SECURE VPN DEPLOYMENT ON AWS USING EC2 & OPENVPN

Proof-of-Concept Documentation (DO NOT use as-is in production)

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1. INTRODUCTION

This documentation outlines the process of deploying a secure VPN server on AWS EC2 using OpenVPN. Readers will learn how to provision an EC2 instance, configure OpenVPN, and securely connect client devices to route traffic through AWS.

2. ARCHITECTURE OVERVIEW

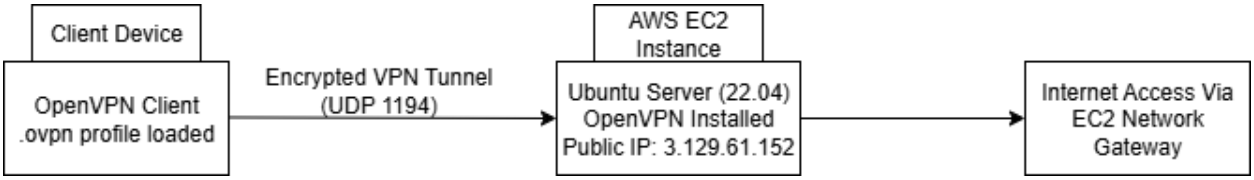

Figure 1: Project Network Diagram

3. PREREQUISITES

Item	Notes
AWS Account (Free Tier)	IAM user with EC2 & Security Group Permissions
OpenVPN Client	Installed locally (Windows, macOS, or Linux)
SSH Client	PuTTY or OpenSSH for EC2 access
.ovpn profile	Generated after server setup

