



Code Camp

Lab 4 - Serverless Platforms

Jason Barbee
Solutions Architect
CCIE #18039

Agenda

1. Sign up for Hook.io
2. Build a simple Hook.io endpoint
 1. This task will send an API call to a Spark Room
3. AWS
 1. Sign up for AWS
 2. Install our example API
 3. Test POST
 4. Test GET
 5. Remove the API

Simple Microservices @ Hook.io

Create a Hook.io Account


Make a function as a service process to call our Spark Logger.


Sign up for an account at Hook.io

Hook.io will give you a very simple click to start web hook service.

Add a new service at Hook.io

Click Create MicroService at the top navigation bar. - Call it **sparklogger**



Type Keyword To Jump To Section...

Deployments: **84,565,700**

MICROSERVICESINSIGHTDATABASESFILE STORAGEROLE BASED ACCESS CONTROLDEVELOPER APICONTACT US

Create New Microservice

Basic Information

Name

Will be part of the url to access the Service. Cannot contain non-url safe characters.

Public Service ☒ Private Service ☐

Public services and their source codes will be accessible to anyone. Private services are protected through API Access Keys.

Notice: In order to enable private services, you must upgrade to a [paid account](#).

Save and Continue

Copy Spark Logging Code

Copy `sparklogger.js` (in the Lab 4 Serverless Folder)

Paste/Save the content into a new hook at Hook.io called "sparklogger")

Your Hook.io URL will be like this

`https://hook.io/yourUserName/sparklogger`

It requires these parameters

- `bottoken` - your authentication bot/person tokens
- `roomid` - the roomID in Spark that you want to post into.
- `message` - the content you want to post

