us-west-2.console.aws.amazon.com/cloud9/ide/4331443ec3bc447193117a8404eb0f07

AWS Cloud9 File Edit View Go Run Tools Window Support Preview Run

Go to Anything (Ctrl-P)

Welcome

Developer Tools

AWS Cloud9 Welcome screen

AWS Cloud9

Welcome to your development environment

AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can tour the IDE, write code for AWS Lambda and Amazon API Gateway, share your IDE with others in real time, and much more.

AWS Cloud9 for AWS Lambda

AWS Lambda is a compute service that lets you run code without provisioning or managing servers. AWS Lambda executes your code only when needed and scales automatically, from a few requests per day to thousands per second.

Create Lambda Function... Import Lambda Function...

Support

If you have any questions or experience issues, refer to our documentation or reach us to get help.

Documentation Get Help Security Best Practices

Getting started

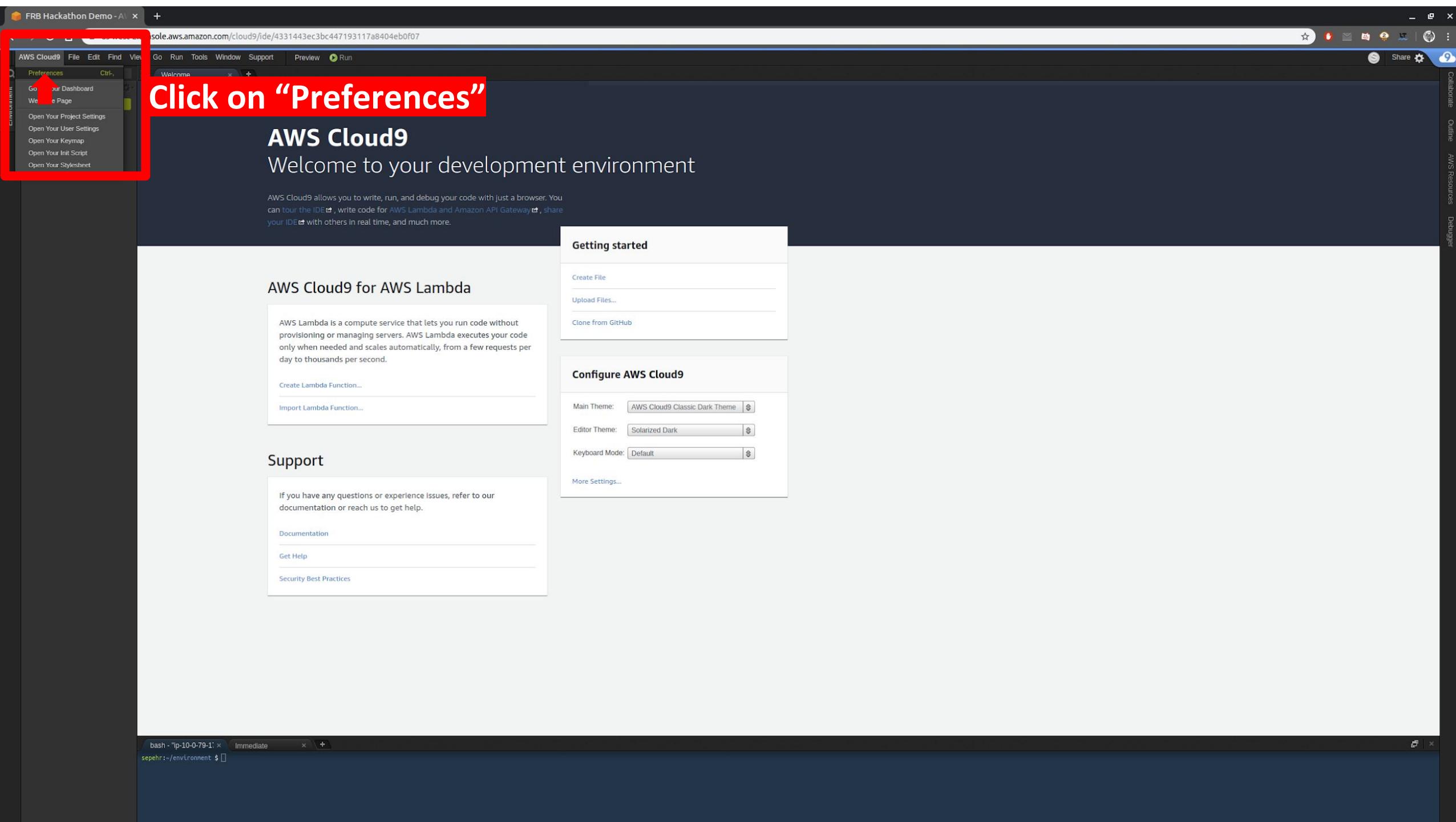
Create File Upload Files... Clone from GitHub

