Configurazione di AnyConnect VPN su FTD con Cisco ISE come server RADIUS con CA radice di Windows Server 2012

Sommario

Sommario

Introduzione

In questo documento viene descritto come configurare AnyConnect VPN (Virtual Private Network) su un firewall FTD (Firepower Threat Defense) con Cisco ISE (Identity Services Engine) come server RADIUS. Utilizziamo Windows Server 2012 come CA radice (Certification Authority) in modo che le comunicazioni tramite VPN siano protette da certificati, ovvero il PC dipendente considererà attendibile il certificato del FTD perché il certificato VPN FTD è stato firmato dalla CA radice di Windows Server 2012

Prerequisiti

Requisiti

Nella rete è necessario disporre dei seguenti componenti distribuiti ed in esecuzione:

- Firepower Management Center e Firepower Threat Defense firewall installati con connettività di base
- Cisco ISE installato e operativo nella rete
- Windows Server (con Active Directory) distribuito e PC Windows/Mac dei dipendenti aggiunti al dominio AD (Active Directory)

Nell'esempio seguente, i dipendenti apriranno il client AnyConnect sul PC Windows/Mac e si connetteranno in modo sicuro all'interfaccia esterna dell'FTD tramite VPN utilizzando le loro credenziali. L'FTD verificherà il nome utente e la password in base a Cisco ISE (che verificherà con Windows Server Active Directory il nome utente, la password e il gruppo, ovvero solo gli utenti del gruppo AD 'Dipendenti' potranno connettersi alla rete aziendale tramite VPN.

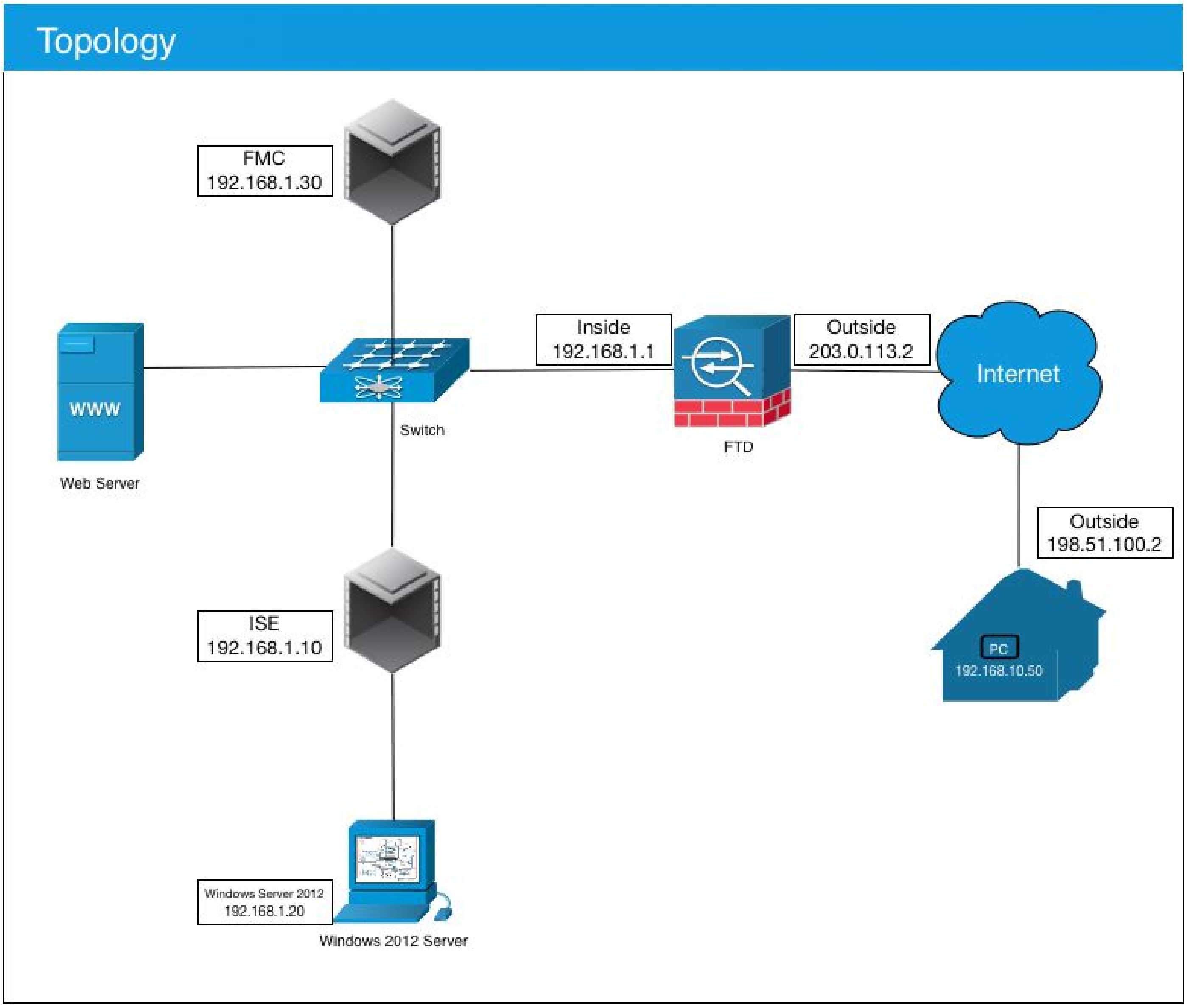
Componenti usati

Le informazioni di questo documento si basano sulle seguenti versioni software:

- Firepower Management Center e Firepower Threat Defense con versione 6.2.3
- Cisco Identity Services Engine con versione 2.4
- Cisco AnyConnect Secure Mobility Client con versione 4.6.03049
- Windows Server 2012 R2 con Active Directory e Servizi certificati (CA radice per tutti i certificati)
- Windows 7, Windows 10, PC Mac

Configurazione

Esempio di rete



In questo caso, il PC Windows/Mac del dipendente con il client VPN Anyconnect si connetterà all'indirizzo IP pubblico esterno del firewall FTD e, una volta connessi tramite VPN, Cisco ISE concederà loro in modo dinamico un accesso limitato o completo a determinate risorse interne o Internet (configurabili), a seconda del gruppo AD a cui appartengono in Active Directory

Sul dispositivo bootflash o slot0:	Nome host/FQDN	Indirizzo IP pubblico	Indirizzo IP privato	Indirizzo IP AnyConnect
PC Windows	-	198.51.100.2	10.0.0.1	192.168.10.50
FTD	ciscofp3.cisco.com	203.0.113.2	192.168.1.1	-
CCP	-	-	192.168.1.30	-
Cisco ISE	ciscoise.cisco.com	-	192.168.1.10	-
Windows Server 2012	ciscodc.cisco.com	-	192.168.1.20	-
Server interni	-	-	192.168.1.x	-

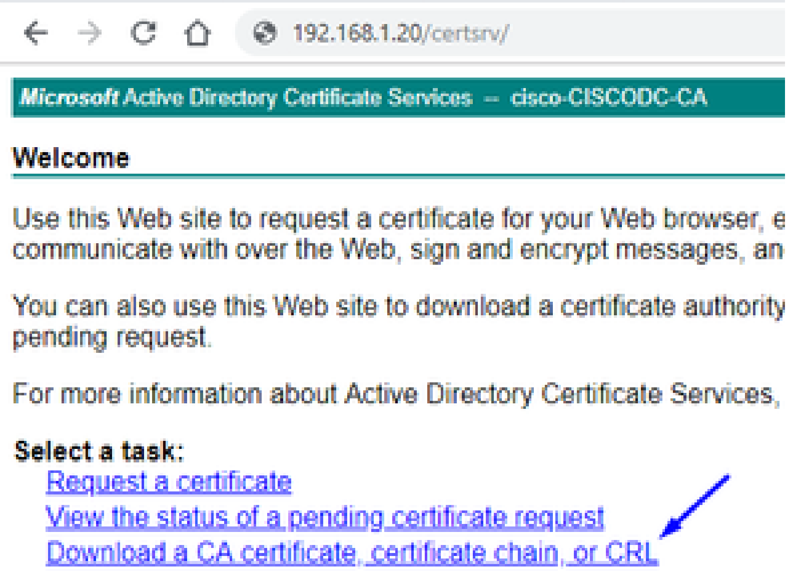
Configurazione

Esporta il certificato CA radice da Windows Server

In questo documento verrà utilizzato Microsoft Windows Server 2012 come CA radice per i certificati. I PC client considereranno attendibile questa CA radice per la connessione protetta al FTD tramite VPN (vedere i passaggi seguenti). Questo assicurerà che possano connettersi in modo sicuro al FTD su Internet e accedere alle risorse interne da casa. Il PC considererà attendibile la connessione nel browser e nel client AnyConnect.

Per scaricare il certificato CA radice di Windows Server, visitare il sito Web all'indirizzo http://192.168.1.20/certsrv e seguire la procedura seguente:

Fare clic su **Scarica certificato CA, catena di certificati o CRL**



192.168.1.20/certsrv/

Microsoft Active Directory Certificate Services -- cisco-CISCODC-CA

Welcome

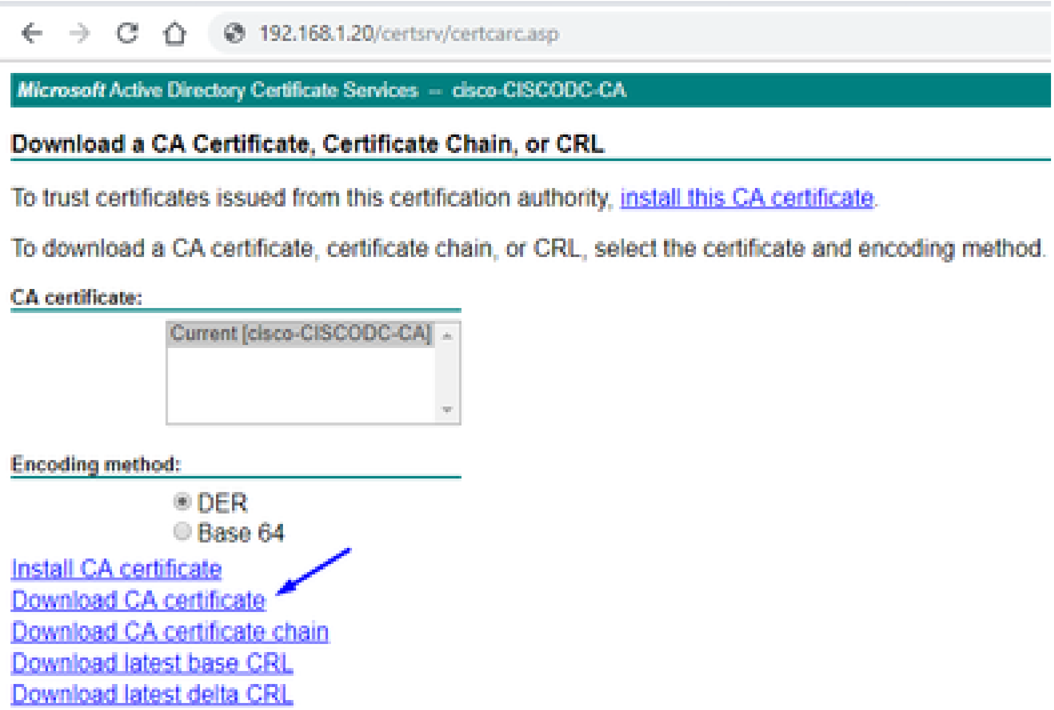
Use this Web site to request a certificate for your Web browser, e
communicate with over the Web, sign and encrypt messages, an

You can also use this Web site to download a certificate authority
pending request.

For more information about Active Directory Certificate Services,

Select a task:
- Request a certificate
- View the status of a pending certificate request
- Download a CA certificate, certificate chain, or CRL

Fare clic su **Scarica certificato** e rinominarlo in 'RootCAcert3.cer'



192.168.1.20/certsrv/certcarc.asp

Microsoft Active Directory Certificate Services -- cisco-CISCODC-CA

Download a CA Certificate, Certificate Chain, or CRL

To trust certificates issued from this certification authority, install this CA certificate.

To download a CA certificate, certificate chain, or CRL, select the certificate and encoding method.

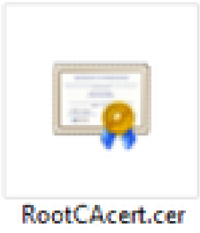
CA certificate:

Current [cisco-CISCODC-CA]

Encoding method:

● DER
○ Base 64

Install CA certificate
Download CA certificate
Download CA certificate chain
Download latest base CRL
Download latest delta CRL



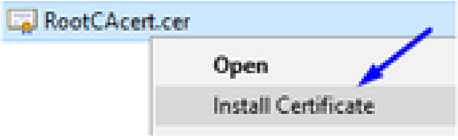
Installa il certificato CA radice nei PC Windows/Mac dei dipendenti

Metodo 1: Installare il certificato su tutti i PC dei dipendenti eseguendo il push tramite Criteri di gruppo di Windows Server (ideale per gli utenti VPN di oltre 10):

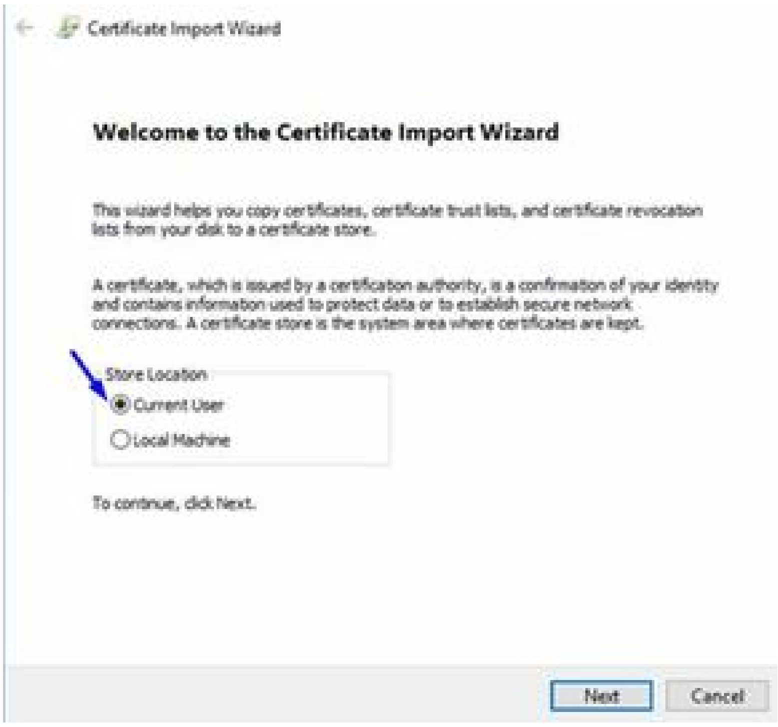
[Come utilizzare Windows Server per distribuire certificati ai computer client tramite Criteri di gruppo]

Metodo 2: Installare il certificato su tutti i PC dei dipendenti installandolo singolarmente su ciascun PC (ideale per testare un utente VPN):

Fare clic con il pulsante destro del mouse sul certificato sul PC Windows/Mac dei dipendenti e scegliere **Installa certificato**



Seleziona 'Utente corrente'



Certificate Import Wizard

Welcome to the Certificate Import Wizard

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

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

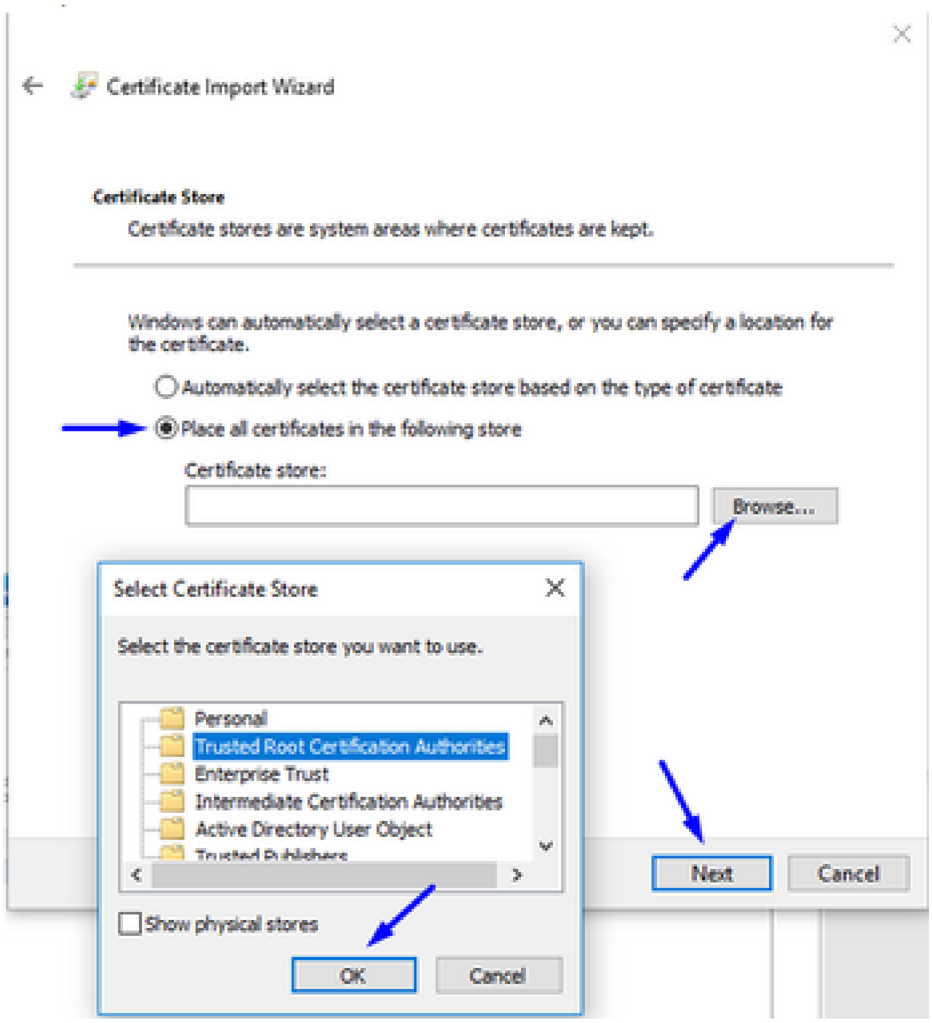
Store Location

● Current User

○ Local Machine

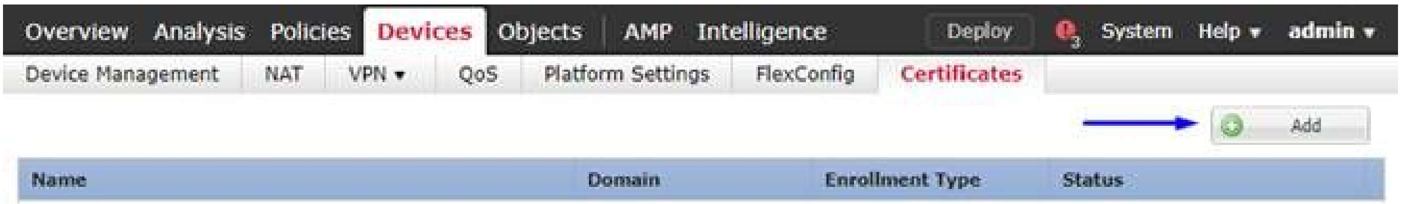
To continue, click Next.

Selezionare **Mettere tutti i certificati nell'archivio seguente** e selezionare **Autorità di certificazione radice attendibili**, fare clic su **Ok**, fare clic su **Avanti**, quindi su **Fine**

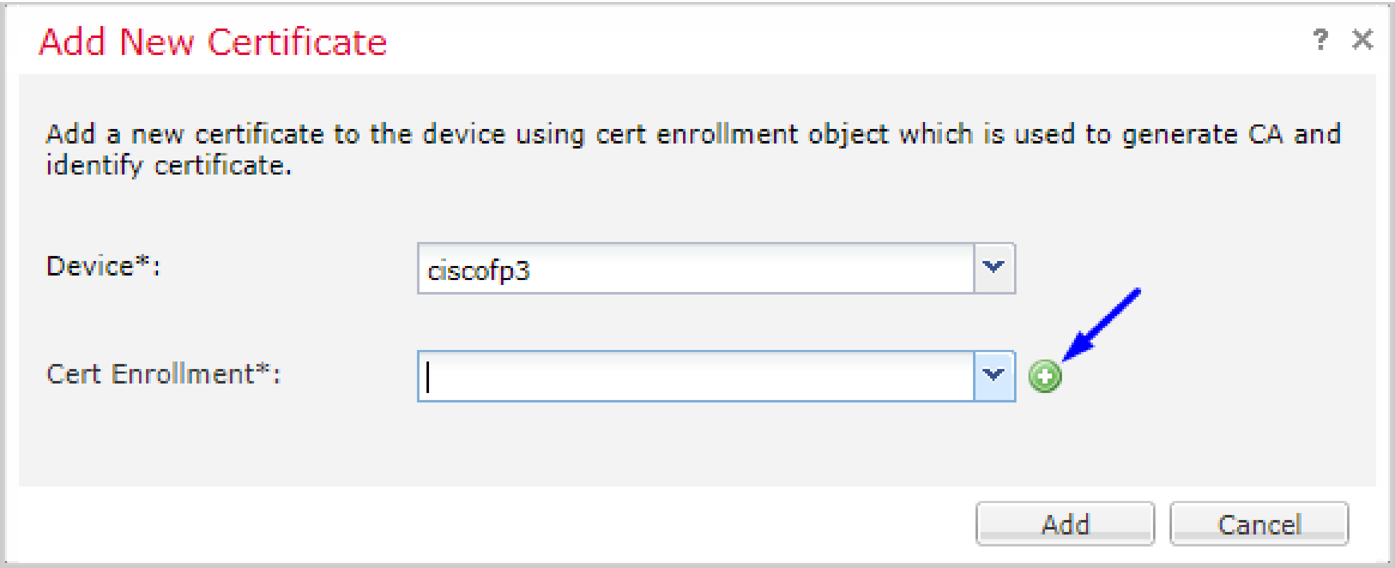

Certificate Import Wizard
Certificate Store
Certificate stores are system areas where certificates are kept.
Windows can automatically select a certificate store, or you can specify a location for the certificate.
○ Automatically select the certificate store based on the type of certificate
● Place all certificates in the following store
Certificate store:
Browse...
Select Certificate Store
Select the certificate store you want to use.
Personal
Trusted Root Certification Authorities
Enterprise Trust
Intermediate Certification Authorities
Active Directory User Object
Trusted Publishers
□ Show physical stores
OK
Cancel
Next
Cancel

Generare un CSR su FTD, ottenere la firma di CSR dalla CA radice di Windows Server e installare tale certificato firmato su FTD

Selezionare Oggetti > Gestione oggetti > **PKI** > **Registrazione certificato**, fare clic su **Aggiungi registrazione certificato**



Fare clic sul pulsante **Aggiungi registrazione certificato**



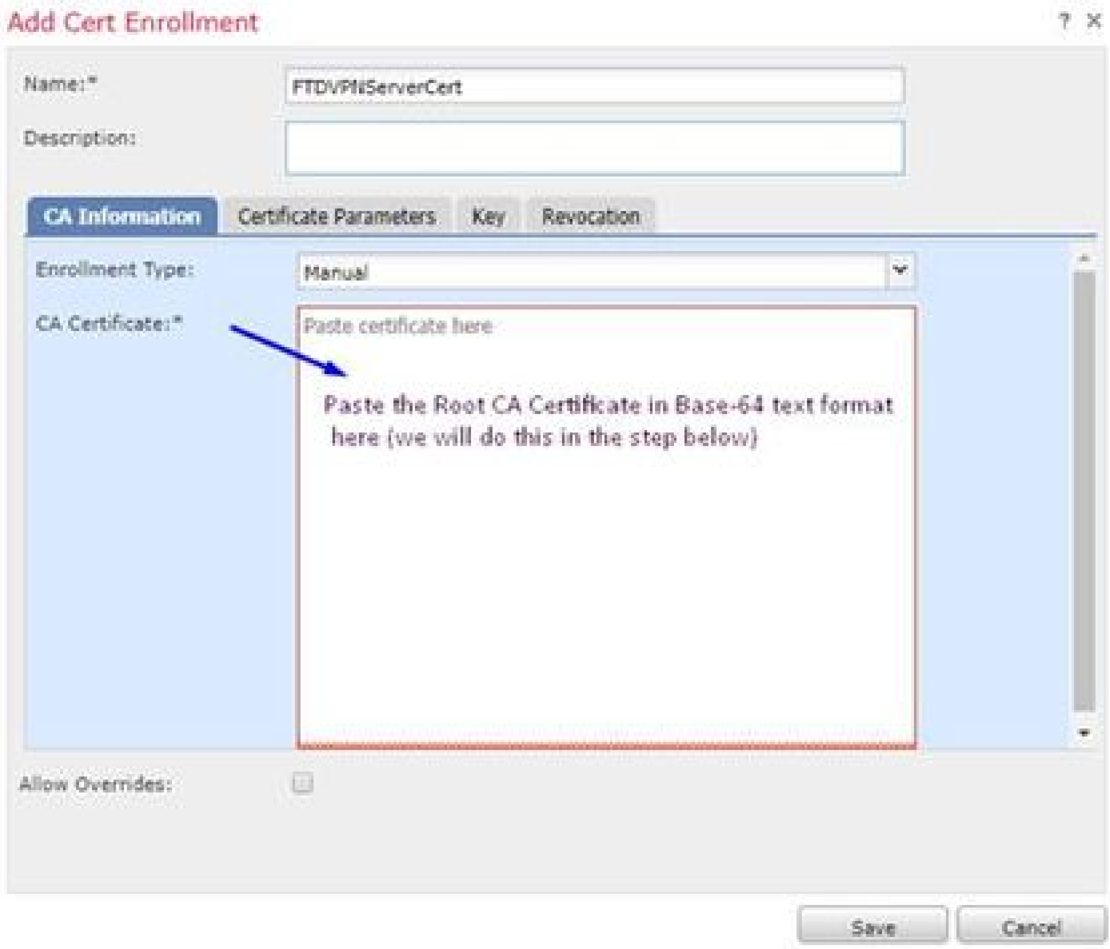
Add New Certificate

Add a new certificate to the device using cert enrollment object which is used to generate CA and identify certificate.

Device*: ciscofp3

Cert Enrollment*:

Selezionare **Tipo di iscrizione** > **Manuale**
Come mostrato nell'immagine seguente, è necessario incollare qui il certificato CA radice:



Add Cert Enrollment

Name:* FTDVPNServerCert

Description:

Enrollment Type: Manual

CA Certificate:* Paste certificate here

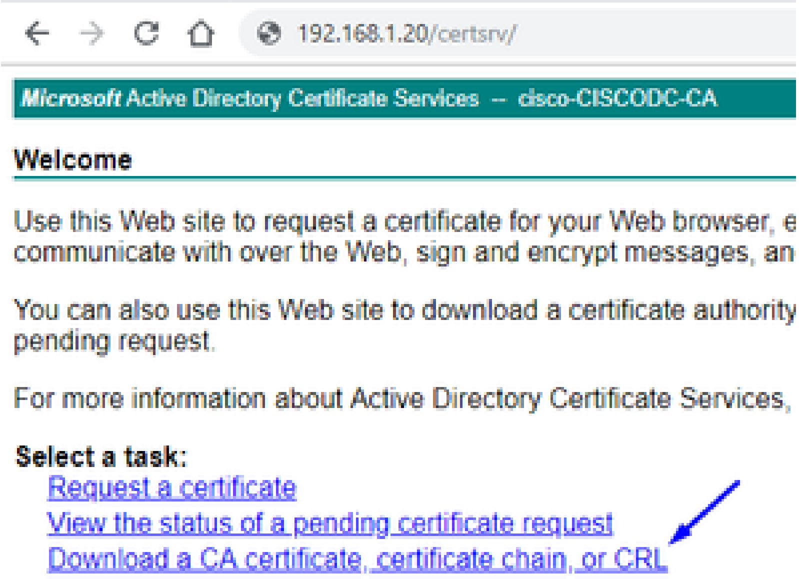
Paste the Root CA Certificate in Base-64 text format here (we will do this in the step below)

Allow Overrides: □

Di seguito viene riportata la procedura per scaricare il certificato CA radice, visualizzarlo in formato testo e incollarlo nella casella in alto:

Visitare il sito Web all'indirizzo http://192.168.1.20/certsrv

Fare clic su **Scarica certificato CA, catena di certificati o CRL**



192.168.1.20/certsrv/

Microsoft Active Directory Certificate Services -- cisco-CISCODC-CA

Welcome

Use this Web site to request a certificate for your Web browser, e
communicate with over the Web, sign and encrypt messages, an

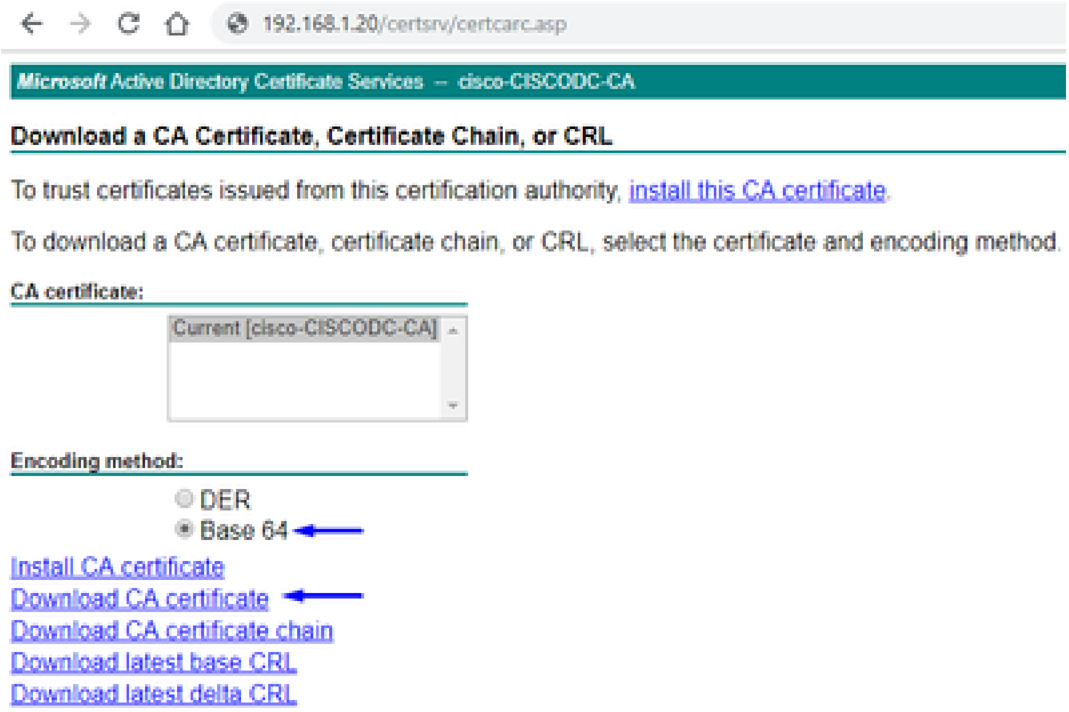
You can also use this Web site to download a certificate authority
pending request.

For more information about Active Directory Certificate Services,

Select a task:

Request a certificate
View the status of a pending certificate request
Download a CA certificate, certificate chain, or CRL

Fare clic sul pulsante **Base 64** > fare clic su **Scarica certificato CA**



192.168.1.20/certsrv/certcarc.asp

Microsoft Active Directory Certificate Services -- cisco-CISCODC-CA

Download a CA Certificate, Certificate Chain, or CRL

To trust certificates issued from this certification authority, install this CA certificate.

To download a CA certificate, certificate chain, or CRL, select the certificate and encoding method.

