IBM Cloud Developer Certification Training

Describe how to use the Build & Deploy option to manage continuous integration and continuous delivery

Version: 2

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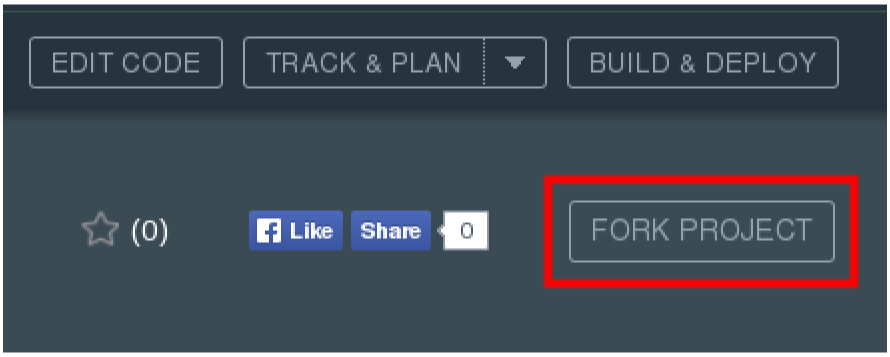
Owner: IBM Ecosystem Development

Exercise 5.5.0 - Lab Prerequisites

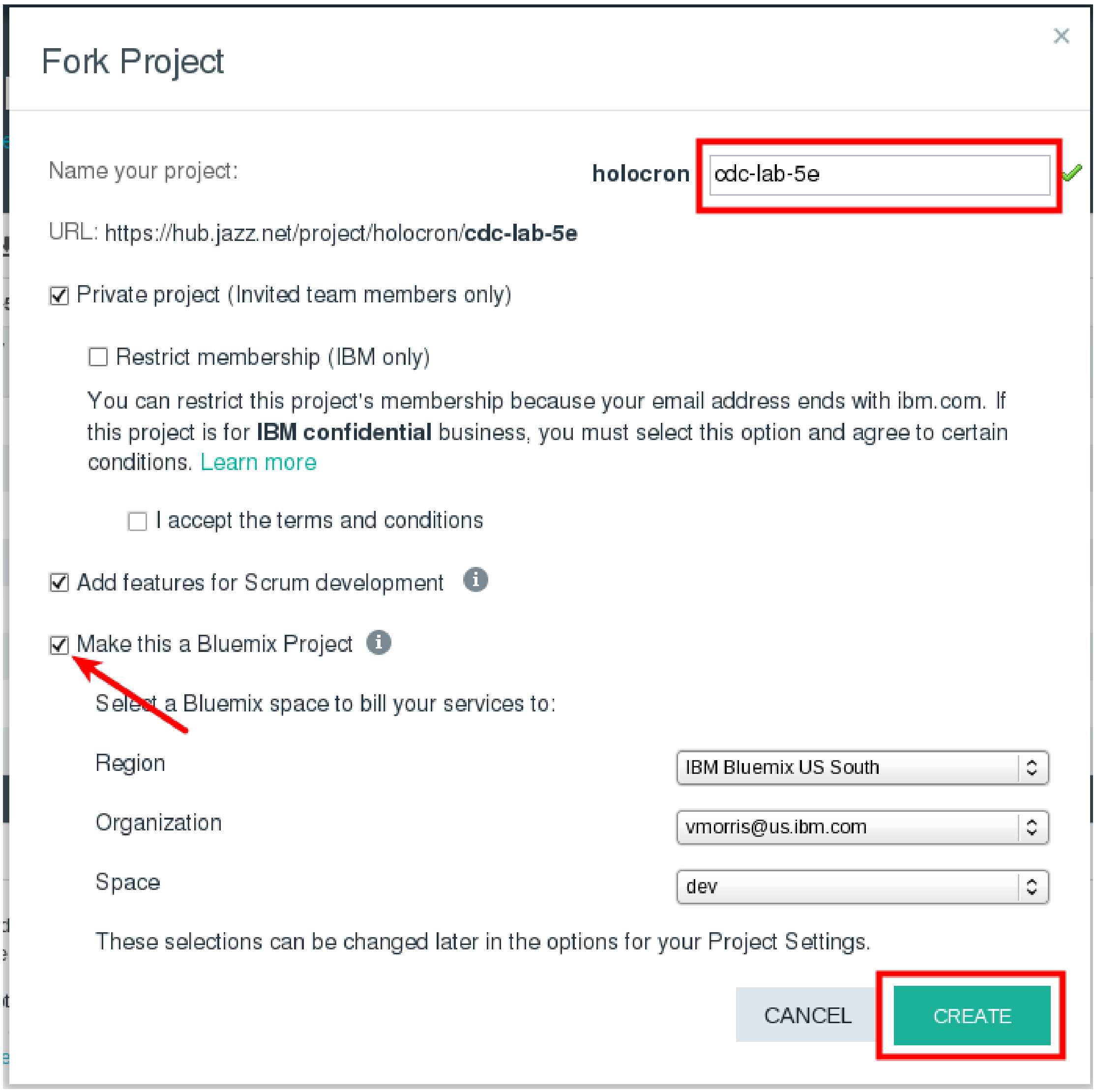
- IBM Bluemix account
  - Sign up for Bluemix: http://bluemix.net
- IBM DevOps account
  - Sign up for DevOps: http://hub.jazz.net
  - Use the same credentials as for Bluemix
- Supported web browsers:
  - Chrome, latest version for your OS
  - Firefox, latest version for your OS or at least ESR 31
  - Internet Explorer, versions 10 and 11
  - Safari, latest version for your OS

Exercise 5.5.1 - Getting Started

1. As in the 5.3 and 5.4 Labs, begin by logging on to IBM DevOps Services and fork the project located at https://hub.jazz.net/project/ecosysdevcnc/cdc-lab-5/overview into a new project.



2. Give the new project a unique name, check all the boxes, and choose an appropriate Bluemix runtime configuration. Click on CREATE.