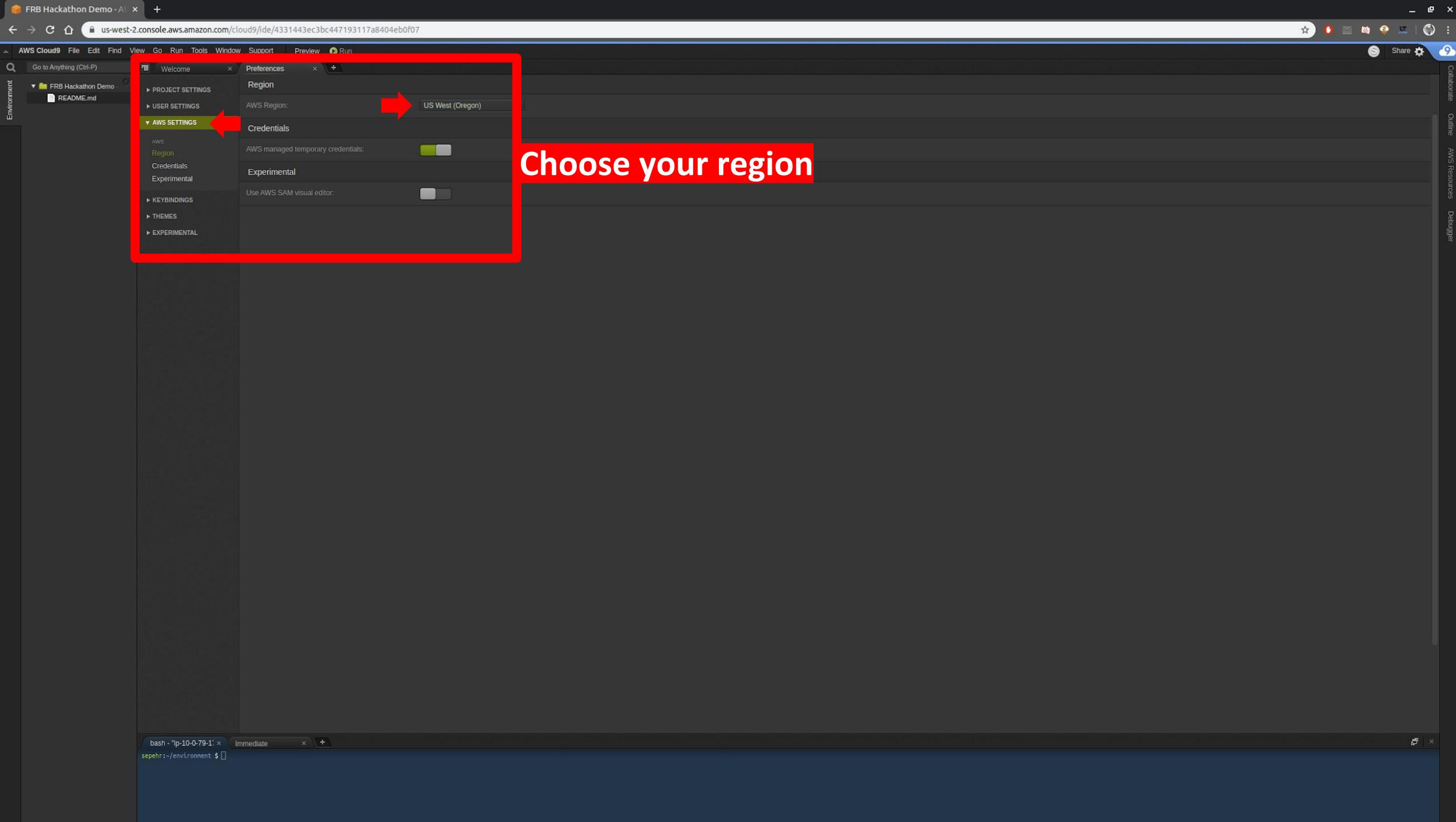
Configure AWS Cloud9

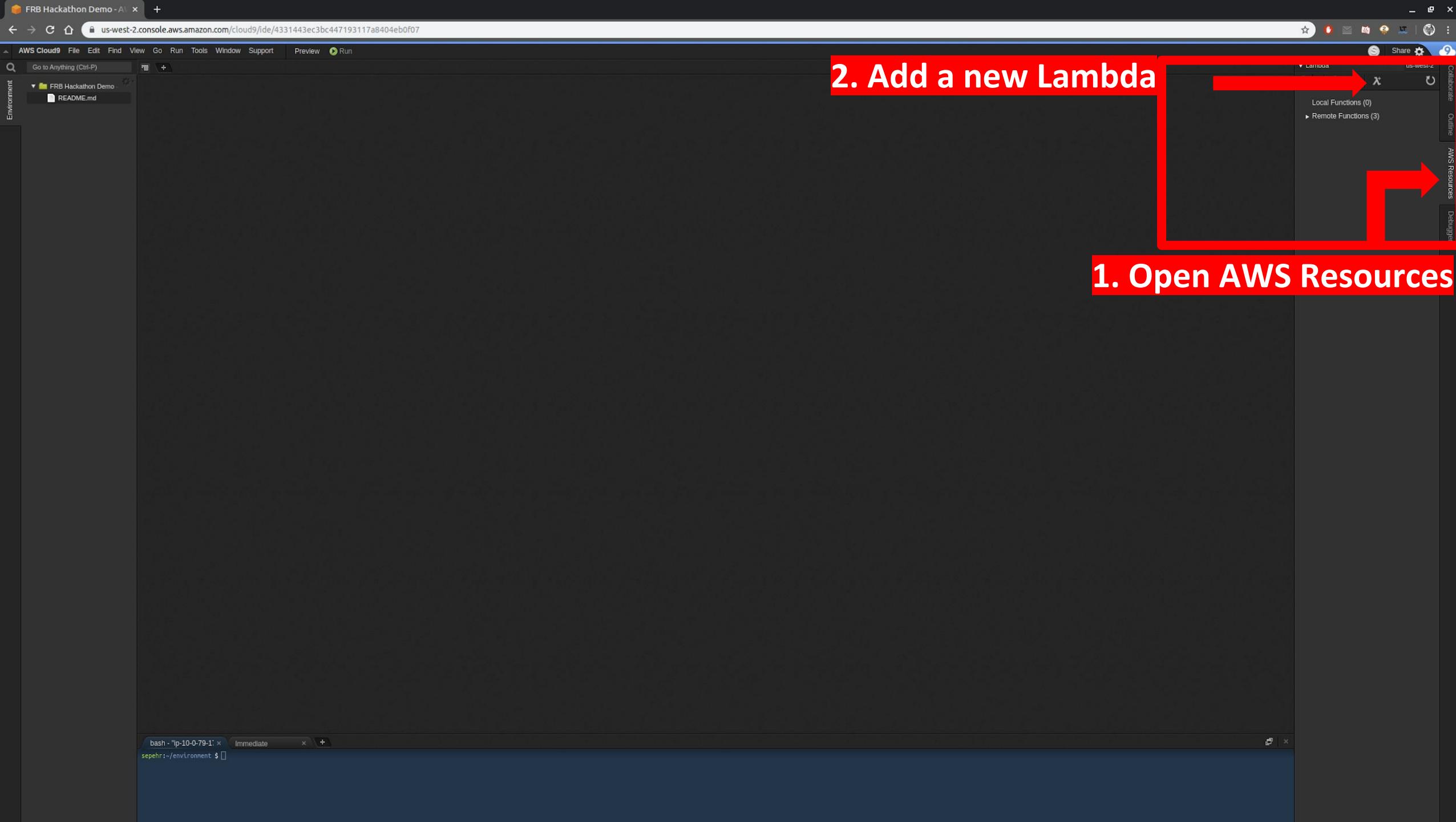
Main Theme: AWS Cloud9 Classic Dark Theme Editor Theme: Solarized Dark Keyboard Mode: Default More Settings...

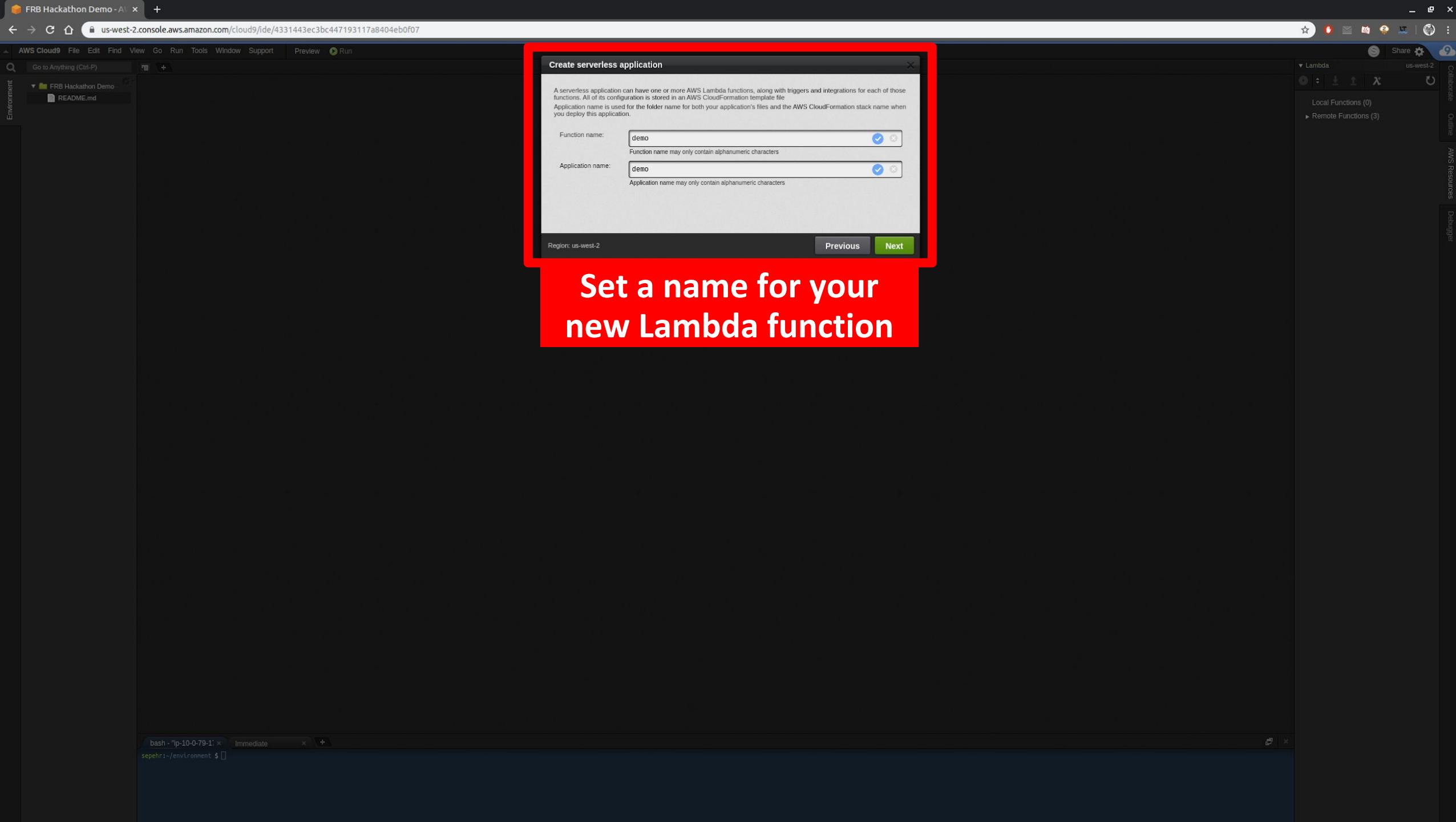
bash - "ip-10-0-79-1" Immediate sepehr:/environment \$

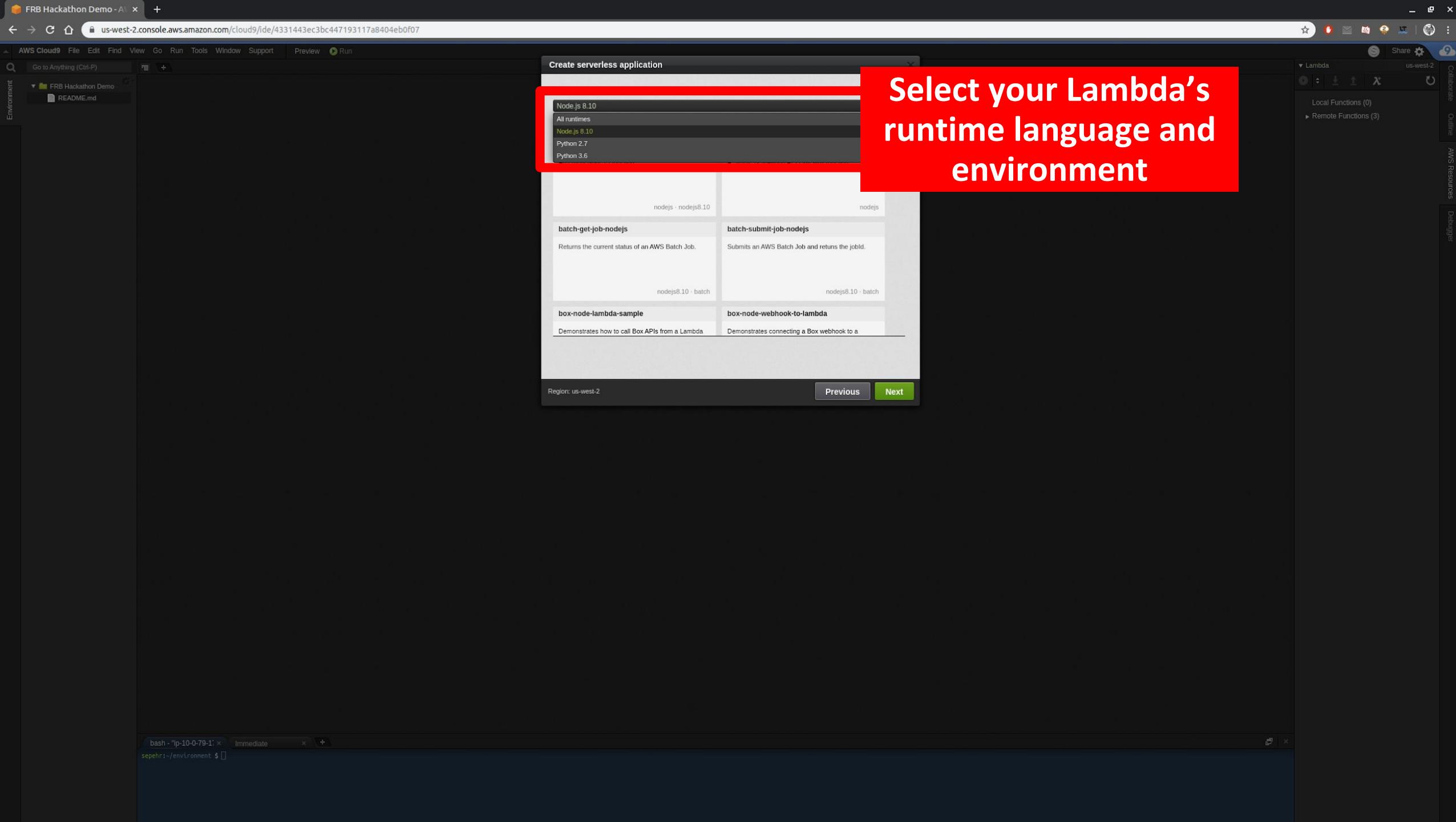
Environment Collaborate Outline AWS Resources Debugger

