在FDM管理的FTD上安装并续订证书

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简介

本文档介绍如何在FTD上安装、信任和续订由第三方CA或内部CA签名的自签名证书和证书。

先决条件

要求

Cisco 建议您了解以下主题：

- 手动证书注册需要访问受信任的第三方证书颁发机构(CA)。 第三方CA供应商的示例包括（但不限于）Entrust、Geotrust、GoDaddy、Thawte和VeriSign。
- 验证Firepower威胁防御(FTD)具有正确的时钟时间、日期和时区。对于证书身份验证，建议使用网络时间协议(NTP)服务器同步FTD上的时间。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 运行6.5的FTDv。
- 对于密钥对和证书签名请求(CSR)创建，使用OpenSSL。

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

配置

证书安装

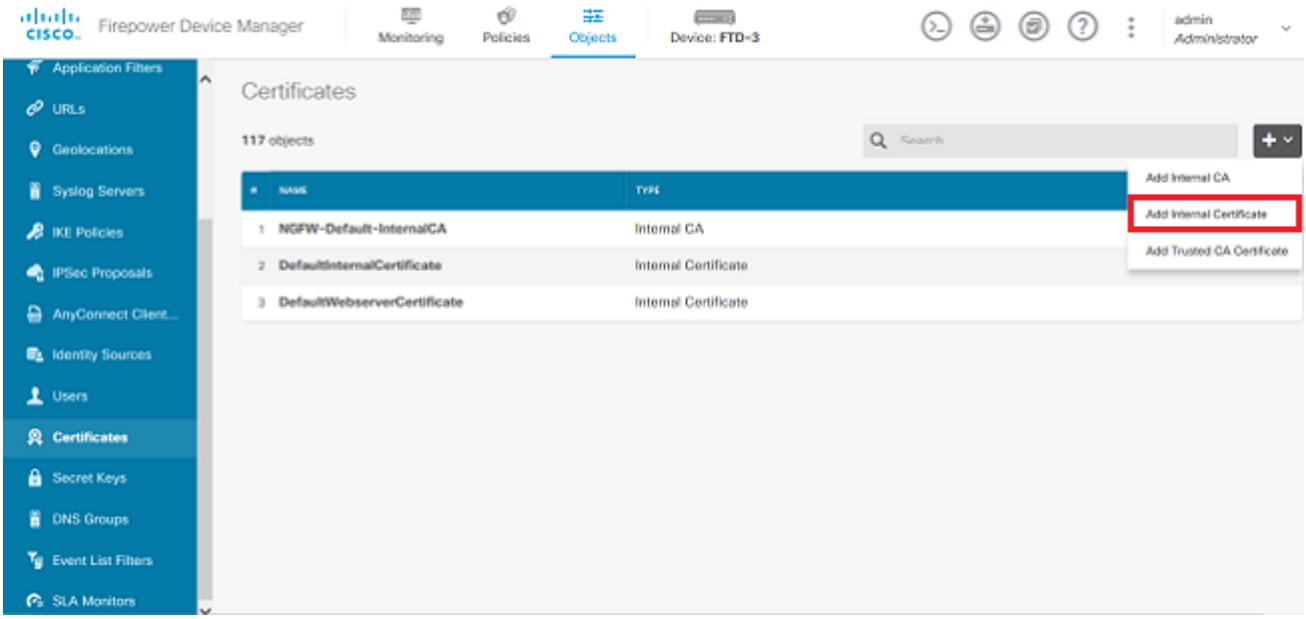
自签名注册

自签名证书是一种轻松获得证书的方法，在FTD设备上添加了相应的字段。虽然在大多数位置无法信任它们，但它们仍可以提供与第三方签名证书类似的加密优势。但是，建议使用受信任CA签名的证书，以便用户和其他设备能够信任FTD提供的证书。

