

DevOps Project 1

Using Terraform to setup the environment in Azure.

```
terraform {
  required_providers {
    azurerm = {
      source  = "hashicorp/azurerm"
      version = "=3.34.0"
    }
  }
}

provider "azurerm" {
  features {}
  subscription_id = "e9c93904-c316-4f60-a1b3-fc5ae575878f"
  tenant_id       = "624a0ea3-8660-4927-96de-a646f74ad52b"
  client_id       = "0feeb28b-8afe-4960-8e65-4c7f823bc736"
  client_secret   = "Z~r8Q~vq51LuxXDRjWnMlh9zLn6KcmZ09sH~GcA2"
}

resource "azurerm_resource_group" "devops" {
  name     = "devops-rg"
  location = "West Europe"
}

resource "azurerm_virtual_network" "devops" {
  name                = "devops-vnet"
  address_space       = ["10.0.0.0/16"]
  location             = azurerm_resource_group.devops.location
  resource_group_name = azurerm_resource_group.devops.name
}

resource "azurerm_subnet" "devops" {
  name                = "devops-subnet"
  resource_group_name = azurerm_resource_group.devops.name
  virtual_network_name = azurerm_virtual_network.devops.name
  address_prefixes     = ["10.0.9.0/24"]
}

resource "azurerm_ssh_public_key" "devops" {
  name                = "devops"
  resource_group_name = azurerm_resource_group.devops.name
  location            = azurerm_resource_group.devops.location
  public_key          = file("~/ssh/id_rsa.pub")
}

resource "azurerm_network_security_group" "devops" {
  name                = "devops-nsg"
  resource_group_name = azurerm_resource_group.devops.name
  location            = azurerm_resource_group.devops.location
}
```

```

security_rule {
  name           = "SSH"
  priority       = 100
  access         = "Allow"
  direction      = "Inbound"
  protocol       = "Tcp"
  source_address_prefix = "*"
  source_port_range   = "*"
  destination_address_prefix = "*"
  destination_port_range = "22"
}

security_rule {
  name           = "HTTP"
  priority       = 101
  access         = "Allow"
  direction      = "Inbound"
  protocol       = "Tcp"
  source_address_prefix = "*"
  source_port_range   = "*"
  destination_address_prefix = "*"
  destination_port_range = "80"
}

security_rule {
  name           = "Jenkins"
  priority       = 102
  access         = "Allow"
  direction      = "Inbound"
  protocol       = "Tcp"
  source_address_prefix = "*"
  source_port_range   = "*"
  destination_address_prefix = "*"
  destination_port_range = "8080"
}
}

// Master
resource "azurerm_public_ip" "master" {
  name           = "master-public-ip"
  location       = azurerm_resource_group.devops.location
  resource_group_name = azurerm_resource_group.devops.name
  allocation_method = "Dynamic"
}

resource "azurerm_network_interface" "master" {
  name           = "master-nic"
  location       = azurerm_resource_group.devops.location
  resource_group_name = azurerm_resource_group.devops.name

  ip_configuration {
    name           = "master-ip"
    subnet_id      = azurerm_subnet.devops.id
    private_ip_address_allocation = "Dynamic"
    public_ip_address_id = azurerm_public_ip.master.id
  }
}

```

```

    }
}

resource "azurerm_network_interface_security_group_association" "master" {
  network_interface_id      = azurerm_network_interface.master.id
  network_security_group_id = azurerm_network_security_group.devops.id
}

resource "azurerm_virtual_machine" "master" {
  name                        = "Master"
  location                   = azurerm_resource_group.devops.location
  resource_group_name        = azurerm_resource_group.devops.name
  vm_size                    = "Standard_D2s_v3"
  network_interface_ids      = [azurerm_network_interface.master.id]
  delete_data_disks_on_termination = true
  delete_os_disk_on_termination   = true

  storage_image_reference {
    publisher = "Canonical"
    offer     = "0001-com-ubuntu-server-focal"
    sku       = "20_04-lts-gen2"
    version   = "latest"
  }

  storage_os_disk {
    name            = "master-disk"
    caching         = "ReadWrite"
    create_option   = "FromImage"
    managed_disk_type = "Standard_LRS"
  }

  os_profile {
    computer_name  = "master"
    admin_username = "azureuser"
    admin_password = "Password@123"
  }

  os_profile_linux_config {
    disable_password_authentication = true
    ssh_keys {
      path      = "/home/azureuser/.ssh/authorized_keys"
      key_data = azurerm_ssh_public_key.devops.public_key
    }
  }
}

// Slave 1
resource "azurerm_public_ip" "slave1" {
  name                = "slave1-public-ip"
  location             = azurerm_resource_group.devops.location
  resource_group_name = azurerm_resource_group.devops.name
  allocation_method   = "Dynamic"
}

```

```

resource "azurerm_network_interface" "slave1" {
  name                = "slave1-nic"
  location             = azurerm_resource_group.devops.location
  resource_group_name = azurerm_resource_group.devops.name

  ip_configuration {
    name                = "slave1-ip"
    subnet_id           = azurerm_subnet.devops.id
    private_ip_address_allocation = "Dynamic"
    public_ip_address_id = azurerm_public_ip.slave1.id
  }
}

resource "azurerm_network_interface_security_group_association" "slave1" {
  network_interface_id      = azurerm_network_interface.slave1.id
  network_security_group_id = azurerm_network_security_group.devops.id
}

resource "azurerm_virtual_machine" "slave1" {
  name                = "Slave1"
  location            = azurerm_resource_group.devops.location
  resource_group_name = azurerm_resource_group.devops.name
  vm_size             = "Standard_D2s_v3"
  network_interface_ids = [azurerm_network_interface.slave1.id]
  delete_data_disks_on_termination = true
  delete_os_disk_on_termination   = true

  storage_image_reference {
    publisher = "Canonical"
    offer     = "0001-com-ubuntu-server-focal"
    sku       = "20_04-lts-gen2"
    version   = "latest"
  }

  storage_os_disk {
    name          = "slave1-disk"
    caching       = "ReadWrite"
    create_option = "FromImage"
    managed_disk_type = "Standard_LRS"
  }

  os_profile {
    computer_name  = "slave1"
    admin_username = "azureuser"
    admin_password = "Password@123"
  }

  os_profile_linux_config {
    disable_password_authentication = true
    ssh_keys {
      path      = "/home/azureuser/.ssh/authorized_keys"
      key_data = azurerm_ssh_public_key.devops.public_key
    }
  }
}

```

```

    }
}

// Slave 2
resource "azurerm_public_ip" "slave2" {
  name            = "slave2-public-ip"
  location        = azurerm_resource_group.devops.location
  resource_group_name = azurerm_resource_group.devops.name
  allocation_method = "Dynamic"
}

resource "azurerm_network_interface" "slave2" {
  name            = "slave2-nic"
  location        = azurerm_resource_group.devops.location
  resource_group_name = azurerm_resource_group.devops.name

  ip_configuration {
    name                  = "slave2-ip"
    subnet_id            = azurerm_subnet.devops.id
    private_ip_address_allocation = "Dynamic"
    public_ip_address_id  = azurerm_public_ip.slave2.id
  }
}

resource "azurerm_network_interface_security_group_association" "slave2" {
  network_interface_id      = azurerm_network_interface.slave2.id
  network_security_group_id = azurerm_network_security_group.devops.id
}

resource "azurerm_virtual_machine" "slave2" {
  name                  = "Slave2"
  location              = azurerm_resource_group.devops.location
  resource_group_name   = azurerm_resource_group.devops.name
  vm_size               = "Standard_D2s_v3"
  network_interface_ids = [azurerm_network_interface.slave2.id]
  delete_data_disks_on_termination = true
  delete_os_disk_on_termination   = true

  storage_image_reference {
    publisher = "Canonical"
    offer     = "0001-com-ubuntu-server-focal"
    sku       = "20_04-lts-gen2"
    version   = "latest"
  }

  storage_os_disk {
    name          = "slave2-disk"
    caching       = "ReadWrite"
    create_option = "FromImage"
    managed_disk_type = "Standard_LRS"
  }

  os_profile {

```

```

computer_name = "slave2"
admin_username = "azureuser"
admin_password = "Password@123"
}

os_profile_linux_config {
  disable_password_authentication = true
  ssh_keys {
    path      = "/home/azureuser/.ssh/authorized_keys"
    key_data = azurerm_ssh_public_key.devops.public_key
  }
}
}
}

