How to conifgure NGS for with certificate chain

Contents

NOTE: This is not a official Cisco document and you use it on your own risk.

Best regards
Roger Nobel

Idea:

These instructions are of relevance if you have a server certificate for the Guest Server for installation that has been issued by an intermediate CA. These instructions are valid for Guest Server 2.0.x only. NGS use certificate from intermediate CA server but client managing NGS only has root CA certificate trust installed. Hence NGS will have to send the full certificate chain to allow client validate the server NGS certificate.

Setup:

NGS 2.0.2

DC's are MS server 2003
DC01 (root CA – domain : wlaaan.ch)
DC03 (subCA - child domain: child1.wlaaan.ch)

Configuration steps:

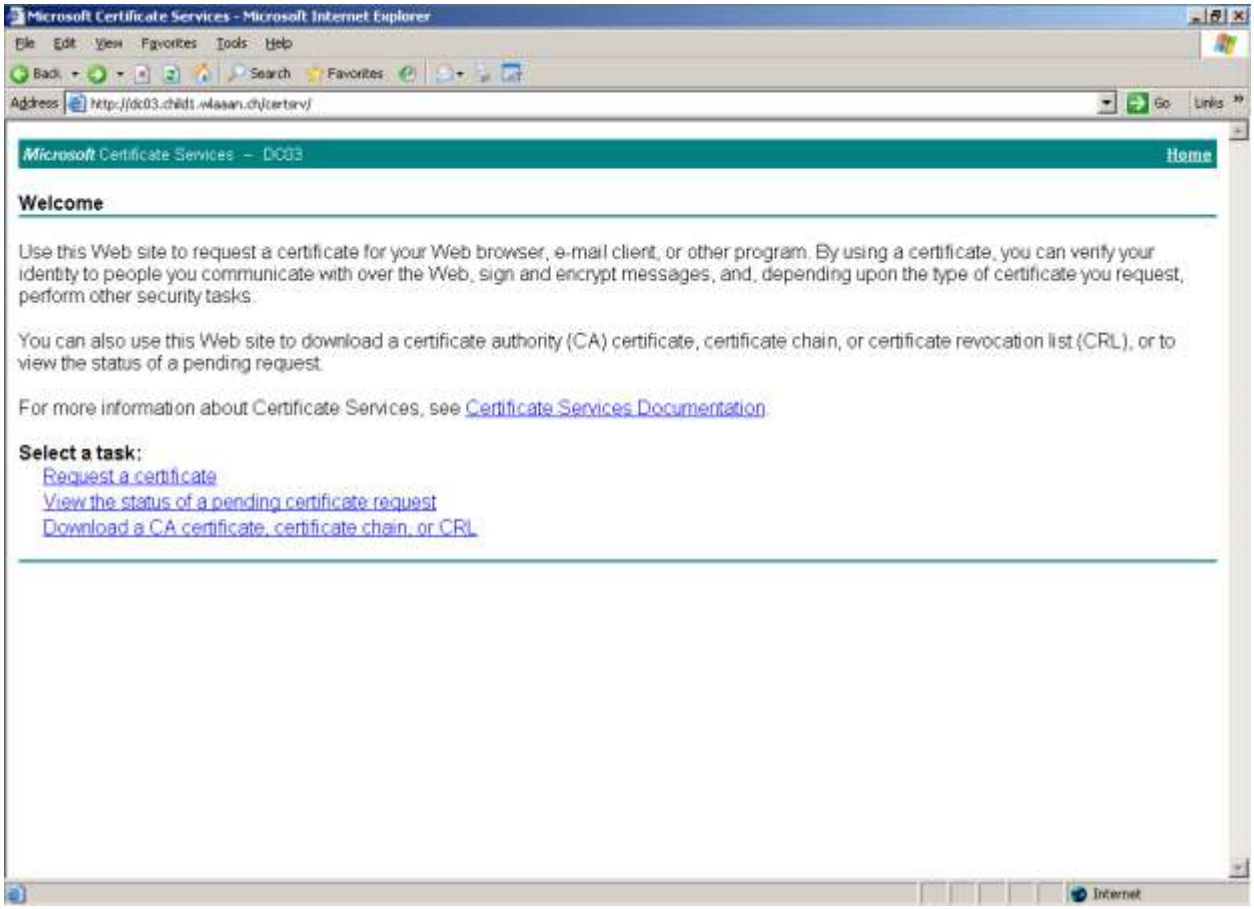
1.) NGS does certificate request

