Date: 29/03/2024 **Prepared By: Shrikanth C R**

INTEGRATING TERRAFORM WITH JENKINS PIPELINE:

PREQUISITES:

1) Install Jenkins in One Ec2 Server: (Jenkins Master)

yum update -y

yum install java-17 -y

yum install git -y

yum install mvn -y

yum install docker -y

systemctl start docker

systemctl enable docker

systemctl status docker

docker run -d -p 8080:8080 -p 50000:50000 jenkins/jenkins:lts

2) For Jenkins Slave:

yum update -y

yum install java-17 -y

yum install git -y

yum install mvn -y

Run Below Commands to connect Jenkins-slave with Jenkins-Master:

curl -sO http://54.152.5.61:8080/jnlpJars/agent.jar

java -jar agent.jar -url http://54.152.5.61:8080/ -secret

12fa91f4004e91707899d75b576ae1e722994b73ec7fe3ee89d60dff88e19996 -name "slave-1" -

workDir "/home/ec2-user/"

Terraform Installation Commands:

sudo yum install -y yum-utils shadow-utils

sudo yum-config-manager --add-repo https://rpm.releases.hashicorp.com/AmazonLinux/hashicorp.repo

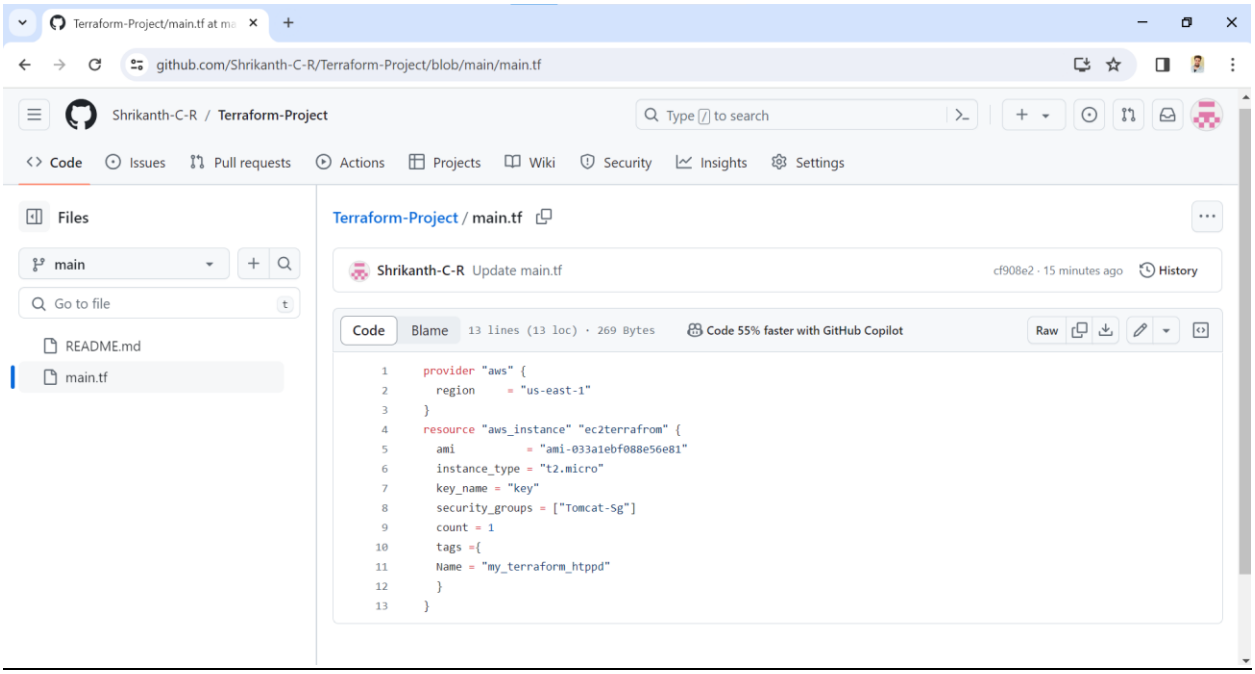
sudo yum -y install terraform

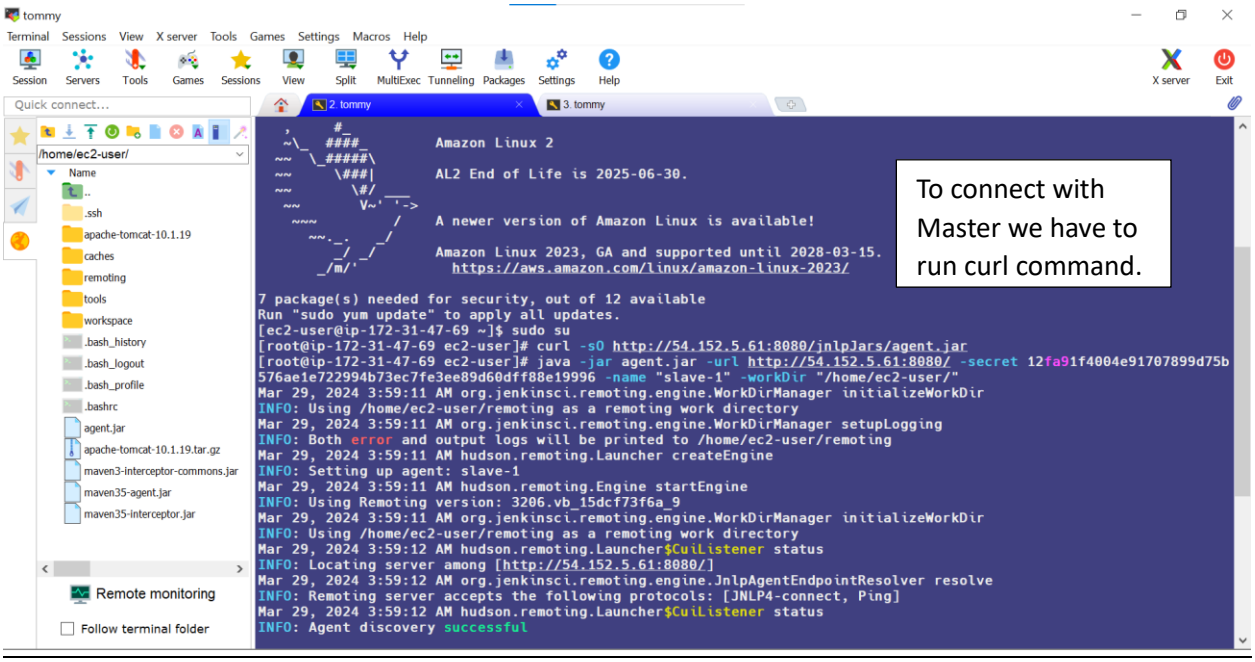
sudo terraform –version

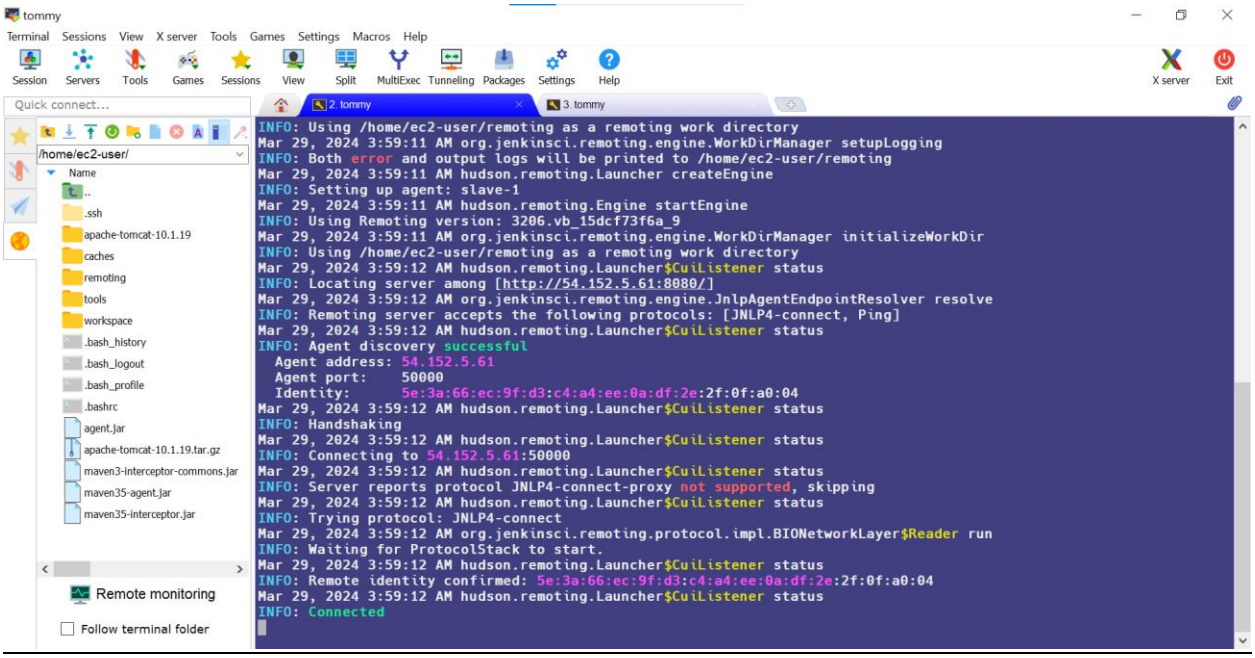
Git Hub Link: https://github.com/Shrikanth-C-R/Terraform-Project.git

