

Building a Cloud Application on IBM Bluemix(PaaS)

DS '17 Hands-On Cloud Lab

Manasa Sutapalli

Lead Researcher (MIL) – IoT/Cloud Apps
Miracle Software Systems, Inc.

December 6th, 2017

Building a Cloud Application on IBM Bluemix(PaaS)

Goal

In this lab we will be creating a sample node application and will then deploy this application to IBM Bluemix by using the Cloud Foundry CLI.

Pre-Requisites

You will need the following to complete this lab successfully,

- Active email ID for registering with Bluemix
- Download and Install Node JS
- Test Editor such as Sublime Text (or) Notepad ++

Technology Involved

- Server Side – Node JS
- Client Side Technologies (HTML,CSS, Bootstrap)
- Cloud Foundry CLI(Open PaaS)
- IBM Bluemix(PaaS)

Labs Steps

So, let us get started with the application!

1 | Let's Start Coding

Create a folder in your machine and name it as **DS'17-CloudLab**.

Create the following files in your app directory, and add the given code. These files will form the base of your application.

- **index.html** : Your web page entry point
- **app.js** : Your Node JS Server file that will use Express to serve the index.html page

index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <!-- Theme Made By www.w3schools.com - No Copyright -->
  <title>Bootstrap Theme Simply Me</title>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <link                                rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css"
>
  <link                                href="https://fonts.googleapis.com/css?family=Montserrat"
rel="stylesheet">
  <script
src="https://ajax.googleapis.com/ajax/libs/jquery/3.2.1/jquery.min.js"></script>
  <script
src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"></s
cript>
  <style>
  body {
    font: 20px Montserrat, sans-serif;
    line-height: 1.8;
    background-color:black;
  }

  .container-fluid {
    padding-top: 130px;
```

```
padding-bottom: 70px;
}

img{
  vertical-align: middle;
  margin-top: 50px;
}
</style>
</head>
<body>
<div class="container-fluid bg-3 text-center">
  <br><br>
  <h2 style="color:#fff">Hello World Cloud Application Lab</h2>
</div>
</body>
</html>
```

app.js

```
var express = require('express'); //requiring express library
var app = express();
var path = require('path');
var port = process.env.PORT || 3000;
var host = process.env.HOST || 'localhost' ;

//serving static files in express
app.use('/', express.static(path.join(__dirname, 'public')))

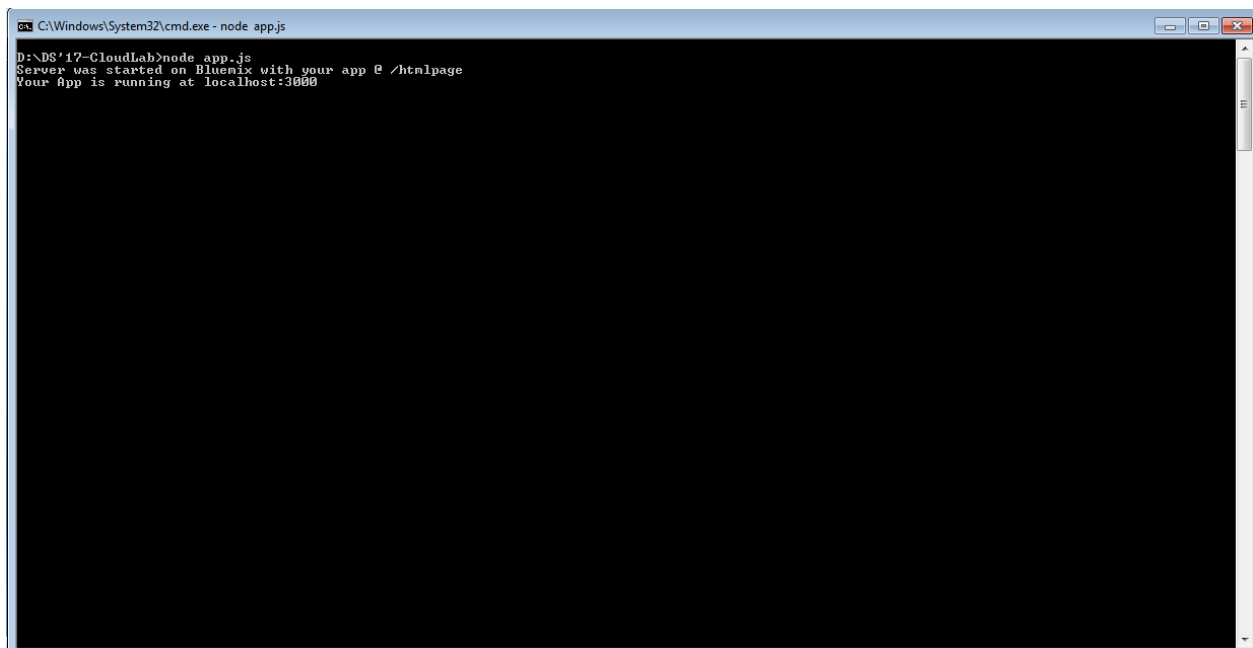
//creating a route to serve html file
app.get("/htmlpage",function(req,res){
  res.sendFile(__dirname + "/public/" + "index.html");
```