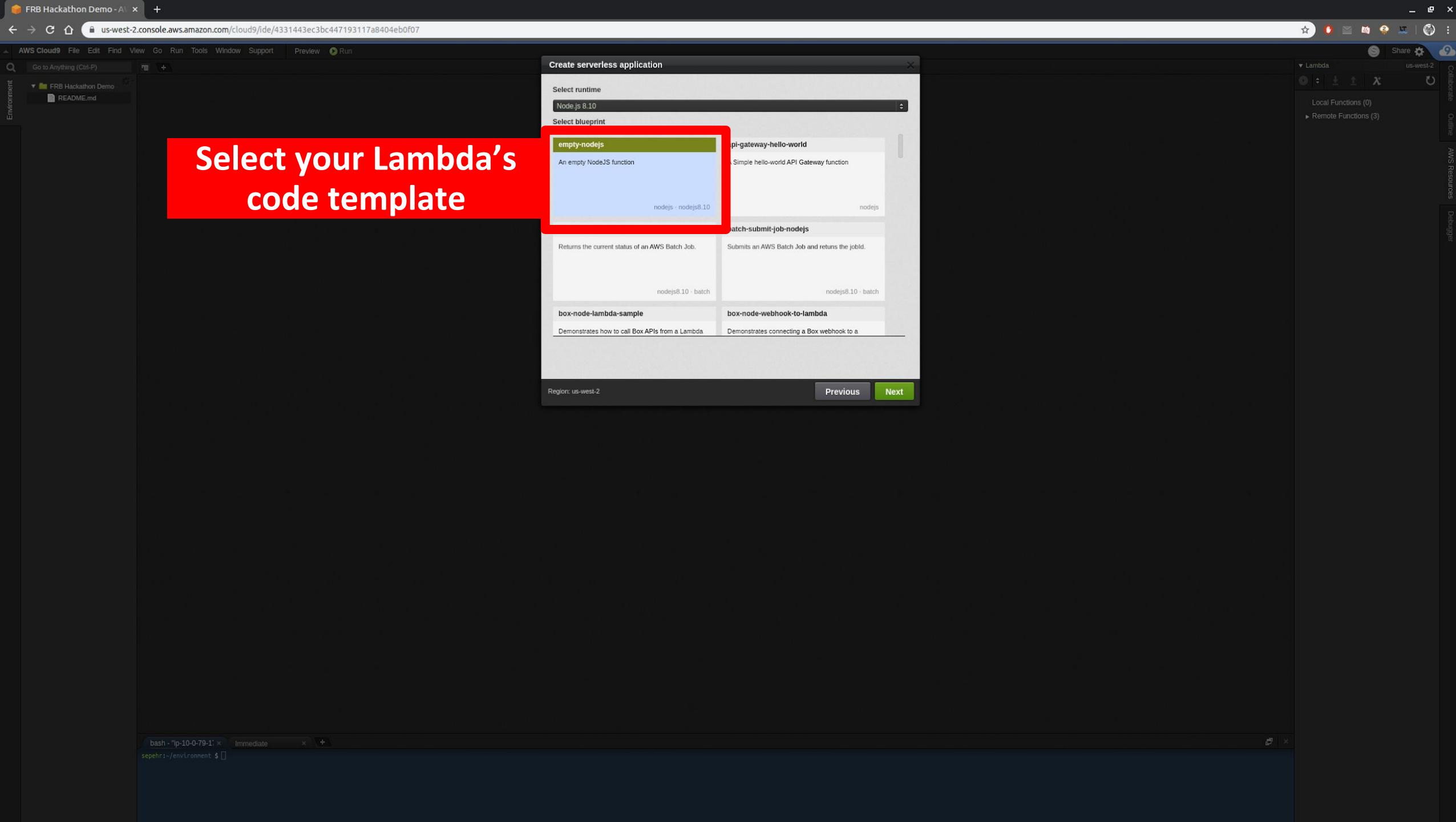


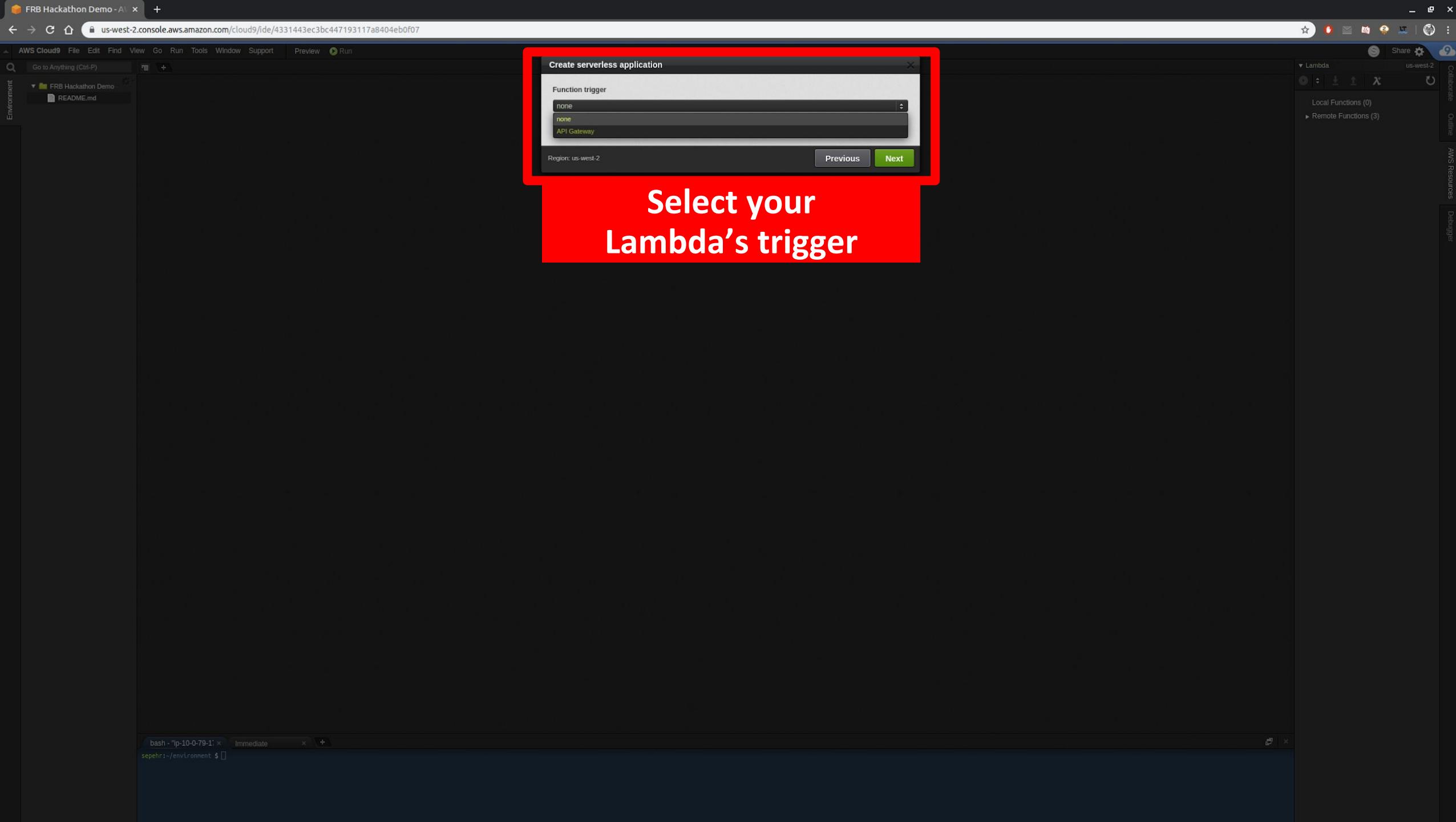




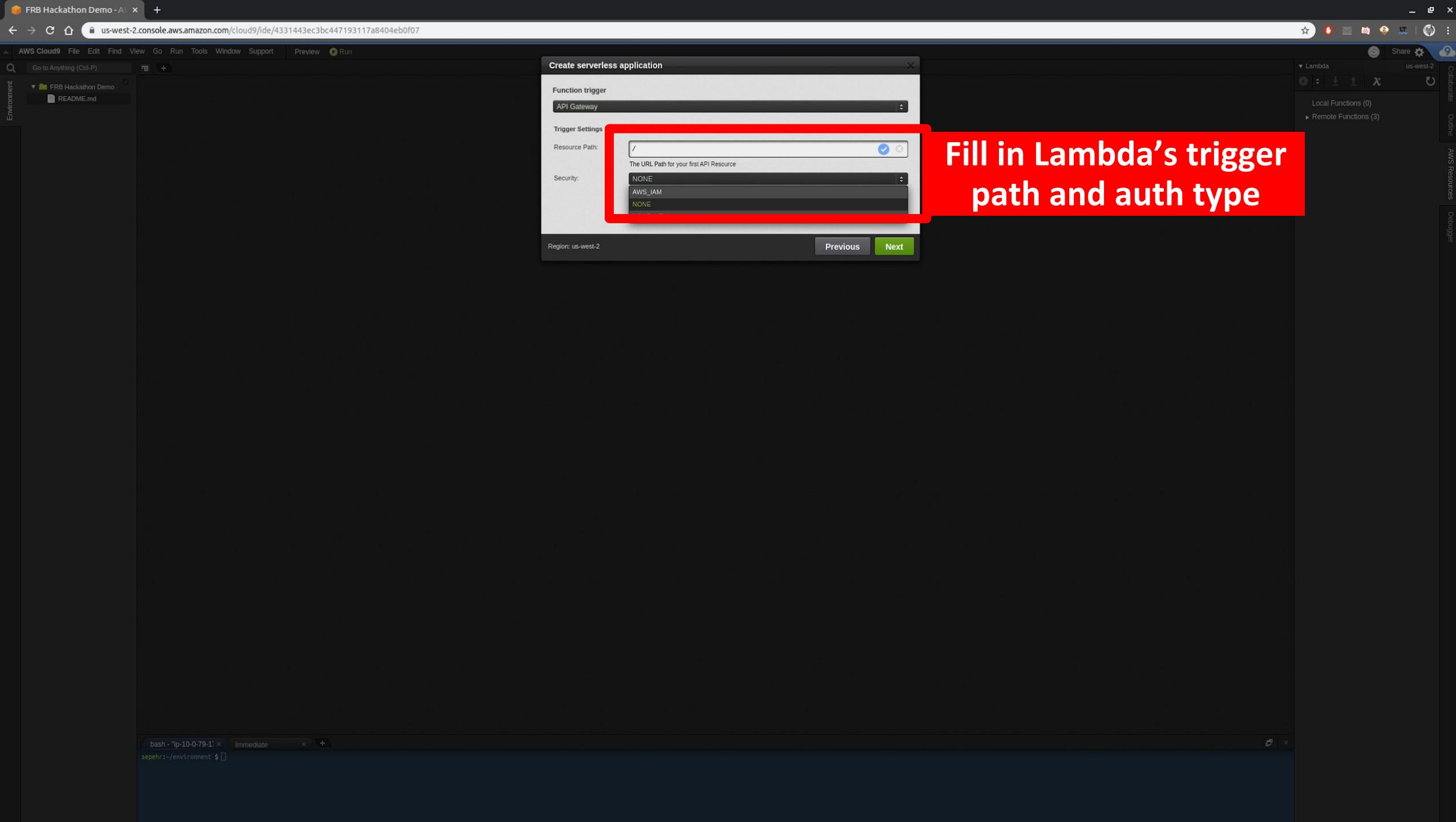


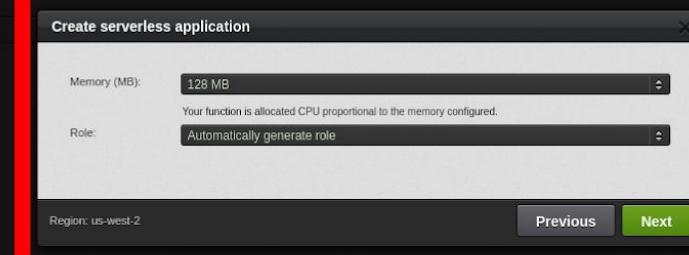
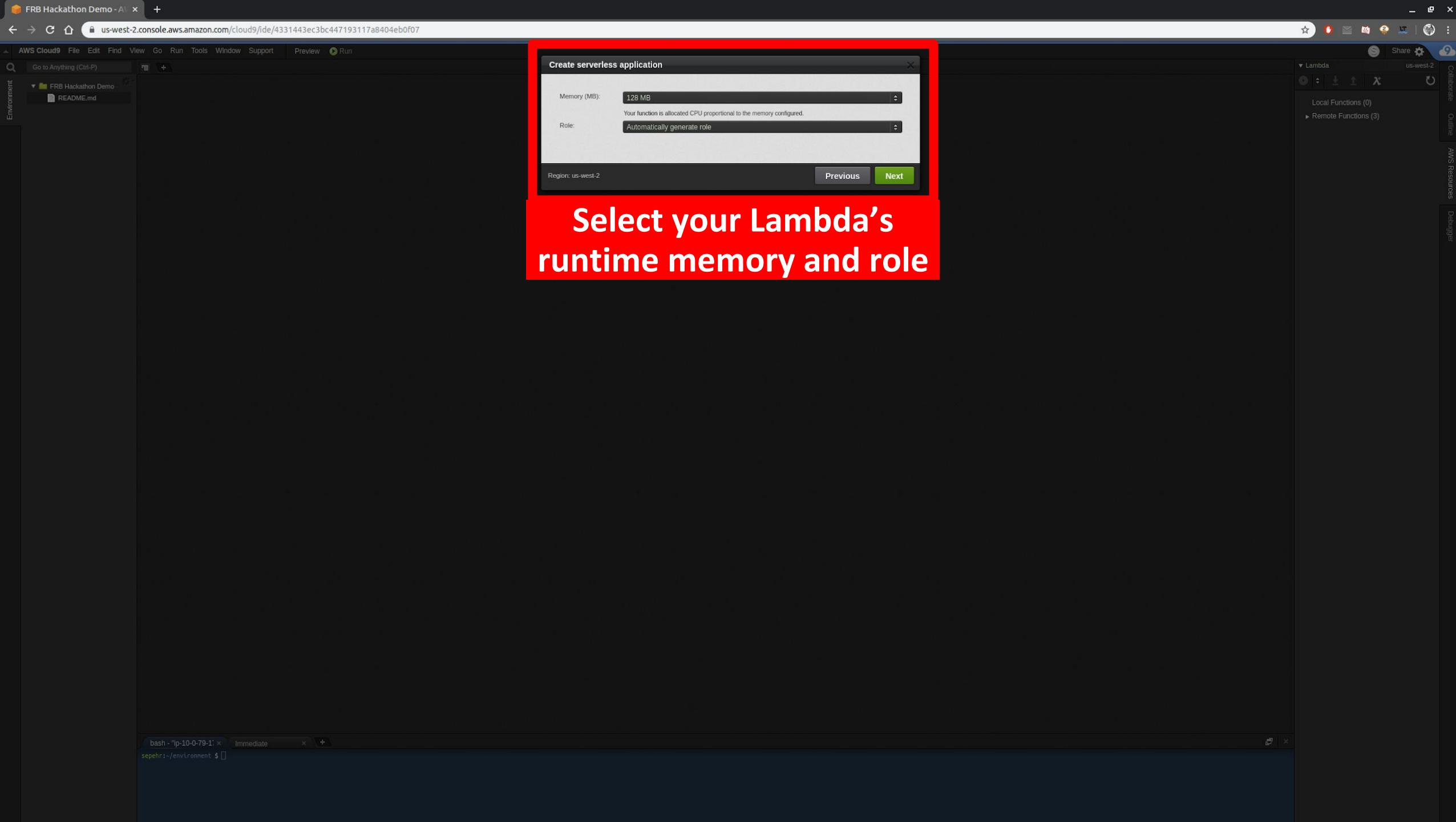




