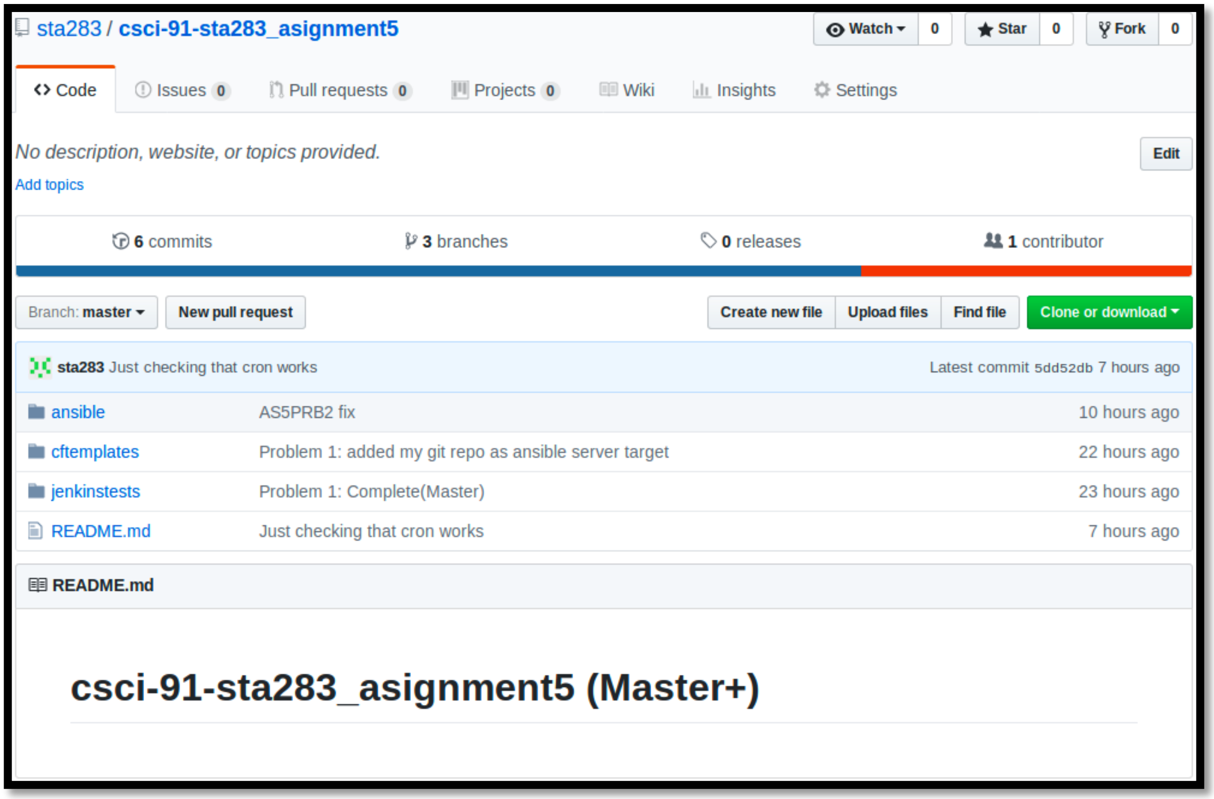
E91 Cloud Devops: Fall 2018
Assignment 5
Stephen Akaeze
https://code.harvard.edu/sta283/csci-91-sta283_asignment5

Instruction Manual:
https://canvas.harvard.edu/courses/53026/files/6838145/download?verifier=sb3I0hyGCl8booSa2xovXS8a2f9ZMAc2Sahp4MBK&wrap=1

Problem 1:

1) As instructed by the manual, csci-91-sta283_asignment5 repo was created comprising the master, dev and stage branches. Each branch is setup to contain the cftemplates, ansible and jenkinstests directories.
2) The ssh key pair was created using "`ssh-keygen -t rsa`" and saved in the local VM.
3) The ansible, cftemplates and jenkinstests directories were updated as instructed.
4) The CloudFormation templates were updated with the newly generated ssh key pair and the public key was added to my git repository
5) The AMI ami-058f0b6d904c90419 was solely used in my CloudFormation templates
6) The branches were pushed to update the remote repo at code.harvard.edu as shown below



sta283 / csci-91-sta283_asignment5

No description, website, or topics provided.