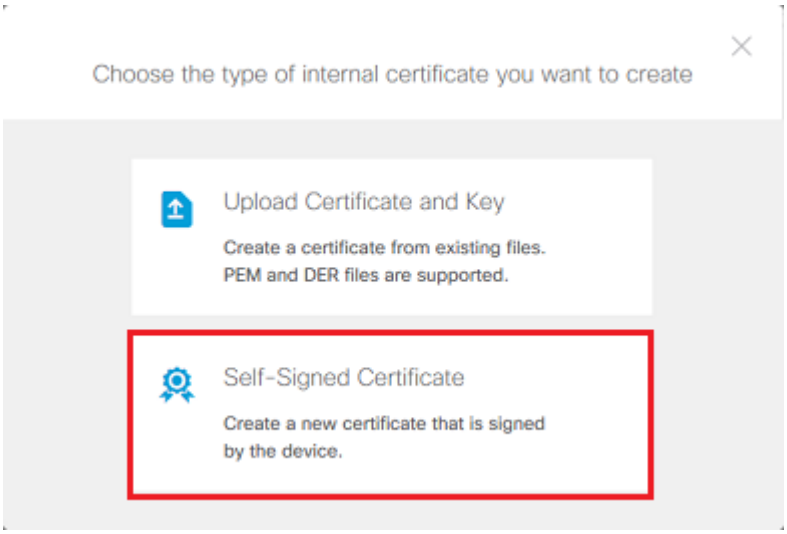


注意：Firepower设备管理(FDM)具有名为DefaultInternalCertificate的默认自签名证书，可用于类似用途。

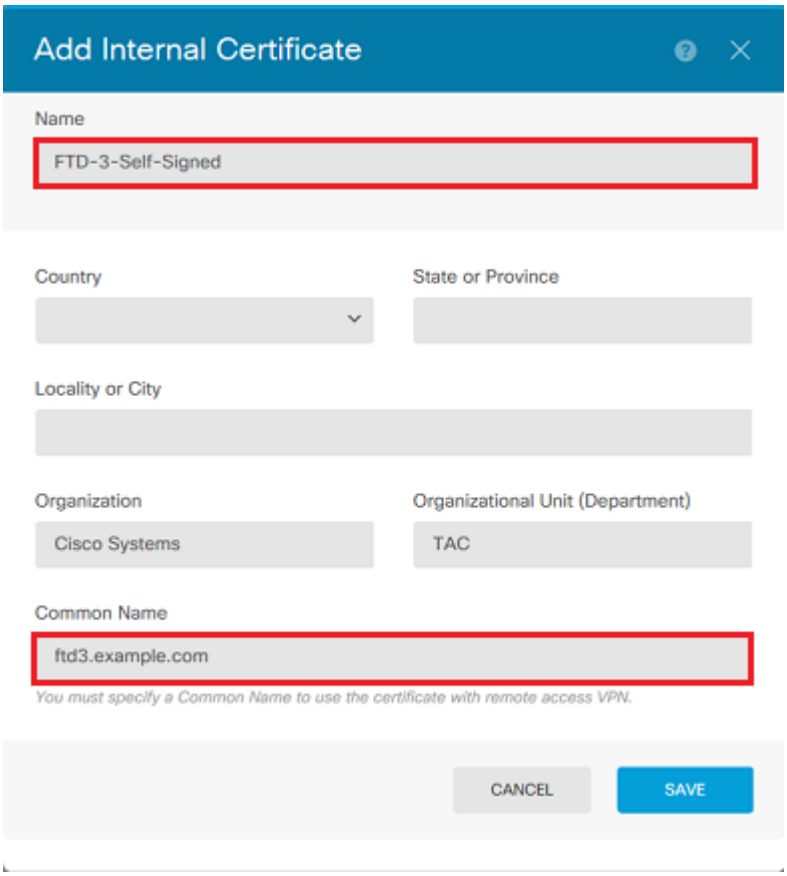
1.定位至对象>证书。单击+符号，然后选择Add Internal Certificate，如图所示。



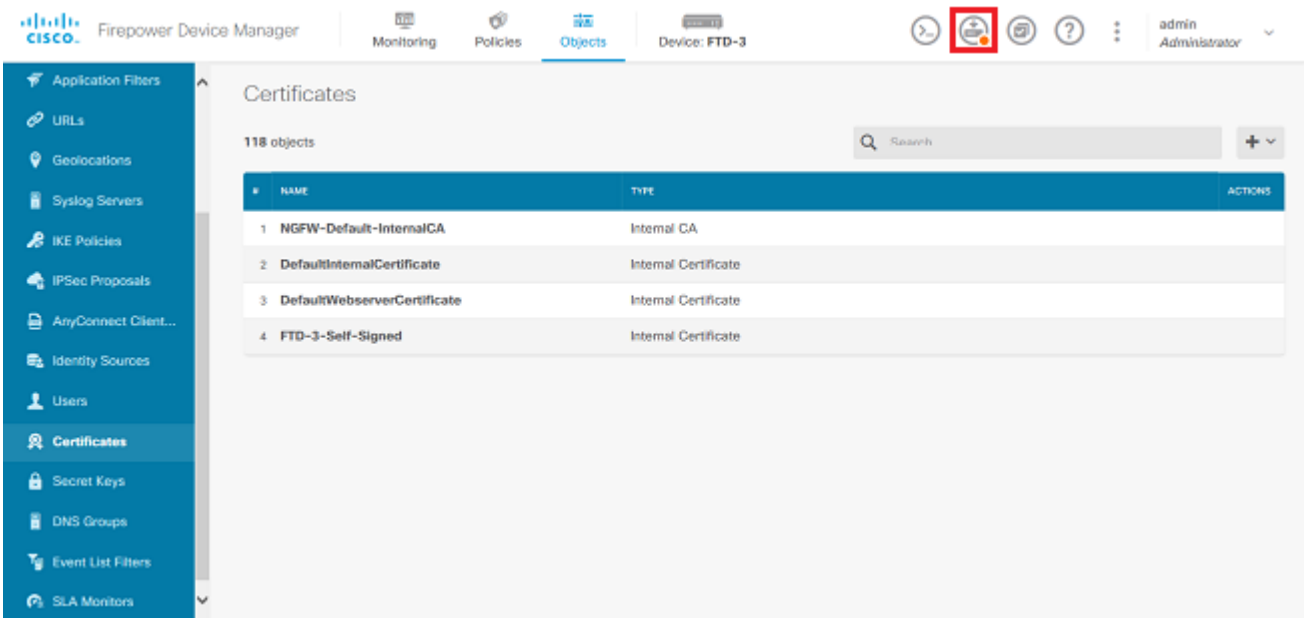
2.在弹出窗口中选择Self-Signed Certificate，如图所示。



3.为信任点指定Name，然后填写主题可分辨名称字段。至少可以添加Common Name字段。这可以与使用证书的服务的完全限定域名(FQDN)或IP地址匹配。完成后单击Save，如图所示。