3) Plugins:

1) Terraform Plugin




tommy
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
X server Exit
Quick connect...
2. tommy
3. tommy
/home/ec2-user/
Name
.ssh
apache-tomcat-10.1.19
caches
remoting
tools
workspace
.bash_history
.bash_logout
.bash_profile
.bashrc
agent.jar
apache-tomcat-10.1.19.tar.gz
maven3-interceptor-commons.jar
maven35-agent.jar
maven35-interceptor.jar
Remote monitoring
Follow terminal folder
Amazon Linux 2
AL2 End of Life is 2025-06-30.
A newer version of Amazon Linux is available!
Amazon Linux 2023, GA and supported until 2028-03-15.
https://aws.amazon.com/linux/amazon-linux-2023/
7 package(s) needed for security, out of 12 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-47-69 ~]$ sudo su
[root@ip-172-31-47-69 ec2-user]# curl -sO http://54.152.5.61:8080/jnlpJars/agent.jar
[root@ip-172-31-47-69 ec2-user]# java -jar agent.jar -url http://54.152.5.61:8080/ -secret 12fa91f4004e91707899d75b576ae1e722994b73ec7fe3ee89d60dff88e19996 -name "slave-1" -workDir "/home/ec2-user/"
Mar 29, 2024 3:59:11 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /home/ec2-user/remoting as a remoting work directory
Mar 29, 2024 3:59:11 AM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to /home/ec2-user/remoting
Mar 29, 2024 3:59:11 AM hudson.remoting.Launcher createEngine
INFO: Setting up agent: slave-1
Mar 29, 2024 3:59:11 AM hudson.remoting.Engine startEngine
INFO: Using Remoting version: 3206.vb_15dcf73f6a_9
Mar 29, 2024 3:59:11 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /home/ec2-user/remoting as a remoting work directory
Mar 29, 2024 3:59:12 AM hudson.remoting.Launcher$CuiListener status
INFO: Locating server among [http://54.152.5.61:8080/]
Mar 29, 2024 3:59:12 AM org.jenkinsci.remoting.engine.JnlpAgentEndpointResolver resolve
INFO: Remoting server accepts the following protocols: [JNLP4-connect, Ping]
Mar 29, 2024 3:59:12 AM hudson.remoting.Launcher$CuiListener status
INFO: Agent discovery successful
To connect with Master we have to run curl command.


tommy
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
X server Exit
Quick connect...
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3. tommy
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apache-tomcat-10.1.19
caches
remoting
tools
workspace
.bash_history
.bash_logout
.bash_profile
.bashrc
agent.jar
apache-tomcat-10.1.19.tar.gz
maven3-interceptor-commons.jar
maven35-agent.jar
maven35-interceptor.jar
Remote monitoring
Follow terminal folder
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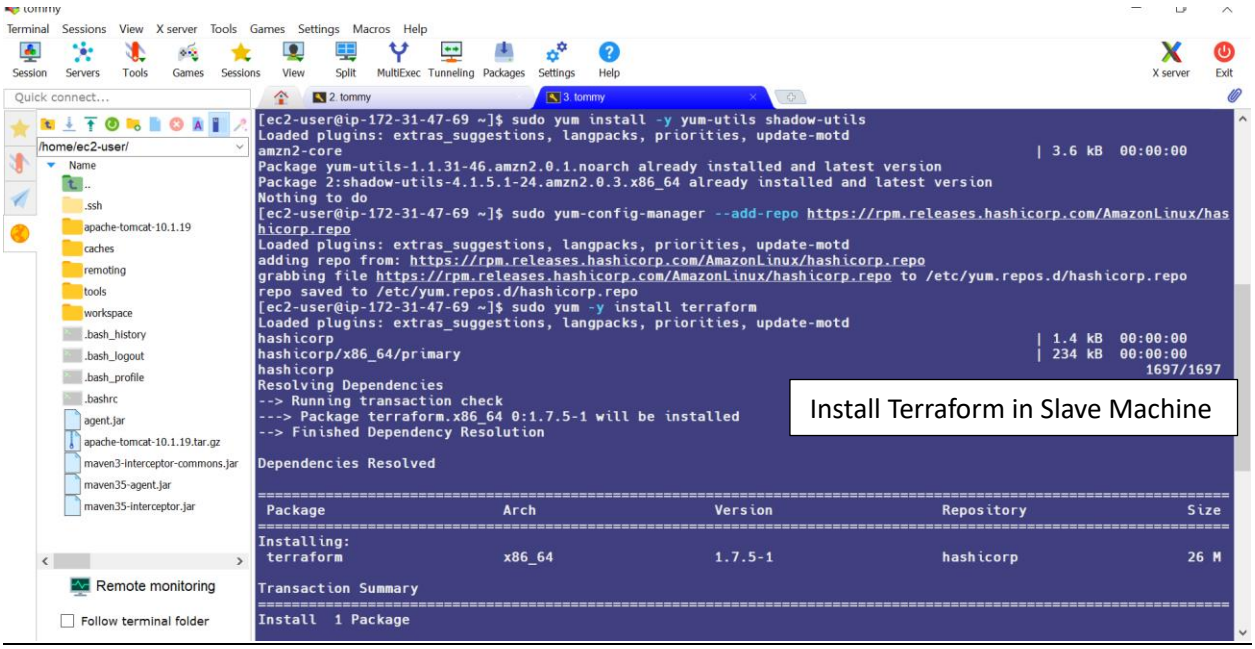
INFO: Remoting server accepts the following protocols: [JNLP4-connect, Ping]
Mar 29, 2024 3:59:12 AM hudson.remoting.Launcher$CuiListener status
INFO: Agent discovery successful
Agent address: 54.152.5.61
Agent port: 50000
Identity: 5e:3a:66:ec:9f:d3:c4:a4:ee:0a:df:2e:2f:0f:a0:04
Mar 29, 2024 3:59:12 AM hudson.remoting.Launcher$CuiListener status
INFO: Handshaking
Mar 29, 2024 3:59:12 AM hudson.remoting.Launcher$CuiListener status
INFO: Connecting to 54.152.5.61:50000
Mar 29, 2024 3:59:12 AM hudson.remoting.Launcher$CuiListener status
INFO: Server reports protocol JNLP4-connect-proxy not supported, skipping
Mar 29, 2024 3:59:12 AM hudson.remoting.Launcher$CuiListener status
INFO: Trying protocol: JNLP4-connect
Mar 29, 2024 3:59:12 AM org.jenkinsci.remoting.protocol.impl.BIONetworkLayer$Reader run
INFO: Waiting for ProtocolStack to start.
Mar 29, 2024 3:59:12 AM hudson.remoting.Launcher$CuiListener status
INFO: Remote identity confirmed: 5e:3a:66:ec:9f:d3:c4:a4:ee:0a:df:2e:2f:0f:a0:04
Mar 29, 2024 3:59:12 AM hudson.remoting.Launcher$CuiListener status
INFO: Connected