6 commits | 3 branches | 0 releases | 1 contributor

sta283 Just checking that cron works — Latest commit 5dd52db 7 hours ago

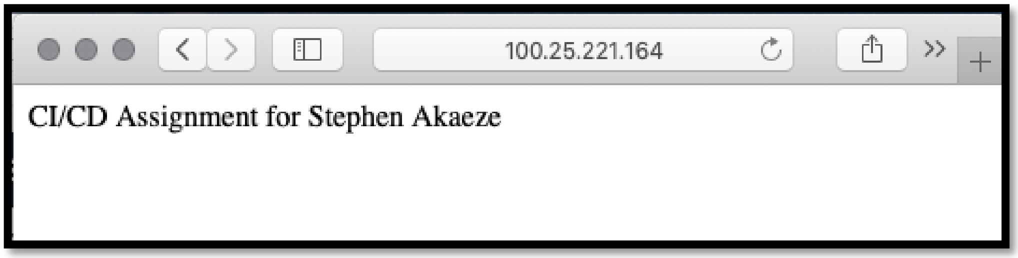
ansible	AS5PRB2 fix	10 hours ago
cftemplates	Problem 1: added my git repo as ansible server target	22 hours ago
jenkinstests	Problem 1: Complete(Master)	23 hours ago
README.md	Just checking that cron works	7 hours ago

README.md

csci-91-sta283_asignment5 (Master+)

Problem 2:

1) As instructed,
    a. My infrastructure (Ansible, Jenkins, Dev, Stage and Prod) was created using my CloudFormation templates (AnsibleServer.yml and AnsibleClient.yml files in the cftemplates directory).
    b. After creating my infrastructure, my ansible server could not clone my git repo due to private key issues. So, I manually deleted the ansible server's faulty private key (`/root/.ssh/id_rsa`) and copied the original key from my local VM to the ansible server. This fixed the problem.
    c. The ansible main host file was updated to reflect my infrastructure's local IPs.
2) As instructed, all the checks and required files were updated. To verify, please view https://code.harvard.edu/sta283/csci-91-sta283_asignment5
3) As instructed,
    a. The Dev, Stage and Prod EC2s cron jobs were setup using commands detailed at https://code.harvard.edu/sta283/csci-91-sta283_asignment5/blob/master/Cron_setup.txt
        i. Dev instance site



100.25.221.164

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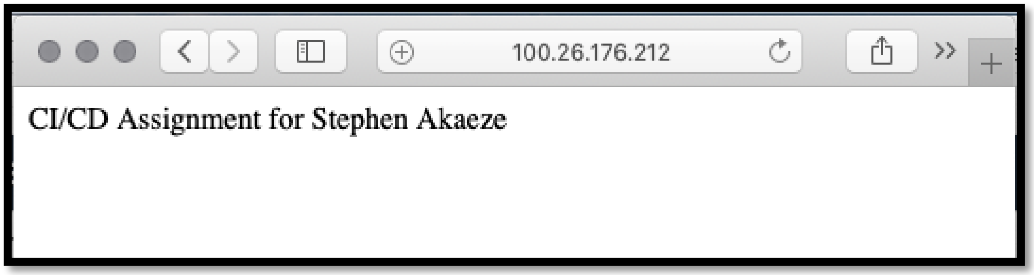
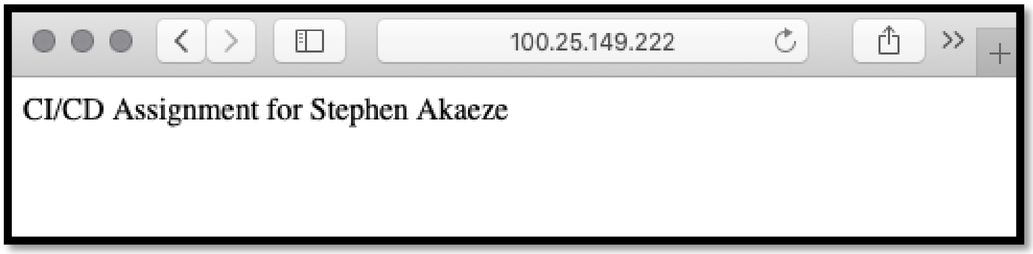
        ii. Stage instance site



