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CIS4951 U01 1261

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BingerVPN Installation Guide

Prerequisites

- Debian 11, 12, or 13
- Root or sudo user
- A static Public IP address

Step 1

1. Install OpenVPN + Easy-RSA

```
BingerVPN@vultr:~$ sudo apt install openvpn easy-rsa
```

Step 2

2. Set up Easy-RSA command line utility in home directory and initialize Public Key Infrastructure

```
BingerVPN@vultr:~$ cp -r /usr/share/easy-rsa ~/easy-rsa
```

```
BingerVPN@vultr:~/easy-rsa$ ./easyrsa init-pki
```

Step 3

3. Build the Certificate Authority

```
BingerVPN@vultr:~/easy-rsa$ ./easyrsa build-ca
```

- Set a strong password

Step 4

4. Create the Server Certificate and Private Key

```
BingerVPN@vultr:~/easy-rsa$ ./easyrsa gen-req server nopass
```

```
BingerVPN@vultr:~/easy-rsa$ ./easyrsa sign-req server server
```

- Type yes when prompted

Step 5

5. Generate Diffie-Hellman Parameters and TLS Authentication Key

```
BingerVPN@vultr:~/easy-rsa$ ./easyrsa gen-dh
```

```
BingerVPN@vultr:~/easy-rsa$ openssl genpkey --genkey --secret ta.key
```

Step 6

6. Create Client Certificate and Private Key

```
BingerVPN@vultr:~/easy-rsa$ ./easyrsa gen-req client1 nopass
```

```
BingerVPN@vultr:~/easy-rsa$ ./easyrsa sign-req client client1
```

Step 7

7. Create OpenVPN Server Configuration

```
BingerVPN@vultr:~$ sudo nano /etc/openvpn/server/server.conf
```

```
port 1194
proto udp
dev tun

ca ca.crt
cert server.crt
key server.key
dh dh.pem

tls-auth ta.key 0

# Enable IPv6 in tunnel
tun-ipv6

# Assign IPv6 subnet to VPN clients
server-ipv6 fddd:1994:1194:1194::/64

# Route ALL IPv6 traffic through VPN
push "redirect-gateway ipv6"

# IPv6 DNS
push "dhcp-option DNS 2001:4860:4860::8888"

# IPv4 subnet for VPN clients
topology subnet
server 10.8.0.0 255.255.255.0

# FULL TUNNEL (force all traffic through VPN)
push "redirect-gateway def1 bypass-dhcp"

# DNS (use Cloudflare or Google)
push "dhcp-option DNS 1.1.1.1"
push "dhcp-option DNS 8.8.8.8"

keepalive 10 120
cipher AES-256-GCM
persist-key
persist-tun

user nobody
group nogroup

status /etc/openvpn/server/openvpn-status.log
status-version 3
verb 3
```

Step 9

9. Enable IP Forwarding by creating config file in sysctl.d and apply it using sysctl --system command

```
BingerVPN@vultr: /etc/sysctl.d
GNU nano 8.4 99-openvpn.conf
net.ipv4.ip_forward=1
net.ipv6.conf.all.forwarding=1
```

Step 10

10. Configure NAT which enables all of the client traffic to go out through the VPN by editing the UFW before.rules

```
BingerVPN@vultr: /etc/uw$ sudo nano /etc/uw/before.rules
```

```
# NAT for IPv4
*nat
:POSTROUTING ACCEPT [0:0]

-A POSTROUTING -s 10.8.0.0/24 -o enp1s0 -j MASQUERADE

COMMIT
```

Step 11

11. Allow necessary ports through UFW

```
BingerVPN@vultr: ~$ sudo ufw status numbered
Status: active

      To Action From
      --
[ 1] 1194/udp ALLOW IN Anywhere
[ 2] OpenSSH ALLOW IN Anywhere
[ 3] 5000 ALLOW IN Anywhere
[ 4] 1194/udp (v6) ALLOW IN Anywhere (v6)
[ 5] OpenSSH (v6) ALLOW IN Anywhere (v6)
[ 6] 5000 (v6) ALLOW IN Anywhere (v6)
```

Step 12

12. Start and Enable OpenVPN

```
BingerVPN@vultr:~$ sudo systemctl start openvpn-server@server
```

```
BingerVPN@vultr:~$ sudo systemctl enable openvpn-server@server
```

Step 13

13. Create Client Configuration File using our bash script

```
BingerVPN@vultr:~/openvpn_scripts$ ./create_client_profile.sh client1
```

Step 14

14. Download client profile on client's local machine and connect to the VPN by importing the configuration file to OpenVPN's official client application (MacOS, Windows, Android, IOS) or through the command line in Linux.

```
federico@federico-ThinkPad-T480:~$ sftp BingerVPN@64.237.55.206:openvpn-clients/Federico.ovpn ~/BingerVPN
```

```
federico@federico-ThinkPad-T480:~$ sudo openvpn --config ~/BingerVPN/Federico.ovpn
```

11:33

Profiles

CONNECTED

OpenVPN Profile

64.237.55.206 [IOS]

CONNECTION STATS

3.7KB/s

0B/s

BYTES IN

3.78 KB/S

BYTES OUT

3.58 KB/S

DURATION

00:00:06

PACKET RECEIVED

0 sec ago

YOU

YOUR PRIVATE IP (IPV4)

10.8.0.4

YOUR PRIVATE IP (IPV6)

fddd:1994:1194:1194::1002