tommy
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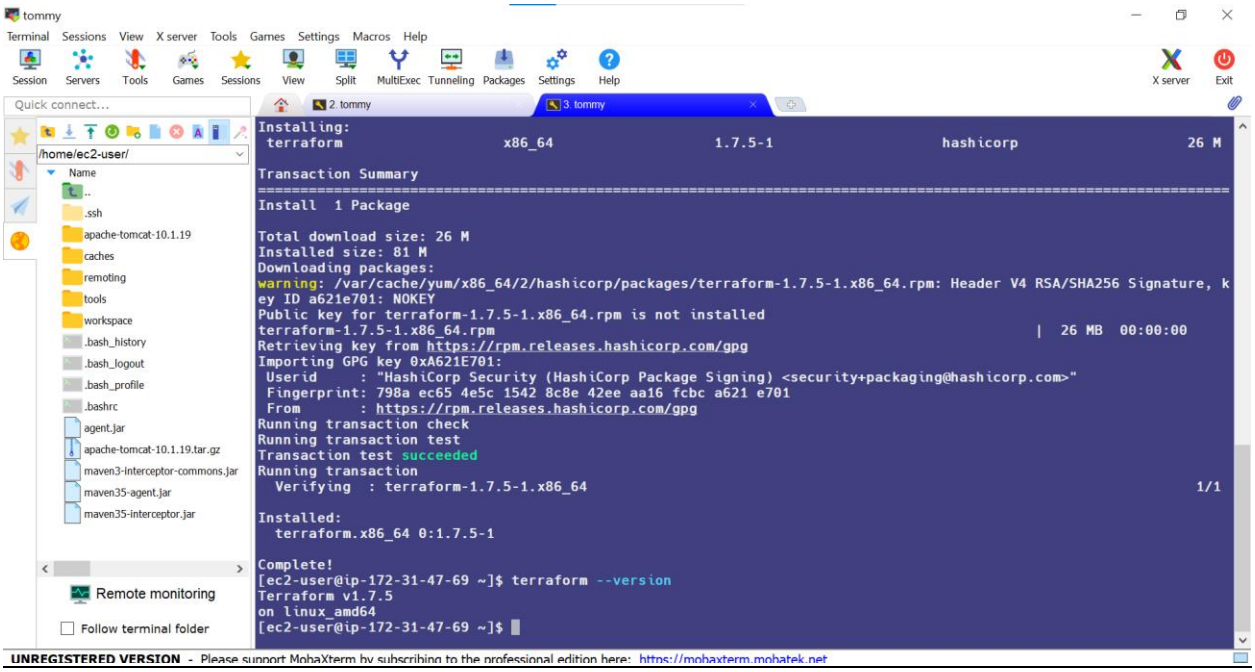
.bashrc
agent.jar
apache-tomcat-10.1.19.tar.gz
maven3-interceptor-commons.jar
maven35-agent.jar
maven35-interceptor.jar
Remote monitoring
Follow terminal folder
[ec2-user@ip-172-31-47-69 ~]$ sudo yum install -y yum-utils shadow-utils
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core | 3.6 kB 00:00:00
Package yum-utils-1.1.31-46.amzn2.0.1.noarch already installed and latest version
Package 2:shadow-utils-4.1.5.1-24.amzn2.0.3.x86_64 already installed and latest version
Nothing to do
[ec2-user@ip-172-31-47-69 ~]$ sudo yum-config-manager --add-repo https://rpm.releases.hashicorp.com/AmazonLinux/hashicorp.repo
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
adding repo from: https://rpm.releases.hashicorp.com/AmazonLinux/hashicorp.repo
grabbing file https://rpm.releases.hashicorp.com/AmazonLinux/hashicorp.repo to /etc/yum.repos.d/hashicorp.repo
repo saved to /etc/yum.repos.d/hashicorp.repo
[ec2-user@ip-172-31-47-69 ~]$ sudo yum -y install terraform
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
hashicorp | 1.4 kB 00:00:00
hashicorp/x86_64/primary | 234 kB 00:00:00
hashicorp 1697/1697
Resolving Dependencies
--> Running transaction check
---> Package terraform.x86_64 0:1.7.5-1 will be installed
--> Finished Dependency Resolution
Dependencies Resolved
Package Arch Version Repository Size
Installing:
terraform x86_64 1.7.5-1 hashicorp 26 M
Transaction Summary
Install 1 Package
Install Terraform in Slave Machine