100.26.176.212

CI/CD Assignment for Stephen Akaeze

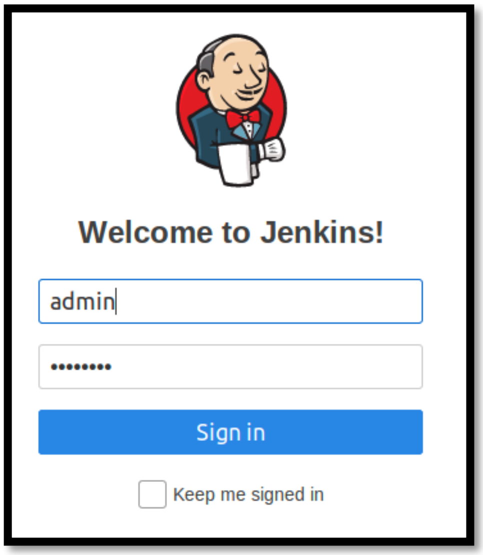
        iii. Prod instance site



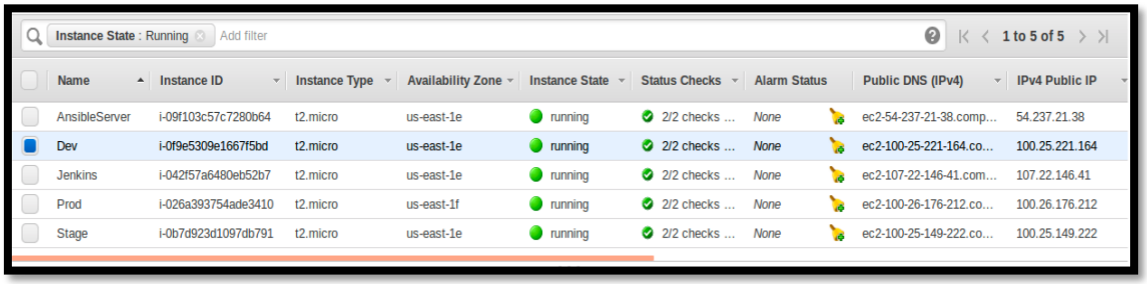
100.25.149.222

CI/CD Assignment for Stephen Akaeze

b. The Jenkins server was also configured as instructed as shown below



c. All Instances

i. 

Instance State : Running ⊗ Add filter — 1 to 5 of 5

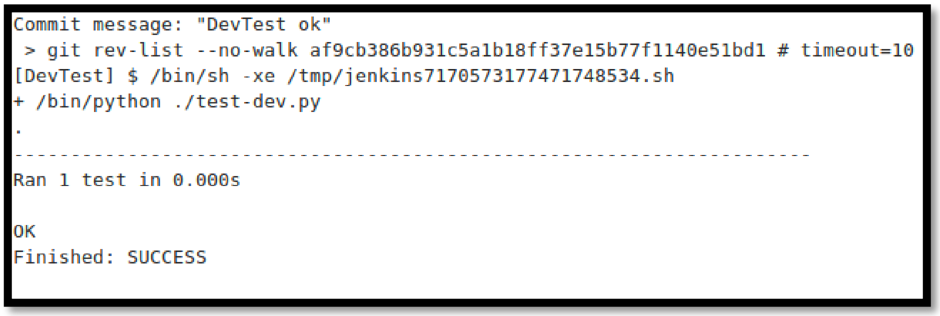
□	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status		Public DNS (IPv4)	IPv4 Public IP
□	AnsibleServer	i-09f103c57c7280b64	t2.micro	us-east-1e	● running	✓ 2/2 checks ...	None		ec2-54-237-21-38.comp...	54.237.21.38
■	Dev	i-0f9e5309e1667f5bd	t2.micro	us-east-1e	● running	✓ 2/2 checks ...	None		ec2-100-25-221-164.co...	100.25.221.164
□	Jenkins	i-042f57a6480eb52b7	t2.micro	us-east-1e	● running	✓ 2/2 checks ...	None		ec2-107-22-146-41.com...	107.22.146.41
□	Prod	i-026a393754ade3410	t2.micro	us-east-1f	● running	✓ 2/2 checks ...	None		ec2-100-26-176-212.co...	100.26.176.212
□	Stage	i-0b7d923d1097db791	t2.micro	us-east-1e	● running	✓ 2/2 checks ...	None		ec2-100-25-149-222.co...	100.25.149.222

Problem 3:

1) As instructed

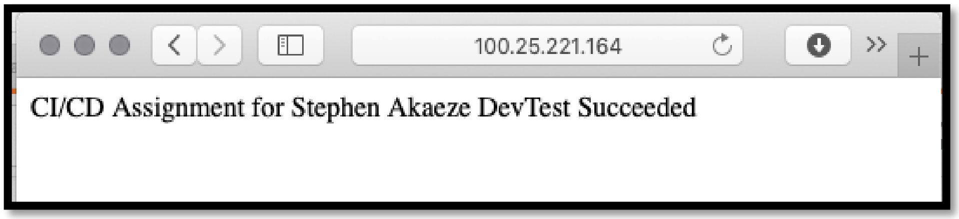
a. The Dev environment test job (DevTest) was setup and successfully executed every minute. Then, the "dev" branch index.html file was updated and was merged into the "stage" branch.

i. The DevTest job



```
Commit message: "DevTest ok"
 > git rev-list --no-walk af9cb386b931c5a1b18ff37e15b77f1140e51bd1 # timeout=10
[DevTest] $ /bin/sh -xe /tmp/jenkins7170573177471748534.sh
+ /bin/python ./test-dev.py
.
----------------------------------------------------------------------
Ran 1 test in 0.000s

OK
Finished: SUCCESS
```

