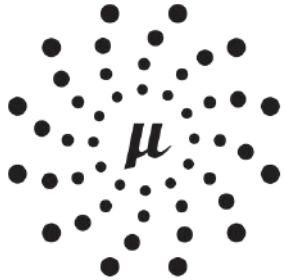
OBJECT COMPUTING



MICRONAUT

Micronaut + Azure Functions

Speakers

Julien Dubois (Microsoft)

Java developer Advocacy team manager at Microsoft.

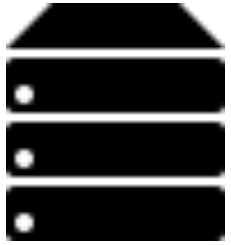
He is the creator and lead developer of the JHipster project and Java Champion.

Sergio del Amo (Object Computing)

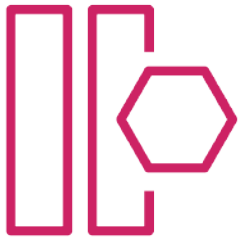
Senior Software Engineer of the Micronaut and Grails teams at Object Computing.

He writes the newsletter Groovy Calamari and organizes the conference GreachConf.

What is Serverless?



Abstraction of servers



Event-driven / instant scale

Micro-billing

Azure Function Core Tools

https://docs.microsoft.com/en-us/cli/azure

Azure Function Core Tools includes a version of the same runtime that powers Azure Functions runtime that you can run on your local development computer. It also provides commands to create functions, connect to Azure, and deploy function projects.

Prerequisites

OBJECT COMPUTING

Azure CLI

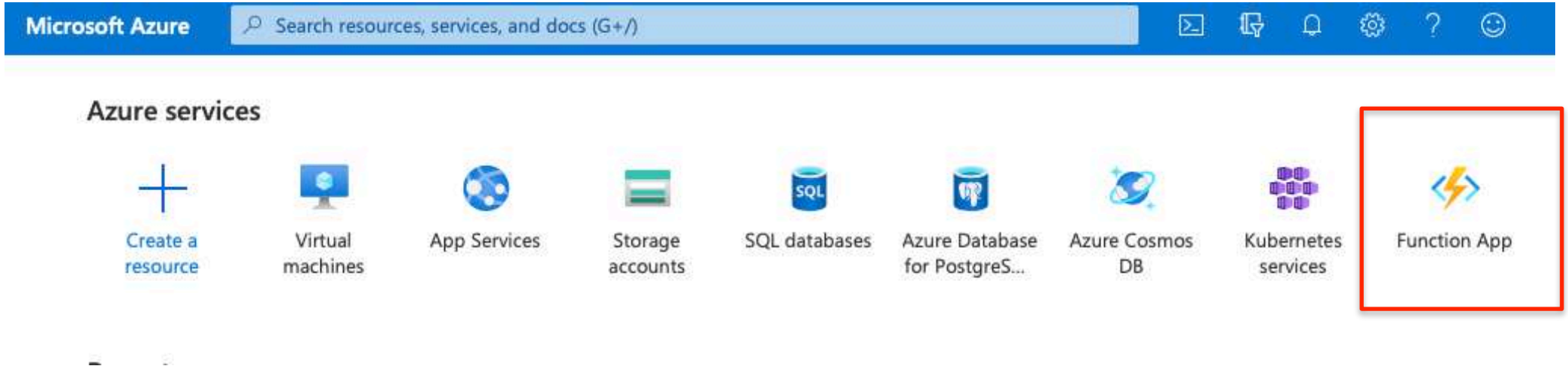
https://docs.microsoft.com/en-us/azure/azure-functions/functions-run-local

Azure CLI is a set of commands used to create and manage Azure resources. The Azure CLI is available across Azure services and is designed to get you working quickly with Azure, with an emphasis on automation.