Spark Logger Code

```
module['exports'] = function simpleHttpRequest (hook) {
  // npm modules available, see: http://hook.io/modules
  var request = require('request');
  var botToken= hook.params.bottoken;
  var roomId= hook.params.roomid;
  var text= hook.params.message;
  var body={"roomId": roomId , "text": text};
  var postReq = {
    url: "https://api.ciscospark.com/v1/messages",
    method: "POST",
    headers: {
      'Accepts': 'application/json',
      'Content-type': 'application/json',
      'Authorization': "Bearer " + botToken
    },
    json: body,
  };

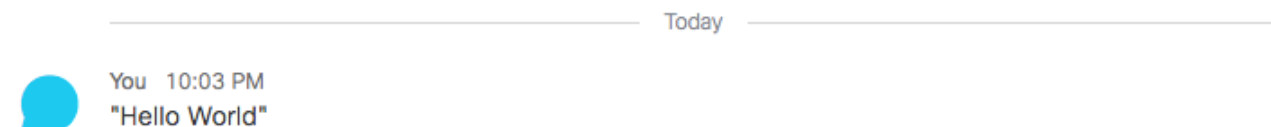
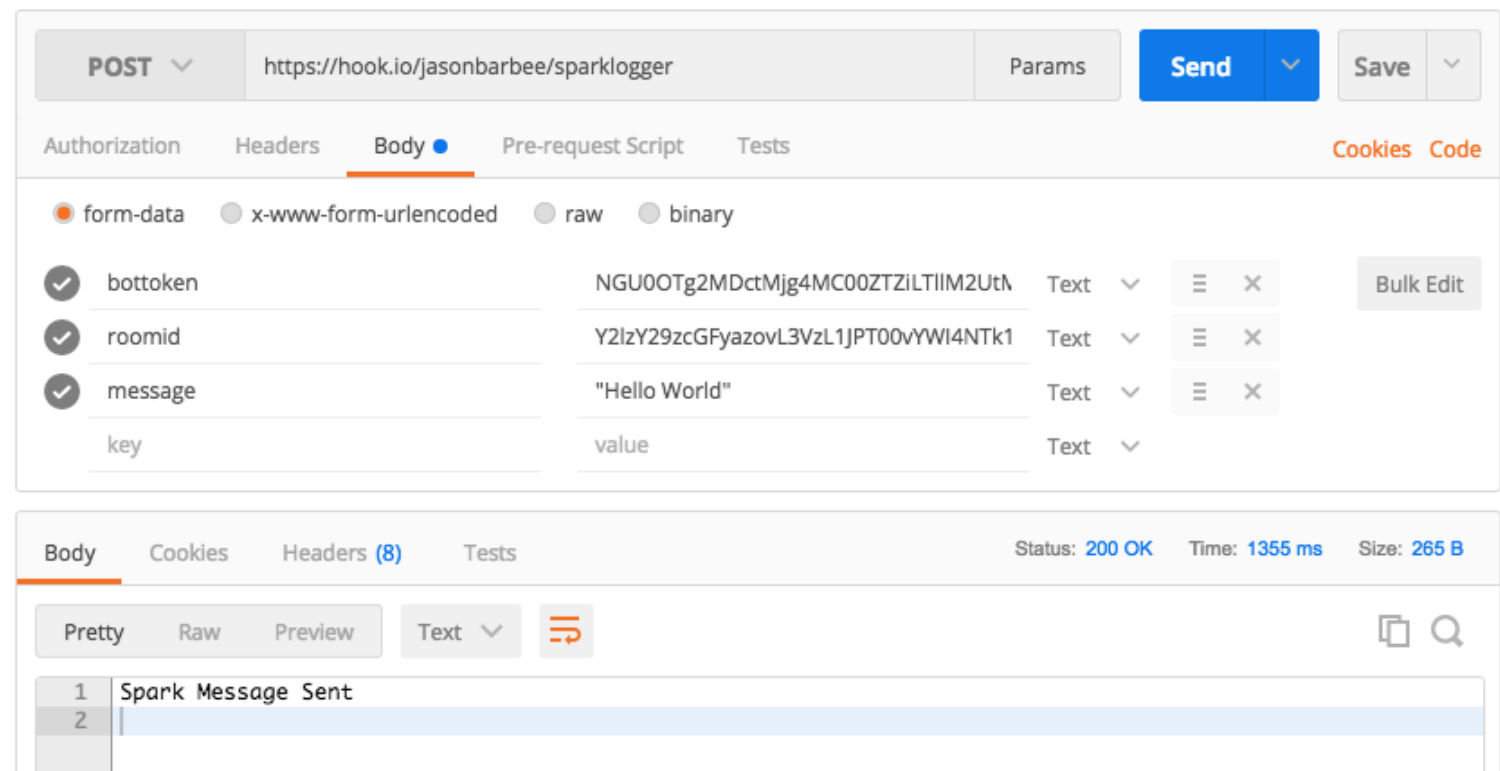
  request.post(postReq,function(err, res, body){

    if (err) {
      console.log("Error", err.message);
      return hook.res.end(err.message);
    }
    //Check for right status code
    if(res.statusCode !== 200){
      console.log('Invalid Status Code Returned:', res.statusCode);
      return hook.res.end("Spark API Error " + res.statusCode);
    }

    //All is good. Print the body
    return hook.res.end("Spark Message Sent");
  });
};
```

Test it in Postman

Now if you call your URL
`https://hook.io/jasonbarbee/sparklogger`
with parameters `bottoken`, `roomid`, `message`
it should post our message...



Making a useful API

Let's make an API that creates, updates, deletes a router inventory.

We will use AWS API Gateway, AWS DynamoDB, AWS Simple Notification Services (SNS) and AWS Lambda.

And some Serverless Framework Magic.

Setup an account for Serverless to use your AWS

Create or login to your Amazon Web Services Account and go to the Identity & Access Management (IAM) page.

Click on Users and then Create New Users. Enter a name in the first field to remind you this User is the Framework, like serverless-admin. Then click Create. Later, you can create different IAM Users for different apps and different stages of those apps. That is, if you don't use separate AWS accounts for stages/apps, which is most common.

View and copy the API Key & Secret to a temporary place. You'll need it in the next step.

In the User record in the AWS IAM Dashboard, look for Managed Policies on the Permissions tab and click Attach Policy.