```
});
```

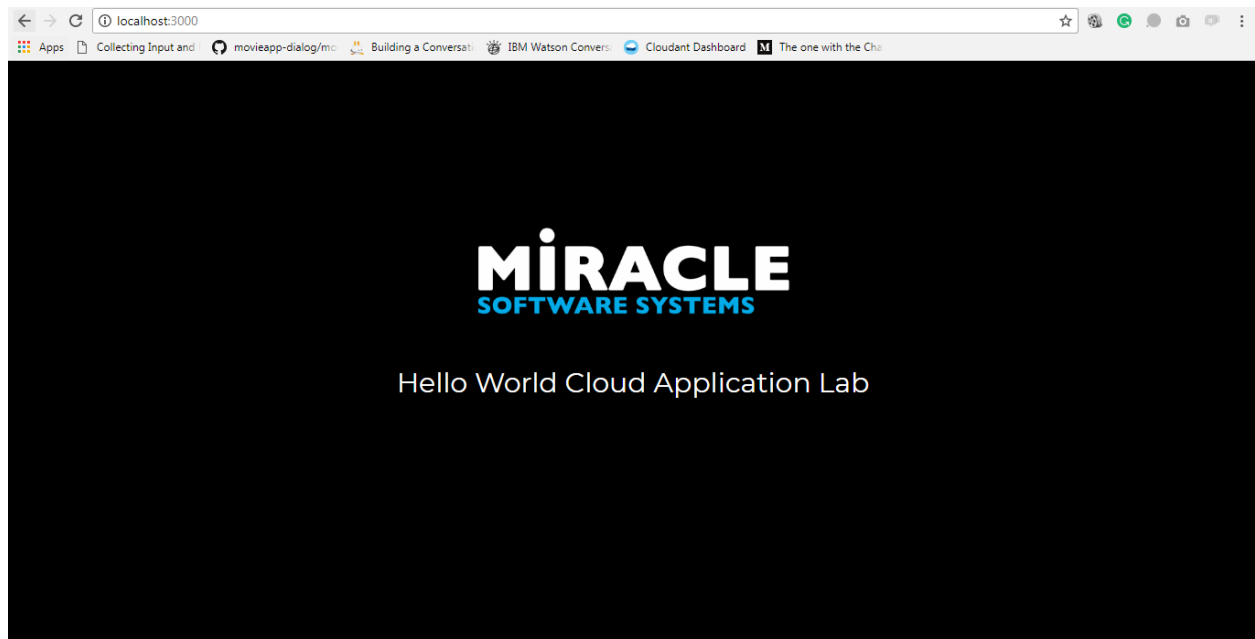
```
//creating server  
app.listen(port, function(){  
  console.log("Server was started on Bluemix with your app @ /htmlpage");  
  console.log("Your App is running at "+host+": "+port);  
});
```

#2 | Testing the application locally

You can run your application from the terminal with the **node app.js** command.

A screenshot of a Windows command prompt window. The title bar reads "C:\Windows\System32\cmd.exe - node app.js". The command prompt shows the following text:
D:\DS'17-CloudLab>node app.js
Server was started on Bluemix with your app @ /htmlpage
Your App is running at localhost:3000
The rest of the terminal window is black.

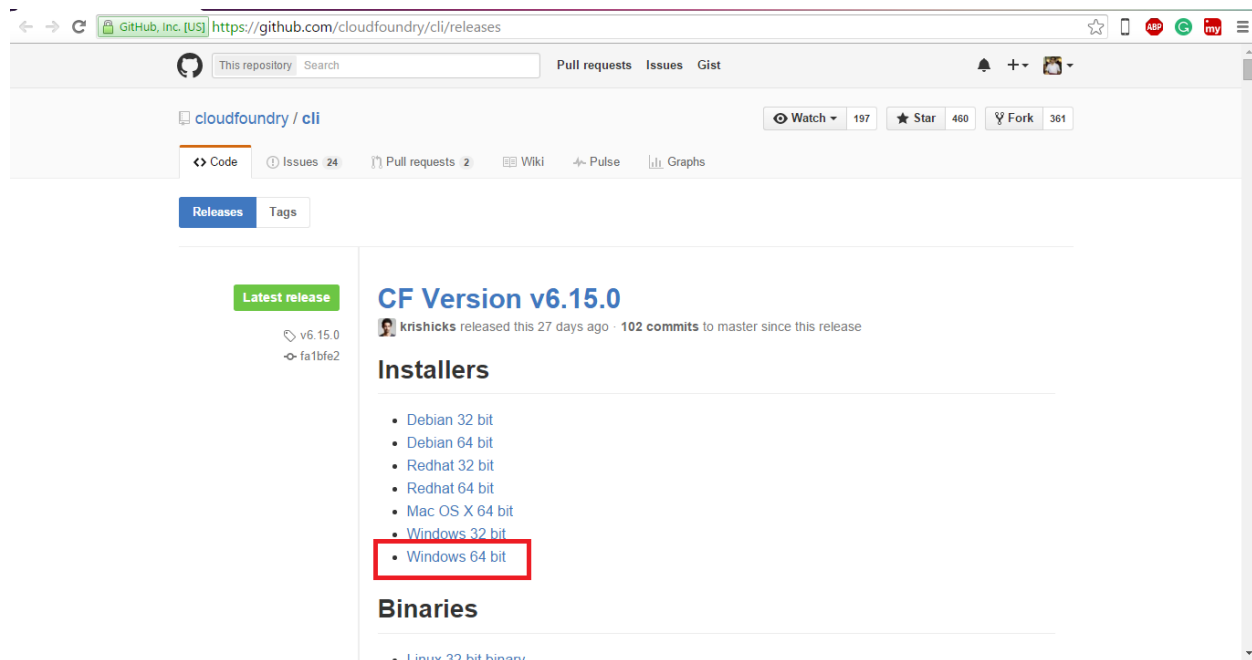
Test your application in Browser using, <http://localhost:3000>



#3 | Download and Install Cloud Foundry

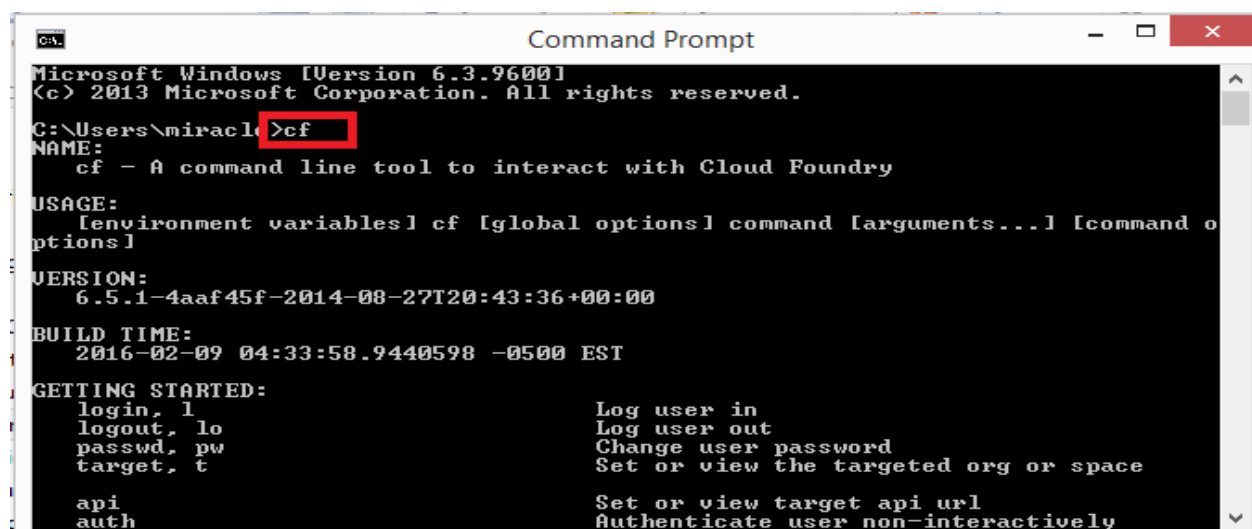
At this point you will be asked how you want to start coding your application. For this lab, we will be using the **Cloud Foundry (CF) CLI** option.

Open this link for installing and downloading,
<https://github.com/cloudfoundry/cli>



Then you will get a zip file. After extracting the zip file, you can find a .exe file inside. Install it.

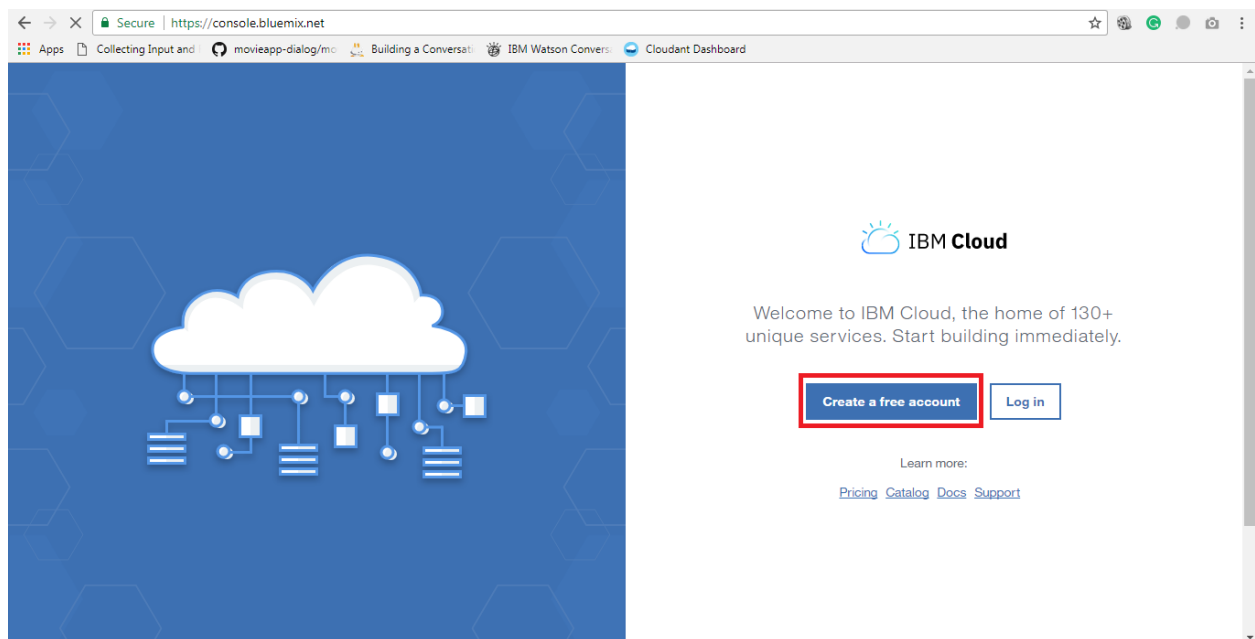
To check whether CF is installed properly or not, open command prompt and execute CF command. Then it will show you a set of CF commands, which indicates that CF is successfully installed on your machine.



