Cloud Developer Certification Preparation

Exercise 5.5:

Using the Build & Deploy option to manage continuous integration and continuous delivery

Exercise 5.5: Prerequisites

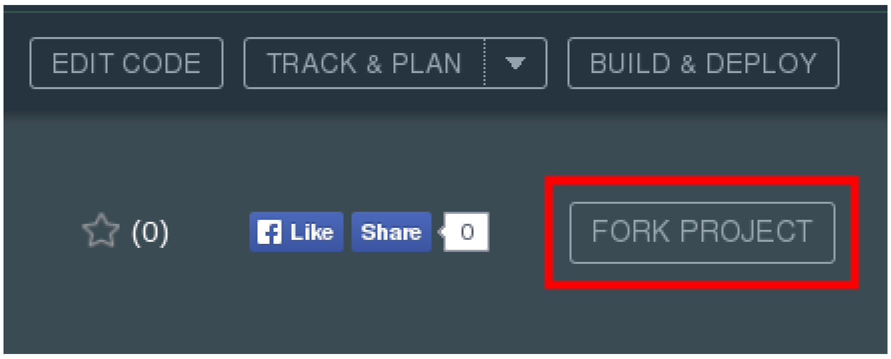
Sign up for a 30-day free trial IBM Bluemix account if you don't already have one. Also, create a DevOps account: https://hub.jazz.net/. You should use the same credentials for both the Bluemix and DevOps accounts.

You also need the following software:

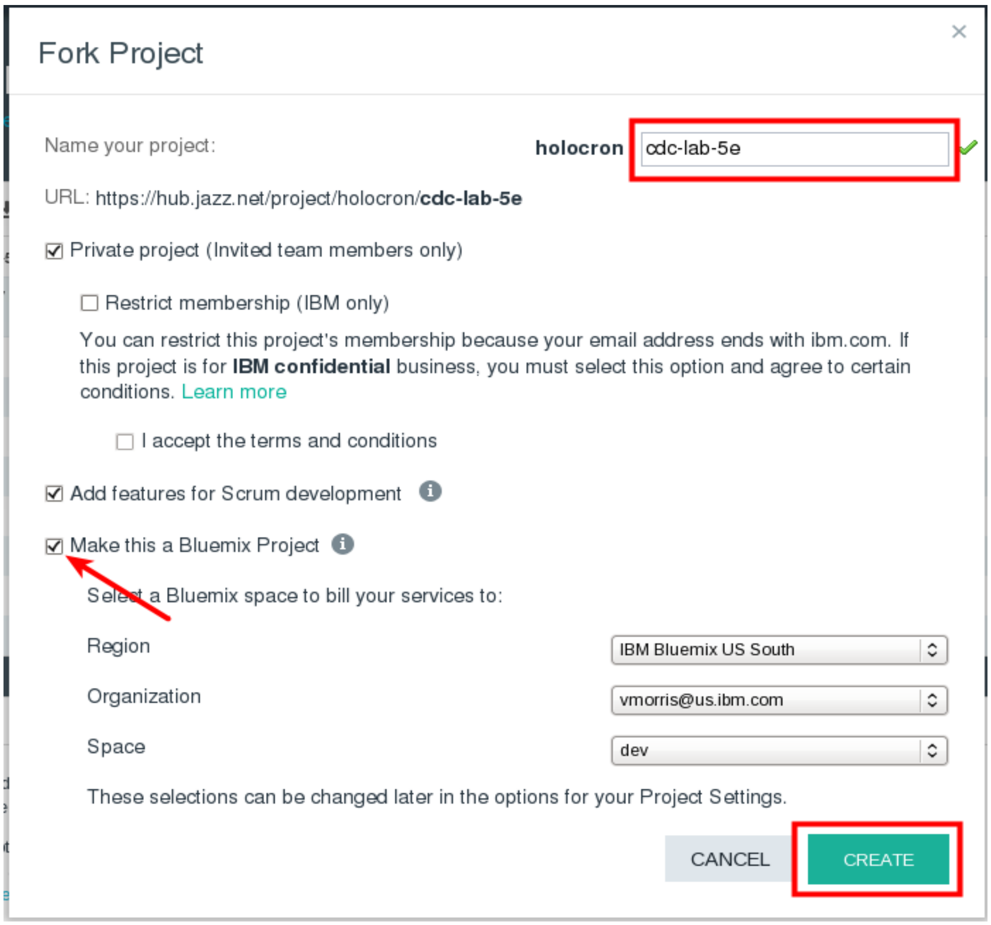
- A web browser supported by Bluemix:
    - Chrome: the latest version for your operating system
    - Firefox: the latest version for your operating system and ESR 31 or ESR 38
    - Internet Explorer: version 10 or 11
    - Safari: the latest version for the Mac

Exercise 5.5.1: Forking a project and changing some HTML code

1. Log in 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, select all the check boxes, and choose an appropriate Bluemix runtime configuration. Click **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

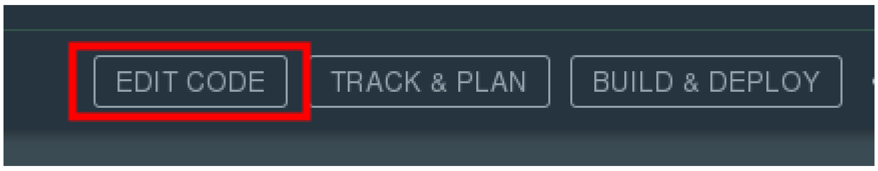
☑ Make this a Bluemix Project

Select a Bluemix space to bill your services to:

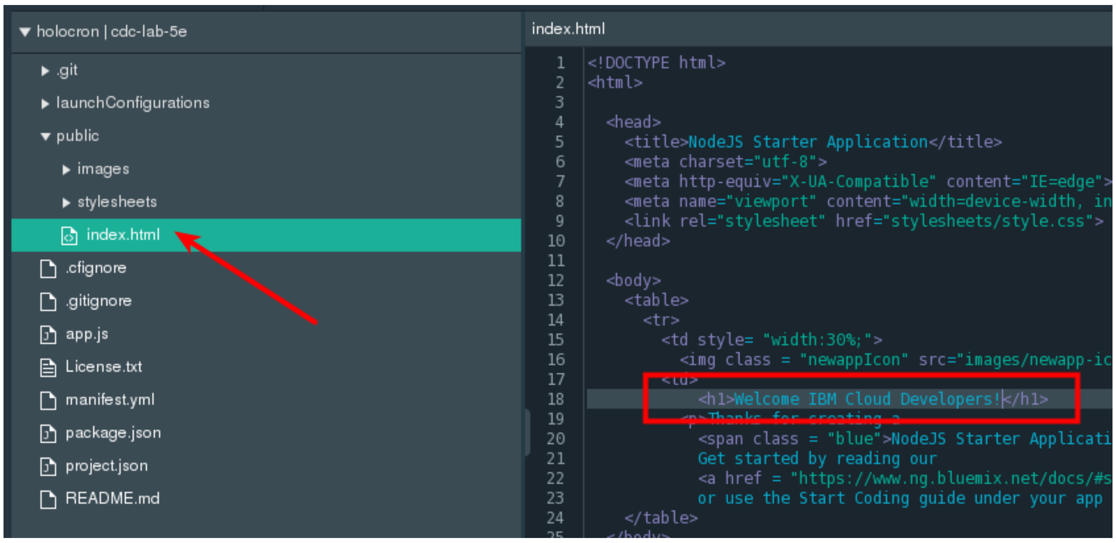
Region	IBM Bluemix US South
Organization	vmorris@us.ibm.com
Space	dev

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

3. After you see the message about successfully creating your project, click **EDIT CODE**.



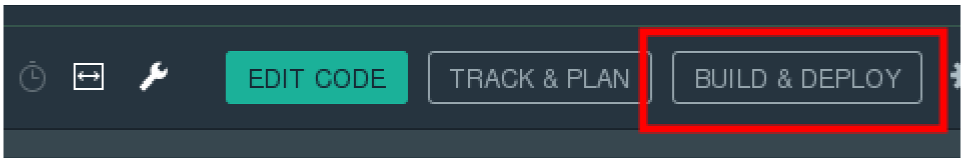
4. Introduce a change to the project's code by editing the public/index.html file and alter the <h1> header tag to something unique.



