



DEMO

How to use OpenWhisk (IBM Function Cloud)

Abstract

Step by Step guide to create a free account and write a JavaScript and one java-based action and deploy that into function cloud and use the command line to deploy and invoke it.

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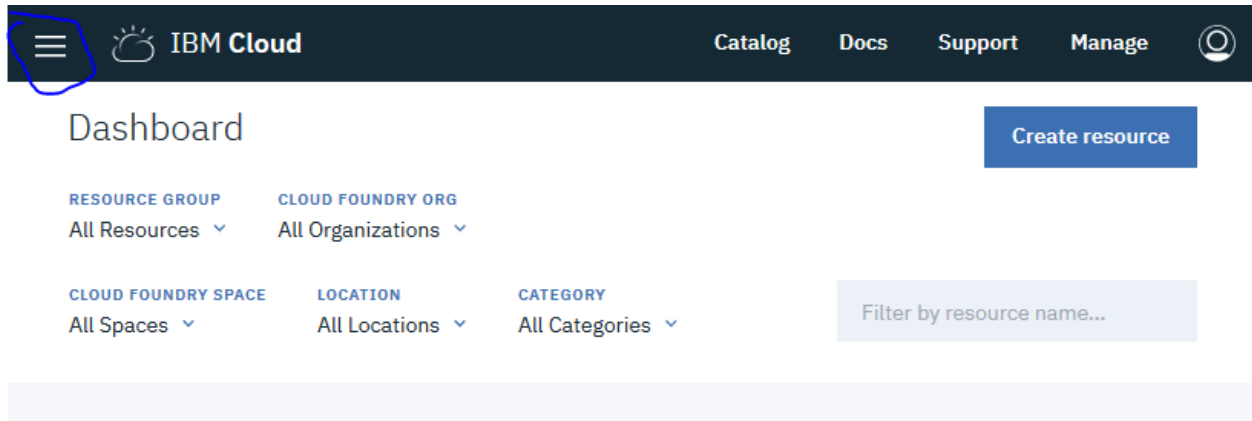
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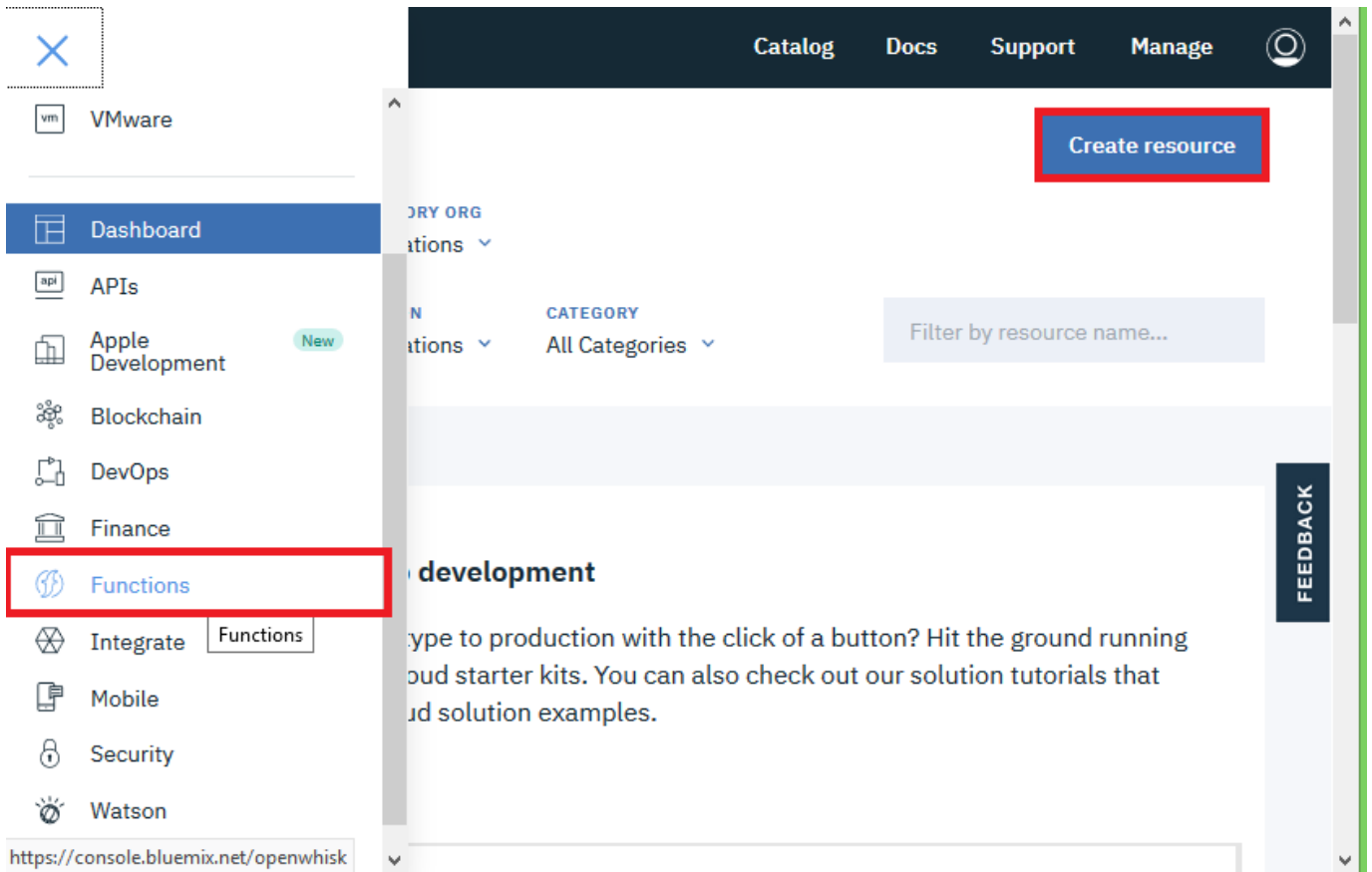
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Create a free account and setup in IBM cloud environment. (One-time task)