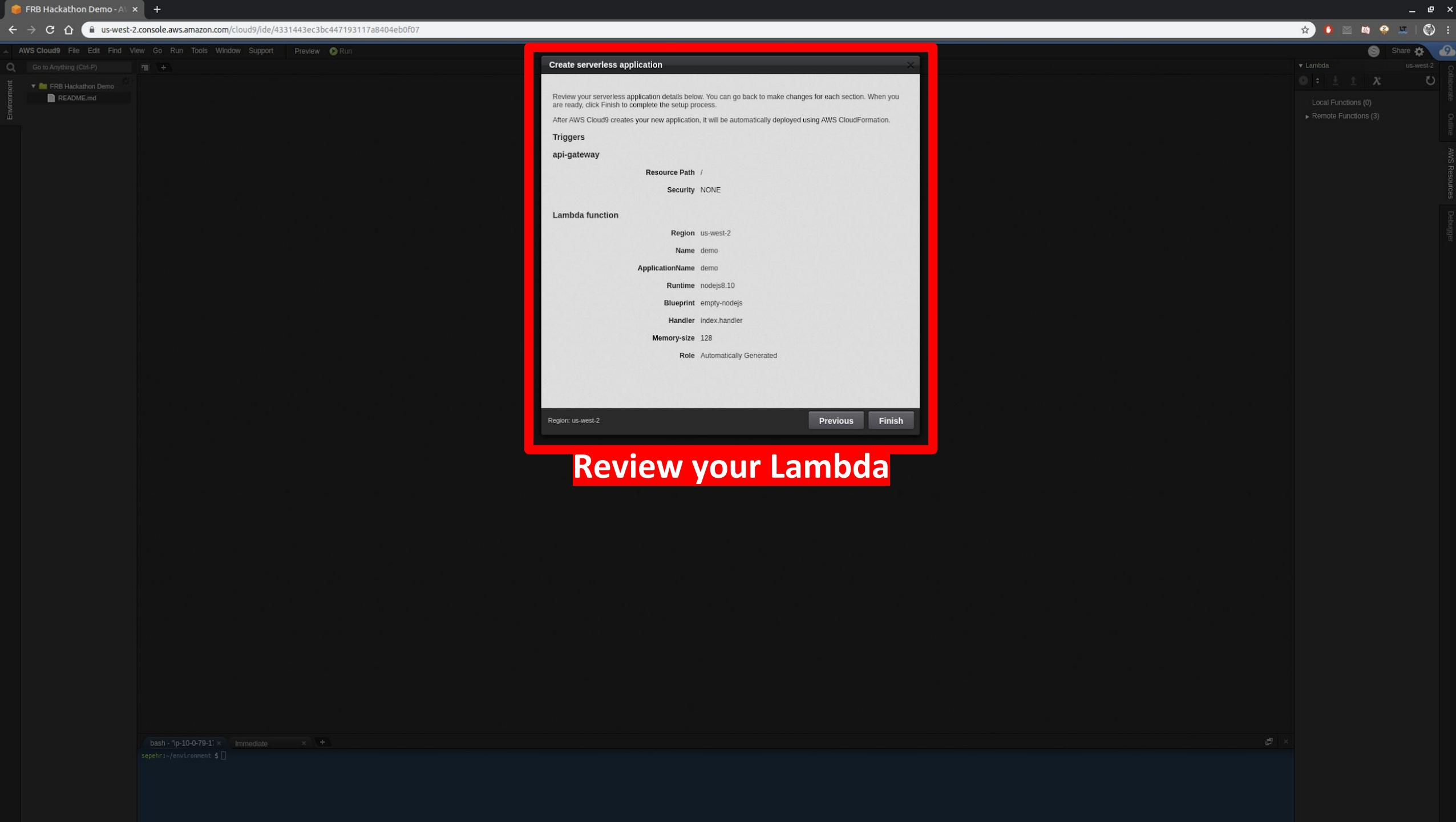


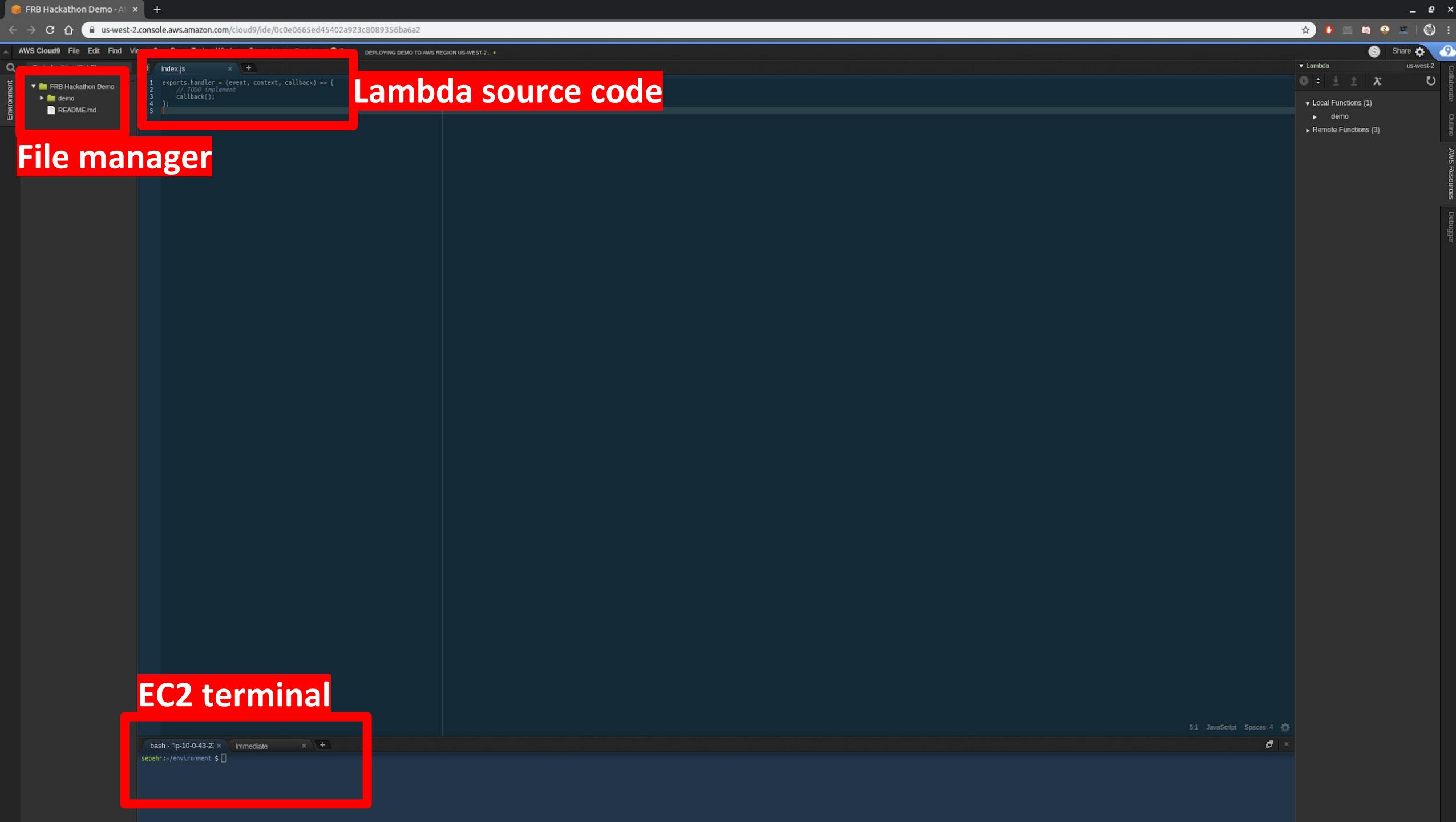
Select your
Lambda's trigger





Select your Lambda's
runtime memory and role





Lambda source code

File manager

EC2 terminal

CloudFormation - Stack F1 FRB Hackathon Demo - A

us-west-2.console.aws.amazon.com/cloud9/ide/a5600646d2f749f8981df61be6bd6b30

AWS Cloud9 File Edit View AWS Cloud9 Go Anything (Ctrl-P) Share Lambda us-west-2 Environment

FRB Hackathon Demo demo README.md

Add some code

```
index.js
1 exports.handler = (event, context, callback) => {
2   callback(null, {
3     statusCode: 200,
4     headers: { 'Content-Type': 'application/json' },
5     body: JSON.stringify({time: +new Date()})
6   });
7 }
8 }
```

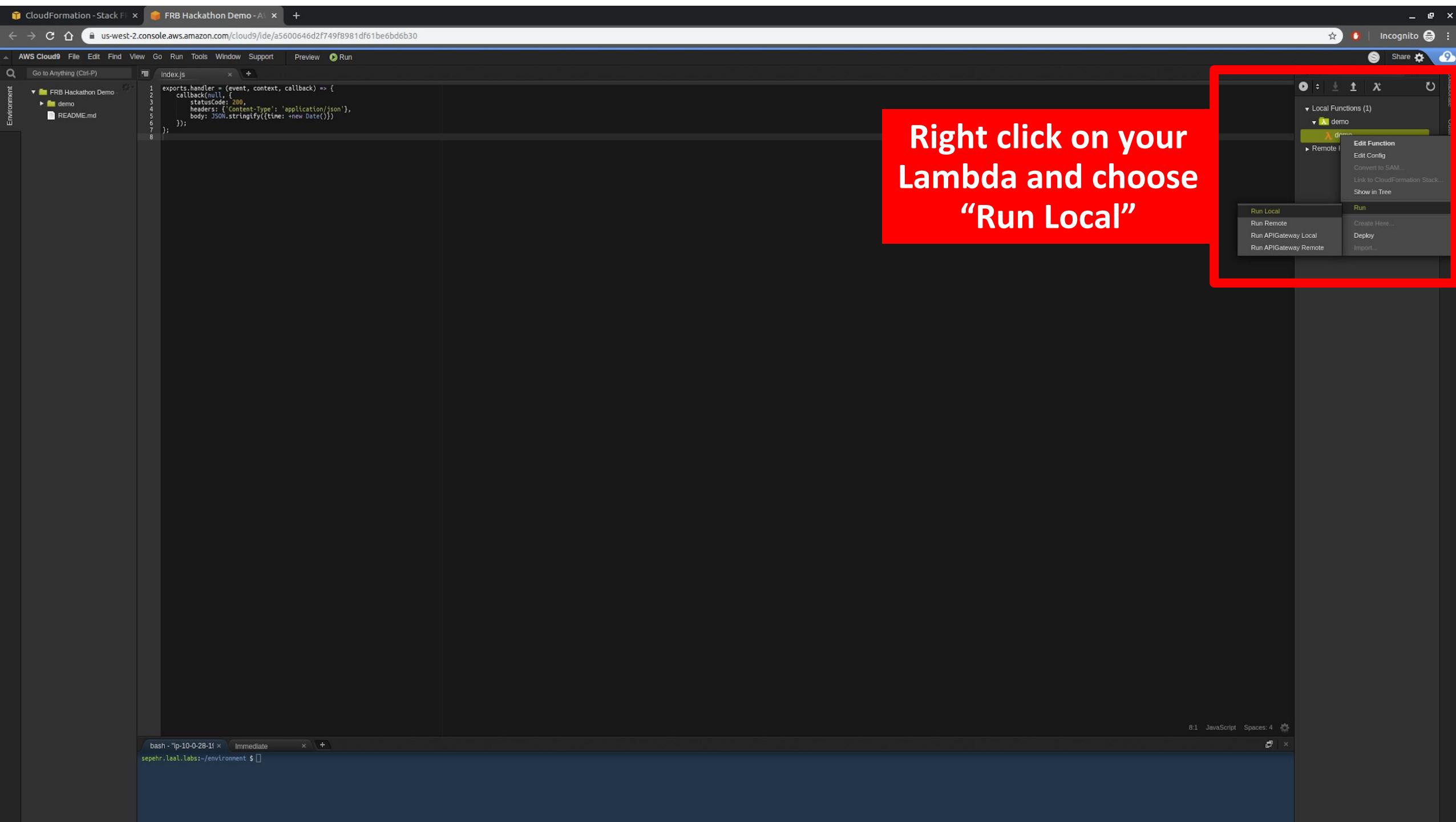
Local Functions (1) demo Remote Functions (1)