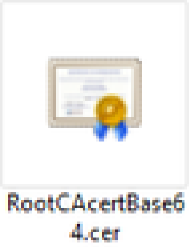
CA certificate:

Current [cisco-CISCODC-CA]

Encoding method:

○ DER
● Base 64

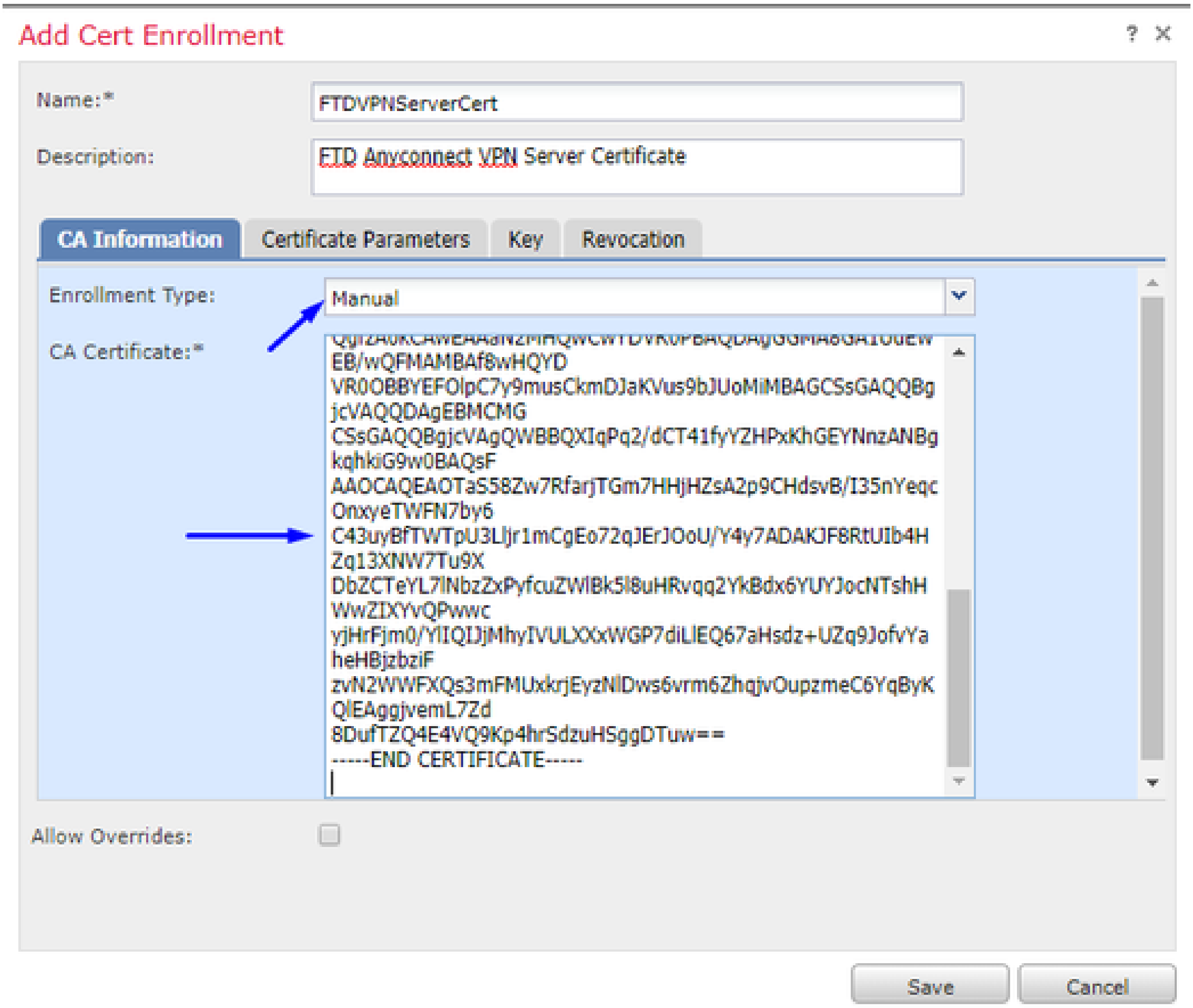
Install CA certificate
Download CA certificate
Download CA certificate chain
Download latest base CRL
Download latest delta CRL



RootCAcertBase64.cer

Aprire il file RootCAcertBase64.cer in Blocco note

Copiare e incollare il contenuto con estensione cer (certificato CA radice) da Windows AD Server qui:



Add Cert Enrollment

Name:* FTDVPNServerCert

Description: FTD Anyconnect VPN Server Certificate

Enrollment Type: Manual

CA Certificate:*

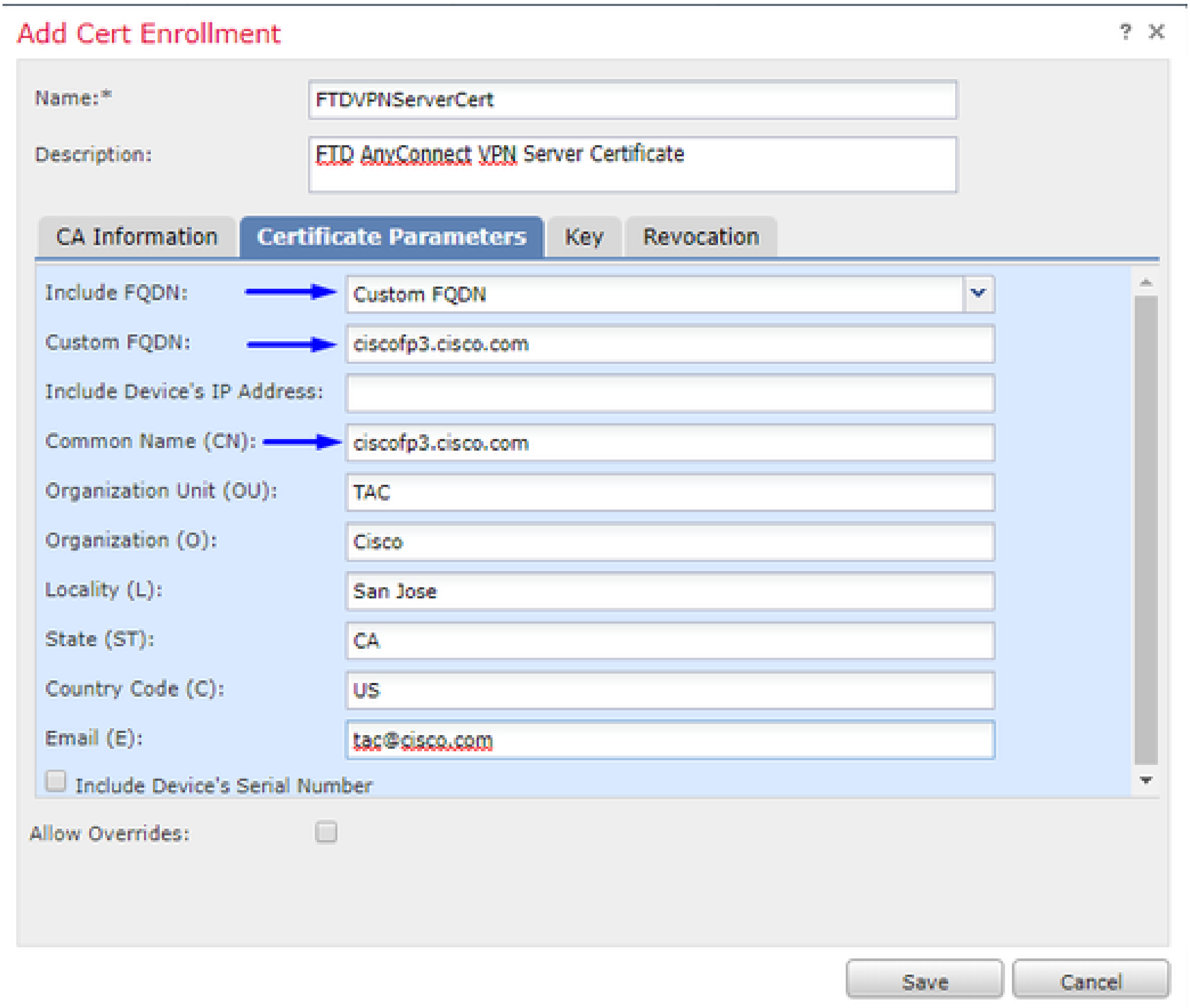
EB/wQFMAMBAf8wHQYD
VR0OBBYEFOlpC7y9musCkmDJaKVus9bJUoMiMBAGCSsGAQQBg
jcVAQQDAgEBMCMG
CSsGAQQBgjcVAgQWBBQXIqPq2/dCT41fyYZHPxKhGEYNnzANBg
kqhkiG9w0BAQsF
AAOCAQEAOTaS58Zw7RfarjTGm7HHjHZsA2p9CHdsvB/I35nYeqc
OnxyeTWFN7by6
C43uyBfTWTpU3LIjr1mCgEo72qJErJOoU/Y4y7ADAKJF8RtUIb4H
Zq13XNW7Tu9X
DbZCTeYL7lNbzZxPyfcuZWlBk5l8uHRvqq2YkBdx6YUYJocNTshH
WwZIXYvQPwwc
yjHrFjm0/YlIQIJjMhyIVULXXxWGP7diLlEQ67aHsdz+UZq9JofvYa
heHBjzbziF
zvN2WWFXQs3mFMUxkrjEyzNlDws6vrm6ZhqjvOupzmeC6YqByK
QlEAggjvemL7Zd
8DufTZQ4E4VQ9Kp4hrSdzuHSggDTuw==
-----END CERTIFICATE-----

Allow Overrides: ☐

Fare clic sulla scheda **Parametri certificato** >> digitare le informazioni sul certificato

Nota:
Il campo FQDN personalizzato deve essere il nome FQDN dell'FTD

Il campo Nome comune deve essere il nome FQDN del FTD


Add Cert Enrollment

Name:* FTDVPNServerCert

Description: FTD AnyConnect VPN Server Certificate

Include FQDN: Custom FQDN

Custom FQDN: ciscofp3.cisco.com

Include Device's IP Address:

Common Name (CN): ciscofp3.cisco.com

Organization Unit (OU): TAC

Organization (O): Cisco

Locality (L): San Jose

State (ST): CA

Country Code (C): US

Email (E): tac@cisco.com

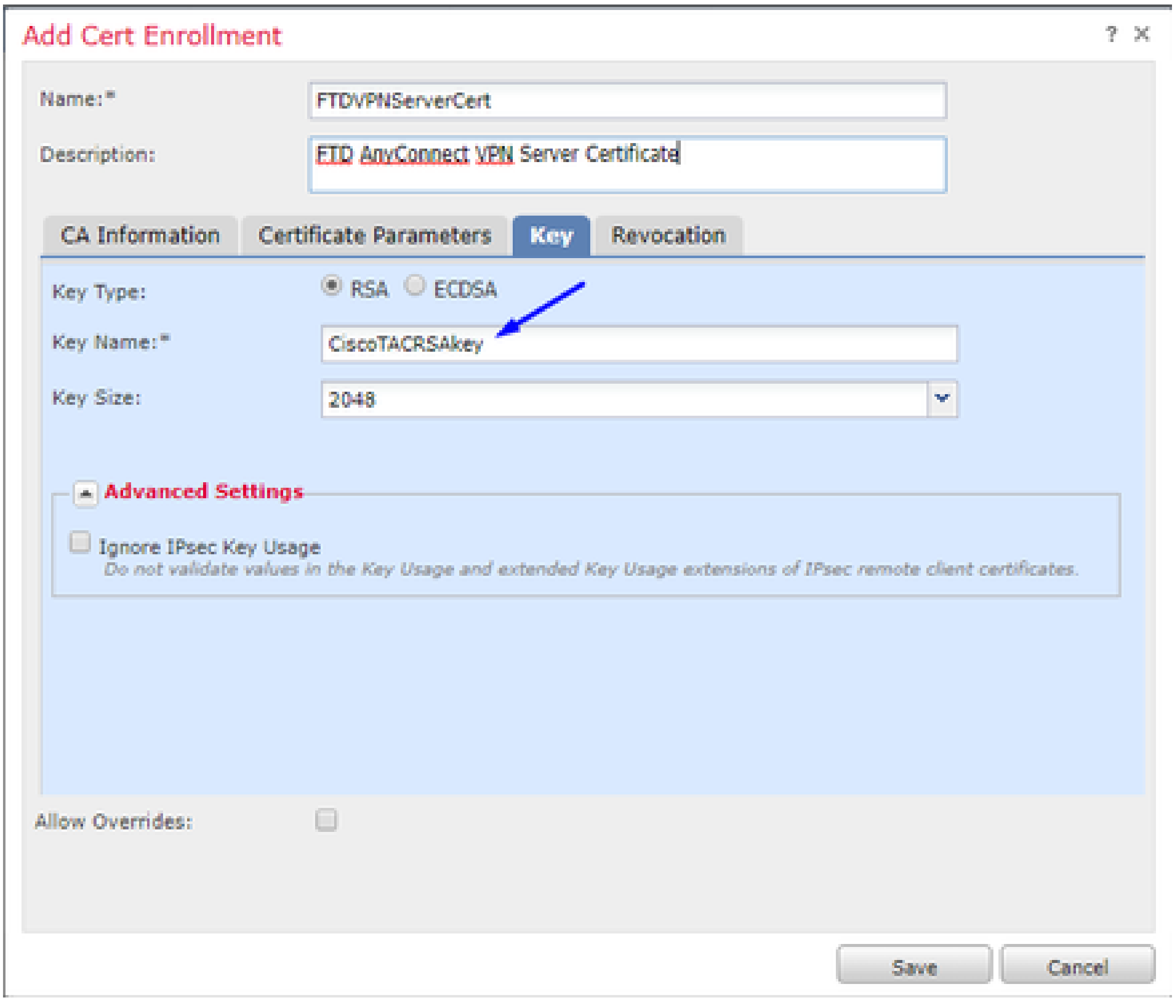
□ Include Device's Serial Number

Allow Overrides: □

Suggerimento: è possibile ottenere il nome di dominio completo (FQDN) dell'FTD digitando il seguente comando dalla CLI dell'FTD:

```
> 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
```

Fare clic sulla scheda **Chiave** e digitare un **nome di chiave**



Add Cert Enrollment

Name:* FTDVPNServerCert

Description: FTD AnyConnect VPN Server Certificate

Key Type: ● RSA ○ ECDSA

Key Name:* CiscoTACRSAkey

Key Size: 2048

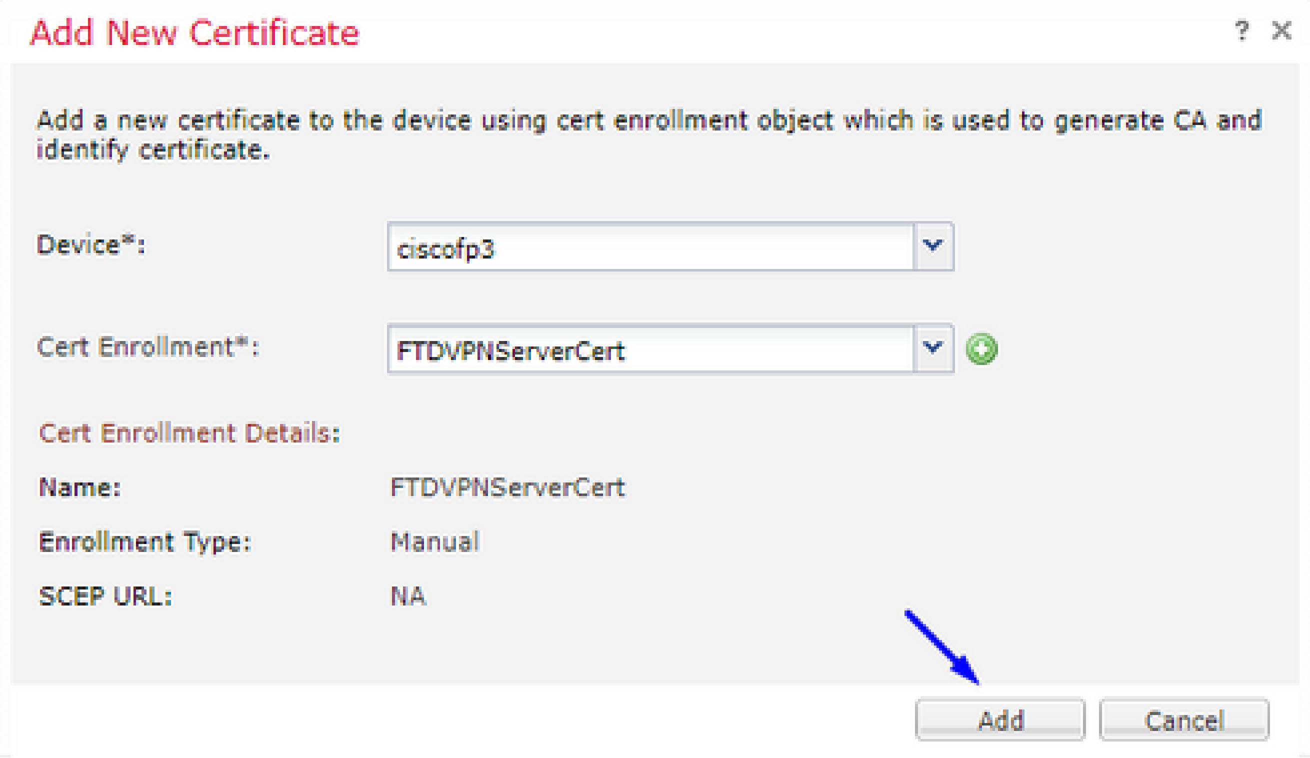
Advanced Settings

□ Ignore IPsec Key Usage
Do not validate values in the Key Usage and extended Key Usage extensions of IPsec remote client certificates.

Allow Overrides: □

Fare clic su **Salva.**

Selezionare il FTDVPNServerCert appena creato e fare clic su **Aggiungi**



Add New Certificate

Add a new certificate to the device using cert enrollment object which is used to generate CA and identify certificate.

Device*: ciscofp3

Cert Enrollment*: FTDVPNServerCert

Cert Enrollment Details:

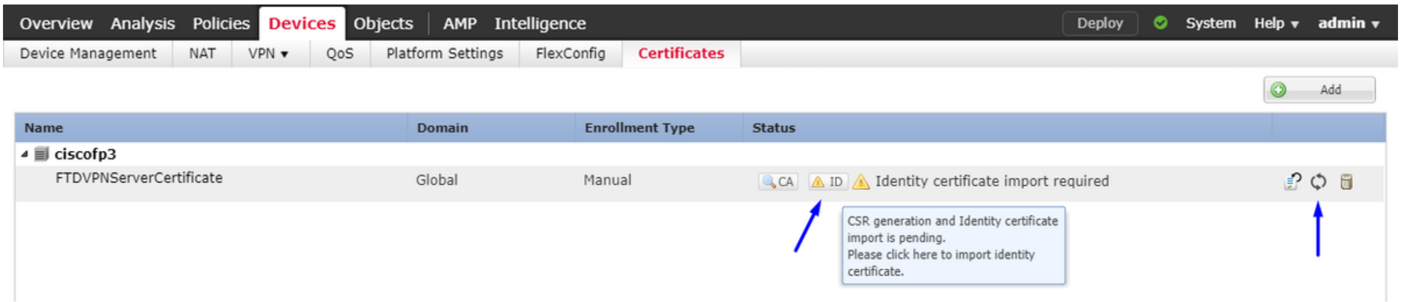
Name: FTDVPNServerCert

Enrollment Type: Manual

SCEP URL: NA

Suggerimento: Attendere circa 10-30 secondi affinché FMC + FTD verifichi e installi il certificato CA radice (fare clic sull'icona Aggiorna se non viene visualizzata)

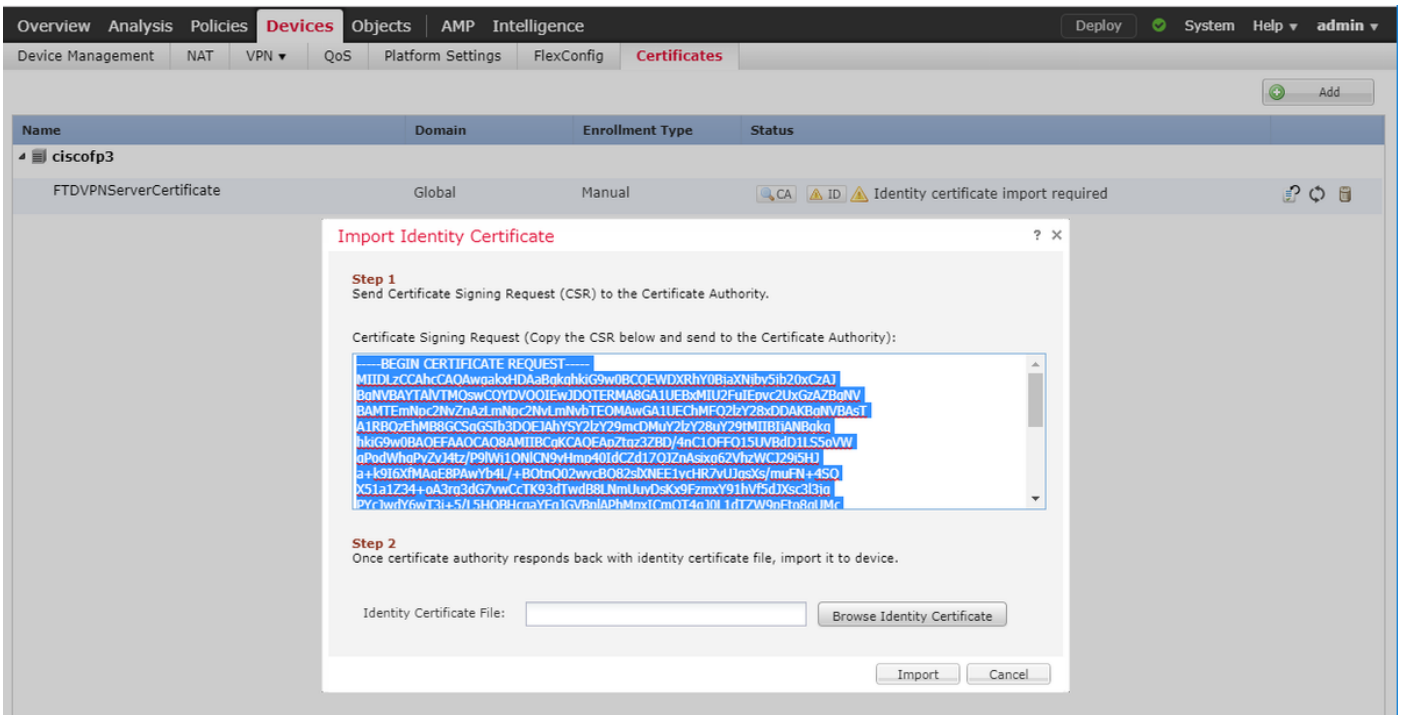
Fare clic sul pulsante **ID**:


Overview Analysis Policies Devices Objects AMP Intelligence
Deploy System Help ▾ admin ▾
Device Management NAT VPN ▾ QoS Platform Settings FlexConfig Certificates
Add

Name	Domain	Enrollment Type	Status
ciscofp3			
FTDVPNServerCertificate	Global	Manual	CA ⚠ ID ⚠ Identity certificate import required

CSR generation and Identity certificate import is pending.
Please click here to import identity certificate.

Copiare e incollare il CSR e trasferirlo alla CA radice di Windows Server:


Overview Analysis Policies Devices Objects AMP Intelligence
Deploy System Help ▾ admin ▾
Device Management NAT VPN ▾ QoS Platform Settings FlexConfig Certificates
Add

Name	Domain	Enrollment Type	Status
ciscofp3			
FTDVPNServerCertificate	Global	Manual	CA ⚠ ID ⚠ Identity certificate import required

Import Identity Certificate

Step 1
Send Certificate Signing Request (CSR) to the Certificate Authority.

Certificate Signing Request (Copy the CSR below and send to the Certificate Authority):

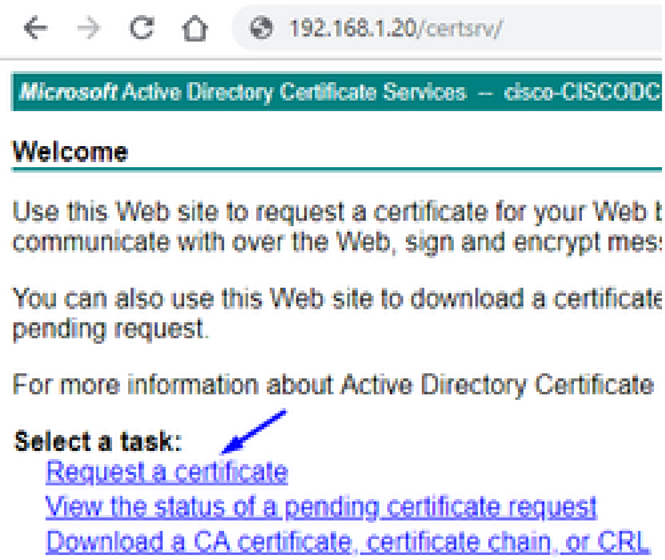
```
-----BEGIN CERTIFICATE REQUEST-----
MIIDLzCCAhcCAQAwgakxHDAaBgkqhkiG9w0BCQEWDXRhY0BiaXNibv5ib20xCzAJ
BgNVBAYTAlVTMQswCQYDVQQIEwJDQTERMA8GA1UEBxMIU2FuIEpvc2UxGzAZBgNV
BAMTEmNpc2NvZnAzLmNpc2NvLmNvbTEOMAwGA1UEChMFQ2lzY28xDDAKBgNVBAsT
A1RBQzEhMB8GCSqGSIb3DQEJAhYSY2lzY29mcDMuY2lzY28uY29tMIIBIjANBgkq
hkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEApZtqz3ZBD/4nC1OFFQ15UVBdD1LS5oVW
gPodWhqPvZvJ4tz/P9lWi1ONlCN9vHmp40IdCZd17QJZnAsixq62VhzWCJ29i5HJ
a+k9I6XfMAqE8PAwYb4L/+BOtnQ02wvcBO82slXNEE1ycHR7vUJgsXs/muFN+4SQ
X51a1Z34+oA3rq3dG7vwCcTK93dTwdB8LNmUuyDsKx9FzmxY91hVf5dJXsc3l3iq
PYcJwdY6wT3i+5/L5HQBHcqaYEqJGVBnlAPhMpxICmQT4qJ0L1dTZW9nEto8gUMc
```

Step 2
Once certificate authority responds back with identity certificate file, import it to device.

Identity Certificate File: Browse Identity Certificate

Import Cancel

Visitare il sito Web all'indirizzo http://192.168.1.20/certsrv



Microsoft Active Directory Certificate Services -- cisco-CISCODC

Welcome

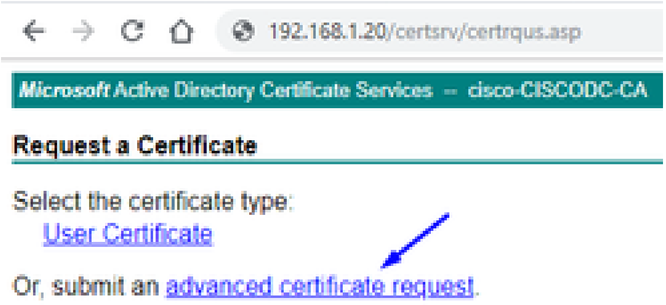
Use this Web site to request a certificate for your Web b
communicate with over the Web, sign and encrypt mes

You can also use this Web site to download a certificate
pending request.

For more information about Active Directory Certificate

Select a task:
Request a certificate
View the status of a pending certificate request
Download a CA certificate, certificate chain, or CRL

Fare clic su **Richiesta avanzata certificati**


192.168.1.20/certsrv/certrqus.asp

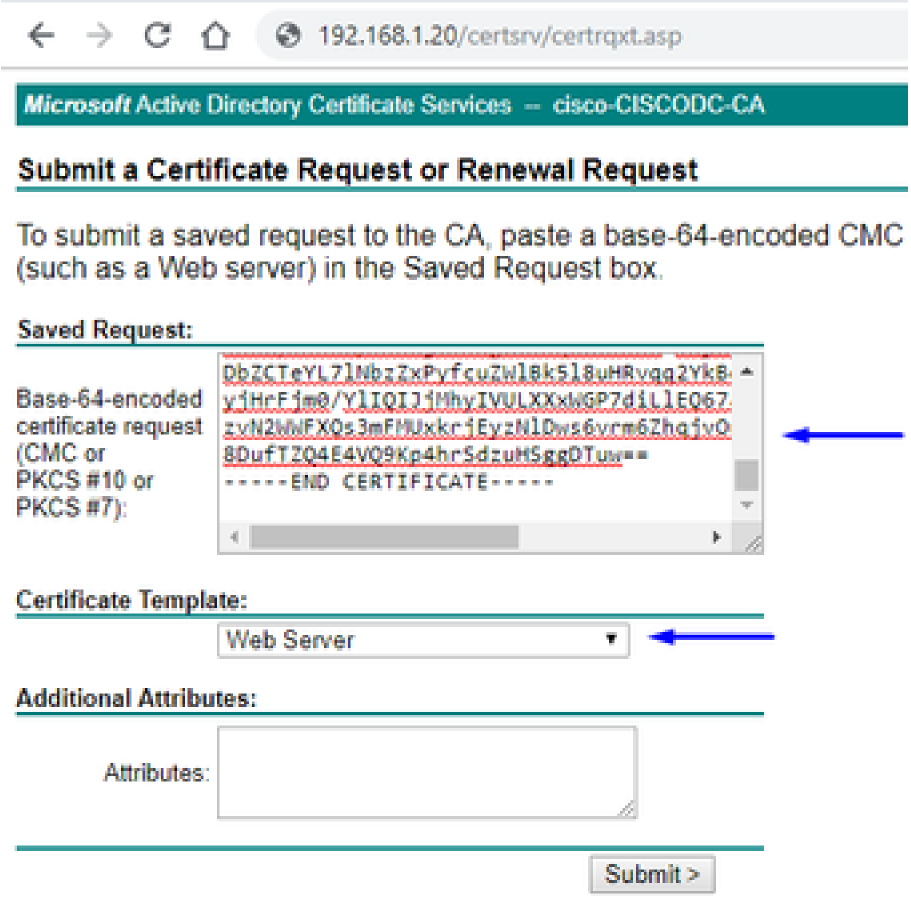
Microsoft Active Directory Certificate Services -- cisco-CISCODC-CA

Request a Certificate

Select the certificate type:
User Certificate

Or, submit an advanced certificate request.

Incollare la richiesta di firma del certificato (CSR) nel campo sottostante e selezionare **Server Web** come modello di certificato


192.168.1.20/certsrv/certrqxt.asp

Microsoft Active Directory Certificate Services -- cisco-CISCODC-CA

Submit a Certificate Request or Renewal Request

To submit a saved request to the CA, paste a base-64-encoded CMC (such as a Web server) in the Saved Request box.

