Jenkins Installation and Management on AWS

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Introduction

Jenkins is an open-source automation server used for **Continuous Integration and Continuous Deployment (CI/CD)**. This guide provides detailed steps for installing, setting up, and managing Jenkins on an **AWS EC2 instance (Amazon Linux 2)**.

Prerequisites

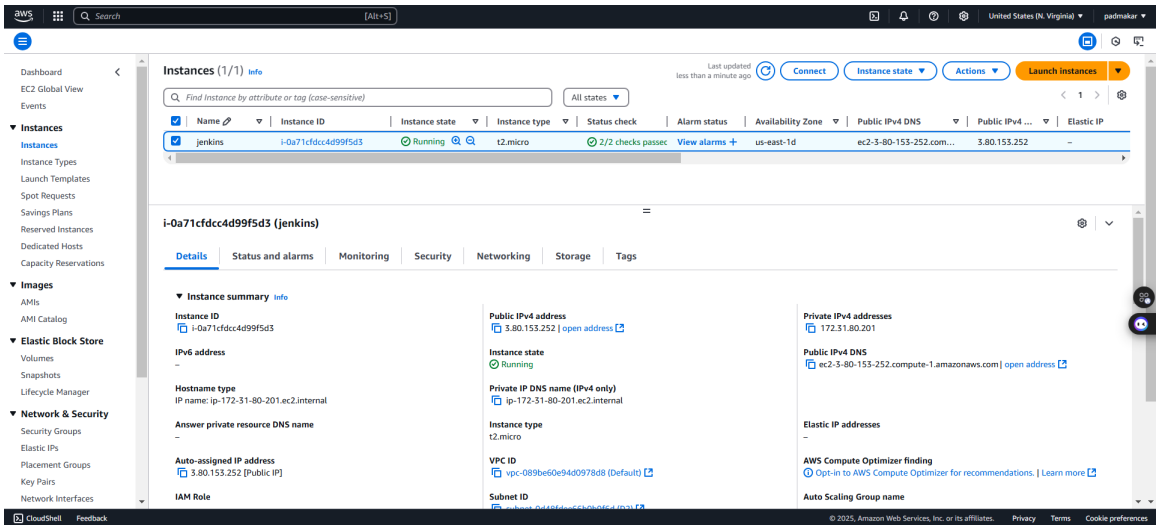
Before installing Jenkins, ensure you have the following:

- AWS Account with access to **EC2**
- **Amazon Linux 2** instance with at least **t2.micro**
- **Security Group** allowing inbound traffic on **port 8080** (Jenkins UI)
- SSH access to the EC2 instance

Installing Jenkins on AWS

1. Launch an EC2 Instance

1. Go to **AWS EC2 Dashboard** → Click **Launch Instance**
2. Select **Amazon Linux 2 AMI**
3. Choose **t2.micro** (Free Tier) or a higher instance type
4. Configure **Security Group**:
    - Allow **port 8080** (for Jenkins)
    - Allow **port 22** (for SSH)
5. Launch the instance and connect via SSH:
6. ssh -i your-key.pem ec2-user@your-instance-ip



2. Install Jenkins

1. **Update the system**:

    - sudo yum update -y

2. **Add the Jenkins repository and install Jenkins** :

    - sudo wget -O /etc/yum.repos.d/jenkins.repo \https://pkg.jenkins.io/redhat-stable/jenkins.repo

3. **Import a key file from Jenkins-CI to enable installation from the package:**

    - sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io-2023.keysudo
    - yum install upgrade