In the next screen, search for and select AdministratorAccess then click Attach.

Vagrant Check

This lab is designed to be run inside the Vagrant profile provided in the Code Camp Repo.

Make sure you have

CD to the vagrant-code-camp folder and run

"vagrant ssh" to access the Vagrant VM.

This Lab 4 is designed to run inside the Serverless Folder within the Vagrant Folder.

Give Serverless AWS Access

Replace the keys below with your own.

```
serverless config credentials --provider aws --key myawesomekey --secret myawesomesecret
```

Let's deploy our prebuilt API

Change Directory to Serverless example

Code Camp Repo / Vagrant/Serverless

This next step will load the dependency packages to the folder. If you don't do this step it will fail.

```
npm install
```

```
serverless deploy
```

Deployed!

This also shows you your REST endpoint URLs!

```
Serverless: Stack update finished...
Service Information
service: serverless-rest-api-with-dynamodb
stage: dev
region: us-east-1
api keys:
  None
endpoints:
  POST - https://3snrpqj7tj.execute-api.us-east-1.amazonaws.com/dev/routers
  GET - https://3snrpqj7tj.execute-api.us-east-1.amazonaws.com/dev/routers
  GET - https://3snrpqj7tj.execute-api.us-east-1.amazonaws.com/dev/routers/{id}
  PUT - https://3snrpqj7tj.execute-api.us-east-1.amazonaws.com/dev/routers/{id}
  DELETE - https://3snrpqj7tj.execute-api.us-east-1.amazonaws.com/dev/routers/{id}
functions:
  serverless-rest-api-with-dynamodb-dev-update: arn:aws:lambda:us-east-1:062829191412:
function:serverless-rest-api-with-dynamodb-dev-update
  serverless-rest-api-with-dynamodb-dev-get: arn:aws:lambda:us-east-1:062829191412:fun
ction:serverless-rest-api-with-dynamodb-dev-get
```

Open the API in your AWS Console

Make sure to choose "N. Virginia" on the top right of AWS console!

Select Amazon API Gateway service.

You should see our new service

"dev-serverless-rest-api-with-dynamodb"

API Gateway Screenshot

The screenshot displays the Amazon API Gateway console interface. At the top, a dark navigation bar includes the AWS logo, 'Services' and 'Resource Groups' dropdown menus, a search icon, a notification bell, and user information for 'Jason Barbee - TekLinks' in 'N. Virginia' with a 'Support' link. Below this, a light gray breadcrumb bar shows 'Amazon API Gateway' and 'APIs', with a 'Show all hints' link and a help icon. The main content area features a left-hand sidebar with a list of resources: 'APIs' (highlighted with an orange bar), 'dev-serverless-rest-api-with-...', 'Usage Plans', 'API Keys', 'Custom Domain Names', 'Client Certificates', and 'Settings'. The 'APIs' section is expanded, showing a list of APIs. The first API, 'dev-serverless-rest-api-with-dynamodb', is selected and highlighted. To the right of this list is a 'Create API' button. The details for the selected API are shown in a box, indicating 'No description.'.

API Methods

The screenshot displays the Amazon API Gateway console interface. At the top, there is a navigation bar with 'Services' and 'Resource Groups' dropdown menus, and a search icon. Below this, a breadcrumb trail shows the path: 'Amazon API Gateway' > 'APIs' > 'dev-serverless-rest-api-with-dynamodb (3snrpqj7tj)' > 'Resource'. The main content area is divided into three panels. The left panel, titled 'APIs', contains a list of navigation items: 'Resources' (highlighted with an orange bar), 'Stages', 'Authorizers', 'Models', 'Documentation', 'Binary Support', 'Dashboard', 'Usage Plans' (with a blue dot), 'API Keys', 'Custom Domain Names', 'Client Certificates', and 'Settings'. The middle panel, titled 'Resources', shows a tree view of resources. The root resource '/' is expanded, revealing two sub-resources: '/routers' and '/{id}'. The '/routers' resource is further expanded, showing its methods: 'GET', 'OPTIONS', and 'POST' (highlighted in green). The '/{id}' resource is also expanded, showing its methods: 'DELETE' (highlighted in red), 'GET', 'OPTIONS', and 'PUT'. The right panel, titled 'Methods', is currently empty, indicating that the specific method details are not yet defined.