Saved Request:

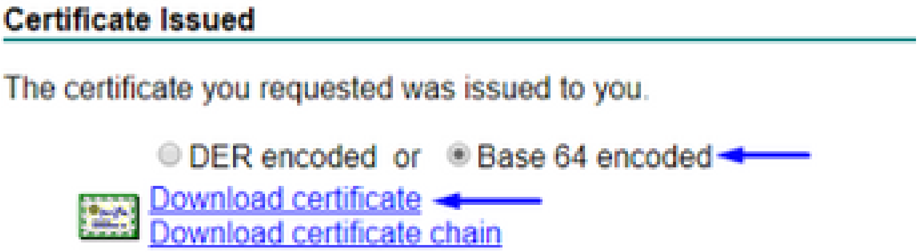
Base-64-encoded certificate request (CMC or PKCS #10 or PKCS #7):

```
DbZCTeYL7lNbzZxPyfcuZWl8k5l8uHRvqq2YkB
yjHrFjm0/YlIQIJjMhyIVULXXxWGP7diLlEQ67
zvN2WNFXQs3mFMUxkrjEyzNlDws6vrm6ZhqjvQ
8DufTZQ4E4VQ9Kp4hrSdzuMSggDTuw==
-----END CERTIFICATE-----
```

Certificate Template:
Web Server ▾

Additional Attributes:
Attributes:

Fare clic su **Submit (Invia).**
Fare clic sul pulsante **Codificato Base 64** e fare clic su **Scarica certificato**

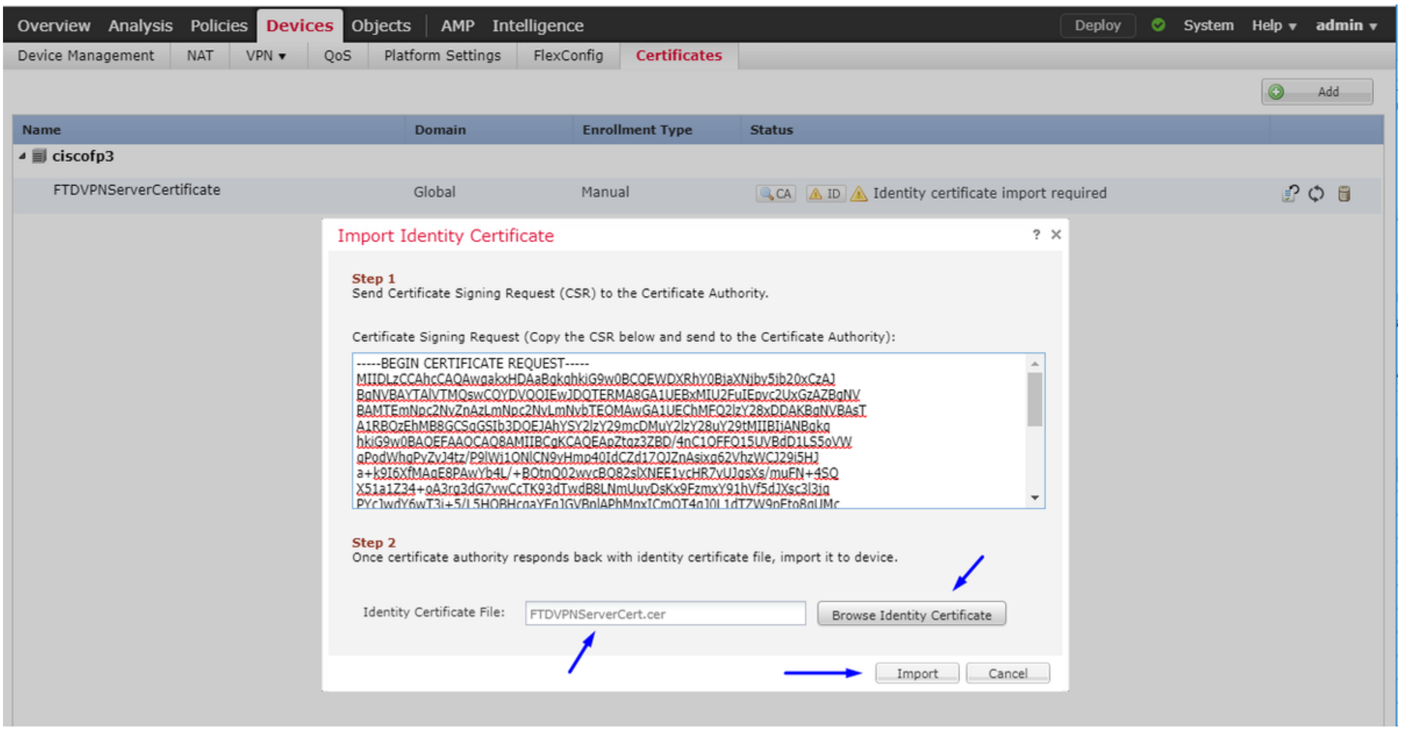

Certificate Issued

The certificate you requested was issued to you.

○ DER encoded or ● Base 64 encoded

Download certificate
Download certificate chain

Fare clic su **Sfoglia certificato di identità** e selezionare il certificato appena scaricato



Name	Domain	Enrollment Type	Status
◢ ciscofp3			
FTDVPNServerCertificate	Global	Manual	CA ⚠ ID ⚠ Identity certificate import required

Import Identity Certificate

Step 1
Send Certificate Signing Request (CSR) to the Certificate Authority.

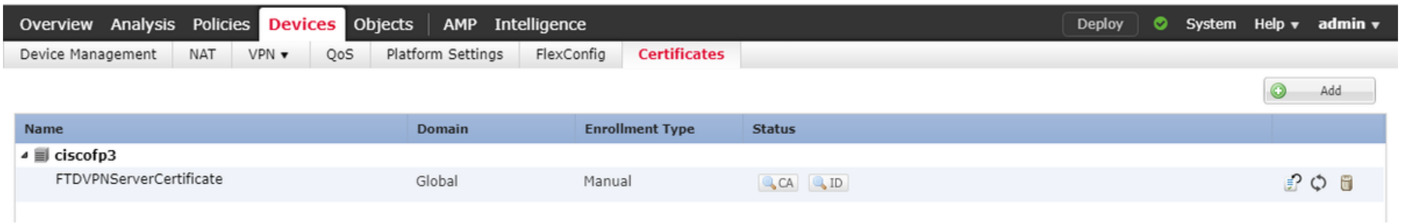
Certificate Signing Request (Copy the CSR below and send to the Certificate Authority):

```
-----BEGIN CERTIFICATE REQUEST-----
MIIDLzCCAhcCAQAwgakxHDAaBgkqhkiG9w0BCQEWDXRhY0BjaXNjby5jb20xCzAJ
BgNVBAYTAlVTMQswCQYDVQQIEwJDQTERMA8GA1UEBxMIU2FuIEpvc2UxGzAZBgNV
BAMTEmNpc2NvZnAzLmNpc2NvLmNvbTEOMAwGA1UEChMFQ2lzY28xDDAKBgNVBAsT
A1RBQzEhMB8GCSqGSIb3DQEJAhYSY2lzY29mcDMuY2lzY28uY29tMIIBIjANBgkq
hkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEApZtqz3ZBD/4nC1OFFQ15UVBdD1LS5oVW
gPodWhgPyZvJ4tz/P9lWj1ONlCN9yHmp40IdCZd17QJZnAsixg62VhzWCJ29i5HJ
a+k9I6XfMAgE8PAwYb4L/+BQtnQ02wycBQ82slXNEE1ycHR7vUJgsXs/muFN+4SQ
X51a1Z34+gA3rg3dG7vwCcTK93dTwdB8LNmUuyDsKx9FzmxY91hVf5dJXsc3l3jq
PYcJwdY6wT3i+5/L5HQBHcgaYFqJGVBnlAPhMpxICmQT4qJ0L1dTZW9pFto8gUMc
```

Step 2
Once certificate authority responds back with identity certificate file, import it to device.

Identity Certificate File: FTDVPNServerCert.cer

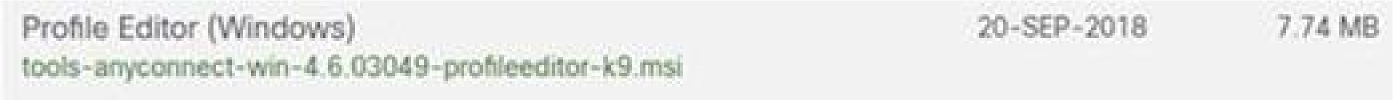
Installazione del certificato server VPN FTD (firmato dalla CA radice di Windows Server) completata



Name	Domain	Enrollment Type	Status
◢ ciscofp3			
FTDVPNServerCertificate	Global	Manual	CA ID

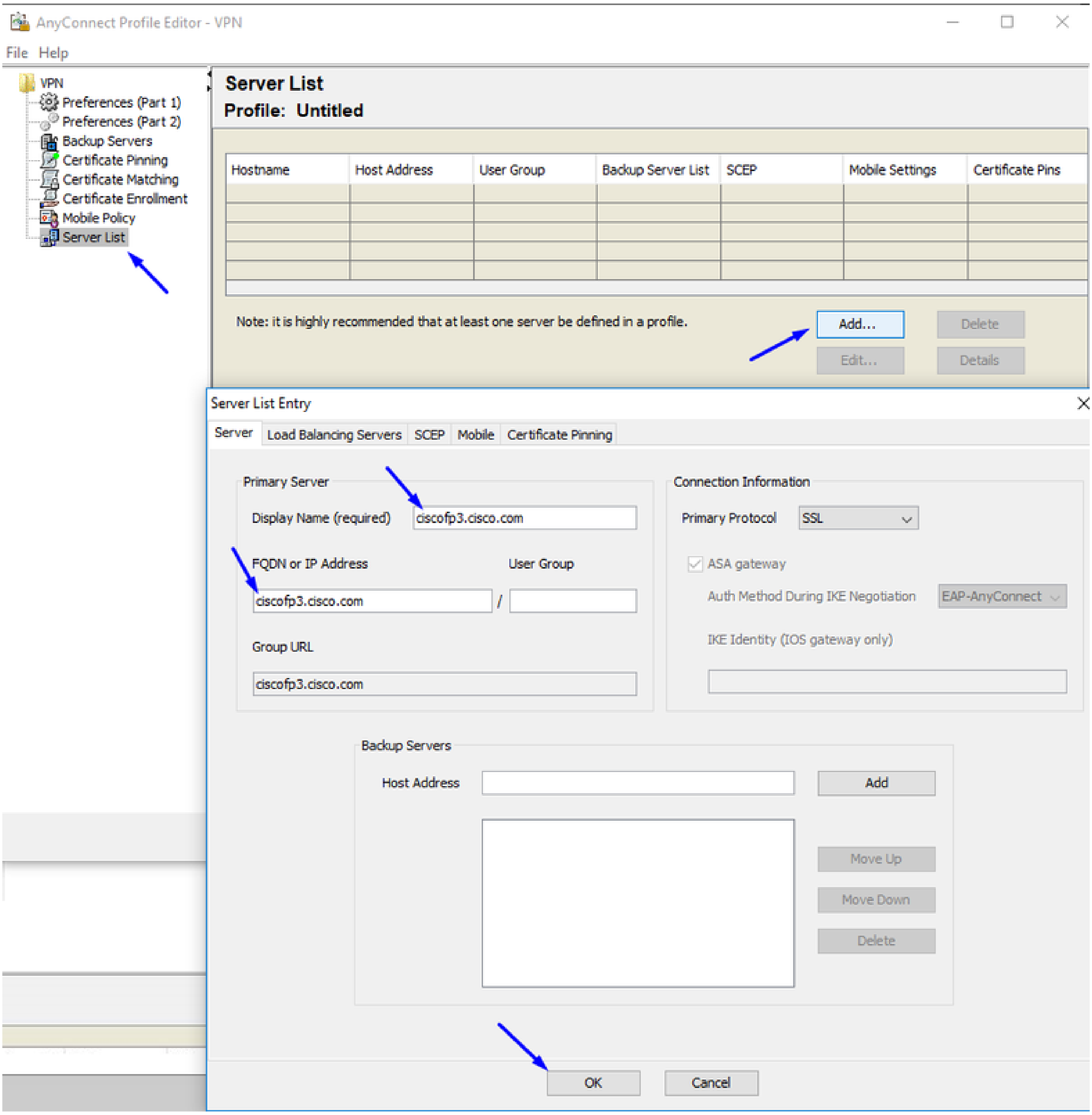
Scarica l'immagine AnyConnect + Editor profili AnyConnect e crea un profilo .xml

Scaricare e installare Cisco AnyConnect Profile Editor



Profile Editor (Windows) tools-anyconnect-win-4.6.03049-profileeditor-k9.msi	20-SEP-2018	7.74 MB

Apri Editor profili AnyConnect
Fare clic su **Server List** > click **Add...**
Digitare un **nome visualizzato** e il **nome FQDN** dell'indirizzo IP dell'interfaccia esterna del FTD. Verranno visualizzate le voci nell'elenco dei server



Server List

Profile: Untitled

Hostname	Host Address	User Group	Backup Server List	SCEP	Mobile Settings	Certificate Pins

Note: it is highly recommended that at least one server be defined in a profile.

Display Name (required): ciscofp3.cisco.com

FQDN or IP Address: ciscofp3.cisco.com / User Group:

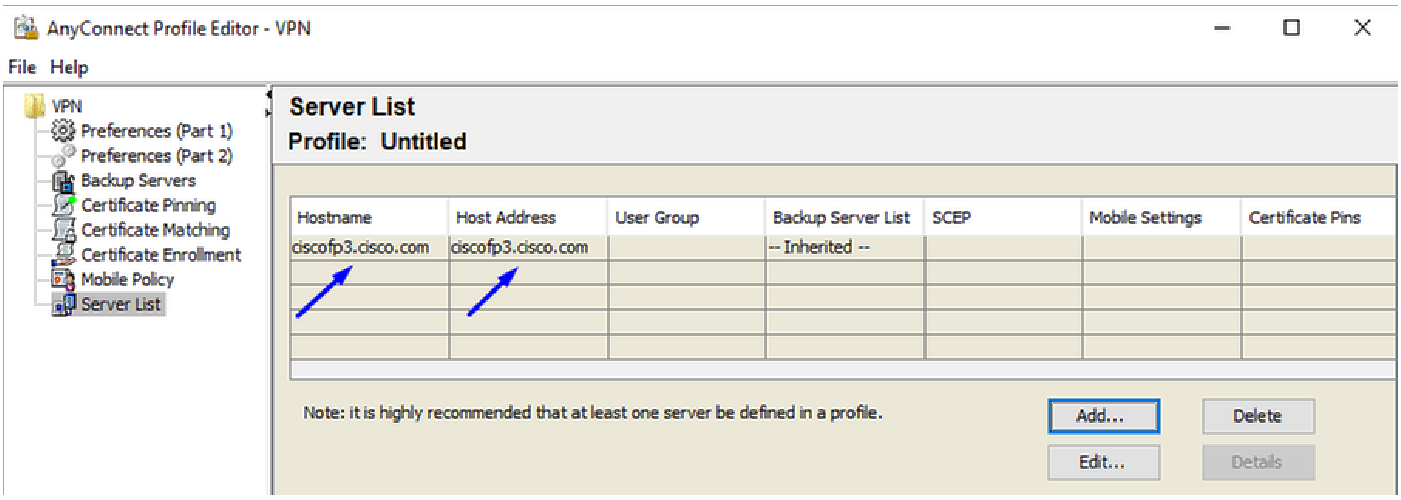
Group URL: ciscofp3.cisco.com

Primary Protocol: SSL

☑ ASA gateway

Auth Method During IKE Negotiation: EAP-AnyConnect

IKE Identity (IOS gateway only):



Server List

Profile: Untitled

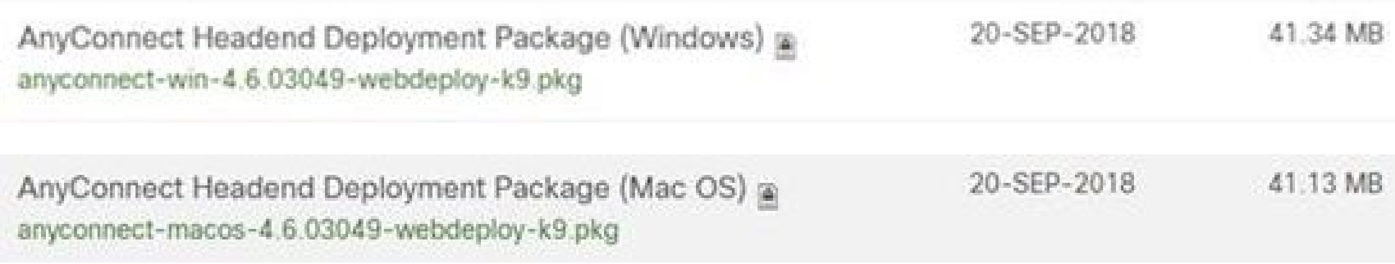
Hostname	Host Address	User Group	Backup Server List	SCEP	Mobile Settings	Certificate Pins
ciscofp3.cisco.com	ciscofp3.cisco.com		-- Inherited --			

Note: it is highly recommended that at least one server be defined in a profile.

Fare clic su **OK** e su **File** > **Salva con nome...**

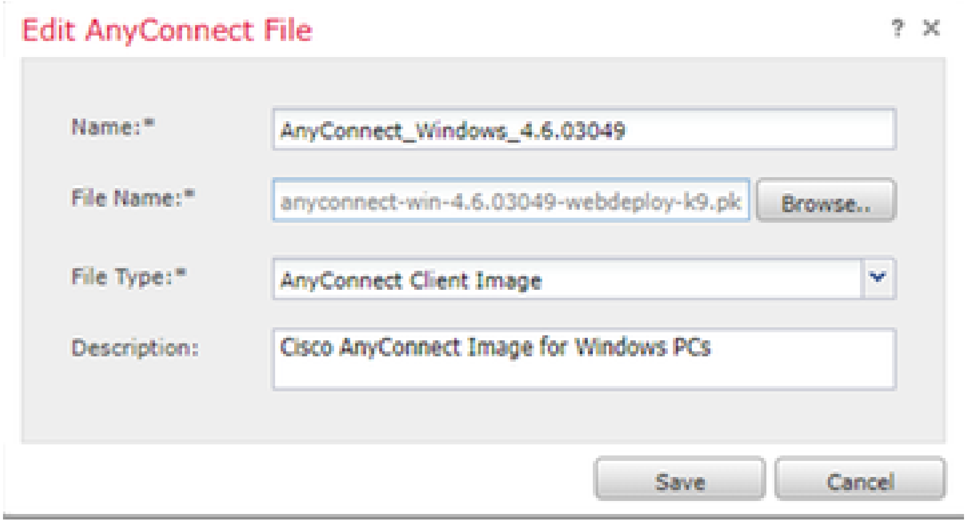
VPNprofile.xml

Scarica immagini .pkg Windows e Mac da qui



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

Selezionare **Oggetti** > **Gestione oggetti** > **VPN** > **File AnyConnect** > fare clic su **Aggiungi file AnyConnect**



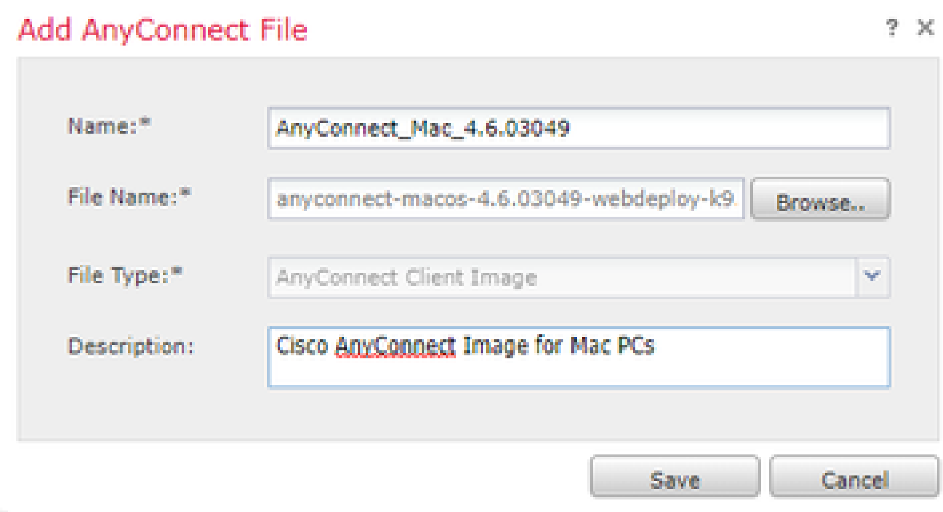
Edit AnyConnect File

Name:* AnyConnect_Windows_4.6.03049

File Name:* anyconnect-win-4.6.03049-webdeploy-k9.pk

File Type:* AnyConnect Client Image

Description: Cisco AnyConnect Image for Windows PCs



Add AnyConnect File

Name:* AnyConnect_Mac_4.6.03049

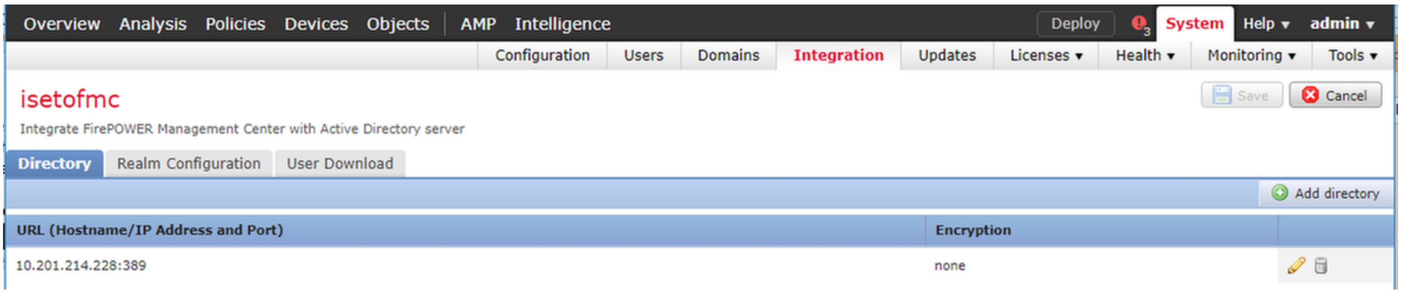
File Name:* anyconnect-macos-4.6.03049-webdeploy-k9

File Type:* AnyConnect Client Image

Description: Cisco AnyConnect Image for Mac PCs

Configurare Anyconnect VPN con FTD (usare il certificato CA radice)

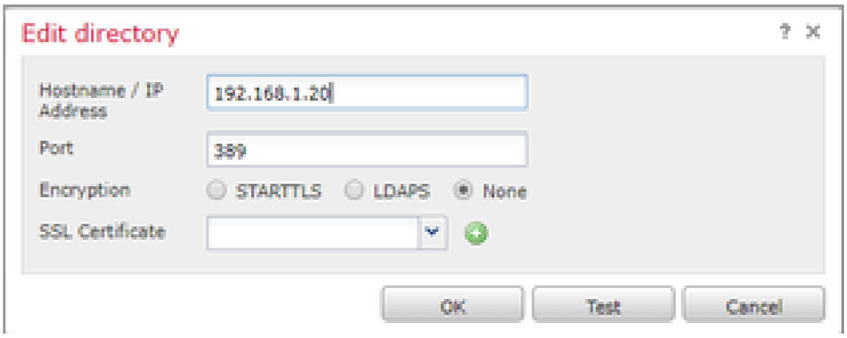
Accesso a **FirePOWER Management Center**
Fate clic su Sistema (System) > Integrazione (Integration) > **Realm** > clic su **Nuovo realm (New Realm)** > clic sulla **scheda Directory (Directory)** > fate clic su **Aggiungi directory (Add directory)**


Overview Analysis Policies Devices Objects AMP Intelligence
Deploy
System Help ▾ admin ▾
Configuration Users Domains Integration Updates Licenses ▾ Health ▾ Monitoring ▾ Tools ▾
Save Cancel
Directory Realm Configuration User Download
Add directory

isetofmc

Integrate FirePOWER Management Center with Active Directory server

URL (Hostname/IP Address and Port)	Encryption
10.201.214.228:389	none



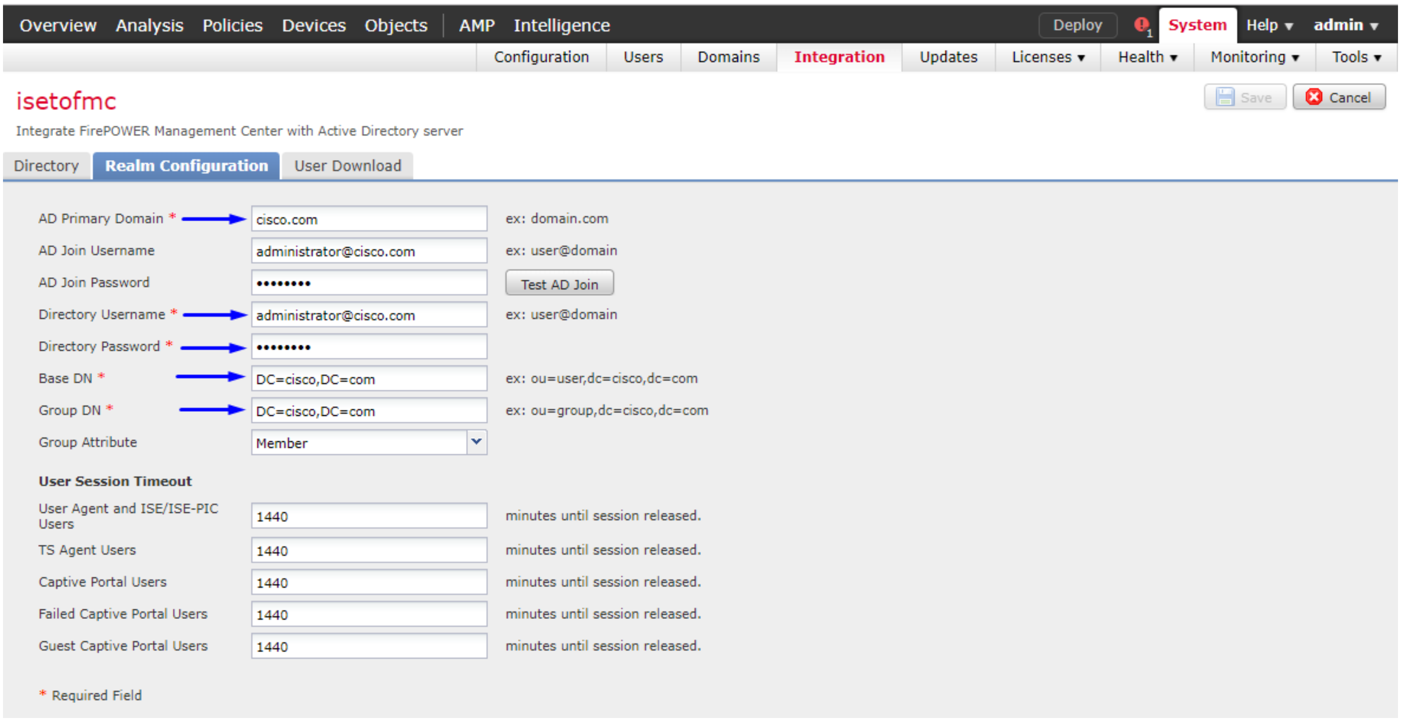
Hostname / IP Address: 192.168.1.20

Port: 389

Encryption: ○ STARTTLS ○ LDAPS ● None

SSL Certificate:

Fare clic sulla scheda **Configurazione realm** - Configura qui le informazioni del controller di dominio


Overview Analysis Policies Devices Objects AMP Intelligence
Deploy
System Help ▾ admin ▾
Configuration Users Domains Integration Updates Licenses ▾ Health ▾ Monitoring ▾ Tools ▾
Save Cancel
Directory Realm Configuration User Download
Test AD Join

isetofmc

Integrate FirePOWER Management Center with Active Directory server

AD Primary Domain * : cisco.com — ex: domain.com

AD Join Username: administrator@cisco.com — ex: user@domain

AD Join Password: ••••••••

Directory Username * : administrator@cisco.com — ex: user@domain

Directory Password * : ••••••••

Base DN * : DC=cisco,DC=com — ex: ou=user,dc=cisco,dc=com

Group DN * : DC=cisco,DC=com — ex: ou=group,dc=cisco,dc=com

Group Attribute: Member

User Session Timeout

User Agent and ISE/ISE-PIC Users: 1440 minutes until session released.

TS Agent Users: 1440 minutes until session released.

Captive Portal Users: 1440 minutes until session released.

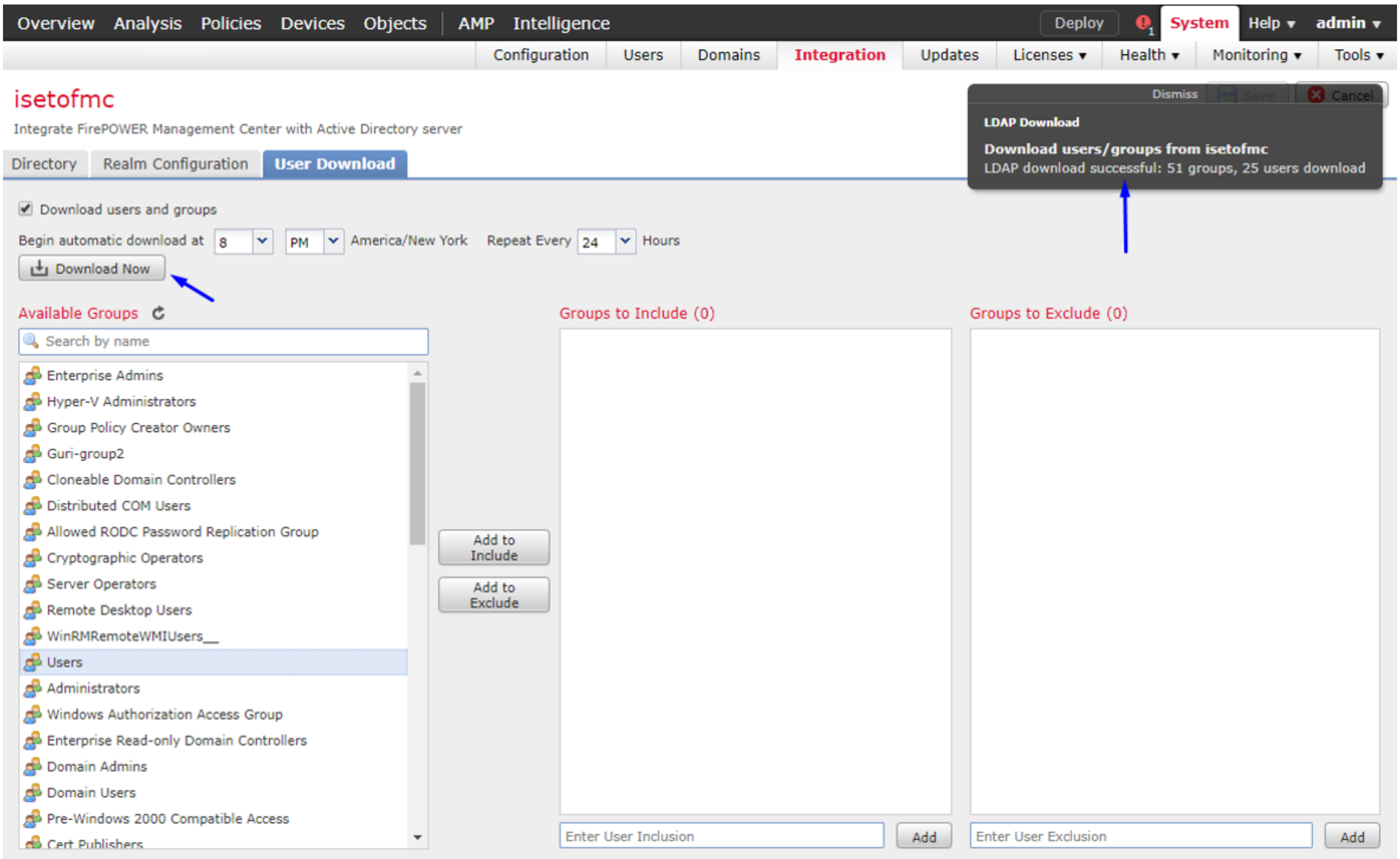
Failed Captive Portal Users: 1440 minutes until session released.

Guest Captive Portal Users: 1440 minutes until session released.