4. **Install Java (Amazon Linux 2023):**

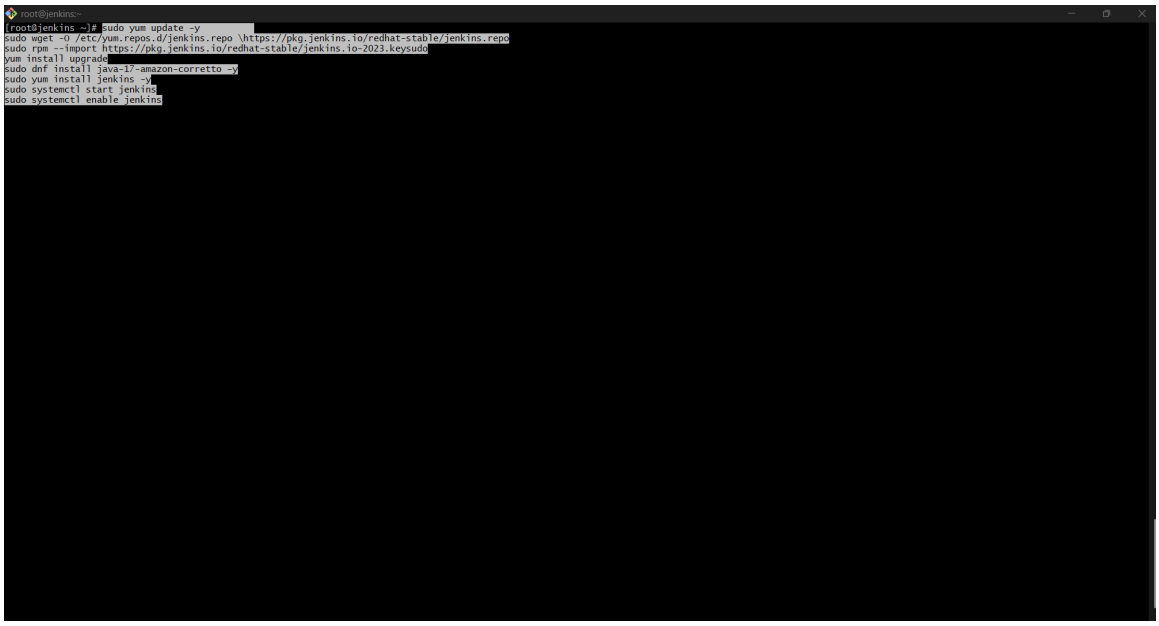
   - sudo dnf install java-17-amazon-corretto –y