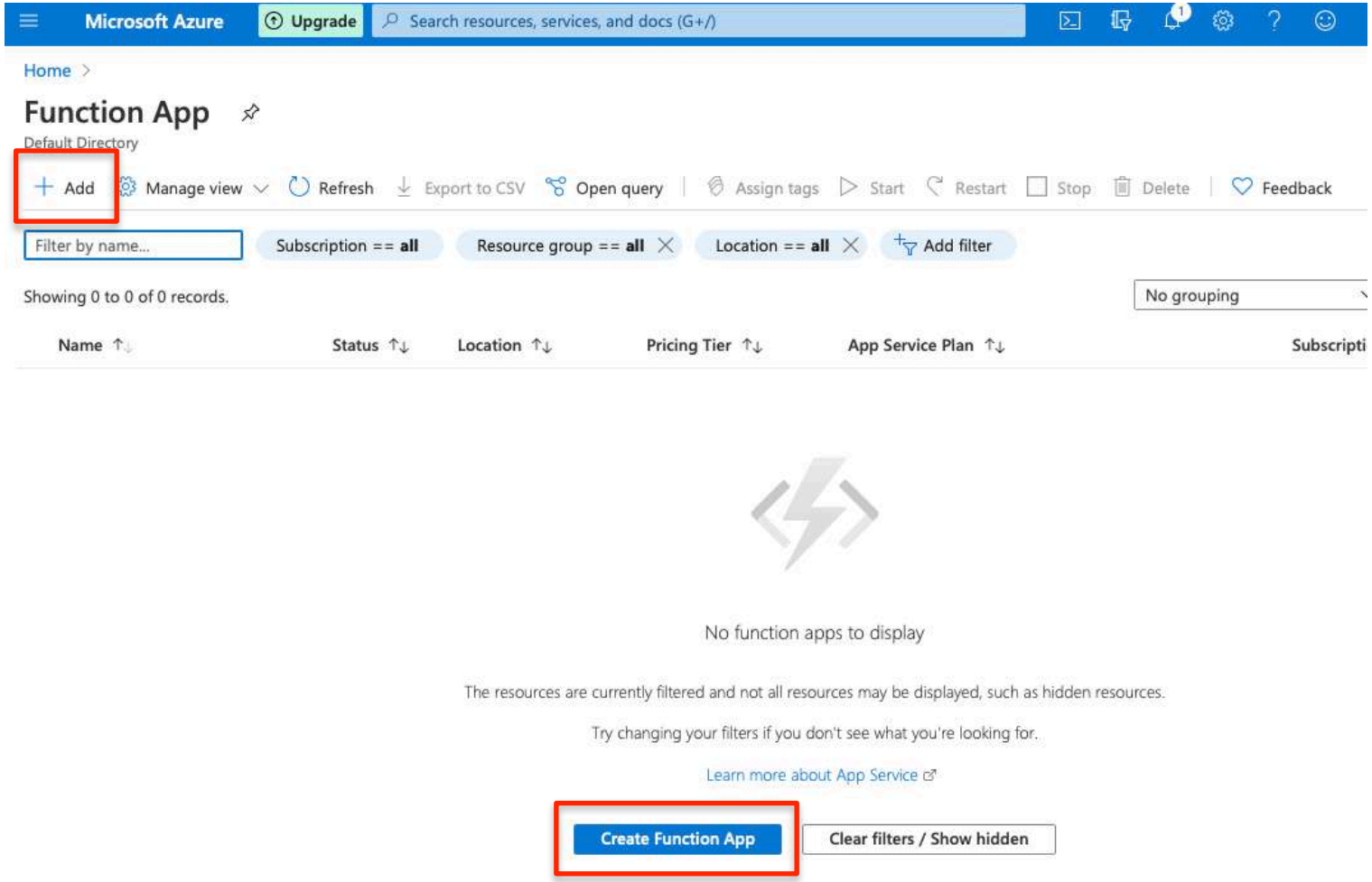
Prerequisites

Creating a function

Creating a function app



Creating a function app



Project Details

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * : Free Trial

Resource Group * : examplemicronaut

Create new

Instance Details

Function App name * : testmicronaut .azurewebsites.net

Publish * : (•) Code ( ) Docker Container

Runtime stack * : Java

Version * : 11.0 (Preview)

Region * : Central US

Storage

When creating a function app, you must create or link to a general-purpose Azure Storage account that supports Blobs, Queue, and Table storage.