Fork Project

Name your project: **holocron** cdc-lab-5e

URL: https://hub.jazz.net/project/holocron/**cdc-lab-5e**

☑ Private project (Invited team members only)

☐ Restrict membership (IBM only)

You can restrict this project's membership because your email address ends with ibm.com. If this project is for **IBM confidential** business, you must select this option and agree to certain conditions. Learn more

☐ I accept the terms and conditions

☑ Add features for Scrum development

☑ Make this a Bluemix Project

Select a Bluemix space to bill your services to:

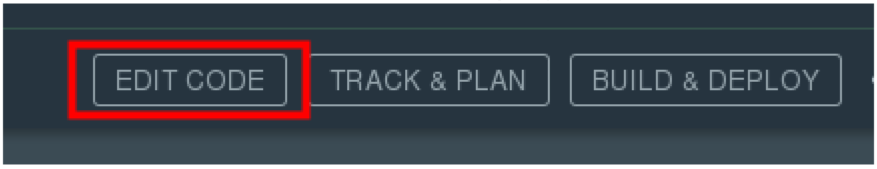
Region: IBM Bluemix US South

Organization: vmorris@us.ibm.com

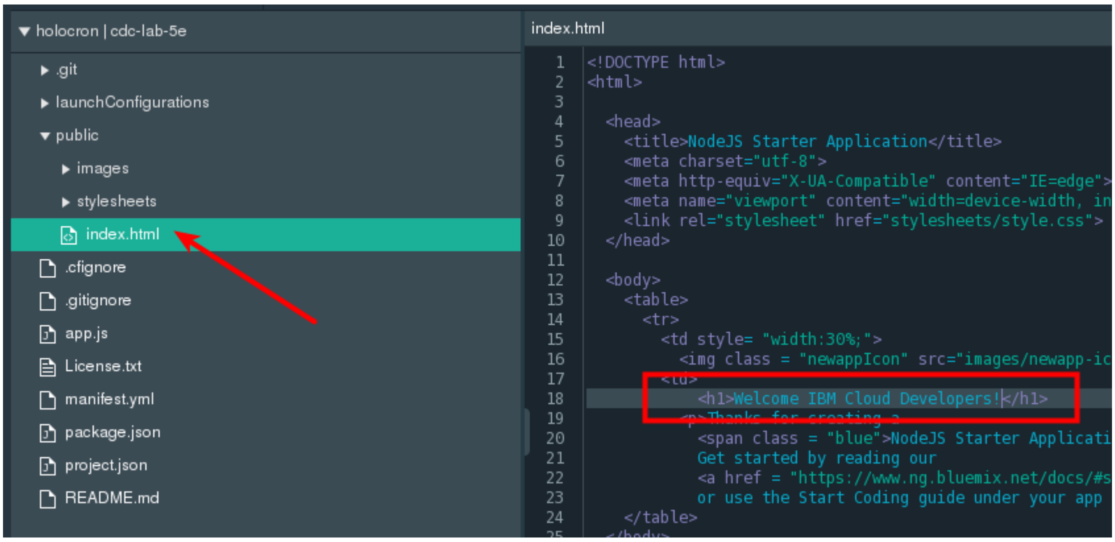
Space: dev

These selections can be changed later in the options for your Project Settings.

3. Once you see the message about successfully creating your project, click on the EDIT CODE button in the top right.



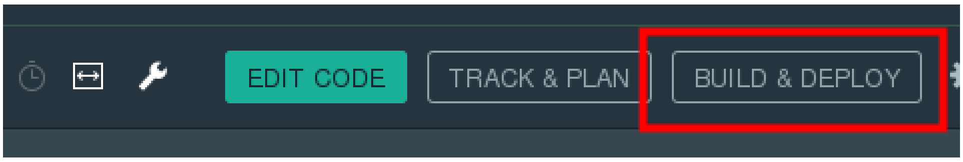
4. Introduce a change to the project's code by editing public/index.html and alter the <h1> header tag to something unique.



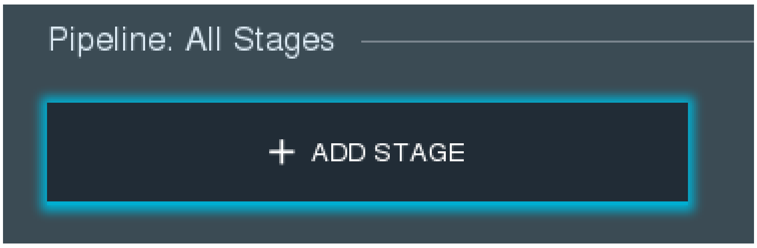
```
<!DOCTYPE html>
<html>

  <head>
    <title>NodeJS Starter Application</title>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, in
    <link rel="stylesheet" href="stylesheets/style.css">
  </head>

  <body>
    <table>
      <tr>
        <td style= "width:30%;">
          <img class = "newappIcon" src="images/newapp-ic
        </td>
            <h1>Welcome IBM Cloud Developers!</h1>
          <p>Thanks for creating a
            <span class = "blue">NodeJS Starter Applicati
            Get started by reading our
            <a href = "https://www.ng.bluemix.net/docs/#s
            or use the Start Coding guide under your app
    </table>
  </body>
```

Exercise 5.5.2 - Configure the Build and Deploy Pipeline

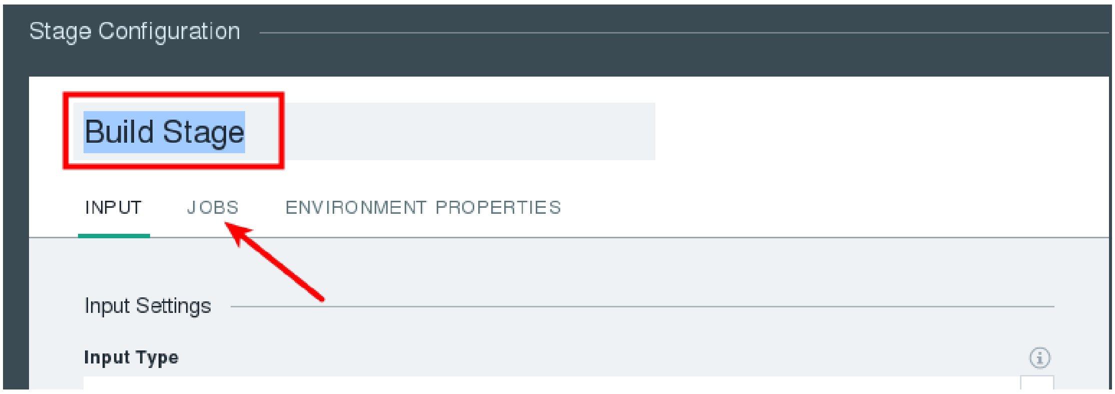
1. Switch to the pipeline overview by clicking on BUILD & DEPLOY in the top right.



