

# Instructions for Setting up CI/CD in Azure

Steps and commands to follow to help setup this within the Azure Environment.

## Create projects in OpenShift

```
oc new-project pytest-dev
oc new-project pytest-prod
```

## Create Service Accounts

```
oc create -f prod-service-account.yaml -n pytest-prod
oc create -f dev-service-account.yaml -n pytest-dev
```

## Create secrets and link to pull

A secret is need to pull from registry.redhat.io

Secrets are valid within a project

Create an account here - <https://access.redhat.com/terms-based-registry/#/accounts>

```
oc project pytest-dev
oc create -f ~/aws/bfarr-secret.yaml
oc secrets link default 7271256-bfarr-pull-secret --for=pull
oc secrets link builder 7271256-bfarr-pull-secret
```

## Process build template

```
oc project pytest-dev
oc process -f pytest-dev-build-template.yml | oc create -f -
```

## Test the build from local code

```
oc start-build pytest-calculator --from-dir=. --follow
```

## Process dev template

```
oc process -f pytest-dev-deployment-template.yml | oc create -f -
```

## Process prod template

```
oc process -f pytest-prod-deployment-template.yml | oc create -f -
```

## Enable the prod service account to be able tag images

```
oc policy add-role-to-user edit system:serviceaccount:pytest-dev:pytest-dev-sa
oc policy add-role-to-user edit system:serviceaccount:pytest-dev:pytest-dev-sa --namespace
pytest-prod
```

```
oc project pytest-prod
oc policy add-role-to-user edit system:serviceaccount:pytest-prod:pytest-prod-sa
```

```
oc policy add-role-to-user edit system:serviceaccount:pytest-prod:pytest-prod-sa --namespace
pytest-dev
```

## Log into Azure

### Install the extension

<https://marketplace.visualstudio.com/items?itemName=redhat.openshift-vsts>

The screenshot shows the Visual Studio Marketplace page for the 'OpenShift Extension' by Red Hat. The page header includes 'Visual Studio | Marketplace' and a 'Sign in' button. The breadcrumb trail is 'Azure DevOps > Azure Pipelines > OpenShift Extension'. The main section features the extension's logo (a red circle with a white 'C' and arrows), the name 'OpenShift Extension', the publisher 'Red Hat', and statistics: '841 installs', a 5-star rating (1 review), and a 'Preview' label. A green 'Get it free' button is present. Below this, there are tabs for 'Overview', 'Q & A', and 'Rating & Review'. The 'Overview' tab is active, showing a description: 'OpenShift tasks for Azure DevOps'. It includes a 'build passing' and 'OpenShift VSTS CI passing' status bar. The description text states: 'This Azure DevOps extension offers tasks for integrating OpenShift into your build and release pipelines, for example by executing user defined oc commands.' It also mentions a 'Get Started' guide and a note about cURL. On the right side, there are sections for 'Categories' (Azure Pipelines), 'Tags' (oc, openshift, tasks, utility, Utility task), 'Works with' (Azure DevOps Services, Azure DevOps Server), 'Resources' (Support, Get Started, License), and 'Project Details'.

## Log into Azure Pipelines

The screenshot shows the Azure DevOps web interface. The top navigation bar includes the 'Azure DevOps' logo, the user 'benjaminfarr', and a search bar. The left sidebar contains a list of navigation items: 'benjaminfarr', 'Overview', 'Pipelines', 'Pipelines', 'Environments', 'Releases', 'Library', 'Task groups', and 'Deployment groups'. The main content area is titled 'Pipelines' and has a 'New pipeline' button. Below the title, there are tabs for 'Recent', 'All', and 'Runs'. A 'Filter pipelines' dropdown is also visible. The 'Recently run pipelines' section shows a table with the following data:

Pipeline	Last run
bfarr-rh.nodejs-ex	#20200508.34 • Set up CI with Azure Pi... PR automated for 1 8 May 59s

Azure DevOps

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Overview

Pipelines

Pipelines

Environments

Releases

Library

Task groups

Deployment groups

ConnectSelectConfigureReview

New pipeline

Where is your code?

Azure Repos Git 

YAML

Free private Git repositories, pull requests, and code search

Bitbucket Cloud 

YAML

Hosted by Atlassian

GitHub 

YAML

Home to the world's largest community of developers

GitHub Enterprise Server 

YAML

The self-hosted version of GitHub Enterprise

Other Git 

Any generic Git repository

Subversion 

Centralized version control by Apache

[Use the classic editor](#) to create a pipeline without YAML.

