

1 How to configure CI/CD with Nexus OSS Repository

1.1 Product Configuration:

- Calm 3.2
- Nexus 3.30.0-01

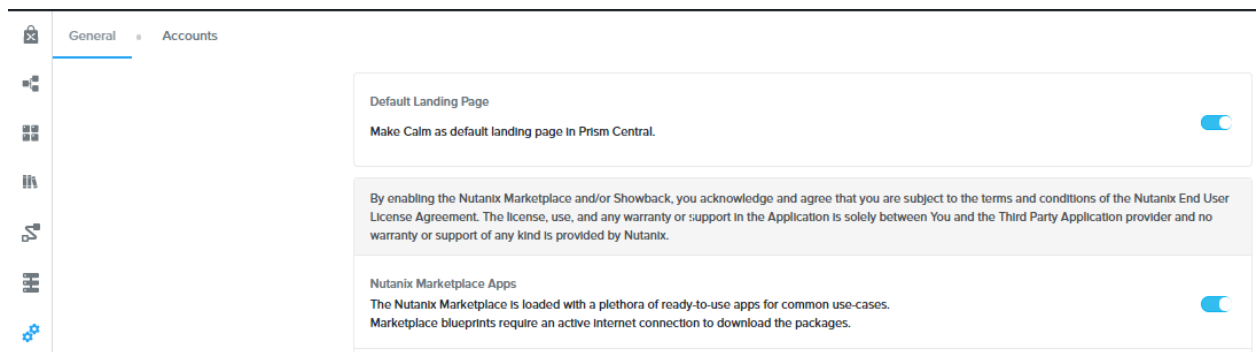
1.2 Pre-requisites:

1. Create a Karbon Kubernetes Cluster

1.3 Steps to configure

1.3.1 Setup the Karbon Kubernetes Provider

1. Click on Settings. Click on Account



2. Click on Add Account. Select Provider as Kubernetes. Select Type as Karbon. Choose the Kubernetes cluster you had created earlier.


General ▾ Accounts

🔍 Type here to apply filters

[+ Add Account](#)


1 unsaved account

AWS


 **UntitledAccount**
State: Unsaved

7 saved accounts

AWS

 **Matthew AWS Account**
State: Verified

Azure

 **Matthew Azure Account**
State: Verified

Account Settings

Name

UntitledAccount

Provider

Kubernetes

Type

Karbon

Cluster

karbon-sit

[Verify](#) [Delete](#) [Save](#)

3. Click on Save. Click on Verify.

1.3.2 Add the Kubernetes Provider to the Project.

1. Click on Project. Click on Add Account.

Matthew Project

OverviewUsers, Groups and RolesAccountsEnvironments

Project Description

No description added [Add Description](#)

Project Setup

Users, Groups & Roles

Add users and groups to have access control to the project

1 user has access >

Add Users

Accounts

Add resources you want this project to consume

6 accounts added >

Add Accounts

Environments

Define deployment infrastructure and VM/Pod defaults for quick app deployments

1 environment added >

Create Environment

- Click on + Add Account and choose the Karbon Kubernetes Cluster.

