AnyConnect VPN op FTD configureren met Cisco ISE als RADIUS-server met Windows Server 2012 Root CA

Inhoud

Inhoud

Inleiding

Dit document beschrijft hoe u AnyConnect VPN (Virtual Private Network) kunt configureren in een FTD (Firepower Threat Defense) firewall met Cisco ISE (Identity Services Engine) als RADIUS-server. We gebruiken een Windows Server 2012 als onze Root CA (certificaatautoriteit), zodat de communicatie via VPN wordt beveiligd met certificaten, d.w.z. dat de PC van de werknemer het

certificaat van de FTD vertrouwde omdat het FTD VPN-certificaat is ondertekend door onze Windows Server 2012 Root CA

Voorwaarden

Vereisten

U moet de volgende functies en functies in uw netwerk hebben:

- Firepower Management Center en Firepower Threat Defreat Firepower, ingezet met basisconnectiviteit
- Cisco ISE-applicatie en -uitvoering in uw netwerk
- Windows Server (met actieve map) is uitgevoerd en Windows/Mac PC van de werknemers is aangesloten bij het AD (Active Directory) domein

In ons voorbeeld hieronder, zullen de werknemers de AnyConnect Client op hun Windows/Mac PC openen en zullen zij zich veilig met de externe interface van de FTD verbinden via VPN met behulp van hun geloofsbrieven. De FTD zal hun gebruikersnaam en wachtwoord tegen Cisco ISE controleren (die met Windows Server Active Directory zal controleren om hun gebruikersnaam, wachtwoord en groep te controleren, d.w.z. alleen gebruikers in de AD Group 'Werknemers' zullen in VPN in het bedrijfsnetwerk kunnen belanden.

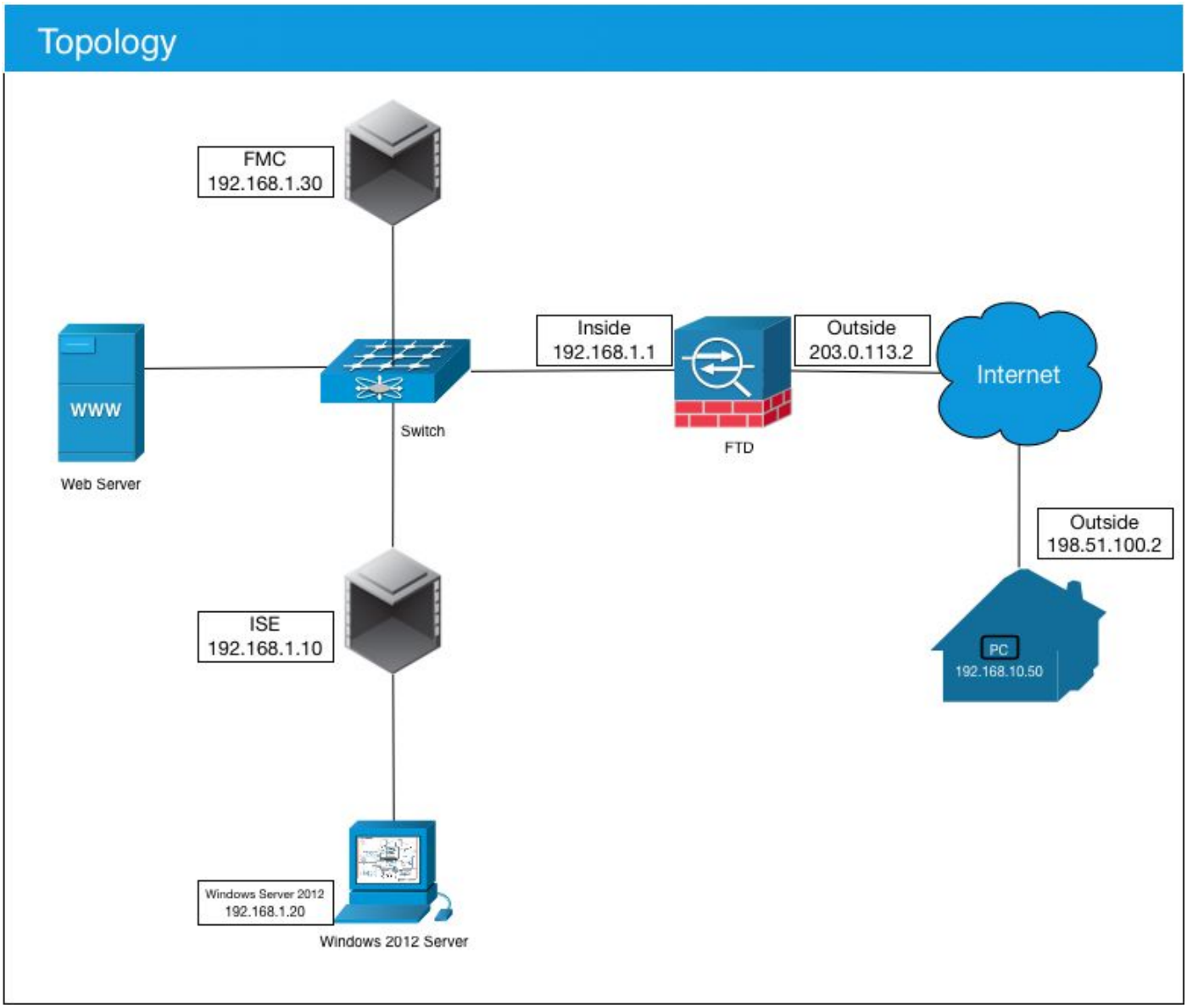
Gebruikte componenten

De informatie in dit document is gebaseerd op deze softwareversies:

- Firepower Management Center en Firepower Threat Defense, actief 6.2.3
- Cisco Identity Services Engine 2.4
- Cisco AnyConnect beveiligde mobiliteit-client met 4.6.030-49
- Windows Server 2012 R2 actieve Directory- en certificaatservices (dit is onze Root CA voor alle certificaten)
- Windows 7, Windows 10, Mac PC's

Configureren

Netwerkdiagram



In dit gebruiksgeval zal de Windows/Mac PC van de medewerker die de Any Connect VPN-client runt, verbinding maken met het externe openbare IP-adres van de FTD-firewall en Cisco ISE zal dynamisch beperkte of volledige toegang tot bepaalde interne of internetbronnen (configureerbaar) geven zodra ze via VPN zijn verbonden, afhankelijk van welke AD-groep ze lid zijn van de Active Directory

Apparaat	Hostname/FQDN	IP-adres:	Private IP-adres	AnyConnect IP-adres
Windows PC	-	198.51.100.2	10.0.0.1	192.168.10.50
FTD	ciscofp3.cisco.com	203.0.113.2	192.168.1.1	-
FMC	-	-	192.168.1.30	-
Cisco ISE	ciscoise.cisco.com	-	192.168.1.10	-
Windows Server 2012	ciscodc.cisco.com	-	192.168.1.20	-
Interne servers	-	-	192.168.1.x	-

Configuratie

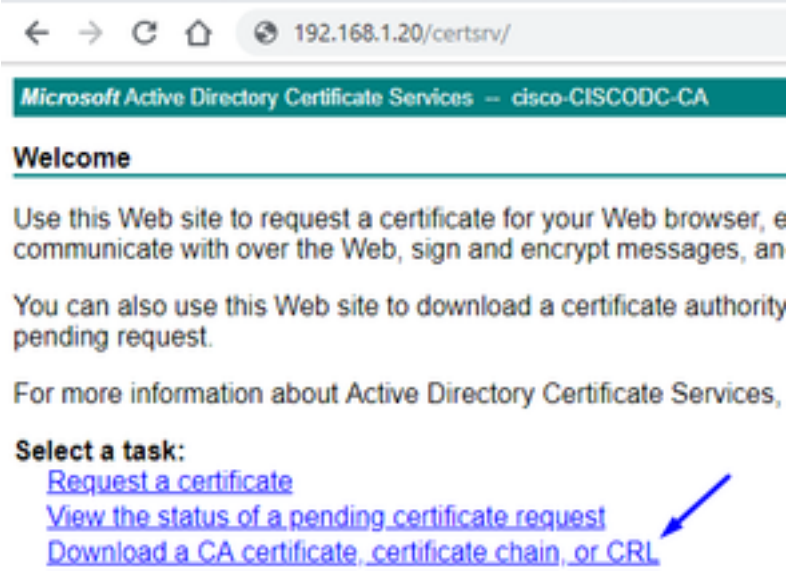
Start CA-certificaat vanuit Windows Server uit

In dit document gebruiken we Microsoft Windows Server 2012 als onze Root CA voor certificaten. De client-pc's vertrouwen op deze Root CA om veilig via VPN aan de FTD te verbinden (zie onderstaande stappen). Hierdoor wordt gewaarborgd dat zij via het internet een veilige verbinding

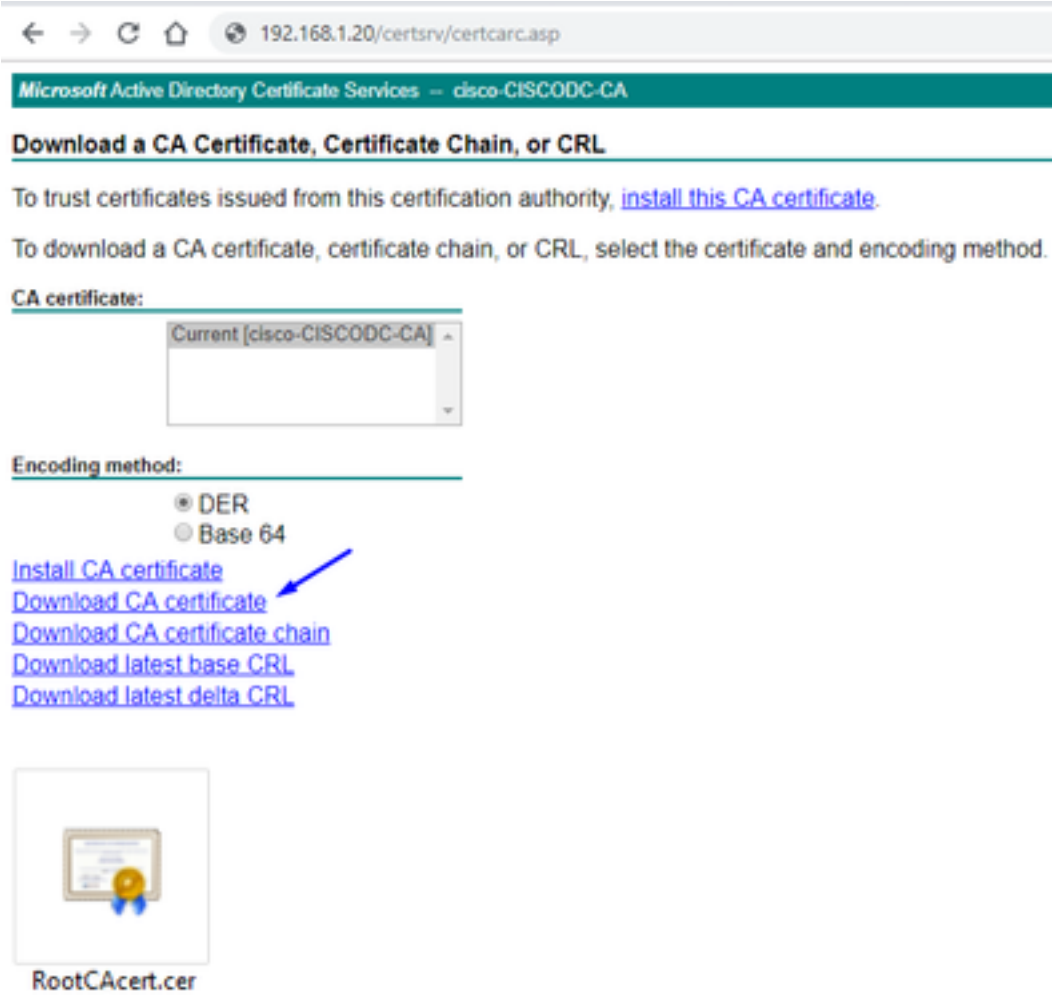
met de FTD kunnen maken en dat zij van thuis gebruik kunnen maken van interne middelen. Hun PC zal de verbinding in hun browser en AnyConnect Client vertrouwen.

Ga naar http://192.168.1.20/certsrv en volg de onderstaande stappen om uw Windows Server Root CA-certificaat te downloaden:

Klik op **CA-certificaat, certificeringsketen of CRL downloaden**



Klik op **Downloadcertificaat** en hernoem het naar 'RootCAcert3.cer'



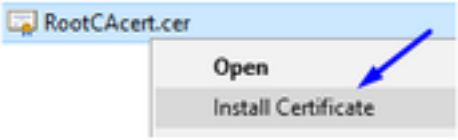
Installeer het Root CA-certificaat op de Windows/Mac-pc's van de medewerker

Methode 1: Installeer het certificaat op alle PC's van de werknemer door het via het beleid van de Groep van de Server van Windows te drukken (ideaal voor om het even wat meer dan 10 VPN gebruikers):

[Hoe Windows Server te gebruiken om certificaten aan clientcomputers te distribueren met behulp van groepsbeleid]

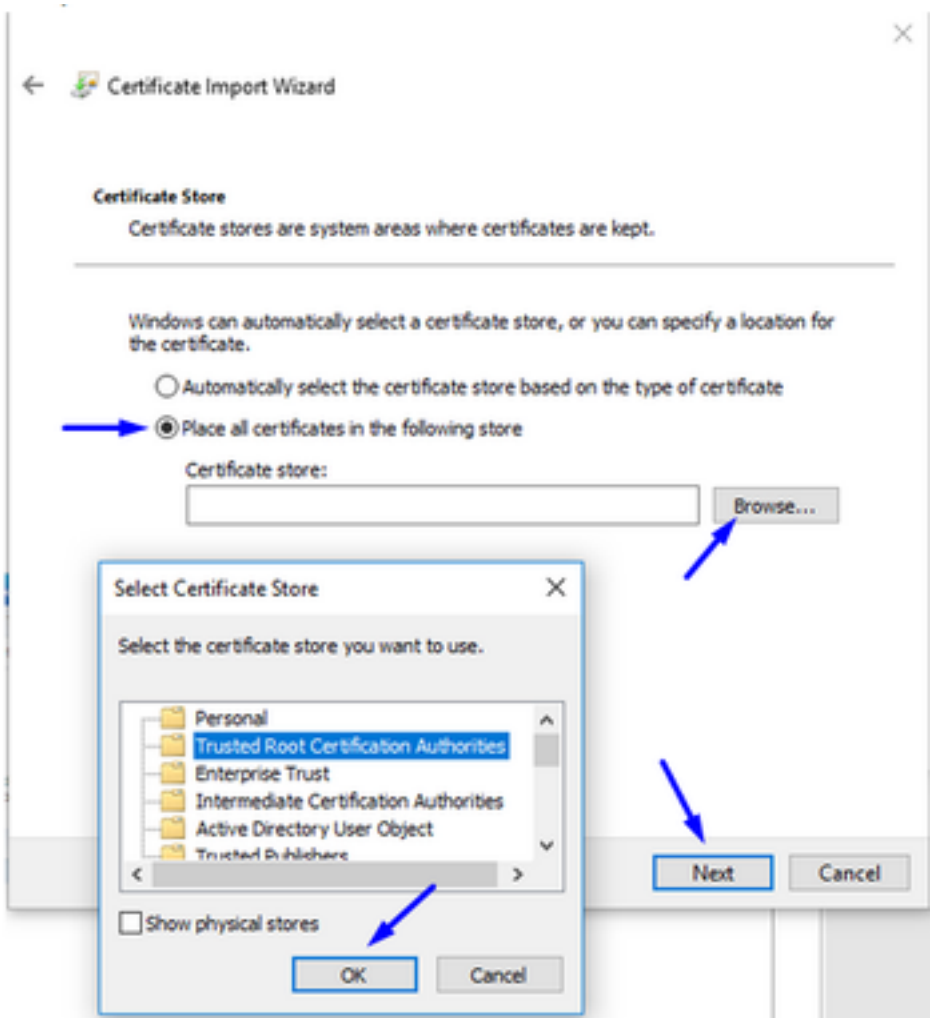
Methode 2: Installeer het certificaat op alle PC's van de werknemer door het op elke PC afzonderlijk te installeren (ideaal om een VPN-gebruiker te testen):

Klik met de rechtermuisknop op het certificaat op de Windows/Mac-pc van uw werknemers en klik op **Install Certificate**



Selecteer 'Huidige gebruiker'

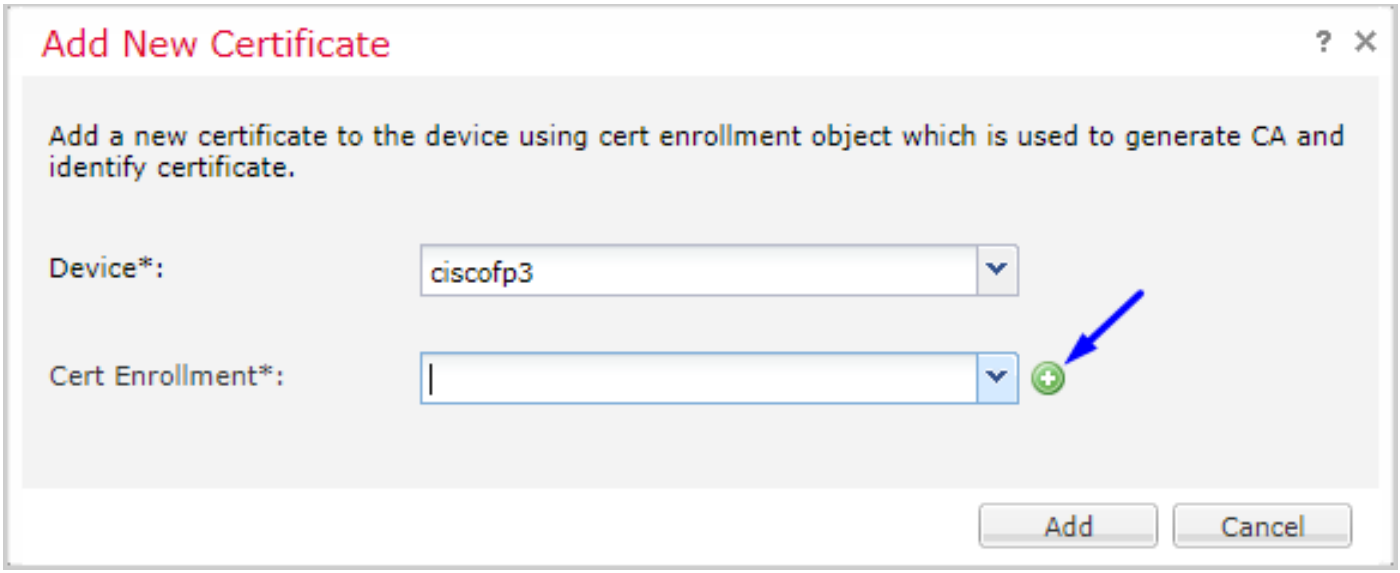
Selecteer **Plaats alle certificaten in de volgende winkel** en selecteer **Trusted Root Certified-certificeringsinstanties**, klik op **OK**, klik op **Volgende** en klik op **Voltooien**



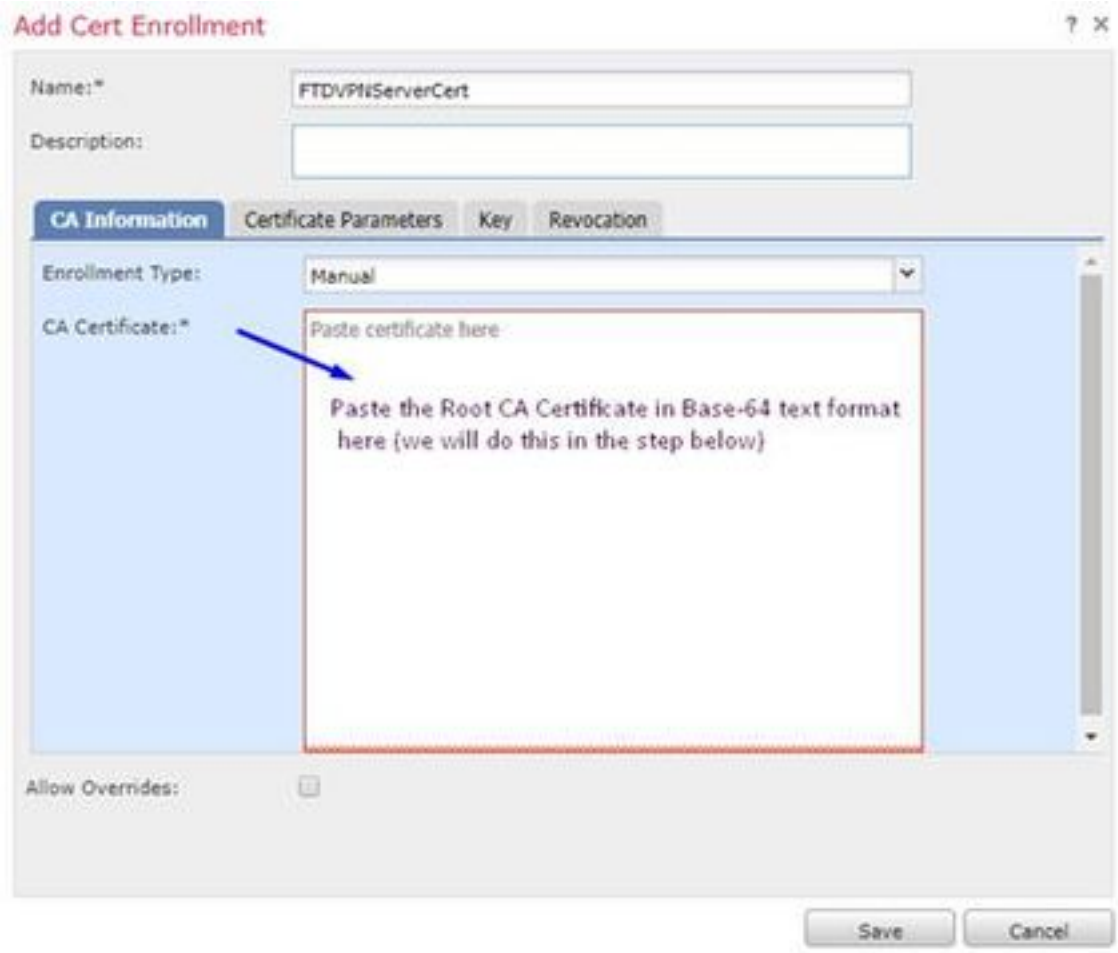
Genereert een CSR op FTD, laat CSR ondertekend door Windows Server Root CA en installeer dat ondertekende certificaat op FTD

Ga naar **Objecten > Objectbeheer > PKI > Certinschrijving, klik op Add Cert Enrollment**

Klik op de knop **Toegang toevoegen**



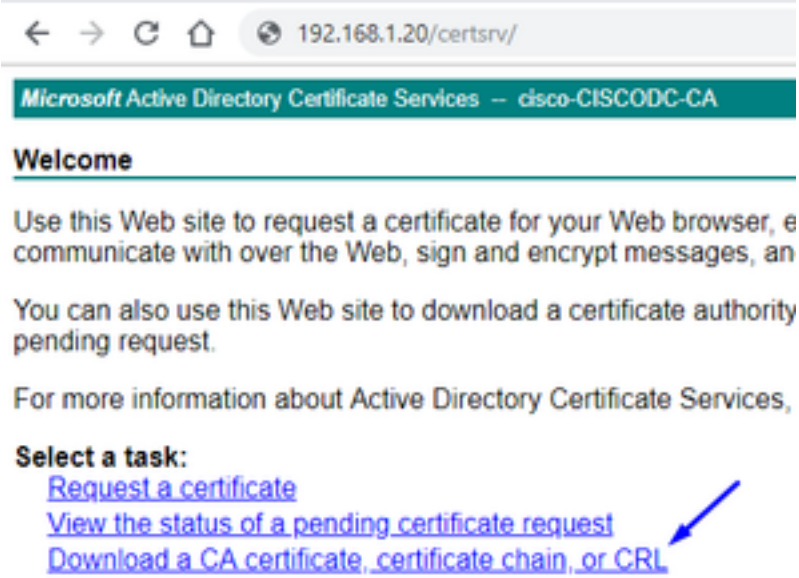
Selecteer **Type inschrijving > Handmatig**
Zoals hieronder in de afbeelding wordt getoond, moeten we hier ons Root CA-certificaat plakken:



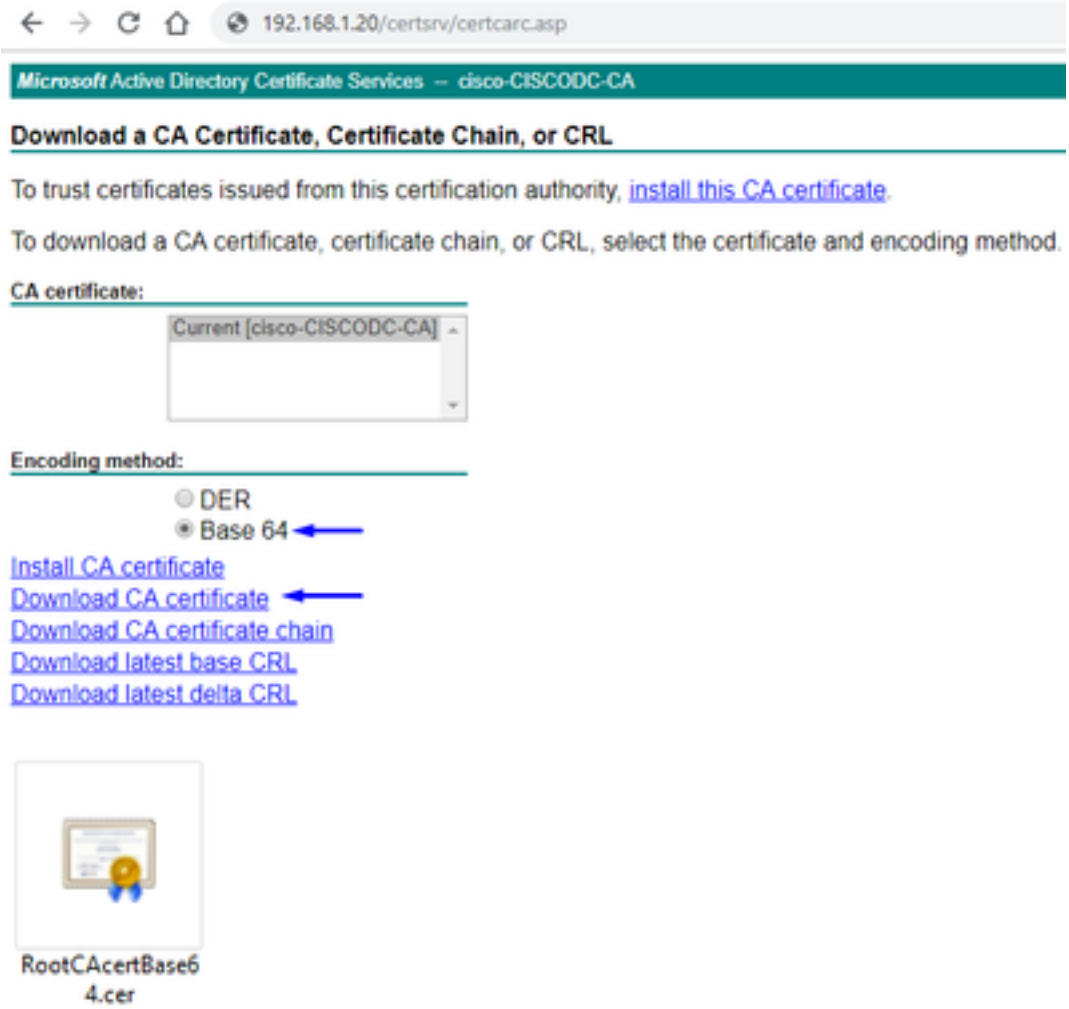
Hier kunt u uw CA-certificaat downloaden, dit in tekstindeling bekijken en in het bovenstaande vak plakken:

Ga naar http://192.168.1.20/certsrv

Klik op **CA-certificaat, certificeringsketen of CRL downloaden**

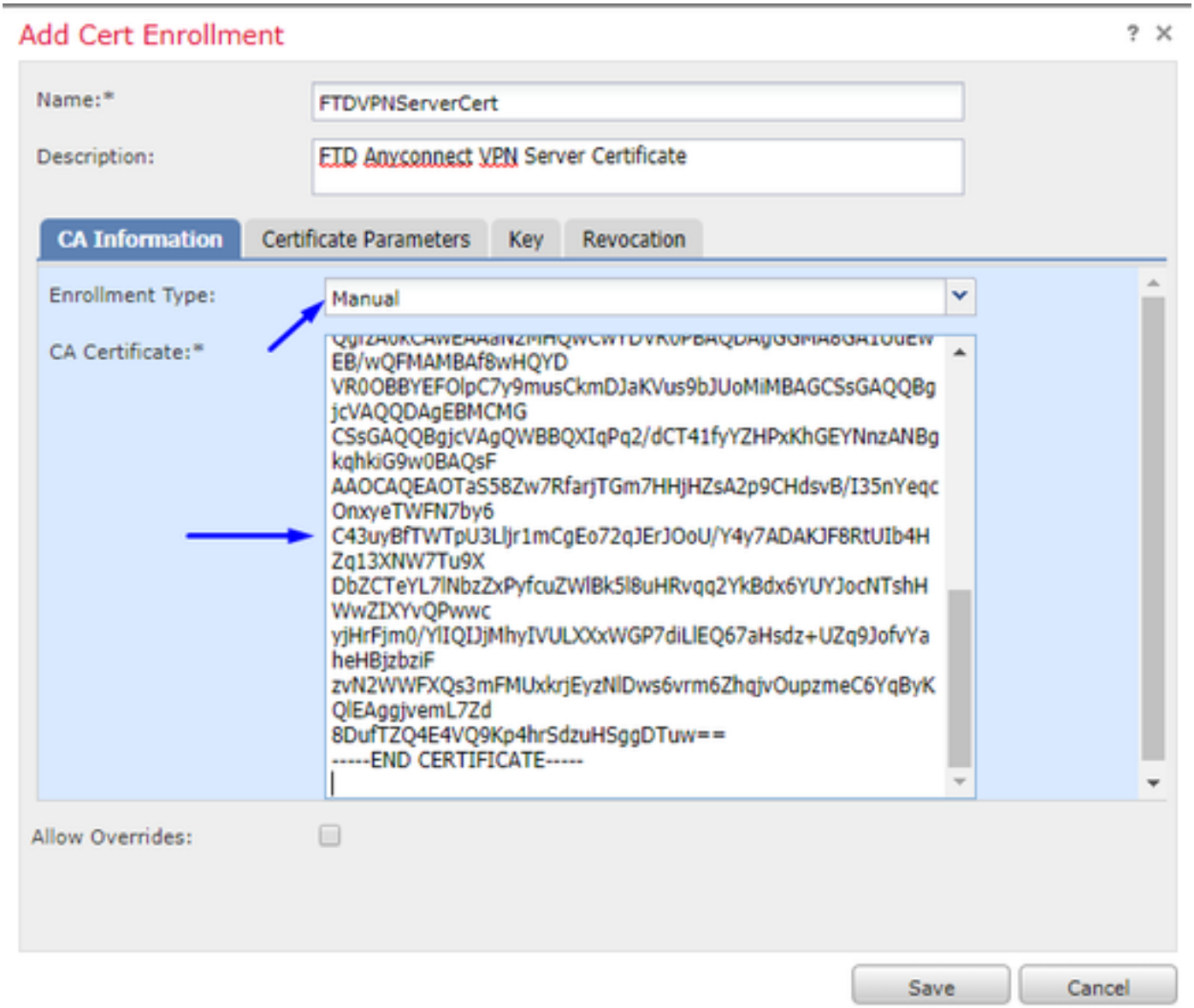


Klik op **Base 64**-toets > Klik op **Download CA**



Open het bestand RootCAcertBase64.cer in Kladblok

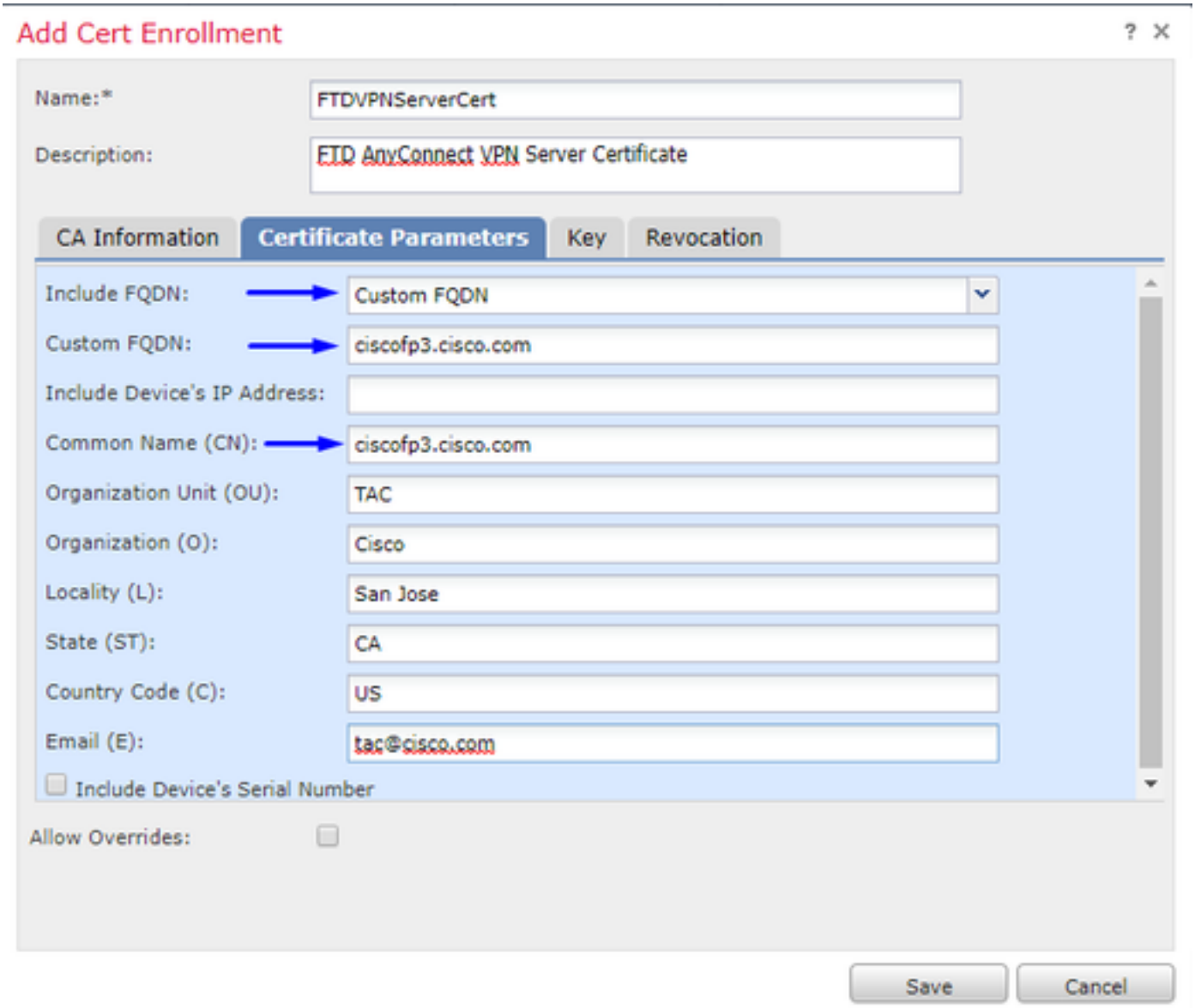
Kopieer en plak de .cer inhoud (Root CA certificaat) van Windows AD Server hier:



Klik op tabblad **certificaatparameters** >> type informatie over het certificaat

Opmerking:
Aangepast FQDN-veld moet de FQDN van uw FTD zijn

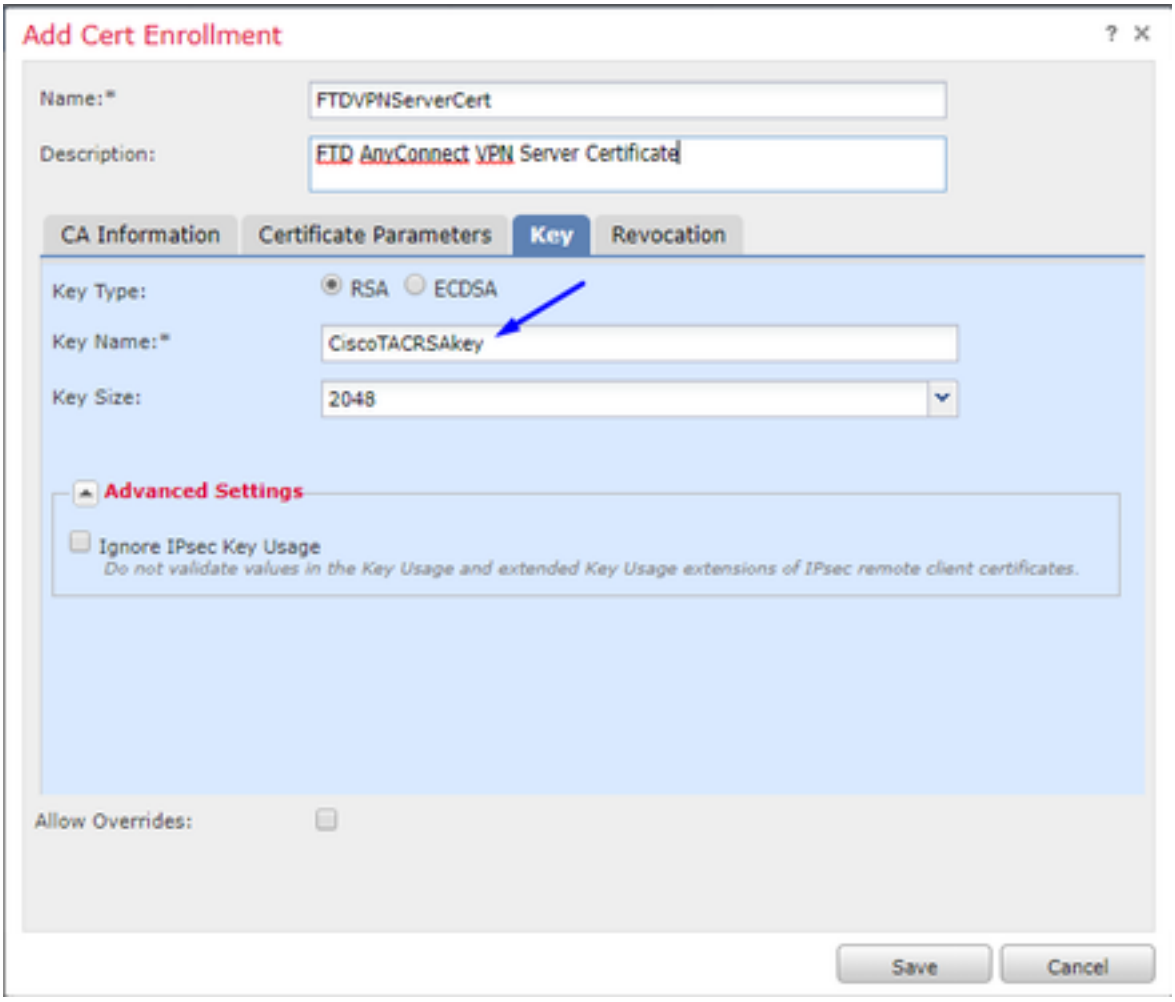
Het veld Gemeenschappelijke naam moet de FQDN van uw FTD zijn



Tip: U kunt de FQDN van uw FTD krijgen door de volgende opdracht van de FTD CLI te typen:

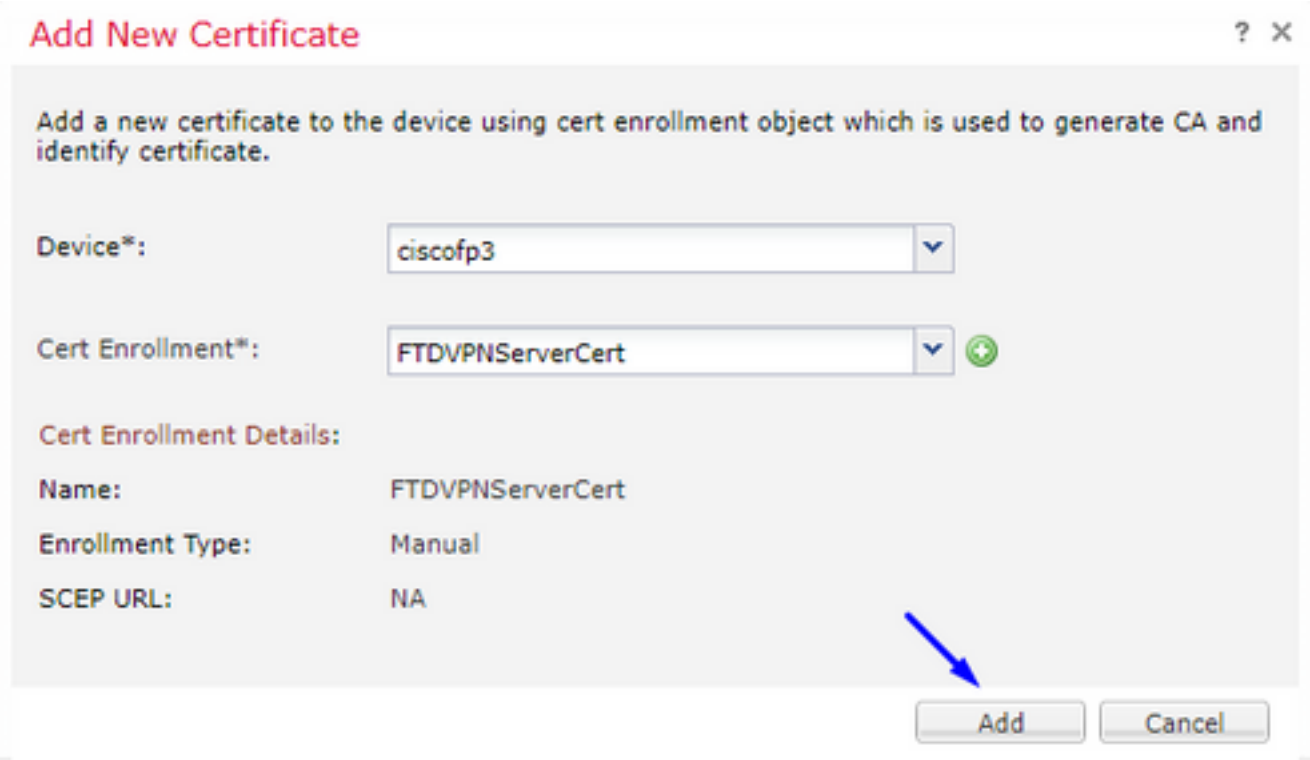
```
> show network
===============[ System Information ]===============
Hostname : ciscofp3.cisco.com
Domains : cisco
DNS Servers : 192.168.1.20
Management port : 8305
IPv4 Default route
Gateway : 192.168.1.1

======================[ br1 ]=======================
State : Enabled
Channels : Management & Events
Mode : Non-Autonegotiation
MDI/MDIX : Auto/MDIX
MTU : 1500
MAC Address : 00:0C:29:4F:AC:71
----------------------[ IPv4 ]----------------------
Configuration : Manual
Address : 192.168.1.2
Netmask : 255.255.255.0
```

Klik op **het** tabblad **Key** en type een **sleutelnaam**



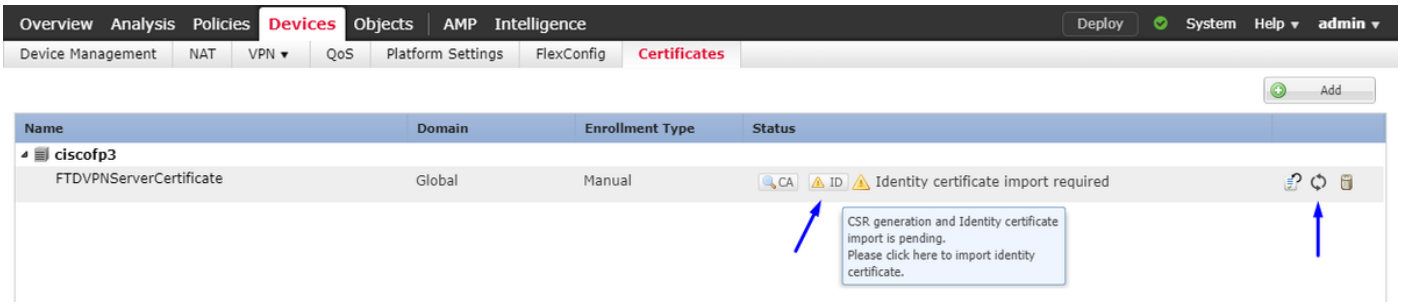
Klik op **Opslaan**

Selecteer uw FTNServerCert die we net boven gemaakt hebben en klik op **Toevoegen**

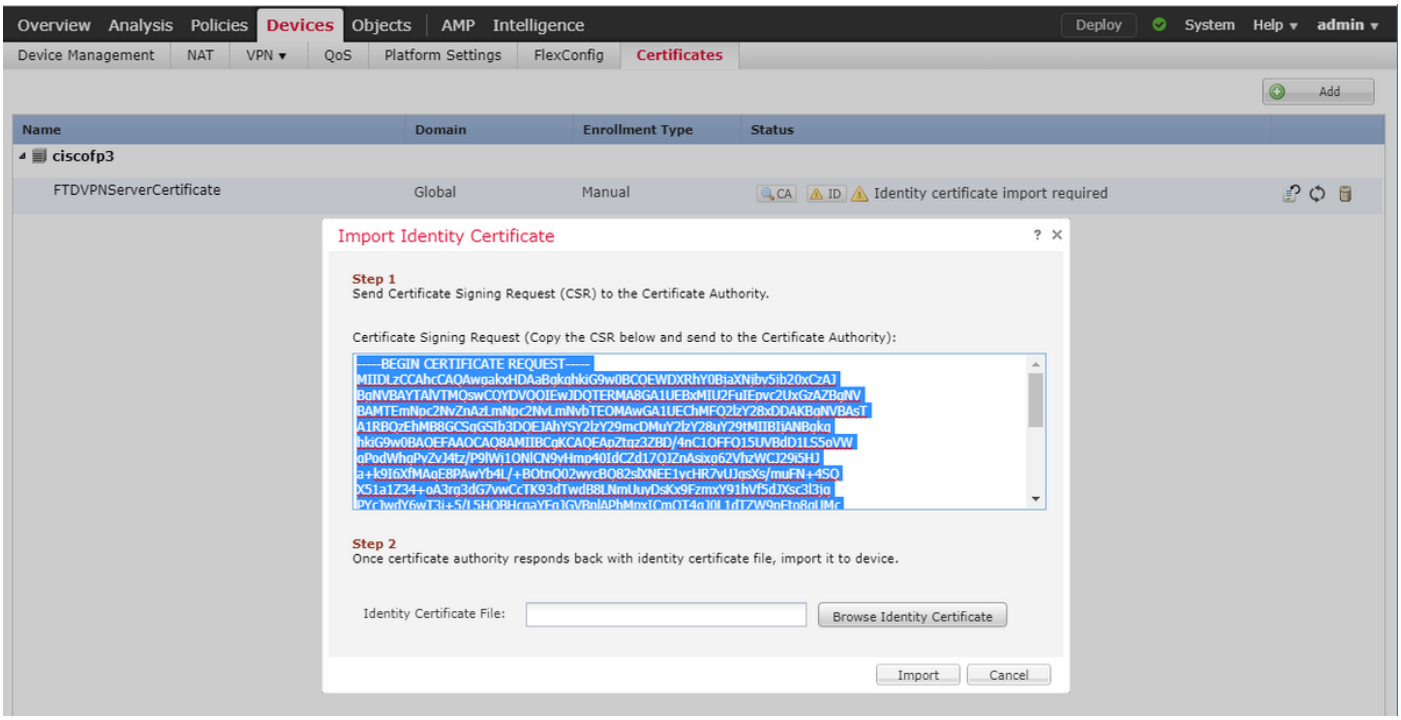


Tip: Wacht ongeveer 10-30 seconden voor de FMC + FTD om het certificaat Root CA te controleren en te installeren (klik op het pictogram Vernieuwen als dit niet wordt weergegeven)

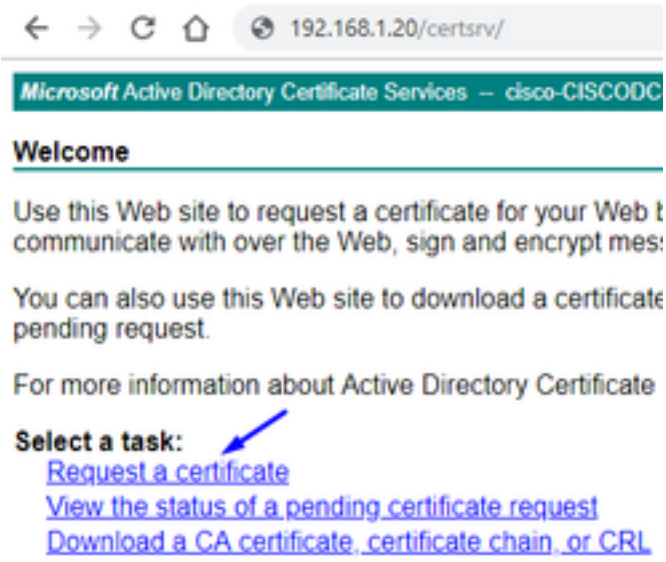
Klik op de knop **ID**:



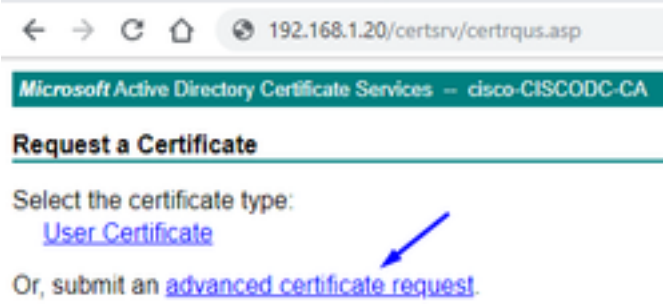
Kopieer en plak deze CSR en breng het naar uw Windows Server Root CA:



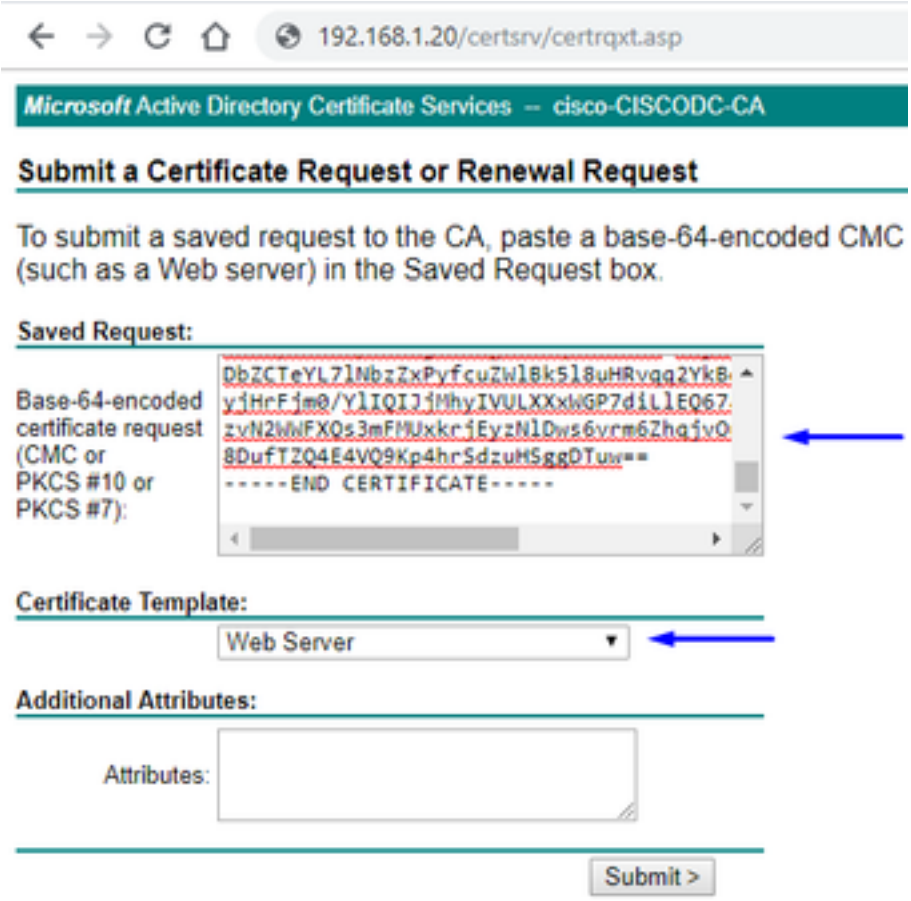
Ga naar http://192.168.1.20/certsrv



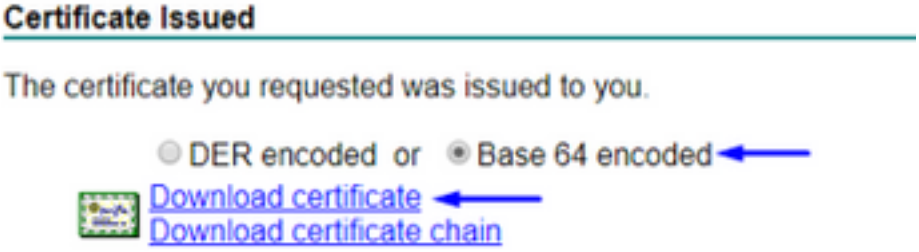
Klik op **geavanceerde certificaataanvraag**



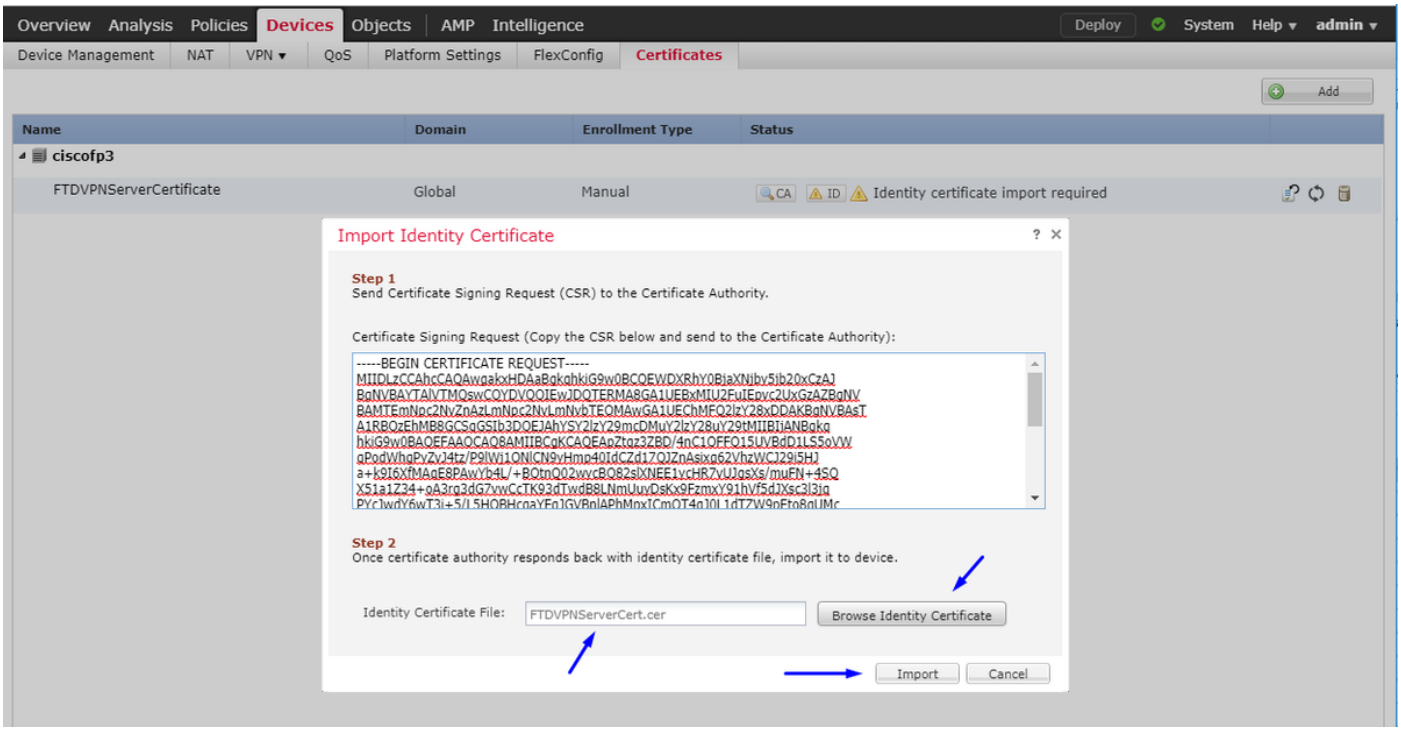
Plakt uw CSR-aanvraag (certificaataanvraag) in het onderstaande veld en selecteer **Webserver** als de certificaatsjabloon



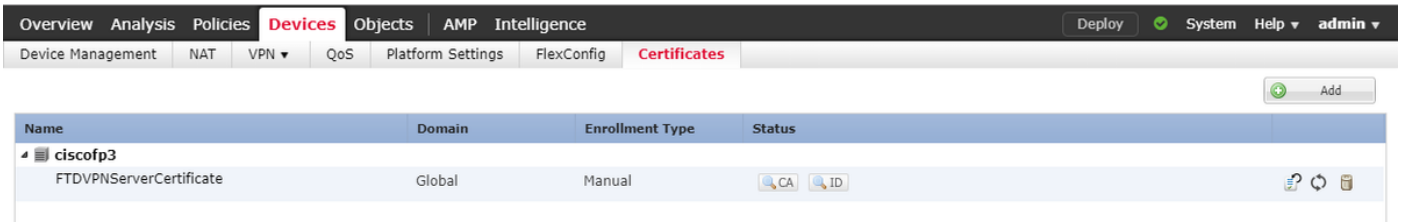
Klik op **Inzenden**
Klik op **Base 64 Encoded** knop en klik op **Download certificaat**



Klik op **Bladeren identiteitsbewijs** en selecteer het certificaat dat we zojuist hebben gedownload



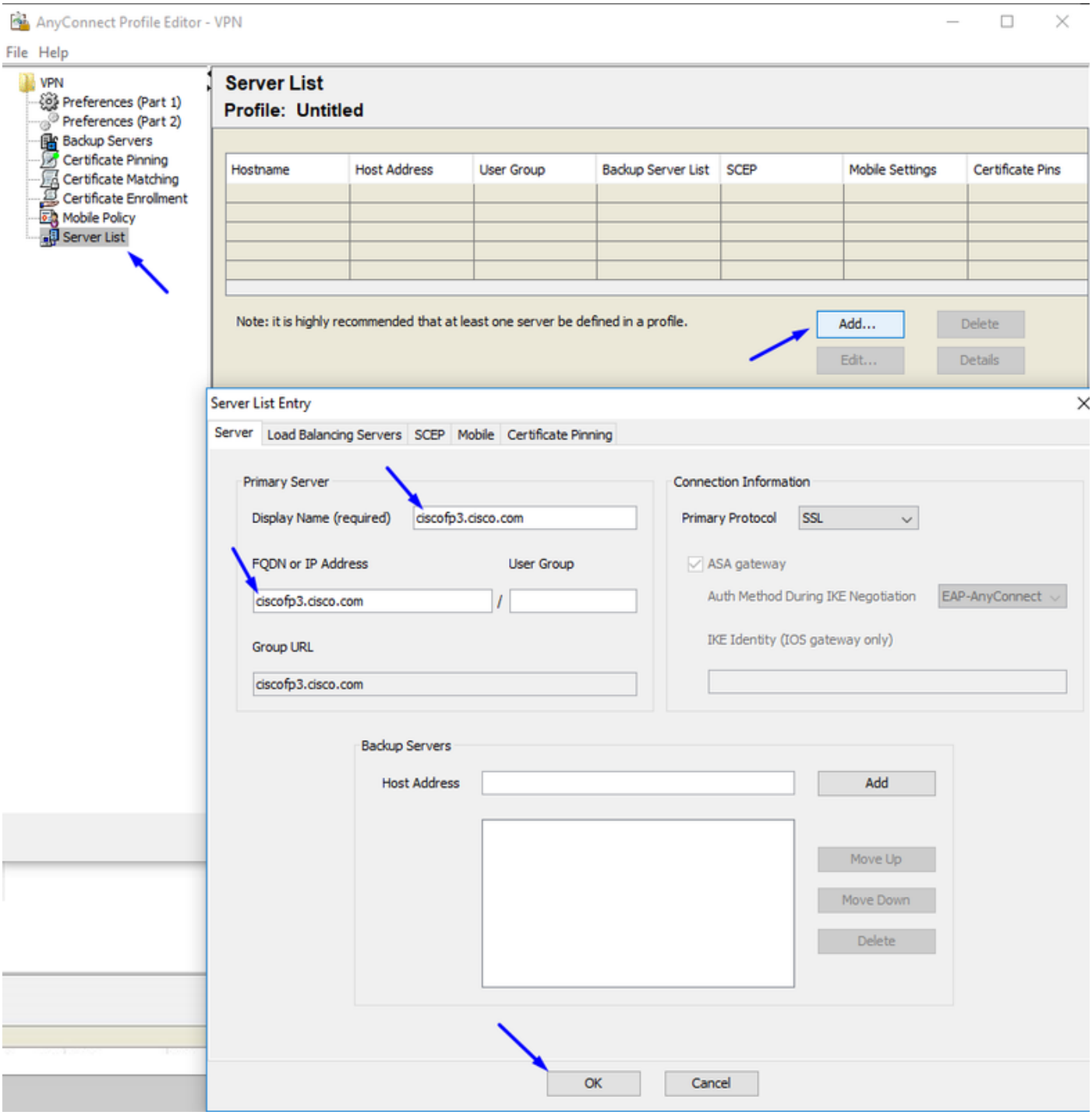
FTD VPN Server Certificate (ondertekend door Windows Server Root CA) is geïnstalleerd.

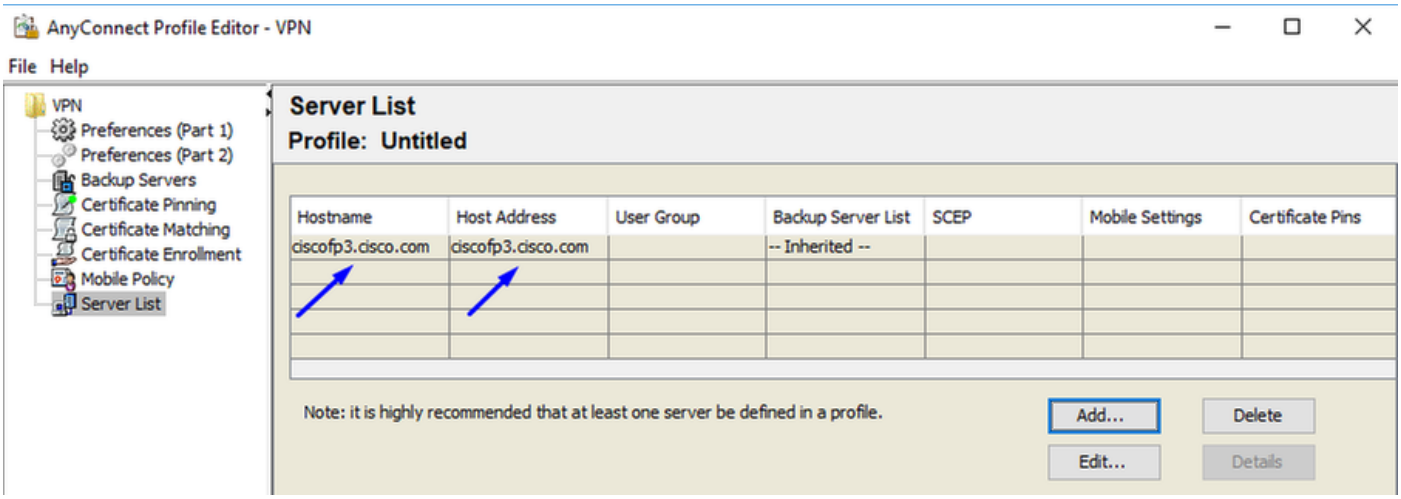


ImageConnect + AnyConnect Profile Editor downloaden en een .xml-profiel maken

Cisco AnyConnect Profile Editor downloaden en installeren

Profieleditor van AnyConnect openen
Klik op **Server List** > Klik op **Add**...
Typ een **Display Name** en de **FQDN** van de externe interface-IP van uw FTD. U dient items in de serverlijst te zien





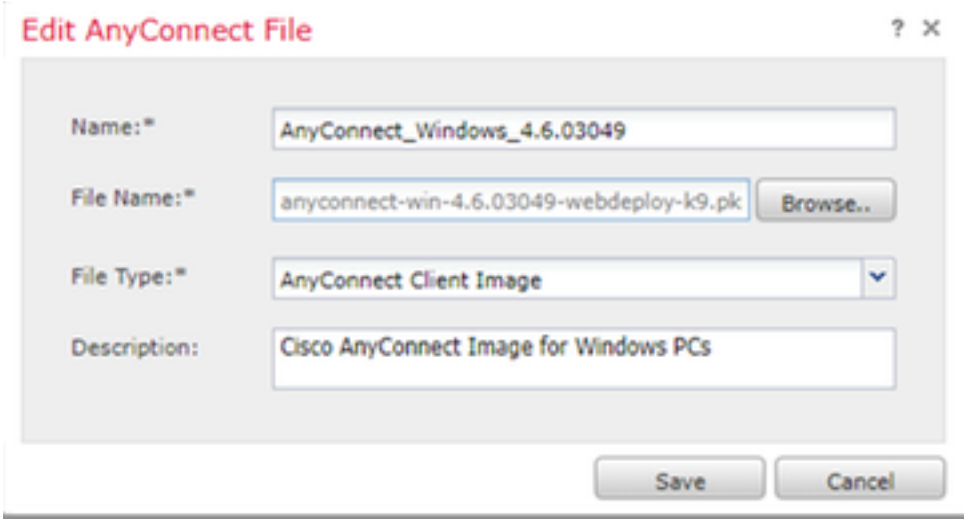
Klik op **OK** en **Bestand > Opslaan als...**

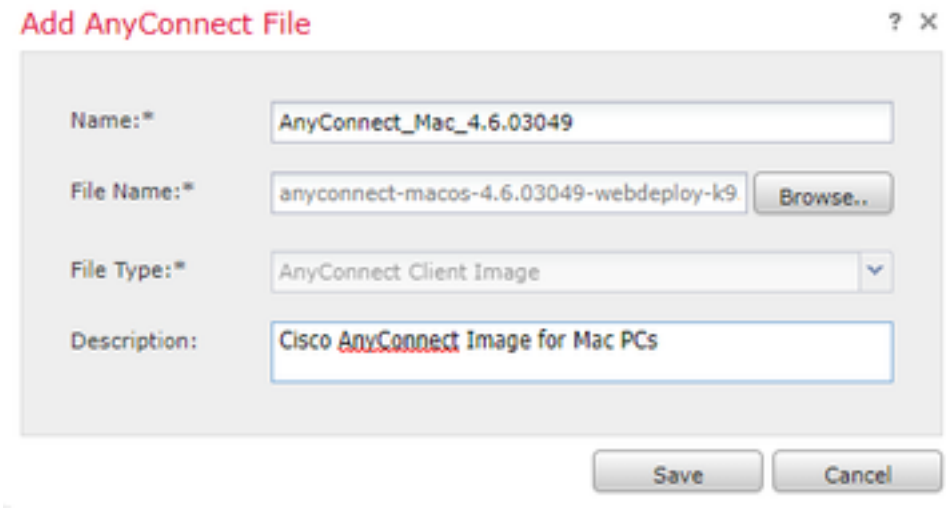
VPNprofile.xml

Download hier Windows- en Mac.pkg-afbeeldingen

AnyConnect Headend Deployment Package (Windows) anyconnect-win-4.6.03049-webdeploy-k9.pkg	20-SEP-2018	41.34 MB
AnyConnect Headend Deployment Package (Mac OS) anyconnect-macos-4.6.03049-webdeploy-k9.pkg	20-SEP-2018	41.13 MB