ii. The dev instance site output

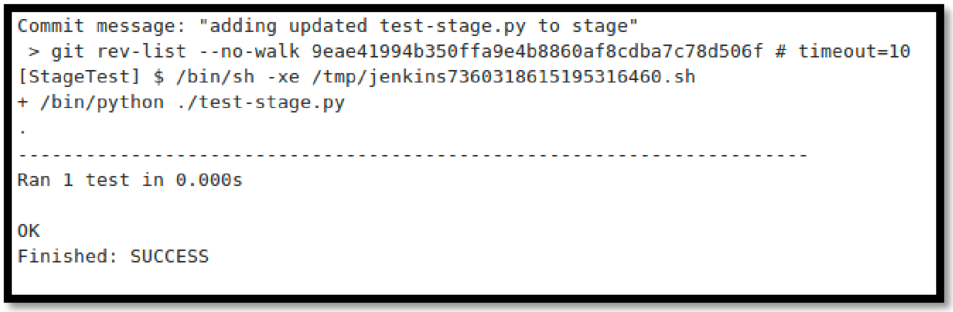


CI/CD Assignment for Stephen Akaeze DevTest Succeeded

2) As instructed

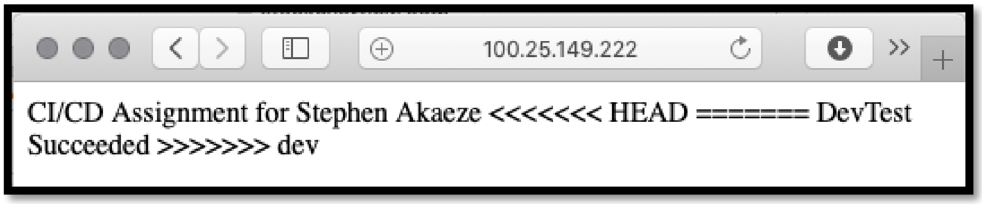
   a. The stage environment test job (StageTest) was setup and successfully executed every minute. Then, the “stage” branch was merged into the “master” branch.

      i. The StageTest job



```
Commit message: "adding updated test-stage.py to stage"
 > git rev-list --no-walk 9eae41994b350ffa9e4b8860af8cdba7c78d506f # timeout=10
[StageTest] $ /bin/sh -xe /tmp/jenkins7360318615195316460.sh
+ /bin/python ./test-stage.py
.
----------------------------------------------------------------------
Ran 1 test in 0.000s

OK
Finished: SUCCESS
```

      ii. The stage instance site output

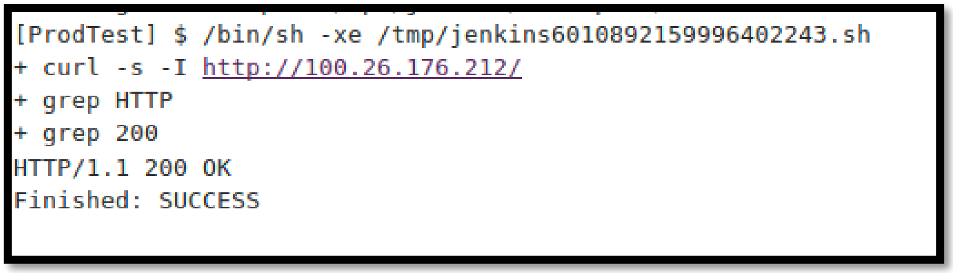


CI/CD Assignment for Stephen Akaeze <<<<<<< HEAD ======= DevTest Succeeded >>>>>>> dev

3) As instructed

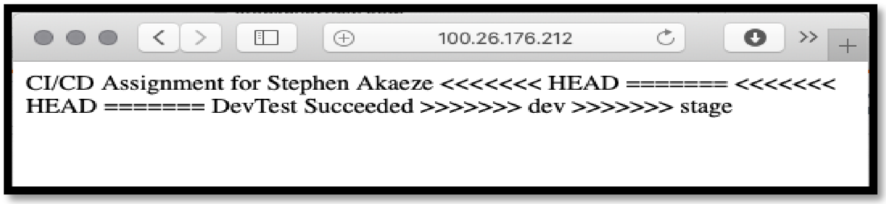
   a. ProdTest was created as instructed and successfully executed every minute. Below are the results

      i. The ProdTest job



```
[ProdTest] $ /bin/sh -xe /tmp/jenkins6010892159996402243.sh
+ curl -s -I http://100.26.176.212/
+ grep HTTP
+ grep 200
HTTP/1.1 200 OK
Finished: SUCCESS
```

