ASA IKEv2 RA VPN met Windows 7- of Android VPN-clients en certificaatconfiguratie

Inhoud

Inleiding

Dit document beschrijft hoe u Cisco adaptieve security applicatie (ASA) versie 9.7.1 en later kunt configureren om Windows 7 en Android native (Virtual Private Network) VPN-clients in te stellen (Remote Access) RA VPN-verbinding met het gebruik van Internet Key Exchange Protocol (IKEv2) en certificaten als de verificatiemethode.

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Voorwaarden

Vereisten

Cisco raadt kennis van de volgende onderwerpen aan:

- certificaatinstantie (CA)
- PKI-infrastructuur
- RA VPN met IKEv2 op ASA
- Windows 7 ingebouwde VPN-client
- Android native VPN-client

Gebruikte componenten

De informatie in dit document is gebaseerd op deze softwareversies:

- CISCO 1921/K9 - 15.5(3)M4a als IOS-CA server
- ASA 5506X - 9.7(1) als VPN-head-end
- Windows 7 als clientmachine
- Galaxy J5 - Android 6.0.1 als mobiele client

De informatie in dit document is gebaseerd op de apparaten in een specifieke laboratoriumomgeving. Alle apparaten die in dit document worden beschreven, hadden een opgeschoonde (standaard)configuratie. Als uw netwerk levend is, zorg er dan voor dat u de mogelijke impact van om het even welke opdracht begrijpt.

Configureren

Overzicht

Dit zijn de stappen om de Windows 7- en Android-native VPN-clients te configureren om verbinding te maken met een ASA-head-end:

Certificaat-instantie instellen

De CA staat toe om het vereiste Extended Key Gebruik (EKU) in het certificaat te insluiten. Voor de ASA head-end-account is Auth EKU van de certificaatserver vereist, terwijl de client-EKU nodig heeft.

Een verscheidenheid aan CA-servers kan worden gebruikt, zoals:

- Cisco IOS CA-server
- OpenSSL CA-server
- Microsoft CA-server
- 3rd partijen

IOS CA Server wordt gebruikt voor dit configuratievoorbeeld.

Dit gedeelte beschrijft de basisconfiguratie voor een CISCO1921/K9 met versie 15.5(3)M4a als een CA-server.

Stap 1. Zorg ervoor dat het apparaat en de versie de opdracht KU ondersteunen.

```
IOS-CA# show run | section crypto pki
crypto pki server <CA_Server>
  issuer-name <cn=calo_root,ou=TAC,o=cisco>
  grant auto
  eku server-auth client-auth
```

Stap 2. Schakel de HTTP-server in op de router.

```
IOS-CA(config)#ip http server
```

Stap 3. Generate a exportable RSA keypair.

```
IOS-CA(config)# crypto key generate rsa modulus 2048 label <HeadEnd> exportable
```

```
The name for the keys will be: HeadEnd
% The key modulus size is 2048 bits
% Generating 2048 bit RSA keys, keys will be exportable...
[OK] (elapsed time was 5 seconds)
```

Stap 4. Het instellen van een betrouwbaar punt.

```
IOS-CA(config)# crypto pki trustpoint <HeadEnd>
IOS-CA(ca-trustpoint)#enrollment url http://10.201.180.230:80
IOS-CA(ca-trustpoint)#subject-name <cn=HeadEnd.david.com>
IOS-CA(ca-trustpoint)#revocation-check none
IOS-CA(ca-trustpoint)#rsakeypair <HeadEnd>
```

> Opmerking: Het IP-adres voor de inschrijving-opdracht is een van de routergeconfigureerde IP-adressen voor een bereikbare interface.

Stap 5. Verifieer het trustpunt (Ontvang het CA-certificaat).

```
IOS-CA(config)#crypto pki authenticate <HeadEnd>
Certificate has the following attributes:
       Fingerprint MD5: DA4502F4 CEFB4F08 AAA3179B 70019185
      Fingerprint SHA1: A887F6DB 0656C7E2 857749F3 EA3D7176 8920F52F
% Do you accept this certificate? [yes/no]: yes
Trustpoint CA certificate accepted.
```

Stap 6. Voer het trustpunt in (Ontvang het identiteitsbewijs).

```
IOS-CA(config)#crypto pki enroll <HeadEnd>
%
% Start certificate enrollment ..
% Create a challenge password. You will need to verbally provide this
   password to the CA Administrator in order to revoke your certificate.
   For security reasons your password will not be saved in the configuration.
   Please make a note of it.
Password: cisco123
Re-enter password: cisco123
% The subject name in the certificate will include: cn=HeadEnd.david.com
% The subject name in the certificate will include: Connected_2_INET-B
% Include the router serial number in the subject name? [yes/no]: no
% Include an IP address in the subject name? [no]: no
Request certificate from CA? [yes/no]: yes
% Certificate request sent to Certificate Authority
% The 'show crypto pki certificate verbose HeadEnd' command will show the fingerprint.
*Jul 17 15:21:11.343: CRYPTO_PKI:  Certificate Request Fingerprint MD5: 0017C310 9F6084E8
63053228 B449794F
*Jul 17 15:21:11.343: CRYPTO_PKI:  Certificate Request Fingerprint SHA1: CFE22C7A B2855C4D
B4B2412B 57FC7106 1C5E7791
*Jul 17 15:21:15.675: %PKI-6-CERTRET: Certificate received from Certificate Authority
```

Stap 7. Controleer de certificaten.

```
IOS-CA#show crypto pki certificates verbose <HeadEnd>
Certificate
  Status: Available
  Version: 3
  Certificate Serial Number (hex): 05
  Certificate Usage: General Purpose
  Issuer:
    cn=calo_root
  Subject:
    Name: Connected_2_INET-B
    hostname=Connected_2_INET-B
    cn=HeadEnd.david.com
  Validity Date:
    start date: 16:56:14 UTC Jul 16 2017
    end   date: 16:56:14 UTC Jul 16 2018
  Subject Key Info:
    Public Key Algorithm: rsaEncryption
    RSA Public Key: (2048 bit)
  Signature Algorithm: SHA1 with RSA Encryption
  Fingerprint MD5: 0017C310 9F6084E8 63053228 B449794F
  Fingerprint SHA1: CFE22C7A B2855C4D B4B2412B 57FC7106 1C5E7791
  X509v3 extensions:
    X509v3 Key Usage: A0000000
      Digital Signature
      Key Encipherment
    X509v3 Subject Key ID: E9B3A080 779A76E7 8BE44F38 C3E4DEDF 18E75009
    X509v3 Authority Key ID: B5EEEEB9 31B9A06C CBD9893C 0E318810 5CA657E6
   Authority Info Access:
    Extended Key Usage:
        Client Auth
        Server Auth
  Associated Trustpoints: HeadEnd
  Key Label: HeadEnd

CA Certificate
  Status: Available
  Version: 3
  Certificate Serial Number (hex): 01
  Certificate Usage: Signature
  Issuer:
    cn=calo_root
  Subject:
    cn=calo_root
  Validity Date:
    start date: 13:24:35 UTC Jul 13 2017
    end   date: 13:24:35 UTC Jul 12 2020
  Subject Key Info:
    Public Key Algorithm: rsaEncryption
    RSA Public Key: (1024 bit)
  Signature Algorithm: MD5 with RSA Encryption
  Fingerprint MD5: DA4502F4 CEFB4F08 AAA3179B 70019185
  Fingerprint SHA1: A887F6DB 0656C7E2 857749F3 EA3D7176 8920F52F
  X509v3 extensions:
    X509v3 Key Usage: 86000000
      Digital Signature
      Key Cert Sign
      CRL Signature
    X509v3 Subject Key ID: B5EEEEB9 31B9A06C CBD9893C 0E318810 5CA657E6
    X509v3 Basic Constraints:
        CA: TRUE
    X509v3 Authority Key ID: B5EEEEB9 31B9A06C CBD9893C 0E318810 5CA657E6
    Authority Info Access:
  Associated Trustpoints: test HeadEnd CA_Server
```

Stap 8. Exporteren van het hoofdeindpunt naar terminal in PKCS12-formaat om het identiteitsbewijs te verkrijgen. Het CA-certificaat en de privé-toets worden in één bestand toegevoegd.

```
IOS-CA(config)#crypto pki export
```

```
          <cisco123>
Exported pkcs12 follows:
```

```
MIIL3wIBAzCCC5kGCSqGSIb3DQEHAaCCC4oEgguGMIILgjCCC34GCSqGSIb3DQEH
BqCCC28wggtrAgEAMIILZAYJKoZIhvcNAQcBMBsGCiqGSIb3DQEMAQMwDQQIocGz
Fa6tZyACAQGAggs4qNTJi7l/f0IvQr8n1c/SCeaSYRLBvcY9yPgJ2K2/Nmu9+KNB
3dAoYkCrGwDdfpobJE0XqBpIE1uBOtAeF7zdFJt/Pgpie4fcqpCVIbDXG8Ansmhj
v0j6W9Z/IJHe7JrENatbi4nhTnCDP79Z65QSkzrb9DenkCGjoQsWP9zLHTiCDNzV
ajMlWFuCFb0wSW/6L73BLTjS7rwtE74gYMU5NJwtOVsJM2LdwuQ+iOnpsnp6q9fu
niUFEutPe8imOCRApe0tpPqhDp74hKziKT8JEsQ8HMO/lX1y/LIXdLISnz1nkoN3
vxD4AMGRFYACPH8PiGcVSx+vD+wmNaHp1vAOrq4pS7ZQ37ko4mFudnftdOUzaPIz
EzTrOwlRE6il/gF8vb14EfeR09vumJBsajF12hrFGugIJTZnElp5go+oHEEAo4Y+
Yhoj/MIOyhZzo3/ujhjKqtsAJXybYF9YqVkTee9u4Xjkcsg5AmbaqeUUfd7Q8CC2
bi39S1maoWbTYiNcHFs/bWKWJsgZwPzfWtmPch/8MNvXn46AJAwIwRQjHruuFE9F
bhv7SRhYSRQZPf7j1PTmJuMkKA3AzjdbmmJuLidbX3yKbTt4PxPMusbv+ojc6Nam
RCsRf7+gnNZLWs3eU1n84rryZg5Pjw3MRTu2yXDvr799gvx7NIZH5yUZyVl1T70b
eC4KbflcmpM6mJ2UVnaoP2N5u892m41BWuk9rt5isl2f/Z/ZuSbkFaxzU0456zSg
VbYsR+51XfQEH5xu88E5EUPWZ86YdUSlbD8ky6WOn0M1O4K6rNDLkgwXcxw3CaZ8
zhao+dE3qoEYWaKPgCQzPqW0BW3y7WSIELug2uSEsXQjIQcF+42CX6RA3yCmy2T8
C+osKlSSao0nzjrlpTWnPiFss9KRFgJDZhV2ItisiALNw9PqruddcmYtw44LXvdc
+OfnyRvuLS6LE/AMmGk0GaVetAXPezD+5pVZW13UMT/ZdzUjLiXjV9GzF6V8i8qN
Ua0MbDEa8T5Le4dCigaA+t1QxQOPGb+w0ZAQzWN4gZpSEk3ejRixOt14SU5ivj/O
lGXNn8Fvebk42CHohjXG9fq/IfbsVWSkxn2OZ/fhXkZztv4ic1VgprgJURjCtcBw
9Qp/ONda+9aDHiSBrKeHC/urgX6rgWXv9+hpRKIRfj3b8WE+N1sivuQEjlWxbD7h
9fpwxXb+/i7HisjzSkOWUNw4lyulfYSiOv86FPWK0H9Vjbg0G0di1rvGZ8uJHQCC
77RLFXp4jrvCgeo4oWKQbphgPAng7rT794vMwq0rYOb4D3HlHCUvU3JJmScDJQy2
zQxbG2q8Htm44COOuJEUBzx1ImayH2XvDck6VmLTGn8XH5Vq7LOlCeUcVDM8aQfy
HJSPk/VmfQ0lXwPIaxxYlr+jOpcorFkH+OH04hz07grAsGyLRoFICTEvHAzVnF0X
2A1j/z/BFAPG86ssAtInRZVeYUS72NwPEtpKmlHZnl+2iWno5iwTZgtjv7oREZKE
RE6m7O8RiPSD2RjjamCmmmnH5dK5wxF7YlIeK/+ZVrfwLecEPRl+eVw0isM/JN/a
WmkZkCcVMx/ec1P8jp8LzCx17HgVNYbg9lsiffD4xo0G/k0QLUlpliAt7LA2BeGs
yl55wtYUcOBH0/Es39yWnm2Ea//IK6BLw98PvU90vkXWwiD3ajFmcHmssDeU/tZR
4KKNuNor7Le9ycXZFM9ofKZ6AIJ9A1AYvOyhGO88voq8MMGXEe/q+DIjaVE1htYu
k0ELmYAD/XOkEvp3SqOkLQZiCzZ20iMWUTWXlXfgrfLEH0utwHTyr3J2vQk5CD37
ZAfsF6zxEvtU2t41J0e9OjWJw9WtWnnS0gzLeXWtW3H0YAIw3QodKNzbaY4eLP4y
BEdsLmWbM4eza0m9BoZOmMUSkhvFrEz5Q5X5r9vCuAi1rYDqyIjhgdme56tVV0Vg
ZauhbNX59PQQzwOdIZJVVL5tgjf0h7XCm9OBsqd12lHurCCmHy7kM5pqf0MMlhH7
oM/DhXdTU+1sEabt/9c2qs1ihJLS1Zaw2q1AaS5h00+xL8Lxwh2/1/R7Q8FferhR
QZDpix+CmtakRu7uPOMa0zsyOko3P9mf74AWDrThAwMA6G238TC6XI1vrXhvEX1l
BVplQq0Wh/p7ZorSjD5l+z7TkXmJNp7iIxAqp0yobC6vOBwQP7/QAs88q9JNSAte
ErdCXoizvs8YmZMoEap948oplYFaIP+xCnCr8l3v7znwfZwTMQPoPvqEFqUmWYgt
xkJ0qaE645ihTnLgk4eglsBLslwPR1RJU+t6kGGAUmxqhPFxb3/1xNRPVzOGn12w
S9yw+XLC6kS4PmKoxkxax4nnCx7s3e7B5e0qmYtgRTJ0GuW7Uf+T3royTOuYm0d+
ik6bmxcnO0qdcHtt2HTbI+kYpken3YrFOh9Jnm9ZKT63gQSqQWL800ZVd4dAZceg
FciNKs9r26fyy+L3rGCh+U9TLf6mNuWu8RstjjIGPHEPKZ9gnMgMJmikP2ghgOAd
XVhs6ashXx33bZ9dIuhRx6uTNMrppsXyg6SxUyeGDYhpxsPt7uRwBswOpi6iDMZn
ISSzQjrkxoNwwOfn87O5fTCLhHlTZa8HS5HMK3KE7LiZv9pa1z6KTo4z+LCQSLDy
FoRJhSaEsCYJsLDS5nYBoR8hE/eMvQDX1f+RZBrJDcftxx7FQ+8RtvHSJRcJK9N/
Ph/pL62NBlSbvCfn1AbisKrbbgCVLOSj/doufPvpMT2UDL0TY8UnQiyWMH1MF3tZ
jJy6Si2glLwA9hu/c1NsREbA0gxMTjAREb5BjAUmlc3fuv2DWpwnkwyZNyHdm9B9
TPRoByGPvSZXa8MwY/8DUEwUQEsfDJi5jlAD4I6VFFUB72ZS7wn/mVR02fPkfOMp
3yhnGgX29OaDDiDlKw1Xwj1NybOhpZ6unDo5J3stMxlbv5TYL2Tl6egZS0SjsLmn
cj5zkyUU22/93E5vfKD1CMiXx9/e4j2rRh3QCIXqaCjC9acTJ8a/k9/bp8Nz5Cir
pnaCbuQsvna92nxVUqcmLlSbVIvGqlH9qm4DurhcLh59j20tX6K8AMJ90+azaYbX
AJV/MCElhJg6wcN8QnCHMhiuK9+zpsUK2FQgfbcgaaNe3xGaXuoOIGQmlbAGtEkp
kuauRzQ8/pwszaZuPh/5rE77z8zMut3+OE5CslB9npzNi0b0itaaRl13bBBml1xn
r6SBUw7AWapZwRx6pihvptLJaqU1IzaV5SWk0zTABR7BmR84L0+/8v/bedcPSioG
ecside21F6CcWO5ywABBxDYQXM1P9qkC/2bkPkEJ0jBI5P5L1+Yqb8hTlone/InR
B8ktEd8+QW8o60h0seONXumTqBfAuNBkprOA3ssXLeEGB0IpeC5oGW+VSziyS9id
zYq8WaehpAIf3pqwn8gsi0B/wd57T0KK91+v0Ei4z+yIdu8Kh9GTiqGvgNAeakgr
ECDiXoKAwltYAn7cLKNpZaojSs2Jt+60oBA5crT04Mtgpjb9Pd/DLqWQDJTyoRVv
cJRb68aOyZvVBU0yoLbox84QKLHIsA92pplS7VFrAWP65wrhs4XOf4YSFlM89Sn4
GD/yEsGVJzwGrxgCNnOZkLIKsFbIOjp2lMps5jVKoFfpPJCie3F2FB3ecS+xRpHo
```

```
5u2KOTmH0rFQ6Vu+JYCo/qWh0ERtL/8gczP7C9ehiaZfemw2bq9xrUo+6y3H9Q+Z
LADwMlAkI+kzbng3R+fj4AYBvf8GTJdpBs8s/t7mZXHiXCtH6qxTMRWJx5Xuxs9F
I8Ii8TA9MCEwCQYFKw4DAhoFAAQUjO/On/REYODupznP9SwYnFX92BYEFESx1MSa
ho3Cv1cZYM0TzZEzlsKdAgIEAA==
---End - This line not part of the pkcs12---

CRYPTO_PKI: Exported PKCS12 file successfully.
*Jul 17 15:46:49.706: %PKI-6-PKCS12EXPORT_SUCCESS: PKCS #12 Successfully Exported.
```

Stap 9. Maak een leeg trustpunt op de ASA.

```
ASA(config)# crypto ca trustpoint <HeadEnd>
DRIVERAP(config-ca-trustpoint)# exit
```

Stap 10. Importeer het PKCS12-bestand.

```
ASA(config)#crypto ca import <HeadEnd> pkcs12 <cisco123>
Enter the base 64 encoded pkcs12.
End with the word "quit" on a line by itself:
MIIL3wIBAzCCC5kGCSqGSIb3DQEHAaCCC4oEgguGMIILgjCCC34GCSqGSIb3DQEH
BqCCC28wggtrAgEAMIILZAYJKoZIhvcNAQcBMBsGCiqGSIb3DQEMAQMwDQQIocGz
Fa6tZyACAQGAggs4qNTJi7l/f0IvQr8n1c/SCeaSYRLBvcY9yPgJ2K2/Nmu9+KNB
3dAoYkCrGwDdfpobJE0XqBpIE1uBOtAeF7zdFJt/Pgpie4fcqpCVIbDXG8Ansmhj
v0j6W9Z/IJHe7JrENatbi4nhTnCDP79Z65QSkzrb9DenkCGjoQsWP9zLHTiCDNzV
ajMlWFuCFb0wSW/6L73BLTjS7rwtE74gYMU5NJwtOVsJM2LdwuQ+iOnpsnp6q9fu
niUFEutPe8imOCRApe0tpPqhDp74hKziKT8JEsQ8HMO/lX1y/LIXdLISnz1nkoN3
vxD4AMGRFYACPH8PiGcVSx+vD+wmNaHp1vAOrq4pS7ZQ37ko4mFudnftdOUzaPIz
EzTrOwlRE6il/gF8vb14EfeR09vumJBsajF12hrFGugIJTZnElp5go+oHEEAo4Y+
Yhoj/MIOyhZzo3/ujhjKqtsAJXybYF9YqVkTee9u4Xjkcsg5AmbaqeUUfd7Q8CC2
bi39S1maoWbTYiNcHFs/bWKWJsgZwPzfWtmPch/8MNvXn46AJAwIwRQjHruuFE9F
bhv7SRhYSRQZPf7j1PTmJuMkKA3AzjdbmmJuLidbX3yKbTt4PxPMusbv+ojc6Nam
RCsRf7+gnNZLWs3eU1n84rryZg5Pjw3MRTu2yXDvr799gvx7NIZH5yUZyVl1T70b
eC4KbflcmpM6mJ2UVnaoP2N5u892m41BWuk9rt5isl2f/Z/ZuSbkFaxzU0456zSg
VbYsR+51XfQEH5xu88E5EUPWZ86YdUSlbD8ky6WOn0M1O4K6rNDLkgwXcxw3CaZ8
zhao+dE3qoEYWaKPgCQzPqW0BW3y7WSIELug2uSEsXQjIQcF+42CX6RA3yCmy2T8
C+osKlSSao0nzjrlpTWnPiFss9KRFgJDZhV2ItisiALNw9PqruddcmYtw44LXvdc
+OfnyRvuLS6LE/AMmGk0GaVetAXPezD+5pVZW13UMT/ZdzUjLiXjV9GzF6V8i8qN
Ua0MbDEa8T5Le4dCigaA+t1QxQOPGb+w0ZAQzWN4gZpSEk3ejRixOt14SU5ivj/O
lGXNn8Fvebk42CHohjXG9fq/IfbsVWSkxn2OZ/fhXkZztv4ic1VgprgJURjCtcBw
9Qp/ONda+9aDHiSBrKeHC/urgX6rgWXv9+hpRKIRfj3b8WE+N1sivuQEjlWxbD7h
9fpwxXb+/i7HisjzSkOWUNw4lyulfYSiOv86FPWK0H9Vjbg0G0di1rvGZ8uJHQCC
77RLFXp4jrvCgeo4oWKQbphgPAng7rT794vMwq0rYOb4D3HlHCUvU3JJmScDJQy2
zQxbG2q8Htm44COOuJEUBzx1ImayH2XvDck6VmLTGn8XH5Vq7LOlCeUcVDM8aQfy
HJSPk/VmfQ0lXwPIaxxYlr+jOpcorFkH+OH04hz07grAsGyLRoFICTEvHAzVnF0X
2A1j/z/BFAPG86ssAtInRZVeYUS72NwPEtpKmlHZnl+2iWno5iwTZgtjv7oREZKE
RE6m7O8RiPSD2RjjamCmmmnH5dK5wxF7YlIeK/+ZVrfwLecEPRl+eVw0isM/JN/a
WmkZkCcVMx/ec1P8jp8LzCx17HgVNYbg9lsiffD4xo0G/k0QLUlpliAt7LA2BeGs
yl55wtYUcOBH0/Es39yWnm2Ea//IK6BLw98PvU90vkXWwiD3ajFmcHmssDeU/tZR
4KKNuNor7Le9ycXZFM9ofKZ6AIJ9A1AYvOyhGO88voq8MMGXEe/q+DIjaVE1htYu
k0ELmYAD/XOkEvp3SqOkLQZiCzZ20iMWUTWXlXfgrfLEH0utwHTyr3J2vQk5CD37
ZAfsF6zxEvtU2t41J0e9OjWJw9WtWnnS0gzLeXWtW3H0YAIw3QodKNzbaY4eLP4y
BEdsLmWbM4eza0m9BoZOmMUSkhvFrEz5Q5X5r9vCuAi1rYDqyIjhgdme56tVV0Vg
ZauhbNX59PQQzwOdIZJVVL5tgjf0h7XCm9OBsqd12lHurCCmHy7kM5pqf0MMlhH7
oM/DhXdTU+1sEabt/9c2qs1ihJLS1Zaw2q1AaS5h00+xL8Lxwh2/1/R7Q8FferhR
QZDpix+CmtakRu7uPOMa0zsyOko3P9mf74AWDrThAwMA6G238TC6XI1vrXhvEX1l
BVplQq0Wh/p7ZorSjD5l+z7TkXmJNp7iIxAqp0yobC6vOBwQP7/QAs88q9JNSAte
ErdCXoizvs8YmZMoEap948oplYFaIP+xCnCr8l3v7znwfZwTMQPoPvqEFqUmWYgt
xkJ0qaE645ihTnLgk4eglsBLslwPR1RJU+t6kGGAUmxqhPFxb3/1xNRPVzOGn12w
S9yw+XLC6kS4PmKoxkxax4nnCx7s3e7B5e0qmYtgRTJ0GuW7Uf+T3royTOuYm0d+
ik6bmxcnO0qdcHtt2HTbI+kYpken3YrFOh9Jnm9ZKT63gQSqQWL800ZVd4dAZceg
FciNKs9r26fyy+L3rGCh+U9TLf6mNuWu8RstjjIGPHEPKZ9gnMgMJmikP2ghgOAd
XVhs6ashXx33bZ9dIuhRx6uTNMrppsXyg6SxUyeGDYhpxsPt7uRwBswOpi6iDMZn
```

```
ISSzQjrkxoNwwOfn87O5fTCLhHlTZa8HS5HMK3KE7LiZv9pa1z6KTo4z+LCQSLDy
FoRJhSaEsCYJsLDS5nYBoR8hE/eMvQDX1f+RZBrJDcftxx7FQ+8RtvHSJRcJK9N/
Ph/pL62NBlSbvCfn1AbisKrbbgCVLOSj/doufPvpMT2UDL0TY8UnQiyWMH1MF3tZ
jJy6Si2glLwA9hu/c1NsREbA0gxMTjAREb5BjAUmlc3fuv2DWpwnkwyZNyHdm9B9
TPRoByGPvSZXa8MwY/8DUEwUQEsfDJi5jlAD4I6VFFUB72ZS7wn/mVR02fPkfOMp
3yhnGgX29OaDDiDlKw1Xwj1NybOhpZ6unDo5J3stMxlbv5TYL2Tl6egZS0SjsLmn
cj5zkyUU22/93E5vfKD1CMiXx9/e4j2rRh3QCIXqaCjC9acTJ8a/k9/bp8Nz5Cir
pnaCbuQsvna92nxVUqcmLlSbVIvGqlH9qm4DurhcLh59j20tX6K8AMJ90+azaYbX
AJV/MCElhJg6wcN8QnCHMhiuK9+zpsUK2FQgfbcgaaNe3xGaXuoOIGQmlbAGtEkp
kuauRzQ8/pwszaZuPh/5rE77z8zMut3+OE5CslB9npzNi0b0itaaRl13bBBml1xn
r6SBUw7AWapZwRx6pihvptLJaqU1IzaV5SWk0zTABR7BmR84L0+/8v/bedcPSioG
ecside21F6CcWO5ywABBxDYQXM1P9qkC/2bkPkEJ0jBI5P5L1+Yqb8hTlone/InR
B8ktEd8+QW8o60h0seONXumTqBfAuNBkprOA3ssXLeEGB0IpeC5oGW+VSziyS9id
zYq8WaehpAIf3pqwn8gsi0B/wd57T0KK91+v0Ei4z+yIdu8Kh9GTiqGvgNAeakgr
ECDiXoKAwltYAn7cLKNpZaojSs2Jt+60oBA5crT04Mtgpjb9Pd/DLqWQDJTyoRVv
cJRb68aOyZvVBU0yoLbox84QKLHIsA92pplS7VFrAWP65wrhs4XOf4YSFlM89Sn4
GD/yEsGVJzwGrxgCNnOZkLIKsFbIOjp2lMps5jVKoFfpPJCie3F2FB3ecS+xRpHo
5u2KOTmH0rFQ6Vu+JYCo/qWh0ERtL/8gczP7C9ehiaZfemw2bq9xrUo+6y3H9Q+Z
LADwMlAkI+kzbng3R+fj4AYBvf8GTJdpBs8s/t7mZXHiXCtH6qxTMRWJx5Xuxs9F
I8Ii8TA9MCEwCQYFKw4DAhoFAAQUjO/On/REYODupznP9SwYnFX92BYEFESx1MSa
ho3Cv1cZYM0TzZEzlsKdAgIEAA==
```

```
quit
INFO: Import PKCS12 operation completed successfully
```

Stap 1. Controleer de certificaatinformatie.

```
ASA(config)#show crypto ca certificates <HeadEnd>
CA Certificate
  Status: Available
  Certificate Serial Number: 01
  Certificate Usage: Signature
  Public Key Type: RSA (1024 bits)
  Signature Algorithm: MD5 with RSA Encryption
  Issuer Name:
    cn=calo_root
  Subject Name:
    cn=calo_root
  Validity Date:
    start date: 13:24:35 UTC Jul 13 2017
    end   date: 13:24:35 UTC Jul 12 2020
  Storage: config
  Associated Trustpoints: test HeadEnd
Certificate
  Status: Available
  Certificate Serial Number: 05
  Certificate Usage: General Purpose
  Public Key Type: RSA (2048 bits)
  Signature Algorithm: SHA1 with RSA Encryption
  Issuer Name:
    cn=calo_root
  Subject Name:
    hostname=Connected_2_INET-B
    cn=HeadEnd.david.com
  Validity Date:
    start date: 16:56:14 UTC Jul 16 2017
    end   date: 16:56:14 UTC Jul 16 2018
  Storage: config
  Associated Trustpoints: HeadEnd
```

Een clientcertificaat genereren

Stap 1. Genereert een exporteerbaar RSA-toetsenbord.

```
IOS-CA(config)# crypto key generate rsa modulus 2048 label <Win7_PC> exportable
The name for the keys will be: Win7_PC
% The key modulus size is 2048 bits
% Generating 2048 bit RSA keys, keys will be exportable...
[OK] (elapsed time was 5 seconds
```

Stap 2. Het configureren van een trustpunt.

```
IOS-CA(config)# crypto pki trustpoint <Win7_PC>
IOS-CA(ca-trustpoint)#enrollment url http://10.201.180.230:80
IOS-CA(ca-trustpoint)#subject-name <cn=Win7_PC.david.com>
IOS-CA(ca-trustpoint)#revocation-check none
IOS-CA(ca-trustpoint)#rsakeypair <Win7_PC>
```

Stap 3. Verifieer het geconfigureerde vertrouwde punt (Ontvang het CA-certificaat).

```
IOS-CA(config)#crypto pki authenticate <Win7_PC>
Certificate has the following attributes:
       Fingerprint MD5: DA4502F4 CEFB4F08 AAA3179B 70019185
      Fingerprint SHA1: A887F6DB 0656C7E2 857749F3 EA3D7176 8920F52F
% Do you accept this certificate? [yes/no]: yes
Trustpoint CA certificate accepted.
```