```

\$ terraform init
 \$ terraform plan
 \$ terraform apply

```

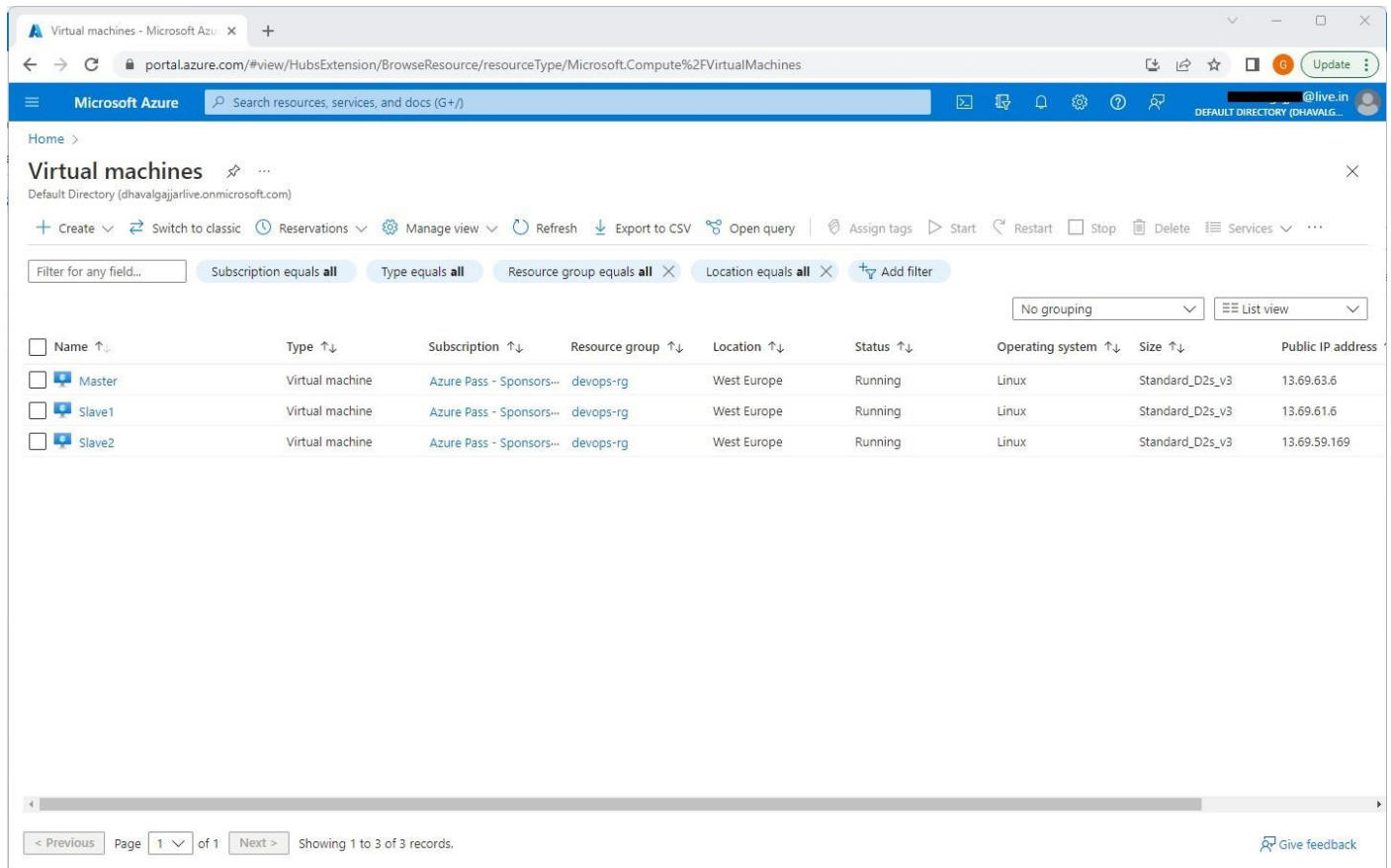
cmd
Enter a value: yes

azurerm_resource_group.devops: Creating...
azurerm_resource_group.devops: Creation complete after 4s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg]
azurerm_ssh_public_key.devops: Creating...
azurerm_public_ip.master: Creating...
azurerm_public_ip.slave2: Creating...
azurerm_public_ip.slave1: Creating...
azurerm_virtual_network.devops: Creating...
azurerm_network_security_group.devops: Creating...
azurerm_ssh_public_key.devops: Creation complete after 4s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Compute/sshPublicKeys/devops]
azurerm_public_ip.slave2: Creation complete after 5s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/publicIPAddresses/slave2-public-ip]
azurerm_public_ip.slave1: Creation complete after 6s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/publicIPAddresses/slave1-public-ip]
azurerm_public_ip.master: Creation complete after 6s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/publicIPAddresses/master-public-ip]
azurerm_virtual_network.devops: Creation complete after 8s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/virtualNetworks/devops-vnet]
azurerm_subnet.devops: Creating...
azurerm_network_security_group.devops: Creation complete after 8s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/networkSecurityGroups/devops-nsg]
azurerm_subnet.devops: Creation complete after 6s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/virtualNetworks/devops-vnet/subnets/devops-subnet]
azurerm_network_interface.slave2: Creating...
azurerm_network_interface.slave1: Creating...
azurerm_network_interface.master: Creating...
azurerm_network_interface.slave2: Creation complete after 3s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/networkInterfaces/slave2-nic]
azurerm_network_interface_security_group_association.slave2: Creating...
azurerm_virtual_machine.slave2: Creating...
azurerm_network_interface.slave1: Creation complete after 6s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/networkInterfaces/slave1-nic]
azurerm_network_interface_security_group_association.slave1: Creating...
azurerm_virtual_machine.slave1: Creating...
azurerm_network_interface_security_group_association.slave2: Creation complete after 4s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/networkInterfaces/slave2-nic/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/networkSecurityGroups/devops-nsg]
azurerm_network_interface.master: Creation complete after 9s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/networkInterfaces/master-nic]
azurerm_network_interface_security_group_association.master: Creating...
azurerm_virtual_machine.master: Creating...
azurerm_network_interface_security_group_association.slave1: Creation complete after 4s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/networkInterfaces/slave1-nic/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/networkSecurityGroups/devops-nsg]
azurerm_network_interface_security_group_association.master: Creation complete after 4s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/networkInterfaces/master-nic/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Network/networkSecurityGroups/devops-nsg]
azurerm_virtual_machine.slave2: Still creating... [11s elapsed]
azurerm_virtual_machine.slave1: Still creating... [10s elapsed]
azurerm_virtual_machine.master: Still creating... [10s elapsed]
azurerm_virtual_machine.slave2: Still creating... [21s elapsed]
azurerm_virtual_machine.slave1: Still creating... [20s elapsed]
azurerm_virtual_machine.master: Still creating... [20s elapsed]
azurerm_virtual_machine.slave2: Still creating... [31s elapsed]
azurerm_virtual_machine.slave1: Still creating... [30s elapsed]
azurerm_virtual_machine.master: Still creating... [30s elapsed]
azurerm_virtual_machine.master: Creation complete after 30s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Compute/virtualMachines/Master]
azurerm_virtual_machine.slave2: Creation complete after 37s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Compute/virtualMachines/Slave2]
azurerm_virtual_machine.slave1: Creation complete after 40s [id=/subscriptions/e9c93904-c316-4f60-a1b3-fc5ae575878f/resourceGroups/devops-rg/providers/Microsoft.Compute/virtualMachines/Slave1]

Apply complete! Resources: 17 added, 0 changed, 0 destroyed.

```

All VMs are created.



The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Azure logo, a search bar, and user information. The main content area is titled "Virtual machines" and displays a table of VMs. The table has columns for Name, Type, Subscription, Resource group, Location, Status, Operating system, Size, and Public IP address. Three VMs are listed: Master, Slave1, and Slave2, all of which are in a "Running" state. Below the table, there are pagination controls showing "Showing 1 to 3 of 3 records."

Name	Type	Subscription	Resource group	Location	Status	Operating system	Size	Public IP address
Master	Virtual machine	Azure Pass - Sponsors...	devops-rg	West Europe	Running	Linux	Standard_D2s_v3	13.69.63.6
Slave1	Virtual machine	Azure Pass - Sponsors...	devops-rg	West Europe	Running	Linux	Standard_D2s_v3	13.69.61.6
Slave2	Virtual machine	Azure Pass - Sponsors...	devops-rg	West Europe	Running	Linux	Standard_D2s_v3	13.69.59.169

Install ansible.

```
$ sudo apt-get update
$ sudo apt install software-properties-common aptitude -y
$ sudo add-apt-repository --yes --update ppa:ansible/ansible
$ sudo aptitude install ansible -y
```