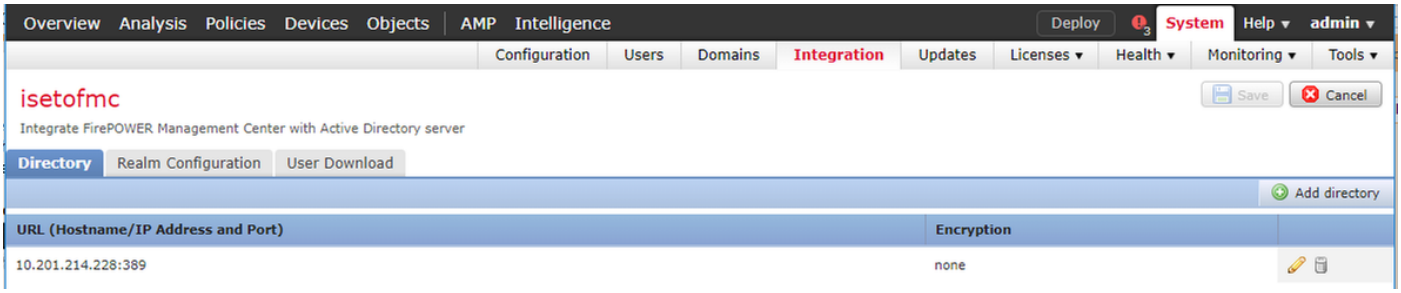
Ga naar **objecten** > **Objectbeheer** > **VPN** > **AnyConnect-bestand** > klik op **AnyConnect-bestand toevoegen**

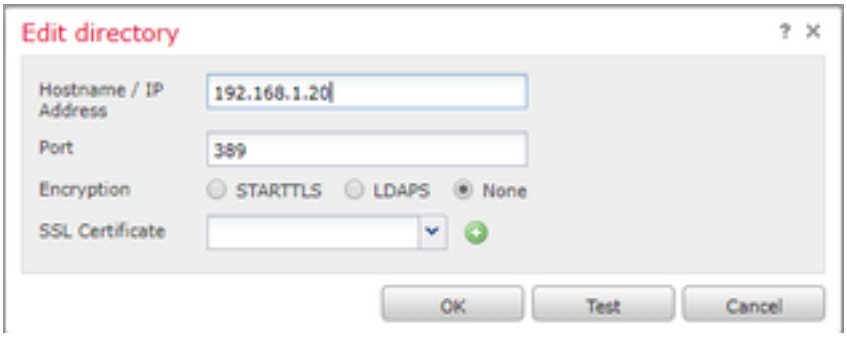




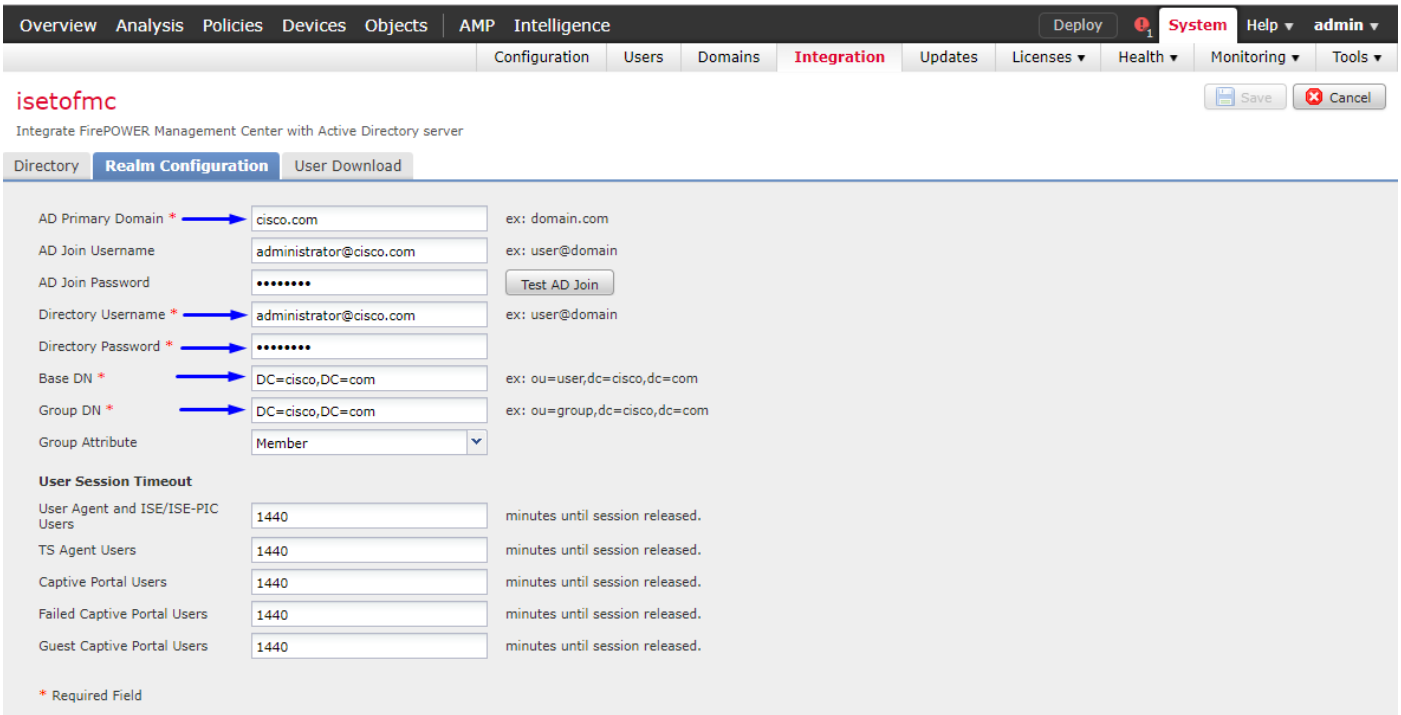
AnyConnect VPN op FTD configureren (gebruik het Root CA-certificaat)

Aanmelden bij het **FirePOWER Management Center**
Klik op **Systeem** > **Integratie** > **Realms** > Klik op **Nieuw** venster > klik **Map** > **klik op Map toevoegen** > **Klik op Map toevoegen**



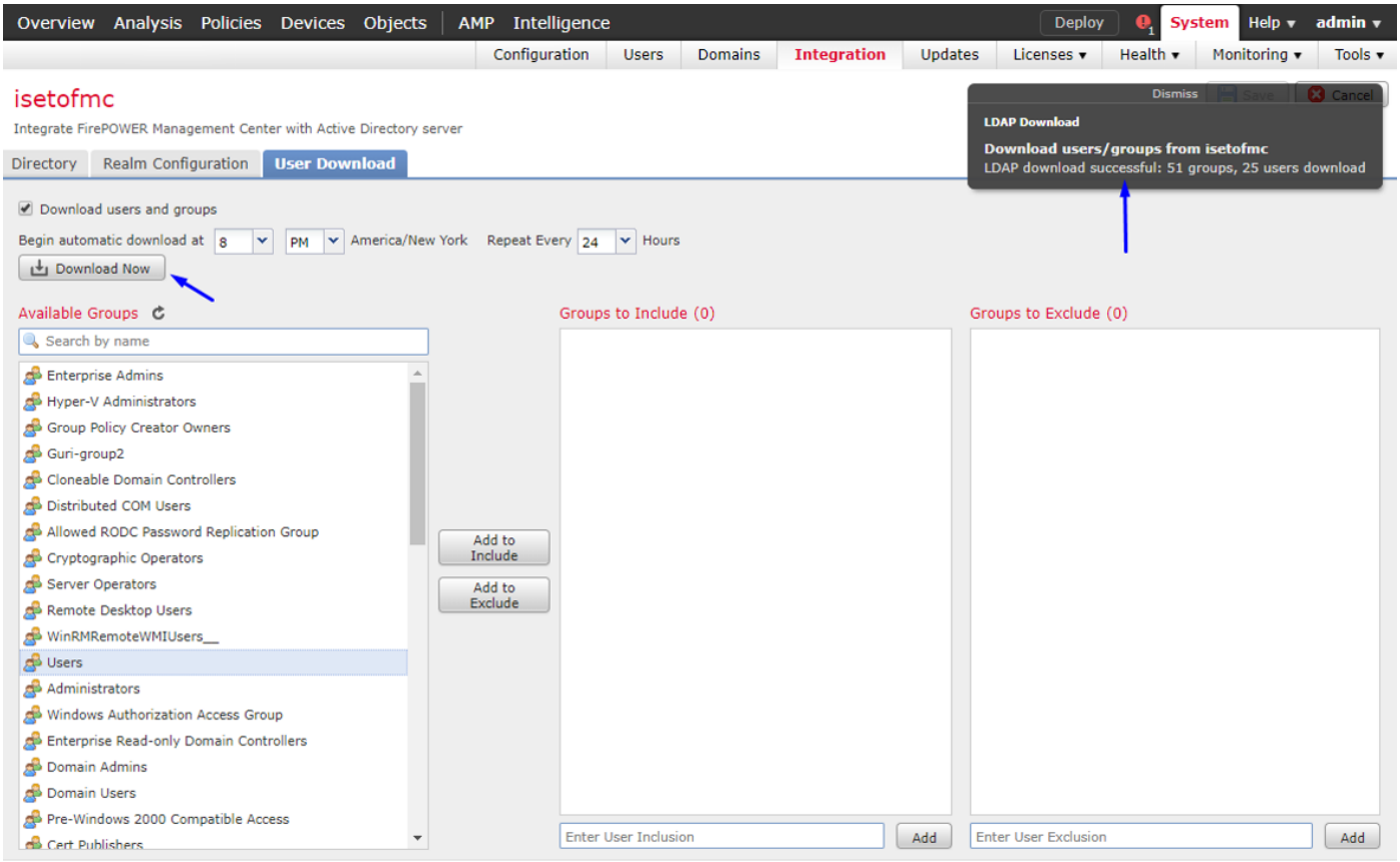


Klik op het tabblad Configuratie **Realm** - configureer hier de informatie van uw domeincontroller

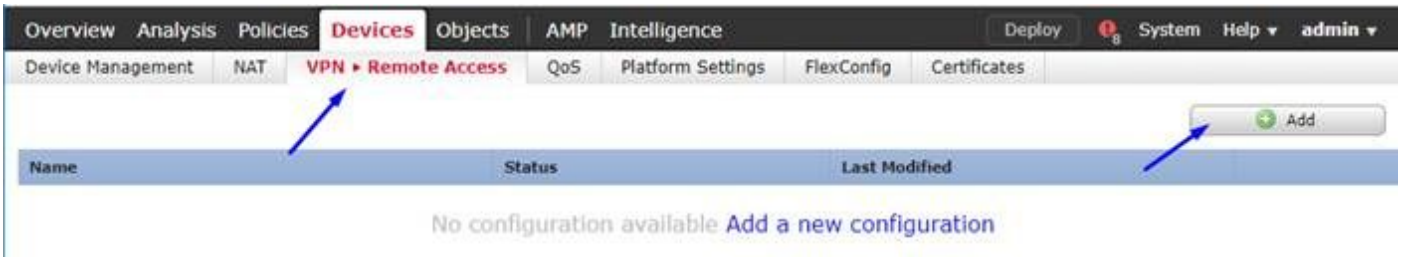


Opmerking: In het bovenstaande voorbeeld wordt een AD-gebruikersnaam met 'Domain Admin'-rechten in de Windows AD-server gebruikt. Als u een gebruiker wilt configureren met specifiekere, minimale bevoegdheden voor het FMC om zich bij uw Active Directory Domain aan te sluiten voor uw configuratie van het programma, kunt u de stappen hier zien

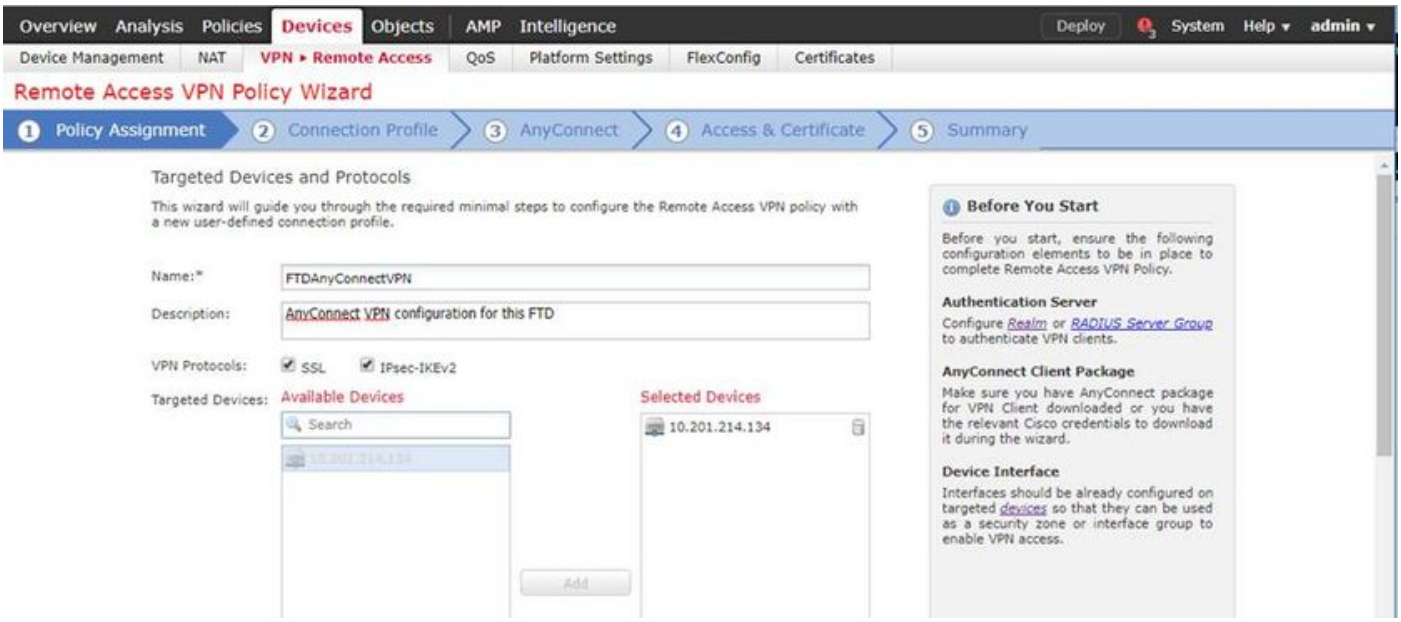
Klik op **het** tabblad **User Download** - zorgt ervoor dat User Download slaagt



Klik op **Apparaten** > **VPN** > **Externe toegang** > klik op **Add**

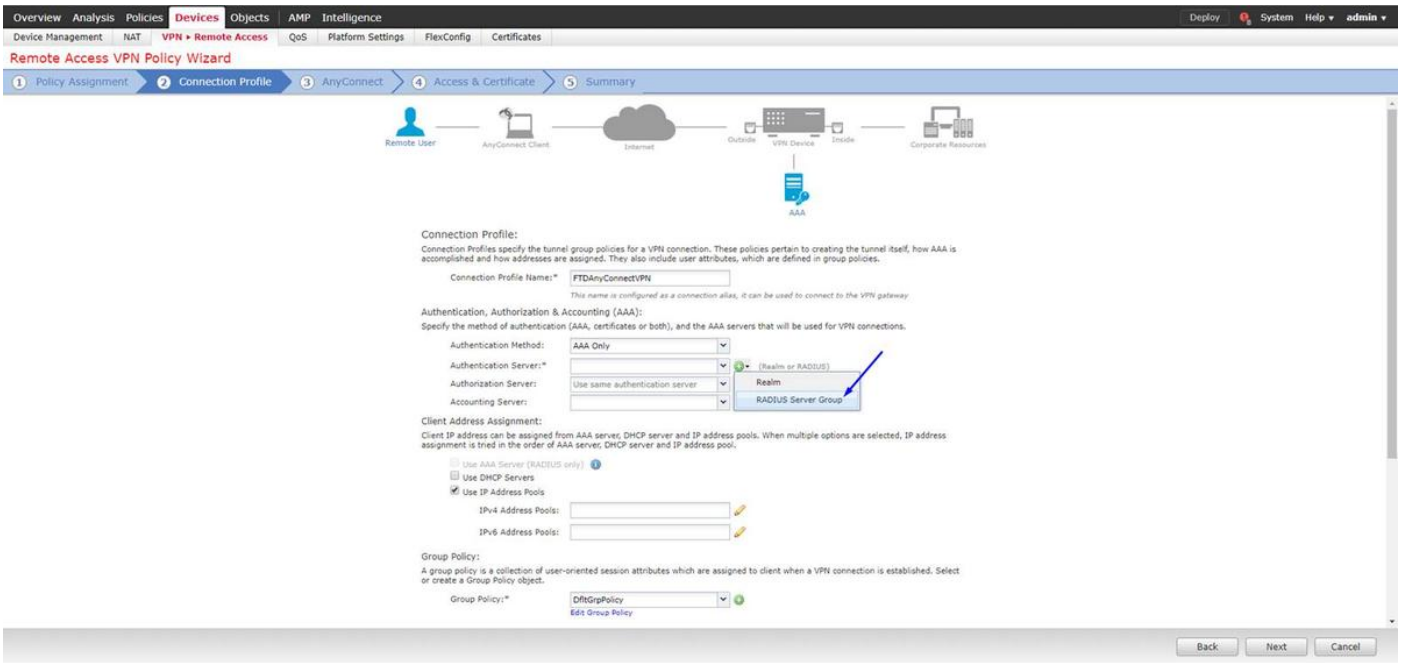


Typ een **naam**, **beschrijving** en klik op **Add** om het FTD-apparaat te selecteren dat u AnyConnect VPN wilt configureren op

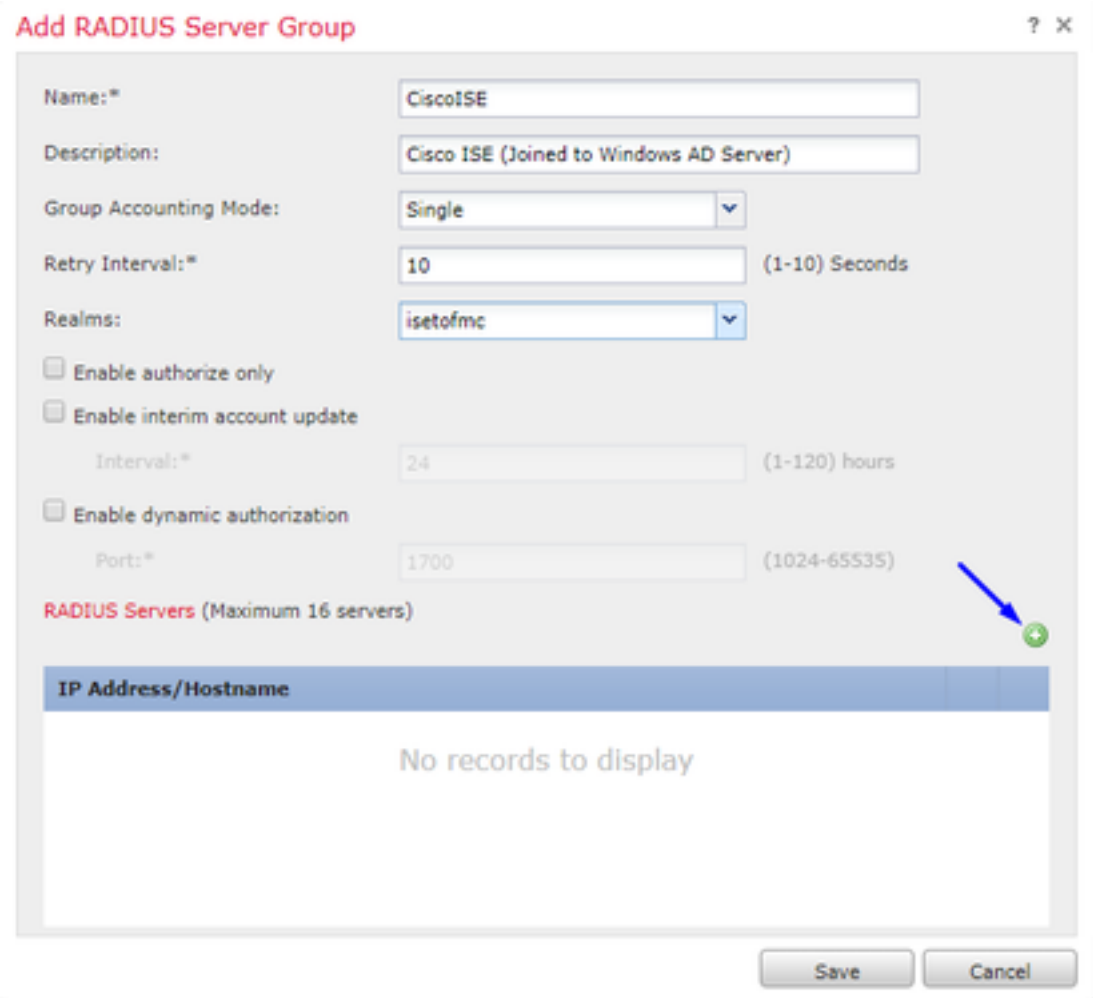


Klik op **Add** voor de verificatieserver en kies **RADIUS-servergroep** - dit is uw Cisco Identity

Services Engine PSN (Policy Services Node)



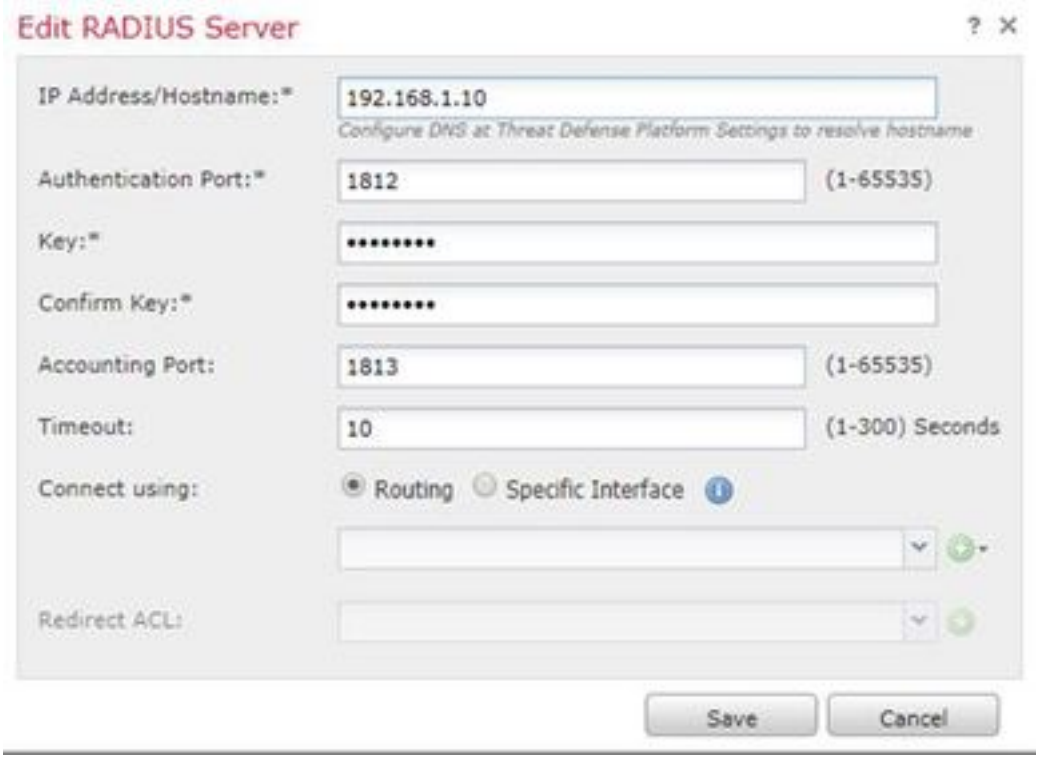
Typ een **naam** voor de RADIUS-server
Selecteer het hierboven ingestelde antwoord
Klik op **Toevoegen**



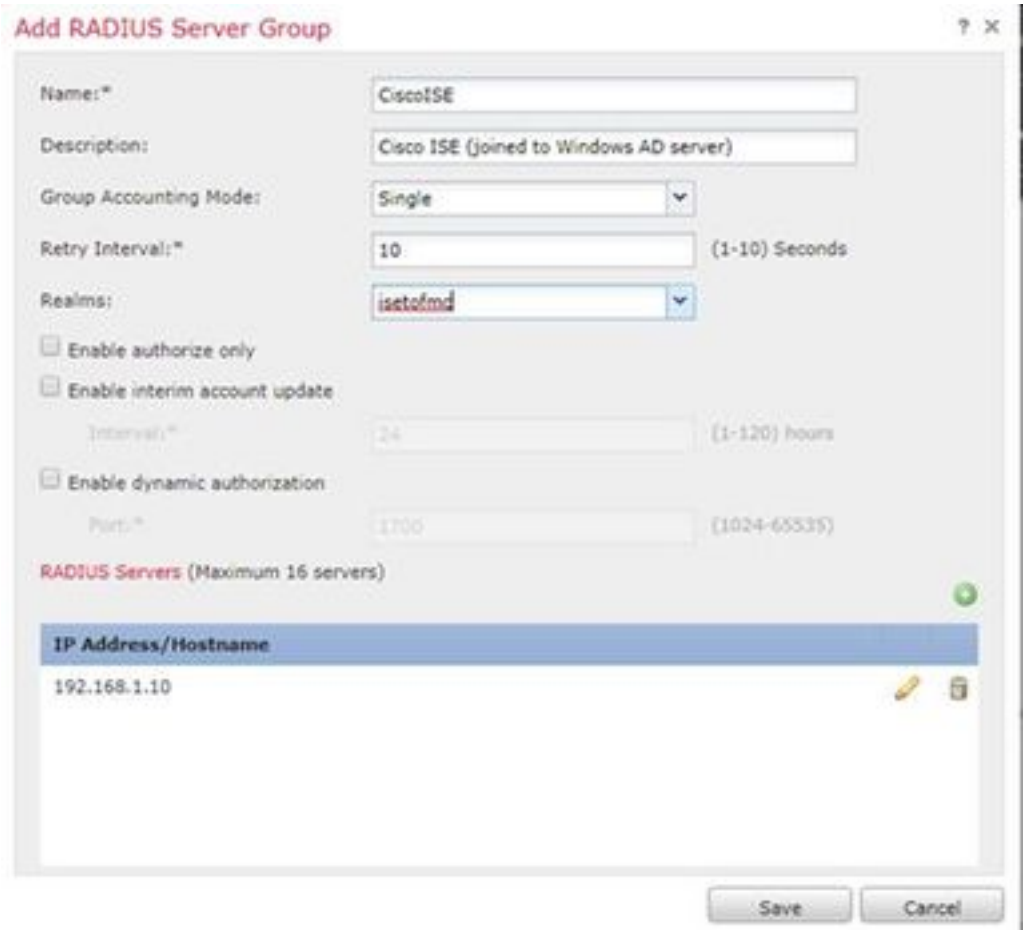
Typ de volgende informatie voor uw Cisco ISE-knooppunt:
IP-adres/hostnaam: IP-adres van Cisco ISE PSN (Policy Service Node) - dit is waar

verificatieverzoeken worden gedaan
Sleutel: Cisco 123
Bevestig sleutel: Cisco 123

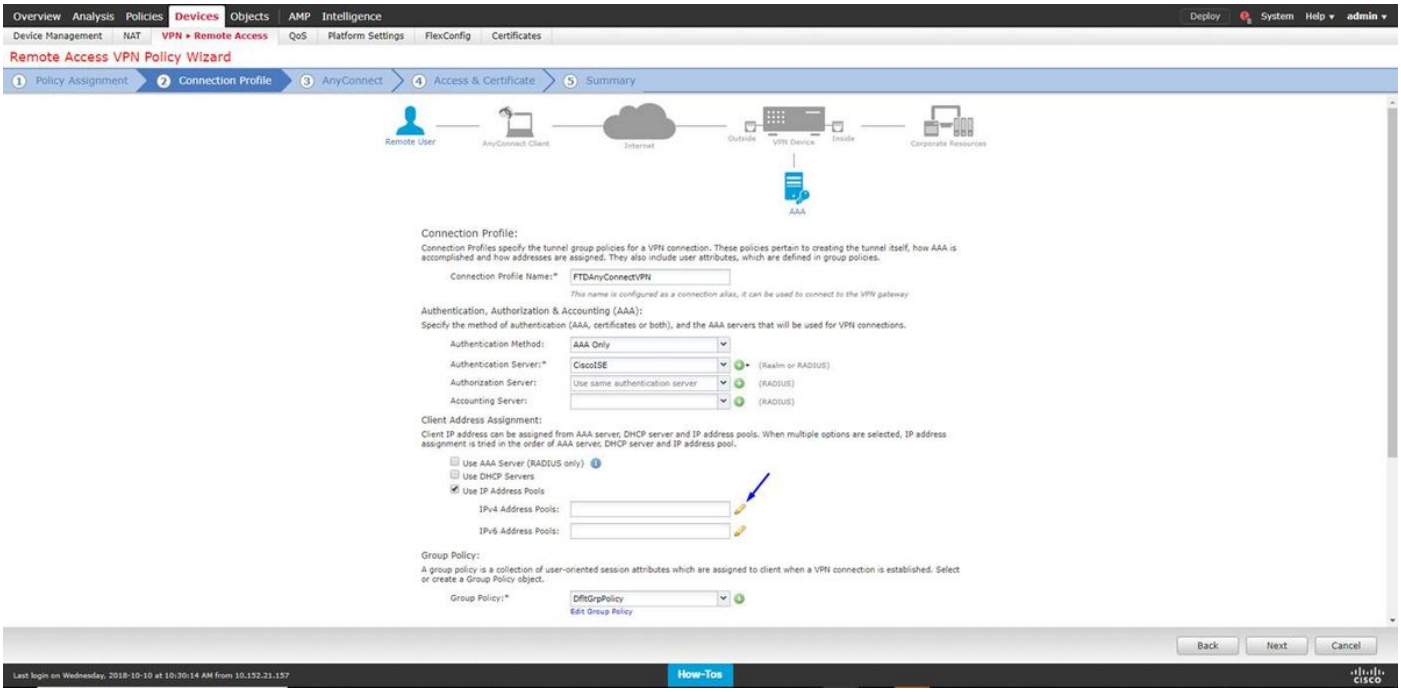
Voorzichtig: Het bovenstaande is uw RADIUS gedeelde geheime toets - we zullen deze toets in een latere stap gebruiken



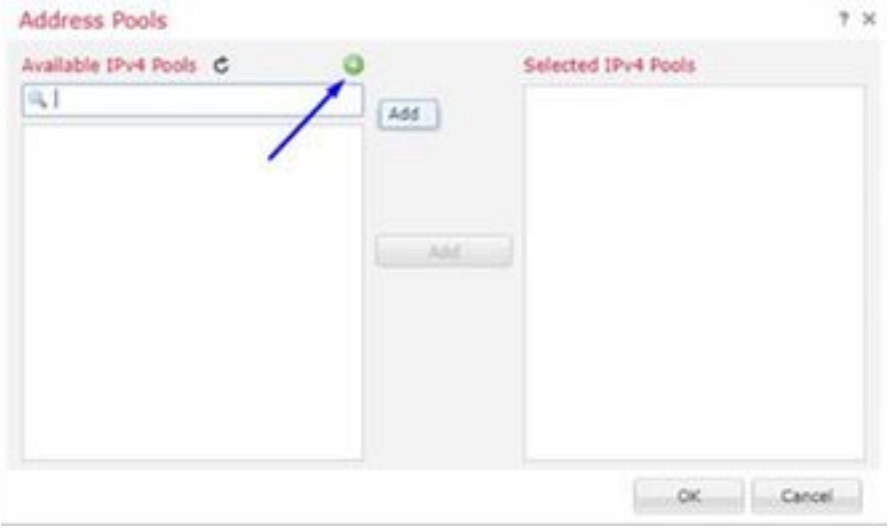
Opmerking: Wanneer de eindgebruiker probeert via AnyConnect VPN verbinding te maken met de FTD, wordt de gebruikersnaam + wachtwoord die hij typt, verzonden als een verificatieaanvraag bij deze FTD. De FTD zal dat verzoek naar het Cisco ISE PSN-knooppunt voor verificatie doorsturen (Cisco ISE zal dan Windows Active Directory voor die gebruikersnaam en wachtwoord controleren en toegangscontrole/netwerktoegang afdwingen, afhankelijk van de voorwaarde die we momenteel in Cisco ISE hebben ingesteld)