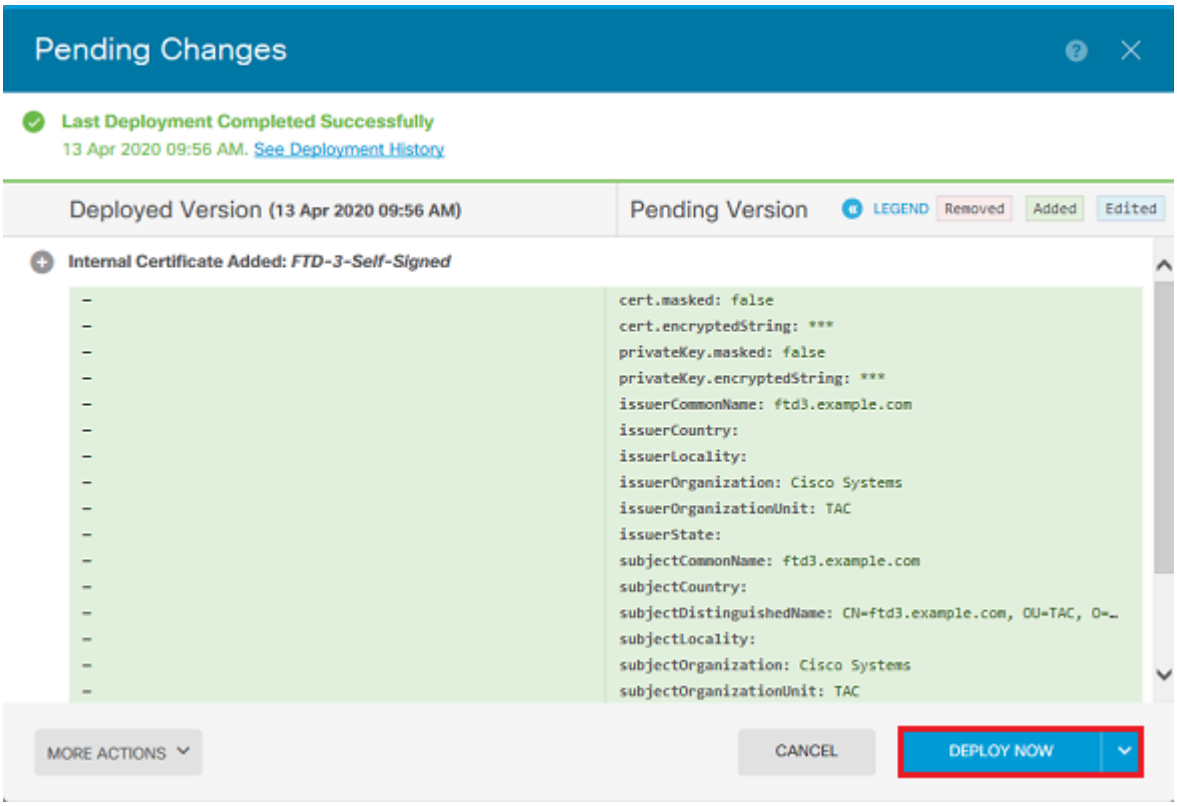


4.单击屏幕右上角的Pending Changes按钮（如图所示）。



5.单击Deploy Now按钮。

注意：部署完成后，只有使用证书的服务（例如AnyConnect）才能在CLI中看到证书。



手动注册

手动注册可用于安装由受信任CA颁发的证书。可以使用OpenSSL或类似工具生成接收CA签名证书所需的私钥和CSR。这些步骤包含用于生成私钥和CSR的常用OpenSSL命令，以及获取证书和私钥后安装证书和私钥的步骤。

1.使用OpenSSL或类似应用，生成私钥和证书签名请求(CSR)。 此示例显示名为private.key的2048位RSA密钥和在OpenSSL中创建的名为ftd3.csr的CSR。

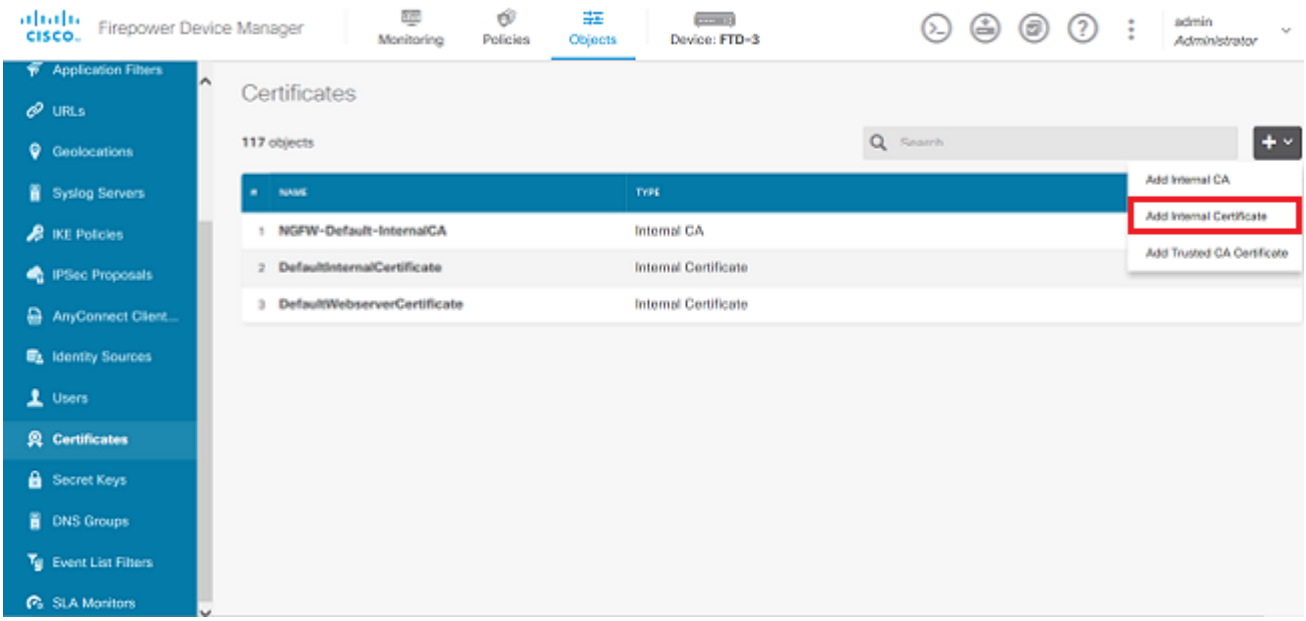
```
openssl req -new -newkey rsa:2048 -nodes -keyout private.key -out ftd3.csr
Generating a 2048 bit RSA private key
.....................................+++
.....................................................................................+++
writing new private key to 'private.key'
-----
You are about to be asked to enter information that is incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there is be a default value,
If you enter '.', the field is left blank.
-----
Country Name (2 letter code) [AU]:.
State or Province Name (full name) [Some-State]:.
Locality Name (eg, city) []:.
Organization Name (eg, company) [Internet Widgits Pty Ltd]:Cisco Systems
Organizational Unit Name (eg, section) []:TAC
Common Name (e.g. server FQDN or YOUR name) []:ftd3.example.com
```

```
Email Address []:.

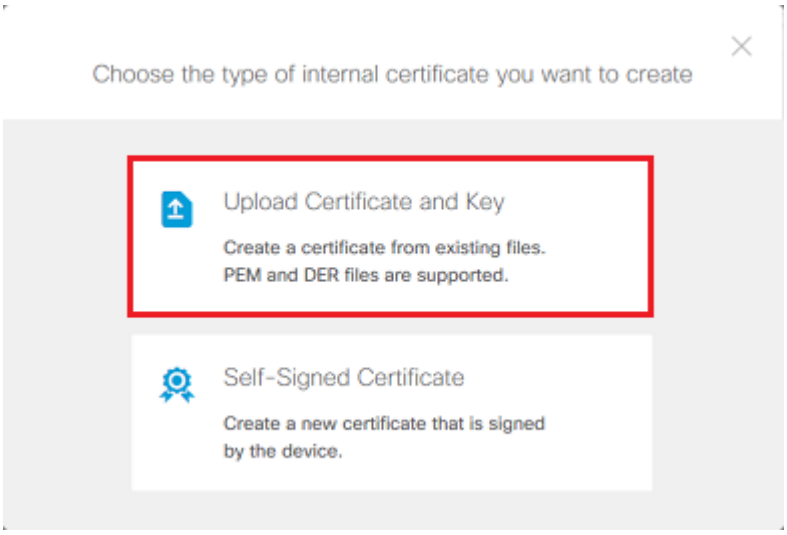
Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:
An optional company name []:
```