Using ansible-playbook setup master machine softwares.

```
---
- name: Master server
  hosts: local
  remote_user: root
  tasks:
    - name: Install JDK 11
      apt:
        name: openjdk-11-jdk
        update_cache: true
    - name: Get Jenkins Keyrings
      get_url:
        url: https://pkg.jenkins.io/debian-stable/jenkins.io.key
        dest: /usr/share/keyrings/jenkins-keyring.asc
    - name: Configure Jenkins Repository
      apt_repository:
        repo: deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc]
        https://pkg.jenkins.io/debian-stable binary/
        state: present
    - name: Install Jenkins
      apt:
        name: jenkins
```

```
    update_cache: true
- name: Start Jenkins
  systemd:
    name: jenkins
    enabled: true
    masked: no
    daemon_reload: yes
- name: Install prerequisites for Docker
  apt:
    pkg:
      - ca-certificates
      - curl
      - gnupg
      - lsb-release
- name: Get Docker GPG Keyrings
  shell: curl -fsSL https://download.docker.com/linux/ubuntu/gpg | gpg --dearmor -o
/usr/share/keyrings/docker.gpg
- name: Setup Docker Repository
  shell: echo "deb [arch=$(dpkg --print-architecture) signed-
by=/usr/share/keyrings/docker.gpg] https://download.docker.com/linux/ubuntu $(lsb_release
-cs) stable" | tee /etc/apt/sources.list.d/docker.list > /dev/null
- name: Install Docker
  apt:
    pkg:
      - docker-ce
      - docker-ce-cli
      - containerd.io
      - docker-compose-plugin
    update_cache: true
- name: Start Docker
  systemd:
    name: docker
    enabled: true
    masked: no
    daemon_reload: yes
```



```
root@master: /etc/ansible/playbooks
root@master:/etc/ansible/playbooks# ansible-playbook local.yaml

PLAY [Master server] *****

TASK [Gathering Facts] *****
ok: [127.0.0.1]

TASK [Get Jenkins Keyrings] *****
changed: [127.0.0.1]

TASK [Configure Jenkins Repository] *****
changed: [127.0.0.1]

TASK [Install Jenkins] *****
changed: [127.0.0.1]

TASK [Install prerequisites for Docker] *****
ok: [127.0.0.1]

TASK [Get Docker GPG Keyrings] *****
changed: [127.0.0.1]

TASK [Setup Docker Repository] *****
changed: [127.0.0.1]

TASK [Install Docker] *****
changed: [127.0.0.1]

PLAY RECAP *****
127.0.0.1 : ok=8 changed=6 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

root@master:/etc/ansible/playbooks#
```

Using ansible-playbook setup test machine softwares.

```
---
- name: Test server
  hosts: test
  remote_user: root
  tasks:
    - name: Install prerequisites for Docker
      apt:
        pkg:
          - ca-certificates
          - curl
          - gnupg
          - lsb-release
    - name: Get Docker GPG Keyrings
      shell: curl -fsSL https://download.docker.com/linux/ubuntu/gpg | gpg --dearmor -o
/usr/share/keyrings/docker.gpg
    - name: Setup Docker Repository
      shell: echo "deb [arch=$(dpkg --print-architecture) signed-
by=/usr/share/keyrings/docker.gpg] https://download.docker.com/linux/ubuntu $(lsb_release
-cs) stable" | tee /etc/apt/sources.list.d/docker.list > /dev/null
    - name: Install Docker
      apt:
        pkg:
          - docker-ce
          - docker-ce-cli
          - containerd.io
          - docker-compose-plugin
        update_cache: true
    - name: Start Docker
      systemd:
        name: docker
        enabled: true
        masked: no
        daemon_reload: yes
    - name: Install JDK 11
      apt:
        name: openjdk-11-jdk
```

```
root@master: /etc/ansible/playbooks
root@master:/etc/ansible/playbooks# ansible-playbook test.yaml

PLAY [Test server] *****

TASK [Gathering Facts] *****
The authenticity of host '10.0.9.5 (10.0.9.5)' can't be established.
ECDSA key fingerprint is SHA256:R6QMLNIRW0zMcmLo0Ta2cuQo+Vy2JPTQ/EsE2FD/Co.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
ok: [10.0.9.5]

TASK [Install prerequisites for Docker] *****
ok: [10.0.9.5]

TASK [Get Docker GPG Keyrings] *****
changed: [10.0.9.5]

TASK [Setup Docker Repository] *****
changed: [10.0.9.5]

TASK [Install Docker] *****
changed: [10.0.9.5]

PLAY RECAP *****
10.0.9.5          : ok=5    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@master:/etc/ansible/playbooks#
```

Using ansible-playbook setup production machine softwares.

```
---
- name: Production server
  hosts: prod
  remote_user: root
  tasks:
    - name: Install prerequisites for Docker
      apt:
        pkg:
          - ca-certificates
          - curl
          - gnupg
          - lsb-release
    - name: Get Docker GPG Keyrings
      shell: curl -fsSL https://download.docker.com/linux/ubuntu/gpg | gpg --dearmor -o
/usr/share/keyrings/docker.gpg
    - name: Setup Docker Repository
      shell: echo "deb [arch=$(dpkg --print-architecture) signed-
by=/usr/share/keyrings/docker.gpg] https://download.docker.com/linux/ubuntu $(lsb_release
-cs) stable" | tee /etc/apt/sources.list.d/docker.list > /dev/null
    - name: Install Docker
      apt:
        pkg:
          - docker-ce
          - docker-ce-cli
          - containerd.io
          - docker-compose-plugin
        update_cache: true
    - name: Start Docker
      systemd:
        name: docker
        enabled: true
```

```
masked: no
daemon_reload: yes
- name: Install JDK 11
  apt:
    name: openjdk-11-jdk
```

```
root@master: /etc/ansible/playbooks
root@master:/etc/ansible/playbooks# ansible-playbook prod.yaml

PLAY [Production server] *****

TASK [Gathering Facts] *****
The authenticity of host '10.0.9.4 (10.0.9.4)' can't be established.
ECDSA key fingerprint is SHA256:cfeeVe0Tm3ilNRacY70uChn9WIJsa+V8fJifajEvknw.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
ok: [10.0.9.4]

TASK [Install prerequisites for Docker] *****
ok: [10.0.9.4]

TASK [Get Docker GPG Keyrings] *****
changed: [10.0.9.4]

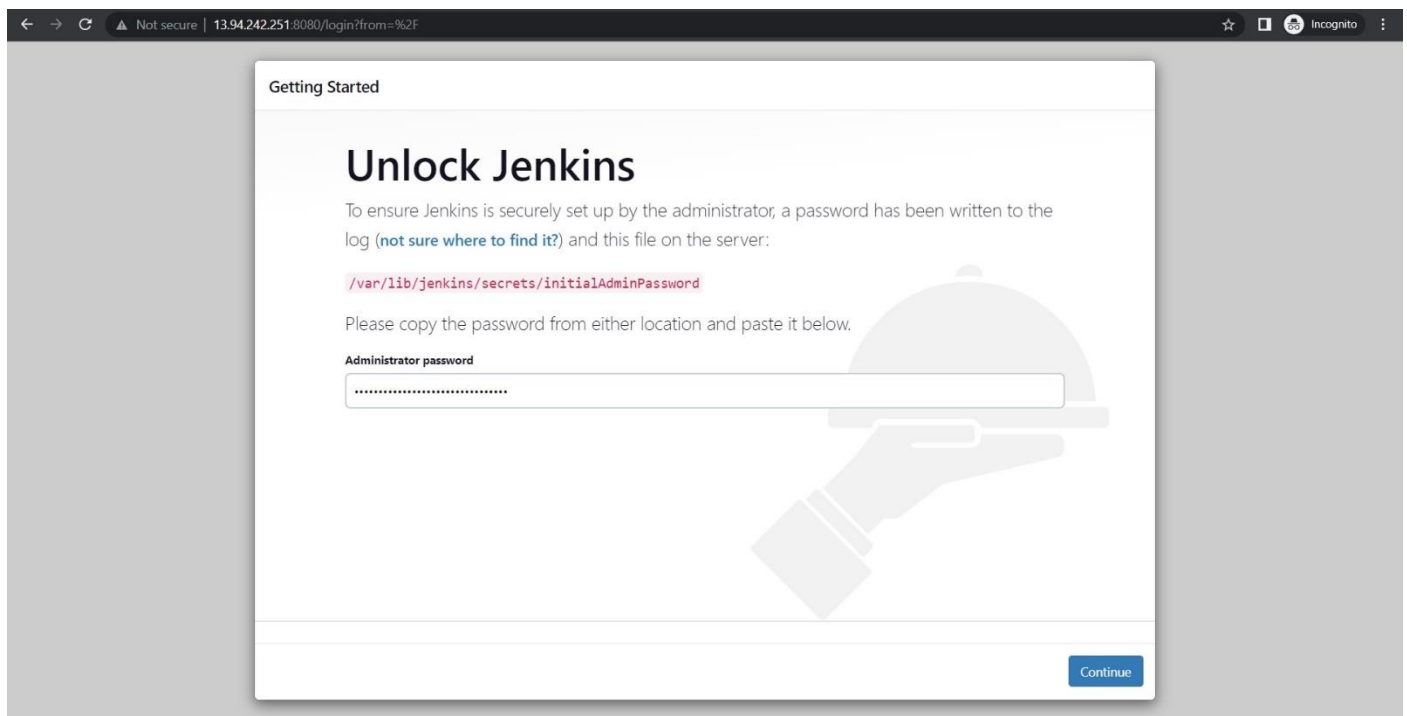
TASK [Setup Docker Repository] *****
changed: [10.0.9.4]

TASK [Install Docker] *****
changed: [10.0.9.4]

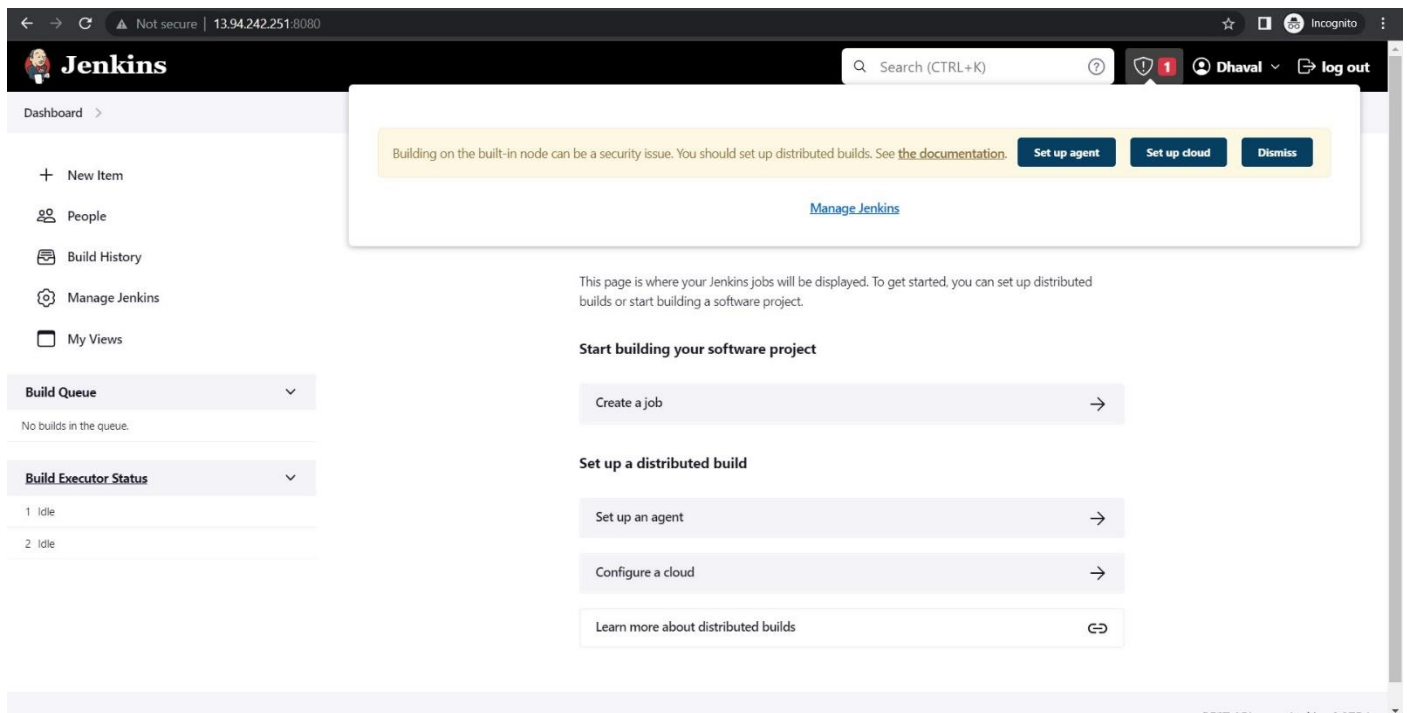
PLAY RECAP *****
10.0.9.4 : ok=5 changed=3 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

root@master:/etc/ansible/playbooks#
```