Add Accounts

+ Add Account

NTNX_LOCAL_AZ

Nutanix

Remove

Matthew AWS Account

AWS

Matthew Azure Account

Azure

karbon dev

Kubernetes

Matthew GCP Account

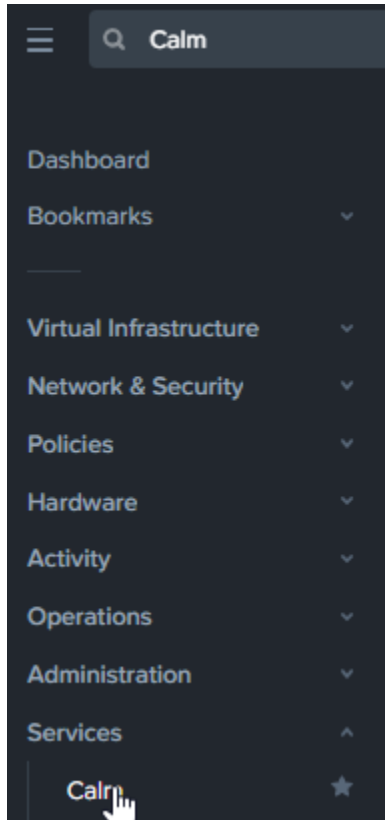
GCP

karbon_sit

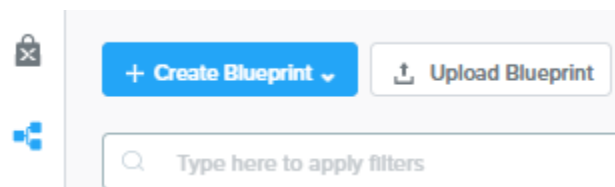
Kubernetes

1.3.3 Upload the following blueprints

1. Login to Nutanix Prism Central. Go to Services->Calm



2. Click on Blueprint. Click on "Upload Blueprint"



3. Upload the CICD_Nexus_Base2-20210208-Final.json and Application Deployment K8s Karbon Containers.json.
4. The passcode was nutanix/4u.

1.3.4 Credentials

1. You may configure the following credentials with this value.

Jenkins Key	Nutanix Key
Credential Name <input type="text" value="Jenkins Key"/>	Credential Name <input type="text" value="Nutanix Key"/>
Username <input type="text" value="jenkins"/>	Username <input type="text" value="nutanix"/>
Secret Type <input type="text" value="SSH Private Key"/>	Secret Type <input type="text" value="SSH Private Key"/>
SSH Private Key <div><div>*****</div><div>⬆ ⬇ ⬆</div></div>	SSH Private Key <div><div>*****</div><div>⬆ ⬇ ⬆</div></div>
+ Add Passphrase Reset Clear	+ Add Passphrase Reset Clear
<input type="checkbox"/> Use as default ?	<input type="checkbox"/> Use as default ?

-----BEGIN RSA PRIVATE KEY-----

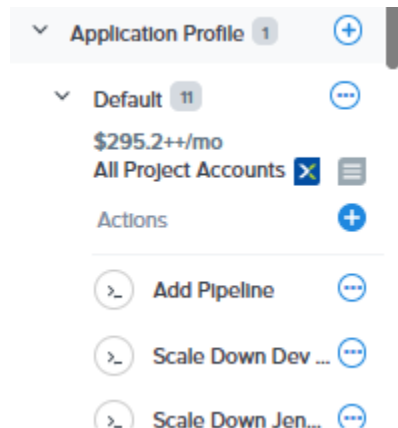
```
MIIeOwIBAAKCAQEai7qFDhVadLx5IULAG/ooCUTA/ATSmXbArs+GdHxbUWd/bNG
ZCXnaQ2L1mSVVGDxfTbSaTJ3En3tVIMtD2RjZPdhqWESCa0j2kXLYSiNDS9qz3SK
6h822je/f9O9CzCTrw2XGhnDVwmNraUvO5wmQObCDthTXc72PcB0d6oa4ENsnuY9
HtiETg29T2XgCYPFXipLBHSZYkBMGgccAeY9dq5ywiwBJLuoSovXkkRjk3cd7Gy
hCRLwYzqfdgSmiAMYgJLrz/UuLxatPqXts2D8v1xqR9EPNZNzgd4QHK4of1lqsNR
uz2SxkwqLcXSw0mGcAL8mlwVpzhPzwmENC5OrwIBJQKCAQB++q2WcKcmbtByyrAp
6ktiukjTL6MGGGhjX/PgYA5IvINX1SvtU0NZnb7FantiSz7GFrODQyFPQ0jL3bq0
MrwzRDA6x+cPzMb/7RvBEIGdadfFjbAVaMqfAsul5SpBokKFLxU6IDb2CMdhS67c
1K2Hv0qKLpHL0vAdEZQ2nFAMWETvVMzl0o1dQmyGzA0GTy8VYdCRsUbwNgvFMvBj
8T/svzjpASDifa7IXIGaLrXfCH584zt7y+qjJ05O1G0NFsIQ9n2wi7F93N8rHxgl
JDE4OhfyaDyLL1UdBIPjYPSUbX7D5NExLggWEVFEwx4JRaK6+aDdFDKbSBliDHf
h45NAoGBANjANRKLbtcmW4foK5ILTuFkOaowqj+2AlgT1ezCVpErHDFg0bkuvDk
QVdsAJRX5//luSO30dI0OWWGjgmIUxD7iej0sjAPJjRAv8ai+MYyaLfdqv1Oj5c
oDC3KjmSdXTuWSYNvarsW+Uf2v7zIzWesTnpV6gkZH3tX86iuiZAoGBAKM0mKX0
EjFkJH65Ym7gIED2CUyuFqq4WsCUD2RakpYZyIBKZGr8MRni3I4z6Hqm+rxVW6Dj
uFGQe5GhgPvO23UG1Y6nm0VkyGzq81TraZc/oMzignSC95w7OsLaLn6qp32Fje1M
Ez2YnOT3dDcu1twY8OoDuvWx5LFMJ3NoRJaHAoGBAJ4rZP+xj17DVELxBo0EPK7k
7TKygDYHwDjnsJRSNOHfFg0agmQqXucjGuzEbyAkeN1Um9vLU+xrTHqEyIN/JqXk
hztKxzfTtBhK7M84p7M5iq+0jfMau8ykdOVHZAB/odHeXLrnbr/gVQsAKw1NdDC
kPCNXP/c9JrzB+c4juEVAoGBAJGPxmp/vTL4c5OeblxnCAKWP6VBUnyWliFhdYME
```

```
rECvNkjoZ2ZWjKhijVw8Il+OAjIFNgwJXzP9Z0qJIAMuHa2QeUfhmFKlo4ku9LOF
2rdUbNjPKD5m+IRsLX1az4W6zLwPVRHp56WjzFJEfGiRjzMBfOxkMSBSjbLjDm3Z
iUf7AoGBALjvtjapDwIEa5/CFvzOVGFq4L/OJTBEbGx/SA4Huc3TFTtIY2hvTDPZ
dQr/JBzLBUJCOBVuUuH3uW7hGhW+DnlzrfbfJATaRR8Ht6VU651T+Gbrr8EqNpCP
gmznERCNf9Kaxl/hlyV5dZBe/2LIK+/jLGNu9EJLoraaCBFshJKF
-----END RSA PRIVATE KEY-----
```