5. **Install Jenkins:**

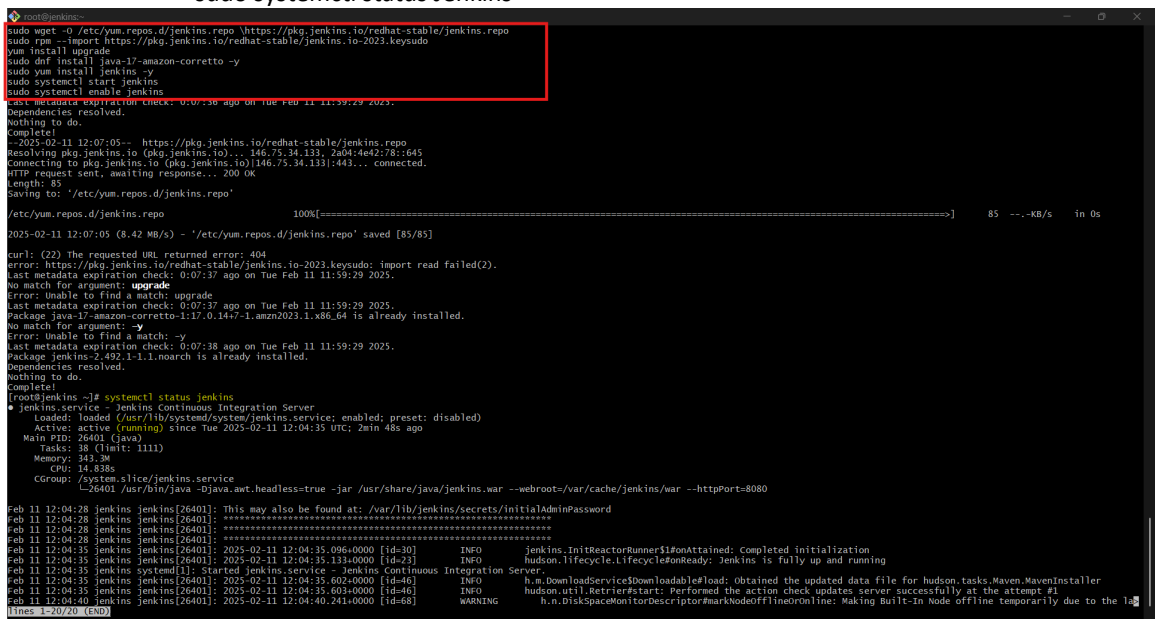
   - sudo yum install jenkins -y

6. **Start and enable Jenkins** :

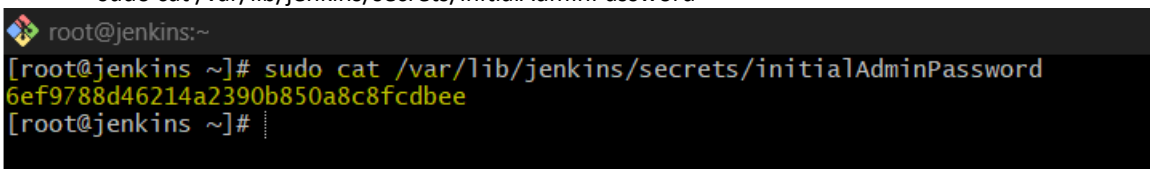
   - sudo systemctl start jenkins
   - sudo systemctl enable jenkins



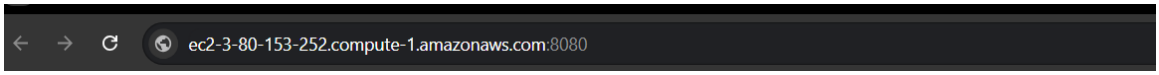
7. **You can check the status of the Jenkins service using the command:**
    - sudo systemctl status Jenkins

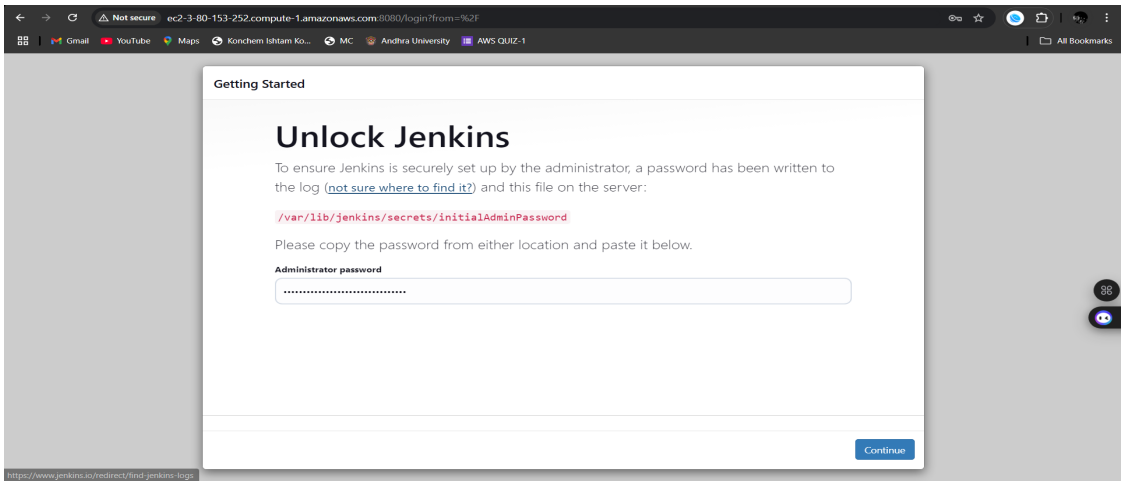


8. **Retrieve the initial admin password**
   sudo cat /var/lib/jenkins/secrets/initialAdminPassword



9. **Access Jenkins UI** Open http://your-ec2-instance-ip:8080 in your browser.