#4 | Creating IBM Bluemix account

The first step will be to make sure that we have access to the IBM Bluemix Console with either the free trial option (or) the paid subscription option.

Login to Bluemix at <http://bluemix.net> (or) Register today at <https://console.ng.bluemix.net/registration/>



Click on Create a free account, and the fields as required.



Sign up for an IBMid and create your IBM Cloud account

Build on IBM Cloud for free with no time restrictions

Guaranteed free development with Lite plans

Develop worry-free and at no cost with cap based Lite plan services for as long as you like.

Start on your projects right away

Skip entering your credit card info and get working in just a few short steps.

Get \$200 on us to try paid services

Ease into cloud pricing or try something new with \$200 in credit available for 1 month upon upgrade.

Ready to get started? Sign up today!



Sign up for an IBMid and create your IBM Cloud account

Build on IBM Cloud for free with no time restrictions

Guaranteed free development with Lite plans

Develop worry-free and at no cost with cap based Lite plan services for as long as you like.

Start on your projects right away

Skip entering your credit card info and get working in just a few short steps.

Get \$200 on us to try paid services

Ease into cloud pricing or try something new with \$200 in credit available for 1 month upon upgrade.

Ready to get started? Sign up today!

Already have an IBM Cloud account? [Log in](#)

Email*

*Enter an email address.

First Name*

Last Name*

Company

Country or Region*

United States

Phone Number*



MIRACLE SOFTWARE SYSTEMS

Country or Region*

United States

Phone Number*

9493415290

Password*



Keep me informed of products, services, and offerings from IBM companies worldwide.

☒ By email ☐ By telephone

By clicking Create Account, I accept the [IBM Cloud privacy policy](#) and [IBM Cloud terms](#).

Create Account



After Clicking on "**Create Account**", confirmation mail will be sent to the registered mail id. Click on Confirm account and then Login to your Bluemix account.

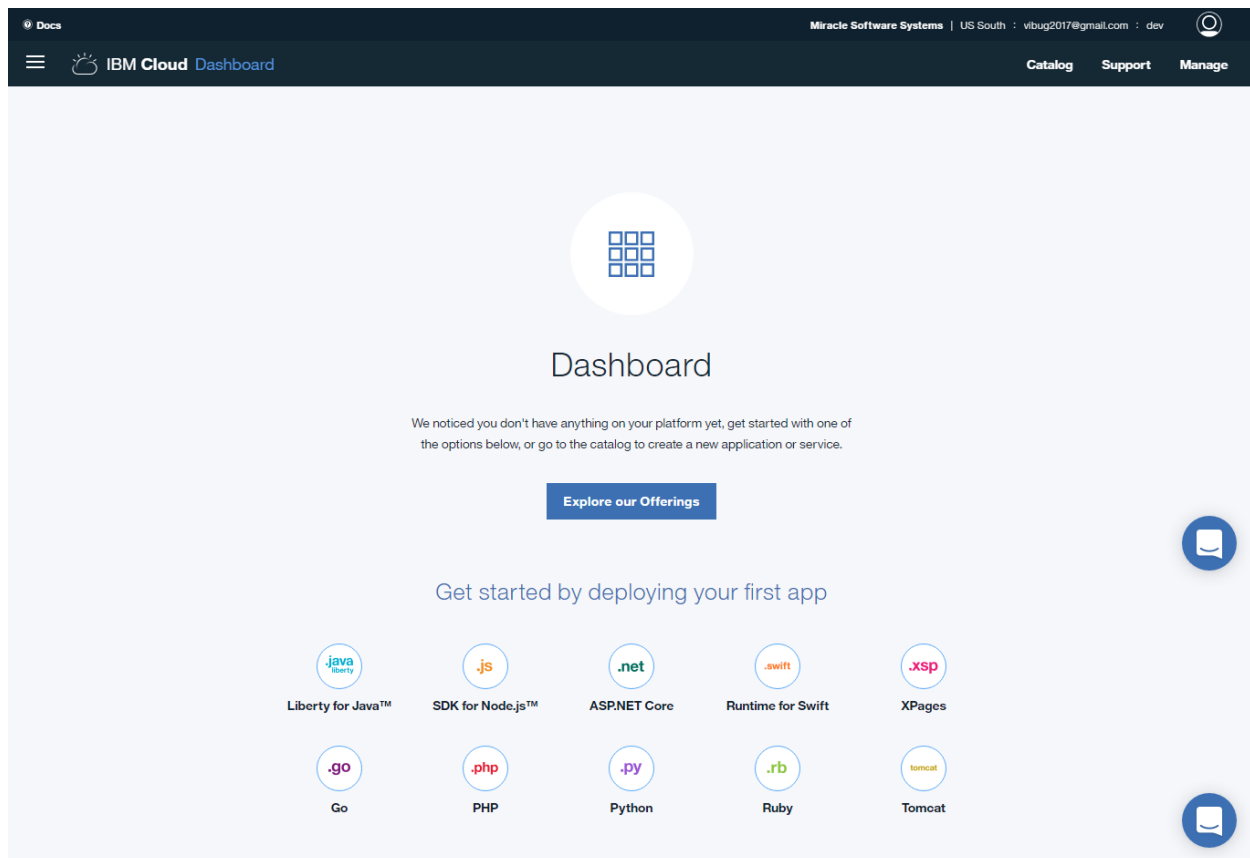
Log into IBM Cloud

Enter Email or IBMid: [Forgot your IBMid?](#)

Continue

New? [Create an IBM Cloud account](#)

After you login, you can see the dashboard where you can take a look at your applications and services.



The screenshot shows the IBM Cloud Dashboard interface. At the top, there's a dark blue header with 'Docs' on the left, 'Miracle Software Systems | US South : vbug2017@gmail.com : dev' in the center, and a user icon on the right. Below the header, a navigation bar contains a hamburger menu, the 'IBM Cloud Dashboard' title, and links for 'Catalog', 'Support', and 'Manage'. The main content area has a large circular icon with a grid pattern and the word 'Dashboard' below it. A message states: 'We noticed you don't have anything on