Azure DevOps

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Overview

Pipelines

Pipelines

Environments

Releases

Library

Task groups

Deployment groups

✓ ConnectSelectConfigureReview

New pipeline

Select a repository

Filter by keywords

My repositories

×

bfarr-rh/pytest-calculator 

25m ago

bfarr-rh/s2i-dotnetcore-ex 

5 Jun

fork

bfarr-rh/nodejs-ex 

8 May

fork

bfarr-rh/jupyter-notebooks 

3 May

bfarr-rh/terraform



## Authorize Azure Pipelines (OAuth)



Azure Pipelines (OAuth) by [AzurePipelines](#)  
wants to access your bfarr-rh account



**Repository webhooks and services**  
Admin access



**Personal user data**  
Email addresses (read-only), profile information (read-only)



**Repositories**  
Public and private



### Organization access



RedHatEMEA ✓

Authorize AzurePipelines

Authorizing will redirect to  
<https://app.vssps.visualstudio.com>

## Repository access

[Azure Pipelines](#) suggested installation on the following repositories.

☐ **All repositories**

This applies to all current *and* future repositories.

☒ **Only select repositories**

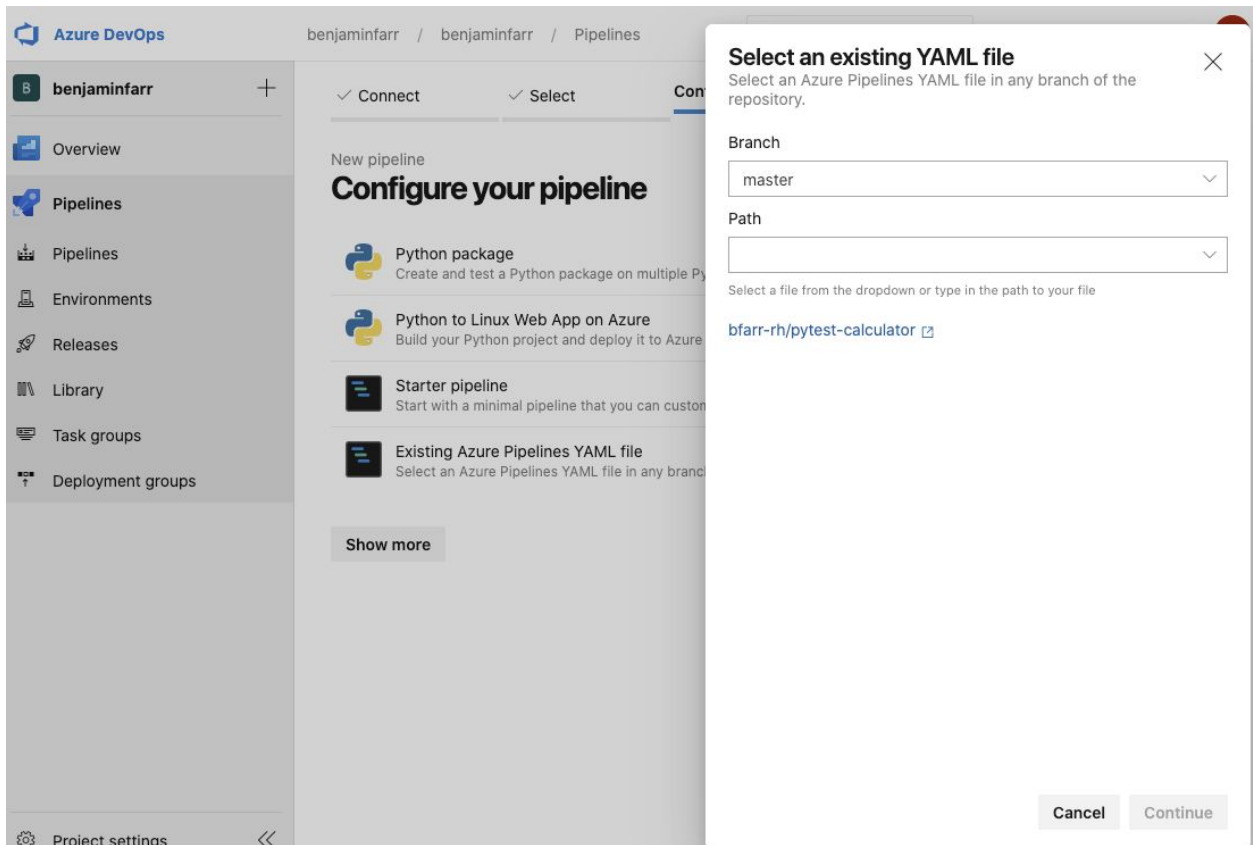
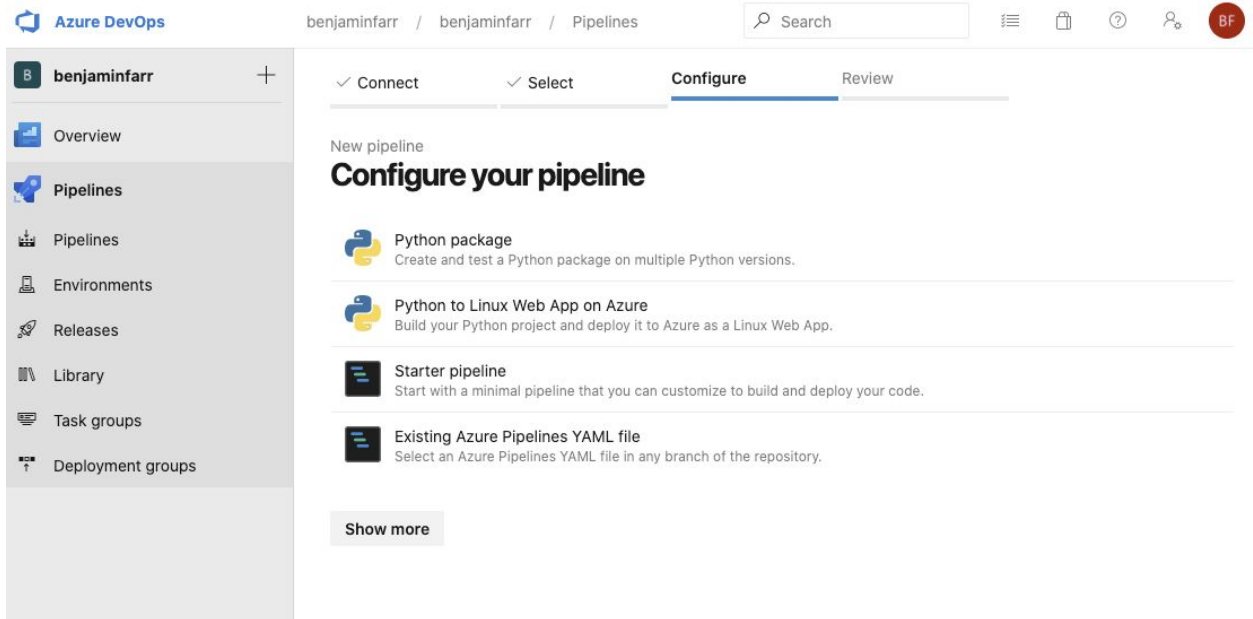
Select repositories ▾

Selected 2 repositories.

bfarr-rh/nodejs-ex	X
bfarr-rh/pytest-calculator suggested	X