Storage account * (New) storageaccountexampbdb9

Create new

Operating system

The Operating System has been recommended for you based on your selection of runtime stack.

Operating System * Linux Windows

Plan

The plan you choose dictates how your app scales, what features are enabled, and how it is priced. Learn more

Plan type * Consumption (Serverless)

Creating a function app

Basics Hosting **Monitoring** Tags Review + create

Application Insights is a code-less attach to provide detailed observability in to your application. Learn more

Application Insights

Enable Application Insights * ○ No ◉ Yes

Application Insights * (New) testmicronaut202009301652 (Central US)

Create new

Region Central US

Creating a function app

Basics Hosting Monitoring **Tags** Review + create

Tags are name/value pairs that enable you to categorize resources and view consolidated billing by applying the same tag to multiple resources and resource groups.

Note that if you create tags and then change resource settings on other tabs, your tags will be automatically updated.

Name ⓘ		Value ⓘ	Resource
project	:	micronaut-azure-webinar	4 selected
	:		4 selected

Basics Hosting Monitoring Tags **Review + create**

Summary

Function App
by Microsoft

Details

Subscription	9825e0b9-244a-4eeb-9194-d3e8123f
Resource Group	examplemicronaut
Name	testmicronaut
Runtime stack	Java 11.0 (Preview)
Tags	project: micronaut-azure-webinar

Hosting

Storage (New)

Storage account	storageaccountexampbdb9
Tags	project: micronaut-azure-webinar

Plan (New)

Plan type	Consumption (Serverless)
Name	ASP-examplemicronaut-9315
Operating System	Linux
Region	Central US
SKU	Dynamic
Tags	project: micronaut-azure-webinar

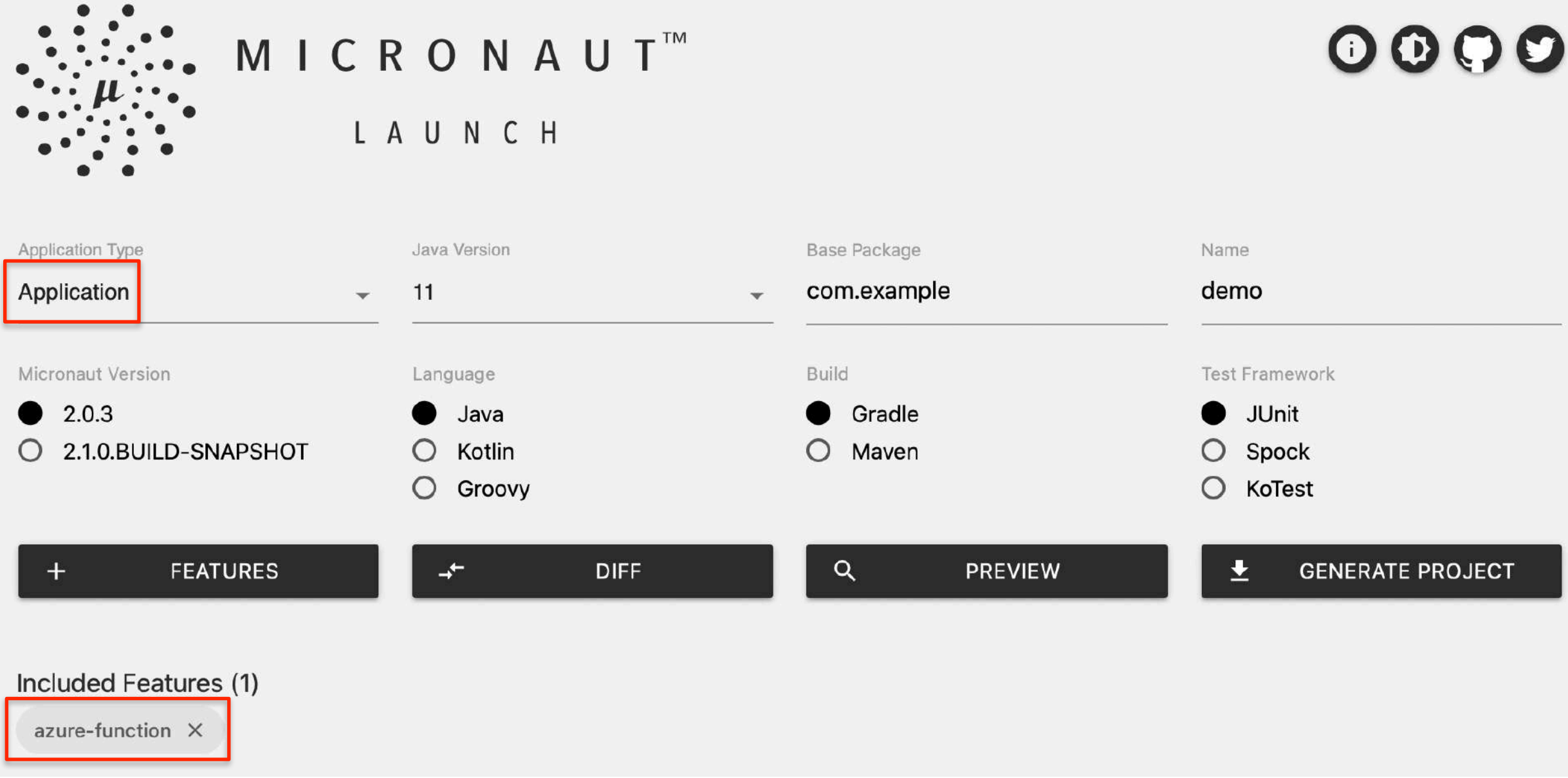
Monitoring (New)