2. Put in the credentials for the following:
 - a. Prism Central
 - b. Ubuntu Credential – used for Gitolite, Jenkins Master, Jenkins Slave, Developer Workstations
 - c. Nexus Credential – used to ssh into Nexus to retrieve the SSL certificate
 - d. Nexus Jenkins Credential – used to configure into Jenkins for Jenkins to push into the Nexus OSS repository.
 - e. Domain Administrator – used to allow joining of VMs into AD Domain

1.3.5 Change the variables







1. Click on the Application Profile. Click on Default.



2. Change the value for the following:
 - a. Nexus_vmname – Nexus VM name
 - b. Nexus_Repo – Name of the Nexus OSS Repository you had setup.
 - c. Nexus_Repo_Port – Port no exposed by the Nexus OSS Repository you had setup.
 - d. Domain_Server – Hostname of the AD Domain Server
 - e. Domain_Server_IP – IP address of the AD Domain Server



f. pc_instance_ip – IP address of the Prism Central

g. domain_name – Active Directory Domain

...	>	Nexus_vmname: n210406-044242		⋮
		Type: String		
<hr/>				
...	>	Nexus_Repo: CentralRepo		⋮
		Type: String		
<hr/>				
...	>	Nexus_Repo_Port: 18090		⋮
		Type: String		
<hr/>				
...	>	Domain_Server: WIN-46KMODAD...		⋮
		Type: String		
<hr/>				
...	>	Domain_Server_IP: 10.42.94.41		⋮
		Type: String		
<hr/>				
...	>	pc_Instance_Ip: 10.42.94.39		⋮
		Type: String		



1.3.6 Change each VMs



1. Use this disk image. Download it from <https://matthewnutanixpublic.s3.us-east-2.amazonaws.com/DiskImage/ubuntu-20-04-no-prompt-ad.qcow2>


▼ DISKS (1)  

▼ Disk 1: SCSI | Ubuntu-20-04-No-Prompt-...


Bootable Image cannot be deleted


Device Type  Device Bus 


DISK  SCSI 

Operation 

Clone from Image Service ▼



Image 

ubuntu-20-04-no-prompt-ad.qcow2 

☒ Bootable 

2. Change the network adapter

Cluster: STEMS-DC1

NIC 1  

Primary ▼

Private IP: ☐ Dynamic ☒ Static

Static IP

3. Repeat for the following VMs:
 - a. GitoliteVM
 - b. JenkinsMasterVM
 - c. JenkinsSlaveVM
 - d. WorkstationsVM

1.4 Launch the applications

1. Click on Launch. Fill in the application name. Click on Launch.

Application Name

Application Name

Application Description

jenkins master: http://@[JenkinsMasterVM.address]@:8080/
jenkins credential: admin/@[JenkinsMasterVM.jenkins_authorization]@
dev workstation: @[WorkstationVM.address]@

Project

Matthew Project

Environment

All Project Accounts

App Profile

- Wait for 15 to 20 mins for the applications to change to Running state.