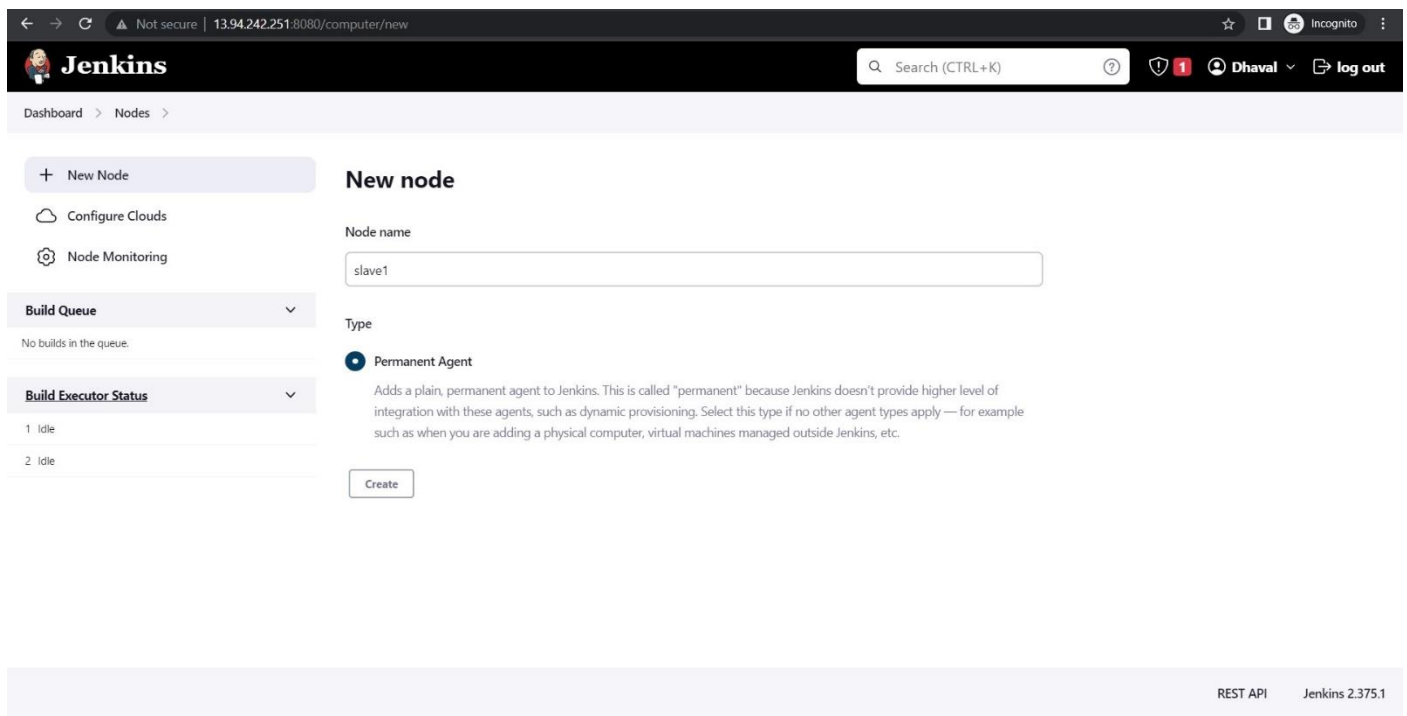
Setup the Jenkins.



Login to Jenkins.



Setup new Jenkins node for test environment.



Dashboard > Nodes >

New node

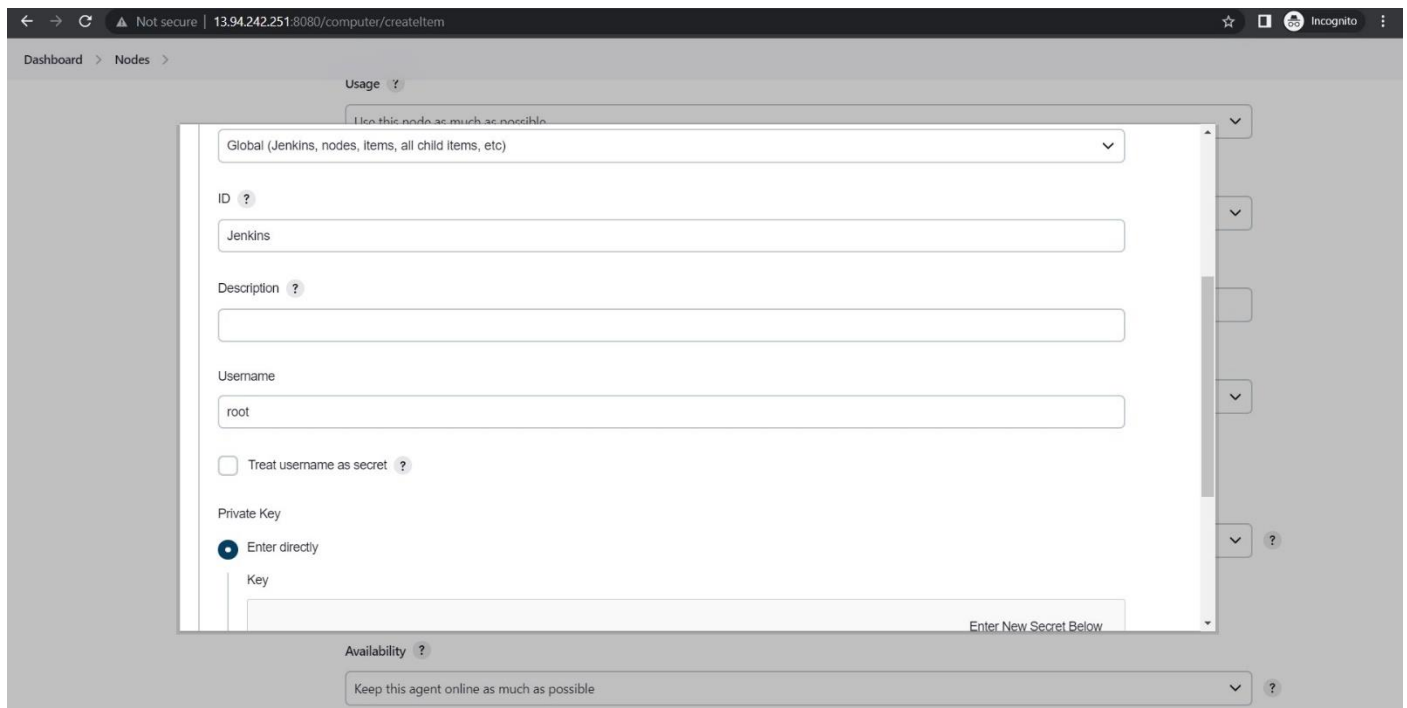
Node name
slave1

Type
☒ Permanent Agent

Adds a plain, permanent agent to Jenkins. This is called "permanent" because Jenkins doesn't provide higher level of integration with these agents, such as dynamic provisioning. Select this type if no other agent types apply — for example such as when you are adding a physical computer, virtual machines managed outside Jenkins, etc.

