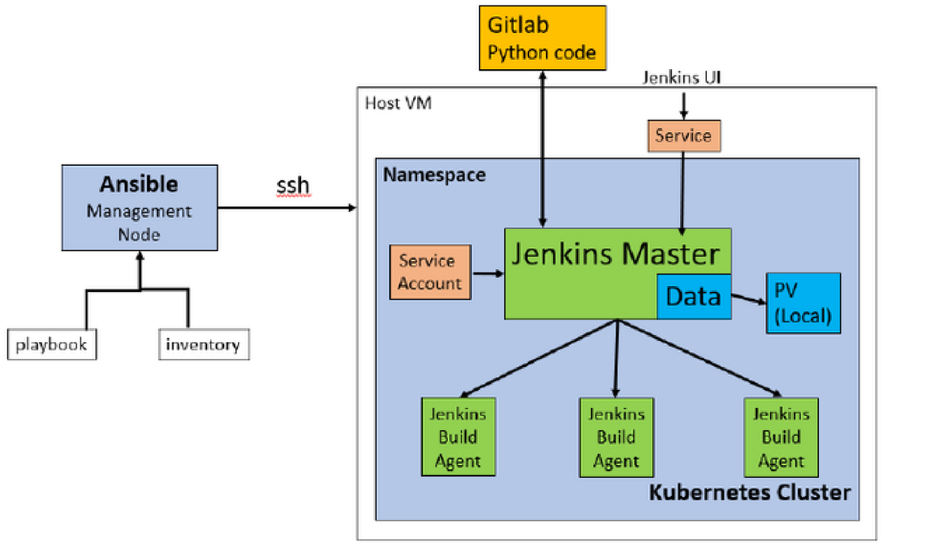
I&P 2 PROJECT

INTRODUCTION

Architecture Configuration



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INSTALL ANSIBLE

```
analyst@analyst-virtual-machine:~$ ansible --version
ansible 2.9.27
  config file = /etc/ansible/ansible.cfg
  configured module search path = [u'/home/analyst/.ansible/plugins/modules', u'/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python2.7/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 2.7.17 (default, Mar  8 2023, 18:40:28) [GCC 7.5.0]
```

ANSIBLE TO INSTALL DOCKER

```
analyst@analyst-virtual-machine:~$ ansible-playbook docker-install.yaml --syntax-check

playbook: docker-install.yaml
analyst@analyst-virtual-machine:~$ ansible-playbook docker-install.yaml

PLAY [docker] ******************************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************************
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 192.168.217.132 should use /usr/bin/python3, but is using
/usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be
 removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [192.168.217.132]

TASK [Install required dependencies] *******************************************************************************************
changed: [192.168.217.132] => (item=default-jre)
changed: [192.168.217.132] => (item=apt-transport-https)
ok: [192.168.217.132] => (item=ca-certificates)
changed: [192.168.217.132] => (item=curl)
ok: [192.168.217.132] => (item=gnupg)
ok: [192.168.217.132] => (item=lsb-release)
ok: [192.168.217.132] => (item=software-properties-common)
[WARNING]: Updating cache and auto-installing missing dependency: python-apt

TASK [Add Docker GPG key] ******************************************************************************************************
changed: [192.168.217.132]

TASK [Add Docker repository to APT sources] ************************************************************************************
changed: [192.168.217.132]

TASK [Install Docker packages] *************************************************************************************************
changed: [192.168.217.132] => (item=docker-ce)
ok: [192.168.217.132] => (item=docker-ce-cli)
ok: [192.168.217.132] => (item=containerd.io)

TASK [Ensure Docker service is started and enabled] ****************************************************************************
ok: [192.168.217.132]

PLAY RECAP *********************************************************************************************************************
192.168.217.132            : ok=6    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

analyst@analyst-virtual-machine:~$
```

DOCKER RUN HELLO WORLD

```
analyst@analyst-virtual-machine:~$ sudo docker run hello-world
[sudo] password for analyst:
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
clec31eb5944: Pull complete
Digest: sha256:4bd78111b6914a99dbc560e6a20eab57ff6655aea4a80c50b0c5491968cbc2e6
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/
```

Check if the image is available in the local server if not, they will automatically pull image from docker hub. Afterwards streaming the output onto the terminal