Approve and install

Cancel



Azure DevOps interface showing the "Review your pipeline YAML" screen. The left sidebar contains navigation links: Overview, Pipelines, Pipelines, Environments, Releases, Library, Task groups, Deployment groups, and Project settings. The main area displays the pipeline configuration for "bfarr-rh/pytest-calculator / azure-dev-pipelines.yml". The configuration includes a trigger for master, a pool using ubuntu-latest, and two steps: "Run a one-line script" and "Run a multi-line script". The "Run a multi-line script" step is configured with task "oc-cmd@2" and inputs for connection type and openshift service.

```
2 # Start with a minimal pipeline that you can customize to build and deploy your code.
3 # Add steps that build, run tests, deploy, and more:
4 # https://aka.ms/yaml
5
6 trigger:
7   - master
8
9 pool:
10  vmImage: 'ubuntu-latest'
11
12 steps:
13   - script: echo Hello, world!
14     displayName: 'Run a one-line script'
15
16   - script: |
17       echo Add other tasks to build, test, and deploy your project.
18       echo See https://aka.ms/yaml
19     displayName: 'Run a multi-line script'
20
21 Settings
22   - task: oc-cmd@2
23     inputs:
24       connectionType: 'OpenShift Connection Service'
25       openshiftService: 'pytest-dev-sa'
```