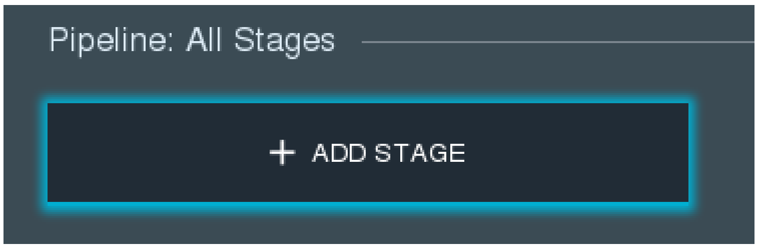
```
<!DOCTYPE html>
<html>

  <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: Configuring the Build and Deploy pipeline

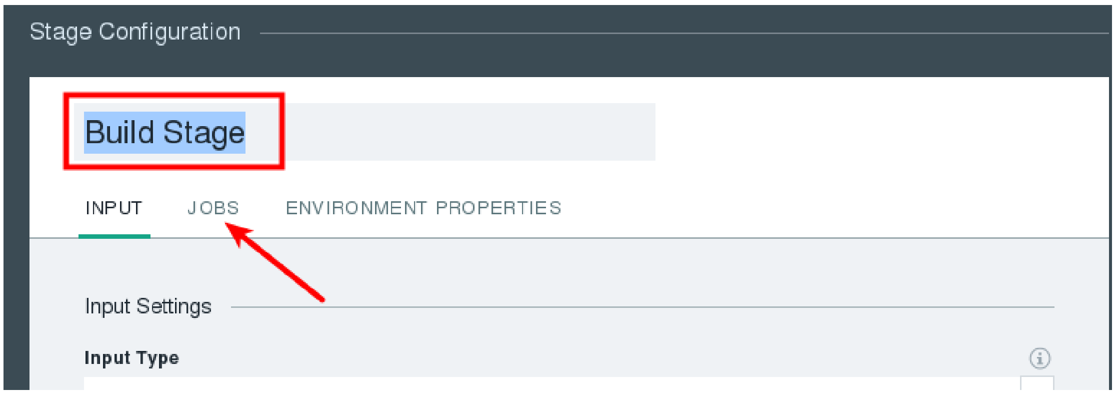
1. Switch to the pipeline overview by clicking **BUILD & DEPLOY**.



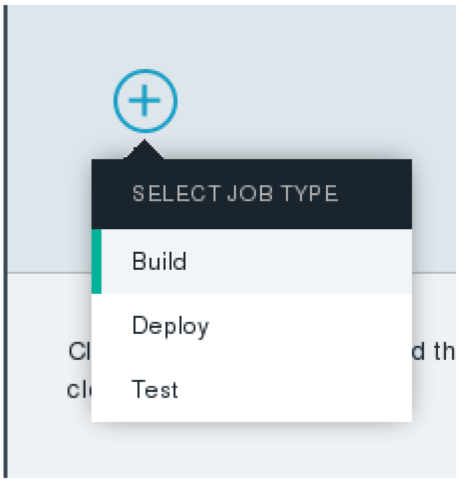
2. Click **ADD STAGE**.



3. Name the stage `Build Stage` and then click the **JOBS** tab.

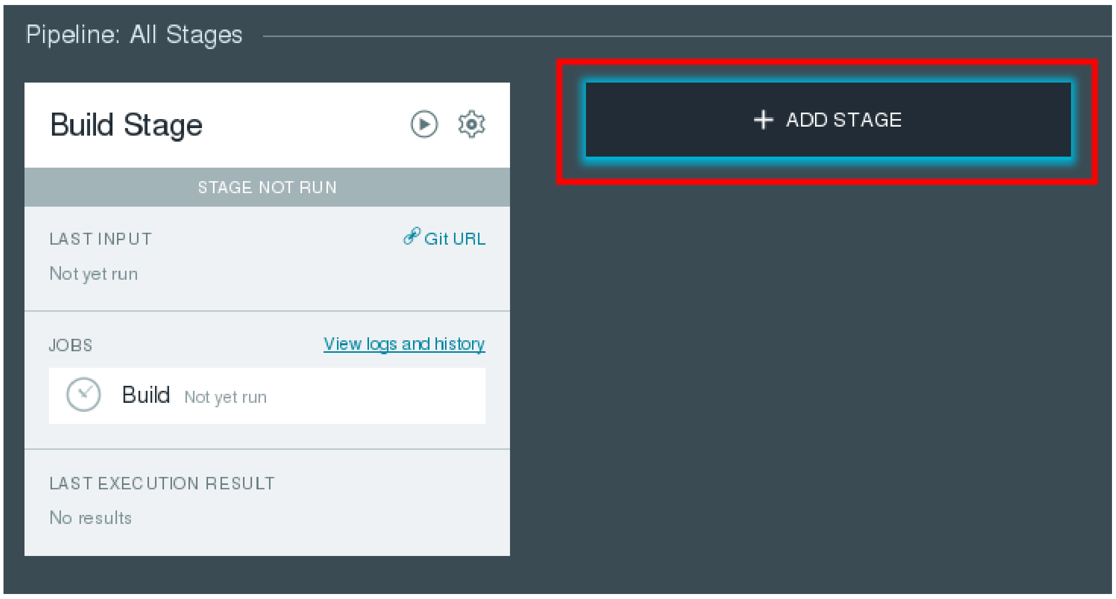


4. Click **ADD A JOB > Build**.

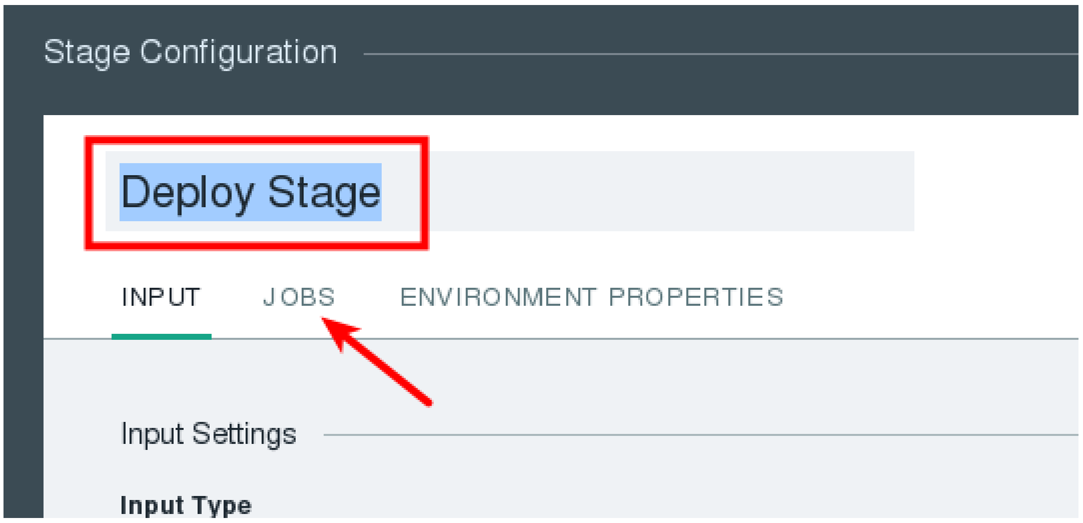


5. Change Builder Type to `npm`. Then, scroll to the bottom and click **SAVE**.

6. In the **Pipeline: All Stages** view, click **ADD STAGE** again.

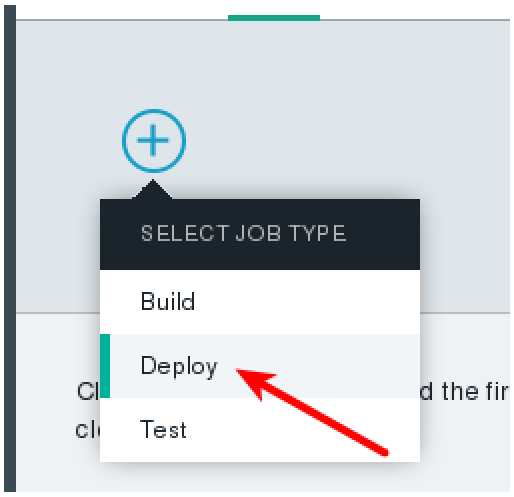


7. Name the stage `Deploy Stage` and note the options available for the stage. The default configuration will use the artifacts that were created from the Build Job in the Build Stage as input, and the Deploy Stage jobs will run after successful completion of the previous stage (Build Stage).



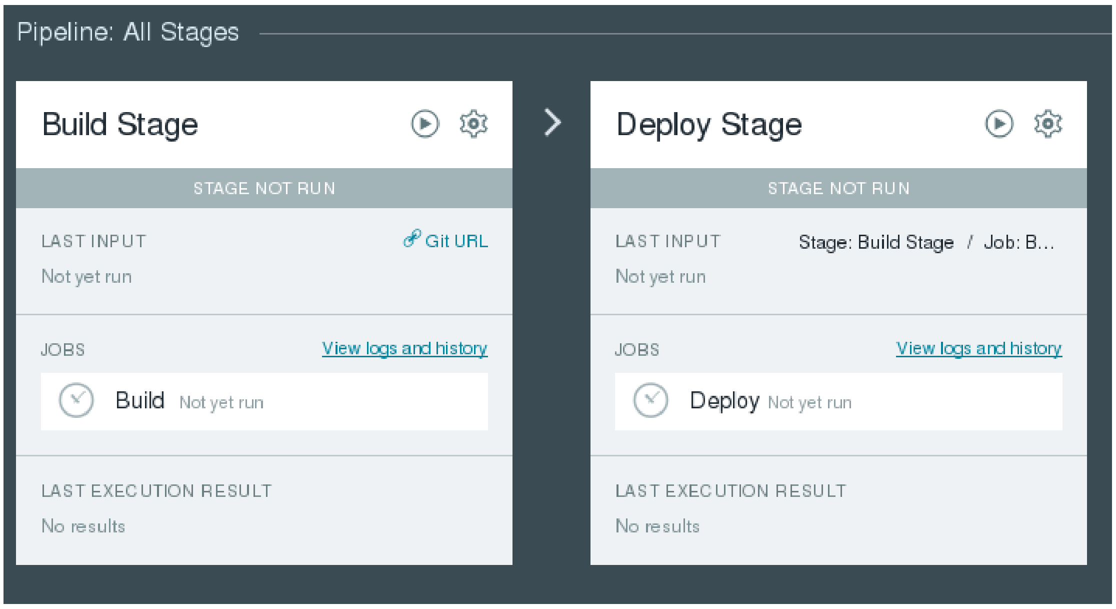
8. Click the **JOBS** tab.

