

DevOps Engineer – Junior Role Assignment

Project Objective

Set up a complete **CI/CD workflow and deployment pipeline** for a Node.js application with secure access and monitoring. The project ensures automated deployment via Jenkins, application availability via **Nginx reverse proxy with SSL**, and basic monitoring of server resources.

Tech Stack

- **Jenkins** – CI/CD Pipeline automation
- **Node.js + npm** – Application runtime
- **PM2** – Process manager for Node.js
- **Nginx** – Reverse proxy and SSL termination
- **DuckDNS** – Free dynamic DNS for custom domain
- **Certbot (Let's Encrypt)** – SSL certificates
- **Linux (Amazon Linux 2023 on EC2)** – Hosting environment

Deployment Steps

1. Clone Application

```
git clone https://github.com/<your-repo>/happy_app.git  
cd happy_app
```

2. Install Dependencies

Run:

```
./scripts/install_dependencies.sh
```

This installs Node.js, Git, Java, and Nginx.

3. Jenkins Setup

- Install Jenkins → `sudo yum install jenkins -y`
- Start service → `sudo systemctl start jenkins`
- Configure **NodeJS Tool** in **Manage Jenkins** → **Global Tool Configuration**
- Secure Jenkins with **Matrix-based Security**:
 - Admin role (full access)
 - Developer role (read/build only)
 - Disable anonymous access

4. CI/CD Pipeline

Pipeline stages:

1. **Checkout** → Pull latest code from GitHub
2. **Install Dependencies** → `npm`
3. **Run Tests** → `npm test` (or skip if none)
4. **Build** → `npm run build`
5. **Deploy** → Start/Reload app using PM2
6. **Nginx Reload** → Validate config and reload proxy

5. Nginx Reverse Proxy with SSL

/etc/nginx/conf.d/happy_app.conf

```
server {  
  
    listen 80;  
  
    server_name happyapp.duckdns.org;  
  
  
    location / {  
  
        proxy_pass http://127.0.0.1:3000;  
  
        proxy_set_header Host $host;  
  
        proxy_http_version 1.1;  
  
        proxy_set_header Upgrade $http_upgrade;  
  
        proxy_set_header Connection 'upgrade';  
  
    }  
}
```

Reload:

```
sudo nginx -t
```

```
sudo systemctl reload nginx
```

6. Auto Update DuckDNS IP

Create update script:

```
mkdir ~/duckdns  
cd ~/duckdns  
nano duck.sh
```

Inside duck.sh

echo

```
url="https://www.duckdns.org/update?domains=devlogin.nextastra.com&token=fba73e66-6b88-4c8a-bce1-ac92d504a73f&ip=13.127.251.217" | curl -k -o ~/duckdns/duck.log -K -
```

(replaced `happyapp` and `YOUR_TOKEN` with your DuckDNS values)