* Required Field

Nota: Nell'esempio precedente viene utilizzato un nome utente AD con privilegi 'Domain Admin' in Windows AD Server. Se si desidera configurare un utente con autorizzazioni minime più specifiche per l'aggiunta di CCP al dominio Active Directory per la configurazione del realm, vedere la procedura qui

Fare clic sulla scheda **User Download (Download utente)** - assicurarsi che il download venga eseguito correttamente



isetofmc

Integrate FirePOWER Management Center with Active Directory server

LDAP Download

Download users/groups from isetofmc

LDAP download successful: 51 groups, 25 users download

☑ Download users and groups

Begin automatic download at 8 PM America/New York Repeat Every 24 Hours

Available Groups

Search by name

- Enterprise Admins
- Hyper-V Administrators
- Group Policy Creator Owners
- Guri-group2
- Cloneable Domain Controllers
- Distributed COM Users
- Allowed RODC Password Replication Group
- Cryptographic Operators
- Server Operators
- Remote Desktop Users
- WinRMRemoteWMIUsers__
- Users
- Administrators
- Windows Authorization Access Group
- Enterprise Read-only Domain Controllers
- Domain Admins
- Domain Users
- Pre-Windows 2000 Compatible Access
- Cert Publishers

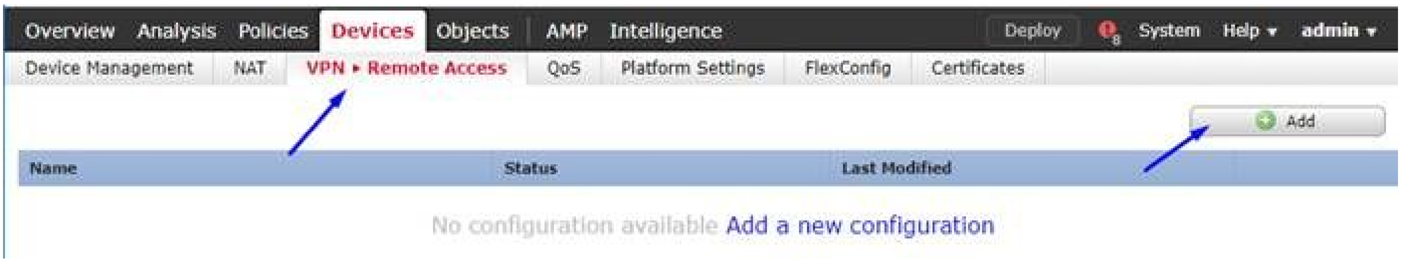
Groups to Include (0)

Enter User Inclusion

Groups to Exclude (0)

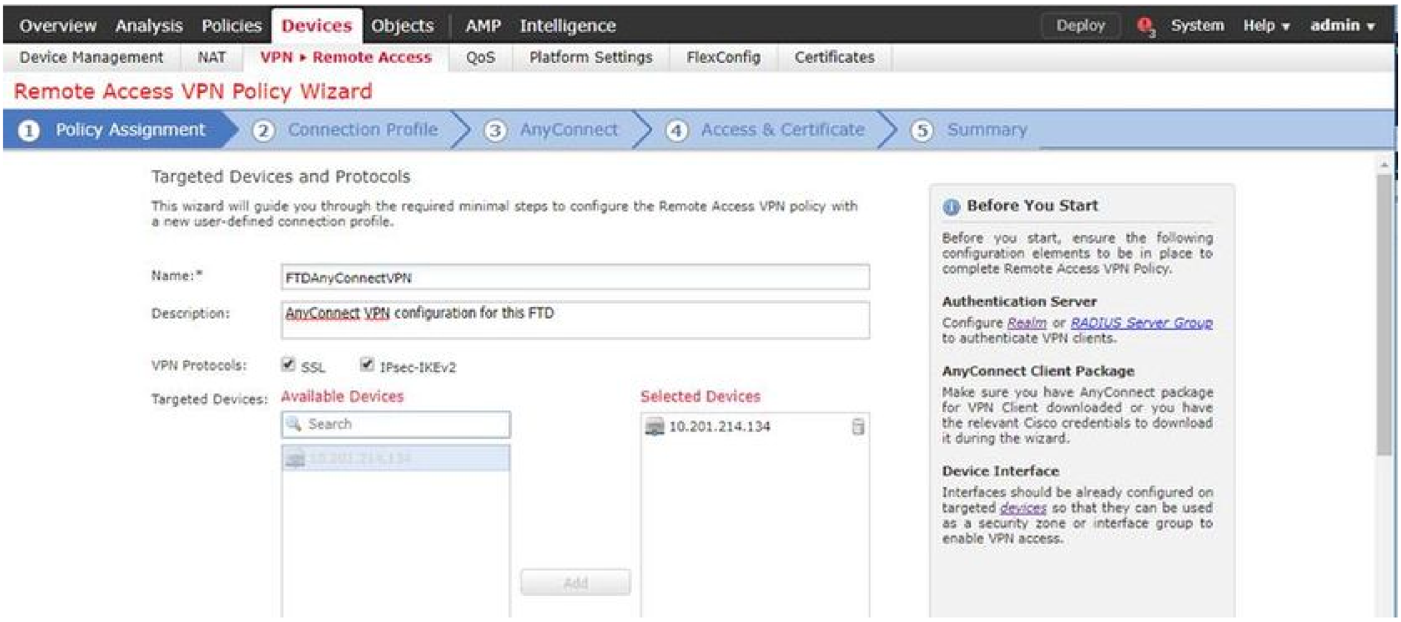
Enter User Exclusion

Fare clic su **Dispositivi** > **VPN** > **Accesso remoto** > fare clic su **Aggiungi**



No configuration available Add a new configuration

Digitare **Nome**, **Descrizione** e fare clic su **Aggiungi** per selezionare il dispositivo FTD su cui configurare Anyconnect VPN



Remote Access VPN Policy Wizard

Targeted Devices and Protocols

This wizard will guide you through the required minimal steps to configure the Remote Access VPN policy with a new user-defined connection profile.

Name:* FTDAnyConnectVPN

Description: AnyConnect VPN configuration for this FTD

VPN Protocols: ☑ SSL ☑ IPsec-IKEv2

Targeted Devices: Available Devices

Search

10.201.214.134

Selected Devices

10.201.214.134

Before You Start

Before you start, ensure the following configuration elements to be in place to complete Remote Access VPN Policy.

Authentication Server

Configure Realm or RADIUS Server Group to authenticate VPN clients.

AnyConnect Client Package

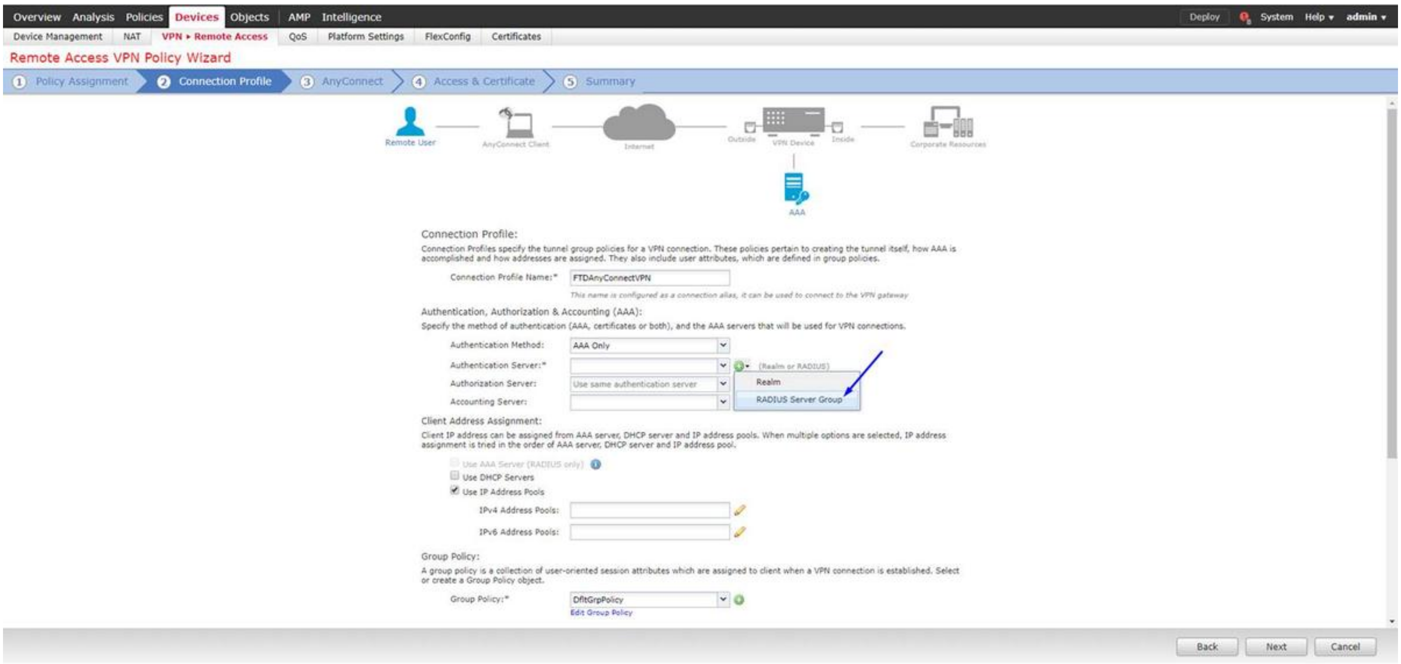
Make sure you have AnyConnect package for VPN Client downloaded or you have the relevant Cisco credentials to download it during the wizard.

Device Interface

Interfaces should be already configured on targeted devices so that they can be used as a security zone or interface group to enable VPN access.

Fare clic su **Add** (Aggiungi) per Authentication Server (Server autenticazione) e scegliere **RADIUS**

Server Group (Gruppo server RADIUS) - sarà il nome di dominio completo (PSN, Policy Services Node) di Cisco Identity Services Engine



Remote Access VPN Policy Wizard

Connection Profile:

Connection Profiles specify the tunnel group policies for a VPN connection. These policies pertain to creating the tunnel itself, how AAA is accomplished and how addresses are assigned. They also include user attributes, which are defined in group policies.

Connection Profile Name:* FTDAnyConnectVPN

This name is configured as a connection alias, it can be used to connect to the VPN gateway

Authentication, Authorization & Accounting (AAA):

Specify the method of authentication (AAA, certificates or both), and the AAA servers that will be used for VPN connections.

Authentication Method: AAA Only

Authentication Server:* (Realm or RADIUS)

Authorization Server: Use same authentication server

Accounting Server:

Client Address Assignment:

Client IP address can be assigned from AAA server, DHCP server and IP address pools. When multiple options are selected, IP address assignment is tried in the order of AAA server, DHCP server and IP address pool.

□ Use AAA Server (RADIUS only)
□ Use DHCP Servers
☑ Use IP Address Pools

IPv4 Address Pools:

IPv6 Address Pools:

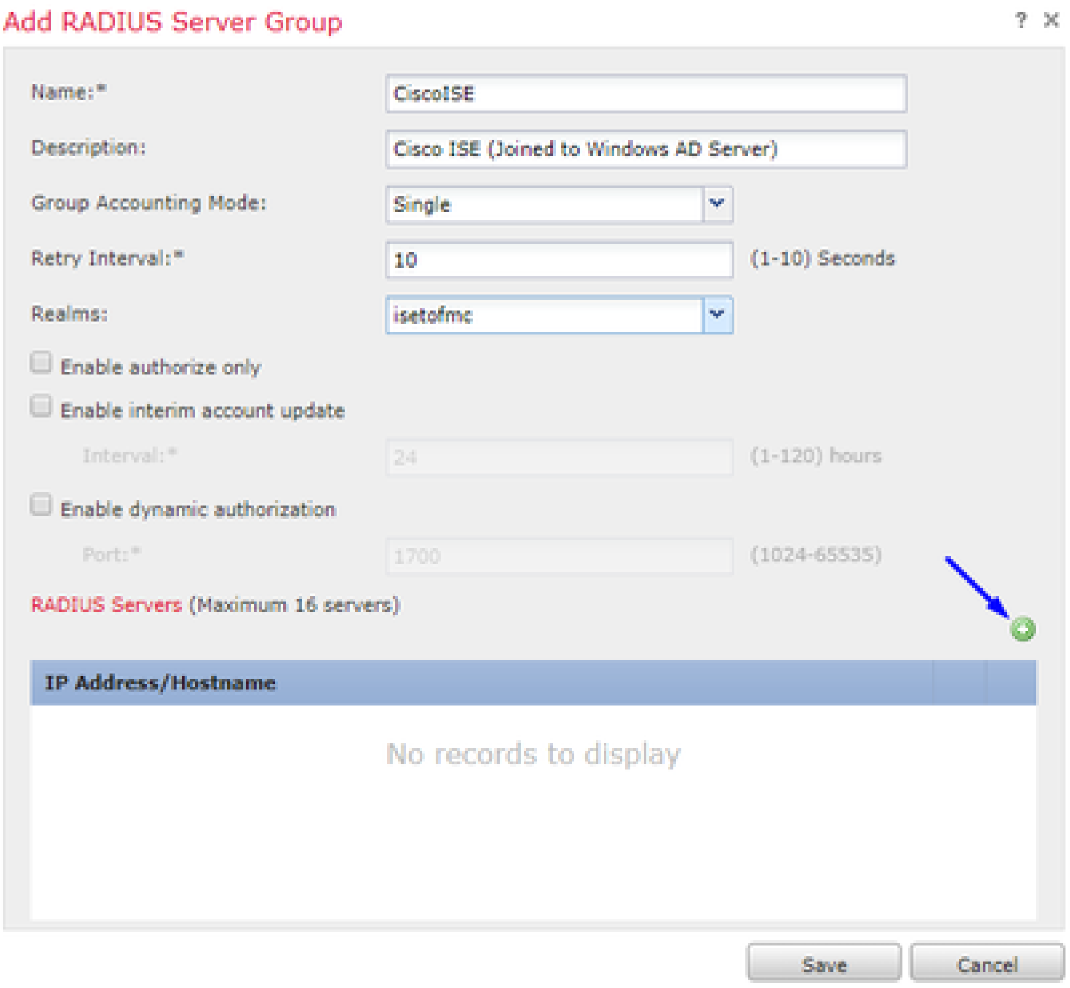
Group Policy:

A group policy is a collection of user-oriented session attributes which are assigned to client when a VPN connection is established. Select or create a Group Policy object.

Group Policy:* DfltGrpPolicy

Edit Group Policy

Digitare un **nome** per il server RADIUS
Selezionare il **realm** configurato in precedenza
Fare clic su **Aggiungi**



Add RADIUS Server Group

Name:* CiscoISE

Description: Cisco ISE (Joined to Windows AD Server)

Group Accounting Mode: Single

Retry Interval:* 10 (1-10) Seconds

Realms: isetofmc

□ Enable authorize only

□ Enable interim account update

Interval:* 24 (1-120) hours

□ Enable dynamic authorization

Port:* 1700 (1024-65535)

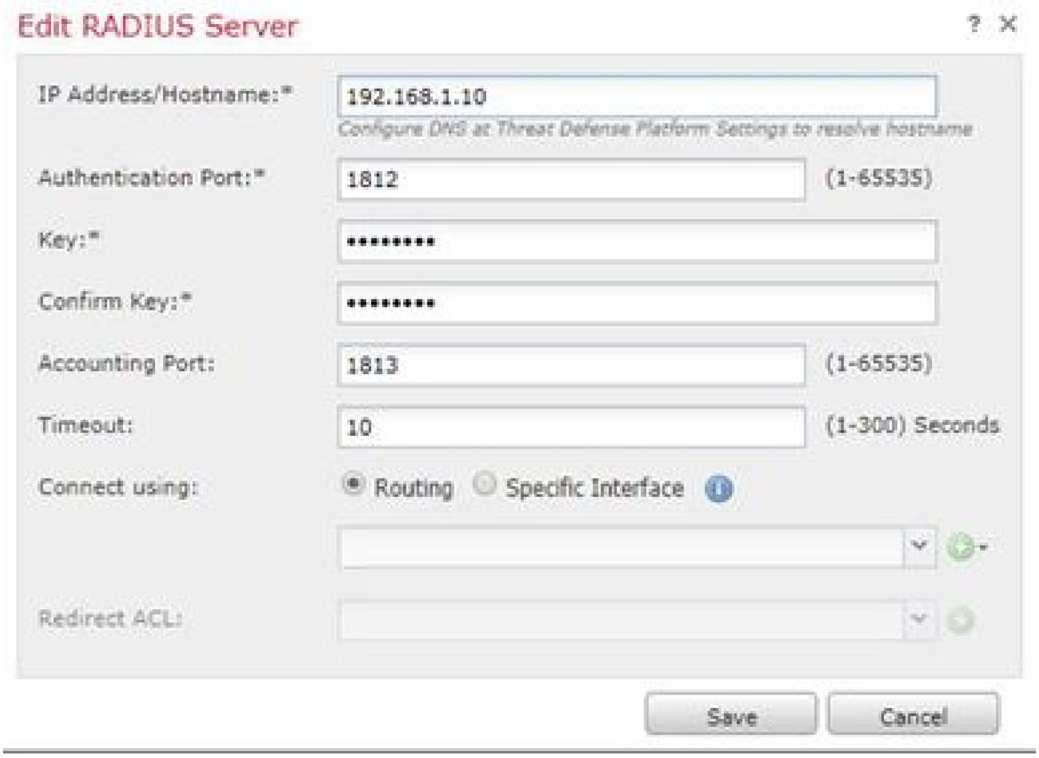
RADIUS Servers (Maximum 16 servers)

IP Address/Hostname
No records to display

Digita le seguenti informazioni per il tuo nodo Cisco ISE:

Indirizzo IP/Nome host: Indirizzo IP di Cisco ISE PSN (Policy Service Node) - destinazione delle richieste di autenticazione
Chiave: cisco 123
Conferma chiave: cisco 123

Attenzione: la chiave privata condivisa RADIUS è la chiave precedente. Verrà utilizzata in un passaggio successivo



Edit RADIUS Server

IP Address/Hostname:* 192.168.1.10
Configure DNS at Threat Defense Platform Settings to resolve hostname

Authentication Port:* 1812 (1-65535)

Key:* •••••••••

Confirm Key:* •••••••••

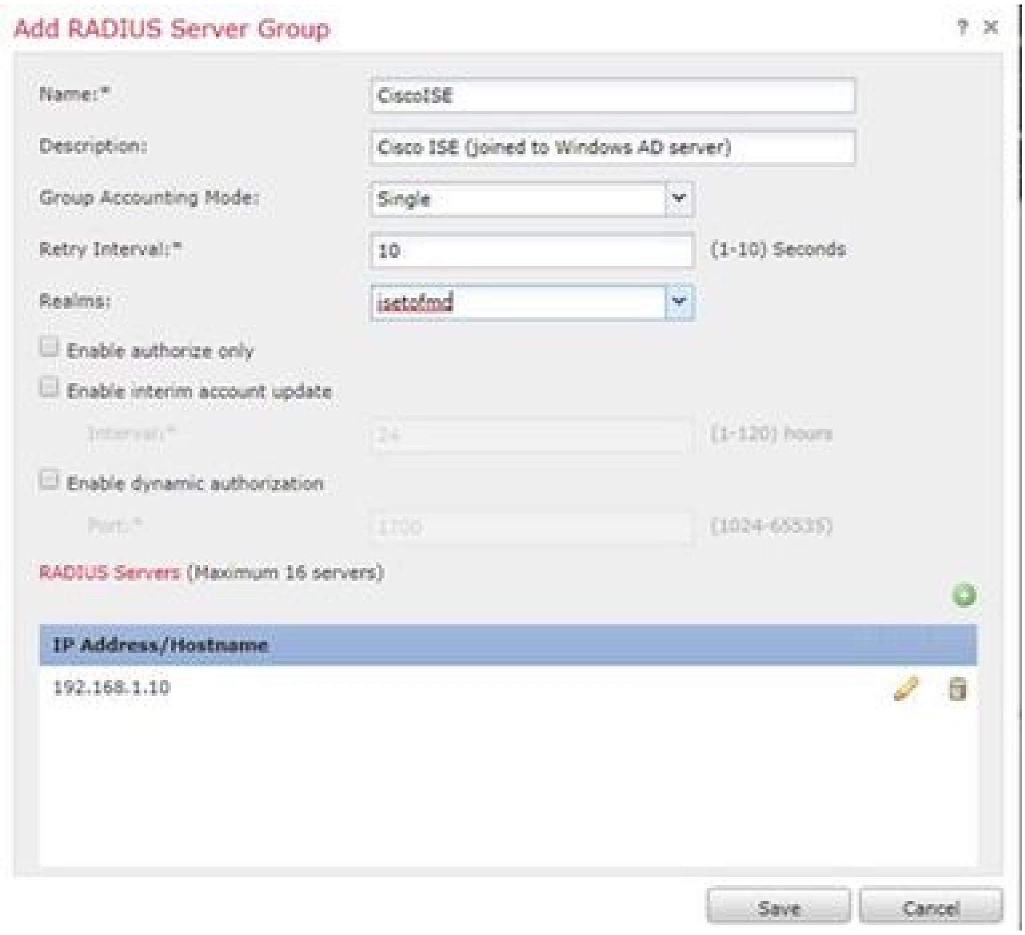
Accounting Port: 1813 (1-65535)

Timeout: 10 (1-300) Seconds

Connect using: ● Routing ○ Specific Interface

Redirect ACL:

Nota: Quando l'utente finale tenta di connettersi all'FTD tramite AnyConnect VPN, il nome utente e la password che digita vengono inviati come richiesta di autenticazione a questo FTD. L'FTD inoltrerà la richiesta al nodo PSN di Cisco ISE per l'autenticazione (Cisco ISE verificherà quindi in Windows Active Directory il nome utente e la password e applicherà il controllo dell'accesso/l'accesso alla rete a seconda della condizione attualmente configurata in Cisco ISE)



Add RADIUS Server Group

Name:* CiscoISE

Description: Cisco ISE (joined to Windows AD server)

Group Accounting Mode: Single

Retry Interval:* 10 (1-10) Seconds

Realms: isetofmd

□ Enable authorize only

□ Enable interim account update

Interval:* 24 (1-120) hours

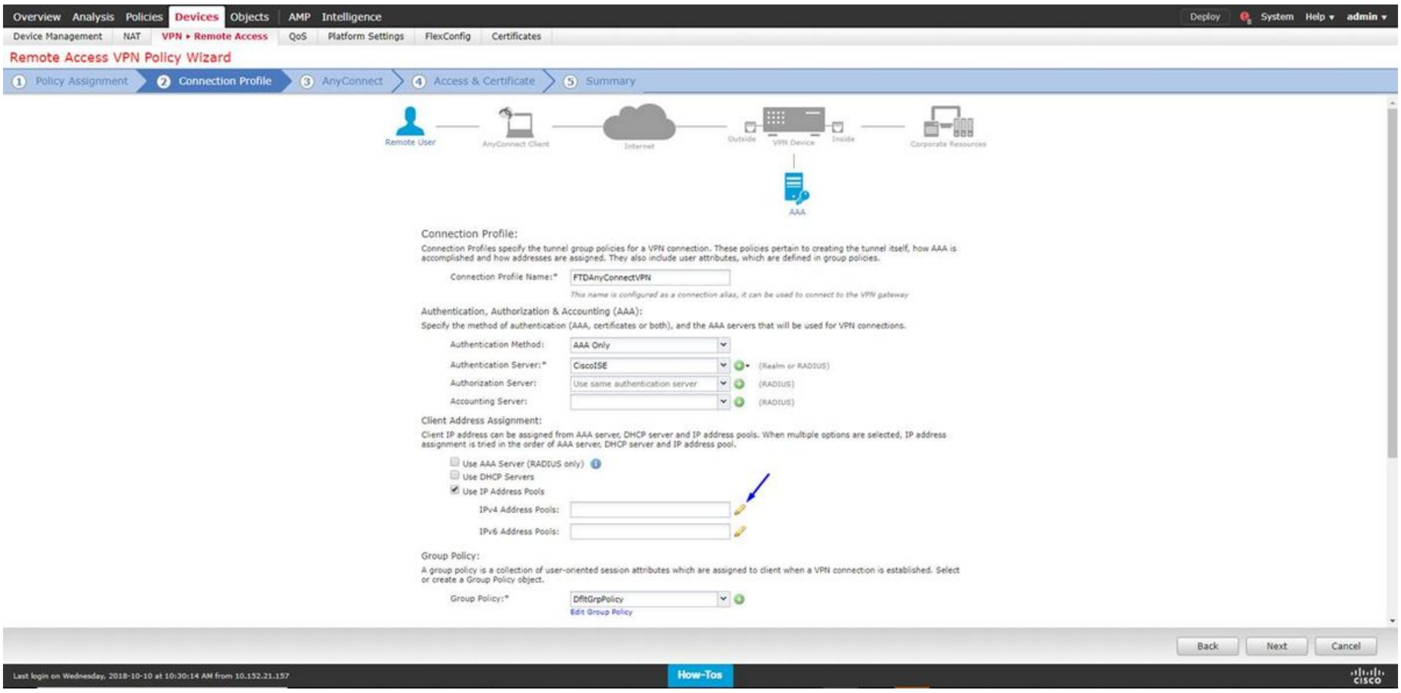
□ Enable dynamic authorization

Port:* 1700 (1024-65535)

RADIUS Servers (Maximum 16 servers)

IP Address/Hostname
192.168.1.10

Fare clic su **Salva.**
Fare clic su **Modifica** per **Pool indirizzi IPv4**



Remote Access VPN Policy Wizard

Connection Profile:

Connection Profiles specify the tunnel group policies for a VPN connection. These policies pertain to creating the tunnel itself, how AAA is accomplished and how addresses are assigned. They also include user attributes, which are defined in group policies.

Connection Profile Name:* FTDAnyConnectVPN

This name is configured as a connection alias, it can be used to connect to the VPN gateway

Authentication, Authorization & Accounting (AAA):

Specify the method of authentication (AAA, certificates or both), and the AAA servers that will be used for VPN connections.

Authentication Method: AAA Only

Authentication Server:* CiscoISE (Realm or RADIUS)

Authorization Server: Use same authentication server (RADIUS)

Accounting Server: (RADIUS)

Client Address Assignment:

Client IP address can be assigned from AAA server, DHCP server and IP address pools. When multiple options are selected, IP address assignment is tried in the order of AAA server, DHCP server and IP address pool.

□ Use AAA Server (RADIUS only)

□ Use DHCP Servers

☑ Use IP Address Pools

IPv4 Address Pools:

IPv6 Address Pools:

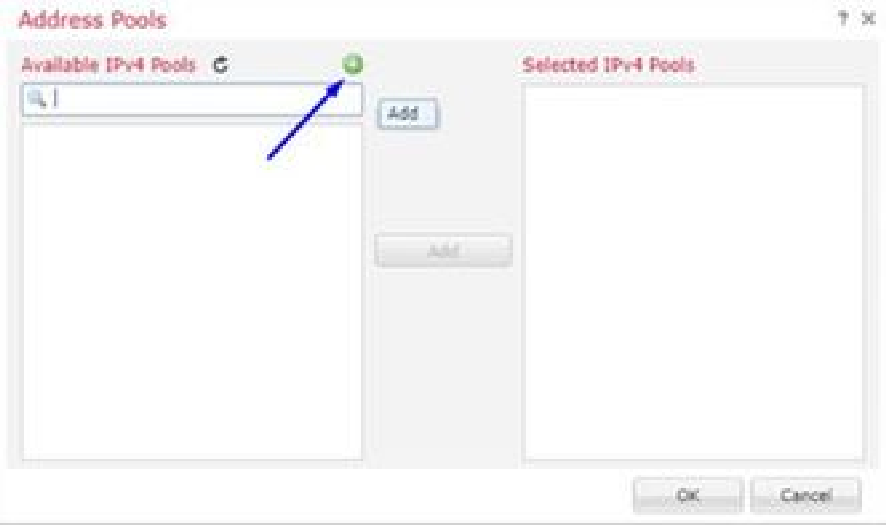
Group Policy:

A group policy is a collection of user-oriented session attributes which are assigned to client when a VPN connection is established. Select or create a Group Policy object.

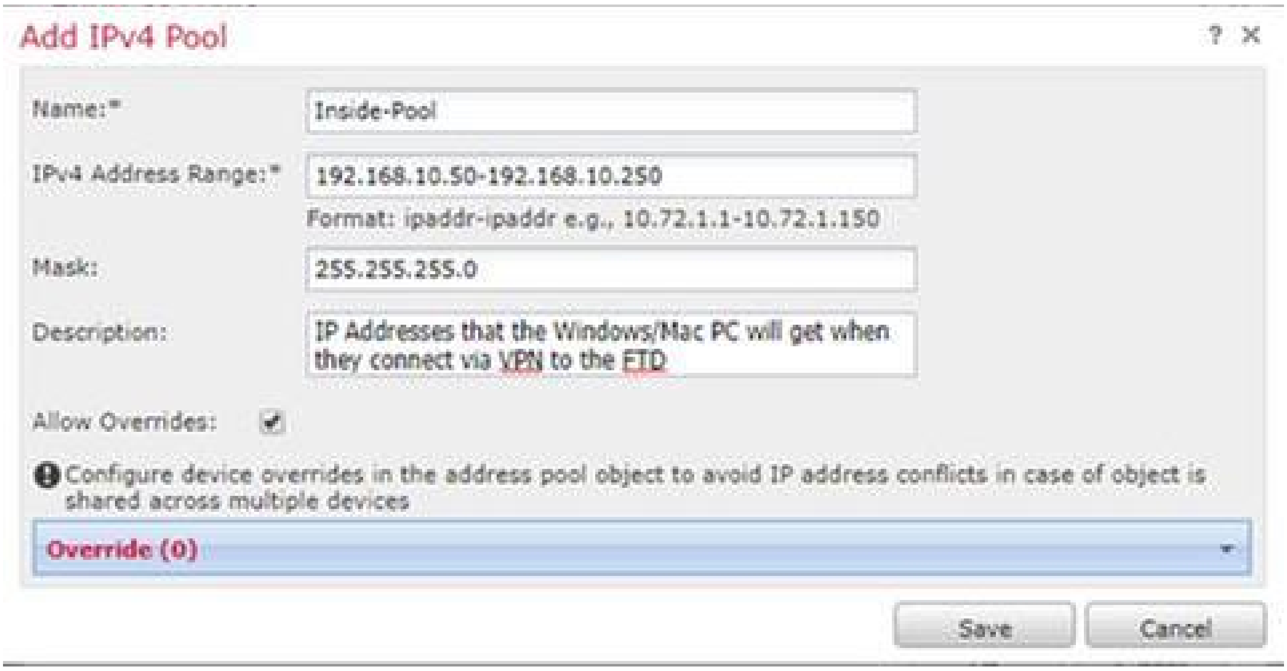
Group Policy:* DfltGrpPolicy

Last login on Wednesday, 2018-10-10 at 10:30:14 AM from 10.152.21.157

Fare clic su **Aggiungi**



Digitare un **nome**, un **intervallo di indirizzi IPv4** e una **subnet mask**



Add IPv4 Pool

Name:* Inside-Pool

IPv4 Address Range:* 192.168.10.50-192.168.10.250

Format: ipaddr-ipaddr e.g., 10.72.1.1-10.72.1.150

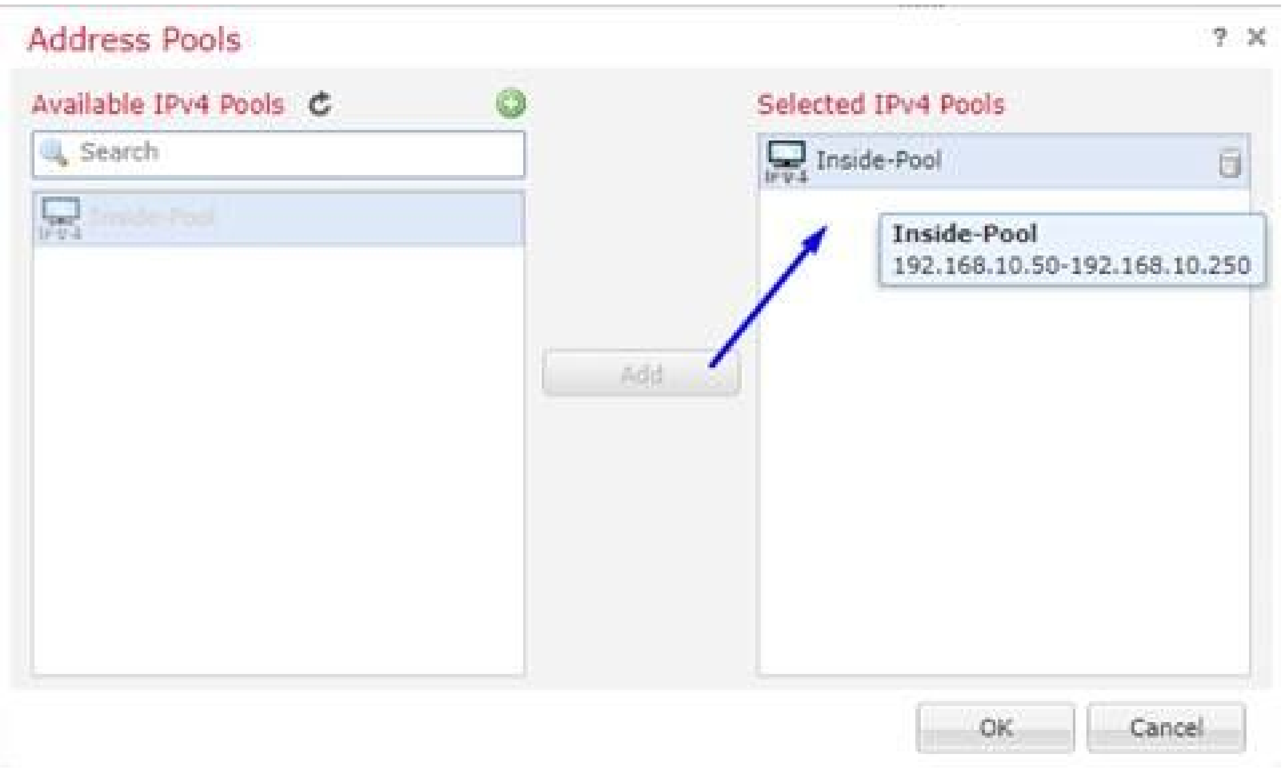
Mask: 255.255.255.0

Description: IP Addresses that the Windows/Mac PC will get when they connect via VPN to the FTD