2. Click the ADD STAGE button.



3. Name the stage "Build Stage", then click on the JOBS tab.



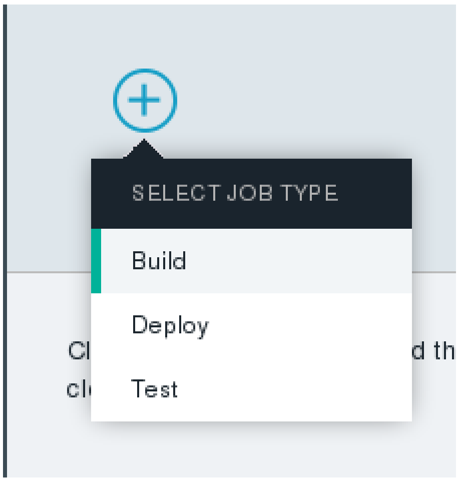
Stage Configuration

Build Stage

Input Settings

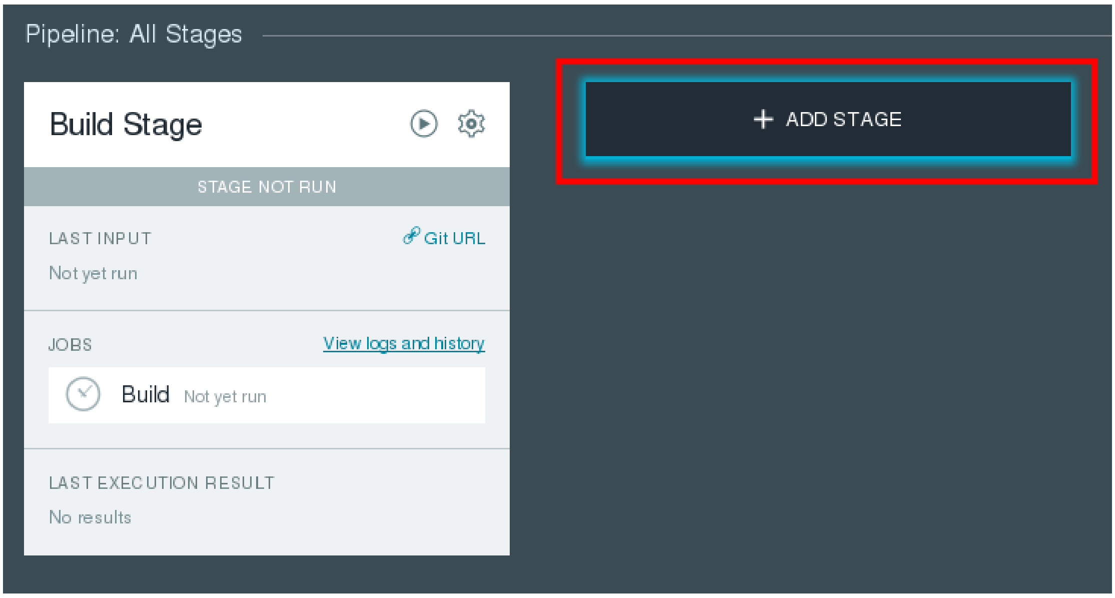
Input Type

4. Click ADD A JOB -> Build.



Change Builder Type to "npm", then scroll to the bottom and click SAVE.

5. Back in the Pipeline: All Stages view, click ADD STAGE again.



Pipeline: All Stages

Build Stage

STAGE NOT RUN

LAST INPUT — Git URL

Not yet run

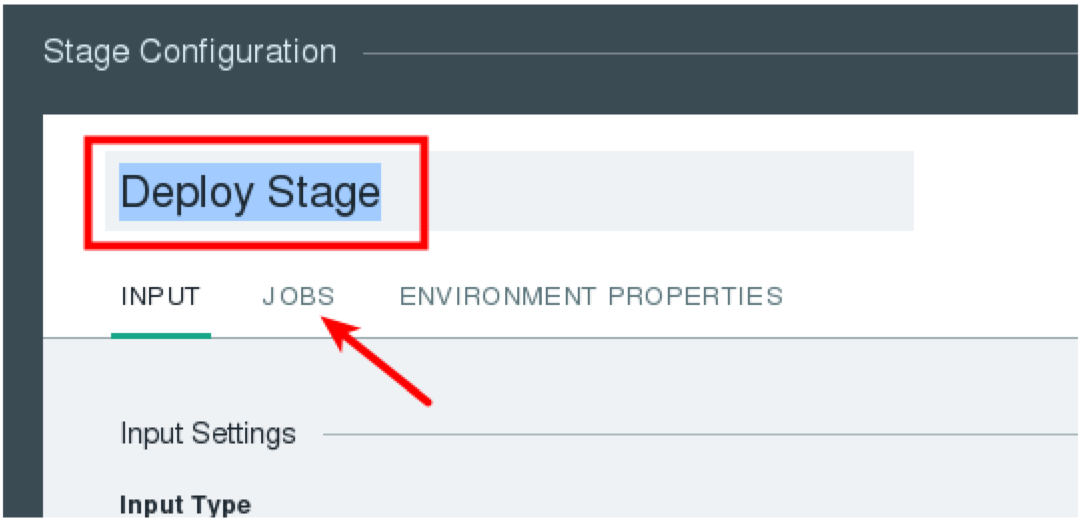
JOBS — View logs and history

Build Not yet run

LAST EXECUTION RESULT

No results

6. Name the stage "Deploy Stage" and note the options available for the stage. The default configuration will use the artifacts created from the Build Job in the Build Stage as input, and the Deploy Stage jobs will run on successful completion of the previous stage (Build Stage).