Configuring Jenkins

1. System Configuration

Go to **Manage Jenkins > Configure System** to modify:

- Build execution settings
- Email notifications
- Environment variables

2. Global Tool Configuration

Go to **Manage Jenkins > Global Tool Configuration** to configure:

- **JDK**
- **Git**
- **Maven**

3. Managing Plugins

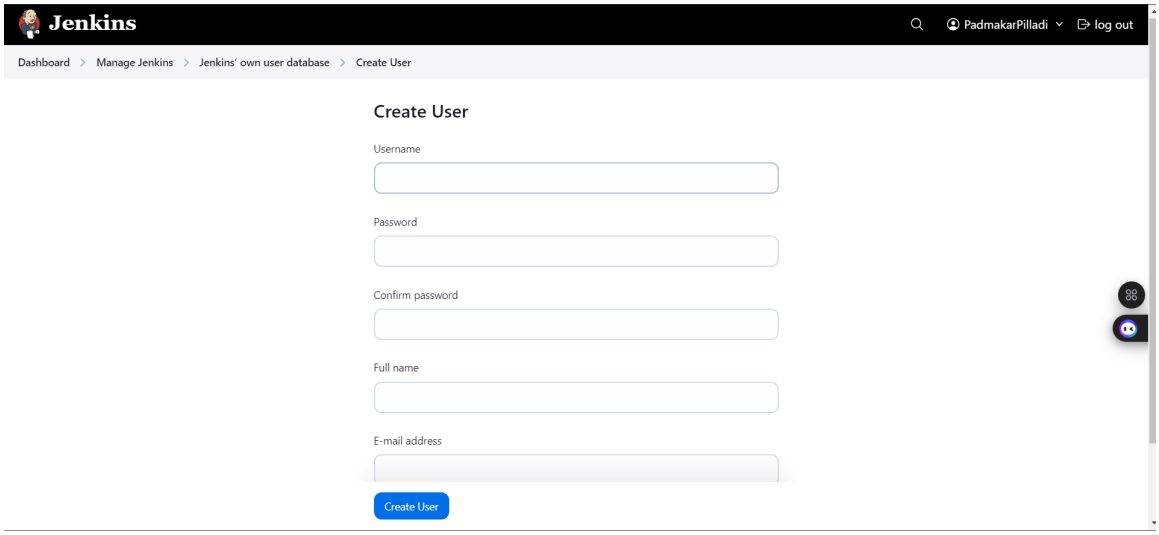
Go to **Manage Jenkins > Manage Plugins** to install essential plugins:

- **Pipeline Plugin**
- **Git Plugin**
- **Role-Based Access Control Plugin**

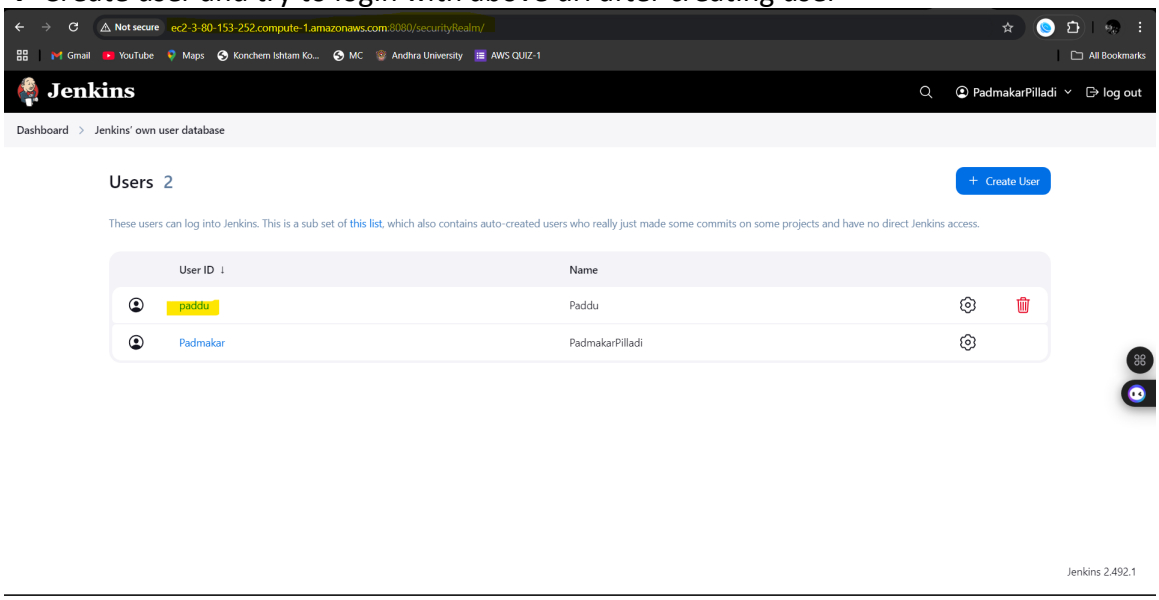
Managing Users & Permissions

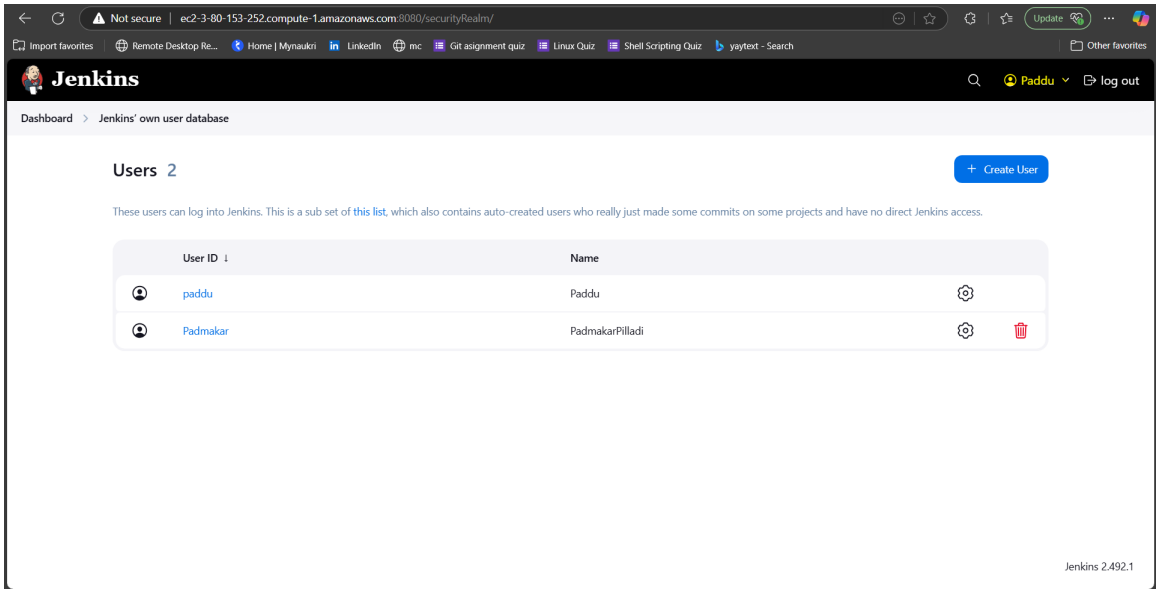
1. Creating Users

1. Go to **Manage Jenkins > Manage Users**
2. Click **Create User** and define:
    - Username
    - Password
    - Email



