Introduction to IBM Cloud Continuous Delivery and toolchains

Overview

In this lab, you will see how to deploy and manage the sample application in IBM Cloud using a continuous delivery methodology. You will learn how Continuous Delivery toolchains can be used to manage an application in an automated manner as you edit the application code, test changes and then commit them to a repository.

Prerequisites

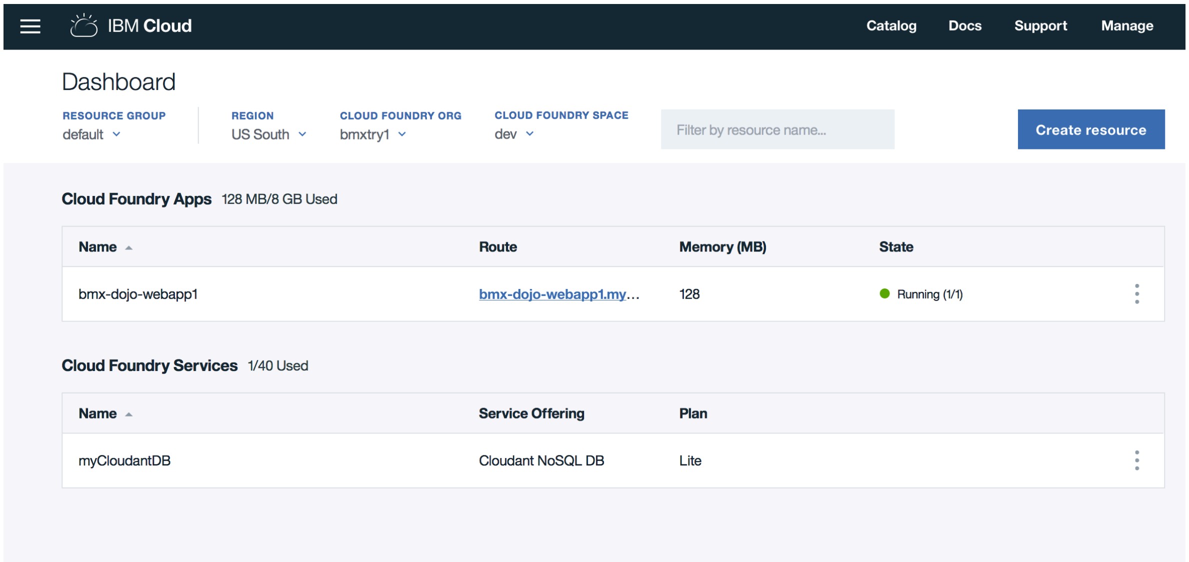
You need the following software:

- Internet Explorer, Safari, Firefox, or Chrome web browser

Section 1. Create the application using a toolchain

In this lab section, you'll get started creating a toolchain automatically from an existing GitHub repository. This repository has a **Deploy to IBM Cloud** button that will automatically create a continuous delivery toolchain, fork a copy of the application to your own code repository, and run the delivery pipeline in the toolchain to deploy the application.

1. In a web browser open the IBM Cloud console:
    - https://console.bluemix.net/: This link should take you to your default region.
2. Click **Log In** and then enter your login information on the IBM id page and click **Sign in**. You will see your dashboard view.



Dashboard

RESOURCE GROUP: default
REGION: US South
CLOUD FOUNDRY ORG: bmxtry1
CLOUD FOUNDRY SPACE: dev

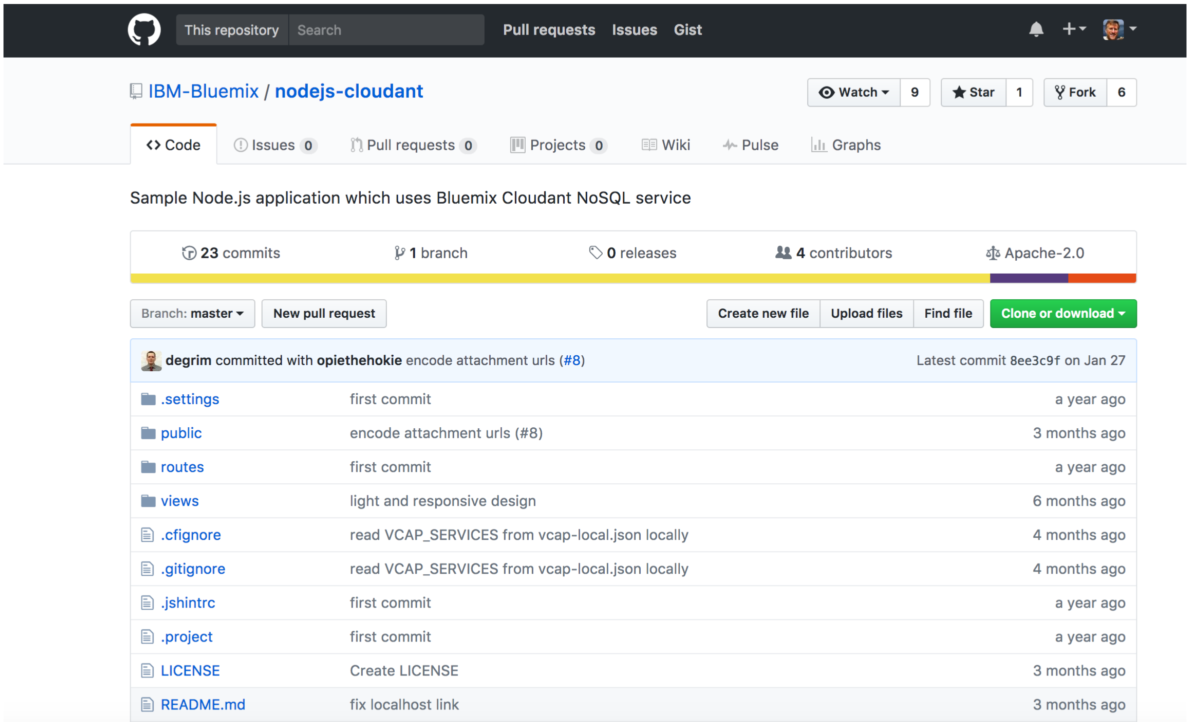
Cloud Foundry Apps 128 MB/8 GB Used

Name	Route	Memory (MB)	State
bmx-dojo-webapp1	bmx-dojo-webapp1.my...	128	● Running (1/1)

Cloud Foundry Services 1/40 Used

Name	Service Offering	Plan
myCloudantDB	Cloudant NoSQL DB	Lite

3. In another browser tab, open the sample application GitHub repository at http://github.com/IBM-Bluemix/nodejs-cloudant .



IBM-Bluemix / nodejs-cloudant

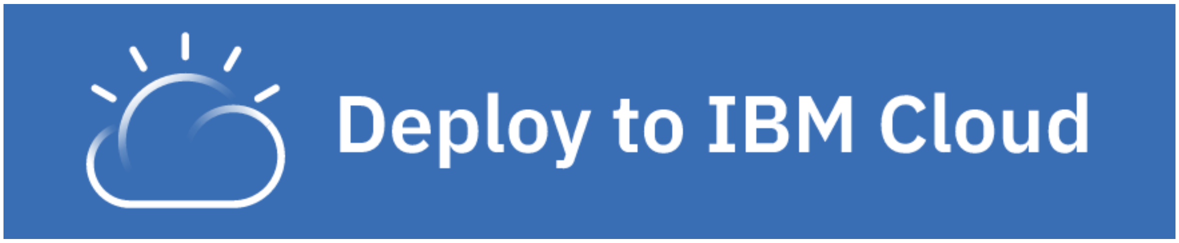
Sample Node.js application which uses Bluemix Cloudant NoSQL service