9. Click **ADD JOB > Deploy**.



The Deploy stage will default to acceptable options, but take a moment to view the different settings that are available. The default settings are gathered from the configuration that you entered when you first forked the project.

10. Accept the default settings and click **SAVE**. Observe that both stages are now configured in the pipeline.

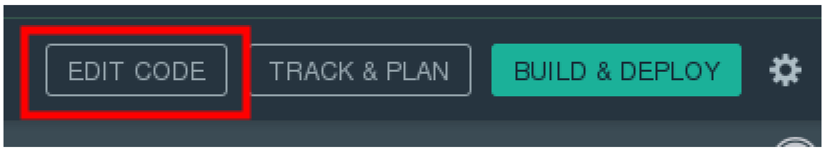

Pipeline: All Stages

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

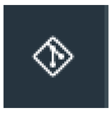
Deploy Stage
STAGE NOT RUN
LAST INPUT Stage: Build Stage / Job: B...
Not yet run
JOBS View logs and history
Deploy Not yet run
LAST EXECUTION RESULT
No results

Exercise 5.5.3: Triggering the pipeline by pushing to the Git repository

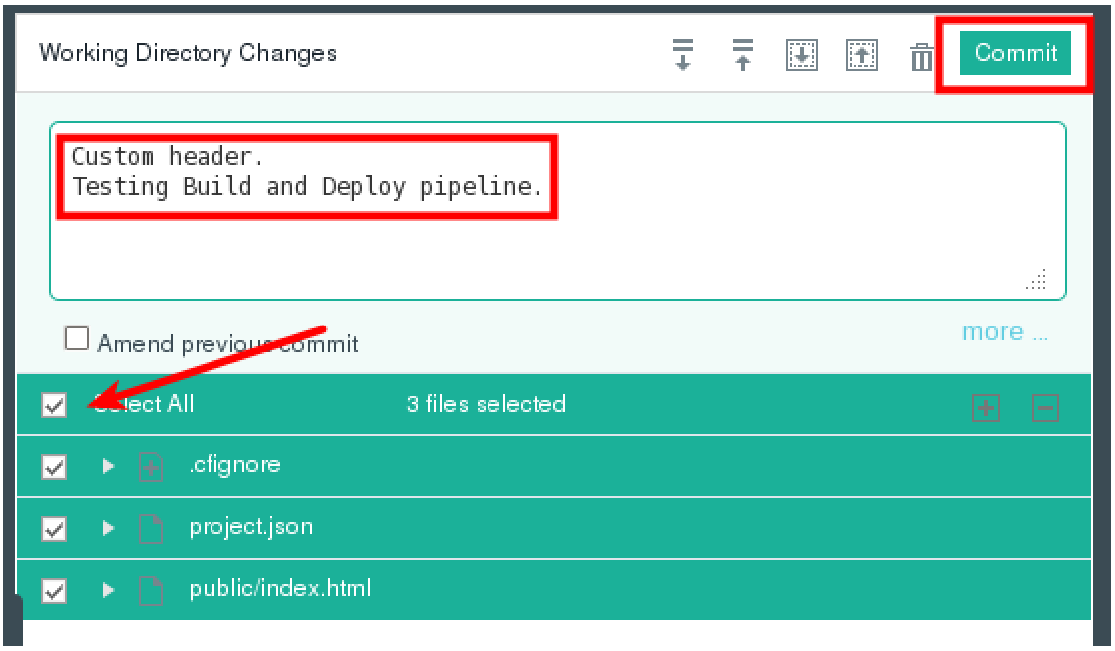
1. Click **EDIT CODE**.



2. Click the **Git** icon in the left column.



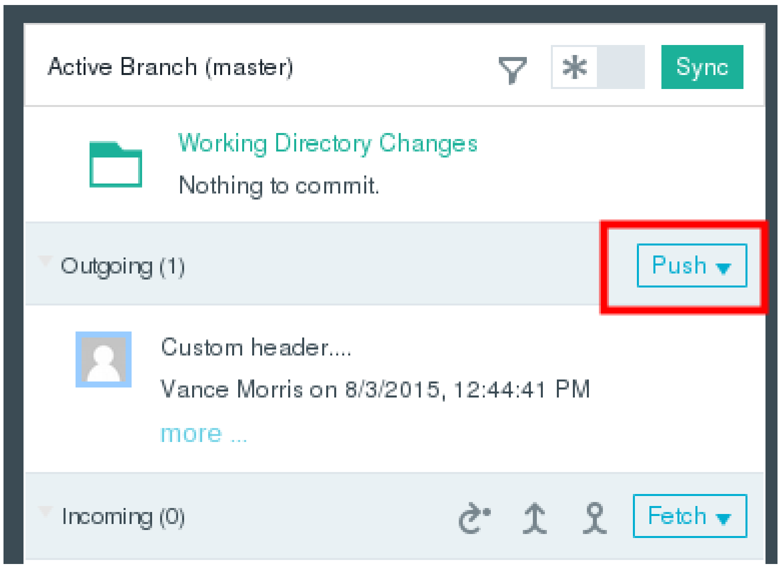
3. Enter an informative commit message and select the **Select All** check box. Then, click **Commit**.

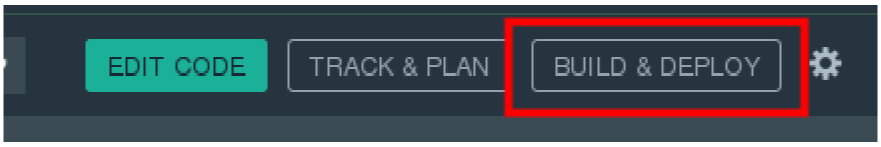