Stap 4. Voer het geauthentiseerde trustpunt in (Ontvang het Identiteitsbewijs).

```
IOS-CA(config)#crypto pki enroll <Win7_PC>
%
% Start certificate enrollment ..
% Create a challenge password. You will need to verbally provide this
   password to the CA Administrator in order to revoke your certificate.
   For security reasons your password will not be saved in the configuration.
   Please make a note of it.
Password: cisco123
Re-enter password: cisco123
% The subject name in the certificate will include: cn=Win7_PC.david.com
% The subject name in the certificate will include: Connected_2_INET-B
% Include the router serial number in the subject name? [yes/no]: no
% Include an IP address in the subject name? [no]: no
Request certificate from CA? [yes/no]: yes
% Certificate request sent to Certificate Authority
% The 'show crypto pki certificate verbose Win7_PC' command will show the fingerprint.
*Jul 17 15:21:11.343: CRYPTO_PKI:  Certificate Request Fingerprint MD5: 9153E537 11C16FAE
B03F7A38 775DBB92
*Jul 17 15:21:11.343: CRYPTO_PKI:  Certificate Request Fingerprint SHA1: 3BC4AC98 91067707
BB6BBBFB ABD97796 F7FB3DD1
*Jul 17 15:21:15.675: %PKI-6-CERTRET: Certificate received from Certificate Authority
```

Stap 5. Controleer de certificaatinformatie.

```
IOS-CA#show crypto pki certificates verbose <Win7_PC>
Certificate
  Status: Available
  Version: 3
  Certificate Serial Number (hex): 03
  Certificate Usage: General Purpose
  Issuer:
    cn=calo_root
  Subject:
    Name: Connected_2_INET-B
    hostname=Connected_2_INET-B
    cn=Win7_PC.david.com
  Validity Date:
    start date: 13:29:51 UTC Jul 13 2017
    end   date: 13:29:51 UTC Jul 13 2018
  Subject Key Info:
    Public Key Algorithm: rsaEncryption
    RSA Public Key: (2048 bit)
  Signature Algorithm: SHA1 with RSA Encryption
  Fingerprint MD5: 9153E537 11C16FAE B03F7A38 775DBB92
  Fingerprint SHA1: 3BC4AC98 91067707 BB6BBBFB ABD97796 F7FB3DD1
  X509v3 extensions:
    X509v3 Key Usage: A0000000
      Digital Signature
      Key Encipherment
    X509v3 Subject Key ID: F37266AE 61F64BD9 3E9FA80C 77455F21 5BEB870D
    X509v3 Authority Key ID: B5EEEEB9 31B9A06C CBD9893C 0E318810 5CA657E6
    Authority Info Access:
    Extended Key Usage:
        Client Auth
        Server Auth
  Associated Trustpoints: Win7_PC
  Key Label: Win7_PC
CA Certificate
  Status: Available
  Version: 3
  Certificate Serial Number (hex): 01
  Certificate Usage: Signature
  Issuer:
    cn=calo_root
  Subject:
    cn=calo_root
  Validity Date:
    start date: 13:24:35 UTC Jul 13 2017
    end   date: 13:24:35 UTC Jul 12 2020
  Subject Key Info:
    Public Key Algorithm: rsaEncryption
    RSA Public Key: (1024 bit)
  Signature Algorithm: MD5 with RSA Encryption
  Fingerprint MD5: DA4502F4 CEFB4F08 AAA3179B 70019185
  Fingerprint SHA1: A887F6DB 0656C7E2 857749F3 EA3D7176 8920F52F
  X509v3 extensions:
    X509v3 Key Usage: 86000000
      Digital Signature
      Key Cert Sign
      CRL Signature
    X509v3 Subject Key ID: B5EEEEB9 31B9A06C CBD9893C 0E318810 5CA657E6
    X509v3 Basic Constraints:
        CA: TRUE
    X509v3 Authority Key ID: B5EEEEB9 31B9A06C CBD9893C 0E318810 5CA657E6
    Authority Info Access:
  Associated Trustpoints: test HeadEnd Win7_PC CA_Server
```

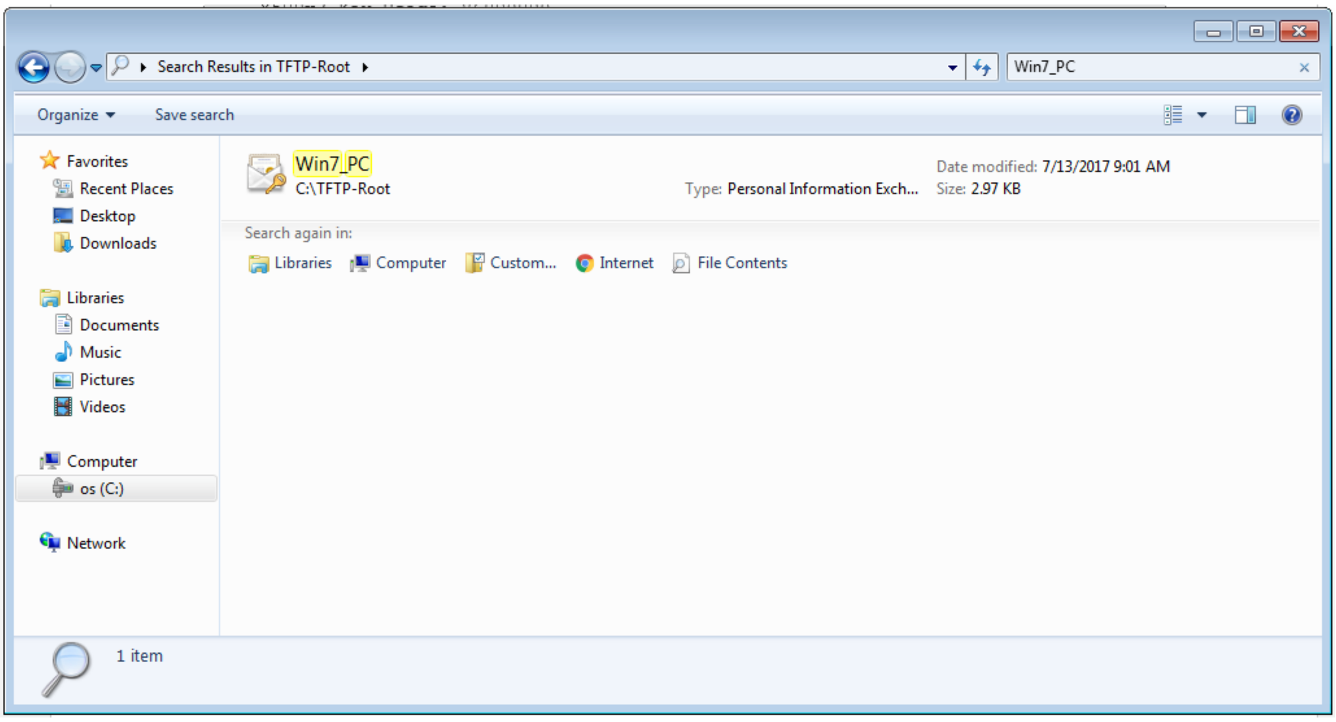
Installeer het identiteitsbewijs op de Windows 7-clientmachine.

Stap 1. Exporteren van het genoemde Win7_PC trustpoint naar een FTP/TFTP-server (geïnstalleerd op uw Windows 7-machine) in PKCS12-formaat (.p12) om het identiteitsbewijs, het CA-certificaat en de privétoets in één bestand te verkrijgen.

```
IOS-CA(config)#crypto pki export <Win7_PC> pkcs12 <tftp://10.152.206.175/ Win7_PC.p12> password
<cisco123>
Address or name of remote host [10.152.206.175]?
Destination filename [Win7_PC.p12]?
```

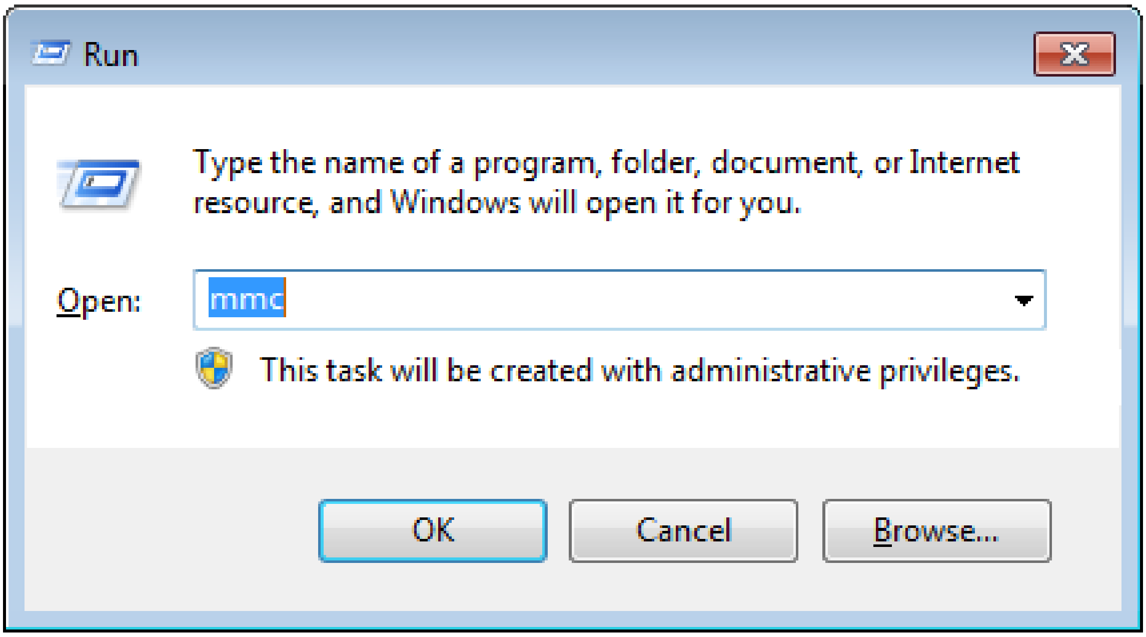
```
!Writing pkcs12 file to tftp://10.152.206.175/Win7_PC.p12
!
CRYPTO_PKI: Exported PKCS12 file successfully.
*Jul 17 16:29:20.310: %PKI-6-PKCS12EXPORT_SUCCESS: PKCS #12 Successfully Exported.
```

Zo ziet het geëxporteerde bestand er uit op een clientmachine.



Win7_PC
C:\TFTP-Root
Type: Personal Information Exch...
Date modified: 7/13/2017 9:01 AM
Size: 2.97 KB

Stap 2. Druk op **Ctrl + R** en type **MC** om de Microsoft Management Console (MMC) te openen.

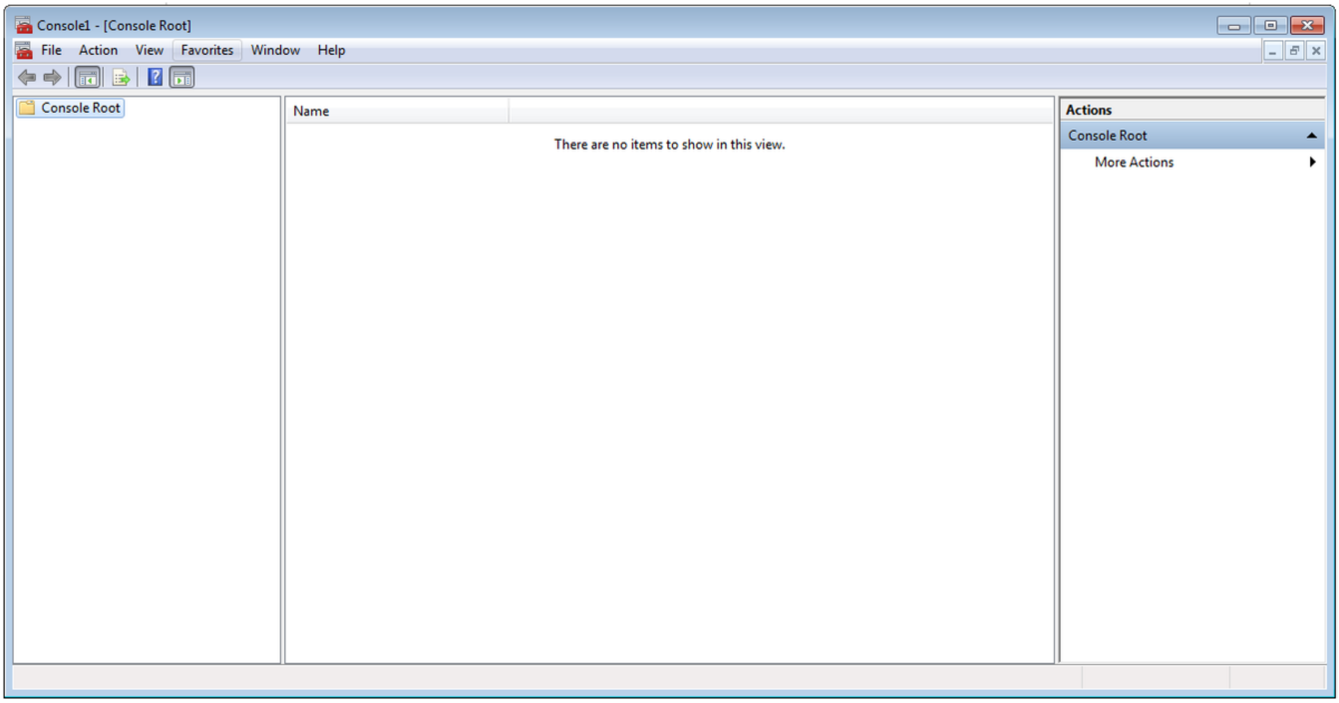


Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.

Open: mmc

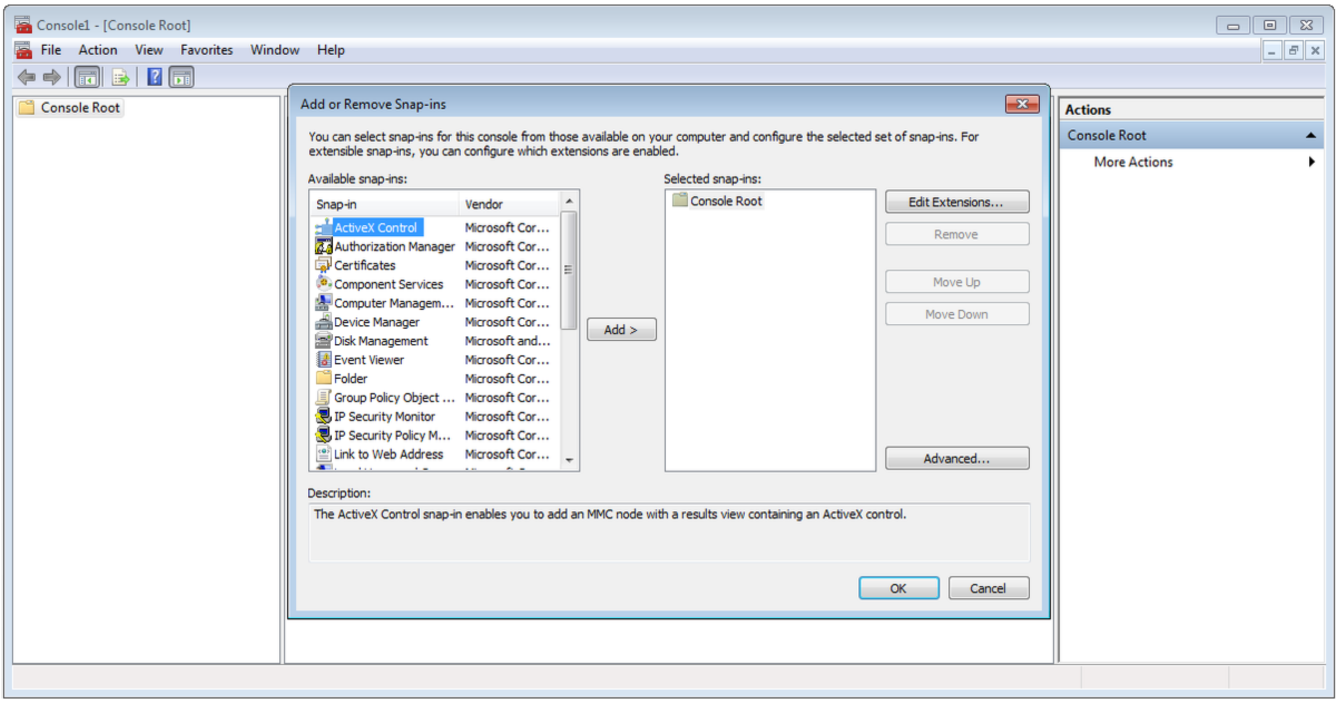
This task will be created with administrative privileges.

Stap 3. Selecteer **OK**.



There are no items to show in this view.

Stap 4. navigeren naar **bestand>Magnetisch toevoegen/verwijderen**.



You can select snap-ins for this console from those available on your computer and configure the selected set of snap-ins. For extensible snap-ins, you can configure which extensions are enabled.

Available snap-ins:

Snap-in	Vendor
ActiveX Control	Microsoft Cor...
Authorization Manager	Microsoft Cor...
Certificates	Microsoft Cor...
Component Services	Microsoft Cor...
Computer Managem...	Microsoft Cor...
Device Manager	Microsoft Cor...
Disk Management	Microsoft and...
Event Viewer	Microsoft Cor...
Folder	Microsoft Cor...
Group Policy Object ...	Microsoft Cor...
IP Security Monitor	Microsoft Cor...
IP Security Policy M...	Microsoft Cor...
Link to Web Address	Microsoft Cor...

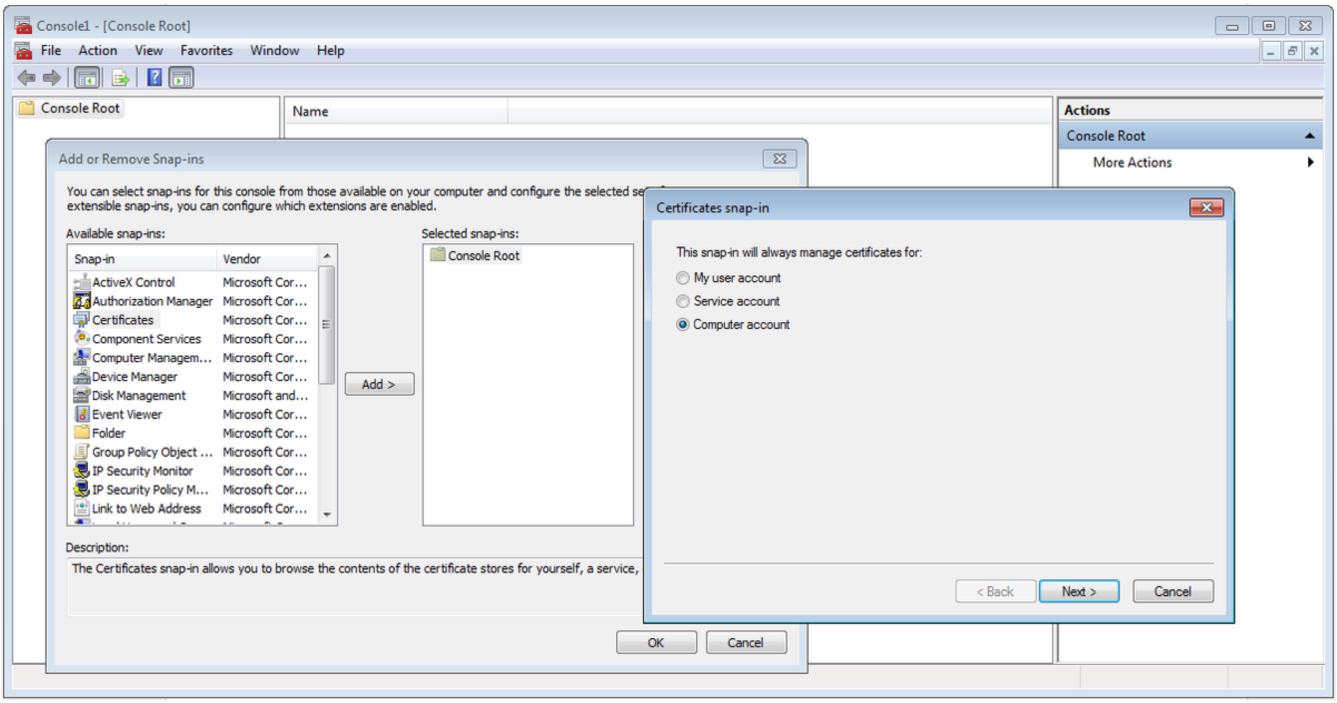
Selected snap-ins:

Console Root

Description:

The ActiveX Control snap-in enables you to add an MMC node with a results view containing an ActiveX control.

Stap 5. Selecteer **Certificaten > Toevoegen > Computer-account.**



Add or Remove Snap-ins

You can select snap-ins for this console from those available on your computer and configure the selected se… extensible snap-ins, you can configure which extensions are enabled.

Available snap-ins:

Snap-in	Vendor
ActiveX Control	Microsoft Cor...
Authorization Manager	Microsoft Cor...
Certificates	Microsoft Cor...
Component Services	Microsoft Cor...
Computer Managem...	Microsoft Cor...
Device Manager	Microsoft Cor...
Disk Management	Microsoft and...
Event Viewer	Microsoft Cor...
Folder	Microsoft Cor...
Group Policy Object ...	Microsoft Cor...
IP Security Monitor	Microsoft Cor...
IP Security Policy M...	Microsoft Cor...
Link to Web Address	Microsoft Cor...

Selected snap-ins: Console Root

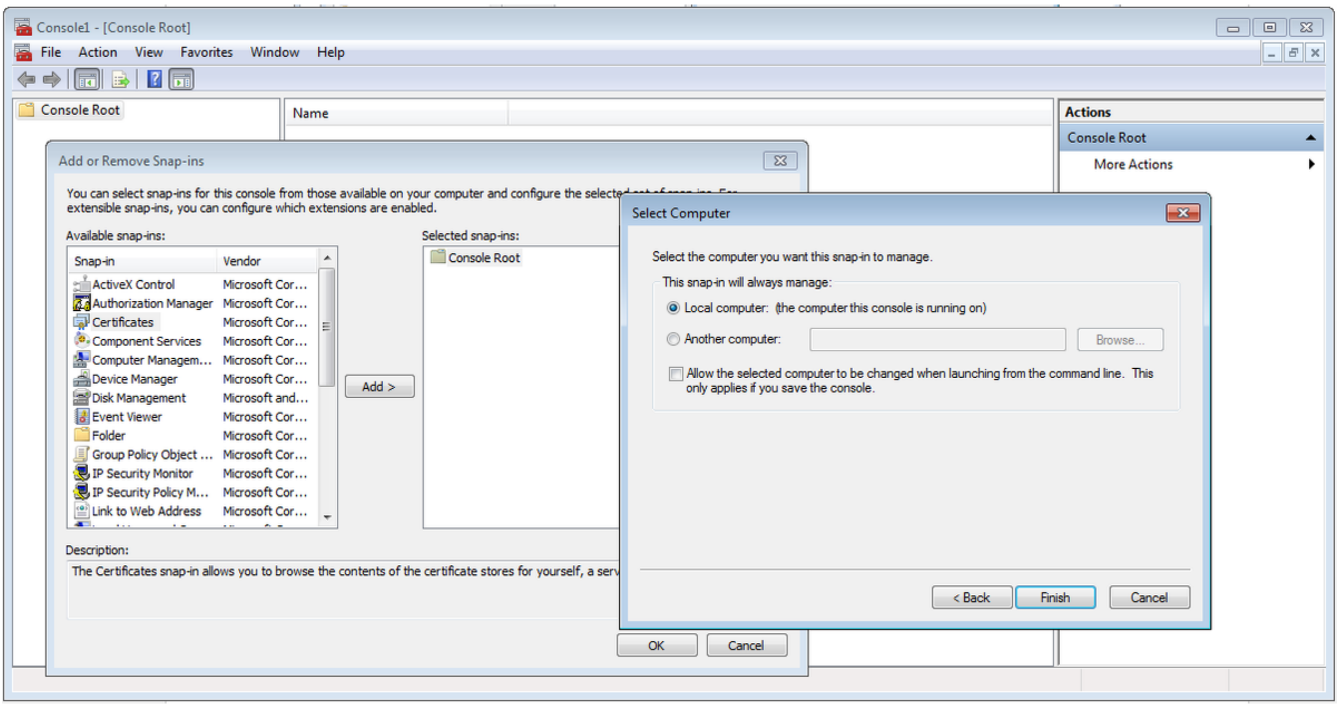
Description:
The Certificates snap-in allows you to browse the contents of the certificate stores for yourself, a service,

Certificates snap-in

This snap-in will always manage certificates for:

○ My user account
○ Service account
● Computer account

Stap 6. Selecteer **Volgende**,



Add or Remove Snap-ins

You can select snap-ins for this console from those available on your computer and configure the selected set of snap-ins. For extensible snap-ins, you can configure which extensions are enabled.

Available snap-ins:

Snap-in	Vendor
ActiveX Control	Microsoft Cor...
Authorization Manager	Microsoft Cor...
Certificates	Microsoft Cor...
Component Services	Microsoft Cor...
Computer Managem...	Microsoft Cor...
Device Manager	Microsoft Cor...
Disk Management	Microsoft and...
Event Viewer	Microsoft Cor...
Folder	Microsoft Cor...
Group Policy Object ...	Microsoft Cor...
IP Security Monitor	Microsoft Cor...
IP Security Policy M...	Microsoft Cor...
Link to Web Address	Microsoft Cor...

Selected snap-ins: Console Root

Description:
The Certificates snap-in allows you to browse the contents of the certificate stores for yourself, a serv

Select Computer

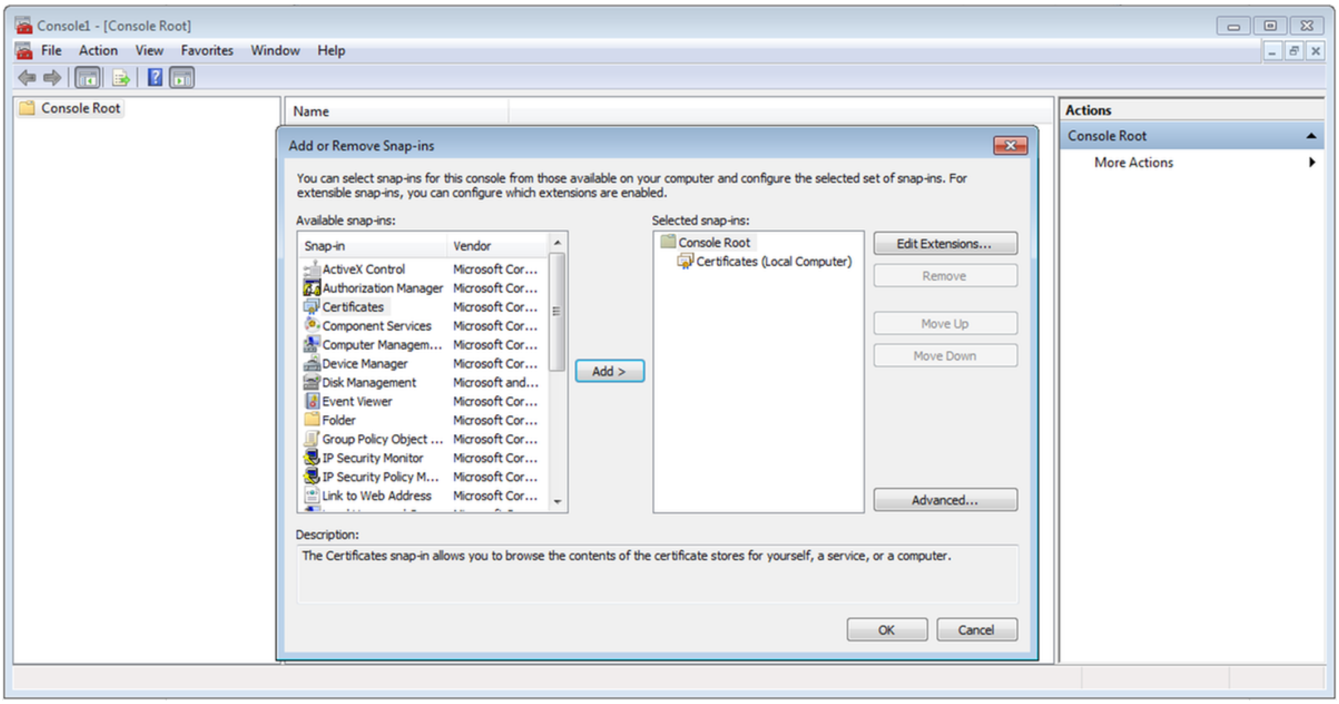
Select the computer you want this snap-in to manage.

This snap-in will always manage:

● Local computer: (the computer this console is running on)
○ Another computer:

□ Allow the selected computer to be changed when launching from the command line. This only applies if you save the console.

Stap 7. **Voltooien**.

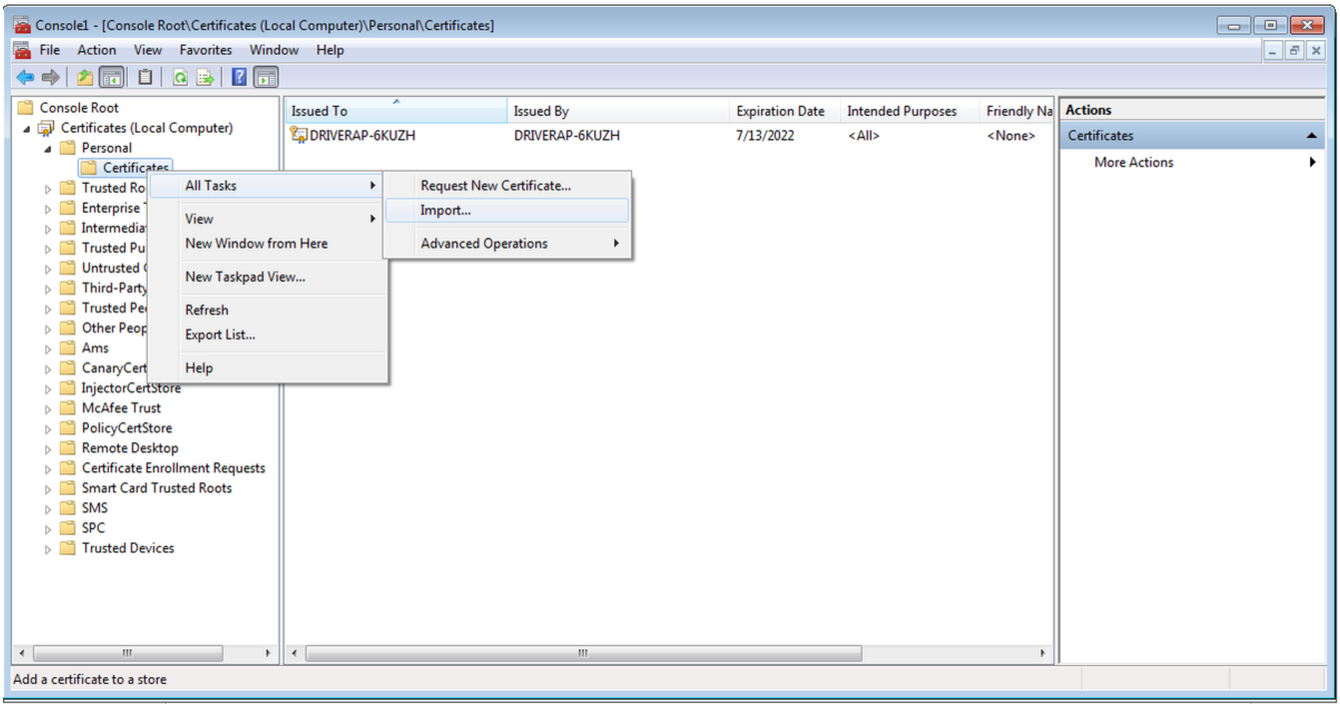


You can select snap-ins for this console from those available on your computer and configure the selected set of snap-ins. For extensible snap-ins, you can configure which extensions are enabled.