NGS (admin) > Server > SSL Settings > Certificate Signing Request > Create CSR

Create
Download CSR

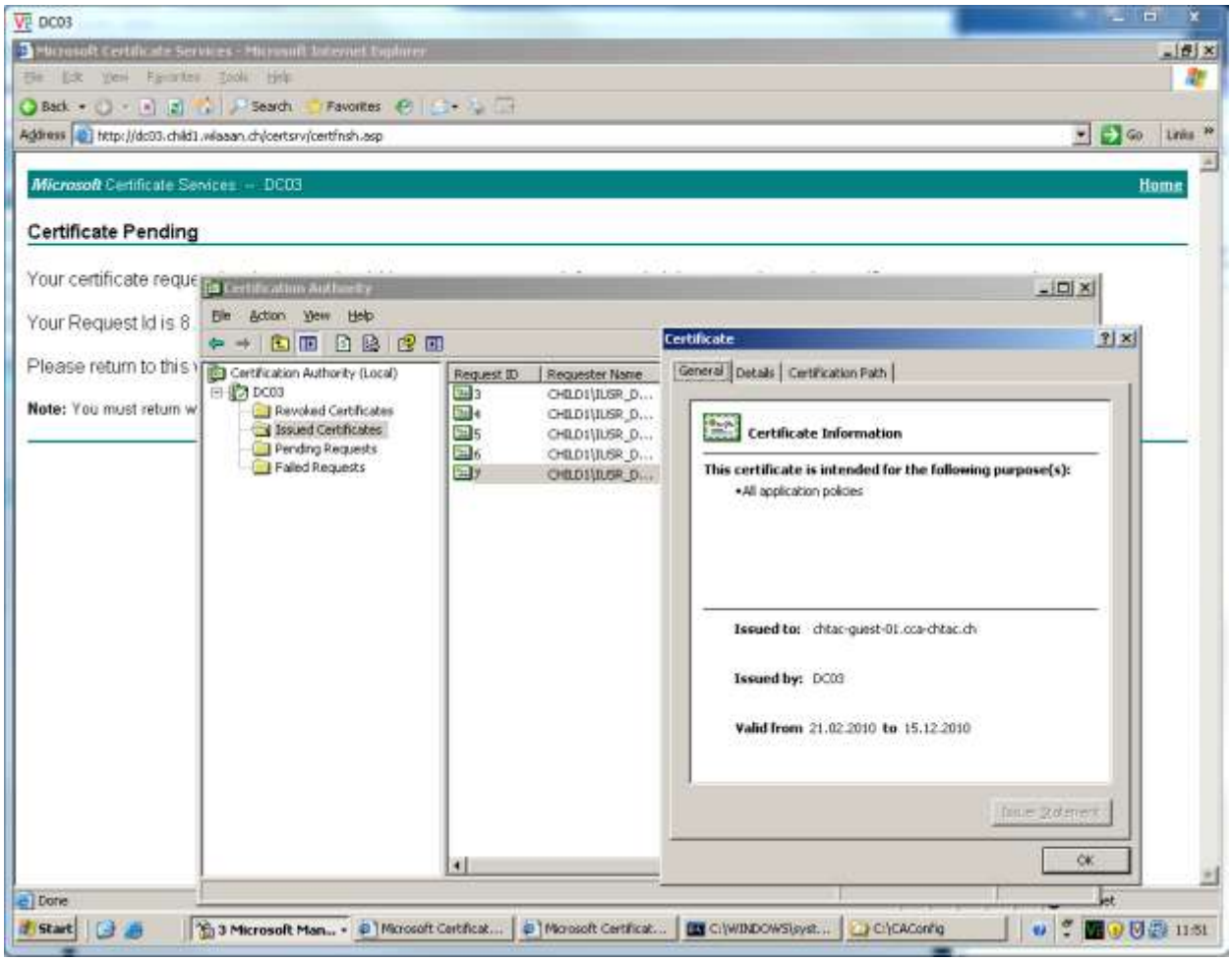
-----BEGIN CERTIFICATE REQUEST-----
MIIBqzCCARQCAQAwazELMAkGA1UEBhMCQ0gxJDAiBgNVBAMTG2NodGFjLWd1ZXN0
LTAxLmNjYS1jaHRhYy5jaDELMAkGA1UECBMCemgxCzAJBgNVBAcTAnpoMQ4wDAYD
VQQKEwVjaHRhYzEMMAoGA1UECxMDdGFjMIGfMA0GCSqGSIb3DQEBAQUAA4GNADCB
iQKBgQDPnC+A7oVx9MsMnSWMyWuK8POj7LDKmxRDHMsZAmG3loZdAHM3g/3nxM2V
pCMmw5vLOJzigPHbc8P7MGDcw15x1ZgDGnLJoS6PmgR6uJmJkdBHKCrjBnSQmVp1
m3cWwuzM3r0dMabJSNhG7uZXmkgetjvD3wP3DOGhX/ogRIwj0QIDAQABoAAwDQYJ
KoZIhvcNAQEFBQADgYEAmioh1BR7VZKC1h82FZ67tRrmkGoHU2Bp17ULVi2uzKu8
GSj7fQ29E74f3r+nBTTuPrHaGKyQqUlXhH3OLYYfkXN7VQXifBZtl/Gsk7leTW72
dzdgy2KmvhypBlGE+7bzNrgPEgdxpDXfOgZJGd4bppY3/8FaYU7TqVoruEDbQ6g=
-----END CERTIFICATE REQUEST-----