Application Insights	Enabled
Name	testmicronaut202009301652
Region	Central US
Tags	project: micronaut-azure-webinar

Micronaut Azure Modules

Dependency	Description
Simple Azure Functions	io.micronaut.azure:micronaut-azure-function
Azure HTTP Functions	io.micronaut.azure:micronaut-azure-function-http

Creating an Azure function application



Micronaut Azure dependencies

OBJECT COMPUTING

```
dependencies {

    ...

    implementation("com.microsoft.azure.functions:azure-functions-java-library")
    implementation("io.micronaut.azure:micronaut-azure-function-http")
}
```

Creating a function app

OBJECT COMPUTING

```
public class Function extends AzureHttpFunction {
    @FunctionName("testmicronaut")
    public HttpResponseMessage invoke(
            @HttpTrigger(
                name = "req",
                methods = {HttpMethod.POST, HttpMethod.GET},
                route = "{*route}",
                authLevel = AuthorizationLevel.ANONYMOUS)
                    HttpRequestMessage<Optional<String>> request,
                final ExecutionContext context) {
        return super.route(request, context);
    }
}
```

```java
import edu.umd.cs.findbugs.annotations.NonNull;

import javax.validation.constraints.Pattern;

public interface NameTransformer {

    @NonNull
    String transform(@NonNull @Pattern(regexp = "sergio") String name);
}
```

```java
import edu.umd.cs.findbugs.annotations.NonNull;
import javax.inject.Singleton;

@Singleton
public class UppercaseNameTransformer implements NameTransformer {

    @NonNull
    @Override
    public String transform(@NonNull String name) {
        return name.toUpperCase();
    }
}
```

OBJECT COMPUTING

```java
import io.micronaut.http.annotation.Body;
import io.micronaut.http.annotation.Controller;
import io.micronaut.http.annotation.Post;

@Controller("/person")
public class PersonController {

    private final NameTransformer nameTransformer;

    public PersonController(NameTransformer nameTransformer) {
        this.nameTransformer = nameTransformer;
    }

    @Post
    public Person index(@Body Person person){
      return new Person(nameTransformer.transform(person.getName()));
    }
}
```