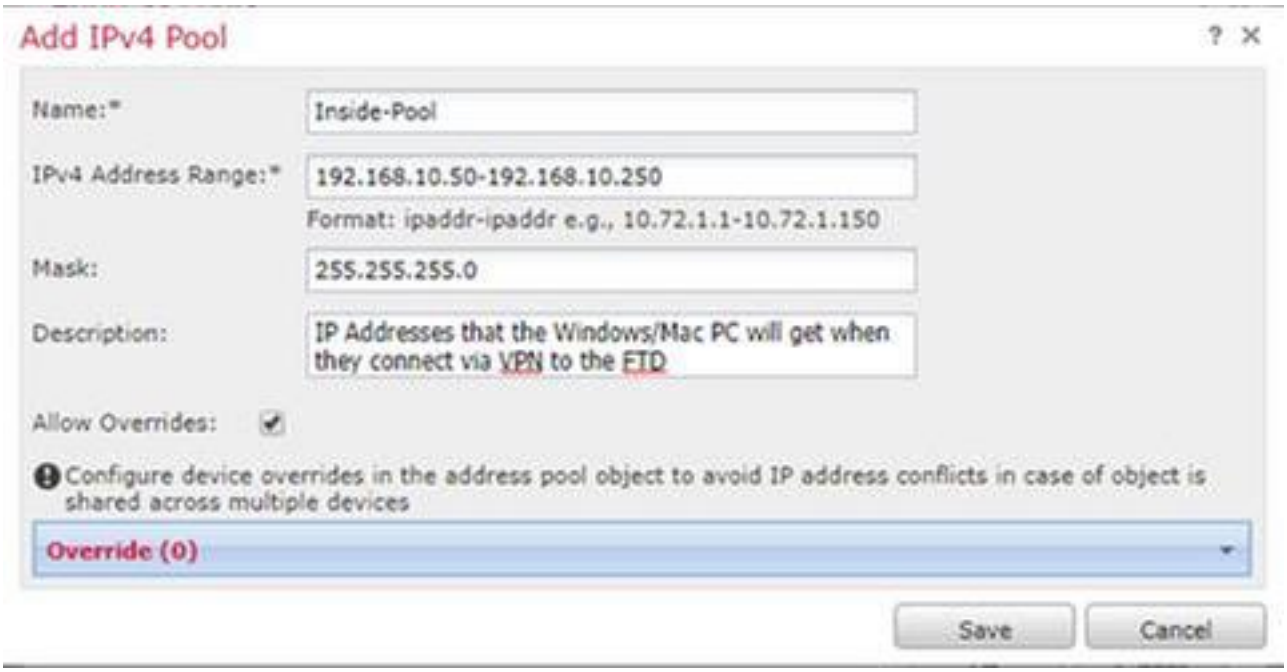
Klik op **Opslaan**
Klik op **Bewerken** voor **IPv4-adresgroep**



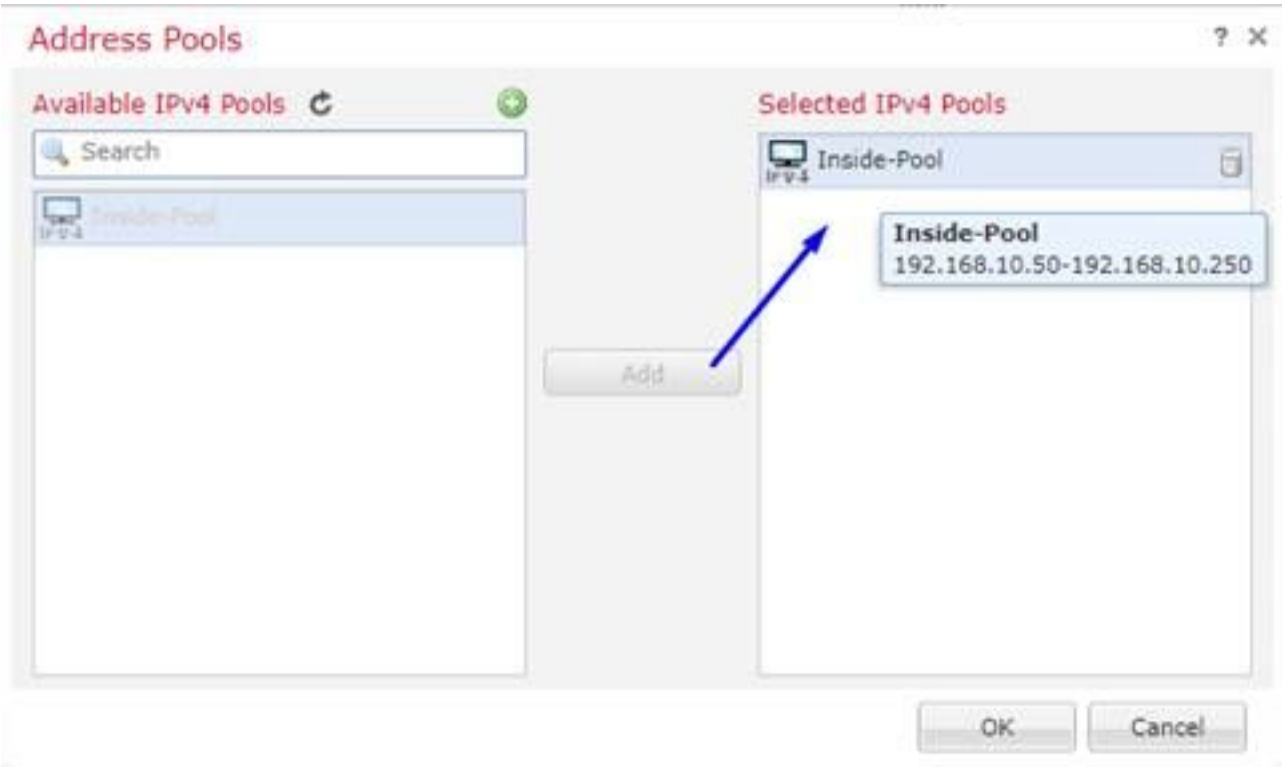
Klik op **Toevoegen**



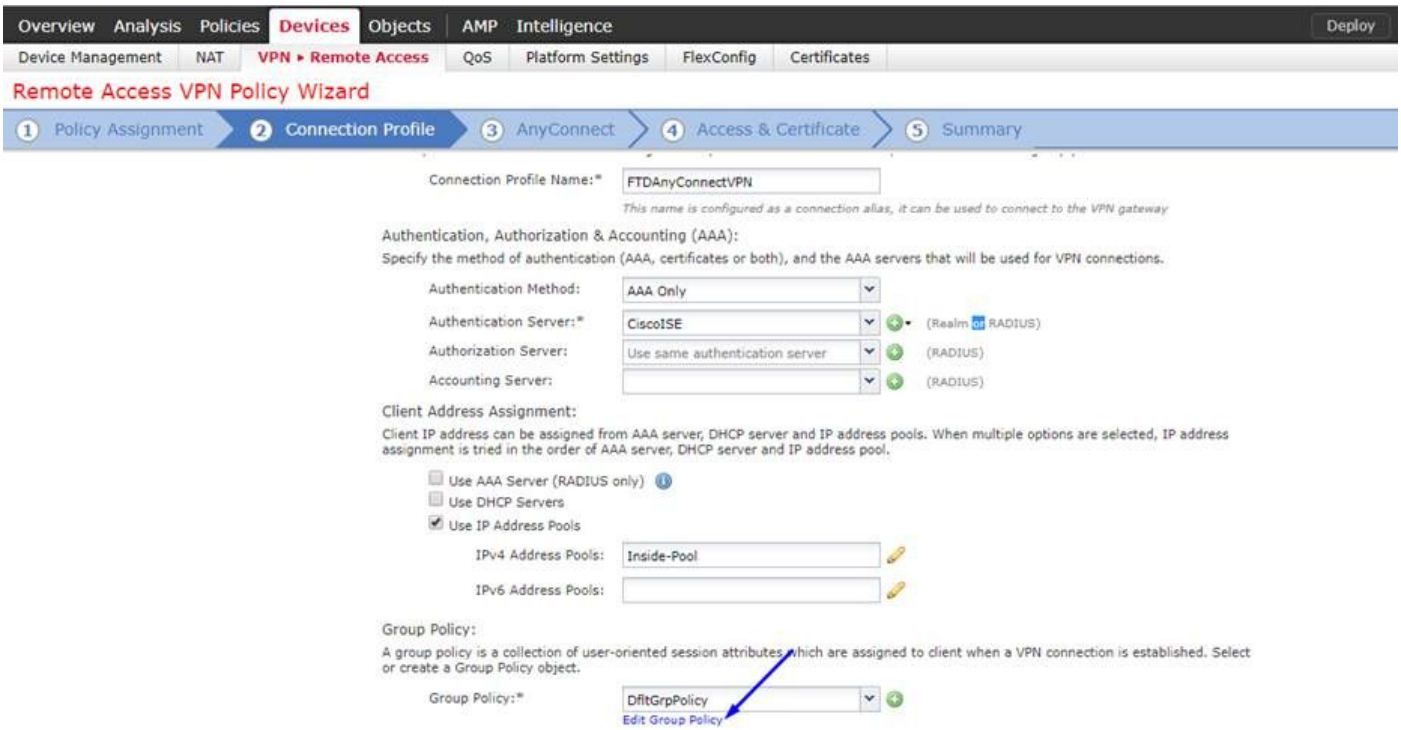
Typ een **naam**, **IPv4-adresbereik** en **subnetmasker**



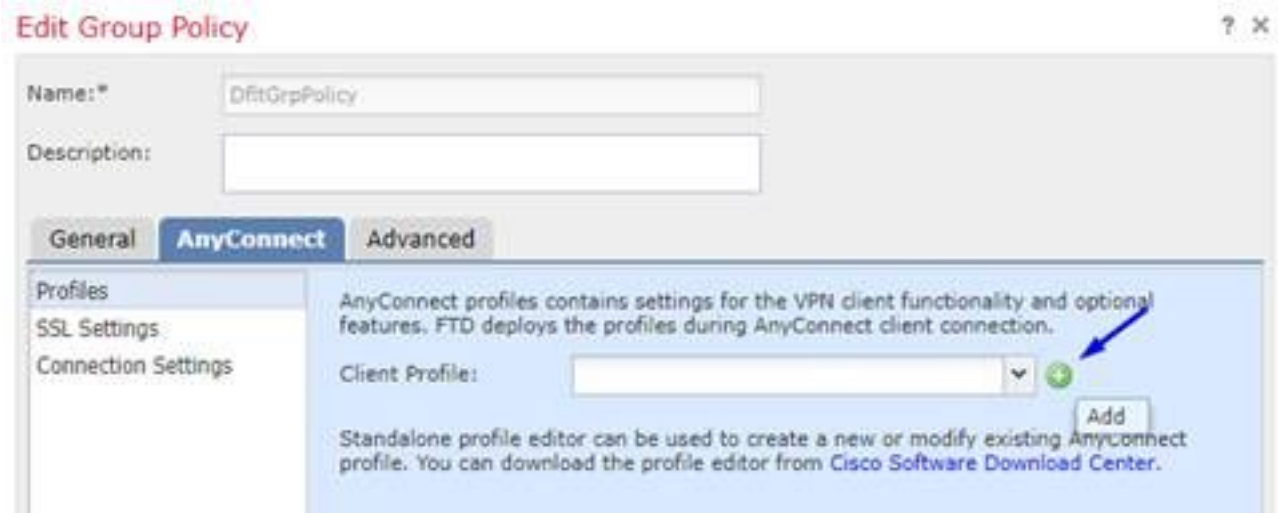
Selecteer uw IP-adresgroep en klik op **OK**



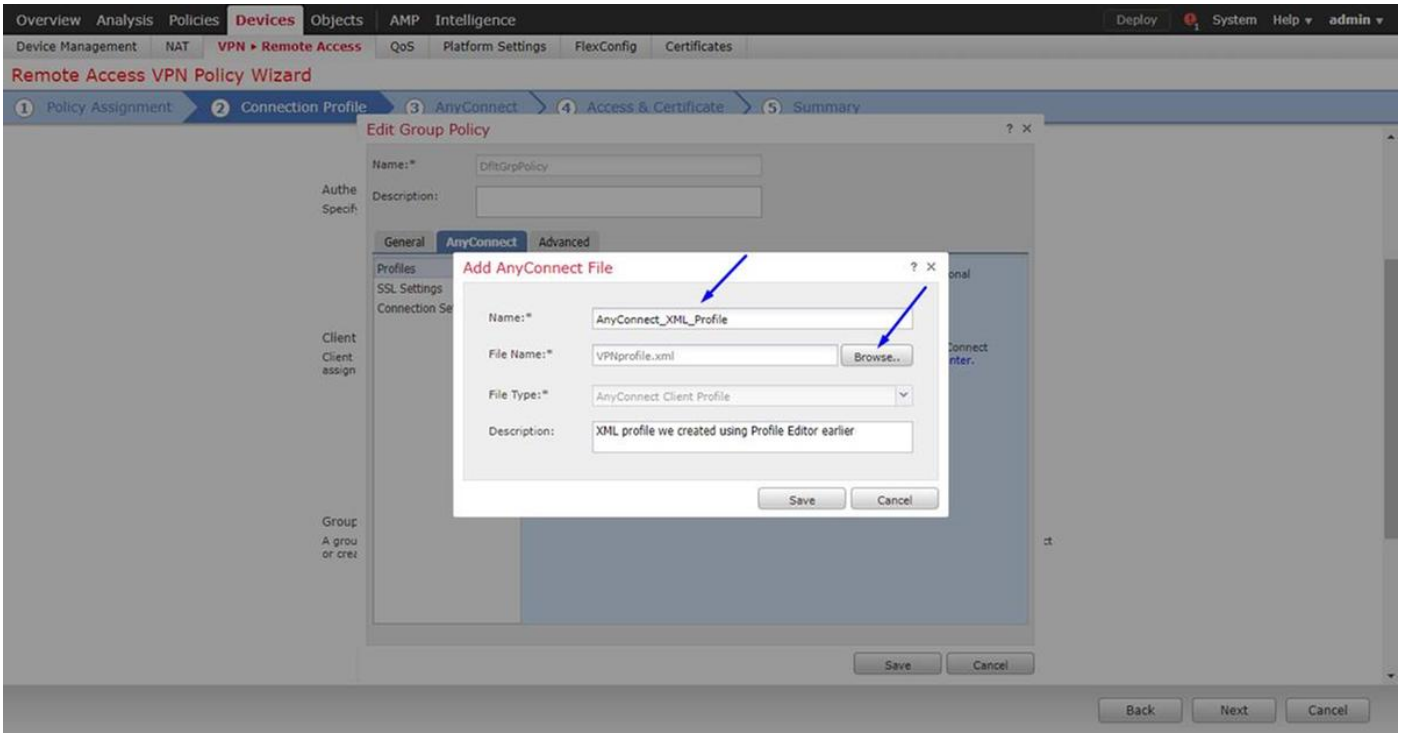
Klik op **groepsbeleid bewerken**



Klik op **AnyConnect** tabblad > **profielen** > klik op **Add**

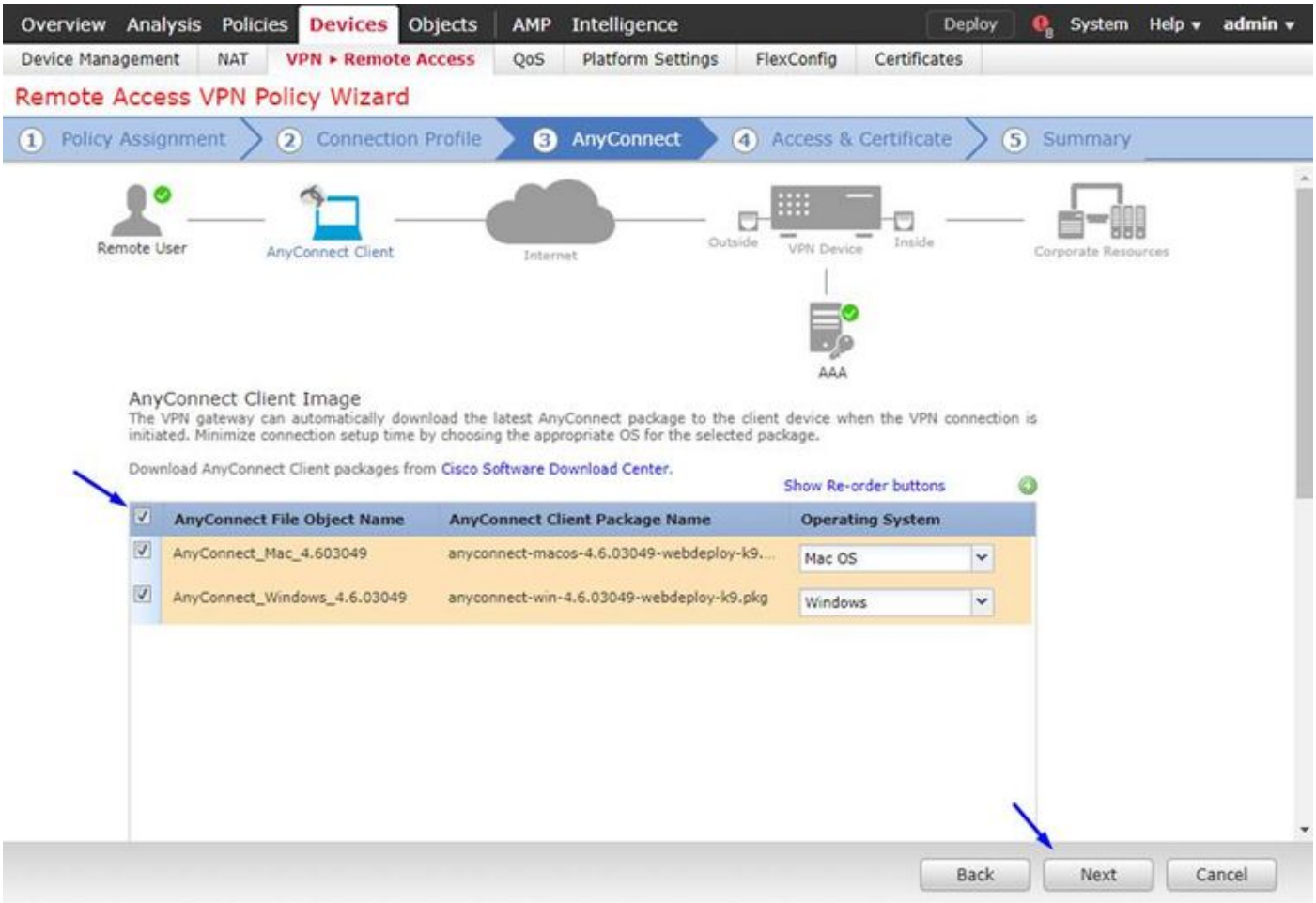


Typ een **naam** en klik op **Bladeren**.. en selecteer het bestand VPNProfile.xml in stap 4 hierboven

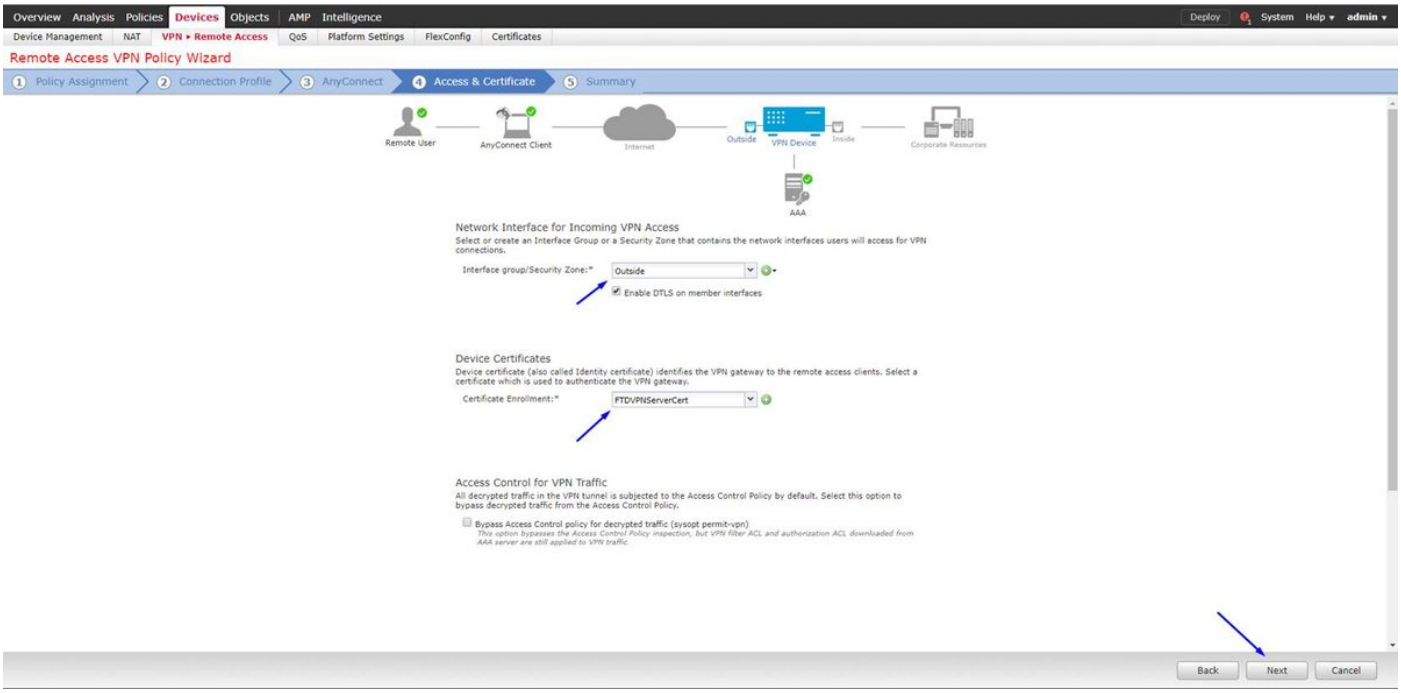


Klik op **Opslaan** en klik op **Volgende**

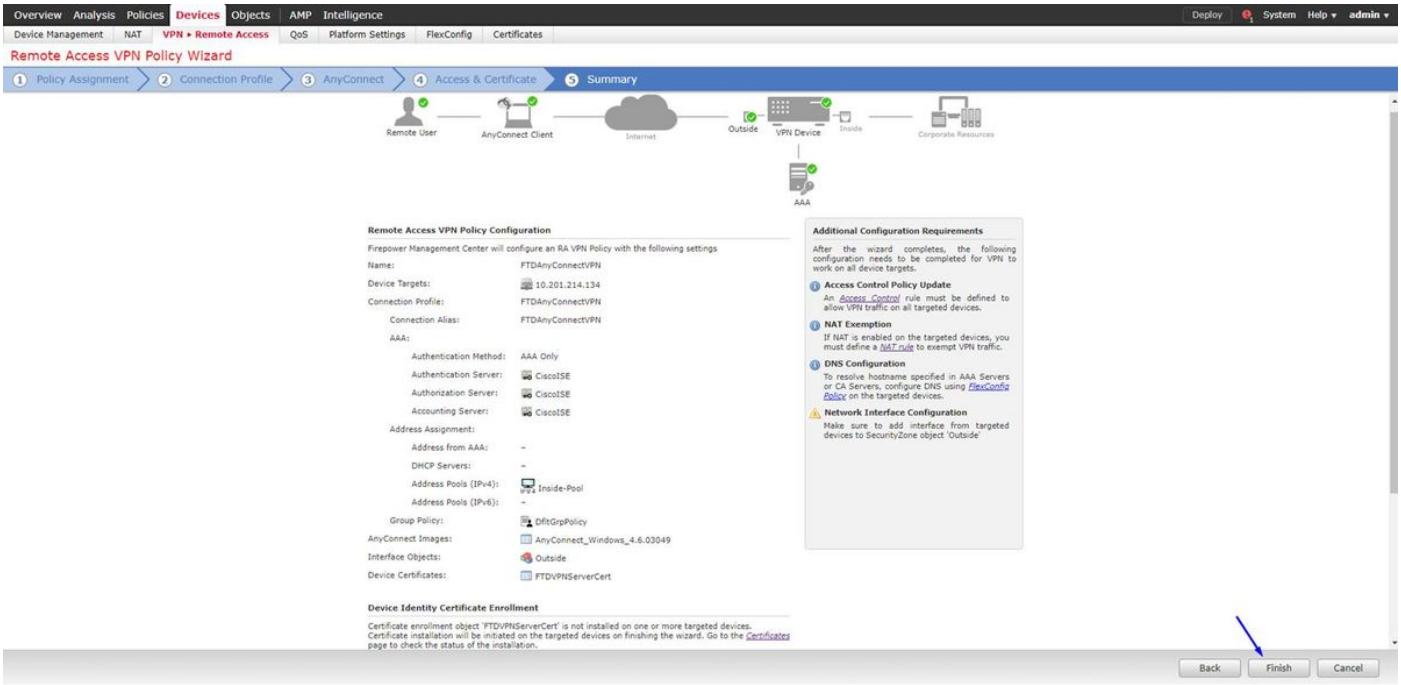
Selecteer vanuit stap 4 hierboven de selectiekaarten voor uw AnyConnect Windows/Mac-bestand



Klik op **Volgende**
Selecteer **Interface Group/Security Zone** als **buiten**
Selecteer **certificaatinschrijving** als uw certificaat dat we in stap 3 hierboven hebben gemaakt

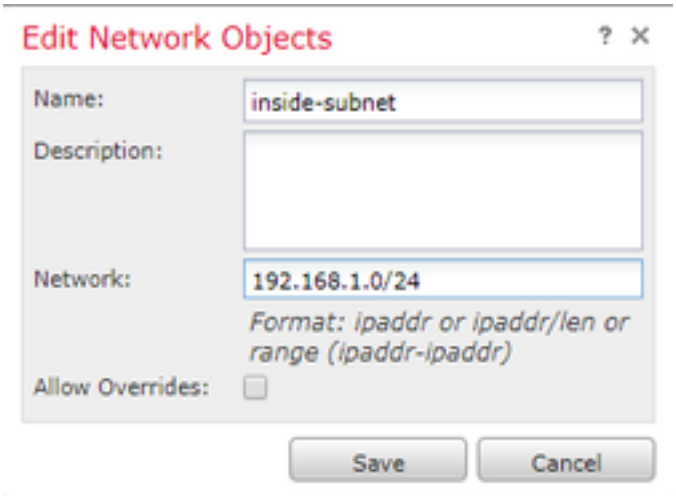


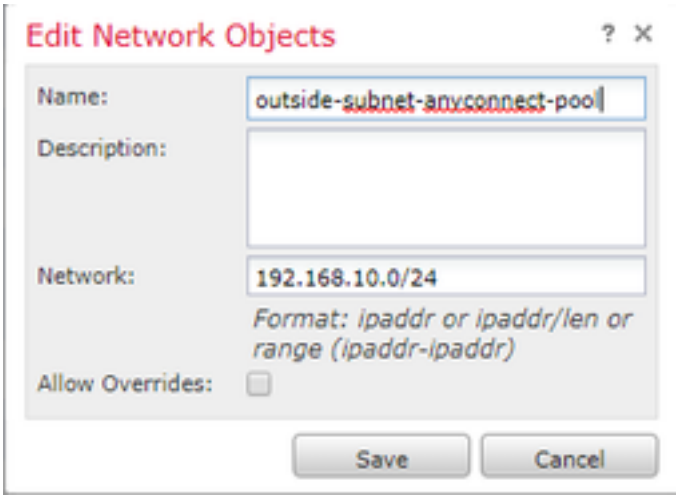
Bekijk uw configuratie en klik op **Volgende**

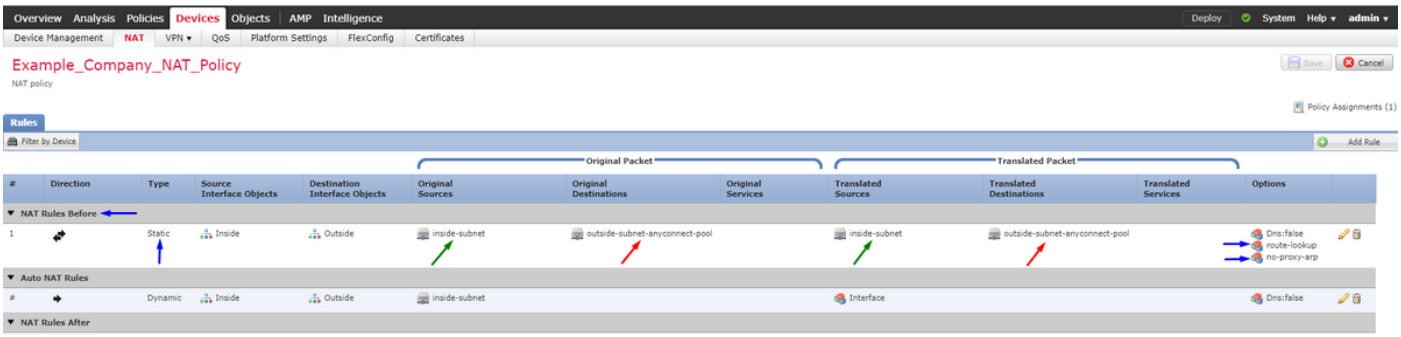


Configureer de FTD NAT-regel om het VPN-verkeer van NAT vrij te stellen omdat deze toch wordt gedecrypteerd en om toegangscontroleregels/toegangscontroleregels te maken

Maak een statische **NAT-regel** om er zeker van te zijn dat het VPN-verkeer geen NAT'd krijgt (FTD decrypteert de AnyConnect-pakketten wanneer ze naar de buiteninterface komen, dus het is alsof die PC al achter de interne interface zit en ze *al* een privé IP-adres hebben - we moeten nog een NAT-vrijstellingsregel (No-NAT) voor dat VPN-verkeer configureren:
Ga naar **objecten** > klik op **Netwerk toevoegen** > klik op **Objecten toevoegen**





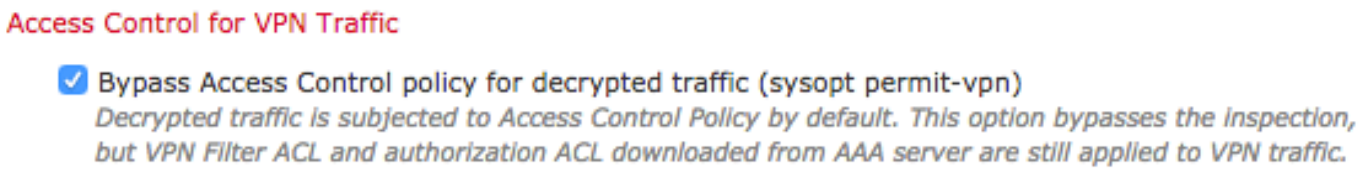


Daarnaast moet u het gegevensverkeer toestaan om na de inloop van de gebruiker VPN te stromen. Hiervoor hebt u twee keuzes:

a. Regels toestaan of ontkennen om VPN-gebruikers toe te staan of te ontkennen om toegang te krijgen tot bepaalde bronnen

b. 'Bypass Access Control Policy voor gedecrypteerd verkeer' - dit maakt iedereen die met succes verbinding kan maken met de FTD via VPN toegang tot ACL's en maakt toegang tot alles achter de FTD zonder regels in toegangsbeleid toe te staan of te ontkennen

Bypass Access Control Policy voor gedecrypteerd verkeer onder: Apparaten > VPN > Externe toegang > VPN-profiel > Toegangsinterfaces:

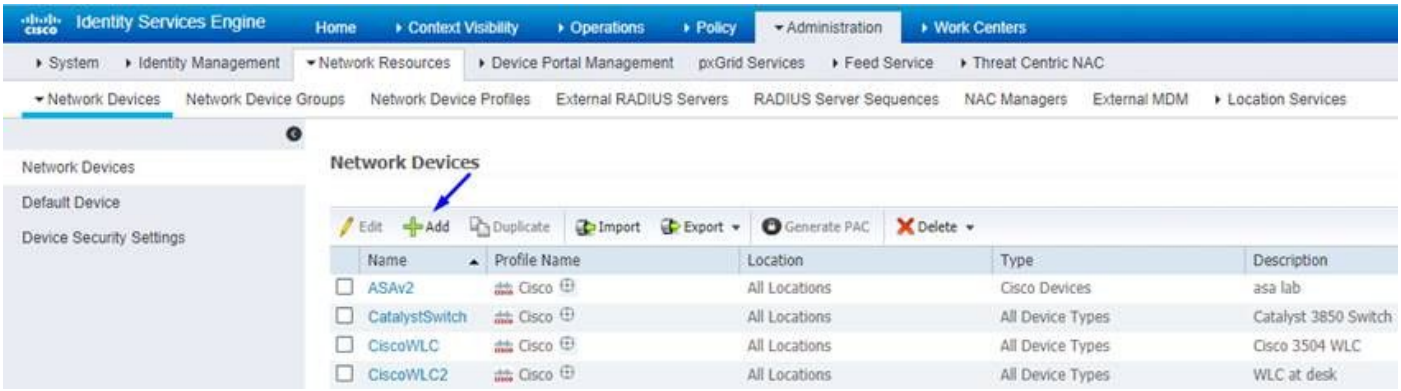


Opmerking: Als u deze optie niet uitschakelt, moet u naar **beleid > Toegangsbeleid** gaan en regels creëren voor VPN-gebruikers die toegang kunnen krijgen tot dingen achter of dmz