aws Resources Debugger

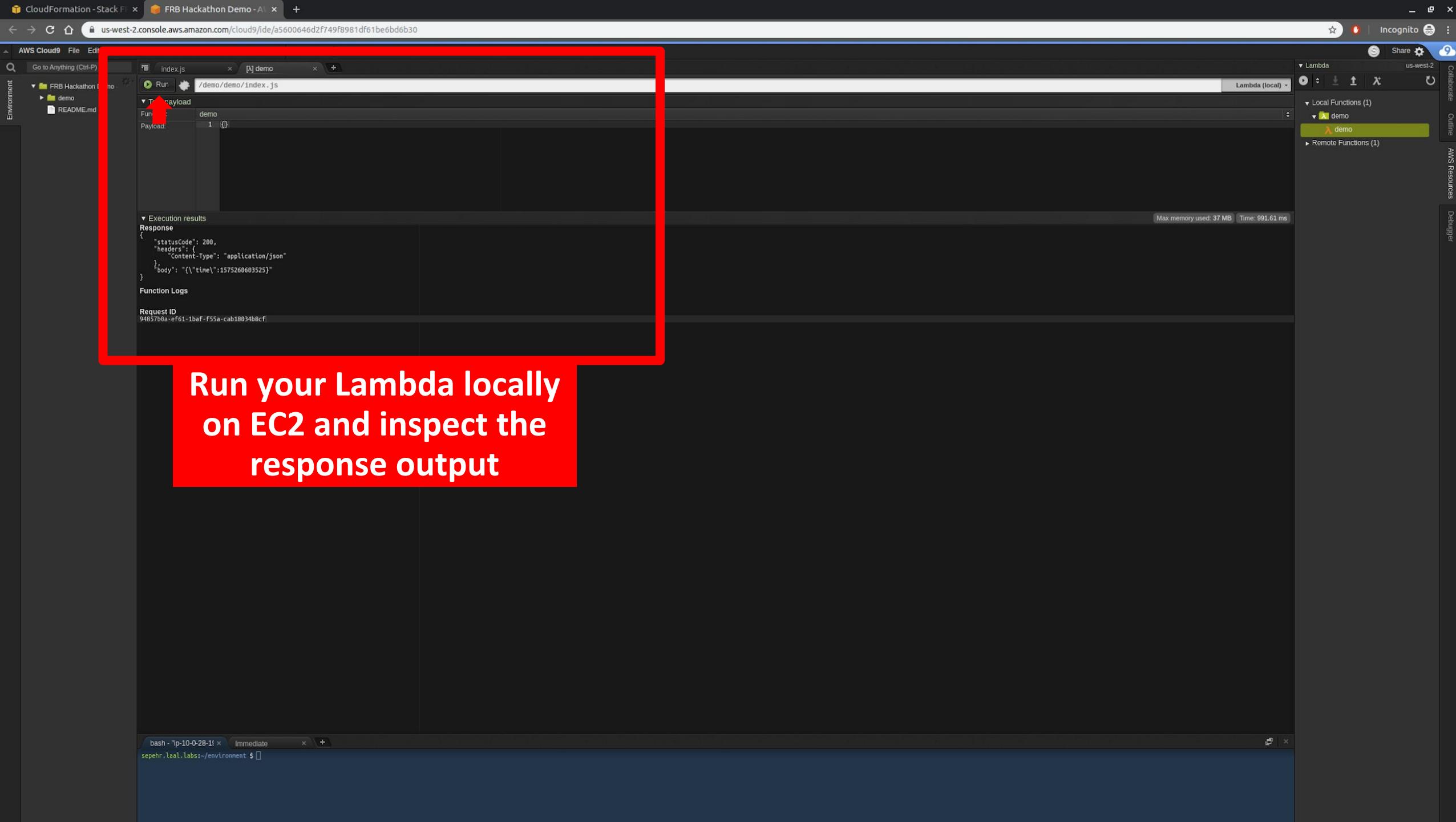
bash - "ip-10-0-28-1" Immediate sepehr.laal.labs:~/environment \$

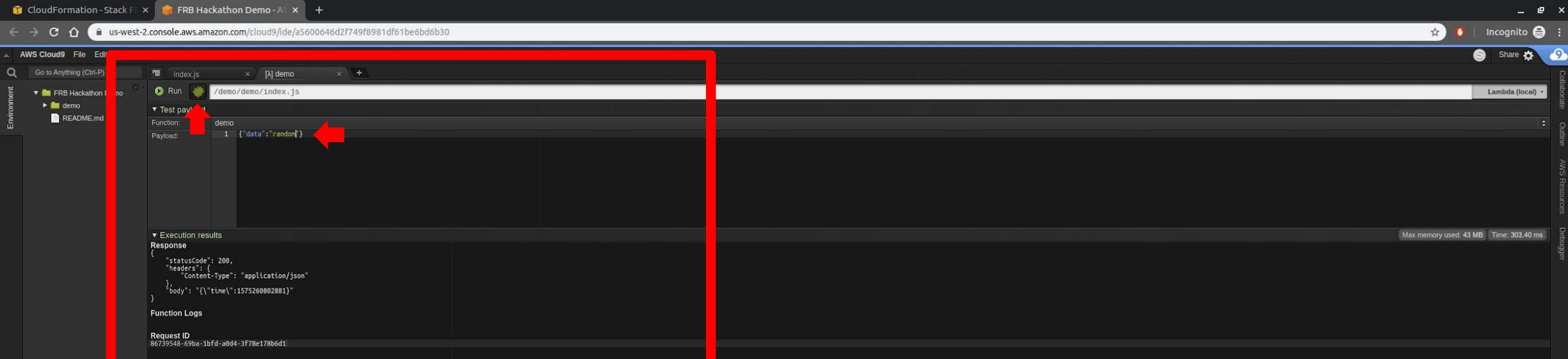
8:1 JavaScript Spaces: 4

The screenshot shows the AWS Cloud9 IDE interface. On the left, there's a file tree with a folder named 'FRB Hackathon Demo' containing 'demo' and 'README.md'. The main workspace is a code editor with a file named 'index.js' open. The code in 'index.js' is a simple Lambda handler that returns a JSON object with the current time. A large red box highlights the code editor area. Overlaid on the code editor is a large red banner with the text 'Add some code' in white. In the bottom left corner, there's a terminal window showing a bash prompt on an AWS instance. The AWS Cloud9 interface also includes a sidebar with Lambda functions and a sidebar for AWS resources.



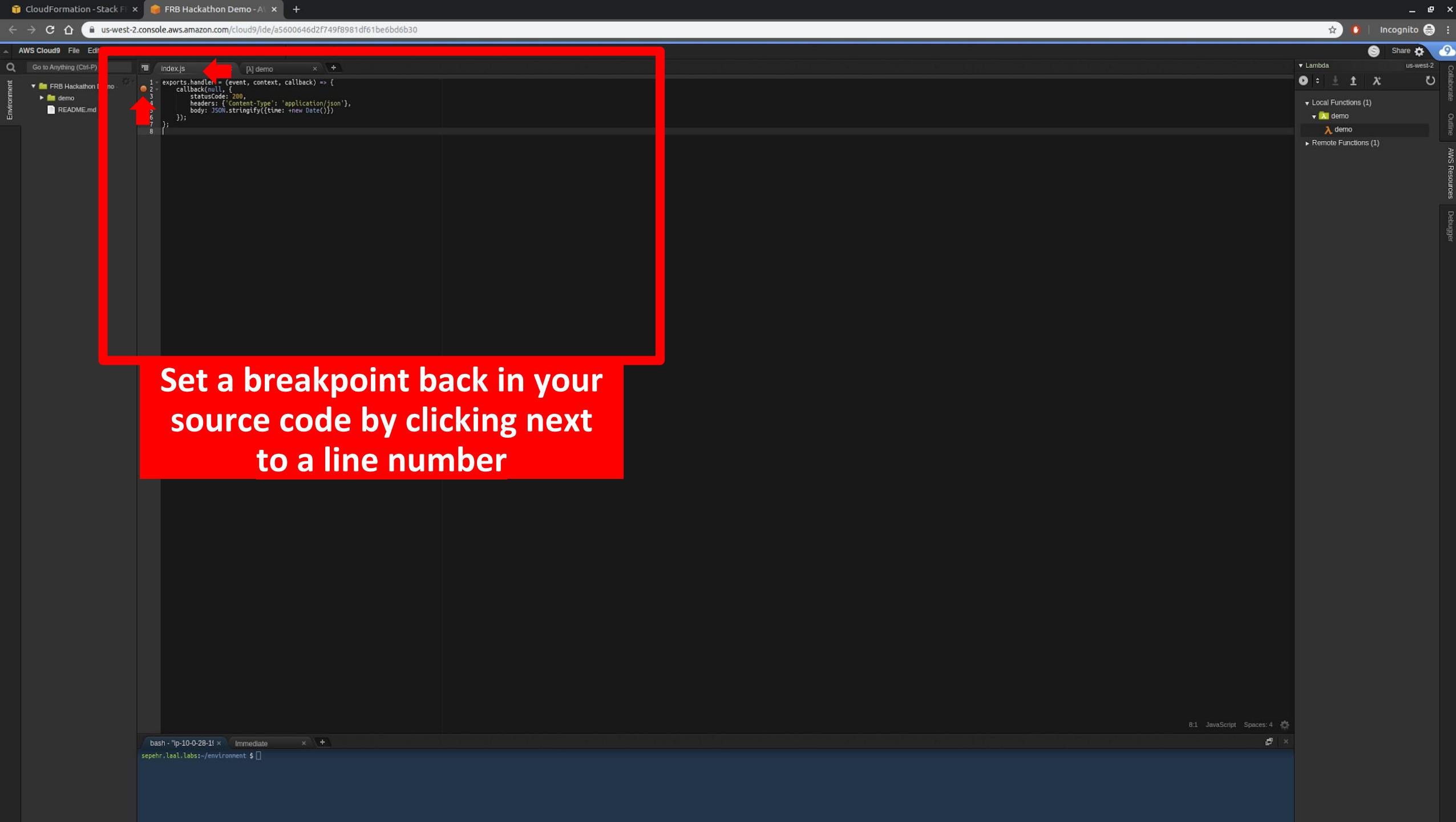
Right click on your
Lambda and choose
“Run Local”





Turn on the debugger,
change the payload

bash - "ip-10-0-28-1" * Immediate * +
sepehr.laal.labs:~/environment \$



CloudFormation - Stack F1 FRB Hackathon Demo - A

us-west-2.console.aws.amazon.com/cloud9/ide/a5600646d2f749f8981df61be6bd6b30

AWS Cloud9 File Edit

Go to Anything (Ctrl-P)

index.js [demo]

```
1+ exports.handler = (event, context, callback) => {
2+   callback(null,
3+     statusCode: 200,
4+     headers: { 'Content-Type': 'application/json' },
5+     body: JSON.stringify({time: +new Date()})
6+   );
7+ };
8|
```

Environment

Lambda us-west-2

Local Functions (1)
demo

Remote Functions (1)
demo

Collaborate Outline AWS Resources Debugger

Set a breakpoint back in your source code by clicking next to a line number

CloudFormation - Stack F1 FRB Hackathon Demo - A + us-west-2.console.aws.amazon.com/cloud9/ide/a5600646d2f749f8981df61be6bd6b30

AWS Cloud9 File Edit Go to Anything (Ctrl-P) AWS Cloud9 Share Environment

FRB Hackathon Demo demo README.md

index.js [demo]

```
1 exports.handler = (event, context, callback) => {
2   // ...
3   callback(null, {
4     statusCode: 200,
5     headers: {
6       'Content-Type': 'application/json'
7     },
8   });
}
```

Watch Expressions Expression Value Type
Type an expression here...