The Certificates snap-in allows you to browse the contents of the certificate stores for yourself, a service, or a computer.

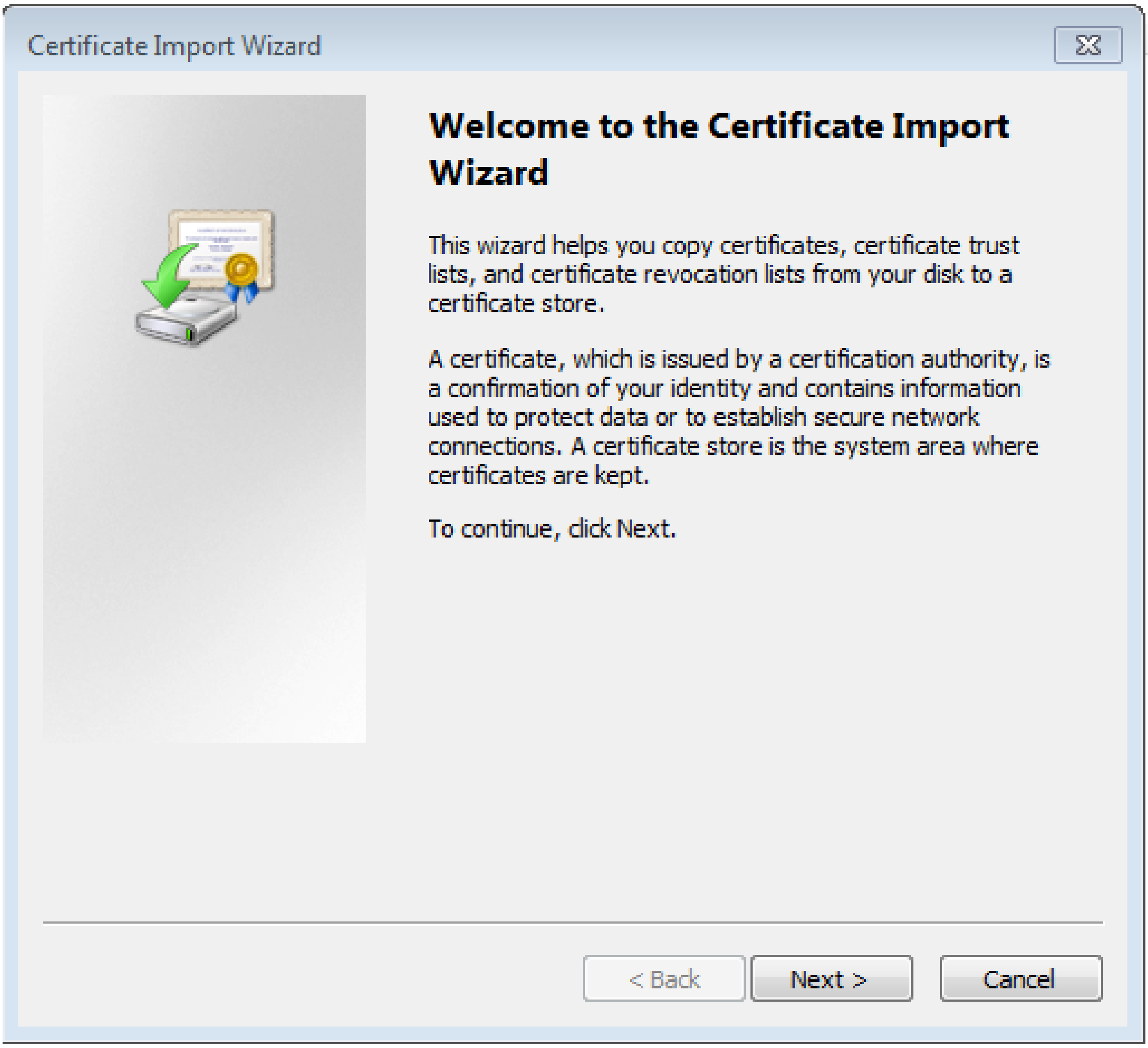
Stap 8. Selecteer **OK**.

Stap 9. Ga naar **Certificaten (lokale computer)>Persoonlijk>**Certificaten, klik met de rechtermuisknop op de map en navigeer naar **Alle taken>Importeren**:



Issued To	Issued By	Expiration Date	Intended Purposes	Friendly Na
DRIVERAP-6KUZH	DRIVERAP-6KUZH	7/13/2022	<All>	<None>

Add a certificate to a store



Certificate Import Wizard

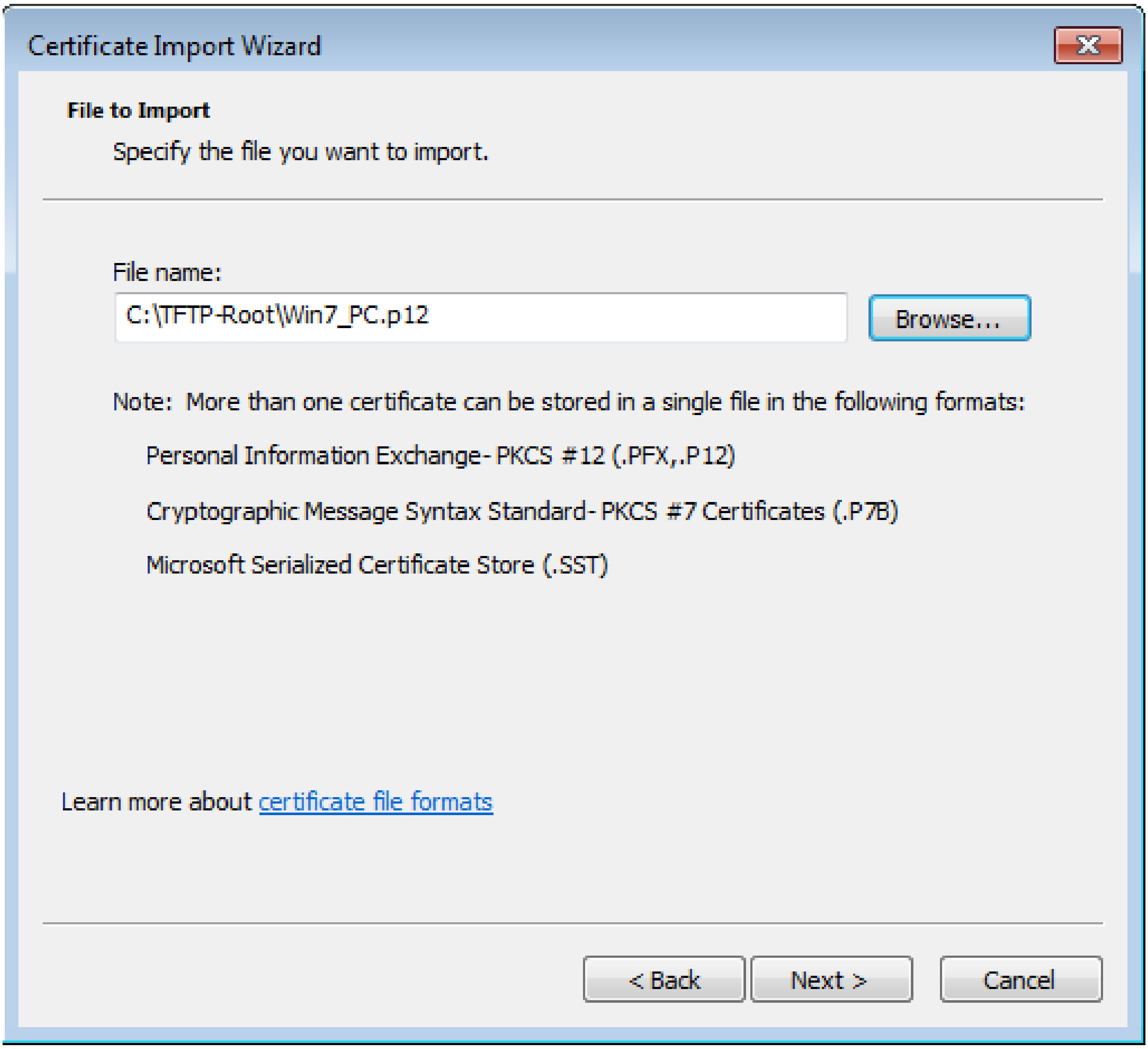
Welcome to the Certificate Import Wizard

This wizard helps you copy certificates, certificate trust lists, and certificate revocation lists from your disk to a certificate store.

A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.

To continue, click Next.

Stap 10. Klik op **Volgende**. Geef het pad op waar het PKCS12-bestand is opgeslagen.



Certificate Import Wizard

File to Import

Specify the file you want to import.

File name:

C:\TFTP-Root\Win7_PC.p12

Note: More than one certificate can be stored in a single file in the following formats:

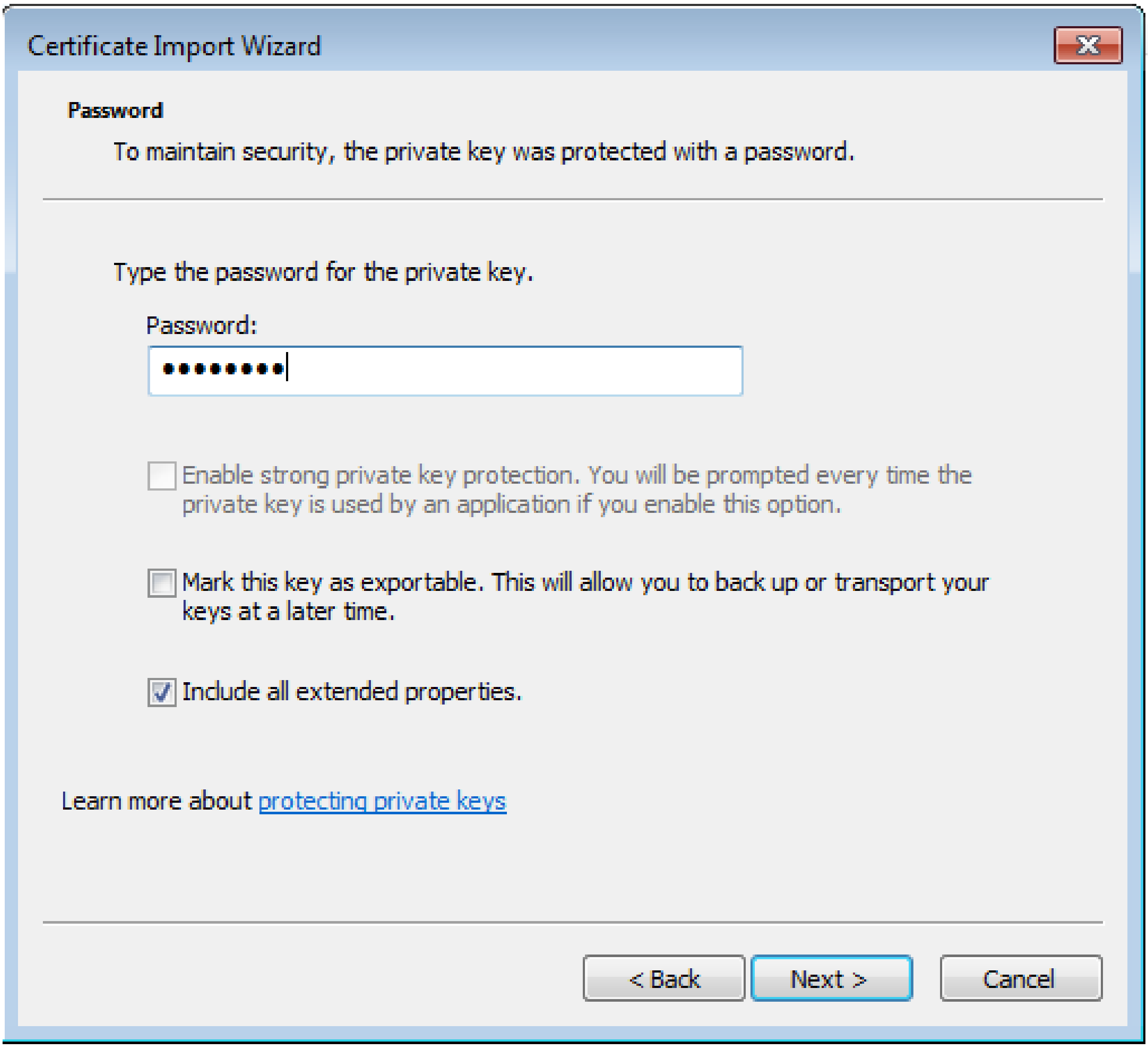
Personal Information Exchange- PKCS #12 (.PFX,.P12)

Cryptographic Message Syntax Standard- PKCS #7 Certificates (.P7B)

Microsoft Serialized Certificate Store (.SST)

Learn more about certificate file formats

Stap 1. Selecteer **Volgende** en type het wachtwoord dat is ingevoerd in het *cryptografische bestand dat wordt geëxporteerd <Win7_PC> pc's12 <tftp://10.152.206.175/ Win7_PC.p12> wachtwoord <cisco123>* opdracht



Certificate Import Wizard

Password

To maintain security, the private key was protected with a password.

Type the password for the private key.

Password:

●●●●●●●●●

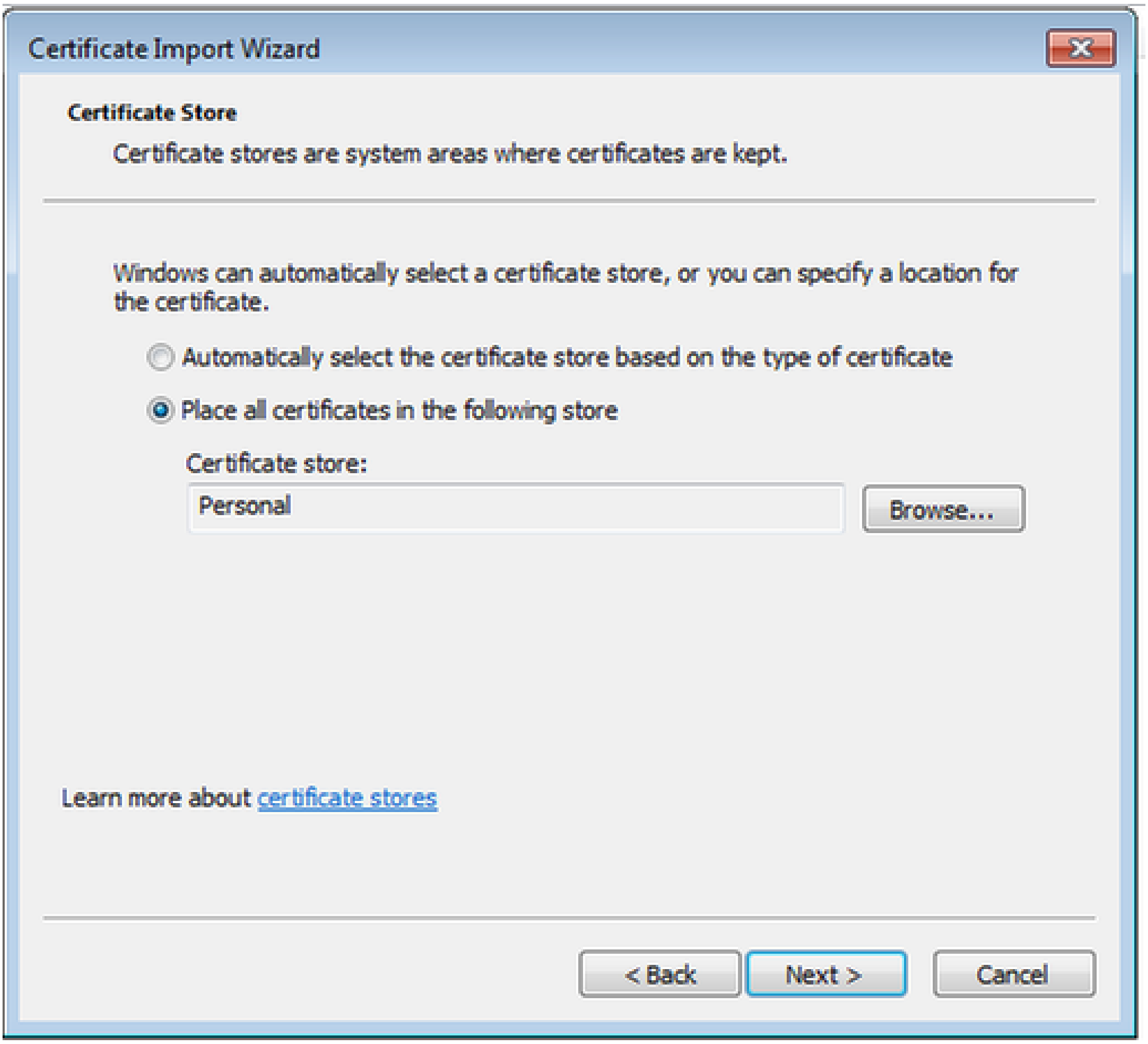
□ Enable strong private key protection. You will be prompted every time the private key is used by an application if you enable this option.

□ Mark this key as exportable. This will allow you to back up or transport your keys at a later time.

☑ Include all extended properties.

Learn more about protecting private keys

Stap 12. Selecteer **Volgende**.



Certificate Import Wizard

Certificate Store

Certificate stores are system areas where certificates are kept.

Windows can automatically select a certificate store, or you can specify a location for the certificate.

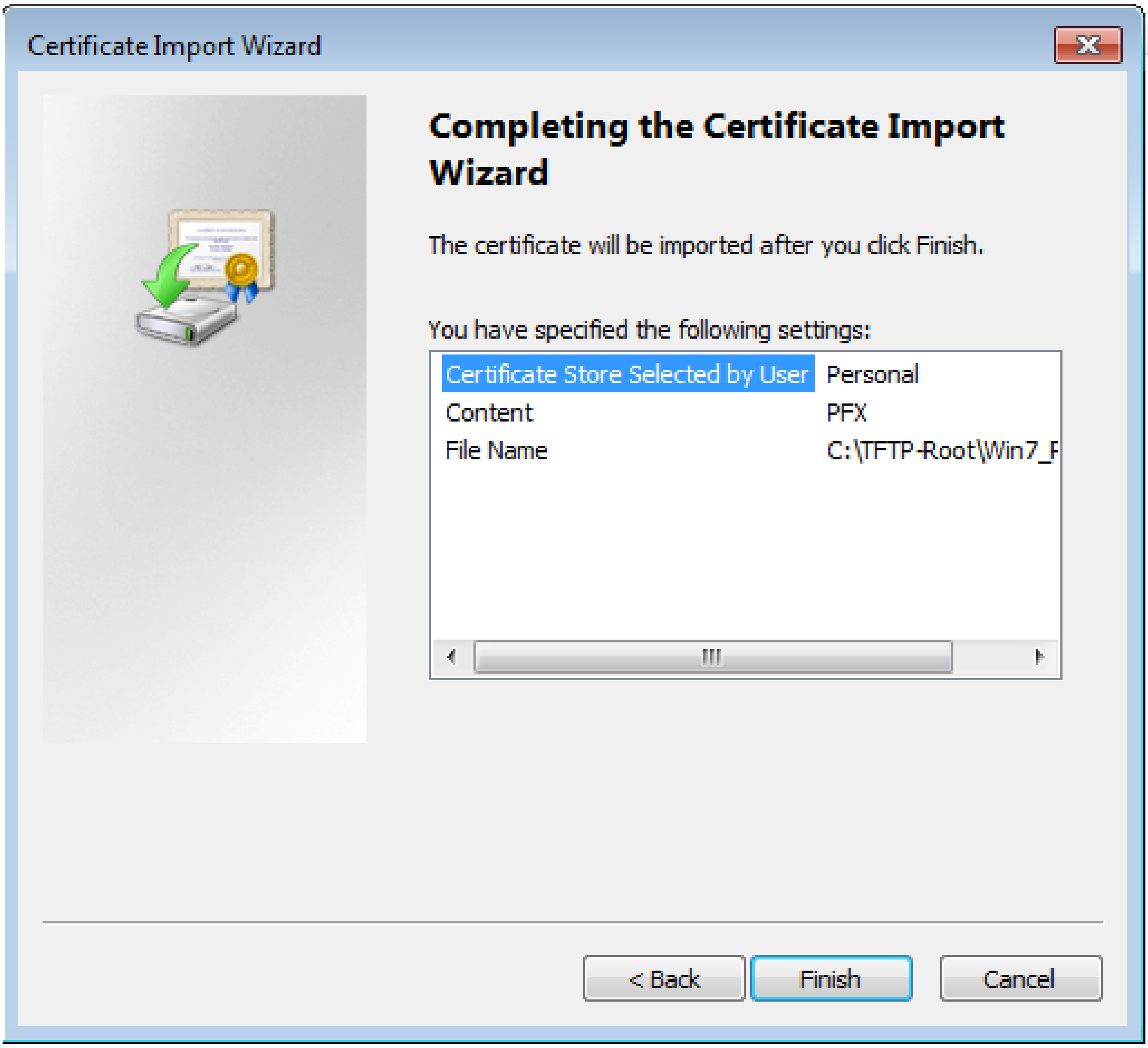
○ Automatically select the certificate store based on the type of certificate

● Place all certificates in the following store

Certificate store:

Personal

Stap 13. Selecteer **Volgende** keer.



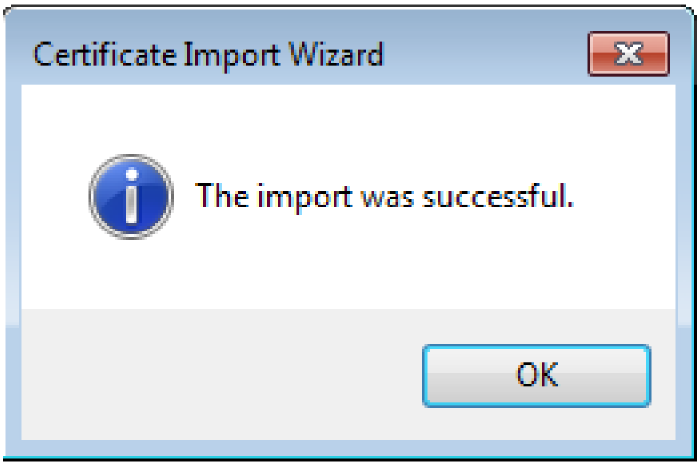
Completing the Certificate Import Wizard

The certificate will be imported after you click Finish.

You have specified the following settings:

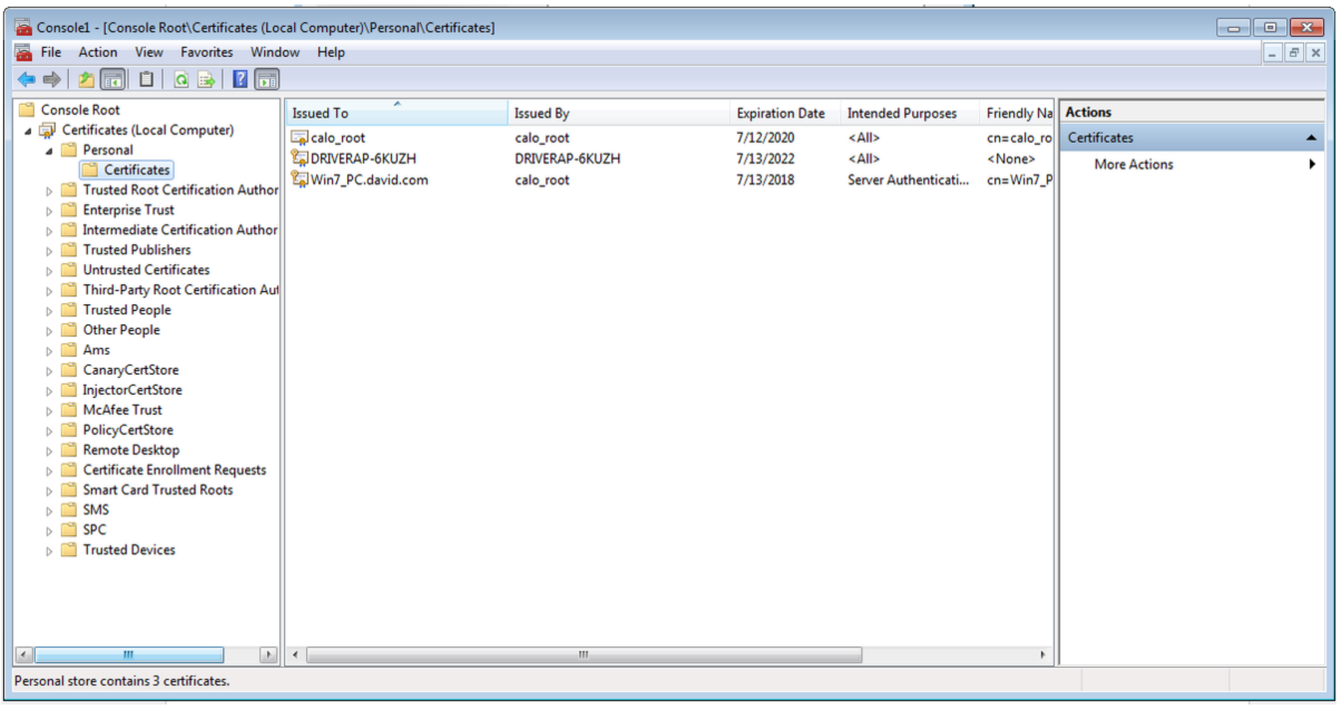
Certificate Store Selected by User	Personal
Content	PFX
File Name	C:\TFTP-Root\Win7_P

Stap 14. Selecteer **Voltooien**.



The import was successful.

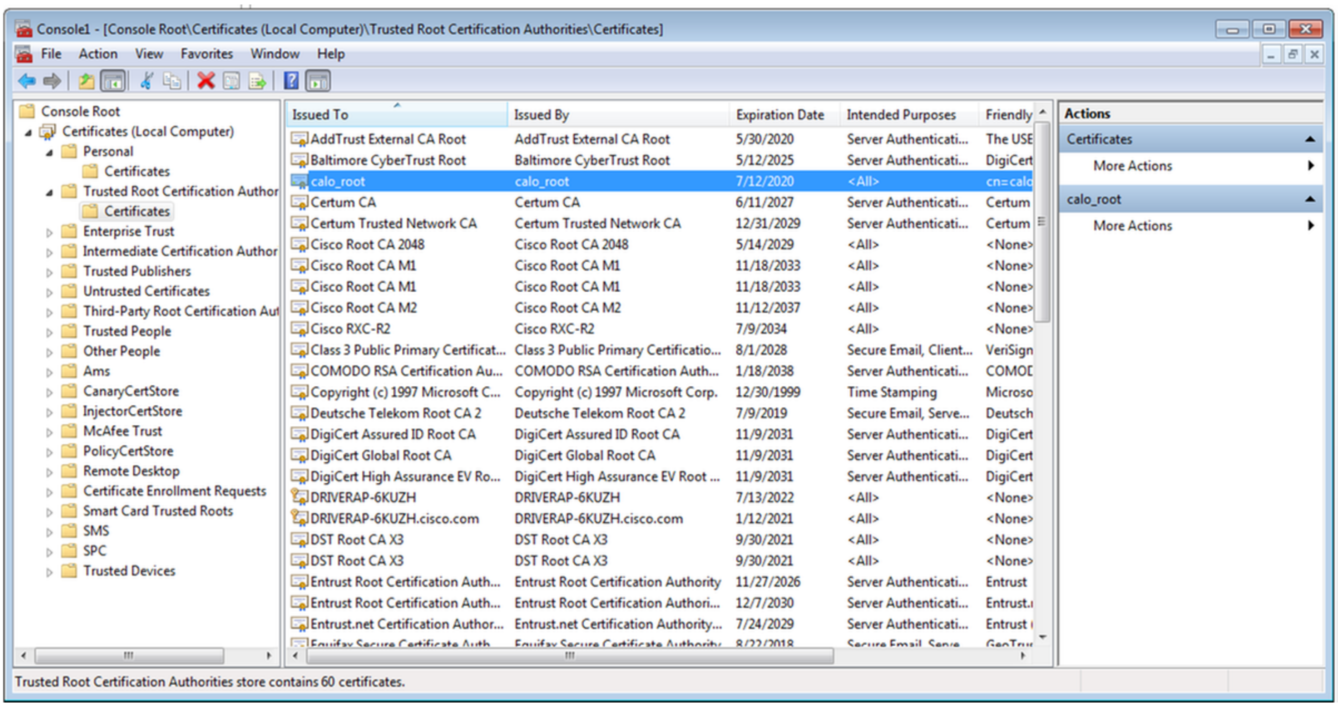
Stap 15. Selecteer **OK**. Nu ziet u de certificaten geïnstalleerd (zowel het CA-certificaat als het Identity-certificaat).



Issued To	Issued By	Expiration Date	Intended Purposes	Friendly Na
calo_root	calo_root	7/12/2020	<All>	cn=calo_ro
DRIVERAP-6KUZH	DRIVERAP-6KUZH	7/13/2022	<All>	<None>
Win7_PC.david.com	calo_root	7/13/2018	Server Authenticati...	cn=Win7_P

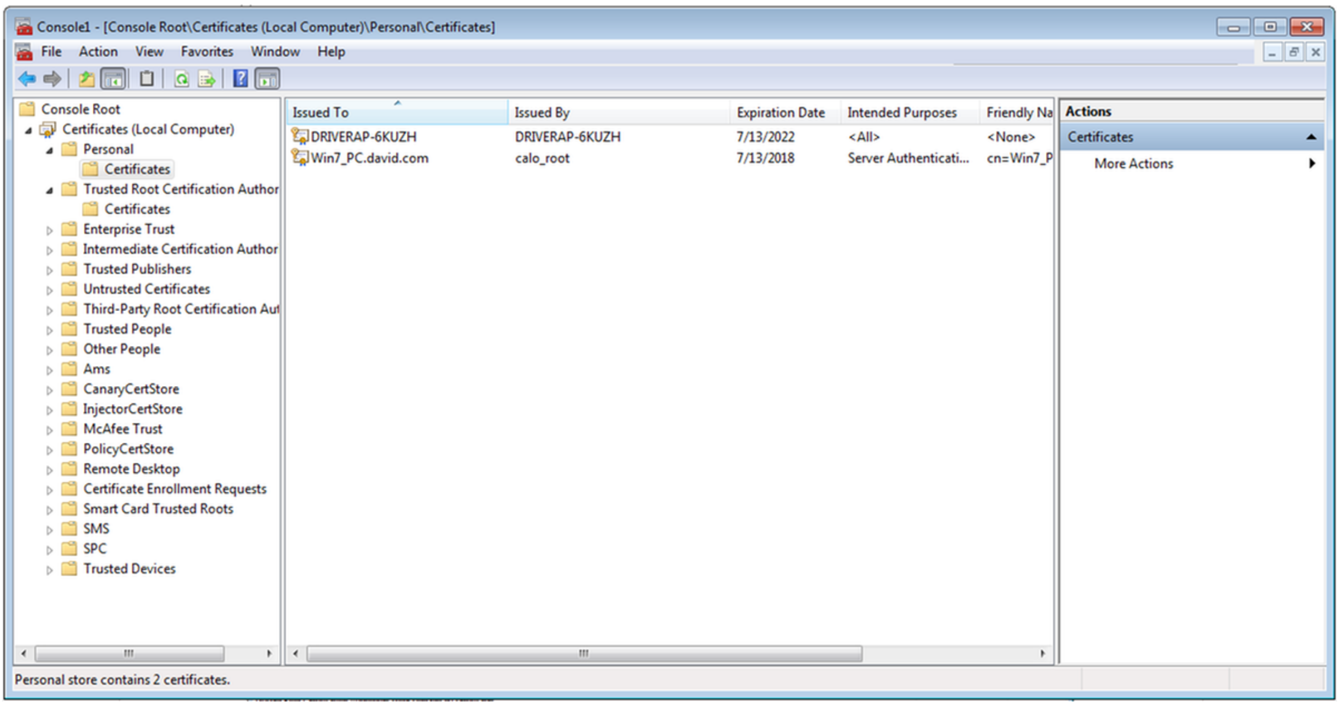
Personal store contains 3 certificates.

