# Créer sa CA et signer ses certificats

## Création de la CA

Pour cela, on va se rendre dans un dossier isolé :

```
# mkdir /root/ca && cd /root/ca
```

puis on va créer l'organisation de dossier suivante:

```
# mkdir certs crl newcerts private csr
# chmod 700 private
```

Et on créer les fichiers de contrôle :

```
# touch index.txt
# echo 1000 > serial
```

puis on créer le fichier :

openssf.cnf

```
[ ca ]
# `man ca`
default_ca = CA_default

[ CA_default ]
# Directory and file locations.
dir               = /root/ca
certs             = $dir/certs
crl_dir           = $dir/crl
new_certs_dir     = $dir/newcerts
database          = $dir/index.txt
serial            = $dir/serial
RANDFILE          = $dir/private/.rand

# The root key and root certificate.
private_key       = $dir/private/ca.key.pem
certificate       = $dir/certs/ca.cert.pem

# For certificate revocation lists.
crlnumber         = $dir/crlnumber
crl               = $dir/crl/ca.crl.pem
crl_extensions    = crl_ext
default_crl_days  = 30

# SHA-1 is deprecated, so use SHA-2 instead.
default_md        = sha256
```

```
name_opt          = ca_default
cert_opt          = ca_default
default_days      = 375
preserve          = no
policy            = policy_loose

[ req ]
# Options for the `req` tool (`man req`).
default_bits        = 4096
distinguished_name  = req_distinguished_name
string_mask         = utf8only

# SHA-1 is deprecated, so use SHA-2 instead.
default_md          = sha256

# Extension to add when the -x509 option is used.
x509_extensions     = v3_ca



[ req_distinguished_name ]
countryName                     = Country Name (2 letter code)
stateOrProvinceName             = State or Province Name
localityName                    = Locality Name
0.organizationName              = Organization Name
organizationalUnitName          = Organizational Unit Name
commonName                      = Common Name
emailAddress                    = Email Address

countryName_default             = FR
stateOrProvinceName_default     = Deux-Sèvres
localityName_default            = Niort
0.organizationName_default      = VirtIT
#organizationalUnitName_default =
emailAddress_default           = contact@virtit.fr

[ v3_ca ]
# Extensions for a typical CA (`man x509v3_config`).
subjectKeyIdentifier = hash
authorityKeyIdentifier = keyid:always,issuer
basicConstraints = critical, CA:true
keyUsage = critical, digitalSignature, cRLSign, keyCertSign

[ policy_loose ]
# Allow the intermediate CA to sign a more diverse range of
certificates.
# See the POLICY FORMAT section of the `ca` man page.
countryName             = optional
stateOrProvinceName     = optional
localityName            = optional
```

```
organizationName        = optional
organizationalUnitName  = optional
commonName              = supplied
emailAddress            = optional

[ server_cert ]
# Extensions for server certificates (`man x509v3_config`).
basicConstraints = CA:FALSE
nsCertType = server
nsComment = "OpenSSL Generated Server Certificate"
subjectKeyIdentifier = hash
authorityKeyIdentifier = keyid,issuer:always
keyUsage = critical, digitalSignature, keyEncipherment
extendedKeyUsage = serverAuth


[ usr_cert ]
# Extensions for client certificates (`man x509v3_config`).
basicConstraints = CA:FALSE
nsCertType = client, email
nsComment = "OpenSSL Generated Client Certificate"
subjectKeyIdentifier = hash
authorityKeyIdentifier = keyid,issuer
keyUsage = critical, nonRepudiation, digitalSignature, keyEncipherment
extendedKeyUsage = clientAuth, emailProtection
```

On génére ensuite la clé privé du CA root :

```
# openssl genrsa -out private/ca.key.pem 4096
```

et puis le certificat :

```
# openssl req -config openssl.cnf \
      -key private/ca.key.pem \
      -new -x509 -days 7300 -extensions v3_ca \
      -out certs/ca.cert.pem
```

## Création d'un certificat

If faut d'abord créer la clé privée du certificat :

```
# openssl genrsa -out private/server.key.pem 4096
```

puis le CSR :

```
# openssl req -key private/server.key.pem -new -out csr/server.csr.pem
```

Et puis on le signe :

```
# openssl ca -config openssl.cnf -extensions server_cert -days 375 -notext -
in csr/server.csr.pem -out certs/server.cert.pem
```

From:
https://wiki.virtit.fr/ - **VirtIT**

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Last update: **2019/01/29 21:06**