tommy
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help X server Exit
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/home/ec2-user/
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caches
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workspace
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.bash_profile
.bashrc
agent.jar
apache-tomcat-10.1.19.tar.gz
maven3-interceptor-commons.jar
maven35-agent.jar
maven35-interceptor.jar
Remote monitoring
Follow terminal folder
Installing:
terraform x86_64 1.7.5-1 hashicorp 26 M
Transaction Summary
Install 1 Package
Total download size: 26 M
Installed size: 81 M
Downloading packages:
warning: /var/cache/yum/x86_64/2/hashicorp/packages/terraform-1.7.5-1.x86_64.rpm: Header V4 RSA/SHA256 Signature, key ID a621e701: NOKEY
Public key for terraform-1.7.5-1.x86_64.rpm is not installed
terraform-1.7.5-1.x86_64.rpm | 26 MB 00:00:00
Retrieving key from https://rpm.releases.hashicorp.com/gpg
Importing GPG key 0xA621E701:
Userid : "HashiCorp Security (HashiCorp Package Signing) <security+packaging@hashicorp.com>"
Fingerprint: 798a ec65 4e5c 1542 8c8e 42ee aa16 fcbc a621 e701
From : https://rpm.releases.hashicorp.com/gpg
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
Verifying : terraform-1.7.5-1.x86_64 1/1
Installed:
terraform.x86_64 0:1.7.5-1
Complete!
[ec2-user@ip-172-31-47-69 ~]$ terraform --version
Terraform v1.7.5
on linux_amd64
[ec2-user@ip-172-31-47-69 ~]$
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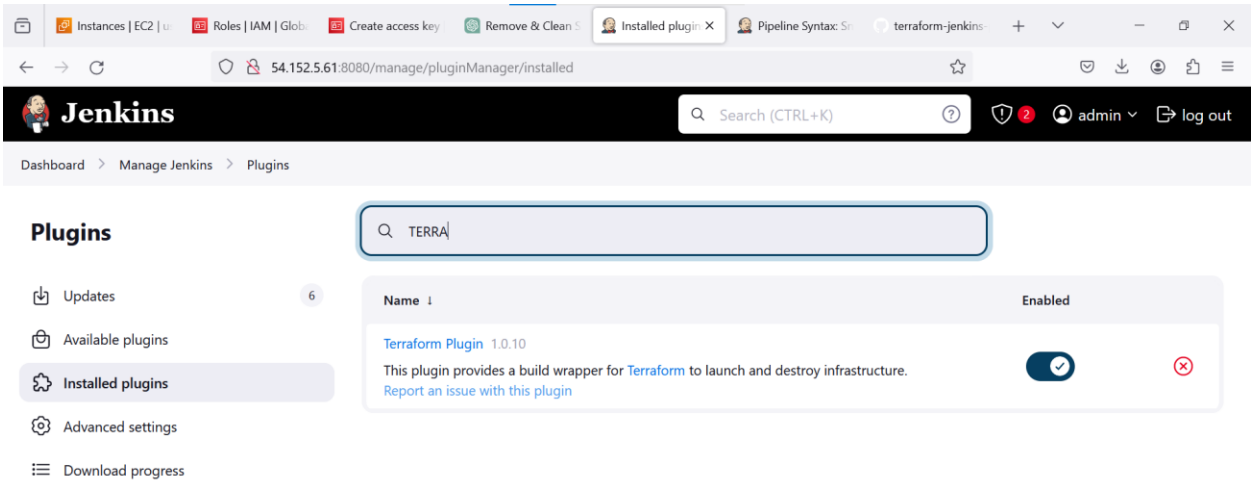
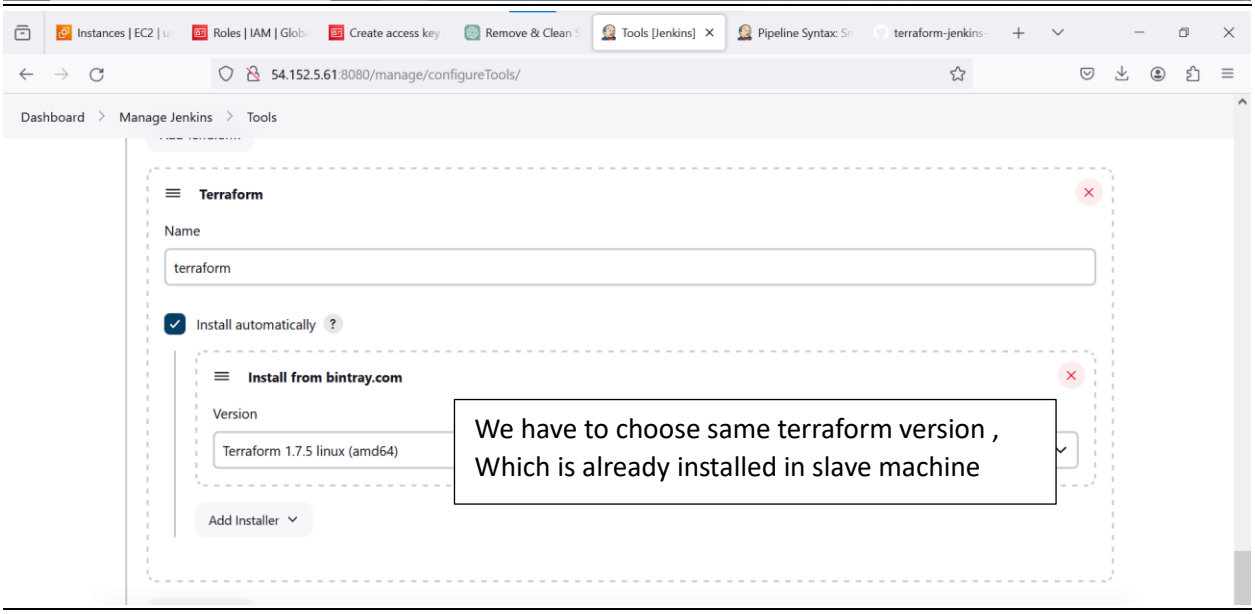
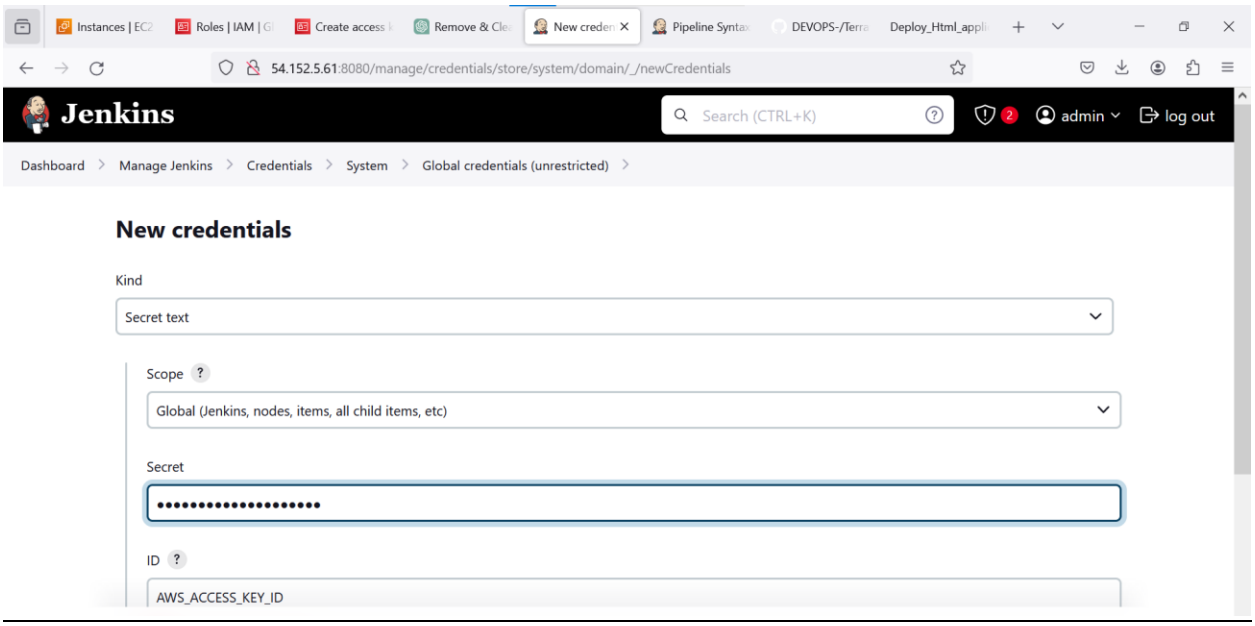
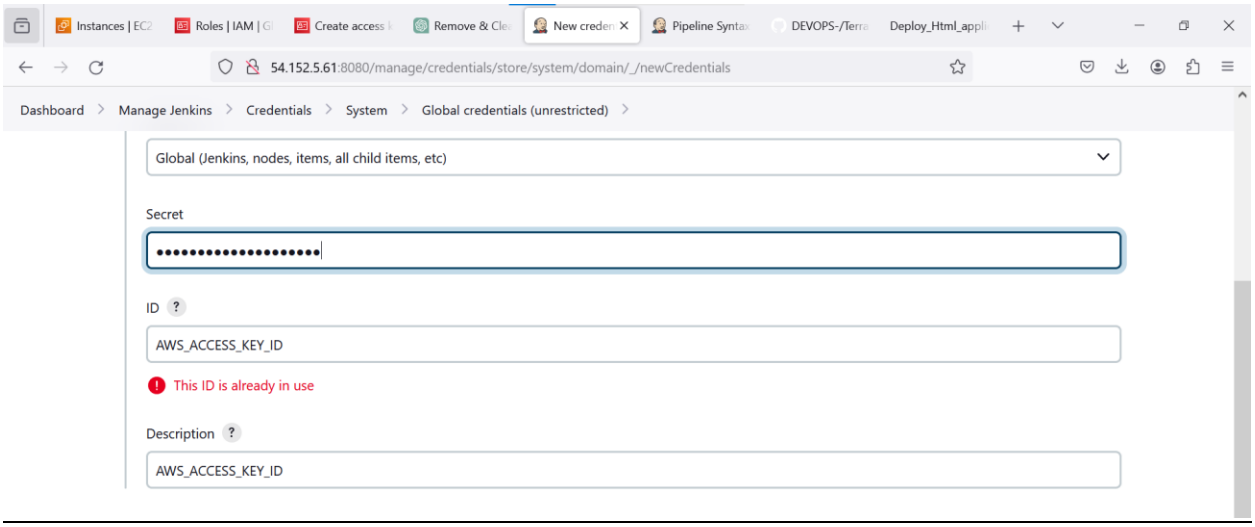
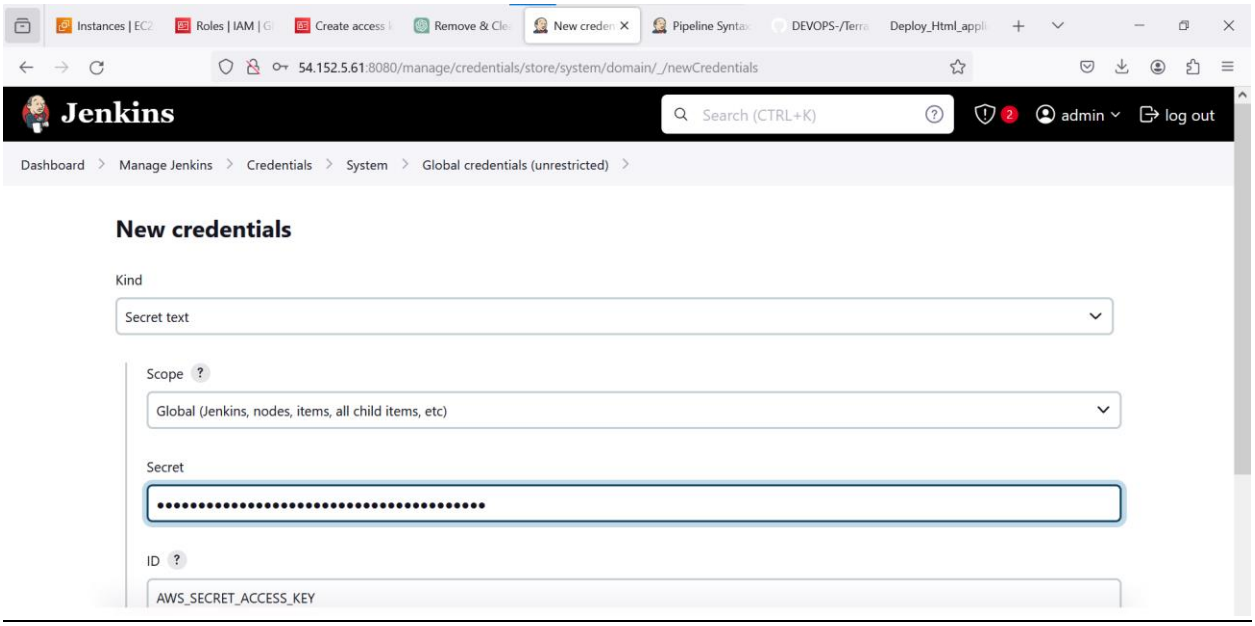
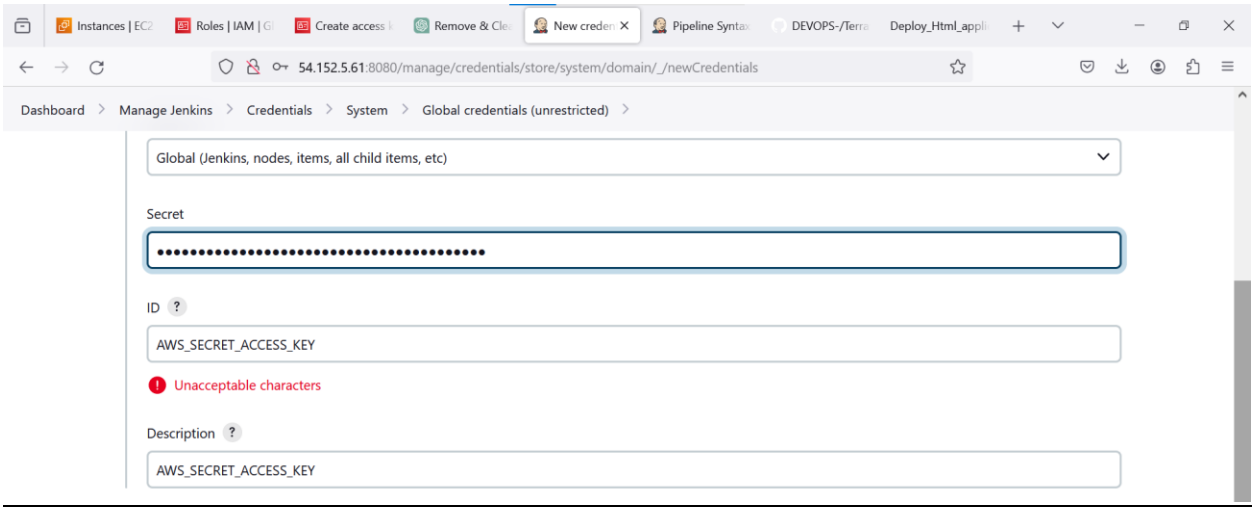