INSTALLING THE SINGLE CLUSTER K8

```
analyst@analyst-virtual-machine:~$ kubectl create namespace devops-tools
namespace/devops-tools created
analyst@analyst-virtual-machine:~$ minikube stop
✋  Stopping node "minikube"  ...
🛑  Powering off "minikube" via SSH ...
🛑  1 node stopped.
analyst@analyst-virtual-machine:~$ sudo nano service-account.yaml
[sudo] password for analyst:
analyst@analyst-virtual-machine:~$ kubectl apply -f service-account.yaml
error: cluster "minikube" does not exist
analyst@analyst-virtual-machine:~$ minikube start
😄  minikube v1.32.0 on Ubuntu 18.04
✨  Using the docker driver based on existing profile
👍  Starting control plane node minikube in cluster minikube
🚜  Pulling base image ...
🔄  Restarting existing docker container for "minikube" ...
🐳  Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
🔗  Configuring bridge CNI (Container Networking Interface) ...
🔎  Verifying Kubernetes components...
    ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
    ▪ Using image docker.io/kubernetesui/metrics-scraper:v1.0.8
    ▪ Using image docker.io/kubernetesui/dashboard:v2.7.0
💡  Some dashboard features require the metrics-server addon. To enable all features please run:

        minikube addons enable metrics-server


🌟  Enabled addons: default-storageclass, storage-provisioner, dashboard
💡  kubectl not found. If you need it, try: 'minikube kubectl -- get pods -A'
🏄  Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
analyst@analyst-virtual-machine:~$ kubectl apply -f service-account.yaml
serviceaccount/jenkins-admin created
role.rbac.authorization.k8s.io/jenkins created
rolebinding.rbac.authorization.k8s.io/jenkins-role-binding created
```

This YAML sets up a service account called "jenkins-admin" with permissions to handle pods, pod execution, pod logs, and secrets in the "default" namespace. It's designed for Jenkins in Kubernetes, enabling Jenkins to perform tasks in the cluster