Stage Configuration

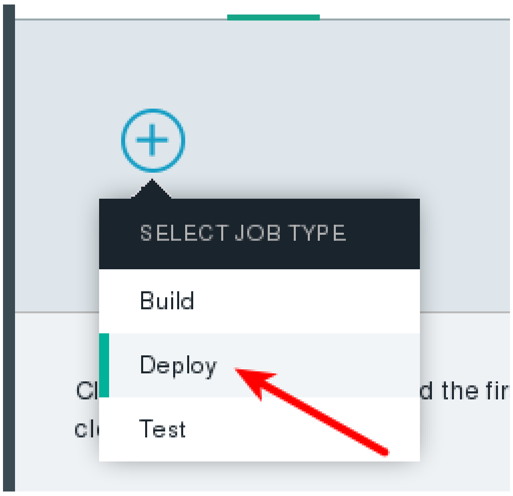
Deploy Stage

Input Settings

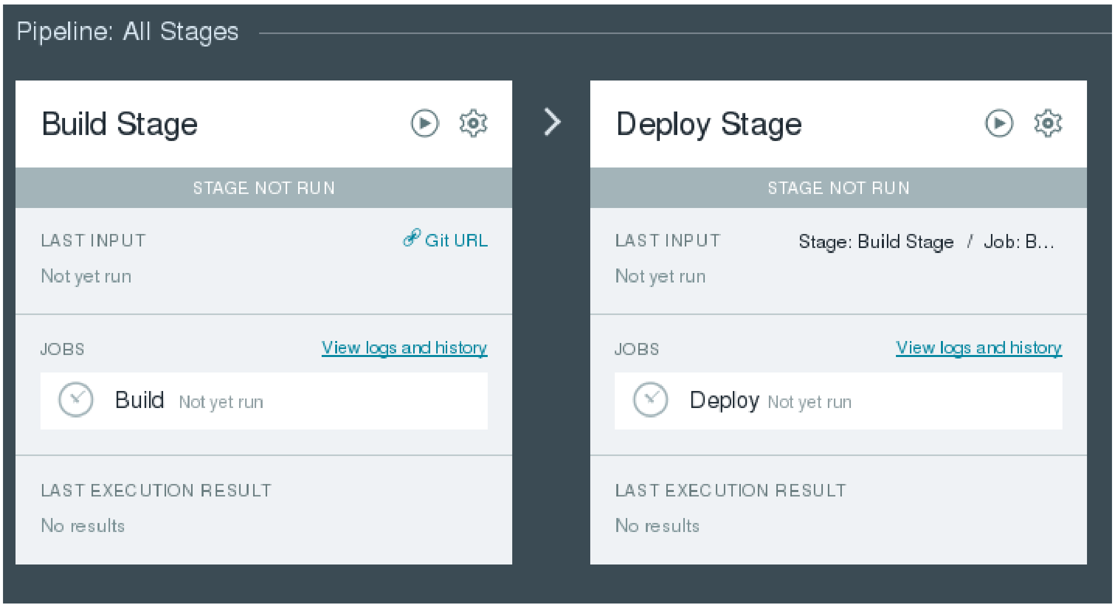
Input Type

Click on the JOBS tab now.

7. Click ADD JOB -> Deploy



8. The Deploy stage will default to acceptable options, but take a moment to view the different settings available. The default settings are gathered from the configuration you entered when first forking the project. Accept the default settings and click on SAVE at the bottom.
Observe that both stages are now configured in the pipeline.



Pipeline: All Stages

Build Stage

STAGE NOT RUN

LAST INPUT Git URL
Not yet run

JOBS View logs and history
Build Not yet run

LAST EXECUTION RESULT
No results

Deploy Stage

STAGE NOT RUN

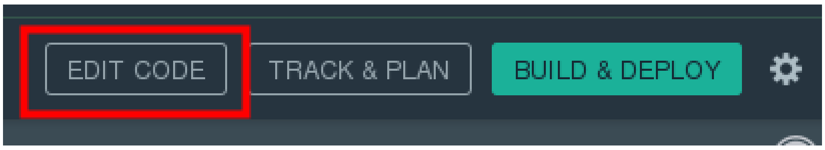
LAST INPUT Stage: Build Stage / Job: B...
Not yet run

JOBS View logs and history
Deploy Not yet run

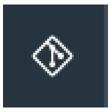
LAST EXECUTION RESULT
No results

Exercise 5.5.3 - Trigger the Pipeline by Pushing to the Git Repository

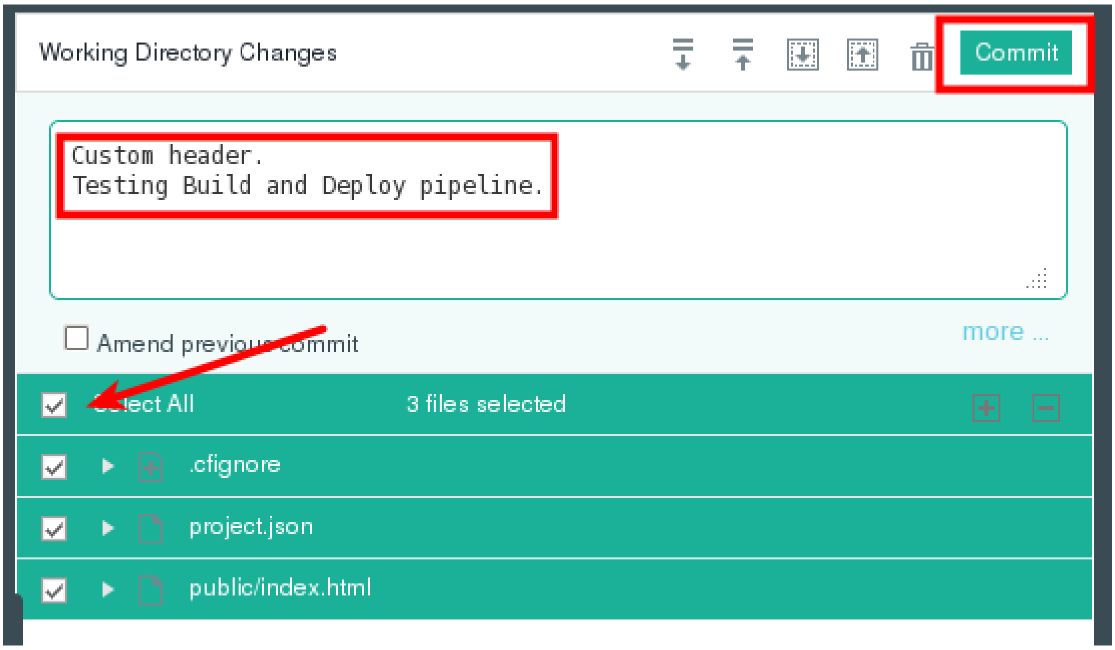
1. Click the EDIT CODE button in the top right.