2.) Request certificate for NGS and DC03 and DC01

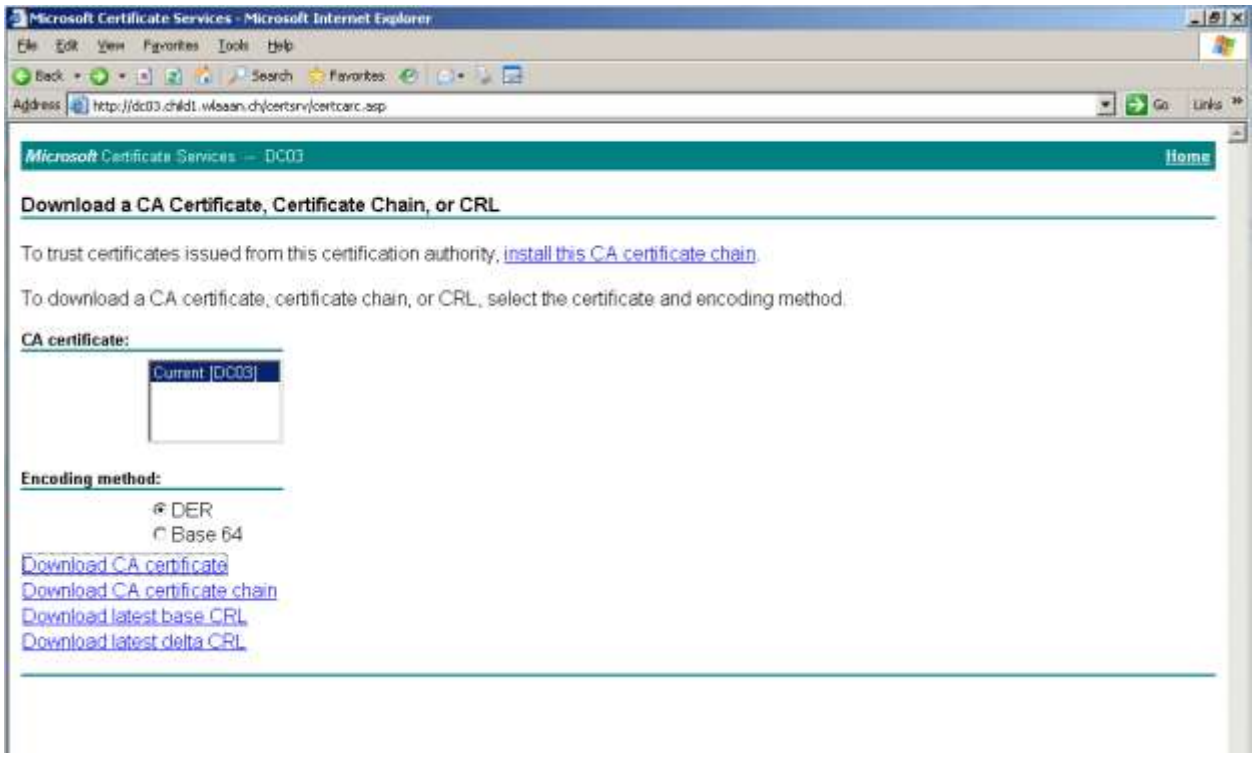


Open IE for http://dc03.child1.wlaaan.ch/certsrv/
a.)Request a certificate
b.)Advanced certificate request
c.)Submit a certificate request by using a base-64-encoded CMC or PKCS#10 file, or submit a renewal by using a base-64-encoded PKCS#7 file.
d.) Past the CSR from NGS to “Save Request:” -> Submit