23 commits · 1 branch · 0 releases · 4 contributors · Apache-2.0

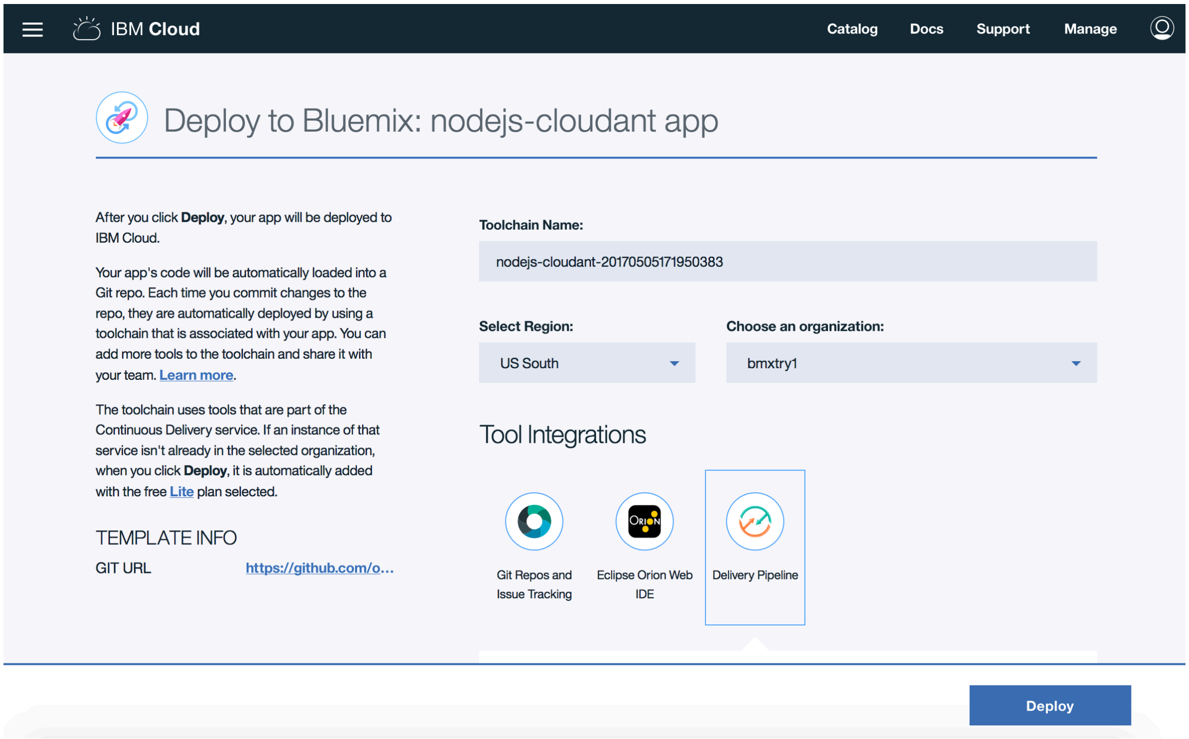
degrim committed with opiethehokie encode attachment urls (#8) — Latest commit 8ee3c9f on Jan 27

.settings	first commit	a year ago
public	encode attachment urls (#8)	3 months ago
routes	first commit	a year ago
views	light and responsive design	6 months ago
.cfignore	read VCAP_SERVICES from vcap-local.json locally	4 months ago
.gitignore	read VCAP_SERVICES from vcap-local.json locally	4 months ago
.jshintrc	first commit	a year ago
.project	first commit	a year ago
LICENSE	Create LICENSE	3 months ago
README.md	fix localhost link	3 months ago

4. Scroll down on the page and click on the **Deploy to IBM Cloud** button.



5. The toolchain creation page for your new application will be shown with the Delivery Pipeline options. These options include region, organization, space, and an app name based on the repository name.



Deploy to Bluemix: nodejs-cloudant app

After you click **Deploy**, your app will be deployed to IBM Cloud.

Your app's code will be automatically loaded into a Git repo. Each time you commit changes to the repo, they are automatically deployed by using a toolchain that is associated with your app. You can add more tools to the toolchain and share it with your team. Learn more.

The toolchain uses tools that are part of the Continuous Delivery service. If an instance of that service isn't already in the selected organization, when you click **Deploy**, it is automatically added with the free Lite plan selected.

TEMPLATE INFO

GIT URL https://github.com/o...

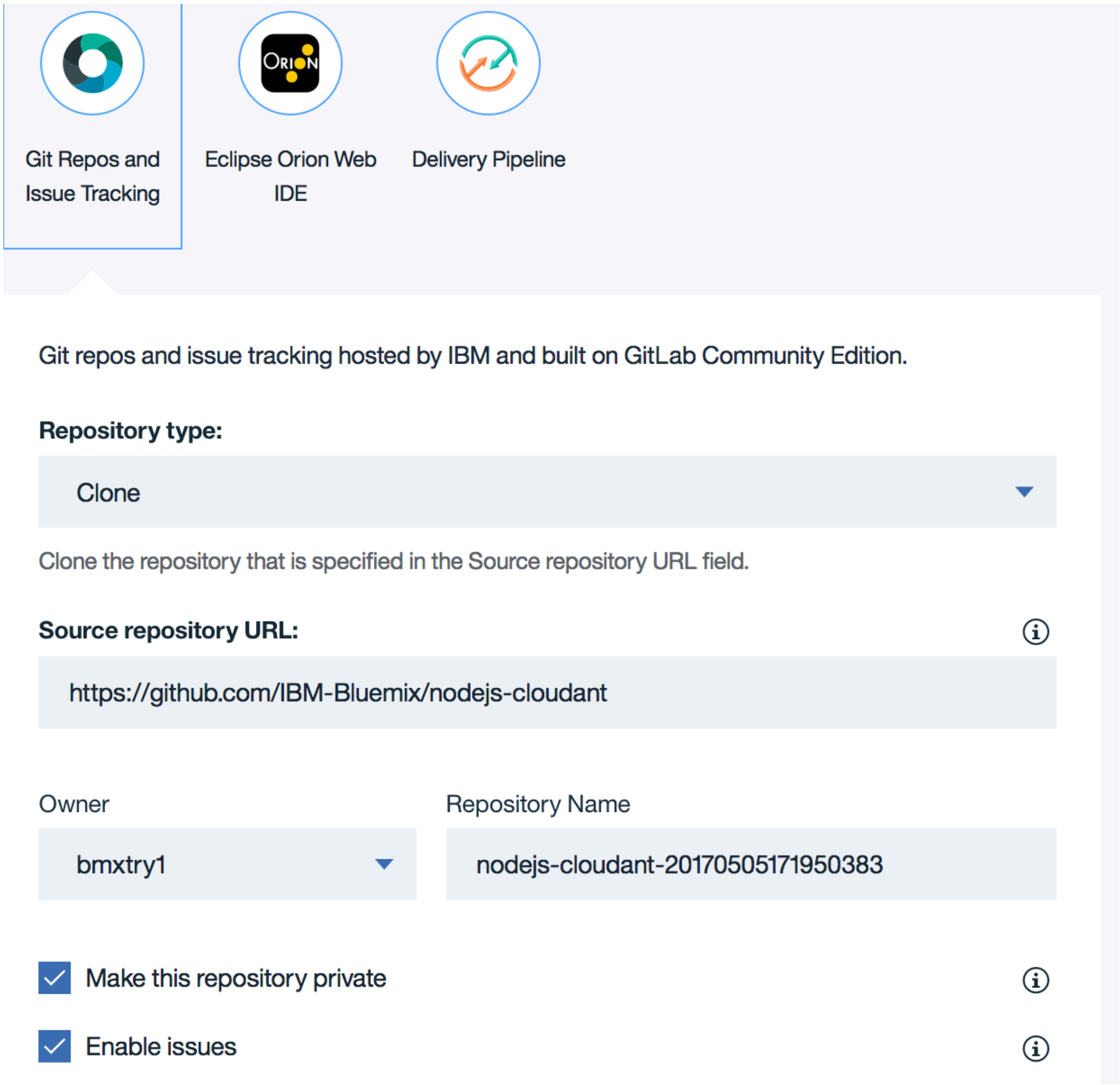
Toolchain Name: nodejs-cloudant-20170505171950383

Select Region: US South

Choose an organization: bmxtry1

Tool Integrations

Select the US South region from the pulldown. Then, click on the **Git Repos and Issue Tracking** icon. When using the **Deploy to IBM Cloud** button a source code repository hosted by IBM on GitLab Community Edition is used. The panel shows the action to take (fork, clone, existing) for creating the repository for the toolchain and the source repository.



Git repos and issue tracking hosted by IBM and built on GitLab Community Edition.

Repository type:

Clone

Clone the repository that is specified in the Source repository URL field.

Source repository URL:

