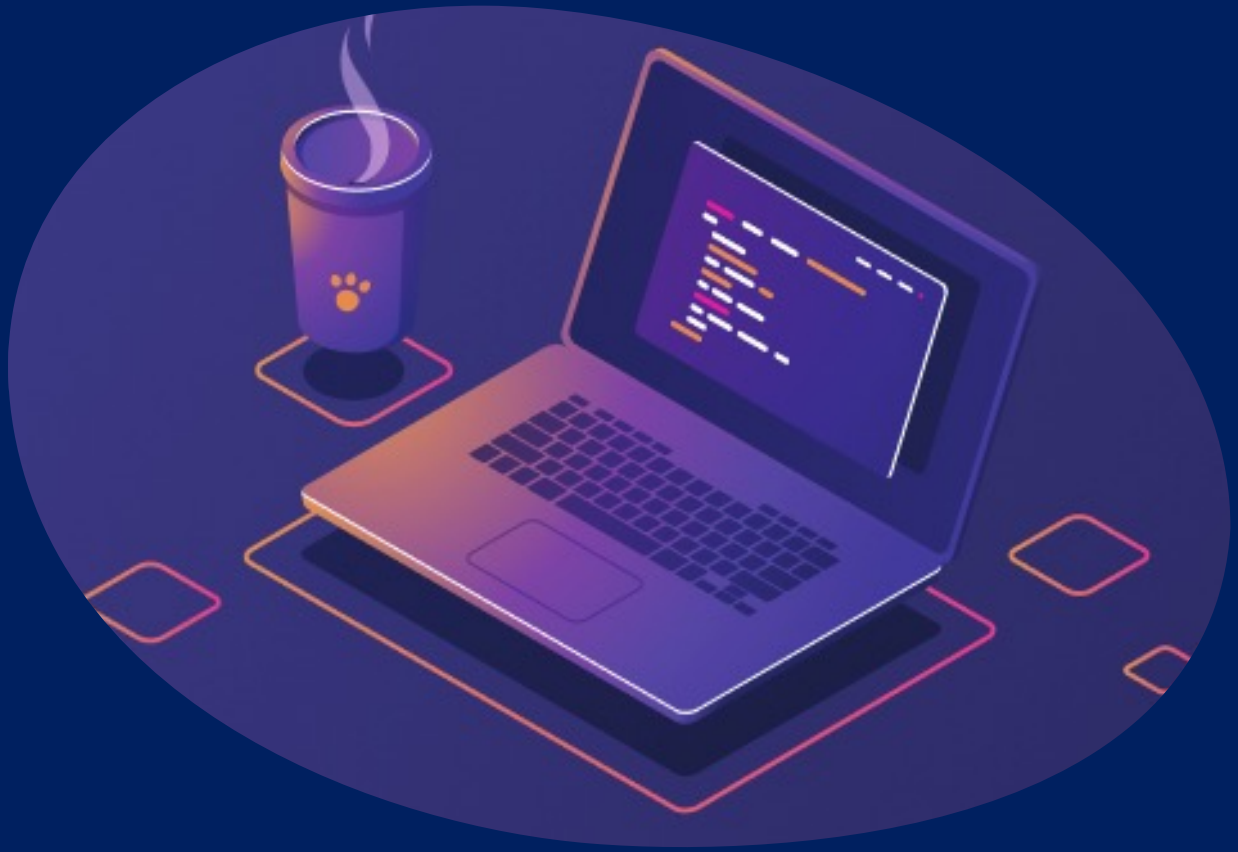


Week 12 : SOFTWARE DEVELOPMENT TOOLS AND ENVIRONMENTS

Traditional Deployment

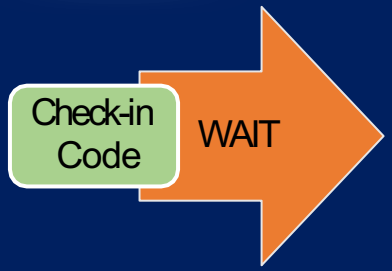
Developer

Operations

Traditional Deployment

Developer

Operations

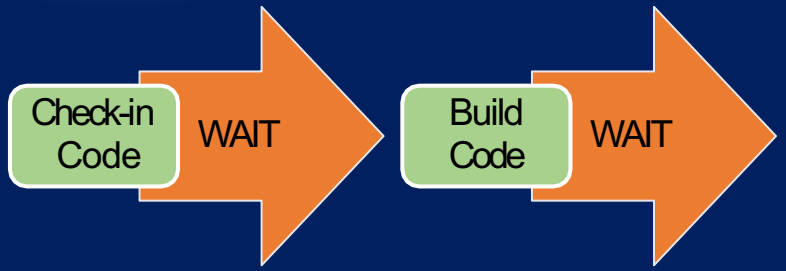


Hours/Days + Lot of Grief for Developer & Operations

Traditional Deployment

Developer

Operations

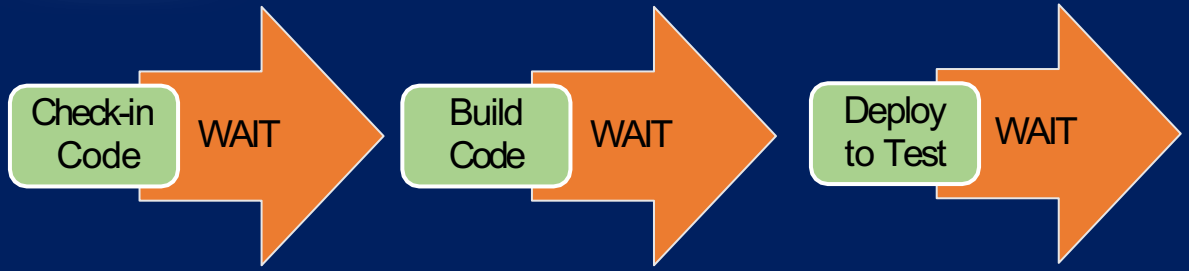


Hours/Days + Lot of Grief for Developer & Operations

Traditional Deployment

Developer

Operations

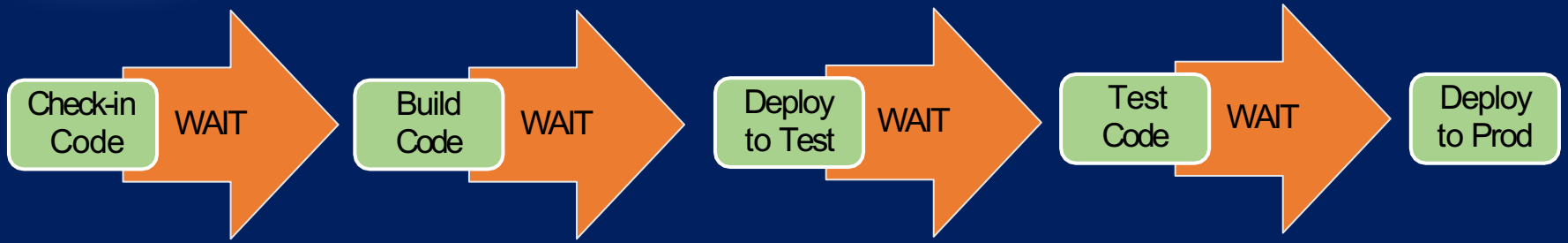


Hours/Days + Lot of Grief for Developer & Operations

Traditional Deployment

Developer

Operations



Hours/Days + Lot of Grief for Developer & Operations

Traditional Deployment

When are you gonna deploy my code?

Developer

When you stop breaking my servers

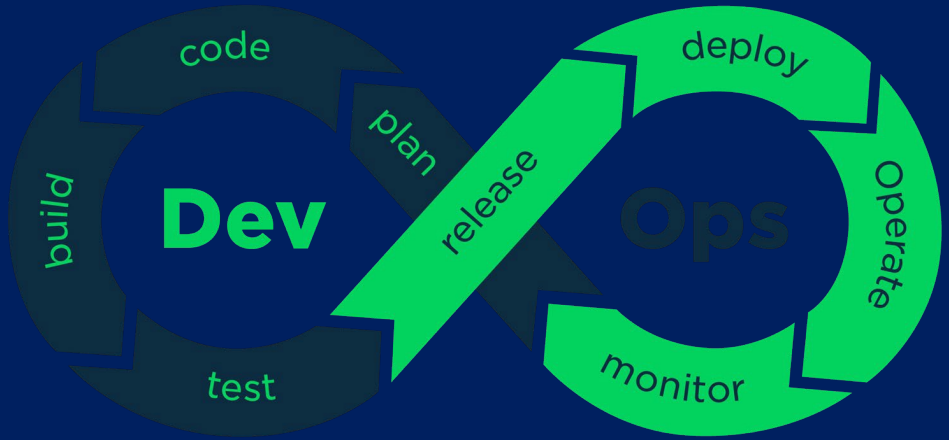
Operations

Check-in Code → WAIT → Build Code → WAIT → Deploy to Test → WAIT → Test Code → WAIT → Deploy to Prod


I just wanna do cool stuff
!
SYSTEM

What is DevOps?

- Word “DevOps” coined in 2009 by Patrick Debois
- Combination of cultural philosophies, practices, and tools
  - Job market is based on tools!
- Development and Operations teams are no longer “siloed”



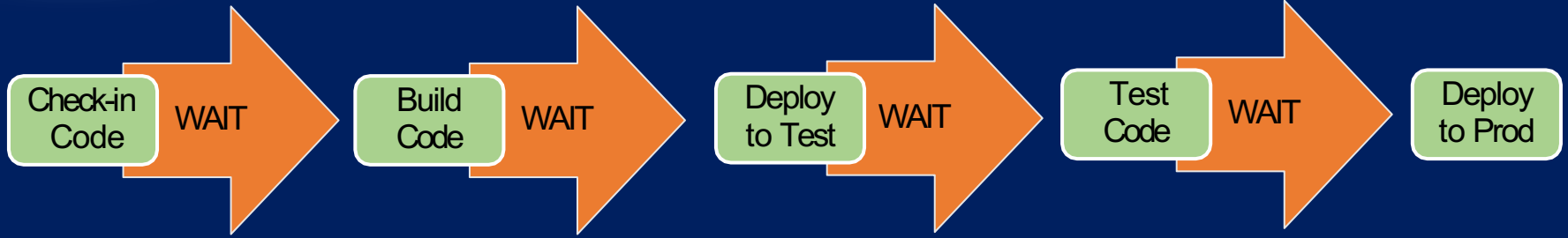
Traditional Deployment

When are you gonna deploy my code?

Developer

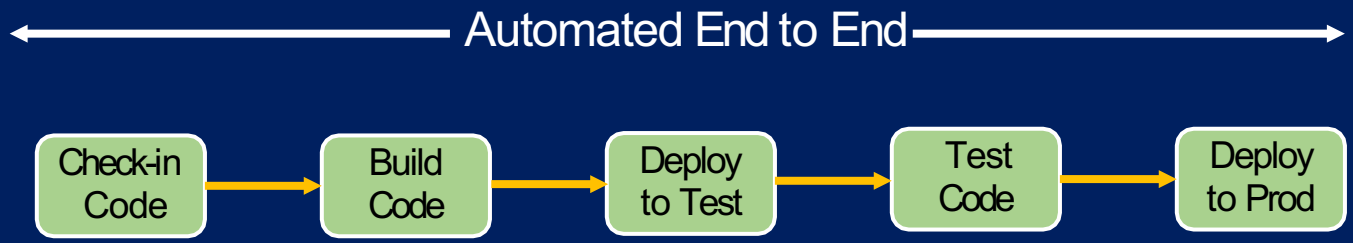
When you stop breaking my servers

Operations



DevOps

Same Team

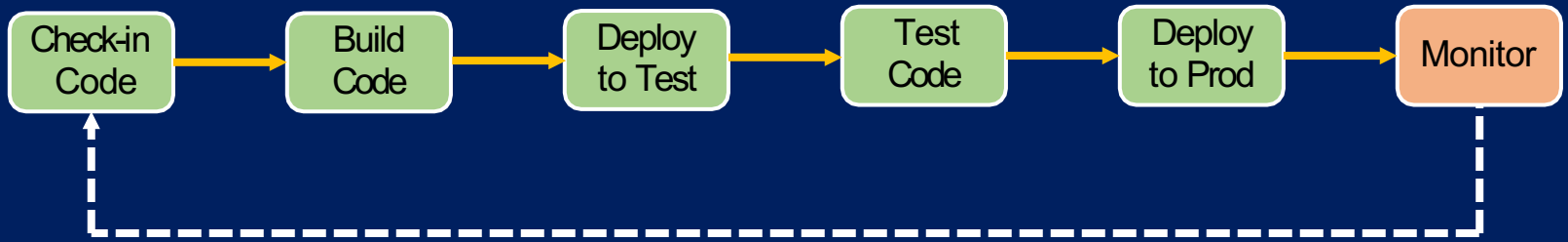


- Whole flow done in seconds!
- Easy to rollback in case of errors

DevOps

Same Team

Automated End to End



Rollback to Previous Version

General DevOps Practices

- Automate everything!
- Deploy frequently rather than one mega deployment in months
- Codify every step - infrastructure, application and more
- Rome was not built in a day!