Create

REST API Jenkins 2.375.1



Usage ?
Use this node as much as possible

Global (Jenkins, nodes, items, all child items, etc)

ID ?
Jenkins

Description ?

Username
root

☐ Treat username as secret ?

Private Key
☒ Enter directly

Key
Enter New Secret Below

Availability ?
Keep this agent online as much as possible

← → ↻ Not secure | 13.94.242.251:8080/computer/createItem

Dashboard > Nodes >

2 Idle

Remote root directory ?

/var/lib/jenkins

Labels ?

Usage ?

Use this node as much as possible

Launch method ?

Launch agents via SSH

Host ?

10.0.9.5

Credentials ?

root

+ Add

Host Key Verification Strategy ?

Known hosts file Verification Strategy

Make sure node is up and online.

← → ↻ Not secure | 13.94.242.251:8080/manage/computer/slave1/log

Dashboard > Manage Jenkins > Nodes > slave1

```
openjdk version "11.0.17" 2022-10-18
OpenJDK Runtime Environment (build 11.0.17+8-post-Ubuntu-1ubuntu220.04)
OpenJDK 64-Bit Server VM (build 11.0.17+8-post-Ubuntu-1ubuntu220.04, mixed mode, sharing)
[12/14/22 19:17:22] [SSH] Checking java version of /var/lib/jenkins/jdk/bin/java
Couldn't figure out the Java version of /var/lib/jenkins/jdk/bin/java
bash: /var/lib/jenkins/jdk/bin/java: No such file or directory

[12/14/22 19:17:22] [SSH] Checking java version of java
[12/14/22 19:17:23] [SSH] java -version returned 11.0.17.
[12/14/22 19:17:23] [SSH] Starting sftp client.
[12/14/22 19:17:23] [SSH] Remote file system root /var/lib/jenkins does not exist. Will try to create it...
[12/14/22 19:17:23] [SSH] Copying latest remoting.jar...
[12/14/22 19:17:23] [SSH] Copied 1,369,460 bytes.
Expanded the channel window size to 4MB
[12/14/22 19:17:23] [SSH] Starting agent process: cd "/var/lib/jenkins" && java -jar remoting.jar -workDir /var/lib/jenkins -jar-cache
/var/lib/jenkins/remoting/jarCache
Dec 14, 2022 7:17:23 PM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /var/lib/jenkins/remoting as a remoting work directory
Dec 14, 2022 7:17:23 PM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to /var/lib/jenkins/remoting
<===[JENKINS REMOTING CAPACITY]==>channel started
Remoting version: 3071.v7e9b_0dc08466
Launcher: SSHLauncher
Communication Protocol: Standard in/out
This is a Unix agent
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by jenkins.slaves.StandardOutputSwapper$ChannelSwapper to constructor java.io.FileDescriptor(int)
WARNING: Please consider reporting this to the maintainers of jenkins.slaves.StandardOutputSwapper$ChannelSwapper
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
Evacuated stdout
Agent successfully connected and online
```

Setup new Jenkins node for production environment.

← → ↻

Not secure | 13.94.242.251:8080/manage/computer/new

☆

Incognito

⋮

Jenkins

Search (CTRL+K)

1

Dhaval

log out

Dashboard > Manage Jenkins > Nodes >

+ New Node

☁ Configure Clouds

🔍 Node Monitoring

Build Queue

No builds in the queue.

Build Executor Status

Built-In Node

1 Idle

2 Idle

slave1

1 Idle

New node

Node name

slave2

Type

☐ Permanent Agent

Adds a plain, permanent agent to Jenkins. This is called "permanent" because Jenkins doesn't provide higher level of integration with these agents, such as dynamic provisioning. Select this type if no other agent types apply — for example such as when you are adding a physical computer, virtual machines managed outside Jenkins, etc.

☒ Copy Existing Node

🔍 slave1

Create

REST API Jenkins 2.375.1

← → ↻

Not secure | 13.94.242.251:8080/manage/computer/slave2/configure

☆

Incognito

⋮

Dashboard > Manage Jenkins > Nodes > slave2

/var/lib/jenkins

Labels ?

Usage ?

Use this node as much as possible

Launch method ?

Launch agents via SSH

Host ?

10.0.9.4

Credentials ?

root

+ Add

Host Key Verification Strategy ?

Save


```
OpenJDK Runtime Environment (build 11.0.17+8-post-Ubuntu-1ubuntu220.04)
OpenJDK 64-Bit Server VM (build 11.0.17+8-post-Ubuntu-1ubuntu220.04, mixed mode, sharing)
[12/14/22 19:20:38] [SSH] Checking java version of /var/lib/jenkins/jdk/bin/java
Couldn't figure out the Java version of /var/lib/jenkins/jdk/bin/java
bash: /var/lib/jenkins/jdk/bin/java: No such file or directory

[12/14/22 19:20:38] [SSH] Checking java version of java
[12/14/22 19:20:38] [SSH] java -version returned 11.0.17.
[12/14/22 19:20:38] [SSH] Starting sftp client.
[12/14/22 19:20:38] [SSH] Remote file system root /var/lib/jenkins does not exist. Will try to create it...
[12/14/22 19:20:38] [SSH] Copying latest remoting.jar...
[12/14/22 19:20:38] [SSH] Copied 1,369,460 bytes.
Expanded the channel window size to 4MB
[12/14/22 19:20:38] [SSH] Starting agent process: cd "/var/lib/jenkins" && java -jar remoting.jar -workDir /var/lib/jenkins -jar-cache
/var/lib/jenkins/remoting/jarCache
Dec 14, 2022 7:20:38 PM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using /var/lib/jenkins/remoting as a remoting work directory
Dec 14, 2022 7:20:38 PM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to /var/lib/jenkins/remoting
<===[JENKINS REMOTING CAPACITY]==>channel started
Remoting version: 3071.v7e9b_0dc08466
Launcher: SSHLauncher
Communication Protocol: Standard in/out
This is a Unix agent
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by jenkins.slaves.StandardOutputSwapper$ChannelSwapper to constructor java.io.FileDescriptor(int)
WARNING: Please consider reporting this to the maintainers of jenkins.slaves.StandardOutputSwapper$ChannelSwapper
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
Evacuated stdout
Agent successfully connected and online
```

Make sure nodes are up and online.

Search (CTRL+K)

Dhaval log out

Dashboard > Manage Jenkins > Nodes >

+ New Node

Configure Clouds

Node Monitoring

Build Queue

No builds in the queue.