Test our API

Click GET and click "TEST"

Amazon API Gateway

APIs > dev-serverless-rest-api-with-dynamodb (3snrpqj7tj) > Resources > /routers (98o8db) > GET

Show all hints ?

APIs

- dev-serverless-rest-api-with-...
- Resources
- Stages
- Authorizers
- Models
- Documentation
- Binary Support
- Dashboard

Usage Plans ●

API Keys

Custom Domain Names

Client Certificates

Settings

Resources

- /
- /routers
 - GET
 - OPTIONS
 - POST
- /id
 - DELETE
 - GET
 - OPTIONS
 - PUT

/routers - GET - Method Execution

Client

TEST

Test

Method Request

Auth: NONE

ARN: arn:aws:execute-api:us-east-1:062829191412:3snrpqj7tj/*/GET/routers

Integration Request

Type: LAMBDA_PROXY

Method Response

Select an integration response.

Integration Response

Proxy integrations cannot be configured to transform responses.

Test GET Results

Top Right Status 200 is good. Right now there are no results in the right box. It's just a blank JSON object {}
We also get a stack trace of the console logs that happened during the method.

The screenshot shows the Amazon API Gateway console interface. The breadcrumb navigation at the top reads: **Amazon API Gateway** > APIs > dev-serverless-rest-api-with-dynamodb (3snrpqj7ti) > Resources > /routers (98o8db) > GET. On the right side of the breadcrumb bar are links for [Show all hints](#) and a help icon (?).

The left sidebar contains a navigation menu with the following items: APIs, dev-serverless-rest-api-with-..., Resources (selected), Stages, Authorizers, Models, Documentation, Binary Support, Dashboard, Usage Plans, API Keys, Custom Domain Names, Client Certificates, and Settings.

The main content area is titled **Method Execution /routers - GET - Method Test**. It includes a sub-header **Resources** with a dropdown menu showing the resource hierarchy: **/** > **/routers** > **GET**. Other methods listed under /routers are OPTIONS, POST, DELETE, GET, OPTIONS, and PUT.

The central panel provides instructions: "Make a test call to your method with the provided input". It includes sections for **Path** (No path parameters exist for this resource. You can define path parameters by using the syntax {myPathParam} in a resource path.), **Query Strings** (routers) with a text input field containing "param1=value1¶m2=value2", **Headers** (routers) with a text area containing "Use a colon (:) to separate header name and value, and new lines to declare multiple headers. eg. Accept:application/json.", **Stage Variables** (No stage variables exist for this method.), **Client Certificate** (No client certificates have been generated.), and **Request Body** (Request Body is not supported for GET methods.). A blue **Test** button with a lightning bolt icon is located at the bottom right of this panel.

The right panel displays the results of the test execution:

- Request:** /routers
- Status:** 200
- Latency:** 94 ms
- Response Body:** `[]`
- Response Headers:** `{"X-Amzn-Trace-Id": "Root=1-58802be2-d2e6931d0f46b38a3fe4108d"}`
- Logs:** Execution log for request test-request. The log contains the following entries:
 - Thu Jan 19 03:00:50 UTC 2017 : Starting execution for request: test-invoke-request
 - Thu Jan 19 03:00:50 UTC 2017 : HTTP Method: GET, Resource Path: /routers
 - Thu Jan 19 03:00:50 UTC 2017 : Method request path: {}
 - Thu Jan 19 03:00:50 UTC 2017 : Method request query string: {}
 - Thu Jan 19 03:00:50 UTC 2017 : Method request headers: {}
 - Thu Jan 19 03:00:50 UTC 2017 : Method request body before transformations:
 - Thu Jan 19 03:00:50 UTC 2017 : Endpoint request URI: https://lambda.us-east-1.amazonaws.com/2015-03-31/functions/arn:aws:lambda:us-east-1:062829191412:function:serverless-rest-api-with-dynamodb-dev-list/invocations
 - Thu Jan 19 03:00:50 UTC 2017 : Endpoint request headers: {x-amzn-lambda-integration-tag=test-request, Authorization=*****}