Jenkins
Search (CTRL+K)
admin
log out
Dashboard > Manage Jenkins > Plugins
Plugins
TERRA
Updates
Available plugins
Installed plugins
Advanced settings
Download progress
Name
Enabled
Terraform Plugin 1.0.10
This plugin provides a build wrapper for Terraform to launch and destroy infrastructure.
Report an issue with this plugin
REST API
Jenkins 2.440.2

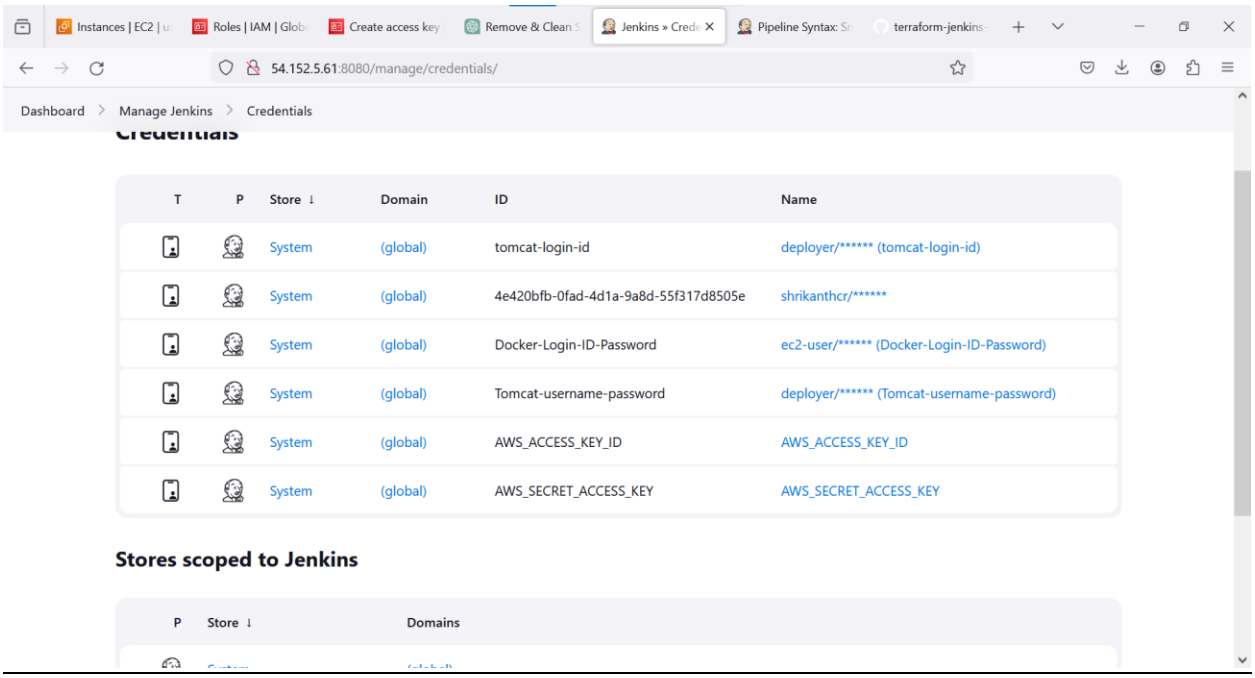

Dashboard > Manage Jenkins > Tools
Terraform
Name
terraform
Install automatically
Install from bintray.com
Version
Terraform 1.7.5 linux (amd64)
Add Installer
We have to choose same terraform version ,
Which is already installed in slave machine

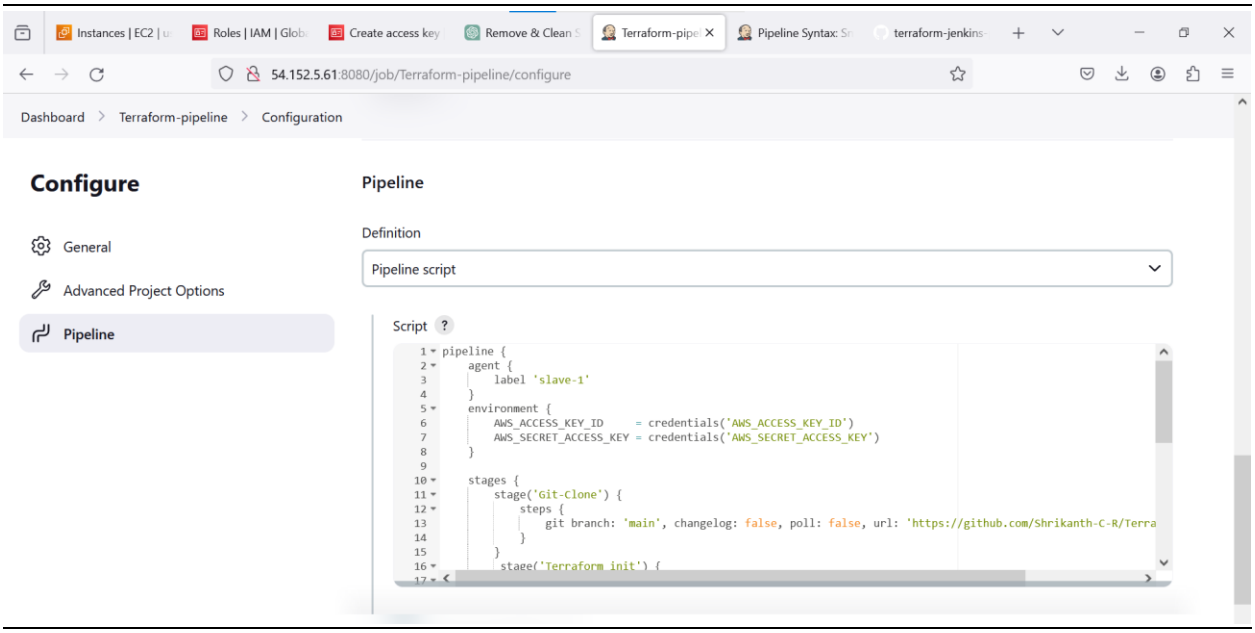

Jenkins
Search (CTRL+K)
admin
log out
Dashboard > Manage Jenkins > Credentials > System > Global credentials (unrestricted) >
New credentials
Kind
Secret text
Scope
Global (Jenkins, nodes, items, all child items, etc)
Secret
ID
AWS_ACCESS_KEY_ID


Dashboard > Manage Jenkins > Credentials > System > Global credentials (unrestricted) >
Global (Jenkins, nodes, items, all child items, etc)
Secret
ID
AWS_ACCESS_KEY_ID
This ID is already in use
Description
AWS_ACCESS_KEY_ID


Jenkins
Search (CTRL+K)
admin
log out
Dashboard > Manage Jenkins > Credentials > System > Global credentials (unrestricted) >
New credentials
Kind
Secret text
Scope
Global (Jenkins, nodes, items, all child items, etc)
Secret
ID
AWS_SECRET_ACCESS_KEY


54.152.5.61:8080/manage/credentials/store/system/domain/_/newCredentials
Dashboard > Manage Jenkins > Credentials > System > Global credentials (unrestricted) >
Global (Jenkins, nodes, items, all child items, etc)
Secret
ID
AWS_SECRET_ACCESS_KEY
Unacceptable characters
Description
AWS_SECRET_ACCESS_KEY


