# LEARNING ibm-bluemix

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bluemix

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# **Chapter 1: Getting started with ibm-bluemix**

### Remarks

Bluemix is a platform as a service (PaaS) developed by IBM, to build, run, deploy, and manage applications on the cloud. Bluemix offers a large catalog of services to integrate with your applications. Supported programming languages and runtimes include Java, Node.js, Swift, Go, PHP, Python, and Ruby, with additional languages supported through the use of buildpacks.

IBM Bluemix is based on Cloud Foundry open technology. In addition to building web applications for multiple frameworks, including iOS, you can create Docker containers, or launch virtual server instances. Bluemix is based on a Hybrid Cloud model. Its apps, containers, and VMs are portable across public, dedicated, and on-premises clouds.

The Bluemix console provides application boilerplates to help you get started. Bluemix consoles in Dallas, London, or Sydney offer a growing catalog of over 100 services to build your applications.

#### Service categories

- Compute Multiple runtimes, Docker-based containers, access to virtual servers
- Network Secure VPN connections
- Storage Unstructured cloud data stores
- Data & Analytics Database options and big-data analytics
- Watson Cognitive application building
- · Integrate API management, cloud integration, secure gateway
- DevOps Delivery pipeline, auto-scaling, track & plan, alert notifications
- Security Single sign-on, security monitoring
- Application Services Business rules, workflow, caching, application server, and more
- · Mobile Services for mobile apps such as push notifications, testing, tuning, and analytics
- Internet of Things IoT foundation and real-time data insights

#### Helpful links

- Bluemix documentation extensive, detailed technical information
- ID and billing questions FAQ for common Bluemix issues
- Bluemix status notifications about events that affect the platform and services
- Get started with Bluemix
- Bluemix consoles US-South, EU-GB, AU-SYD

#### **Examples**

Installation or Setup

Detailed instructions on getting ibm-bluemix set up or installed.

# **Step 1: Create a bluemix account**

Create an account at https://console.ng.bluemix.net/registration/

This will set you up with a 30 day trial. You don't have to pay anything for the free resources and you don't have to set up billing until the end of your trial (though not all services will be available).

# **Step 2: Install Bluemix and Cloud Foundry Command Line tools**

This is optional, you can perform most actions via the web console from step 1. The CLI utilities can be downloaded from <a href="https://new-console.ng.bluemix.net/docs/starters/install\_cli.html">https://new-console.ng.bluemix.net/docs/starters/install\_cli.html</a> and you should install both the bluemix cli and the cloud foundry cli.

## Step 2a: Connect to Bluemix

\$ bluemix api https://api.ng.bluemix.net

## Step 2b: Login to Bluemix

\$ bluemix login -u username -o org\_name -s space\_name

You need to specify your username, org\_name, and space\_name which you can get from the web console in Step 1.

After you log in successfully, you have now setup bluemix. You can learn more about the CLI and get additional plugins from http://clis.ng.bluemix.net/ui/home.html

Continuous deployment of RESTful API (Node.js) via GitHub using IBM Bluemix Toolchain

# **Step 1: Create your GitHub account**

If you already have a GitHub account, please proceed to Step 2. Otherwise, please follow below:

1.a Go to Github page.

1.b Enter your desired username, your email address and then your desired password. Afterwards, click the **Sign up for GitHub** button.



## Step 2: Create your IBM Bluemix account

Please refer to Bluemix Get Started on how to create account or follow the previous example on how to create your Bluemix account on this page.

# Step 3: Deploy your Rest API package to GitHub

3.a If you do not know how to use Git, please read the Git Tutorial or you can use the SourceTree a GUI based Git implementation. Please read the SourceTree Tutorial to learn more about SourceTree.

3.b Upload your Rest API code to GitHub using the **git push** command. In contrast, you can fork or clone my Rest API on GitHub then apply your own changes as needed then upload the code to your GitHub account. Note: My sample Rest API contains a sample implementation of MongoDB and APICache.