https://github.com/IBM-Bluemix/nodejs-cloudant

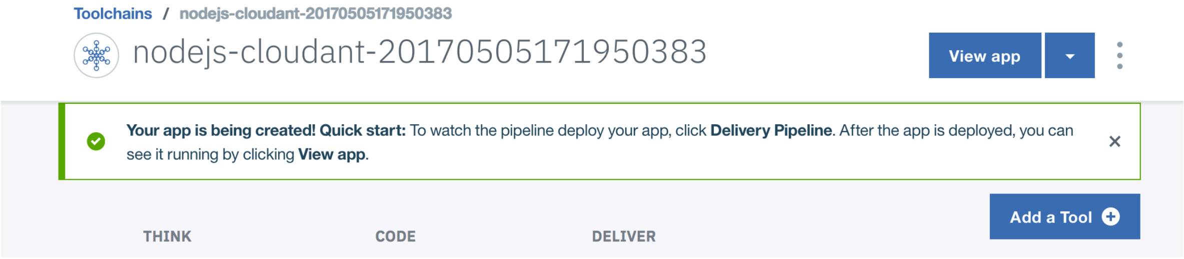
Owner: bmxtry1

Repository Name: nodejs-cloudant-20170505171950383

☑ Make this repository private

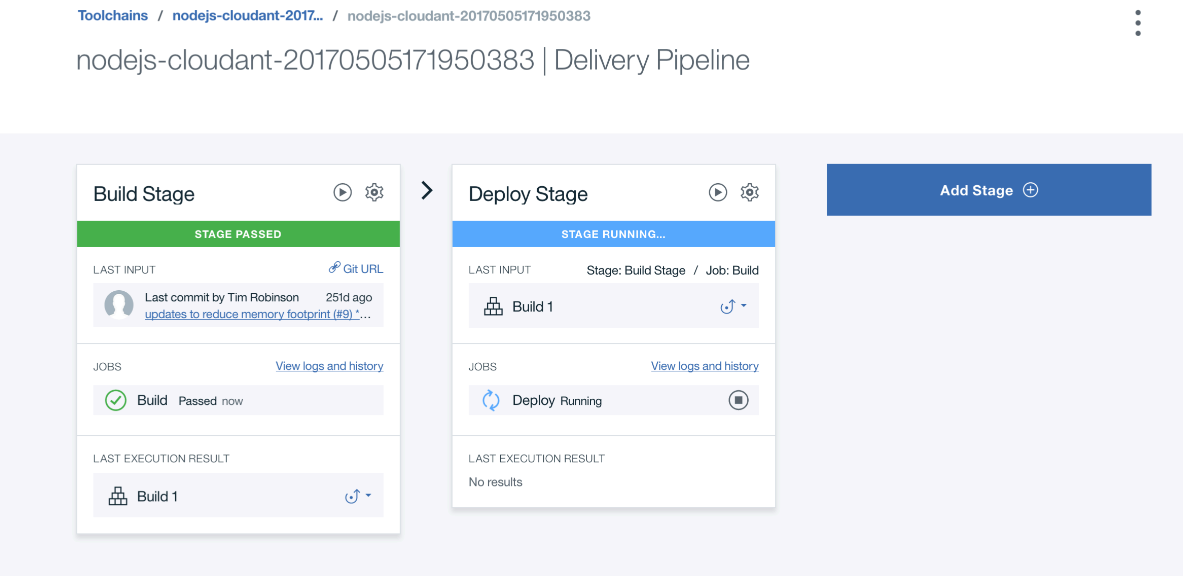
☑ Enable issues

6. Click on the **Delivery Pipeline** icon and change the application name to match the name you were using for the previous deployments, or any new name with your initials and the date to make it unique. Then click on the **Deploy** button.
7. A confirmation display will appear.


Toolchains / nodejs-cloudant-20170505171950383
nodejs-cloudant-20170505171950383
View app
Add a Tool
THINK
CODE
DELIVER

Your app is being created! Quick start: To watch the pipeline deploy your app, click **Delivery Pipeline**. After the app is deployed, you can see it running by clicking **View app**.

8. Click on the icon for **Delivery Pipeline**. Depending on how quickly you do this, you might be able to see the Deploy stage still running. If it is, open the **View logs and history** link to follow along with the deployment (use the browser back button to get back to the stage view).

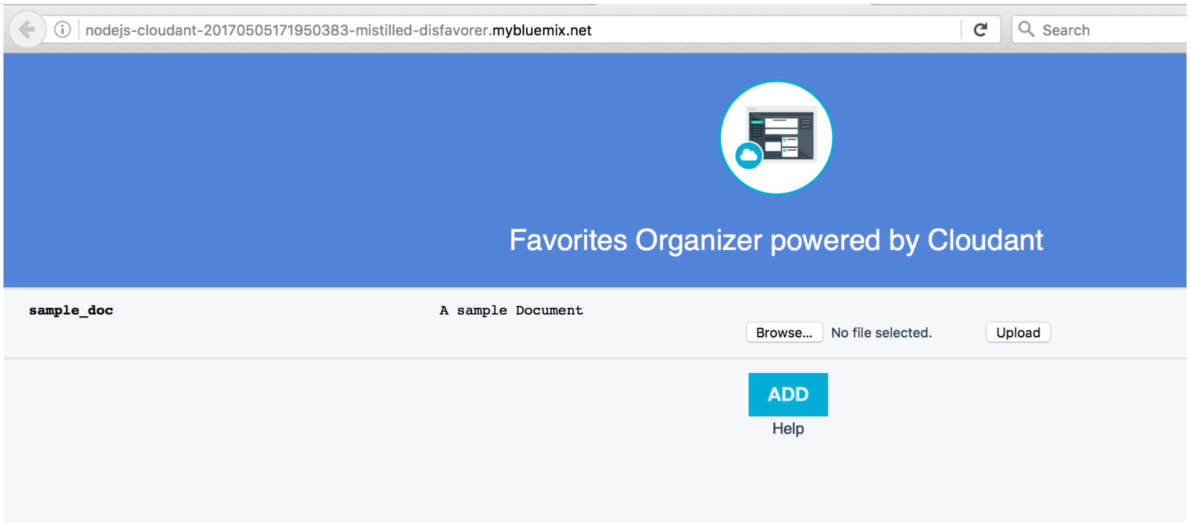


Toolchains / nodejs-cloudant-2017... / nodejs-cloudant-20170505171950383

nodejs-cloudant-20170505171950383 | Delivery Pipeline

If the deployment has completed, both stages will have green bars at the top.

If you see in the **Deploy Stage** under the JOBS list that the **Deploy** job has a status of "Passed", the application has successfully deployed. Click on the link below the application name to open the application.



nodejs-cloudant-20170505171950383-mistilled-disfavorer.mybluemix.net

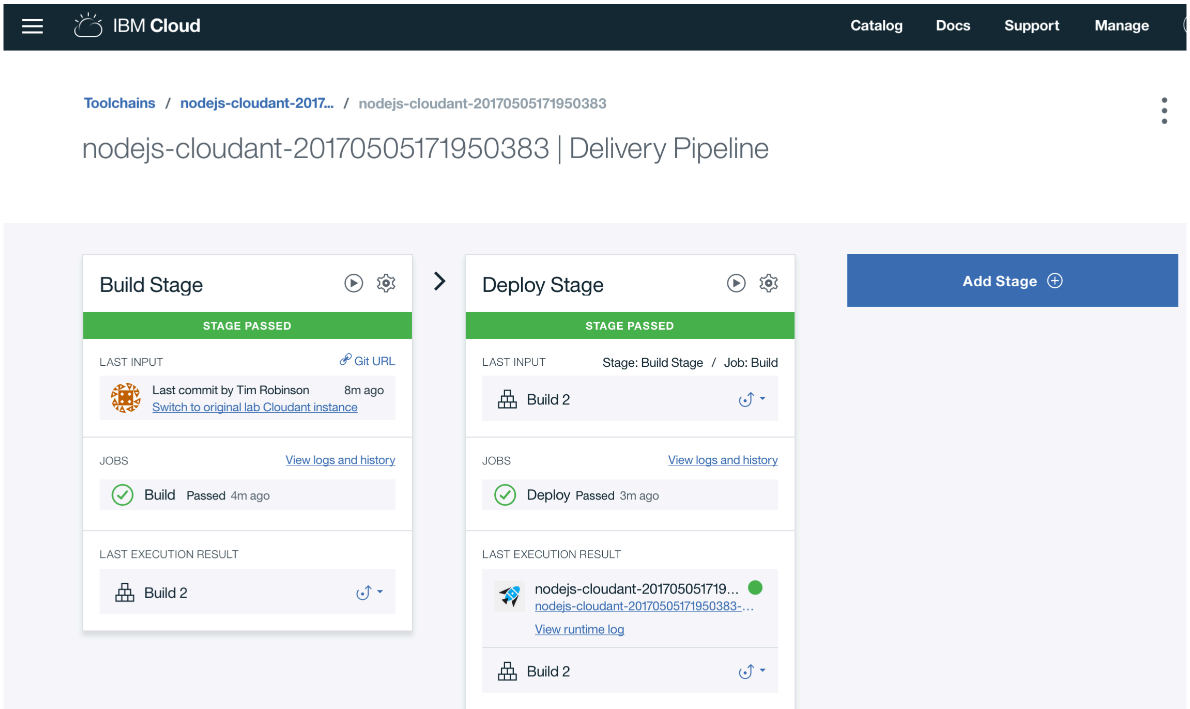
Summary

You've now added the sample application using the Continuous Delivery toolchain feature of IBM Cloud. Now let's put the toolchain to work.

Section 2. Working with the Delivery Pipeline

You saw in the second lab with the Cloud Foundry CLI how when an application is pushed to Cloud Foundry, it is temporarily unavailable. In this lab, you will see how to fix this by modifying the default deployment script in Delivery Pipeline.