Stap 16. Sleep het CA-certificaat van **certificaten (lokale computer)>Persoonlijk>Certificaten** aan **certificaten (lokale computer)>Trusted Root-certificeringsinstantie>Certificaten.**



Issued To	Issued By	Expiration Date	Intended Purposes	Friendly
AddTrust External CA Root	AddTrust External CA Root	5/30/2020	Server Authenticati...	The USE
Baltimore CyberTrust Root	Baltimore CyberTrust Root	5/12/2025	Server Authenticati...	DigiCert
calo_root	calo_root	7/12/2020	<All>	cn=calo
Certum CA	Certum CA	6/11/2027	Server Authenticati...	Certum
Certum Trusted Network CA	Certum Trusted Network CA	12/31/2029	Server Authenticati...	Certum
Cisco Root CA 2048	Cisco Root CA 2048	5/14/2029	<All>	<None>
Cisco Root CA M1	Cisco Root CA M1	11/18/2033	<All>	<None>
Cisco Root CA M1	Cisco Root CA M1	11/18/2033	<All>	<None>
Cisco Root CA M2	Cisco Root CA M2	11/12/2037	<All>	<None>
Cisco RXC-R2	Cisco RXC-R2	7/9/2034	<All>	<None>
Class 3 Public Primary Certificat...	Class 3 Public Primary Certificatio...	8/1/2028	Secure Email, Client...	VeriSign
COMODO RSA Certification Au...	COMODO RSA Certification Auth...	1/18/2038	Server Authenticati...	COMOD
Copyright (c) 1997 Microsoft C...	Copyright (c) 1997 Microsoft Corp.	12/30/1999	Time Stamping	Microso
Deutsche Telekom Root CA 2	Deutsche Telekom Root CA 2	7/9/2019	Secure Email, Serve...	Deutsch
DigiCert Assured ID Root CA	DigiCert Assured ID Root CA	11/9/2031	Server Authenticati...	DigiCert
DigiCert Global Root CA	DigiCert Global Root CA	11/9/2031	Server Authenticati...	DigiCert
DigiCert High Assurance EV Ro...	DigiCert High Assurance EV Root ...	11/9/2031	Server Authenticati...	DigiCert
DRIVERAP-6KUZH	DRIVERAP-6KUZH	7/13/2022	<All>	<None>
DRIVERAP-6KUZH.cisco.com	DRIVERAP-6KUZH.cisco.com	1/12/2021	<All>	<None>
DST Root CA X3	DST Root CA X3	9/30/2021	<All>	<None>
DST Root CA X3	DST Root CA X3	9/30/2021	<All>	<None>
Entrust Root Certification Auth...	Entrust Root Certification Authority	11/27/2026	Server Authenticati...	Entrust
Entrust Root Certification Auth...	Entrust Root Certification Authori...	12/7/2030	Server Authenticati...	Entrust.i
Entrust.net Certification Author...	Entrust.net Certification Authority...	7/24/2029	Server Authenticati...	Entrust
Equifax Secure Certificate Auth...	Equifax Secure Certificate Authority	8/22/2018	Secure Email, Serve...	GeoTru

Trusted Root Certification Authorities store contains 60 certificates.



Issued To	Issued By	Expiration Date	Intended Purposes	Friendly Na
DRIVERAP-6KUZH	DRIVERAP-6KUZH	7/13/2022	<All>	<None>
Win7_PC.david.com	calo_root	7/13/2018	Server Authenticati...	cn=Win7_P

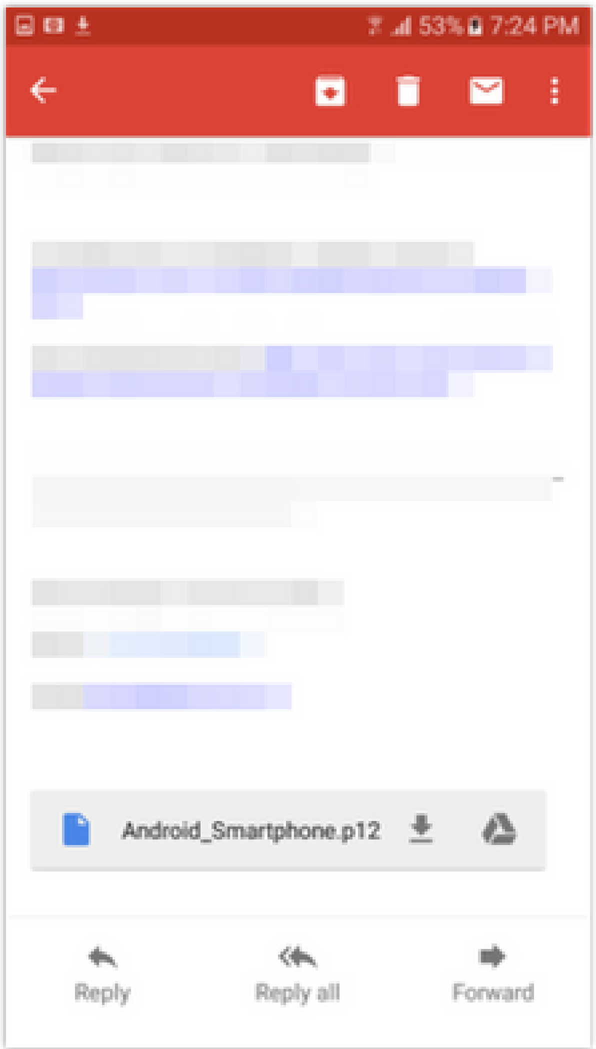
Personal store contains 2 certificates.

Het identiteitsbewijs op uw Android-mobiele apparaat installeren

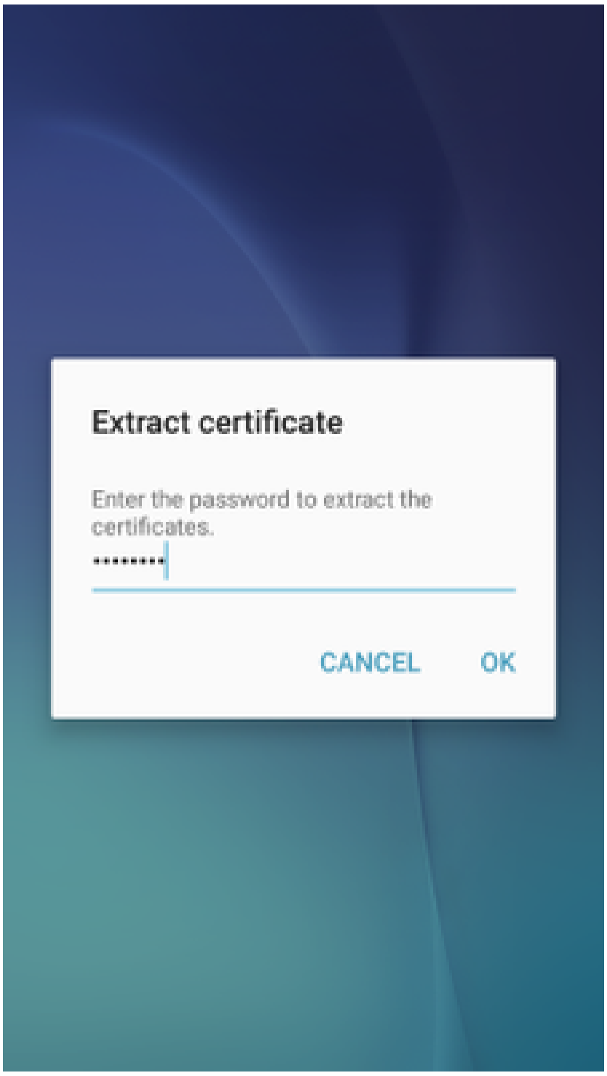
Opmerking: Android ondersteunt PKCS#12 key Store-bestanden met .pfx of .p12-extensie.

Opmerking: Android ondersteunt alleen DER-gecodeerde X.509 SSL-certificaten.

Stap 1. Na de export van het client-certificaat van de IOS CA Server in het PKCS12-formaat (4.p12), verstuur het bestand naar het Android-apparaat via e-mail. Klik op de naam van het bestand om de automatische installatie te starten. (**Het bestand niet downloaden**)



Stap 2. Voer het wachtwoord in dat wordt gebruikt om het certificaat te exporteren. In dit voorbeeld is het wachtwoord **cisco123**.

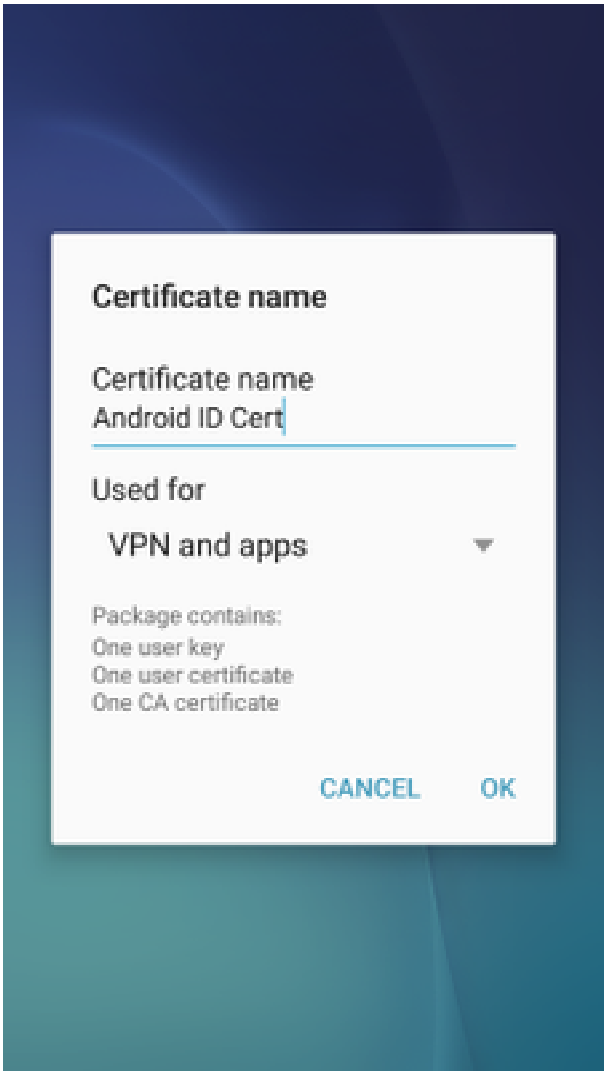


Extract certificate

Enter the password to extract the certificates.

****

Stap 3. Selecteer **OK** en voer een **certificaatnaam in**. Het kan elk woord zijn, in dit voorbeeld is de naam **Android ID Cert**.



Certificate name

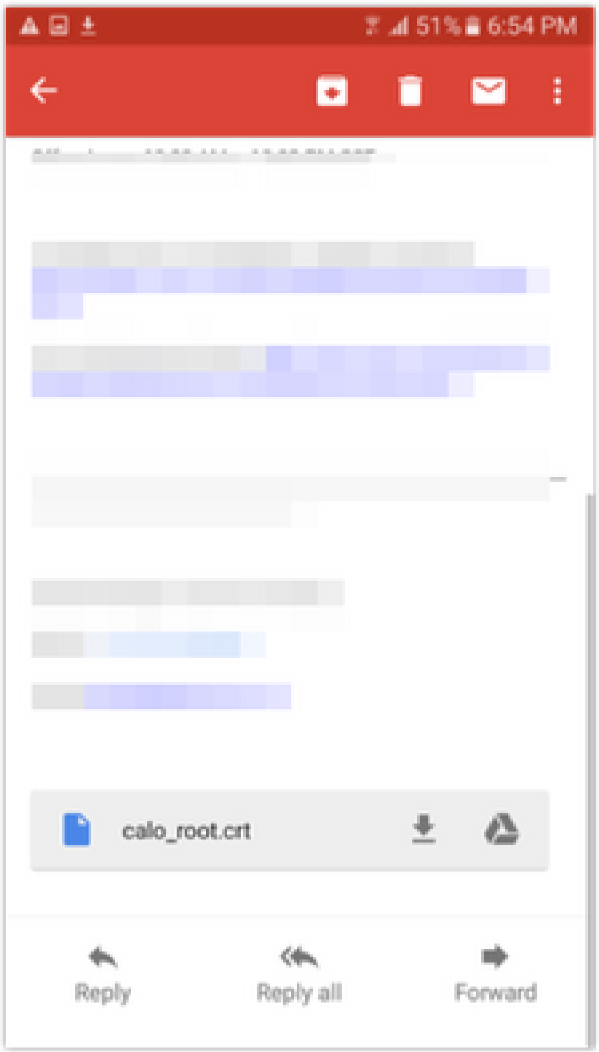
Certificate name
Android ID Cert

Used for
VPN and apps

Package contains:
One user key
One user certificate
One CA certificate

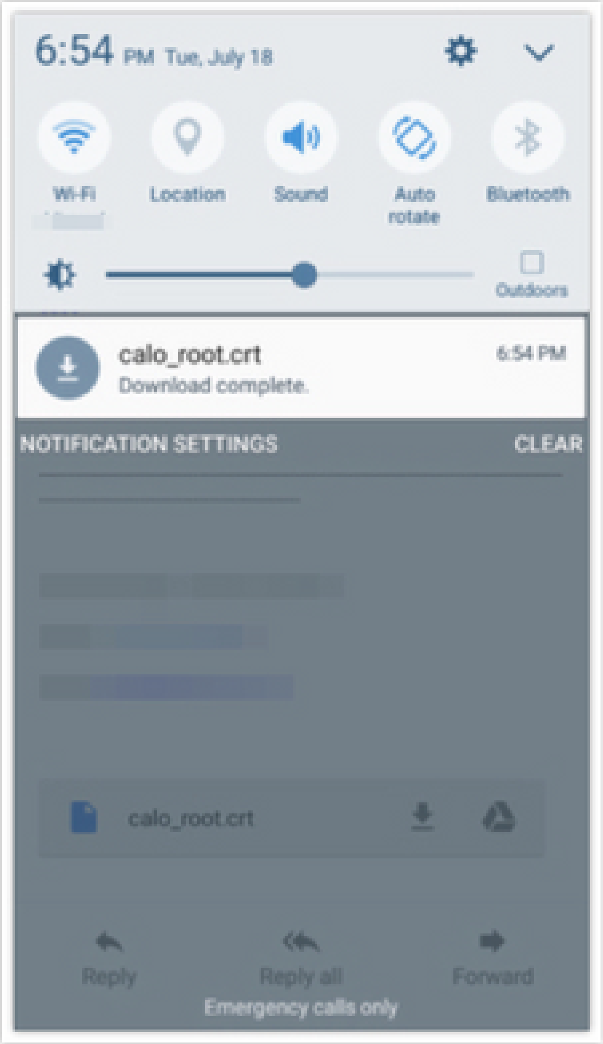
Stap 4. Selecteer **OK** en het bericht "Android ID Cert installeert" verschijnt.

Stap 5. Om het CA-certificaat te installeren, haalt u het uit de IOS CA-server in Base64-indeling en slaat u het op met .crt-extensie. Verzend het bestand naar uw androïde-apparaat via e-mail. Nu moet u het bestand downloaden door het pijltje op de pijl naast de naam van het bestand te zetten.



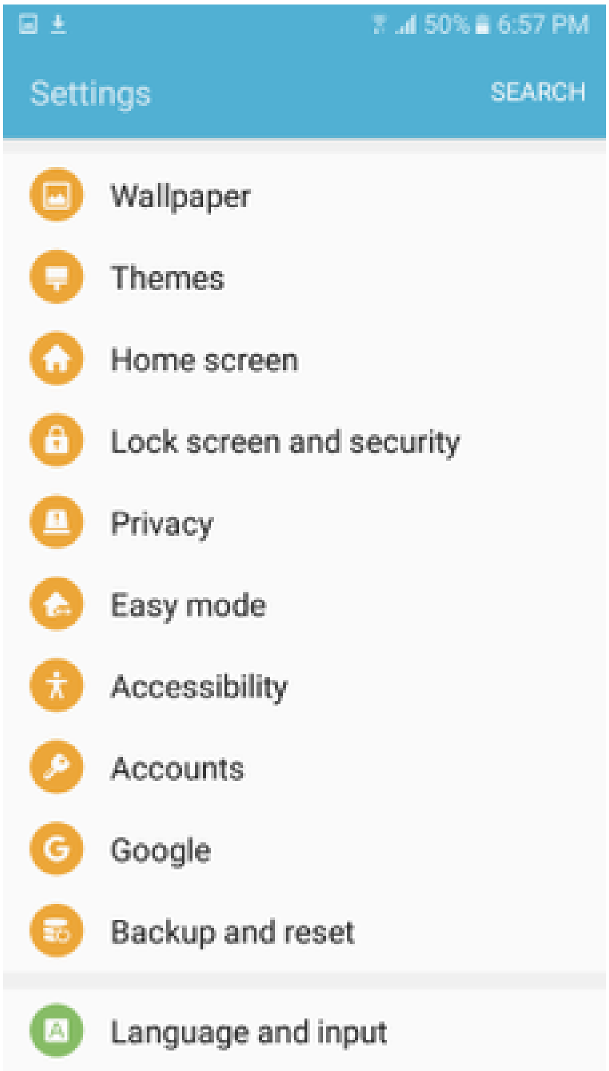
[redacted]

calo_root.crt

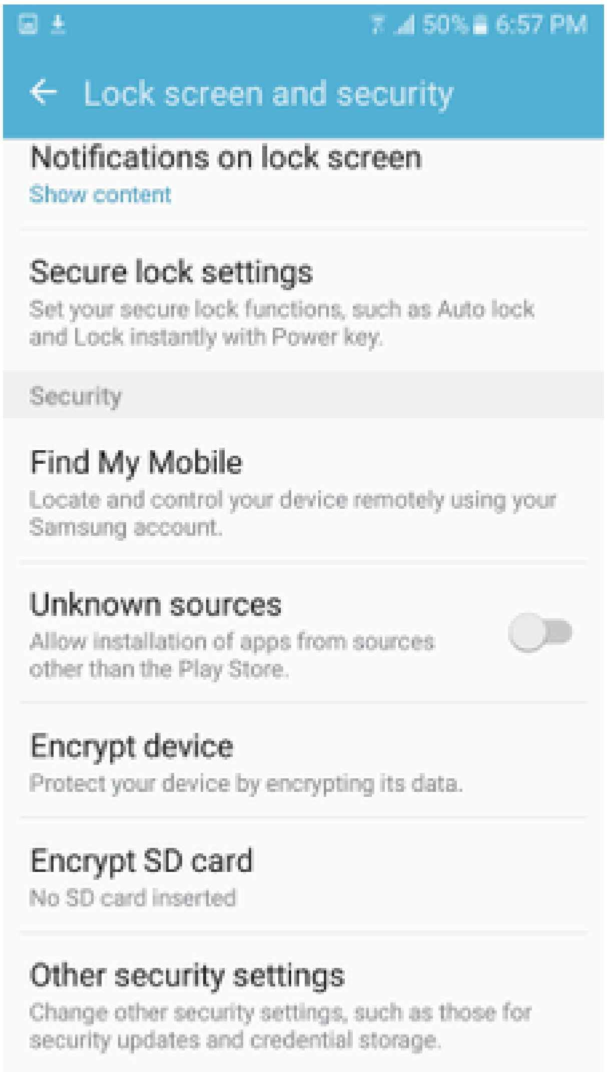


calo_root.crt 6:54 PM
Download complete.

Stap 6. Navigeer naar **Instellingen** en **slot scherm en beveiliging.**



Stap 7. Selecteer **Overige beveiligingsinstellingen.**



50% 6:57 PM

Lock screen and security

Notifications on lock screen
Show content

Secure lock settings
Set your secure lock functions, such as Auto lock and Lock instantly with Power key.

Security

Find My Mobile
Locate and control your device remotely using your Samsung account.

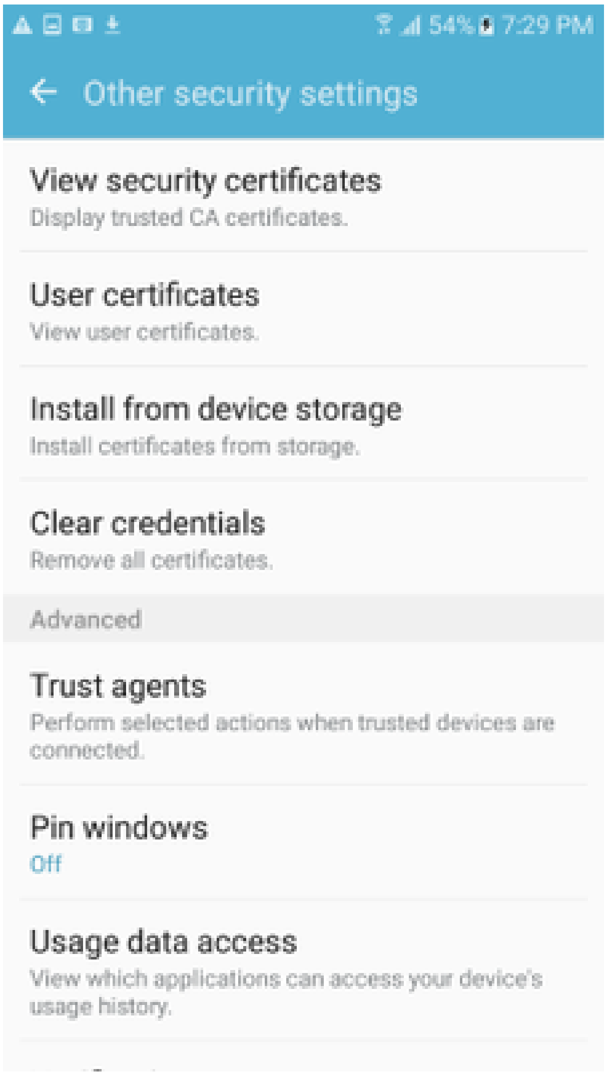
Unknown sources
Allow installation of apps from sources other than the Play Store.

Encrypt device
Protect your device by encrypting its data.

Encrypt SD card
No SD card inserted

Other security settings
Change other security settings, such as those for security updates and credential storage.

Stap 8. Navigeer om **te installeren van de apparaatopslag.**



Other security settings

View security certificates
Display trusted CA certificates.

User certificates
View user certificates.

Install from device storage
Install certificates from storage.

Clear credentials
Remove all certificates.

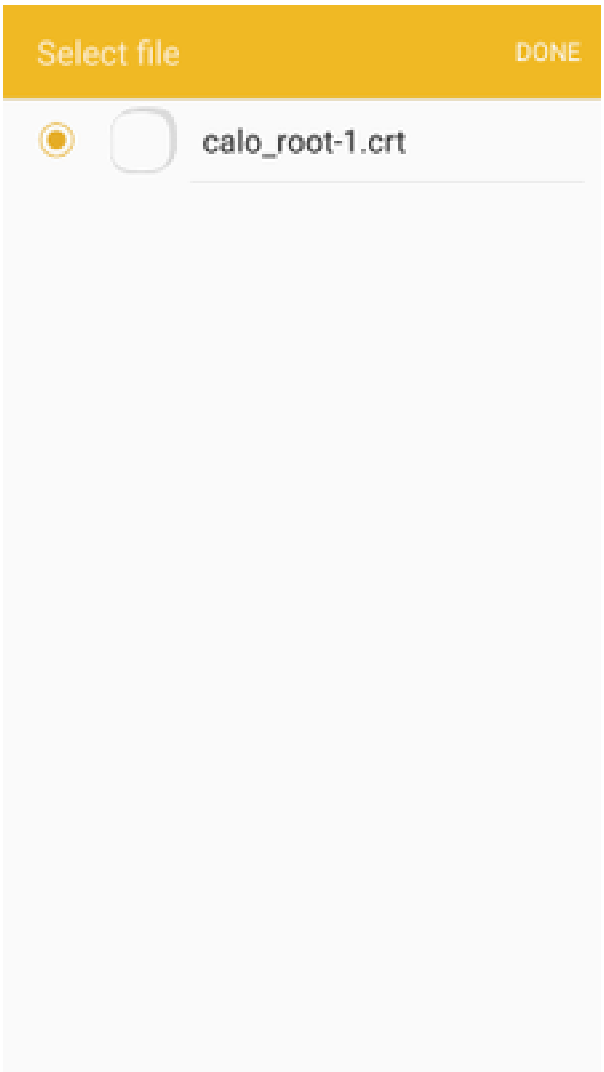
Advanced

Trust agents
Perform selected actions when trusted devices are connected.

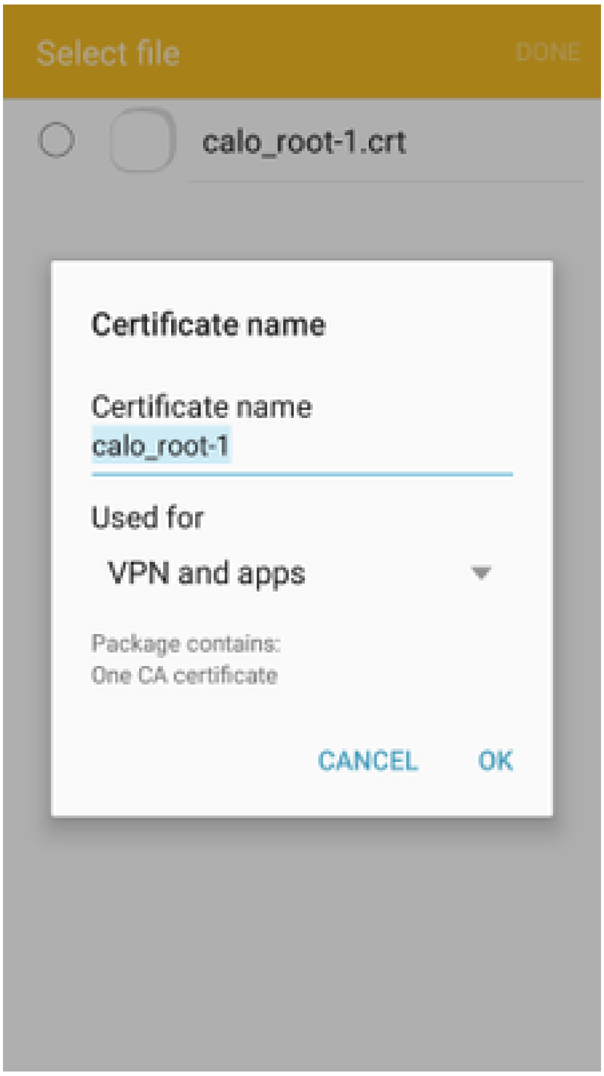
Pin windows
Off

Usage data access
View which applications can access your device's usage history.

Stap 9. Selecteer het .crt-bestand en de kraan op **Gereed.**



Stap 10. Voer een **certificaatnaam in**. Het kan elk woord zijn, in dit voorbeeld, de naam is **calo_root-1**.



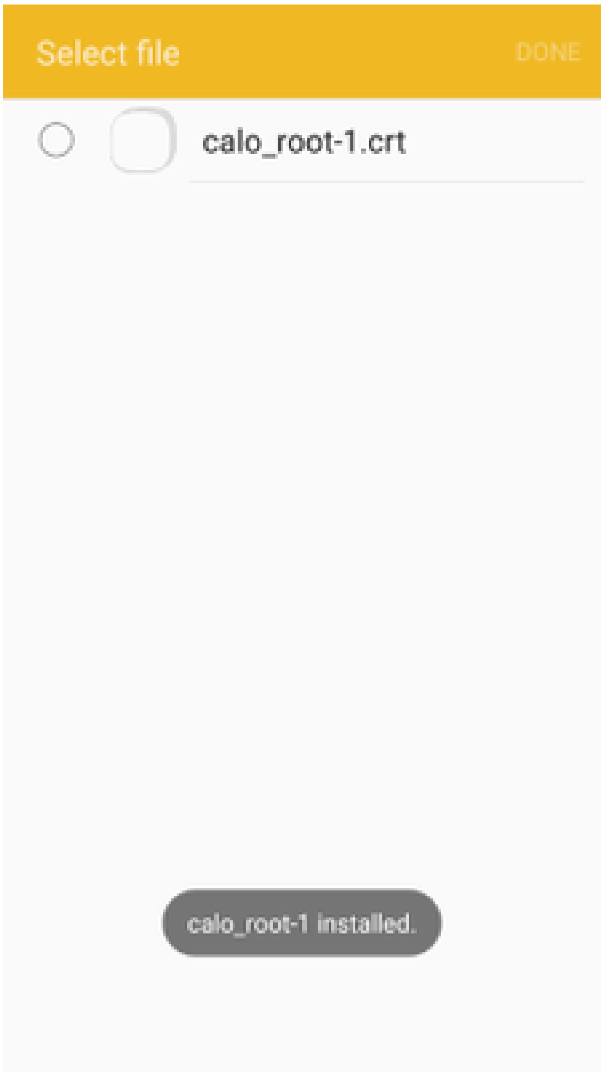
Certificate name

Certificate name
calo_root-1

Used for
VPN and apps

Package contains:
One CA certificate

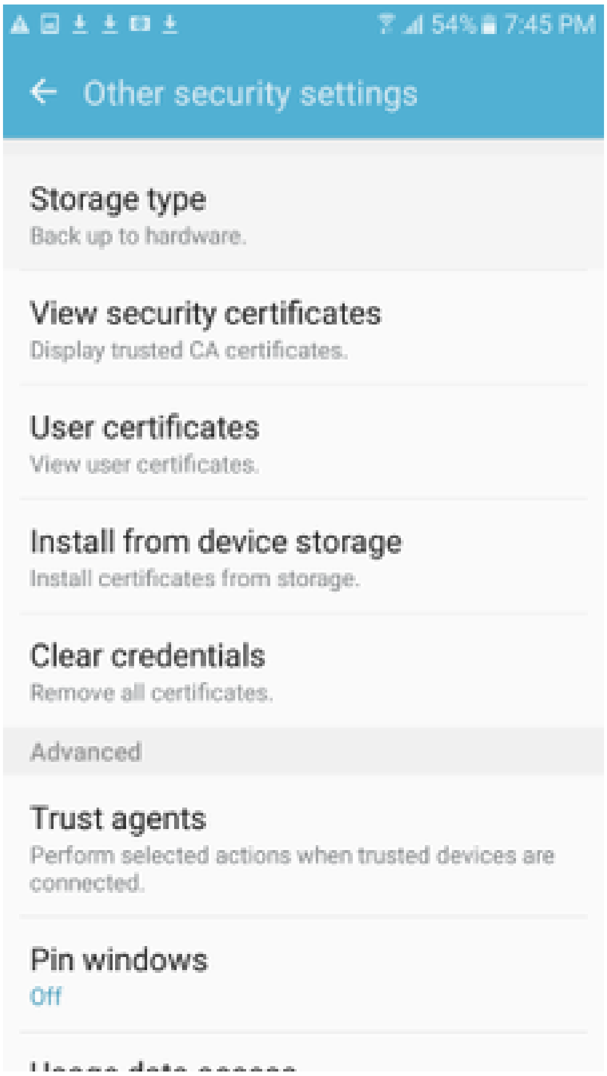
Stap 10. Selecteer **OK** en u ziet het bericht "calo_root-1 geïnstalleerd".