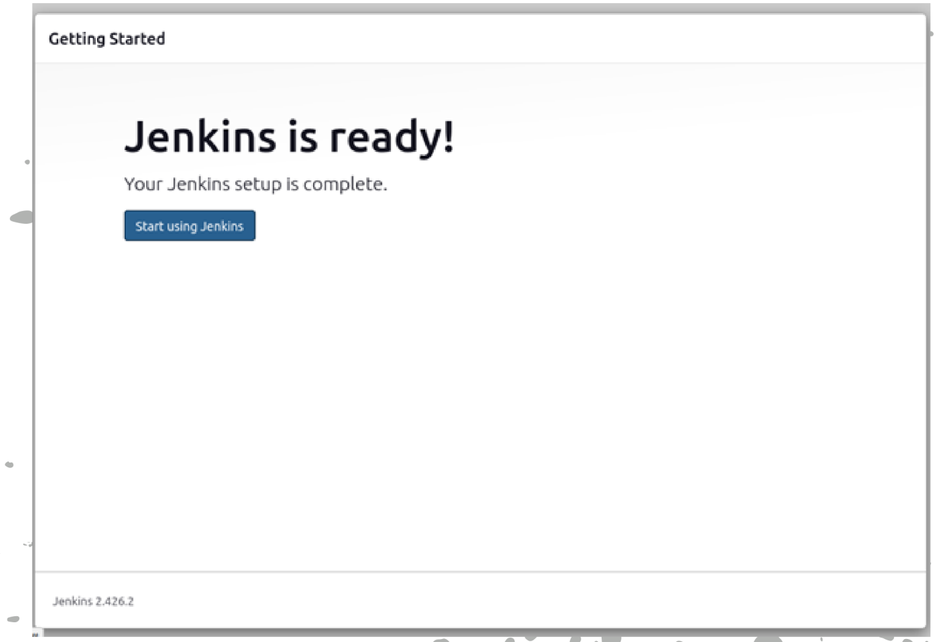
```
analyst@analyst-virtual-machine:~$ kubectl get serviceaccount
NAME            SECRETS   AGE
default         0         19m
jenkins-admin   0         2m42s
analyst@analyst-virtual-machine:~$ kubectl get role
NAME      CREATED AT
jenkins   2024-01-22T10:23:55Z
analyst@analyst-virtual-machine:~$ kubectl get rolebinding
NAME                   ROLE          AGE
jenkins-role-binding   Role/jenkins   3m19s
analyst@analyst-virtual-machine:~$ kubectl describe role
Name:         jenkins
Labels:       app.kubernetes.io/name=jenkins
Annotations:  <none>
PolicyRule:
  Resources   Non-Resource URLs  Resource Names  Verbs
  ---------   -----------------  --------------  -----
  pods/exec   []                 []              [create delete get list patch update watch]
  pods        []                 []              [create delete get list patch update watch]
  configmaps  []                 []              [get list watch]
  pods/log    []                 []              [get list watch]
  secrets     []                 []              [get]
analyst@analyst-virtual-machine:~$ sudo nano persistentstorage.yaml
analyst@analyst-virtual-machine:~$ kubectl apply -f persistentstorage.yaml
persistentvolumeclaim/jenkins-pv-claim created
analyst@analyst-virtual-machine:~$ kubectl get pv,pvc
NAME                                                        CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS   CLAIM                       STORAGECLASS   REASON   AGE
persistentvolume/pvc-907a1481-847b-4311-b0ad-80a49ececfd3   2Gi        RWO            Delete           Bound    default/jenkins-pv-claim   standard                16s

NAME                                      STATUS   VOLUME                                     CAPACITY   ACCESS MODES   STORAGECLASS   AGE
persistentvolumeclaim/jenkins-pv-claim   Bound    pvc-907a1481-847b-4311-b0ad-80a49ececfd3   2Gi        RWO            standard       16s
```

```
analyst@analyst-virtual-machine:~$ sudo nano persistentstorage.yaml
analyst@analyst-virtual-machine:~$ kubectl apply -f persistentstorage.yaml
persistentvolumeclaim/jenkins-pv-claim created
analyst@analyst-virtual-machine:~$ kubectl get pv,pvc
NAME                                                        CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS   CLAIM                       STORAGECLASS   REASON   AGE
persistentvolume/pvc-907a1481-847b-4311-b0ad-80a49ececfd3   2Gi        RWO            Delete           Bound    default/jenkins-pv-claim   standard                16s

NAME                                      STATUS   VOLUME                                     CAPACITY   ACCESS MODES   STORAGECLASS   AGE
persistentvolumeclaim/jenkins-pv-claim   Bound    pvc-907a1481-847b-4311-b0ad-80a49ececfd3   2Gi        RWO            standard       16s
analyst@analyst-virtual-machine:~$ sudo nano deployment.yaml
analyst@analyst-virtual-machine:~$ kubectl apply -f deployment.yaml
deployment.apps/jenkins-deployment created
analyst@analyst-virtual-machine:~$ kubectl rollout status deployment jenkins-deployment
Waiting for deployment "jenkins-deployment" rollout to finish: 0 of 1 updated replicas are available...
deployment "jenkins-deployment" successfully rolled out
analyst@analyst-virtual-machine:~$ sudo nano service.yaml
analyst@analyst-virtual-machine:~$ kubectl apply -f service.yaml
service/jenkins-service created
analyst@analyst-virtual-machine:~$ kubectl get services
NAME              TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)                        AGE
jenkins-service   NodePort    10.110.92.29   <none>        8080:32000/TCP,50000:31637/TCP   7s
kubernetes        ClusterIP   10.96.0.1      <none>        443/TCP                        35m
analyst@analyst-virtual-machine:~$ minikube ip
192.168.49.2
```