4. IMPLEMENTATION STEPS

4.1 Launch EC2 Instance

1. Navigate to EC2 -> Launch Instance.

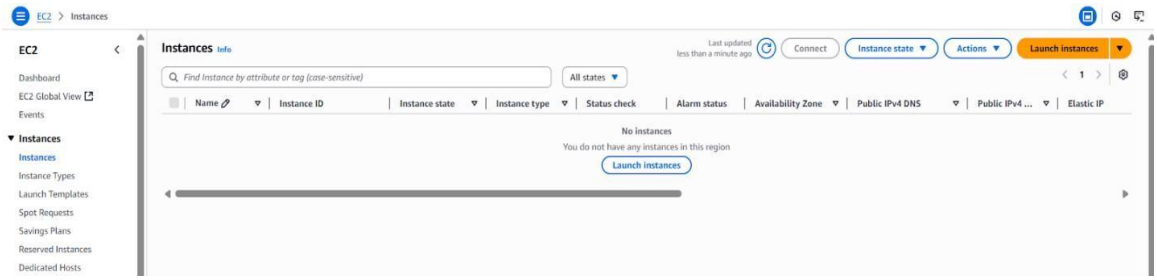

Figure 2: AWS EC2 Instance Dashboard

2. AMI: Ubuntu Server 22.04 LTS

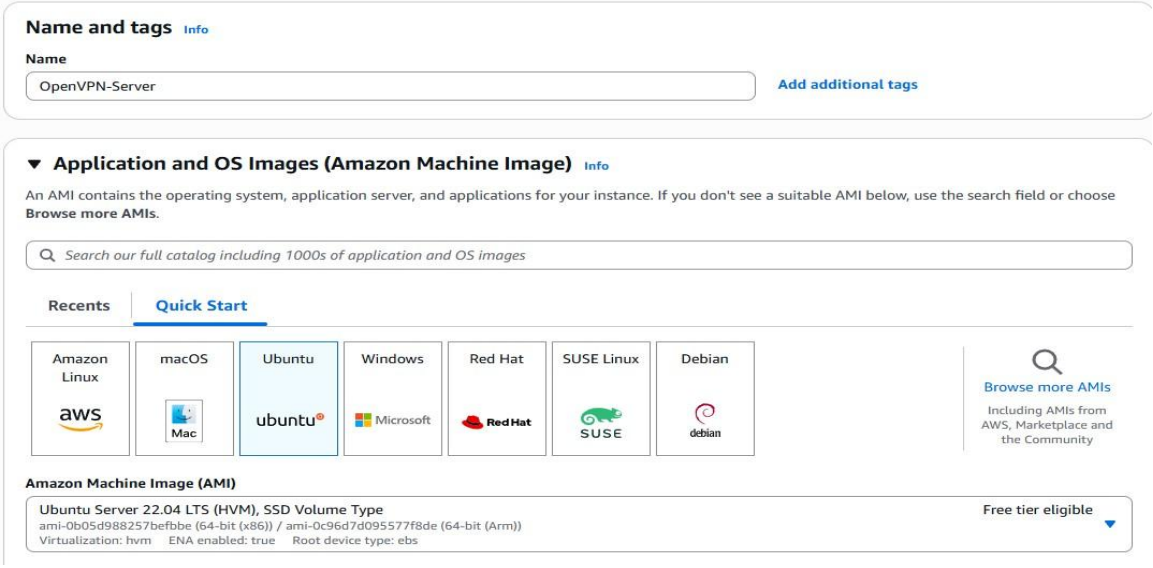

Figure 3: AMI Selection

3. Instance type: t2.micro (Free Tier)
4. Configure key pair for SSH access.

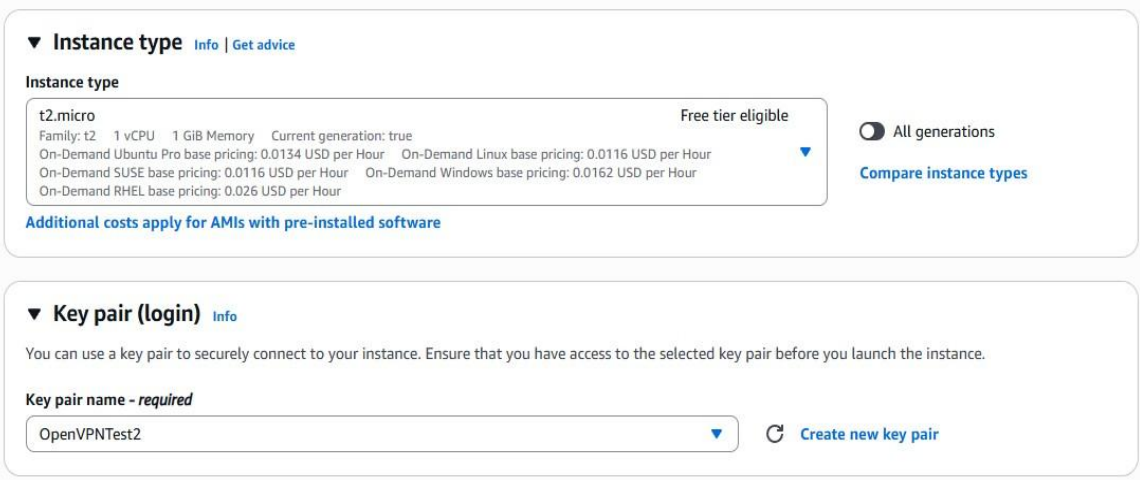

Figure 4: Instance Type & Key Pair

4.2 Configure Security Groups

1. Allow inbound traffic:
    - UDP 1194 (OpenVPN)
    - TCP 22 (SSH)
2. Restrict source IP ranges for security.

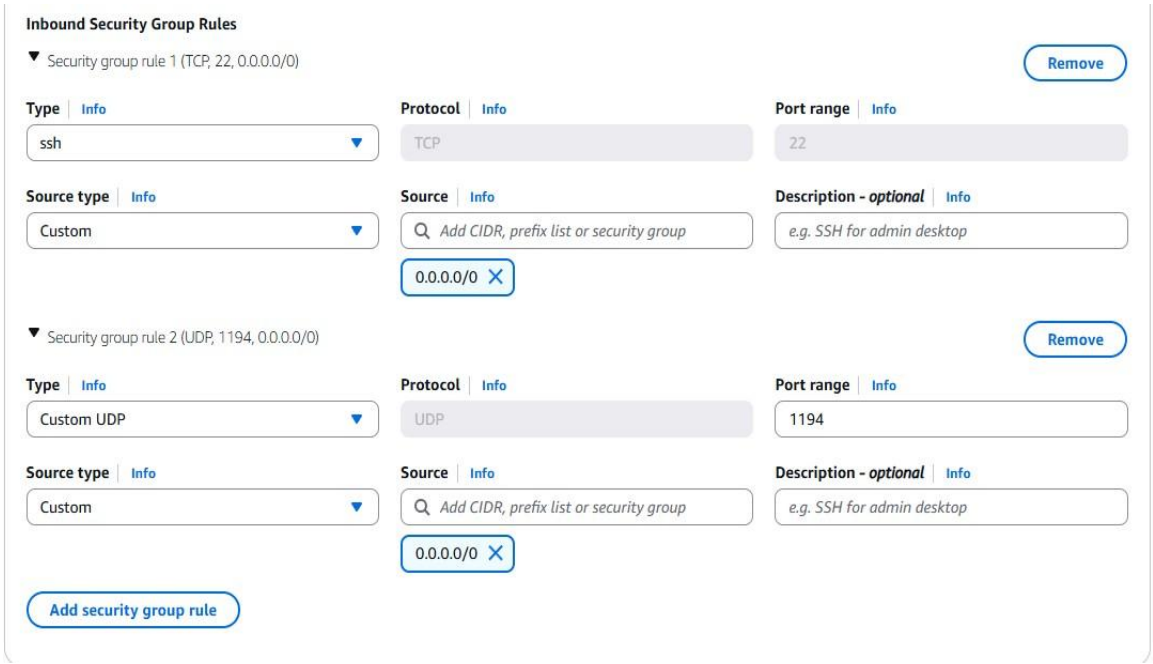

Figure 5: Security Group Rules

4.3 Install & Configure OpenVPN

1. Download OpenVPN install script
    - Bash curl -O (install script)

```
ubuntu@ip-172-31-30-161:~$ curl -O https://raw.githubusercontent.com/angristan/openvpn-install/master/openvpn-install.sh
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 42167  100 42167    0     0   199k      0 --:--:-- --:--:-- --:--:--  200k
```

Figure 6: Downloading OpenVPN Install Script

2. Give the script permission to run and run it
    - Chmod +x openvpn-install.sh
    - Sudo ./openvpn-install.sh

```
ubuntu@ip-172-31-30-161:~$ chmod +x openvpn-install.sh
ubuntu@ip-172-31-30-161:~$ sudo ./openvpn-install.sh
Welcome to the OpenVPN installer!
```