DevOps Phases

AUTHOR → **SOURCE** → **BUILD** → **TEST** → **DEPLOY** → **MONITOR**

- Write Code
- Check-in Source Code
- Compile Code
- Create Artifacts
- Unit Testing
- Integration Testing
- Load Testing
- UI Testing
- Penetration Testing
- Deploy Artifacts
- Logs, Metrics, and Traces

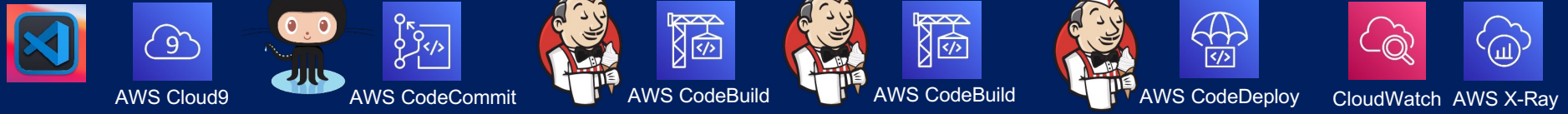
Continuous Integration (CI)

Continuous Delivery (CD)

Manual Approval

Continuous Deployment (CD)

DevOps Tools



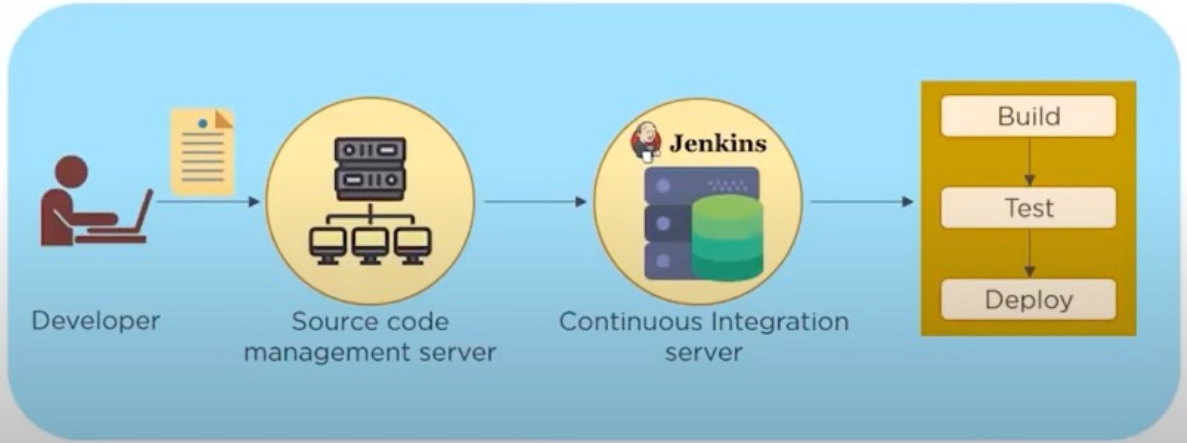
AUTHOR → SOURCE → BUILD → TEST → DEPLOY → MONITOR

- Write Code
- Check-in Source Code
- Compile Code
- Create Artifacts
- Unit Testing
- Integration Testing
- Load Testing
- UI Testing
- Penetration Testing
- Deploy Artifacts
- Logs, Metrics, and Traces

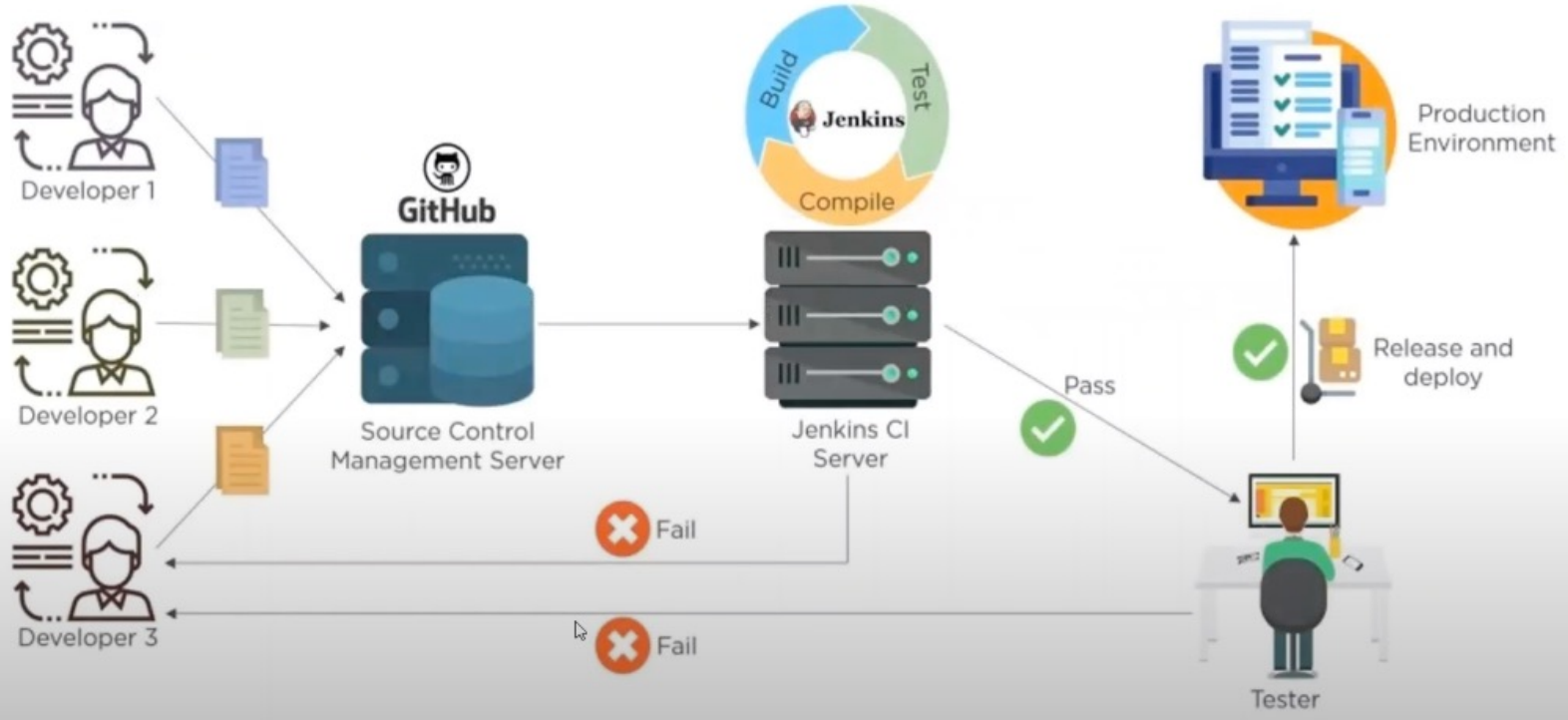
What is Jenkins?

Jenkins

Jenkins is an open source Continuous Integration server written in Java that allows continuous development, test and deployment of codes



CI & CD


Developer 1
Developer 2
Developer 3
GitHub
Source Control
Management Server
Build
Test
Compile
Jenkins
Jenkins CI
Server
Fail
Fail
Pass
Production
Environment
Release and
deploy
Tester

Lab 01:
01_1_Jenkins Installation
01_2_Jenkins Plugin Installation

01_1_Jenkins Installation

Installation Steps

1. **Update System Packages** Update the list of available packages and their versions.

```
sudo apt-get update
```

2. Installation of Java

```
sudo apt update
sudo apt install fontconfig openjdk-17-jre
java -version
openjdk version "17.0.8" 2023-07-18
OpenJDK Runtime Environment (build 17.0.8+7-Debian-1deb12u1)
OpenJDK 64-Bit Server VM (build 17.0.8+7-Debian-1deb12u1, mixed mode, sharing)
```

3. Long Term Support release

```
curl -fsSL https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key | sudo tee \
  /usr/share/keyrings/jenkins-keyring.asc > /dev/null
echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] \
  https://pkg.jenkins.io/debian-stable binary/ | sudo tee \
  /etc/apt/sources.list.d/jenkins.list > /dev/null
sudo apt-get update
sudo apt-get install jenkins
```