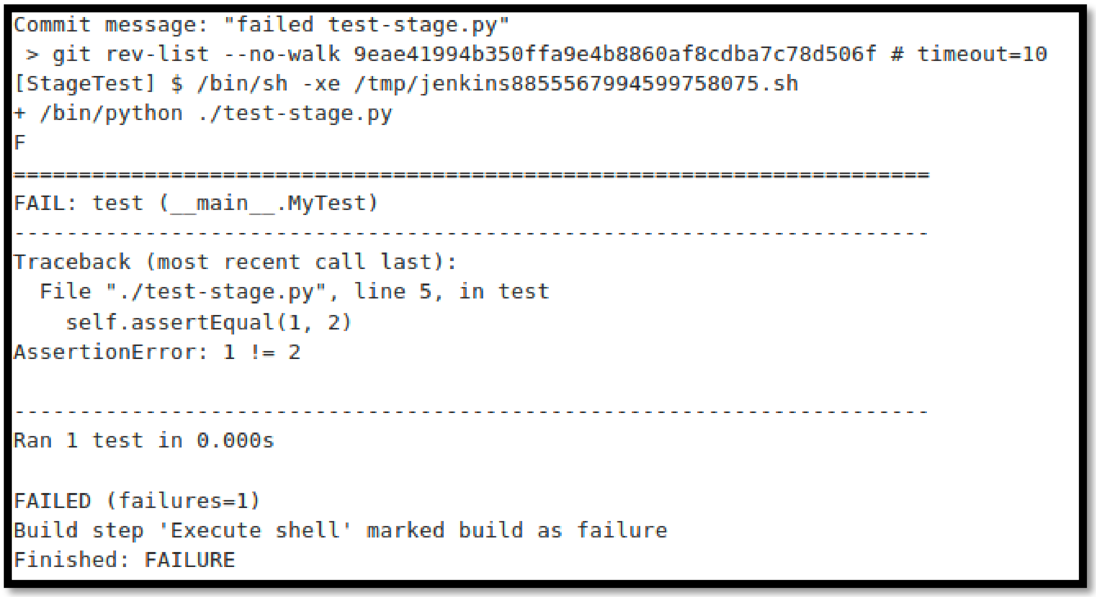
      ii. The Prod instance site output



CI/CD Assignment for Stephen Akaeze <<<<<<< HEAD ======= <<<<<<< HEAD ======= DevTest Succeeded >>>>>>> dev >>>>>>> stage

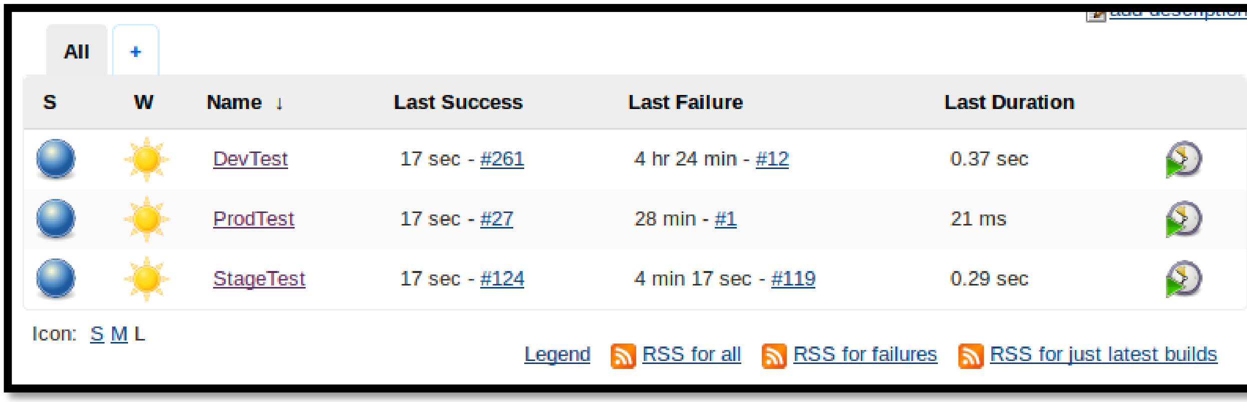
4) The information is provided above

5) After the “`self.assertEqual(1,2)`” update, the StageTest failed. All the previous outputs remained the same except the StageTest which failed as shown below



