LAB ACTION PLAN FOR WEEK 11

Week 11 Exercise : AWS-LEARNING-ACCOUNT-CREATION

Jenkins-CI/CD (Practice Exercises Below)

1. CI-Continuous Integration using Webhooks .
2. Sending E-mail Notification on Build Failure or success
3. Draw **sequence diagram**, class diagram, and component diagram for your III/I project.
4. Upload the screenshots for the tasks

Lab

Setting Up Jenkins CI------using GitHub Webhook with Jenkins

Step 1: Configure Webhook in GitHub

1. Go to your GitHub repository.
2. Navigate to Settings → **Webhooks.**
3. Click "**Add webhook**".
4. In the Payload URL field:
   - Enter the Jenkins webhook URL in the format: http://<**jenkins-server-url**>/github-webhook/

Note: If Jenkins is running on localhost, GitHub cannot access it directly.

Use ngrok to expose your local Jenkins to the internet:

   - ngrok.exe http <**Jenkins local host:8080**>
     - Use the generated ngrok URL, e.g.:
     - https://wintry-gloryingly-nam.ngrok-free.dev /**github-webhook**/

5. Set Content type to:
   application/json
6. Under "Which events would you like to trigger this webhook?", select:
   - Just the push event
7. Click "Add webhook" to save.

Step 2: Configure Jenkins to Accept GitHub Webhooks

1. Open Jenkins Dashboard.
2. Select the job (freestyle or pipeline) you've already created.
3. Click Configure.
4. Scroll down to the Build Triggers section.
5. Check the box: ☑ GitHub hook trigger for GITScm polling
6. Click Save**.**

Step 3: Test the Setup

1. Make any code update in your local repo and push it to GitHub.
2. Once pushed, GitHub will trigger the webhook.
3. Jenkins will automatically detect the change and start the build pipeline**.**

outcome

- You’ve successfully connected GitHub and Jenkins using webhooks.
- Every time you push code to GitHub, Jenkins will automatically start building your project without manual intervention.

Set-uping the ngrok

How to Install and Use ngrok

Step 1. Download ngrok
https://ngrok.com/download
Download and extract it for your OS (Windows, macOS, or Linux).

Step 2. Connect Your ngrok Account (optional but useful)
After you sign up (free), ngrok gives you an auth token.

- Then got to Your Authtoken click here and copy
- Go ngrok   command promt

CREATE AUTHENTICATOR [https://dashboard.ngrok.com/get-started/your-authtoken]
Run this command (replace <your_token> with yours):
ngrok config add-authtoken <your_token>
This ensures stable sessions and more control.

Step 3. Start a Tunnel for Jenkins

Assuming Jenkins runs locally on port 8080:
Now Go ngrok   command prompt and type below commad
ngrok http 8080
You’ll see output like:

```
Session Status              online
Forwarding                  https://wintry-gloryingly-nam.ngrok-free.dev -> http://localhost:8080
```

Copy the HTTPS URL (https://wintry-gloryingly-nam.ngrok-free.dev) — this is your public Jenkins URL for webhooks.
Step 4. Use it in GitHub Webhook

In your GitHub repo → Settings → Webhooks:

- **Payload URL:**   ***[paste the url generated by ngrok]***

https://wintry-gloryingly-nam.ngrok-free.dev /github-webhook/   [please include this – remaining all default]
Now, whenever you push code, GitHub sends an event to that URL, which ngrok forwards to your local Jenkins.

Setting Up   Jenkins Email Notification Setup (Using Gmail with App Password)

Creation of app password

1. Gmail: Enable App Password (for 2-Step Verification)

i. Go to: https://myaccount.google.com

ii. Enable 2-Step Verification

- Navigate to:
  - Security → 2-Step Verification
  - Turn it **ON**
  - Complete the OTP verification process (via phone/email)

iii. Generate App Password for Jenkins

- Go to:
  - Security → App passwords
- Select:
  - **App**: Other (Custom name)
  - **Name**: Jenkins-Demo
- Click **Generate**
- Copy the **16-digit app password**
  - Save it in a secure location (e.g., Notepad)

2. Jenkins Plugin Installation

i. Open Jenkins Dashboard

ii. Navigate to:

- Manage Jenkins → Manage Plugins

iii. Install Plugin:

- Search for and install:
  - Email Extension Plugin

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3. Configure Jenkins Global Email Settings

i. Go to:

- Manage Jenkins → Configure System

A. E-mail Notification Section

Field	**Value**
SMTP Server	smtp.gmail.com
Use SMTP Auth	☑ Enabled
User Name	Your Gmail ID (e.g., archanareddykmit@gmail.com)
Password	Paste the 16-digit App Password
Use SSL	☑ Enabled
SMTP Port	465
Reply-To Address	Your Gmail ID (same as above)

➤ **Test Configuration**

- Click: Test configuration by sending test e-mail
- Provide a valid email address to receive a test mail
- ☑ Should receive email from Jenkins

B. Extended E-mail Notification Section

Field	Value
SMTP Server	smtp.gmail.com
SMTP Port	465
Use SSL	☑ Enabled
Credentials	Add Gmail ID and App Password as Jenkins credentials
Default Content Type	text/html or leave default
Default Recipients	Leave empty or provide default emails
Triggers	Select as per needs (e.g., Failure)

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4. Configure Email Notifications for a Jenkins Job

i. Go to:

- Jenkins → Select a Job → Configure

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ii. In the Post-build Actions section:

- Click: Add post-build action → **Editable Email Notification**

A. Fill in the fields:

Field	Value
Project Recipient List	Add recipient email addresses (comma-separated)
Content Type	Default (text/plain) or text/html
Triggers	Select events (e.g., Failure, Success, etc.)

Field	**Value**
Attachments	(Optional) Add logs, reports, etc.

iii. Click Save

Now your Jenkins job is set up to send email notifications based on the build status!

Takeaway :
Students learned how to integrate Jenkins with GitHub using webhooks to automate build triggers and configure email notifications to monitor build success or failure effectively.

Viva Questions

1. What is Continuous Integration (CI)?
2. What is Continuous Deployment or Continuous Delivery (CD)?
3. What is the role of Jenkins in a CI/CD pipeline?
4. What is a webhook in GitHub?
5. Why are webhooks used in Jenkins integration?
6. What are the different types of build triggers available in Jenkins?
7. What is the difference between polling and webhook triggers?
8. What is ngrok and why is it used in Jenkins–GitHub integration?
9. How does ngrok help in setting up webhooks for Jenkins running on a local machine?
10. Why do we configure email notifications in Jenkins and how are they useful for monitoring build results?