2.复制生成的CSR并将其发送到CA。签署CSR后，提供身份证书。

3.定位至对象>证书。单击+符号，然后选择添加内部证书，如图所示。



4.在弹出窗口中选择Upload Certificate and Key，如图所示。

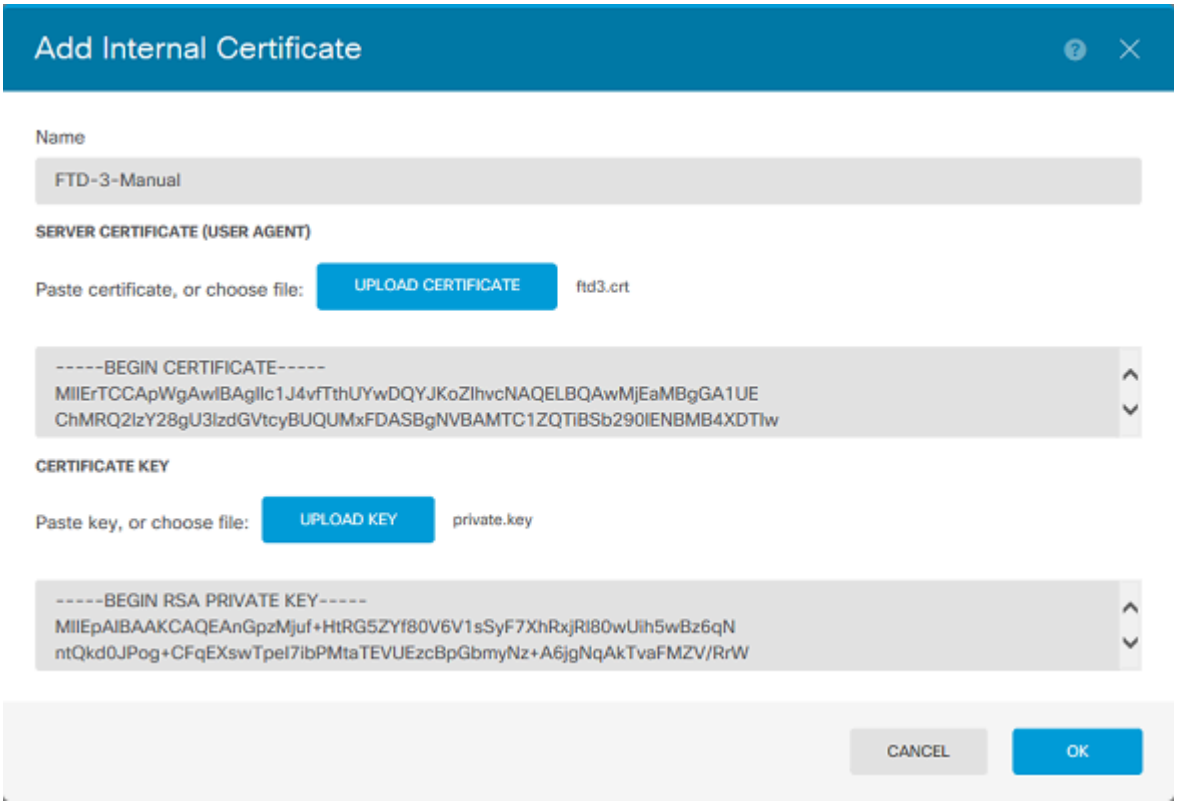


5.指定信任点的Name，然后上传或复制并粘贴身份证书和私钥（采用隐私增强型邮件[PEM]格式）。如果CA在单个PKCS12中同时提供证书和密钥，请导航至本文档后面的从PKCS12文件中提取