Build Executor Status

Built-In Node

1 idle

2 idle

slave1

1 idle

slave2

1 idle

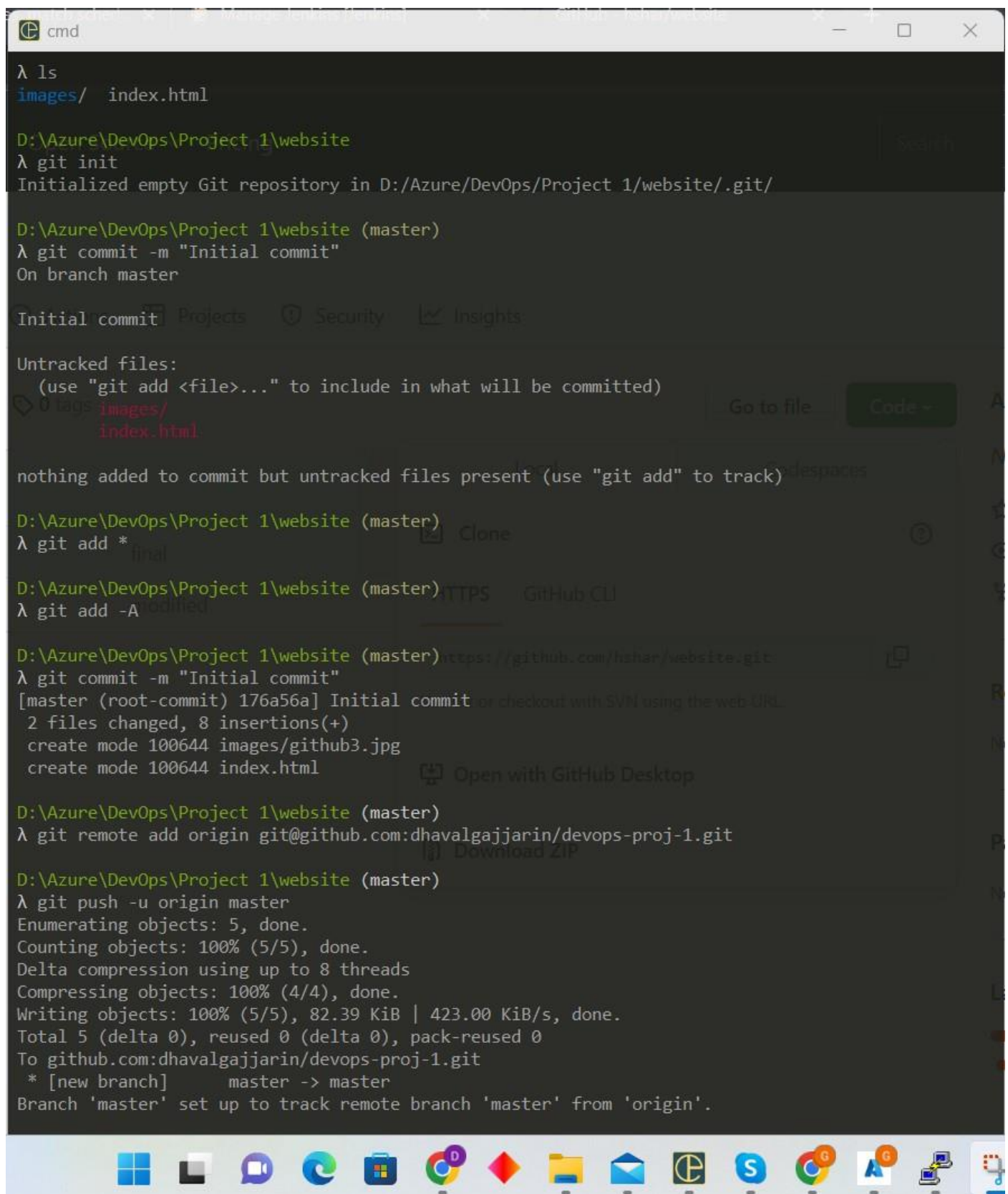
Manage nodes and clouds

Refresh status

S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	Built-In Node	Linux (amd64)	In sync	24.59 GB	0 B	24.59 GB	0ms
	slave1	Linux (amd64)	In sync	25.76 GB	0 B	25.76 GB	32ms
	slave2	Linux (amd64)	In sync	25.71 GB	0 B	25.71 GB	21ms
	last checked	24 sec	24 sec	24 sec	24 sec	24 sec	24 sec

REST API Jenkins 2.375.1

Setup the initial commit to GitHub repository in the master branch.



```
cmd
λ ls
images/  index.html

D:\Azure\DevOps\Project 1\website
λ git init
Initialized empty Git repository in D:/Azure/DevOps/Project 1/website/.git/

D:\Azure\DevOps\Project 1\website (master)
λ git commit -m "Initial commit"
On branch master

Initial commit
Projects  Security  Insights

Untracked files:
(use "git add <file>..." to include in what will be committed)
images/
index.html

nothing added to commit but untracked files present (use "git add" to track)

D:\Azure\DevOps\Project 1\website (master)
λ git add *

D:\Azure\DevOps\Project 1\website (master)
λ git add -A

D:\Azure\DevOps\Project 1\website (master)
λ git commit -m "Initial commit"
[master (root-commit) 176a56a] Initial commit
2 files changed, 8 insertions(+)
create mode 100644 images/github3.jpg
create mode 100644 index.html

D:\Azure\DevOps\Project 1\website (master)
λ git remote add origin git@github.com:dhavalgajjarin/devops-proj-1.git

D:\Azure\DevOps\Project 1\website (master)
λ git push -u origin master
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 8 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (5/5), 82.39 KiB | 423.00 KiB/s, done.
Total 5 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:dhavalgajjarin/devops-proj-1.git
* [new branch]      master -> master
Branch 'master' set up to track remote branch 'master' from 'origin'.
```

Create GitHub workflow with creating develop branch.

```
cmd
To github.com:dhavalgajjarin/devops-proj-1.git
* [new branch]      master -> master
Branch 'master' set up to track remote branch 'master' from 'origin'.

D:\Azure\DevOps\Project 1\website (master -> origin)
λ touch Dockerfile

D:\Azure\DevOps\Project 1\website (master -> origin)
λ git add Dockerfile

D:\Azure\DevOps\Project 1\website (master -> origin)
λ git commit -m "Adding docker file"
[master 77f72fd] Adding docker file
1 file changed, 2 insertions(+)
create mode 100644 Dockerfile

D:\Azure\DevOps\Project 1\website (master -> origin)
λ git push -u origin master
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 359 bytes | 359.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:dhavalgajjarin/devops-proj-1.git
176a56a..77f72fd master -> master
Branch 'master' set up to track remote branch 'master' from 'origin'.

D:\Azure\DevOps\Project 1\website (master -> origin)
λ git branch develop

D:\Azure\DevOps\Project 1\website (master -> origin)
λ git push -u origin develop
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'develop' on GitHub by visiting:
remote:   https://github.com/dhavalgajjarin/devops-proj-1/pull/new/develop
remote:
To github.com:dhavalgajjarin/devops-proj-1.git
* [new branch]      develop -> develop
Branch 'develop' set up to track remote branch 'develop' from 'origin'.

D:\Azure\DevOps\Project 1\website (master -> origin)
λ
```

Create Jenkins Job1 which can checkout and build.

← → ↻ Not secure | 52.143.60.135:8080/job/job1/configure

Dashboard > job1 > Configuration

Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions

☐ Discard old builds ?

☒ GitHub project

Project url ?

Display name ?

☐ This project is parameterised ?

☐ Throttle builds ?

☐ Execute concurrent builds if necessary ?

☒ Restrict where this project can be run ?

Label Expression ?

[Label built-in](#) matches 1 node. Permissions or other restrictions provided by plugins may further reduce that list.

← → ↻ Not secure | 52.143.60.135:8080/job/job1/configure

Dashboard > job1 > Configuration

Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions

Credentials ?

Name ?

Refspec ?

Branches to build ?

Branch Specifier (blank for 'any') ?

Dashboard > job1 > Configuration

Configure

General

Source Code Management

Build Triggers

Build Environment

Build Steps

Post-build Actions

Terminate a build if it's stuck

With Ant

Build Steps

Execute shell

Command

See the list of available environment variables

docker build \${WORKSPACE} -t build:v\${BUILD_NUMBER}

Advanced...