Now get the certificate from the CA Authority in base-64-encoded format



Also collect certificate for DC01 and DC03

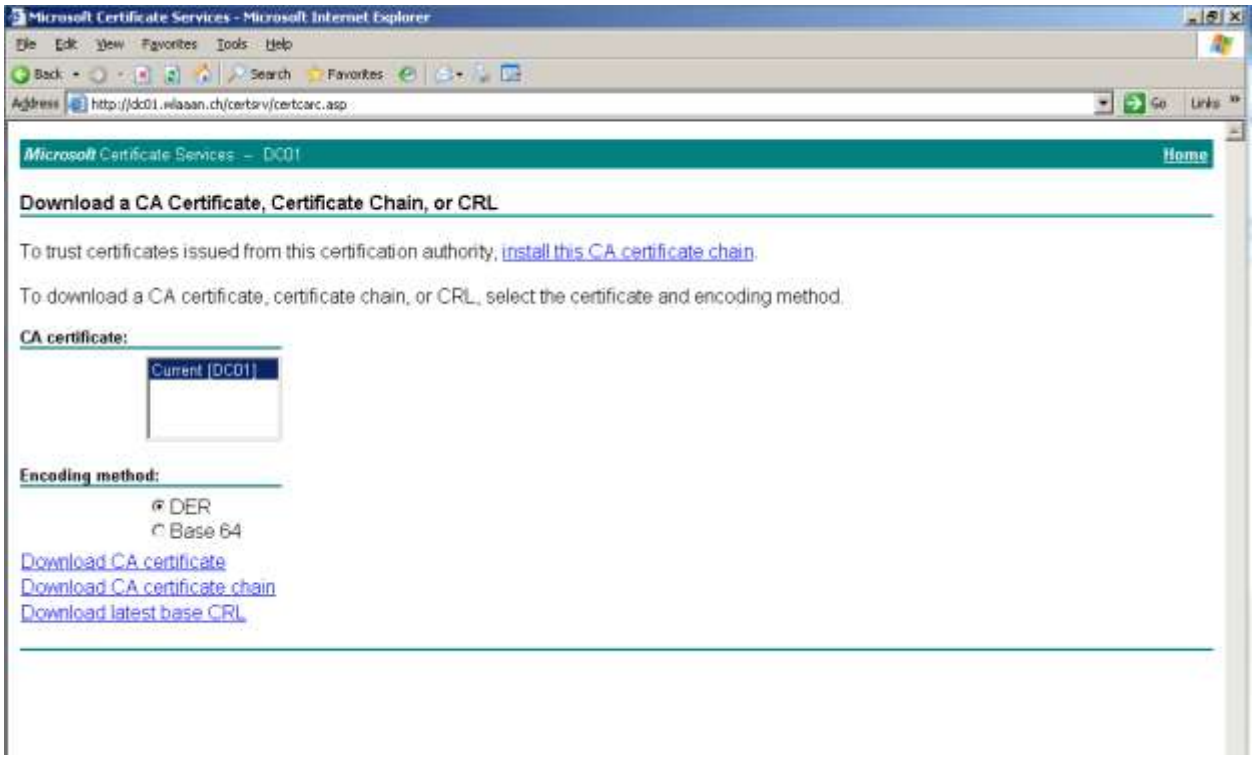


http://dc03.child1.wlaaan.ch/certsrv/

a.)Download a CA certificate, certificate chain, or CRL

b.)Download CA certificate

=> RootSubCA-DC03.cer



http://dc01.wlaaan.ch/certsrv/

a.)Download a CA certificate, certificate chain, or CRL

b.)Download CA certificate

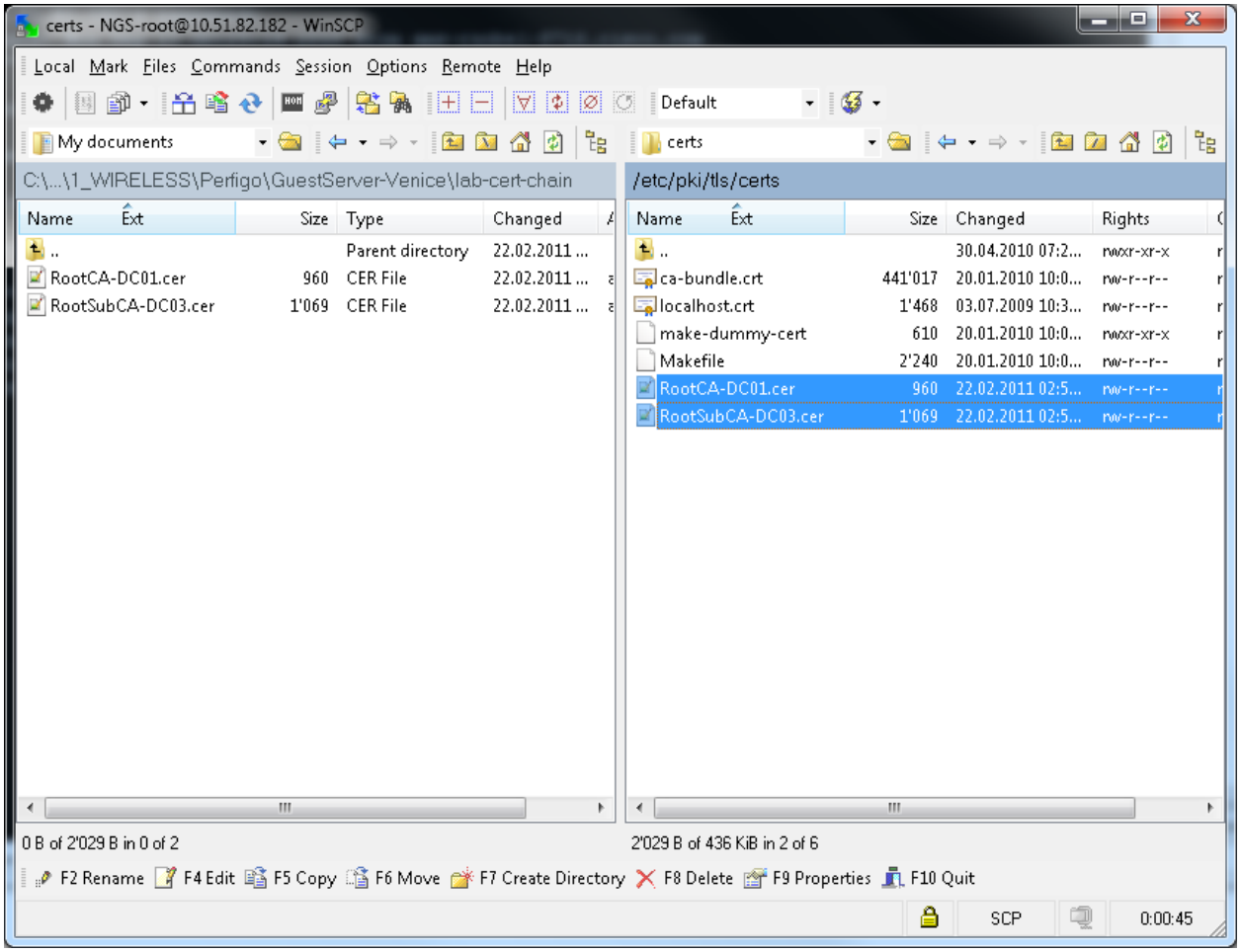
=> RootCA-DC01.cer

3.) Create server certificate chain

A cert is in PEM format if it contains the text "-----BEGIN CERTIFICATE-----". If the file is in binary (DER) format it can be converted to PEM using:

openssl x509 -in cert.der -inform DER -out cert.pem -outform PEM

1.) Using sftp or scp upload the intermediate and root certs to `/etc/pki/tls/certs`.



Since we did get all the certificate from DC01 and DC03 – convert it to PEM.

openssl x509 -in RootCA-DC01.cer -inform DER -out root.pem -outform PEM
openssl x509 -in RootSubCA-DC03.cer -inform DER -out intermediate.pem -outform PEM

2.)In a root shell:

```
cd /etc/pki/tls/certs
chmod 666 *.pem
cp intermediate.pem  localhost.chain.crt
cat root.pem >> localhost.chain.crt
```

e.g

```
[root@chtac-guest-01 certs]# ls -al
total 488
drwxr-xr-x 2 root root   4096 Sep 13 01:42 .
drwxr-xr-x 5 root root   4096 Apr 30 07:25 ..
```