Applications > MRP_DEV_ENV_GP1 **RUNNING**

Overview • Manage • Services • Audit • ?

jenkins master:
http://@[JenkinsMasterVM.address]@:8080/
jenkins credential:
admin/@[JenkinsMasterVM.jenkins_authorization]@
dev workstation: @[WorkstationVM.address]@

Variables (13)

domain_name
ntnslab.local

Cost summary ⓘ

\$162.57
Total cost incurred

Cost incurred this month

Current cost per hour

✓ Synced

1.4.1 Trouble-shoot Jenkins stuck in Configure Jenkins Master

- Jenkins needs to install the plugins specified in the script. However, each plugin may have dependencies to specific version of other plug-ins. This dependency is specified by 3rd party plugin provider and beyond the control of Nutanix Calm. Hence, this script will be stuck.

IP

Install Plugins

Last Updated At - yesterday at 6:10 PM

Started yesterday at 6:10 PM

Status RUNNING

Output

```
70 Installing junit from update center
71 Installing script-security from update center
72 Installing authentication-tokens from update center
73
74 ERROR: Failed to install plugin authentication
75 + '[' 5 -eq 0 ']'
76 + sleep 60
77 + true
78 + sudo java -jar jenkins-cli.jar -auth admin:admin
79 Installing junit from update center
80 Installing script-security from update center
81 Installing authentication-tokens from update center
82
83 ERROR: Failed to install plugin authentication
84
```

[View Script](#)

2. Login to Jenkins Master using the specific IP address. You can look for the password in this step

AP

Get Initial Authorization Password

Finished - yesterday at 6:10 PM

Started yesterday at 6:10 PM

Status SUCCESS

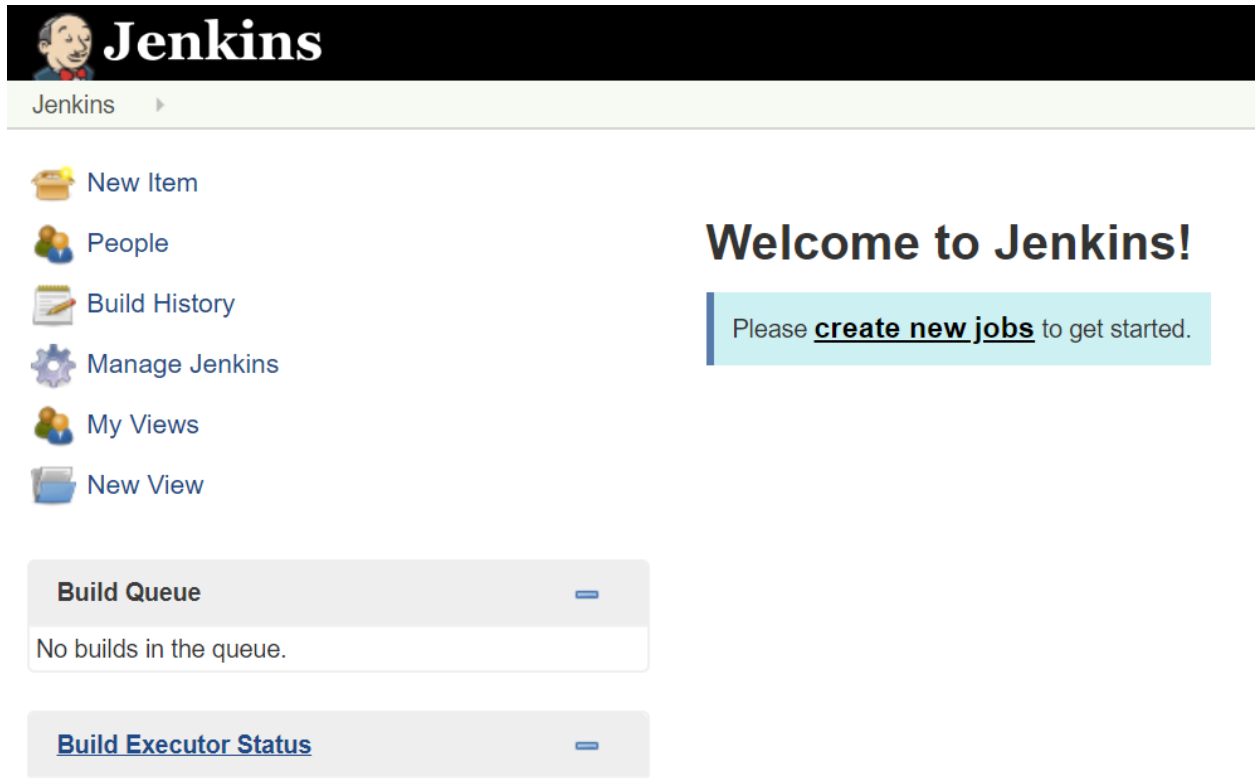
Output

```
1 -----
2
3 Initial Authorization Password:
4 085e522fab2f40009846751eccb0c846
5
6 -----
7 jenkins_authorization=085e522fab2f40009846751eccb0c846
8
9
```