# Step 4: Deploy your GitHub repository to IBM Bluemix using Toolchain (Continuous Deployment tool)

4.a Log-on to your Bluemix account.



Enter IBMid or email

Forgot your IBMid?

Continue

New? Create an IBMid.

4.b Click Menu to show other items.



Then select "Services".



And then, click "DevOps".

ODC	Docs				
X					
ၜၟႜ႞ၜ	Services				
	Dashboard				
$\square$	Data & Analytics				
`Ö́	Watson				
503 UU	Internet of Things				
api	APIs				
÷.	Network				
())))	Storage				
9	Security				
[₽]	DevOps				
$\bigotimes$	Application Services				
$\Leftrightarrow$	Integrate				

4.c Select Toolchains. Then, click **Create a Toolchain** button.

≡	🔹 IBM Bluemix Dev	Ops
_	Getting Started	O, Search
	Toolchains	
	Pipelines	Toolchains
	Services	

https://riptutorial.com/

#### 4.d Select Other Templates



4.e Enter desired Toolchain Name, please note this will show in your URL for API's.

≡	🔹 IBM Bluemix DevOps				С
	This toolchain has no preconfigured tools. If you are a To get started, click <b>Create</b> .	already	familia	ar with toolchains, you can set up your own toolchair	1.
	TEMPLATE INFO GIT URL GIT BRANCH			https://github.com/open-toolchain/e master	en
	Organization	•	/	Toolchain Name sample-rest-api-bluemix-toolchain	
		•	/	sample-rest-api-bluemix-toolchain	

4.f Wait for a few seconds for Bluemix to create your Toolchain. Afterwards, click Add a Tool.



#### 4.g Choose GitHub

😑 🔹 IBM Bluemix DevOps				Ca
<u>Learn More</u>		Alert Notification Never miss critical issues.		Artifactory Store build an Artifactory re Third Party
	<b>**</b>	Availability Monitoring Test, monitor, and improve your application as you build it. IBM	$\oslash$	Delivery Pip Automate yo and more.
		DevOps Insights Use analytics to determine whether to deploy. IBM Beta		Eclipse Orio A browser-ba cloud develo
	0	Git Repos and Issue Tracking IBM hosted repos and issue tracking based on GitLab IBM Experimental		GitHub Store and ma way. Third Party

4.h Now, we need to link our existing repository on GitHub to this Toolchain. Under **Repository type**, please choose **Existing**. Then, choose the correct repository URL for your Rest API source. After that, it is up to you if you want to track the changes of the repository via Toolchain. To do that please check the **Track deployment of code changes** check box.

Tool Catalog

Config	gure the In	tegration
Store your source or existing report	tHub ce code in a new sitory on d engage in social	Repository type: Existing Link to the repository that is specified in the Source repository URL fi
coding through	wikis, issue	Source repository URL:
tracking, and pull requests.		https://github.com/ariescamitan/node-api-with-express
Third Party		Track deployment of code changes
View Docs		
PROVIDER	IBM	
TOOLCHAIN	sample-rest- api-bluemix- toolchain	

4.i Now what we need is something to build and deploy our Rest API repository automatically. So we need to add another tool.

📃 🚳 IBM Bluemix DevO	ps	
← Toolchains	sample-rest-api	-bluemix-toolchain
Overview		
Connections	<ul> <li>Your toolchain is ready!</li> <li>Quick start: You can now for this toolchain.</li> </ul>	v add tool integrations. For step-by-step ins
Manage		
	THINK	CODE
	- <b></b>	_ <b></b>
	Issues node-api-with-express	GitHub node-api-with-express
	✓ Configured	✓ Configured

4.j Let's add the Delivery Pipeline



Then, name it **Build and Deploy**.