4. Start Jenkins

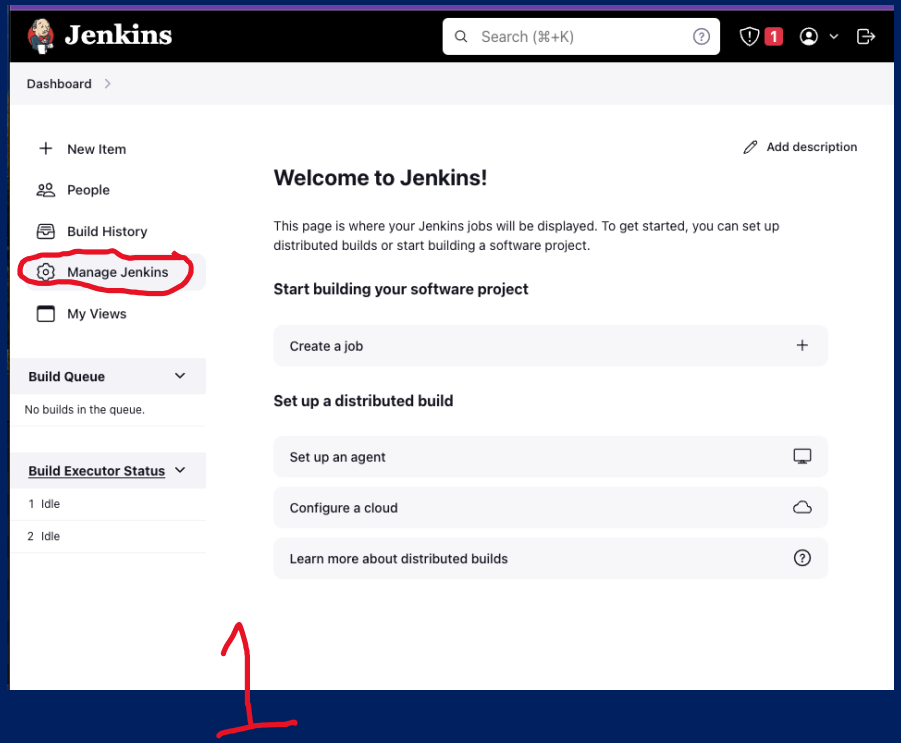
```
sudo systemctl enable jenkins
```

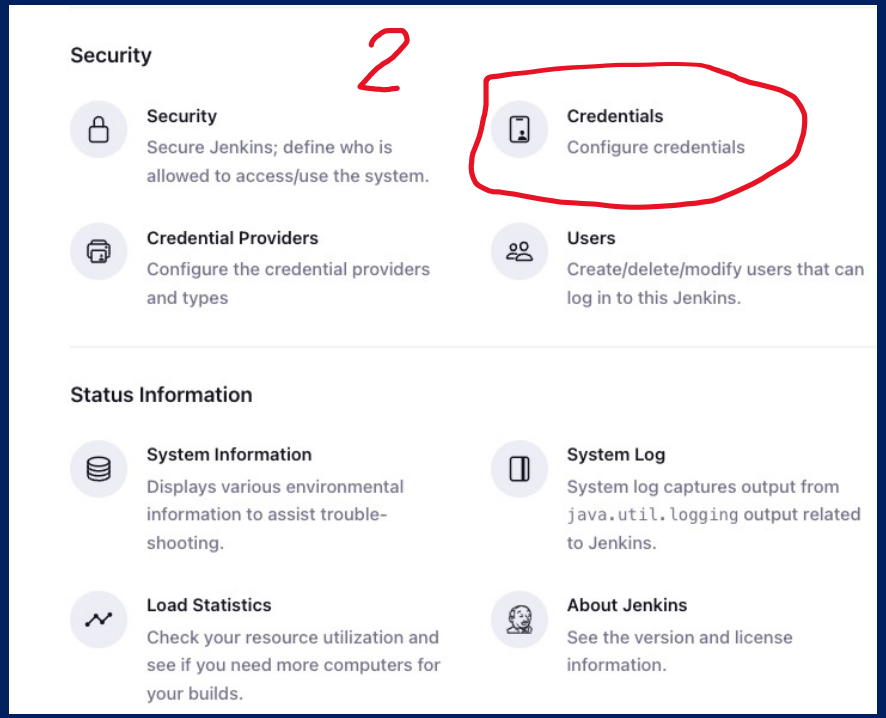
```
sudo systemctl start jenkins
```

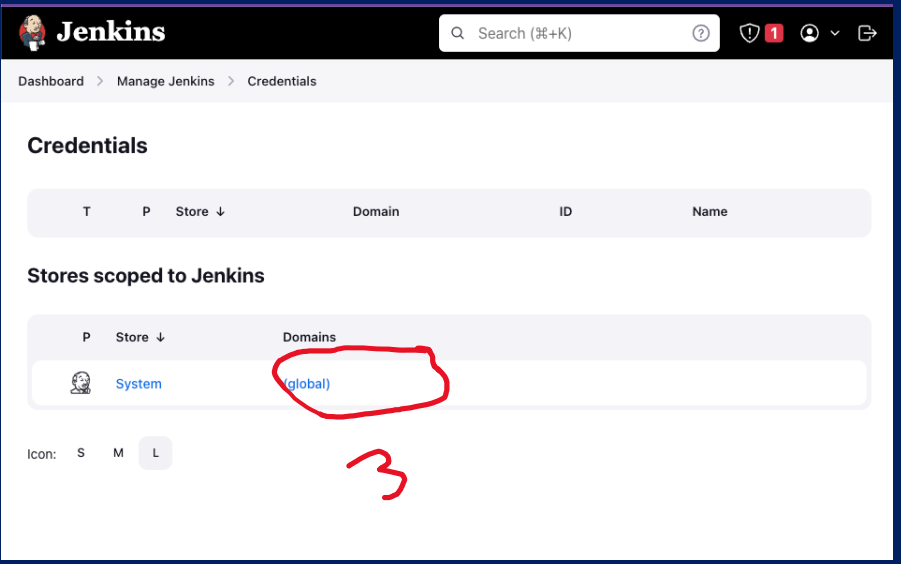
```
sudo systemctl status jenkins
```

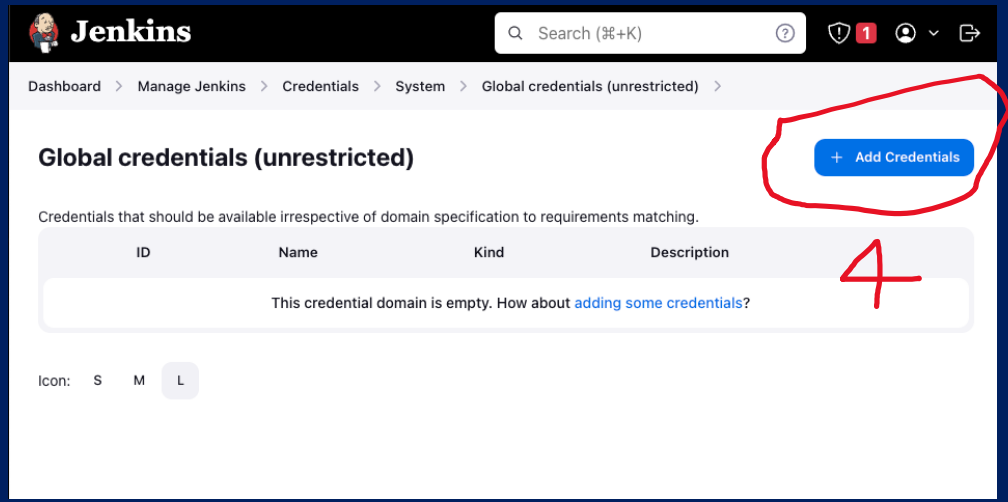
LAB 02 : Jenkins Add Credentials

1.Add SSH-Credentials

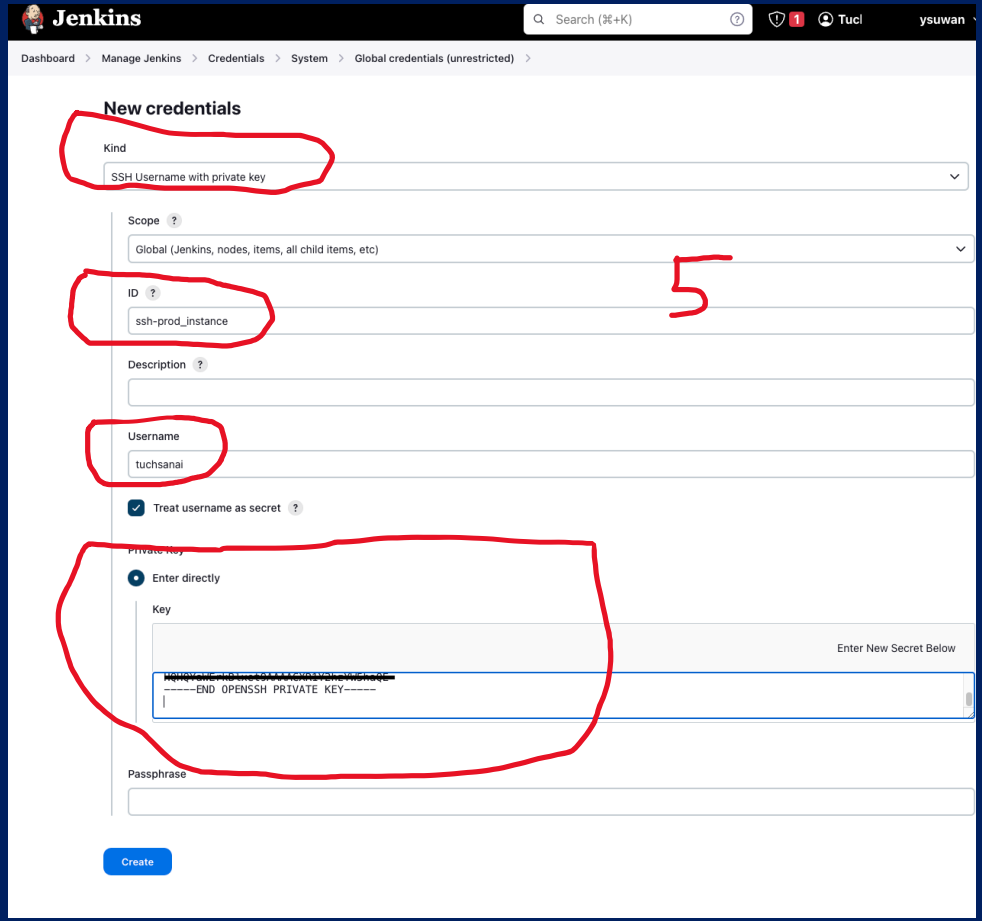


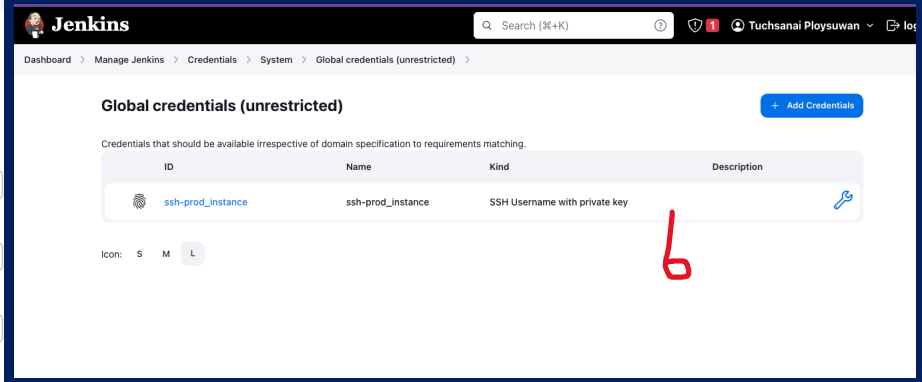


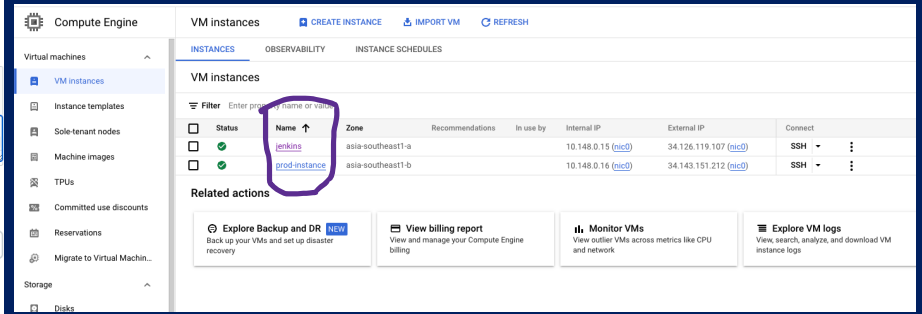

Jenkins
Search (⌘+K)
1
Dashboard
Manage Jenkins
Credentials
Credentials
T
P
Store ↓
Domain
ID
Name
Stores scoped to Jenkins
P
Store ↓
Domains
System
(global)
Icon:
S
M
L
3


Jenkins
Search (⌘+K)
1
Dashboard
Manage Jenkins
Credentials
System
Global credentials (unrestricted)
Global credentials (unrestricted)
+ Add Credentials
Credentials that should be available irrespective of domain specification to requirements matching.
ID
Name
Kind
Description
This credential domain is empty. How about adding some credentials?
4
Icon:
S
M
L

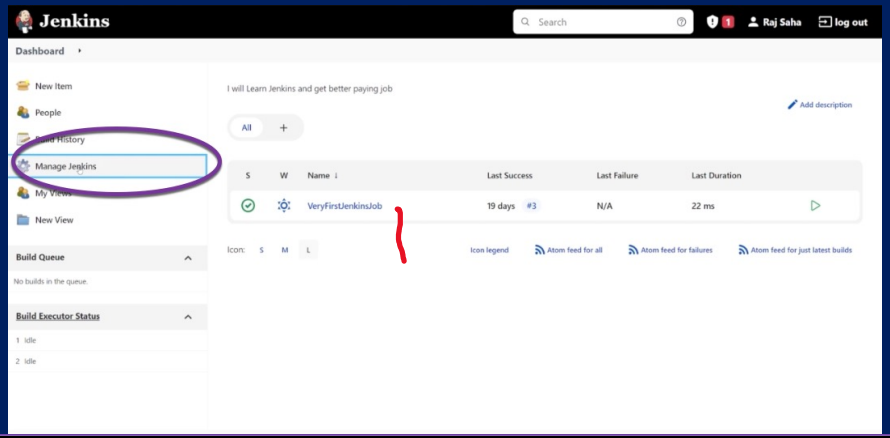
For SSH

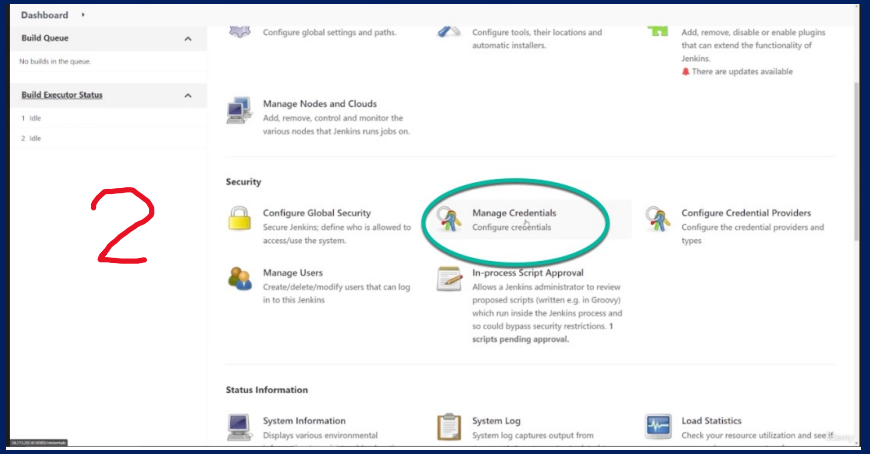

Jenkins
Search (⌘+K)
Tucl
ysuwan
Dashboard > Manage Jenkins > Credentials > System > Global credentials (unrestricted) >
New credentials
Kind
SSH Username with private key
Scope
Global (Jenkins, nodes, items, all child items, etc)
5
ID
ssh-prod_instance
Description
Username
tuchsanai
Treat username as secret
Enter directly
Key
Enter New Secret Below
-----END OPENSSH PRIVATE KEY-----
Passphrase
Create

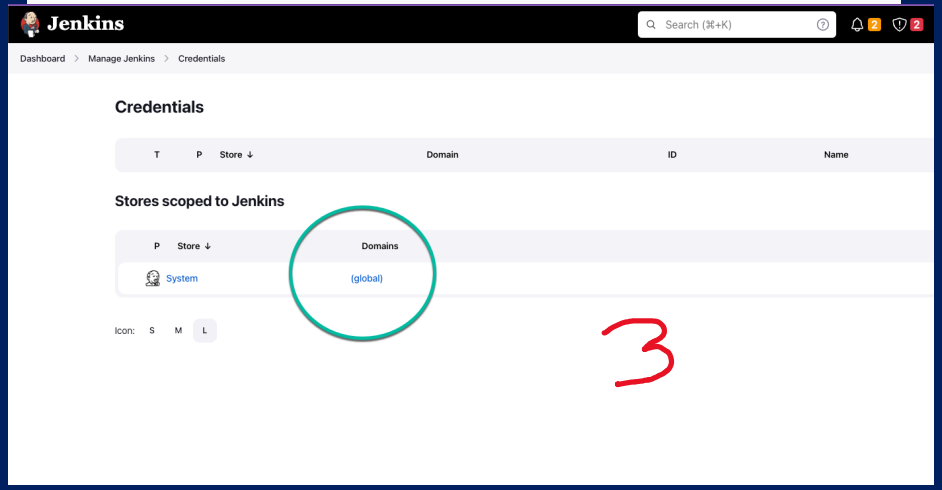

Jenkins
Search (⌘+K)
Tuchsanai Ploysuwan
Dashboard > Manage Jenkins > Credentials > System > Global credentials (unrestricted) >
Global credentials (unrestricted)
+ Add Credentials
Credentials that should be available irrespective of domain specification to requirements matching.
ID
Name
Kind
Description
ssh-prod_instance
ssh-prod_instance
SSH Username with private key
Icon: S M L
6