Allow Overrides: ☑

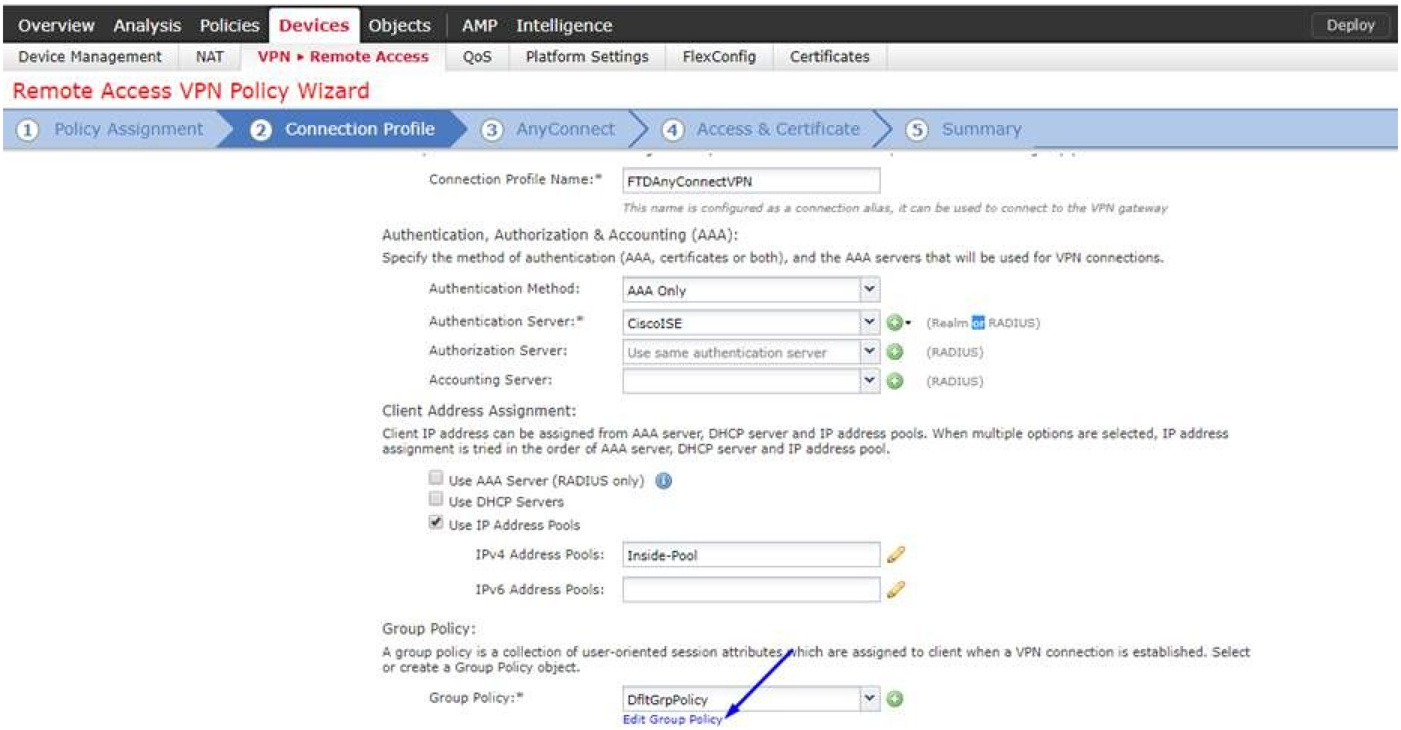
Configure device overrides in the address pool object to avoid IP address conflicts in case of object is shared across multiple devices

Selezionare il pool di indirizzi IP e fare clic su **OK**



Inside-Pool
192.168.10.50-192.168.10.250

Fare clic su **Modifica Criteri di gruppo**



Connection Profile Name:* FTDAnyConnectVPN

This name is configured as a connection alias, it can be used to connect to the VPN gateway

Authentication, Authorization & Accounting (AAA):

Specify the method of authentication (AAA, certificates or both), and the AAA servers that will be used for VPN connections.

Authentication Method: AAA Only

Authentication Server:* CiscoISE (Realm or RADIUS)

Authorization Server: Use same authentication server (RADIUS)

Accounting Server: (RADIUS)

Client Address Assignment:

Client IP address can be assigned from AAA server, DHCP server and IP address pools. When multiple options are selected, IP address assignment is tried in the order of AAA server, DHCP server and IP address pool.

☐ Use AAA Server (RADIUS only)
☐ Use DHCP Servers
☑ Use IP Address Pools

IPv4 Address Pools: Inside-Pool

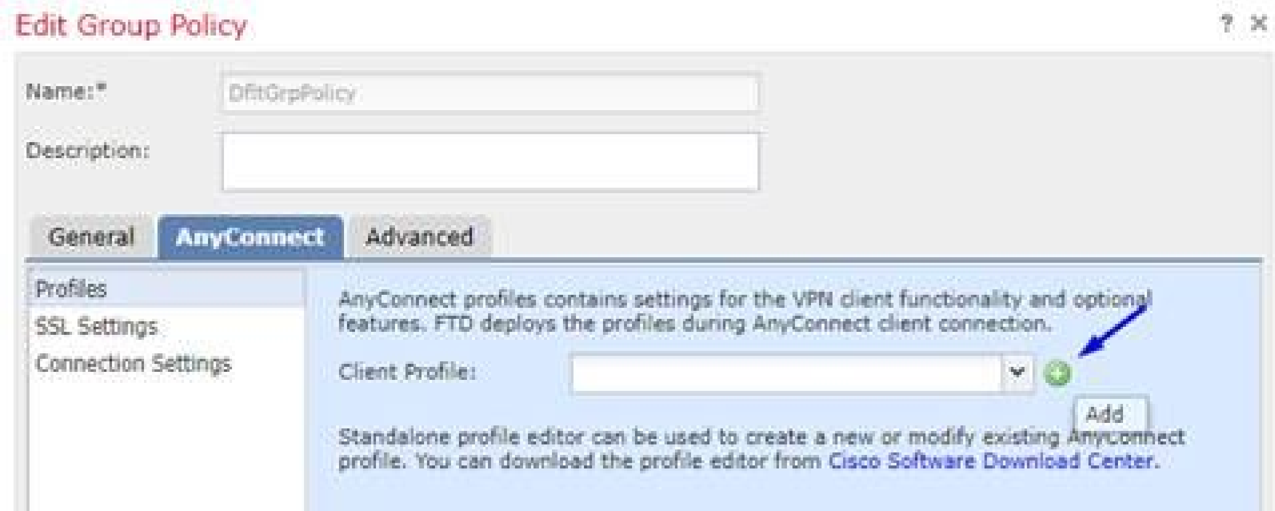
IPv6 Address Pools:

Group Policy:

A group policy is a collection of user-oriented session attributes which are assigned to client when a VPN connection is established. Select or create a Group Policy object.

Group Policy:* DfltGrpPolicy

Fare clic sulla scheda **Anyconnect** > **Profili** > clic su **Aggiungi**



Edit Group Policy

Name:* DfltGrpPolicy

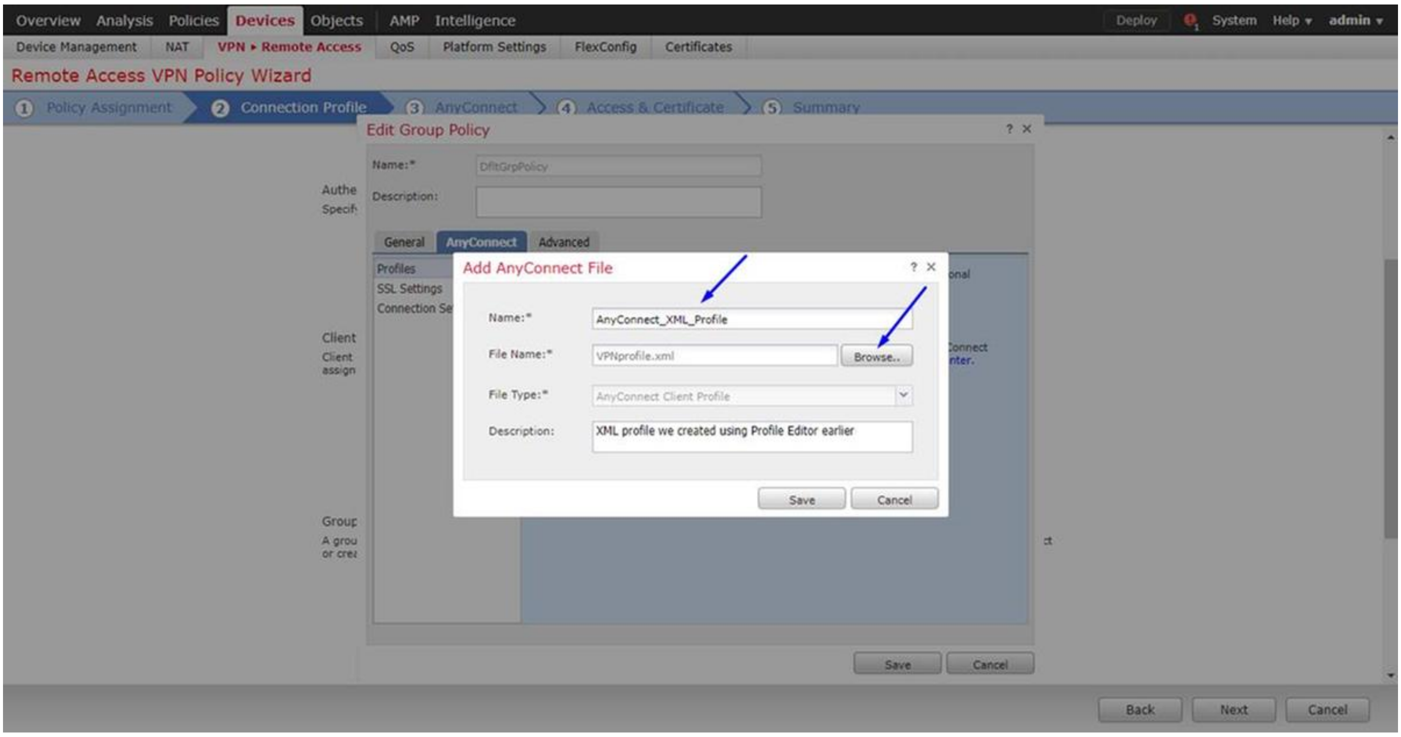
Description:

AnyConnect profiles contains settings for the VPN client functionality and optional features. FTD deploys the profiles during AnyConnect client connection.

Client Profile:

Standalone profile editor can be used to create a new or modify existing AnyConnect profile. You can download the profile editor from Cisco Software Download Center.

Digitare un **Nome**, fare clic su **Sfoglia** e selezionare il file VPNprofile.xml dal passaggio 4 sopra



Edit Group Policy

Name:* DfltGrpPolicy

Description:

Add AnyConnect File

Name:* AnyConnect_XML_Profile

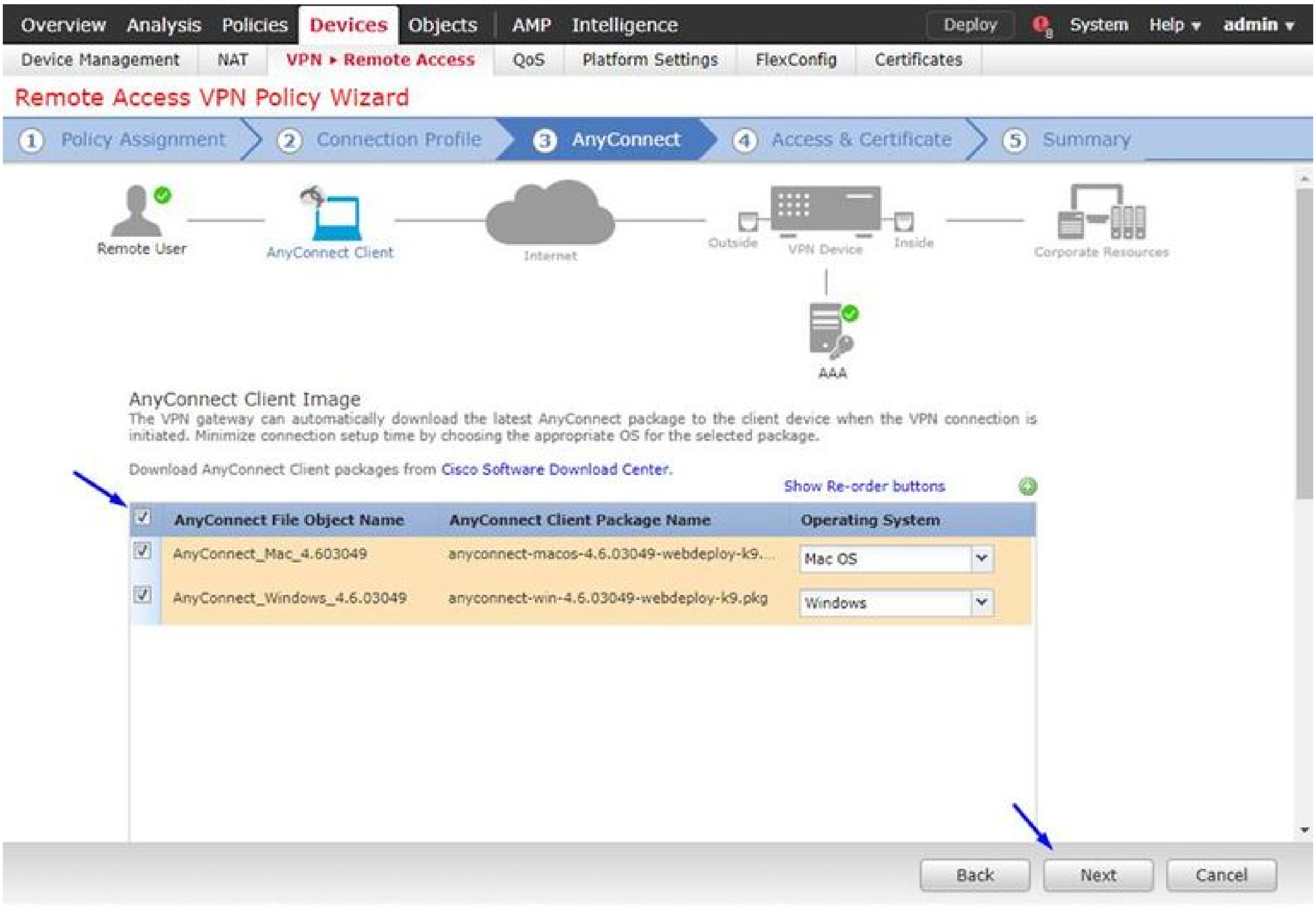
File Name:* VPNprofile.xml

File Type:* AnyConnect Client Profile

Description: XML profile we created using Profile Editor earlier

Fare clic su **Save** (Salva), quindi su **Next (Avanti).**

Selezionare le caselle di controllo relative al file Windows/Mac AnyConnect dal passaggio 4 riportato sopra



AnyConnect Client Image

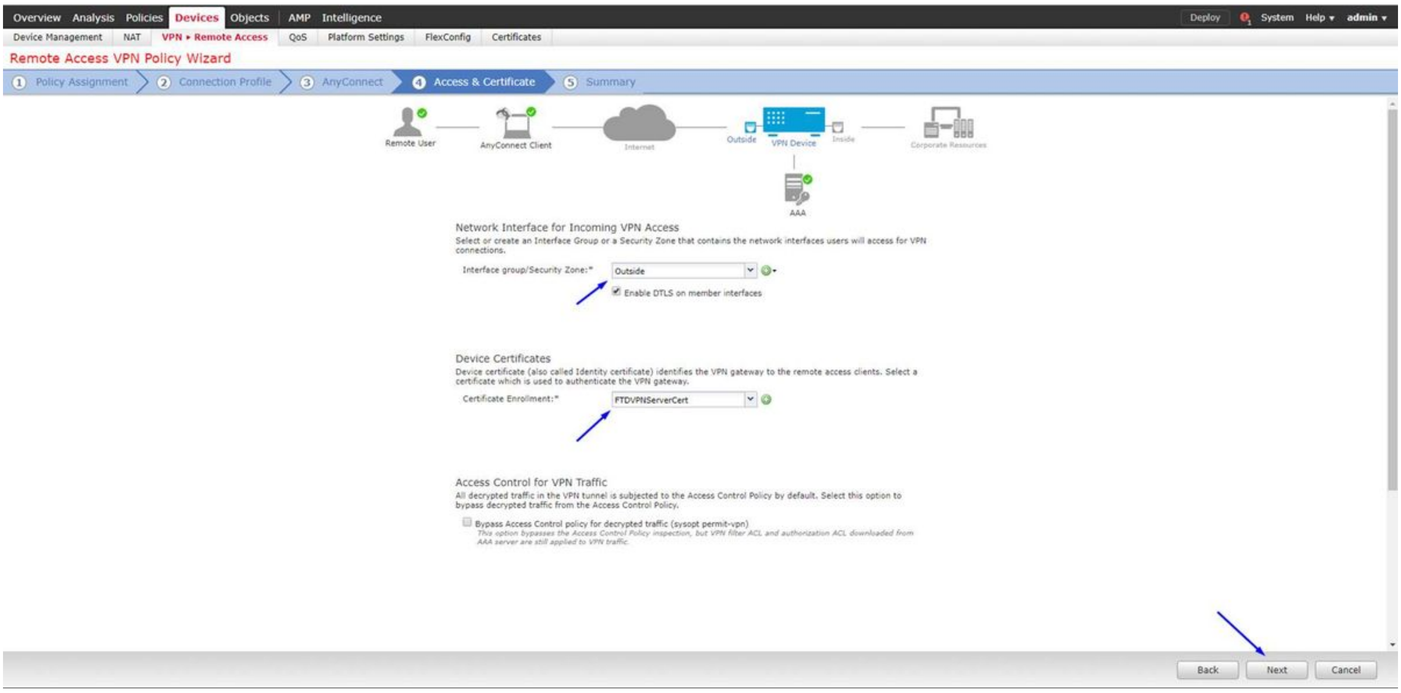
The VPN gateway can automatically download the latest AnyConnect package to the client device when the VPN connection is initiated. Minimize connection setup time by choosing the appropriate OS for the selected package.

Download AnyConnect Client packages from Cisco Software Download Center.

Show Re-order buttons

☑	AnyConnect File Object Name	AnyConnect Client Package Name	Operating System
☑	AnyConnect_Mac_4.603049	anyconnect-macos-4.6.03049-webdeploy-k9....	Mac OS
☑	AnyConnect_Windows_4.6.03049	anyconnect-win-4.6.03049-webdeploy-k9.pkg	Windows

Fare clic su **Avanti.**
Selezionare **Gruppo interfaccia/Area di sicurezza** come **Esterno**
Selezionare **Registrazione certificato** come certificato creato nel passaggio 3



Network Interface for Incoming VPN Access

Select or create an Interface Group or a Security Zone that contains the network interfaces users will access for VPN connections.

Interface group/Security Zone:* Outside

☑ Enable DTLS on member interfaces

Device Certificates

Device certificate (also called Identity certificate) identifies the VPN gateway to the remote access clients. Select a certificate which is used to authenticate the VPN gateway.

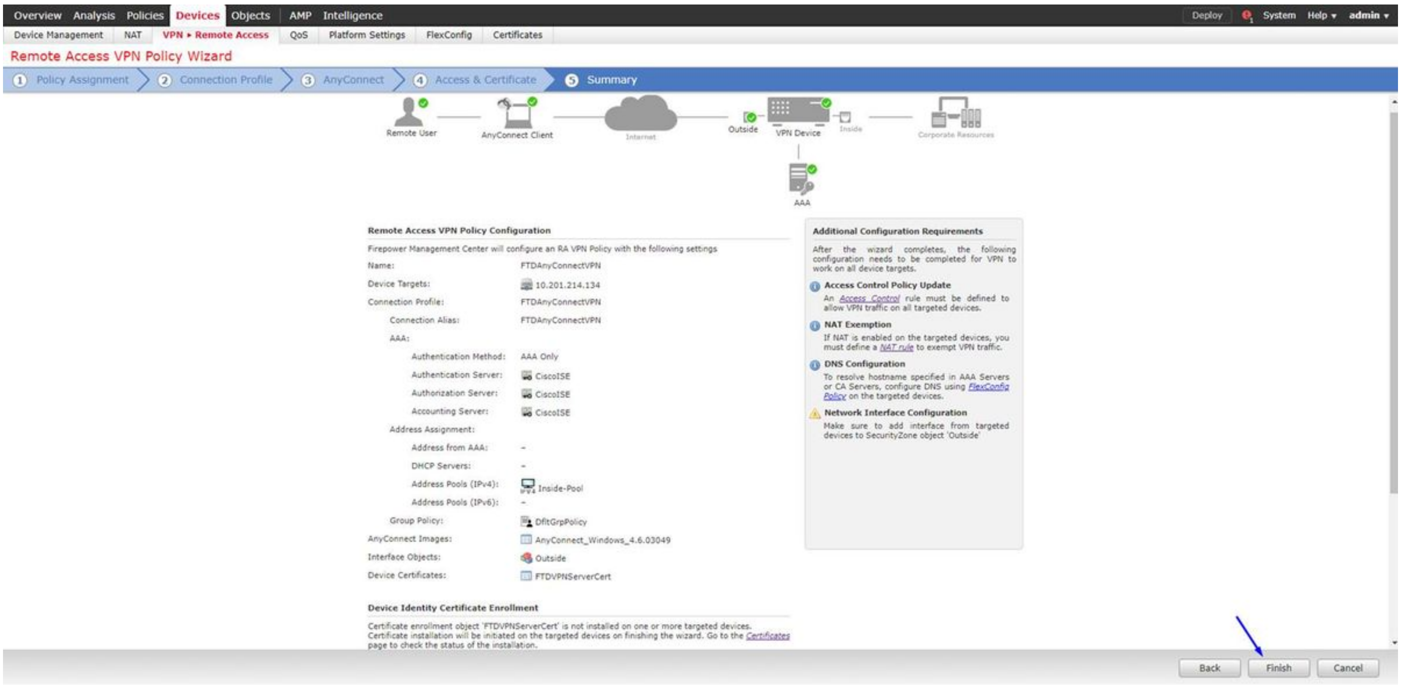
Certificate Enrollment:* FTDVPNServerCert

Access Control for VPN Traffic

All decrypted traffic in the VPN tunnel is subjected to the Access Control Policy by default. Select this option to bypass decrypted traffic from the Access Control Policy.

□ Bypass Access Control policy for decrypted traffic (sysopt permit-vpn)
This option bypasses the Access Control Policy inspection, but VPN filter ACL and authorization ACL downloaded from AAA server are still applied to VPN traffic.

Verificare la configurazione e fare clic su **Avanti**



Remote Access VPN Policy Configuration

Firepower Management Center will configure an RA VPN Policy with the following settings

Name:	FTDAnyConnectVPN
Device Targets:	10.201.214.134
Connection Profile:	FTDAnyConnectVPN
Connection Alias:	FTDAnyConnectVPN
AAA:	
Authentication Method:	AAA Only
Authentication Server:	CiscoISE
Authorization Server:	CiscoISE
Accounting Server:	CiscoISE
Address Assignment:	
Address from AAA:	-
DHCP Servers:	-
Address Pools (IPv4):	Inside-Pool
Address Pools (IPv6):	-
Group Policy:	DfltGrpPolicy
AnyConnect Images:	AnyConnect_Windows_4.6.03049
Interface Objects:	Outside
Device Certificates:	FTDVPNServerCert

Device Identity Certificate Enrollment

Certificate enrollment object 'FTDVPNServerCert' is not installed on one or more targeted devices. Certificate installation will be initiated on the targeted devices on finishing the wizard. Go to the Certificates page to check the status of the installation.

Additional Configuration Requirements

After the wizard completes, the following configuration needs to be completed for VPN to work on all device targets.

Access Control Policy Update

An Access Control rule must be defined to allow VPN traffic on all targeted devices.

NAT Exemption

If NAT is enabled on the targeted devices, you must define a NAT rule to exempt VPN traffic.

DNS Configuration

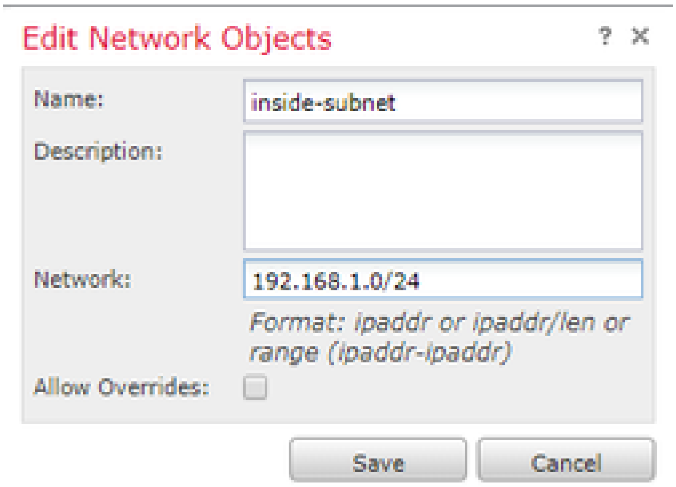
To resolve hostname specified in AAA Servers or CA Servers, configure DNS using FlexConfig Policy on the targeted devices.

Network Interface Configuration

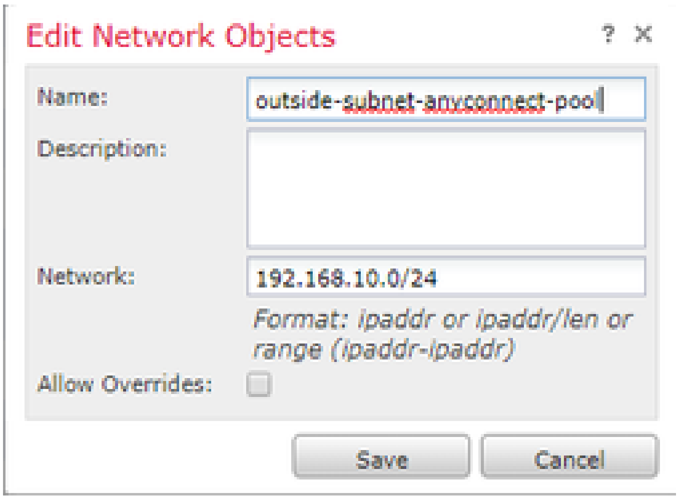
Make sure to add interface from targeted devices to SecurityZone object 'Outside'

Configurare la regola NAT FTD per esentare il traffico VPN da NAT poiché verrà decrittografato comunque e creare criteri/regole di controllo di accesso

Creare una **regola NAT** statica per assicurarsi che il traffico VPN non ottenga NAT (FTD decrittografa già i pacchetti AnyConnect quando arrivano all'interfaccia esterna, quindi è come se il PC sia già dietro l'interfaccia interna e abbiano *già* un indirizzo IP privato - dobbiamo ancora configurare una regola NAT-Exempt (No-NAT) per il traffico VPN):
Vai a **Oggetti** > fare clic su **Aggiungi rete** > fare clic su **Aggiungi oggetto**

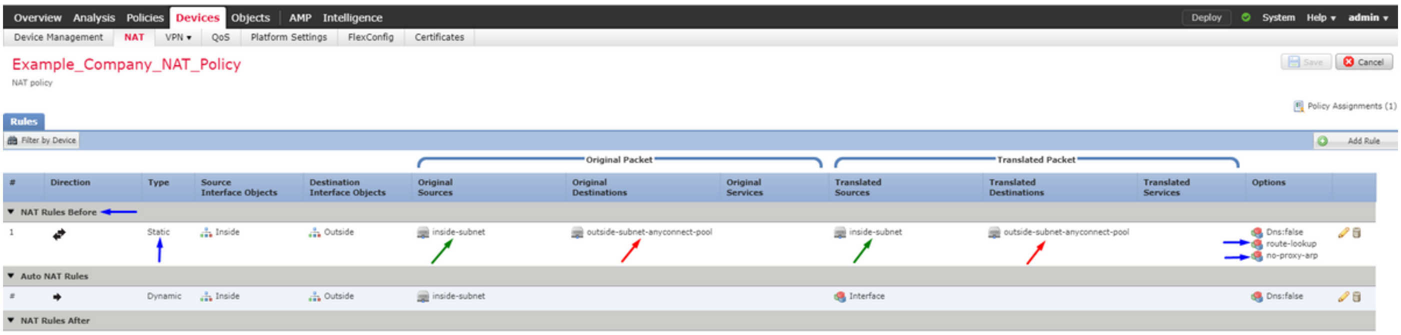


Name:	inside-subnet
Description:	
Network:	192.168.1.0/24
	Format: ipaddr or ipaddr/len or range (ipaddr-ipaddr)
Allow Overrides:	□



Edit Network Objects

Name:	outside-subnet-anyconnect-pool
Description:	
Network:	192.168.10.0/24
	Format: ipaddr or ipaddr/len or range (ipaddr-ipaddr)
Allow Overrides:	□



Overview Analysis Policies Devices Objects AMP Intelligence
Deploy System Help ▾ admin ▾
Device Management NAT VPN ▾ QoS Platform Settings FlexConfig Certificates
Save
Cancel
Policy Assignments (1)
Rules
Filter by Device
Add Rule

Example_Company_NAT_Policy

NAT policy

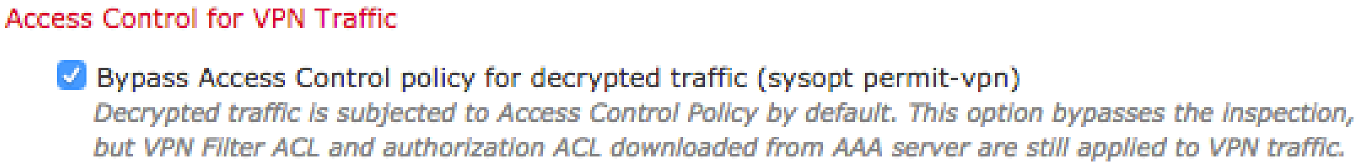
					Original Packet			Translated Packet			
#	Direction	Type	Source Interface Objects	Destination Interface Objects	Original Sources	Original Destinations	Original Services	Translated Sources	Translated Destinations	Translated Services	Options
▼ NAT Rules Before											
1	⇄	Static	Inside	Outside	inside-subnet	outside-subnet-anyconnect-pool		inside-subnet	outside-subnet-anyconnect-pool		Dns:false route-lookup no-proxy-arp
▼ Auto NAT Rules											
#	→	Dynamic	Inside	Outside	inside-subnet			Interface			Dns:false
▼ NAT Rules After											

Inoltre, è necessario consentire il flusso del traffico di dati dopo l'accesso della VPN utente. A tale scopo, sono disponibili due opzioni:

r. Creare regole di tipo Consenti o Nega per consentire o negare agli utenti VPN l'accesso a determinate risorse

b. Abilitare 'Ignora i criteri di controllo di accesso per il traffico decriptato' - in questo modo, chiunque sia in grado di connettersi correttamente all'FTD tramite VPN Ignora gli ACL e può accedere a qualsiasi elemento dietro l'FTD senza passare attraverso le regole di Consenti o Nega nei criteri di controllo di accesso

Abilitare **Ignora criteri di controllo di accesso per il traffico decrittografato** in: **Dispositivi** > **VPN** > **Accesso remoto** > **Profilo VPN** > **Interfacce di accesso**:



Access Control for VPN Traffic

☑ Bypass Access Control policy for decrypted traffic (sysopt permit-vpn)

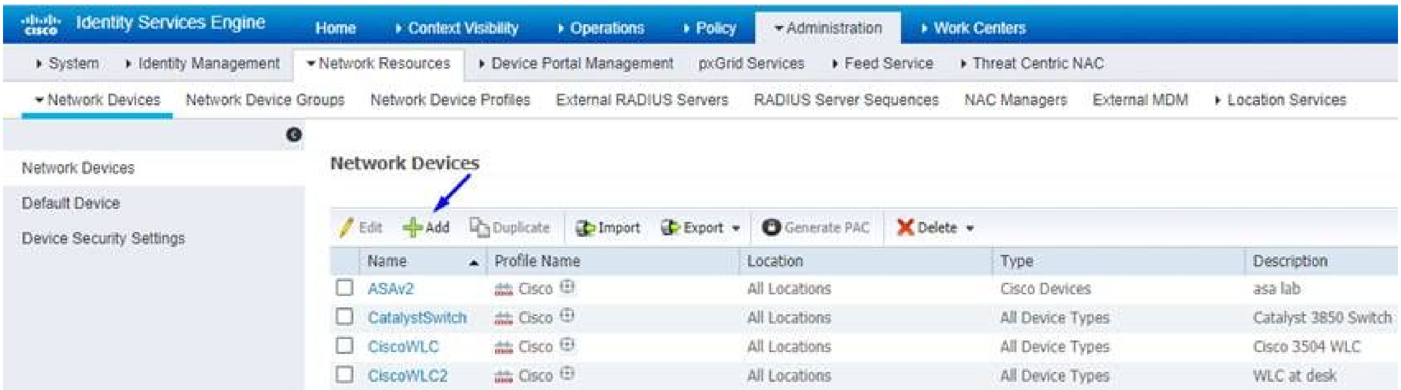
Decrypted traffic is subjected to Access Control Policy by default. This option bypasses the inspection, but VPN Filter ACL and authorization ACL downloaded from AAA server are still applied to VPN traffic.

