Inspecting a Stack

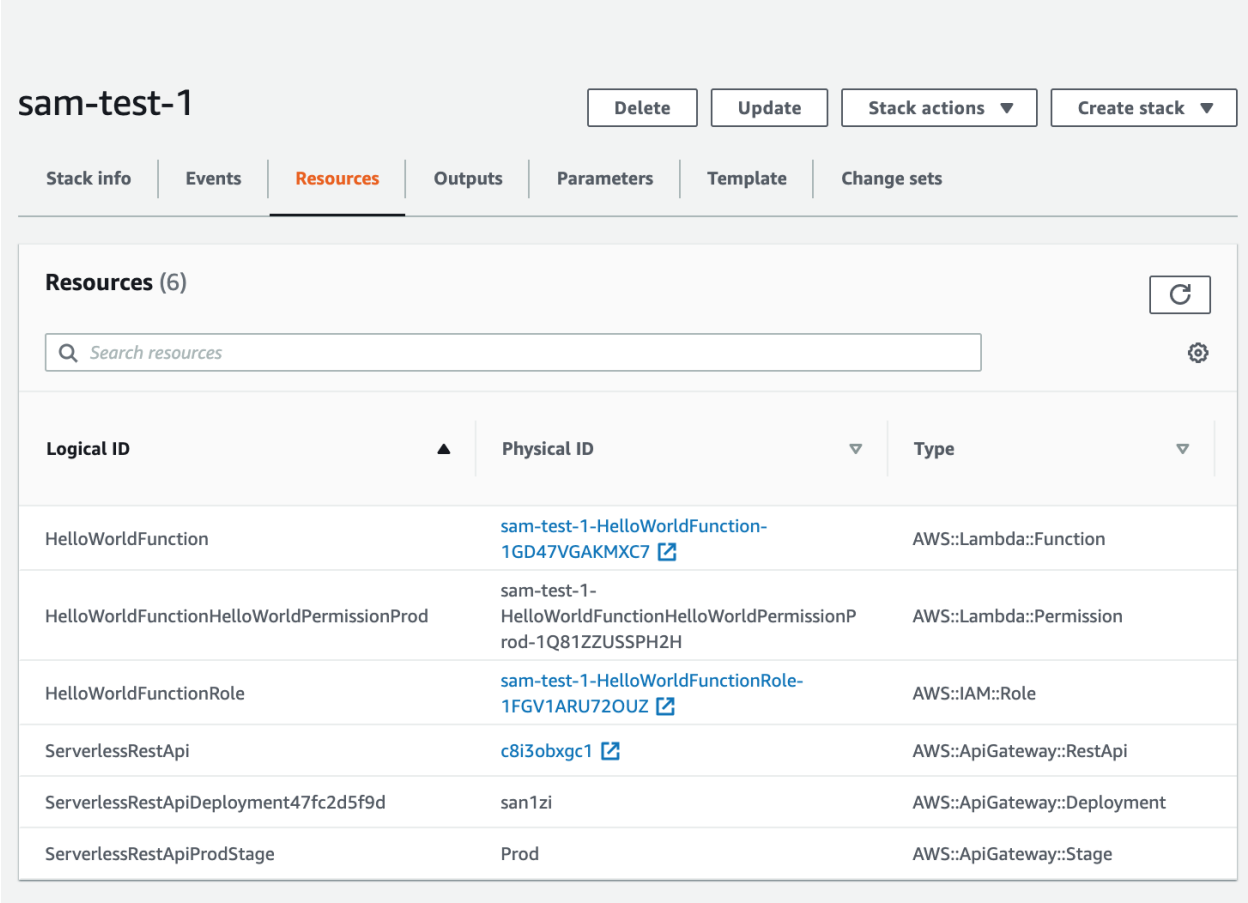
Get ready to learn how to inspect the stack outputs using the AWS Web Console and AWS command lines!