Instances | EC2 | u
Roles | IAM | Glob
Create access key
Remove & Clean S
Jenkins » Crede
Pipeline Syntax: Sr
terraform-jenkins
54.152.5.61:8080/manage/credentials/
Dashboard
Manage Jenkins
Credentials
T
P
Store ↓
Domain
ID
Name
System
(global)
tomcat-login-id
deployer/****** (tomcat-login-id)
System
(global)
4e420bfb-0fad-4d1a-9a8d-55f317d8505e
shrikanthcr/******
System
(global)
Docker-Login-ID-Password
ec2-user/****** (Docker-Login-ID-Password)
System
(global)
Tomcat-username-password
deployer/****** (Tomcat-username-password)
System
(global)
AWS_ACCESS_KEY_ID
AWS_ACCESS_KEY_ID
System
(global)
AWS_SECRET_ACCESS_KEY
AWS_SECRET_ACCESS_KEY
Stores scoped to Jenkins
P
Store ↓
Domains


Instances | EC2 | u
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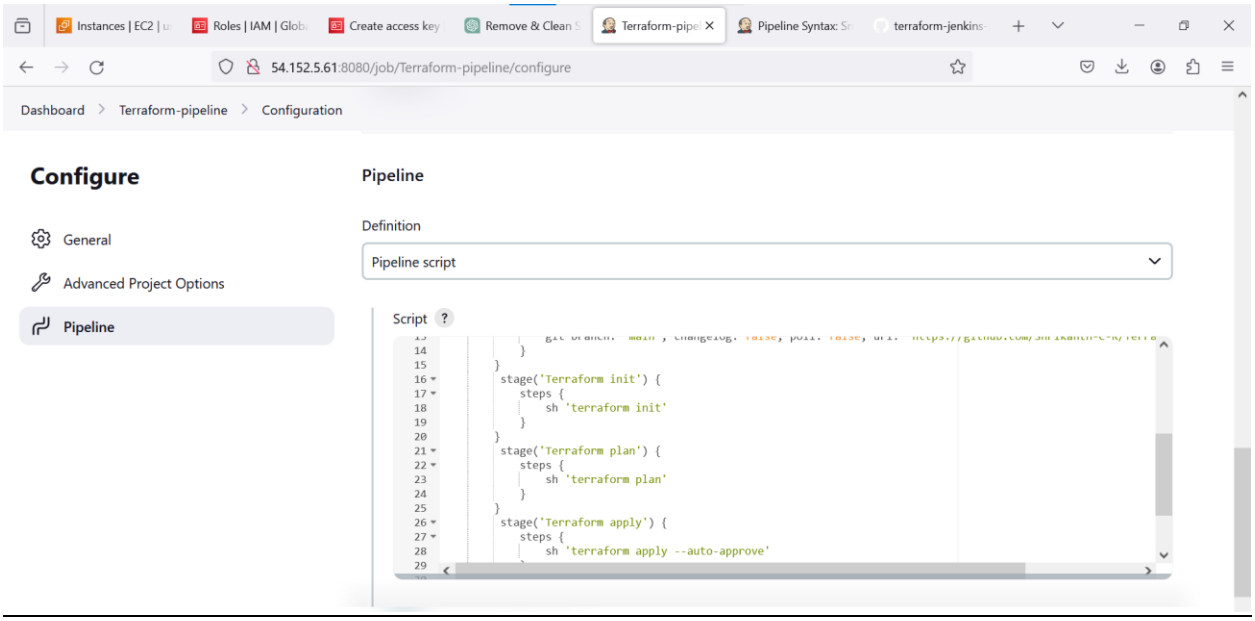
Create access key
Remove & Clean S
Terraform-pipel
Pipeline Syntax: Sr
terraform-jenkins
54.152.5.61:8080/job/Terraform-pipeline/configure
Dashboard
Terraform-pipeline
Configuration
Configure
General
Advanced Project Options
Pipeline
Pipeline
Definition
Pipeline script
Script
pipeline {
agent {
label 'slave-1'
}
environment {
AWS_ACCESS_KEY_ID = credentials('AWS_ACCESS_KEY_ID')
AWS_SECRET_ACCESS_KEY = credentials('AWS_SECRET_ACCESS_KEY')
}
stages {
stage('Git-Clone') {
steps {
git branch: 'main', changelog: false, poll: false, url: 'https://github.com/Shrikanth-C-R/Terra
}
}
stage('Terraform init') {