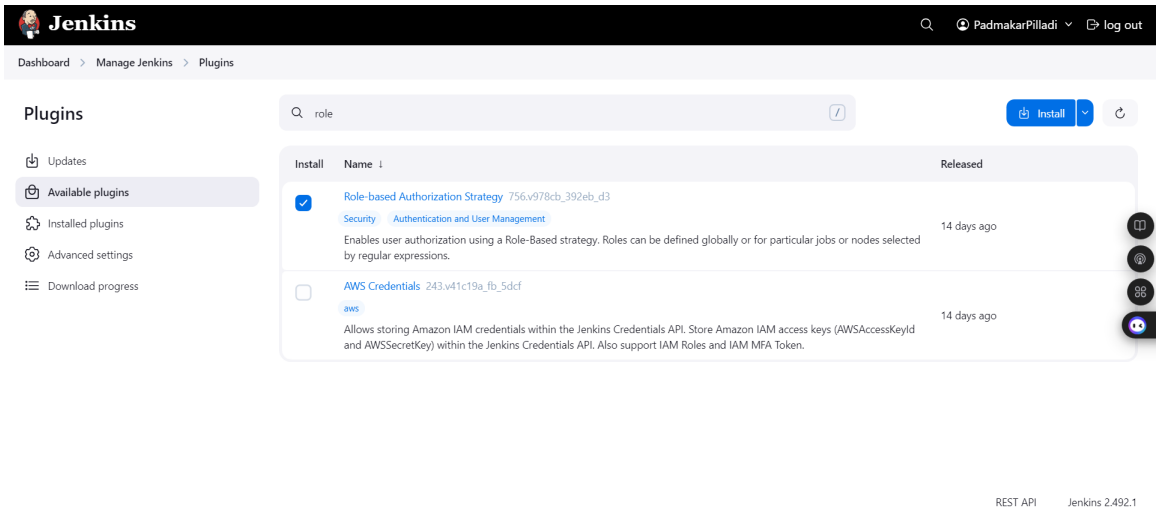
→ Create user and try to login with above url after creating user