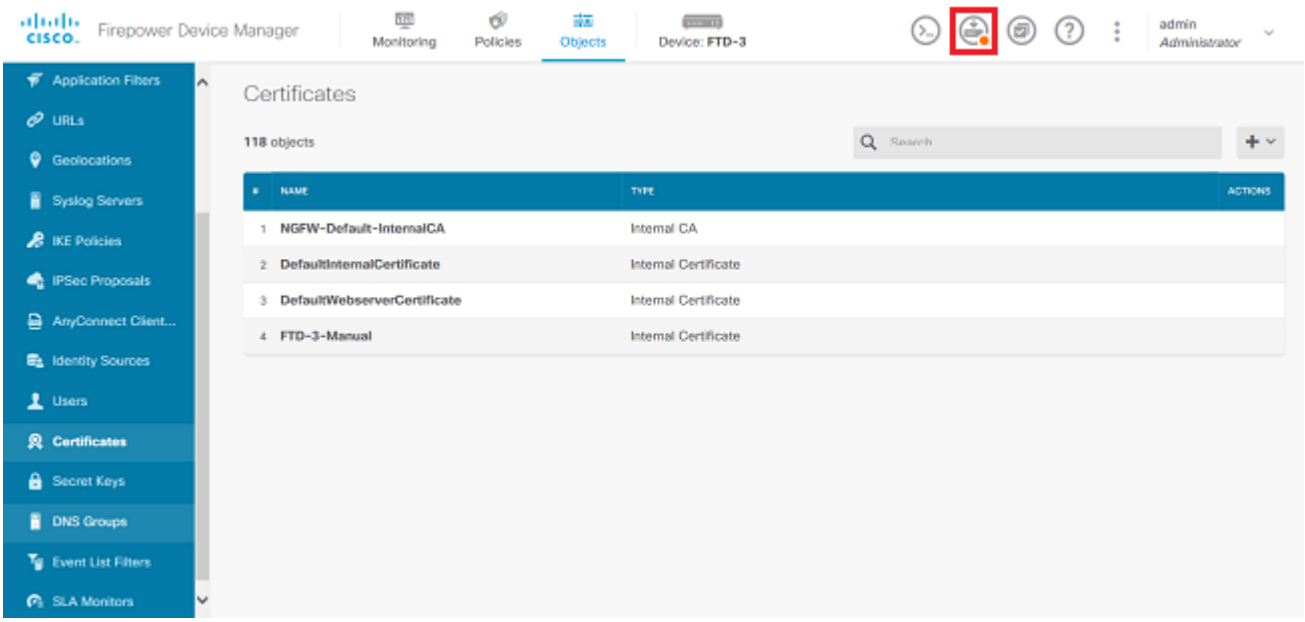
身份证书和私钥部分以分离它们。

注意：文件名不能有任何空格，或者FDM不接受它们。此外，私钥不能加密。

如图所示，完成后单击OK。

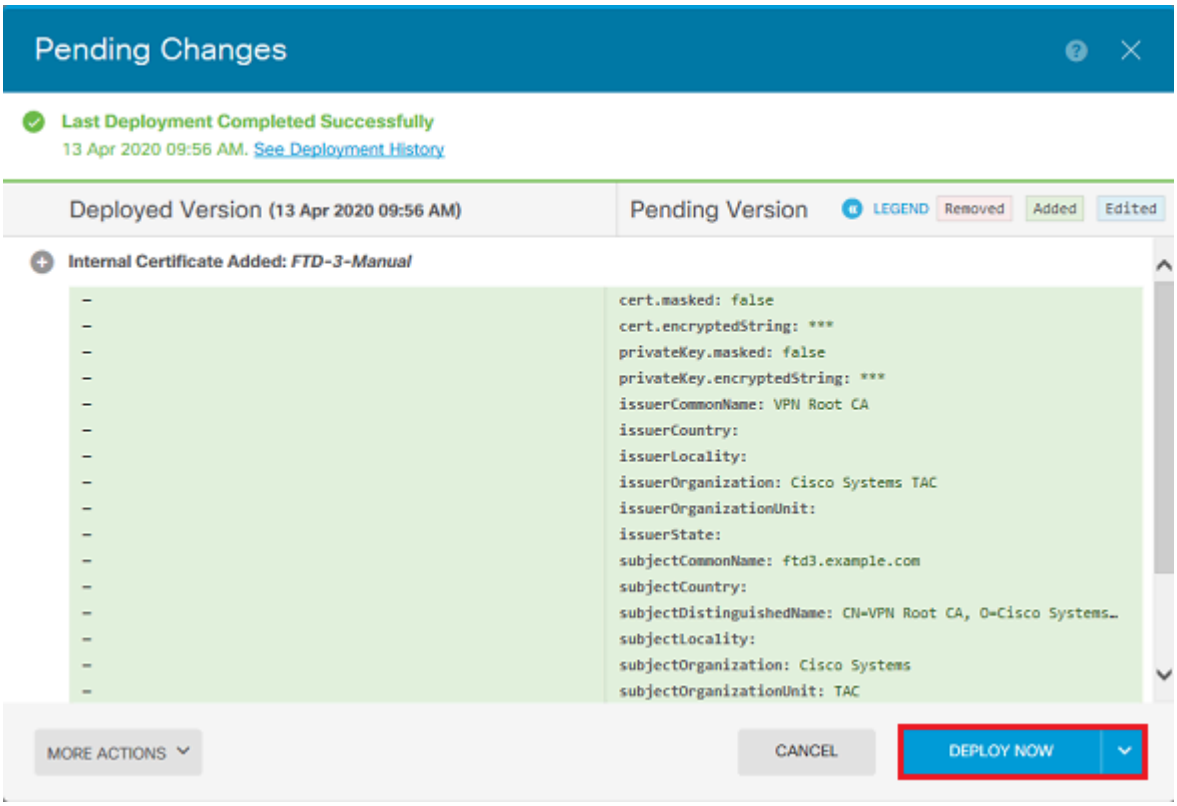


6.单击屏幕右上角的Pending Changes按钮（如图所示）。



7.单击Deploy Now(立即部署)按钮。

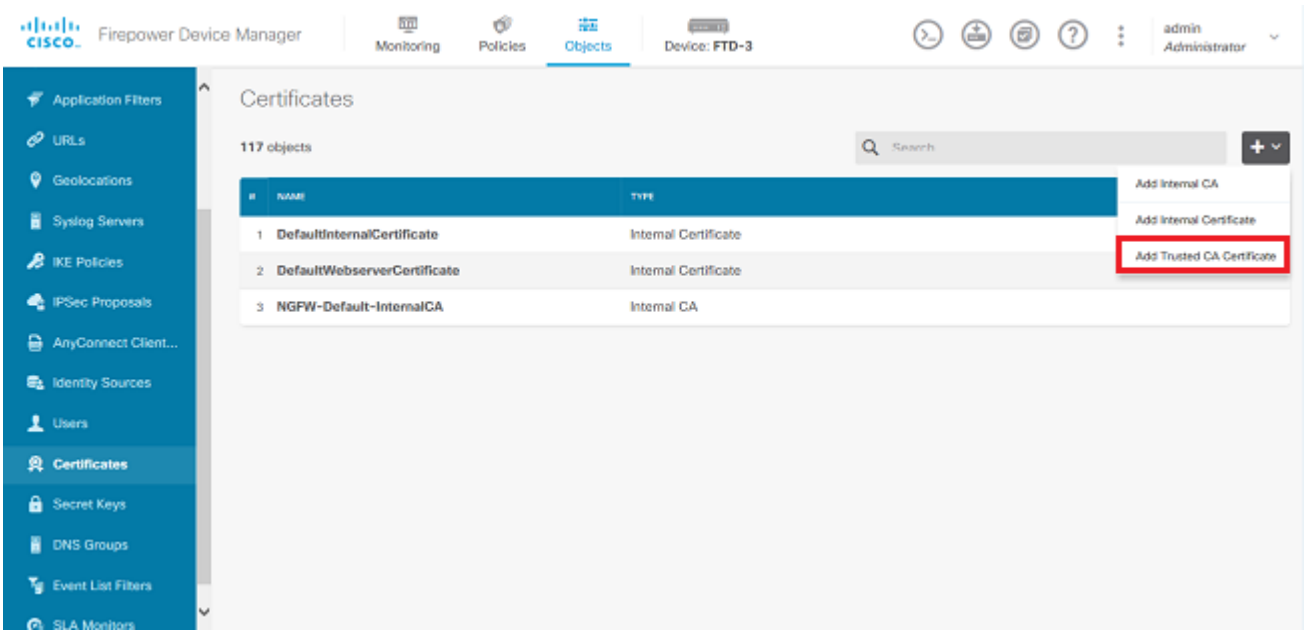
注意：部署完成后，只有使用证书的服务（例如AnyConnect）才能在CLI中看到证书。