OBJECT COMPUTING

```java
import io.micronaut.core.annotation.Introspected;

@Introspected
public class Person {

    private String name;

    public Person() {
    }

    public Person(String name) {
        this.name = name;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }
}
```

Run the function locally

BUILD PLUGINS

OBJECT COMPUTING

https://plugins.gradle.org/plugin/com.microsoft.azure.azurefunctions

https://docs.microsoft.com/en-us/java/api/overview/azure/maven/azure-functions-maven-plugin/readme

RUN THE FUNCTION LOCALLY

OBJECT COMPUTING

```
% ./gradlew azureFunctionRun

...

Functions:

        testmicronaut: [POST,GET] http://localhost:7071/api/{*route}
...
> :azureFunctionsRun

% curl -X POST -d "{\"name\": \"sergio\"}" http://localhost:7071/api/person
{"name":"SERGIO"}
```

Deploy the function

DEPLOY THE FUNCTION

OBJECT COMPUTING

```
azurefunctions {
    resourceGroup = 'examplemicronaut'
    appName = 'micronautest'
    pricingTier = 'Consumption'
    region = 'westus'
    runtime {
      os = 'linux'
    }
    localDebug = "transport=dt_socket,server=y,suspend=n,address=5005"
}
```

DEPLOY THE FUNCTION

OBJECT COMPUTING

```
% ./gradlew azureFunctionsDeploy

Successfully deployed the artifact to https://testmicronaut.azurewebsites.net
Successfully deployed the function app at https://testmicronaut.azurewebsites.net

% curl -X POST -d "{\"name\": \"sergio\"}" https://testmicronaut.azurewebsites.net/api/person
{"name":"SERGIO"}
```

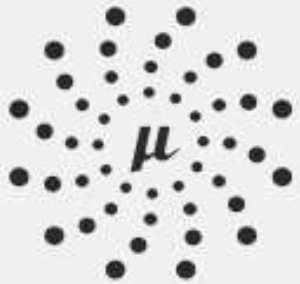
Creating an Azure serverless function

Triggers

OBJECT COMPUTING

Dependency	Description
Timer	A set interval
HTTP	An HTTP request is received
Blob	file is uploaded or updated in Azure blob storage
Queue	A message is added to an Azure Storage queue
Cosmos DB	A document changes in a collection
Event Grid	An event hub receives a new event

Check classes inside package `com.microsoft.azure.functions.annotation`



MICRONAUT™

LAUNCH

Application Type: Serverless Function

Java Version: 11

Base Package: com.example

Name: demo

Micronaut Version
- (●) 2.0.3
- ( ) 2.1.0.BUILD-SNAPSHOT

Language
- (●) Java
- ( ) Kotlin
- ( ) Groovy

Build
- (●) Gradle
- ( ) Maven

Test Framework
- (●) JUnit
- ( ) Spock
- ( ) KoTest

+ FEATURES | DIFF | PREVIEW | GENERATE PROJECT

Included Features (1)

azure-function ×

Micronaut Azure dependencies

OBJECT COMPUTING

```
dependencies {
    ...
    implementation("com.microsoft.azure.functions:azure-functions-java-library")
    implementation("io.micronaut.azure:micronaut-azure-function")
}
```