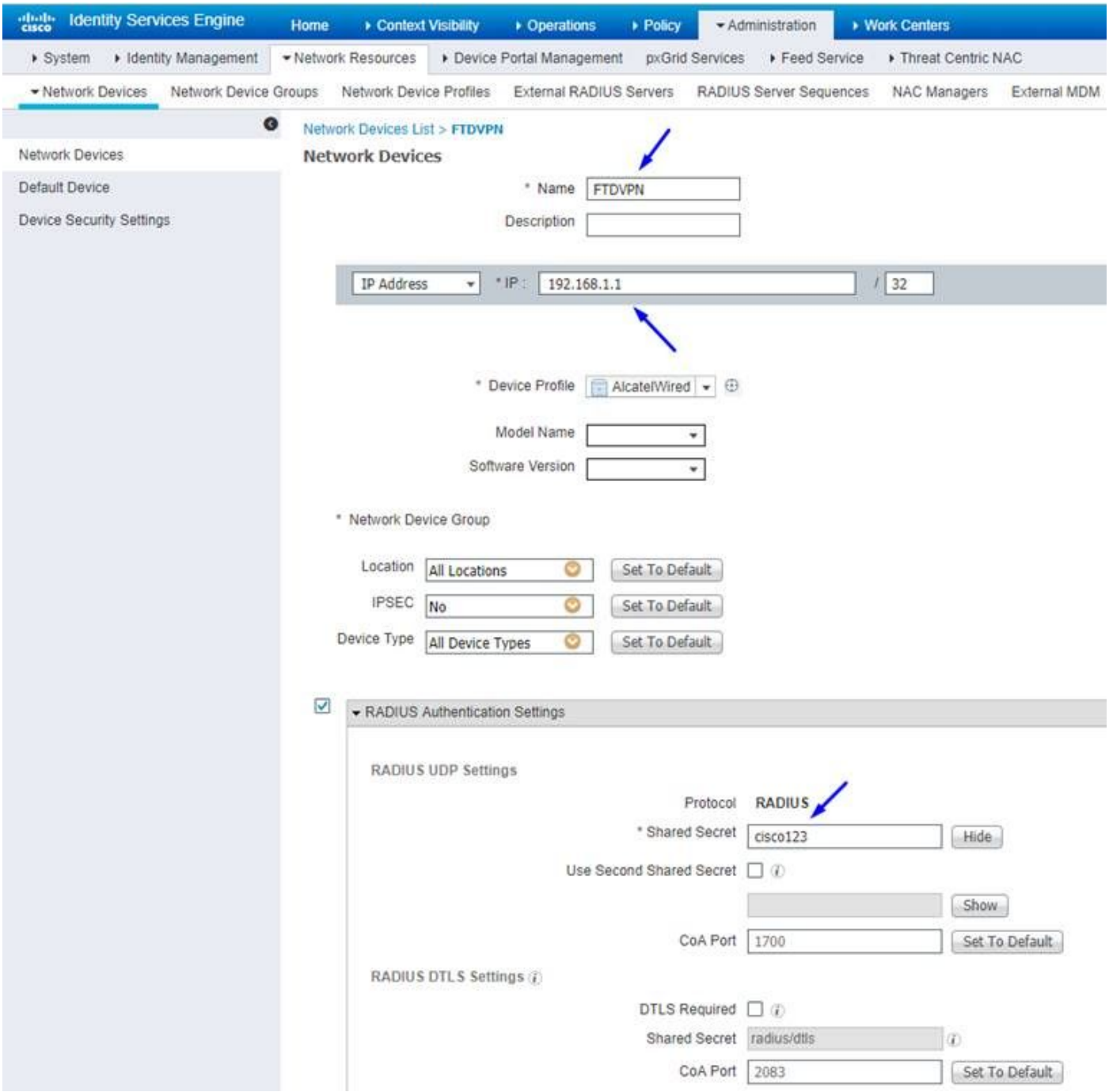
Klik op Instellen rechtsboven op FirePOWER Management Center

Voeg FTD toe als Netwerkapparaat en stel beleid in op Cisco ISE (gebruik RADIUS gedeeld geheim)

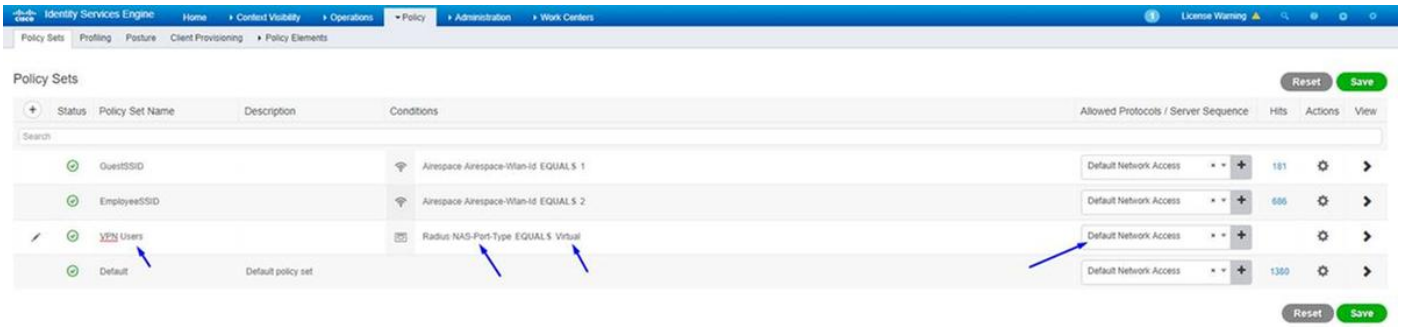
Aanmelden bij Cisco Identity Services Engine en klik op **Beheer > Netwerkapparaten** > klik op **Add**



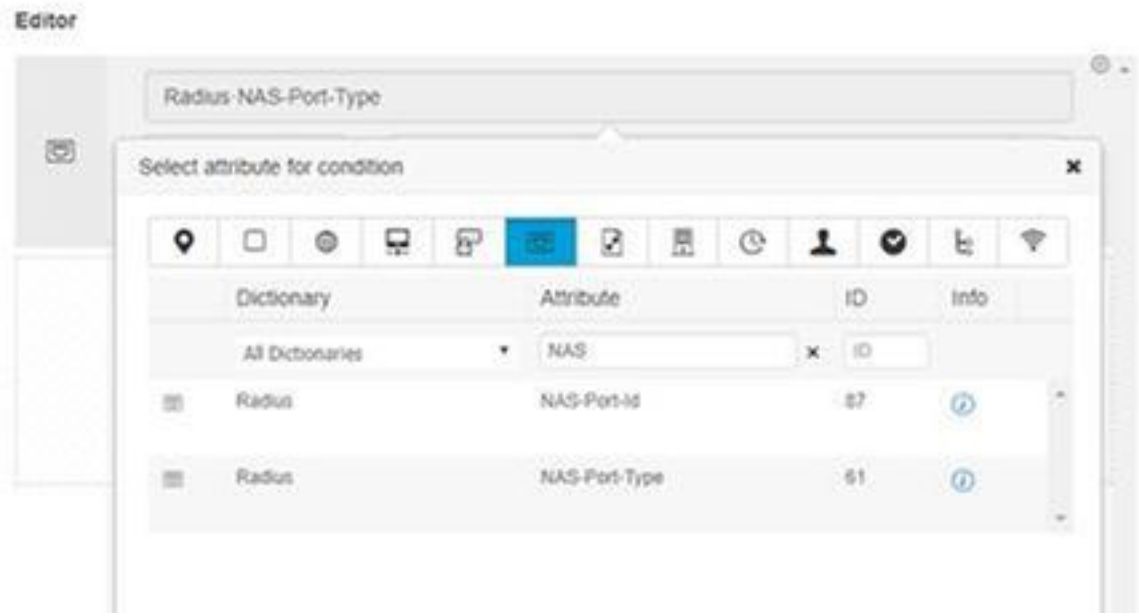
Typ een **naam**, type het **IP-adres** van uw FTD en type uw **RADIUS gedeelde geheim** uit de bovenstaande stappen
Voorzichtig: Dit moet het interface/ip-adres zijn waarop de FTD uw Cisco ISE (RADIUS-server) kan bereiken, d.w.z. de FTD-interface die uw Cisco ISE via FTD kan bereiken



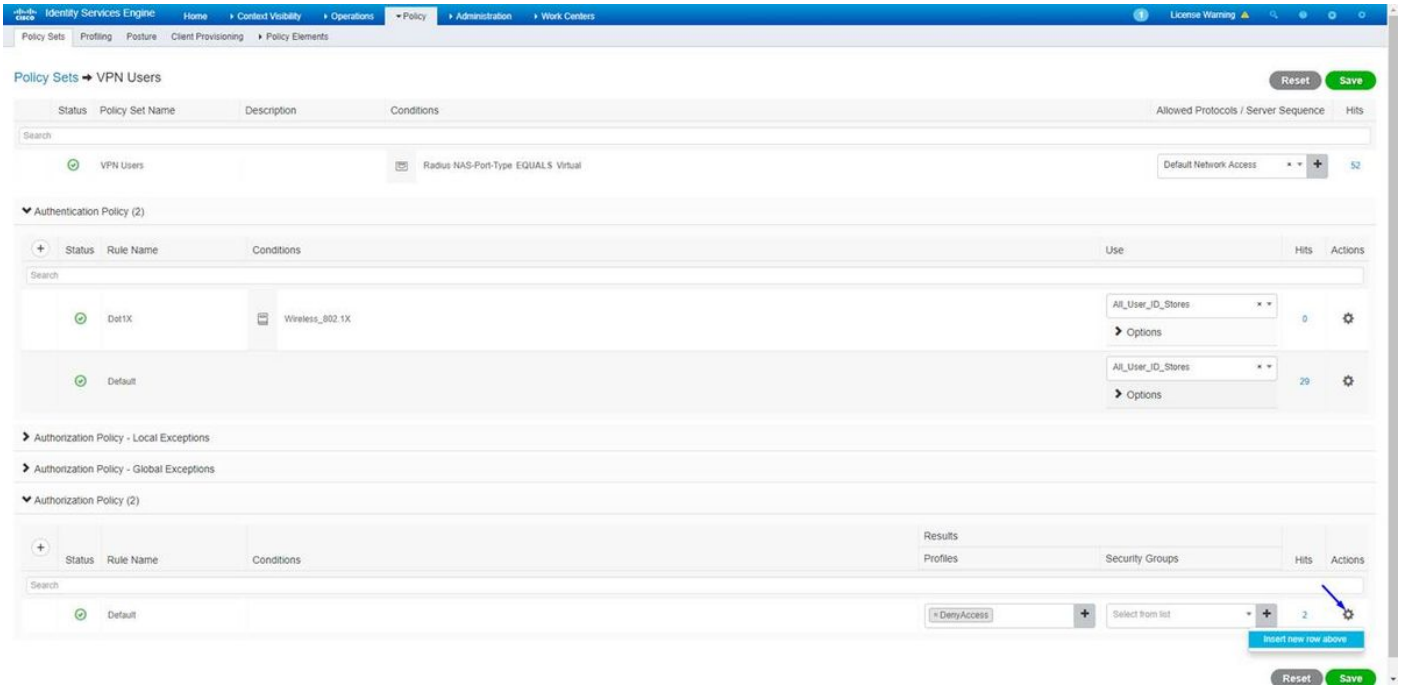
Klik op **Policy** > **Policy Set** > creëren **PolicySet voor alle verificatieverzoeken van het volgende type:**
RADIUS-NAS-poorts EQUALS virtueel
Dit betekent dat als een RADIUS-aanvraag die in ISE komt en er op VPN-verbindingen uitziet, deze Policy Suite wordt ingedrukt



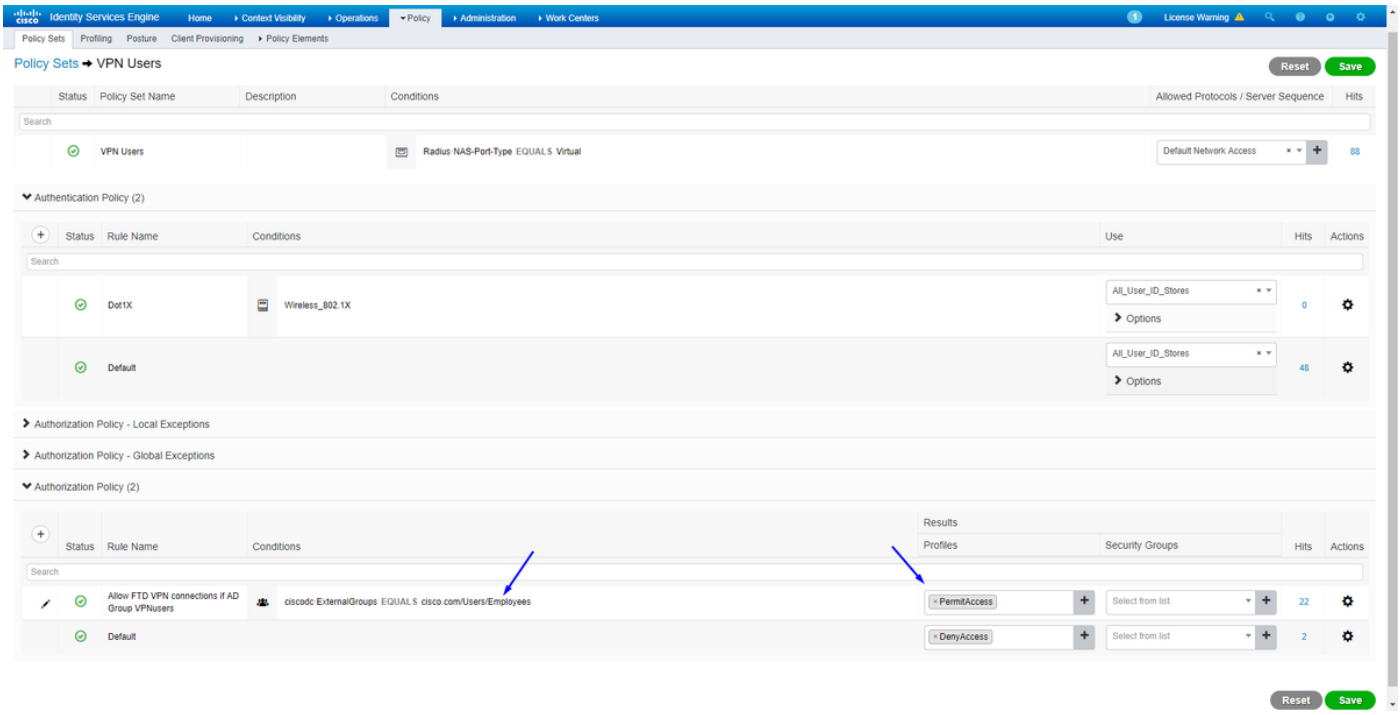
Hier kunt u die voorwaarde in Cisco ISE vinden:



Bewerken van de hierboven gemaakte **beleidsset**
Voeg een regel boven de standaardblokregel toe om mensen het machtigingsprofiel van de **"Toegang"** te geven slechts als zij in de Actieve Groep van de Map "**Werknemers**" zijn:

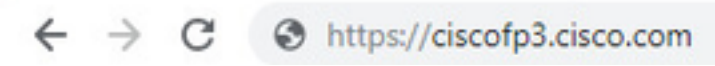


Hieronder ziet uw wet er na voltooiing uit

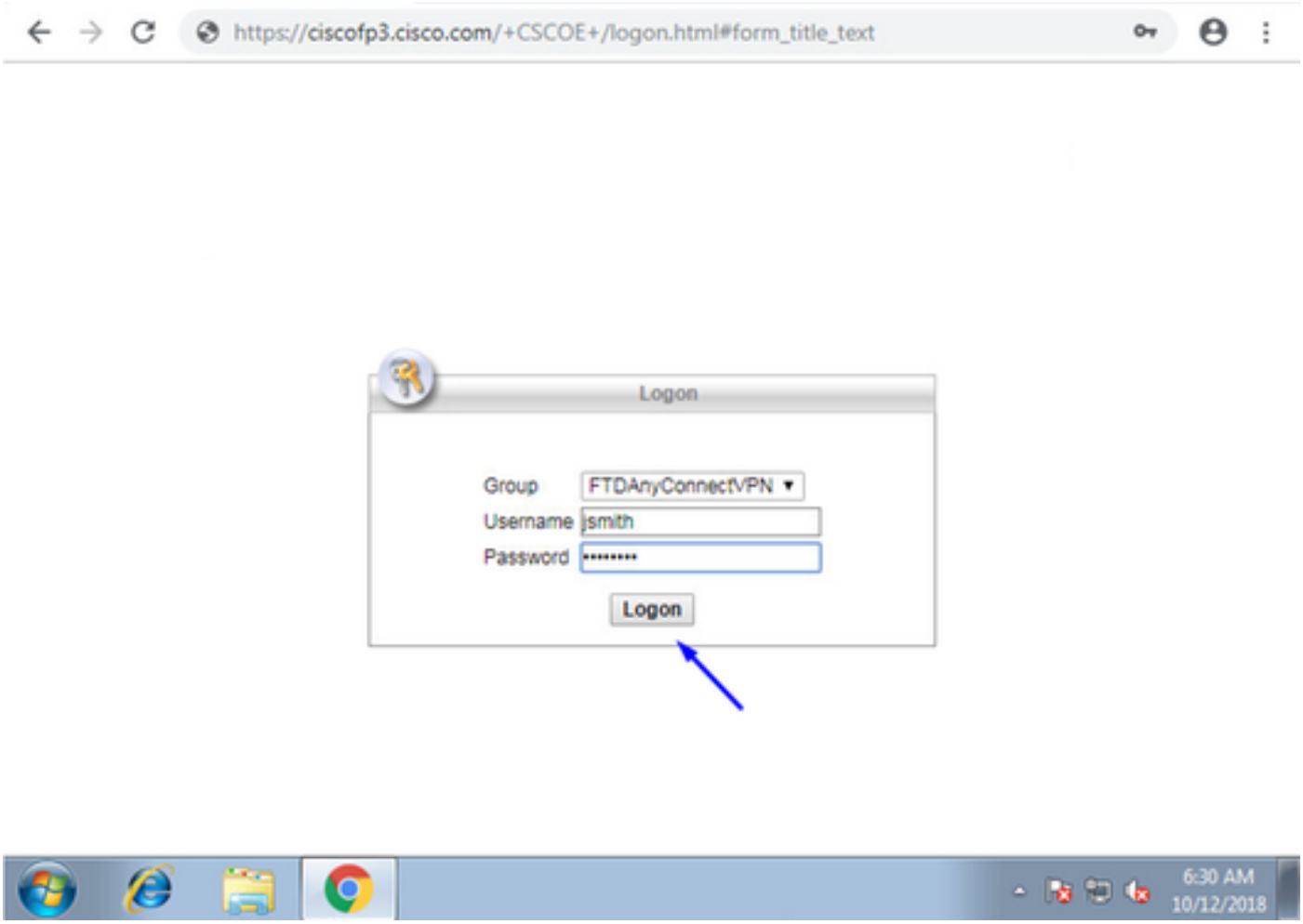


Downloaden, installeren en aansluiten op de FTD met AnyConnect VPN-client op Windows/Mac PC's van werknemers

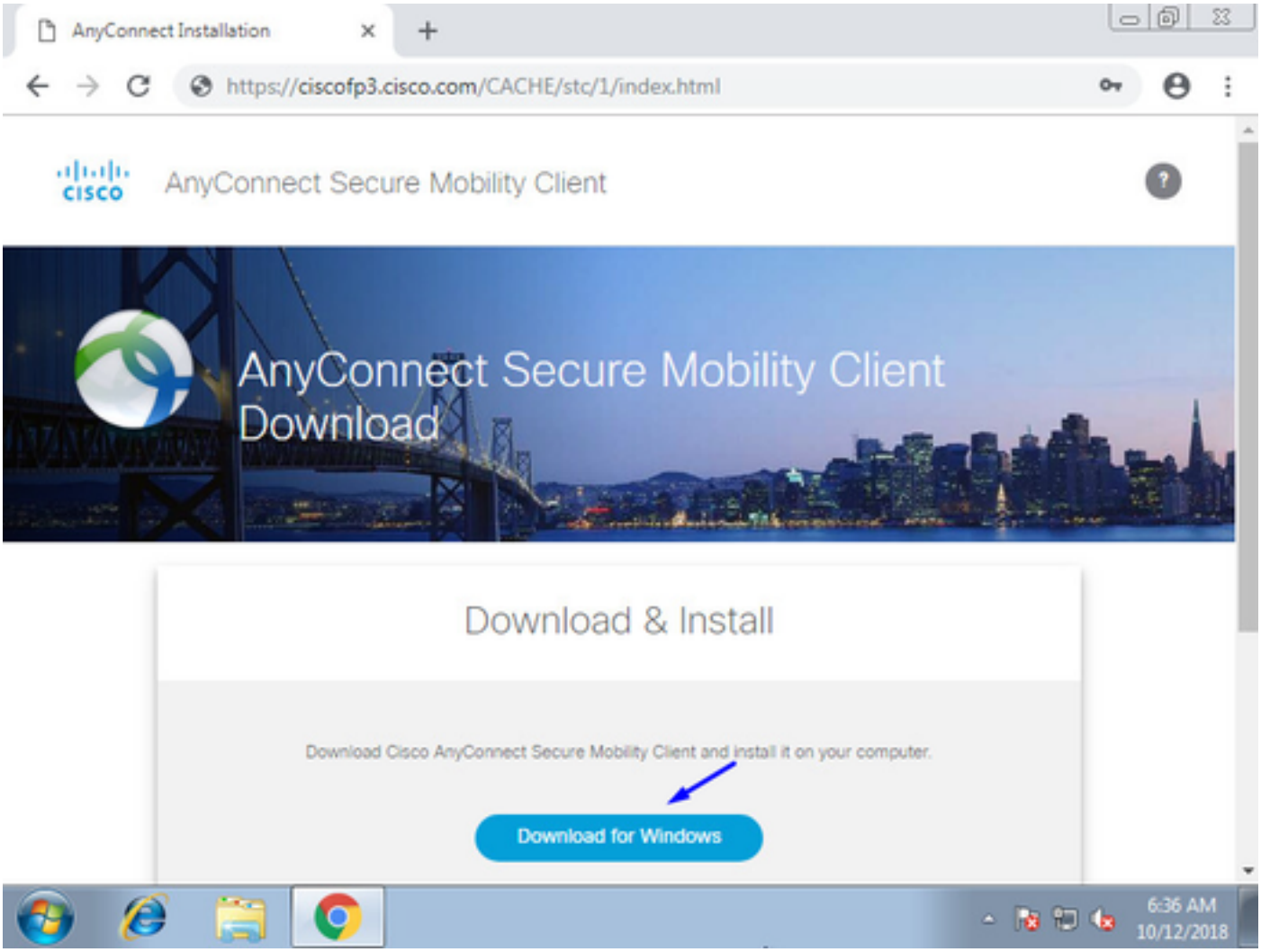
Open uw browser op de Windows/Mac PC van de medewerker en ga naar het externe adres van uw FTD in uw browser



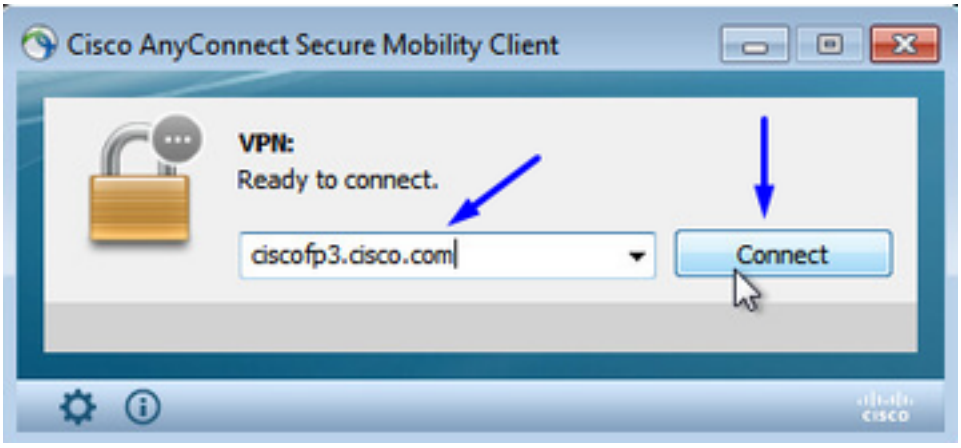
Typ uw gebruikersnaam en wachtwoord voor de actieve map



Klik op **Download**

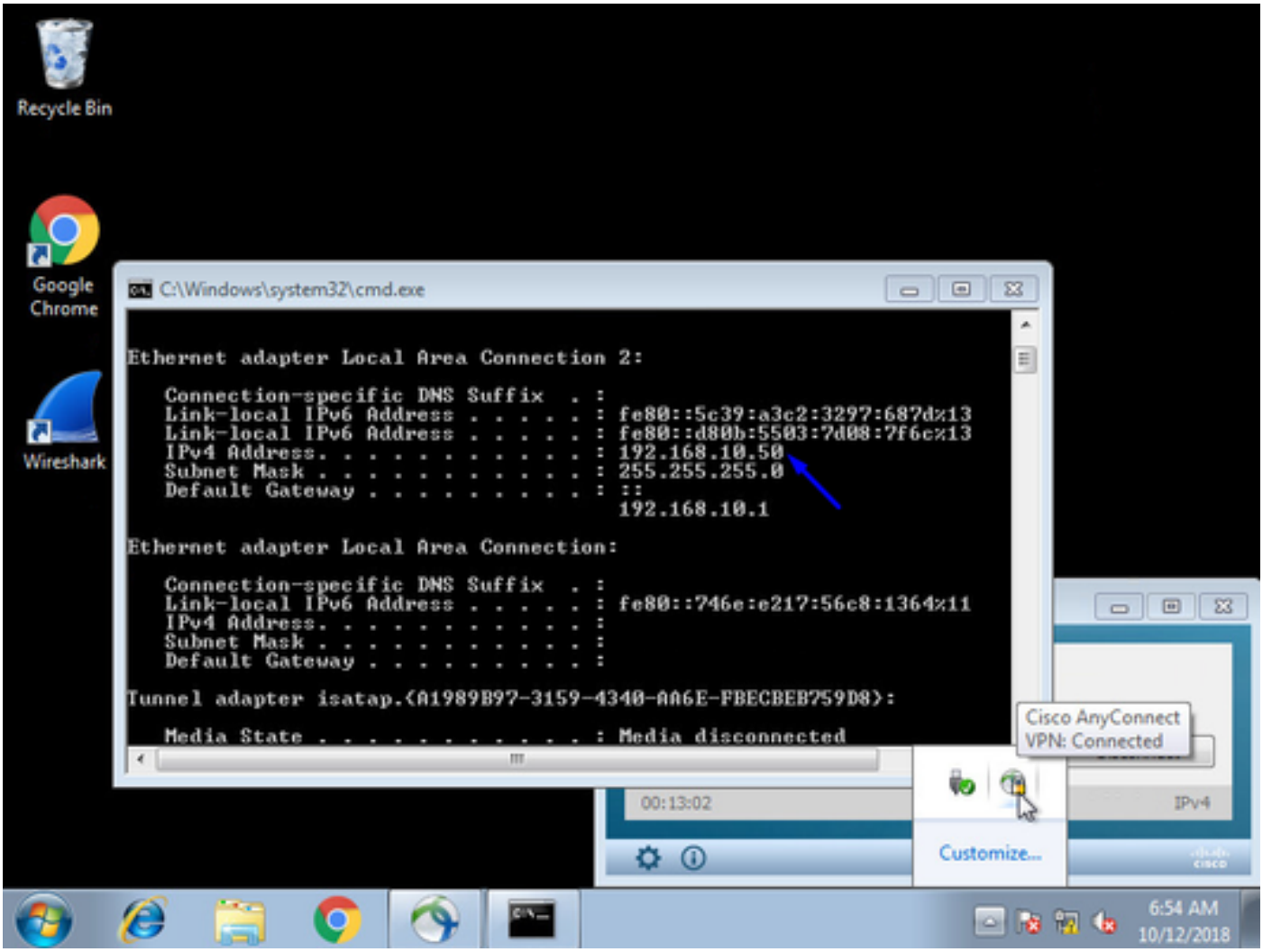


AnyConnect VPN Secure Mobility Client op Windows/Mac installeren en uitvoeren



Typ uw gebruikersnaam en wachtwoord voor de actieve map wanneer dit wordt gevraagd

U krijgt een IP-adres van de IP-adrespool die boven in stap 5 is gemaakt en een standaardgateway van de .1 in dat subprogramma



Verifiëren

FTD

Opdrachten weergeven

Controleer op FTD dat de eindgebruiker is aangesloten op AnyConnect VPN:

```
> show ip
System IP Addresses:
Interface          Name   IP address  Subnet mask     Method
GigabitEthernet0/0 inside 192.168.1.1 255.255.255.240 CONFIG
GigabitEthernet0/1 outside 203.0.113.2   255.255.255.240 CONFIG
Current IP Addresses:
Interface          Name   IP address  Subnet mask     Method
GigabitEthernet0/0 inside 192.168.1.1 255.255.255.240 CONFIG
GigabitEthernet0/1 outside 203.0.113.2   255.255.255.240 CONFIG

> show vpn-sessiondb detail anyconnect
Session Type: AnyConnect Detailed
Username : jsmith Index : 2
Assigned IP : 192.168.10.50 Public IP : 198.51.100.2
Protocol : AnyConnect-Parent SSL-Tunnel DTLS-Tunnel
License : AnyConnect Premium
Encryption : AnyConnect-Parent: (1)none SSL-Tunnel: (1)AES-GCM-256 DTLS-Tunnel: (1)AES256
```

```
Hashing : AnyConnect-Parent: (1)none SSL-Tunnel: (1)SHA384 DTLS-Tunnel: (1)SHA1
Bytes Tx : 18458 Bytes Rx : 2706024
Pkts Tx : 12 Pkts Rx : 50799
Pkts Tx Drop : 0 Pkts Rx Drop : 0
Group Policy : DfltGrpPolicy Tunnel Group : FTDAnyConnectVPN
Login Time : 15:08:19 UTC Wed Oct 10 2018
Duration : 0h:30m:11s
Inactivity : 0h:00m:00s
VLAN Mapping : N/A VLAN : none
Audt Sess ID : 0ac9d68a000020005bbe15e3
Security Grp : none Tunnel Zone : 0

AnyConnect-Parent Tunnels: 1
SSL-Tunnel Tunnels: 1
DTLS-Tunnel Tunnels: 1

AnyConnect-Parent:
Tunnel ID : 2.1
Public IP : 198.51.100.2
Encryption : none Hashing : none
TCP Src Port : 53956 TCP Dst Port : 443
Auth Mode : userPassword
Idle Time Out: 30 Minutes Idle TO Left : 0 Minutes
Client OS : win
Client OS Ver: 6.1.7601 Service Pack 1
Client Type : AnyConnect
Client Ver : Cisco AnyConnect VPN Agent for Windows 4.6.03049
Bytes Tx : 10572 Bytes Rx : 289
Pkts Tx : 6 Pkts Rx : 0
Pkts Tx Drop : 0 Pkts Rx Drop : 0

SSL-Tunnel:
Tunnel ID : 2.2
Assigned IP : 192.168.10.50 Public IP : 198.51.100.2
Encryption : AES-GCM-256 Hashing : SHA384
Ciphersuite : ECDHE-RSA-AES256-GCM-SHA384
Encapsulation: TLSv1.2 TCP Src Port : 54634
TCP Dst Port : 443 Auth Mode : userPassword
Idle Time Out: 30 Minutes Idle TO Left : 29 Minutes
Client OS : Windows
Client Type : SSL VPN Client
Client Ver : Cisco AnyConnect VPN Agent for Windows 4.6.03049
Bytes Tx : 7886 Bytes Rx : 2519
Pkts Tx : 6 Pkts Rx : 24
Pkts Tx Drop : 0 Pkts Rx Drop : 0

DTLS-Tunnel:
Tunnel ID : 2.3
Assigned IP : 192.168.10.50 Public IP : 198.51.100.2
Encryption : AES256 Hashing : SHA1
Ciphersuite : DHE-RSA-AES256-SHA
Encapsulation: DTLSv1.0 UDP Src Port : 61113
UDP Dst Port : 443 Auth Mode : userPassword
Idle Time Out: 30 Minutes Idle TO Left : 30 Minutes
Client OS : Windows
Client Type : DTLS VPN Client
Client Ver : Cisco AnyConnect VPN Agent for Windows 4.6.03049
Bytes Tx : 0 Bytes Rx : 2703216
Pkts Tx : 0 Pkts Rx : 50775
Pkts Tx Drop : 0 Pkts Rx Drop : 0
```

Zodra u op de Windows 7 PC bent en op 'Koppelen' klikt op Cisco AnyConnect-client, krijgt u:

```
> show vpn-sessiondb detail anyconnect
INFO: There are presently no active sessions
```

Bijleggen

Hoe een werkopname er uitziet op Outside Interface wanneer u op AnyConnect Client klikt

Voorbeeld:
De openbare IP van de eindgebruiker zal bijvoorbeeld het openbare IP van hun router thuis zijn

```
ciscofp3# capture capin interface outside trace detail trace-count 100 match ip any host
```

```
<now hit Connect on AnyConnect Client from employee PC>
ciscofp3# show cap
capture capin type raw-data trace detail trace-count 100 interface outside [Buffer Full - 524153
bytes]
match ip any host 198.51.100.2
```