2. Click the Git button in the left column.



3. Enter an informative commit message, check the box next to Select All, then click on Commit.



```
Custom header.
Testing Build and Deploy pipeline.
```

□ Amend previous commit

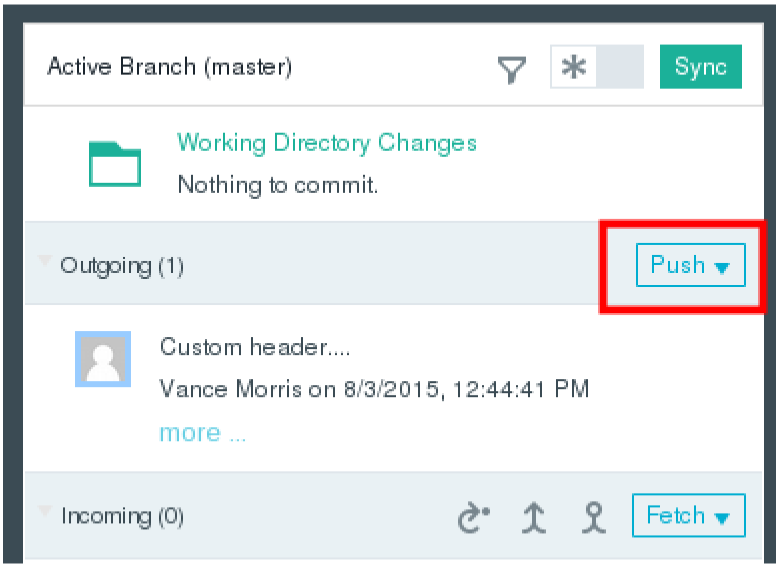
☑ Select All

☑ .cfignore

☑ project.json

☑ public/index.html

4. Note that the outgoing commit is now staged. Click on PUSH, then immediately click on BUILD & DEPLOY.



Active Branch (master)

Working Directory Changes

Nothing to commit.

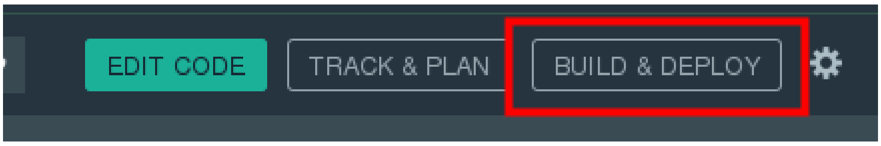
Outgoing (1)

Custom header....

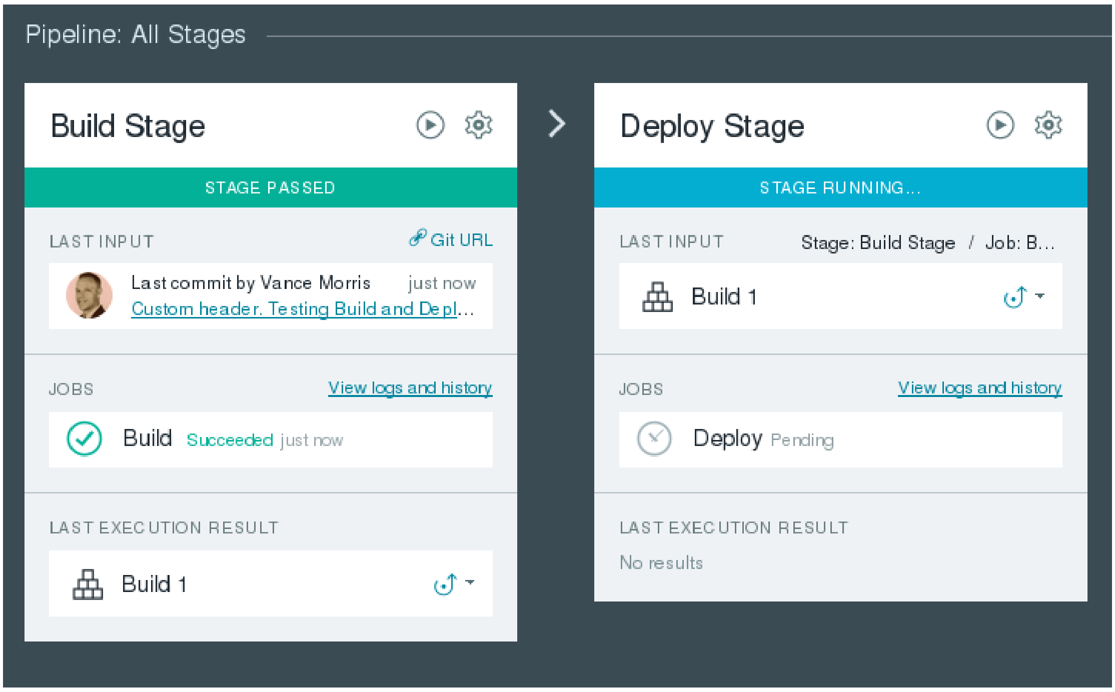
Vance Morris on 8/3/2015, 12:44:41 PM

more ...

Incoming (0)



5. Observe how the build stage is automatically started and once complete, the deploy stage is automatically started.



Pipeline: All Stages

Build Stage

STAGE PASSED

LAST INPUT

Last commit by Vance Morris just now

Custom header. Testing Build and Depl...

JOBS

Build Succeeded just now

LAST EXECUTION RESULT

Build 1

Deploy Stage

STAGE RUNNING...