Call Stack Function File
exports.handler demo/demo/index.js ...
invoke var/runtime/node_mo...
start var/runtime/node_mo...
awslambda.waitForInvoke var/runtime/node_mo...
module.exports.waitForInvoke.P var/runtime/node_mo...
emitOne events.js 111:20
emit events.js 208:7
endReadableNT _stream_readable.js ...
_combinedTickCallback internal/process/next_tick...
_tickDomainCallback internal/process/next_tick...

Local Variables Variable Value Type
Scope callback (err, data) => { if (consum... function
Scope context Object object
Scope event Object object
Scope global

Breakpoints index.js:2 checked

bash - "ip-10-0-28-1" Immediate sepehr.laal.labs:~/environment \$

2.5 JavaScript Spaces: 4

Output Immediate

Go back to “Run Local” tab and hit Run. It breaks on your breakpoint and you can inspect the payload

CloudFormation - Stack FRB Hackathon Demo - A

us-west-2.console.aws.amazon.com/cloud9/ide/a5600646d2f749f8981df61be6bd6b30

AWS Cloud9 File Edit View Go Run Tools Window Support Preview Run

Go to Anything (Ctrl-P)

index.js demo Lambda (local)

Environment

FRB Hackathon Demo

demo README.md

Run Test payload

Function: demo

Payload: 1 [{"data": "random"}]

Execution results

Response

```
{ "errorMessage": "2019-12-02T04:28:13.548Z ecdc1368-de34-13c4-3c5c-675f92126cf2 Task timed out after 15.00 seconds" }
```