Bekijk de pakketten die vanuit de pc van de eindgebruiker naar de buiteninterface van de FTD zijn gekomen om er zeker van te zijn dat ze op onze buiteninterface op FTD aankomen:

```
ciscofp3# show cap capin
2375 packets captured
1: 17:05:56.580994       198.51.100.2.55928 > 203.0.113.2.443: S 2933933902:2933933902(0) win
8192 <mss 1460,nop,wscale 8,nop,nop,sackOK>
2: 17:05:56.581375       203.0.113.2.443 > 198.51.100.2.55928: S 430674106:430674106(0) ack
2933933903 win 32768 <mss 1460>
3: 17:05:56.581757       198.51.100.2.55928 > 203.0.113.2.443: . ack 430674107 win 64240
4: 17:05:56.582382       198.51.100.2.55928 > 203.0.113.2.443: P 2933933903:2933934036(133) ack
430674107 win 64240
5: 17:05:56.582458       203.0.113.2.443 > 198.51.100.2.55928: . ack 2933934036 win 32768
6: 17:05:56.582733       203.0.113.2.443 > 198.51.100.2.55928: P 430674107:430675567(1460) ack
2933934036 win 32768
7: 17:05:56.790211       198.51.100.2.55928 > 203.0.113.2.443: . ack 430675567 win 64240
8: 17:05:56.790349       203.0.113.2.443 > 198.51.100.2.55928: P 430675567:430676672(1105) ack
2933934036 win 32768
9: 17:05:56.791691       198.51.100.2.55928 > 203.0.113.2.443: P 2933934036:2933934394(358) ack
430676672 win 63135
10: 17:05:56.794911       203.0.113.2.443 > 198.51.100.2.55928: P 430676672:430676763(91) ack
2933934394 win 32768
11: 17:05:56.797077       198.51.100.2.55928 > 203.0.113.2.443: P 2933934394:2933934703(309) ack
430676763 win 63044
12: 17:05:56.797169       203.0.113.2.443 > 198.51.100.2.55928: . ack 2933934703 win 32768
13: 17:05:56.797199       198.51.100.2.55928 > 203.0.113.2.443: P 2933934703:2933935524(821) ack
430676763 win 63044
14: 17:05:56.797276       203.0.113.2.443 > 198.51.100.2.55928: . ack 2933935524 win 32768
15: 17:05:56.798634       203.0.113.2.443 > 198.51.100.2.55928: P 430676763:430677072(309) ack
2933935524 win 32768
16: 17:05:56.798786       203.0.113.2.443 > 198.51.100.2.55928: P 430677072:430677829(757) ack
2933935524 win 32768
17: 17:05:56.798817       203.0.113.2.443 > 198.51.100.2.55928: P 430677829:430677898(69) ack
2933935524 win 32768
18: 17:05:56.799397       198.51.100.2.55928 > 203.0.113.2.443: . ack 430677898 win 64240
19: 17:05:56.810215       198.51.100.2.55928 > 203.0.113.2.443: P 2933935524:2933935593(69) ack
430677898 win 64240
20: 17:05:56.810398       203.0.113.2.443 > 198.51.100.2.55928: . ack 2933935593 win 32768
21: 17:05:56.810428       198.51.100.2.55928 > 203.0.113.2.443: F 2933935593:2933935593(0) ack
```

```
430677898 win 64240
22: 17:05:56.810489       203.0.113.2.443 > 198.51.100.2.55928: . ack 2933935594 win 32768
23: 17:05:56.810627       203.0.113.2.443 > 198.51.100.2.55928: FP 430677898:430677898(0) ack
2933935594 win 32768
24: 17:05:56.811008       198.51.100.2.55928 > 203.0.113.2.443: . ack 430677899 win 64240
25: 17:05:59.250566       198.51.100.2.56228 > 203.0.113.2.443: S 2614357960:2614357960(0) win
8192 <mss 1460,nop,wscale 8,nop,nop,sackOK>
26: 17:05:59.250963       203.0.113.2.443 > 198.51.100.2.56228: S 3940915253:3940915253(0) ack
2614357961 win 32768 <mss 1460>
27: 17:05:59.251406       198.51.100.2.56228 > 203.0.113.2.443: . ack 3940915254 win 64240
28: 17:05:59.252062       198.51.100.2.56228 > 203.0.113.2.443: P 2614357961:2614358126(165) ack
3940915254 win 64240
29: 17:05:59.252138       203.0.113.2.443 > 198.51.100.2.56228: . ack 2614358126 win 32768
30: 17:05:59.252458       203.0.113.2.443 > 198.51.100.2.56228: P 3940915254:3940915431(177) ack
2614358126 win 32768
31: 17:05:59.253450       198.51.100.2.56228 > 203.0.113.2.443: P 2614358126:2614358217(91) ack
3940915431 win 64063
32: 17:05:59.253679       203.0.113.2.443 > 198.51.100.2.56228: . ack 2614358217 win 32768
33: 17:05:59.255235       198.51.100.2.56228 > 203.0.113.2.443: P 2614358217:2614358526(309) ack
3940915431 win 64063
34: 17:05:59.255357       203.0.113.2.443 > 198.51.100.2.56228: . ack 2614358526 win 32768
35: 17:05:59.255388       198.51.100.2.56228 > 203.0.113.2.443: P 2614358526:2614359555(1029)
ack 3940915431 win 64063
36: 17:05:59.255495       203.0.113.2.443 > 198.51.100.2.56228: . ack 2614359555 win 32768
37: 17:05:59.400110       203.0.113.2.443 > 198.51.100.2.56228: P 3940915431:3940915740(309) ack
2614359555 win 32768
38: 17:05:59.400186       203.0.113.2.443 > 198.51.100.2.56228: P 3940915740:3940917069(1329)
ack 2614359555 win 32768
39: 17:05:59.400675       198.51.100.2.56228 > 203.0.113.2.443: . ack 3940917069 win 64240
40: 17:05:59.400736       203.0.113.2.443 > 198.51.100.2.56228: P 3940917069:3940918529(1460)
ack 2614359555 win 32768
41: 17:05:59.400751       203.0.113.2.443 > 198.51.100.2.56228: P 3940918529:3940919979(1450)
ack 2614359555 win 32768
42: 17:05:59.401544       198.51.100.2.56228 > 203.0.113.2.443: . ack 3940919979 win 64240
43: 17:05:59.401605       203.0.113.2.443 > 198.51.100.2.56228: P 3940919979:3940921439(1460)
ack 2614359555 win 32768
44: 17:05:59.401666       203.0.113.2.443 > 198.51.100.2.56228: P 3940921439:3940922899(1460)
ack 2614359555 win 32768
45: 17:05:59.401727       203.0.113.2.443 > 198.51.100.2.56228: P 3940922899:3940923306(407) ack
2614359555 win 32768
46: 17:05:59.401743       203.0.113.2.443 > 198.51.100.2.56228: P 3940923306:3940923375(69) ack
2614359555 win 32768
47: 17:05:59.402185       198.51.100.2.56228 > 203.0.113.2.443: . ack 3940923375 win 64240
48: 17:05:59.402475       198.51.100.2.56228 > 203.0.113.2.443: P 2614359555:2614359624(69) ack
3940923375 win 64240
49: 17:05:59.402597       203.0.113.2.443 > 198.51.100.2.56228: . ack 2614359624 win 32768
50: 17:05:59.402628       198.51.100.2.56228 > 203.0.113.2.443: F 2614359624:2614359624(0) ack
3940923375 win 64240
51: 17:05:59.402673       203.0.113.2.443 > 198.51.100.2.56228: . ack 2614359625 win 32768
52: 17:05:59.402765       203.0.113.2.443 > 198.51.100.2.56228: FP 3940923375:3940923375(0) ack
2614359625 win 32768
53: 17:05:59.413384       198.51.100.2.56228 > 203.0.113.2.443: . ack 3940923376 win 64240
54: 17:05:59.555665       198.51.100.2.56280 > 203.0.113.2.443: S 1903869753:1903869753(0) win
8192 <mss 1460,nop,wscale 8,nop,nop,sackOK>
55: 17:05:59.556154       203.0.113.2.443 > 198.51.100.2.56280: S 2583094766:2583094766(0) ack
1903869754 win 32768 <mss 1460>
56: 17:05:59.556627       198.51.100.2.56280 > 203.0.113.2.443: . ack 2583094767 win 64240
57: 17:05:59.560502       198.51.100.2.56280 > 203.0.113.2.443: P 1903869754:1903869906(152) ack
2583094767 win 64240
58: 17:05:59.560578       203.0.113.2.443 > 198.51.100.2.56280: . ack 1903869906 win 32768
59: 17:05:59.563996       203.0.113.2.443 > 198.51.100.2.56280: P 2583094767:2583096227(1460)
ack 1903869906 win 32768
60: 17:05:59.780034       198.51.100.2.56280 > 203.0.113.2.443: . ack 2583096227 win 64240
61: 17:05:59.780141       203.0.113.2.443 > 198.51.100.2.56280: P 2583096227:2583097673(1446)
```

```
ack 1903869906 win 32768
62: 17:05:59.998376       198.51.100.2.56280 > 203.0.113.2.443: . ack 2583097673 win 62794
63: 17:06:14.809253       198.51.100.2.56280 > 203.0.113.2.443: P 1903869906:1903870032(126) ack
2583097673 win 62794
64: 17:06:14.809970       203.0.113.2.443 > 198.51.100.2.56280: P 2583097673:2583097724(51) ack
1903870032 win 32768
65: 17:06:14.815768       198.51.100.2.56280 > 203.0.113.2.443: P 1903870032:1903870968(936) ack
2583097724 win 64240
66: 17:06:14.815860       203.0.113.2.443 > 198.51.100.2.56280: . ack 1903870968 win 32768
67: 17:06:14.816913       203.0.113.2.443 > 198.51.100.2.56280: P 2583097724:2583099184(1460)
ack 1903870968 win 32768
68: 17:06:14.816928       203.0.113.2.443 > 198.51.100.2.56280: P 2583099184:2583099306(122) ack
1903870968 win 32768
69: 17:06:14.816959       203.0.113.2.443 > 198.51.100.2.56280: P 2583099306:2583100766(1460)
ack 1903870968 win 32768
70: 17:06:14.816974       203.0.113.2.443 > 198.51.100.2.56280: P 2583100766:2583100888(122) ack
1903870968 win 32768
71: 17:06:14.816989       203.0.113.2.443 > 198.51.100.2.56280: P 2583100888:2583102142(1254)
ack 1903870968 win 32768
72: 17:06:14.817554       198.51.100.2.56280 > 203.0.113.2.443: . ack 2583102142 win 64240
73: 17:06:14.817615       203.0.113.2.443 > 198.51.100.2.56280: P 2583102142:2583103602(1460)
ack 1903870968 win 32768
74: 17:06:14.817630       203.0.113.2.443 > 198.51.100.2.56280: P 2583103602:2583103930(328) ack
1903870968 win 32768
75: 17:06:14.817630       203.0.113.2.443 > 198.51.100.2.56280: P 2583103930:2583104052(122) ack
1903870968 win 32768
76: 17:06:14.817645       203.0.113.2.443 > 198.51.100.2.56280: P 2583104052:2583105512(1460)
ack 1903870968 win 32768
77: 17:06:14.817645       203.0.113.2.443 > 198.51.100.2.56280: P 2583105512:2583105634(122) ack
1903870968 win 32768
78: 17:06:14.817660       203.0.113.2.443 > 198.51.100.2.56280: P 2583105634:2583105738(104) ack
1903870968 win 32768
79: 17:06:14.818088       198.51.100.2.56280 > 203.0.113.2.443: . ack 2583105512 win 64240
80: 17:06:14.818530       198.51.100.2.56280 > 203.0.113.2.443: . ack 2583105738 win 64014
81: 17:06:18.215122       198.51.100.2.58944 > 203.0.113.2.443:  udp 99
82: 17:06:18.215610       203.0.113.2.443 > 198.51.100.2.58944:  udp 48
83: 17:06:18.215671       198.51.100.2.56280 > 203.0.113.2.443: P 1903870968:1903872025(1057)
ack 2583105738 win 64014
84: 17:06:18.215763       203.0.113.2.443 > 198.51.100.2.56280: . ack 1903872025 win 32768
85: 17:06:18.247011       198.51.100.2.58944 > 203.0.113.2.443:  udp 119
86: 17:06:18.247728       203.0.113.2.443 > 198.51.100.2.58944:  udp 188
87: 17:06:18.249285       198.51.100.2.58944 > 203.0.113.2.443:  udp 93
88: 17:06:18.272309       198.51.100.2.58944 > 203.0.113.2.443:  udp 93
89: 17:06:18.277680       198.51.100.2.58944 > 203.0.113.2.443:  udp 93
90: 17:06:18.334501       198.51.100.2.58944 > 203.0.113.2.443:  udp 221
91: 17:06:18.381541       198.51.100.2.58944 > 203.0.113.2.443:  udp 109
92: 17:06:18.443565       198.51.100.2.58944 > 203.0.113.2.443:  udp 109
93: 17:06:18.786702       198.51.100.2.58944 > 203.0.113.2.443:  udp 157
94: 17:06:18.786870       198.51.100.2.58944 > 203.0.113.2.443:  udp 157
95: 17:06:18.786931       198.51.100.2.58944 > 203.0.113.2.443:  udp 157
96: 17:06:18.952755       198.51.100.2.58944 > 203.0.113.2.443:  udp 109
97: 17:06:18.968272       198.51.100.2.58944 > 203.0.113.2.443:  udp 109
98: 17:06:18.973902       198.51.100.2.58944 > 203.0.113.2.443:  udp 109
99: 17:06:18.973994       198.51.100.2.58944 > 203.0.113.2.443:  udp 109
100: 17:06:18.989267       198.51.100.2.58944 > 203.0.113.2.443:  udp 109
```

Bekijk de details van wat er gebeurt met het pakket dat afkomstig is van de eindgebruiker binnen de firewall

```
ciscofp3# show cap capin packet-number 1 trace detail
```

```
2943 packets captured

1: 17:05:56.580994 006b.f1e7.6c5e 000c.294f.ac84 0x0800 Length: 66
198.51.100.2.55928 > 203.0.113.2.443: S [tcp sum ok] 2933933902:2933933902(0) win 8192 <mss
1460,nop,wscale 8,nop,nop,sackOK> (DF) (ttl 127, id 31008)

Phase: 1
Type: CAPTURE
Subtype:
Result: ALLOW
Config:
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace13beec90, priority=13, domain=capture, deny=false
hits=2737, user_data=0x2ace1232af40, cs_id=0x0, l3_type=0x0
src mac=0000.0000.0000, mask=0000.0000.0000
dst mac=0000.0000.0000, mask=0000.0000.0000
input_ifc=outside, output_ifc=any

Phase: 2
Type: ACCESS-LIST
Subtype:
Result: ALLOW
Config:
Implicit Rule
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace107c8480, priority=1, domain=permit, deny=false
hits=183698, user_data=0x0, cs_id=0x0, l3_type=0x8
src mac=0000.0000.0000, mask=0000.0000.0000
dst mac=0000.0000.0000, mask=0100.0000.0000
input_ifc=outside, output_ifc=any

Phase: 3
Type: ROUTE-LOOKUP
Subtype: Resolve Egress Interface
Result: ALLOW
Config:
Additional Information:
found next-hop 203.0.113.2 using egress ifc identity

Phase: 4
Type: ACCESS-LIST
Subtype:
Result: ALLOW
Config:
Implicit Rule
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace1199f680, priority=119, domain=permit, deny=false
hits=68, user_data=0x0, cs_id=0x0, flags=0x0, protocol=6
src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any
dst ip/id=0.0.0.0, mask=0.0.0.0, port=443, tag=any, dscp=0x0
input_ifc=outside, output_ifc=identity

Phase: 5
Type: CONN-SETTINGS
Subtype:
Result: ALLOW
Config:
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace1199efd0, priority=8, domain=conn-set, deny=false
hits=68, user_data=0x2ace1199e5d0, cs_id=0x0, reverse, flags=0x0, protocol=6
```

```
src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any
dst ip/id=0.0.0.0, mask=0.0.0.0, port=443, tag=any, dscp=0x0
input_ifc=outside, output_ifc=identity

Phase: 6
Type: NAT
Subtype: per-session
Result: ALLOW
Config:
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace0fa81330, priority=0, domain=nat-per-session, deny=false
hits=178978, user_data=0x0, cs_id=0x0, reverse, use_real_addr, flags=0x0, protocol=6
src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any
dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0
input_ifc=any, output_ifc=any

Phase: 7
Type: IP-OPTIONS
Subtype:
Result: ALLOW
Config:
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace107cdb00, priority=0, domain=inspect-ip-options, deny=true
hits=174376, user_data=0x0, cs_id=0x0, reverse, flags=0x0, protocol=0
src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any
dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0
input_ifc=outside, output_ifc=any

Phase: 8
Type: CLUSTER-REDIRECT
Subtype: cluster-redirect
Result: ALLOW
Config:
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace107c90c0, priority=208, domain=cluster-redirect, deny=false
hits=78, user_data=0x0, cs_id=0x0, flags=0x0, protocol=0
src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any
dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0
input_ifc=outside, output_ifc=identity

Phase: 9
Type: TCP-MODULE
Subtype: webvpn
Result: ALLOW
Config:
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace1199df20, priority=13, domain=soft-np-tcp-module, deny=false
hits=58, user_data=0x2ace061efb00, cs_id=0x0, reverse, flags=0x0, protocol=6
src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any
dst ip/id=0.0.0.0, mask=0.0.0.0, port=443, tag=any, dscp=0x0
input_ifc=outside, output_ifc=identity

Phase: 10
Type: VPN
Subtype: ipsec-tunnel-flow
Result: ALLOW
Config:
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace11d455e0, priority=13, domain=ipsec-tunnel-flow, deny=true
```

```
hits=87214, user_data=0x0, cs_id=0x0, flags=0x0, protocol=0
src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any
dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0
input_ifc=outside, output_ifc=any

Phase: 11
Type: CAPTURE
Subtype:
Result: ALLOW
Config:
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace11da7000, priority=13, domain=capture, deny=false
hits=635, user_data=0x2ace1232af40, cs_id=0x2ace11f21620, reverse, flags=0x0, protocol=0
src ip/id=198.51.100.2, mask=255.255.255.255, port=0, tag=any
dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0
input_ifc=outside, output_ifc=any

Phase: 12
Type: CAPTURE
Subtype:
Result: ALLOW
Config:
Additional Information:
Reverse Flow based lookup yields rule:
out id=0x2ace10691780, priority=13, domain=capture, deny=false
hits=9, user_data=0x2ace1232af40, cs_id=0x2ace11f21620, reverse, flags=0x0, protocol=0
src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any
dst ip/id=198.51.100.2, mask=255.255.255.255, port=0, tag=any, dscp=0x0
input_ifc=any, output_ifc=outside

Phase: 13
Type: FLOW-CREATION
Subtype:
Result: ALLOW
Config:
Additional Information:
New flow created with id 87237, packet dispatched to next module
Module information for forward flow ...
snp_fp_inspect_ip_options
snp_fp_tcp_normalizer
snp_fp_tcp_mod
snp_fp_adjacency
snp_fp_fragment
snp_fp_drop

Module information for reverse flow ...
snp_fp_inspect_ip_options
snp_fp_tcp_normalizer
snp_fp_adjacency
snp_fp_fragment
snp_ifc_stat

Result:
input-interface: outside
input-status: up
input-line-status: up
output-interface: NP Identity Ifc
Action: allow

1 packet shown
ciscofp3#
```

Kopieert de opname naar schijf0: van uw FTD. U kunt het vervolgens downloaden via SCP, FTP

of TFTP

(of vanuit FirePOWER Management Center Web UI > Systeem > Health > Health Monitor > Klik op Advanced Problemen opsporen > Klik op het tabblad Downloadbestand)

```
ciscofp3# copy /pcap capture:capin disk0:/capin.pcap
Source capture name [capin]? <hit Enter>
Destination filename [capin.pcap]? <hit Enter>
!!!!!!!!!!!!!!!
207 packets copied in 0.0 secs

ciscofp3# dir
Directory of disk0:/
122 -rwx 198 05:13:44 Apr 01 2018 lina_phase1.log
49 drwx 4096 21:42:20 Jun 30 2018 log
53 drwx 4096 21:42:36 Jun 30 2018 coredumpinfo
110 drwx 4096 14:59:51 Oct 10 2018 csm
123 -rwx 21074 01:26:44 Oct 10 2018 backup-config.cfg
124 -rwx 21074 01:26:44 Oct 10 2018 startup-config
125 -rwx 20354 01:26:44 Oct 10 2018 modified-config.cfg
160 -rwx 60124 17:06:22 Oct 10 2018 capin.pcap

ciscofp3# copy disk0:/capin.pcap tftp:/
Source filename [capin.pcap]? <hit Enter>
Address or name of remote host []? 192.168.1.25 (your TFTP server IP address (your PC if using
tftpd32 or Solarwinds TFTP Server))
Destination filename [capin.pcap]? <hit Enter>
113645 bytes copied in 21.800 secs (5411 bytes/sec)
ciscofp3#

(or from FirePOWER Management Center Web GUI >> System >> Health >> Health Monitor >> click
Advanced Troubleshooting >> click Download File tab)
```

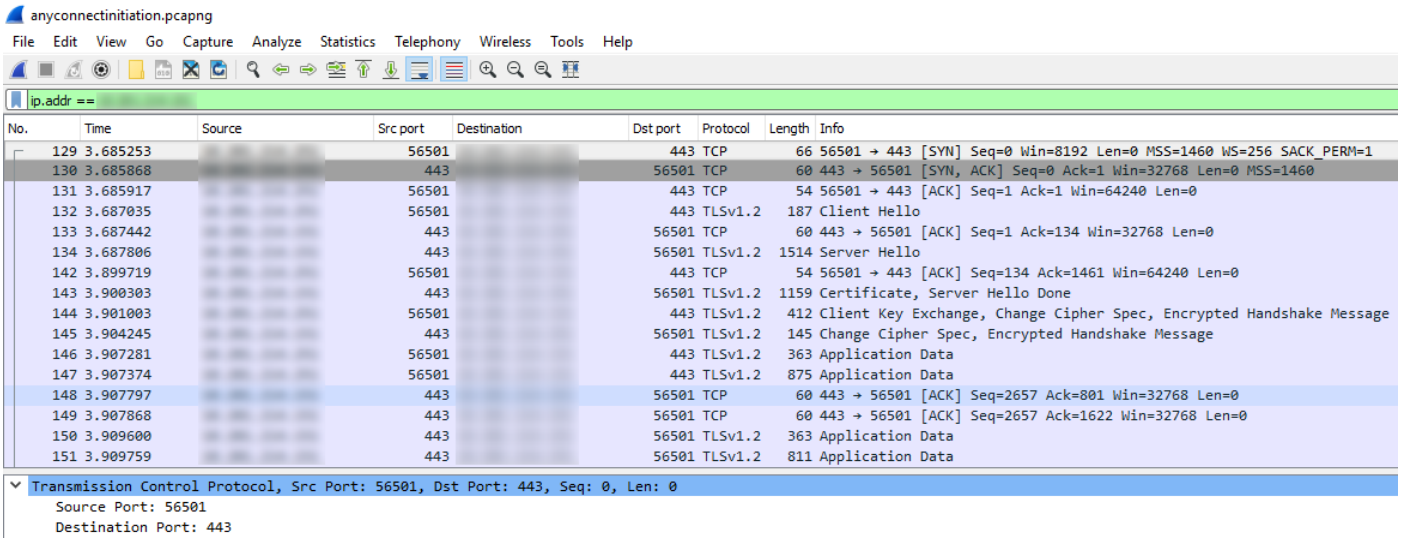
Controleer of de NAT-regel correct is ingesteld:

```
ciscofp3# packet-tracer input outside tcp 192.168.10.50 1234 192.168.1.30 443 detailed

Phase: 1
Type: CAPTURE
Subtype:
Result: ALLOW
Config:
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace0fa90e70, priority=13, domain=capture, deny=false
hits=11145169, user_data=0x2ace120c4910, cs_id=0x0, l3_type=0x0
src mac=0000.0000.0000, mask=0000.0000.0000
dst mac=0000.0000.0000, mask=0000.0000.0000
input_ifc=outside, output_ifc=any

Phase: 2
Type: ACCESS-LIST
Subtype:
Result: ALLOW
Config:
Implicit Rule
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace107c8480, priority=1, domain=permit, deny=false
hits=6866095, user_data=0x0, cs_id=0x0, l3_type=0x8
src mac=0000.0000.0000, mask=0000.0000.0000
```

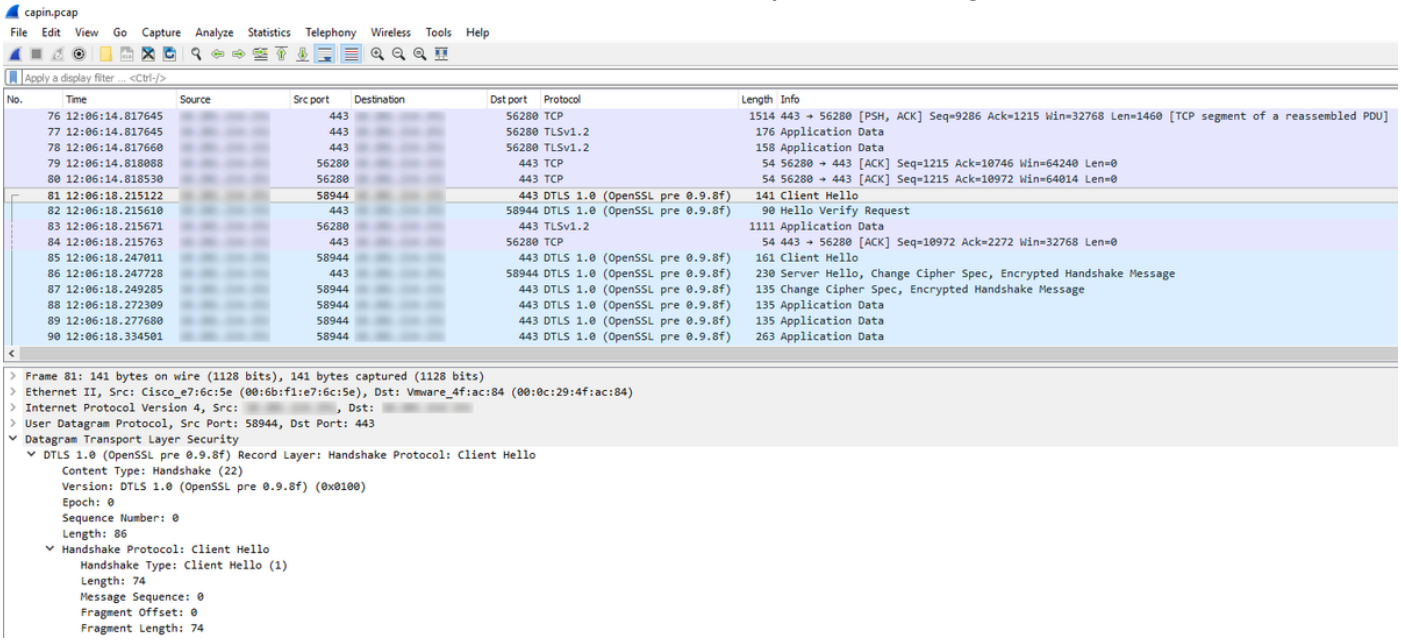
```
dst mac=0000.0000.0000, mask=0100.0000.0000
input_ifc=outside, output_ifc=any

Phase: 3
Type: ROUTE-LOOKUP
Subtype: Resolve Egress Interface
Result: ALLOW
Config:
Additional Information:
found next-hop 192.168.1.30 using egress ifc inside

Phase: 4
Type: UN-NAT
Subtype: static
Result: ALLOW
Config:
nat (inside,outside) source static inside-subnet inside-subnet destination static outside-
subnet-anyconnect-po ol outside-subnet-anyconnect-pool no-proxy-arp route-lookup
Additional Information:
NAT divert to egress interface inside
Untranslate 192.168.1.30/443 to 192.168.1.30/443

Phase: 5
Type: ACCESS-LIST
Subtype: log
Result: ALLOW
Config:
access-group CSM_FW_ACL_ global
access-list CSM_FW_ACL_ advanced trust ip ifc outside any any rule-id 268436481 event-log flow-
end
access-list CSM_FW_ACL_ remark rule-id 268436481: PREFILTER POLICY:
Example_Company_Prefilter_Policy
access-list CSM_FW_ACL_ remark rule-id 268436481: RULE: AllowtoVPNOutsideinterface
Additional Information:
Forward Flow based lookup yields rule:
in id=0x2ace0fa8f4e0, priority=12, domain=permit, trust
hits=318637, user_data=0x2ace057b9a80, cs_id=0x0, use_real_addr, flags=0x0, protocol=0
src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=outside
dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, ifc=any, vlan=0, dscp=0x0
input_ifc=any, output_ifc=any

...

Phase: 7
Type: NAT
Subtype:
Result: ALLOW
Config:
nat (inside,outside) source static inside-subnet inside-subnet destination static outside-
subnet-anyconnect-po ol outside-subnet-anyconnect-pool no-proxy-arp route-lookup
Additional Information:
Static translate 192.168.10.50/1234 to 192.168.10.50/1234
Forward Flow based lookup yields rule:
in id=0x2ace11975cb0, priority=6, domain=nat, deny=false
hits=120, user_data=0x2ace0f29c4a0, cs_id=0x0, flags=0x0, protocol=0
src ip/id=192.168.10.0, mask=255.255.255.0, port=0, tag=any
dst ip/id=10.201.214.128, mask=255.255.255.240, port=0, tag=any, dscp=0x0
input_ifc=outside, output_ifc=inside

...
Phase: 10 Type: VPN Subtype: ipsec-tunnel-flow Result: ALLOW Config: Additional Information:
Forward Flow based lookup yields rule: in id=0x2ace11d455e0, priority=13, domain=ipsec-tunnel-
flow, deny=true hits=3276174, user_data=0x0, cs_id=0x0, flags=0x0, protocol=0 src ip/id=0.0.0.0,
mask=0.0.0.0, port=0, tag=any dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any, dscp=0x0
```

```
input_ifc=outside, output_ifc=any Phase: 11 Type: NAT Subtype: rpf-check Result: ALLOW Config:
nat (inside,outside) source static inside-subnet inside-subnet destination static outside-
subnet-anyconnect-po ol outside-subnet-anyconnect-pool no-proxy-arp route-lookup
Additional Information:
Forward Flow based lookup yields rule:
out id=0x2ace0d5a9800, priority=6, domain=nat-reverse, deny=false
hits=121, user_data=0x2ace1232a4c0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0
src ip/id=192.168.10.0, mask=255.255.255.0, port=0, tag=any
dst ip/id=10.201.214.128, mask=255.255.255.240, port=0, tag=any, dscp=0x0
input_ifc=outside, output_ifc=inside

...

Phase: 14
Type: FLOW-CREATION
Subtype:
Result: ALLOW
Config:
Additional Information:
New flow created with id 3279248, packet dispatched to next module

Module information for reverse flow ...
...

Phase: 15
Type: ROUTE-LOOKUP
Subtype: Resolve Egress Interface
Result: ALLOW
Config:
Additional Information:
found next-hop 192.168.1.30 using egress ifc inside

Result:
input-interface: outside
input-status: up
input-line-status: up
output-interface: inside
output-status: up
output-line-status: up
Action: allow

ciscofp3#
```

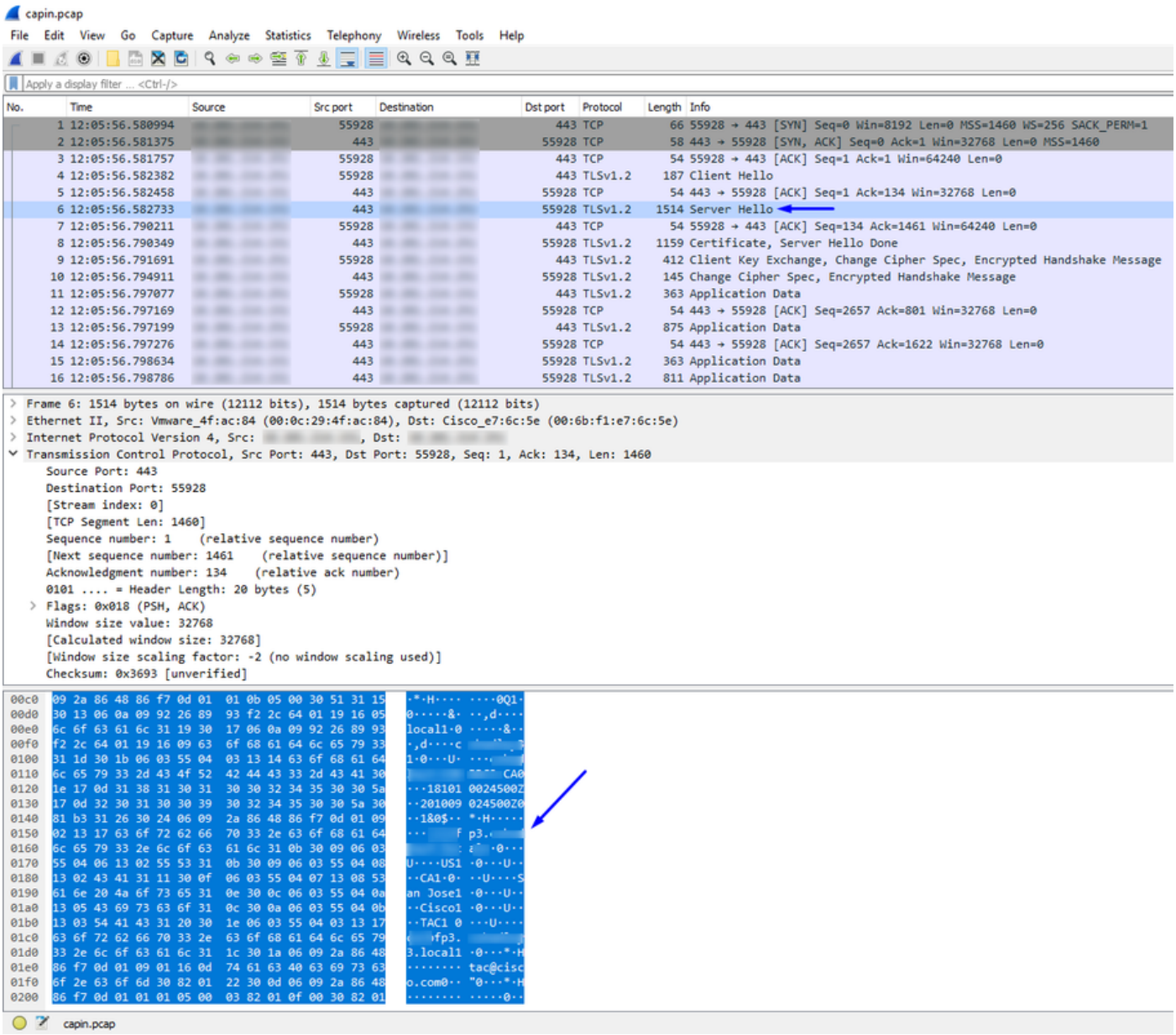
Opname op de PC waar de PC met succes is aangesloten, die via AnyConnect VPN op de FTD is aangesloten



U kunt ook zien dat de DTLS-tunnel later in dezelfde opname wordt gevormd

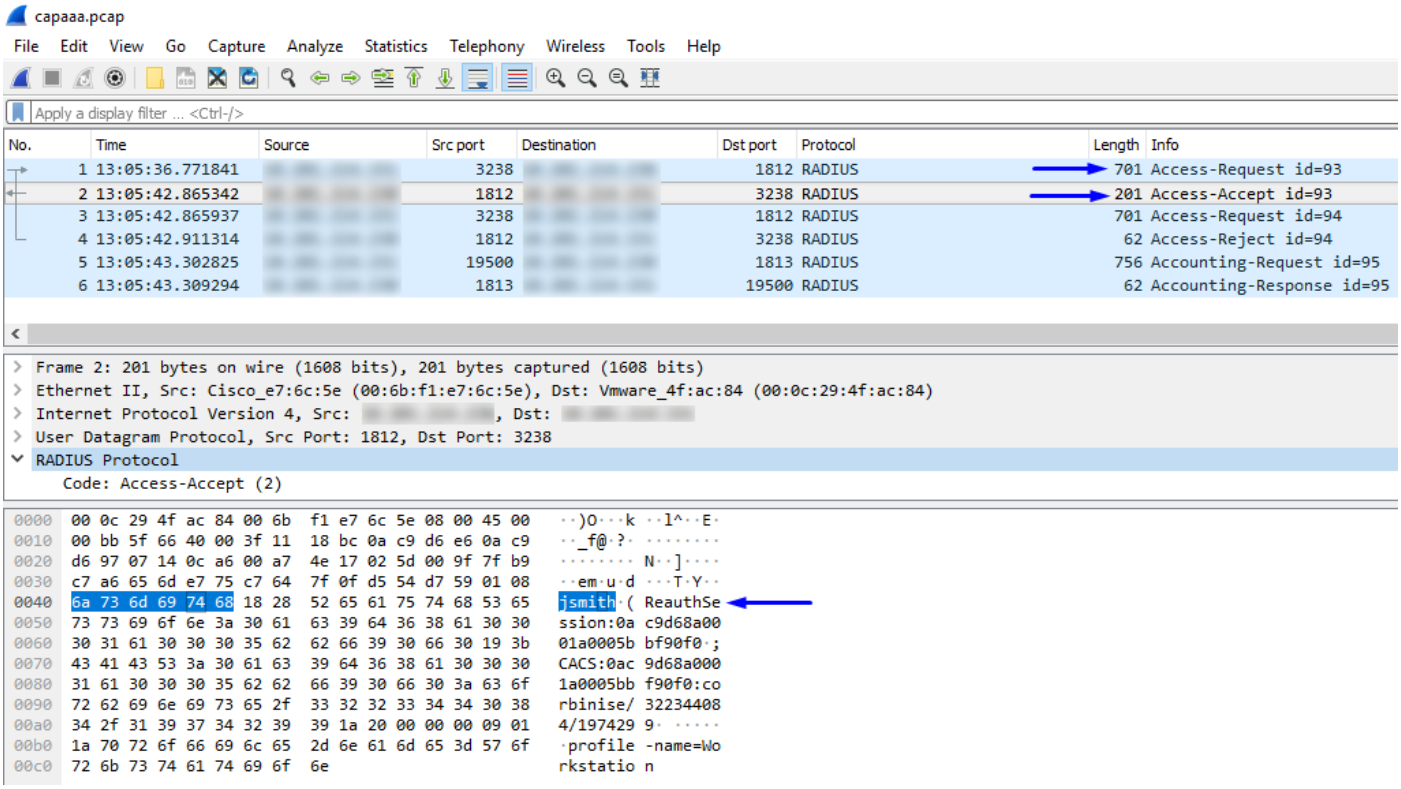


Opname op de buiteninterface van de FTD waarop de AnyConnect PC met succes wordt aangesloten, met VPN



Opmerking: U kunt het FTD VPN Server certificaat in het pakket van "Server Hallo" zien aangezien we verbinding maken met de externe interface van de FTD via VPN. De PC van de werknemer zal dit certificaat vertrouwen omdat de PC van de werknemer het certificaat van de Root CA op het heeft en het certificaat van de FTD VPN Server werd ondertekend door die zelfde CA van de Root.