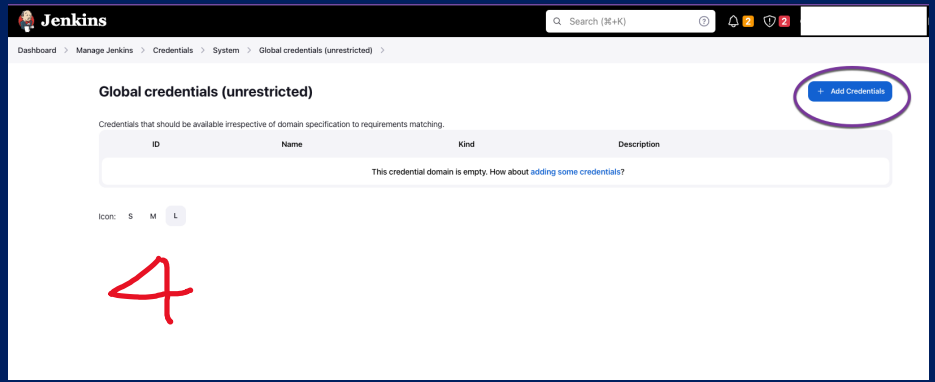

Compute Engine
VM instances
CREATE INSTANCE
IMPORT VM
REFRESH
Virtual machines
VM instances
Instance templates
Sole-tenant nodes
Machine images
TPUs
Committed use discounts
Reservations
Migrate to Virtual Machin...
Storage
Disks
INSTANCES
OBSERVABILITY
INSTANCE SCHEDULES
VM instances
Filter
Status
Name
Zone
Recommendations
In use by
Internal IP
External IP
Connect
jenkins
asia-southeast1-a
10.148.0.15 (nic0)
34.126.119.107 (nic0)
SSH
prod-instance
asia-southeast1-b
10.148.0.16 (nic0)
34.143.151.212 (nic0)
SSH
Related actions
Explore Backup and DR
NEW
Back up your VMs and set up disaster recovery
View billing report
View and manage your Compute Engine billing
Monitor VMs
View outlier VMs across metrics like CPU and network
Explore VM logs
View, search, analyze, and download VM instance logs

2.Add Github-Credentials

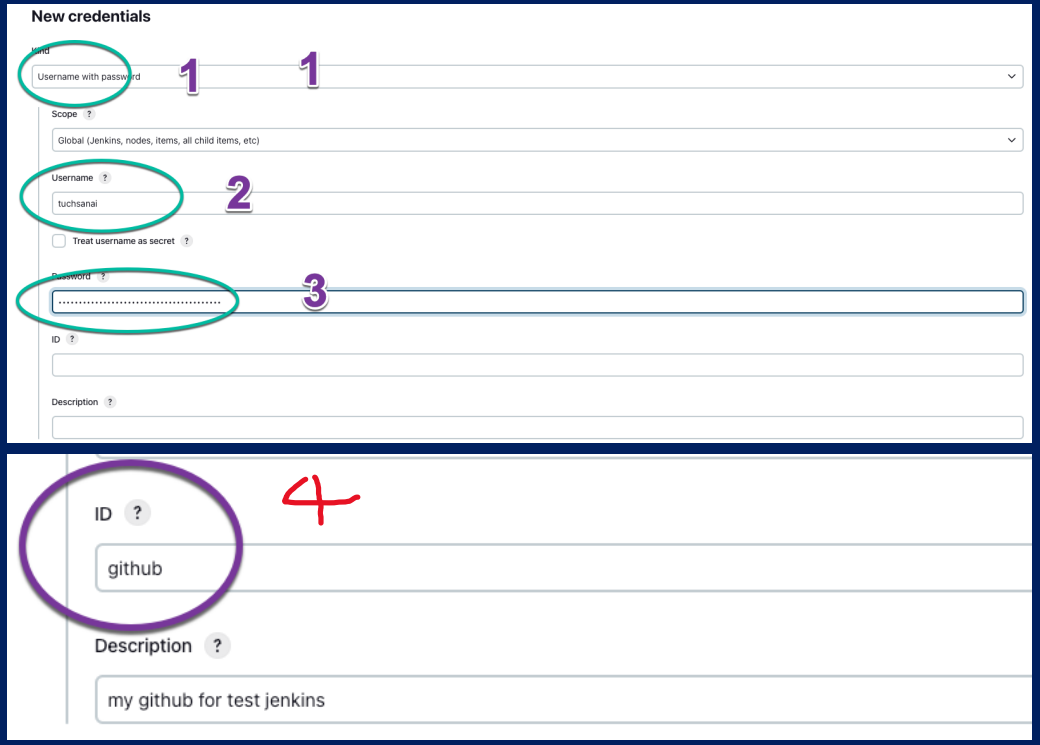




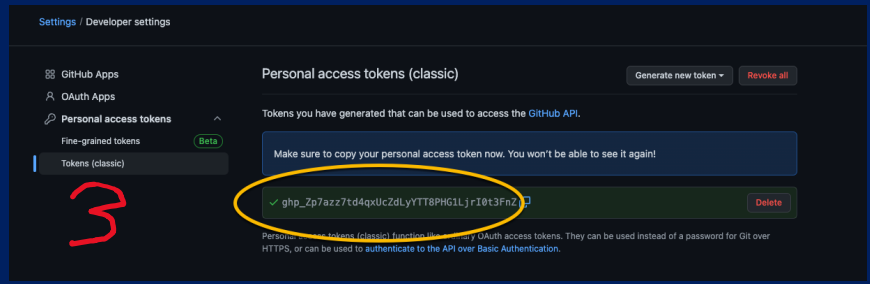


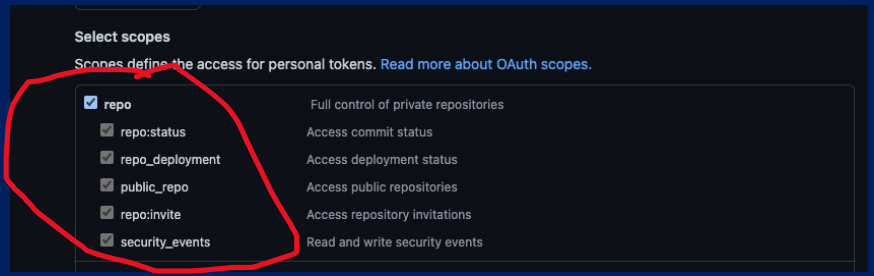


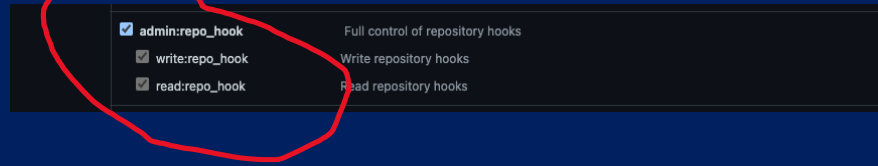
For Github


New credentials
Kind
Username with password
1
1
Scope
Global (Jenkins, nodes, items, all child items, etc)
Username
tuchsanai
2
Treat username as secret
Password
3
ID
Description

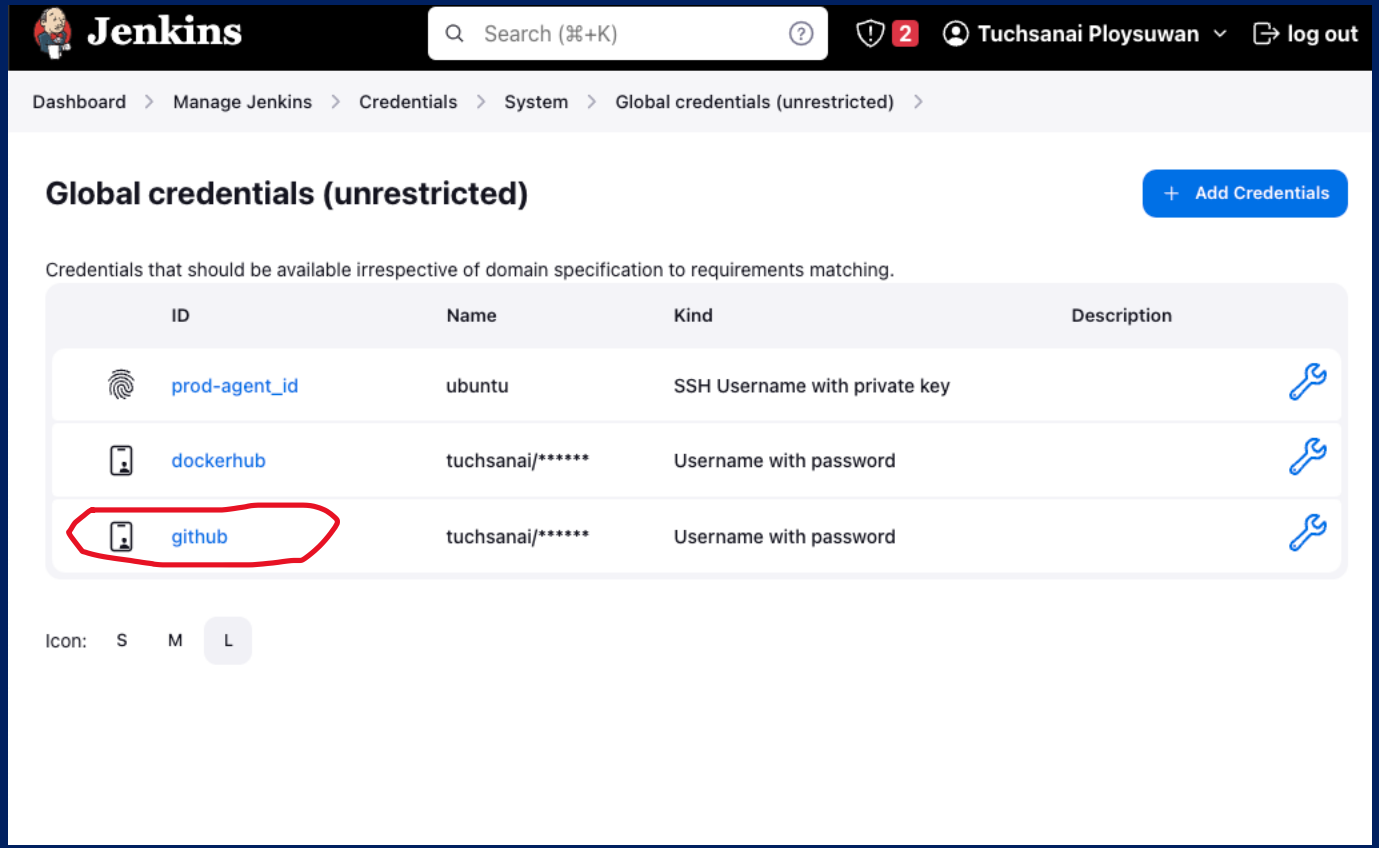
ID
4
github
Description
my github for test jenkins


Settings / Developer settings
GitHub Apps
OAuth Apps
Personal access tokens
Fine-grained tokens
Beta
Tokens (classic)
3
Personal access tokens (classic)
Generate new token
Revoke all
Tokens you have generated that can be used to access the GitHub API.
Make sure to copy your personal access token now. You won't be able to see it again!
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
Delete
HTTPS, or can be used to authenticate to the API over Basic Authentication.

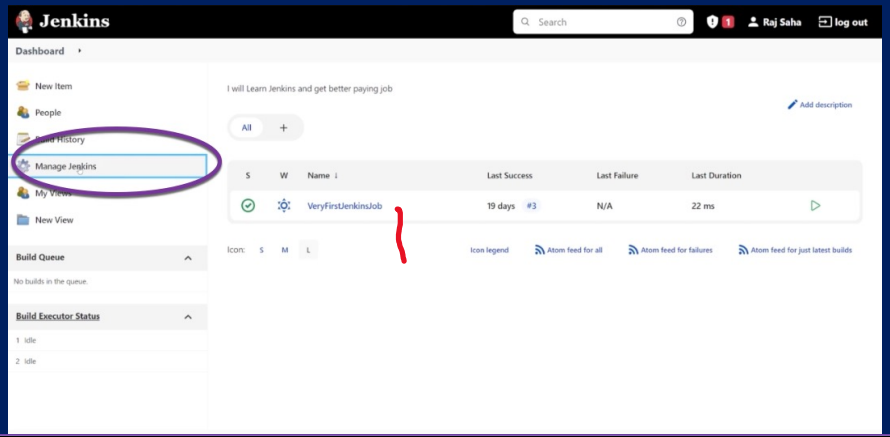

Select scopes
Scopes define the access for personal tokens. Read more about OAuth scopes.
repo
Full control of private repositories
repo:status
Access commit status
repo_deployment
Access deployment status
public_repo
Access public repositories
repo:invite
Access repository invitations
security_events
Read and write security events

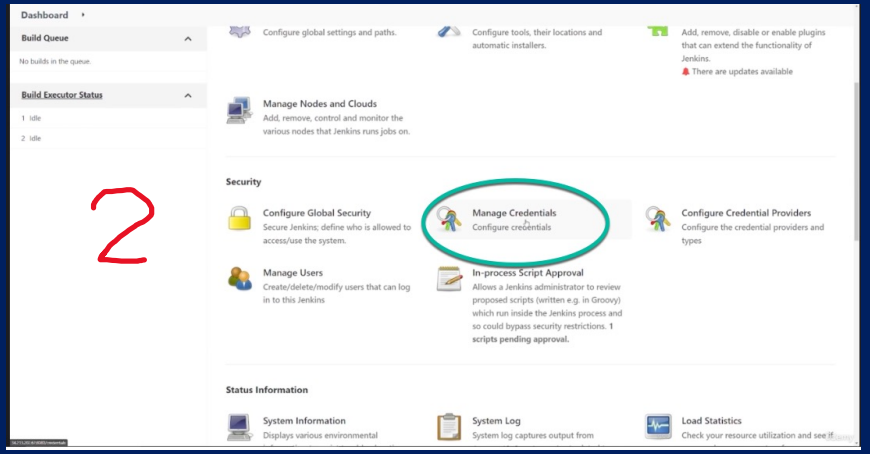

admin:repo_hook
Full control of repository hooks
write:repo_hook
Write repository hooks
read:repo_hook
Read repository hooks