Confic	gure the In	Itegration
O De Pi	elivery Seline	Pipeline name: Build and Deploy
The Delivery Pip automates conti deployment.	peline service inuous	Show apps in the View app menu
IBM		
View Docs		
PROVIDER	IBM	
TOOLCHAIN	sample-rest- api-bluemix- toolchain	

After a few seconds, the newly added Delivery Pipeline will show up. Click it.



4.k We need to add stages to our Delivery Pipeline. Click Add Stage.

🗮 🚳 IBM Bluemix DevOps	
← Toolchain Build and Deploy   Delivery Pipeline	}
Add Stage 🕀	

4.1 Create the **Build stage** in which will automatically build our package. Follow the steps on the figure below:

≡ •	💰 ІВМ	Bluemix DevOps		Ca
		Build 1. Name it "Build".		
		INPUT JOBS ENVIRONMENT PROPERTI	ES	
		5. Click "JOBS" tab.		
		Input Settings		
		Input Type 2. Choose SCM Repository.		
		SCM Repository		
		Git Repository		
		node-api-with-express	3. Verify the Git Repository.	
		Git URL		
		https://github.com/ariescamitan/node-api-with-exp	press.git	
		Branch		
		master		
		Stage Trigger       Image: Stage Trigger         Image: Run jobs whenever a change is pushed to Git       Image: Stage is run manually         Image: Run jobs only when this stage is run manually       Image: Stage is run manually	4. Select "Run jobs whenever a change is pushed to Git.	
			SAVE	C

We need to Add a **JOB** that will run the **npm install** command.

## Build and Deploy | Stage Configuration

Build
INPUT JOBS ENVIRONMENT PROPERTIES
ADD JOB
Click "ADD JOB" above to add the first job to this stage. Jobs runs sequentially in a stage, and each job runs container environment.
SAVE

Select the **Build** option.

Ca

	Build			
	INPUT	JOBS	ENVI	RONMENT PROPERTIES
		т јов түре	:	
	Build Deploy			
c	c Test			the first job to this stage. Jobs ru

Then, select **npm** under the **Builder Type**. And then, under the **Build Shell Command** automatically configure that it will run the **npm install** command.

•	IBM Bluemix DevOps	Catalog
	Build	REMOVE
	Build Configuration	
	Builder Type	
	npm	
	Build Shell Command	
	<pre>#!/bin/bash # The default Node.js version is 0.10.40 # To use Node.js 0.12.7, uncomment the following line: #export PATH=/opt/IBM/node-v0.12/bin:\$PATH # To use Node.js 4.2.2, uncomment the following line: #export PATH=/opt/IBM/node-v4.2/bin:\$PATH npm install</pre>	
	Don't have a build script? Create a new one from a template. + ADD	
	Working Directory	
	Build Archive Directory	
	Enable Test Report	
	Run Conditions	
	Stop running this stage if this job fails	

Make sure to click **Save** button to save the changes.



4.m After creating the build stage, now we need to create the **Deploy** stage. Go and add another stage by clicking the **Add Stage**.

# Pipelines Build and Deploy | Delivery Pipeline

Build	پ ا
STAGE NO	TRUN
LAST INPUT	𝖉 Git URL
Not yet run	
JOBS	View logs and history
Build Not yet run	
LAST EXECUTION RESULT	
ALC: IN	

Follow the steps defined in the figure below:



Deploy 1	. Rename to "Deploy"	-	
INPUT JOBS	ENVIRONMENT PROPER	{TIES	
	4. Click "JOBS" tab.		
Input Settings –			
Innut Time 2 (	Choose "None"		
input type 2. C			
None			
Stage Trigger –			
Run jobs when t	the previous stage is completed	3. Leave it as is.	
<ul> <li>Run jobs only w</li> </ul>	hen this stage is run manually		
Run jobs only w	hen this stage is run manually	•	
Run jobs only w	/hen this stage is run manually		
Run jobs only w	/hen this stage is run manually		SAVE

Then, under **JOBS** tab, click **Add Job**.