[View Script](#)

3. Open a new browser tab and key in the IP address for Jenkins. The UI may change depending on the new version of Jenkins.

- Click on “Manage Jenkins”



The Jenkins Welcome Screen features a black header with the Jenkins logo and name. Below the header is a light green navigation bar with the text "Jenkins" and a right-pointing arrow. On the left side, there is a vertical list of icons and links: "New Item" (box icon), "People" (people icon), "Build History" (notepad icon), "Manage Jenkins" (gear icon), "My Views" (people icon), and "New View" (folder icon). On the right side, there is a large "Welcome to Jenkins!" message in bold black text, followed by a light blue box containing the text "Please [create new jobs](#) to get started." Below the navigation links, there are two expandable sections: "Build Queue" and "Build Executor Status". The "Build Queue" section is currently expanded, showing the text "No builds in the queue." The "Build Executor Status" section is collapsed.

- Click on “Correct”



The Jenkins Manage Jenkins screen features a black header with the Jenkins logo and name. Below the header is a light green navigation bar with the text "Jenkins" and a right-pointing arrow. On the left side, there is a vertical list of icons and links: "New Item" (box icon), "People" (people icon), "Build History" (notepad icon), "Manage Jenkins" (gear icon), "My Views" (people icon), and "New View" (folder icon). On the right side, there is a large "Manage Jenkins" message in bold black text. Below the navigation links, there are two expandable sections: "Build Queue" and "Build Executor Status". The "Build Queue" section is currently expanded, showing the text "No builds in the queue." The "Build Executor Status" section is collapsed. On the right side, there is a large pink box containing the text "Dependency errors:" and "Downstream dependency errors:". The "Dependency errors:" section contains the text "Some plugins could not be loaded due to unsatisfied dependencies. Fix these issues and restart Jenkins to restore the functionality provided by these plugins." The "Downstream dependency errors:" section contains the text "These plugins failed to load because of one or more of the errors above. Fix those and these plugins will load again." Below the pink box, there is a "Correct" button.

- Click on “Download now and Install after Restart”

Updates			
Available			
Installed			
Advanced			
Install	Name ↓	Version	Installed
<input type="checkbox"/>	bouncycastle API This plugin provides an stable API to Bouncy Castle related tasks.	2.17	2.16.0
<input type="checkbox"/>	Command Agent Launcher Allows agents to be launched using a specified command.	1.3	1.2
<input checked="" type="checkbox"/>	JUnit Allows JUnit-format test results to be published.	1.28	1.26.1
<input type="checkbox"/>	Oracle Java SE Development Kit Installer Allows the Oracle Java SE Development Kit (JDK) to be installed via download from Oracle's website.	1.3	1.0
<input type="checkbox"/>	PAM Authentication Adds Unix Pluggable Authentication Module (PAM) support to Jenkins	1.5.1	1.4
<input type="checkbox"/>	Pipeline: API Plugin that defines Pipeline API.	2.37	2.35
<input type="checkbox"/>	SCM API This plugin provides a standardized API for interaction with SCM systems.	2.6.3	2.4.1
Download now and install after restart		Update information obtained: 18 hr ago	
		Check now	

7. Scroll down and click on “Restart Jenkins”

Script Security	 Success
Credentials	 Failure - Details
Authentication Tokens API	 Failure - Details
JUnit	 Success
Script Security	 Success
Credentials	 Failure - Details
Authentication Tokens API	 Failure - Details

➡ [Go back to the top page](#)
(you can start using the installed plugins right away)


➡ ☐ Restart Jenkins when installation is complete and no jobs are running

8. You may see the script stuck again on installing subversion plugin

```
84 Installing ssh-slaves from update center
85 Installing structs from update center
86 Installing subversion from update center
87
88 ERROR: Failed to install plugin subversion
89 + '[' 5 -eq 0 ']'
90 + sleep 60
91
```

[View Script](#)

9. Click on “Correct” again



- People
- Build History
- Manage Jenkins
- My Views
- Credentials
- New View

Manage Jenkins

Correct

Dependency errors:
Some plugins could not be loaded due to unsatisfied dependencies. Fix these issues and restart Jenkins to restore the functionality provided by these plugins.

