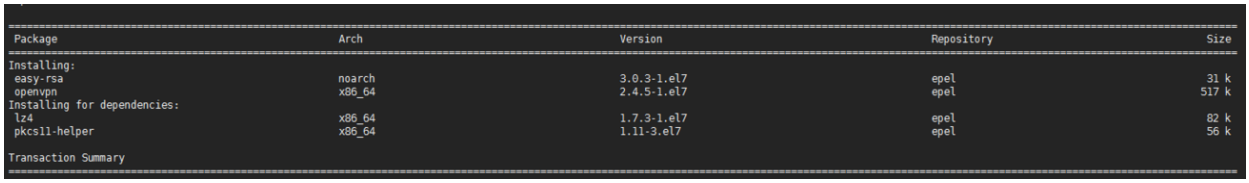
emmmm，前段时间把公司用的 vpn 换掉了，换成了 openvpn，刚开始用的是 tcp 协议，没有用 udp，然而，之前在家里连接到 VPN 之后向服务器传东西慢的有点夸张，只有 20 几 K，忍无可忍，无需再忍，就前几天把协议从 tcp 切换到了 udp 协议，经过测试没有问题，传输速率提升了 N 倍，但是这个 vpn 不止我们研发部门在用，而财务的也在用，他们外出有时候需要连接内部的财务服务器，下午找我说外出连接 vpn 之后连不到财务的服务器了，之前还行，最后经过确认是 vpn 的问题，使用 tcp 协议的时候就可以正常连接，而且换到 udp 协议之后就不行了，这个有点蛋疼，难不成再换回 tcp 的？不太现实，所以准备新装一套专给财务用，说搞就搞，但是情况和我之前搞不太一样了，具体如下。
老

新



easy-rsa 的版本从之前的 2.2 直接窜到了 3.0，也都是用 yum 装的，貌似是更新了吧，今晚有点事要加班，就顺便琢磨了一下，配置和之前完全不一样了，还有点麻烦，具体如下，本篇文章写得不完整，这是针对 3.0 生成证书，2.2 完整版点这里，而且这篇文章没怎么贴图，如果你看这晕就 `Ctrl+F` 查找 localhost，也就是我主机名，兴许看着没那么晕，哈哈。

安装软件包

环境就是新装 CentOS7.4，使用阿里云的 epel 源和常规源，不知道别的源有没有更新这个包，不废话，直接安装软件包。

```
[root@localhost ~]# yum -y install openvpn easy-rsa
```

看这里，如果是 2.2 的，直接去看这里吧。

配置 easy-rsa-3.0

复制文件

```
[root@localhost ~]# cp -r /usr/share/easy-rsa/ /etc/openvpn/easy-rsa
[root@localhost ~]# cd /etc/openvpn/easy-rsa/
[root@localhost easy-rsa]# \rm 3 3.0
[root@localhost easy-rsa]# cd 3.0.3/
[root@localhost 3.0.3]# find / -type f -name "vars.example" | xargs -i cp {}
 . && mv vars.example vars
```

```
[root@localhost 3.0.3]# find / -type f -name "vars.example" | xargs -i cp {} . && mv vars.example vars
[root@localhost 3.0.3]# ls
easyrsa  openssl-1.0.cnf  vars  x509-types
[root@localhost 3.0.3]# ll
总用量 52
-rwxr-xr-x. 1 root root 35985 4月  10 22:24 easyrsa
-rw-r--r--. 1 root root  4560 4月  10 22:24 openssl-1.0.cnf
-rw-r--r--. 1 root root  8126 4月  10 22:27 vars
drwxr-xr-x. 2 root root    64 4月  10 22:24 x509-types
[root@localhost 3.0.3]#
[root@localhost 3.0.3]# ls
easyrsa  openssl-1.0.cnf  vars  x509-types
[root@localhost 3.0.3]# tree .
.
├── easyrsa
├── openssl-1.0.cnf
├── vars
└── x509-types
    ├── ca
    ├── client
    ├── COMMON
    ├── san
    └── server

1 directory, 8 files
[root@localhost 3.0.3]#
```