WE'LL COVER THE FOLLOWING

Inspecting a stack from the AWS Web Console

Our first SAM function is live and ready to receive traffic. You just need to find out where SAM actually put it. For that, you'll need to look at the stack outputs. The easiest way to inspect a stack is with the AWS Web Console. Here is how to find information about a stack:

1. Sign in to the AWS Web Console, at https://aws.amazon.com/.
2. Find the CloudFormation service.
3. Make sure that the region selector in the top-right corner is showing the region where you deployed the stack. For `us-east-1`, the region name is `US East (N. Virginia)`.
4. In the list of stacks, click on `sam-test-1` (or whatever you called the stack).
5. The console will show information about your stack, divided into several tabs.



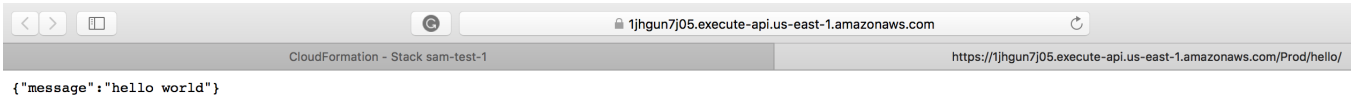
CloudFormation web console shows stack resources.

The *Resources* tab contains a list of all the AWS resources CloudFormation created for a stack. In the *Type* column, you should see a Lambda function, API Gateway, an IAM role, and some additional API Gateway resources. Note that the `Type` value in the same row as the `HelloWorldFunction` says `AWS::Lambda::Function`, although the template requested `AWS::Serverless::Function`. This is because SAM resources (`AWS::Serverless`) are just higher-level templates that get transformed into lower-level AWS resources. Those transformations are activated by the header line `Transform: AWS::Serverless-2016-10-31`.

The *Outputs* tab contains the list of stack results that was requested in the `Outputs` section of the template. These outputs are useful for combining stacks by using the results of one template as inputs into another. It can be helpful to use stack outputs as a convenient way to point out important resources.

Switch to the *Outputs* tab and click on the link next to the `HelloWorldApi` output value. This is the web address where API Gateway expects your requests. Open it in a browser and you should see the Lambda function in

action.