Create a free account using [this](#) link, after you created your account and login with that, you will see the dashboard page like below:



You can find the menu button on the left-up hand side, expand it and find function.



Then you should be able to see the IBM cloud function dashboard, so you can create and manage your actions and triggers over there.

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You should be able to see below set of options

The screenshot shows the IBM Cloud Functions 'Getting Started' page. The header includes the IBM Cloud logo and navigation links for Catalog, Docs, Support, and Manage. The left sidebar lists various options under the 'Functions' menu, with 'Overview' highlighted. The main content area features a large blue heading 'Getting Started with IBM Cloud Functions', a descriptive paragraph about the FaaS platform, and two buttons: 'Start Creating' and 'Download CLI'. A graphic at the bottom shows a stylized 'f' logo and a Twitter icon.

Next step is to select action to get into the action part.

Every time you deploy an action you can use CLI or above page to customize it.

If you want to develop a javascript action you can use dashboard UI to develop and deploy and tweak that. For java-based actions, that UI is not sufficient enough and I suggest using the command line to do the development and deployment. There are several options to manage the API however using the UI dashboard/website.

Install CLI tool (Bluemix command line interface) (One-time task)

Go to this below link and download the proper version of the CLI tool based on your Operating system

https://console.bluemix.net/docs/cli/reference/bluemix_cli/download_cli.html#download_install

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Install plugin for WSK (OpenWhisk command line) (One-time task)

After the installation was successfully completed you can run the command line and test if the application was working properly.