your platform yet, get started with one of the options below, or go to the catalog to create a new application or service.' Below this is a blue button labeled 'Explore our Offerings'. Further down, a section titled 'Get started by deploying your first app' displays ten technology icons in a 2x5 grid: Liberty for Java™ (.java), SDK for Node.js™ (.js), ASP.NET Core (.net), Runtime for Swift (.swift), XPages (.xsp), Go (.go), PHP (.php), Python (.py), Ruby (.rb), and Tomcat (tomcat). On the right side of the dashboard, there are two blue circular chat icons.

The next step will be to take your application and deploy it back to Bluemix so that you can share it with your friends.

#5 | Creating IBM Bluemix account

Add manifest file, for pushing the application to IBM Bluemix.

applications:

- path: .

memory: 256M

instances: 1

domain: mybluemix.net

name: Node JS-cloudlab

host: Node JS-cloudlab

disk_quota: 1024M

Name the file as manifest.yml and save in the same folder.

Open the **Command Prompt** and go to the location where you have your workspace. Then, connect to Bluemix using one of the following commands (Depends on which region you selected in your profile).

For Sydney: cf api <https://api.au-syd.bluemix.net>

For US South: cf api <https://api.ng.bluemix.net>

For United Kingdom: cf api <https://api.eu-gb.bluemix.net>

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

D:\DS'17-CloudLab>cf api https://api.ng.bluemix.net
```