○ calo_root-1.crt

calo_root-1 installed.

Stap 11. Om te controleren of het identiteitsbewijs is geïnstalleerd, navigeer dan naar **Instellingen/Vergrendeling Scherm en Security/Overige > Beveiligingsinstellingen/Gebruikerscertificaten/tabblad Systeem.**



54% 7:45 PM

Other security settings

Storage type
Back up to hardware.

View security certificates
Display trusted CA certificates.

User certificates
View user certificates.

Install from device storage
Install certificates from storage.

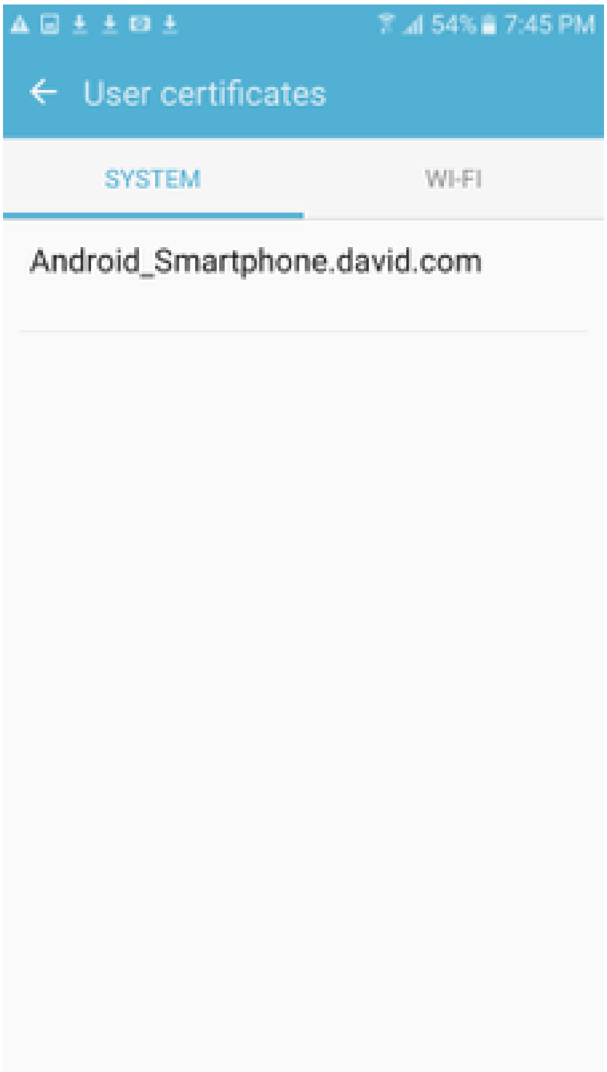
Clear credentials
Remove all certificates.

Advanced

Trust agents
Perform selected actions when trusted devices are connected.

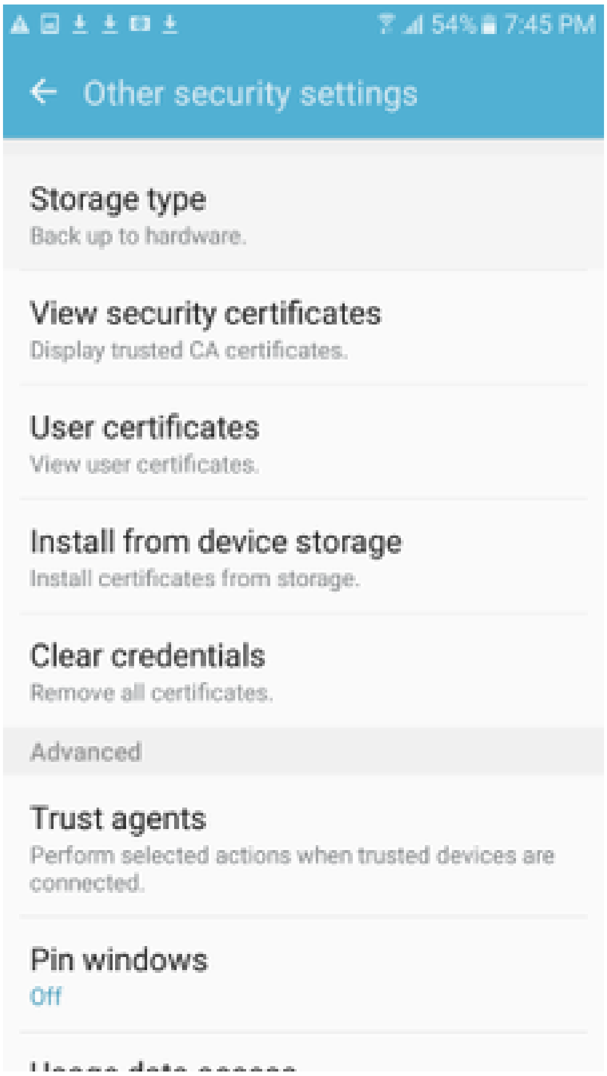
Pin windows
Off

Usage data access



Android_Smartphone.david.com

Stap 12. Om te verifiëren dat het CA-certificaat is geïnstalleerd, navigeer dan naar **Instellingen/Lock-scherm en security/andere beveiligingsinstellingen/View security certificaten/tabblad gebruiker.**



Other security settings

Storage type
Back up to hardware.

View security certificates
Display trusted CA certificates.

User certificates
View user certificates.

Install from device storage
Install certificates from storage.

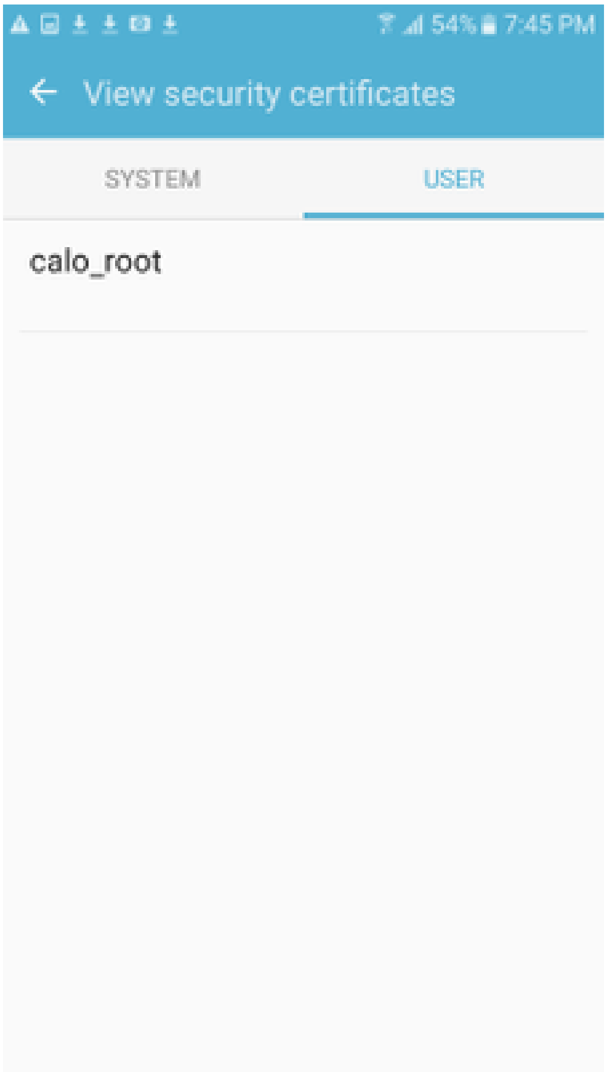
Clear credentials
Remove all certificates.

Advanced

Trust agents
Perform selected actions when trusted devices are connected.

Pin windows
Off

Usage data access



calo_root

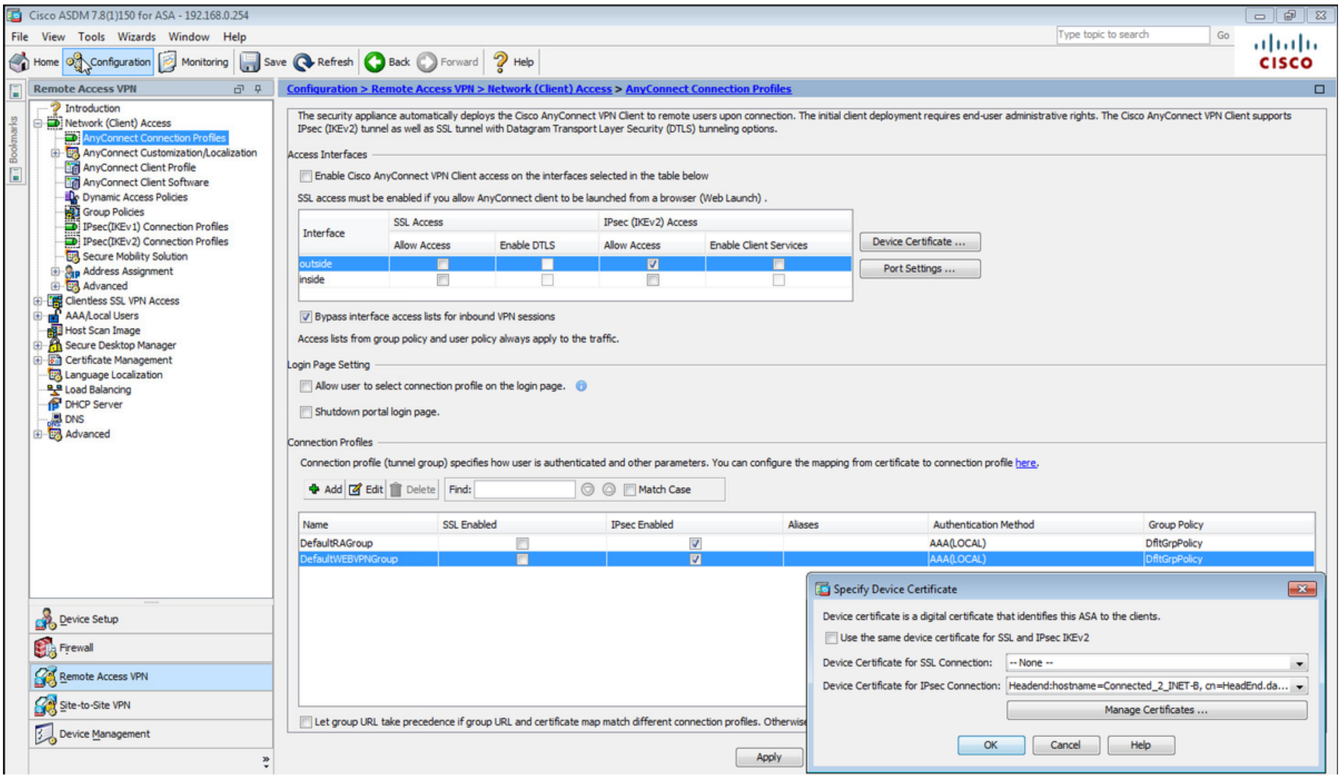
ASA head-end configureren voor RA VPN met IKEv2

Stap 1. Ga op ASDM naar **configuratie>Remote Access VPN > Network (client) Access> Any-verbindingsprofielen**. Controleer de **toegang van IPSec (IKEv2), het** vakje **voor toegang** op de interface waarmee de VPN-clients worden geconfronteerd (optie **Clientservices** inschakelen is niet nodig).

Stap 2. Selecteer **Apparaatcertificaat** en verwijder het selectieteken van **Gebruik hetzelfde apparaatcertificaat voor SSL en IPSec IKEv2**.

Stap 3. Selecteer het Head-end certificaat voor de IPSec-verbinding en selecteer — Geen — voor de SSL-verbinding.

Deze optie stelt de crypto ikev2, crypto ipsec, crypto dynamisch-kaart en de crypto-kaartconfiguratie in.



Configuration > Remote Access VPN > Network (Client) Access > AnyConnect Connection Profiles

The security appliance automatically deploys the Cisco AnyConnect VPN Client to remote users upon connection. The initial client deployment requires end-user administrative rights. The Cisco AnyConnect VPN Client supports IPsec (IKEv2) tunnel as well as SSL tunnel with Datagram Transport Layer Security (DTLS) tunneling options.

Access Interfaces

□ Enable Cisco AnyConnect VPN Client access on the interfaces selected in the table below

SSL access must be enabled if you allow AnyConnect client to be launched from a browser (Web Launch) .

Interface	SSL Access		IPsec (IKEv2) Access	
	Allow Access	Enable DTLS	Allow Access	Enable Client Services
outside	□	□	☑	□
inside	□	□	□	□

Device Certificate ...

Port Settings ...

☑ Bypass interface access lists for inbound VPN sessions

Access lists from group policy and user policy always apply to the traffic.

Login Page Setting

□ Allow user to select connection profile on the login page.

□ Shutdown portal login page.

Connection Profiles

Connection profile (tunnel group) specifies how user is authenticated and other parameters. You can configure the mapping from certificate to connection profile here.

Add Edit Delete Find: □ Match Case

Name	SSL Enabled	IPsec Enabled	Aliases	Authentication Method	Group Policy
DefaultRAGroup	□	☑		AAA(LOCAL)	DfltGrpPolicy
DefaultWEBVPNGroup	□	☑		AAA(LOCAL)	DfltGrpPolicy

□ Let group URL take precedence if group URL and certificate map match different connection profiles. Otherwis

Apply

Specify Device Certificate

Device certificate is a digital certificate that identifies this ASA to the clients.

□ Use the same device certificate for SSL and IPsec IKEv2

Device Certificate for SSL Connection: -- None --

Device Certificate for IPsec Connection: Headend:hostname=Connected_2_INET-B, cn=HeadEnd.da...

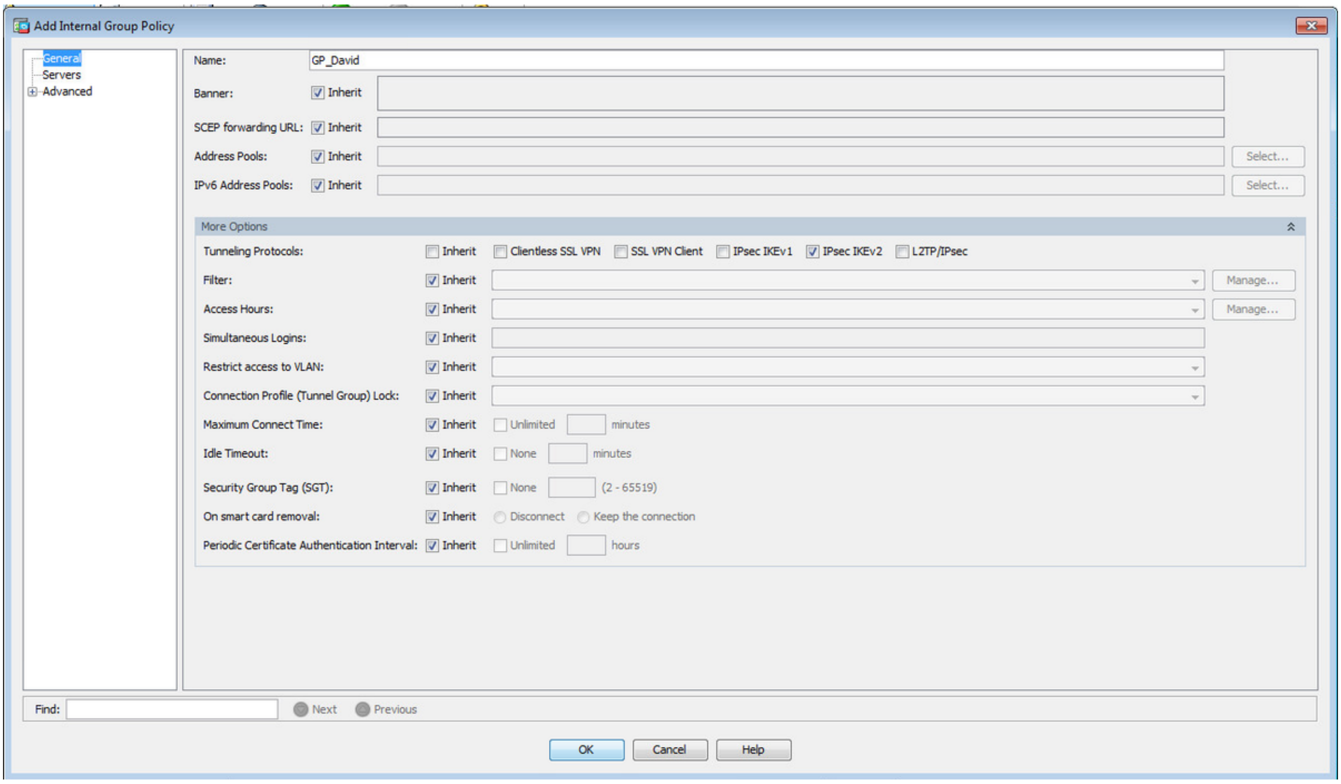
Manage Certificates ...

OK Cancel Help

Zo ziet de configuratie er uit op Opdrachtlijn Interface (CLI).

```
crypto ikev2 policy 1
 encryption aes-256
 integrity sha
 group 5
 prf sha
 lifetime seconds 86400
crypto ikev2 enable outside

crypto ikev2 remote-access trustpoint HeadEnd
crypto ipsec ikev2 ipsec-proposal AES256
 protocol esp encryption aes-256
 protocol esp integrity sha-1 md5

crypto dynamic-map Anyconnect 65535 set ikev2 ipsec-proposal AES256
crypto map outside_map 65535 ipsec-isakmp dynamic Anyconnect
crypto map outside_map interface outside
```

Stap 4. Navigeer naar **Configuration > Remote Access VPN > Network (Client) Access > Group Policy** om een groepsbeleid te maken


Add Internal Group Policy

Name: GP_David

Banner: ☑ Inherit

SCEP forwarding URL: ☑ Inherit

Address Pools: ☑ Inherit

IPv6 Address Pools: ☑ Inherit

More Options

Tunneling Protocols: □ Inherit □ Clientless SSL VPN □ SSL VPN Client □ IPsec IKEv1 ☑ IPsec IKEv2 □ L2TP/IPsec

Filter: ☑ Inherit

Access Hours: ☑ Inherit

Simultaneous Logins: ☑ Inherit

Restrict access to VLAN: ☑ Inherit

Connection Profile (Tunnel Group) Lock: ☑ Inherit

Maximum Connect Time: ☑ Inherit □ Unlimited minutes

Idle Timeout: ☑ Inherit □ None minutes

Security Group Tag (SGT): ☑ Inherit □ None (2 - 65519)

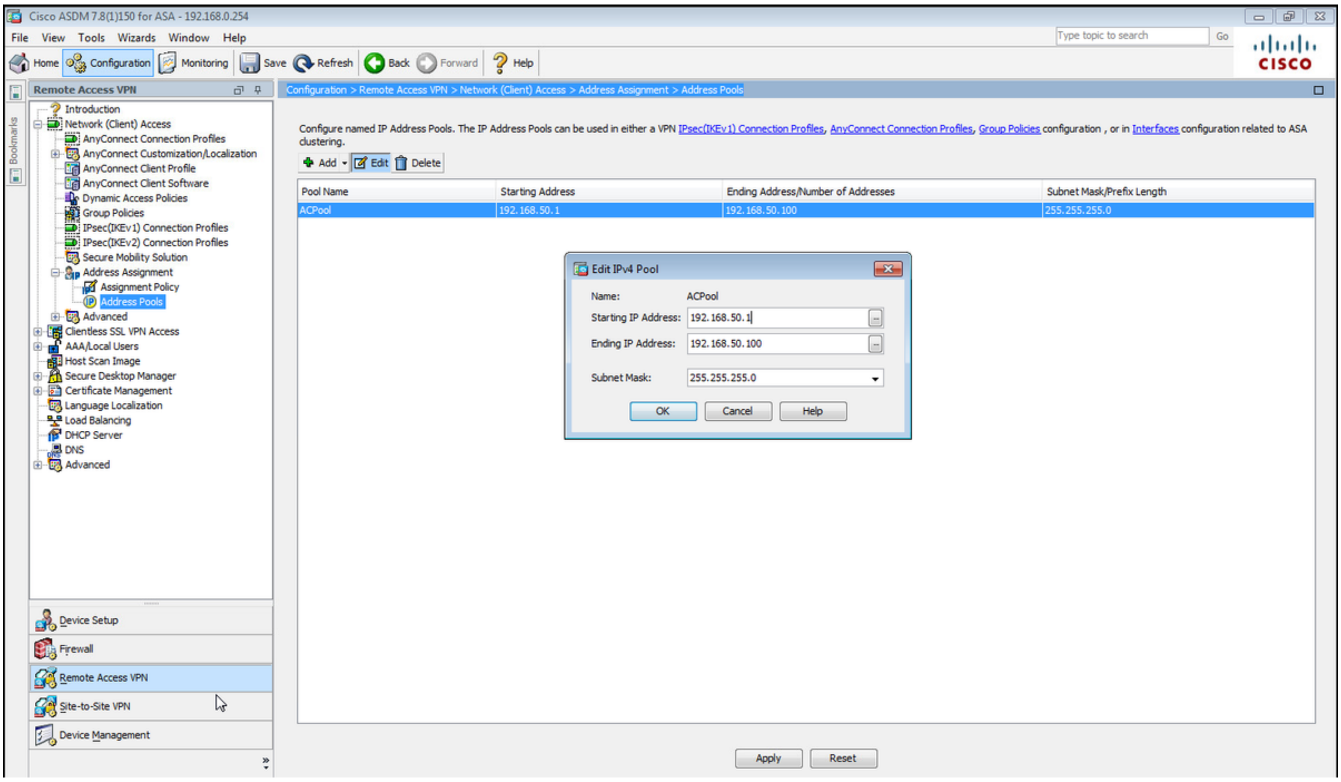
On smart card removal: ☑ Inherit ○ Disconnect ○ Keep the connection

Periodic Certificate Authentication Interval: ☑ Inherit □ Unlimited hours

Op CLI.

```
group-policy GP_David internal
group-policy GP_David attributes
 vpn-tunnel-protocol ikev2
```

Stap 5. Navigeer naar **Configuration > Remote Access VPN > Network (Client) Access > adresgroepen** en selecteer **Add** om een IPv4-pool te maken.


Cisco ASDM 7.8(1)150 for ASA - 192.168.0.254

Configuration > Remote Access VPN > Network (Client) Access > Address Assignment > Address Pools

Configure named IP Address Pools. The IP Address Pools can be used in either a VPN IPsec(IKEv1) Connection Profiles, AnyConnect Connection Profiles, Group Policies configuration , or in Interfaces configuration related to ASA clustering.

Pool Name	Starting Address	Ending Address/Number of Addresses	Subnet Mask/Prefix Length
ACPool	192.168.50.1	192.168.50.100	255.255.255.0

Edit IPv4 Pool

Name: ACPool

Starting IP Address: 192.168.50.1

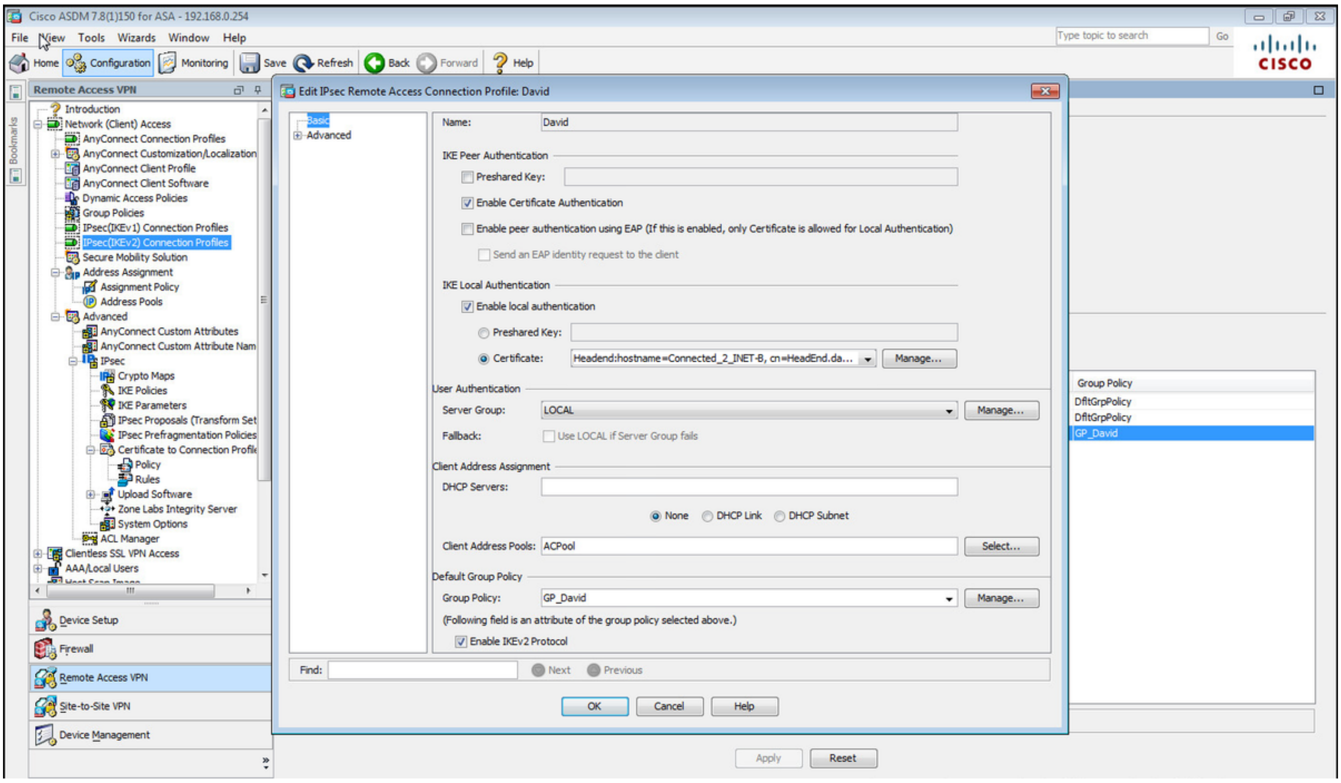
Ending IP Address: 192.168.50.100

Subnet Mask: 255.255.255.0

Op CLI.

```
ip local pool ACPool 192.168.50.1-192.168.50.100 mask 255.255.255.0
```

Stap 6. Navigeer naar **Configuration > Remote Access VPN > Network (Client) Access > IPSec (IKEv2) Connection-profielen** en selecteer **Add** om een nieuwe tunnelgroep te maken.



Edit IPsec Remote Access Connection Profile: David

Name: David

IKE Peer Authentication

□ Preshared Key:

☑ Enable Certificate Authentication

□ Enable peer authentication using EAP (If this is enabled, only Certificate is allowed for Local Authentication)

□ Send an EAP identity request to the client

IKE Local Authentication

☑ Enable local authentication

○ Preshared Key:

● Certificate: Headend:hostname=Connected_2_INET-B, cn=HeadEnd.da...

User Authentication

Server Group: LOCAL

Fallback: □ Use LOCAL if Server Group fails

Client Address Assignment

DHCP Servers:

● None ○ DHCP Link ○ DHCP Subnet

Client Address Pools: ACPool

Default Group Policy

Group Policy: GP_David

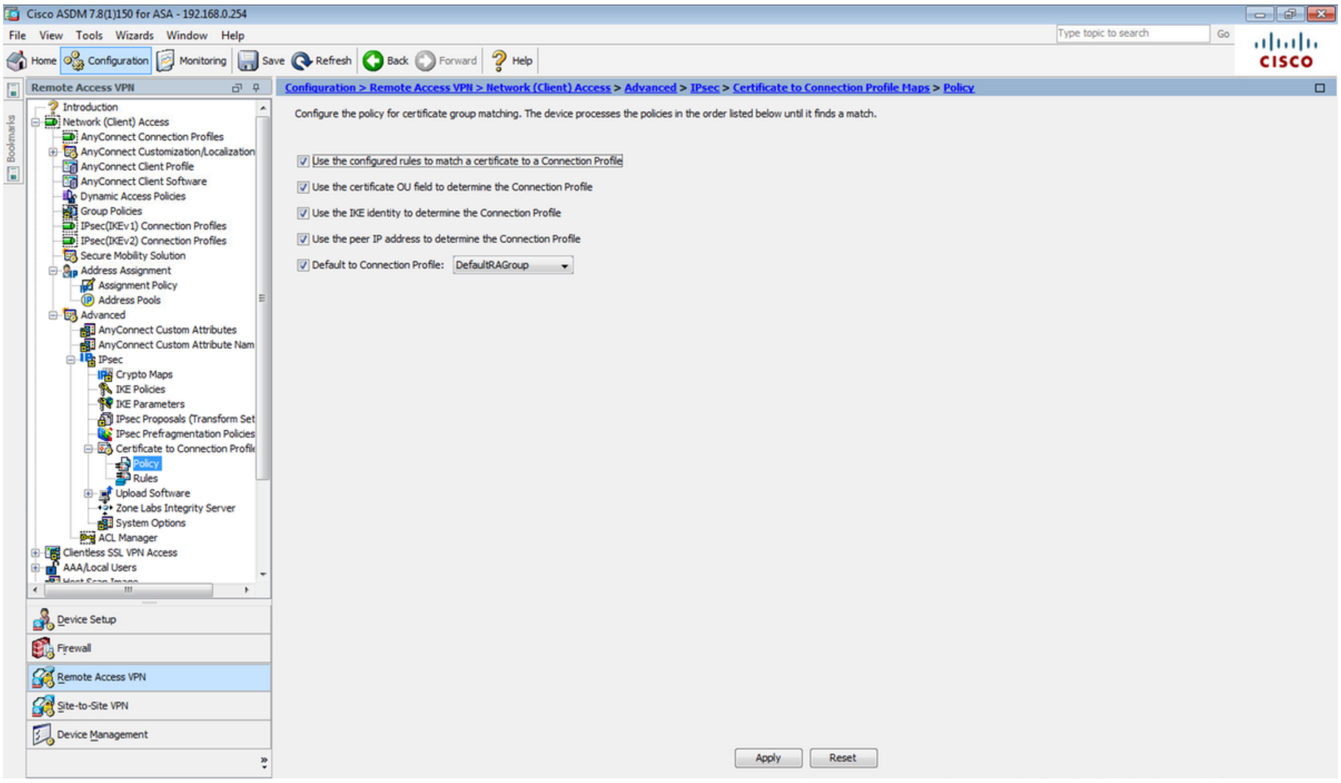
(Following field is an attribute of the group policy selected above.)