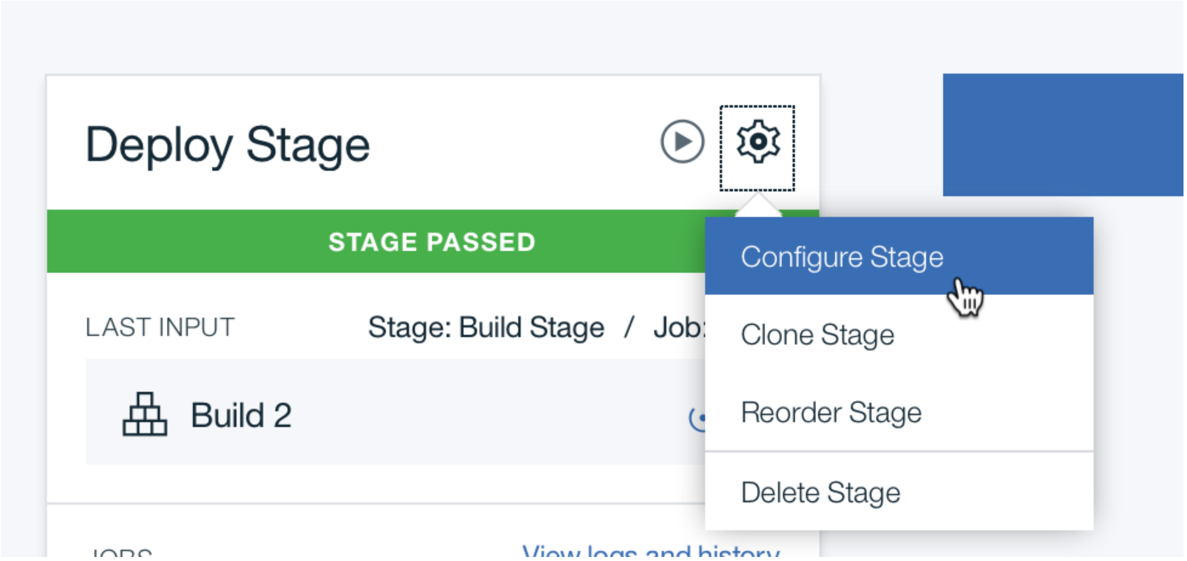
1. From the IBM Cloud App dashboard, click on the hamburger (three lines) menu, and select **Services** and then **DevOps** from the drop-down items. Select your toolchain to get the toolchain **Overview**, and then click on the icon for **Delivery Pipeline**.


IBM Cloud
Catalog
Docs
Support
Manage
Toolchains / nodejs-cloudant-2017... / nodejs-cloudant-20170505171950383
nodejs-cloudant-20170505171950383 | Delivery Pipeline
Build Stage
STAGE PASSED
LAST INPUT
Git URL
Last commit by Tim Robinson 8m ago
Switch to original lab Cloudant instance
JOBS
View logs and history
Build Passed 4m ago
LAST EXECUTION RESULT
Build 2
Deploy Stage
STAGE PASSED
LAST INPUT
Stage: Build Stage / Job: Build
Build 2
JOBS
View logs and history
Deploy Passed 3m ago
LAST EXECUTION RESULT
nodejs-cloudant-201705051719...
nodejs-cloudant-20170505171950383-...
View runtime log
Build 2
Add Stage

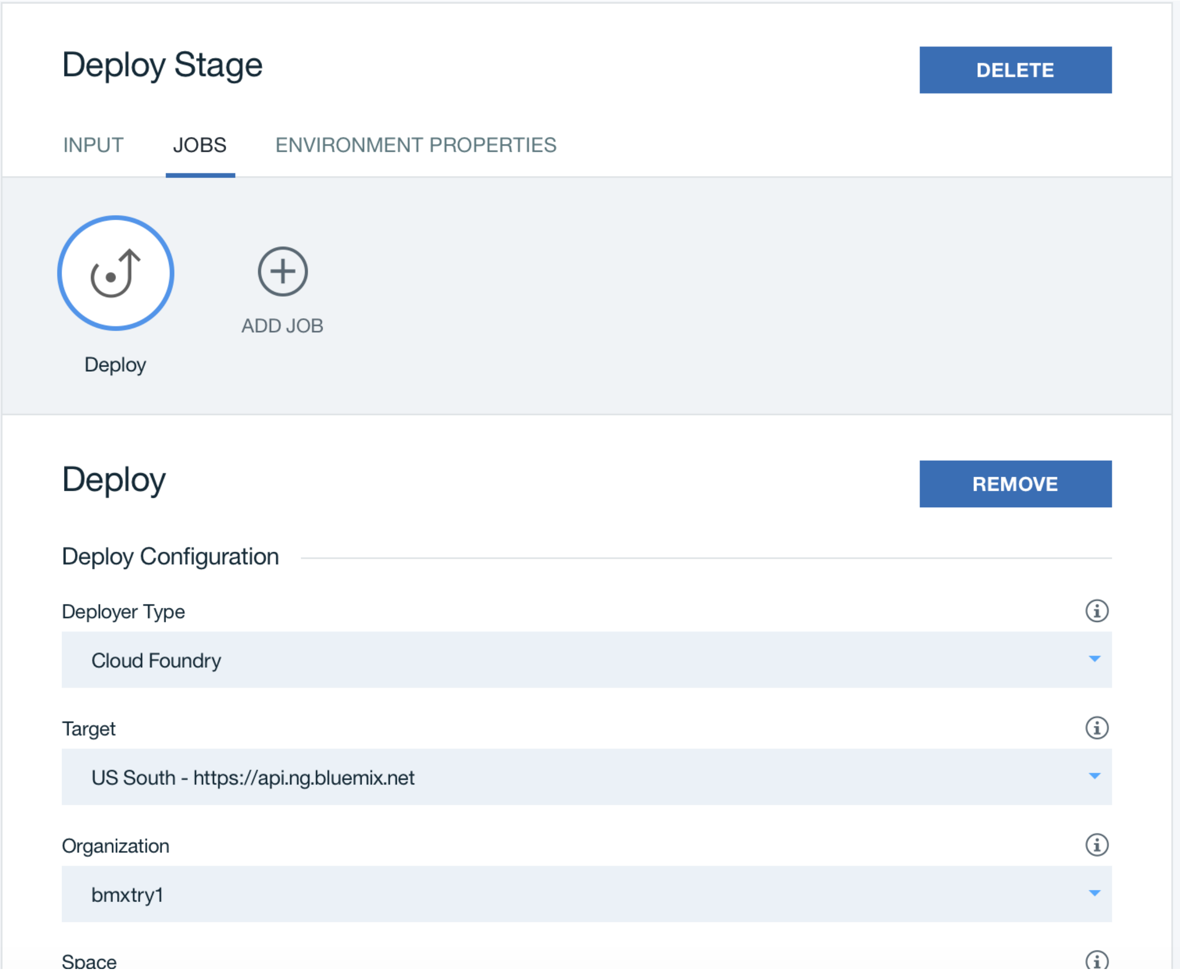
This simple pipeline has two stages, a Build stage that runs a build job based on commits to a source code repository, and a Deploy stage that has a deploy job which takes the build artifacts and deploys them as a Cloud Foundry application.

> There's one more type of job (besides build and deploy) that can be configured in a stage and that is a test job. You won't need one of those today, but test jobs can be used, as you might expect, to run code tests, or test an application deployed to a staging environment before continuing to run later stages that would deploy to production.

2. To modify the deploy job script in the Deploy stage, click on the settings icon in the upper right corner of the stage and select **Configure Stage**.



3. This defaults to the **Jobs** panel. This stage has a single job called deploy and the details of the job are shown.



Deploy Stage

Deploy

Deploy Configuration

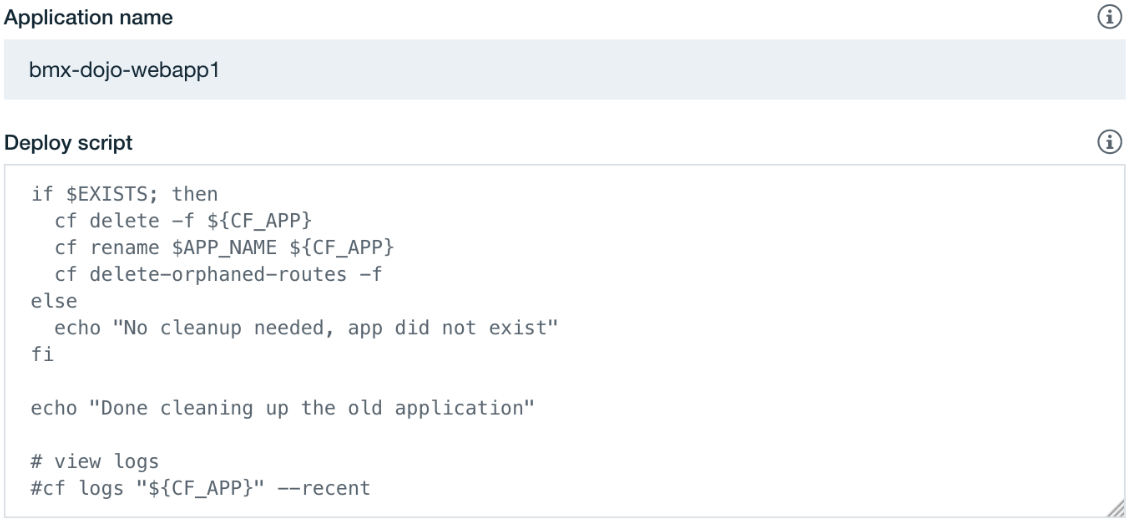
Deployer Type: Cloud Foundry

Target: US South - https://api.ng.bluemix.net

Organization: bmxtry1

Space

4. You will keep the Cloud Foundry deployer type, and just replace the default deployment script. Download the blue-green.sh script and then paste it into the Deploy script box.