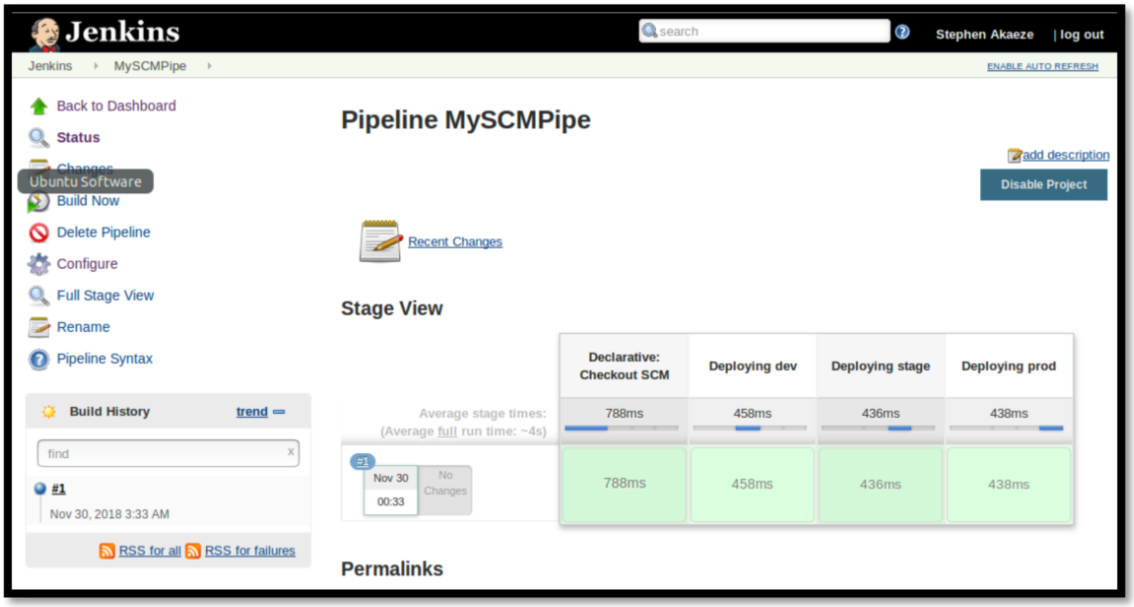
```
Commit message: "failed test-stage.py"
 > git rev-list --no-walk 9eae41994b350ffa9e4b8860af8cdba7c78d506f # timeout=10
[StageTest] $ /bin/sh -xe /tmp/jenkins8855567994599758075.sh
+ /bin/python ./test-stage.py
F
======================================================================
FAIL: test (__main__.MyTest)
----------------------------------------------------------------------
Traceback (most recent call last):
  File "./test-stage.py", line 5, in test
    self.assertEqual(1, 2)
AssertionError: 1 != 2

----------------------------------------------------------------------
Ran 1 test in 0.000s

FAILED (failures=1)
Build step 'Execute shell' marked build as failure
Finished: FAILURE
```

Jenkins Console nippet



S	W	Name ↓	Last Success	Last Failure	Last Duration
●	☀	DevTest	17 sec - #261	4 hr 24 min - #12	0.37 sec
●	☀	ProdTest	17 sec - #27	28 min - #1	21 ms
●	☀	StageTest	17 sec - #124	4 min 17 sec - #119	0.29 sec

6) Thoughts and Ideas
   a. If the index.html file is archived through the successful dev and stage, it becomes a fully and truly automated continuous integration and deployment setup. This can serve a notification feature to tell the developer about a successful CI/CD. This will minimize the need for a human intervention.
   b. Jenkins needs the ssh private key for the ansible server to send files to the respective servers.
7) Thoughts and ideas
   a. Yes, Jenkins can perform the push and merge after successful because it possesses the required ssh private key to perform the commands.
8) Thoughts and ideas
   a. Yes, Ansible can utilize webhooks to get notified on new code commits
9) As instructed, Jenpipe was created and successfully executed. It is located at https://code.harvard.edu/sta283/csci-91-sta283_asignment5/blob/master/jenpipe



Pipeline MySCMPipe

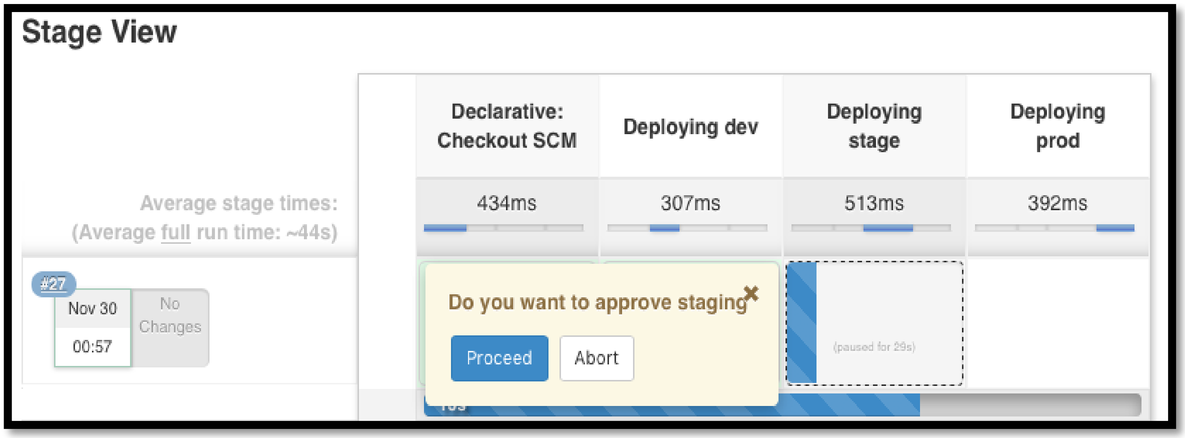
Stage View

	Declarative: Checkout SCM	Deploying dev	Deploying stage	Deploying prod
Average stage times: (Average full run time: ~4s)	788ms	458ms	436ms	438ms
#1 Nov 30 00:33 No Changes	788ms	458ms	436ms	438ms