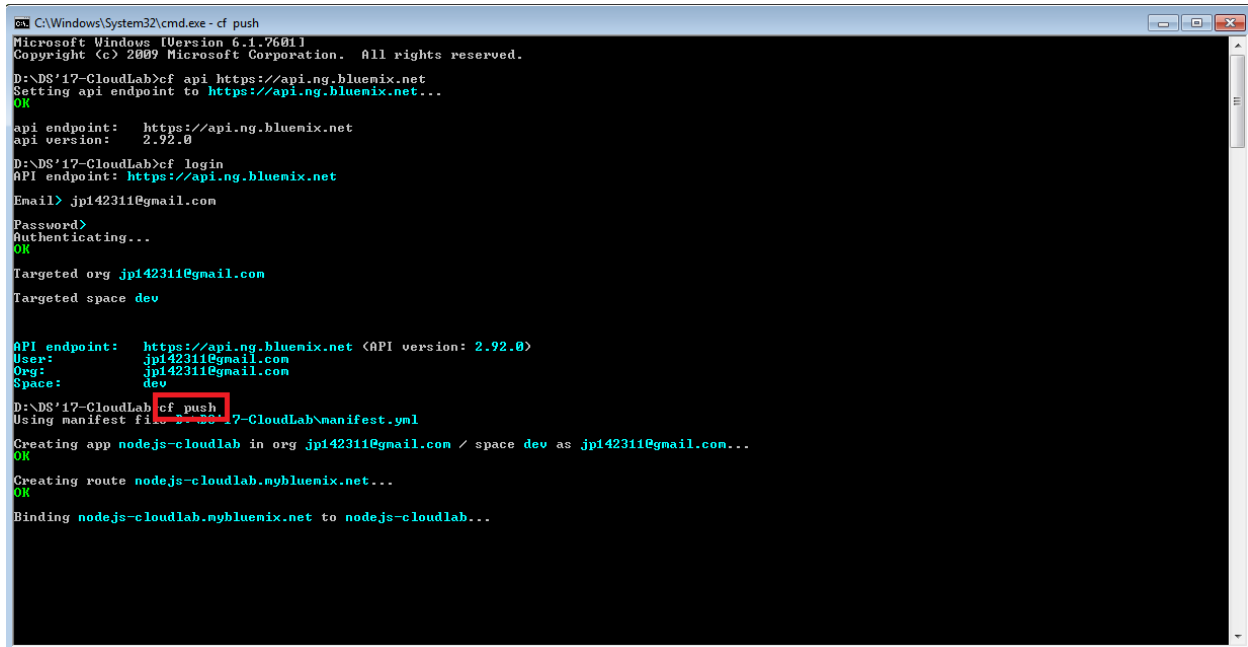
Login to Bluemix using the **cf login** command, and when prompted enter your user ID and password to login.