Leg de FTD van de FTD vragende RADIUS-server vast als de gebruikersnaam + het wachtwoord juist is (Cisco ISE)

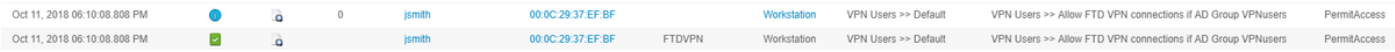


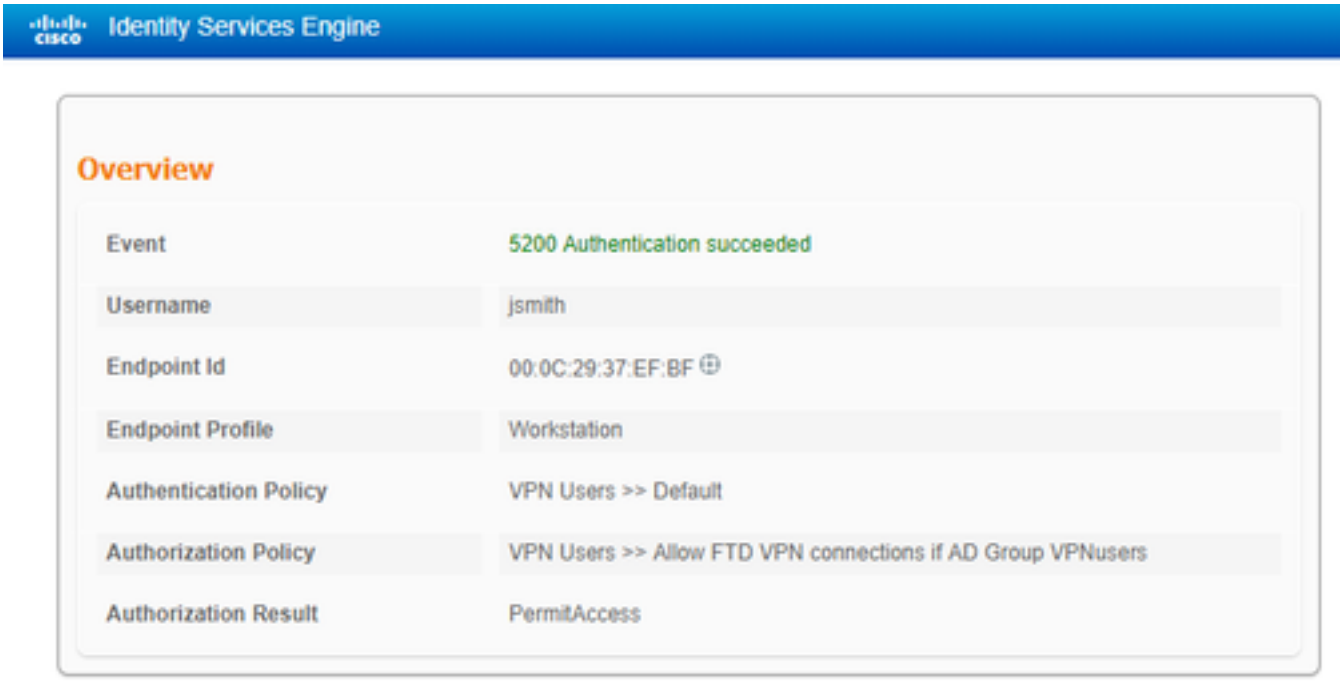
Zoals u hierboven kunt zien, krijgt onze VPN-verbinding een access-Accept en is onze AnyConnect VPN-client met succes verbonden met de FTD via VPN

Capture (CLI) van FTD waarin Cisco ISE wordt gevraagd of de gebruikersnaam + het wachtwoord geldig is (Controleer dus of de RADIUS-verzoeken succesvol verlopen tussen FTD en ISE en controleer of de interface weg is)

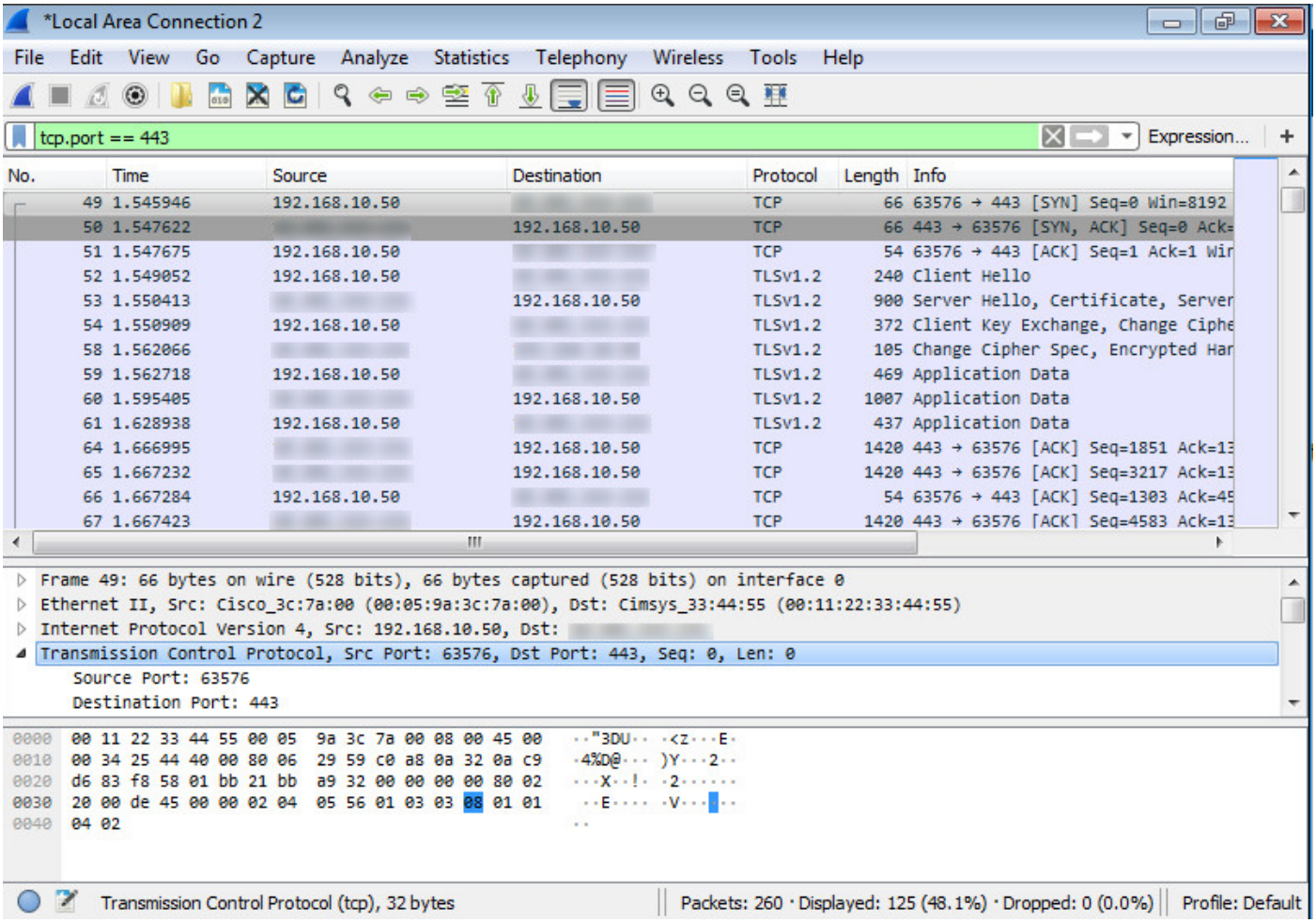
```
ciscofp3# capture capout interface inside trace detail trace-count 100 [Capturing - 35607 bytes]
ciscofp3# show cap
ciscofp3# show cap capout | i 192.168.1.10
37: 01:23:52.264512 192.168.1.1.3238 > 192.168.1.10.1812: udp 659
38: 01:23:52.310210 192.168.1.10.1812 > 192.168.1.1.3238: udp 159
39: 01:23:52.311064 192.168.1.1.3238 > 192.168.1.10.1812: udp 659
40: 01:23:52.326734 192.168.1.10.1812 > 192.168.1.1.3238: udp 20
82: 01:23:52.737663 192.168.1.1.19500 > 192.168.1.10.1813: udp 714
85: 01:23:52.744483 192.168.1.10.1813 > 192.168.1.1.19500: udp 20
```

Onder de Cisco ISE RADIUS-server toont dat de verificatie succesvol is. Klik op het vergrootglas om de details van de succesvolle authenticatie te zien





Opnemen op de AnyConnect-adapter van de PC van de medewerker die naar een website met interne gebruiker via HTTPS gaat (d.w.z. terwijl deze met succes VPN'd in staat is):



Debugs

Straal verwijderen

debug van webversie 25

Start 'debug Straal' opdracht op FTD diagnostic CLI (>systeemondersteuning voor diagnostiek-CLI) en druk 'Connect' op Windows/Mac PC op Cisco Any Connect Client

```
> system support diagnostic-cli
Attaching to Diagnostic CLI ... Press 'Ctrl+a then d' to detach.
ciscofp3> enable
Password: <hit enter>
ciscofp3# terminal monitor
ciscofp3# debug radius all
<hit Connect on Anyconnect client on PC>

radius mkreq: 0x15
alloc_rip 0x00002ace10875428
new request 0x15 --> 16 (0x00002ace10875428)
got user 'jsmith'
got password
add_req 0x00002ace10875428 session 0x15 id 16
RADIUS_REQUEST
radius.c: rad_mkpkt
rad_mkpkt: ip:source-ip=198.51.100.2

RADIUS packet decode (authentication request)

--------------------------------------
Raw packet data (length = 659).....
01 10 02 93 fb 19 19 df f6 b1 c7 3e 34 fc 88 ce | ...........>4...
75 38 2d 55 01 08 6a 73 6d 69 74 68 02 12 a0 83 | u8-U..jsmith....
c9 bd ad 72 07 d1 bc 24 34 9e 63 a1 f5 93 05 06 | ...r...$4.c.....
00 00 50 00 1e 10 31 30 2e 32 30 31 2e 32 31 34 | ..P...198.51.100.2
2e 31 35 31 1f 10 31 30 2e 32 30 31 2e 32 31 34 | .151..198.51.100.2
2e 32 35 31 3d 06 00 00 00 05 42 10 31 30 2e 32 | .4=.....B.198.
30 31 2e 32 31 34 2e 32 35 31 1a 23 00 00 00 09 | 51.100.2#....
01 1d 6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 | ..mdm-tlv=device
2d 70 6c 61 74 66 6f 72 6d 3d 77 69 6e 1a 2c 00 | -platform=win.,.
00 00 09 01 26 6d 64 6d 2d 74 6c 76 3d 64 65 76 | ....&mdm-tlv=dev
69 63 65 2d 6d 61 63 3d 30 30 2d 30 63 2d 32 39 | ice-mac=00-0c-29
2d 33 37 2d 65 66 2d 62 66 1a 33 00 00 00 09 01 | -37-ef-bf.3.....
2d 6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d | -mdm-tlv=device-
70 75 62 6c 69 63 2d 6d 61 63 3d 30 30 2d 30 63 | public-mac=00-0c
2d 32 39 2d 33 37 2d 65 66 2d 62 66 1a 3a 00 00 | -29-37-ef-bf.:..
00 09 01 34 6d 64 6d 2d 74 6c 76 3d 61 63 2d 75 | ...4mdm-tlv=ac-u
73 65 72 2d 61 67 65 6e 74 3d 41 6e 79 43 6f 6e | ser-agent=AnyCon
6e 65 63 74 20 57 69 6e 64 6f 77 73 20 34 2e 36 | nect Windows 4.6
2e 30 33 30 34 39 1a 3f 00 00 00 09 01 39 6d 64 | .03049.?.....9md
6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 6c 61 | m-tlv=device-pla
74 66 6f 72 6d 2d 76 65 72 73 69 6f 6e 3d 36 2e | tform-version=6.
31 2e 37 36 30 31 20 53 65 72 76 69 63 65 20 50 | 1.7601 Service P
61 63 6b 20 31 1a 40 00 00 00 09 01 3a 6d 64 6d | ack 1.@.....:mdm
2d 74 6c 76 3d 64 65 76 69 63 65 2d 74 79 70 65 | -tlv=device-type
3d 56 4d 77 61 72 65 2c 20 49 6e 63 2e 20 56 4d | =VMware, Inc. VM
77 61 72 65 20 56 69 72 74 75 61 6c 20 50 6c 61 | ware Virtual Pla
74 66 6f 72 6d 1a 5b 00 00 00 09 01 55 6d 64 6d | tform.[.....Umdm
2d 74 6c 76 3d 64 65 76 69 63 65 2d 75 69 64 3d | -tlv=device-uid=
33 36 39 33 43 36 34 30 37 43 39 32 35 32 35 31 | 3693C6407C925251
46 46 37 32 42 36 34 39 33 42 44 44 38 37 33 31 | FF72B6493BDD8731
38 41 42 46 43 39 30 43 36 32 31 35 34 32 43 33 | 8ABFC90C621542C3
38 46 41 46 38 37 38 45 46 34 39 36 31 34 41 31 | 8FAF878EF49614A1
04 06 00 00 00 00 1a 31 00 00 00 09 01 2b 61 75 | .......1.....+au
64 69 74 2d 73 65 73 73 69 6f 6e 2d 69 64 3d 30 | dit-session-id=0
61 63 39 64 36 38 61 30 30 30 30 35 30 30 30 35 | ac9d68a000050005
62 62 65 31 66 39 31 1a 23 00 00 00 09 01 1d 69 | bbe1f91.#......i
70 3a 73 6f 75 72 63 65 2d 69 70 3d 31 30 2e 32 | p:source-ip=192.1
```

```
30 31 2e 32 31 34 2e 32 35 31 1a 18 00 00 0c 04 | 68.10.50........
92 12 46 54 44 41 6e 79 43 6f 6e 6e 65 63 74 56 | ..FTDAnyConnectV
50 4e 1a 0c 00 00 0c 04 96 06 00 00 00 02 1a 15 | PN..............
00 00 00 09 01 0f 63 6f 61 2d 70 75 73 68 3d 74 | ......coa-push=t
72 75 65 | rue

Parsed packet data.....
Radius: Code = 1 (0x01)
Radius: Identifier = 16 (0x10)
Radius: Length = 659 (0x0293)
Radius: Vector: FB1919DFF6B1C73E34FC88CE75382D55
Radius: Type = 1 (0x01) User-Name
Radius: Length = 8 (0x08)
Radius: Value (String) =
6a 73 6d 69 74 68 | jsmith
Radius: Type = 2 (0x02) User-Password
Radius: Length = 18 (0x12)
Radius: Value (String) =
a0 83 c9 bd ad 72 07 d1 bc 24 34 9e 63 a1 f5 93 | .....r...$4.c...
Radius: Type = 5 (0x05) NAS-Port
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x5000
Radius: Type = 30 (0x1E) Called-Station-Id
Radius: Length = 16 (0x10)
Radius: Value (String) =
31 30 2e 32 30 31 2e 32 31 34 2e 31 35 31 | 203.0.113.2
Radius: Type = 31 (0x1F) Calling-Station-Id
Radius: Length = 16 (0x10)
Radius: Value (String) =
31 30 2e 32 30 31 2e 32 31 34 2e 32 35 31 | 198.51.100.2
Radius: Type = 61 (0x3D) NAS-Port-Type
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x5
Radius: Type = 66 (0x42) Tunnel-Client-Endpoint
Radius: Length = 16 (0x10)
Radius: Value (String) =
31 30 2e 32 30 31 2e 32 31 34 2e 32 35 31 | 198.51.100.2
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 35 (0x23)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 29 (0x1D)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 | mdm-tlv=device-p
6c 61 74 66 6f 72 6d 3d 77 69 6e | latform=win
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 44 (0x2C)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 38 (0x26)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 6d | mdm-tlv=device-m
61 63 3d 30 30 2d 30 63 2d 32 39 2d 33 37 2d 65 | ac=00-0c-29-37-e
66 2d 62 66 | f-bf
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 51 (0x33)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 45 (0x2D)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 | mdm-tlv=device-p
75 62 6c 69 63 2d 6d 61 63 3d 30 30 2d 30 63 2d | ublic-mac=00-0c-
32 39 2d 33 37 2d 65 66 2d 62 66 | 29-37-ef-bf
Radius: Type = 26 (0x1A) Vendor-Specific
```

```
Radius: Length = 58 (0x3A)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 52 (0x34)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 61 63 2d 75 73 65 72 2d | mdm-tlv=ac-user-
61 67 65 6e 74 3d 41 6e 79 43 6f 6e 6e 65 63 74 | agent=AnyConnect
20 57 69 6e 64 6f 77 73 20 34 2e 36 2e 30 33 30 | Windows 4.6.030
34 39 | 49
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 63 (0x3F)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 57 (0x39)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 | mdm-tlv=device-p
6c 61 74 66 6f 72 6d 2d 76 65 72 73 69 6f 6e 3d | latform-version=
36 2e 31 2e 37 36 30 31 20 53 65 72 76 69 63 65 | 6.1.7601 Service
20 50 61 63 6b 20 31 | Pack 1
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 64 (0x40)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 58 (0x3A)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 74 | mdm-tlv=device-t
79 70 65 3d 56 4d 77 61 72 65 2c 20 49 6e 63 2e | ype=VMware, Inc.
20 56 4d 77 61 72 65 20 56 69 72 74 75 61 6c 20 | VMware Virtual
50 6c 61 74 66 6f 72 6d | Platform
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 91 (0x5B)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 85 (0x55)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 75 | mdm-tlv=device-u
69 64 3d 33 36 39 33 43 36 34 30 37 43 39 32 35 | id=3693C6407C925
32 35 31 46 46 37 32 42 36 34 39 33 42 44 44 38 | 251FF72B6493BDD8
37 33 31 38 41 42 46 43 39 30 43 36 32 31 35 34 | 7318ABFC90C62154
32 43 33 38 46 41 46 38 37 38 45 46 34 39 36 31 | 2C38FAF878EF4961
34 41 31 | 4A1
Radius: Type = 4 (0x04) NAS-IP-Address
Radius: Length = 6 (0x06)
Radius: Value (IP Address) = 0.0.0.0 (0x00000000)
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 49 (0x31)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 43 (0x2B)
Radius: Value (String) =
61 75 64 69 74 2d 73 65 73 73 69 6f 6e 2d 69 64 | audit-session-id
3d 30 61 63 39 64 36 38 61 30 30 30 30 35 30 30 | =0ac9d68a0000500
30 35 62 62 65 31 66 39 31 | 05bbe1f91
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 35 (0x23)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 29 (0x1D)
Radius: Value (String) =
69 70 3a 73 6f 75 72 63 65 2d 69 70 3d 31 30 2e | ip:source-ip=192.
32 30 31 2e 32 31 34 2e 32 35 31 | 168.10.50
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 24 (0x18)
Radius: Vendor ID = 3076 (0x00000C04)
```

```
Radius: Type = 146 (0x92) Tunnel-Group-Name
Radius: Length = 18 (0x12)
Radius: Value (String) =
46 54 44 41 6e 79 43 6f 6e 6e 65 63 74 56 50 4e | FTDAnyConnectVPN
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 12 (0x0C)
Radius: Vendor ID = 3076 (0x00000C04)
Radius: Type = 150 (0x96) Client-Type
Radius: Length = 6 (0x06)
Radius: Value (Integer) = 2 (0x0002)
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 21 (0x15)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 15 (0x0F)
Radius: Value (String) =
63 6f 61 2d 70 75 73 68 3d 74 72 75 65 | coa-push=true
send pkt 192.168.1.10/1812
rip 0x00002ace10875428 state 7 id 16
rad_vrfy() : response message verified
rip 0x00002ace10875428
: chall_state ''
: state 0x7
: reqauth:
fb 19 19 df f6 b1 c7 3e 34 fc 88 ce 75 38 2d 55
: info 0x00002ace10875568
session_id 0x15
request_id 0x10
user 'jsmith'
response '***'
app 0
reason 0
skey 'cisco123'
sip 192.168.1.10
type 1

RADIUS packet decode (response)

--------------------------------------
Raw packet data (length = 159).....
02 10 00 9f 39 45 43 cf 05 be df 2f 24 d5 d7 05 | ....9EC..../$...
47 67 b4 fd 01 08 6a 73 6d 69 74 68 18 28 52 65 | Gg....jsmith.(Re
61 75 74 68 53 65 73 73 69 6f 6e 3a 30 61 63 39 | authSession:0ac9
64 36 38 61 30 30 30 30 35 30 30 30 35 62 62 65 | d68a000050005bbe
31 66 39 31 19 3b 43 41 43 53 3a 30 61 63 39 64 | 1f91.;CACS:0ac9d
36 38 61 30 30 30 30 35 30 30 30 35 62 62 65 31 | 68a000050005bbe1
66 39 31 3a 63 6f 72 62 69 6e 69 73 65 2f 33 32 | f91:corbinise/32
32 33 34 34 30 38 34 2f 31 39 33 31 36 38 32 1a | 2344084/1931682.
20 00 00 00 09 01 1a 70 72 6f 66 69 6c 65 2d 6e | ......profile-n
61 6d 65 3d 57 6f 72 6b 73 74 61 74 69 6f 6e | ame=Workstation

Parsed packet data.....
Radius: Code = 2 (0x02)
Radius: Identifier = 16 (0x10)
Radius: Length = 159 (0x009F)
Radius: Vector: 394543CF05BEDF2F24D5D7054767B4FD
Radius: Type = 1 (0x01) User-Name
Radius: Length = 8 (0x08)
Radius: Value (String) =
6a 73 6d 69 74 68 | jsmith
Radius: Type = 24 (0x18) State
Radius: Length = 40 (0x28)
Radius: Value (String) =
52 65 61 75 74 68 53 65 73 73 69 6f 6e 3a 30 61 | ReauthSession:0a
```

```
63 39 64 36 38 61 30 30 30 30 35 30 30 30 35 62 | c9d68a000050005b
62 65 31 66 39 31 | be1f91
Radius: Type = 25 (0x19) Class
Radius: Length = 59 (0x3B)
Radius: Value (String) =
43 41 43 53 3a 30 61 63 39 64 36 38 61 30 30 30 | CACS:0ac9d68a000
30 35 30 30 30 35 62 62 65 31 66 39 31 3a 63 6f | 050005bbe1f91:co
72 62 69 6e 69 73 65 2f 33 32 32 33 34 34 30 38 | rbinise/32234408
34 2f 31 39 33 31 36 38 32 | 4/1931682
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 32 (0x20)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 26 (0x1A)
Radius: Value (String) =
70 72 6f 66 69 6c 65 2d 6e 61 6d 65 3d 57 6f 72 | profile-name=Wor
6b 73 74 61 74 69 6f 6e | kstation
rad_procpkt: ACCEPT
Got AV-Pair with value profile-name=Workstation
RADIUS_ACCESS_ACCEPT: normal termination
radius mkreq: 0x16
alloc_rip 0x00002ace10874b80
new request 0x16 --> 17 (0x00002ace10874b80)
got user 'jsmith'
got password
add_req 0x00002ace10874b80 session 0x16 id 17
RADIUS_DELETE
remove_req 0x00002ace10875428 session 0x15 id 16
free_rip 0x00002ace10875428
RADIUS_REQUEST
radius.c: rad_mkpkt
rad_mkpkt: ip:source-ip=198.51.100.2

RADIUS packet decode (authentication request)

--------------------------------------
Raw packet data (length = 659).....
01 11 02 93 c6 fc 11 c1 0e c4 81 ac 09 a7 85 a8 | ................
83 c1 e4 88 01 08 6a 73 6d 69 74 68 02 12 79 41 | ......jsmith..yA
0e 71 13 38 ae 9f 49 be 3c a9 e4 81 65 93 05 06 | .q.8..I.<...e...
00 00 50 00 1e 10 31 30 2e 32 30 31 2e 32 31 34 | ..P...203.0.113
2e 31 35 31 1f 10 31 30 2e 32 30 31 2e 32 31 34 | .2..203.0.113
2e 32 35 31 3d 06 00 00 00 05 42 10 31 30 2e 32 | .2=.....<ip addr
30 31 2e 32 31 34 2e 32 35 31 1a 23 00 00 00 09 | ess>.#....
01 1d 6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 | ..mdm-tlv=device
2d 70 6c 61 74 66 6f 72 6d 3d 77 69 6e 1a 2c 00 | -platform=win.,.
00 00 09 01 26 6d 64 6d 2d 74 6c 76 3d 64 65 76 | ....&mdm-tlv=dev
69 63 65 2d 6d 61 63 3d 30 30 2d 30 63 2d 32 39 | ice-mac=00-0c-29
2d 33 37 2d 65 66 2d 62 66 1a 33 00 00 00 09 01 | -37-ef-bf.3.....
2d 6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d | -mdm-tlv=device-
70 75 62 6c 69 63 2d 6d 61 63 3d 30 30 2d 30 63 | public-mac=00-0c
2d 32 39 2d 33 37 2d 65 66 2d 62 66 1a 3a 00 00 | -29-37-ef-bf.:..
00 09 01 34 6d 64 6d 2d 74 6c 76 3d 61 63 2d 75 | ...4mdm-tlv=ac-u
73 65 72 2d 61 67 65 6e 74 3d 41 6e 79 43 6f 6e | ser-agent=AnyCon
6e 65 63 74 20 57 69 6e 64 6f 77 73 20 34 2e 36 | nect Windows 4.6
2e 30 33 30 34 39 1a 3f 00 00 00 09 01 39 6d 64 | .03049.?.....9md
6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 6c 61 | m-tlv=device-pla
74 66 6f 72 6d 2d 76 65 72 73 69 6f 6e 3d 36 2e | tform-version=6.
31 2e 37 36 30 31 20 53 65 72 76 69 63 65 20 50 | 1.7601 Service P
61 63 6b 20 31 1a 40 00 00 00 09 01 3a 6d 64 6d | ack 1.@.....:mdm
2d 74 6c 76 3d 64 65 76 69 63 65 2d 74 79 70 65 | -tlv=device-type
3d 56 4d 77 61 72 65 2c 20 49 6e 63 2e 20 56 4d | =VMware, Inc. VM
77 61 72 65 20 56 69 72 74 75 61 6c 20 50 6c 61 | ware Virtual Pla
74 66 6f 72 6d 1a 5b 00 00 00 09 01 55 6d 64 6d | tform.[.....Umdm
```

```
2d 74 6c 76 3d 64 65 76 69 63 65 2d 75 69 64 3d | -tlv=device-uid=
33 36 39 33 43 36 34 30 37 43 39 32 35 32 35 31 | 3693C6407C925251
46 46 37 32 42 36 34 39 33 42 44 44 38 37 33 31 | FF72B6493BDD8731
38 41 42 46 43 39 30 43 36 32 31 35 34 32 43 33 | 8ABFC90C621542C3
38 46 41 46 38 37 38 45 46 34 39 36 31 34 41 31 | 8FAF878EF49614A1
04 06 00 00 00 00 1a 31 00 00 00 09 01 2b 61 75 | .......1.....+au
64 69 74 2d 73 65 73 73 69 6f 6e 2d 69 64 3d 30 | dit-session-id=0
61 63 39 64 36 38 61 30 30 30 30 35 30 30 30 35 | ac9d68a000050005
62 62 65 31 66 39 31 1a 23 00 00 00 09 01 1d 69 | bbe1f91.#......i
70 3a 73 6f 75 72 63 65 2d 69 70 3d 31 30 2e 32 | p:source-ip=192.1
30 31 2e 32 31 34 2e 32 35 31 1a 18 00 00 0c 04 | 68.10.50......
92 12 46 54 44 41 6e 79 43 6f 6e 6e 65 63 74 56 | ..FTDAnyConnectV
50 4e 1a 0c 00 00 0c 04 96 06 00 00 00 02 1a 15 | PN..............
00 00 00 09 01 0f 63 6f 61 2d 70 75 73 68 3d 74 | ......coa-push=t
72 75 65 | rue

Parsed packet data.....
Radius: Code = 1 (0x01)
Radius: Identifier = 17 (0x11)
Radius: Length = 659 (0x0293)
Radius: Vector: C6FC11C10EC481AC09A785A883C1E488
Radius: Type = 1 (0x01) User-Name
Radius: Length = 8 (0x08)
Radius: Value (String) =
6a 73 6d 69 74 68 | jsmith
Radius: Type = 2 (0x02) User-Password
Radius: Length = 18 (0x12)
Radius: Value (String) =
79 41 0e 71 13 38 ae 9f 49 be 3c a9 e4 81 65 93 | yA.q.8..I.<...e.
Radius: Type = 5 (0x05) NAS-Port
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x5000
Radius: Type = 30 (0x1E) Called-Station-Id
Radius: Length = 16 (0x10)
Radius: Value (String) =
31 30 2e 32 30 31 2e 32 31 34 2e 31 35 31 | 203.0.113.2
Radius: Type = 31 (0x1F) Calling-Station-Id
Radius: Length = 16 (0x10)
Radius: Value (String) =
31 30 2e 32 30 31 2e 32 31 34 2e 32 35 31 | 198.51.100.2
Radius: Type = 61 (0x3D) NAS-Port-Type
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x5
Radius: Type = 66 (0x42) Tunnel-Client-Endpoint
Radius: Length = 16 (0x10)
Radius: Value (String) =
31 30 2e 32 30 31 2e 32 31 34 2e 32 35 31 | 198.51.100.2
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 35 (0x23)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 29 (0x1D)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 | mdm-tlv=device-p
6c 61 74 66 6f 72 6d 3d 77 69 6e | latform=win
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 44 (0x2C)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 38 (0x26)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 6d | mdm-tlv=device-m
61 63 3d 30 30 2d 30 63 2d 32 39 2d 33 37 2d 65 | ac=00-0c-29-37-e
66 2d 62 66 | f-bf
```

```
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 51 (0x33)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 45 (0x2D)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 | mdm-tlv=device-p
75 62 6c 69 63 2d 6d 61 63 3d 30 30 2d 30 63 2d | ublic-mac=00-0c-
32 39 2d 33 37 2d 65 66 2d 62 66 | 29-37-ef-bf
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 58 (0x3A)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 52 (0x34)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 61 63 2d 75 73 65 72 2d | mdm-tlv=ac-user-
61 67 65 6e 74 3d 41 6e 79 43 6f 6e 6e 65 63 74 | agent=AnyConnect
20 57 69 6e 64 6f 77 73 20 34 2e 36 2e 30 33 30 | Windows 4.6.030
34 39 | 49
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 63 (0x3F)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 57 (0x39)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 | mdm-tlv=device-p
6c 61 74 66 6f 72 6d 2d 76 65 72 73 69 6f 6e 3d | latform-version=
36 2e 31 2e 37 36 30 31 20 53 65 72 76 69 63 65 | 6.1.7601 Service
20 50 61 63 6b 20 31 | Pack 1
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 64 (0x40)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 58 (0x3A)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 74 | mdm-tlv=device-t
79 70 65 3d 56 4d 77 61 72 65 2c 20 49 6e 63 2e | ype=VMware, Inc.
20 56 4d 77 61 72 65 20 56 69 72 74 75 61 6c 20 | VMware Virtual
50 6c 61 74 66 6f 72 6d | Platform
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 91 (0x5B)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 85 (0x55)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 75 | mdm-tlv=device-u
69 64 3d 33 36 39 33 43 36 34 30 37 43 39 32 35 | id=3693C6407C925
32 35 31 46 46 37 32 42 36 34 39 33 42 44 44 38 | 251FF72B6493BDD8
37 33 31 38 41 42 46 43 39 30 43 36 32 31 35 34 | 7318ABFC90C62154
32 43 33 38 46 41 46 38 37 38 45 46 34 39 36 31 | 2C38FAF878EF4961
34 41 31 | 4A1
Radius: Type = 4 (0x04) NAS-IP-Address
Radius: Length = 6 (0x06)
Radius: Value (IP Address) = 0.0.0.0 (0x00000000)
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 49 (0x31)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 43 (0x2B)
Radius: Value (String) =
61 75 64 69 74 2d 73 65 73 73 69 6f 6e 2d 69 64 | audit-session-id
3d 30 61 63 39 64 36 38 61 30 30 30 30 35 30 30 | =0ac9d68a0000500
30 35 62 62 65 31 66 39 31 | 05bbe1f91
Radius: Type = 26 (0x1A) Vendor-Specific
```

```
Radius: Length = 35 (0x23)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 29 (0x1D)
Radius: Value (String) =
69 70 3a 73 6f 75 72 63 65 2d 69 70 3d 31 30 2e | ip:source-ip=192.
32 30 31 2e 32 31 34 2e 32 35 31 | 168.10.50
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 24 (0x18)
Radius: Vendor ID = 3076 (0x00000C04)
Radius: Type = 146 (0x92) Tunnel-Group-Name
Radius: Length = 18 (0x12)
Radius: Value (String) =
46 54 44 41 6e 79 43 6f 6e 6e 65 63 74 56 50 4e | FTDAnyConnectVPN
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 12 (0x0C)
Radius: Vendor ID = 3076 (0x00000C04)
Radius: Type = 150 (0x96) Client-Type
Radius: Length = 6 (0x06)
Radius: Value (Integer) = 2 (0x0002)
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 21 (0x15)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 15 (0x0F)
Radius: Value (String) =
63 6f 61 2d 70 75 73 68 3d 74 72 75 65 | coa-push=true
send pkt 192.168.1.10/1812
rip 0x00002ace10874b80 state 7 id 17
rad_vrfy() : response message verified
rip 0x00002ace10874b80
: chall_state ''
: state 0x7
: reqauth:
c6 fc 11 c1 0e c4 81 ac 09 a7 85 a8 83 c1 e4 88
: info 0x00002ace10874cc0
session_id 0x16
request_id 0x11
user 'jsmith'
response '***'
app 0
reason 0
skey 'cisco123'
sip 192.168.1.10
type 1

RADIUS packet decode (response)

--------------------------------------
Raw packet data (length = 20).....
03 11 00 14 15 c3 44 44 7d a6 07 0d 7b 92 f2 3b | ......DD}...{..;
0b 06 ba 74 | ...t

Parsed packet data.....
Radius: Code = 3 (0x03)
Radius: Identifier = 17 (0x11)
Radius: Length = 20 (0x0014)
Radius: Vector: 15C344447DA6070D7B92F23B0B06BA74
rad_procpkt: REJECT
RADIUS_DELETE
remove_req 0x00002ace10874b80 session 0x16 id 17
free_rip 0x00002ace10874b80
radius: send queue empty
radius mkreq: 0x18
```

```
alloc_rip 0x00002ace10874b80
new request 0x18 --> 18 (0x00002ace10874b80)
add_req 0x00002ace10874b80 session 0x18 id 18
ACCT_REQUEST
radius.c: rad_mkpkt

RADIUS packet decode (accounting request)

--------------------------------------
Raw packet data (length = 714).....
04 12 02 ca be a0 6e 46 71 af 5c 65 82 77 c7 b5 | ......nFq.\e.w..
50 78 61 d7 01 08 6a 73 6d 69 74 68 05 06 00 00 | Pxa...jsmith....
50 00 06 06 00 00 00 02 07 06 00 00 00 01 08 06 | P...............
c0 a8 0a 32 19 3b 43 41 43 53 3a 30 61 63 39 64 | ...2.;CACS:0ac9d
36 38 61 30 30 30 30 35 30 30 30 35 62 62 65 31 | 68a000050005bbe1
66 39 31 3a 63 6f 72 62 69 6e 69 73 65 2f 33 32 | f91:corbinise/32
32 33 34 34 30 38 34 2f 31 39 33 31 36 38 32 1e | 2344084/1931682.
10 31 30 2e 32 30 31 2e 32 31 34 2e 31 35 31 1f | .203.0.113.2.
10 31 30 2e 32 30 31 2e 32 31 34 2e 32 35 31 28 | .198.51.100.2(
06 00 00 00 01 29 06 00 00 00 00 2c 0a 43 31 46 | .....).....,.C1F
30 30 30 30 35 2d 06 00 00 00 01 3d 06 00 00 00 | 00005-.....=....
05 42 10 31 30 2e 32 30 31 2e 32 31 34 2e 32 35 | .B.203.0.113.2
31 1a 18 00 00 0c 04 92 12 46 54 44 41 6e 79 43 | ........FTDAnyC
6f 6e 6e 65 63 74 56 50 4e 1a 0c 00 00 0c 04 96 | onnectVPN.......
06 00 00 00 02 1a 0c 00 00 0c 04 97 06 00 00 00 | ................
01 1a 0c 00 00 0c 04 98 06 00 00 00 03 1a 23 00 | ..............#.
00 00 09 01 1d 6d 64 6d 2d 74 6c 76 3d 64 65 76 | .....mdm-tlv=dev
69 63 65 2d 70 6c 61 74 66 6f 72 6d 3d 77 69 6e | ice-platform=win
1a 2c 00 00 00 09 01 26 6d 64 6d 2d 74 6c 76 3d | .,.....&mdm-tlv=
64 65 76 69 63 65 2d 6d 61 63 3d 30 30 2d 30 63 | device-mac=00-0c
2d 32 39 2d 33 37 2d 65 66 2d 62 66 1a 31 00 00 | -29-37-ef-bf.1..
00 09 01 2b 61 75 64 69 74 2d 73 65 73 73 69 6f | ...+audit-sessio
6e 2d 69 64 3d 30 61 63 39 64 36 38 61 30 30 30 | n-id=0ac9d68a000
30 35 30 30 30 35 62 62 65 31 66 39 31 1a 33 00 | 050005bbe1f91.3.
00 00 09 01 2d 6d 64 6d 2d 74 6c 76 3d 64 65 76 | ....-mdm-tlv=dev
69 63 65 2d 70 75 62 6c 69 63 2d 6d 61 63 3d 30 | ice-public-mac=0
30 2d 30 63 2d 32 39 2d 33 37 2d 65 66 2d 62 66 | 0-0c-29-37-ef-bf
1a 3a 00 00 00 09 01 34 6d 64 6d 2d 74 6c 76 3d | .:.....4mdm-tlv=
61 63 2d 75 73 65 72 2d 61 67 65 6e 74 3d 41 6e | ac-user-agent=An
79 43 6f 6e 6e 65 63 74 20 57 69 6e 64 6f 77 73 | yConnect Windows
20 34 2e 36 2e 30 33 30 34 39 1a 3f 00 00 00 09 | 4.6.03049.?....
01 39 6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 | .9mdm-tlv=device
2d 70 6c 61 74 66 6f 72 6d 2d 76 65 72 73 69 6f | -platform-versio
6e 3d 36 2e 31 2e 37 36 30 31 20 53 65 72 76 69 | n=6.1.7601 Servi
63 65 20 50 61 63 6b 20 31 1a 40 00 00 00 09 01 | ce Pack 1.@.....
3a 6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d | :mdm-tlv=device-
74 79 70 65 3d 56 4d 77 61 72 65 2c 20 49 6e 63 | type=VMware, Inc
2e 20 56 4d 77 61 72 65 20 56 69 72 74 75 61 6c | . VMware Virtual
20 50 6c 61 74 66 6f 72 6d 1a 5b 00 00 00 09 01 | Platform.[.....
55 6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d | Umdm-tlv=device-
75 69 64 3d 33 36 39 33 43 36 34 30 37 43 39 32 | uid=3693C6407C92
35 32 35 31 46 46 37 32 42 36 34 39 33 42 44 44 | 5251FF72B6493BDD
38 37 33 31 38 41 42 46 43 39 30 43 36 32 31 35 | 87318ABFC90C6215
34 32 43 33 38 46 41 46 38 37 38 45 46 34 39 36 | 42C38FAF878EF496
31 34 41 31 04 06 00 00 00 00 | 14A1......

Parsed packet data.....
Radius: Code = 4 (0x04)
Radius: Identifier = 18 (0x12)
Radius: Length = 714 (0x02CA)
Radius: Vector: BEA06E4671AF5C658277C7B5507861D7
Radius: Type = 1 (0x01) User-Name
Radius: Length = 8 (0x08)
Radius: Value (String) =
```

```
6a 73 6d 69 74 68 | jsmith
Radius: Type = 5 (0x05) NAS-Port
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x5000
Radius: Type = 6 (0x06) Service-Type
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x2
Radius: Type = 7 (0x07) Framed-Protocol
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x1
Radius: Type = 8 (0x08) Framed-IP-Address
Radius: Length = 6 (0x06)
Radius: Value (IP Address) = 192.168.10.50 (0xC0A80A32)
Radius: Type = 25 (0x19) Class
Radius: Length = 59 (0x3B)
Radius: Value (String) =
43 41 43 53 3a 30 61 63 39 64 36 38 61 30 30 30 | CACS:0ac9d68a000
30 35 30 30 30 35 62 62 65 31 66 39 31 3a 63 6f | 050005bbe1f91:co
72 62 69 6e 69 73 65 2f 33 32 32 33 34 34 30 38 | rbinise/32234408
34 2f 31 39 33 31 36 38 32 | 4/1931682
Radius: Type = 30 (0x1E) Called-Station-Id
Radius: Length = 16 (0x10)
Radius: Value (String) =
31 30 2e 32 30 31 2e 32 31 34 2e 31 35 31 | 203.0.113.2
Radius: Type = 31 (0x1F) Calling-Station-Id
Radius: Length = 16 (0x10)
Radius: Value (String) =
31 30 2e 32 30 31 2e 32 31 34 2e 32 35 31 | 198.51.100.2
Radius: Type = 40 (0x28) Acct-Status-Type
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x1
Radius: Type = 41 (0x29) Acct-Delay-Time
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x0
Radius: Type = 44 (0x2C) Acct-Session-Id
Radius: Length = 10 (0x0A)
Radius: Value (String) =
43 31 46 30 30 30 30 35 | C1F00005
Radius: Type = 45 (0x2D) Acct-Authentic
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x1
Radius: Type = 61 (0x3D) NAS-Port-Type
Radius: Length = 6 (0x06)
Radius: Value (Hex) = 0x5
Radius: Type = 66 (0x42) Tunnel-Client-Endpoint
Radius: Length = 16 (0x10)
Radius: Value (String) =
31 30 2e 32 30 31 2e 32 31 34 2e 32 35 31 | 198.51.100.2
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 24 (0x18)
Radius: Vendor ID = 3076 (0x00000C04)
Radius: Type = 146 (0x92) Tunnel-Group-Name
Radius: Length = 18 (0x12)
Radius: Value (String) =
46 54 44 41 6e 79 43 6f 6e 6e 65 63 74 56 50 4e | FTDAnyConnectVPN
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 12 (0x0C)
Radius: Vendor ID = 3076 (0x00000C04)
Radius: Type = 150 (0x96) Client-Type
Radius: Length = 6 (0x06)
Radius: Value (Integer) = 2 (0x0002)
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 12 (0x0C)
Radius: Vendor ID = 3076 (0x00000C04)
```

```
Radius: Type = 151 (0x97) VPN-Session-Type
Radius: Length = 6 (0x06)
Radius: Value (Integer) = 1 (0x0001)
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 12 (0x0C)
Radius: Vendor ID = 3076 (0x00000C04)
Radius: Type = 152 (0x98) VPN-Session-Subtype
Radius: Length = 6 (0x06)
Radius: Value (Integer) = 3 (0x0003)
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 35 (0x23)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 29 (0x1D)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 | mdm-tlv=device-p
6c 61 74 66 6f 72 6d 3d 77 69 6e | latform=win
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 44 (0x2C)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 38 (0x26)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 6d | mdm-tlv=device-m
61 63 3d 30 30 2d 30 63 2d 32 39 2d 33 37 2d 65 | ac=00-0c-29-37-e
66 2d 62 66 | f-bf
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 49 (0x31)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 43 (0x2B)
Radius: Value (String) =
61 75 64 69 74 2d 73 65 73 73 69 6f 6e 2d 69 64 | audit-session-id
3d 30 61 63 39 64 36 38 61 30 30 30 30 35 30 30 | =0ac9d68a0000500
30 35 62 62 65 31 66 39 31 | 05bbe1f91
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 51 (0x33)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 45 (0x2D)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 | mdm-tlv=device-p
75 62 6c 69 63 2d 6d 61 63 3d 30 30 2d 30 63 2d | ublic-mac=00-0c-
32 39 2d 33 37 2d 65 66 2d 62 66 | 29-37-ef-bf
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 58 (0x3A)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 52 (0x34)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 61 63 2d 75 73 65 72 2d | mdm-tlv=ac-user-
61 67 65 6e 74 3d 41 6e 79 43 6f 6e 6e 65 63 74 | agent=AnyConnect
20 57 69 6e 64 6f 77 73 20 34 2e 36 2e 30 33 30 | Windows 4.6.030
34 39 | 49
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 63 (0x3F)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 57 (0x39)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 70 | mdm-tlv=device-p
6c 61 74 66 6f 72 6d 2d 76 65 72 73 69 6f 6e 3d | latform-version=
36 2e 31 2e 37 36 30 31 20 53 65 72 76 69 63 65 | 6.1.7601 Service
20 50 61 63 6b 20 31 | Pack 1
```

```
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 64 (0x40)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 58 (0x3A)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 74 | mdm-tlv=device-t
79 70 65 3d 56 4d 77 61 72 65 2c 20 49 6e 63 2e | ype=VMware, Inc.
20 56 4d 77 61 72 65 20 56 69 72 74 75 61 6c 20 | VMware Virtual
50 6c 61 74 66 6f 72 6d | Platform
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 91 (0x5B)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 85 (0x55)
Radius: Value (String) =
6d 64 6d 2d 74 6c 76 3d 64 65 76 69 63 65 2d 75 | mdm-tlv=device-u
69 64 3d 33 36 39 33 43 36 34 30 37 43 39 32 35 | id=3693C6407C925
32 35 31 46 46 37 32 42 36 34 39 33 42 44 44 38 | 251FF72B6493BDD8
37 33 31 38 41 42 46 43 39 30 43 36 32 31 35 34 | 7318ABFC90C62154
32 43 33 38 46 41 46 38 37 38 45 46 34 39 36 31 | 2C38FAF878EF4961
34 41 31 | 4A1
Radius: Type = 4 (0x04) NAS-IP-Address
Radius: Length = 6 (0x06)
Radius: Value (IP Address) = 0.0.0.0 (0x00000000)
send pkt 192.168.1.10/1813
rip 0x00002ace10874b80 state 6 id 18
rad_vrfy() : response message verified
rip 0x00002ace10874b80
: chall_state ''
: state 0x6
: reqauth:
be a0 6e 46 71 af 5c 65 82 77 c7 b5 50 78 61 d7
: info 0x00002ace10874cc0
session_id 0x18
request_id 0x12
user 'jsmith'
response '***'
app 0
reason 0
skey 'cisco123'
sip 192.168.1.10
type 3

RADIUS packet decode (response)

--------------------------------------
Raw packet data (length = 20).....
05 12 00 14 e5 fd b1 6d fb ee 58 f0 89 79 73 8e | .......m..X..ys.
90 dc a7 20 | ...

Parsed packet data.....
Radius: Code = 5 (0x05)
Radius: Identifier = 18 (0x12)
Radius: Length = 20 (0x0014)
Radius: Vector: E5FDB16DFBEE58F08979738E90DCA720
rad_procpkt: ACCOUNTING_RESPONSE
RADIUS_DELETE
remove_req 0x00002ace10874b80 session 0x18 id 18
free_rip 0x00002ace10874b80
radius: send queue empty
ciscofp3#
```