**Save instead of running it**

**Click on Project settings**

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>>

← bfarr-rh.pytest-calculator

VariablesRun⋮

master

bfarr-rh/pytest-calculator / azure-dev-pipelines.yml

```
16 - script: |
17   ... echo Add other tasks to build, test, and deploy your project.
18   ... echo See https://aka.ms/yaml
19   ... displayName: 'Run a multi-line script'
20   Settings
21   - task: oc-cmd@2
22     inputs:
23       ... connectionType: 'OpenShift Connection Service'
24       ... openshiftService: 'pytest-dev-sa'
25       ... cmd: 'status'
26   Settings
27   - task: oc-cmd@2
28     inputs:
29       ... connectionType: 'OpenShift Connection Service'
30       ... openshiftService: 'pytest-dev-sa'
31       ... cmd: 'start-build pytest-calculator'
32   Settings
33   - task: oc-cmd@2
34     inputs:
35       ... connectionType: 'OpenShift Connection Service'
36       ... openshiftService: 'pytest-dev-sa'
37       ... cmd: 'rollout latest dc/pytest-calculator'
38   Settings
39   - task: oc-cmd@2
40     inputs:
41       ... connectionType: 'OpenShift Connection Service'
42       ... openshiftService: 'pytest-dev-sa'
```

Tasks

🔍 openshift

Execute conditional oc command  
OpenShift execute CLI command if the condi...

Execute oc command  
OpenShift execute CLI command.

Update ConfigMap  
Applies environment properties to specified O...

benjaminfarr / benjaminfarr / Settings / Service connections

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## Project Settings

benjaminfarr

### General

- Overview
- Teams
- Permissions
- Notifications
- Service hooks
- Dashboards

### Pipelines

- Agent pools
- Parallel jobs
- Settings
- Test management
- Release retention
- Service connections**
- XAML build services

### Test

- Retention

## Service connections

Filter by keywords

bfarr-rh

bfarr-rh (1)

### New service connection

Choose a service or connection type

☒ Azure Classic

☐ Azure Repos/Team Foundation Server

☐ Azure Resource Manager

☐ Azure Service Bus

☐ Bitbucket Cloud

☐ Chef

☐ Docker Host

☐ Docker Registry

☐ Generic

☐ GitHub

☐ GitHub Enterprise Server

[Learn more](#)


Next





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>>

### Project Settings

benjaminfarr

#### General

- Overview
- Teams
- Permissions
- Notifications
- Service hooks
- Dashboards

#### Pipelines


- Agent pools
- Parallel jobs
- Settings
- Test management
- Release retention
- Service connections
- XAML build services


#### Test

- Retention

### Service connections


Filter by keywords


 bfarr-rh

 bfarr-rh (1)