```
Custom header.
Testing Build and Deploy pipeline.
```

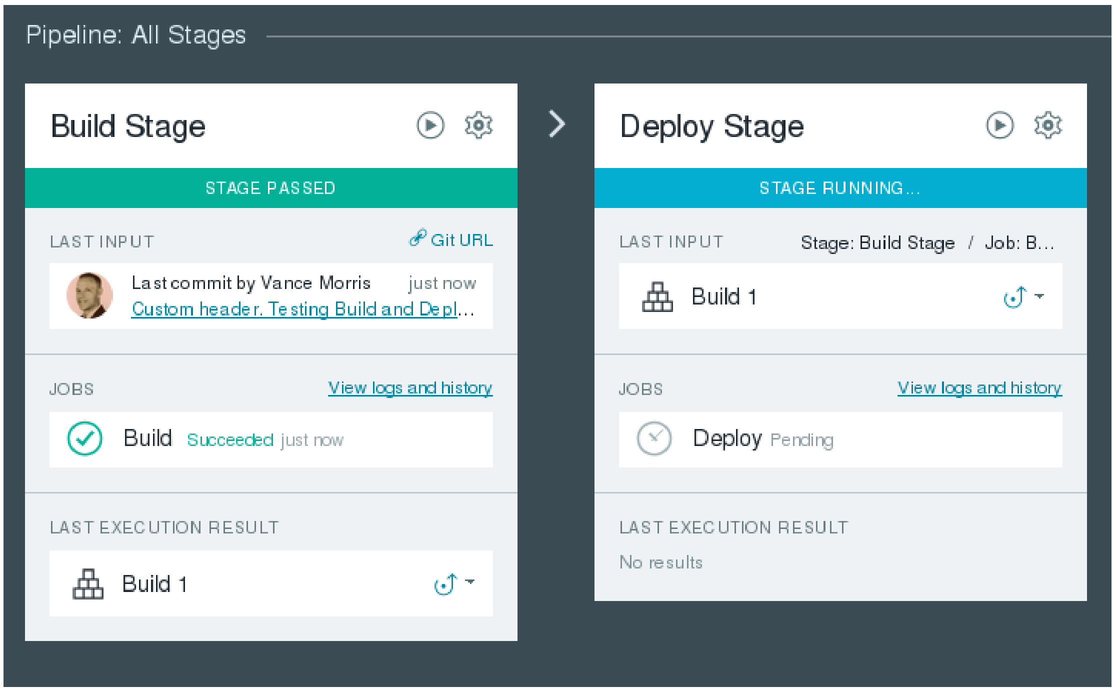
Note that the outgoing commit is now staged.

4. Click **PUSH** and then immediately click **BUILD & DEPLOY**.

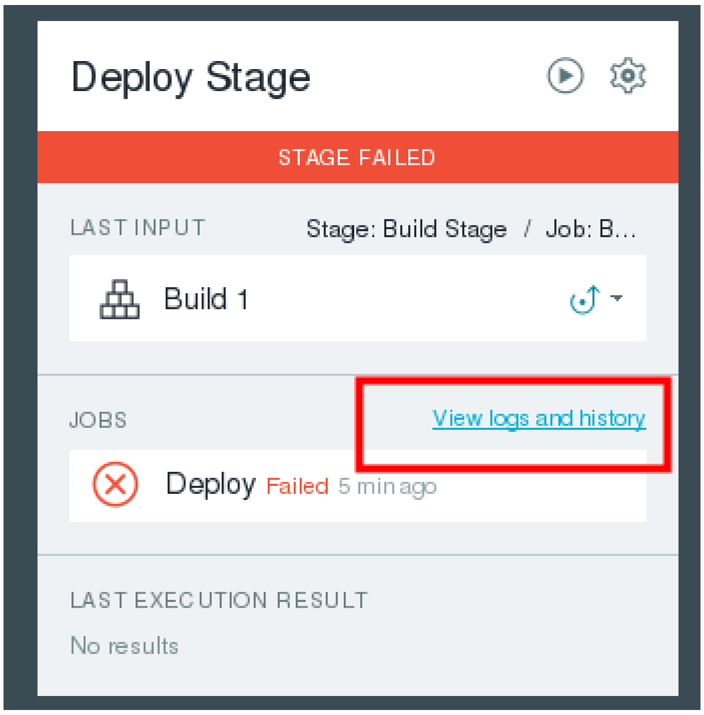




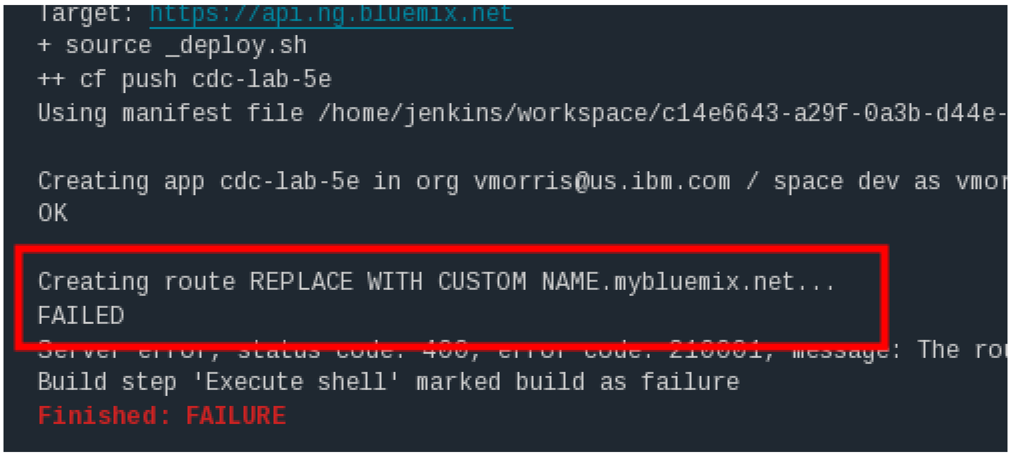
Observe how the build stage is automatically started and once complete, the deploy stage is automatically started.



5. The deploy stage should fail. To determine why, click **View logs and history**.

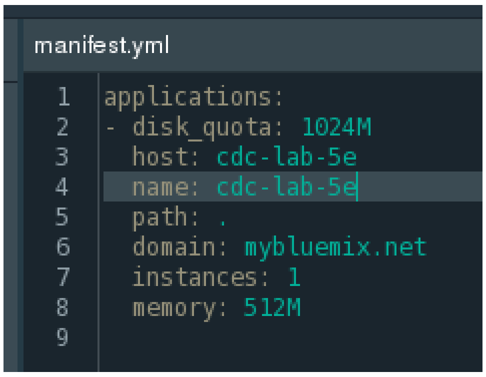


6. From the log, note that Cloud Foundry determined that requested route "REPLACE WITH CUSTOM NAME.mybluemix.net" is not valid.