Start 'debug web anyconnect 255' opdracht op FTD diagnostic CLI (>systeemondersteuning

diagnostisch-cli) en druk 'Connect' op Windows/Mac PC op Cisco AnyConnect Client

```
> system support diagnostic-cli
Attaching to Diagnostic CLI ... Press 'Ctrl+a then d' to detach.
ciscofp3> enable
Password: <hit enter>
ciscofp3# terminal monitor
ciscofp3# debug webvpn anyconnect 255
<hit Connect on Anyconnect client on PC>

http_parse_cstp_method()
...input: 'CONNECT /CSCOSSLC/tunnel HTTP/1.1'
webvpn_cstp_parse_request_field()
...input: 'Host: ciscofp3.cisco.com'
Processing CSTP header line: 'Host: ciscofp3.cisco.com'
webvpn_cstp_parse_request_field()
...input: 'User-Agent: Cisco AnyConnect VPN Agent for Windows 4.6.03049'
Processing CSTP header line: 'User-Agent: Cisco AnyConnect VPN Agent for Windows 4.6.03049'
Setting user-agent to: 'Cisco AnyConnect VPN Agent for Windows 4.6.03049'
webvpn_cstp_parse_request_field()
...input: 'Cookie: webvpn=2B0E85@28672@6501@2FF4AE4D1F69B98F26E8CAD62D5496E5E6AE5282'
Processing CSTP header line: 'Cookie:
webvpn=2B0E85@28672@6501@2FF4AE4D1F69B98F26E8CAD62D5496E5E6AE5282'
Found WebVPN cookie: 'webvpn=2B0E85@28672@6501@2FF4AE4D1F69B98F26E8CAD62D5496E5E6AE5282'
WebVPN Cookie: 'webvpn=2B0E85@28672@6501@2FF4AE4D1F69B98F26E8CAD62D5496E5E6AE5282'
webvpn_cstp_parse_request_field()
...input: 'X-CSTP-Version: 1'
Processing CSTP header line: 'X-CSTP-Version: 1'
webvpn_cstp_parse_request_field()
...input: 'X-CSTP-Hostname: jsmith-PC'
Processing CSTP header line: 'X-CSTP-Hostname: jsmith-PC'
Setting hostname to: 'jsmith-PC'
webvpn_cstp_parse_request_field()
...input: 'X-CSTP-MTU: 1399'
Processing CSTP header line: 'X-CSTP-MTU: 1399'
webvpn_cstp_parse_request_field()
...input: 'X-CSTP-Address-Type: IPv6,IPv4'
Processing CSTP header line: 'X-CSTP-Address-Type: IPv6,IPv4'
webvpn_cstp_parse_request_field()
...input: 'X-CSTP-Local-Address-IP4: 198.51.100.2'
Processing CSTP header line: 'X-CSTP-Local-Address-IP4: 198.51.100.2'
webvpn_cstp_parse_request_field()
...input: 'X-CSTP-Base-MTU: 1500'
Processing CSTP header line: 'X-CSTP-Base-MTU: 1500'
webvpn_cstp_parse_request_field()
...input: 'X-CSTP-Remote-Address-IP4: 203.0.113.2'
Processing CSTP header line: 'X-CSTP-Remote-Address-IP4: 203.0.113.2'
webvpn_cstp_parse_request_field()
...input: 'X-CSTP-Full-IPv6-Capability: true'
Processing CSTP header line: 'X-CSTP-Full-IPv6-Capability: true'
webvpn_cstp_parse_request_field()
...input: 'X-DTLS-Master-Secret:
1FA92A96D5E82C13CB3A5758F11371EE6B54C6F36F0A8DCE8F4DECB73A034EEF4FE95DA614A5872E1EE5557C3BF4765A
'
Processing CSTP header line: 'X-DTLS-Master-Secret:
1FA92A96D5E82C13CB3A5758F11371EE6B54C6F36F0A8DCE8F4DECB73A034EEF4FE95DA614A5872E1EE5557C3BF4765A
'
webvpn_cstp_parse_request_field()
...input: 'X-DTLS-CipherSuite: DHE-RSA-AES256-GCM-SHA384:DHE-RSA-AES256-SHA256:DHE-RSA-AES256-
SHA:DHE-RSA-AES128-GCM-SHA256:DHE-RSA-AES128-SHA256:DHE-RSA-AES128-SHA:AES256-SHA:AES128-
SHA:DES-CBC3-SHA'
Processing CSTP header line: 'X-DTLS-CipherSuite: DHE-RSA-AES256-GCM-SHA384:DHE-RSA-AES256-
```

```
SHA256:DHE-RSA-AES256-SHA:DHE-RSA-AES128-GCM-SHA256:DHE-RSA-AES128-SHA256:DHE-RSA-AES128-
SHA:AES256-SHA:AES128-SHA:DES-CBC3-SHA'
webvpn_cstp_parse_request_field()
...input: 'X-DTLS-Accept-Encoding: lzs'
Processing CSTL header line: 'X-DTLS-Accept-Encoding: lzs'
webvpn_cstp_parse_request_field()
...input: 'X-DTLS-Header-Pad-Length: 0'
webvpn_cstp_parse_request_field()
...input: 'X-CSTP-Accept-Encoding: lzs,deflate'
Processing CSTP header line: 'X-CSTP-Accept-Encoding: lzs,deflate'
webvpn_cstp_parse_request_field()
...input: 'X-CSTP-Protocol: Copyright (c) 2004 Cisco Systems, Inc.'
Processing CSTP header line: 'X-CSTP-Protocol: Copyright (c) 2004 Cisco Systems, Inc.'
cstp_util_address_ipv4_accept: address asigned: 192.168.10.50
cstp_util_address_ipv6_accept: No IPv6 Address
np_svc_create_session(0x7000, 0x00002acdff1d6440, TRUE)
webvpn_svc_np_setup
SVC ACL Name: NULL
SVC ACL ID: -1
vpn_put_uauth success for ip 192.168.10.50!
No SVC ACL
Iphdr=20 base-mtu=1500 def-mtu=1500 conf-mtu=1406
tcp-mss = 1460
path-mtu = 1460(mss)
TLS Block size = 16, version = 0x303
mtu = 1460(path-mtu) - 0(opts) - 5(ssl) - 16(iv) = 1439
mod-mtu = 1439(mtu) & 0xfff0(complement) = 1424
tls-mtu = 1424(mod-mtu) - 8(cstp) - 48(mac) - 1(pad) = 1367
DTLS Block size = 16
mtu = 1500(base-mtu) - 20(ip) - 8(udp) - 13(dtlshdr) - 16(dtlsiv) = 1443
mod-mtu = 1443(mtu) & 0xfff0(complement) = 1440
dtls-mtu = 1440(mod-mtu) - 1(cdtp) - 20(mac) - 1(pad) = 1418
computed tls-mtu=1367 dtls-mtu=1418 conf-mtu=1406
DTLS enabled for intf=3 (outside)
overide computed dtls-mtu=1418 with conf-mtu=1406
tls-mtu=1367 dtls-mtu=1406
SVC: adding to sessmgmt
Sending X-CSTP-MTU: 1367
Sending X-DTLS-MTU: 1406
Sending X-CSTP-FW-RULE msgs: Start
Sending X-CSTP-FW-RULE msgs: Done
Sending X-CSTP-Quarantine: false
Sending X-CSTP-Disable-Always-On-VPN: false
Sending X-CSTP-Client-Bypass-Protocol: false
```

Cisco ISE

Cisco ISE > Operations > RADIUS > Live Logs > Klik op details van elke verificatie

Controleer op Cisco ISE uw VPN-inlognaam en het ACL-resultaat ‘PermitAccess’ wordt gegeven
Live Logs laten zien dat jsmid via VPN echt is bevonden op FTD

Identity Services Engine

Overview

Event	5200 Authentication succeeded
Username	jsmith
Endpoint Id	
Endpoint Profile	
Authentication Policy	VPN Users >> Default
Authorization Policy	VPN Users >> Allow ASA VPN connections if AD Group VPNusers
Authorization Result	PermitAccess

Authentication Details

Source Timestamp	2018-10-09 01:47:55.112
Received Timestamp	2018-10-09 01:47:55.113
Policy Server	corbinise
Event	5200 Authentication succeeded
Username	jsmith
Endpoint Id	
Calling Station Id	
Authentication Identity Store	corbdc3
Audit Session Id	00000000000070005bbc08c3
Authentication Method	PAP_ASCII
Authentication Protocol	PAP_ASCII
Network Device	FTDVPN
Device Type	All Device Types
Location	All Locations

Steps

11001	Received RADIUS Access-Request
11017	RADIUS created a new session
15049	Evaluating Policy Group
15008	Evaluating Service Selection Policy
15048	Queried PIP - Airespace.Airespace-Wlan-Id
15048	Queried PIP - Radius.NAS-Port-Type
15041	Evaluating Identity Policy
15048	Queried PIP - Normalised Radius.RadiusFlowType
22072	Selected identity source sequence - All_User_ID_Stores
15013	Selected Identity Source - Internal Users
24210	Looking up User in Internal Users IDStore - jsmith
24216	The user is not found in the internal users identity store
15013	Selected Identity Source - All_AD_Join_Points
24430	Authenticating user against Active Directory - All_AD_Join_Points
24325	Resolving identity - jsmith (Step latency=7106 ms)
24313	Search for matching accounts at join point -
24319	Single matching account found in forest -
24313	Search for matching accounts at join point - windows_ad_server.com
24366	Skipping unjoined domain - Windows_AD_Server.com
24323	Identity resolution detected single matching account
24343	RPC Logon request succeeded - jsmith
24402	User authentication against Active Directory succeeded - All_AD_Join_Points
22037	Authentication Passed
24715	ISE has not confirmed locally previous successful machine authentication for user in Active Directory
15036	Evaluating Authorization Policy
24432	Looking up user in Active Directory -
24355	LDAP fetch succeeded -
24416	User's Groups retrieval from Active Directory succeeded -
15048	Queried PIP - ExternalGroups
15016	Selected Authorization Profile - PermitAccess
22081	Max sessions policy passed
22080	New accounting session created in Session cache
11002	Returned RADIUS Access-Accept

Identity Services Engine

11002 Returned RADIUS Access-Accept

Location	All Locations
NAS IPv4 Address	0.0.0.0
NAS Port Type	Virtual
Authorization Profile	PermitAccess
Response Time	7294 milliseconds

Other Attributes

ConfigVersionId	257
DestinationPort	1812
Protocol	Radius
NAS-Port	28672
Tunnel-Client-Endpoint	(tag=0)
CVPN3000/ASA/PIX7x-Tunnel-Group-Name	FTDAnyConnectVPN
OriginalUserName	jsmith
NetworkDeviceProfileId	b0699505-3150-4215-a80e-6753d45bf56c
IsThirdPartyDeviceFlow	false
CVPN3000/ASA/PIX7x-Client-Type	3
AcsSessionID	corbinise/322344084/1870108
SelectedAuthenticationIdentityStores	Internal Users
SelectedAuthenticationIdentityStores	All_AD_Join_Points
SelectedAuthenticationIdentityStores	Guest Users
AuthenticationStatus	AuthenticationPassed
IdentityPolicyMatchedRule	Default
AuthorizationPolicyMatchedRule	Allow ASA VPN connections if AD Group VPNusers
CPMSessionID	00000000000070005bbc08c3

Identity Services Engine

CPMSessionID	00000000000070005bbc08c3
ISEPolicySetName	VPN Users
IdentitySelectionMatchedRule	Default
StepLatency	14=7106
AD-User-Resolved-Identities	jsmith@cohadley3.local
AD-User-Candidate-Identities	jsmith@cohadley3.local
AD-User-Join-Point	COHADLEY3.LOCAL
AD-User-Resolved-DNs	CN=John Smith,CN=Users,DC=cohadley3,DC=local
AD-User-DNS-Domain	cohadley3.local

AD-User-NetBios-Name	COHADLEY3
IsMachineIdentity	false
UserAccountControl	66048
AD-User-SamAccount-Name	jsmith
AD-User-Qualified-Name	jsmith@cohadley3.local
DTLSSupport	Unknown
Network Device Profile	Cisco
Location	Location#All Locations
Device Type	Device Type#All Device Types
IPSEC	IPSEC#Is IPSEC Device#No
ExternalGroups	S-1-5-21-872014162-156988481-842954196-1121
IdentityAccessRestricted	false
RADIUS Username	jsmith
Device IP Address	
Called-Station-ID	
CiscoAVPair	audit-session-id=00000000000070005bbc08c3, ip:source-ip= coa-push=true

AnyConnect VPN-client

DART-bundel

[Hoe de DART-bundel voor AnyConnect wordt verzameld]

Problemen oplossen

DNS

Controleer Cisco ISE, FTD, Windows Server 2012 en Windows/Mac PCs kunnen elk ander vooruit- en achteruit oplossen (controleer DNS op alle apparaten)

Windows PC
Start een opdrachtmelding en zorg ervoor dat u een 'nslookup' kunt uitvoeren op de hostnaam van de FTD

FTD CLI

```
>show network

> nslookup 192.168.1.10
Server: 192.168.1.10
Address: 192.168.1.10#53
10.1.168.192.in-addr.arpa name = ciscoise.cisco.com
```

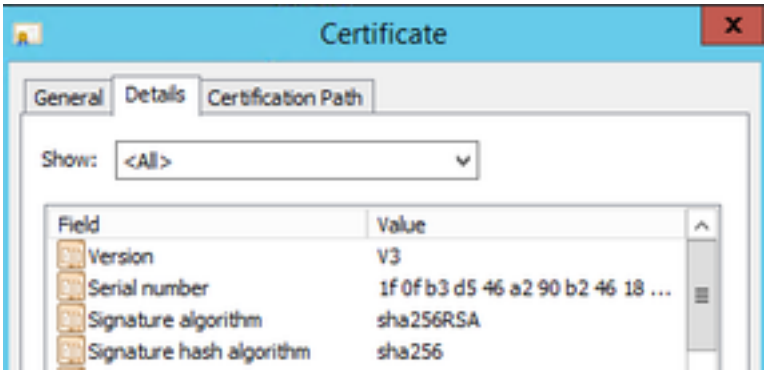
ISE CLI:

```
ciscoise/admin# nslookup 192.168.1.20
Trying "20.1.168.192.in-addr.arpa"
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 56529
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;20.1.168.192.in-addr.arpa. IN PTR

;; ANSWER SECTION:
20.1.168.192.in-addr.arpa. 1200 IN PTR ciscodc.cisco.com
```

Windows Server 2012
Start een opdrachtmelding en zorg ervoor dat u een 'nslookup' kunt uitvoeren op de hostname/FQDN van de FTD

certificaatsterkte (voor browser-compatibiliteit)

Controleer de Windows Server 2012-tekens op certificaten als SHA256 of hoger. Dubbelklik in Windows op uw CA-certificaat en controleer de velden 'Signature algoritme'



Als zij SHA1 zijn, zullen de meeste browsers een browser waarschuwing voor deze certificaten tonen. U kunt deze functie hier wijzigen:

[Hoe u Windows Server-certificeringsinstantie voor upgrade naar SHA256 kunt upgraden]

Controleer of het VPN-servercertificaat van FTD de volgende velden correct heeft (wanneer u in browser aan FTD koppelt)

Algemene naam = <FTDFQDN>

Onderwerp Alternatieve naam (SAN) = <FTDFQDN>

Voorbeeld:

Vaak voorkomende naam: **ciscofp3.cisco.com**

Onderwerp Alternatieve naam (SAN): **DNS-naam=cisco.fp3.cisco.com**

Connectiviteit en firewallconfiguratie

Controleer met behulp van Captures op FTD CLI en Captures op PC met Wireshark om te controleren dat pakketten over TCP+UDP 443 naar de Outside IP van de FTD worden verzonden. Controleer dat die pakketten zijn afgeleid van het openbare IP-adres van de router van het startpunt van de werknemer

```
ciscofp3# capture capin interface outside trace detail trace-count 100 match ip any host




<now hit Connect on AnyConnect Client from employee PC>
ciscofp3# show cap
capture capin type raw-data trace detail trace-count 100 interface outside [Buffer Full - 524153
bytes]
match ip any host 198.51.100.2

ciscofp3# show cap capin
2375 packets captured
1: 17:05:56.580994 198.51.100.2.55928 > 203.0.113.2.443: S 2933933902:2933933902(0) win 8192




2: 17:05:56.581375 203.0.113.2.443 > 198.51.100.2.55928: S 430674106:430674106(0) ack 2933933903
win 32768




3: 17:05:56.581757 198.51.100.2.55928 > 203.0.113.2.443: . ack 430674107 win 64240
...
```