WMI Windows Agents Plugin version 1.5:
JDK Tool Plugin version 1.0 is older than required. To fix, install version 1.3 or later.

Jenkins Subversion Plug-in version 2.12.2:
SCM API Plugin version 2.4.1 is older than required. To fix, install version 2.6.3 or later.

Build Queue
No builds in the queue.

10. It was stuck in

```
84 Installing token-macro from update center
85 Installing workflow-api from update center
86 Installing workflow-cps from update center
87
88 ERROR: Failed to install plugin workflow-cps
89 + '[' 5 -eq 0 ']'
90 + sleep 60
91
```

11. Click on “Correct”

Manage Jenkins

Correct

Dependency errors:
Some plugins could not be loaded due to unsatisfied dependencies. Fix these issues and restart Jenkins to restore the functionality provided by these plugins.

Pipeline: Groovy version 2.74:
Pipeline: API version 2.35 is older than required. To fix, install version 2.36 or later.

1.5 Verification

1. Login to Jenkins Master and verify the 2 pipelines were created

add description

All						
S	W	Name ↓	Last Success	Last Failure	Last Duration	
		devops	4 days 15 hr - #5	4 days 16 hr - #3	1 min 42 sec	
		devops_deploy	4 days 15 hr - #4	N/A	3.2 sec	

- Find out the IP address for the Developer Workstation

Applications > MRP_DEV_ENV_GP1 RUNNING Delete ?

Overview Manage Services Audit ?

8 Active Services

Developer ...

Jenkins Sla...

Gitolite

Jenkins Ma...

Nexus

Service: Developer W...

Name WorkstationVM

Account NTNX_LOCAL_AZ

IP Address 10.42.94.80

- Putty into the IP address for the workstation. Login as nutanix and password: nutanix/4u.
- Run the following commands


```
cd devops/web/src/css
vi style.css
```
- Search for databox

```
/*
** Styles used in the Calm Demo
*/
body {
  font-family: "Open Sans", sans-serif;
  font-size: 10pt;
  margin: 0;
  line-height: 1.2em;
}

body > h1 {
  background-color: #024394;
  color: white;
  font-family: Arial, Helvetica, sans-serif;
  font-weight: 100;
  font-size: 350%;
  margin: 0;
  padding-left: 10pt;
  padding-right: 10pt;
  padding-top: 25pt;
  padding-bottom: 15pt;
  box-shadow: 0px 5px 5px 0px rgba(171,171,171,1);
}
/databox
```

6. Change the background color. Saved the change

```
#databox {
  border-radius: 25px;
  background-color: #004394;
  font-size: 10pt;
  padding-left: 10pt;
}
```

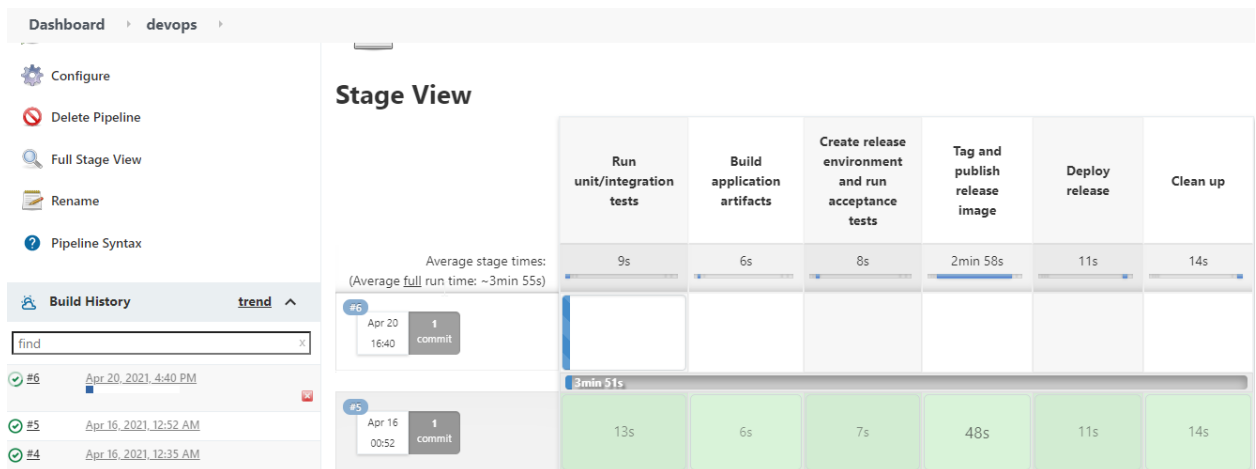
7. Run the following command

```
cd ~/devops
```