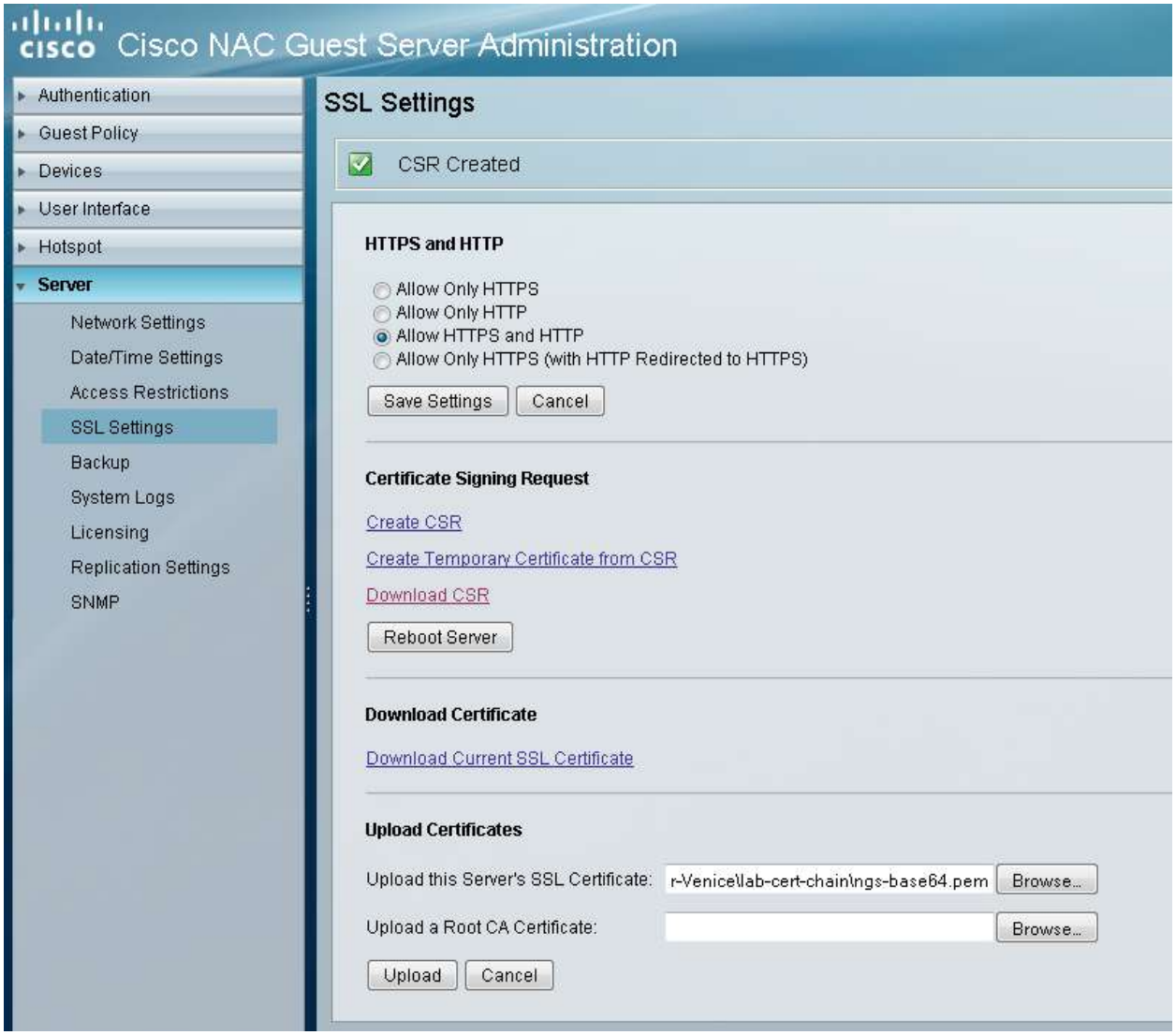
```
-rw-r--r-- 1 root root 441017 Jan 20  2010 ca-bundle.crt
-rw-rw-rw- 1 root root   1505 Sep 13 01:42 intermediate.pem
-rw-r--r-- 1 root root   2859 Sep 13 01:42 localhost.chain.crt
-rw-r--r-- 1 root root   1468 Jul  3  2009 localhost.crt
-rwxr-xr-x 1 root root    610 Jan 20  2010 make-dummy-cert
-rw-r--r-- 1 root root   2240 Jan 20  2010 Makefile
-rw-r--r-- 1 root root    960 Feb 22  2011 RootCA-DC01.cer
-rw-rw-rw- 1 root root   1354 Sep 13 01:42 root.pem
-rw-r--r-- 1 root root   1069 Feb 22  2011 RootSubCA-DC03.cer
[root@chtac-guest-01 certs]#
```

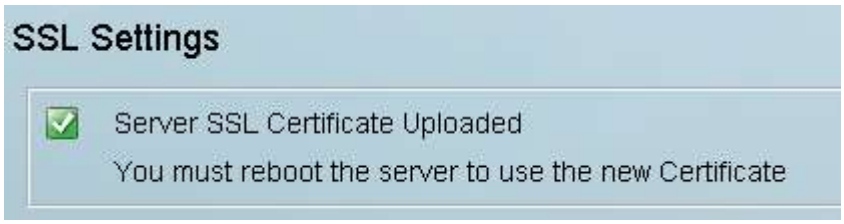
3.) Edit /etc/httpd/conf.d/ssl.conf – e.g use VI

```
Find the line starting:#SSLCertificateChainFile
Uncomment the line and change it to read:
SSLCertificateChainFile /etc/pki/tls/certs/localhost.chain.crt
```

4.) In the admin interface upload the server cert ("Upload this Server's SSL Certificate"

on Server -> SSL Settings).





5.)Recreate the cert structure and reboot server:

c_rehash
reboot

e.g
[root@chtac-guest-01 conf.d]# c_rehash

Doing /etc/pki/tls/certs
root.pem => d391afe4.0
intermediate.pem => 9d6f598b.0

s_ [root@chtac-guest-01 conf.d]# reboot
Broadcast message from root (pts/0) (Mon Sep 13 21:24:36 2010):
The system is going down for reboot NOW!
[root@chtac-guest-01 conf.d]#

Test login with client and verify certificate chain

From another machine running openssl you can test using:

```
openssl s_client -connect x.x.x.x:443 -showcerts
```

This will list all certificates that would be supplied to a client.
Replace x.x.x.x with the NGS IP address.