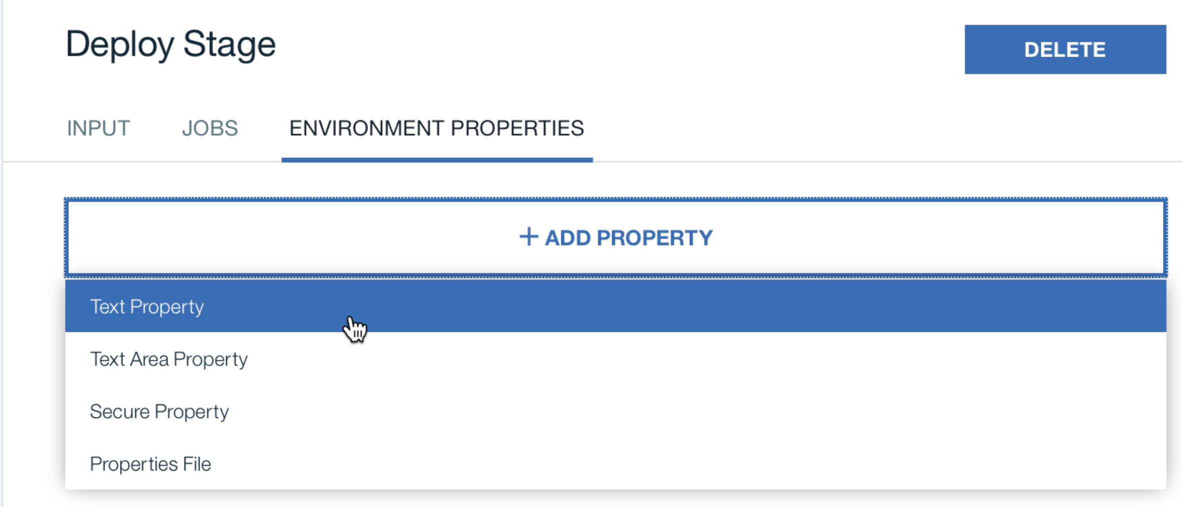
Application name: bmx-dojo-webapp1

Deploy script

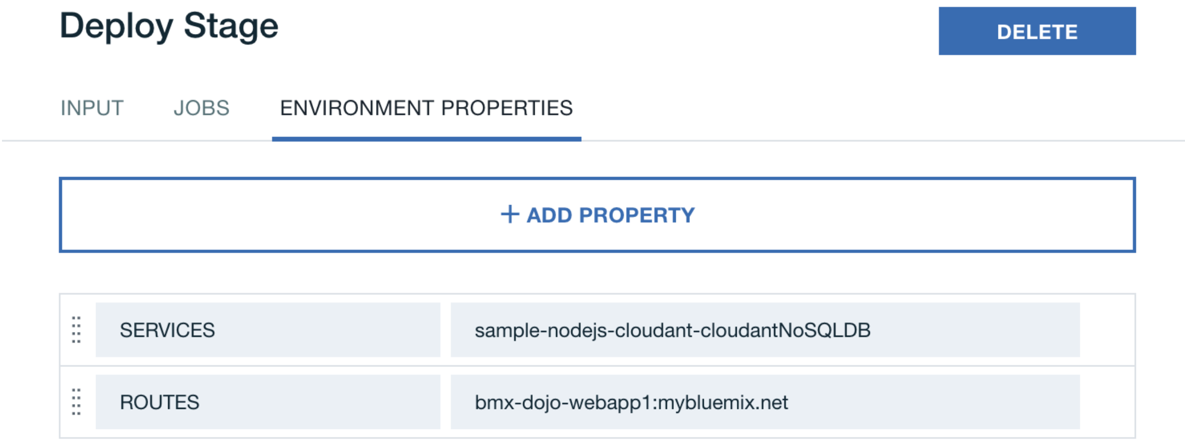
```
if $EXISTS; then
  cf delete -f ${CF_APP}
  cf rename $APP_NAME ${CF_APP}
  cf delete-orphaned-routes -f
else
  echo "No cleanup needed, app did not exist"
fi

echo "Done cleaning up the old application"

# view logs
#cf logs "${CF_APP}" --recent
```

5. For this script to function, some environment variables need to be added. The CF_APP environment variable in the script is already defined, but you'll need to add a value for SERVICES and ROUTES. Scroll up and click on **ENVIRONMENT PROP-**

ERTIES to bring up the editor to set properties within the stage. Then click on **ADD PROPERTY** and choose Text property.

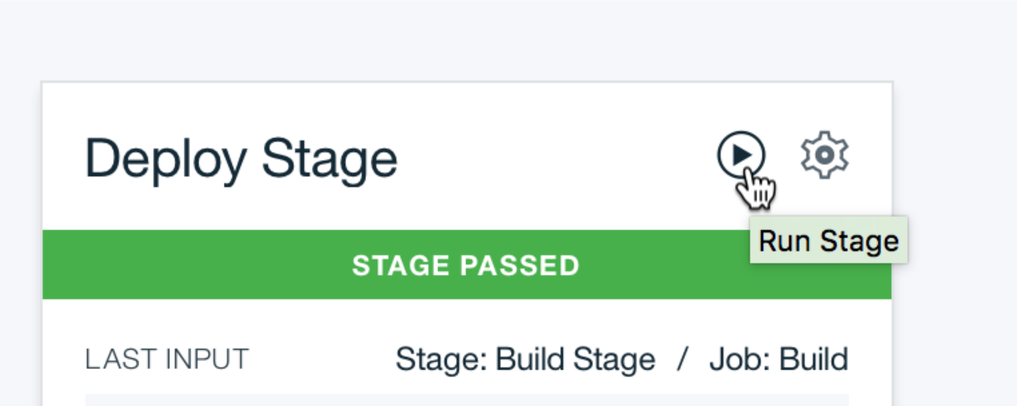


6. Assign a value to `SERVICES` using the same service name from the manifest.yml file `sample-nodejs-cloudant-cloudantNoSQLDB`
7. Add another text property and this time, assign a value to `ROUTES` using the hostname that you have used previously for the application in the web UI and append the default system domain using `:mybluemix.net`. After adding both, you should see:



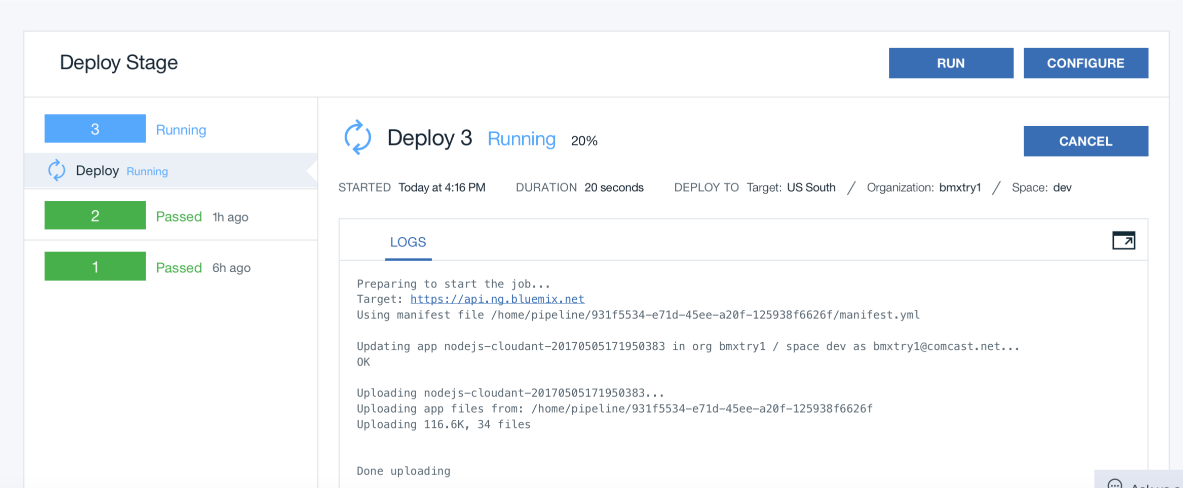
SERVICES	sample-nodejs-cloudant-cloudantNoSQLDB
ROUTES	bmx-dojo-webapp1:mybluemix.net

8. Click on the **SAVE** button to save the changes to the Deploy stage.
9. You can use a manual trigger to execute the deploy instead of needing another commit to the code repository and re-running the entire pipeline. Click on the **Run Stage** button to trigger the manual execution of the Deploy stage. When you trigger a manual run of a stage, it will start running with the latest artifacts from the input to the stage.