```
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 rou
Build step 'Execute shell' marked build as failure
Finished: FAILURE
```

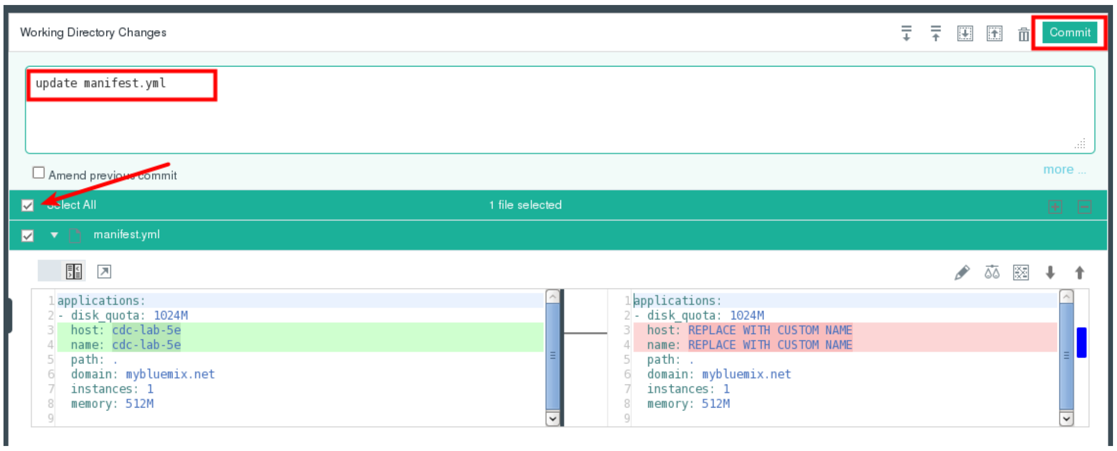
7. Return to the web GUI code editor and open the manifest.yml file. Replace the `host` and `name` values with a unique name that will be used when you create the route and URL to your application.



manifest.yml

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

8. Open the Git repository view and commit the changed manifest file.

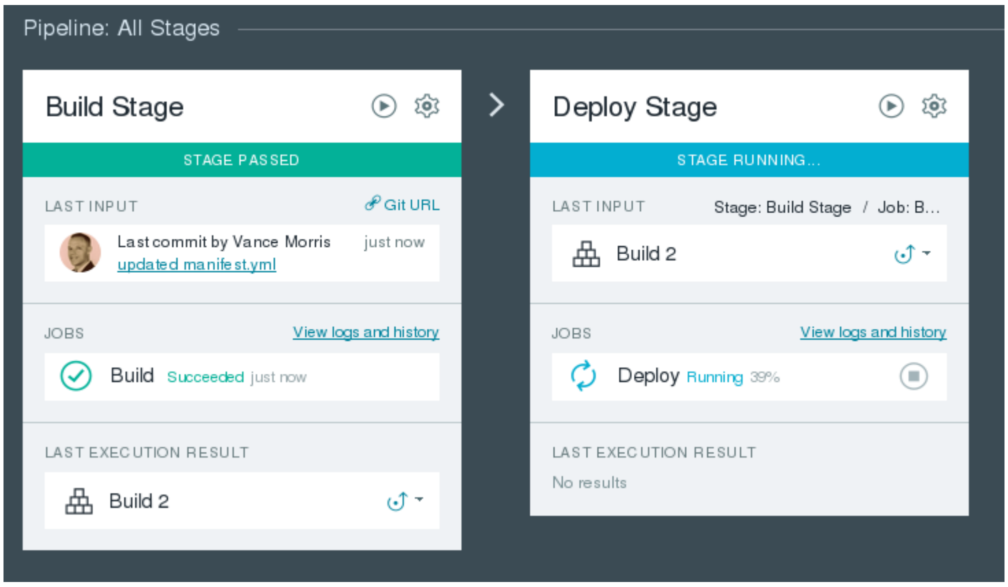