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

Build 1

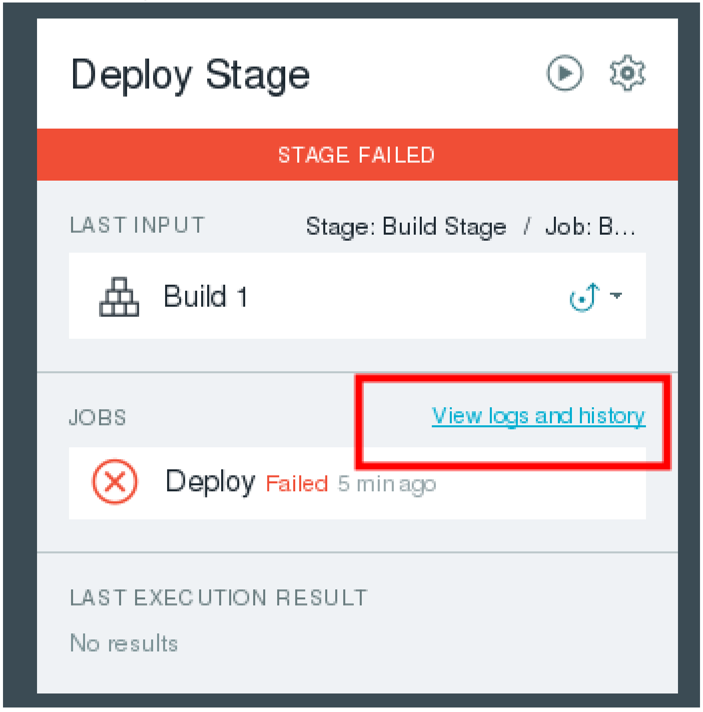
JOBS

Deploy Pending

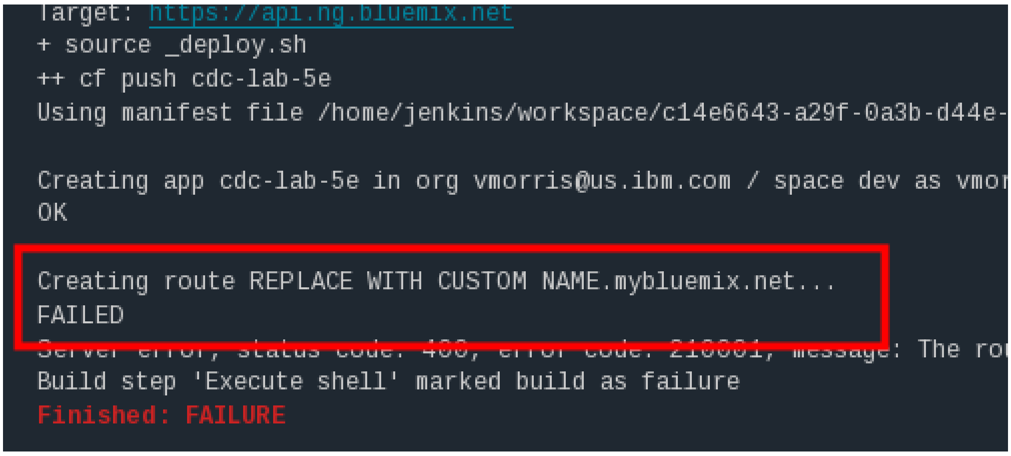
LAST EXECUTION RESULT

No results

6. The deploy stage should fail. To determine why, click on the "View logs and history" link.

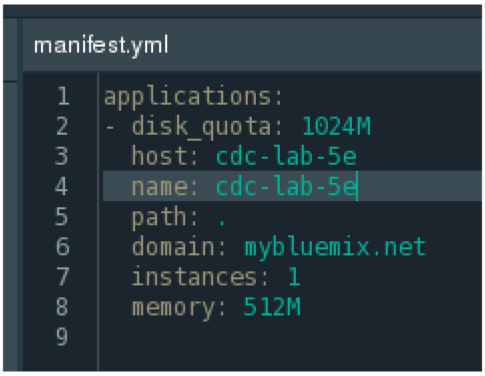


7. From the log, we can see that Cloud Foundry was not happy with the requested route "REPLACE WITH CUSTOM NAME.mybluemix.net".



```
Target: https://api.ng.bluemix.net
+ source _deploy.sh
++ cf push cdc-lab-5e
Using manifest file /home/jenkins/workspace/c14e6643-a29f-0a3b-d44e-

Creating app cdc-lab-5e in org vmorris@us.ibm.com / space dev as vmor
OK

Creating route REPLACE WITH CUSTOM NAME.mybluemix.net...
FAILED
Server error, status code: 400, error code: 210001, message: The ro
Build step 'Execute shell' marked build as failure
Finished: FAILURE
```

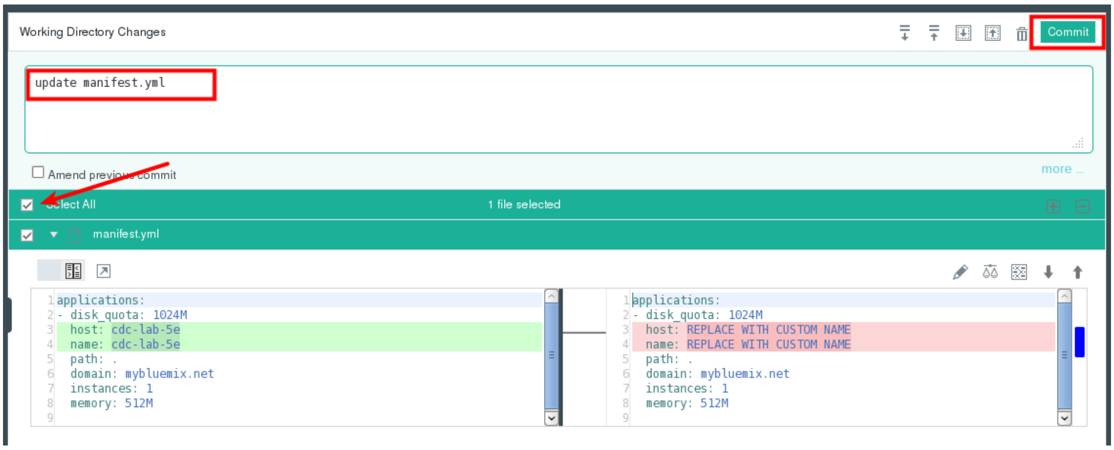
8. Return to the web GUI code editor, and open the manifest.yml file. Replace the host: and name: values with a unique name that will be used when creating the route and URL to your application.



manifest.yml

```
applications:
- disk_quota: 1024M
  host: cdc-lab-5e
  name: cdc-lab-5e
  path: .
  domain: mybluemix.net
  instances: 1
  memory: 512M

```

9. Open the Git repository view, and commit the changed manifest file.



Working Directory Changes

update manifest.yml

☐ Amend previous commit

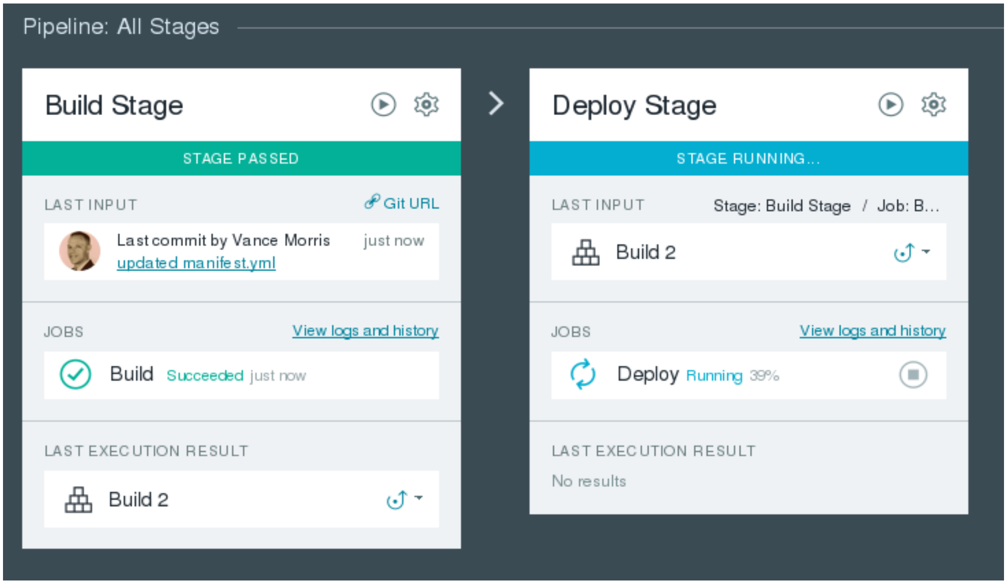
☑ Select All 1 file selected

☑ ▾ manifest.yml

```
applications:
- disk_quota: 1024M
  host: cdc-lab-5e
  name: cdc-lab-5e
  path: .
  domain: mybluemix.net
  instances: 1
  memory: 512M