Add build step

Save

Apply

Dashboard > job1 > #2

Status

Changes

Console Output

View as plain text

Edit Build Information

Git Build Data

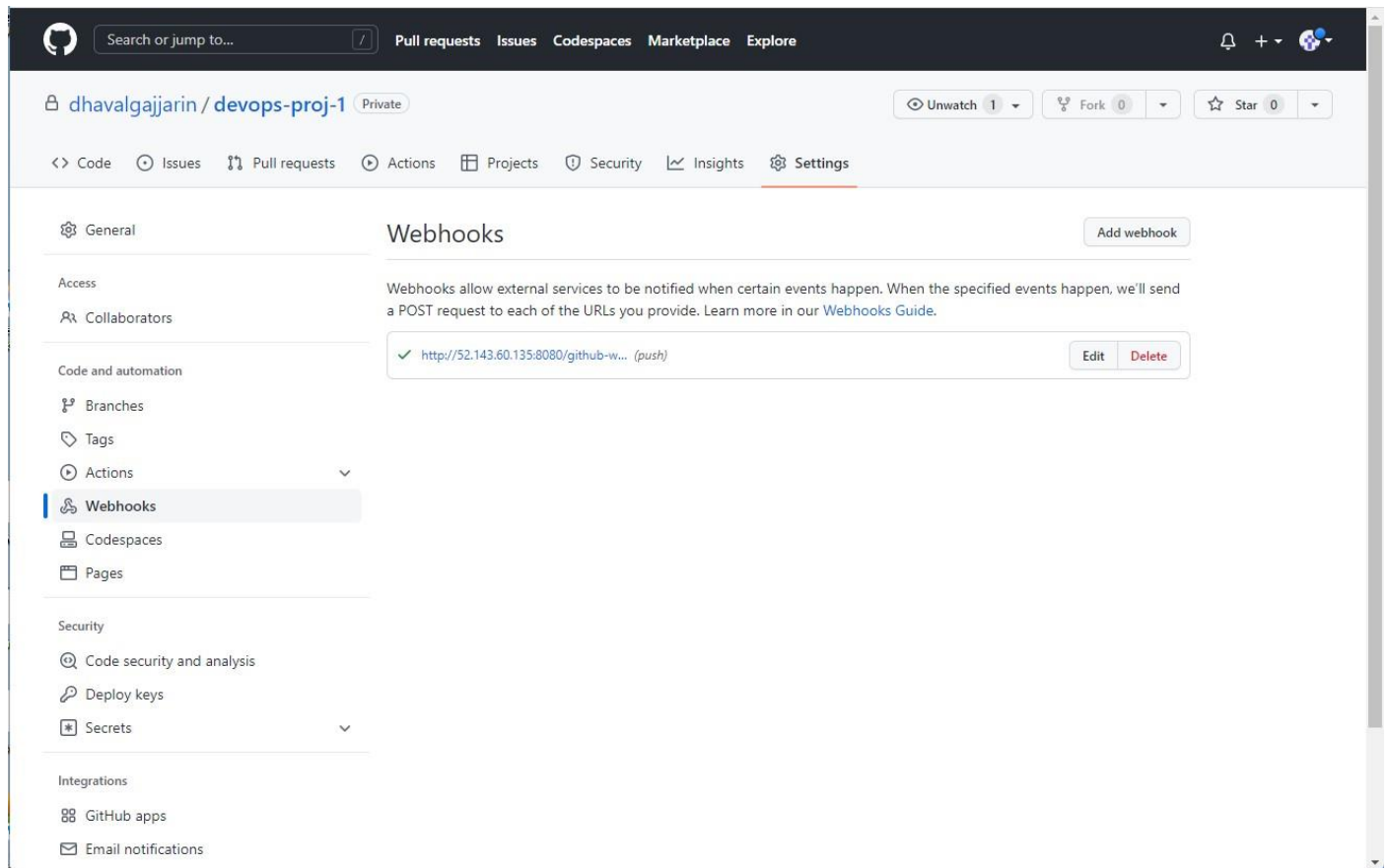
Previous Build

Console Output

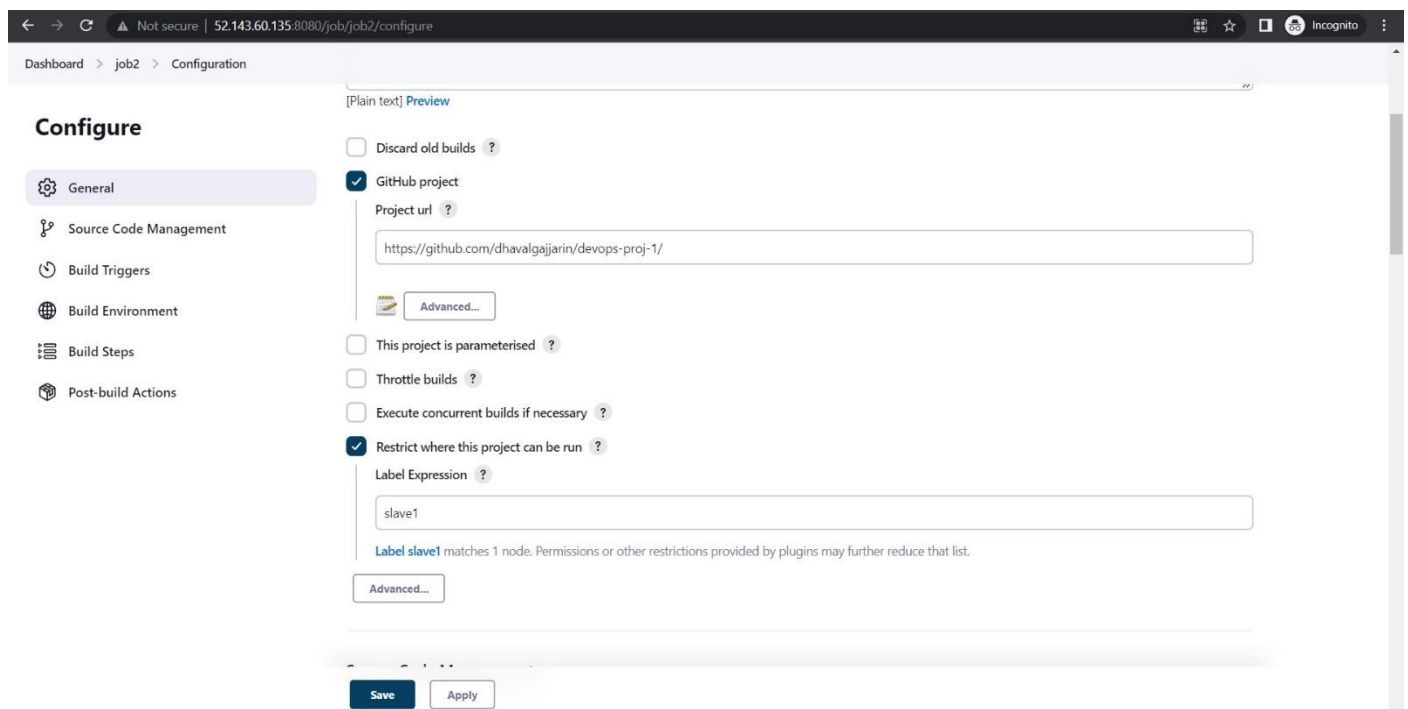
Started by user Dhaval
Running as SYSTEM
Building on the built-in node in workspace /var/lib/jenkins/workspace/job1
The recommended git tool is: NONE
using credential Github
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/job1/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/dhavalgajjarin/devops-proj-1.git # timeout=10
Fetching upstream changes from https://github.com/dhavalgajjarin/devops-proj-1.git
> git --version # timeout=10
> git --version # 'git version 2.25.1'
using GIT_ASKPASS to set credentials
> git fetch --tags --force --progress -- https://github.com/dhavalgajjarin/devops-proj-1.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Checking out Revision 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 # timeout=10
Commit message: "Adding docker file"
> git rev-list --no-walk 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 # timeout=10
[job1] \$ /bin/sh -xe /tmp/jenkins11121704652496777406.sh
+ docker build /var/lib/jenkins/workspace/job1 -t build:v2
Sending build context to Docker daemon 255.5kB

Step 1/2 : FROM hshar/webapp
latest: Pulling from hshar/webapp
a48c500ed24e: Pulling fs layer

Configure webhook in GitHub so commit will trigger build.



Create Jenkins Job2 which can checkout and build and deploy to the test environment.



← → ↻ ⚠ Not secure | 52.143.60.135:8080/job/job2/configure ☆ Incognito

Dashboard > job2 > Configuration

Configure

⚙ General

🔑 Source Code Management

🕒 Build Triggers

🌐 Build Environment

☰ Build Steps

📦 Post-build Actions

Repository URL ?

https://github.com/dhavalgajjarin/devops-proj-1.git

Credentials ?

dhavalgajjarin/*****

+ Add

Advanced...

Add Repository

Branches to build ?

Branch Specifier (blank for 'any') ?

*/develop

Add Branch

Save

Apply

← → ↻ ⚠ Not secure | 52.143.60.135:8080/job/job2/configure ☆ Incognito

Dashboard > job2 > Configuration

Configure

⚙ General

🔑 Source Code Management

🕒 Build Triggers

🌐 Build Environment

☰ Build Steps

📦 Post-build Actions

Remember to build if it's stuck

☐ With Ant ?

Build Steps

≡ Execute shell ?

Command

See the list of available environment variables

```
docker rm -f $(docker ps -a -q)
docker build ${WORKSPACE} -t test:v${BUILD_NUMBER}
docker run -itd -p 80:80 test:v${BUILD_NUMBER}
```

Advanced...

Add build step ▾

Save

Apply

Manual build.

The screenshot shows the Jenkins web interface for a build named 'job2' with ID '#4'. The left sidebar contains links for Status, Changes, Console Output (selected), View as plain text, Edit Build Information, Git Build Data, and Previous Build. The main area displays the 'Console Output' with a green checkmark icon. The output text shows the build process starting by user 'Dhaval', running as 'SYSTEM', and building remotely on 'slave1'. It details the use of 'git' to fetch changes from a remote repository, checkout a specific revision, and build a Docker image. The build context is sent to the Docker daemon, and the process concludes with 'Step 1/2 : FROM hshar/webapp'.

```
Started by user Dhaval
Running as SYSTEM
Building remotely on slave1 in workspace /var/lib/jenkins/workspace/job2
The recommended git tool is: NONE
using credential Github
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/job2/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/dhavalgajjarin/devops-proj-1.git # timeout=10
Fetching upstream changes from https://github.com/dhavalgajjarin/devops-proj-1.git
> git --version # timeout=10
> git --version # 'git version 2.25.1'
using GIT_ASKPASS to set credentials
> git fetch --tags --force --progress -- https://github.com/dhavalgajjarin/devops-proj-1.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/develop^{commit} # timeout=10
Checking out Revision 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 (refs/remotes/origin/develop)
> git config core.sparsecheckout # timeout=10
> git checkout -f 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 # timeout=10
Commit message: "Adding docker file"
> git rev-list --no-walk 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 # timeout=10
[job2] $ /bin/sh -xe /tmp/jenkins3119084655707346724.sh
+ docker ps -a -q
+ docker rm -f 8a5665568e50
8a5665568e50
+ docker build /var/lib/jenkins/workspace/job2 -t test:v4
Sending build context to Docker daemon 255.5kB

Step 1/2 : FROM hshar/webapp
```

Automatic build using commit.