Make executable:

```
chmod 700 duck.sh
```

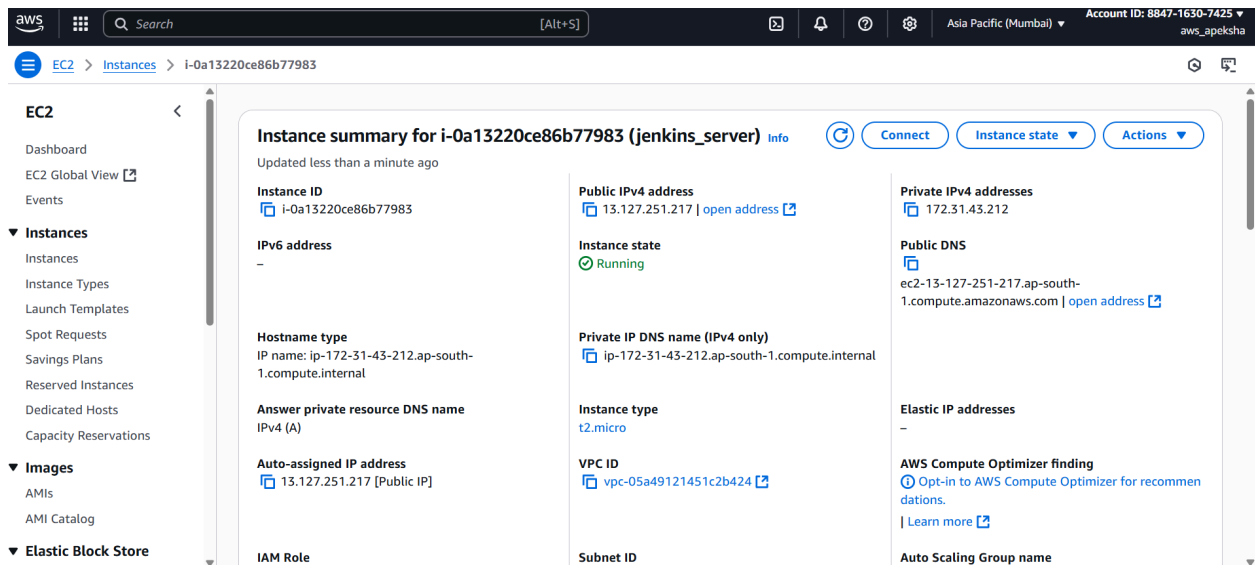
Screenshots

DevOps pipeline

This screenshot shows the Jenkins web interface for a pipeline named "DevOps-Pipeline". The browser address bar indicates the URL is 13.127.251.217:8080/job/DevOps-Pipeline/. The Jenkins logo and "DevOps-Pipeline" are at the top left. On the right, there are search, settings, and user icons, along with an "Edit description" button. A left sidebar contains navigation links: Status (selected), Changes, Build Now, Configure, Delete Pipeline, Stages, Rename, and Pipeline Syntax. The main content area shows a green checkmark icon next to "DevOps-Pipeline" with the description "nodejs application pipeline". Below this is a "Permalinks" section with a list of links: "Last build (#2), 3 min 53 sec ago", "Last stable build (#2), 3 min 53 sec ago", "Last successful build (#2), 3 min 53 sec ago", "Last failed build (#1), 17 min ago", "Last unsuccessful build (#1), 17 min ago", and "Last completed build (#2), 3 min 53 sec ago". A "Builds" panel on the left shows a filter input and a list of builds: "#2 9:30 pm" (green circle) and "#1 9:16 pm" (red circle). At the bottom right, it says "REST API" and "Jenkins 2.516.2". The Windows taskbar at the very bottom shows the date and time as 3:05 AM on 8/23/2025.

This screenshot is identical to the one above, showing the Jenkins web interface for the "DevOps-Pipeline". The browser address bar shows the same URL. The Jenkins logo and "DevOps-Pipeline" are at the top left. The right sidebar contains search, settings, and user icons, along with an "Edit description" button. The left sidebar contains navigation links: Status (selected), Changes, Build Now, Configure, Delete Pipeline, Stages, Rename, and Pipeline Syntax. The main content area shows a green checkmark icon next to "DevOps-Pipeline" with the description "nodejs application pipeline". Below this is a "Permalinks" section with a list of links: "Last build (#2), 16 min ago", "Last stable build (#2), 16 min ago", "Last successful build (#2), 16 min ago", "Last failed build (#1), 29 min ago", "Last unsuccessful build (#1), 29 min ago", and "Last completed build (#2), 16 min ago". A "Builds" panel on the left shows a filter input and a list of builds: "#2 9:30 pm" (green circle) and "#1 9:16 pm" (red circle). At the bottom right, it says "REST API" and "Jenkins 2.516.2". The Windows taskbar at the very bottom shows the date and time as 3:05 AM on 8/23/2025.

Jenkins server



The screenshot displays the AWS Management Console interface for an EC2 instance. The left sidebar shows the navigation menu with categories like EC2, Images, and Elastic Block Store. The main content area shows the 'Instance summary for i-0a13220ce86b77983 (jenkins_server)'. The instance is in a 'Running' state. Key details include: Instance ID: i-0a13220ce86b77983, Public IPv4 address: 13.127.251.217, Private IPv4 address: 172.31.43.212, Public DNS: ec2-13-127-251-217.ap-south-1.compute.amazonaws.com, Private IP DNS name: ip-172-31-43-212.ap-south-1.compute.internal, Instance type: t2.micro, VPC ID: vpc-05a49121451c2b424, and Subnet ID. The instance is associated with the IAM Role 'jenkins_server'.

Instance summary for i-0a13220ce86b77983 (jenkins_server) info [Connect](#) [Instance state](#) [Actions](#)

Updated less than a minute ago

Instance ID
i-0a13220ce86b77983

Public IPv4 address
13.127.251.217 | [open address](#)

Private IPv4 addresses
172.31.43.212

Instance state
Running

Public DNS
ec2-13-127-251-217.ap-south-1.compute.amazonaws.com | [open address](#)

Private IP DNS name (IPv4 only)
ip-172-31-43-212.ap-south-1.compute.internal

Instance type
t2.micro

VPC ID
vpc-05a49121451c2b424 | [open address](#)

Subnet ID

IPv6 address
-

Hostname type
IP name: ip-172-31-43-212.ap-south-1.compute.internal

Answer private resource DNS name
IPv4 (A)

Auto-assigned IP address
13.127.251.217 [Public IP]