```

```
applications:
- disk_quota: 1024M
  host: REPLACE WITH CUSTOM NAME
  name: REPLACE WITH CUSTOM NAME
  path: .
  domain: mybluemix.net
  instances: 1
  memory: 512M

```

10. Just ast before, push the staged outgoing commit, then switch back to the BUILD & DEPLOY view. Observe the Build and Deploy stages execution again.



Pipeline: All Stages

Build Stage

STAGE PASSED

LAST INPUT Git URL

Last commit by Vance Morris just now
updated manifest.yml

JOBS View logs and history

Build Succeeded just now

LAST EXECUTION RESULT

Build 2

Deploy Stage

STAGE RUNNING...

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

Build 2

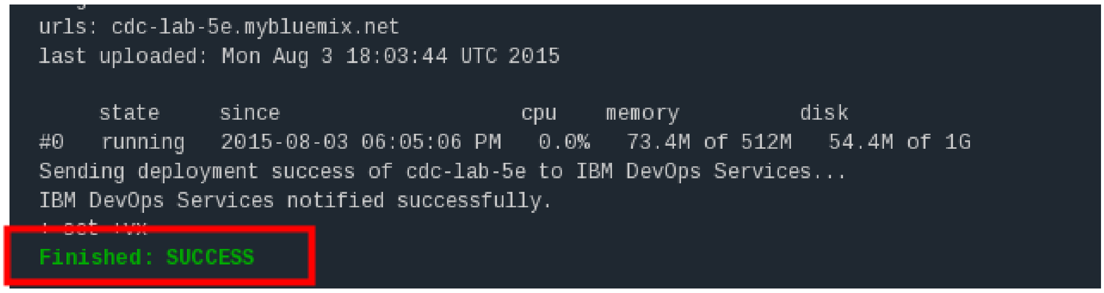
JOBS View logs and history

Deploy Running 39%

LAST EXECUTION RESULT

No results

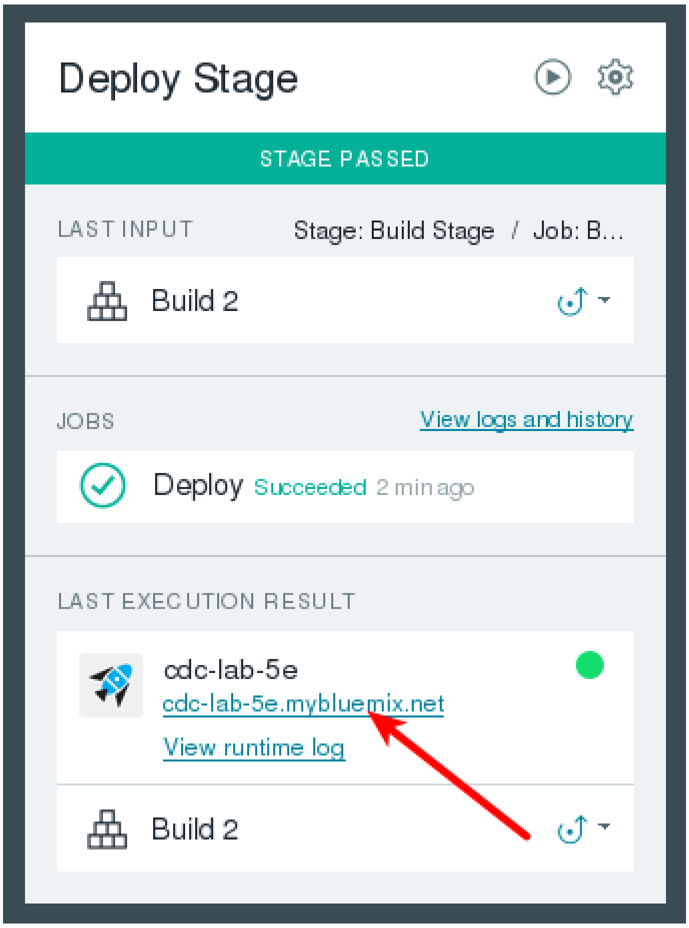
11. During the deploy stage's execution, click on the "View logs and history" link and scroll to the bottom of the log stream. Once the application has successfully deployed to Bluemix, you will see a "Finished: SUCCESS" message.



```
urls: cdc-lab-5e.mybluemix.net
last uploaded: Mon Aug 3 18:03:44 UTC 2015

     state     since                    cpu    memory          disk
#0   running   2015-08-03 06:05:06 PM   0.0%   73.4M of 512M   54.4M of 1G
Sending deployment success of cdc-lab-5e to IBM DevOps Services...
IBM DevOps Services notified successfully.
+ set +vx
Finished: SUCCESS
```

12. Scroll to the top of the page and click the Back to Pipeline button.

13. Locate the Last Execution Result section inside the Deploy stage summary, and note that the status of the Bluemix runtime is displayed, along with a hyperlink to open the application. Click the link now.