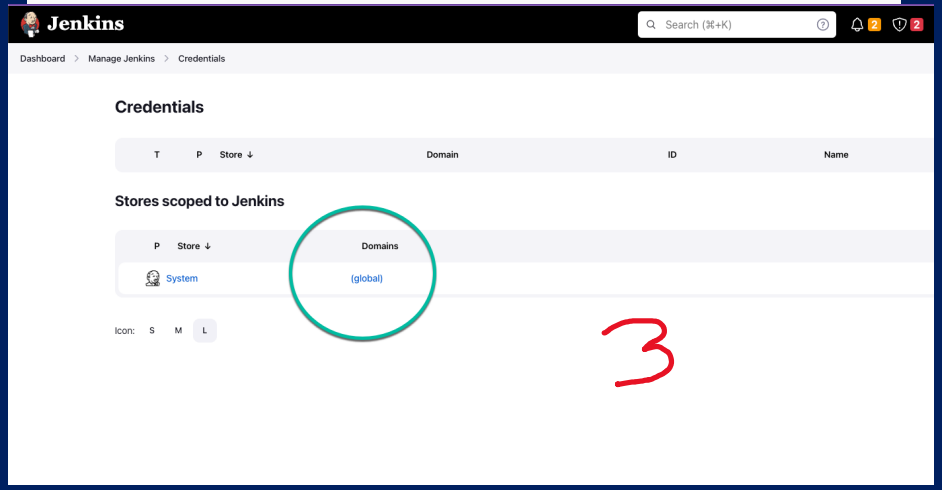
For Github

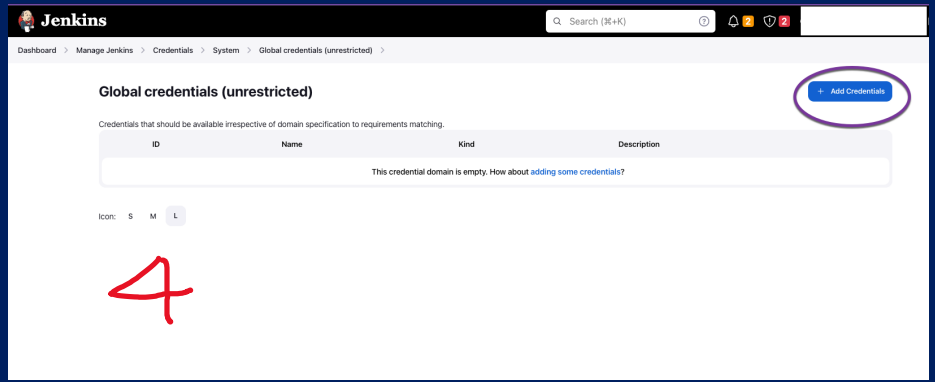

Jenkins
Search (⌘+K)
2
Tuchsanai Ploysuwan
log out
Dashboard
Manage Jenkins
Credentials
System
Global credentials (unrestricted)
Global credentials (unrestricted)
Add Credentials
Credentials that should be available irrespective of domain specification to requirements matching.
ID
Name
Kind
Description
prod-agent_id
ubuntu
SSH Username with private key
dockerhub
tuchsanai/******
Username with password
github
tuchsanai/******
Username with password
Icon:
S
M
L

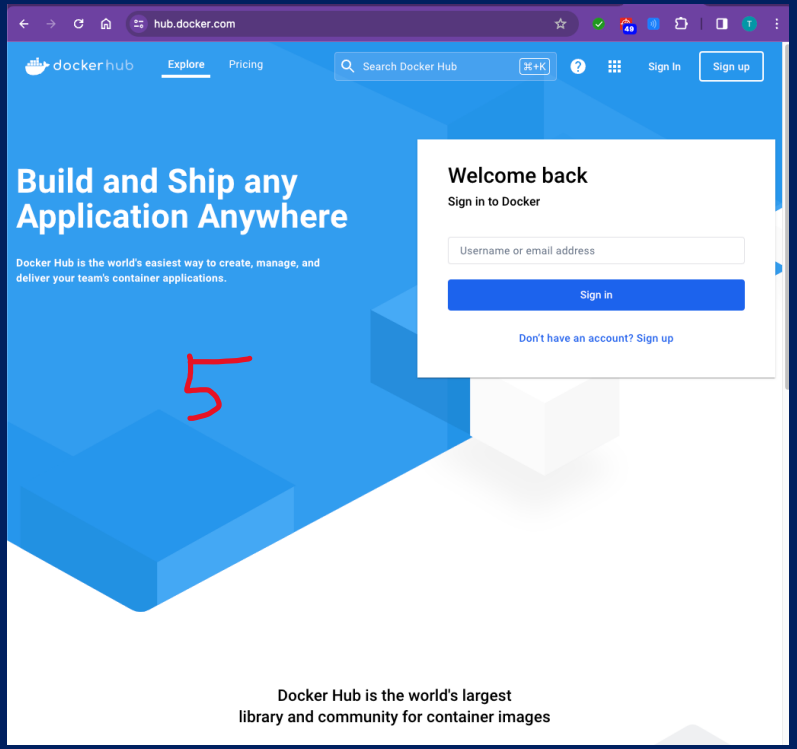
3.Add docker hub Credentials

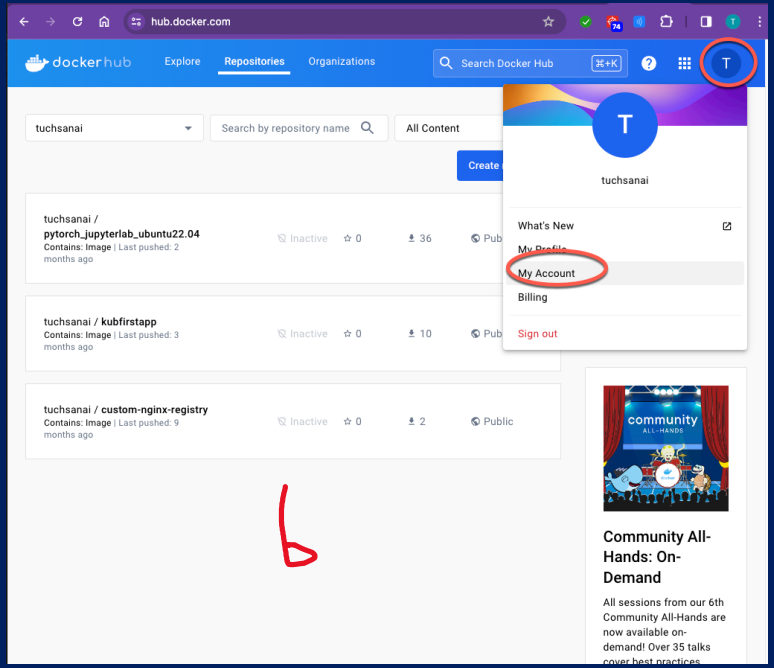


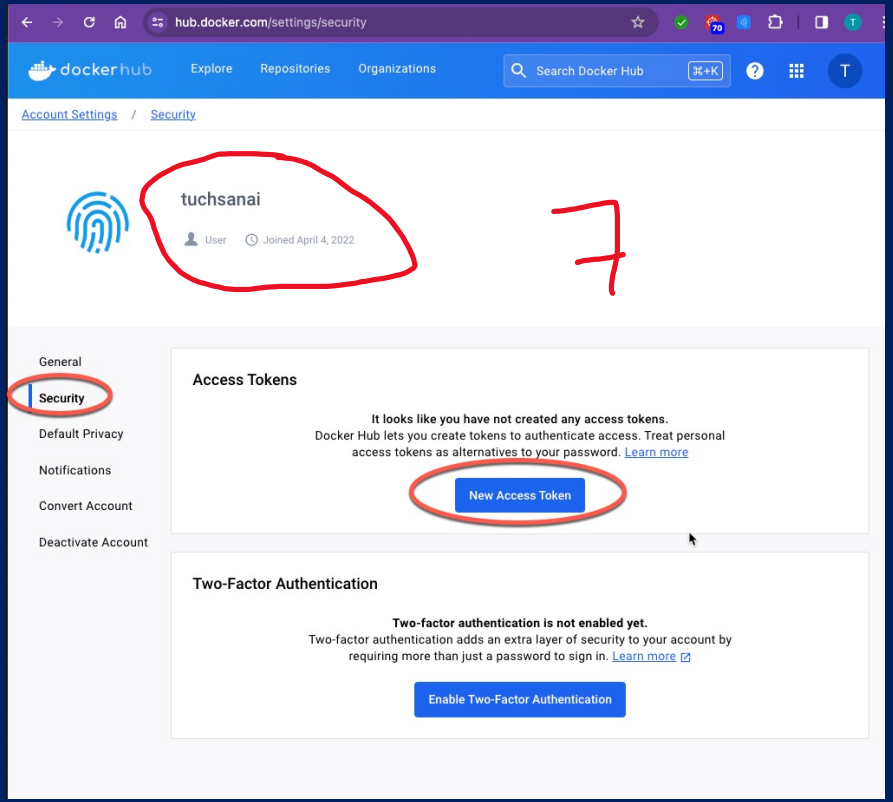


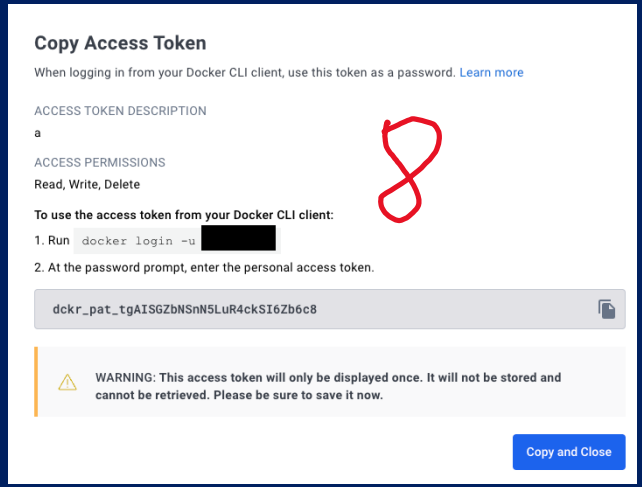


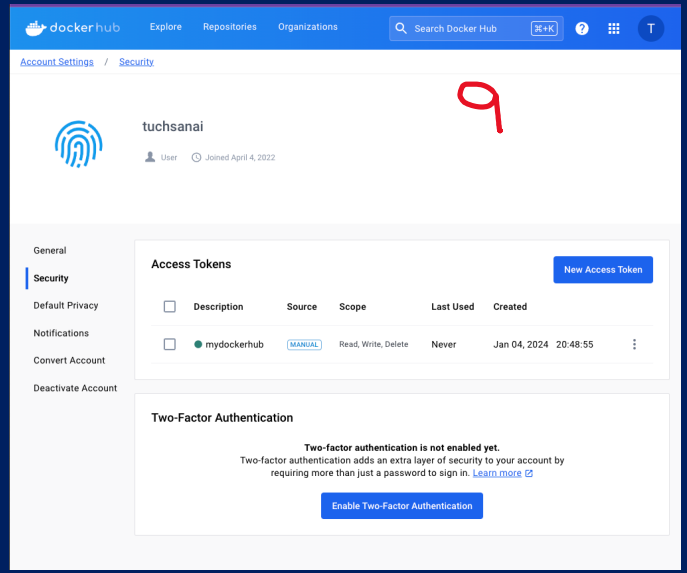


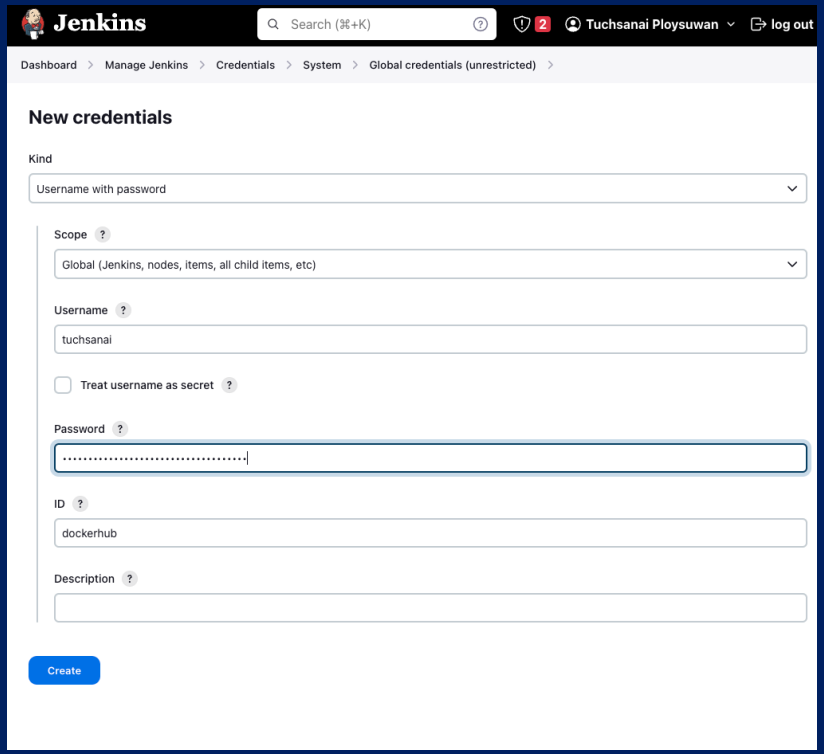

hub.docker.com
dockerhub
Explore
Pricing
Search Docker Hub
⌘+K
Sign In
Sign up
Build and Ship any Application Anywhere
Docker Hub is the world's easiest way to create, manage, and deliver your team's container applications.
Welcome back
Sign in to Docker
Username or email address
Sign in
Don't have an account? Sign up
5
Docker Hub is the world's largest library and community for container images