By typing

```
C:\Users\Unknown_>bx --help
```

You will get something like below

```
Unknown_@AlienInside MINGW64 /f
$ bx --help
NAME:
  C:\Program Files\IBM\Bluemix\bin\bx.exe - A command line tool to interact with IBM Cloud

USAGE:
  [environment variables] C:\Program Files\IBM\Bluemix\bin\bx.exe [global options] command [arguments...] [command options]

VERSION:
  0.6.7+283a906-2018-05-14T07:34:25+00:00

COMMANDS:
  api                Set or view target API endpoint
  login              Log user in
  logout             Log user out
  target             Set or view the targeted region, account, resource group, org or space
  info               View cloud information
  config             Write default values to the config
  update             Update CLI to the latest version
  regions            List all the regions
  cloud-functions, wsk Bluemix CLI plug-in for IBM Cloud Functions
  account            Manage accounts, users, orgs and spaces
  catalog            Manage catalog
  resource            Manage resource groups and resources
  iam                Manage identities and access to resources
  app                Manage Cloud Foundry applications and application related domains, routes and certificates
  service            Manage Cloud Foundry services
  billing            Retrieve usage and billing information
  plugin             Manage plug-ins and plug-in repositories
  cf                 Run Cloud Foundry CLI with IBM Cloud CLI context
  sl                 Gen1 infrastructure Infrastructure services
  help

Enter 'C:\Program Files\IBM\Bluemix\bin\bx.exe help [command]' for more information about a command.

ENVIRONMENT VARIABLES:
  BLUEMIX_COLOR=false          Do not colorize output
  BLUEMIX_ANALYTICS=false      Do not collect usage statistics for analytics
  BLUEMIX_VERSION_CHECK=false  Do not check latest version for update
  BLUEMIX_HTTP_TIMEOUT=5      A time limit for HTTP requests
  BLUEMIX_API_KEY=api_key_value API Key used for login
  BLUEMIX_TRACE=true           Print API request diagnostics to stdout
  BLUEMIX_TRACE=path/to/trace.log Append API request diagnostics to a log file
  BLUEMIX_HOME=path/to/dir     Path to config directory

GLOBAL OPTIONS:
  --version, -v                Print the version
  --help, -h                   Show help

Unknown_@AlienInside MINGW64 /f
```

Then you can try wsk (the older version of WSK command line) by executing below command.

```
$wsk
```

'wsk' is not recognized as an internal or external command, operable program or batch file.

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Then you need to install the plugin for WSK with below command and after a while it finishes the downloading and installing the plugin and it will be ready to login into your ORG and SPACE and start deploying functions into your environment.

```
C:\Users\Unknown_>bx plugin install Cloud-Functions -r Bluemix
Looking up 'Cloud-Functions' from repository 'Bluemix'...
Plug-in 'cloud-functions 1.0.14' found in repository 'Bluemix'
Attempting to download the binary file...
 11.19 MiB / 11.19 MiB
[=====]
=====] 100.00% 2s
11731968 bytes downloaded
Installing binary...
OK
Plug-in 'cloud-functions 1.0.14' was successfully installed into
C:\Users\Unknown_\.bluemix\plugins\cloud-functions. Use 'bx plugin show
cloud-functions' to show its details.
```

```
C:\Users\Unknown_>
```

And below is showing what plugins have already been installed in your machine

```
Unknown_@AlienInside MINGW64 /f
$ bx wsk --version

Plug-in 'cloud-functions 1.0.15' is now available (you have 1.0.14).
Use 'C:\Program Files\IBM\Bluemix\bin\bx.exe plugin update cloud-functions' to upgrade the plug-in.
Use 'C:\Program Files\IBM\Bluemix\bin\bx.exe config --check-version=false' to disable update check.

Error: unknown flag: --version
unknown flag: --version

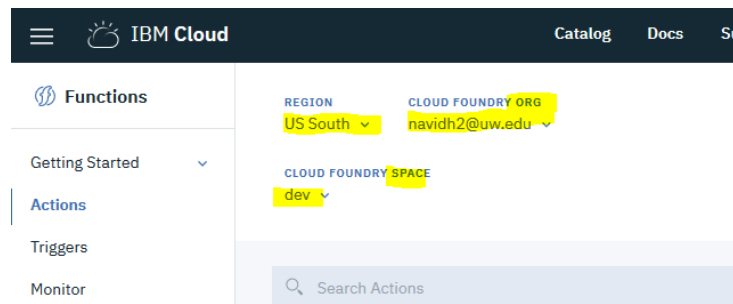
Unknown_@AlienInside MINGW64 /f
$ bx plugin list
Listing installed plug-ins...

Plugin Name      Version
cloud-functions  1.0.14
```

Configuring your local environment/ Login into your space

Like most of the CLI tools, when you are trying to use the any cloud foundry environment using command line, you need to specify your

1. API end point that you want to connect to
2. ORG/Organization and
3. Space.



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All this information is available when you just sign up into cloud foundry. For example, after I created my account, in dashboard I could see below information

So I used them into command line by entering

```
$bx login
```

To verify what you have entered you can use below command

```
Unknown_@AlienInside MINGW64 /f
$ bx api
API endpoint: https://api.ng.bluemix.net (CF API version: 2.92.0)

Unknown_@AlienInside MINGW64 /f
$ bx app list
Invoking 'cf apps'...

Getting apps in org navidh2@uw.edu / space dev as navidh2@uw.edu...
OK

No apps found

Unknown_@AlienInside MINGW64 /f
$ |
```