Nota: Se non si abilita questa opzione, sarà necessario andare a **Criteri > Criteri di controllo di accesso** e creare regole di autorizzazione per gli utenti VPN per poter accedere agli elementi sottostanti interni o dmz

Fare clic su Distribuzione nella parte superiore destra di FirePOWER Management Center

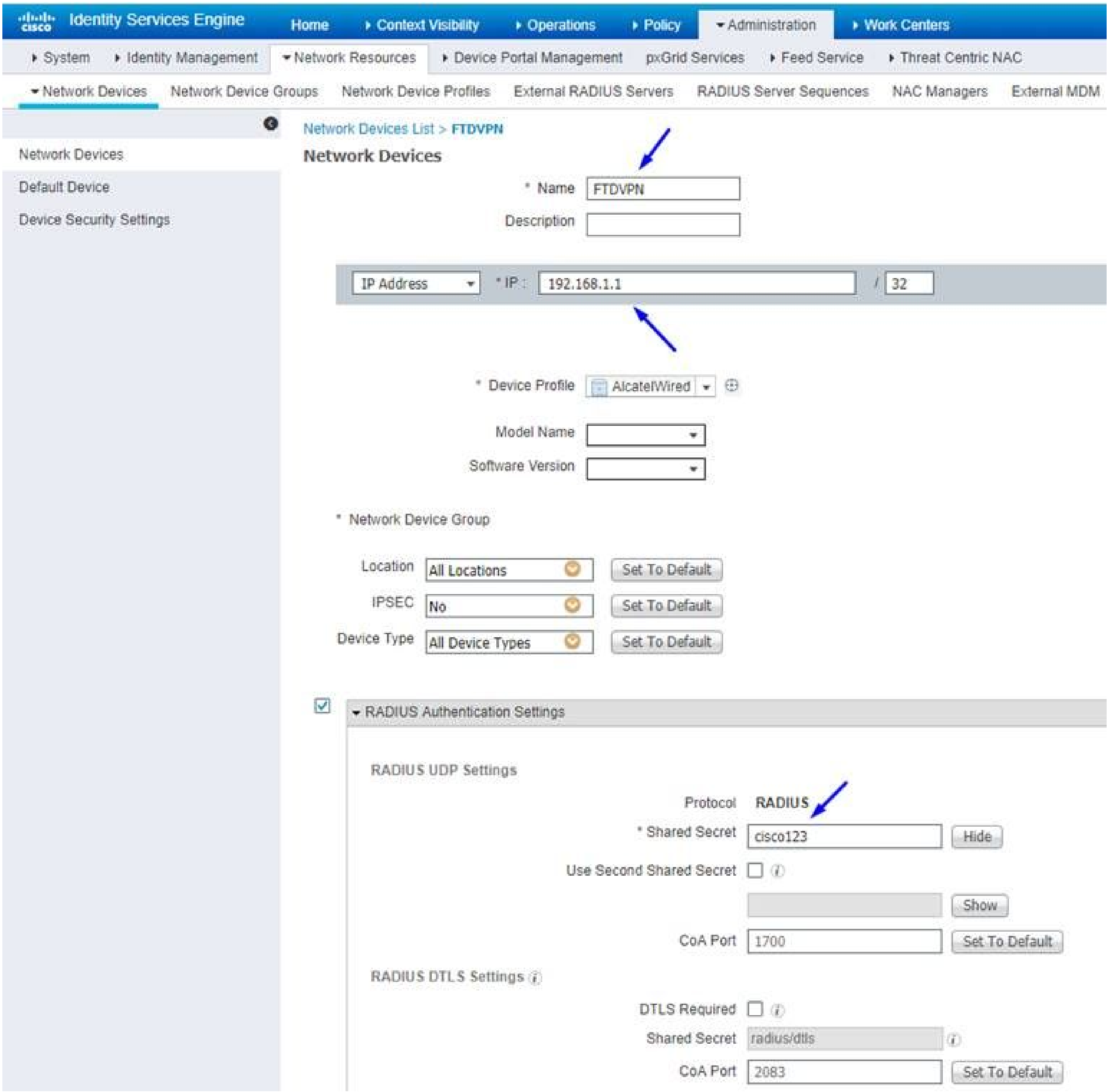
Aggiungi FTD come dispositivo di rete e configura il criterio impostato su Cisco ISE (usa segreto condiviso RADIUS)

Accedere a Cisco Identity Services Engine e fare clic su **Amministrazione** > **Dispositivi di rete** > fare clic su **Aggiungi**



	Name	Profile Name	Location	Type	Description
□	ASAv2	Cisco	All Locations	Cisco Devices	asa lab
□	CatalystSwitch	Cisco	All Locations	All Device Types	Catalyst 3850 Switch
□	CiscoWLC	Cisco	All Locations	All Device Types	Cisco 3504 WLC
□	CiscoWLC2	Cisco	All Locations	All Device Types	WLC at desk

Digitare un **nome**, l'**indirizzo IP** del FTD e il **segreto condiviso RADIUS** come indicato nei passaggi precedenti
Attenzione: Deve essere l'indirizzo di interfaccia/ip in uscita tramite il quale l'FTD può raggiungere l'ISE Cisco (server RADIUS), ossia l'interfaccia FTD su cui l'ISE Cisco può raggiungere l'FTD



Network Devices List > FTDVPN

Network Devices

* Name: FTDVPN

Description:

IP Address * IP : 192.168.1.1 / 32

* Device Profile: AlcatelWired

Model Name:

Software Version:

* Network Device Group

Location: All Locations — Set To Default

IPSEC: No — Set To Default

Device Type: All Device Types — Set To Default

☑ RADIUS Authentication Settings

RADIUS UDP Settings

Protocol: RADIUS

* Shared Secret: cisco123 — Hide

Use Second Shared Secret □

Show

CoA Port: 1700 — Set To Default

RADIUS DTLS Settings

DTLS Required □

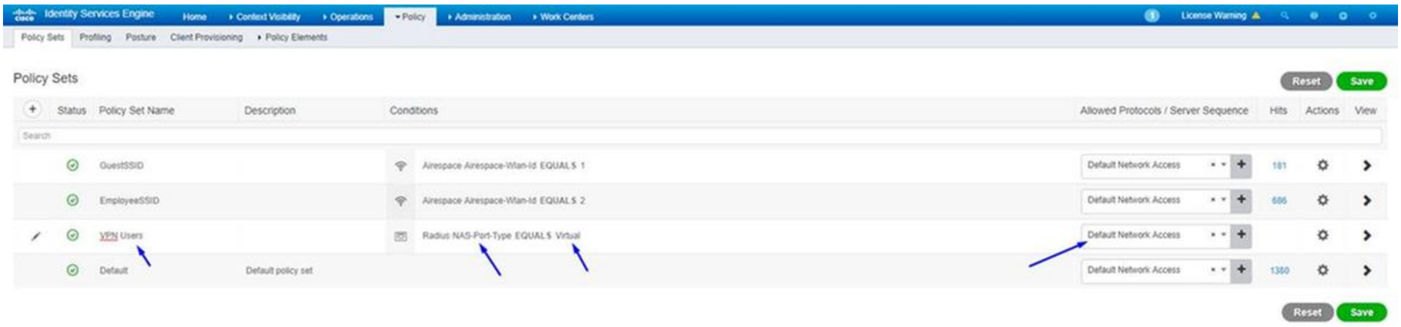
Shared Secret: radius/dtls

CoA Port: 2083 — Set To Default

Fare clic su **Policy** > **Policy Set** > create a **Policy Set** (Criterio) per qualsiasi richiesta di autenticazione del tipo seguente:

Radius-NAS-Port-Type EQUALS Virtual

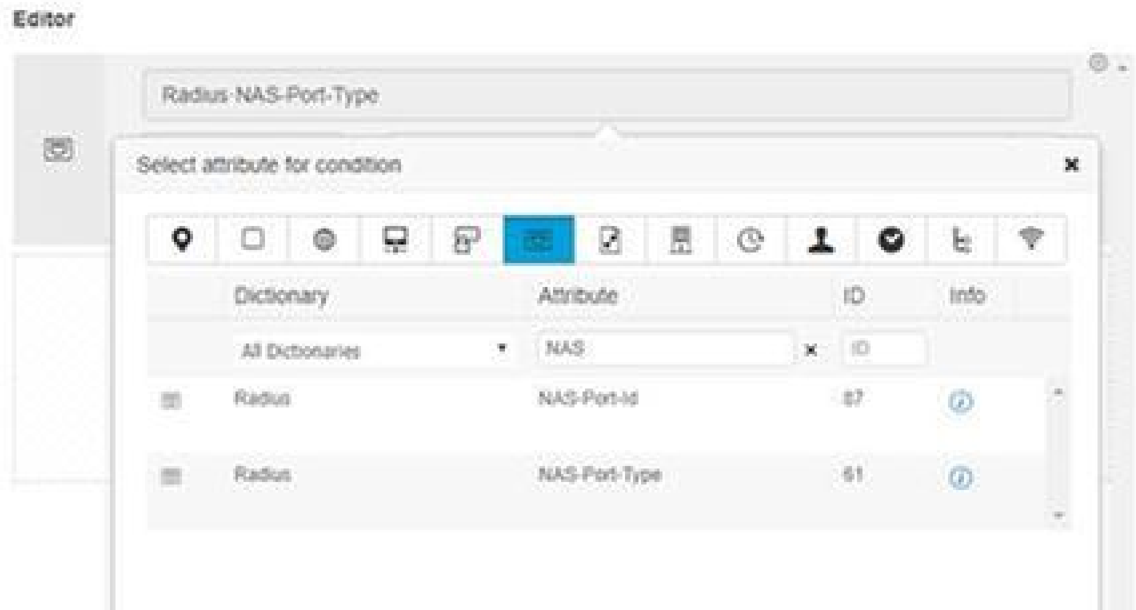
Ciò significa che se richieste RADIUS che arrivano ad ISE e che hanno l'aspetto di connessioni VPN, avranno esito positivo su questo set di criteri



Policy Sets

Status	Policy Set Name	Description	Conditions	Allowed Protocols / Server Sequence	Hits	Actions	View
✓	GuestSSID		Airespace Airespace-Wlan-Id EQUALS 1	Default Network Access	181	⚙	>
✓	EmployeeSSID		Airespace Airespace-Wlan-Id EQUALS 2	Default Network Access	686	⚙	>
✓	VPN Users		Radius NAS-Port-Type EQUALS Virtual	Default Network Access		⚙	>
✓	Default	Default policy set		Default Network Access	1380	⚙	>

Qui è possibile trovare questa condizione in Cisco ISE:



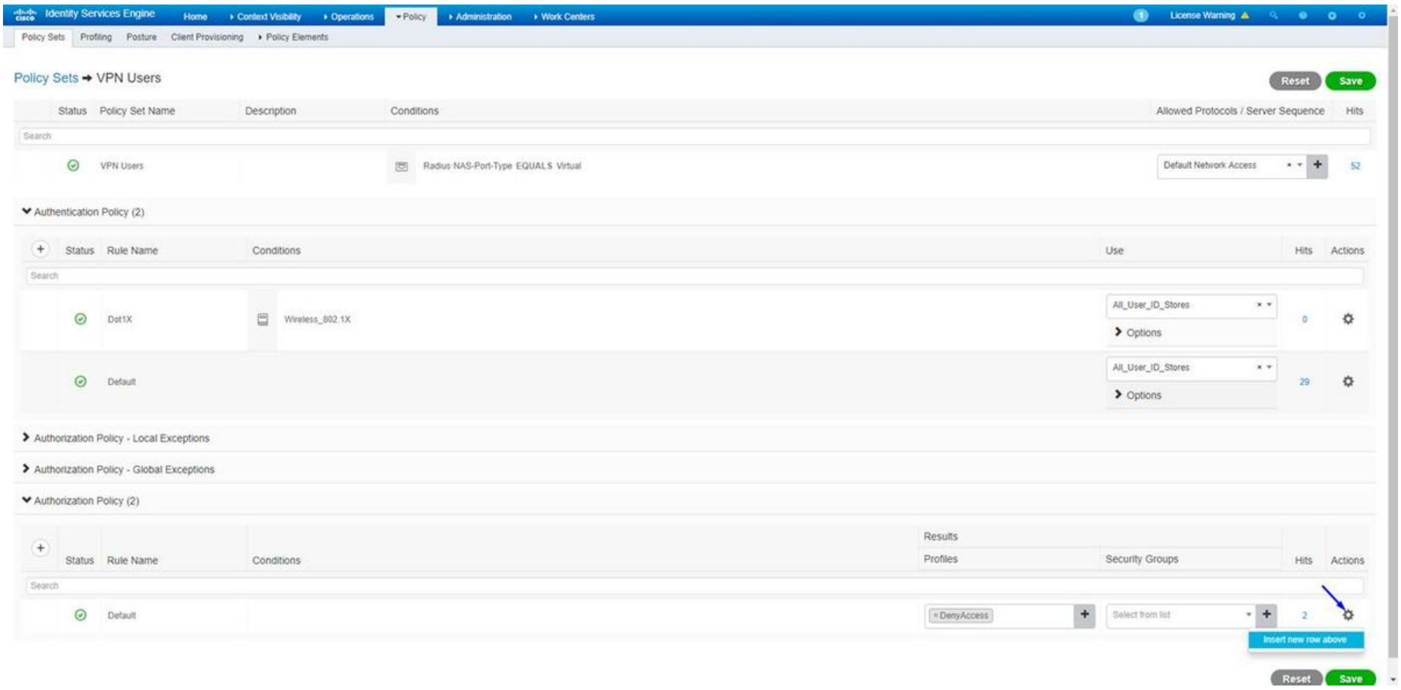
Editor

Radius·NAS-Port-Type

Select attribute for condition

	Dictionary	Attribute	ID	Info
	All Dictionaries	NAS	ID	
	Radius	NAS-Port-Id	87	ⓘ
	Radius	NAS-Port-Type	61	ⓘ

Modificare il **set di criteri** creato in precedenza
Aggiungere una regola al di sopra della regola di blocco predefinita per concedere agli utenti il profilo di autorizzazione **'Autorizza accesso'** solo se si trovano nel gruppo di Active Directory denominato '**Dipendenti**':



Policy Sets → VPN Users

Status	Policy Set Name	Description	Conditions	Allowed Protocols / Server Sequence	Hits
✓	VPN Users		Radius·NAS-Port-Type EQUALS Virtual	Default Network Access	52

Authentication Policy (2)

Status	Rule Name	Conditions	Use	Hits	Actions
✓	Dot1X	Wireless_802.1X	All_User_ID_Stores Options	0	⚙
✓	Default		All_User_ID_Stores Options	29	⚙

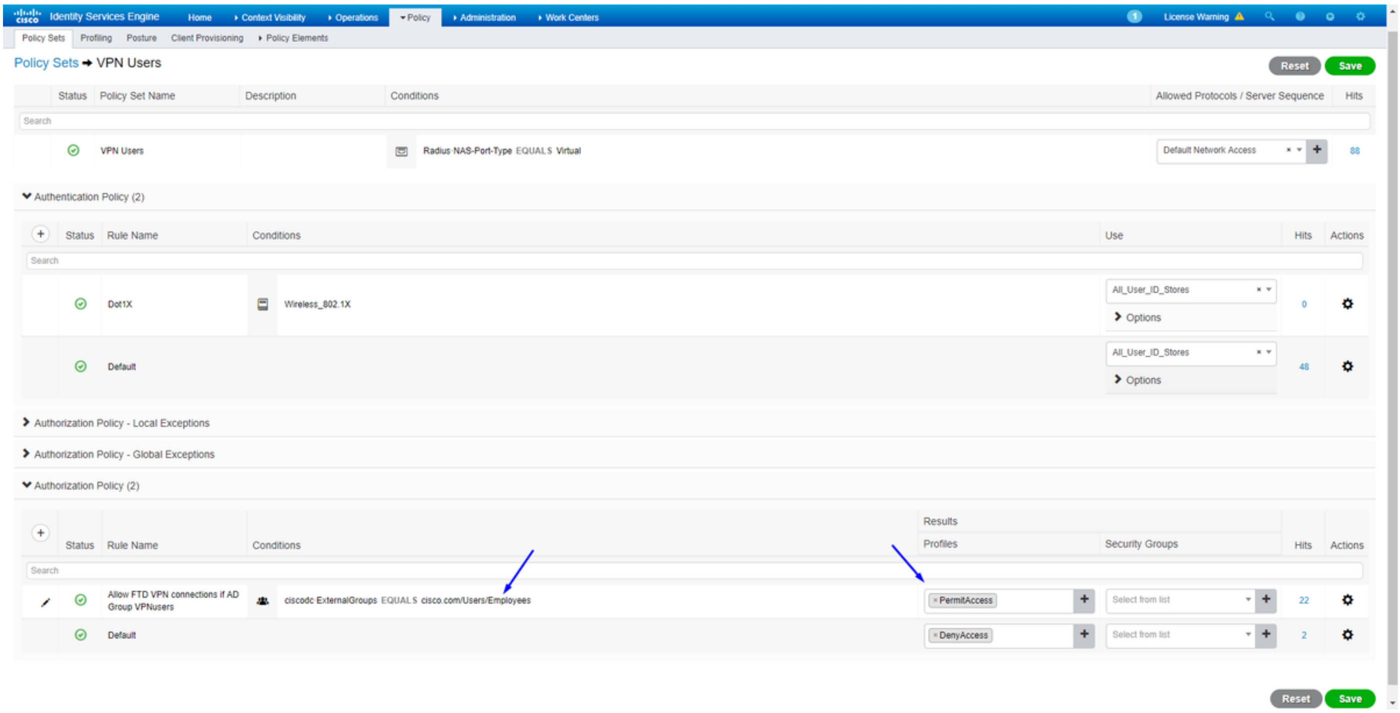
Authorization Policy - Local Exceptions

Authorization Policy - Global Exceptions

Authorization Policy (2)

			Results			
Status	Rule Name	Conditions	Profiles	Security Groups	Hits	Actions
✓	Default		×DenyAccess	Select from list	2	⚙

Di seguito è riportato l'aspetto della regola una volta completata



Policy Sets ➔ VPN Users

Status	Policy Set Name	Description	Conditions	Allowed Protocols / Server Sequence	Hits
✓	VPN Users		Radius·NAS-Port-Type EQUALS Virtual	Default Network Access	88

Authentication Policy (2)

Status	Rule Name	Conditions	Use	Hits	Actions
✓	Dot1X	Wireless_802.1X	All_User_ID_Stores Options	0	⚙
✓	Default		All_User_ID_Stores Options	48	⚙

Authorization Policy - Local Exceptions

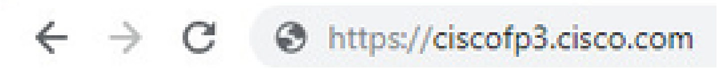
Authorization Policy - Global Exceptions

Authorization Policy (2)

Status	Rule Name	Conditions	Results: Profiles	Results: Security Groups	Hits	Actions
✓	Allow FTD VPN connections if AD Group VPNusers	ciscodc·ExternalGroups EQUALS cisco.com/Users/Employees	PermitAccess	Select from list	22	⚙
✓	Default		DenyAccess	Select from list	2	⚙

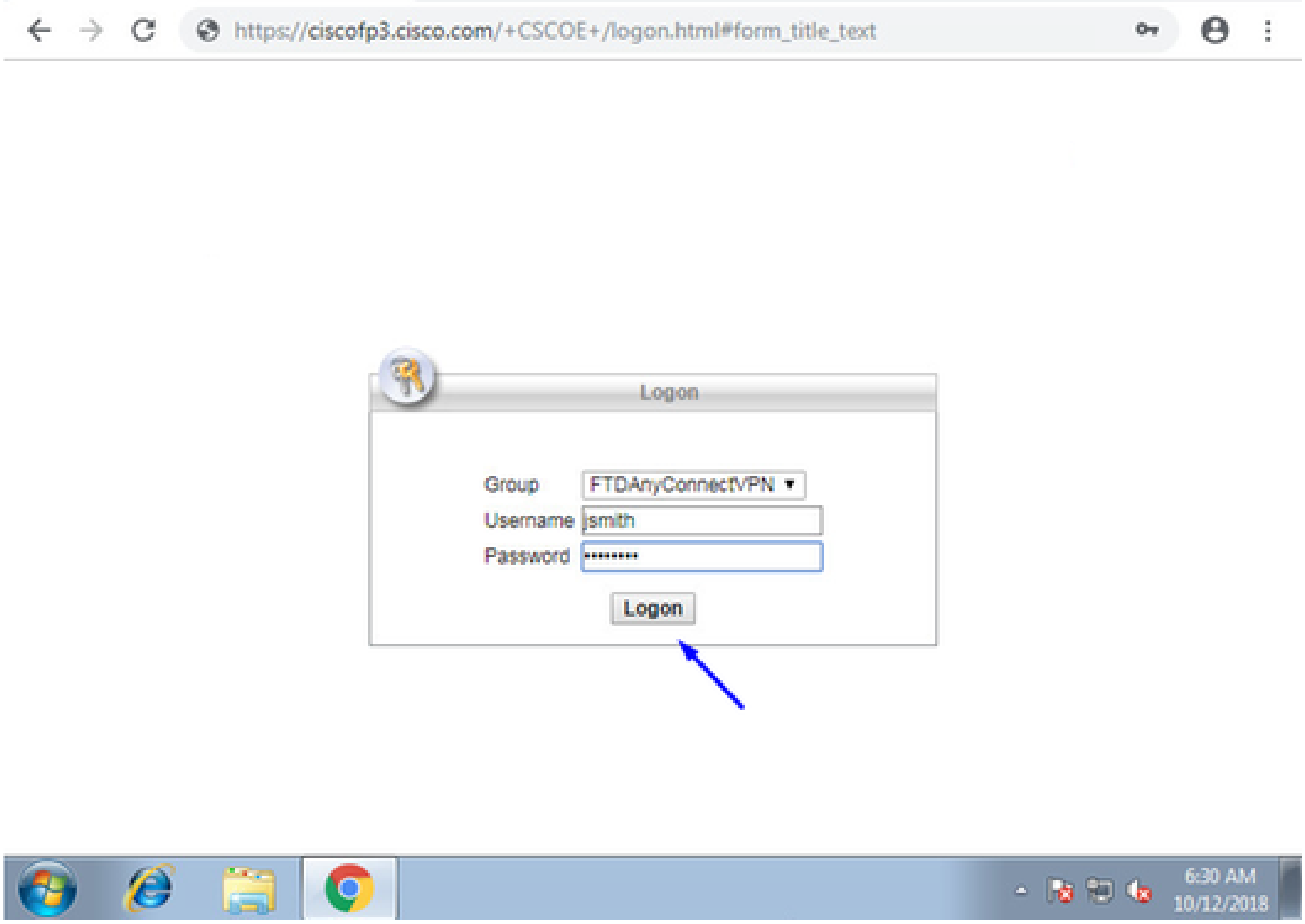
Scarica, installa e connetti il FTD utilizzando AnyConnect VPN Client sui PC Windows/Mac dei dipendenti

Apri il browser sul PC Windows/Mac del dipendente e vai all'indirizzo esterno del tuo FTD nel browser



https://ciscofp3.cisco.com

Digitare il nome utente e la password di Active Directory



https://ciscofp3.cisco.com/+CSCOE+/logon.html#form_title_text

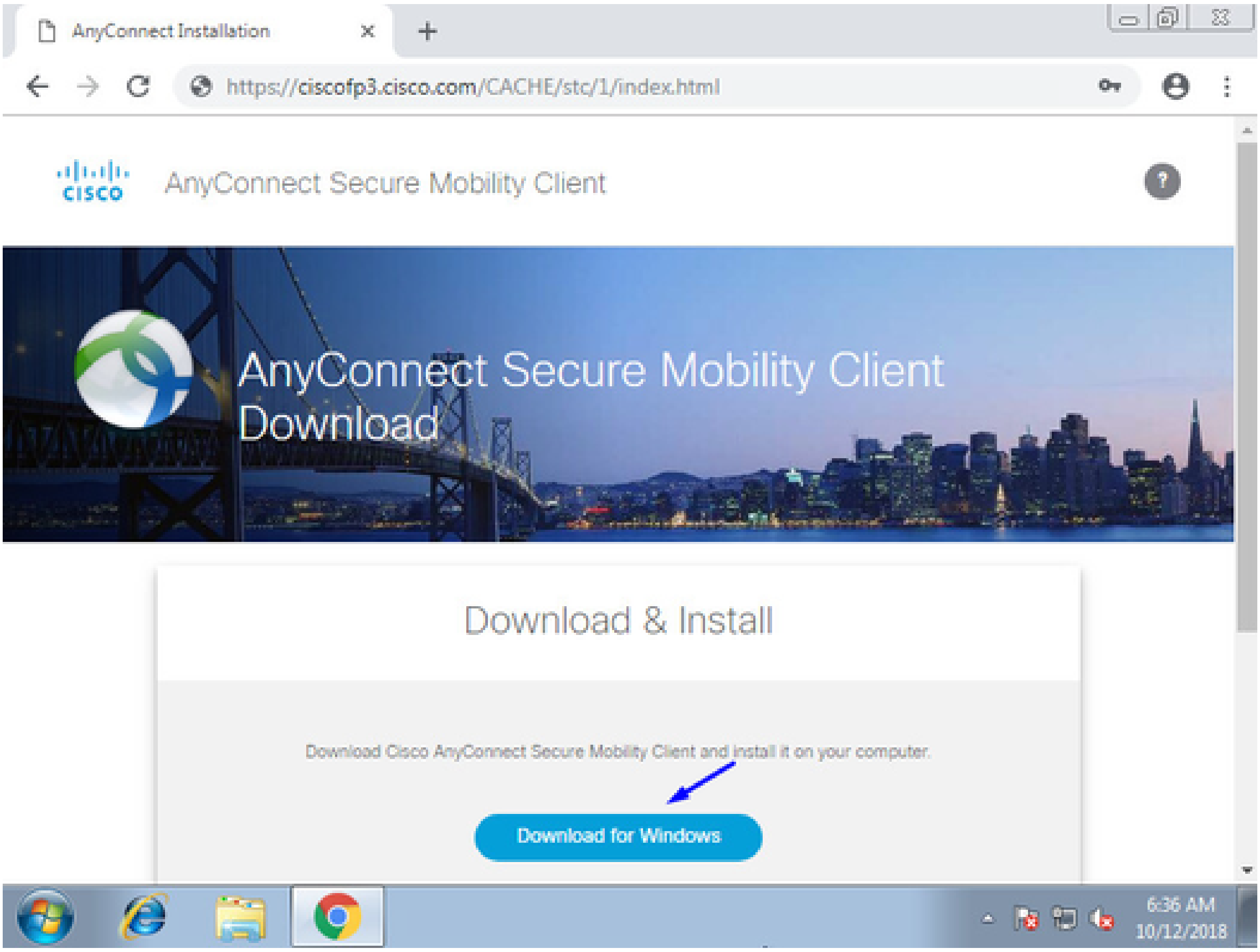
Logon

Group FTDAnyConnectVPN ▾

Username jsmith

Password ••••••••

Fare clic su **Download**



AnyConnect Installation

https://ciscofp3.cisco.com/CACHE/stc/1/index.html

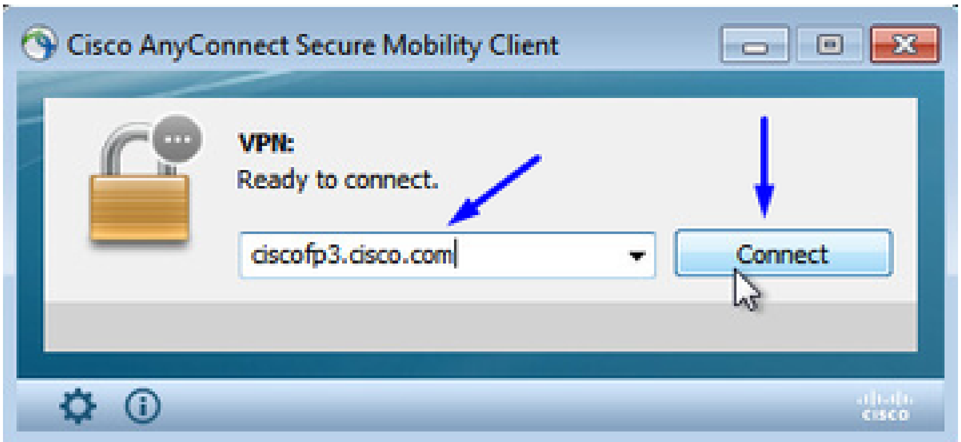
AnyConnect Secure Mobility Client

AnyConnect Secure Mobility Client Download

Download & Install

Download Cisco AnyConnect Secure Mobility Client and install it on your computer.

