## Install Jenkins on an EC2 from the Default VPC

* Create an EC2 with Ubuntu AMI and ports 22, 80, and 8080 open:

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* SSH into the EC2 and run setup\_jenkins.sh to install, run, and check status of Jenkins:

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* Go to http://<ec2-public-ip>:8080 to set up Jenkins admin role – retrieve password by running the command **sudo cat /var/lib/Jenkins/secrets/initialAdminPassword**
* Install suggested plugins
* Reset admin password then save

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## Create an EC2 in the Public Subnet of Kura VPC

* Select Ubuntu AMI and follow the configurations:
  + Kura VPC
  + Public Subnet
  + Auto-Assign Public IP -> Enable

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* + Ports 22 and 5000:

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* + Install necessary packages: default-jre, python3-pip, python3.10-venv, nginx > Use **setup\_VPC\_pub\_ec2.sh** or Include under User Data as a bootstrap script:

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## Configure and Connect a Jenkins Agent to Jenkins

* Inside Jenkins server (EC2 from Default VPC), click on Build Executor Status > + New Node > Enter node name and select Permanent Agent:

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* Enter following configurations:
  + **Name:** awsDeploy
  + **Description:** Deployment Server
  + **Number of Executors:** 1
  + **Remote Root Directory:** /home/ubuntu/agent
  + **Labels:** awsDeploy
  + **Usage:** Only build jobs with label…
  + **Launch Method:** Launch Agents via SSH
  + **Host:** Public IP of EC2 from Kura VPC
  + **Host Key Verification Strategy:** Non-verifying verification strategy
  + **Availability:** Keep this agent online as much as possible

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* + **Credentials:**

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***\*\*\*PRIVATE KEY IS THE CONTENT OF THE PEM FILE USED TO SSH INTO EC2 INSTANCES\*\*\****

* Once Agent configuration info is saved, it will be created and can be viewed from Dashboard > Build Executor Status:

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* You can check the log as well:

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## Create a Pipeline Build in Jenkins

* Prior to building a pipeline – SSH into the EC2 in Kura VPC and change the **/etc/nginx/sites-enabled/default** file:



1. Change port from 80 to 5000:

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1. Replace contents of location as below: Text

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* Go back to Jenkins server on EC2 in Default VPC and configure a multibranch pipeline by navigating to Dashboard > New Item > Multibranch Pipeline
* Under Branch Sources > GitHub > Credentials > + Add > Enter GitHub username and generated access token as password:

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* Once entered, validate connection to ensure Jenkins can access GitHub repo:

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* Then, navigate to Dashboard > Manage Jenkins > Plugin Manager and install Pipeline Keep Running Step plugin:

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* Once completed, edit the Jenkinsfile in deployment repo with the following code:

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### **Test Stage Issues**

* Test failed initially due to an extra space on line 6 – removed the extra space and did another build:

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* Successful Build after edits made in the Test Stage:

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## **Deployment Issues**

### Initial Jenkinsfile

* Even with a successful Deploy stage on Jenkins, there was 502 Bad Gateway error:

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* To resolve this, I manually went inside the VPC EC2, activated the venv and ran the last command found in the Jenkins Deploy stage:



* Then, I was able to access the url-shortener website using the VPC EC2’s IP and port 5000:

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### Updated Jenkinsfile

* That said, Tyrone informed us that there was a bug within the original Jenkinsfile, so he provided us with new instructions – upon installing the Jenkins Pipeline Keep Running Step and editing the Jenkinsfile, the Deploy stage was successful:

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## Additions from Deployment 2

### Webhook

* Navigate to GitHub repo > Settings > Webhooks
  + Payload URL: http://<ec2-public-ip>:8080/github-webhook/
  + Content Type: application/json

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### Slack Notifications

* Navigate to <https://kura-labs.slack.com/apps/new/A0F7VRFKN-jenkins-ci>:

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* Once added, follow the steps provided to set up – take note of the Integration Token Credential ID to enter in Jenkins:

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* In Jenkins, go to Dashboard > Manage Jenkins > Plugin Manager > Available > Search for “Slack” and Install

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* Once completed, navigate to Dashboard > Manage Jenkins > Configure System > Slack > Add workspace name > Add credentials as “Secret Text” > Enter the Integration Token Credential ID provided earlier:

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* Make sure to enter workspace name (i.e. kura-labs) and select the credential entered:

Application

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* Test connection to ensure it is successful:



* Once you Apply and Save, you will receive a confirmation Slack notification:

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* On GitHub, go to the project repository and edit the Jenkinsfile to include Slack notifications based on build status on each run:

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* As soon as the change is committed, Jenkins will detect the changes (thanks to the webhook) and will automatically trigger a new build:

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* As Jenkins builds each of the stages, a Slack notification will be sent as below:

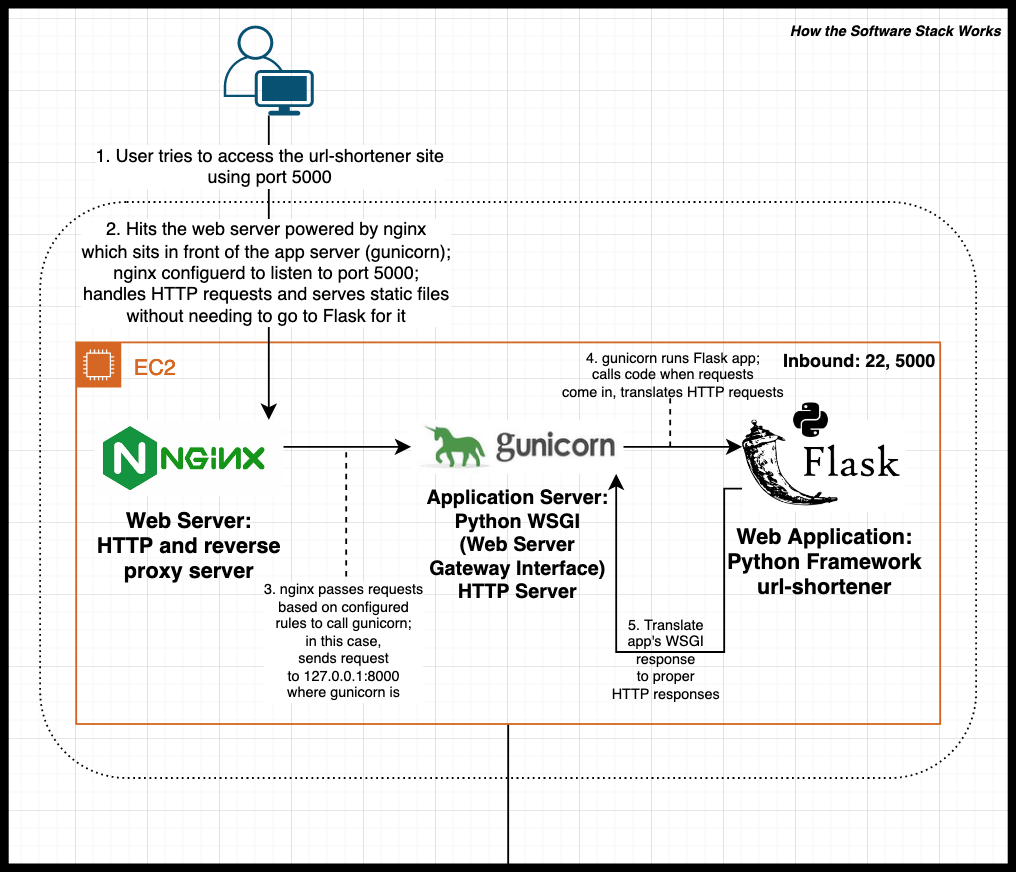
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## Software Stack

My guess of how the **nginx-gunicorn-Flask** stack works:

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