Deploy
INPUT JOBS ENVIRONMENT PROPERTIES
ADD JOB
Click "ADD JOB" above to add the first job to this stage. Jobs runs sequentially in a stage, and each job runs in a clean container environment.

#### And then, select **Deploy** option.

Deploy	/	
INPUT	JOBS	ENVIRONMENT PROPERTIES
(+)		
SELEC	Т ЈОВ ТҮРЕ	
Build		
Deploy		the first is the this stars. Is he may a superior the is a stars and each is house is a stars.
cc Test		the first job to this stage. Jobs runs sequentially in a stage, and each job runs in a clean

Under **Deployer Type** select **Cloud Foundry** (IBM Bluemix default Cloud Service).

Deploy	
INPUT JOBS ENVIRONMENT PROPERTIES	
Deploy	
Deploy	REMOVE
Deploy Configuration	
Deployer Type	(i)
Cloud Foundry	•
Target	(i)
US South - https://api.ng.bluemix.net	•
Organization	(i)
	•

In this case, I selected **dev** space. For real project, you may want to select a better space that can handle your actual production usage. Afterwards, click the **Save** button.

Space	(
dev	
Application Name	(
Build and Deploy	
Deploy Script	(
#!/bin/bash cf push "\${CF_APP}" -c "node server.js"	
Run Conditions	
✓ Stop running this stage if this job fails	(
	SAVE CANCEL

4.n Now all stages are all configured. By default, all stages is in **Stop** status. We need to **Run** all our stages by clicking the **Play** like buttons.

Build	<b>1.</b> 🕟 🕸	>	Deploy 2. 🕞 🕸
STAGE RI	JNNING		STAGE NOT RUN
LAST INPUT Last commit by Ar Added MongoDB	es B. Camitan 13d ago on readme file.		INPUT No input configured
JOBS	View logs and history		JOBS View logs and history Deploy Not yet run
ۯ Build Running	۲		LAST EXECUTION RESULT
LAST EXECUTION RESULT			No results

4.0 If you see similar figure below means you successfully configured and implemented our **Continuous Deployment** of our RESTful API's via IBM Bluemix using ToolChain.

STAGE PASSED			:	STAGE PASSED
LAST INPUT	𝖉 Git URL	LAST IN	NPUT	Stage: npm install / Job: Build
Last commit by Aries B. Camitan Added MongoDB on readme file.	13d ago	盘	Build 1	- ئ
JOBS <u>View logs</u>	and history	JOBS		View logs and history
Build Passed 11d ago		$\oslash$	Deploy Pa	issed 11d ago
LAST EXECUTION RESULT		LAST E	XECUTION R	ESULT
Build 1	∙ ئ	Ħ	node-rest node-rest View runti	st-express-mongodb-a -express-mongodb-apicach me log
		盘	Build 1	. €

Try clicking the link as define above figure to see if the API is running as expected.

$\leftarrow \ \rightarrow$	C () node-rest-express-mongodb-apicache.mybluemix.net/api/rests
📙 IBM	📙 Learning 🕒 Firewall Authenticatio 🛛 🕄 Don't just blindly crea 🔞 How To El
[	
- { },	<pre>_id: "58b69aa7957c5a0528ab8fbc", name: "Virgo",v: 0</pre>
- {	_id: "58b7d844f5bc8825bcca9327", name: "Ram", v: 0
}, - { }	<pre>_id: "58b7d97b6a80521c78526505", name: "Josephine",v: 0</pre>
]	

## Step 5: Test the Rest API using PostMan

Postman is a powerful API testing tool and can be install via Google Chrome as an extension. Make sure on your testing to follow the route convention you defined on your express code. To know more how to use the Postman tool, please see the Postman Blog.

## **Disclaimer:**

I do not own any external link given in this example. Credit to those who own those links.