LAST INPUT Stage: Build Stage / Job: Build

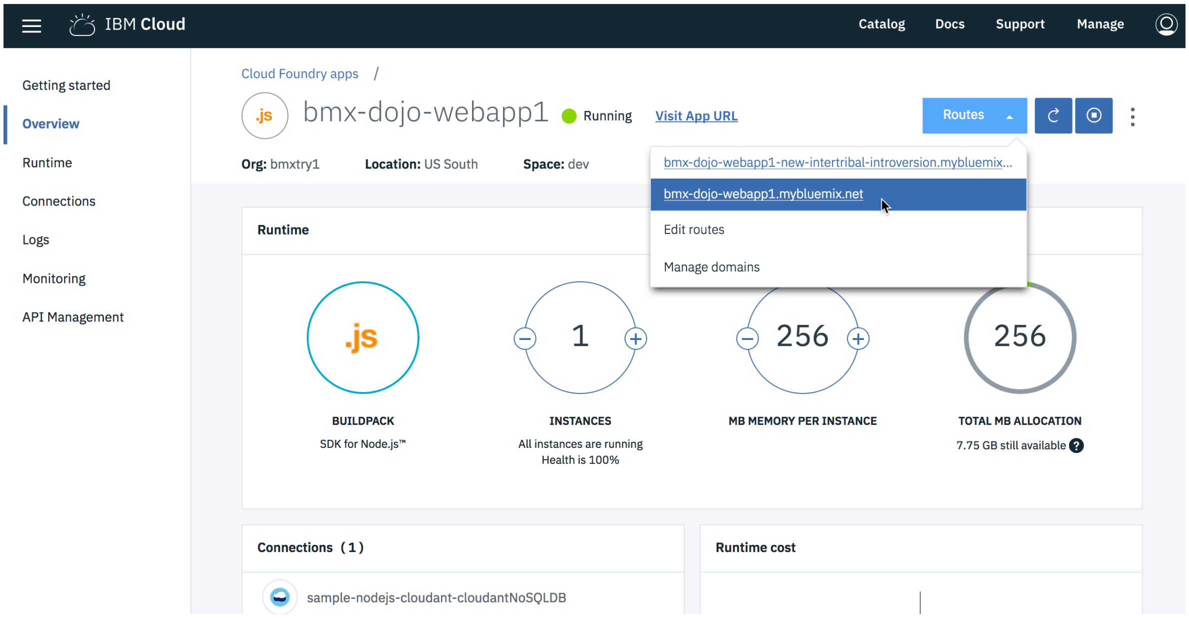
10. Click on the **View logs and history** link in the stage to be able to follow along with the deployment process of the new application instance and the removal of the previous one.



STARTED Today at 4:16 PM DURATION 20 seconds DEPLOY TO Target: US South / Organization: bmxtry1 / Space: dev

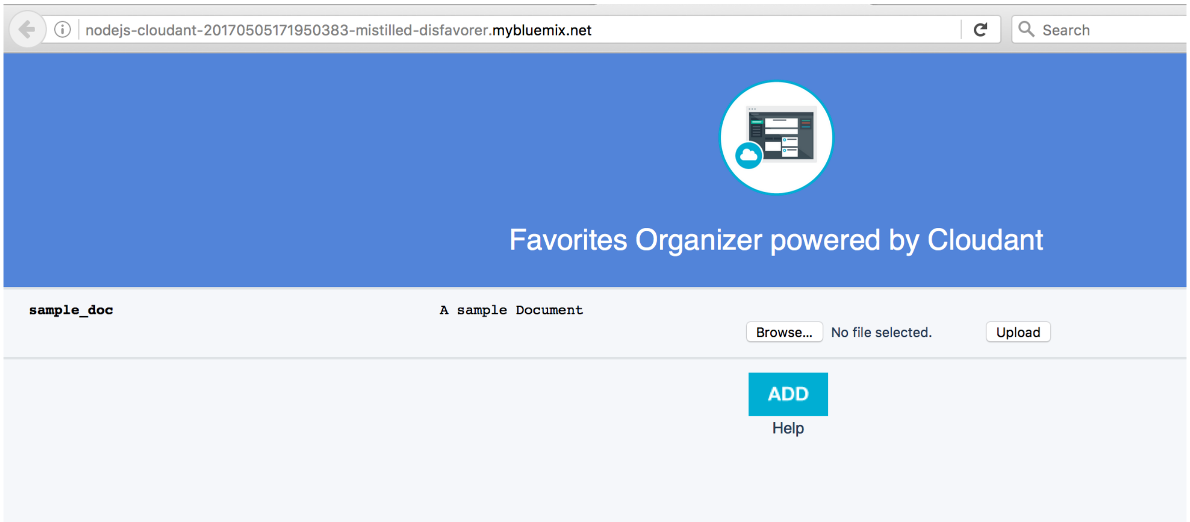
```
Preparing to start the job...
Target: https://api.ng.bluemix.net
Using manifest file /home/pipeline/931f5534-e71d-45ee-a20f-125938f6626f/manifest.yml

Updating app nodejs-cloudant-20170505171950383 in org bmxtry1 / space dev as bmxtry1@comcast.net...
OK

Uploading nodejs-cloudant-20170505171950383...
Uploading app files from: /home/pipeline/931f5534-e71d-45ee-a20f-125938f6626f
Uploading 116.6K, 34 files


Done uploading
```

11. After the first blue-green deployment, the link shown in the Deploy stage may still be the app name with the random strings appended. To check that the hostname you specified in the ROUTES environment variable is active, go to the application overview from the IBM Cloud Dashboard and check the **Routes** pulldown:



Org: bmxtry1 Location: US South Space: dev

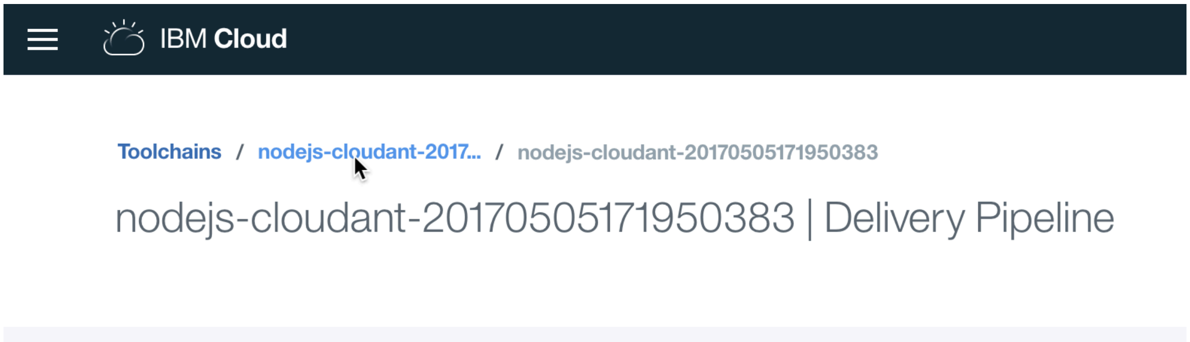
12. Click on the short route name to open the application in a new tab.


nodejs-cloudant-20170505171950383-mistilled-disfavorer.mybluemix.net
Search
Favorites Organizer powered by Cloudant
sample_doc
A sample Document
Browse...
No file selected.
Upload
ADD
Help

Section 3. Update the application using a web browser

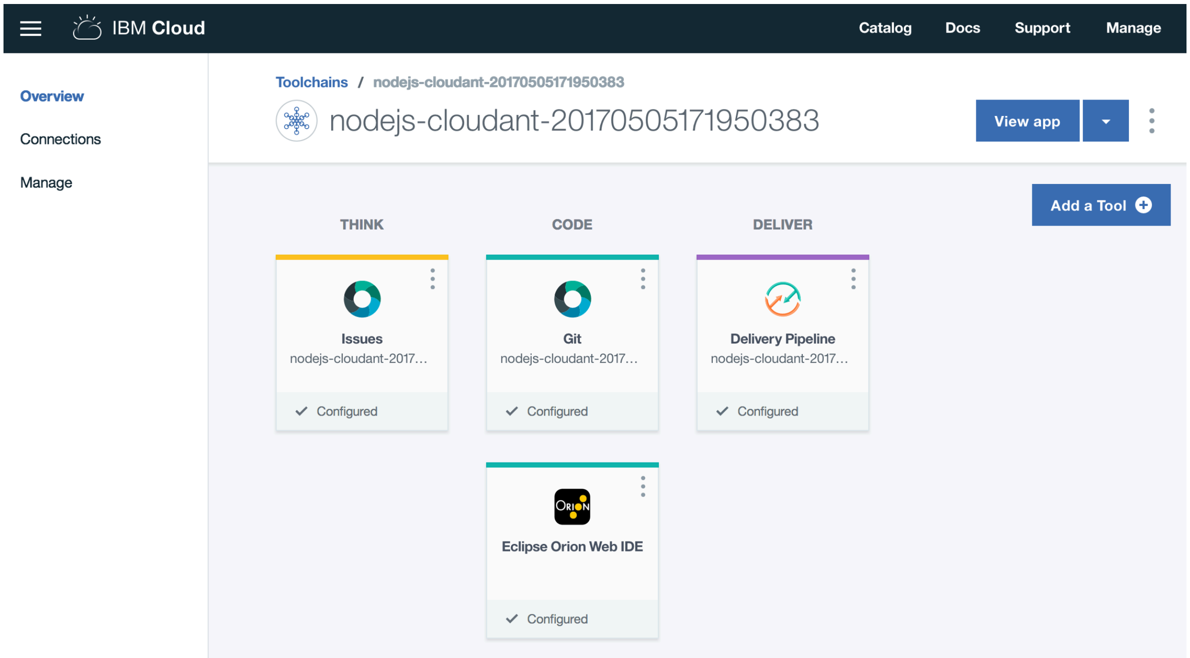
With the deployment script updated, you can now modify the application, commit the change and the application will be updated with zero downtime. You'll use Orion web editor for this, but this method works with any technique that updates the git SCM used by the delivery pipeline.