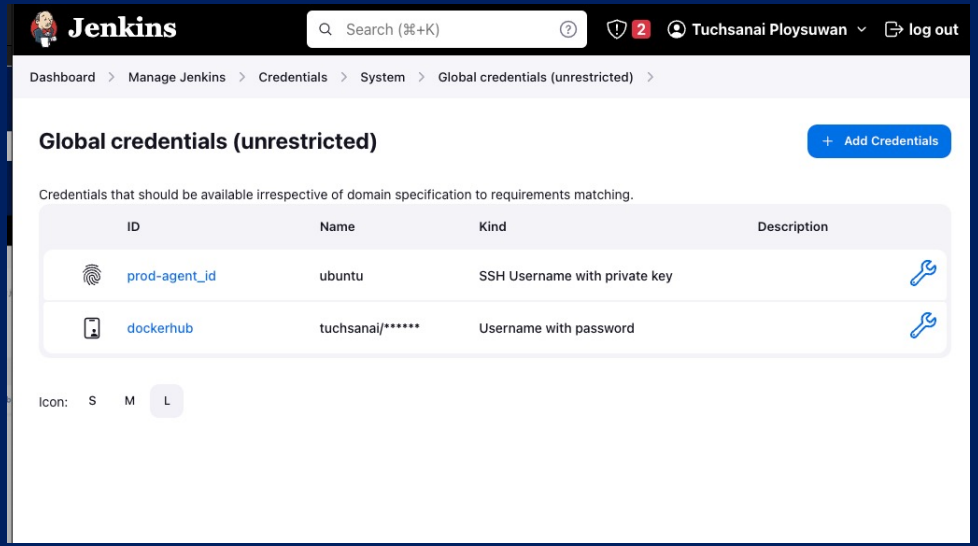

hub.docker.com
dockerhub
Explore
Repositories
Organizations
Search Docker Hub
⌘+K
T
tuchsanai
Search by repository name
All Content
Create
tuchsanai / pytorch_jupyterlab_ubuntu22.04
Contains: Image | Last pushed: 2 months ago
Inactive
0
36
tuchsanai / kubfirstapp
Contains: Image | Last pushed: 3 months ago
Inactive
0
10
tuchsanai / custom-nginx-registry
Contains: Image | Last pushed: 9 months ago
Inactive
0
2
Public
What's New
My Account
Billing
Sign out
6
community
ALL-HANDS
Community All-Hands: On-Demand
All sessions from our 6th Community All-Hands are now available on-demand! Over 35 talks

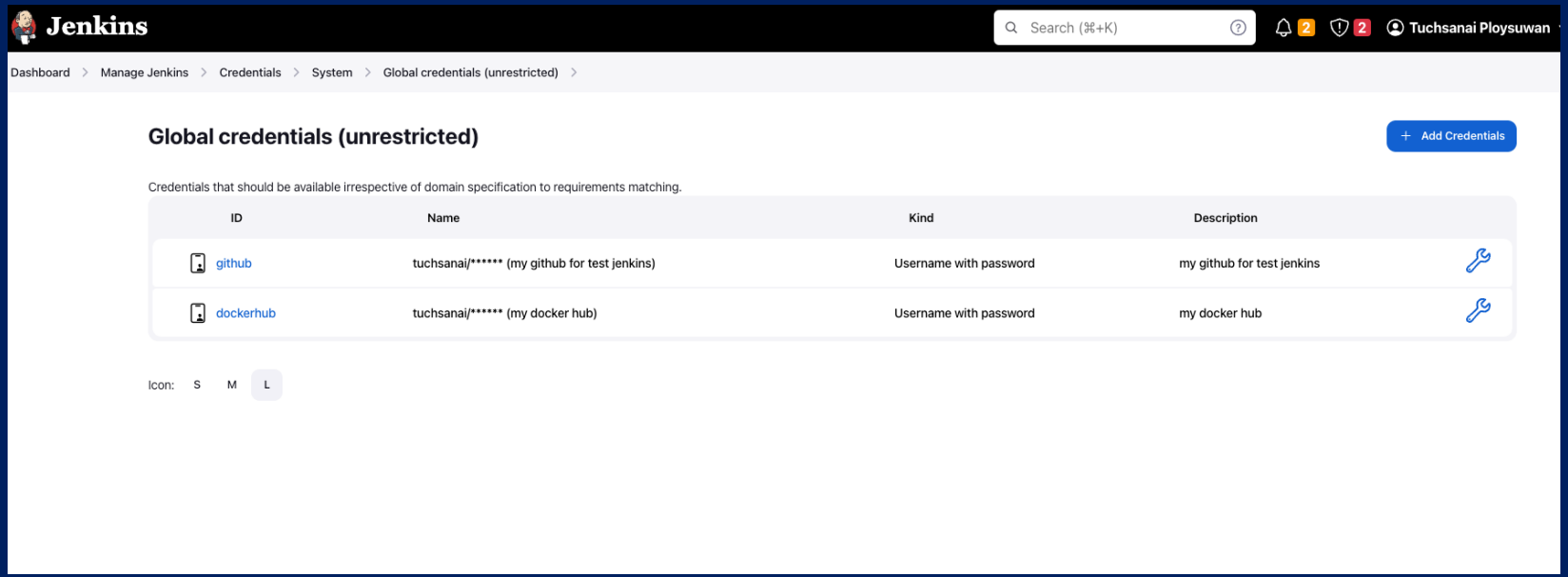

hub.docker.com/settings/security
dockerhub
Explore
Repositories
Organizations
Search Docker Hub
⌘+K
Account Settings / Security
tuchsanai
User
Joined April 4, 2022
7
General
Security
Default Privacy
Notifications
Convert Account
Deactivate Account
Access Tokens
It looks like you have not created any access tokens.
Docker Hub lets you create tokens to authenticate access. Treat personal access tokens as alternatives to your password. Learn more
New Access Token
Two-Factor Authentication
Two-factor authentication is not enabled yet.
Two-factor authentication adds an extra layer of security to your account by requiring more than just a password to sign in. Learn more
Enable Two-Factor Authentication


Copy Access Token
When logging in from your Docker CLI client, use this token as a password. Learn more
ACCESS TOKEN DESCRIPTION
a
ACCESS PERMISSIONS
Read, Write, Delete
8
To use the access token from your Docker CLI client:
1. Run docker login -u [redacted]
2. At the password prompt, enter the personal access token.
dckr_pat_tgAISGZbNSnN5LuR4ckSI6Zb6c8
WARNING: This access token will only be displayed once. It will not be stored and cannot be retrieved. Please be sure to save it now.
Copy and Close

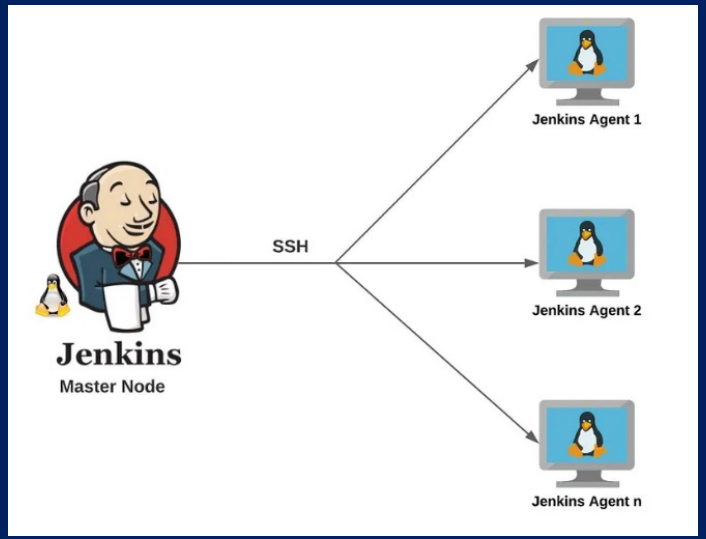

dockerhub
Explore
Repositories
Organizations
Search Docker Hub
⌘+K
Account Settings / Security
9
tuchsanai
User
Joined April 4, 2022
General
Security
Default Privacy
Notifications
Convert Account
Deactivate Account
Access Tokens
New Access Token
Description
Source
Scope
Last Used
Created
mydockerhub
MANUAL
Read, Write, Delete
Never
Jan 04, 2024 20:48:55
Two-Factor Authentication
Two-factor authentication is not enabled yet.
Two-factor authentication adds an extra layer of security to your account by requiring more than just a password to sign in. Learn more
Enable Two-Factor Authentication

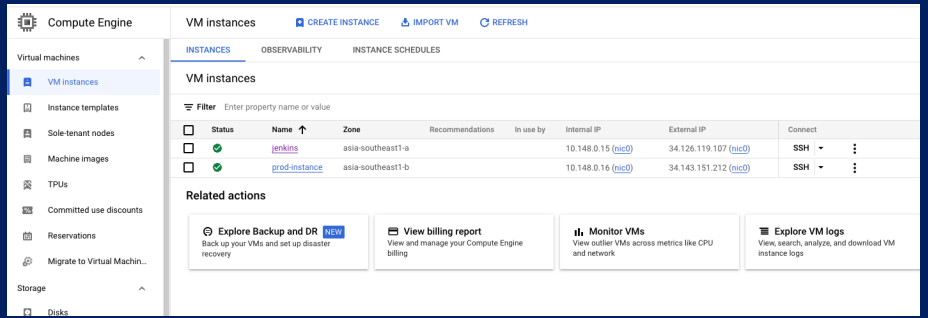

Jenkins
Search (⌘+K)
2
Tuchsanai Ploysuwan
log out
Dashboard
Manage Jenkins
Credentials
System
Global credentials (unrestricted)
New credentials
Kind
Username with password
Scope
Global (Jenkins, nodes, items, all child items, etc)
Username
tuchsanai
Treat username as secret
Password
ID
dockerhub
Description
Create

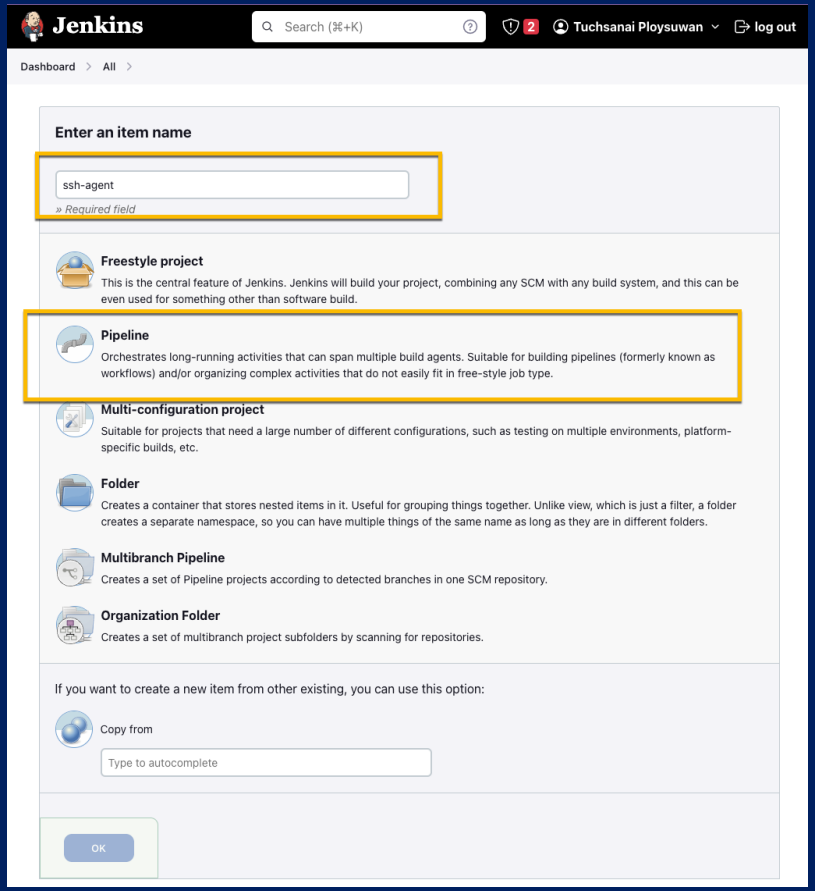

Jenkins
Search (⌘+K)
2
Tuchsanai Ploysuwan
log out
Dashboard
Manage Jenkins
Credentials
System
Global credentials (unrestricted)
Global credentials (unrestricted)
Add Credentials
Credentials that should be available irrespective of domain specification to requirements matching.
ID
Name
Kind
Description
prod-agent_id
ubuntu
SSH Username with private key
dockerhub
tuchsanai/******
Username with password
Icon:
S
M
L