### New service connection

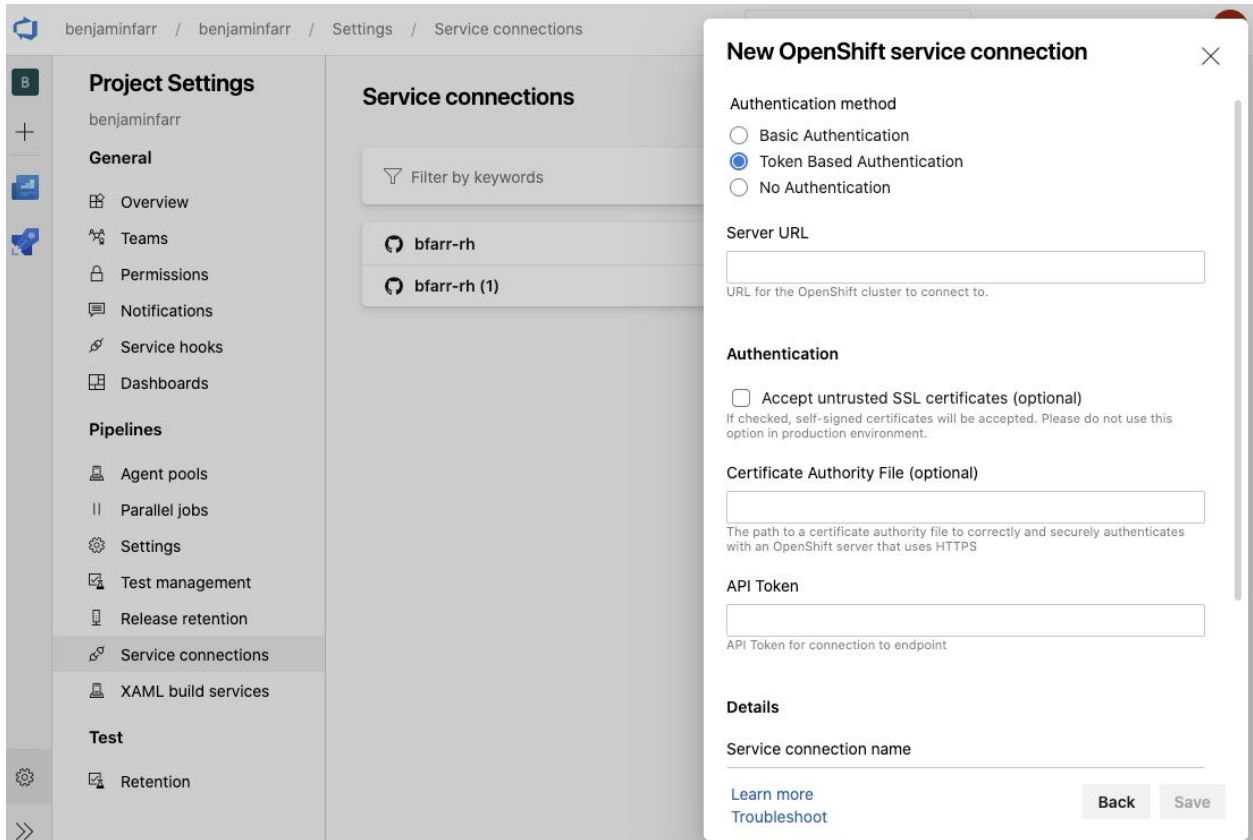
Choose a service or connection type



 OpenShift

Learn more

Next



## Paste and use the token from

oc sa get-token pytest-dev-sa

eyJhbGciOiJSUzI1NiIsImtpZCI6ImVLWmtGbEtOWWdkRkFUSURtRjdXYjVON2o1UUNGU19FYXVfM1dNLTJHbTgifQ.eyJpc3MiOiJrdWJlcm5ldGVzL3NlcnZpY2VhY2NvdW50Iiwia3ViZXJuZXRlcy5pby9zZXJ2aWNlYWNjb3VudC9uYW1lc3BhY2UiOiJweXRlc3QtZGV2liwia3ViZXJuZXRlcy5pby9zZXJ2aWNlYWNjb3VudC9zZWNyZXQubmFtZSI6InB5dGVzdC1kZXlhc2EtdG9rZW4tcm1kanEiLCJrdWJlc5ldGVzLmVzL3NlcnZpY2VhY2NvdW50L3NlcnZpY2UtYWNjb3VudC5uYW1lIjoicHI0ZXN0LWRldi1zYSIsImt1YmVybmV0ZXMuaW8vc2VydmljZWJyY291bnQvc2VydmljZS1hY2NvdW50LmVpZCI6ImQ2Yjk0NmE4LTk1NjctNDU0Yi04MWM5LWUwZDhjYmIxc0gM4YyIsInN1Yil6InN5c3RlbTpsZXJ2aWNlYWNjb3VudDpweXRlc3QtZGV2OnB5dGVzdC1kZXlhc2EifQ.fAIJXqqP-B9crso6B-ntYrzs0XUIRQpsoVEYyA-Ty0pA5KRYwMNzpVPfV5C\_dNeo\_t91WYQ9hsmAfIQ5Nf-4gzYhuonXJin4zZphPm8JEmnZMUYYmA394XXK2bM\_i1JoTNHWUITb13w8Mye497V14NaesZvsySkgPpQ3BBT6OOW0dufdREDigAA XgcrqMQ9vKQtDWnxYGd7u2fbnoG5S7Q3TH5CNvKUxrTCI5Ee-wEhJ0gOK4ZhLPN5aMBKdjn5mwPsvewocTxvK\_y\_EzFR-ADT5pZdozzmpl8EAouIOSI3wRyidUzJeBHbvl0BtsEk5q3nczAdXgtb97qi8gZ.....