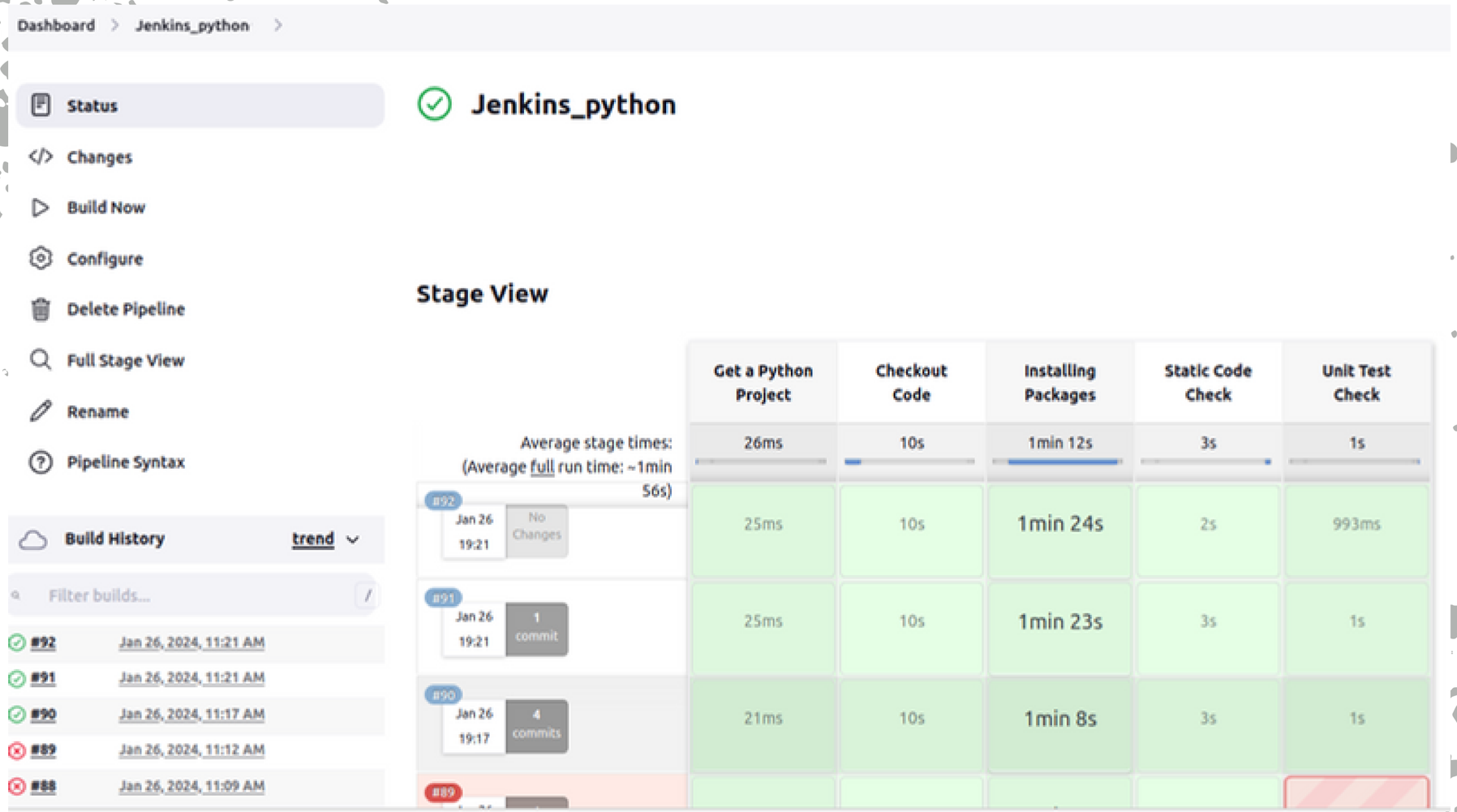

COMMAND IN KUBECTL

DEPLOYMENT JENKINS

```
analyst@analyst-virtual-machine:~$ kubectl logs jenkins-deployment-75787868bf-kp8wm
Running from: /usr/share/jenkins/jenkins.war
webroot: /var/jenkins_home/war
2024-01-22 10:39:24.220+0000 [id=1]     INFO    winstone.Logger#logInternal: Beginning extraction from war file
2024-01-22 10:39:25.430+0000 [id=1]     WARNING o.e.j.s.handler.ContextHandler#setContextPath: Empty contextPath
2024-01-22 10:39:25.598+0000 [id=1]     INFO    org.eclipse.jetty.server.Server#doStart: jetty-10.0.18; built: 2023-10-27T01:59:58.245Z; git: 8545fd9bf4cd8d08038f626b405fd4963441546b7; jvm 17.0.9+9
2024-01-22 10:39:26.039+0000 [id=1]     INFO    o.e.j.w.StandardDescriptorProcessor#visitServlet: NO JSP Support for /, did not find org.eclipse.jetty.jsp.JettyJspServlet
2024-01-22 10:39:26.125+0000 [id=1]     INFO    o.e.j.s.s.DefaultSessionIdManager#doStart: Session workerName=node0
2024-01-22 10:39:27.075+0000 [id=1]     INFO    hudson.WebAppMain#contextInitialized: Jenkins home directory: /var/jenkins_home found at: EnvVars.masterEnvVars.get("JENKINS_HOME")
2024-01-22 10:39:27.323+0000 [id=1]     INFO    o.e.j.s.handler.ContextHandler#doStart: Started w.@3e15bb06{Jenkins v2.426.2,/,file:///var/jenkins_home/war/,AVAILABLE}{/var/jenkins_home/war}
2024-01-22 10:39:27.381+0000 [id=1]     INFO    o.e.j.server.AbstractConnector#doStart: Started ServerConnector@6955cb39{HTTP/1.1, (http/1.1)}{0.0.0.0:8080}
2024-01-22 10:39:27.397+0000 [id=1]     INFO    org.eclipse.jetty.server.Server#doStart: Started Server@7c098bb3{STARTING}[10.0.18,sto=0] @4139ms
2024-01-22 10:39:27.406+0000 [id=25]    INFO    winstone.Logger#logInternal: Winstone Servlet Engine running: controlPort=disabled
2024-01-22 10:39:27.963+0000 [id=31]    INFO    jenkins.InitReactorRunner$1#onAttained: Started initialization
2024-01-22 10:39:28.005+0000 [id=31]    INFO    jenkins.InitReactorRunner$1#onAttained: Listed all plugins
2024-01-22 10:39:29.601+0000 [id=31]    INFO    jenkins.InitReactorRunner$1#onAttained: Prepared all plugins
2024-01-22 10:39:29.605+0000 [id=31]    INFO    jenkins.InitReactorRunner$1#onAttained: Started all plugins
2024-01-22 10:39:29.616+0000 [id=32]    INFO    jenkins.InitReactorRunner$1#onAttained: Augmented all extensions