[root@chtac-profiler-02 ~]# openssl s_client -connect 10.51.82.182:443 -showcerts
CONNECTED(00000003)
depth=2 /DC=ch/DC=wlaaan/CN=DC01
verify error:num=19:self signed certificate in certificate chain
verify return:0

Certificate chain
 0 s:/C=CH/ST=zh/L=zh/O=chtac/OU=tac/CN=chtac-guest-01.cca-chtac.ch
   i:/DC=ch/DC=wlaaan/DC=child1/CN=DC03
-----BEGIN CERTIFICATE-----
MIIEOzCCA6SgAwIBAgIKIf8b8wAAAAAACjANBgkqhkiG9w0BAQUFADBTMRIwEAYK
CZImiZPyLGQBGRYCY2gxFjAUBgoJkiaJk/IsZAEZFgZ3bGFhYW4xFjAUBgoJkiaJ
k/IsZAEZFgZjaGlsZDExDTALBgNVBAMTBERDMDMwHhcNMTAwMjIyMDMzOTE0WhcN
MTAxMjE1MTAyNTAzWjBrMQswCQYDVQQGEwJDSDELMAkGA1UECBMCemgxCzAJBgNV
BAcTAnpoMQ4wDAYDVQQKEwVjaHRhYzEMMAoGA1UECxMDdGFjMSQwIgYDVQQDExtj
aHRhYy1ndWVzdC0wMS5jY2EtY2h0YWMuY2gwggEiMA0GCSqGSIb3DQEBAQUAA4IB
DwAwggEKAoIBAQDvPBPIbutHvQZ/CS20D7Aw4JCLyVNrw847d+KumTR7v/TKqpAV
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US4d6piykQv0GgvZ0esB0kFaPIHMx1oaXOnud/q5I6yCEykRruplKonuQlRRtYy7
dmQKbIWNz9/kBjX94NGnqDyhFETBltd90qU4rOAfW4QXDHtDdVyxvJNSorBCZl/B
XmcuZfZNNZ+6PMeTilCOs2u1o/MK8KHdFISCvEkKj/FMfkHoxMB85ome1m+7prBa
mc2pZHLvpxmZ5ARbPYTvZFWQ73yLwrimGoA1AgMBAAGjggF4MIIBdDAdBgNVHQ4E
FgQUMoUHGiDJ3jF70RNIP0MP9q3F7LswHwYDVR0jBBgwFoAUvwLIKZBisSHyIdJA
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dEVucm9sbC9EQzAzLmNoaWxkMS53bGFhYW4uY2hfREMwMy5jcnQwVAYIKwYBBQUH
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9GmWeOLwxMVJKN6thyw8FvSfr3BToz8xsAkScsE4DKYpe0mdYNxiSkozBCHMBDA2
jQzcRedal2eUkdyqDgO6GBzvn8vt7S1rNYnlTURXBqTk9Z/k0woVi5spM4HC2O6g
I1qfm1jP6YtMNFfMHlcDuvN8bthdlchTPlrk+Da9wg==
-----END CERTIFICATE-----
1 s:/DC=ch/DC=wlaaan/DC=child1/CN=DC03
i:/DC=ch/DC=wlaaan/CN=DC01
-----BEGIN CERTIFICATE-----
MIIEKTCCAxGgAwIBAgIKE25meAAAAAAADTANBgkqhkiG9w0BAQUFADA7MRIwEAYK
CZImiZPyLGQBGRYCY2gxFjAUBgoJkiaJk/IsZAEZFgZ3bGFhYW4xDTALBgNVBAMT
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/HtAUTALBgNVHQ8EBAMCAYYwEAYJKwYBBAGCNxUBBAMCAQAwGQYJKwYBBAGCNxQC
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ZGMwMS53bGFhYW4uY2gvQ2VydEVucm9sbC9EQzAxLndsYWFhbi5jaF9EQzAxLmNy
dDBGBggrBgEFBQcwAoY6ZmlsZTovL1xcREMwMS53bGFhYW4uY2hcQ2VydEVucm9s
bFxEQzAxLndsYWFhbi5jaF9EQzAxLmNydDANBgkqhkiG9w0BAQUFAAOCAQEAIMOC
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UrZkry5XE7DqpalVHsL0Ades3SQhnQnXqEP1AJj6KUuDFg6UvRdp1xv8k5KpuPkc
ywL1gWfIc9j/rjmsU9FMkWNTqAMxNJ0Kn4XBoTPCQZEs7x0nKCfQF2NzdV9uBzaJ
Yi0txJxXIfZywjfO72k8JDBmDaO0xw/vHSN9yb2FSJbJTMAHGWMkK0I5nH4WQJ/q
suEzf912Iy3fWr1LkP8J/kv15bnDAcwPDUkHZhp6mFJdTbVNplLIkvoH5r8DyCrV
Es57uTtt+AIktIiRQQ==
-----END CERTIFICATE-----
2 s:/DC=ch/DC=wlaaan/CN=DC01
i:/DC=ch/DC=wlaaan/CN=DC01
-----BEGIN CERTIFICATE-----
MIIDvDCCAqSgAwIBAgIQbI6ZPgiJHI5G0ra5Jn9DXTANBgkqhkiG9w0BAQUFADA7
MRIwEAYKCZImiZPyLGQBGRYCY2gxFjAUBgoJkiaJk/IsZAEZFgZ3bGFhYW4xDTAL
BgNVBAMTBERDMDEwHhcNMDkxMjExMTU1NzIzWhcNMTQxMjExMTYwNjQ1WjA7MRIw
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PLsEdoAmpaLESjbe0dEE93f5YJajfV3wIelzsCRTR8tqYEVrgsC0t9TbATCYCSFr
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Af8wHQYDVR0OBBYEFGDiINQHmY4TdikPWVdeQlCazZLgMGcGA1UdHwRgMF4wXKBa
oFiGKWh0dHA6Ly9kYzAxLndsYWFhbi5jaC9DZXJ0RW5yb2xsL0RDMDEuY3Jshitm
aWxlOi8vXFxEQzAxLndsYWFhbi5jaFxDZXJ0RW5yb2xsXERDMDEuY3JsMBAGCSsG
AQQBgjcVAQQDAgEAMA0GCSqGSIb3DQEBBQUAA4IBAQAz6nn/KKzen1QJEXE3vJV/
4x7ykrRBpzZVGd6Y04eSammbjgxpqUe9bKbewHwW4rJXzcSkYlvS2uXqF72GU8Iy
QkY8vPXoMV9vA7l8+IIykPwubdm6AFdV44+SOR469CQx5WVgbMOdWvswpQO/SDX1
cZC45QO7mp5EqT4YxgqvoophPhZvpX+xsR/9oYzquB23lqJsaeqxBsktLZ0+hRt7
5eWi9vbCTHSR8TfIEKmPiv0scQTrs15Eq+GXmX3D4TtkE69pKxst+8/BLeHv7Ow/
mG5WG7b/5VVXrMY7lOSM365977eAB3gAcjrxNJXxlnUxocA1K9yClwARCByivu94
-----END CERTIFICATE-----