Max memory used: 43 MB Time: 307.28 ms

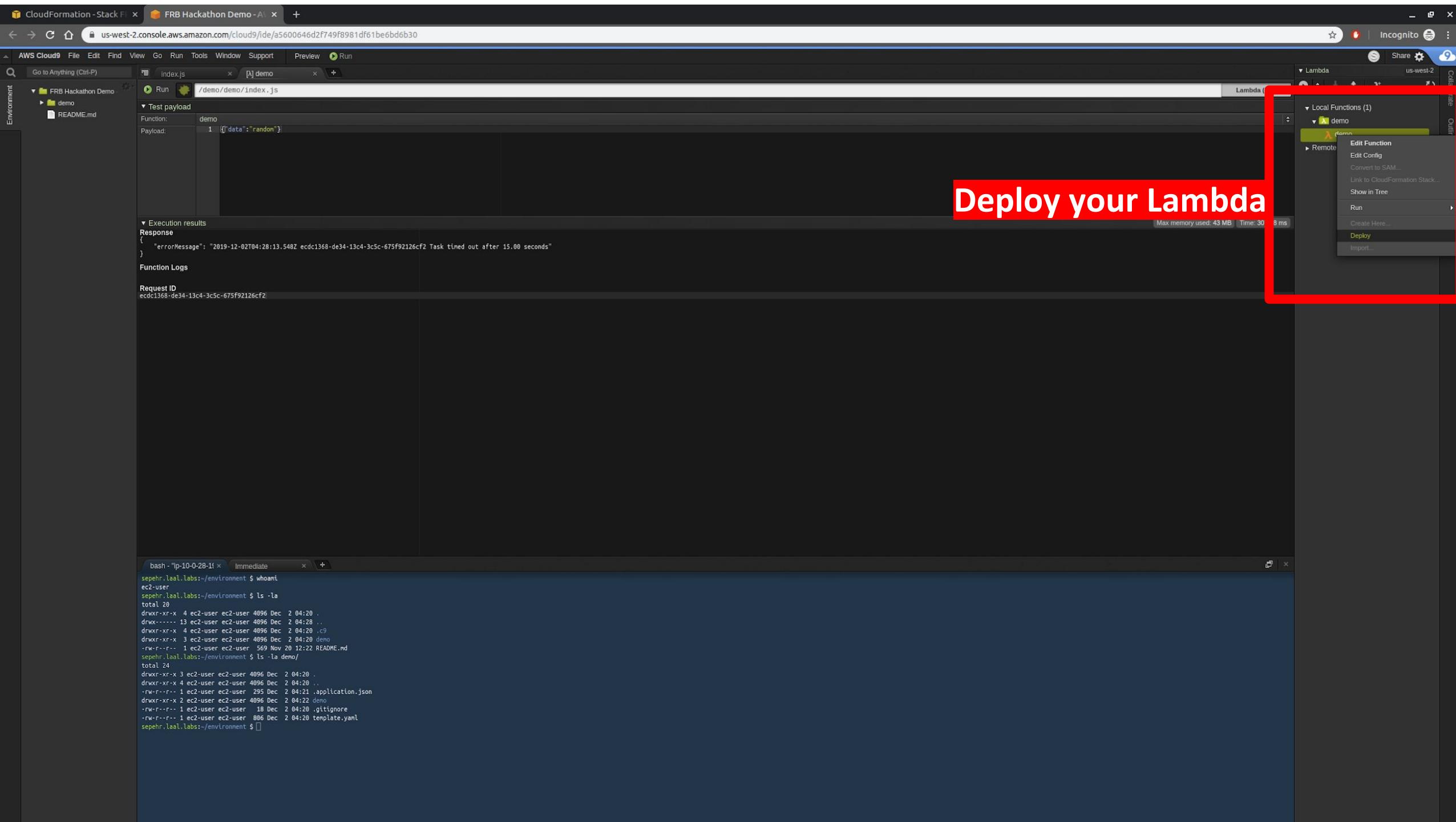
Function Logs

Request ID

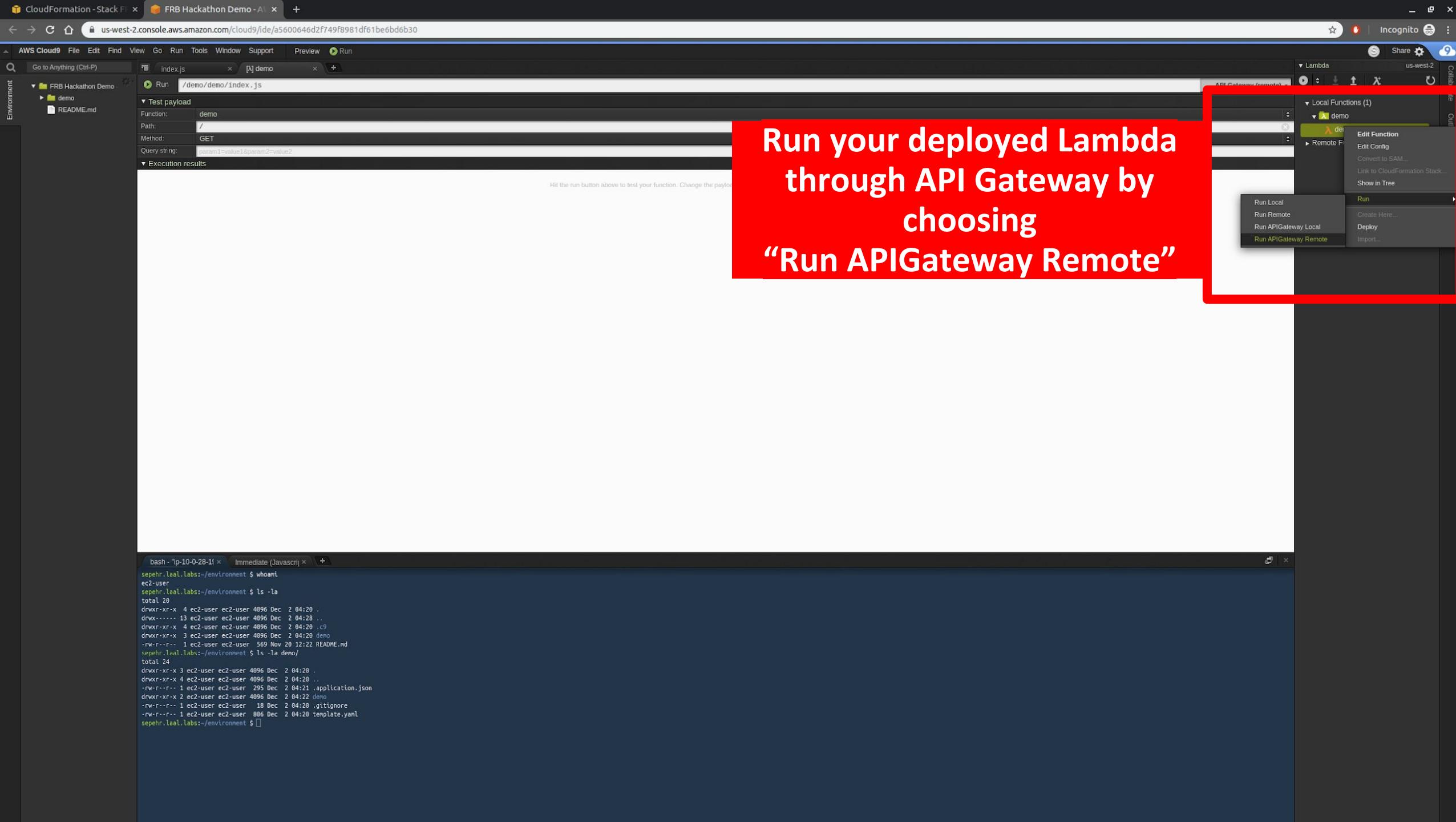
ecdc1368-de34-13c4-3c5c-675f92126cf2

This is a bash terminal in the EC2 instance hosting your Cloud9 IDE. Try some commands!

```
bash-~[p-10-0-28-1] Immediate
sepehr.laal.labs:~/environment $ whoami
ec2-user
sepehr.laal.labs:~/environment $ ls -la
total 20
drwxr-xr-x 4 ec2-user ec2-user 4096 Dec 2 04:20 .
drwxr-xr-x 13 ec2-user ec2-user 4096 Dec 2 04:28 ..
drwxr-xr-x 4 ec2-user ec2-user 4096 Dec 2 04:28 .c9
drwxr-xr-x 3 ec2-user ec2-user 4096 Dec 2 04:28 demo
-rw-r--r-- 1 ec2-user ec2-user 569 Nov 20 12:22 README.md
sepehr.laal.labs:~/environment $ ls -la demo/
total 24
drwxr-xr-x 3 ec2-user ec2-user 4096 Dec 2 04:20 .
drwxr-xr-x 4 ec2-user ec2-user 4096 Dec 2 04:20 ..
-rw-r--r-- 1 ec2-user ec2-user 295 Dec 2 04:21 application.json
drwxr-xr-x 2 ec2-user ec2-user 4096 Dec 2 04:22 demo
-rw-r--r-- 1 ec2-user ec2-user 18 Dec 2 04:28 .gitignore
-rw-r--r-- 1 ec2-user ec2-user 806 Dec 2 04:20 template.yaml
sepehr.laal.labs:~/environment $
```



Deploy your Lambda



Inspect Lambda's result through API Gateway triggers

HTTP Logs
Execution log for request cfdd66db-1502-4311-869d-f0359bb02881
Mon Dec 02 04:34:03 UTC 2019 : Starting execution for request: cfdd66db-1502-4311-869d-f0359bb02881
Mon Dec 02 04:34:03 UTC 2019 : HTTP Method: GET, Resource Path: /
Mon Dec 02 04:34:03 UTC 2019 : Method request path: ()
Mon Dec 02 04:34:03 UTC 2019 : Method request query string: {}
Mon Dec 02 04:34:03 UTC 2019 : Method request headers: {}
Mon Dec 02 04:34:03 UTC 2019 : Method request body after transformations:
Mon Dec 02 04:34:03 UTC 2019 : Endpoint request URL: https://lambda.us-west-2.amazonaws.com/2015-03-31/functions/arn:aws:lambda:us-west-2:324320755747:function:cloud9-demo-demo-TG4H00E0AAJ/invoices
Mon Dec 02 04:34:03 UTC 2019 : Endpoint request headers: {x-amzn-lambda-integration-tag:cfdd66db-1502-4311-869d-f0359bb02881, Authorization:*****}
Mon Dec 02 04:34:03 UTC 2019 : Endpoint request body after transformations: { "resource": "/", "path": "/ ", "httpMethod": "GET", "headers": null, "multiValueHeaders": null, "queryStringParameters": null, "pathParameters": null, "stageVariables": null, "requestContext": { "resourceId": "jyv8t8le12", "resourcePath": "/ ", "httpMethod": "GET", "extendedRequestId": "D9A8B000000000000000000000000000", "identity": { "cognitoIdentityPoolId": null, "accountId": null, "cognitoIdentityId": null, "caller": null, "accessKeyId": null, "cognitoAuthenticationType": null, "sourceIp": "127.0.0.1", "userAgent": "aws-sdk-node/2.610.0 Node/v12.14.1 Linux/6.2.0-10-amazon-x86_64", "user": null }, "apiId": "TG4H00E0AAJ" } }
Mon Dec 02 04:34:03 UTC 2019 : Sending request to https://lambda.us-west-2.amazonaws.com/2015-03-31/functions/arn:aws:lambda:us-west-2:324320755747:function:cloud9-demo-demo-TG4H00E0AAJ/invoices
Mon Dec 02 04:34:04 UTC 2019 : Received response. Status: 200, Integration latency: 227 ms
Mon Dec 02 04:34:04 UTC 2019 : Endpoint response headers: {x-amzn-Trace-Id: Root=1-5de4943b-5b35295b03bbddaae7dc96a, Content-Type:application/json, Content-Length:98, Connection:keep-alive, x-amzn-requestid:e5195e70-ad23-419d-a959-260b057254bd, x-amzn-remapped-content-length:0, X-Amz-Executed-Version:\$LATEST, X-Amzn-Trace-Id=root-1-5de4943b-5b35295b03bbddaae7dc96a;sampled=0}
Mon Dec 02 04:34:04 UTC 2019 : Endpoint response body after transformations: { "time": "1575261244949" }
Mon Dec 02 04:34:04 UTC 2019 : Method response body after transformations: { "time": "1575261244949" }
Mon Dec 02 04:34:04 UTC 2019 : Method response headers: {Content-type:application/json, X-Amzn-Trace-Id:Root=1-5de4943b-5b35295b03bbddaae7dc96a;sampled=0}
