Hands-On Lab: Launch and Configure an EC2 Instance with a Web Server

This lab guides you through launching a t2.micro EC2 instance with Amazon Linux 2 AMI, configuring security groups, connecting via SSH, installing Apache web server, and hosting a simple web page.

Prerequisites

- AWS Free Tier account with IAM user access (preferably with EC2FullAccess permissions)
- AWS CLI installed and configured
- SSH client installed (OpenSSH for Mac/Linux/Windows)
- Internet access and web browser for AWS Management Console
- (Optional) Smartphone with MFA app if root account access is needed

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Task 1: Launch an EC2 Instance

Step 1.1: Access AWS Console

1. Navigate to AWS Management Console
2. Log in with your IAM user credentials
3. Ensure you're in a Free Tier supported region (e.g., **us-east-1**)

Step 1.2: Navigate to EC2

1. Search for "EC2" in the Console or select EC2 from the services menu
2. Click **Instances** > **Launch instances**

Step 1.3: Configure Instance Settings

Name and Tags:

- Instance name: `My-Web-Server`

Application and OS Images (AMI):

- Select **Amazon Linux 2 AMI (HVM), SSD Volume Type** (Free Tier eligible)

Instance Type:

- Choose **t2.micro** (Free Tier eligible: 1 vCPU, 1 GiB memory)

Key Pair (Login):

1. Click **Create new key pair**
2. Configure the key pair:
   - Key pair name: `my-ec2-key`
   - Key pair type: **RSA**
   - Private key file format: **.pem**
3. Click **Create key pair** and download `my-ec2-key.pem`
4. Store the file securely (e.g., `~/Downloads/my-ec2-key.pem`)
5. Set correct permissions:

```bash
chmod 400 ~/Downloads/my-ec2-key.pem
```

Network Settings:

- VPC: Use the **default VPC**
- Subnet: Select **No preference** (uses default subnet)
- Auto-assign public IP: **Enable** (required for SSH and HTTP access)

Firewall (Security Groups):

1. Select **Create security group**
2. Security group name: `Web-Server-SG`
3. Description: `Security group for web server access`
4. Add the following rules:
   - **Rule 1:**
     - Type: **SSH**
     - Protocol: TCP
     - Port: **22**
     - Source: **My IP** (or 0.0.0.0/0 for simplicity, but less secure)
   - **Rule 2:**
     - Type: **HTTP**
     - Protocol: TCP
     - Port: **80**

- Source: **Anywhere** (0.0.0.0/0)

Storage:

- Keep default: 1x 8 GiB gp2 volume (Free Tier eligible)

Advanced Details:

- Leave defaults (no IAM role needed for this lab)

Step 1.4: Launch Instance

1. Click **Launch instance**
2. Go to **EC2** > **Instances** and confirm `My-Web-Server` is in **"Running"** state
3. Note the instance's **Public IPv4 address** (e.g., 54.123.45.67)

Troubleshooting

- **Instance Not Launching:** Ensure t2.micro and Amazon Linux 2 AMI are selected
- **No Public IP:** Verify "Auto-assign public IP" is enabled
- **Security Group Issues:** Ensure SSH (port 22) and HTTP (port 80) rules are configured correctly

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Task 2: Connect to the EC2 Instance

Step 2.1: Connect via SSH

1. Open a terminal (Mac/Linux/Windows)
2. Connect using the downloaded key pair:

```bash
ssh -i ~/Downloads/my-ec2-key.pem ec2-user@<public-ip>
```

Example:

```bash
ssh -i ~/Downloads/my-ec2-key.pem ec2-user@54.123.45.67
```

3. If prompted, type `yes` to accept the host key

Expected Output: Terminal prompt like `[ec2-user@ip-xxx-xxx-xxx-xxx ~]$`

Step 2.2: Verify Connection

Run the following command:

```bash
whoami
```

Expected Output: `ec2-user`

Step 2.3: Test System Information

```bash
uname -a
```

Expected Output: Information about the Amazon Linux 2 system (kernel version, etc.)