TimeTrigger

OBJECT COMPUTING

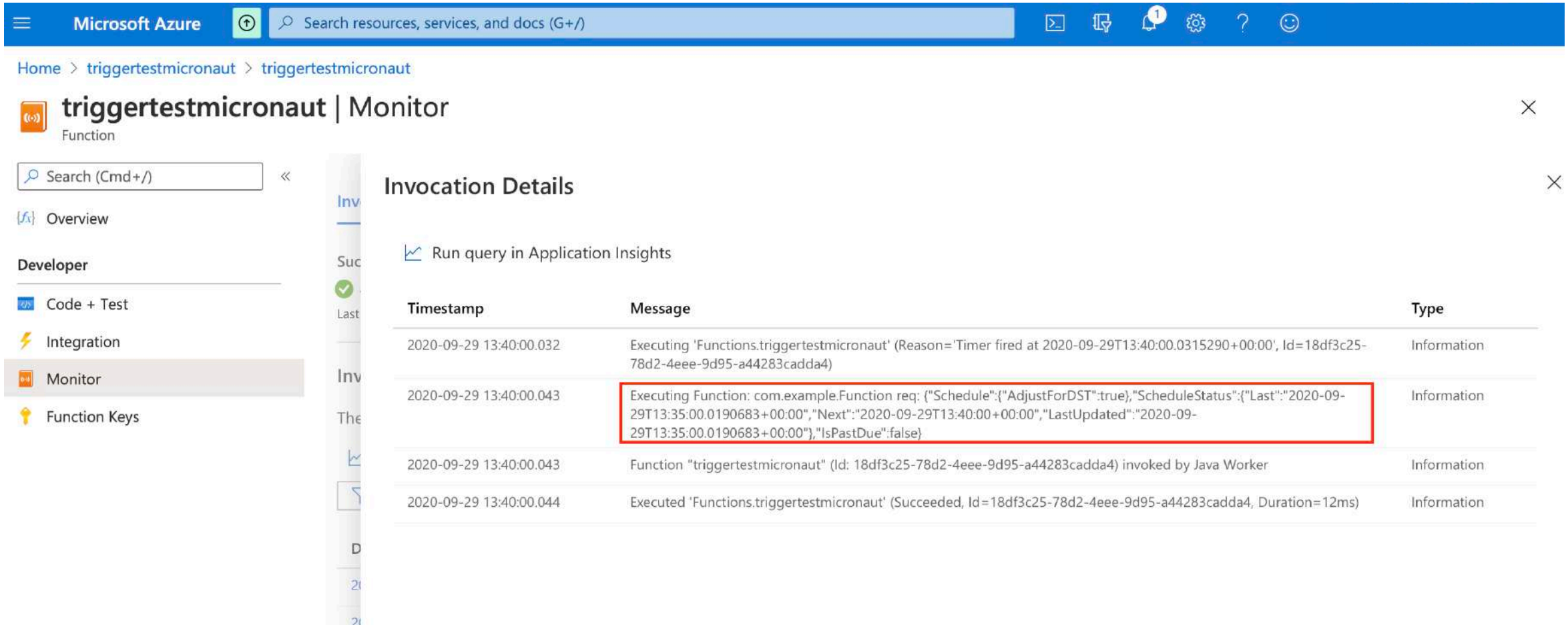
```
import com.microsoft.azure.functions.ExecutionContext;
import com.microsoft.azure.functions.annotation.FunctionName;
import com.microsoft.azure.functions.annotation.TimerTrigger;
import io.micronaut.azure.function.AzureFunction;

public class Function extends AzureFunction {

    @FunctionName("triggertestmicronaut")
    public void echo(@TimerTrigger(name = "req",
            dataType = "string",
            schedule = "0 */5 * * * *") String req, // trigger once every 5m
                    ExecutionContext context) {
        if (context != null) {
            context.getLogger().info("Executing Function: " + getClass().getName() + " req: " + req);
        }
    }
}
```

Azure Gradle Plugin Configuration

OBJECT COMPUTING



Micronaut Azure Resources

- https://micronaut-projects.github.io/micronaut-azure/snapshot/guide/index.html
- https://github.com/Azure/azure-functions-java-librarymicronaut.io/faq.html
- https://docs.microsoft.com/en-us/azure/azure-functions/functions-reference-java

Micronaut Resources

- gitter.im/micronautfw
- docs.micronaut.io
- guides.micronaut.io
- micronaut.io/faq.html
- github.com/micronaut-projects/micronaut-core
- github.com/micronaut-projects/micronaut-examples
- objectcomputing.com/products/micronaut
- info@micronaut.io

Questions?

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