## Edit service connection



https://api.cluster-melbourn-f4f9.melbourn-f4f9.example.ope

URL for the OpenShift cluster to connect to.

### Authentication

☒ Accept untrusted SSL certificates (optional)

If checked, self-signed certificates will be accepted. Please do not use this option in production environment.

### Certificate Authority File (optional)

The path to a certificate authority file to correctly and securely authenticates with an OpenShift server that uses HTTPS

### API Token

API Token for connection to endpoint

### Details

#### Service connection name

#### Description (optional)

[Learn more](#)  
[Troubleshoot](#)

Cancel

Save

## Run pipeline



Select parameters below and manually run the pipeline

Branch/tag

master



Select the branch or tag

Commit

### Advanced options

Variables

This pipeline has no defined variables



Stages to run

Run as configured



Resources

Use latest version of all resources



☐ Enable system diagnostics

Cancel

Run



## #20200612.1 openshift files

on bfarr-rh.pytest-calculator

Cancel



### Summary

Manually run by Benjamin Farr

View change

Repository and version

bfarr-rh/pytest-calculator

master 95e2015

Time started and elapsed

Just now

-

Related

0 work items

0 artifacts

Tests and coverage

[Get started](#)

### Jobs

Name	Status	Duration
Job	Queued	

benjaminfarr

Pipelines

bfarr-rh.pytest-calculator

20200612.1

Search

Jobs in run #202006...  
bfarr-rh.pytest-calculator

Jobs

Job40s

Initialize job3s

Checkout bfarr-...2s

Run a one-line ...<1s

Run a multi-lin...<1s

occmd15s

occmd3s

occmd4s

occmd9s

ocsetup

CmdLine

PublishTestResults

Post-job: Checkou...

occmd

```
1 Starting: occmd
2 =====
3 Task      : Execute oc command
4 Description : OpenShift execute CLI command.
5 Version   : 2.0.13
6 Author    : Red Hat
7 Help      : See [getting started](https://github.com/redhat-developer/openshift-vsts/blob/master
8 =====
9 /home/vsts/work/1/s/.download/oc login --insecure-skip-tls-verify --token *** https://api.cluster-
10 Logged into "https://api.cluster-melbourn-f4f9.melbourn-f4f9.example.opentlc.com:6443" as "system:
11 You have access to the following projects and can switch between them with 'oc project <projectname
12
13 * pytest-dev
14   pytest-prod
15
16 Using project "pytest-dev".
17
18 /home/vsts/work/1/s/.download/oc rollout status dc pytest-calculator
19 Waiting for rollout to finish: 0 of 1 updated replicas are available...
```

Project: pytest-dev

## Pods

Create Pod

Filter by name...

2 Running	0 Pending	0 Terminating	0 CrashLoopBackOff	3 Completed	0 Failed	0 Unknown	Select all filters	2 of 5 items
Name ↑	Namespace ↓	Status ↓	Ready ↓	Restarts ↓	Owner ↓	Memory ↓	CPU ↓	Created ↓
pytest-calculator-1-7wwkg	NS pytest-dev	Running	1/1	0	RC pytest-calculator-1	28.0 MiB	0.001 cores	a minute ago
pytest-calculator-3-build	NS pytest-dev	Running	1/1	0	B pytest-calculator-3	116.4 MiB	0.097 cores	2 minutes ago

benjaminfarr / Pipelines / bfarr-rh.pytest-calculator / 20200612.1

Search

### Jobs in run #20200612.1

bfarr-rh.pytest-calculator

Jobs

Job	Duration
Job	2m 35s
Initialize job	3s
Checkout bfarr-...	2s
Run a one-line ...	<1s
Run a multi-lin...	<1s
occmd	15s
occmd	3s
occmd	4s
occmd	20s
ocsetup	4s
CmdLine	1m 34s
PublishTestRes...	4s
Post-job: Chec...	<1s
Finalize Job	<1s

### Job

View raw log

```

1 Pool: Azure Pipelines
2 Image: ubuntu-latest
3 Agent: Hosted Agent
4 Started: Today at 14:36
5 Duration: 2m 35s
6
7 > Job preparation parameters
8 100% tests passed
9 Job live console data:
10 Finishing: Job