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

D:\DS'17-CloudLab>cf api https://api.ng.bluemix.net
Setting api endpoint to https://api.ng.bluemix.net...
OK
api endpoint: https://api.ng.bluemix.net
api version: 2.92.0
D:\DS'17-CloudLab>cf login
API endpoint: https://api.ng.bluemix.net
Email> jpi42311@gmail.com
Password>
Authenticating...
OK
Targeted org jpi42311@gmail.com
Targeted space dev

API endpoint: https://api.ng.bluemix.net (API version: 2.92.0)
User: jpi42311@gmail.com
Org: jpi42311@gmail.com
Space: dev
D:\DS'17-CloudLab>
```

Make sure that you are within your application's directory and use the **cf push** command to push your application to your Bluemix Organization.



```
C:\Windows\System32\cmd.exe - cf push
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

D:\DS'17-CloudLab>cf api https://api.ng.bluemix.net
Setting api endpoint to https://api.ng.bluemix.net...
OK
api endpoint: https://api.ng.bluemix.net
api version: 2.92.0

D:\DS'17-CloudLab>cf login
API endpoint: https://api.ng.bluemix.net
Email> jpi42311@gmail.com
Password>
Authenticating...
OK
Targeted org jpi42311@gmail.com
Targeted space dev

API endpoint: https://api.ng.bluemix.net (API version: 2.92.0)
User: jpi42311@gmail.com
Org: jpi42311@gmail.com
Space: dev
D:\DS'17-CloudLab>cf push
Using manifest file D:\DS'17-CloudLab\manifest.yml
Creating app nodejs-cloudlab in org jpi42311@gmail.com / space dev as jpi42311@gmail.com...
OK
Creating route nodejs-cloudlab.mybluemix.net...
OK
Binding nodejs-cloudlab.mybluemix.net to nodejs-cloudlab...
```

Note: This process might take around 3 to 5 minutes for completion

Once your application is pushed, your Command Prompt should look as shown below,

```
C:\Windows\System32\cmd.exe
etage1.8.1
finalhandler1.1.0
  unpipe1.0.0
fresh0.5.2
methods1.1.2
  on-finished2.3.0
    ee-first1.1.1
  parseurl1.3.2
    proxy-addr2.0.2
      qs6.5.1
        safe-buffer5.1.1
      send0.16.1
        destroy1.0.4
      serve-static1.13.1
        setprototypeof1.1.0
        type-is1.6.15
        utils-merge1.0.1
-----> Installing App Management
-----> Caching build
      Clearing previous node cache
      Saving 2 cacheDirectories (default):
        - node_modules
        - bower_components (nothing to cache)
-----> Build succeeded!

1 of 1 instances running
App started

OK

App nodejs-cloudlab was started using this command './vendor/initial_startup.rb'
Showing health and status for app nodejs-cloudlab in org jp14231@gmail.com / space dev as jp14231@gmail.com...
OK

requested state: started
instances: 1/1
usage: 256M x 1 instances
urls: nodejs-cloudlab.mybluemix.net
last uploaded: Wed Dec 6 19:25:20 UTC 2017
stack: cflinuxfs2
buildpack: SDK for Node.js(TM) <ibm-node.js-6.11.4, buildpack-v3.15-20171024-1528>

#0 state since cpu memory disk details
running 2017-12-06 01:26:12 PM 0.2% 46.6M of 256M 76M of 1G
D:\DS'17-CloudLab>
```

Now, you can go back to your Bluemix account in the browser and access your applications URL through **Dashboard->Application Overview->Application URL**. Your very own application, that you created and deployed in IBM Bluemix, should now be available as shown below!