Build History: #1 Nov 30, 2018 3:33 AM

Permalinks

10) As instructed Jenpipe2 was created and successfully executed. It is located at https://code.harvard.edu/sta283/csci-91-sta283_asignment5/blob/master/jenpipe2



Stage View

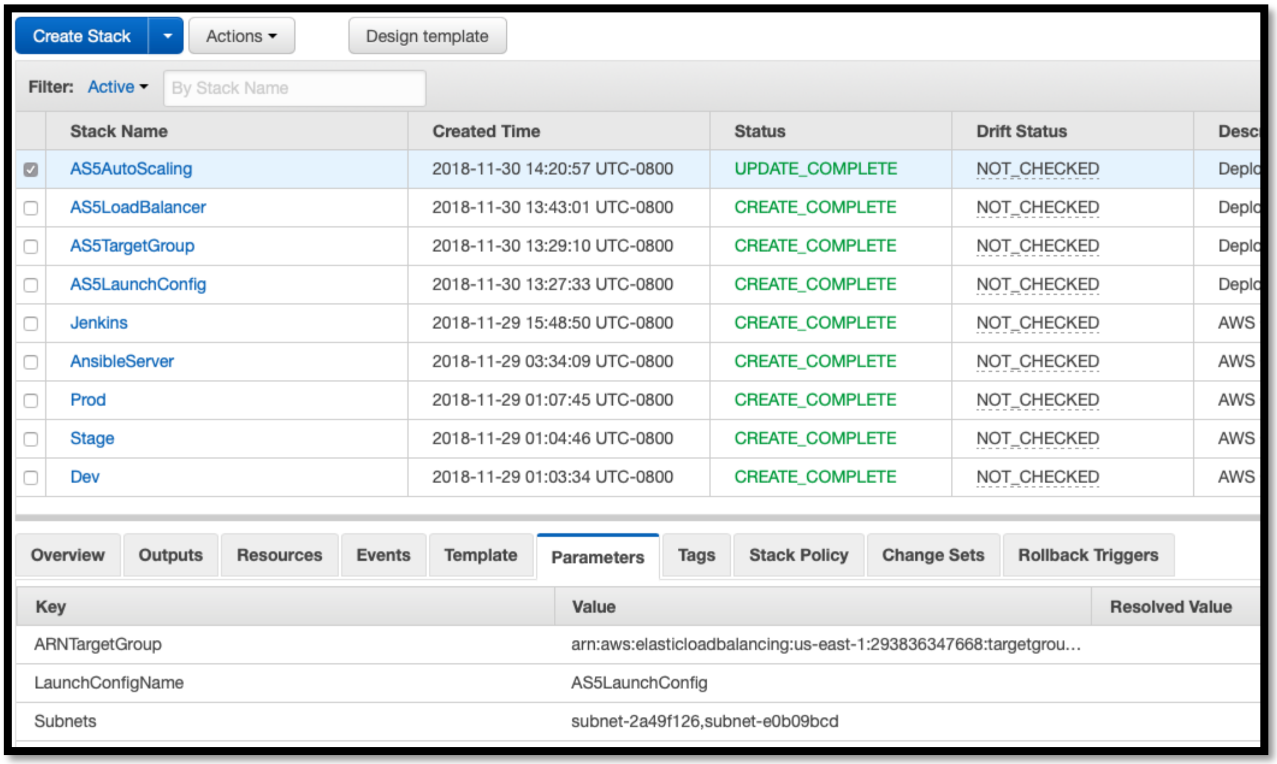
	Declarative: Checkout SCM	Deploying dev	Deploying stage	Deploying prod
Average stage times: (Average full run time: ~44s)	434ms	307ms	513ms	392ms
#27 Nov 30 00:57 No Changes	Do you want to approve staging?		(paused for 29s)	

Problem 4:

As instructed the environment was setup using the following files

1) **Launch config:** https://code.harvard.edu/sta283/csci-91-sta283_asignment5/blob/master/cftemplates%E2%80%8B%E2%80%8B/AS5LaunchConfig.yml
2) **Target group:** https://code.harvard.edu/sta283/csci-91-sta283_asignment5/blob/master/cftemplates%E2%80%8B%E2%80%8B/AS5TargetGroup.yml
3) **Load Balancer:** https://code.harvard.edu/sta283/csci-91-sta283_asignment5/blob/master/cftemplates%E2%80%8B%E2%80%8B/ASLoadbalancer.yml
4) **Auto Scaling:** https://code.harvard.edu/sta283/csci-91-sta283_asignment5/blob/master/cftemplates%E2%80%8B%E2%80%8B/AS5AutoScale.yml