Mon Dec 02 04:34:04 UTC 2019 : Successfully completed execution
Mon Dec 02 04:34:04 UTC 2019 : Method completed with status: 200

```
bash -l [0-10-0-28-1] * Immediate (Javascript) +  
sepehr.laal.labs:~/environment $ whoami  
ec2-user  
sepehr.laal.labs:~/environment $ ls -la  
total 20  
drwxr-xr-x 4 ec2-user ec2-user 4096 Dec 2 04:20 .  
drwxr-xr-x 13 ec2-user ec2-user 4096 Dec 2 04:28 ..  
drwxr-xr-x 4 ec2-user ec2-user 4096 Dec 2 04:28 .c9  
drwxr-xr-x 3 ec2-user ec2-user 4096 Dec 2 04:20 demo  
rwxr--r-- 1 ec2-user ec2-user 569 Nov 29 2012 README.md  
sepehr.laal.labs:~/environment $ ls -la demo/  
total 24  
drwxr-xr-x 3 ec2-user ec2-user 4096 Dec 2 04:28 .  
drwxr-xr-x 4 ec2-user ec2-user 4096 Dec 2 04:28 ..  
rwxr--r-- 1 ec2-user ec2-user 295 Dec 2 04:21 application.json  
drwxr-xr-x 2 ec2-user ec2-user 4096 Dec 2 04:22 demo  
rwxr--r-- 1 ec2-user ec2-user 18 Dec 2 04:20 .gitignore  
rwxr--r-- 1 ec2-user ec2-user 806 Dec 2 04:20 template.yaml  
sepehr.laal.labs:~/environment $
```

CloudFormation - Stack F | FRB Hackathon Demo - A | API Gateway

us-west-2.console.aws.amazon.com/apigateway/main/apis?region=us-west-2

AWS Services Resource Groups Incognito

Amazon API Gateway APIs Show all hints ?

APIs Custom domain names

APIs (1)

Find APIs

Name Description ID Protocol Endpoint type Created

cloud9-demo ni6aqj5wwg REST Edge 2019-12-02



Head over to the APIGateway
console and choose your
deployed API

CloudFormation - Stack F1 | FRB Hackathon Demo - A1 | API Gateway

us-west-2.console.aws.amazon.com/apigateway/home?region=us-west-2#/apis/ni6aqj5wwg/stages/Prod

AWS Services Resource Groups

Amazon API Gateway APIs > cloud9-demo (ni6aqj5wwg) > Stages > Prod

Stages Create Prod Stage Editor

Custom Domain Names

API: cloud9-demo

Resources Stages Authorizers Gateway Responses Models Resource Policy Documentation Dashboard Settings Usage Plans API Keys Client Certificates VPC Links Settings

Prod Stage Editor

Invoke URL: https://ni6aqj5wwg.execute-api.us-west-2.amazonaws.com/Prod

Settings Logs/Tracing Stage Variables SDK Generation Export Deployment History Documentation History Canary

Cache Settings

Enable API cache

Default Method Throttling

Choose the default throttling level for the methods in this stage. Each method in this stage will respect these rate and burst settings. Your current account level throttling rate is 10000 requests per second with a burst of 5000 requests. [Read more about API Gateway throttling](#)

Enable throttling Rate 10000 requests per second

Burst 5000 requests

Web Application Firewall (WAF) [Learn more.](#)

Select the Web ACL to be applied to this stage.

Web ACL None [Create Web ACL](#)

Client Certificate

Select the client certificate that API Gateway will use to call your integration endpoints in this stage.

Certificate None

Save Changes

Grab the "Prod" stage's Invoke URL



**Test the “Prod” stage’s
Invoke URL in your browser,
you should see your
Lambda’s output**

Summary and Q&A

<https://github.com/stelligent/frb-hackathon-cloud9-demo>

Follow-up contact:

Sepehr Laal <sepehr.laal@stelligent.com>
Trevor Millner <trevor.millner@stelligent.com>
Murtuza Bohri <murtuza.bohri@mphasis.com>

THANK YOU

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About Stelligent

Stelligent provides DevOps automation professional services on AWS, enabling engineering teams to focus on creating software users love. Our goal is to work closely with customers to develop fundamentally secure infrastructure automation code, deployment pipelines, and feedback mechanisms for faster, more consistent software and infrastructure deployments. For more information, please visit: [www.Stelligent.com](#)

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The Next Applied