Server certificate
subject=/C=CH/ST=zh/L=zh/O=chtac/OU=tac/CN=chtac-guest-01.cca-chtac.ch
issuer=/DC=ch/DC=wlaaan/DC=child1/CN=DC03

No client certificate CA names sent

SSL handshake has read 3814 bytes and written 334 bytes

New, TLSv1/SSLv3, Cipher is DHE-RSA-AES256-SHA
Server public key is 2048 bit
Compression: NONE
Expansion: NONE
SSL-Session:
  Protocol : TLSv1
  Cipher   : DHE-RSA-AES256-SHA
  Session-ID: CC199168FE8774E32A24FAB644D9B1C050A34E4C3DC7EA4688FA1D19713B67E5
  Session-ID-ctx:
  Master-Key:
4D373D55E036C9836387DF14ED6B7B177EDB8E71C10595EE168EF0ADB582109C56877B2E6684C94847
05B8E6BD884417
  Key-Arg   : None
  Start Time: 1298372073
  Timeout   : 300 (sec)
  Verify return code: 19 (self signed certificate in certificate chain)

Or directly from NGS CLI:>

```
openssl s_client -connect localhost:443 -state -debug
```

…..
read from 0x95bfe90 [0x95c543d] (48 bytes => 48 (0x30))
0000 - 7a 5e f4 a5 45 68 ad 84-46 a8 af ab bd 30 42 69   z^..Eh..F....0Bi
0010 - d5 a6 be 4e 22 82 2b 22-c4 d2 be f8 0f d7 a0 a2   ...N".+".....
0020 - f2 5b 53 57 24 39 39 21-f4 77 58 50 3d 9b d4 64   .[SW$99!.wXP=..d

SSL_connect:SSLv3 read finished A

Certificate chain
 0 s:/C=CH/ST=zh/L=zh/O=chtac/OU=tac/CN=chtac-guest-01.cca-chtac.ch
   i:/DC=ch/DC=wlaaan/DC=child1/CN=DC03
 1 s:/DC=ch/DC=wlaaan/DC=child1/CN=DC03
   i:/DC=ch/DC=wlaaan/CN=DC01
 2 s:/DC=ch/DC=wlaaan/CN=DC01
   i:/DC=ch/DC=wlaaan/CN=DC01