☑ Enable IKEv2 Protocol

Op CLI.

```
tunnel-group David type remote-access
tunnel-group David general-attributes
 address-pool ACPool
 default-group-policy GP_David
 authentication-server-group LOCAL
tunnel-group David webvpn-attributes
 authentication certificate
tunnel-group David ipsec-attributes
 ikev2 remote-authentication certificate
 ikev2 local-authentication certificate HeadEnd
```

Stap 7. **Navigeer** in **Configuration > Remote Access VPN > Network (Client) Access > Advanced > IPsec > Document Connection Profile maps > Policy** en controleer **de geconfigureerde regels om een certificaat aan een** vak **van verbindingsprofiel aan te passen.**


Cisco ASDM 7.8(1)150 for ASA - 192.168.0.254
File View Tools Wizards Window Help
Home Configuration Monitoring Save Refresh Back Forward Help
Remote Access VPN
Device Setup
Firewall
Remote Access VPN
Site-to-Site VPN
Device Management
Apply
Reset

Configuration > Remote Access VPN > Network (Client) Access > Advanced > IPsec > Certificate to Connection Profile Maps > Policy

Configure the policy for certificate group matching. The device processes the policies in the order listed below until it finds a match.

☑ Use the configured rules to match a certificate to a Connection Profile

☑ Use the certificate OU field to determine the Connection Profile

☑ Use the IKE identity to determine the Connection Profile

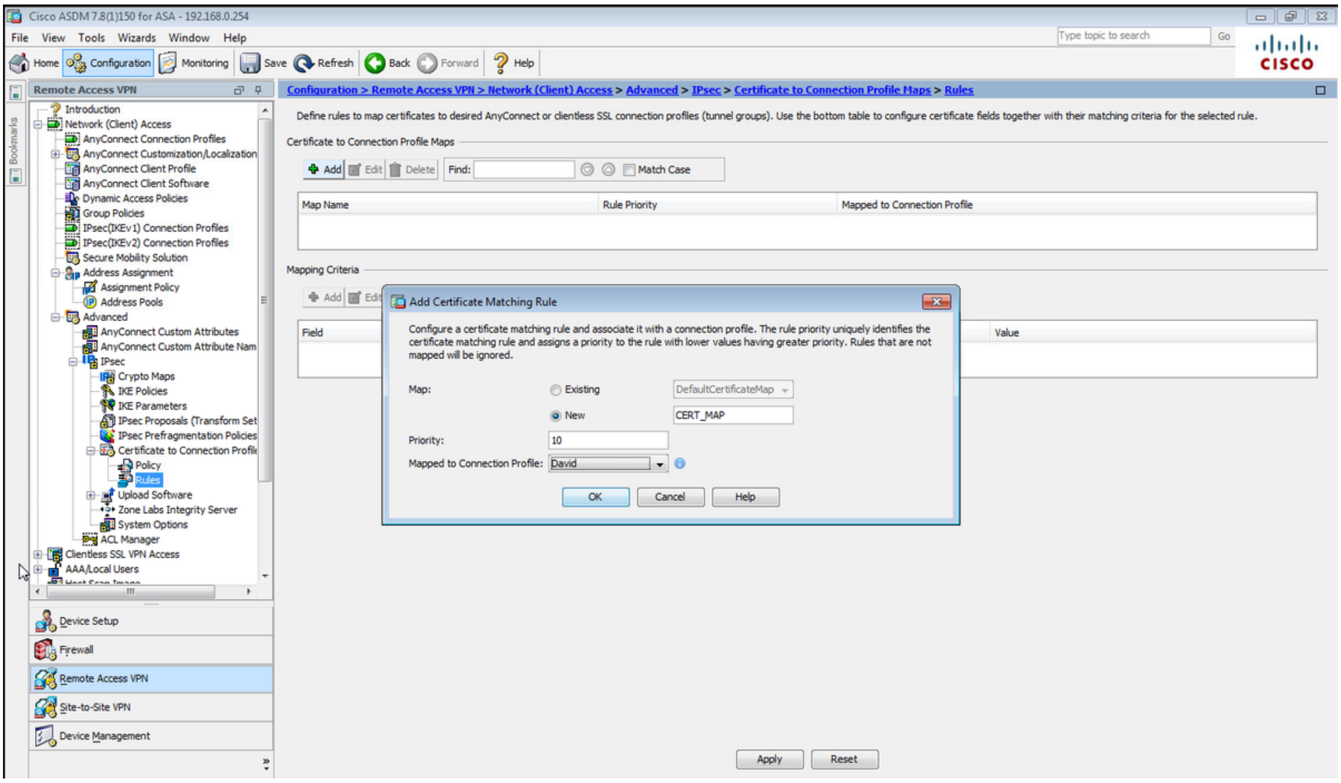
☑ Use the peer IP address to determine the Connection Profile

☑ Default to Connection Profile: DefaultRAGroup

Op CLI.

```
tunnel-group-map enable rules
```

Stap 8. Navigeer naar **Configuration > Remote Access VPN > Network (Client) Access > Advanced > IPsec > Document Connection Profile maps > Regels** en maak een nieuwe certificaatkaart. Selecteer **Add** en associeer deze met de tunnelgroep. In dit voorbeeld heet de tunnelgroep **David**.


Cisco ASDM 7.8(1)150 for ASA - 192.168.0.254
File View Tools Wizards Window Help
Home Configuration Monitoring Save Refresh Back Forward Help
Remote Access VPN
Add Edit Delete Find: Match Case
Map Name
Rule Priority
Mapped to Connection Profile
Mapping Criteria
Field
Value
Device Setup
Firewall
Remote Access VPN
Site-to-Site VPN
Device Management
Apply
Reset

Configuration > Remote Access VPN > Network (Client) Access > Advanced > IPsec > Certificate to Connection Profile Maps > Rules

Define rules to map certificates to desired AnyConnect or clientless SSL connection profiles (tunnel groups). Use the bottom table to configure certificate fields together with their matching criteria for the selected rule.

Certificate to Connection Profile Maps

Add Certificate Matching Rule

Configure a certificate matching rule and associate it with a connection profile. The rule priority uniquely identifies the certificate matching rule and assigns a priority to the rule with lower values having greater priority. Rules that are not mapped will be ignored.

Map: ○ Existing DefaultCertificateMap

● New CERT_MAP

Priority: 10

Mapped to Connection Profile: David

OK Cancel Help

Op CLI.

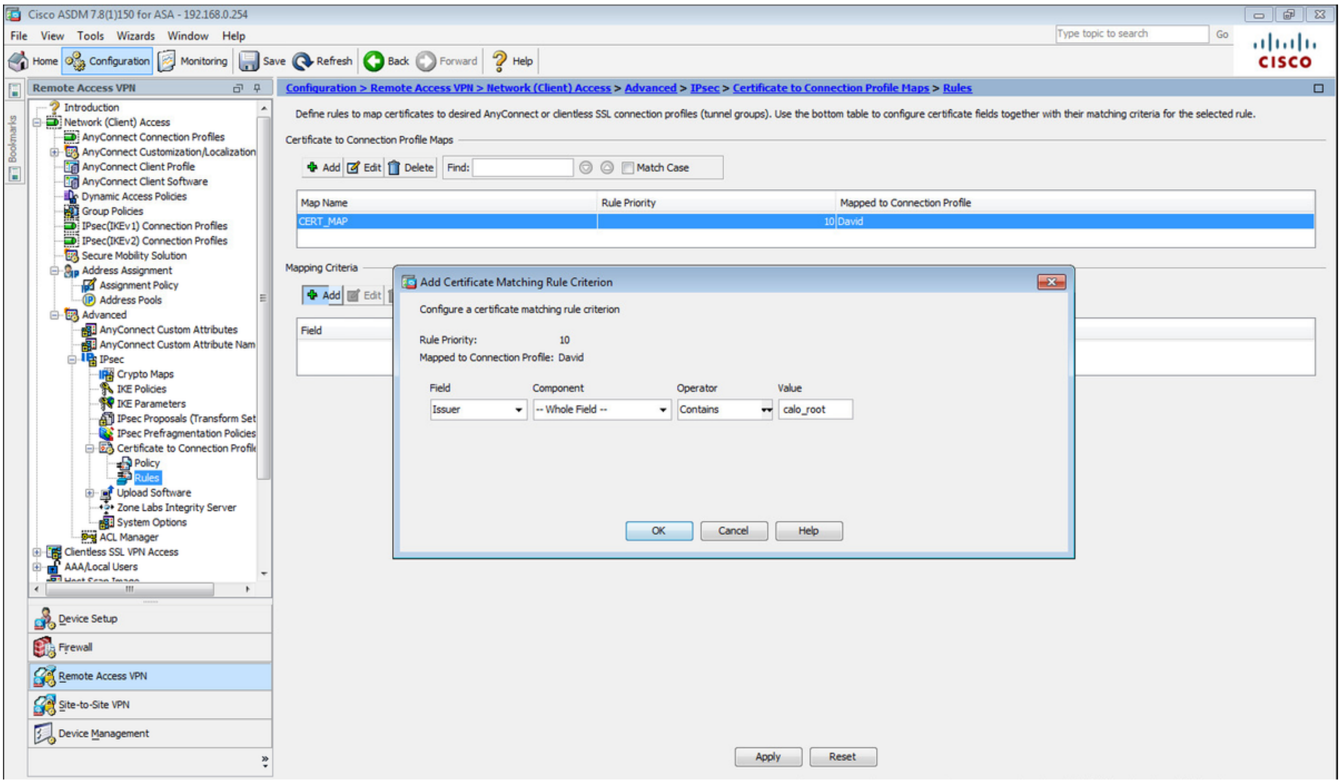
```
tunnel-group-map CERT_MAP 10 David
```

Stap 9. Selecteer **Toevoegen** in het gedeelte **Kappingscriteria** en voer deze waarden in.

Veld: uitgever

Exploitant: Bevat

Value: calo_root



Configuration > Remote Access VPN > Network (Client) Access > Advanced > IPsec > Certificate to Connection Profile Maps > Rules

Define rules to map certificates to desired AnyConnect or clientless SSL connection profiles (tunnel groups). Use the bottom table to configure certificate fields together with their matching criteria for the selected rule.

Certificate to Connection Profile Maps

Map Name	Rule Priority	Mapped to Connection Profile
CERT_MAP	10	David

Add Certificate Matching Rule Criterion

Configure a certificate matching rule criterion

Rule Priority: 10

Mapped to Connection Profile: David

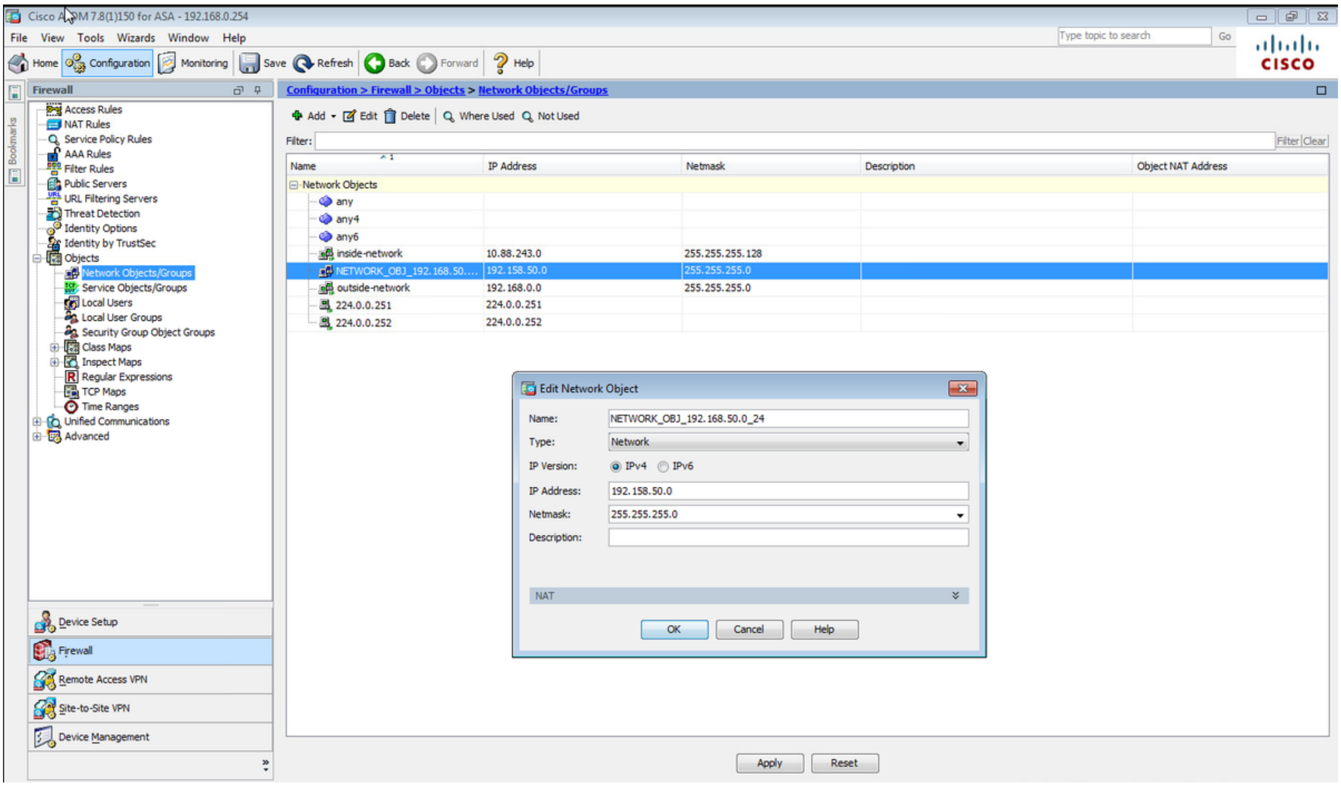
Field	Component	Operator	Value
Issuer	-- Whole Field --	Contains	calo_root

Cisco ASDM 7.8(1)150 for ASA - 192.168.0.254
File View Tools Wizards Window Help
Home Configuration Monitoring Save Refresh Back Forward Help
Remote Access VPN
Mapping Criteria
Add Edit Delete Find: Match Case
OK Cancel Help
Apply Reset
Device Setup
Firewall
Remote Access VPN
Site-to-Site VPN
Device Management

Op CLI.

```
crypto ca certificate map CERT_MAP 10
 issuer-name co calo_root
```

Stap 10. Maak een object met het IP-poolnetwerk dat moet worden gebruikt om een NAT-vrijstellingsregel (Network Address Translation) toe te voegen bij **Configuration > Firewall > Objects > Network Objects/Group> Add**.



Cisco ASDM 7.8(1)150 for ASA - 192.168.0.254

Configuration > Firewall > Objects > Network Objects/Groups

Name	IP Address	Netmask	Description	Object NAT Address
Network Objects				
any				
any4				
any6				
inside-network	10.88.243.0	255.255.255.128		
NETWORK_OBJ_192.168.50....	192.158.50.0	255.255.255.0		
outside-network	192.168.0.0	255.255.255.0		
224.0.0.251	224.0.0.251			
224.0.0.252	224.0.0.252			

Edit Network Object

Name: NETWORK_OBJ_192.168.50.0_24

Type: Network

IP Version: ● IPv4 ○ IPv6

IP Address: 192.158.50.0

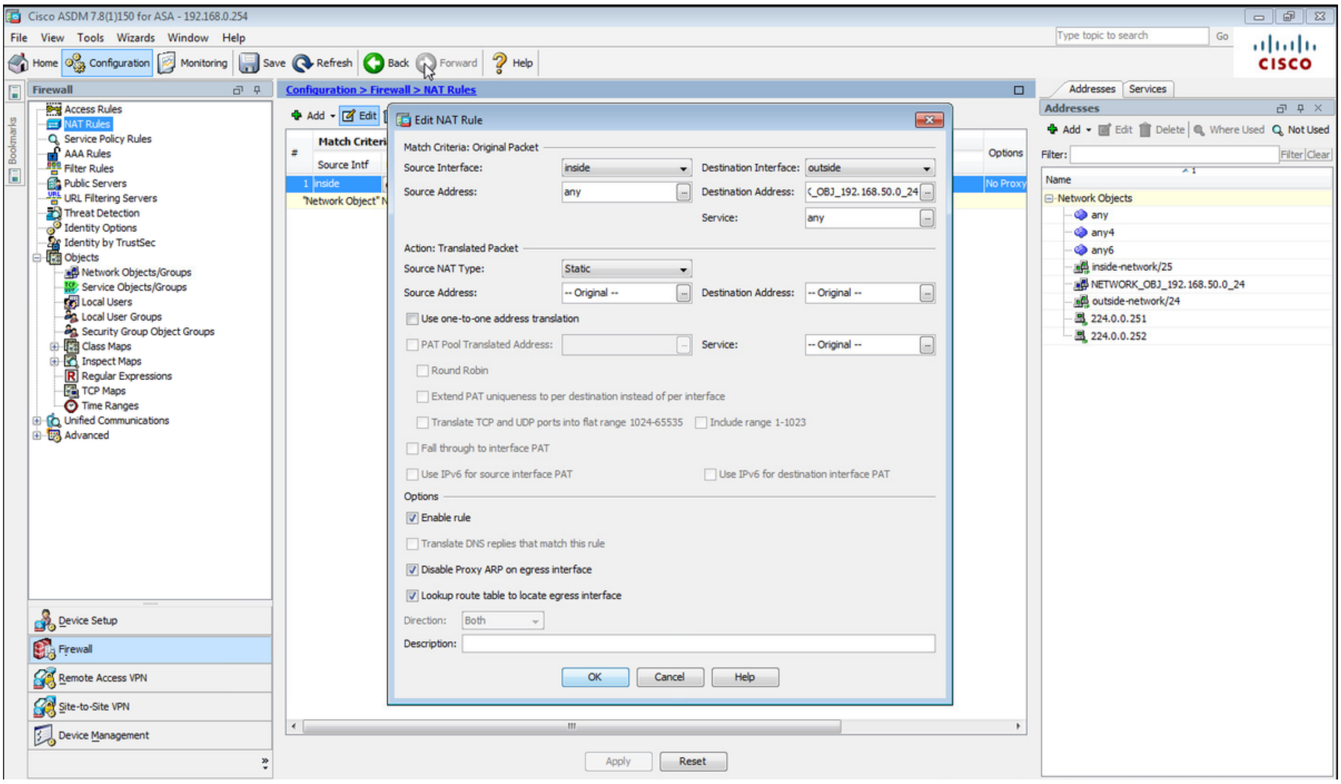
Netmask: 255.255.255.0

Description:

Op CLI.

```
object network NETWORK_OBJ_192.168.50.0_24
 subnet 192.168.50.0 255.255.255.0
```

Stap 1. Navigeer naar **Configuration > Firewall > NAT-regels** en selecteer **Add** om de NAT-vrijstellingsregel voor RA VPN-verkeer te maken.



Cisco ASDM 7.8(1)150 for ASA - 192.168.0.254

Configuration > Firewall > NAT Rules

Edit NAT Rule

Match Criteria: Original Packet

Source Interface: inside

Destination Interface: outside

Source Address: any

Destination Address: (_OBJ_192.168.50.0_24

Service: any

Action: Translated Packet

Source NAT Type: Static

Source Address: -- Original --

Destination Address: -- Original --

□ Use one-to-one address translation

□ PAT Pool Translated Address:

Service: -- Original --

□ Round Robin

□ Extend PAT uniqueness to per destination instead of per interface

□ Translate TCP and UDP ports into flat range 1024-65535 □ Include range 1-1023

□ Fall through to interface PAT

□ Use IPv6 for source interface PAT □ Use IPv6 for destination interface PAT

Options

☑ Enable rule

□ Translate DNS replies that match this rule

☑ Disable Proxy ARP on egress interface

☑ Lookup route table to locate egress interface

Direction: Both

Description:

Op CLI.

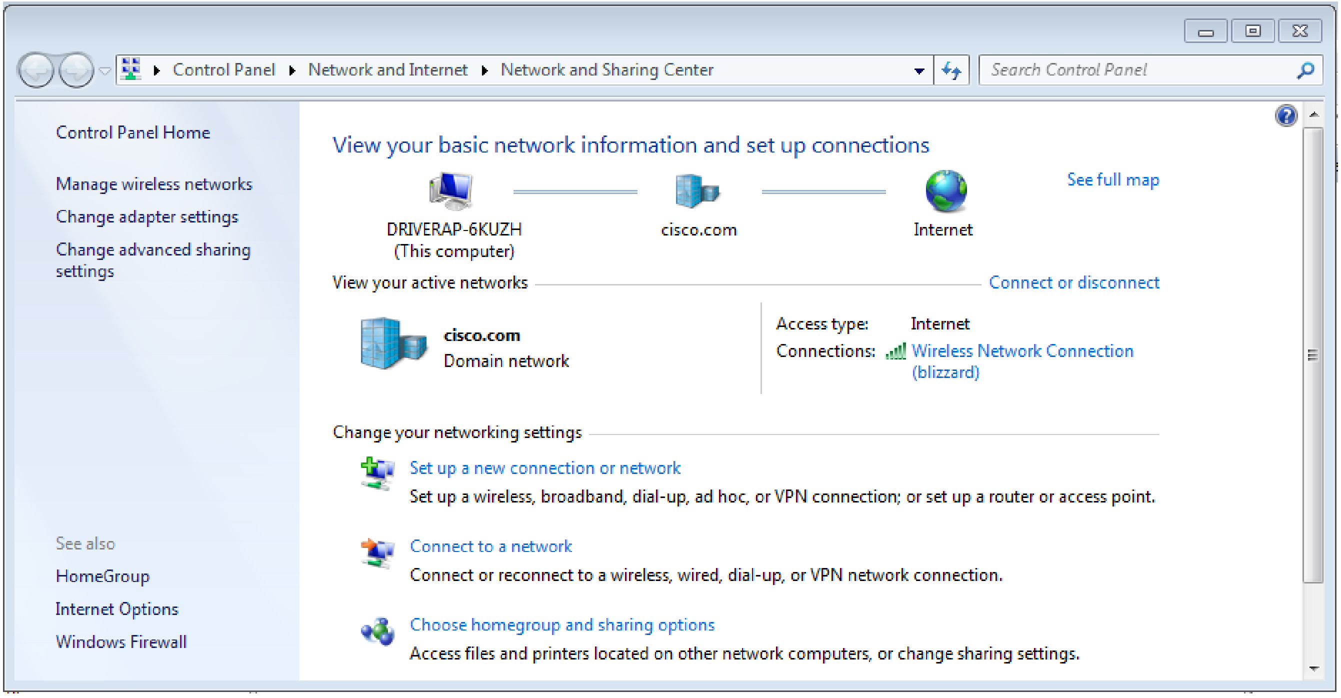
```
nat (inside,outside) source static any any destination static NETWORK_OBJ_192.168.50.0_24
NETWORK_OBJ_192.168.50.0_24 no-proxy-arp route-lookup
```

Dit is de volledige ASA-configuratie gebruikt voor dit voorbeeld.

```
interface GigabitEthernet1/1
 nameif outside
 security-level 0
 ip address 10.88.243.108 255.255.255.128

object network NETWORK_OBJ_192.168.50.0_24
 subnet 192.168.50.0 255.255.255.0
nat (inside,outside) source static any any destination static NETWORK_OBJ_192.168.50.0_24
NETWORK_OBJ_192.168.50.0_24
ip local pool ACPool 192.168.50.1-192.168.50.100 mask 255.255.255.0
crypto ikev2 policy 1
 encryption aes-256
 integrity sha
 group 5
 prf sha
 lifetime seconds 86400
crypto ikev2 enable outside

crypto ikev2 remote-access trustpoint HeadEnd

group-policy GP_David internal
group-policy GP_David attributes
 vpn-tunnel-protocol ikev2

tunnel-group David type remote-access
tunnel-group David general-attributes
 address-pool ACPool
 default-group-policy GP_David
 authentication-server-group LOCAL
tunnel-group David webvpn-attributes
 authentication certificate
tunnel-group David ipsec-attributes
 ikev2 remote-authentication certificate
 ikev2 local-authentication certificate HeadEnd

tunnel-group-map enable rules
crypto ca certificate map CERT_MAP 10
 issuer-name co calo_root
tunnel-group-map CERT_MAP 10 David

crypto ipsec ikev2 ipsec-proposal AES256
 protocol esp encryption aes-256
 protocol esp integrity sha-1 md5

crypto dynamic-map Anyconnect 65535 set ikev2 ipsec-proposal AES256
crypto map outside_map 65535 ipsec-isakmp dynamic Anyconnect
crypto map outside_map interface outside
```

Ingebouwde Windows 7-client configureren

Stap 1. Navigeer naar **Control Panel > Network en Internet > Network en Sharing Center**.


Control Panel ▸ Network and Internet ▸ Network and Sharing Center

Search Control Panel

Control Panel Home

Manage wireless networks

Change adapter settings

Change advanced sharing settings

See also

HomeGroup

Internet Options

Windows Firewall

View your basic network information and set up connections

DRIVERAP-6KUZH (This computer) — cisco.com — Internet

See full map

View your active networks

Connect or disconnect

cisco.com
Domain network

Access type: Internet
Connections: Wireless Network Connection (blizzard)

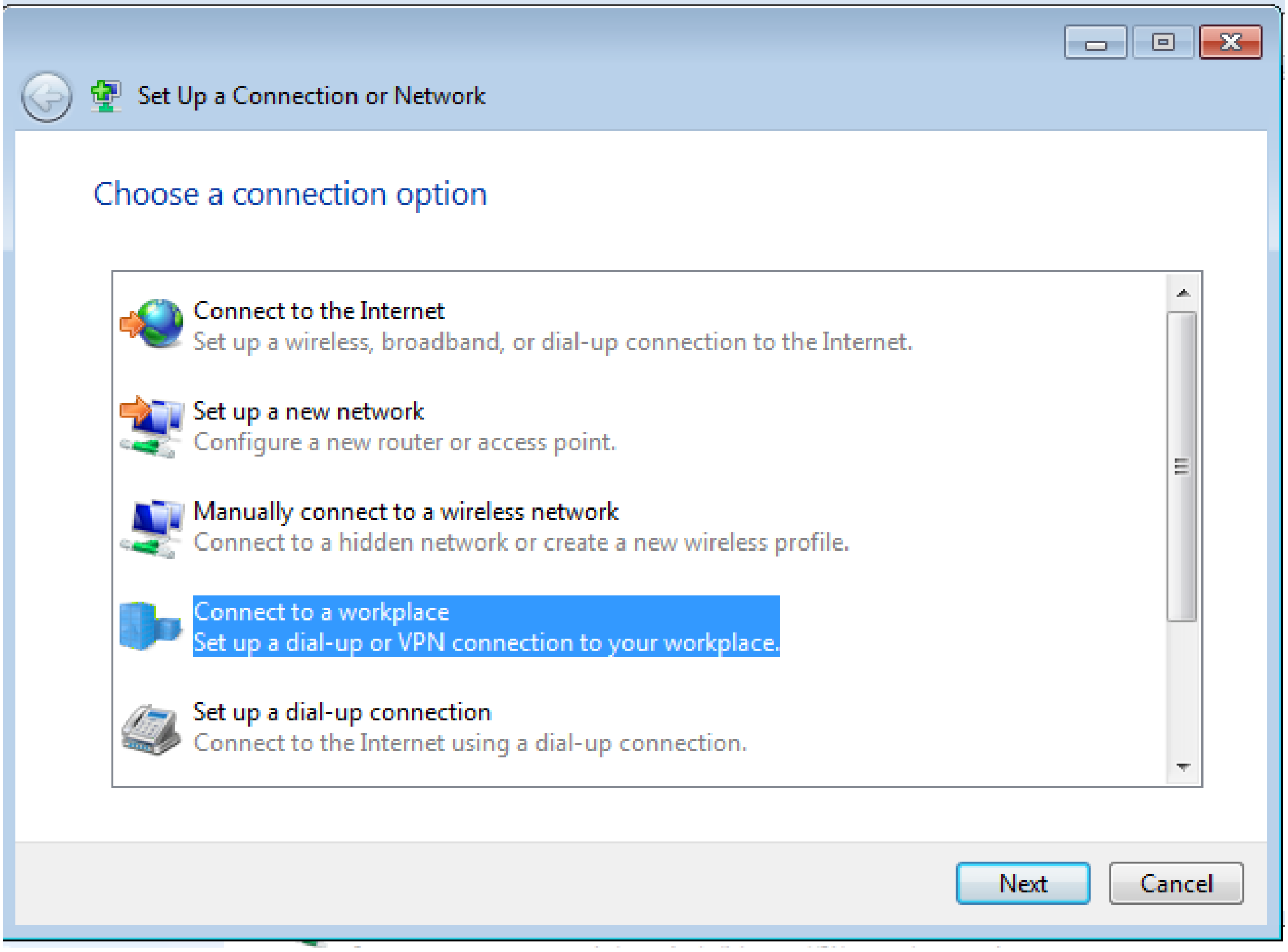
Change your networking settings

Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.

Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

Choose homegroup and sharing options
Access files and printers located on other network computers, or change sharing settings.

Stap 2. Selecteer **Een nieuwe verbinding of een nieuw netwerk instellen**.


Set Up a Connection or Network

Choose a connection option

Connect to the Internet
Set up a wireless, broadband, or dial-up connection to the Internet.