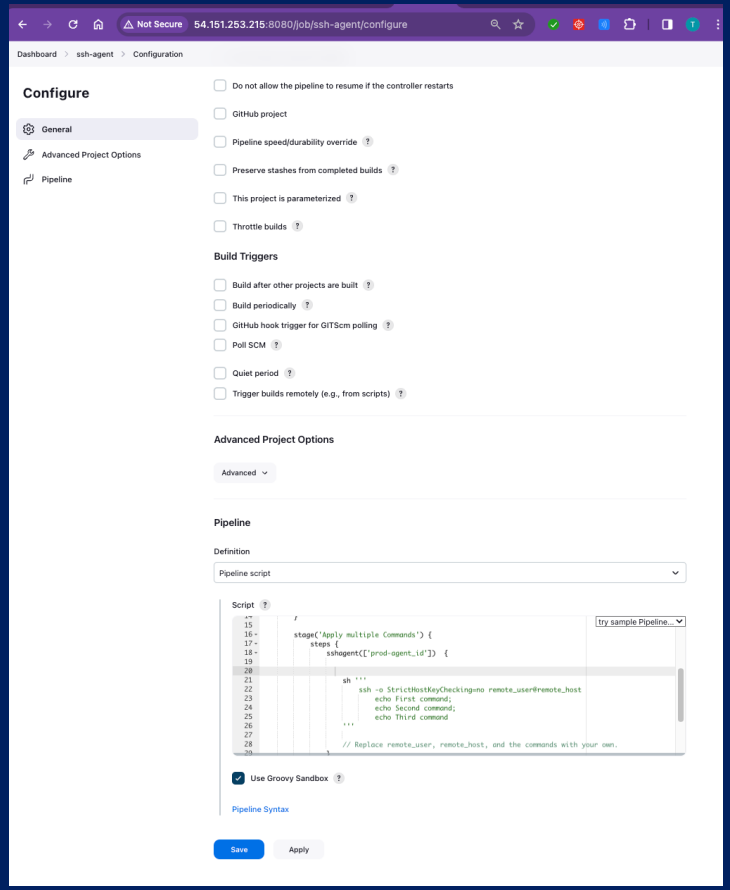

Jenkins
Search (⌘+K)
2
2
Tuchsanai Ploysuwan
Dashboard
Manage Jenkins
Credentials
System
Global credentials (unrestricted)
Global credentials (unrestricted)
Add Credentials
Credentials that should be available irrespective of domain specification to requirements matching.
ID
Name
Kind
Description
github
tuchsanai/****** (my github for test jenkins)
Username with password
my github for test jenkins
dockerhub
tuchsanai/****** (my docker hub)
Username with password
my docker hub
Icon:
S
M
L

LAB x : Jenkins SSH-Agent


Jenkins Agent 1
SSH
Jenkins Agent 2
Jenkins
Master Node
Jenkins Agent n


Compute Engine
VM instances
CREATE INSTANCE
IMPORT VM
REFRESH
Virtual machines
VM instances
Instance templates
Sole-tenant nodes
Machine images
TPUs
Committed use discounts
Reservations
Migrate to Virtual Machin...
Storage
Disks
INSTANCES
OBSERVABILITY
INSTANCE SCHEDULES
VM instances
Filter
Enter property name or value
Status
Name
Zone
Recommendations
In use by
Internal IP
External IP
Connect
jenkins
asia-southeast1-a
10.148.0.15 (nic0)
34.126.119.107 (nic0)
SSH
prod-instance
asia-southeast1-b
10.148.0.16 (nic0)
34.143.151.212 (nic0)
SSH
Related actions
Explore Backup and DR
NEW
Back up your VMs and set up disaster recovery
View billing report
View and manage your Compute Engine billing
Monitor VMs
View outlier VMs across metrics like CPU and network
Explore VM logs
View, search, analyze, and download VM instance logs


Jenkins
Search (⌘+K)
2
Tuchsanai Ploysuwan
log out
Dashboard
All
Enter an item name
ssh-agent
» Required field
Freestyle project
This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.
Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.
Multi-configuration project
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.
Folder
Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.
Multibranch Pipeline
Creates a set of Pipeline projects according to detected branches in one SCM repository.
Organization Folder
Creates a set of multibranch project subfolders by scanning for repositories.
If you want to create a new item from other existing, you can use this option:
Copy from
Type to autocomplete
OK


Not Secure
54.151.253.215:8080/job/ssh-agent/configure
Dashboard
ssh-agent
Configuration
Configure
General
Advanced Project Options
Pipeline
Do not allow the pipeline to resume if the controller restarts
GitHub project
Pipeline speed/durability override
Preserve stashes from completed builds
This project is parameterized
Throttle builds
Build Triggers
Build after other projects are built
Build periodically
GitHub hook trigger for GITScm polling
Poll SCM
Quiet period
Trigger builds remotely (e.g., from scripts)
Advanced Project Options
Advanced
Pipeline
Definition
Pipeline script
Script
try sample Pipeline...
stage('Apply multiple Commands') {
steps {
sshagent(['prod-agent_id']) {
sh '''
ssh -o StrictHostKeyChecking=no remote_user@remote_host
echo First command;
echo Second command;
echo Third command
'''
// Replace remote_user, remote_host, and the commands with your own.
Use Groovy Sandbox
Pipeline Syntax
Save
Apply

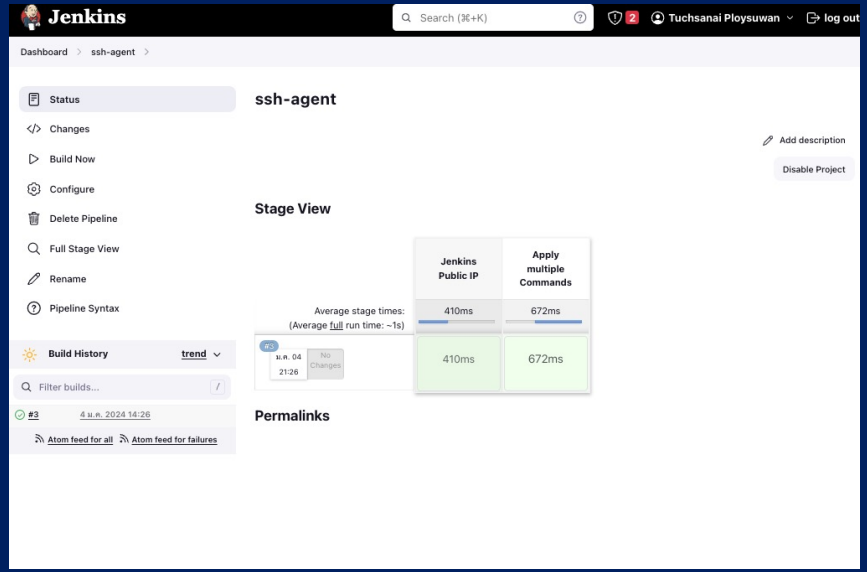
```
pipeline {
    agent any

    stages {

        stage('Jenkins Public IP') {
            steps {
                script {
                    // Use a shell command to get the public IP address
                    def ip = sh(script: 'curl -s ifconfig.me', returnStdout: true).trim()
                    echo "Jenkins Public IP Address: ${ip}"
                }
            }
        }

        stage('Apply multiple Commands') {
            steps {
                sshagent(['agent_id']) {

                    sh '''
                        ssh -o StrictHostKeyChecking=no remote_user@remote_host
                            echo First command;
                            echo Second command;
                            echo Third command
                    '''
                    // Replace remote_user, remote_host, and the commands with your own.
                }
            }
        }
    }
}
```



Status
Changes
Console Output
View as plain text
Edit Build Information
Delete build '#3'
Restart from Stage
Replay
Pipeline Steps
Workspaces

Console Output

```
Started by user Tuchsanai Ploysuwan
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/lib/jenkins/workspace/ssh-agent
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Jenkins Public IP)
[Pipeline] script
[Pipeline] {
[Pipeline] sh
+ curl -s ifconfig.me
[Pipeline] echo
Jenkins Public IP Address: 54.151.253.215
[Pipeline] }
[Pipeline] // script
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Apply multiple Commands)
[Pipeline] sshagent
[ssh-agent] Using credentials ubuntu
[ssh-agent] Looking for ssh-agent implementation...
[ssh-agent]   Exec ssh-agent (binary ssh-agent on a remote machine)
$ ssh-agent
SSH_AUTH_SOCK=/tmp/ssh-XXXXXXpD4dnA/agent.15229
SSH_AGENT_PID=15232
Running ssh-add (command line suppressed)
Identity added: /var/lib/jenkins/workspace/ssh-agent@tmp/private_key_17588309639608727163.key (/var/lib/jenkins/workspace/ssh-agent@tmp/private_key_17588309639608727163.key)
[ssh-agent] Started.
[Pipeline] {
[Pipeline] sh
+ ssh -o StrictHostKeyChecking=no ubuntu@18.143.133.167
Pseudo-terminal will not be allocated because stdin is not a terminal.
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-1017-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Thu Jan  4 14:26:20 UTC 2024

  System load:  0.0               Processes:             108
  Usage of /:   19.5% of 9.51GB   Users logged in:       1
  Memory usage: 6%                IPv4 address for eth0: 172.31.37.159
  Swap usage:   0%

 * Ubuntu Pro delivers the most comprehensive open source security and
   compliance features.

   https://ubuntu.com/aws/pro

Expanded Security Maintenance for Applications is not enabled.

29 updates can be applied immediately.
20 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status


+ echo First command
First command
+ echo Second command
Second command
+ echo Third command
Third command
[Pipeline] }
$ ssh-agent -k
unset SSH_AUTH_SOCK;
unset SSH_AGENT_PID;
echo Agent pid 15232 killed;
[ssh-agent] Stopped.
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

LAB : How to Change Port for Jenkins?

http://localhost:8080

http://localhost:5000

HTTP Port (default: 8080) − This is the main port used by Jenkins to serve web pages on your machine. By default, this port is set to 8080 but can be changed based on your requirements.

If Jenkins fails to start because a port is in use, run systemctl edit jenkins and add the following:

1. Override the Jenkins Service Configuration

```
sudo systemctl edit jenkins
```

2. Add or Modify the ExecStart Command

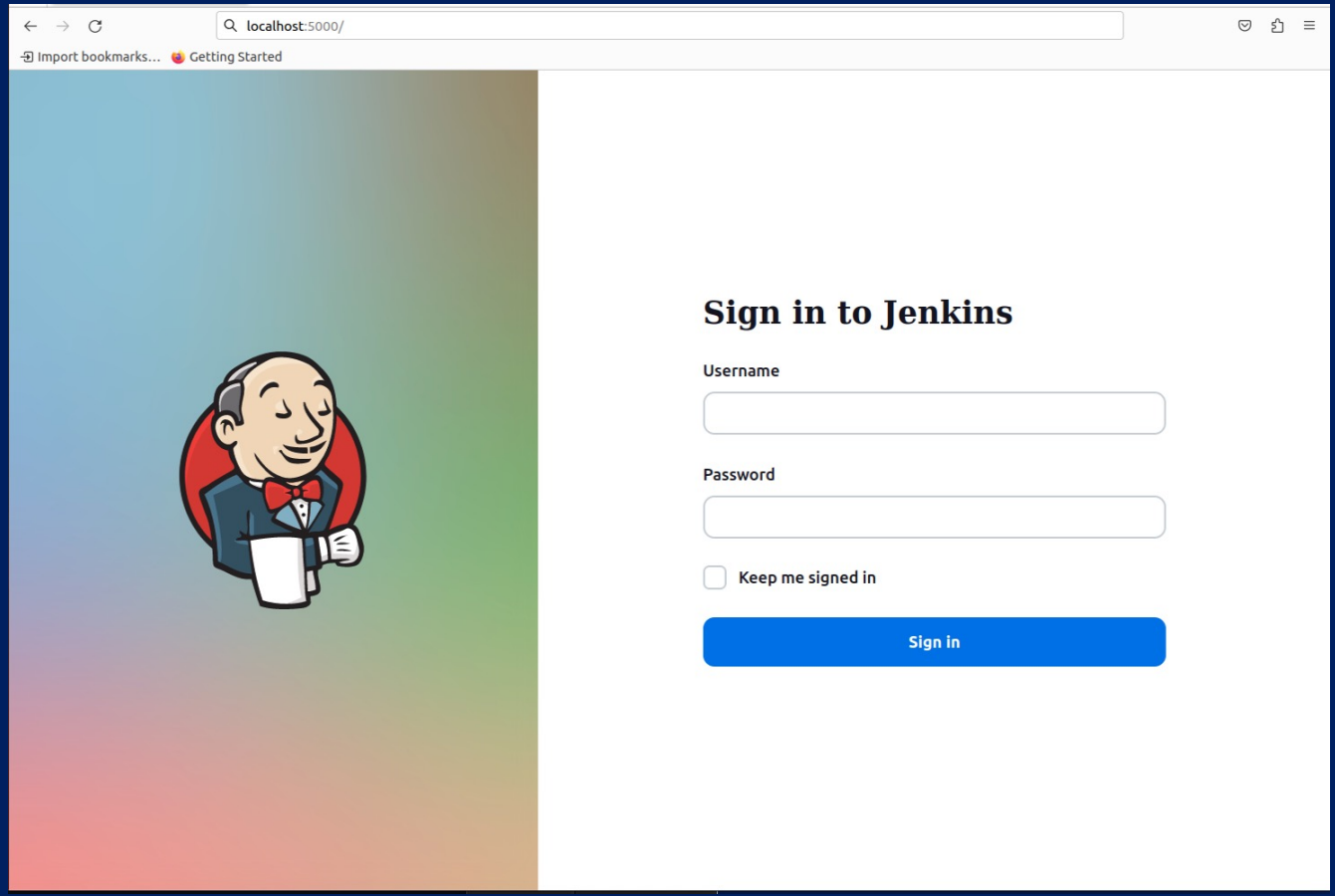
```
[Service]
Environment="JENKINS_PORT=5000"
```

3.Reload the Systemd Daemon