2024-01-22 10:39:29.987+0000 [id=32]    INFO    jenkins.InitReactorRunner$1#onAttained: System config loaded
2024-01-22 10:39:29.987+0000 [id=32]    INFO    jenkins.InitReactorRunner$1#onAttained: System config adapted
2024-01-22 10:39:29.988+0000 [id=32]    INFO    jenkins.InitReactorRunner$1#onAttained: Loaded all jobs
2024-01-22 10:39:29.989+0000 [id=32]    INFO    jenkins.InitReactorRunner$1#onAttained: Configuration for all jobs updated
2024-01-22 10:39:30.087+0000 [id=45]    INFO    hudson.util.Retrier#start: Attempt #1 to do the action check updates server
2024-01-22 10:39:31.097+0000 [id=32]    INFO    jenkins.install.SetupWizard#init:

*************************************************************
*************************************************************
*************************************************************

Jenkins initial setup is required. An admin user has been created and a password generated.
Please use the following password to proceed to installation:

d81158e5858948c99c2876ed54bf27e6

This may also be found at: /var/jenkins_home/secrets/initialAdminPassword

*************************************************************
*************************************************************
*************************************************************

2024-01-22 10:40:09.628+0000 [id=45]    INFO    h.m.DownloadService$Downloadable#load: Obtained the updated data file for hudson.tasks.Maven.MavenInstaller
2024-01-22 10:40:09.631+0000 [id=45]    INFO    hudson.util.Retrier#start: Performed the action check updates server successfully at the attempt #1
2024-01-22 10:40:10.875+0000 [id=31]    INFO    jenkins.InitReactorRunner$1#onAttained: Completed initialization
2024-01-22 10:40:10.884+0000 [id=24]    INFO    hudson.lifecycle.Lifecycle#onReady: Jenkins is fully up and running
```



PIPELINE STAGE VIEW



Output for Pipeline

```
+ pwd
/home/jenkins/agent/workspace/Jenkins_python
[Pipeline] sh
+ python3 -m unittest python/pythontest.py
....
----------------------------------------------------------------------
Ran 4 tests in 0.002s

OK
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // container
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // podTemplate
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Difficulties Faced

192.168.49.2:32000/job/Jenkins Unitest/

Stage Logs (Checkout Code)

Shell Script -- apt install -y nano (self time 2s)