Installare ed eseguire AnyConnect VPN Secure Mobility Client su PC Windows/Mac



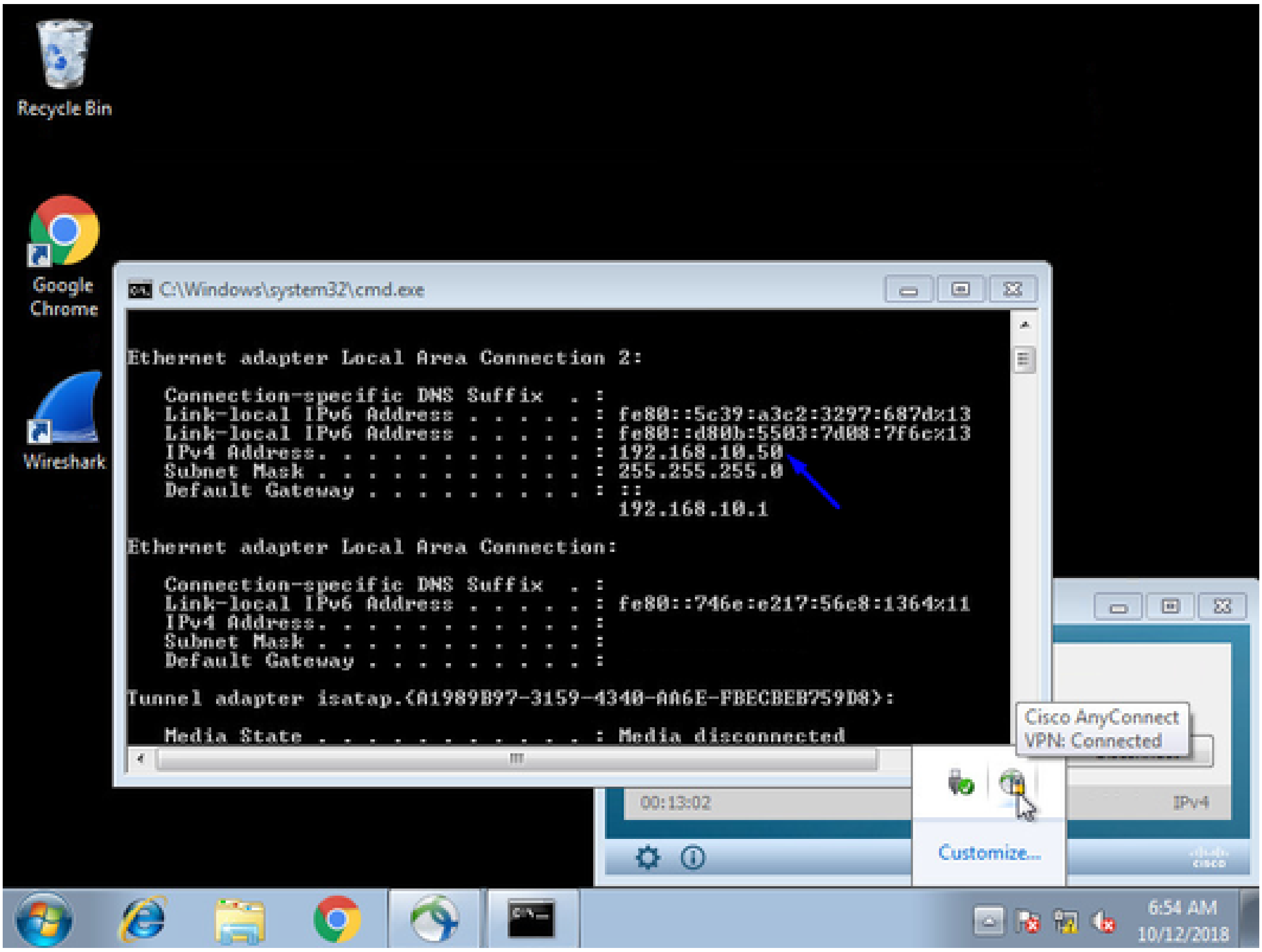
Cisco AnyConnect Secure Mobility Client

VPN:
Ready to connect.

ciscofp3.cisco.com

Digitare il nome utente e la password di Active Directory quando richiesto

Verrà fornito un indirizzo IP dal pool di indirizzi IP creato nel passaggio 5 e un gateway predefinito di .1 in tale subnet



```
Ethernet adapter Local Area Connection 2:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::5c39:a3c2:3297:687d%13
   Link-local IPv6 Address . . . . . : fe80::d80b:5503:7d08:7f6c%13
   IPv4 Address. . . . . . . . . . . : 192.168.10.50
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : ::
                                       192.168.10.1

Ethernet adapter Local Area Connection:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::746e:e217:56c8:1364%11
   IPv4 Address. . . . . . . . . . . :
   Subnet Mask . . . . . . . . . . . :
   Default Gateway . . . . . . . . . :

Tunnel adapter isatap.{A1989B97-3159-4340-AA6E-FBECBEB759D8}:

   Media State . . . . . . . . . . . : Media disconnected
```

Verifica

FTD

Comandi show

Verificare a FTD che l'utente finale sia connesso alla VPN AnyConnect:

```
> 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
```

Dopo aver aperto il PC con Windows 7 e aver fatto clic su 'Disconnetti' sul client Cisco AnyConnect, si otterranno:

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

Clip

Come appare un'acquisizione funzionante sull'interfaccia esterna quando si preme connect sul client AnyConnect

Esempio:
L'IP pubblico dell'utente finale sarà, ad esempio, l'IP pubblico del router dell'utente a casa

```
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
```

Visualizza i pacchetti provenienti dall'interfaccia esterna dell'FTD dal PC dell'utente finale per assicurarti che arrivino sull'interfaccia esterna dell'FTD:

```
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
```

Visualizzare i dettagli di ciò che accade al pacchetto proveniente dall'utente finale all'interno del 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#
```

Copiare l'acquisizione su disco0: FTD. È quindi possibile scaricarlo tramite SCP, FTP o TFTP

(o da FirePOWER Management Center Web UI >> Sistema >> Integrità >> Health Monitor >> fare clic su Advanced Troubleshooting >> fare clic su Download File tab)

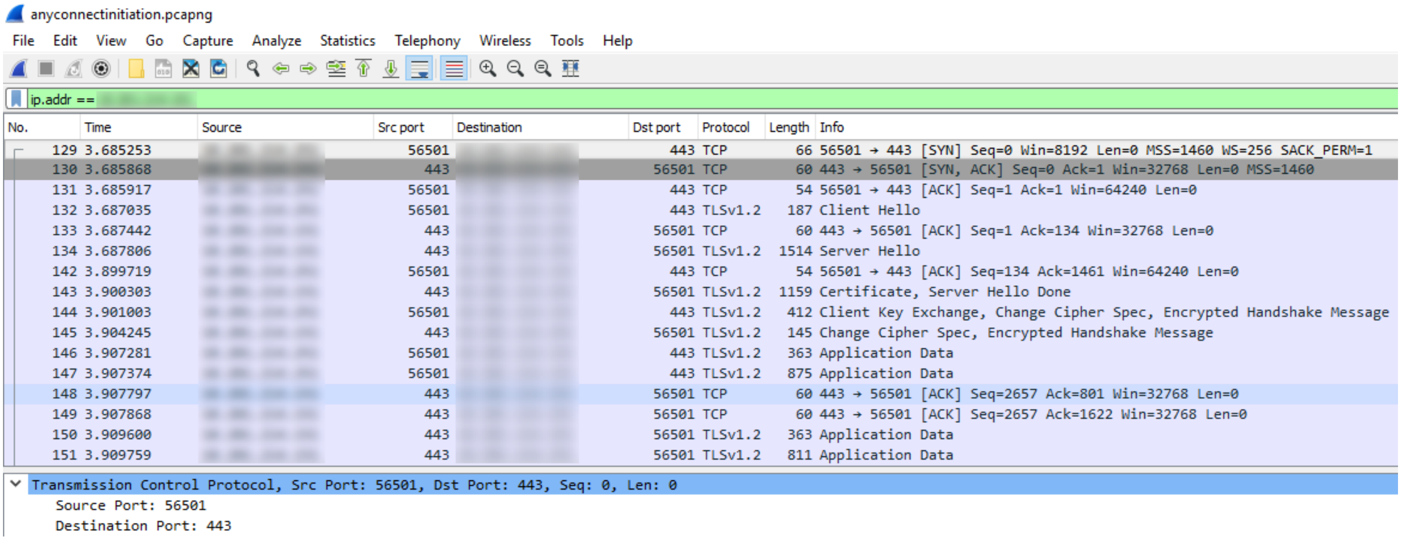
```
ciscofp3# copy /pcap capture:capin disk0:/capin.pcap
Source capture name [capin]? <hit Enter>
Destination filename [capin.pcap]? <hit Enter>
!!!!!!!!!!!!!!!
207 packets copied in 0.0 secs

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)
```

Verificare che la regola NAT sia configurata correttamente:

```
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#
```

Acquisizione sul PC del dipendente con il collegamento del PC all'FTD tramite VPN AnyConnect

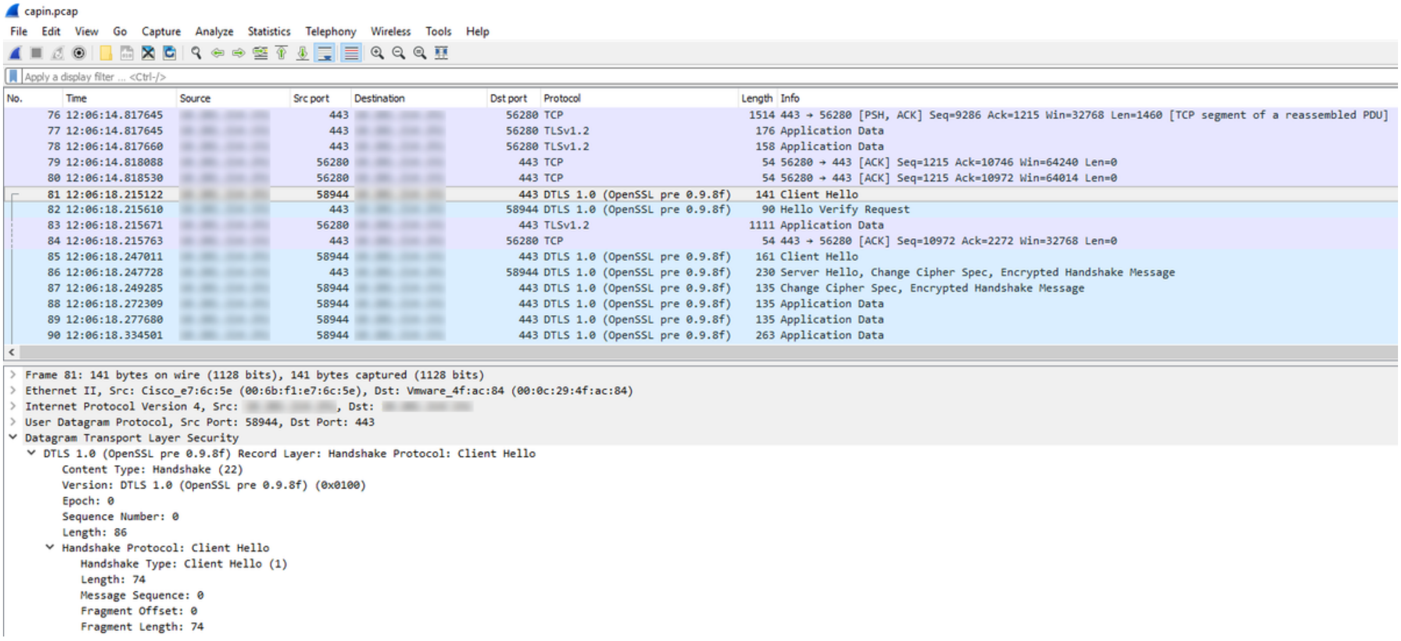


ip.addr == [redacted]

No.	Time	Source	Src port	Destination	Dst port	Protocol	Length	Info
129	3.685253	[redacted]	56501	[redacted]	443	TCP	66	56501 → 443 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=256 SACK_PERM=1
130	3.685868	[redacted]	443	[redacted]	56501	TCP	60	443 → 56501 [SYN, ACK] Seq=0 Ack=1 Win=32768 Len=0 MSS=1460
131	3.685917	[redacted]	56501	[redacted]	443	TCP	54	56501 → 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
132	3.687035	[redacted]	56501	[redacted]	443	TLSv1.2	187	Client Hello
133	3.687442	[redacted]	443	[redacted]	56501	TCP	60	443 → 56501 [ACK] Seq=1 Ack=134 Win=32768 Len=0
134	3.687806	[redacted]	443	[redacted]	56501	TLSv1.2	1514	Server Hello
142	3.899719	[redacted]	56501	[redacted]	443	TCP	54	56501 → 443 [ACK] Seq=134 Ack=1461 Win=64240 Len=0
143	3.900303	[redacted]	443	[redacted]	56501	TLSv1.2	1159	Certificate, Server Hello Done
144	3.901003	[redacted]	56501	[redacted]	443	TLSv1.2	412	Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
145	3.904245	[redacted]	443	[redacted]	56501	TLSv1.2	145	Change Cipher Spec, Encrypted Handshake Message
146	3.907281	[redacted]	56501	[redacted]	443	TLSv1.2	363	Application Data
147	3.907374	[redacted]	56501	[redacted]	443	TLSv1.2	875	Application Data
148	3.907797	[redacted]	443	[redacted]	56501	TCP	60	443 → 56501 [ACK] Seq=2657 Ack=801 Win=32768 Len=0
149	3.907868	[redacted]	443	[redacted]	56501	TCP	60	443 → 56501 [ACK] Seq=2657 Ack=1622 Win=32768 Len=0
150	3.909600	[redacted]	443	[redacted]	56501	TLSv1.2	363	Application Data
151	3.909759	[redacted]	443	[redacted]	56501	TLSv1.2	811	Application Data

```
Transmission Control Protocol, Src Port: 56501, Dst Port: 443, Seq: 0, Len: 0
    Source Port: 56501
    Destination Port: 443
```

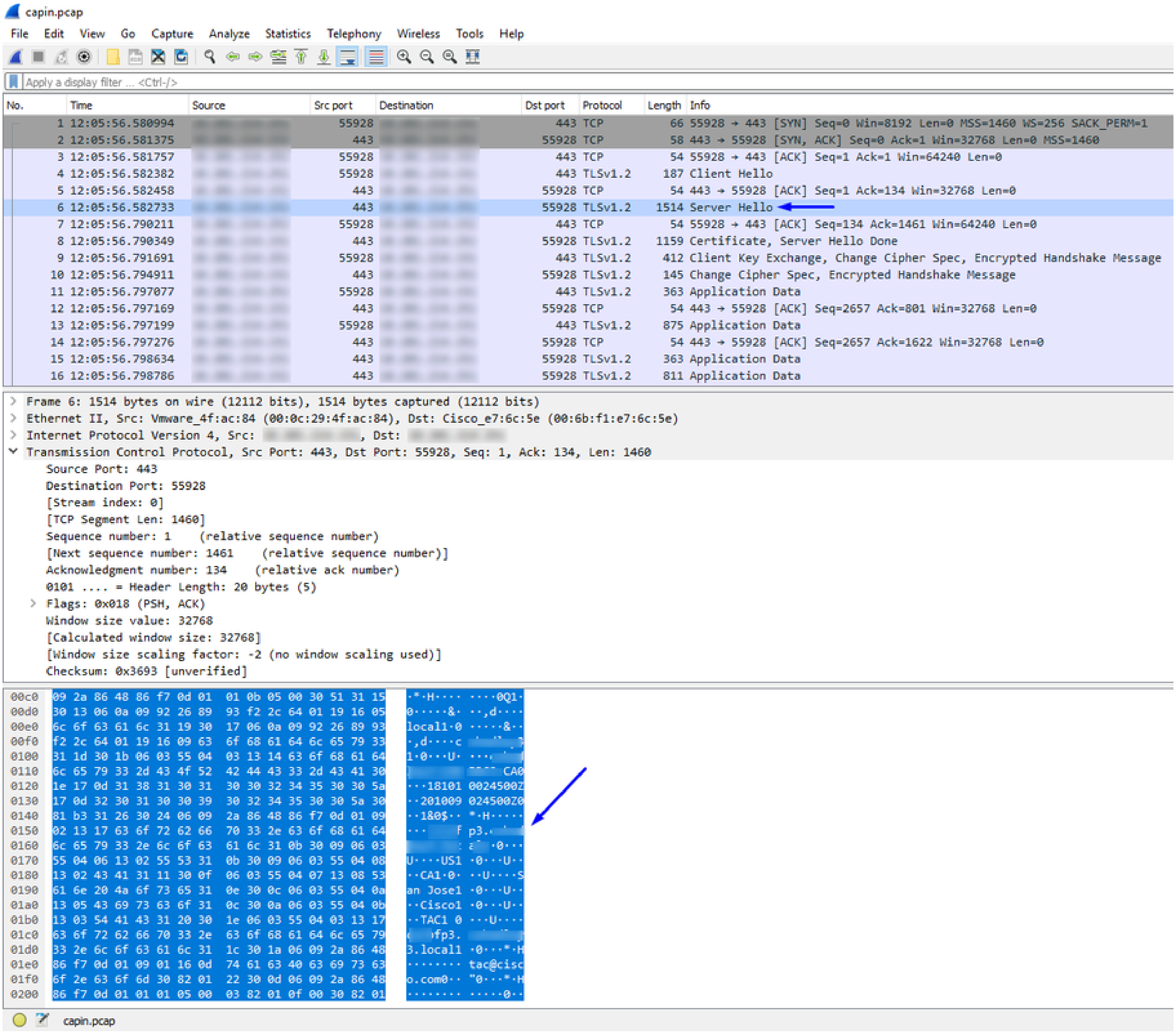
Successivamente, nella stessa acquisizione, è possibile vedere la formazione del tunnel DTLS



```
No.  Time             Source      Src port Destination Dst port Protocol                       Length Info
  76 12:06:14.817645  [redacted]       443 [redacted]     56280 TCP                              1514 443 → 56280 [PSH, ACK] Seq=9286 Ack=1215 Win=32768 Len=1460 [TCP segment of a reassembled PDU]
  77 12:06:14.817645  [redacted]       443 [redacted]     56280 TLSv1.2                           176 Application Data
  78 12:06:14.817660  [redacted]       443 [redacted]     56280 TLSv1.2                           158 Application Data
  79 12:06:14.818088  [redacted]     56280 [redacted]       443 TCP                                54 56280 → 443 [ACK] Seq=1215 Ack=10746 Win=64240 Len=0
  80 12:06:14.818530  [redacted]     56280 [redacted]       443 TCP                                54 56280 → 443 [ACK] Seq=1215 Ack=10972 Win=64014 Len=0
  81 12:06:18.215122  [redacted]     58944 [redacted]       443 DTLS 1.0 (OpenSSL pre 0.9.8f)     141 Client Hello
  82 12:06:18.215610  [redacted]       443 [redacted]     58944 DTLS 1.0 (OpenSSL pre 0.9.8f)      90 Hello Verify Request
  83 12:06:18.215671  [redacted]     56280 [redacted]       443 TLSv1.2                          1111 Application Data
  84 12:06:18.215763  [redacted]       443 [redacted]     56280 TCP                                54 443 → 56280 [ACK] Seq=10972 Ack=2272 Win=32768 Len=0
  85 12:06:18.247011  [redacted]     58944 [redacted]       443 DTLS 1.0 (OpenSSL pre 0.9.8f)     161 Client Hello
  86 12:06:18.247728  [redacted]       443 [redacted]     58944 DTLS 1.0 (OpenSSL pre 0.9.8f)     230 Server Hello, Change Cipher Spec, Encrypted Handshake Message
  87 12:06:18.249285  [redacted]     58944 [redacted]       443 DTLS 1.0 (OpenSSL pre 0.9.8f)     135 Change Cipher Spec, Encrypted Handshake Message
  88 12:06:18.272309  [redacted]     58944 [redacted]       443 DTLS 1.0 (OpenSSL pre 0.9.8f)     135 Application Data
  89 12:06:18.277680  [redacted]     58944 [redacted]       443 DTLS 1.0 (OpenSSL pre 0.9.8f)     135 Application Data
  90 12:06:18.334501  [redacted]     58944 [redacted]       443 DTLS 1.0 (OpenSSL pre 0.9.8f)     263 Application Data
```

```
> Frame 81: 141 bytes on wire (1128 bits), 141 bytes captured (1128 bits)
> Ethernet II, Src: Cisco_e7:6c:5e (00:6b:f1:e7:6c:5e), Dst: Vmware_4f:ac:84 (00:0c:29:4f:ac:84)
> Internet Protocol Version 4, Src: [redacted], Dst: [redacted]
> User Datagram Protocol, Src Port: 58944, Dst Port: 443
v Datagram Transport Layer Security
  v DTLS 1.0 (OpenSSL pre 0.9.8f) Record Layer: Handshake Protocol: Client Hello
      Content Type: Handshake (22)
      Version: DTLS 1.0 (OpenSSL pre 0.9.8f) (0x0100)
      Epoch: 0
      Sequence Number: 0
      Length: 86
    v Handshake Protocol: Client Hello
        Handshake Type: Client Hello (1)
        Length: 74
        Message Sequence: 0
        Fragment Offset: 0
        Fragment Length: 74
```

Acquisizione effettuata sull'interfaccia esterna dell'FTD con la visualizzazione della connessione del PC AnyConnect alla VPN



capin.pcap
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter … <Ctrl-/>

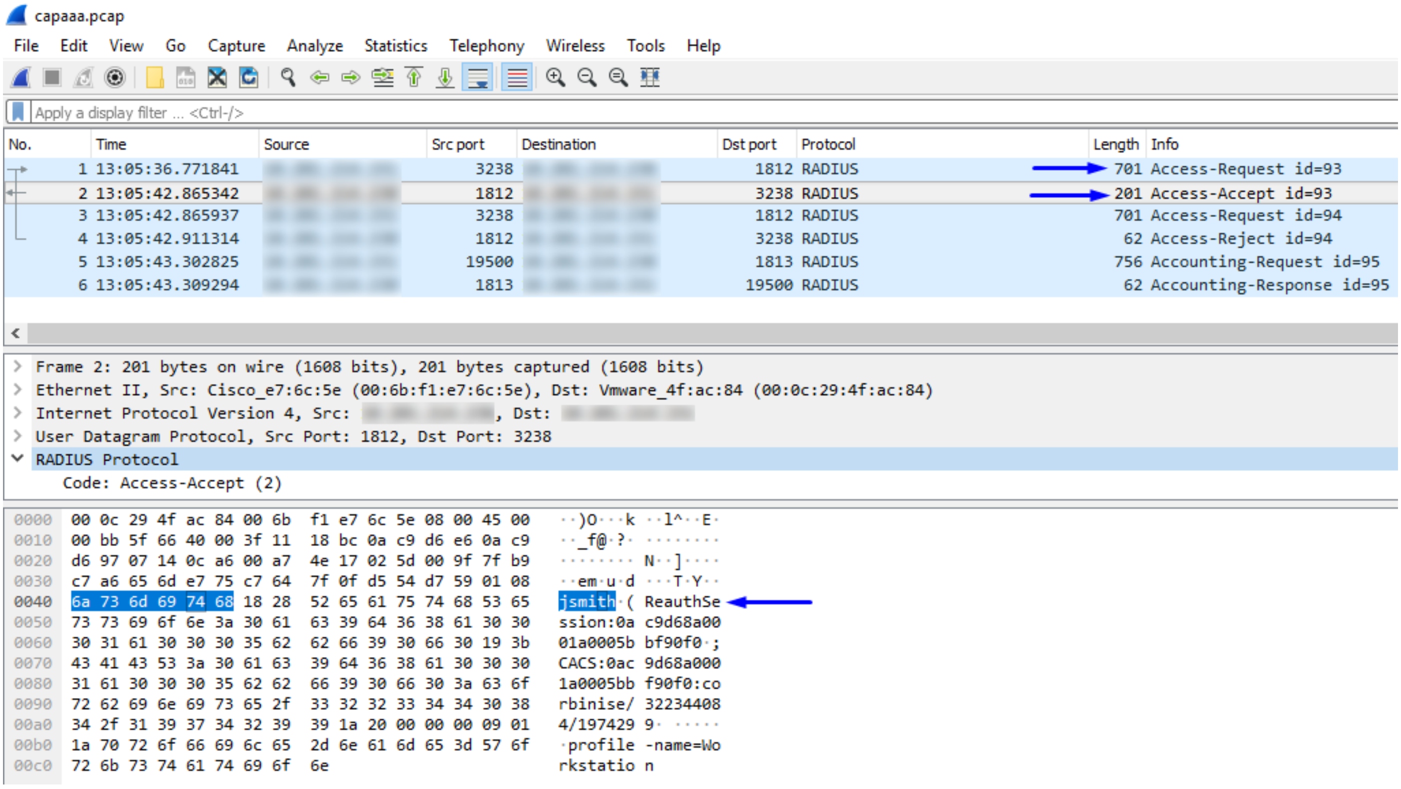
```
No.  Time             Source      Src port  Destination  Dst port  Protocol  Length  Info
  1 12:05:56.580994  [redacted]  55928     [redacted]   443       TCP         66     55928 → 443 [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=256 SACK_PERM=1
  2 12:05:56.581375  [redacted]    443     [redacted]   55928     TCP         58     443 → 55928 [SYN, ACK] Seq=0 Ack=1 Win=32768 Len=0 MSS=1460
  3 12:05:56.581757  [redacted]  55928     [redacted]   443       TCP         54     55928 → 443 [ACK] Seq=1 Ack=1 Win=64240 Len=0
  4 12:05:56.582382  [redacted]  55928     [redacted]   443       TLSv1.2    187     Client Hello
  5 12:05:56.582458  [redacted]    443     [redacted]   55928     TCP         54     443 → 55928 [ACK] Seq=1 Ack=134 Win=32768 Len=0
  6 12:05:56.582733  [redacted]    443     [redacted]   55928     TLSv1.2   1514     Server Hello
  7 12:05:56.790211  [redacted]  55928     [redacted]   443       TCP         54     55928 → 443 [ACK] Seq=134 Ack=1461 Win=64240 Len=0
  8 12:05:56.790349  [redacted]    443     [redacted]   55928     TLSv1.2   1159     Certificate, Server Hello Done
  9 12:05:56.791691  [redacted]  55928     [redacted]   443       TLSv1.2    412     Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
 10 12:05:56.794911  [redacted]    443     [redacted]   55928     TLSv1.2    145     Change Cipher Spec, Encrypted Handshake Message
 11 12:05:56.797077  [redacted]  55928     [redacted]   443       TLSv1.2    363     Application Data
 12 12:05:56.797169  [redacted]    443     [redacted]   55928     TCP         54     443 → 55928 [ACK] Seq=2657 Ack=801 Win=32768 Len=0
 13 12:05:56.797199  [redacted]  55928     [redacted]   443       TLSv1.2    875     Application Data
 14 12:05:56.797276  [redacted]    443     [redacted]   55928     TCP         54     443 → 55928 [ACK] Seq=2657 Ack=1622 Win=32768 Len=0
 15 12:05:56.798634  [redacted]    443     [redacted]   55928     TLSv1.2    363     Application Data
 16 12:05:56.798786  [redacted]    443     [redacted]   55928     TLSv1.2    811     Application Data
```

```
> Frame 6: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits)
> Ethernet II, Src: Vmware_4f:ac:84 (00:0c:29:4f:ac:84), Dst: Cisco_e7:6c:5e (00:6b:f1:e7:6c:5e)
> Internet Protocol Version 4, Src: [redacted], Dst: [redacted]
v Transmission Control Protocol, Src Port: 443, Dst Port: 55928, Seq: 1, Ack: 134, Len: 1460
    Source Port: 443
    Destination Port: 55928
    [Stream index: 0]
    [TCP Segment Len: 1460]
    Sequence number: 1    (relative sequence number)
    [Next sequence number: 1461    (relative sequence number)]
    Acknowledgment number: 134    (relative ack number)
    0101 .... = Header Length: 20 bytes (5)
  > Flags: 0x018 (PSH, ACK)
    Window size value: 32768
    [Calculated window size: 32768]
    [Window size scaling factor: -2 (no window scaling used)]
    Checksum: 0x3693 [unverified]
```

```
00c0  09 2a 86 48 86 f7 0d 01  01 0b 05 00 30 51 31 15   ·*·H···· ····0Q1·
00d0  30 13 06 0a 09 92 26 89  93 f2 2c 64 01 19 16 05   0·····&· ··,d····
00e0  6c 6f 63 61 6c 31 19 30  17 06 0a 09 92 26 89 93   local1·0 ·····&··
00f0  f2 2c 64 01 19 16 09 63  6f 68 61 64 6c 65 79 33   ·,d····c [redacted]
0100  31 1d 30 1b 06 03 55 04  03 13 14 63 6f 68 61 64   1·0···U· ···[redacted]
0110  6c 65 79 33 2d 43 4f 52  42 44 43 33 2d 43 41 30   [redacted] CA0
0120  1e 17 0d 31 38 31 30 31  30 30 32 34 35 30 30 5a   ···18101 0024500Z
0130  17 0d 32 30 31 30 30 39  30 32 34 35 30 30 5a 30   ··201009 024500Z0
0140  81 b3 31 26 30 24 06 09  2a 86 48 86 f7 0d 01 09   ··1&0$·· *·H·····
0150  02 13 17 63 6f 72 62 66  70 33 2e 63 6f 68 61 64   ···[redacted]f p3.[redacted]
0160  6c 65 79 33 2e 6c 6f 63  61 6c 31 0b 30 09 06 03   [redacted] ·0···
0170  55 04 06 13 02 55 53 31  0b 30 09 06 03 55 04 08   U····US1 ·0···U··
0180  13 02 43 41 31 11 30 0f  06 03 55 04 07 13 08 53   ··CA1·0· ··U····S
0190  61 6e 20 4a 6f 73 65 31  0e 30 0c 06 03 55 04 0a   an Jose1 ·0···U··
01a0  13 05 43 69 73 63 6f 31  0c 30 0a 06 03 55 04 0b   ··Cisco1 ·0···U··
01b0  13 03 54 41 43 31 20 30  1e 06 03 55 04 03 13 17   ··TAC1 0 ···U····
01c0  63 6f 72 62 66 70 33 2e  63 6f 68 61 64 6c 65 79   [redacted]fp3. [redacted]
01d0  33 2e 6c 6f 63 61 6c 31  1c 30 1a 06 09 2a 86 48   3.local1 ·0···*·H
01e0  86 f7 0d 01 09 01 16 0d  74 61 63 40 63 69 73 63   ········ tac@cisc
01f0  6f 2e 63 6f 6d 30 82 01  22 30 0d 06 09 2a 86 48   o.com0·· "0···*·H
0200  86 f7 0d 01 01 01 05 00  03 82 01 0f 00 30 82 01   ········ ·····0··
```

Nota: è possibile vedere il certificato del server VPN FTD nel pacchetto 'Server Hello' mentre ci colleghiamo all'interfaccia esterna dell'FTD tramite VPN. Il PC dipendente considererà attendibile questo certificato perché nel PC del dipendente è presente il certificato CA radice e il certificato del server VPN FTD è stato firmato dalla stessa CA radice.

Acquisizione eseguita sull'FTD del server RADIUS con richiesta di nome utente e password (Cisco ISE)


capaaa.pcap
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>

No.	Time	Source	Src port	Destination	Dst port	Protocol	Length	Info
1	13:05:36.771841	[redacted]	3238	[redacted]	1812	RADIUS	701	Access-Request id=93
2	13:05:42.865342	[redacted]	1812	[redacted]	3238	RADIUS	201	Access-Accept id=93
3	13:05:42.865937	[redacted]	3238	[redacted]	1812	RADIUS	701	Access-Request id=94
4	13:05:42.911314	[redacted]	1812	[redacted]	3238	RADIUS	62	Access-Reject id=94
5	13:05:43.302825	[redacted]	19500	[redacted]	1813	RADIUS	756	Accounting-Request id=95
6	13:05:43.309294	[redacted]	1813	[redacted]	19500	RADIUS	62	Accounting-Response id=95