Step 2.4: Alternative - EC2 Instance Connect (Browser-Based)

1. In AWS Console, go to **EC2** > **Instances** > Select `My-Web-Server`
2. Click **Connect** > **EC2 Instance Connect** tab
3. Ensure User name is `ec2-user`
4. Click **Connect**

Expected Output: Browser-based terminal opens with EC2 prompt

Troubleshooting

- **SSH Connection Refused:** Verify security group allows port 22 from your IP and instance is running
- **Permission Denied:** Ensure key pair file has correct permissions (`chmod 400`) and using `ec2-user` as username
- **EC2 Instance Connect Fails:** Ensure instance is in public subnet with public IP and security group allows SSH

Task 3: Install and Configure a Web Server

Step 3.1: Connect to Instance

Connect via SSH (as shown in Task 2):

```bash
```

```
ssh -i ~/Downloads/my-ec2-key.pem ec2-user@<public-ip>
```

Step 3.2: Install Apache Web Server

Update the instance:

```
bash

sudo yum update -y
```

Install Apache HTTP Server:

```
bash

sudo yum install httpd -y
```

Start Apache:

```
bash

sudo systemctl start httpd
```

Enable Apache to start on boot:

```
bash

sudo systemctl enable httpd
```

Verify Apache is running:

```
bash

sudo systemctl status httpd
```

Expected Output: Shows `active (running)` status

Step 3.3: Create a Simple HTML Page

Navigate to Apache web directory:

```
bash

cd /var/www/html
```

Create an index.html file:

```bash
sudo nano index.html
```

Add the following HTML content:

```html
<!DOCTYPE html>
<html>
<head>
    <title>My AWS Web Server</title>
</head>
<body>
    <h1>Welcome to My AWS EC2 Web Server!</h1>
    <p>This is a simple web page hosted on an EC2 instance.</p>
</body>
</html>
```

Save and exit: Press `Ctrl+O`, `Enter`, then `Ctrl+X`

Set correct permissions:

```bash
sudo chmod 644 /var/www/html/index.html
sudo chown apache:apache /var/www/html/index.html
```

Troubleshooting

- **Apache Not Running:** Restart Apache and check status:

```bash
sudo systemctl restart httpd
sudo systemctl status httpd
```

- **Permission Issues:** Verify `index.html` permissions and ownership (`apache:apache`)

Task 4: Test and Clean Up

Step 4.1: Access the Web Page

1. Open a web browser
2. Enter the instance's public IP address:

```
http://<public-ip>
```

Example: `http://54.123.45.67`

Expected Output: Web page displays "Welcome to My AWS EC2 Web Server!"

Step 4.2: Verify Apache Logs (Optional)

Check Apache access logs:

```
bash

sudo cat /var/log/httpd/access_log
```

Expected Output: Shows HTTP requests from your browser

Step 4.3: Exit the Terminal

```
bash

exit
```

Step 4.4: Clean Up Resources

Terminate EC2 Instance:

1. Go to **EC2** > **Instances**
2. Select `My-Web-Server`
3. Click **Instance state** > **Terminate instance**

Key Pair and Security Group:

- **Keep** `my-ec2-key.pem` for future labs (no cost)
- **Keep** `Web-Server-SG` for future labs (no cost)

Billing Check:

- Verify no unexpected charges in AWS Billing Console
- Set up billing alerts if not already configured

Troubleshooting

- **Web Page Not Accessible:** Ensure security group allows HTTP (port 80) from 0.0.0.0/0 and instance has public IP
- **Browser Errors:** Ensure using `http://` (not `https://`) with correct public IP

Expected Outcomes

- ✅ t2.micro EC2 instance launched with Amazon Linux 2 AMI
- ✅ Security group configured for SSH (port 22) and HTTP (port 80)
- ✅ Successfully connected to instance via SSH
- ✅ Apache web server installed, started, and hosting HTML page
- ✅ Web page accessible via instance's public IP in browser

Important Tips

- **Store** the key pair file (`my-ec2-key.pem`) securely; it cannot be re-downloaded
- **Always terminate** unused EC2 instances to stay within Free Tier limits
- **Monitor usage** in AWS Billing Console and set billing alerts
- **Refer to documentation:**
  - AWS EC2 Documentation
  - Amazon Linux 2 Documentation

Quick Reference Commands

bash

```
# Set key pair permissions
chmod 400 ~/Downloads/my-ec2-key.pem

# Connect via SSH
ssh -i ~/Downloads/my-ec2-key.pem ec2-user@<public-ip>

# Update and install Apache
sudo yum update -y
sudo yum install httpd -y

# Manage Apache service
sudo systemctl start httpd
sudo systemctl enable httpd
sudo systemctl status httpd

# Create web page
cd /var/www/html
sudo nano index.html

# Set permissions
sudo chmod 644 /var/www/html/index.html
sudo chown apache:apache /var/www/html/index.html

# View logs
sudo cat /var/log/httpd/access_log
```