POST a Router manually

Use the POST/ method - click TEST, and use this as a template the body

```
{  
  "customer" : "Jason",  
  "ip" : "1.1.1.1",  
  "os" : "VyOS",  
  "hostname" : "VyOS Router",  
  "version" : "12.2",  
  "securitycheck" : "false"  
}
```

You should get Status 200 (OK) - that means it posted correctly to the database.

Let's post some real data to the API

Your GET request will return all the routers in the inventory.
Let's add a router to the database using Ansible.

Build an Ansible Playbook

You can use the file "aws-inventory.yml" under the Vagrant/Ansible folder.

We use a built in Ansible module called URI to POST data to a URL after collecting the inventory.

make sure to change this line in aws-inventory.yml

url: "https://3snrpqj7tj.execute-api.us-east-1.amazonaws.com/dev/routers"

to **YOUR URL** reported by Serverless so that the data gets posted to YOUR API (not mine)

Ansible AWS Tasks - Example

```
tasks:
- name: collect all facts from the device
  vyos_facts:
    gather_subset: all
    provider: "{{ cli }}"
    register: result

- name: Write a record to AWS API
  uri:
    url: "https://3snrpqj7tj.execute-api.us-east-1.amazonaws.com/dev/routers"
    method: POST
    HEADER_Content-Type: application/json
    body: '{
      "ip" : "{{ inventory_hostname }}",
      "version" : "{{ result.ansible_facts.ansible_net_version }}",
      "hostname" : "{{ result.ansible_facts.ansible_net_hostname }}",
      "customer" : "{{ customername }}",
      "securitycheck" : "false"
    }'
    body_format: json
    validate_certs: no
```

Run Ansible AWS inventory

ansible-playbook -i inventory aws-inventory.yml

```
vagrant@vagrant:/vagrant/Ansible$ ansible-playbook -i inventory aws-inventory.yml

PLAY [VyOS Inventory Collector] *****

TASK [setup] *****
ok: [35.166.172.203]

TASK [collect all facts from the device] *****
ok: [35.166.172.203]

TASK [Write a record to AWS API] *****
ok: [35.166.172.203]

PLAY RECAP *****
35.166.172.203      : ok=3    changed=0    unreachable=0    failed=0

vagrant@vagrant:/vagrant/Ansible$
```


Query our API/database

On the right we see both entries, our custom posted entry, and the Ansible entry.

← Method Execution /routers - GET - Method Test

Make a test call to your method with the provided input

Path

No path parameters exist for this resource. You can define path parameters by using the syntax `{myPathParam}` in a resource path.

Query Strings

`{routers}`

param1=value1¶m2=value2

Headers

`{routers}`

Use a colon (:) to separate header name and value, and new lines to declare multiple headers. eg.
Accept:application/json.

Stage Variables

No [stage variables](#) exist for this method.

Client Certificate

No client certificates have been generated.

Request: /routers

Status: 200

Latency: 124 ms

Response Body

```
[
  {
    "hostname": "VyOS Router",
    "version": "12.2",
    "os": "VyOS",
    "updatedAt": 1484794975466,
    "ip": "1.1.1.1",
    "createdAt": 1484794975466,
    "customer": "Jason",
    "id": "c64634a0-ddf3-11e6-b422-4185d1ed2616"
  },
  {
    "hostname": "AWS-CodeCamp",
    "version": "VyOS",
    "updatedAt": 1484796176710,
    "ip": "35.166.172.203",
    "createdAt": 1484796176710,
    "customer": "Example Customer",
    "id": "92457e60-ddf6-11e6-b422-4185d1ed2616"
  }
]
```

Caution if you run Ansible more than once, it will upload duplicates.
If you feel like rewriting some code to prevent that - go for it.

End of Lab 4

Thanks!