To create the root CA:

```
$ openssl req -newkey rsa:1024 -sha1 -keyout rootkey.pem -out rootreq.pem

$ openssl x509 -req -in rootreq.pem -sha1 -extfile myopenssl.cnf -extensions
v3_ca -signkey rootkey.pem -out rootcert.pem

$ cat rootcert.pem rootkey.pem > root.pem

$ openssl x509 -subject -issuer -noout -in root.pem
subject= /C=US/ST=VA/L=Fairfax/O=Zork.org/CN=Root CA
issuer= /C=US/ST=VA/L=Fairfax/O=Zork.org/CN=Root CA
```

To create the server CA and sign it with the root CA:

```
$ openssl req -newkey rsa:1024 -sha1 -keyout serverCAkey.pem -out
serverCAreq.pem

$ openssl x509 -req -in serverCAreq.pem -sha1 -extfile myopenssl.cnf -extensions
v3_ca -CA root.pem -CAkey root.pem -CAcreateserial -out serverCAcert.pem

$ cat serverCAcert.pem serverCAkey.pem rootcert.pem > serverCA.pem

$ openssl x509 -subject -issuer -noout -in serverCA.pem
subject= /C=US/ST=VA/L=Fairfax/O=Zork.org/OU=Server Division/CN=Server CA
issuer= /C=US/ST=VA/L=Fairfax/O=Zork.org/CN=Root CA
```

To create the server's certificate and sign it with the Server CA:

```
$ openssl req -newkey rsa:1024 -sha1 -keyout serverkey.pem - out serverreq.pem

$ openssl x509 -req -in serverreq.pem -sha1 -extfile myopenssl.cnf -extensions
usr_cert -CA serverCA.pem -CAkey serverCA.pem -CAcreateserial -out
servercert.pem

$ cat servercert.pem serverkey.pem serverCAcert.pem rootcert.pem > server.pem

$ openssl x509 -subject -issuer -noout -in server.pem
subject= /C=US/ST=VA/L=Fairfax/O=Zork.org/CN=splat.zork.org
issuer= /C=US/ST=VA/L=Fairfax/O=Zork.org/OU=Server Division/CN=Server CA
```

To create the client certificate and sign it with the Root CA

```
$ openssl req -newkey rsa:1024 -sha1 -keyout clientkey.pem - out clientreq.pem

$ openssl x509 -req -in clientreq.pem -sha1 -extfile myopenssl.cnf -extensions
usr_cert -CA root.pem -CAkey root.pem -CAcreateserial -out clientcert.pem

$ cat clientcert.pem clientkey.pem rootcert.pem > client.pem

$ openssl x509 -subject -issuer -noout -in client.pem
subject= /C=US/ST=VA/L=Fairfax/O=Zork.org/CN=shell.zork.org
issuer= /C=US/ST=VA/L=Fairfax/O=Zork.org/CN=Root CA
```