Read Getting started with ibm-bluemix online: https://riptutorial.com/ibmbluemix/topic/1110/getting-started-with-ibm-bluemix

# **Chapter 2: Binding**

### **Examples**

Accessing credentials through the VCAP\_SERVICES environment variable

When you bind a service to your application credentials become available through the VCAP\_SERVICES environment variable.

This environment variable contains JSON containing the credentials for all bound services.

#### Example VCAP\_SERVICES environment variable

You can then access these credentials through your application.

#### Javascript

In a Node application you could do the following:

```
var reappt_credentials = JSON.parse(process.env.VCAP_SERVICES)["push-reappt"][0].credentials;
diffusion.connect({
    host : reappt_credentials.host,
    principal : reappt_credentials.principal,
    credentials : reappt_credentials.credentials
}).then(connected, error);
```

#### Java

In a Java application the same could be done as follows:

```
private static final JsonParser PARSER = new JsonParser();
private static final JsonObject VCAP_SERVICES =
PARSER.parse(System.getenv("VCAP_SERVICES")).getAsJsonObject();
private static final JsonObject REAPPT_CREDENTIALS = VCAP_SERVICES.getAsJsonArray("push-
```

```
reappt").get(0)
         .getAsJsonObject().getAsJsonObject("credentials");
    protected static final String HOST =
REAPPT_CREDENTIALS.getAsJsonPrimitive("host").getAsString();
    protected static final String PRINCIPAL =
REAPPT_CREDENTIALS.getAsJsonPrimitive("principal").getAsString();
    protected static final String CREDENTIALS =
REAPPT_CREDENTIALS.getAsJsonPrimitive("credentials").getAsString();
```

Read Binding online: https://riptutorial.com/ibm-bluemix/topic/2542/binding

# **Chapter 3: Mobile Analytics for Bluemix**

### Introduction

Mobile Analytics service on IBM Bluemix allows you to analyze the usage of your Mobile applications. Instrument your app with the Mobile Analytics SDK and gain insights on your users, the way your app behaves and the configure alerts on specific events

### **Examples**

Getting Started with iOS Swift apps and Mobile Analytics for Bluemix

- 1. Create an instance of Mobile Analytics for Bluemix.
- 2. Add the Bluemix Mobile Services SDK to your iOS project.
- 3. After installing the SDK, add these import statements at top of your AppDelegate.swift file:

```
import BMSCore
import BMSAnalytics
```

4. Next you'll need to initialize and send mobile analytics in your didFinishLaunchingWithOptions method:

```
func application (application: UIApplication, didFinishLaunchingWithOptions launchOptions:
[NSObject: AnyObject]?) -> Bool {
   // Set api key, Bluemix region. These are available in the Mobile Analytics console
after you create an instance
   let bmixRegion=BMSClient.Region.usSouth
   //Provide a name for your app that will appear in the Mobile Analytics console.
   let appName="MyAppName"
   //Initialize Mobile Analytics in your Bluemix region
   BMSClient.sharedInstance.initialize(bluemixRegion: bmixRegion)
   Analytics.initialize(appName: appName, apiKey: api_key, hasUserContext: false,
deviceEvents: DeviceEvent.LIFECYCLE)
  //Send analytics
  //Analytics.send()
  //Alternately send analytics and log to your xCode console
  Analytics.send { (response: Response?, error: NSError?) in
    if response?.statusCode == 201 {
       print("Successfully sent analytics: \(response?.responseText)")
    }
    else {
       print("Failed to send analytics: \(response?.responseText). Error:
\(error?.localizedDescription)")
    }
   }
```

```
return true }
```

- 5. Add Analytics.send() into your app code everywhere you want the analytics stored in the app to be sent to the Mobile Analytics for Bluemix service.
- 6. Run your app. You will see a new user and a new session in your analytics console.

Read Mobile Analytics for Bluemix online: https://riptutorial.com/ibm-bluemix/topic/6680/mobileanalytics-for-bluemix

# Credits

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