Final Project - OpenVPN

Summary:

In the final project, I created two separate,virtual LANs with instances of the Centos VM we have been using in class on VirtualBox. Each LAN has a router and a host. One router acts as a VPN client and the other router acts like a VPN server. Each host acts like a subnet behind the routers so the client has a subnet behind it and the server has a subnet behind it.

I downloaded openVPN software to the both the client and the router. I downloaded easy-rsa to the server and made the appropriate certificates and signed the public and private keys with the certificate authority (ca.crt). I then copied the ca.crt (certificate authority) over to the client so that it would recognize the server when it tries to connect to it. I set up both a client.conf and server.conf with the security measures necessary to connect to the vpn server from the client with a username and password. In the configuration files, I push the subnet routes so that the client can see behind the server and the server behind the client.

The vpn creates a virtual tun interface on the client and the server so that traffic to and from the vpn can travel through it. The server and client are assigned virtual addresses that are the ip-addresses of the virtual tun interfaces on both machines. The client connects to the server by a username and password created on the server. Once connected the clients virtual ip-address and actions are logged in a .log file.

Applications Used

1. OpenVPN

2. Easy-RSA 3
3. I used static routes

References

1. http://steveapm.blogspot.com/2013/11/openvpn-centos-server-ubuntu-client.html
    a. How to download easy-rsa
2. https://www.digitalocean.com/community/tutorials/how-to-setup-and-configure-an-openvpn-server-on-centos-6
    a. How to download openVPN
3. https://github.com/OpenVPN/easy-rsa/blob/master/easyrsa3/easyrsa
    a. How to create all necessary certificates and keys
4. https://openvpn.net/index.php/open-source/documentation/howto.html
    a. How to set up configuration files

OpenVPN Server and Client Configuration Files

VPNClientRouter [Running]

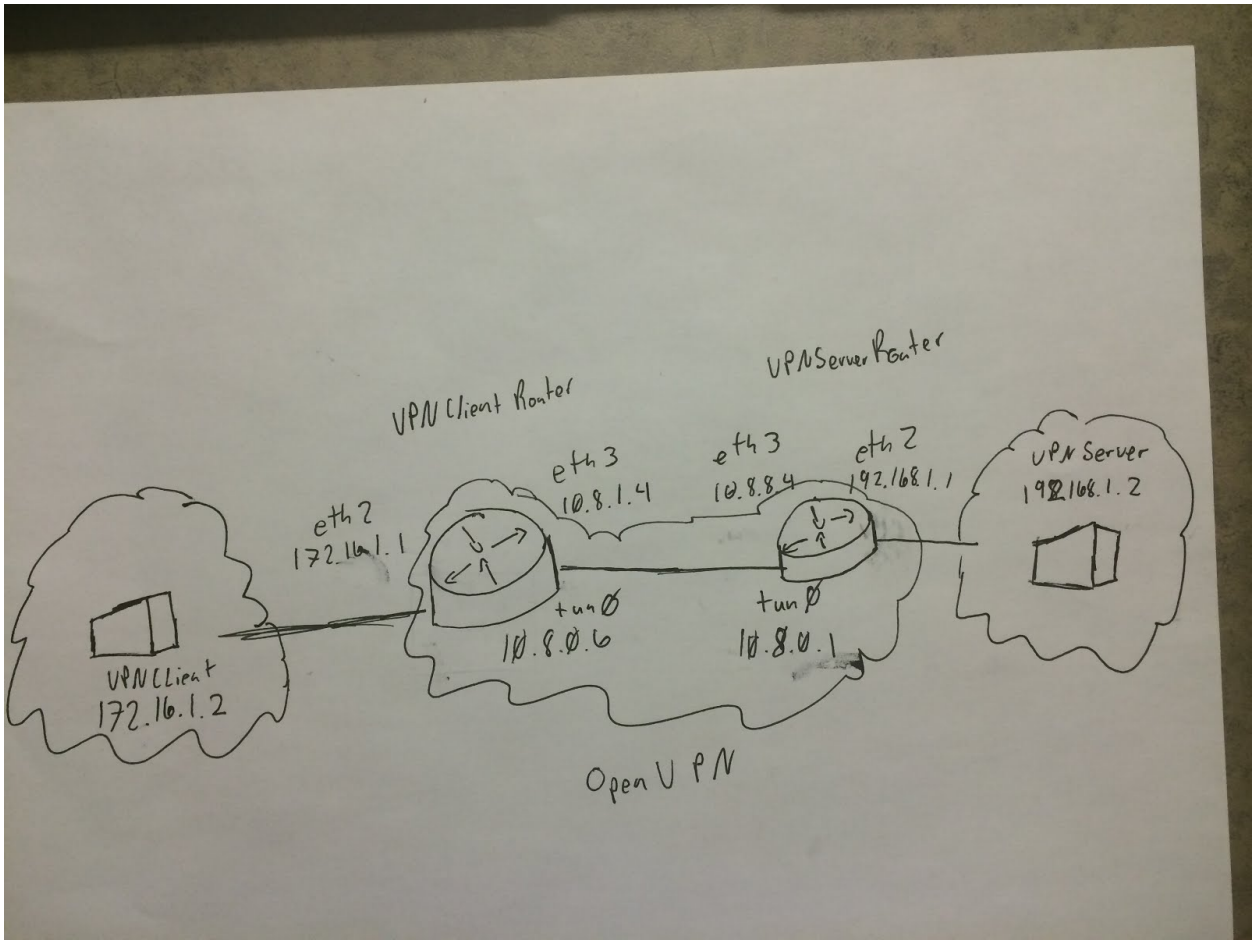
```
[root@VPNClientRouter openvpn]# cd
[root@VPNClientRouter ~]# cat /etc/openvpn/client.conf
client
dev tun
proto udp
ca /etc/openvpn/easy-rsa/easyrsa3/pki/ca.crt
remote 10.8.8.4 1194
resolv-retry infinite
auth-user-pass
nobind
log openvpn.log
verb 3
[root@VPNClientRouter ~]# _
```

VPNServerRouter [Running]

```
[root@VPNServerRouter openvpn]# cd
[root@VPNServerRouter ~]# cat /etc/openvpn/server.conf
port 1194
proto udp
dev tun
ca /etc/openvpn/easy-rsa/easyrsa3/pki/ca.crt
dh /etc/openvpn/easy-rsa/easyrsa3/pki/dh.pem
cert /etc/openvpn/easy-rsa/easyrsa3/pki/issued/server.crt
key /etc/openvpn/easy-rsa/easyrsa3/pki/private/server.key
plugin /usr/lib64/openvpn/plugins/openvpn-plugin-auth-pam.so login
ifconfig-pool-persist ipp.txt
server 10.8.0.0 255.255.255.0
push "route 192.168.1.0 255.255.255.0"
client-config-dir ccd
route 172.16.1.0 255.255.255.0
client-cert-not-required
username-as-common-name
client-to-client
push "route 172.16.1.0 255.255.255.0"
status openvpn-status.log
log openvpn.log
verb 6

[root@VPNServerRouter ~]# _
```

Topology


VPN Client Router
VPN Server Router
eth2
172.16.1.1
eth3
10.8.1.4
eth3
10.8.8.4
eth2
192.168.1.1
VPN Server
192.168.1.2
tun0
10.8.0.6
tun0
10.8.0.1
VPN Client
172.16.1.2
Open VPN