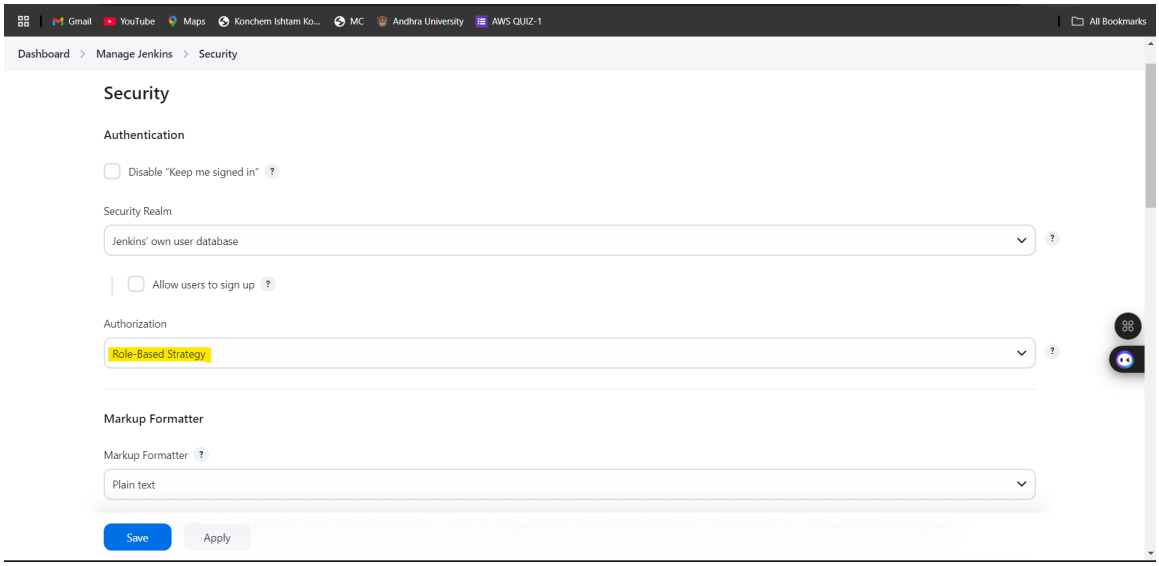


2. Role-Based Access Control (RBAC)

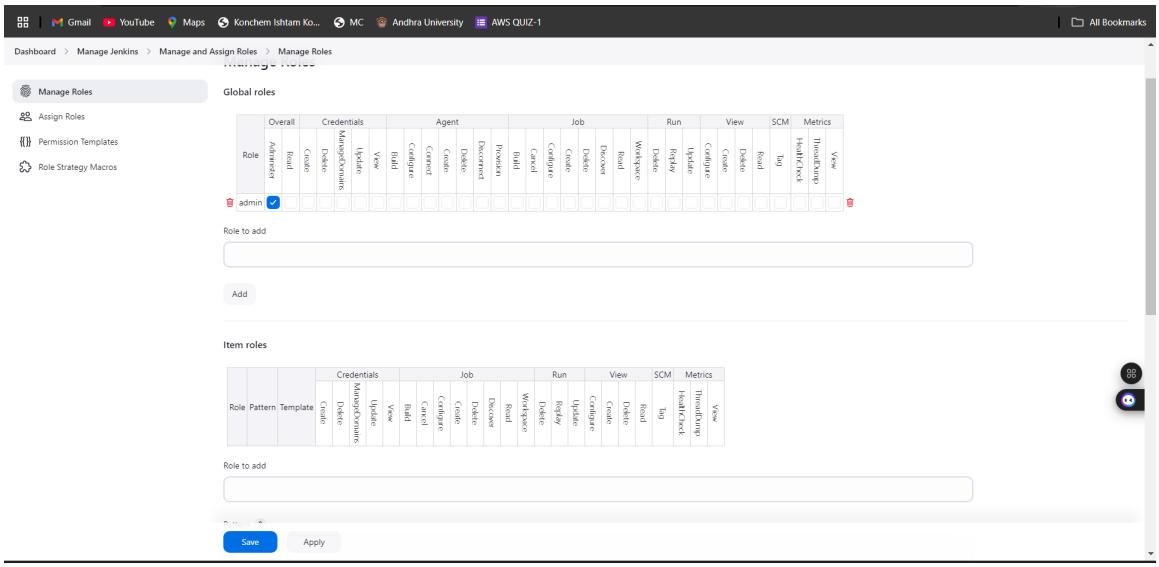
1. Install the **Role-Based Authorization Strategy Plugin**



2. Go to **Manage Jenkins > Configure Global Security**
3. Select **Role-Based Strategy**



4. Define **roles and permissions** based on user needs
    1. After adding Role-Based Strategy, in securities we get manage and and assign roles.
    2. There we can give permissions according to roles and assign users to respective roles.



Security Best Practices

- **Enable Authentication** (Avoid anonymous access)
- **Use Role-Based Access Control (RBAC)**
- **Secure Jenkins with HTTPS**
- **Limit Public Access** (Restrict access via AWS Security Groups)
- **Use API Tokens instead of passwords**

Troubleshooting

Jenkins Not Starting?

Check logs using:

```
sudo journalctl -u jenkins -xe
```

Port 8080 Not Accessible?

Ensure Security Group allows **inbound traffic on port 8080**.

Permission Issues?

Check **Manage Jenkins > Configure Global Security** and update user roles.

Conclusion

This guide covered everything from **installing Jenkins on AWS** to **managing users, security, and troubleshooting**. You can now use Jenkins effectively in your CI/CD pipeline!