```

benjaminfarr / benjaminfarr / Pipelines / bfarr-rh.pytest-calculator / 20200612.1

Search

### #20200612.1 openshift files

on bfarr-rh.pytest-calculator Retained

Run new

Summary Tests Code Coverage

#### Summary


1 Run(s) Completed ( 1 Passed, 0 Failed )

2	2 ● Passed	100%	100ms	0
Total tests	0 ● Failed	Pass percentage	Run duration	Tests not reported
+2	0 ● Others	↑ 100%	↑ +100ms	

Filter by test or run name

Tags Test run Column Options

Tags Test file Owner Aborted (+1)



https://dev.azure.com/benjaminfarr/benjaminfarr/\_build/results?buildId=432&u=ms.vss-test-wah-build-test-results-tah

Test results published

## Examine unit tests in available file

Project: pytest-dev ▾

---

Pods > Pod Details

**pytest-calculator-2-8rcx2** Running Actions ▾

---

Details **YAML** Environment Logs Events Terminal

---

Connecting to pytest-calculator ▾ Expand

```
(app-root) sh-4.4$ cat junit.xml
<?xml version="1.0" encoding="utf-8"?><testsuites><testsuite errors="0" failures="0" hostname="pytest-calculator-2-8rcx2" name="pytes
t" skipped="0" tests="2" time="0.018" timestamp="2020-06-12T04:48:39.359465"><testcase classname="calc.tests.test_calculator" file="c
alc/tests/test_calculator.py" line="3" name="test_add" time="0.001"></testcase><testcase classname="calc.tests.test_calculator" file=
"calc/tests/test_calculator.py" line="7" name="test_add_string" time="0.000"></testcase></testsuite></testsuites>(app-root) sh-4.4$
```

Promote to prod.

Create a new pipeline as before but with azure-prod-pipelines.yml file

benjaminfarr / benjaminfarr / Pipelines Search ⋮ 📄 🕒 🔍 BF

---

**Review**

New pipeline **Review your pipeline YAML** Variables Run ▾

**bfarr-rh/pytest-calculator / azure-prod-pipelines.yml** Show assistant

```
1 # Starter pipeline
2 # Start with a minimal pipeline that you can customize to build and deploy your code.
3 # Add steps that build, run tests, deploy, and more:
4 # https://aka.ms/yaml
5
6 pool:
7   vmImage: 'ubuntu-latest'
8
9 steps:
10  - script: echo Hello, world!
11    displayName: 'Run a one-line script'
12
13  Settings
14  - task: oc-setup@2
15    inputs:
16      openshiftService: 'pytest-prod-sa'
17      version: '4.3'
18  - script: |
19    oc status
20    oc tag pytest-dev/pytest-calculator:latest pytest-prod/pytest-calculator:live
21    oc rollout latest dc/pytest-calculator
22    oc rollout status dc/pytest-calculator
23
```

And run it



## Run pipeline



Select parameters below and manually run the pipeline

Branch/tag

master



Select the branch or tag

Commit

### Advanced options

Variables

This pipeline has no defined variables



Stages to run

Run as configured



Resources

Use latest version of all resources



☐ Enable system diagnostics

Cancel

Run

benjaminfarr / benjaminfarr / Pipelines / bfarr-rh.pytest-calculator ... / 20200612.2

Search

Jobs in run #20200612...

bfarr-rh.pytest-calculator (1)

Jobs

Job 29s

Initialize job 1s

Checkout bfarr-rh/pyt... 2s

Run a one-line script <1s

ocsetup 14s

CmdLine 9s

Post-job: Checkout bfarr...