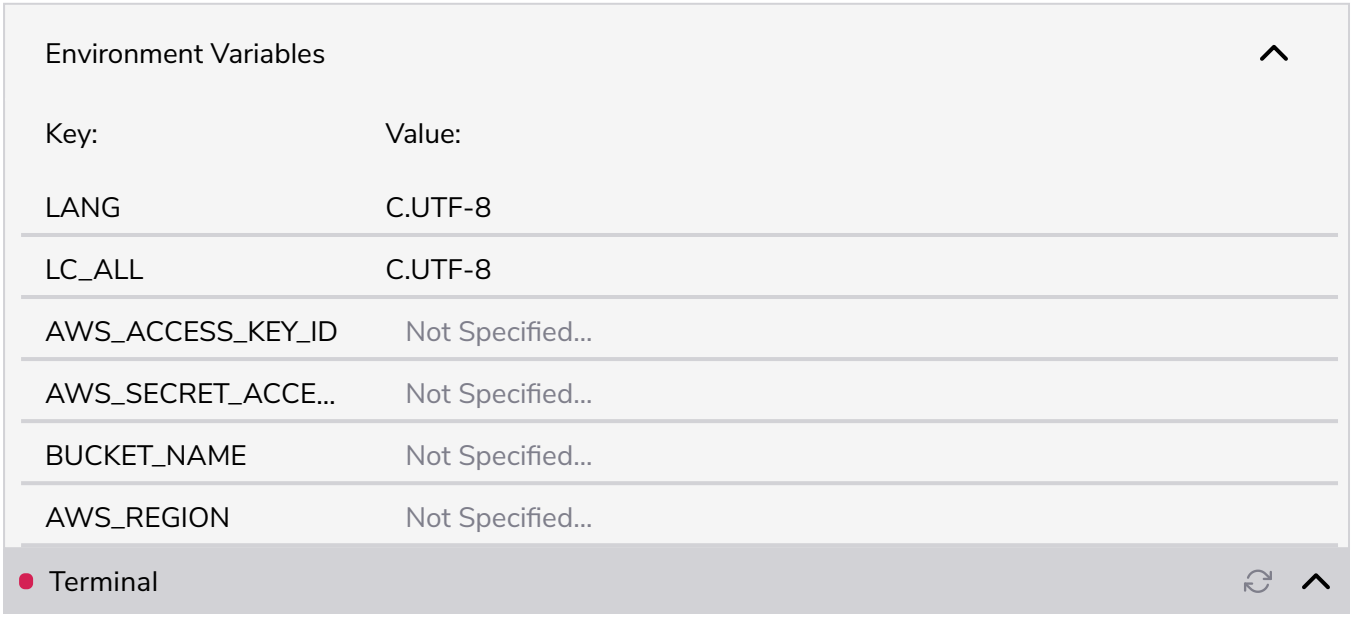


Lambda responds with Hello World!

Inspecting a stack from the command line

The web console is a nice interface for discovering new information, but if you know what you are looking for, it's much faster to find it using the AWS command line tools. Instead of pointing and clicking, run the following command line:

```
aws cloudformation describe-stacks --stack-name sam-test-1
```



You will see all the information about the stack directly in your console. To avoid reading through irrelevant information, you can also reduce the output by providing a `--query` parameter. For example, list just the outputs using `--query Stacks[].Outputs`:

```
$ aws cloudformation describe-stacks --stack-name sam-test-1 --query Stack
s[].Outputs
[
    [
        {
            "Description": "Implicit IAM Role created for Hello World func
tion"
```

```
tion",
            "OutputKey": "HelloWorldFunctionIamRole",
            "OutputValue": "arn:aws:iam::536317743507:role/sam-test-1-Hell
oWorldFunctionRole-1HQFT86U30UWC"
        },
        {
            "Description": "API Gateway endpoint URL for Prod stage for He
llo World function",
            "OutputKey": "HelloWorldApi",
            "OutputValue": "https://1jhgun7j05.execute-api.us-east-1.amazo
naws.com/Prod/hello/"
        },
        {
            "Description": "Hello World Lambda Function ARN",
            "OutputKey": "HelloWorldFunction",
            "OutputValue": "arn:aws:lambda:us-east-1:536317743507:functio
n:sam-test-1-HelloWorldFunction-4PAFAAQX7BC8"
        }
    ]
]
```


JSON output is nice if you need to pass this into another tool, but for humans, you can also add `--output text` or `--output table` to format the results more nicely.

The `--query` value `Stacks[].Outputs` means 'find the `Outputs` key in all elements of the `Stacks` array and ignore anything else'. AWS command line tools use the JMESPath query syntax, which makes it possible to do complex searching, filtering and transformations of the results. For example, you can pull out just the output value for a key matching the `HelloWorldAPI`, in order to use it as a shell environment variable or pass it to another command. Here is a command that does that:

```
aws cloudformation describe-stacks --stack-name sam-test-1 --output text -
-query 'Stacks[].Outputs[?OutputKey==`HelloWorldApi`][OutputValue]'
```

> ### Backticks and quotes in Windows and Linux command lines
>
> To run the previous command on Windows, you may need to remove the single quotes around the `query` parameter. On Linux and MacOS, you will most likely need to keep single quotes around the value to prevent the shell from interpreting `HelloWorldApi` as a command because of the

> the shell from interpreting `HelloWorldApi` as a command because of the back-ticks.

This course will keep things simple and avoid complex JMESPath queries, but remember that the JMESPath query syntax is quite a powerful option for automating reports on the command line. Check out http://jmespath.org for more information.

To see the list of resources in a stack from the command line, run the following command:

```
aws cloudformation describe-stack-resources --stack-name sam-test-1
```

Now that you know how to create a Lambda function, it's time to look at some common development tasks in the next chapter.