这里说明一下，正常来说 `easy-rsa-3.0.3` 安装完之后， `vars.example` 文件在 `/usr/share/doc/easy-rsa-3.0.3/` 目录，至于有些人说找不到这个文件，我暂时还没遇到过，可能你的安装方式和我不一致，或版本不同，不做深究，过。

创建一个新的 PKI 和 CA

```
[root@localhost 3.0.3]# pwd
/etc/openvpn/easy-rsa/3.0.3
[root@localhost 3.0.3]# ./easyrsa init-pki  #创建空的pki

Note: using Easy-RSA configuration from: ./vars

init-pki complete; you may now create a CA or requests.
Your newly created PKI dir is: /etc/openvpn/easy-rsa/3.0.3/pki

[root@localhost 3.0.3]# ./easyrsa build-ca nopass #创建新的CA，不使用密码

Note: using Easy-RSA configuration from: ./vars
Generating a 2048 bit RSA private key
.....................+++
.............................................+++
writing new private key to '/etc/openvpn/easy-rsa/3.0.3/pki/private/ca.key.pC
lvaQ1GLD'
-----
You are about to be asked to enter information that will be incorporated
```

```
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Common Name (eg: your user, host, or server name) [Easy-RSA CA]: 回车

CA creation complete and you may now import and sign cert requests.
Your new CA certificate file for publishing is at:
/etc/openvpn/easy-rsa/3.0.3/pki/ca.crt
```

创建服务端证书

```
[root@localhost 3.0.3]# ./easyrsa gen-req server nopass

Note: using Easy-RSA configuration from: ./vars
Generating a 2048 bit RSA private key
..........................+++
.....................................................................
+++
writing new private key to '/etc/openvpn/easy-rsa/3.0.3/pki/private/server.ke
y.wy7Q0fuG6A'
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Common Name (eg: your user, host, or server name) [server]: 回车

Keypair and certificate request completed. Your files are:
req: /etc/openvpn/easy-rsa/3.0.3/pki/reqs/server.req
key: /etc/openvpn/easy-rsa/3.0.3/pki/private/server.key
```

签约服务端证书

```
[root@localhost 3.0.3]# ./easyrsa sign server server

Note: using Easy-RSA configuration from: ./vars


You are about to sign the following certificate.
Please check over the details shown below for accuracy. Note that this reques
t
has not been cryptographically verified. Please be sure it came from a truste
d
```

```
source or that you have verified the request checksum with the sender.

Request subject, to be signed as a server certificate for 3650 days:

subject=
    commonName                = server


Type the word 'yes' to continue, or any other input to abort.
  Confirm request details: yes
Using configuration from ./openssl-1.0.cnf
Check that the request matches the signature
Signature ok
The Subject's Distinguished Name is as follows
commonName            :ASN.1 12:'server'
Certificate is to be certified until Apr  7 14:54:08 2028 GMT (3650 days)

Write out database with 1 new entries
Data Base Updated

Certificate created at: /etc/openvpn/easy-rsa/3.0.3/pki/issued/server.crt
```

创建 Diffie-Hellman

```
[root@localhost 3.0.3]# ./easyrsa gen-dh
.....................................................
DH parameters of size 2048 created at /etc/openvpn/easy-rsa/3.0.3/pki/dh.pem
```

到这里服务端的证书就创建完了，然后创建客户端的证书。

创建客户端证书

复制文件

```
[root@localhost ~]# cp -r /usr/share/easy-rsa/ /etc/openvpn/client/easy-rsa
[root@localhost ~]# cd /etc/openvpn/client/easy-rsa/
[root@localhost easy-rsa]# \rm 3 3.0
[root@localhost easy-rsa]# cd 3.0.3/
[root@localhost 3.0.3]# find / -type f -name "vars.example" | xargs -i cp {}
 . && mv vars.example vars
```