Figure 7: Running Installation Script

4.4 Transfer Client Configuration File

1. Use SCP or WinSCP to download .ovpn file from server to local machine

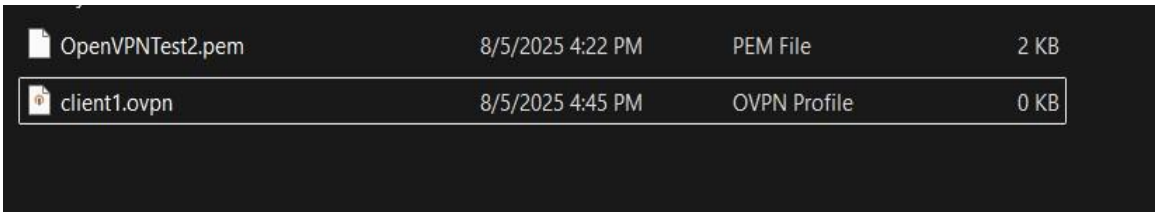

Figure 8: Generated Keys and Profiles

4.5 Connect to VPN

1. Import .ovpn file into OpenVPN Client.
2. Connect and verify traffic is routed through EC2 instance.

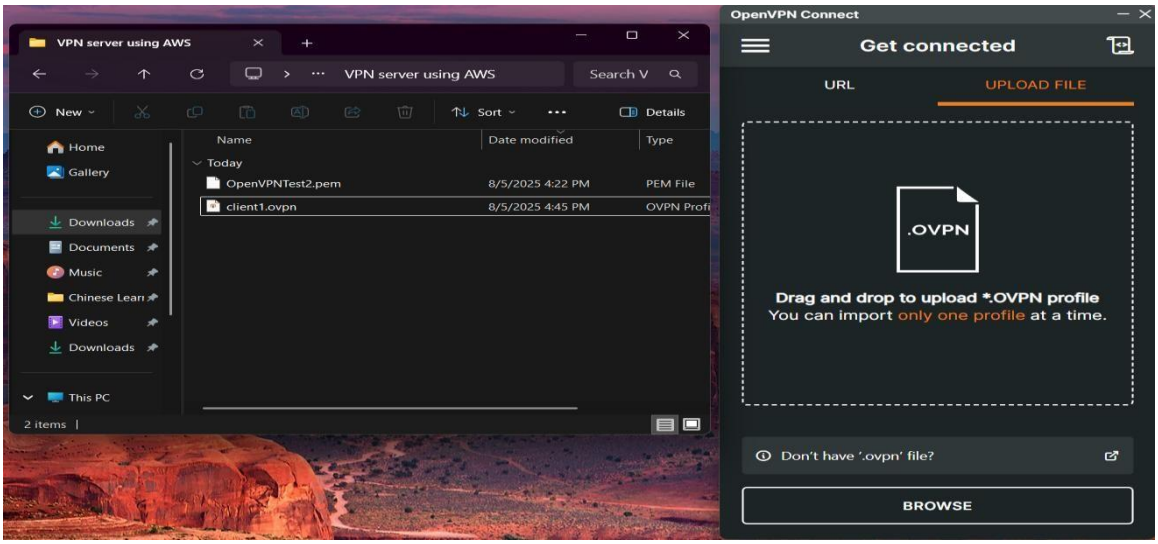

Figure 9: Importing VPN Profile

5. COST & SECURITY CONSIDERATIONS

Service	Free Tier?	Approx. Monthly Cost
EC2 t2.micro	Yes (750 hrs)	~0.00 (Free Tier)
Data transfer	Partial	Varies with usage

- Use IAM least privilege roles for EC2.
- Consider fail2ban or AWS WAF for SSH brute-force protection.
- Implement firewall rules to limit access.

6. OUTCOME & VERIFICATION

- VPN tunnel was established between client and AWS EC2. (See Appendix A)
- Verified public IP change using whatismyip.com. (See Appendix B)

7. FUTURE ENHANCEMENTS

- Automate setup with AWS CDK or Terraform.
- Implement MFA-based VPN authentication.
- Enable CloudWatch logs for monitoring.
- Configure certificate-based authentication.

8. APPENDIX

Appendix A – OpenVPN Connection Status

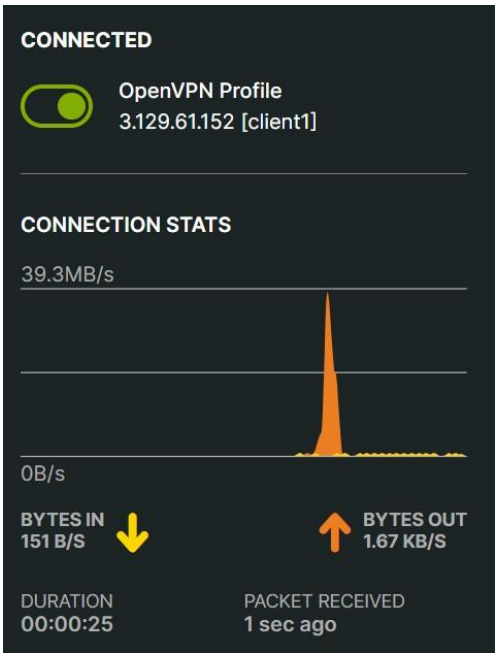

Figure 10: OpenVPN Connection Status

Appendix B – Public IP Verification After VPN Connection

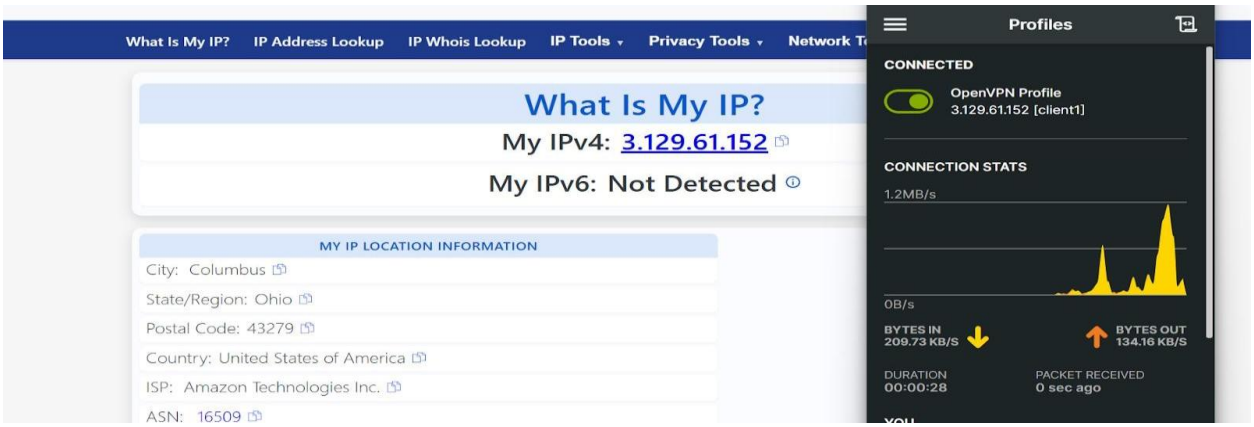

Figure 11: VPN IP Address Verification