```
+ apt install -y nano

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

E: Could not open lock file /var/lib/dpkg/lock-frontend - open (13: Permission denied)
E: Unable to acquire the dpkg frontend lock (/var/lib/dpkg/lock-frontend), are you root?
```

Filter builds...

#16	Jan 25, 2024, 9:07 AM	#14 Jan 25 17:05	2 commits	23ms	666ms failed
#15	Jan 25, 2024, 9:07 AM	#13 Jan 25 17:01	5 commits	40ms	1s failed
#14	Jan 25, 2024, 9:05 AM	#5 Jan 25 16:32	1 commit	70ms	796ms
#13	Jan 25, 2024, 9:01 AM	#4 Jan 25 16:29	No Changes	39ms	1s
#5	Jan 25, 2024, 8:32 AM				
#4	Jan 25, 2024, 8:29 AM				

Atom feed for all Atom feed for failures

ERROR MESSAGE : IT IS UNABLE TO PULL THE IMAGE

Stage Logs (Static Code Check)

Shell Script -- pylint python/pythonfile.py (self time 2s)

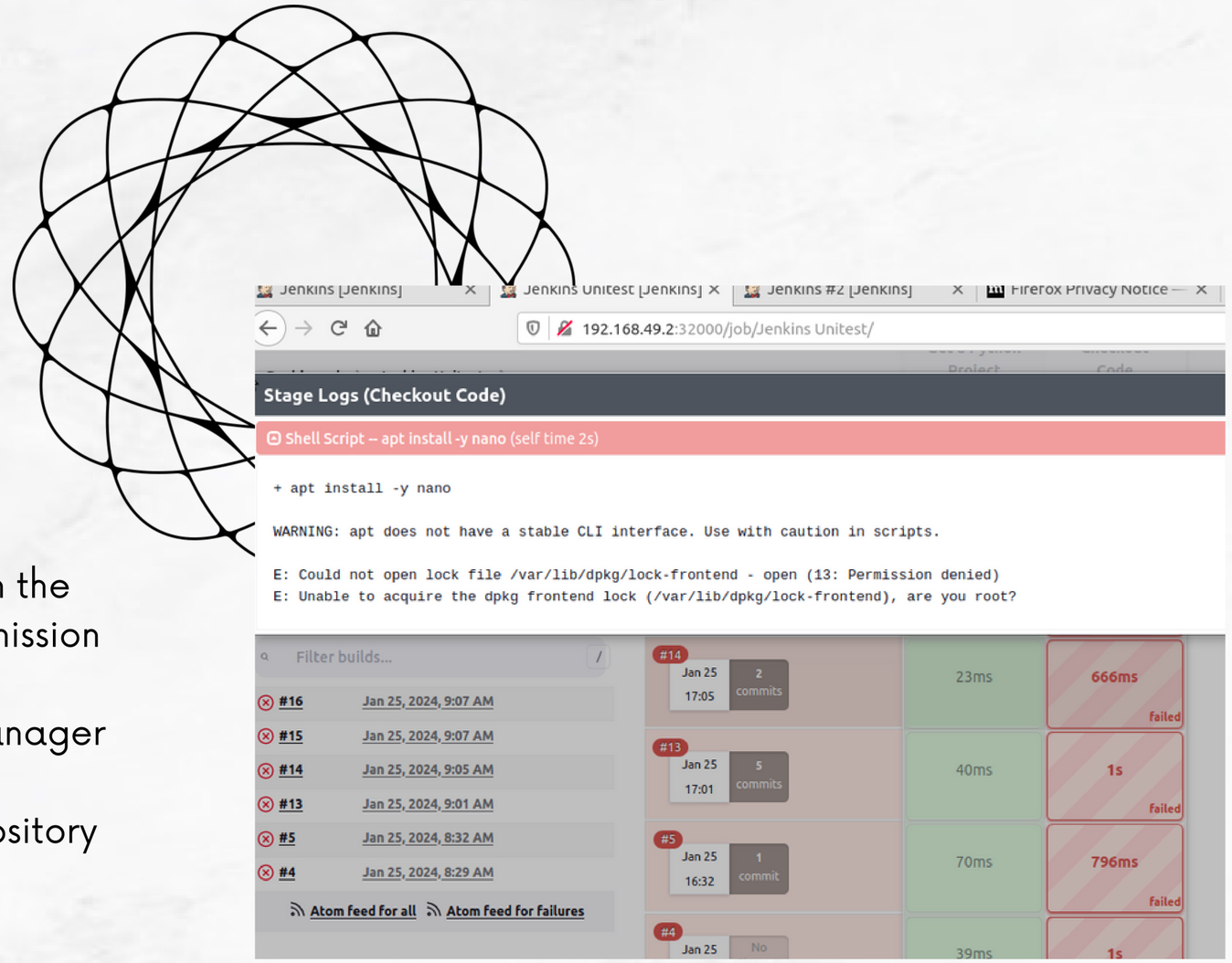
```
+ pylint python/pythonfile.py
************ Module pythonfile
python/pythonfile.py:10:0: W0406: Module import itself (import-self)
python/pythonfile.py:12:0: C0115: Missing class docstring (missing-class-docstring)
python/pythonfile.py:13:4: C0116: Missing function or method docstring (missing-function-docstring)
python/pythonfile.py:17:4: C0116: Missing function or method docstring (missing-function-docstring)
python/pythonfile.py:22:0: E0102: class already defined line 10 (function-redefined)