Switch to cloud function environment

Using command line to start developing however we need to configure that

```
Unknown_@AlienInside MINGW64 /f
$ bx login
API endpoint: https://api.ng.bluemix.net

Email> navidh2@uw.edu
navidh2@uw.edu

Password>

Authenticating...
OK

Targeted account Navid Heydari's Account (3718302df5990fb50868a41f7bc8c4e1)

Targeted resource group Default

API endpoint:      https://api.ng.bluemix.net (API version: 2.92.0)
Region:           us-south
User:             navidh2@uw.edu
Account:          Navid Heydari's Account (3718302df5990fb50868a41f7bc8c4e1)
Resource group:   Default
Org:
```

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Space:

Tip: If you are managing Cloud Foundry applications and services

- Use 'C:\Program Files\IBM\Bluemix\bin\bx.exe target --cf' to target Cloud Foundry org/space interactively, or use 'C:\Program Files\IBM\Bluemix\bin\bx.exe target -o ORG -s SPACE' to target the org/space.
- Use 'C:\Program Files\IBM\Bluemix\bin\bx.exe cf' if you want to run the Cloud Foundry CLI with current IBM Cloud CLI context.

```
Unknown_@AlienInside MINGW64 /f
```

```
$ bx target -s dev -o navidh2@uw.edu
```

```
Targeted org navidh2@uw.edu
```

Targeted space dev

```
API endpoint:      https://api.ng.bluemix.net (API version: 2.92.0)
Region:           us-south
User:             navidh2@uw.edu
Account:          Navid Heydari's Account (3718302df5990fb50868a41f7bc8c4e1)
Resource group:   Default
Org:              navidh2@uw.edu
Space:            dev
```

```
Unknown_@AlienInside MINGW64 /f
```

```
$ bx wsk action
```

work with actions

Usage:

```
wsk action [command]
```

Available Commands:

```
create      create a new action
update      update an existing action, or create an action if it does not
exist
invoke      invoke action
get         get action
delete      delete action
list        list all actions in a namespace or actions contained in a
package
```

Flags:

```
-h, --help  help for action
```

Global Flags:

```
--apihost HOST      whisk API HOST
--apiversion VERSION whisk API VERSION
-u, --auth KEY       authorization KEY
--cert string        client cert
-d, --debug          debug level output
-i, --insecure       bypass certificate checking
--key string         client key
-v, --verbose        verbose output
```

Use "wsk action [command] --help" for more information about a command.

```
Unknown_@AlienInside MINGW64 /f
```


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Create action using console (swift or NodeJS)

I just created a javascript file which is getting a parameter and echoing that out to the invoker.

You can get the source from [here](#).

Create action using local development environment (Java or Docker-based implementations)

You can use [this](#) code base sample for java action.

There are some restrictions if you want to develop docker based actions, since the output format should be in JSON Response object, the java main method signature is slightly different than regular java codes.

Deploy and invoke your action using CLI

Then next step is to create an action and deploy that action pointer to the javascript code that we created. With below command you can create a JAVA based action.

```
$ bx wsk action create openWhiskTester target/OpenWhiskTester-0.0.1-SNAPSHOT.jar --main edu.uw.tc562.navid.openwhisk.Action3
```

And with this command you can create javascript action:

```
$ bx wsk action create action1 action1.js
```

Invoke your action through CLI

to execute/invoke the action you can use below

```
$ bx wsk action invoke --result openWhiskTester --param --blocking
```

So the result will be something like this for the openWhiskTester java action

```
Unknown_@AlienInside MINGW64 /f
$ bx wsk action invoke --result openWhiskTester --param number 3 --blocking
{
  "result": "input_number,start_time, stop_time, interval_nanoSec,\n3, 2562537880845430, 2562537880850230, 4800, "
}
Unknown_@AlienInside MINGW64 /f
```

NOTE: --blocking

--blocking is for calling the action right now and not doing any asynchronous calls, if you don't pass the blocking the result will be the hash code that is referring to your actual JSON presentation of the result.

References:

<https://www.ibm.com/developerworks/cloud/library/cl-bluemix-getting-started-video/index.html>

<https://github.com/cloudfoundry/cli#getting-started>