Instances | EC2 | u
Roles | IAM | Glob
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Terraform-pipel
Pipeline Syntax: Sr
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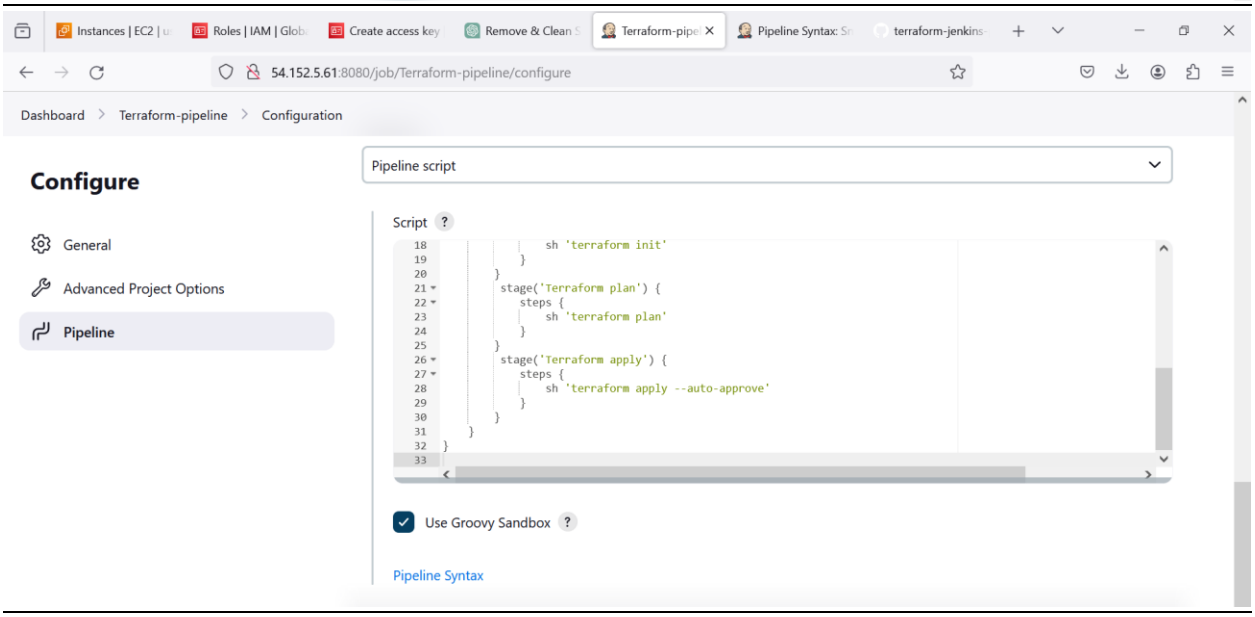
54.152.5.61:8080/job/Terraform-pipeline/configure
Dashboard
Terraform-pipeline
Configuration
Configure
General
Advanced Project Options
Pipeline
Pipeline
Definition
Pipeline script
Script
14 }
15 }
16 stage('Terraform init') {
17 steps {
18 sh 'terraform init'
19 }
20 }
21 stage('Terraform plan') {
22 steps {
23 sh 'terraform plan'
24 }
25 }
26 stage('Terraform apply') {
27 steps {
28 sh 'terraform apply --auto-approve'
29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Terraform-pipel
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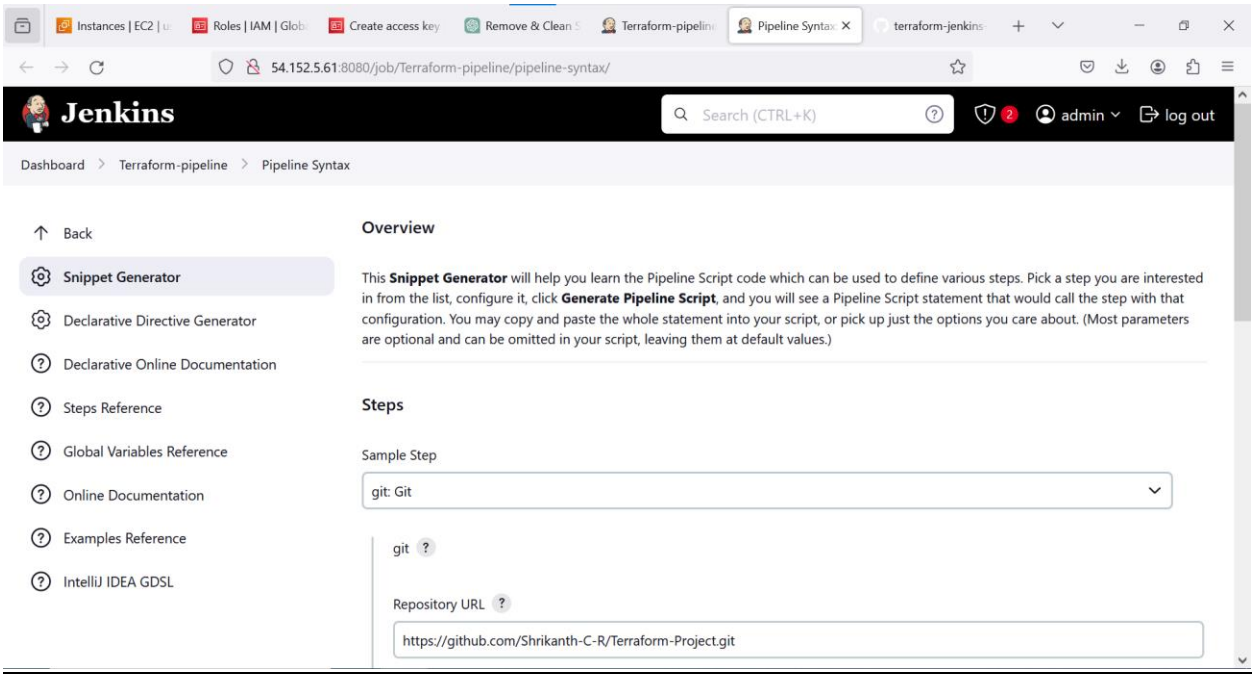
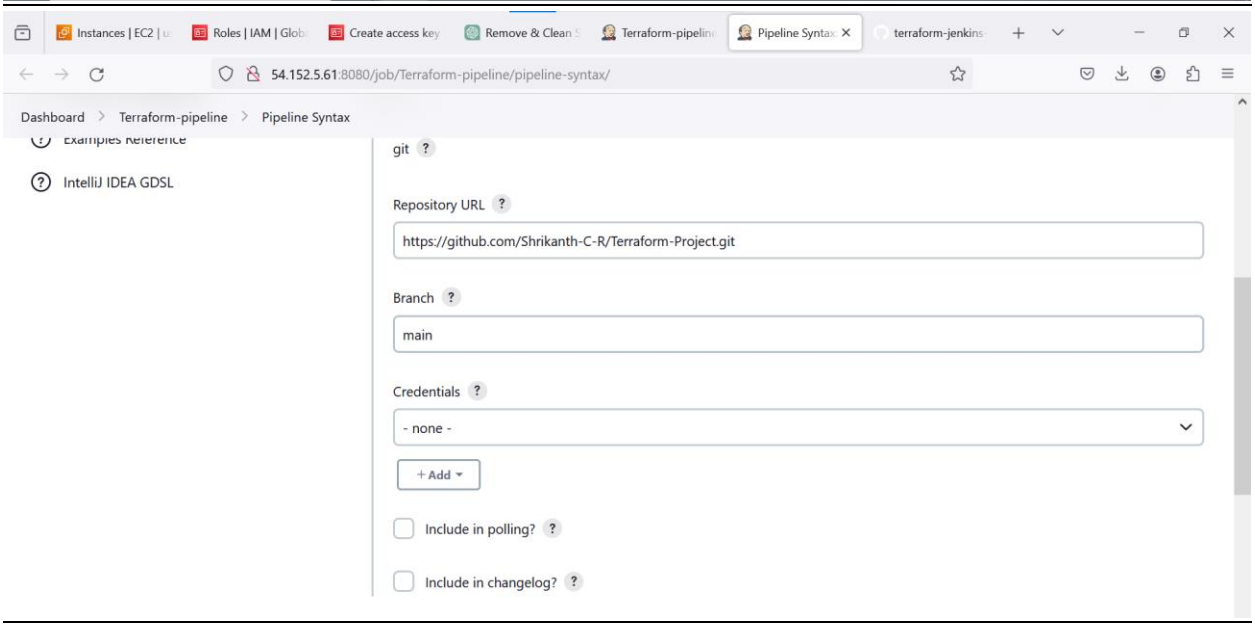
Terraform-pipeline
Configuration
Configure
General
Advanced Project Options
Pipeline
Pipeline script
Script
18 sh 'terraform init'
19 }
20 }
21 stage('Terraform plan') {
22 steps {
23 sh 'terraform plan'
24 }
25 }
26 stage('Terraform apply') {
27 steps {
28 sh 'terraform apply --auto-approve'
29 }
30 }
31 }
32 }
33
Use Groovy Sandbox
Pipeline Syntax