```
> Frame 2: 201 bytes on wire (1608 bits), 201 bytes captured (1608 bits)
> Ethernet II, Src: Cisco_e7:6c:5e (00:6b:f1:e7:6c:5e), Dst: Vmware_4f:ac:84 (00:0c:29:4f:ac:84)
> Internet Protocol Version 4, Src: [redacted], Dst: [redacted]
> User Datagram Protocol, Src Port: 1812, Dst Port: 3238
v RADIUS Protocol
    Code: Access-Accept (2)
```

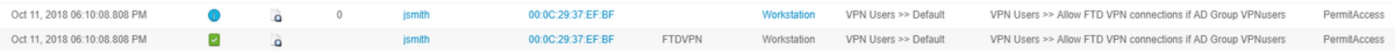
```
0000  00 0c 29 4f ac 84 00 6b  f1 e7 6c 5e 08 00 45 00   ··)O···k ··l^··E·
0010  00 bb 5f 66 40 00 3f 11  18 bc 0a c9 d6 e6 0a c9   ··_f@·?· ········
0020  d6 97 07 14 0c a6 00 a7  4e 17 02 5d 00 9f 7f b9   ········ N··]····
0030  c7 a6 65 6d e7 75 c7 64  7f 0f d5 54 d7 59 01 08   ··em·u·d ···T·Y··
0040  6a 73 6d 69 74 68 18 28  52 65 61 75 74 68 53 65   jsmith·( ReauthSe
0050  73 73 69 6f 6e 3a 30 61  63 39 64 36 38 61 30 30   ssion:0a c9d68a00
0060  30 31 61 30 30 30 35 62  62 66 39 30 66 30 19 3b   01a0005b bf90f0·;
0070  43 41 43 53 3a 30 61 63  39 64 36 38 61 30 30 30   CACS:0ac 9d68a000
0080  31 61 30 30 30 35 62 62  66 39 30 66 30 3a 63 6f   1a0005bb f90f0:co
0090  72 62 69 6e 69 73 65 2f  33 32 32 33 34 34 30 38   rbinise/ 32234408
00a0  34 2f 31 39 37 34 32 39  39 1a 20 00 00 00 09 01   4/197429 9· ·····
00b0  1a 70 72 6f 66 69 6c 65  2d 6e 61 6d 65 3d 57 6f   ·profile -name=Wo
00c0  72 6b 73 74 61 74 69 6f  6e                        rkstatio n
```

Come puoi vedere sopra, la nostra connessione VPN ottiene un Access-Accept e il nostro client VPN AnyConnect si connette correttamente alla FTD tramite VPN

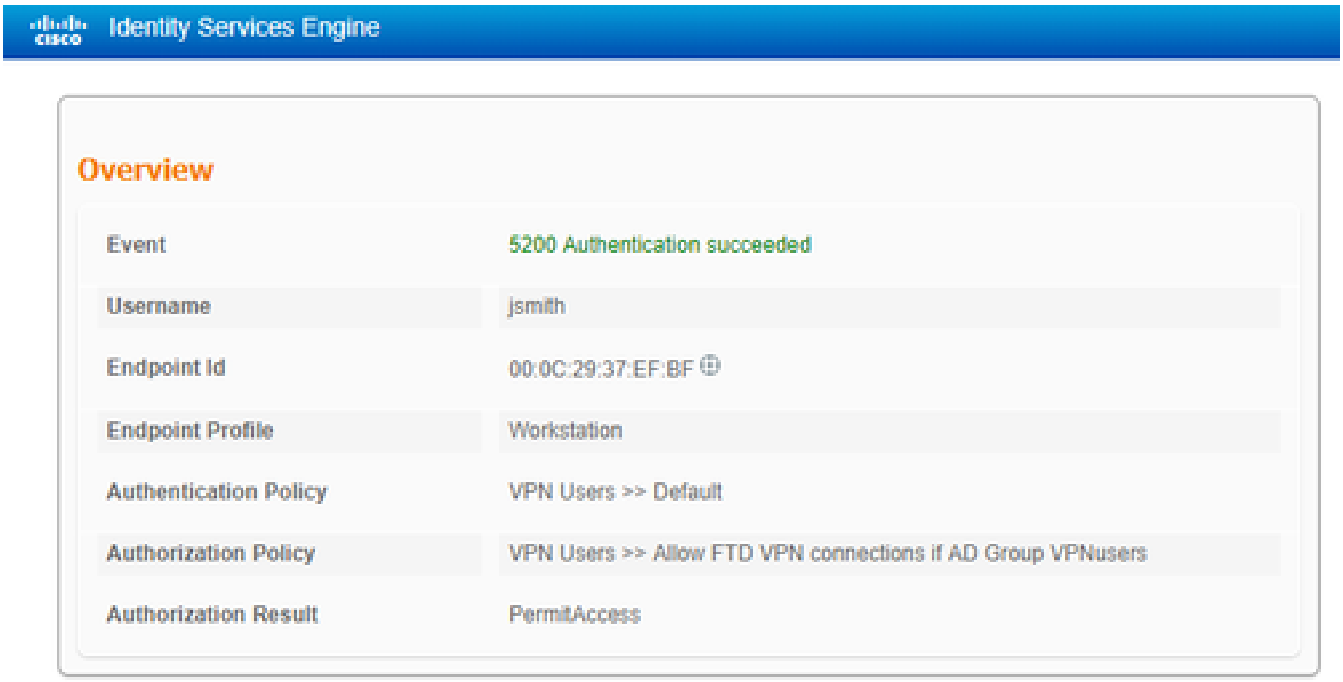
Acquisizione (CLI) di FTD con richiesta a Cisco ISE di verificare la validità del nome utente e della password (ad esempio, accertarsi che le richieste RADIUS vengano eseguite correttamente tra FTD e ISE e verificare l'interfaccia in uscita)

```
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
```

Sotto, il server Cisco ISE RADIUS mostra che l'autenticazione è riuscita. Fare clic sulla lente di ingrandimento per visualizzare i dettagli dell'autenticazione riuscita



Oct 11, 2018 06:10:08.808 PM	●	🔍	0	jsmith	00:0C:29:37:EF:BF		Workstation	VPN Users >> Default	VPN Users >> Allow FTD VPN connections if AD Group VPNusers	PermitAccess
Oct 11, 2018 06:10:08.808 PM	✓	🔍		jsmith	00:0C:29:37:EF:BF	FTDVPN	Workstation	VPN Users >> Default	VPN Users >> Allow FTD VPN connections if AD Group VPNusers	PermitAccess

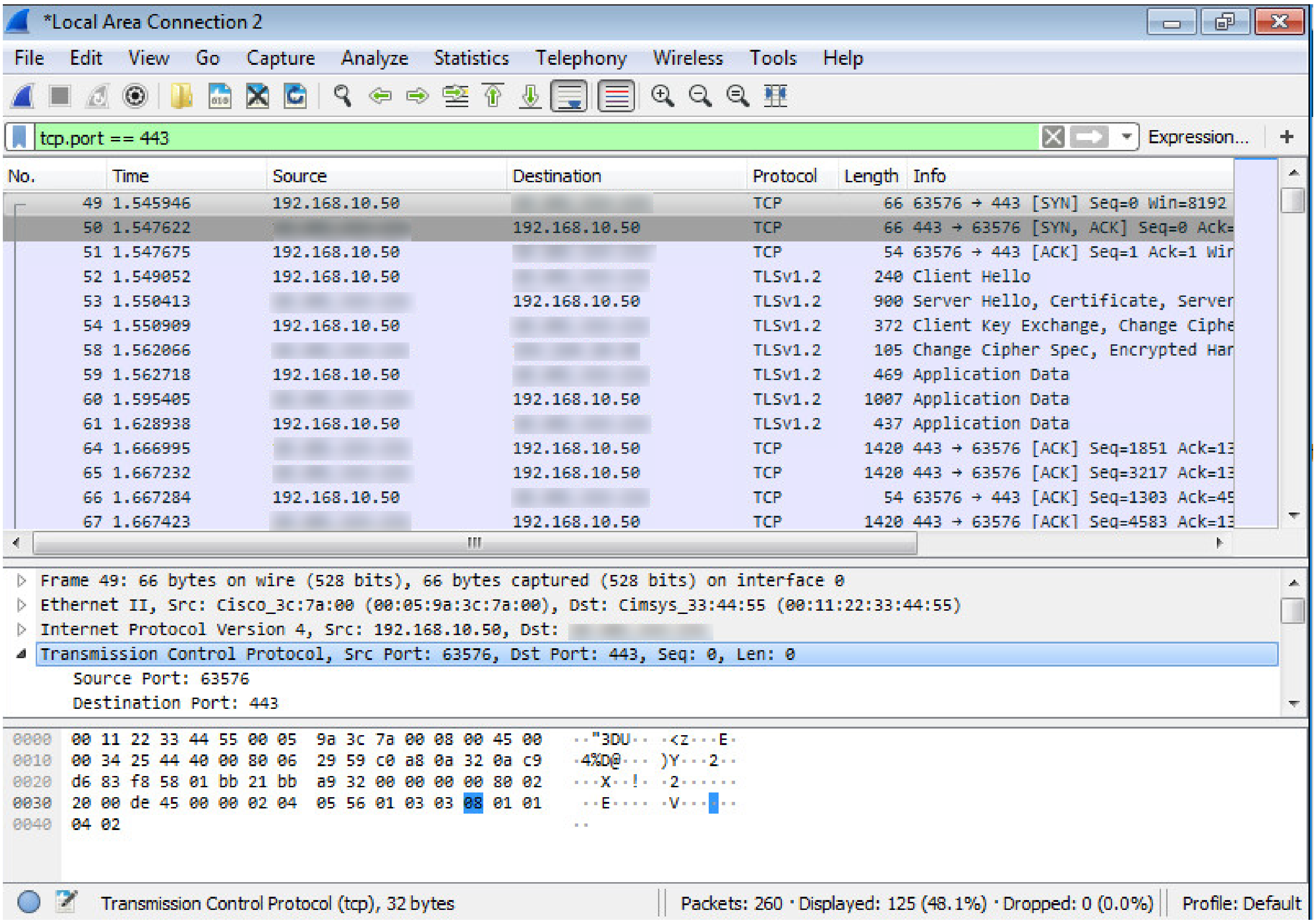


Identity Services Engine

Overview

Event	5200 Authentication succeeded
Username	jsmith
Endpoint Id	00:0C:29:37:EF:BF
Endpoint Profile	Workstation
Authentication Policy	VPN Users >> Default
Authorization Policy	VPN Users >> Allow FTD VPN connections if AD Group VPNusers
Authorization Result	PermitAccess

Effettuare la cattura sulla scheda AnyConnect del PC del dipendente che si reca a un sito Web interno tramite HTTPS (ad esempio, quando la connessione VPN è riuscita):



*Local Area Connection 2
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Expression...

tcp.port == 443

```
No.   Time       Source          Destination     Protocol  Length Info
   49 1.545946   192.168.10.50   [redacted]      TCP         66 63576 → 443 [SYN] Seq=0 Win=8192
   50 1.547622   [redacted]      192.168.10.50   TCP         66 443 → 63576 [SYN, ACK] Seq=0 Ack=
   51 1.547675   192.168.10.50   [redacted]      TCP         54 63576 → 443 [ACK] Seq=1 Ack=1 Win
   52 1.549052   192.168.10.50   [redacted]      TLSv1.2    240 Client Hello
   53 1.550413   [redacted]      192.168.10.50   TLSv1.2    900 Server Hello, Certificate, Server
   54 1.550909   192.168.10.50   [redacted]      TLSv1.2    372 Client Key Exchange, Change Ciphe
   58 1.562066   [redacted]      [redacted]      TLSv1.2    105 Change Cipher Spec, Encrypted Har
   59 1.562718   192.168.10.50   [redacted]      TLSv1.2    469 Application Data
   60 1.595405   [redacted]      192.168.10.50   TLSv1.2   1007 Application Data
   61 1.628938   192.168.10.50   [redacted]      TLSv1.2    437 Application Data
   64 1.666995   [redacted]      192.168.10.50   TCP       1420 443 → 63576 [ACK] Seq=1851 Ack=13
   65 1.667232   [redacted]      192.168.10.50   TCP       1420 443 → 63576 [ACK] Seq=3217 Ack=13
   66 1.667284   192.168.10.50   [redacted]      TCP         54 63576 → 443 [ACK] Seq=1303 Ack=45
   67 1.667423   [redacted]      192.168.10.50   TCP       1420 443 → 63576 [ACK] Seq=4583 Ack=13
```

```
▷ Frame 49: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
▷ Ethernet II, Src: Cisco_3c:7a:00 (00:05:9a:3c:7a:00), Dst: Cimsys_33:44:55 (00:11:22:33:44:55)
▷ Internet Protocol Version 4, Src: 192.168.10.50, Dst: [redacted]
◢ Transmission Control Protocol, Src Port: 63576, Dst Port: 443, Seq: 0, Len: 0
     Source Port: 63576
     Destination Port: 443
```

```
0000  00 11 22 33 44 55 00 05  9a 3c 7a 00 08 00 45 00   ··"3DU·· ·<z···E·
0010  00 34 25 44 40 00 80 06  29 59 c0 a8 0a 32 0a c9   ·4%D@··· )Y···2··
0020  d6 83 f8 58 01 bb 21 bb  a9 32 00 00 00 00 80 02   ···X··!· ·2······
0030  20 00 de 45 00 00 02 04  05 56 01 03 03 08 01 01    ··E···· ·V······
0040  04 02                                              ··
```

Transmission Control Protocol (tcp), 32 bytes | Packets: 260 · Displayed: 125 (48.1%) · Dropped: 0 (0.0%) | Profile: Default

Debug

debug radius all

debug webvpn anyconnect 255

Eseguire il comando 'debug radius all' sulla CLI di diagnostica FTD (>system support diagnostic-cli) e premere 'Connect' su Windows/Mac PC sul client Cisco Anyconnect

```
> 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#
```

Eseguire il comando 'debug webvpn anyconnect 255' sulla CLI di diagnostica FTD (>system support diagnostic-cli) e premere 'Connect' su Windows/Mac PC sul client Cisco Anyconnect

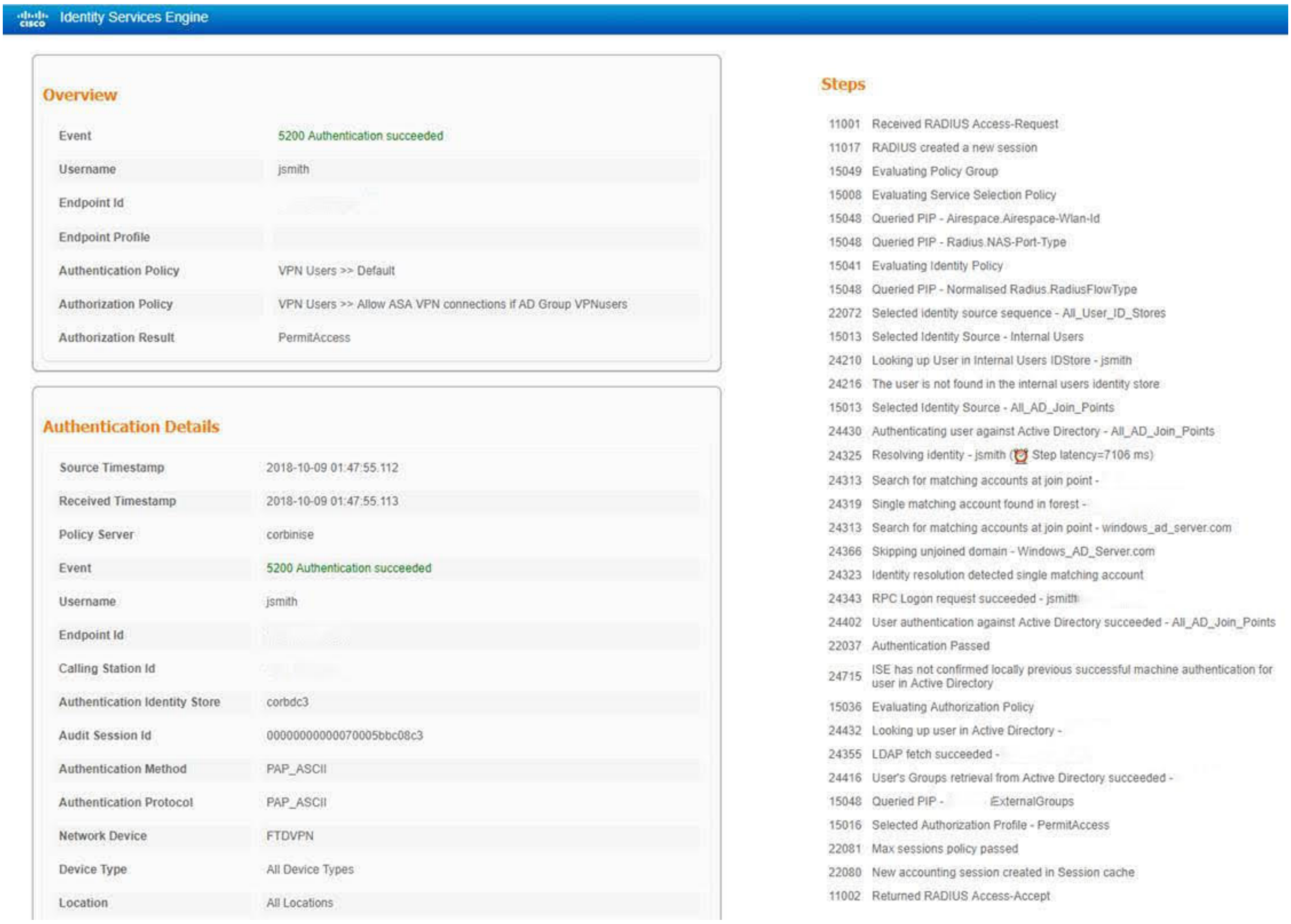
```
> system support diagnostic-cli
Attaching to Diagnostic CLI ... Press 'Ctrl+a then d' to detach.
ciscofp3> enable
Password: <hit enter>
ciscofp3# terminal monitor
ciscofp3# debug webvpn anyconnect 255
<hit Connect on Anyconnect client on PC>

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 > Operazioni > RADIUS > Live Log > fare clic sui dettagli di ciascuna autenticazione

Verificare su Cisco ISE il proprio accesso VPN e il risultato dell'ACL "PermitAccess" è stato fornito
I Live Log mostrano che jsmith è stato autenticato a FTD tramite VPN



Identity Services Engine

Overview

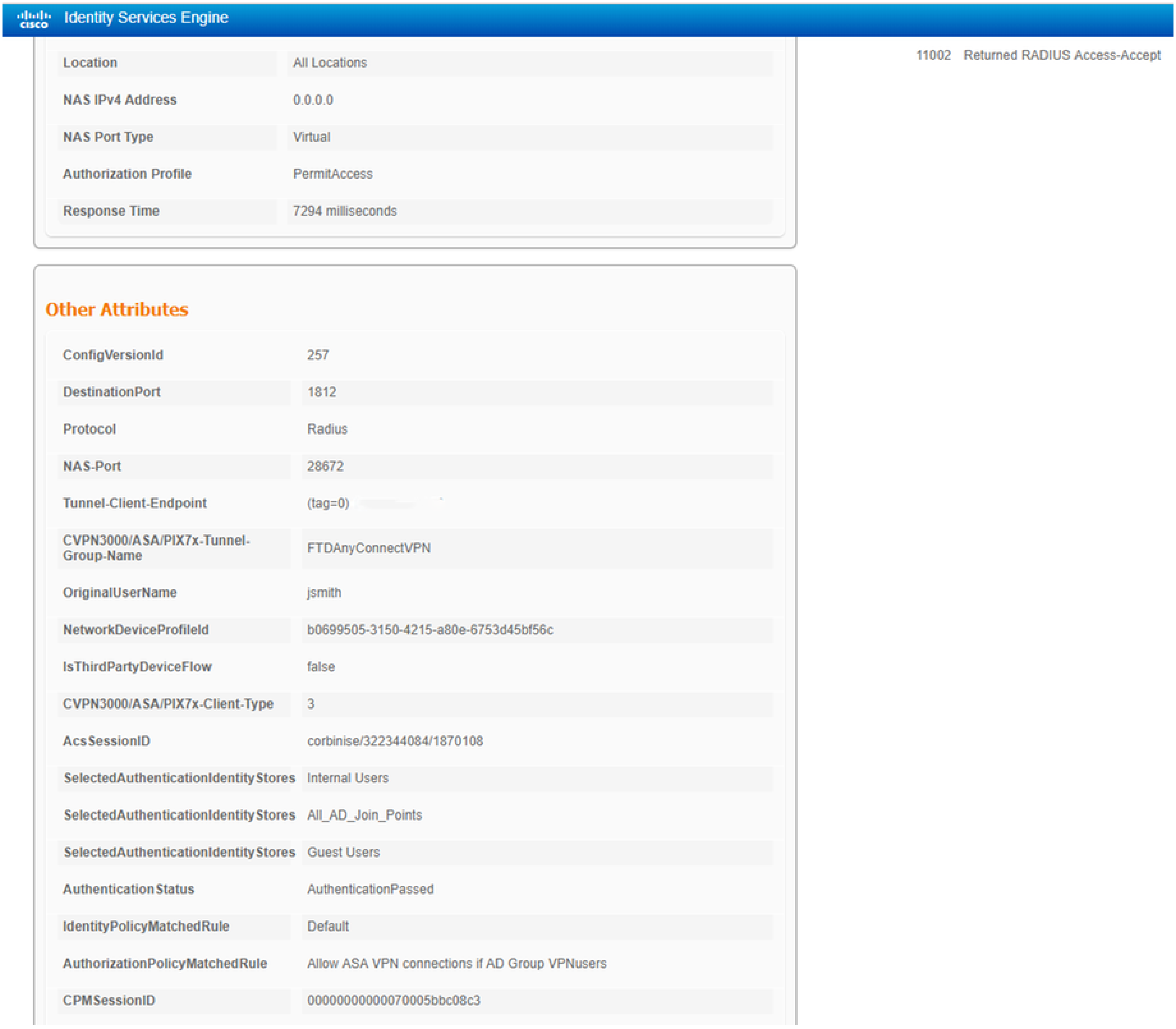
Event	5200 Authentication succeeded
Username	jsmith
Endpoint Id	
Endpoint Profile	
Authentication Policy	VPN Users >> Default
Authorization Policy	VPN Users >> Allow ASA VPN connections if AD Group VPNusers
Authorization Result	PermitAccess

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

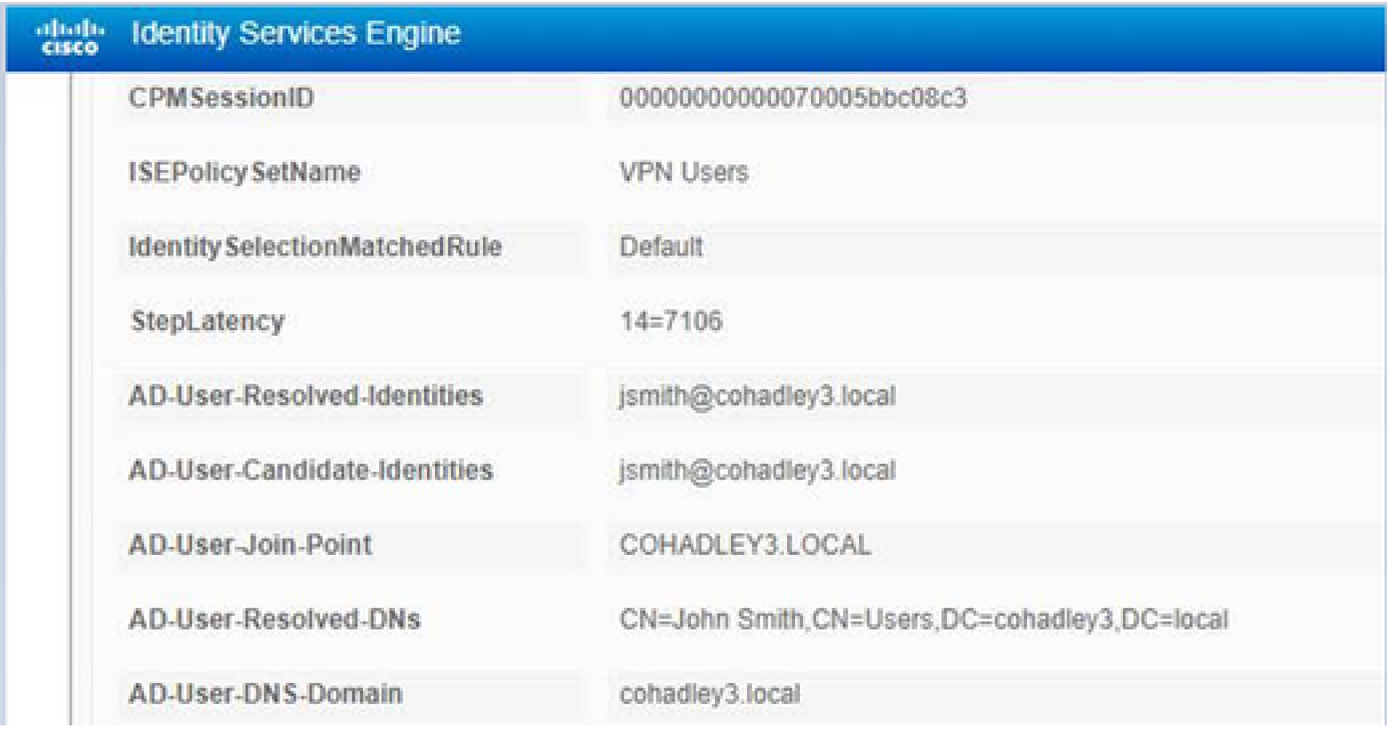


Location	All Locations
NAS IPv4 Address	0.0.0.0
NAS Port Type	Virtual
Authorization Profile	PermitAccess
Response Time	7294 milliseconds

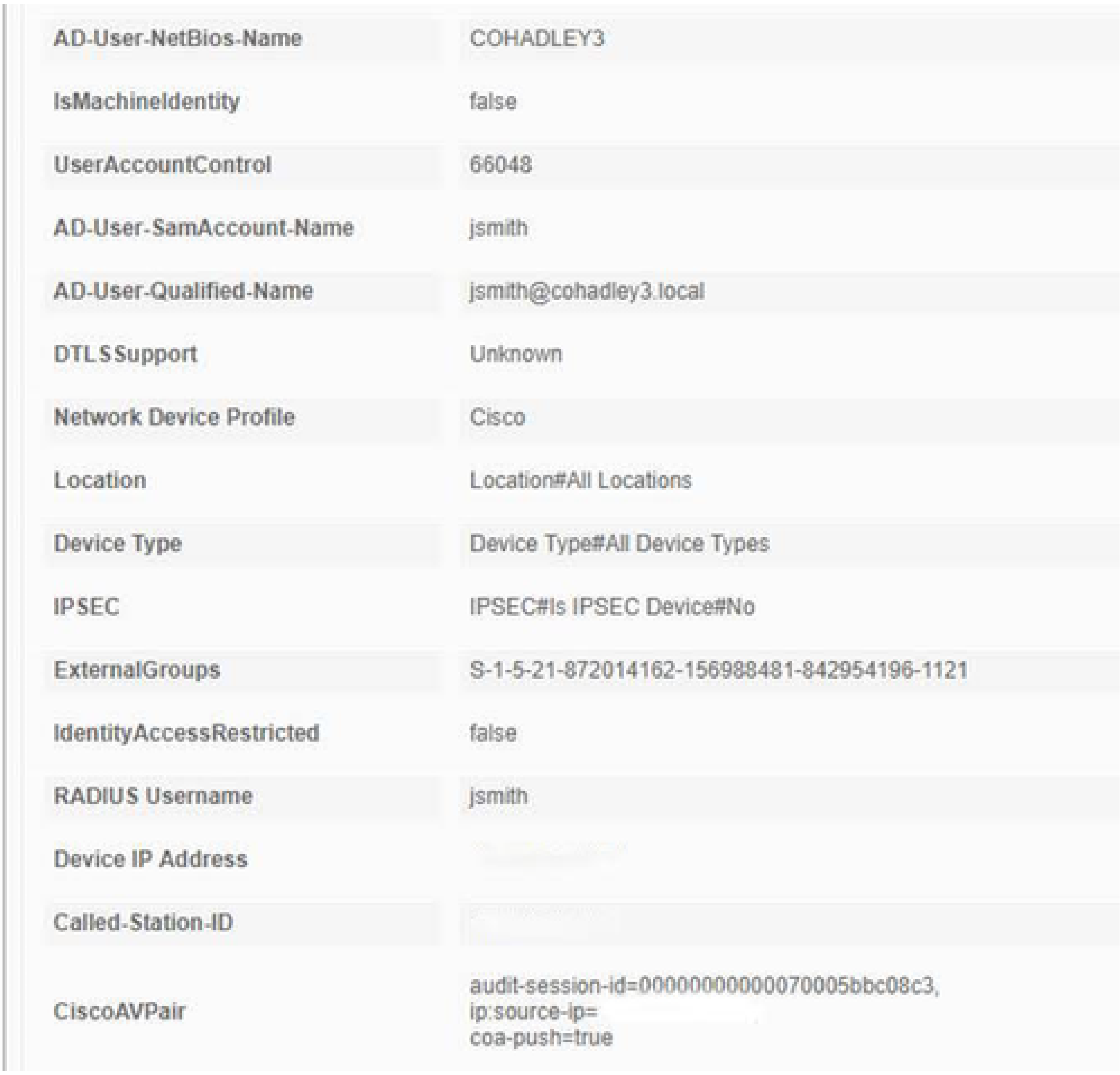
11002 Returned RADIUS Access-Accept

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



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	[redacted]
Called-Station-ID	[redacted]

CiscoAVPair	audit-session-id=0000000000070005bbc08c3,
	ip:source-ip= [redacted]
	coa-push=true

AnyConnect VPN Client

Pacchetto DART

Come raccogliere il bundle DART per AnyConnect

Risoluzione dei problemi

DNS

Verifica che i PC Cisco ISE, FTD, Windows Server 2012 e Windows/Mac siano in grado di risolversi a vicenda in avanti e all'indietro (verifica il DNS su tutti i dispositivi)

PC Windows
Avviare un prompt dei comandi e verificare che sia possibile eseguire 'nslookup' sul nome host dell'FTD

CLI FTD

```
>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:

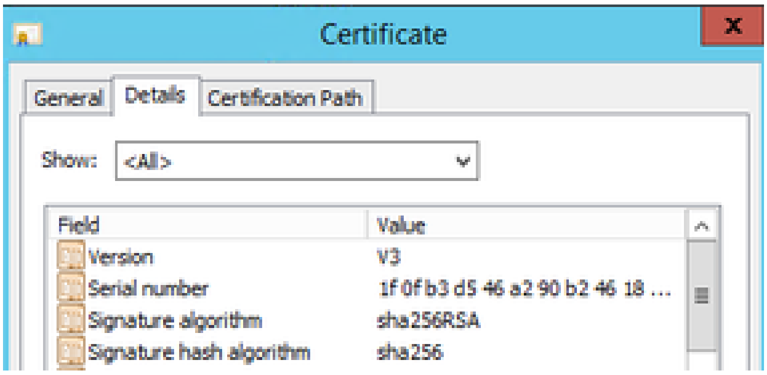
```
ciscoise/admin# nslookup 192.168.1.20
Trying "20.1.168.192.in-addr.arpa"
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 56529
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0

;; 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

Avviare un prompt dei comandi e verificare che sia possibile eseguire 'nslookup' sul nome host/FQDN dell'FTD

Livello certificato (per compatibilità browser)

Verificare che Windows Server 2012 firmi i certificati come SHA256 o versione successiva. Fare doppio clic sul certificato CA radice in Windows e controllare i campi 'Algoritmo di firma'



Show: <All>

Field	Value
Version	V3
Serial number	1f 0f b3 d5 46 a2 90 b2 46 18 ...
Signature algorithm	sha256RSA
Signature hash algorithm	sha256

Se si tratta di SHA1, nella maggior parte dei browser verrà visualizzato un avviso per tali certificati. Per modificarlo, fare clic su:

Come aggiornare Autorità di certificazione Windows Server a SHA256

Verificare che il certificato del server VPN FTD contenga i seguenti campi (quando ci si connette nel browser a FTD)

Nome comune = <FTDFQDN>

Nome alternativo soggetto (SAN) = <FTDFQDN>

Esempio:

Nome comune: **ciscofp3.cisco.com**

Nome alternativo soggetto (SAN): **Nome DNS=cicscofp3.cisco.com**

Connettività e configurazione del firewall

Verificare l'utilizzo di acquisizioni sulla CLI FTD e acquisizioni sul PC dei dipendenti utilizzando Wireshark per verificare che i pacchetti vengano trasmessi su TCP+UDP 443 all'IP esterno dell'FTD. Verificare che i pacchetti provengano dall'indirizzo IP pubblico del router di origine del dipendente

```
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
...
```