生成证书

```
[root@localhost 3.0.3]# pwd
/etc/openvpn/client/easy-rsa/3.0.3
[root@localhost 3.0.3]# ./easyrsa init-pki #创建新的pki

Note: using Easy-RSA configuration from: ./vars
```

```
init-pki complete; you may now create a CA or requests.
Your newly created PKI dir is: /etc/openvpn/client/easy-rsa/3.0.3/pki
[root@localhost 3.0.3]# ./easyrsa gen-req dalin nopass  #客户证书名为大林，木有密码

Note: using Easy-RSA configuration from: ./vars
Generating a 2048 bit RSA private key
..............................................................+++
............+++
writing new private key to '/etc/openvpn/client/easy-rsa/3.0.3/pki/private/dalin.key.FkrLzXH9Bm'
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Common Name (eg: your user, host, or server name) [dalin]: 回车

Keypair and certificate request completed. Your files are:
req: /etc/openvpn/client/easy-rsa/3.0.3/pki/reqs/dalin.req
key: /etc/openvpn/client/easy-rsa/3.0.3/pki/private/dalin.key
```

最后签约客户端证书

```
[root@localhost 3.0.3]# cd /etc/openvpn/easy-rsa/3.0.3/
[root@localhost 3.0.3]# pwd
/etc/openvpn/easy-rsa/3.0.3
[root@localhost 3.0.3]# ./easyrsa import-req /etc/openvpn/client/easy-rsa/3.0.3/pki/reqs/dalin.req dalin

Note: using Easy-RSA configuration from: ./vars

The request has been successfully imported with a short name of: dalin
You may now use this name to perform signing operations on this request.

[root@localhost 3.0.3]# ./easyrsa sign client dalin

Note: using Easy-RSA configuration from: ./vars


You are about to sign the following certificate.
Please check over the details shown below for accuracy. Note that this request
has not been cryptographically verified. Please be sure it came from a trusted
source or that you have verified the request checksum with the sender.
```

```
Request subject, to be signed as a client certificate for 3650 days:

subject=
    commonName                = dalin


Type the word 'yes' to continue, or any other input to abort.
  Confirm request details: yes
Using configuration from ./openssl-1.0.cnf
Check that the request matches the signature
Signature ok
The Subject's Distinguished Name is as follows
commonName            :ASN.1 12:'dalin'
Certificate is to be certified until Apr  8 01:54:57 2028 GMT (3650 days)

Write out database with 1 new entries
Data Base Updated

Certificate created at: /etc/openvpn/easy-rsa/3.0.3/pki/issued/dalin.crt
```

整理证书

现在所有的证书都已经生成完了，下面来整理一下。

服务端所需要的文件

```
[root@localhost ~]# mkdir /etc/openvpn/certs
[root@localhost ~]# cd /etc/openvpn/certs/
[root@localhost certs]# cp /etc/openvpn/easy-rsa/3.0.3/pki/dh.pem .
[root@localhost certs]# cp /etc/openvpn/easy-rsa/3.0.3/pki/ca.crt .
[root@localhost  certs]#  cp  /etc/openvpn/easy-rsa/3.0.3/pki/issued/server.crt
 .
[root@localhost certs]# cp /etc/openvpn/easy-rsa/3.0.3/pki/private/server.key
.
[root@localhost certs]# ll
总用量 20
-rw-------. 1 root root 1172 4月  11 10:02 ca.crt
-rw-------. 1 root root  424 4月  11 10:03 dh.pem
-rw-------. 1 root root 4547 4月  11 10:03 server.crt
-rw-------. 1 root root 1704 4月  11 10:02 server.key
```

客户端所需的文件

```
[root@localhost certs]# mkdir /etc/openvpn/client/dalin/
[root@localhost certs]# cp /etc/openvpn/easy-rsa/3.0.3/pki/ca.crt /etc/openvp
n/client/dalin/
[root@localhost certs]# cp /etc/openvpn/easy-rsa/3.0.3/pki/issued/dalin.crt /
etc/openvpn/client/dalin/
```

```
[root@localhost certs]# cp /etc/openvpn/client/easy-rsa/3.0.3/pki/private/dal
in.key /etc/openvpn/client/dalin/
[root@localhost certs]# ll /etc/openvpn/client/dalin/
总用量 16
-rw-------. 1 root root 1172 4月  11 10:07 ca.crt
-rw-------. 1 root root 4431 4月  11 10:08 dalin.crt
-rw-------. 1 root root 1704 4月  11 10:08 dalin.key
```

其实这三个文件就够了，之前全下载下来是因为方便，然而这次懒得弄了，哈哈，编写服务端配置文件。顺便提一下再添加用户在 `./easyrsa gen-req` 这里开始就行了，像是吊销用户证书的命令都自己用 `./easyrsa --help` 去看吧，GitHub 项目地址