```
update manifest.yml
```

```
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
```

9. Just as you did before, push the staged outgoing commit and 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

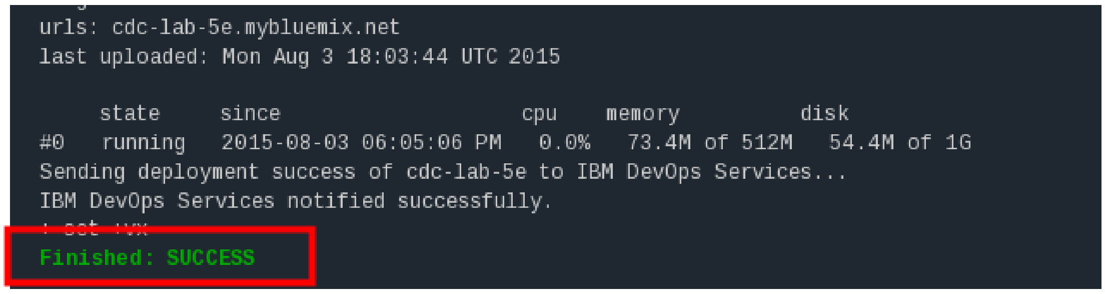
JOBS View logs and history

Deploy Running 39%

LAST EXECUTION RESULT

No results

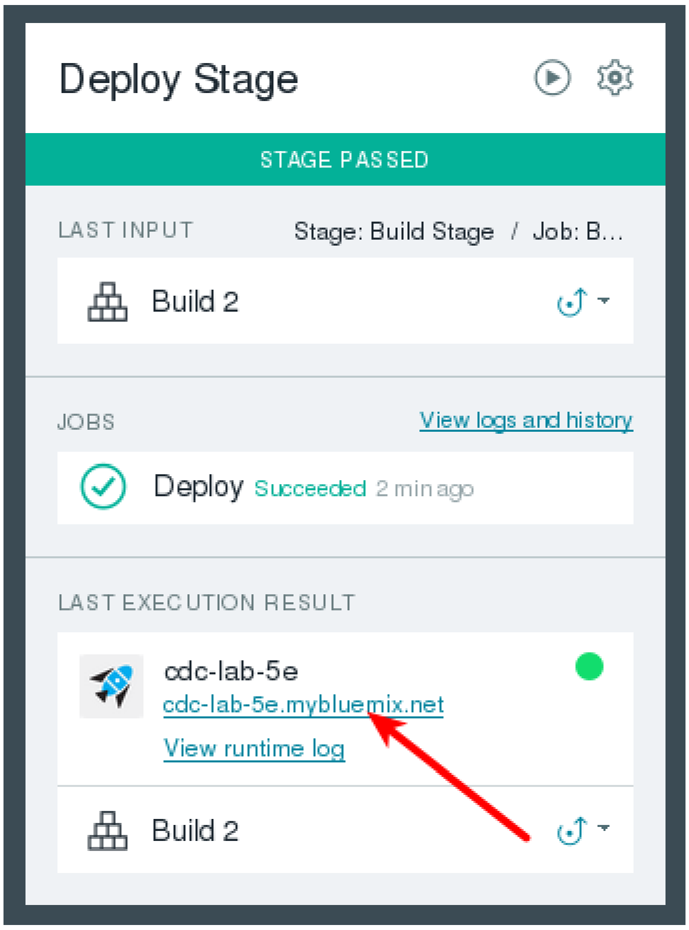
10. During the deploy stage's execution, click **View logs and history** and scroll to the bottom of the log stream. After the application has successfully deployed to Bluemix, you will see a `Finished: SUCCESS` message.