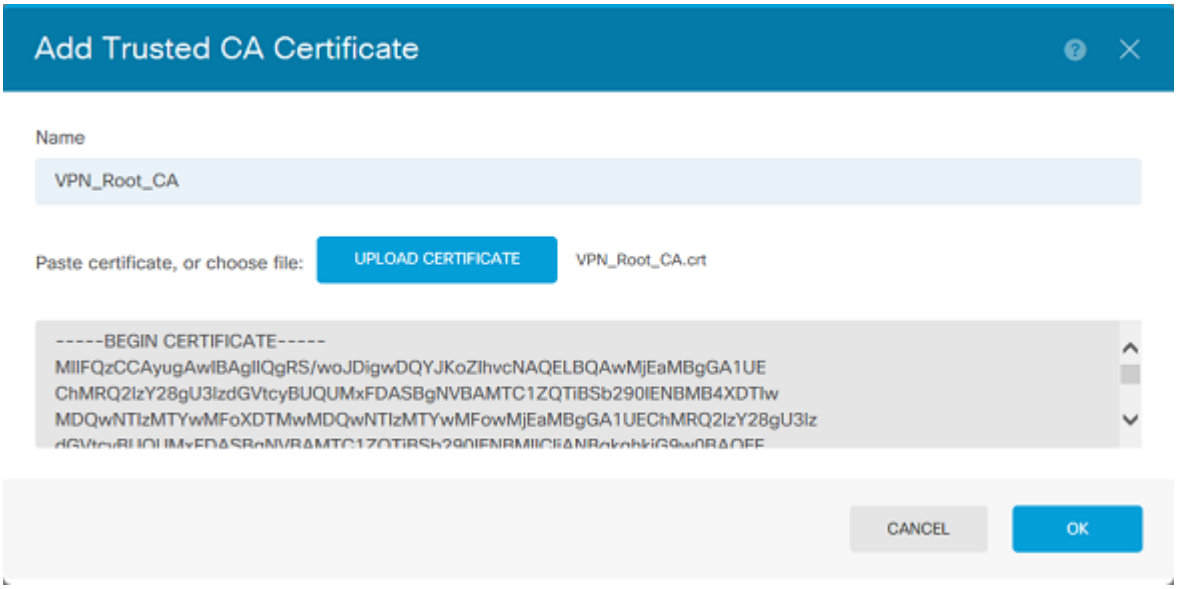
受信任CA证书安装

安装受信任CA证书时，必须选择Validation Usage，以便成功对向FTD提供身份证书的用户或设备进行身份验证。常见示例包括AnyConnect证书身份验证和S2S VPN证书身份验证。这些步骤介绍如何信任CA证书，以便也信任该CA颁发的证书。