1. Go back to your browser tab with the toolchain and click on the name of the toolchain to return to the panel for your toolchain

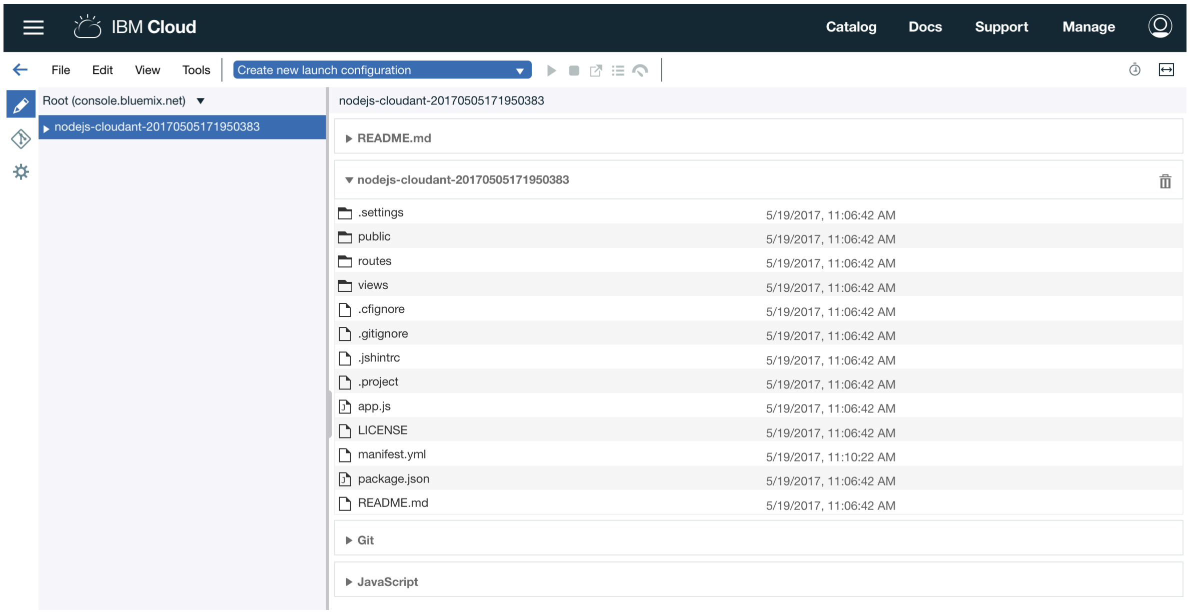

IBM Cloud
Toolchains / nodejs-cloudant-2017... / nodejs-cloudant-20170505171950383

nodejs-cloudant-20170505171950383 | Delivery Pipeline

The **Overview** panel for the toolchain will be shown with the current tools displayed.



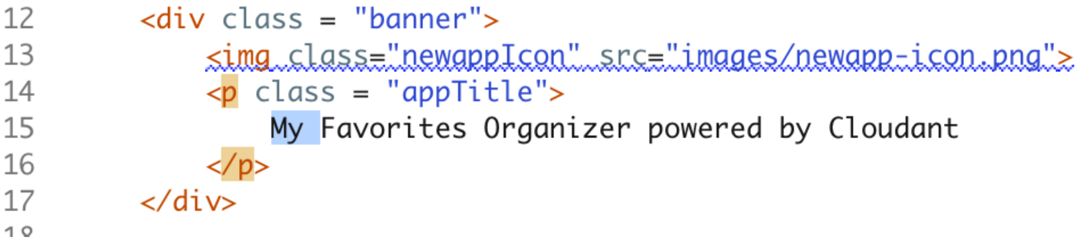
2. Click on the **Eclipse Orion Web IDE** icon to launch a web editor and code management environment hosted from IBM Cloud, and running in the browser.


IBM Cloud
Catalog
Docs
Support
Manage
File
Edit
View
Tools
Create new launch configuration
Root (console.bluemix.net)
nodejs-cloudant-20170505171950383
nodejs-cloudant-20170505171950383
README.md
nodejs-cloudant-20170505171950383
Git
JavaScript

.settings	5/19/2017, 11:06:42 AM
public	5/19/2017, 11:06:42 AM
routes	5/19/2017, 11:06:42 AM
views	5/19/2017, 11:06:42 AM
.cfignore	5/19/2017, 11:06:42 AM
.gitignore	5/19/2017, 11:06:42 AM
.jshintrc	5/19/2017, 11:06:42 AM
.project	5/19/2017, 11:06:42 AM
app.js	5/19/2017, 11:06:42 AM
LICENSE	5/19/2017, 11:06:42 AM
manifest.yml	5/19/2017, 11:10:22 AM
package.json	5/19/2017, 11:06:42 AM
README.md	5/19/2017, 11:06:42 AM

Make note of the pencil icon in the upper left next to the repository name. This is the edit mode for the IDE.

3. Open the views/index.html file and update the banner on line 15. It's time you owned this application! Change it to (or use your name if you prefer):

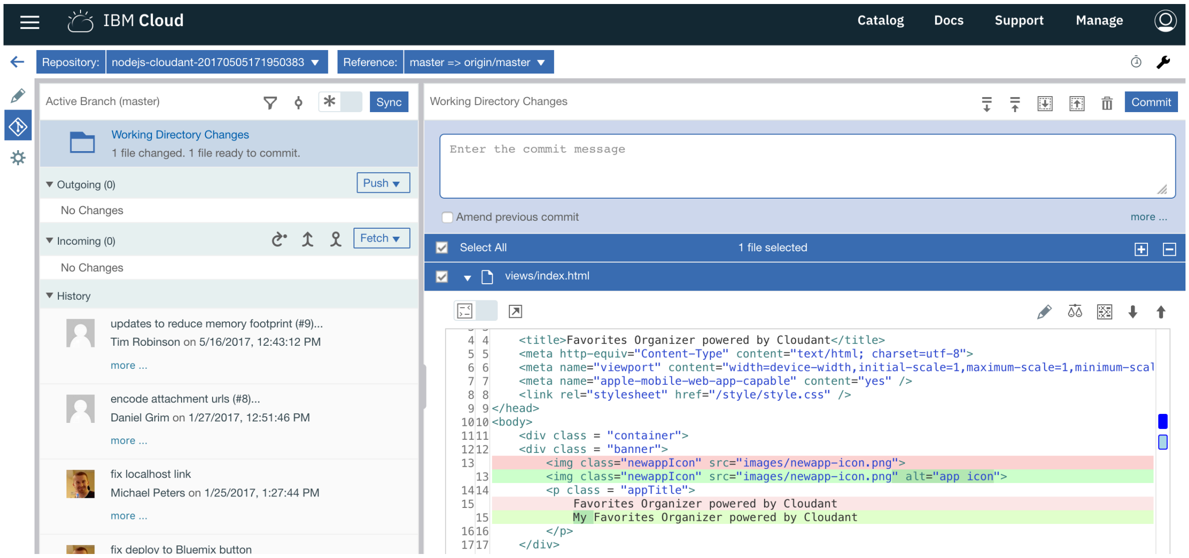


```
12      <div class = "banner">
13          <img class="newappIcon" src="images/newapp-icon.png">
14          <p class = "appTitle">
15              My Favorites Organizer powered by Cloudant
16          </p>
17      </div>
18
```

   if you hover over the line above, an accessibility warning tooltip appears indicating that the <img> tag is missing an alt attribute, which is needed for screen readers that won't display the image. You can add this attribute to fix this if you prefer.

   After you move the cursor off the line with the banner, the file change in the workspace is saved.

4. Click on the **Git** icon on the left side of the IDE below the **Edit** icon. This will open the IDE's interface to a git-based source code repository. If you are familiar with git concepts, you will recognize key parts of the display.



Working Directory Changes
1 file changed. 1 file ready to commit.