服务器配置文件

```
[root@localhost ~]# vim /etc/openvpn/server.conf
local 192.168.1.113
port 1194
proto tcp
dev tun

ca /etc/openvpn/certs/ca.crt
cert /etc/openvpn/certs/server.crt
key /etc/openvpn/certs/server.key
dh /etc/openvpn/certs/dh.pem

ifconfig-pool-persist /etc/openvpn/ipp.txt

server 17.166.221.0 255.255.255.0
push "route 192.168.1.0 255.255.255.0"
push "redirect-gateway def1 bypass-dhcp"
push "dhcp-option DNS 223.5.5.5"
push "dhcp-option DNS 223.6.6.6"
client-to-client

keepalive 20 120
comp-lzo
#duplicate-cn

user openvpn
group openvpn

persist-key
persist-tun
status openvpn-status.log
log-append  openvpn.log
verb 1
mute 20
```

启动服务

启动服务

```
[root@localhost ~]# systemctl start openvpn@server
```

然后接下来的请看这里吧，从配置 iptables 及转发开始，懒得写了。

吊销证书

最近被游客问到如何去吊销证书，所以在这里就加一下，正常情况下证书就是一人一个，下面栗子，注销名为 `dalin` 的证书。

```
[root@openvpn ~]# cd /etc/openvpn/easy-rsa/
[root@openvpn easy-rsa]# ./easyrsa revoke dalin

Note: using Easy-RSA configuration from: ./vars


Please confirm you wish to revoke the certificate with the following subject:

subject=
    commonName                = dalin


Type the word 'yes' to continue, or any other input to abort.
  Continue with revocation: yes
Using configuration from /etc/openvpn/easy-rsa/openssl-1.0.cnf
Revoking Certificate 06.
Data Base Updated

IMPORTANT!!!

Revocation was successful. You must run gen-crl and upload a CRL to your
infrastructure in order to prevent the revoked cert from being accepted.

[root@openvpn easy-rsa]# ./easyrsa gen-crl

Note: using Easy-RSA configuration from: ./vars
Using configuration from /etc/openvpn/easy-rsa/openssl-1.0.cnf

An updated CRL has been created.
CRL file: /etc/openvpn/easy-rsa/pki/crl.pem
```

执行上述命令后用户证书不会被删除，只是更新了 `crl.pem` 文件，可以看到上面的提示，文件位置在 `/etc/openvpn/easy-rsa/pki/crl.pem`，查看所有证书的的信息，阔以这样去看。

```
[root@openvpn easy-rsa]# find /etc/openvpn/ -type f -name "index.txt" | xargs
cat
```

```
V    280825082643Z        01    unknown    /CN=server
R    280826061455Z    181211135800Z    03    unknown    /CN=dalin
```

列举了两个作对比，`V` 为可用，`R` 为注销，现在 `dalin` 的证书还是能连接到服务器，现在需要告知服务端 `crl.pem` 的位置，下面修改配置文件。

```
[root@openvpn easy-rsa]# vim /etc/openvpn/server.conf
crl-verify /etc/openvpn/easy-rsa/pki/crl.pem
[root@openvpn easy-rsa]# systemctl restart openvpn@server
```

这样就可以了，`dalin` 现在就无法连接到服务器了，服务端日志。

```
WARNING: Failed to stat CRL file, not (re)loading CRL.
VERIFY ERROR: depth=0, error=certificate revoked: CN=dalin
OpenSSL: error:14089086:SSL routines:ssl3_get_client_certificate:certificate verify failed
TLS_ERROR: BIO read tls_read_plaintext error
TLS Error: TLS object -> incoming plaintext read error
TLS Error: TLS handshake failed
SIGUSR1[soft,tls-error] received, client-instance restarting
```

emmmm，效果达到了，我还得重新生成一下，因为我要用，当然还叫 `dalin`，这种情况建议将被吊销的证书删掉之后再生成新的。

```
[root@openvpn easy-rsa]# cd /etc/openvpn/
[root@openvpn openvpn]# find . -type f -name "dalin.*" | xargs rm
```

vpn

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