Server certificate
-----BEGIN CERTIFICATE-----
MIIEOzCCA6SgAwIBAgIKIf8b8wAAAAAACjANBgkqhkiG9w0BAQUFADBTMRIwEAYK
CZImiZPyLGQBGRYCY2gxFjAUBgoJkiaJk/IsZAEZFgZ3bGFhYW4xFjAUBgoJkiaJ
k/IsZAEZFgZjaGlsZDExDTALBgNVBAMTBERDMDMwHhcNMTAwMjIyMDMzOTE0WhcN
MTAxMjE1MTAyNTAzWjBrMQswCQYDVQQGEwJDSDELMAkGA1UECBMCemgxCzAJBgNV
BAcTAnpoMQ4wDAYDVQQKEwVjaHRhYzEMMAoGA1UECxMDdGFjMSQwIgYDVQQDExtj
aHRhYy1ndWVzdC0wMS5jY2EtY2h0YWMuY2gwggEiMA0GCSqGSIb3DQEBAQUAA4IB
DwAwggEKAoIBAQDvPBPIbutHvQZ/CS20D7Aw4JCLyVNrw847d+KumTR7v/TKqpAV
MiZoA4M1D2NyG9rebsa9DJTfqIH2fk2KKGF2g9aGFLlYkoqASnjWaGIbFm73aK2I
US4d6piykQv0GgvZ0esB0kFaPIHMx1oaXOnud/q5I6yCEykRruplKonuQlRRtYy7
dmQKbIWNz9/kBjX94NGnqDyhFETBltd90qU4rOAfW4QXDHtDdVyxvJNSorBCZl/B
XmcuZfZNNZ+6PMeTilCOs2u1o/MK8KHdFISCvEkKj/FMfkHoxMB85ome1m+7prBa
mc2pZHLvpxmZ5ARbPYTvZFWQ73yLwrimGoA1AgMBAAGjggF4MIIBdDAdBgNVHQ4E
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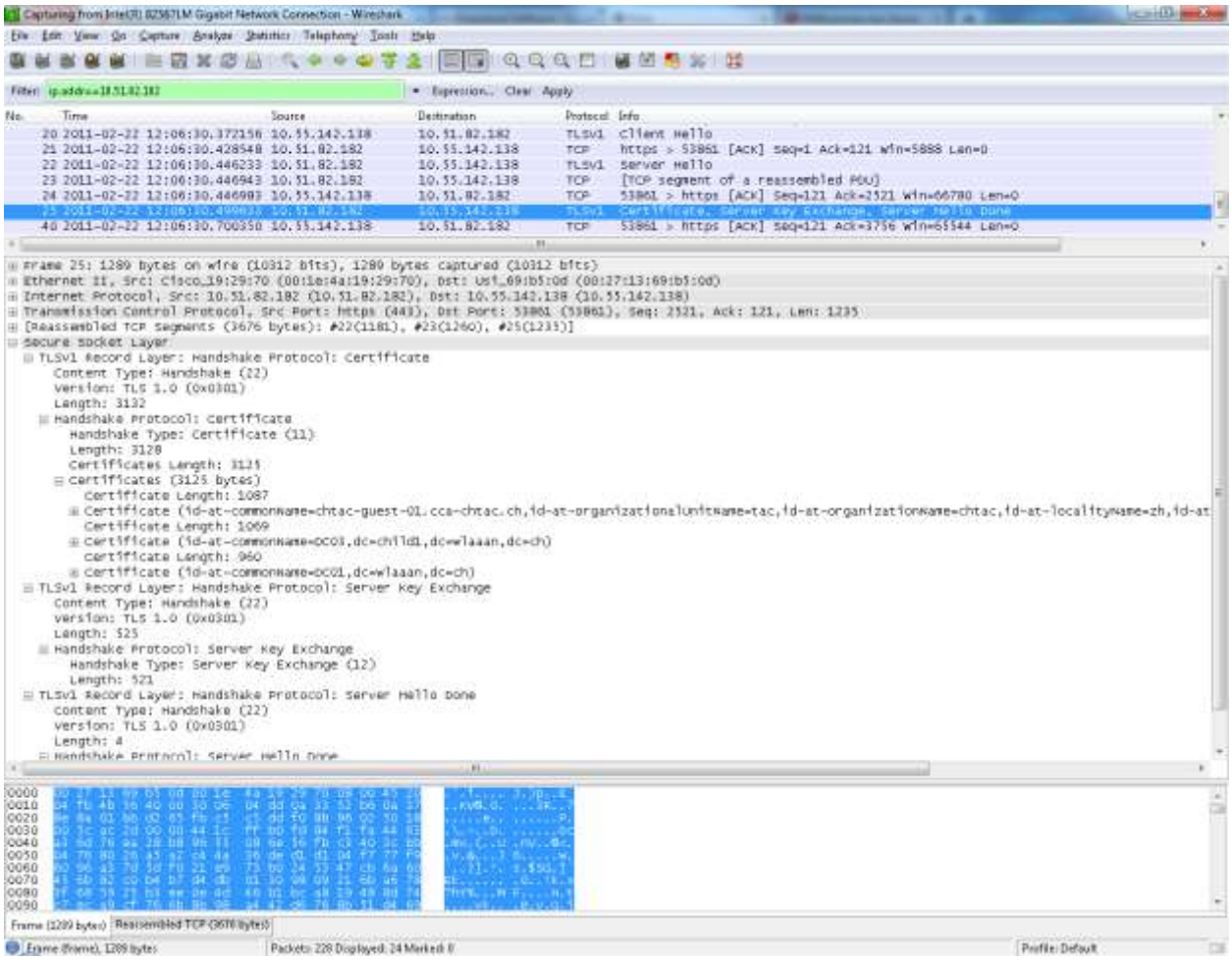
OK98Gfx7QFEwdQYDVR0fBG4wbDBqoGigZoYwaHR0cDovL2RjMDMuY2hpbGQxLnds
YWFhbi5jaC9DZXJ0RW5yb2xsL0RDMDMuY3JshjJmaWxlOi8vXFxEQzAzLmNoaWxk
MS53bGFhYW4uY2hcQ2VydEVucm9sbFxEQzAzLmNybDCBugYIKwYBBQUHAQEEga0w
gaowUgYIKwYBBQUHMAKGRmh0dHA6Ly9kYzAzLmNoaWxkMS53bGFhYW4uY2gvQ2Vy
dEVucm9sbC9EQzAzLmNoaWxkMS53bGFhYW4uY2hfREMwMy5jcnQwVAYIKwYBBQUH
MAKGSGZpbGU6Ly9cXERDMDMuY2hpbGQxLndsYWFhbi5jaFxDZXJ0RW5yb2xsXERD
MDMuY2hpbGQxLndsYWFhbi5jaF9EQzAzLmNydDANBgkqhkiG9w0BAQUFAAOBgQBQ
9GmWeOLwxMVJKN6thyw8FvSfr3BToz8xsAkScsE4DKYpe0mdYNxiSkozBCHMBDA2
jQzcRedal2eUkdyqDgO6GBzvn8vt7S1rNYnlTURXBqTk9Z/k0woVi5spM4HC2O6g
I1qfm1jP6YtMNFfMHlcDuvN8bthdlchTPlrk+Da9wg==
-----END CERTIFICATE-----
subject=/C=CH/ST=zh/L=zh/O=chtac/OU=tac/CN=chtac-guest-01.cca-chtac.ch
issuer=/DC=ch/DC=wlaaan/DC=child1/CN=DC03

Now on the client workstation you can validate using sniffer trace (wireshark)



Note: certificate for DC01 / DC03 and chtac-guest-01.cca-chtac.ch