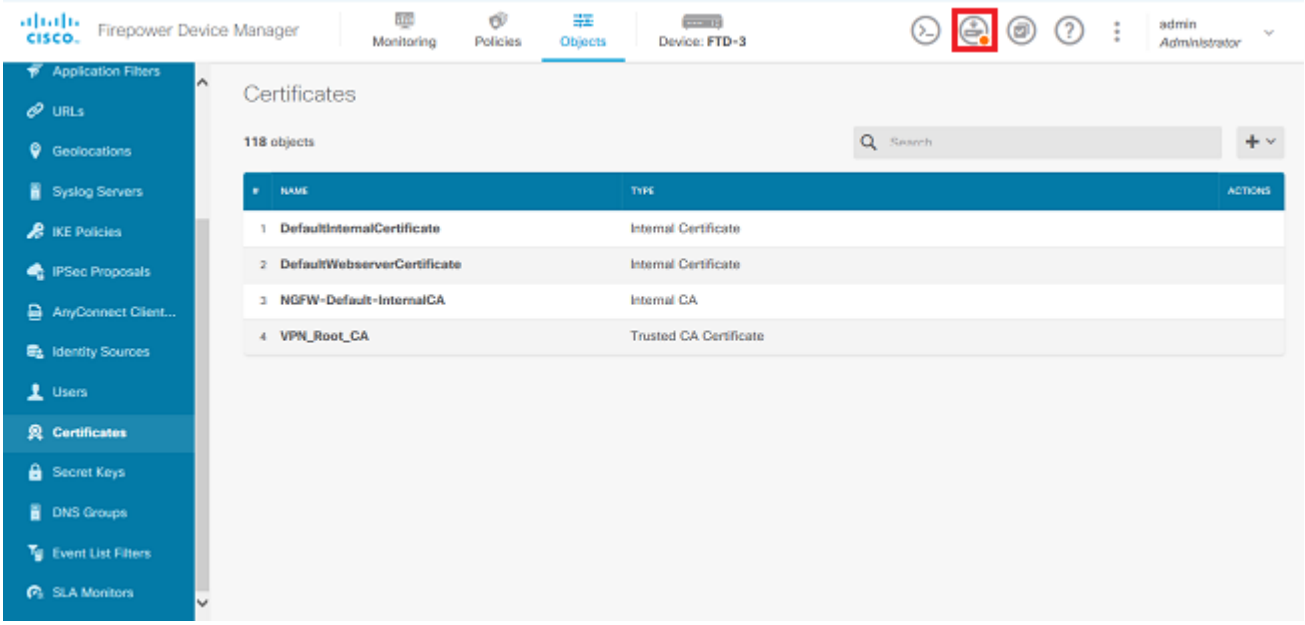
1.定位至对象>证书。单击+符号，然后选择添加受信任CA证书，如图所示。



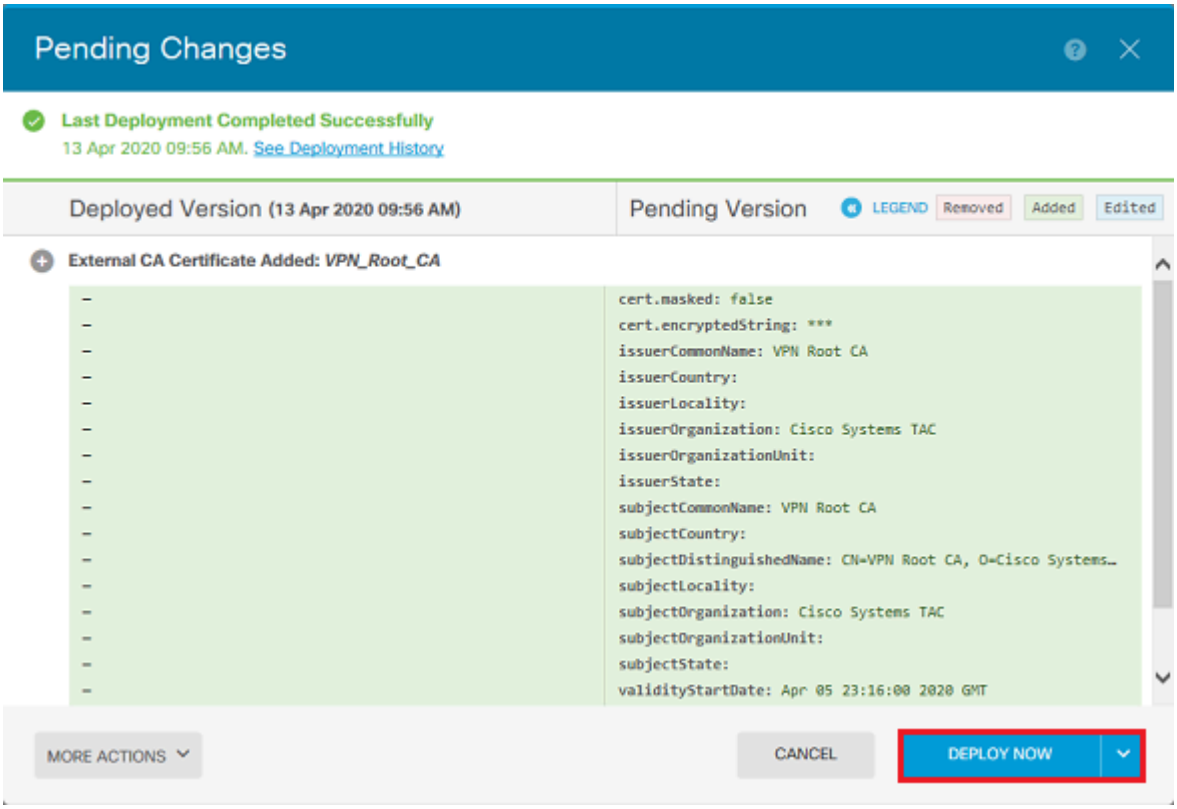
2.指定信任点的“名称”。然后上传或复制并粘贴PEM格式的CA证书。请记得将特殊服务的验证用法设置为SSL服务器。如图所示，完成后单击OK。



3.单击屏幕右上角的Pending Changes按钮（如图所示）。



4.单击Deploy Now按钮，如图所示。



证书续订

FDM管理的FTD上的证书续订涉及替换以前的证书，可能还包括私钥。如果您没有用于创建原始证书的原始CSR和私钥，则需要创建新的CSR和私钥。

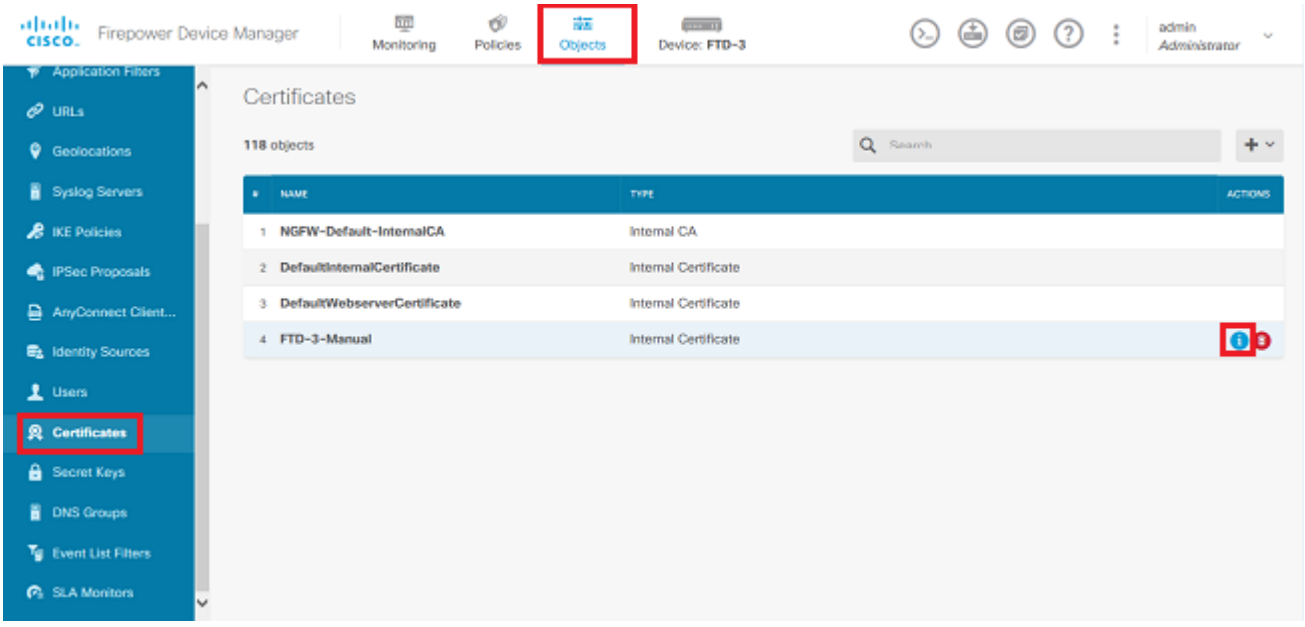
1.如果您具有原始CSR和私钥，则可以忽略此步骤。否则，需要创建新的私钥和CSR。使用OpenSSL或类似应用程序生成私钥和CSR。此示例显示名为private.key的2048位RSA密钥和在OpenSSL中创建的名为ftd3.csr的CSR。

```
openssl req -new -newkey rsa:2048 -nodes -keyout private.key -out ftd3.csr
Generating a 2048 bit RSA private key
.....................................+++
.....................................................................................+++
writing new private key to 'private.key'
-----
You are about to be asked to enter information that is incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there is a default value,
If you enter '.', the field is left blank.
-----
Country Name (2 letter code) [AU]:.
State or Province Name (full name) [Some-State]:.
Locality Name (eg, city) []:.
Organization Name (eg, company) [Internet Widgits Pty Ltd]:Cisco Systems
Organizational Unit Name (eg, section) []:TAC
Common Name (e.g. server FQDN or YOUR name) []:ftd3.example.com
Email Address []:.

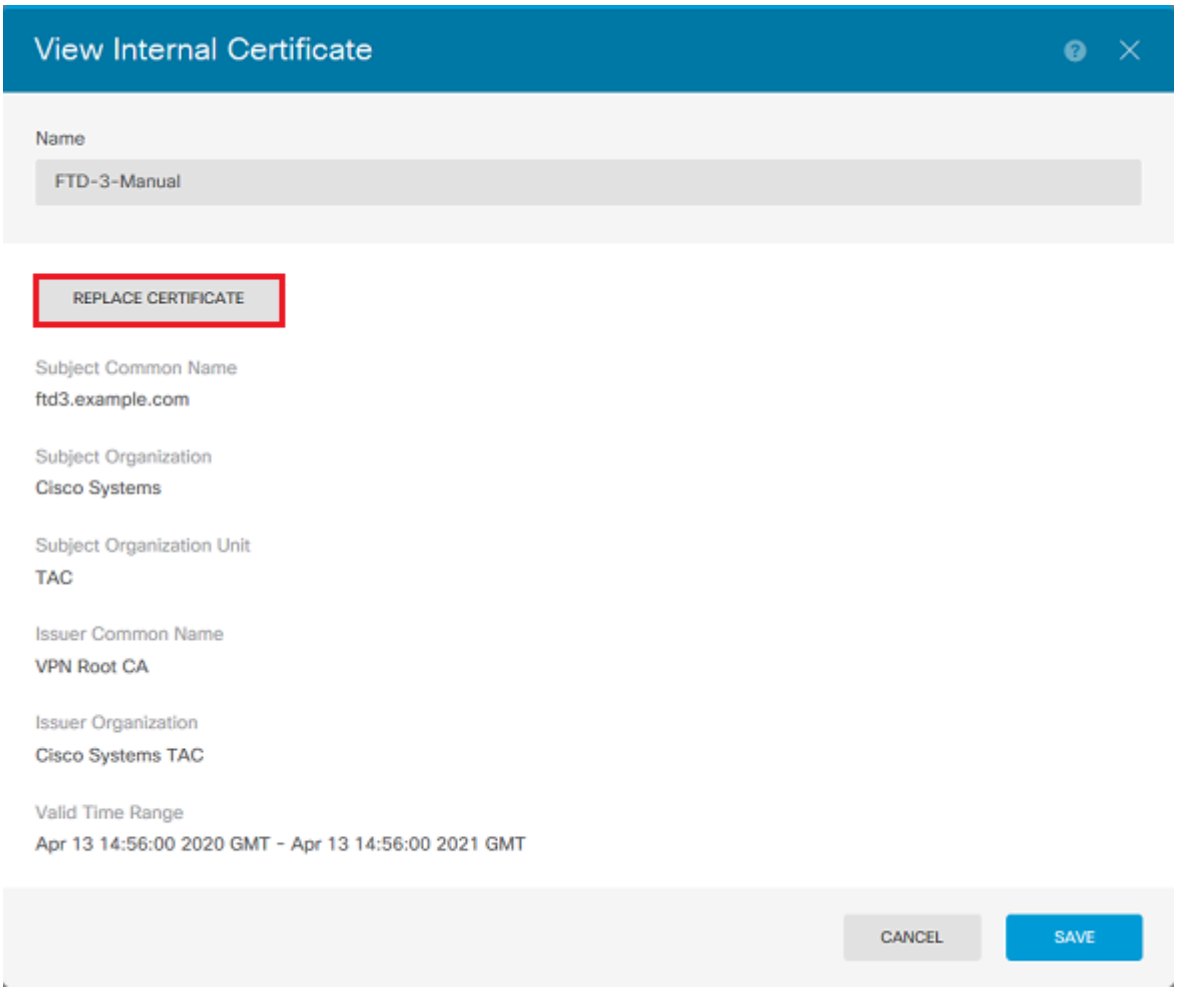
Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:
An optional company name []:
```