The screenshot shows the Jenkins web interface for a build named 'job2' with ID '#5'. The left sidebar contains links for Status, Changes, Console Output (selected), View as plain text, Edit Build Information, Delete build '#5', Polling Log, Git Build Data, and Previous Build. The main area displays the 'Console Output' with a green checkmark icon. The output text shows the build process starting by 'GitHub push by dhavalgajjarin', running as 'SYSTEM', and building remotely on 'slave1'. It details the use of 'git' to fetch changes from a remote repository, checkout a specific revision, and build a Docker image. The build context is sent to the Docker daemon, and the process concludes with 'Step 1/2 : FROM hshar/webapp'.

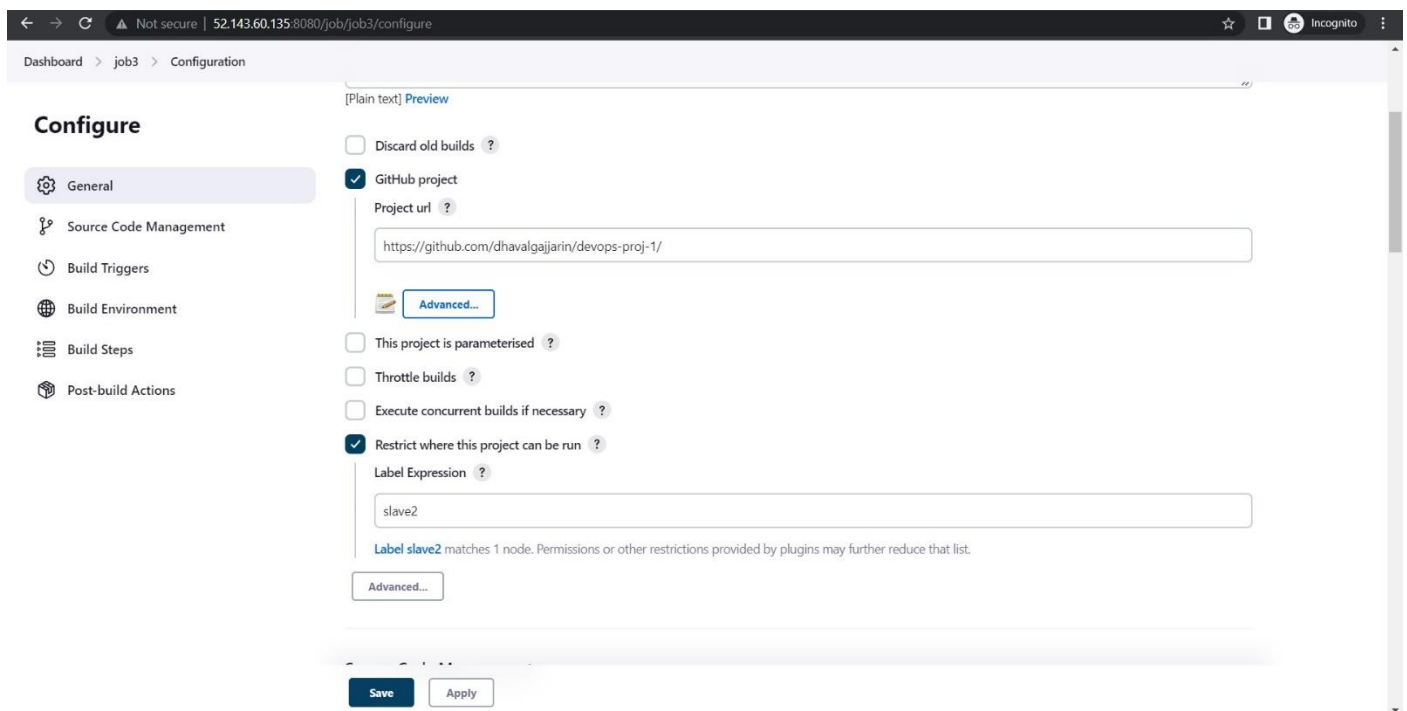
```
Started by GitHub push by dhavalgajjarin
Running as SYSTEM
Building remotely on slave1 in workspace /var/lib/jenkins/workspace/job2
The recommended git tool is: NONE
using credential Github
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/job2/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/dhavalgajjarin/devops-proj-1.git # timeout=10
Fetching upstream changes from https://github.com/dhavalgajjarin/devops-proj-1.git
> git --version # timeout=10
> git --version # 'git version 2.25.1'
using GIT_ASKPASS to set credentials
> git fetch --tags --force --progress -- https://github.com/dhavalgajjarin/devops-proj-1.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/develop^{commit} # timeout=10
Checking out Revision be8865a6ad144770b946cc7f5fa5c4c538084d3c (refs/remotes/origin/develop)
> git config core.sparsecheckout # timeout=10
> git checkout -f be8865a6ad144770b946cc7f5fa5c4c538084d3c # timeout=10
Commit message: "Change index content"
> git rev-list --no-walk 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 # timeout=10
[job2] $ /bin/sh -xe /tmp/jenkins2547769930156486612.sh
+ docker ps -a -q
+ docker rm -f 5e82923ba086
5e82923ba086
+ docker build /var/lib/jenkins/workspace/job2 -t test:v5
Sending build context to Docker daemon 266.8kB

Step 1/2 : FROM hshar/webapp
```


Open browser URL and test it.



Create Jenkins Job3 which can checkout and build and deploy to the production environment.



← → ↻ Not secure | 52.143.60.135:8080/job/job3/configure

Dashboard > job3 > Configuration

Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions

Repository URL ?

Credentials ?

+ Add

Advanced...

Add Repository

Branches to build ?

Branch Specifier (blank for 'any') ?

Add Branch

Save Apply

Manual build.

← → ↻ Not secure | 52.143.60.135:8080/job/job3/2/console

Dashboard > job3 > #2

- Status
- Changes
- Console Output
- View as plain text
- Edit Build Information
- Delete build '#2'
- Git Build Data
- Previous Build

Console Output

```
Started by user Dhaval
Running as SYSTEM
Building remotely on slave2 in workspace /var/lib/jenkins/workspace/job3
The recommended git tool is: NONE
using credential Github
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/job3/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/dhavalgajjarin/devops-proj-1.git # timeout=10
Fetching upstream changes from https://github.com/dhavalgajjarin/devops-proj-1.git
> git --version # timeout=10
> git --version # 'git version 2.25.1'
using GIT_ASKPASS to set credentials
> git fetch --tags --force --progress -- https://github.com/dhavalgajjarin/devops-proj-1.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Checking out Revision 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 # timeout=10
Commit message: "Adding docker file"
> git rev-list --no-walk 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 # timeout=10
[job3] $ /bin/sh -xe /tmp/jenkins2299104475077586395.sh
+ docker ps -a -q
+ docker rm -f 97d9e0d1c1f9
97d9e0d1c1f9
+ docker build /var/lib/jenkins/workspace/job3 -t prod:v2
Sending build context to Docker daemon 264.7kB

Step 1/2 : FROM hshar/webapp
... 0.001463544s
```

Automatic build using commit.

Dashboard > job3 > #3

Status

Changes

Console Output

View as plain text

Edit Build Information

Delete build '#3'

Polling Log

Git Build Data

Previous Build

Console Output

```
Started by GitHub push by dhavalgajjarin
Running as SYSTEM
Building remotely on slave2 in workspace /var/lib/jenkins/workspace/job3
The recommended git tool is: NONE
using credential Github
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/job3/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/dhavalgajjarin/devops-proj-1.git # timeout=10
Fetching upstream changes from https://github.com/dhavalgajjarin/devops-proj-1.git
> git --version # timeout=10
> git --version # 'git version 2.25.1'
using GIT_ASKPASS to set credentials
> git fetch --tags --force --progress -- https://github.com/dhavalgajjarin/devops-proj-1.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Checking out Revision be8865a6ad144770b946cc7f5fa5c4c538084d3c (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f be8865a6ad144770b946cc7f5fa5c4c538084d3c # timeout=10
Commit message: "Change index content"
> git rev-list --no-walk 77f72fd2b3aa09eb860a74d7b1f01354c47e4412 # timeout=10
[job3] $ /bin/sh -xe /tmp/jenkins18187915855050203245.sh
+ docker ps -a -q
+ docker rm -f d2d92a3f68c4
d2d92a3f68c4
+ docker build /var/lib/jenkins/workspace/job3 -t prod:v3
Sending build context to Docker daemon 266.8kB

Step 1/2 : FROM hshar/webapp
```

Open browser URL and test it.

← → ↻ Not secure | 52.157.195.22

DevOps Project 1



GitHub