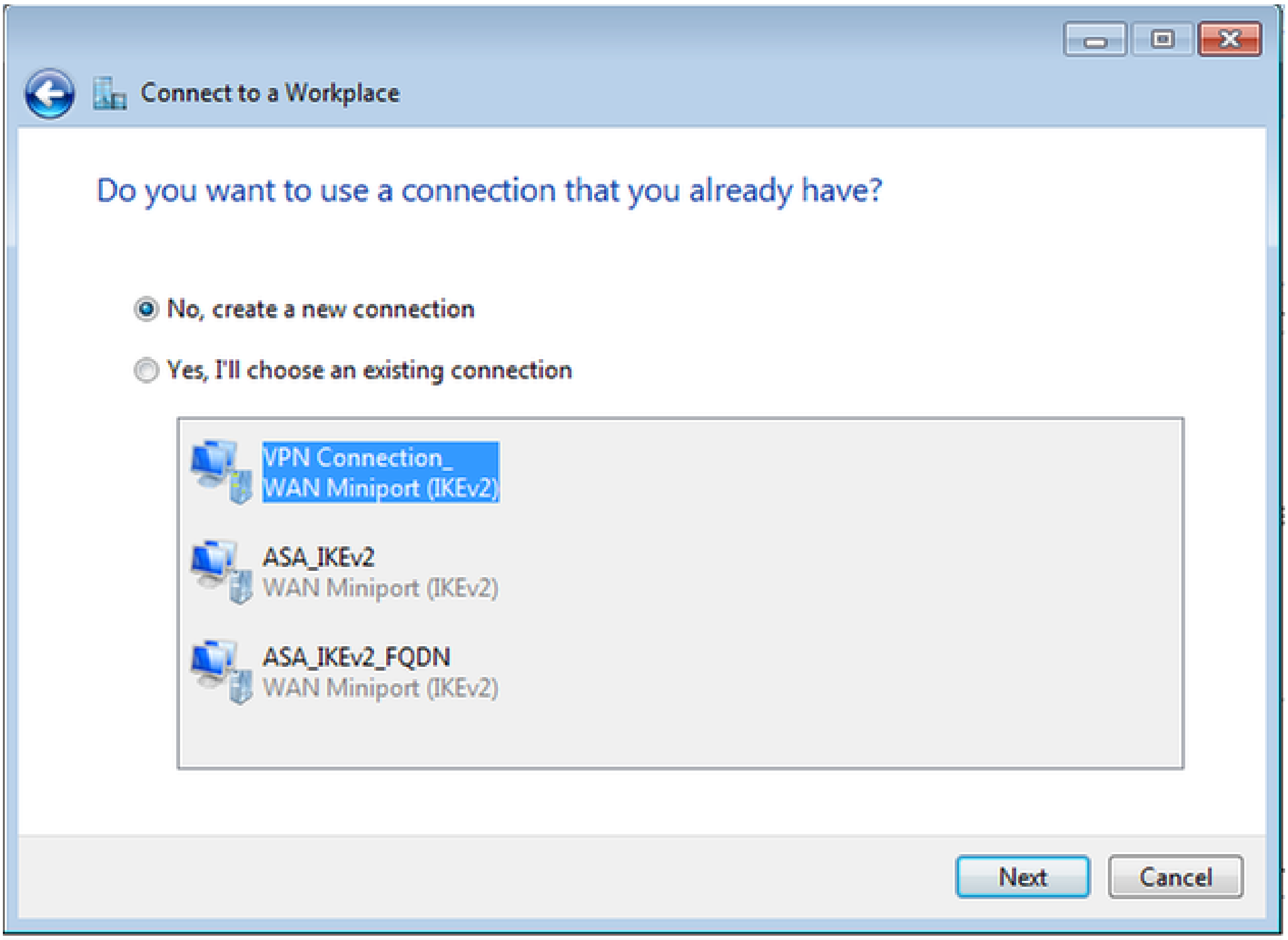
Set up a new network
Configure a new router or access point.

Manually connect to a wireless network
Connect to a hidden network or create a new wireless profile.

Connect to a workplace
Set up a dial-up or VPN connection to your workplace.

Set up a dial-up connection
Connect to the Internet using a dial-up connection.

Stap 3. Selecteer **Connect met een werkplek** en **Volgende**.



Connect to a Workplace

Do you want to use a connection that you already have?

● No, create a new connection

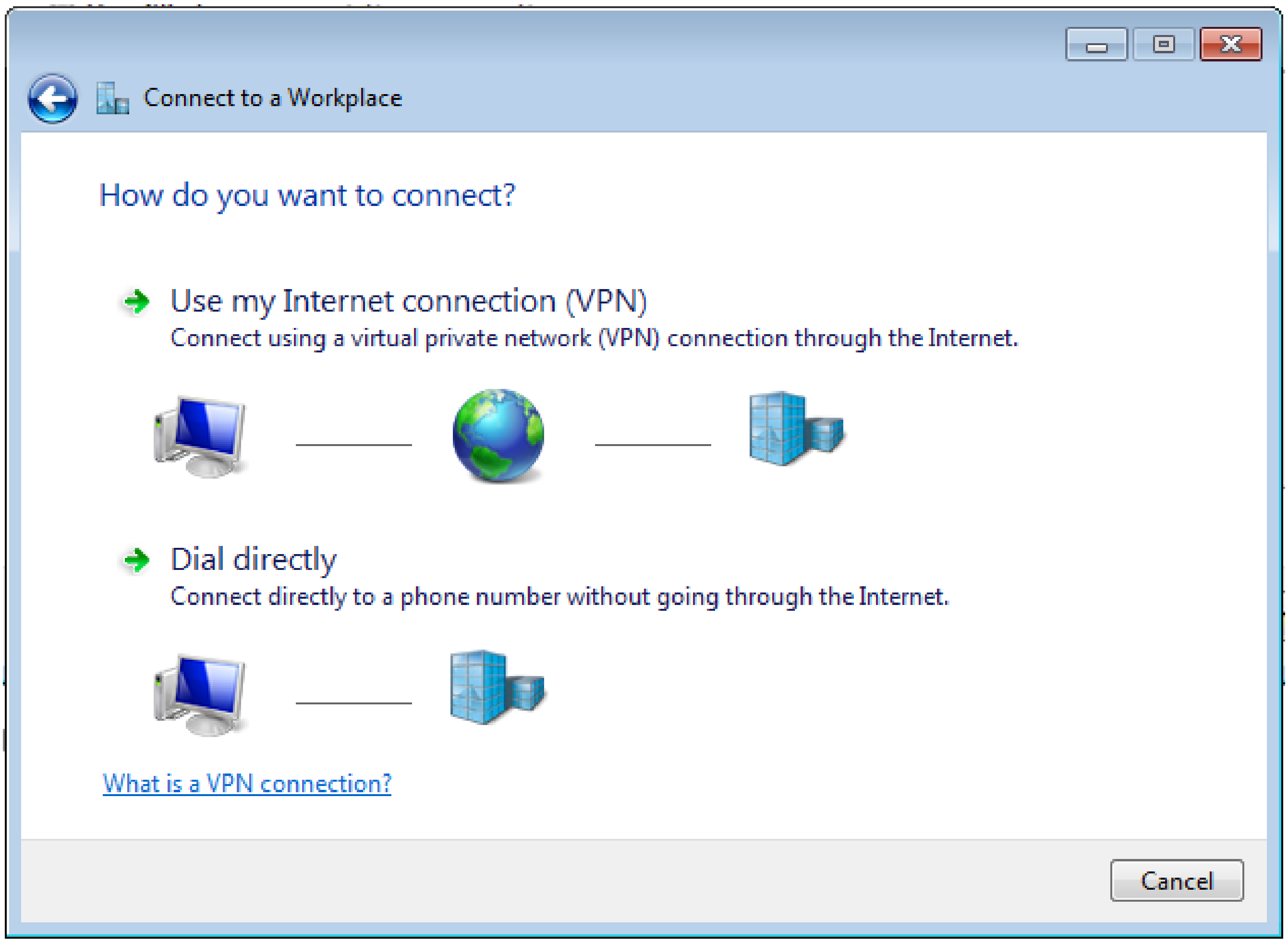
○ Yes, I'll choose an existing connection

VPN Connection_
WAN Miniport (IKEv2)

ASA_IKEv2
WAN Miniport (IKEv2)

ASA_IKEv2_FQDN
WAN Miniport (IKEv2)

Stap 4. Selecteer **Nee, maak een nieuwe verbinding** en **Volgende**.



Connect to a Workplace

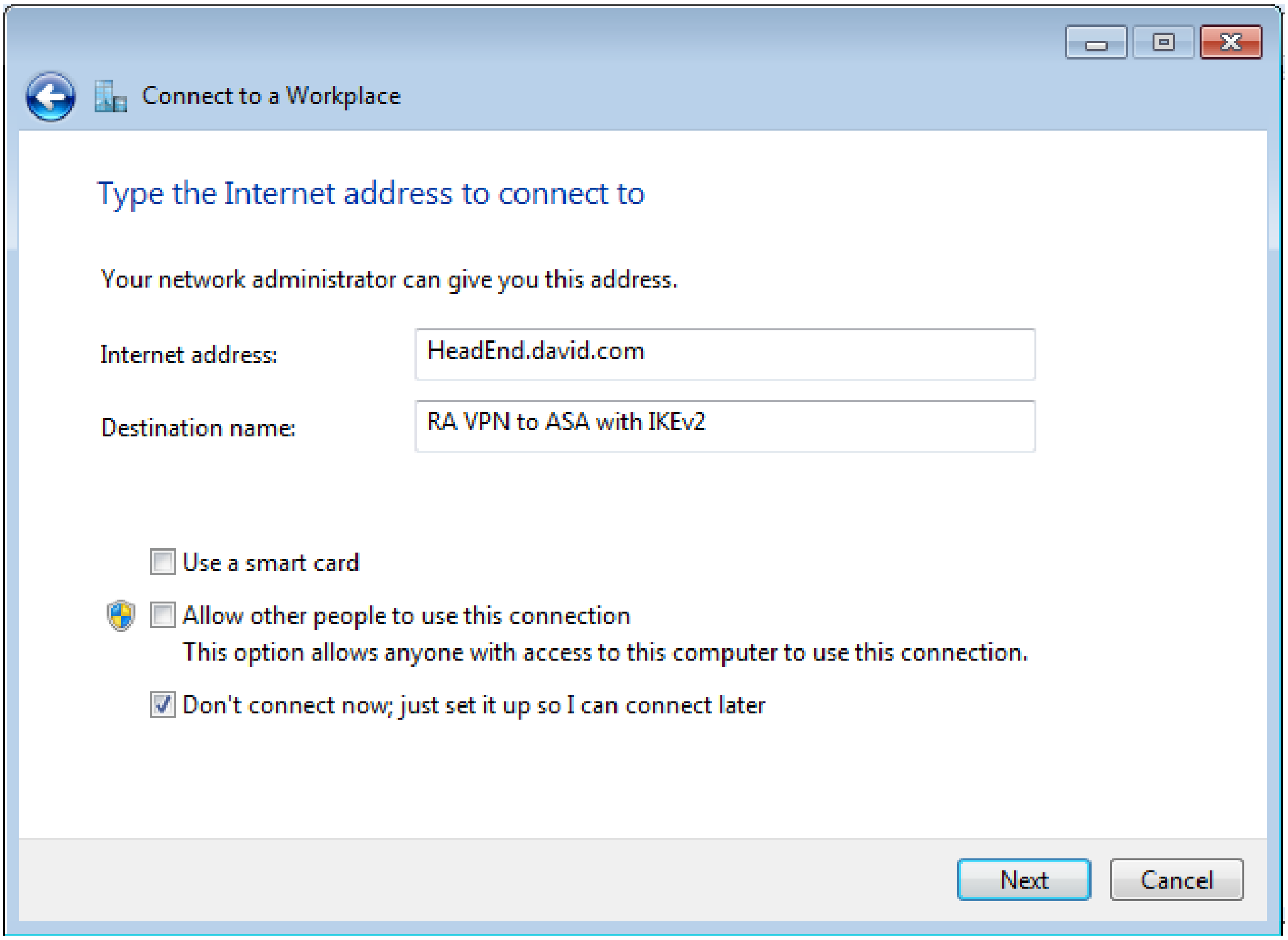
How do you want to connect?

Use my Internet connection (VPN)
Connect using a virtual private network (VPN) connection through the Internet.

Dial directly
Connect directly to a phone number without going through the Internet.

What is a VPN connection?

Stap 5. Selecteer **Gebruik mijn internetverbinding (VPN)** en voeg de string van het headEnd-certificaat Common Name (CN) toe op het **internetadres** in. Typ in het veld **Naam** bestemming de naam van de verbinding. Het kan om het even welke string zijn. Verzeker u ervan dat de **Don nu geen verbinding maakt; Stel het in zodat ik later** een **verbinding kan maken**.



Type the Internet address to connect to

Your network administrator can give you this address.

Internet address: HeadEnd.david.com

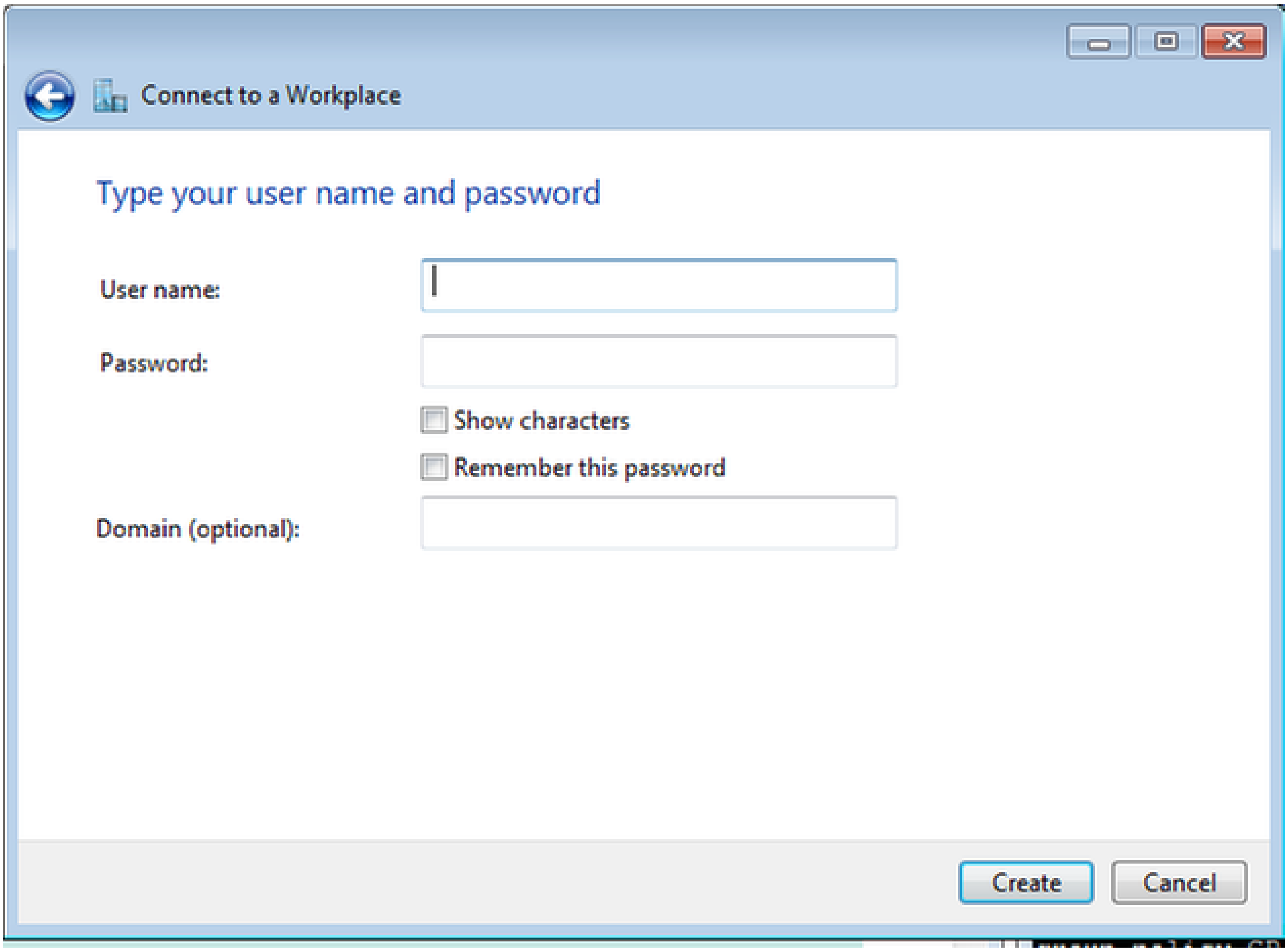
Destination name: RA VPN to ASA with IKEv2

□ Use a smart card

□ Allow other people to use this connection
This option allows anyone with access to this computer to use this connection.

☑ Don't connect now; just set it up so I can connect later

Stap 6. Selecteer **Volgende**.



Connect to a Workplace

Type your user name and password

User name:

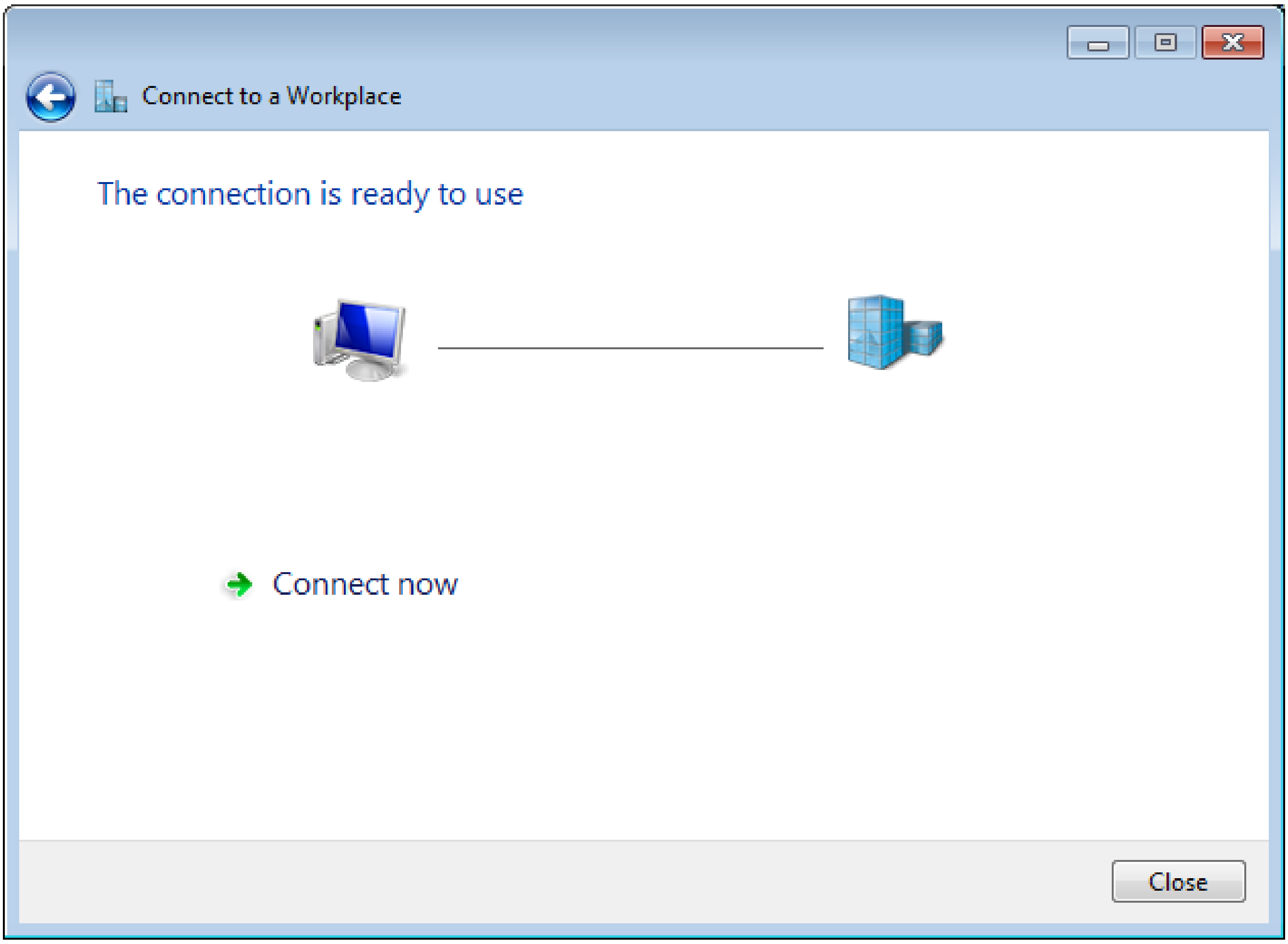
Password:

□ Show characters

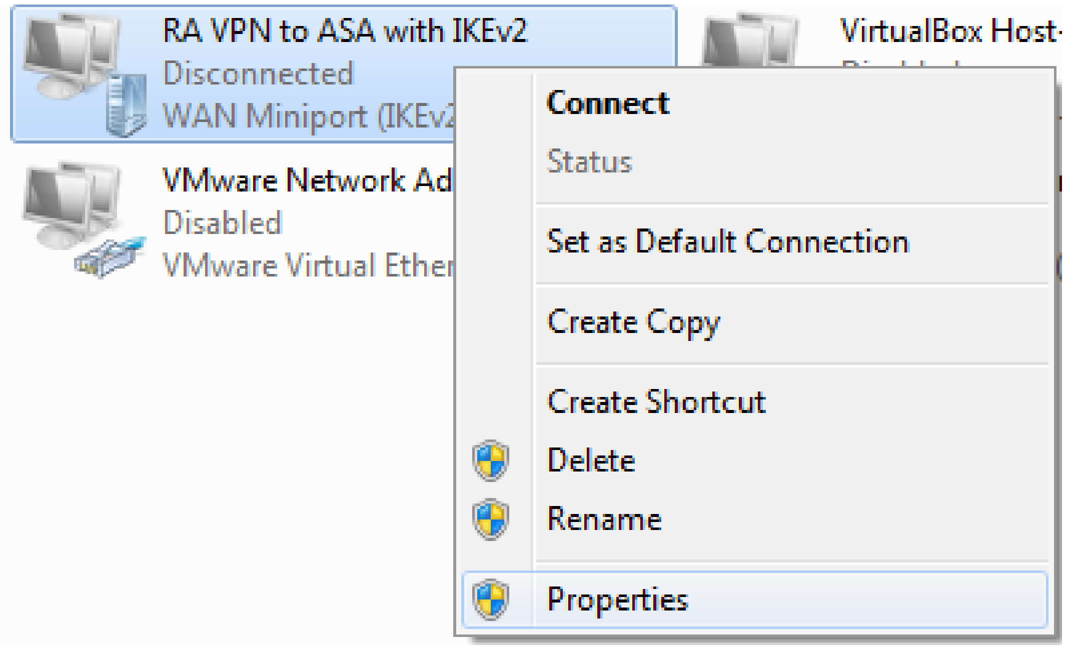
□ Remember this password

Domain (optional):

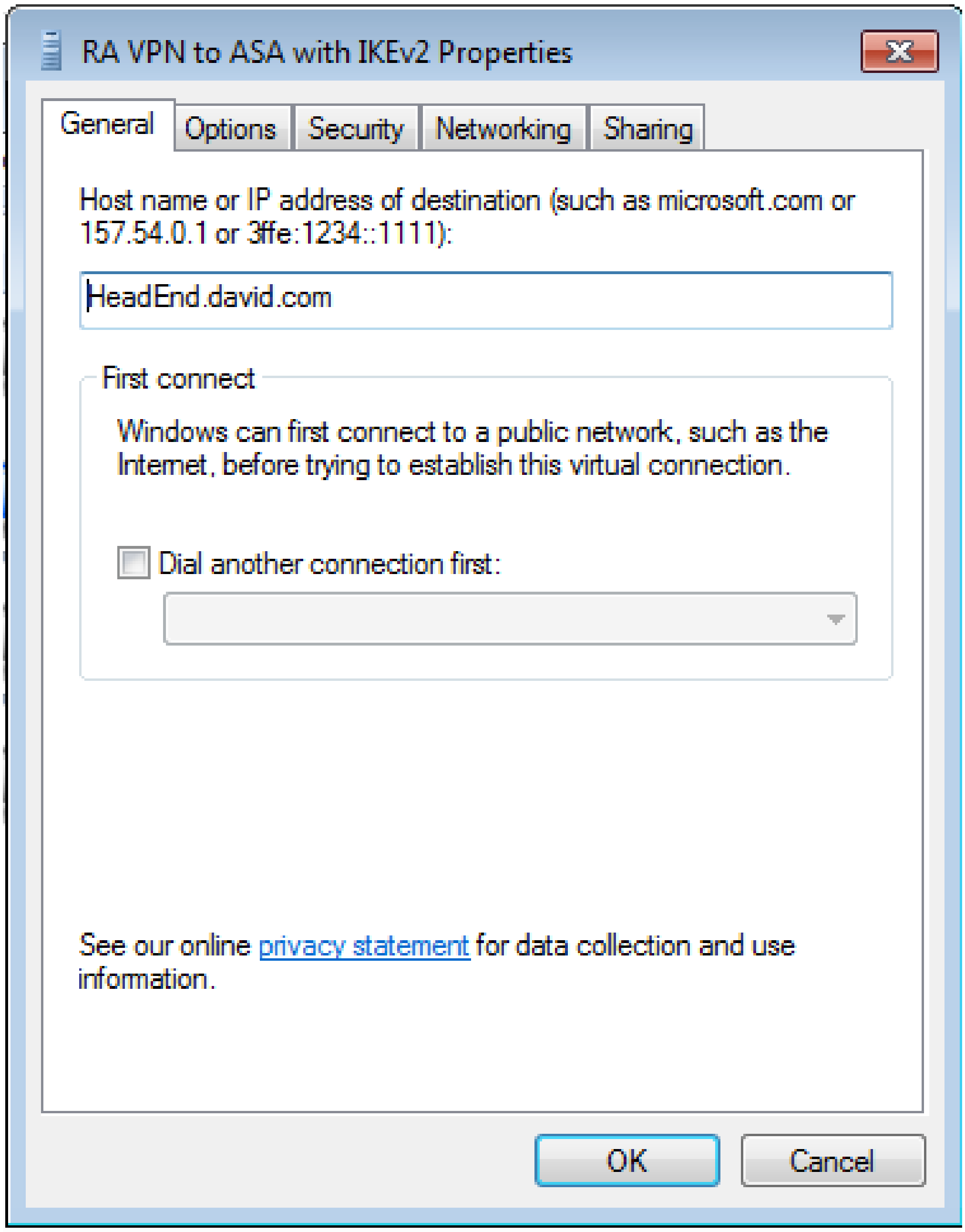
Stap 7. Selecteer **Maken**.



Stap 8. Selecteer **Close** en navigeer naar **Control Panel > Network en Internet > Network Connections**. Selecteer de gemaakte netwerkverbinding en klik met de rechtermuisknop op de verbinding. Selecteer **Eigenschappen**.



Stap 9. In het tabblad **Algemeen** kunt u controleren of de juiste hostnaam voor het kopeinde is correct. Uw computer zal deze naam aan het ASA IP adres oplossen dat gebruikt wordt om RA VPN-gebruikers te verbinden.



Host name or IP address of destination (such as microsoft.com or 157.54.0.1 or 3ffe:1234::1111):

HeadEnd.david.com

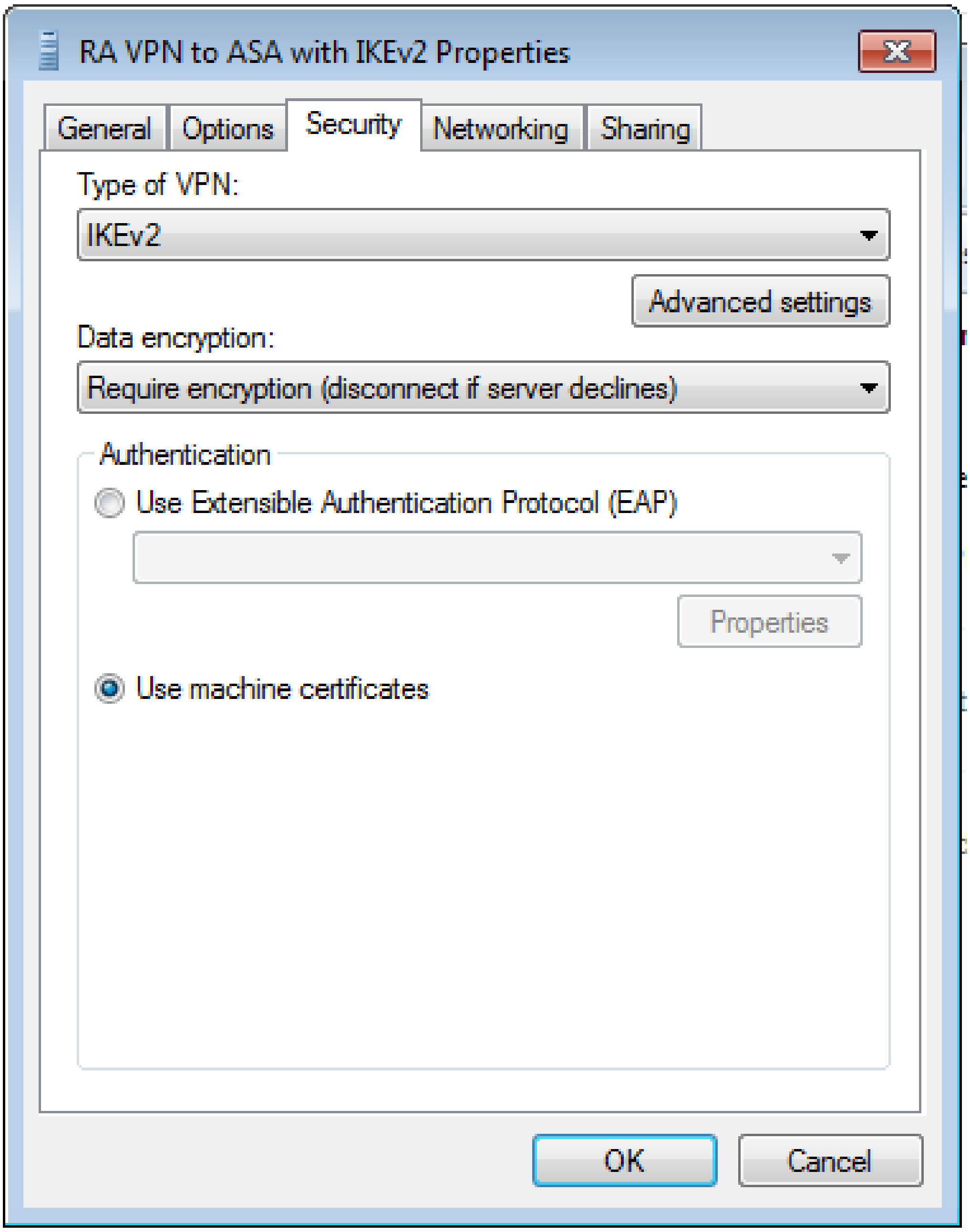
First connect

Windows can first connect to a public network, such as the Internet, before trying to establish this virtual connection.

□ Dial another connection first:

See our online privacy statement for data collection and use information.

Stap 10. Navigeer naar het tabblad **Security** en selecteer **IKEv2** als **type VPN**. Selecteer in het gedeelte **Verificatie de optie Machinecertificaten gebruiken**.