8. Run the following command to commit the change into the repository

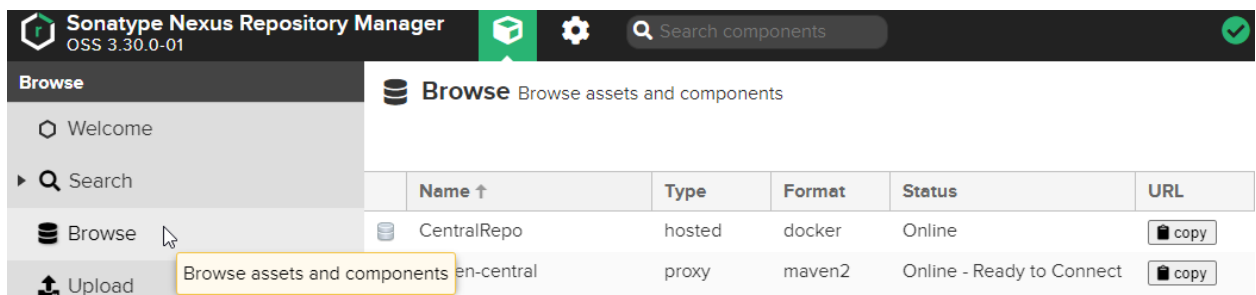
```
git add .
git commit -m 'change css'
git push origin master
```

9. Observe the Jenkins pipeline. Drill into the devops pipeline.

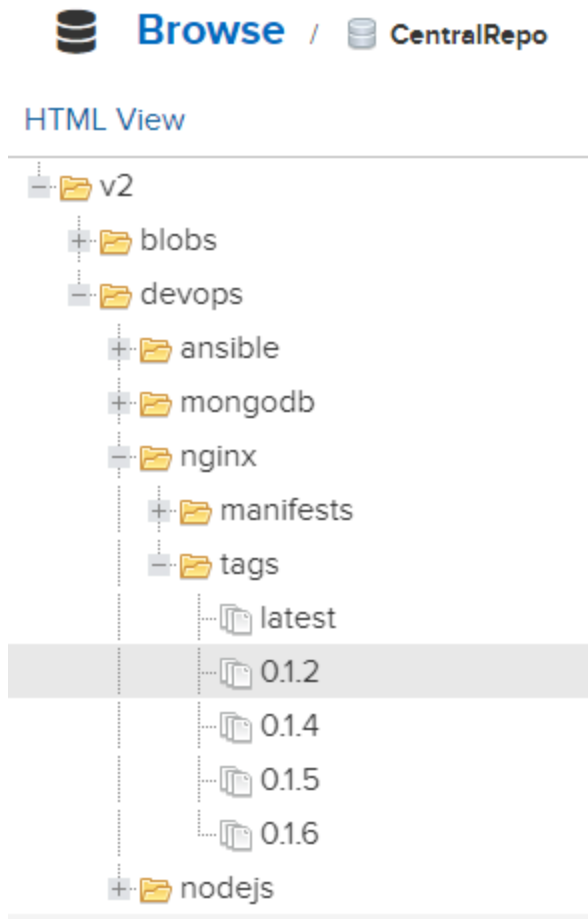


10. Wait for a few minutes for all the steps in the devops pipeline to complete.

11. Login to Nexus OSS repository. Click on Browse. Click on CentralRepo



12. The latest version 0.1.6 corresponds to the Jenkins Build No 6.



13. Currently, the devops_deploy pipeline will succeed but the Calm application for the Karbon Kubernetes will fail. The

1.6 How to add Nexus Private Image Registry with Karbon.

1. Follow the steps in <https://nutanixinc.sharepoint.com/sites/APJSME/SitePages/How-to-add-private-image-registry-to-Karbon.aspx>