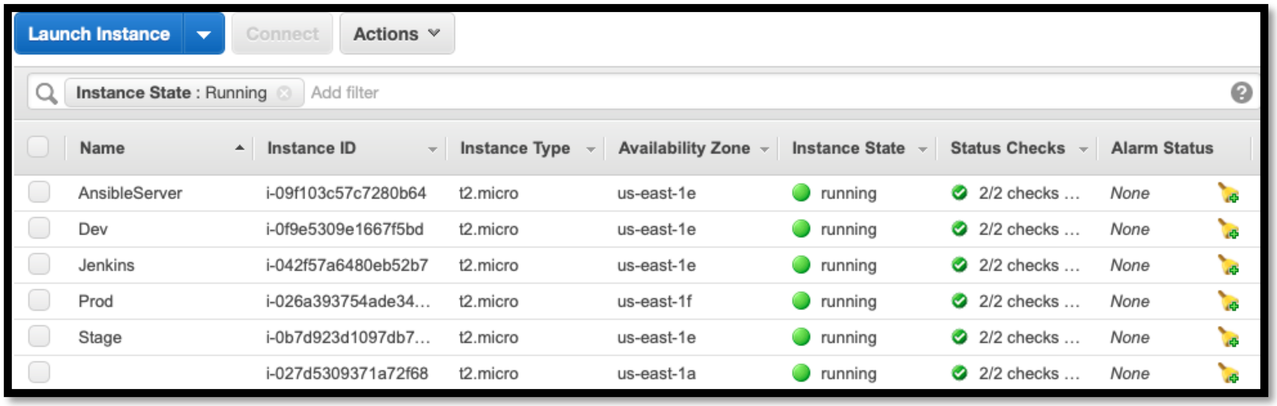
Cloud formation snippet



	Stack Name	Created Time	Status	Drift Status	Desc
☑	AS5AutoScaling	2018-11-30 14:20:57 UTC-0800	UPDATE_COMPLETE	NOT_CHECKED	Deplo
☐	AS5LoadBalancer	2018-11-30 13:43:01 UTC-0800	CREATE_COMPLETE	NOT_CHECKED	Deplo
☐	AS5TargetGroup	2018-11-30 13:29:10 UTC-0800	CREATE_COMPLETE	NOT_CHECKED	Deplo
☐	AS5LaunchConfig	2018-11-30 13:27:33 UTC-0800	CREATE_COMPLETE	NOT_CHECKED	Deplo
☐	Jenkins	2018-11-29 15:48:50 UTC-0800	CREATE_COMPLETE	NOT_CHECKED	AWS
☐	AnsibleServer	2018-11-29 03:34:09 UTC-0800	CREATE_COMPLETE	NOT_CHECKED	AWS
☐	Prod	2018-11-29 01:07:45 UTC-0800	CREATE_COMPLETE	NOT_CHECKED	AWS
☐	Stage	2018-11-29 01:04:46 UTC-0800	CREATE_COMPLETE	NOT_CHECKED	AWS
☐	Dev	2018-11-29 01:03:34 UTC-0800	CREATE_COMPLETE	NOT_CHECKED	AWS

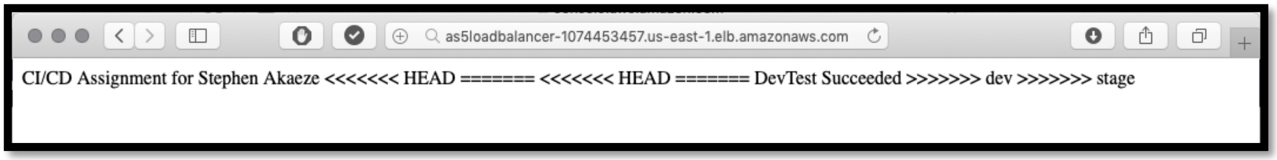
Key	Value	Resolved Value
ARNTargetGroup	arn:aws:elasticloadbalancing:us-east-1:293836347668:targetgrou...	
LaunchConfigName	AS5LaunchConfig	
Subnets	subnet-2a49f126,subnet-e0b09bcd	

Instance List for infrastructure



	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status
☐	AnsibleServer	i-09f103c57c7280b64	t2.micro	us-east-1e	● running	✓ 2/2 checks ...	None
☐	Dev	i-0f9e5309e1667f5bd	t2.micro	us-east-1e	● running	✓ 2/2 checks ...	None
☐	Jenkins	i-042f57a6480eb52b7	t2.micro	us-east-1e	● running	✓ 2/2 checks ...	None
☐	Prod	i-026a393754ade34...	t2.micro	us-east-1f	● running	✓ 2/2 checks ...	None
☐	Stage	i-0b7d923d1097db7...	t2.micro	us-east-1e	● running	✓ 2/2 checks ...	None
☐		i-027d5309371a72f68	t2.micro	us-east-1a	● running	✓ 2/2 checks ...	None

Load Balancer DNS name query



CI/CD Assignment for Stephen Akaeze <<<<<<< HEAD ======= <<<<<<< HEAD ======= DevTest Succeeded >>>>>>> dev >>>>>>> stage