Outgoing (0)
No Changes

Incoming (0)
No Changes

History

updates to reduce memory footprint (#9)...
Tim Robinson on 5/16/2017, 12:43:12 PM

encode attachment urls (#8)...
Daniel Grim on 1/27/2017, 12:51:46 PM

fix localhost link
Michael Peters on 1/25/2017, 1:27:44 PM

fix deploy to Bluemix button

Enter the commit message

☐ Amend previous commit

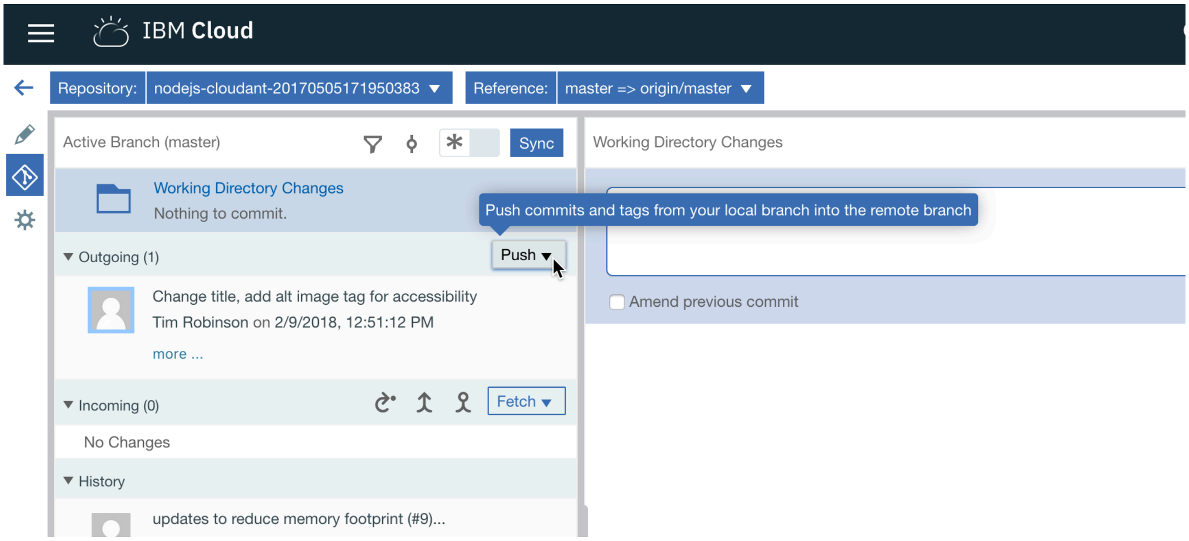
☑ Select All — 1 file selected

☑ views/index.html

```
    <title>Favorites Organizer powered by Cloudant</title>
    <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
    <meta name="viewport" content="width=device-width,initial-scale=1,maximum-scale=1,minimum-scal
    <meta name="apple-mobile-web-app-capable" content="yes" />
    <link rel="stylesheet" href="/style/style.css" />
</head>
<body>
    <div class = "container">
    <div class = "banner">
        <img class="newappIcon" src="images/newapp-icon.png">
        <img class="newappIcon" src="images/newapp-icon.png" alt="app icon">
        <p class = "appTitle">
            Favorites Organizer powered by Cloudant
            My Favorites Organizer powered by Cloudant
        </p>
    </div>
```

In the right panel, there is a list of the changed files compared to the origin repository.

5. Add a comment in the **Commit message** panel and then click on the **Commit** button.
6. Next click on the **Push** button to synchronize these changes to the origin repository.



Working Directory Changes
Nothing to commit.

Push commits and tags from your local branch into the remote branch

Outgoing (1)

Change title, add alt image tag for accessibility
Tim Robinson on 2/9/2018, 12:51:12 PM

Incoming (0)
No Changes

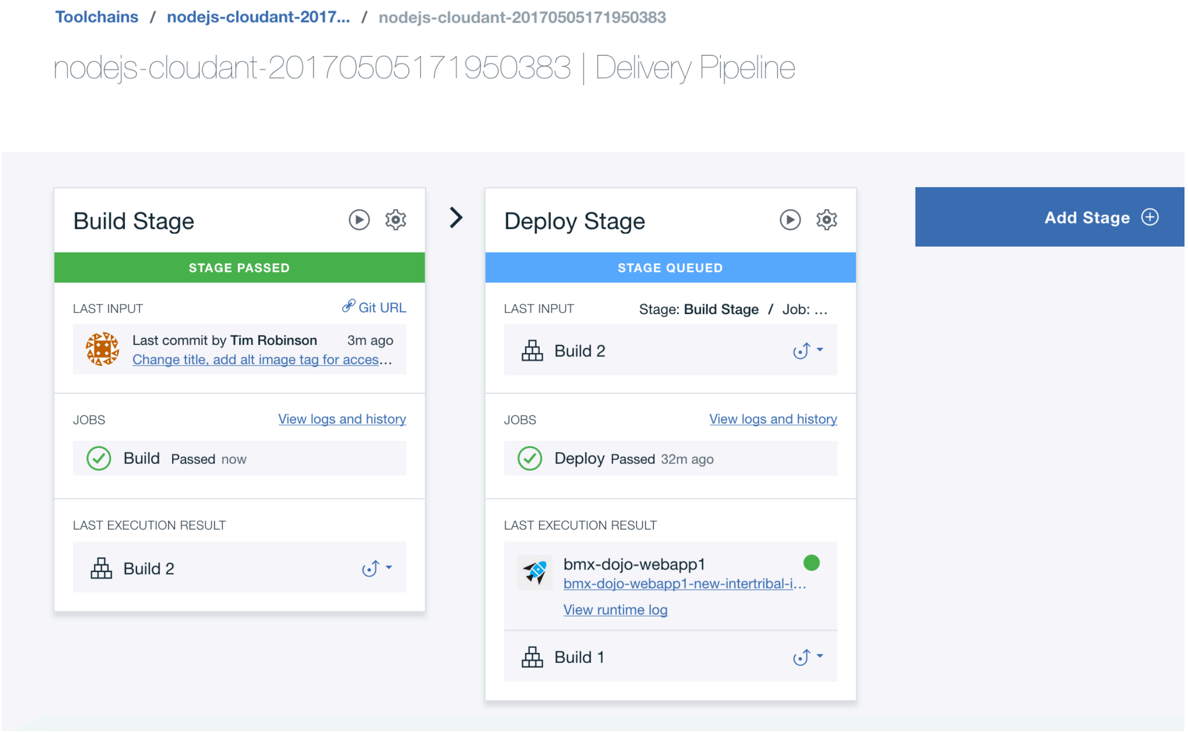
History

updates to reduce memory footprint (#9)...

Working Directory Changes

☐ Amend previous commit

7. If you move quickly by clicking on the left arrow to go back to the toolchain **Overview** and then click on the **Delivery Pipeline** you may be able to catch the pipeline in action.



Toolchains / nodejs-cloudant-2017... / nodejs-cloudant-20170505171950383

nodejs-cloudant-20170505171950383 | Delivery Pipeline

Build Stage

STAGE PASSED

LAST INPUT — Git URL

Last commit by Tim Robinson 3m ago
Change title, add alt image tag for acces...

JOBS — View logs and history

Build Passed now

LAST EXECUTION RESULT

Build 2

Deploy Stage

STAGE QUEUED

LAST INPUT — Stage: Build Stage / Job: ...

Build 2

JOBS — View logs and history

Deploy Passed 32m ago

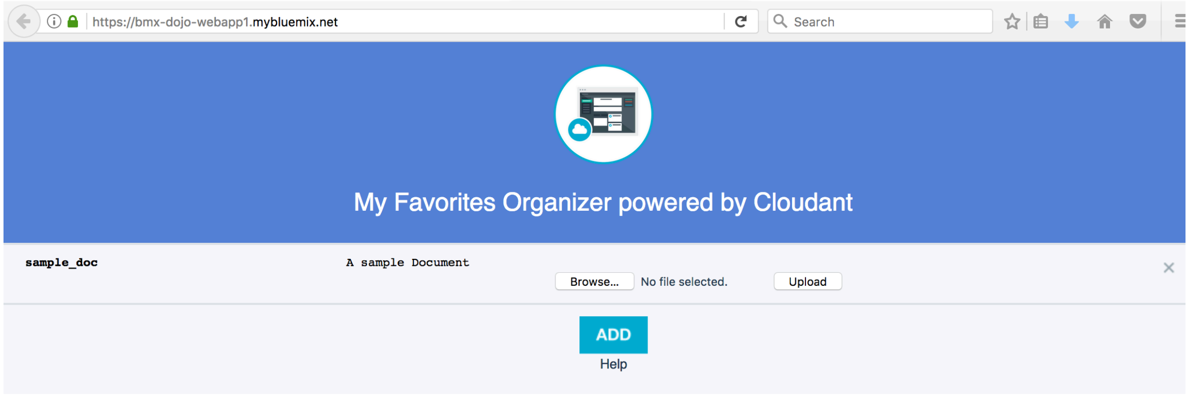
LAST EXECUTION RESULT

bmx-dojo-webapp1
bmx-dojo-webapp1-new-intertribal-i...
View runtime log

Build 1

You will see in the Build stage that there has been an input update, based upon your push to the git repository. The Build stage ran a simple builder, and then the Deploy stage will deploy the modified application using the blue-green deployment script.

8. Go to the browser tab you have opened to the application. Reload the application home page while the delivery pipeline is running the deployment. You'll now notice that the application is continuously responding. When the updated application is live, the heading will show your changes:



https://bmx-dojo-webapp1.mybluemix.net

My Favorites Organizer powered by Cloudant

sample_doc — A sample Document

Browse... No file selected. Upload

Summary

IBM Cloud Continuous Delivery toolchains can work with your source code repositories to provide an integrated DevOps experience including automated deployments of changes made using either a web editor or your local workstation tools with a git push to the source code repository.

Summary

You have seen how to use several aspects of Continuous Delivery toolchains, including source code management, editing with the Orion Web IDE, and customization of the Delivery Pipeline to change how the sample application is deployed to avoid downtime.

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