Deploy Stage

STAGE PASSED

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

Build 2

JOBS View logs and history

Deploy Succeeded 2 min ago

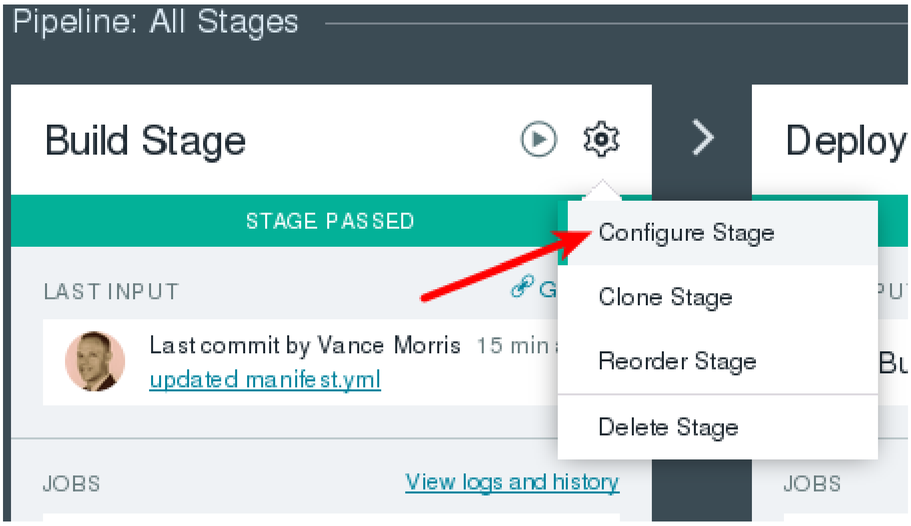
LAST EXECUTION RESULT

cdc-lab-5e
cdc-lab-5e.mybluemix.net
View runtime log

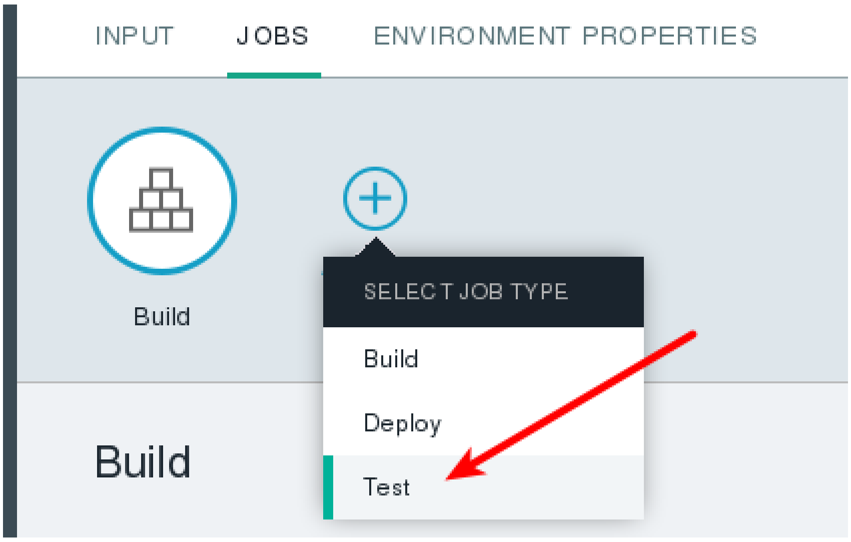
Build 2

Exercise 5.5.4 - Configure a Test Job and Modify the Pipeline

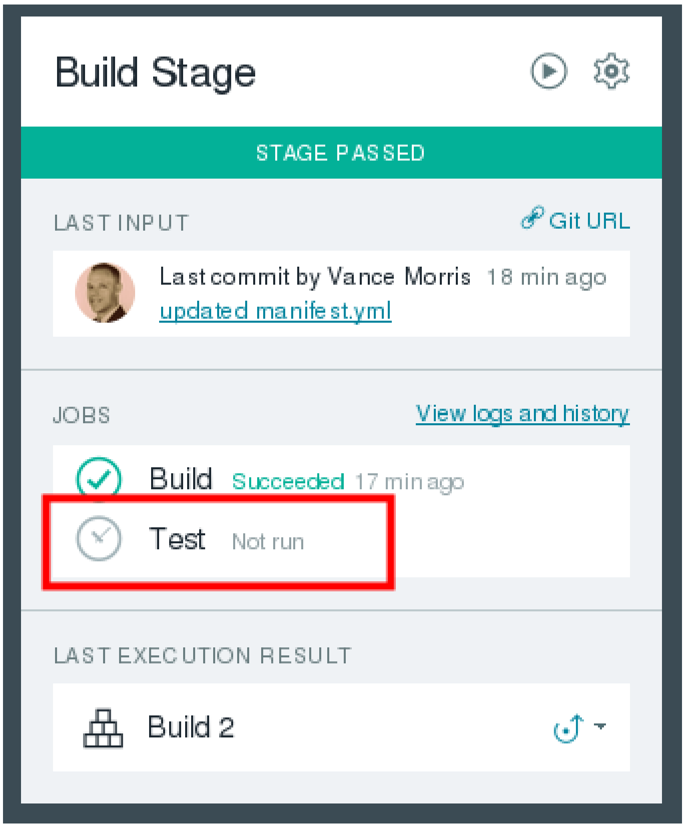
1. Return to the DevOps Services Build and Deploy Pipeline overview and click the Stage Configuration button on the Build Stage and click Configure Stage.



2. Click ADD JOB -> Test.



3. Accept the default configuration for the Test job. Note that the Simple Tester Type allows one to execute a custom Bash script. Our simple project does not have any testing framework to execute, but if it did this would be the place to execute and evaluate tests. Click the SAVE button at the bottom. Note that a new job is added to the Build Stage overview.



Build Stage

STAGE PASSED

LAST INPUT

Git URL

Last commit by Vance Morris 18 min ago
updated manifest.yml

JOBS

View logs and history

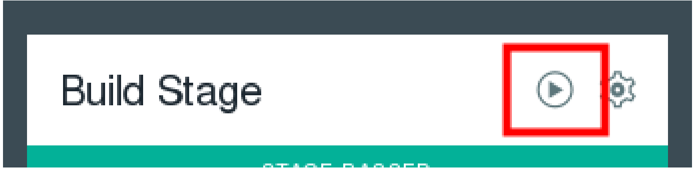
Build Succeeded 17 min ago

Test Not run

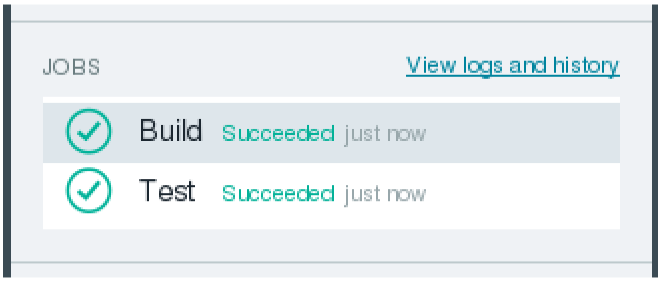
LAST EXECUTION RESULT

Build 2

4. Manually start the Build stage by clicking the play button at the top.



5. Note that the Build job executes, followed by the Test job. If either of these jobs were to fail, the pipeline execution would stop and the Deploy Stage would not execute.



JOBS

View logs and history

Build Succeeded just now

Test Succeeded just now

This completes the IBM Cloud Developer Certification Section 5.5 Lab.