1.7 Verification after adding the Private Image Registry to Karbon.

1. Putty into the IP address for the workstation. Login as nutanix and password: nutanix/4u.
2. Run the following commands

```
cd devops/web/src/css  
vi style.css
```

3. Search for databox

```
/*
** Styles used in the Calm Demo
*/
body {
  font-family: "Open Sans", sans-serif;
  font-size: 10pt;
  margin: 0;
  line-height: 1.2em;
}

body > h1 {
  background-color: #024394;
  color: white;
  font-family: Arial, Helvetica, sans-serif;
  font-weight: 100;
  font-size: 350%;
  margin: 0;
  padding-left: 10pt;
  padding-right: 10pt;
  padding-top: 25pt;
  padding-bottom: 15pt;
  box-shadow: 0px 5px 5px 0px rgba(171,171,171,1);
}
/databox
```

4. Change the background color. Saved the change

```
#databox {
  border-radius: 25px;
  background-color: #004394;
  font-size: 10pt;
  padding-left: 10pt;
}
```

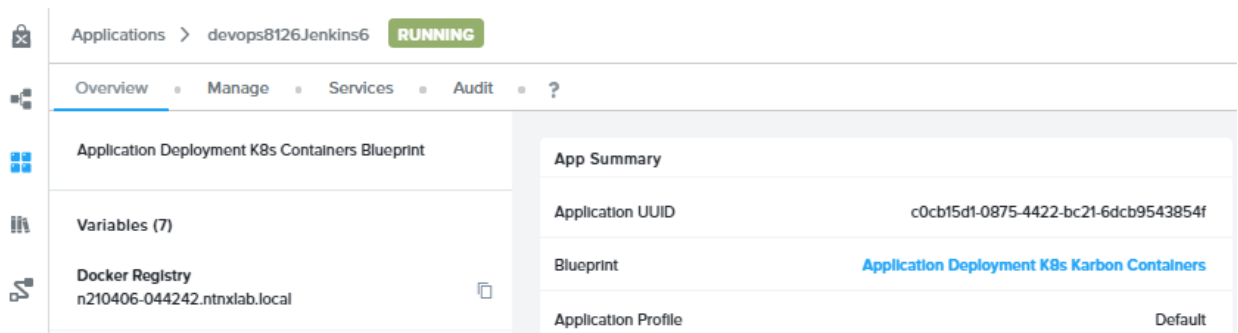
- Run the following command

```
cd ~/devops
```

- Run the following command to commit the change into the repository

```
git add .
git commit -m 'change css'
git push origin master
```

- The Calm application was deployed successfully.



- Putty into a VM with kubectl installed. Ensure the Karbon KUBECONFIG was installed. Eg

```
KUBECONFIG=/home/centos/karbon-sit-kubectl.cfg
export KUEBCONFIG.
```

- Run this command. It was assumed the MetalLB was installed for the external IP address to show.

```
kubectl -n default get all.
```

```
[centos@vm-0-210415-085915 ~]$ kubectl -n default get all
```

NAME	READY	STATUS	RESTARTS	AGE
pod/mongodb-dep-7298-7df8cdc7b4-w6lt9	1/1	Running	0	6m15s
pod/nginx-dep-8229-6f4d55bd74-b647s	1/1	Running	0	4m32s
pod/nginx-dep-8229-6f4d55bd74-lqxc1	1/1	Running	0	4m32s
pod/nodejs-dep-6372-fb7c4bdb4-dxx25	1/1	Running	0	5m20s

NAME	RT (S)	AGE	TYPE	CLUSTER-IP	EXTERNAL-IP	PO
service/kubernetes	3/TCP	4d16h	ClusterIP	172.19.0.1	<none>	44
service/mongodb-calm-svc-8473	017:32468/TCP	5m28s	LoadBalancer	172.19.13.5	10.42.94.113	27
service/nginx-calm-svc-9149	:30160/TCP	3m44s	LoadBalancer	172.19.82.3	10.42.94.115	80
service/nodejs-calm-svc-2447	00:30466/TCP	4m41s	LoadBalancer	172.19.76.157	10.42.94.114	30

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/mongodb-dep-7298	1/1	1	1	6m15s
deployment.apps/nginx-dep-8229	2/2	2	2	4m32s
deployment.apps/nodejs-dep-6372	1/1	1	1	5m20s

10. Open the browser and key in the external IP address for service/nginx-calm-svc-9149.