-----------------------------------
Your code has been rated at 7.86/10
```

PYTHON SCRIPT ERROR

#61	Jan 25, 2024, 5:41 PM		01:47	1 commit	57ms	10s	1m
#60	Jan 25, 2024, 5:39 PM	#61	Jan 26 01:41	1 commit	40ms	10s	1min 8s
#59	Jan 25, 2024, 5:36 PM						
#58	Jan 25, 2024, 5:30 PM						
#57	Jan 25, 2024, 5:28 PM	#60	Jan 26 01:39	1 commit	50ms	10s	1min 7s
#56	Jan 25, 2024, 5:25 PM						
#55	Jan 25, 2024, 5:22 PM						
#54	Jan 25, 2024, 5:21 PM	#59	Jan 26 01:36	3 commits	35ms	10s	1min 8s
#53	Jan 25, 2024, 5:17 PM						
#52	Jan 25, 2024, 5:11 PM						
#51	Jan 25, 2024, 5:09 PM	#58	Jan 26 01:30	1 commit	27ms	10s	1min 7s
#50	Jan 25, 2024, 5:06 PM						

		2s	512ms failed
		2s failed	
		2s failed	
		2s failed	

ERROR: PULL IMAGE

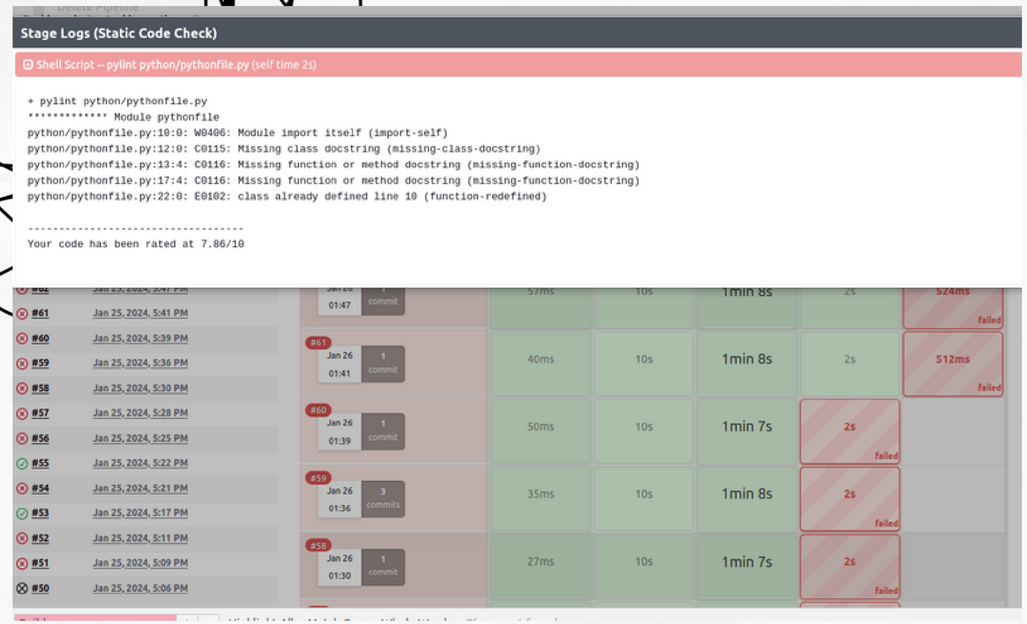


- This error message is encountered while trying to run the apt install command in Jenkins and indicates a permission issue
- Due to the multiple attempt that uses the project manager and it got locked out. Also we have to reinstall “app install” to Installs a specified package from the repository

PYTHON SCRIPT ERROR

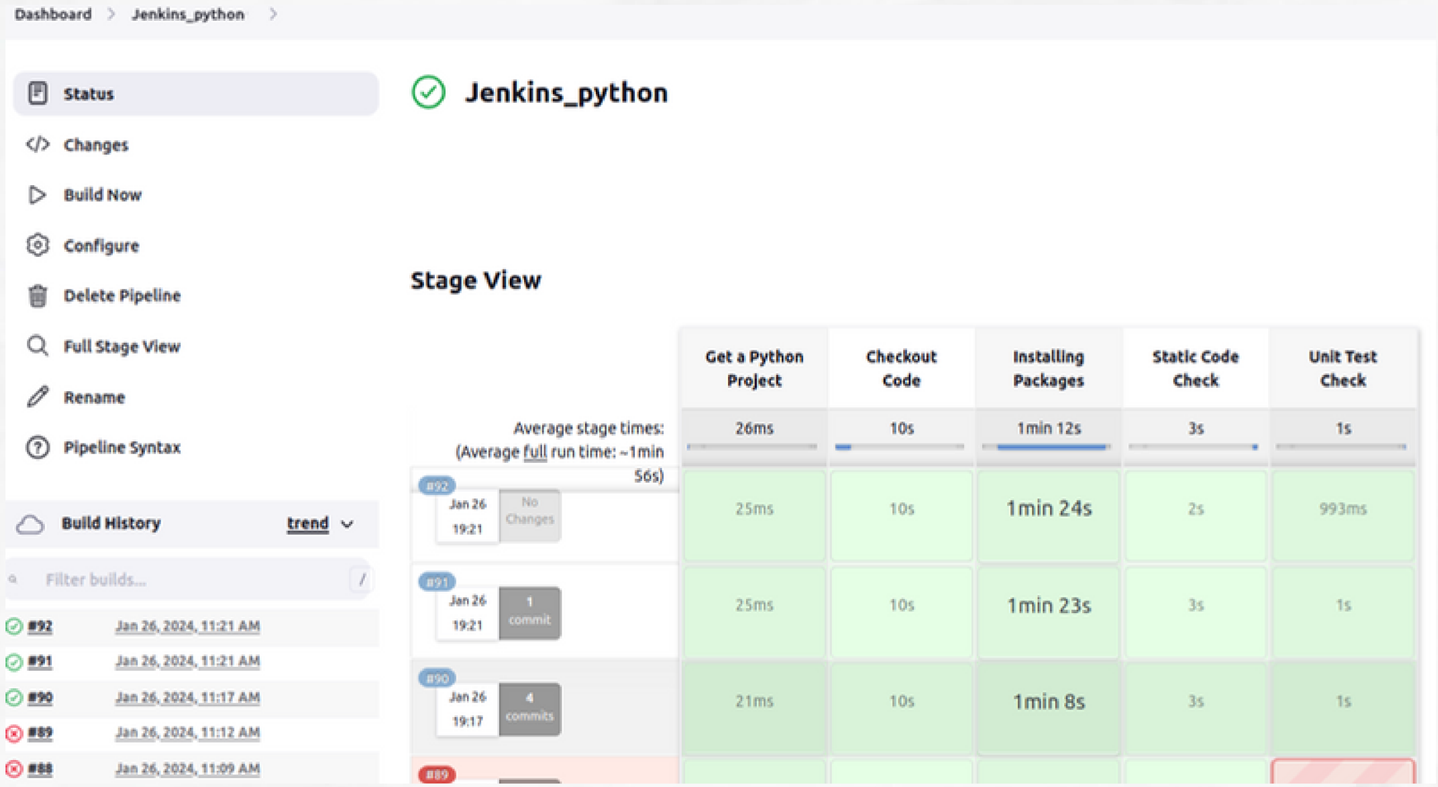
Re-modified python script in the git hub :

- Remove unnecessary self-imports to avoid circular dependencies.
- Missing docstrings: Add clear descriptions for the identified class and functions to improve readability.
- Remove duplicate script



QUESTION & ANSWER

THANKS



WATCHING