RA VPN to ASA with IKEv2 Properties

Type of VPN: IKEv2

Data encryption: Require encryption (disconnect if server declines)

Authentication

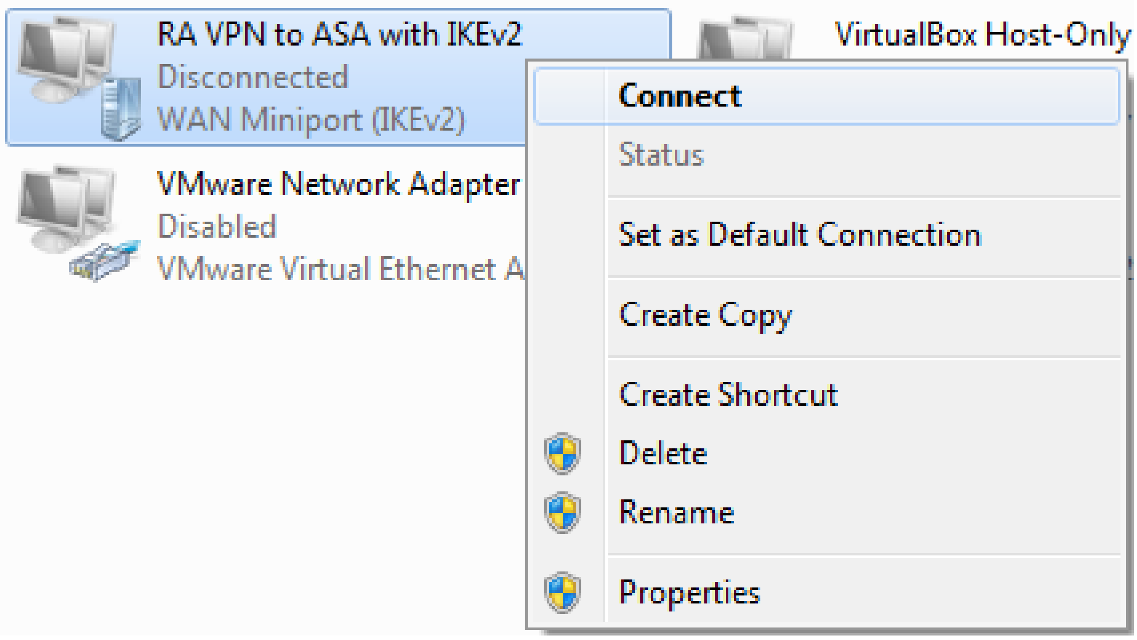
○ Use Extensible Authentication Protocol (EAP)

● Use machine certificates

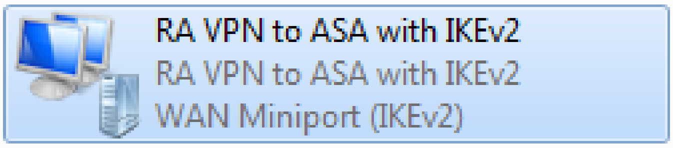
Stap 1. Selecteer **OK** en navigeer naar **C:\Windows\System32\drivers\etc**. Open het hostbestand met een teksteditor. Configureer een bestandsindeling om de FQDN-naam (volledig gekwalificeerd domein naam) op te lossen die in de netwerkverbinding is ingesteld met het IP-adres van uw ASA head-end (in dit voorbeeld de externe interface).

```
# For example:
#
#      102.54.94.97     rhino.acme.com          # source server
#       38.25.63.10     x.acme.com              # x client host
10.88.243.108 HeadEnd.david.com
```

Stap 12. Ga terug naar **Configuratiescherm > Netwerk en internet > Netwerkverbindingen**. Selecteer de netwerkverbinding die u hebt gemaakt. Klik met de rechtermuisknop op de tekst en selecteer **Connect.**



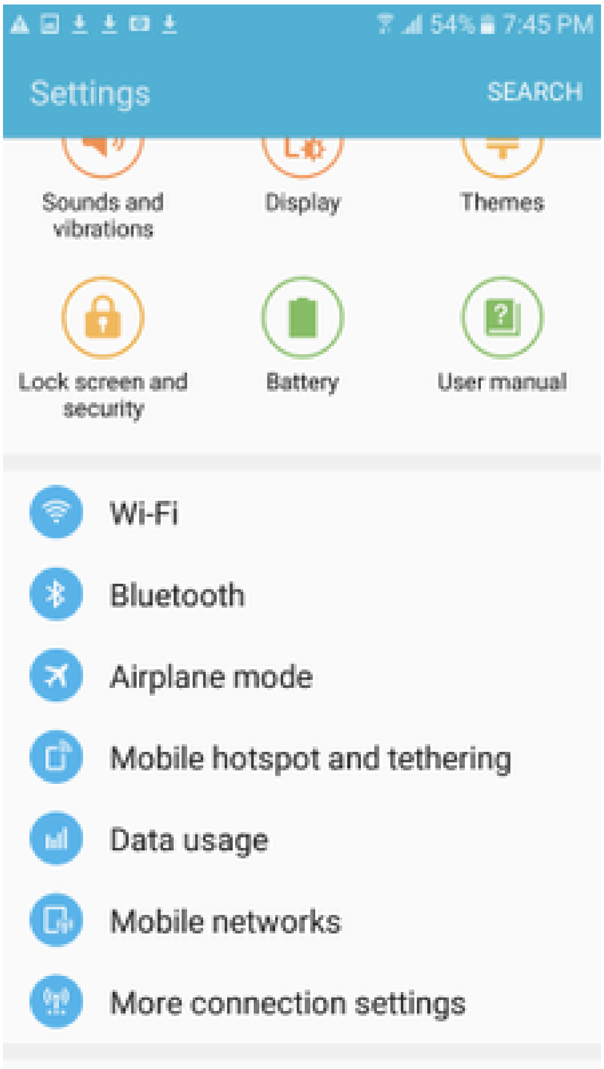
Stap 13. De status van de netwerkverbinding verandert van Verbonden naar Verbonden en dan van Verbonden. Ten slotte wordt de naam die u voor de netwerkverbinding hebt opgegeven, weergegeven.



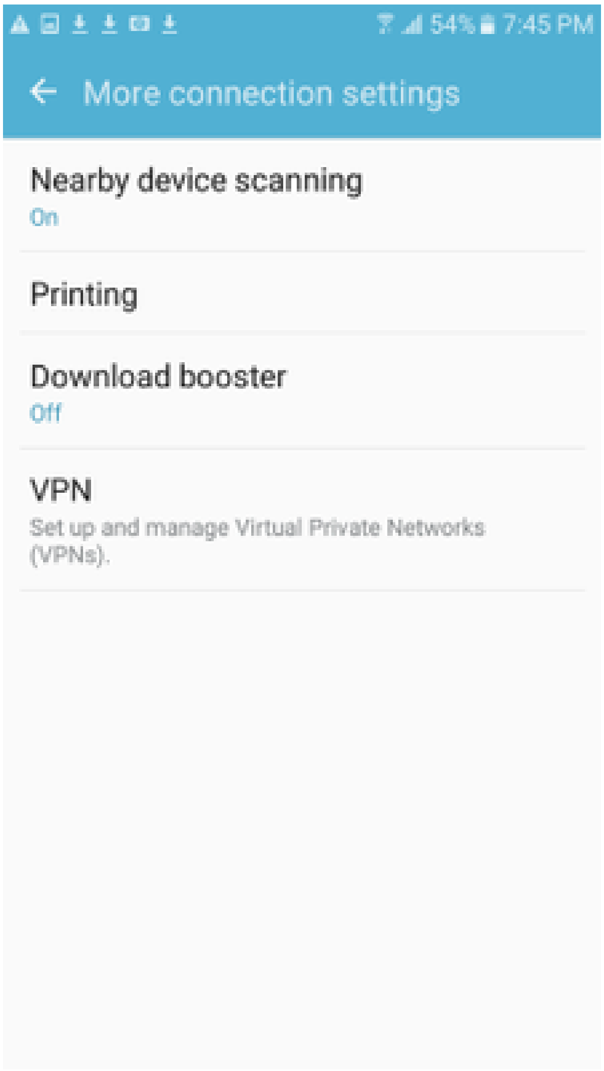
De computer is op dit punt aangesloten op het VPN-eindpunt.

Android native VPN-client configureren

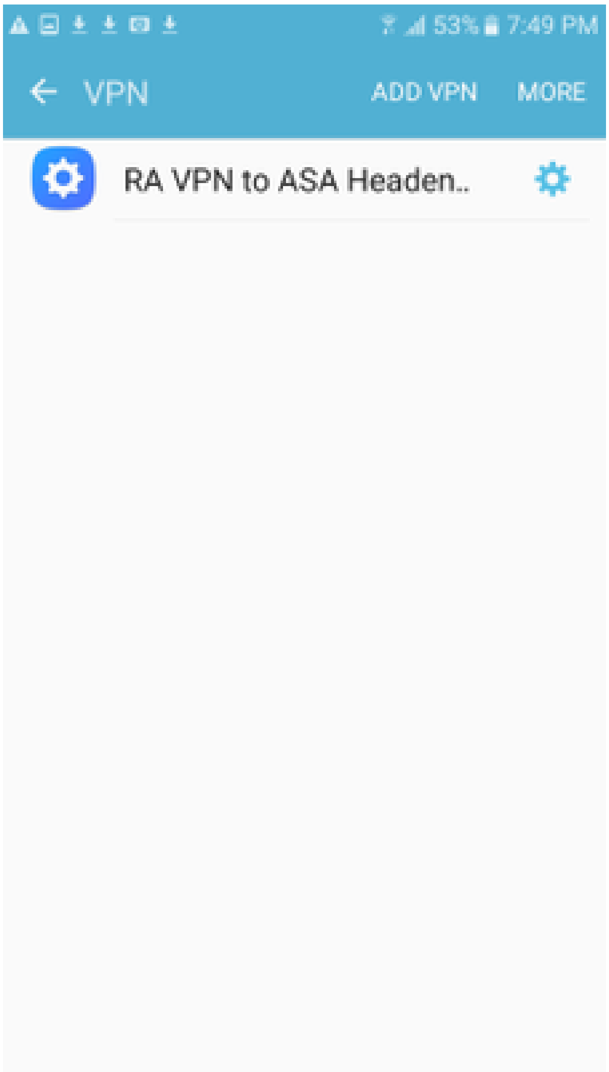
Stap 1. navigeren naar **instellingen>Meer verbindingsinstellingen**

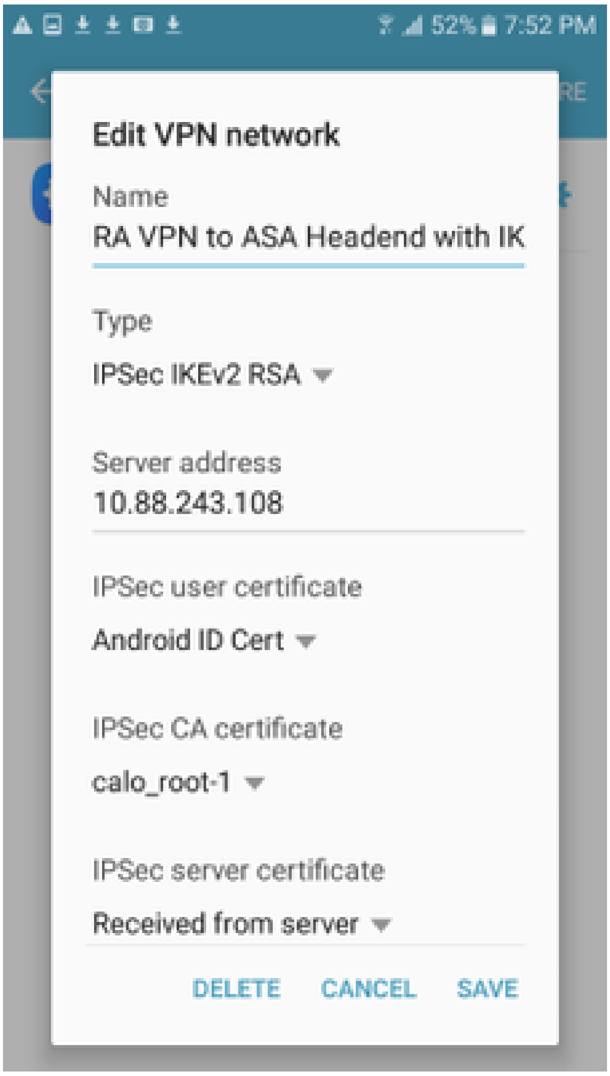


Stap 2. Selecteer **VPN**



Stap 3. Selecteer **VPN toevoegen**. Als de verbinding zoals in dit voorbeeld reeds gecreëerd is, tik op het motorpictogram om het te bewerken. Specificeer IPSec IKEv2 RSA in het veld **Type**. Het **serveradres** is het IKEv2 enabled ASA-interface-IP-adres. Voor het **IPSec-gebruikerscertificaat** en het **IPSec-certificaat** selecteert u de certificaten die zijn geïnstalleerd door in de uitrolmenu's te tikken. Laat het **IPSec-servercertificaat** met de standaardoptie achter, die van server is ontvangen.


53% 7:49 PM
VPN
ADD VPN
MORE
RA VPN to ASA Headen..



Edit VPN network

Name
RA VPN to ASA Headend with IK

Type
IPSec IKEv2 RSA

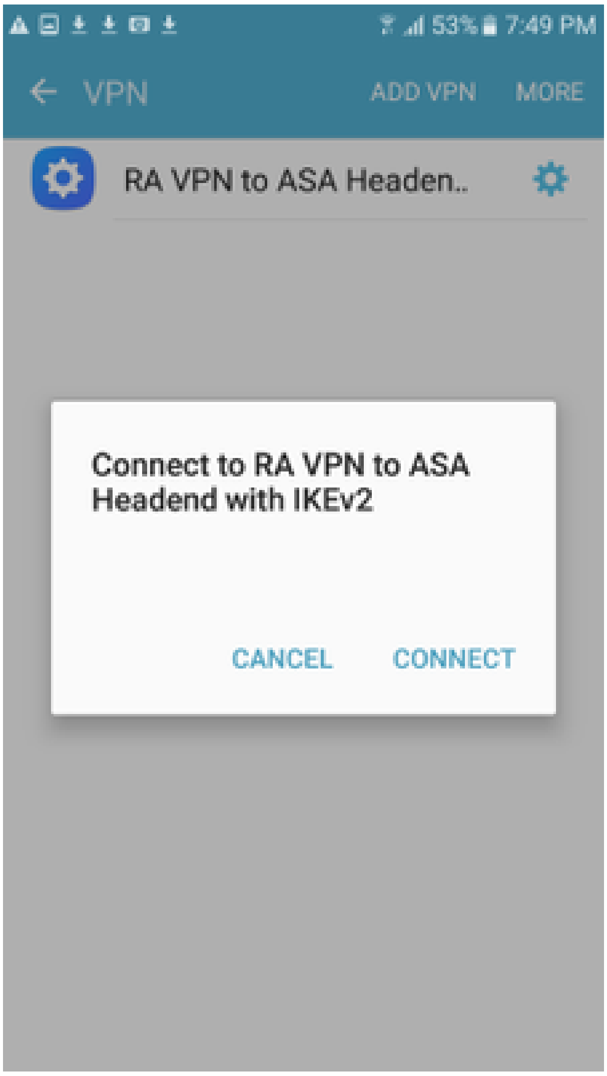
Server address
10.88.243.108

IPSec user certificate
Android ID Cert

IPSec CA certificate
calo_root-1

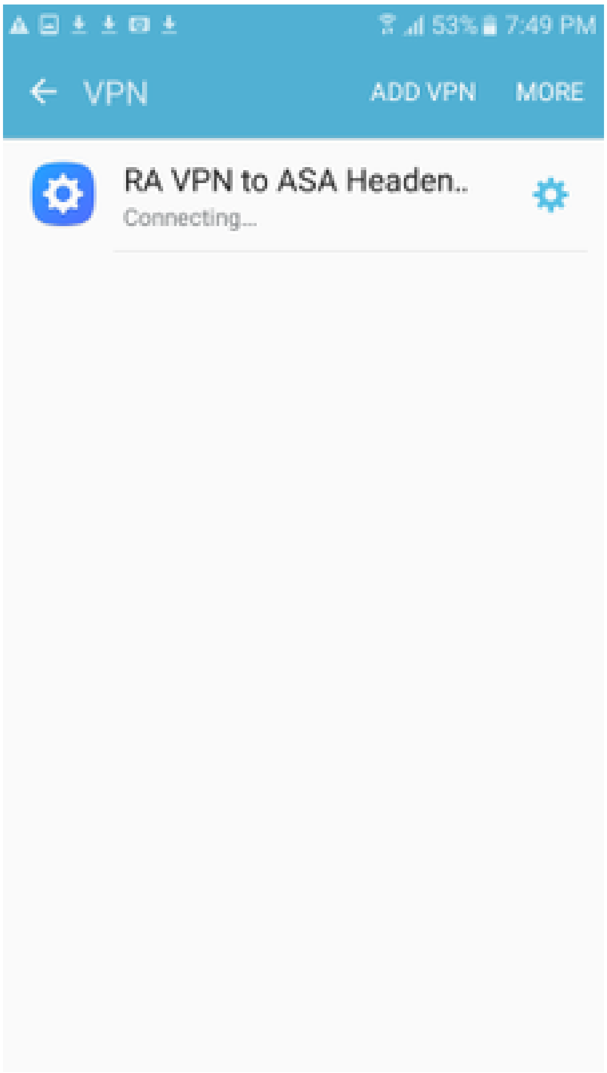
IPSec server certificate
Received from server

Stap 4. Selecteer **Opslaan** en tap op de naam van de nieuwe VPN-verbinding.



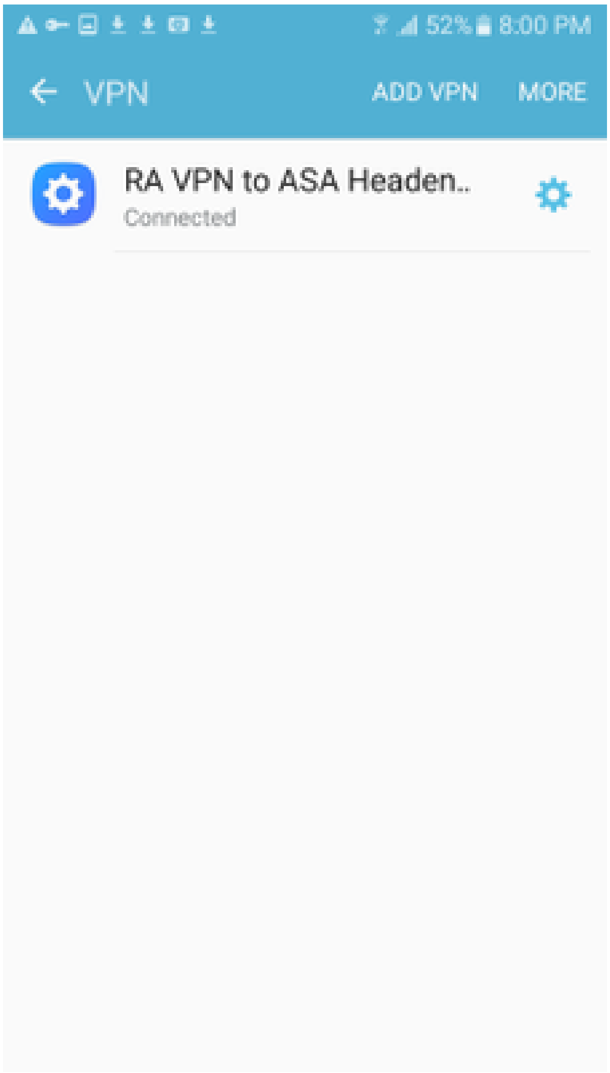
Connect to RA VPN to ASA Headend with IKEv2

Stap 5. Selecteer **Connect.**



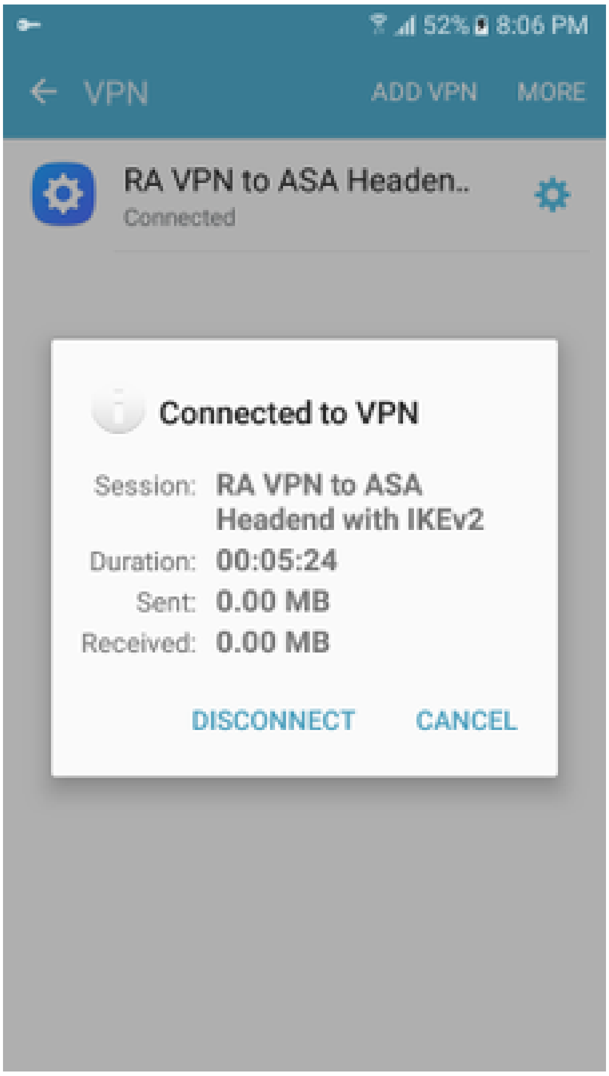
RA VPN to ASA Headen..

Connecting...



RA VPN to ASA Headen..
Connected

Stap 6. Typ de VPN-verbinding één keer om de status te controleren. Het wordt nu weergegeven als **Connected**.



Connected to VPN

Session: RA VPN to ASA Headend with IKEv2
Duration: 00:05:24
Sent: 0.00 MB
Received: 0.00 MB

Verifiëren

Verificatieopdrachten op ASA Head-end:

```
ASA#show vpn-sessiondb detail ra-ikev2-ipsec
Session Type: Generic Remote-Access IKEv2 IPsec Detailed
Username     : Win7_PC.david.com      Index        : 24
Assigned IP  : 192.168.50.1           Public IP    : 10.152.206.175
Protocol     : IKEv2 IPsec
License      : AnyConnect Premium
Encryption   : IKEv2: (1)AES256  IPsec: (1)AES256
Hashing      : IKEv2: (1)SHA1  IPsec: (1)SHA1
Bytes Tx     : 0                      Bytes Rx     : 16770
Pkts Tx      : 0                      Pkts Rx      : 241
Pkts Tx Drop : 0                      Pkts Rx Drop : 0
Group Policy : GP_David               Tunnel Group : David
Login Time   : 08:00:01 UTC Tue Jul 18 2017
Duration     : 0h:00m:21s
Inactivity   : 0h:00m:00s
VLAN Mapping : N/A                    VLAN         : none
Audt Sess ID : 0a0a0a0100018000596dc001
Security Grp : none
IKEv2 Tunnels: 1
IPsec Tunnels: 1
IKEv2:
  Tunnel ID    : 24.1
  UDP Src Port : 4500                   UDP Dst Port : 4500
  Rem Auth Mode: rsaCertificate
  Loc Auth Mode: rsaCertificate
  Encryption   : AES256                 Hashing      : SHA1
  Rekey Int (T): 86400 Seconds          Rekey Left(T): 86379 Seconds
  PRF          : SHA1                   D/H Group    : 2
  Filter Name  :
IPsec:
  Tunnel ID    : 24.2
  Local Addr   : 0.0.0.0/0.0.0.0/0/0
  Remote Addr  : 192.168.50.1/255.255.255.255/0/0
  Encryption   : AES256                 Hashing      : SHA1
  Encapsulation: Tunnel
  Rekey Int (T): 28800 Seconds          Rekey Left(T): 28778 Seconds
  Idle Time Out: 30 Minutes             Idle TO Left : 30 Minutes
  Conn Time Out: 518729 Minutes         Conn TO Left : 518728 Minutes
  Bytes Tx     : 0                      Bytes Rx     : 16947
  Pkts Tx      : 0                      Pkts Rx      : 244

ASA# show crypto ikev2 sa
IKEv2 SAs:
Session-id:24, Status:UP-ACTIVE, IKE count:1, CHILD count:1
Tunnel-id                 Local                Remote     Status         Role
2119549341    10.88.243.108/4500   10.152.206.175/4500      READY    RESPONDER      Encr: AES-
CBC, keysize: 256, Hash: SHA96, DH Grp:2, Auth sign: RSA, Auth verify: RSA
      Life/Active Time: 86400/28 sec
Child sa: local selector  0.0.0.0/0 - 255.255.255.255/65535
          remote selector 192.168.50.1/0 - 192.168.50.1/65535
          ESP spi in/out: 0xbfff64d7/0x76131476
ASA# show crypto ipsec sa
interface: outside
    Crypto map tag: Anyconnect, seq num: 65535, local addr: 10.88.243.108
      local ident (addr/mask/prot/port): (0.0.0.0/0.0.0.0/0/0)
      remote ident (addr/mask/prot/port): (192.168.50.1/255.255.255.255/0/0)
      current_peer: 10.152.206.175, username: Win7_PC.david.com
      dynamic allocated peer ip: 192.168.50.1
      dynamic allocated peer ip(ipv6): 0.0.0.0

      #pkts encaps: 0, #pkts encrypt: 0, #pkts digest: 0
      #pkts decaps: 339, #pkts decrypt: 339, #pkts verify: 339
      #pkts compressed: 0, #pkts decompressed: 0
      #pkts not compressed: 0, #pkts comp failed: 0, #pkts decomp failed: 0
      #pre-frag successes: 0, #pre-frag failures: 0, #fragments created: 0
      #PMTUs sent: 0, #PMTUs rcvd: 0, #decapsulated frgs needing reassembly: 0
      #TFC rcvd: 0, #TFC sent: 0
      #Valid ICMP Errors rcvd: 0, #Invalid ICMP Errors rcvd: 0
      #send errors: 0, #recv errors: 0

      local crypto endpt.: 10.88.243.108/4500, remote crypto endpt.: 10.152.206.175/4500
      path mtu 1496, ipsec overhead 58(44), media mtu 1500
      PMTU time remaining (sec): 0, DF policy: copy-df
      ICMP error validation: disabled, TFC packets: disabled
      current outbound spi: 76131476
      current inbound spi : BFFF64D7
    inbound esp sas:
      spi: 0xBFFF64D7 (3221185751)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={RA, Tunnel, IKEv2, }
         slot: 0, conn_id: 98304, crypto-map: Anyconnect
         sa timing: remaining key lifetime (sec): 28767
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0xFFFFFFFF 0xFFFFFFFF
    outbound esp sas:
      spi: 0x76131476 (1980961910)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={RA, Tunnel, IKEv2, }
         slot: 0, conn_id: 98304, crypto-map: Anyconnect
         sa timing: remaining key lifetime (sec): 28767
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x00000001
ASA#show vpn-sessiondb license-summary
---------------------------------------------------------------------------
VPN Licenses and Configured Limits Summary
---------------------------------------------------------------------------
                                     Status : Capacity : Installed :  Limit
                                  -----------------------------------------
AnyConnect Premium               :  ENABLED :       50 :        50 :   NONE
AnyConnect Essentials            : DISABLED :       50 :         0 :   NONE
Other VPN (Available by Default) :  ENABLED :       10 :        10 :   NONE
Shared License Server            : DISABLED
Shared License Participant       : DISABLED
AnyConnect for Mobile            :  ENABLED(Requires Premium or Essentials)
Advanced Endpoint Assessment     :  ENABLED(Requires Premium)
AnyConnect for Cisco VPN Phone   :  ENABLED
VPN-3DES-AES                     :  ENABLED
VPN-DES                          :  ENABLED
---------------------------------------------------------------------------

---------------------------------------------------------------------------
VPN Licenses Usage Summary
---------------------------------------------------------------------------
                          Local : Shared :   All  :   Peak :  Eff.  :
                         In Use : In Use : In Use : In Use :  Limit : Usage
                       ----------------------------------------------------
AnyConnect Premium     :      1 :      0 :      1 :      1 :     50 :    2%
  AnyConnect Client    :                 :      0 :      1          :    0%
    AnyConnect Mobile  :                 :      0 :      0          :    0%
  Clientless VPN       :                 :      0 :      0          :    0%
  Generic IKEv2 Client :                 :      1 :      1          :    2%
Other VPN              :                 :      0 :      0 :     10 :    0%
  Cisco VPN Client     :                 :      0 :      0          :    0%
  L2TP Clients
  Site-to-Site VPN     :                 :      0 :      0          :    0%
---------------------------------------------------------------------------
ASA# show vpn-sessiondb
---------------------------------------------------------------------------
VPN Session Summary
---------------------------------------------------------------------------
                               Active : Cumulative : Peak Concur : Inactive
                             ----------------------------------------------
AnyConnect Client            :      0 :         11 :           1 :        0
  SSL/TLS/DTLS               :      0 :          1 :           1 :        0
  IKEv2 IPsec                :      0 :         10 :           1 :        0
Generic IKEv2 Remote Access  :      1 :         14 :           1
---------------------------------------------------------------------------
Total Active and Inactive    :      1             Total Cumulative :     25
Device Total VPN Capacity    :     50
Device Load                  :     2%
---------------------------------------------------------------------------

---------------------------------------------------------------------------
Tunnels Summary
---------------------------------------------------------------------------
                               Active : Cumulative : Peak Concurrent
```

```
                              ----------------------------------------------
IKEv2                         :      1 :         25 :                1
IPsec                         :      1 :         14 :                1
IPsecOverNatT                 :      0 :         11 :                1
AnyConnect-Parent             :      0 :         11 :                1
SSL-Tunnel                    :      0 :          1 :                1
DTLS-Tunnel                   :      0 :          1 :                1
----------------------------------------------------------------------------
Totals                        :      2 :         63
```

Problemen oplossen

Deze sectie verschaft de informatie die u kunt gebruiken om problemen met uw configuratie op te lossen.

> Opmerking: Raadpleeg Belangrijke informatie over Debug Commands voordat u opdrachten hebt gebruikt.

> **Waarschuwing**: bij ASA kunt u verschillende debug-niveaus instellen. standaard wordt niveau 1 gebruikt. Als u het debug-niveau wijzigt, neemt de breedtegraad van de insecten toe. Doe dit met voorzichtigheid, vooral in productieomgevingen.

- **Debug crypto ikev2-protocol 15**
- **Debug crypto ikev2 platform 15**
- **Debug crypto ca. 255**