CmdLine

```

3 Task : Command line
4 Description : Run a command line script using Bash on Linux and macOS and cmd.exe on Windows
5 Version : 2.164.2
6 Author : Microsoft Corporation
7 Help : https://docs.microsoft.com/azure/devops/pipelines/tasks/utility/command-line
8 =====
9 Generating script.
10 ===== Starting Command Output =====
11 /bin/bash --noprofile --nrc /home/vsts/work/_temp/18466e71-2dca-4967-a70f-9b7d371bc00b.sh
12 In project pytest-dev on server https://api.cluster-melbourn-f4f9.melbourn-f4f9.example.opentlc.com:6443
13
14 svc/pytest-calculator - 172.30.168.43:8080
15 rc/pytest-calculator-2 runs image-registry.openshift-image-registry.svc:5000/pytest-dev/pytest-calculator@sha256:990ac500d2fdad1bad216853d1614d059
16 rc/pytest-calculator-2 created 6 minutes ago - 1 pod
17 rc/pytest-calculator-1 runs image-registry.openshift-image-registry.svc:5000/pytest-dev/pytest-calculator@sha256:990ac500d2fdad1bad216853d1614d059
18 rc/pytest-calculator-1 created 16 minutes ago
19
20 dc/pytest-calculator deploys istag/pytest-calculator:latest <-
21 bc/pytest-calculator source builds https://github.com/bfarr-rh/pytest-calculator.git#master on registry.redhat.io/rhel8/python-38:latest
22 deployment #2 deployed 6 minutes ago - 1 pod
23 deployment #1 deployed 16 minutes ago
24
25
26 1 info identified, use 'oc status --suggest' to see details.
27 Tag pytest-prod/pytest-calculator:live set to pytest-dev/pytest-calculator@sha256:c50792ae5bc4b5ed07e225758cbb9299e5d99e004b389dbdfb85b653bb122d6b.
28 Now using project "pytest-prod" on server "https://api.cluster-melbourn-f4f9.melbourn-f4f9.example.opentlc.com:6443".
29 deploymentconfig.apps.openshift.io/pytest-calculator rolled out
30 Waiting for rollout to finish: 0 out of 1 new replicas have been updated...
31 Waiting for rollout to finish: 0 out of 1 new replicas have been updated...
32 Waiting for rollout to finish: 0 of 1 updated replicas are available...

```

Project: pytest-prod ▼

## Pods

Create Pod

Filter by name...

1 Running 0 Pending 0 Terminating 0 CrashLoopBackOff 1 Completed 0 Failed 0 Unknown Select all filters 1 of 2 Items

Name ↑	Namespace ↑	Status ↑	Ready ↑	Restarts ↑	Owner ↑	Memory ↑	CPU ↑	Created ↑
P pytest-calculator-1-wsjmn	NS pytest-prod	Running	1/1	0	RC pytest-calculator-1	-	-	less than a minute ago

Note the dev pipeline may run at this time because of sharing of the same branch and there is a trigger

Now optionally if we want to use the local code within Azure (avoid checking out code from git in openshift we can do that by changing the command, this could take longer)

```
1 Starting: occmd
2 =====
3 Task      : Execute oc command
4 Description : OpenShift execute CLI command.
5 Version   : 2.0.13
6 Author    : Red Hat
7 Help      : See [getting started](https://github.com/redhat-developer/openshift-vsts/blob/master/docs/getting-started.md)
8 =====
9 /home/vsts/work/1/s/.download/oc login --insecure-skip-tls-verify --token *** https://api.cluster-melbourn-f4f9.melbourn-f4f9.example.opentlc.com:6443/
10 Logged into "https://api.cluster-melbourn-f4f9.melbourn-f4f9.example.opentlc.com:6443" as "system:serviceaccount:pytest-dev:pytest-dev-sa" using the token
11 You have access to the following projects and can switch between them with 'oc project <projectname>':
12
13 * pytest-dev
14   pytest-prod
15
16 Using project "pytest-dev".
17
18 /home/vsts/work/1/s/.download/oc start-build pytest-calculator --from-dir=. --follow
19 Uploading directory "." as binary input for the build ...
```

If you want to test the service - create a route through the console or command line

## Create Route

[Edit YAML](#)

Routing is a way to make your application publicly visible.

**Name \***

calculator

A unique name for the route within the project.

**Hostname**

www.example.com

Public hostname for the route. If not specified, a hostname is generated.

**Path**

/

Path that the router watches to route traffic to the service.

**Service \***

 pytest-calculator ▼

Service to route to.

**Target Port \***

8080 → 8080 (TCP) ▼

Target port for traffic.

**Security**

☒ Secure route

Routes can be secured using several TLS termination types for serving certificates.

**TLS Termination \***

Edge ▼

~~Insecure Traffic~~

Invoke the url with /add/1/2 like below

<https://calculator-pytest-prod.apps.cluster-melbourn-f4f9.melbourn-f4f9.example.opentlc.com/add/1/2>