Instances | EC2 |
Roles | IAM | Glob
Create access key
Remove & Clean
Terraform-pipelin
Pipeline Syntax
terraform-jenkins
54.152.5.61:8080/job/Terraform-pipeline/pipeline-syntax/
Jenkins
Search (CTRL+K)
admin
log out
Dashboard
Terraform-pipeline
Pipeline Syntax
Back
Snippet Generator
Declarative Directive Generator
Declarative Online Documentation
Steps Reference
Global Variables Reference
Online Documentation
Examples Reference
IntelliJ IDEA GDSL
Overview
This Snippet Generator will help you learn the Pipeline Script code which can be used to define various steps. Pick a step you are interested in from the list, configure it, click Generate Pipeline Script, and you will see a Pipeline Script statement that would call the step with that configuration. You may copy and paste the whole statement into your script, or pick up just the options you care about. (Most parameters are optional and can be omitted in your script, leaving them at default values.)
Steps
Sample Step
git: Git
git
Repository URL
https://github.com/Shrikanth-C-R/Terraform-Project.git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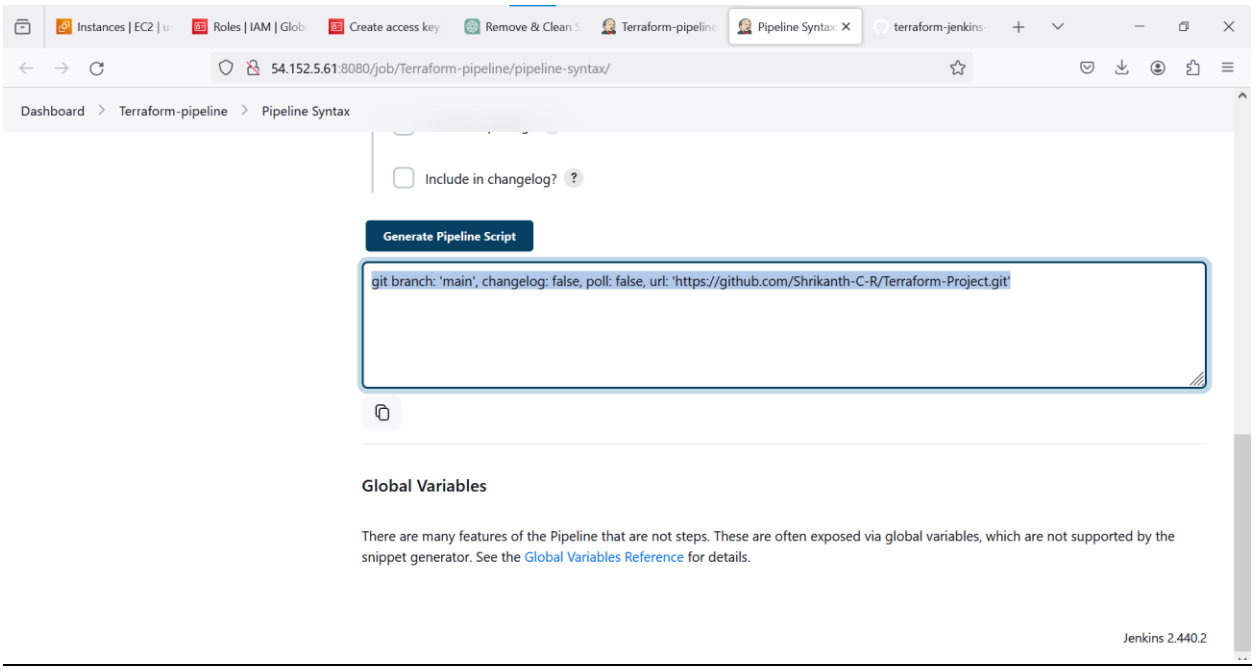
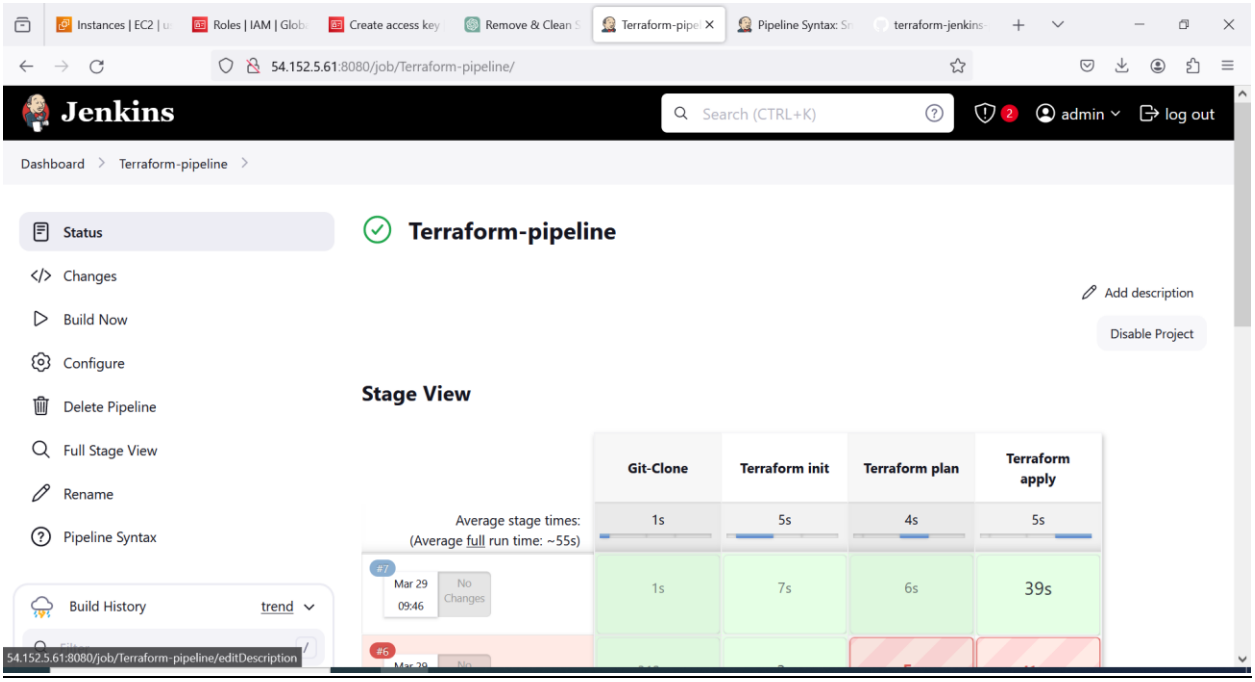
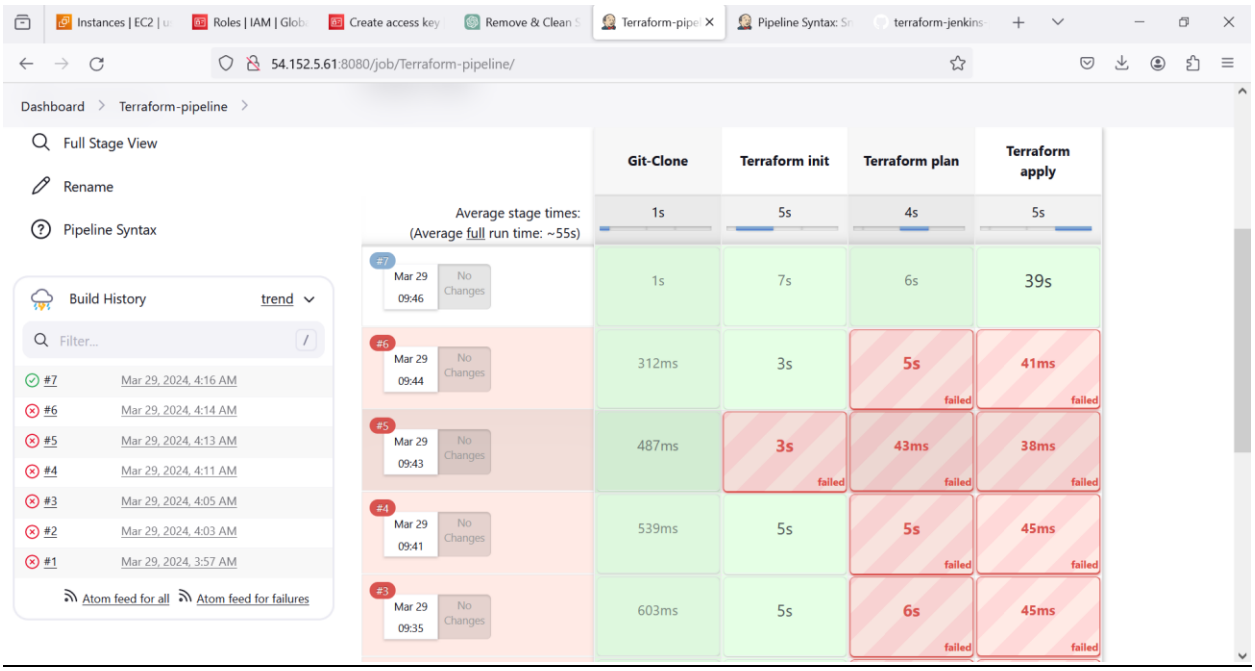
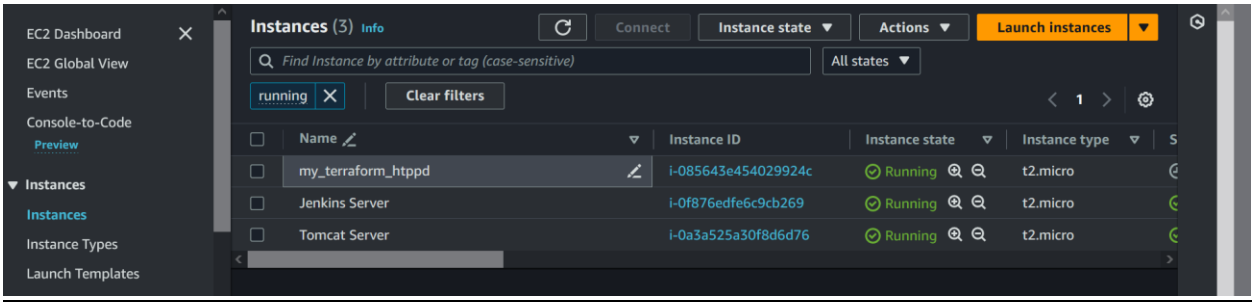
terraform-jenkins
54.152.5.61:8080/job/Terraform-pipeline/pipeline-syntax/
Dashboard
Terraform-pipeline
Pipeline Syntax
IntelliJ IDEA GDSL
git
Repository URL
https://github.com/Shrikanth-C-R/Terraform-Project.git
Branch
main
Credentials
- none -
+ Add
Include in polling?
Include in changelog?


54.152.5.61:8080/job/Terraform-pipeline/pipeline-syntax/
Dashboard
Terraform-pipeline
Pipeline Syntax
Include in changelog?
Generate Pipeline Script
git branch: 'main', changelog: false, poll: false, url: 'https://github.com/Shrikanth-C-R/Terraform-Project.git'
Global Variables
There are many features of the Pipeline that are not steps. These are often exposed via global variables, which are not supported by the snippet generator. See the Global Variables Reference for details.
Jenkins 2.440.2


54.152.5.61:8080/job/Terraform-pipeline/
Jenkins
Search (CTRL+K)
admin
log out
Dashboard
Terraform-pipeline
Status
Changes
Build Now
Configure
Delete Pipeline
Full Stage View
Rename
Pipeline Syntax
Build History
trend
Terraform-pipeline
Add description
Disable Project
Stage View
Git-Clone
Terraform init
Terraform plan
Terraform apply
Average stage times:
(Average full run time: ~55s)
1s
5s
4s
5s
#7
Mar 29
09:46
No Changes
1s
7s
6s
39s
54.152.5.61:8080/job/Terraform-pipeline/editDescription





Jenkins-Pipeline:

```
pipeline {
   agent {
      label 'slave-1'
   }
   environment {
      AWS_ACCESS_KEY_ID     = credentials('AWS_ACCESS_KEY_ID')
      AWS_SECRET_ACCESS_KEY = credentials('AWS_SECRET_ACCESS_KEY')
   }

   stages {
      stage('Git-Clone') {
```

```
        steps {
            git branch: 'main', changelog: false, poll: false, url: 'https://github.com/Shrikanth-C-R/Terraform-Project.git'
        }
      }
       stage('Terraform init') {
        steps {
            sh 'terraform init'
        }
      }
       stage('Terraform plan') {
        steps {
            sh 'terraform plan'
        }
      }
       stage('Terraform apply') {
        steps {
            sh 'terraform apply --auto-approve'
        }
      }
   }
}
```