```
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
```

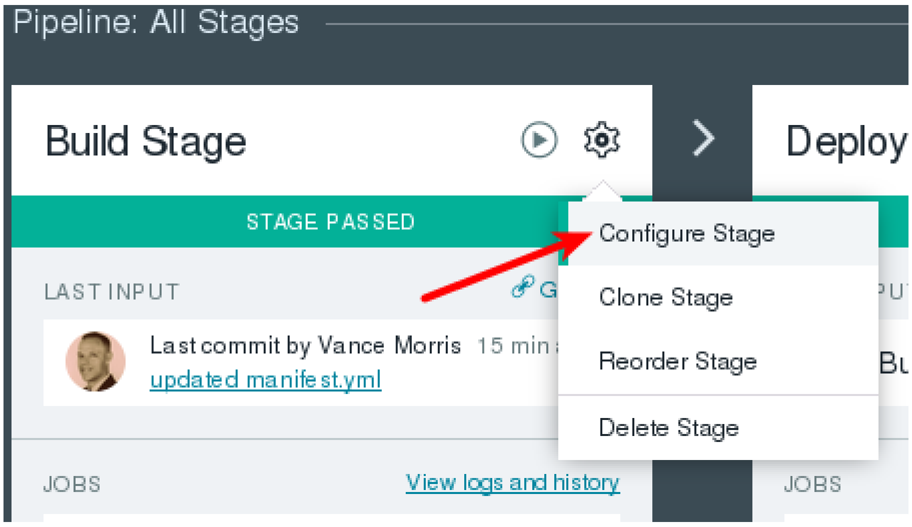
11. Scroll to the top of the page and click **Back to Pipeline**.

12. 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 that link.

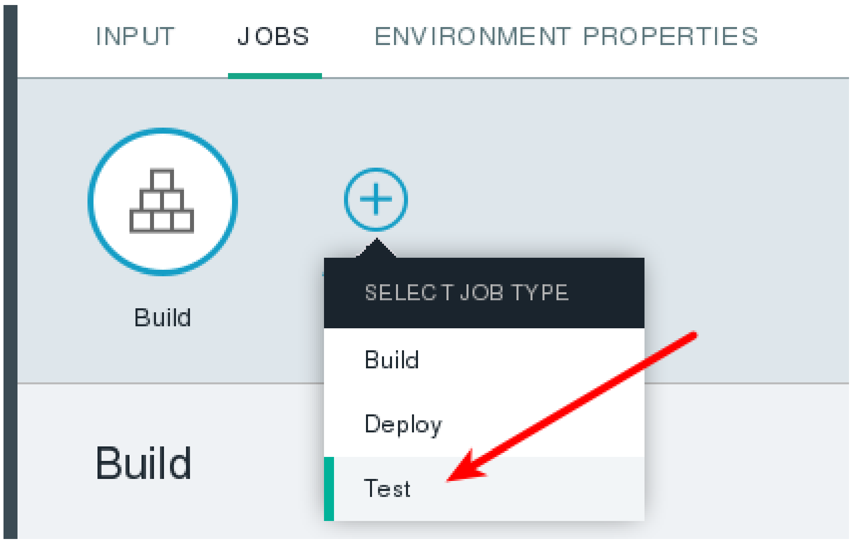


Exercise 5.5.4: Configuring a test job and modifying the pipeline

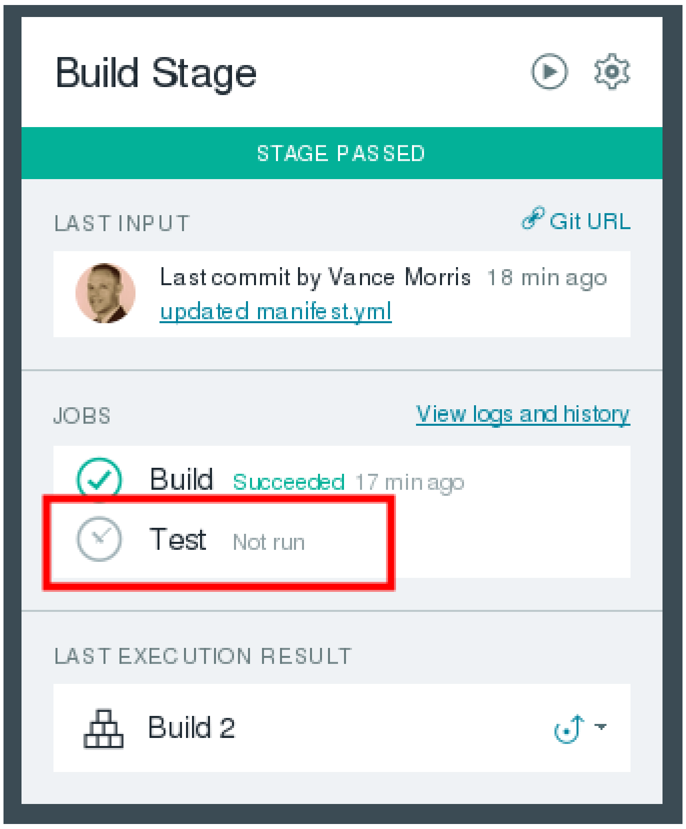
1. Return to the DevOps Services Build and Deploy Pipeline overview and from the Build Stage section, click **Stage Configuration**. Then, click **Configure Stage**.



2. Click **ADD JOB > Test**.



3. Accept the default configuration for the Test job. Note that the Simple Tester Type allows you to execute a custom Bash script. Our simple project does not have any testing framework to execute, but if it did, this is the place to execute and evaluate tests. Click **SAVE**. 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

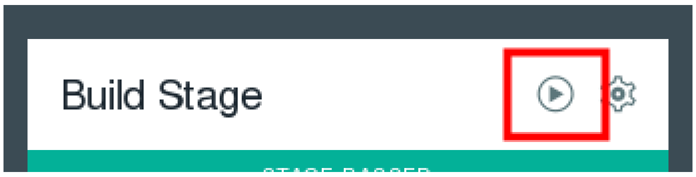
Build Succeeded 17 min ago

Test Not run

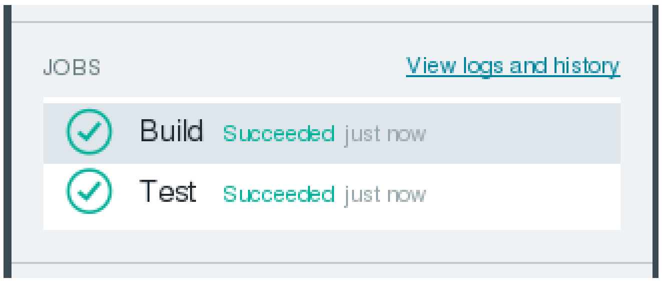
LAST EXECUTION RESULT

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