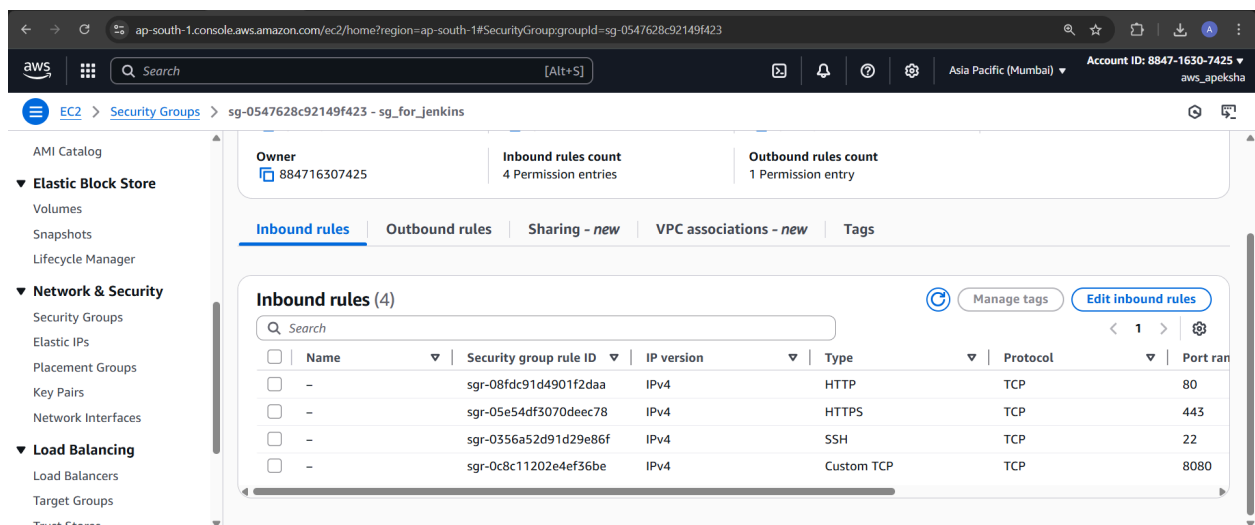
IAM Role

Elastic IP addresses
-

AWS Compute Optimizer finding
Opt-in to AWS Compute Optimizer for recommendations. | [Learn more](#)

Auto Scaling Group name

Security group



The screenshot displays the AWS Management Console interface for a Security Group. The left sidebar shows the navigation menu with categories like Elastic Block Store, Network & Security, and Load Balancing. The main content area shows the 'Security group details for sg-0547628c92149f423 - sg_for_jenkins'. The security group is owned by 884716307425. It has 4 inbound rules and 1 outbound rule. The inbound rules are listed in a table below.

Owner
884716307425

Inbound rules count
4 Permission entries

Outbound rules count
1 Permission entry

Inbound rules | **Outbound rules** | **Sharing - new** | **VPC associations - new** | **Tags**

Inbound rules (4) [Manage tags](#) [Edit inbound rules](#)

<input type="checkbox"/>	Name	Security group rule ID	IP version	Type	Protocol	Port range
<input type="checkbox"/>	-	sgr-08fdc91d4901f2daa	IPv4	HTTP	TCP	80
<input type="checkbox"/>	-	sgr-05e54df3070deec78	IPv4	HTTPS	TCP	443
<input type="checkbox"/>	-	sgr-0356a52d91d29e86f	IPv4	SSH	TCP	22
<input type="checkbox"/>	-	sgr-0c8c11202e4ef36be	IPv4	Custom TCP	TCP	8080

NGINX test

```
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh/home?region=ap-south-1&connType=standard&iinstanceId=i-0a13220ce86b77983&osUser=ec2-user&sshPort=22&...
aws Search [Alt+S] Asia Pacific (Mumbai) Account ID: 8847-1630-7425 aws_apeksha


[ec2-user@ip-172-31-43-212 ~]$ sudo nginx -t
nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
nginx: configuration file /etc/nginx/nginx.conf test is successful
[ec2-user@ip-172-31-43-212 ~]$
```

i-0a13220ce86b77983 (jenkins_server)

PublicIPs: 13.127.251.217 PrivateIPs: 172.31.43.212

Duck DNS

www.duckdns.org/login-google?state=uhiuhogyufowaeohawhesauoi&code=4%2F0AVMBsJbUUX4t2INxtooFLp1sqCmHpfI31e9AC2Jf44XaLL2mlcrh_hKUUS2BzFMJ1g&scope=email+http...
Duck DNS spec about why install faqs logout logged in with apekshagangurde1205@gmail.com |||



Duck DNS

account apekshagangurde1205@gmail.com
type free
token fba73e66-6b88-4c8a-bce1-ac92d504a73f
token generated 21 minutes ago
created date 22 Aug 2025, 20:55:07

domains 0/5

domain	current ip	ipv6	changed
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Deployed [Node.js](#) app



Submitted by,
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