```
systemctl daemon-reload
```

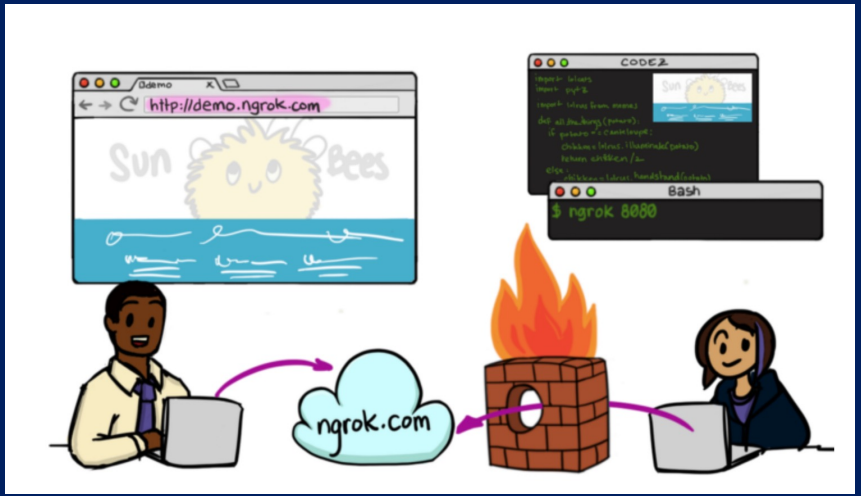
4. Restart the Jenkins service to apply the changes

```
sudo service jenkins restart
```


localhost:5000/
Import bookmarks...
Getting Started
Sign in to Jenkins
Username
Password
Keep me signed in
Sign in

LAB : Forward my local port to public using ngrok

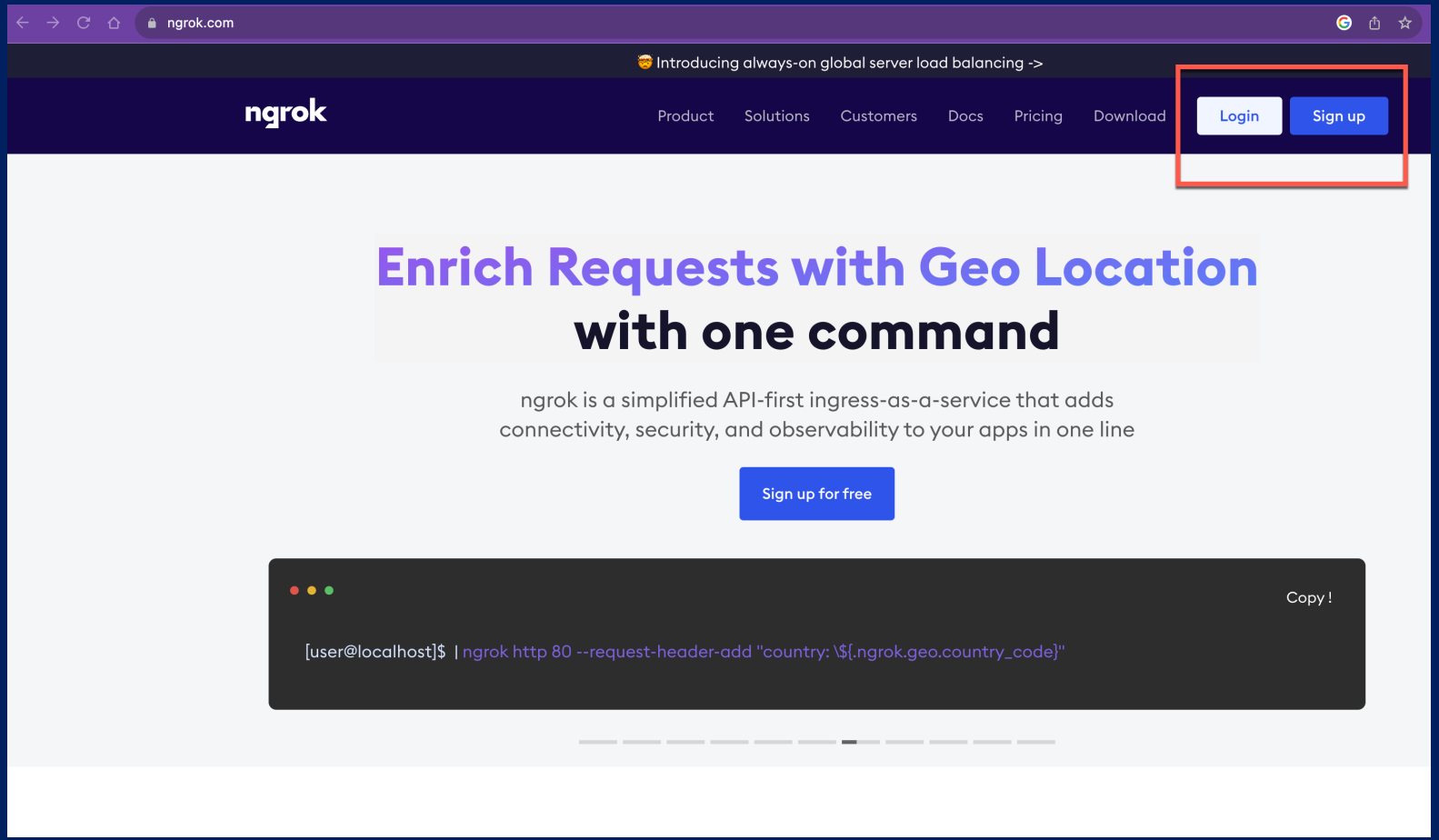
What is ngrok?

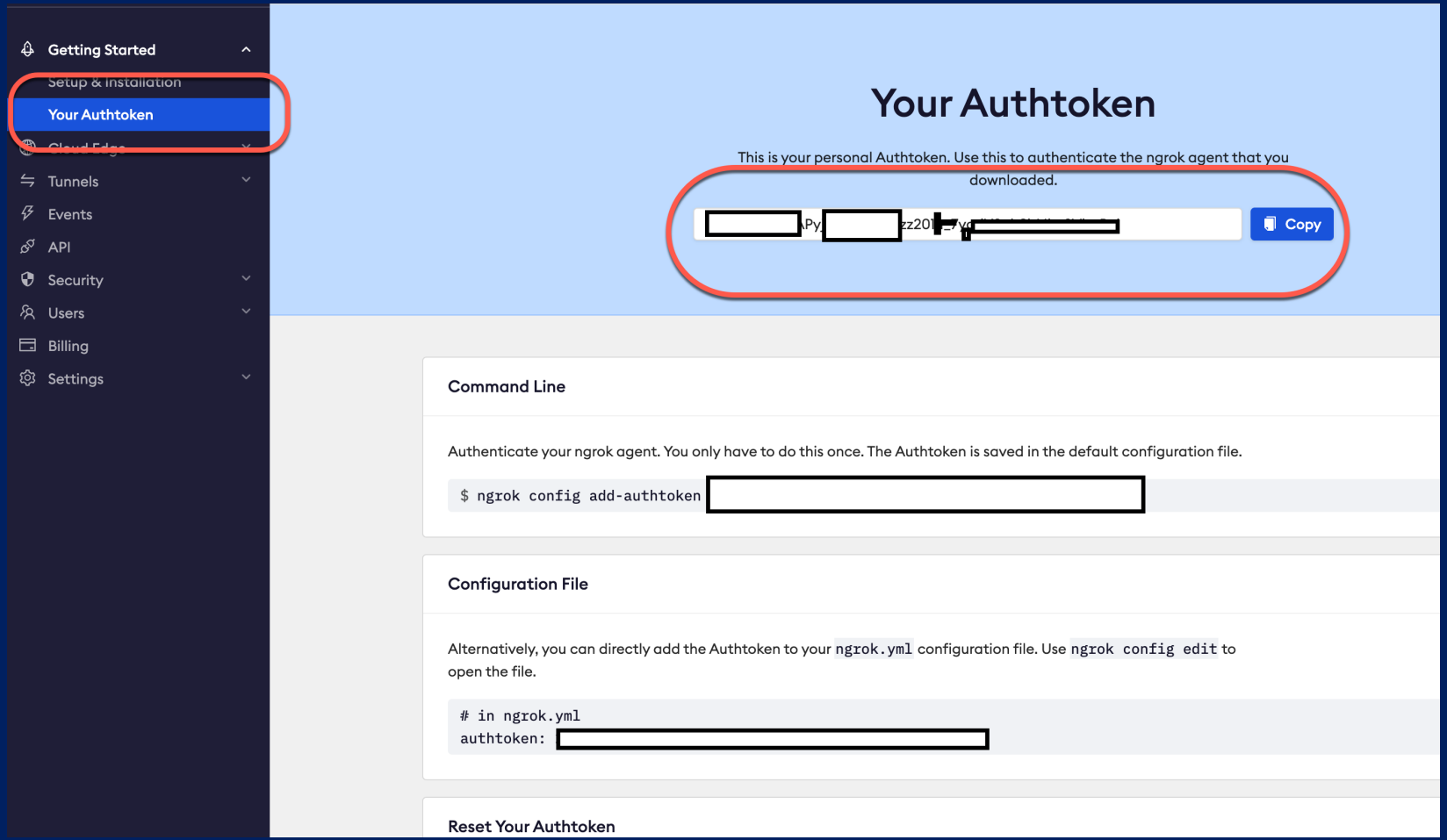


ngrok exposes local servers behind NATs and firewalls to the public internet over secure tunnels.

Advantages

- Demoing web sites without deploying
- Building webhook consumers on your dev machine
- Testing mobile apps connected to your locally running backend
- Stable addresses for your connected devices that are deployed in the field
- Running personal cloud services from your home


ngrok.com
Introducing always-on global server load balancing ->
ngrok
Product
Solutions
Customers
Docs
Pricing
Download
Login
Sign up
Enrich Requests with Geo Location
with one command
ngrok is a simplified API-first ingress-as-a-service that adds
connectivity, security, and observability to your apps in one line
Sign up for free
Copy !
[user@localhost]$ | ngrok http 80 --request-header-add "country: \${.ngrok.geo.country_code}"


Getting Started
Setup & Installation
Your Authtoken
Tunnels
Events
API
Security
Users
Billing
Settings
Your Authtoken
This is your personal Authtoken. Use this to authenticate the ngrok agent that you downloaded.
Copy
Command Line
Authenticate your ngrok agent. You only have to do this once. The Authtoken is saved in the default configuration file.
$ ngrok config add-authtoken
Configuration File
Alternatively, you can directly add the Authtoken to your ngrok.yml configuration file. Use ngrok config edit to open the file.
in ngrok.yml
authtoken:
Reset Your Authtoken

To setup ngrok on Ubuntu 22.04, there are two primary methods you can follow.

1. **Create an Ngrok Account**:
   - If you don't have an ngrok account, create one on the official ngrok website.
2. **Download ngrok**:
   - You can download ngrok directly from the Setup & Installation page on the ngrok dashboard or use the following command in the terminal to download the binary file:

```
wget https://bin.equinox.io/c/bNyj1mQVY4c/ngrok-v3-stable-linux-amd64.tgz
```

3. **Decompress & Install Ngrok Tunnel**:
   - Extract the downloaded file with the following command:

```
tar zxvf ngrok-v3-stable-linux-amd64.tgz
```

4. **Connect Ubuntu to the ngrok account**:
   - Run the following command to add the auth token to the default Ngrok.yml configuration file (replace the token with your own):

```
./ngrok config add-authtoken <YourAuthToken>
```

5. **Usage**:
   - To create a tunnel to your local server or port forwarding using ngrok, use the following command (replace `8080` with your desired port):

```
./ngrok http 8080
```

   - This will provide you with a URL accessible on any device having internet connectivity. The URL of your local Web Interface will be like “http://127.0.0.1:8080,” and the URL provided by ngrok to access this web server worldwide will be something like “https://.in.ngrok.io”】.

```
ngrok

Introducing Always-On Global Server Load Balancer: https://ngrok.com/r/gslb

Session Status                online
Account                       [redacted]i@gmail.com (Plan: Free)
Version                       3.3.5
Region                        Asia Pacific (ap)
Latency                       39ms
Web Interface                 http://127.0.0.1:4040
Forwarding                    https://8bc7-171-96-174-205.ngrok-free.app -> http://localhost:8080

Connections                   ttl     opn     rt1     rt5     p50     p90
                              2       0       0.01    0.00    30.64   30.92


HTTP Requests
-------------

GET /static/e6b141b3/favicon.ico               200 OK
GET /login                                     200 OK
GET /static/e6b141b3/images/svgs/logo.svg      200 OK
GET /static/e6b141b3/jsbundles/simple-page.css 200 OK
GET /                                          403 Forbidden
```