2.将生成的CSR或原始CSR发送到证书颁发机构。CSR签名后，提供续订的身份证书。

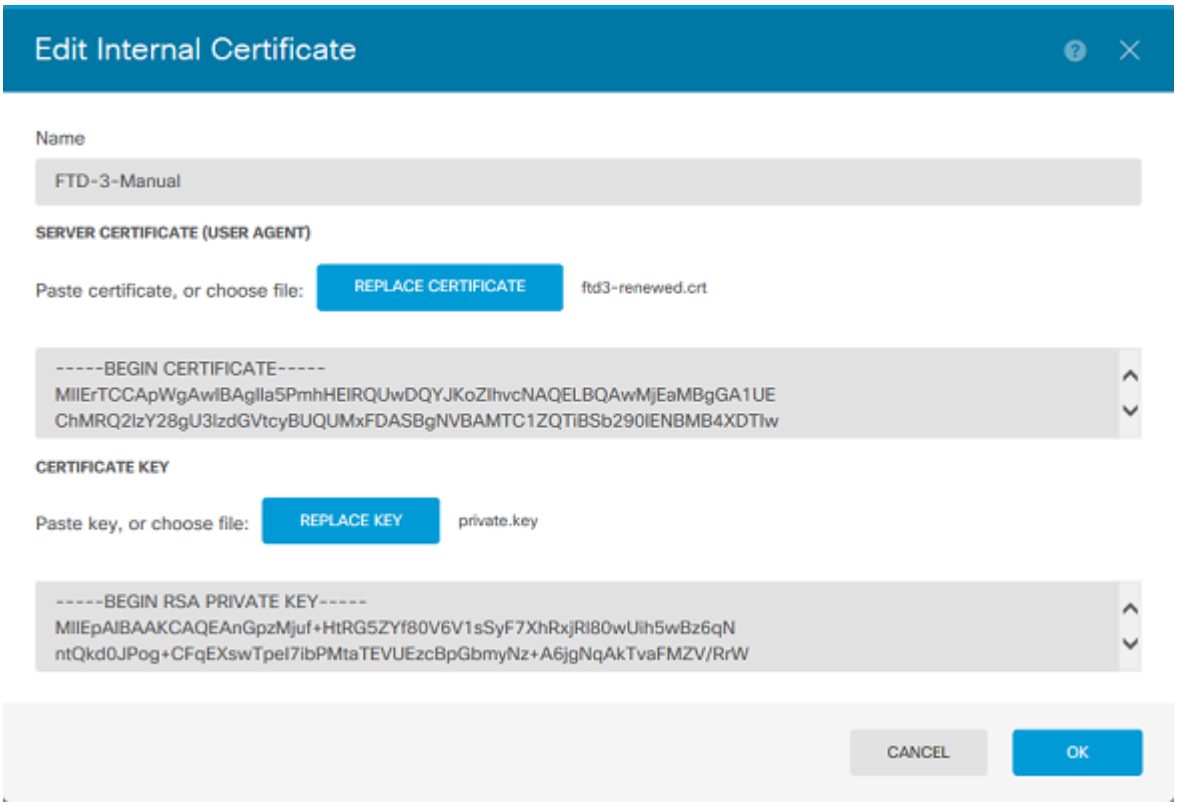
3.定位至对象>证书。将鼠标悬停在要续订的证书上，然后单击查看按钮（如图所示）。



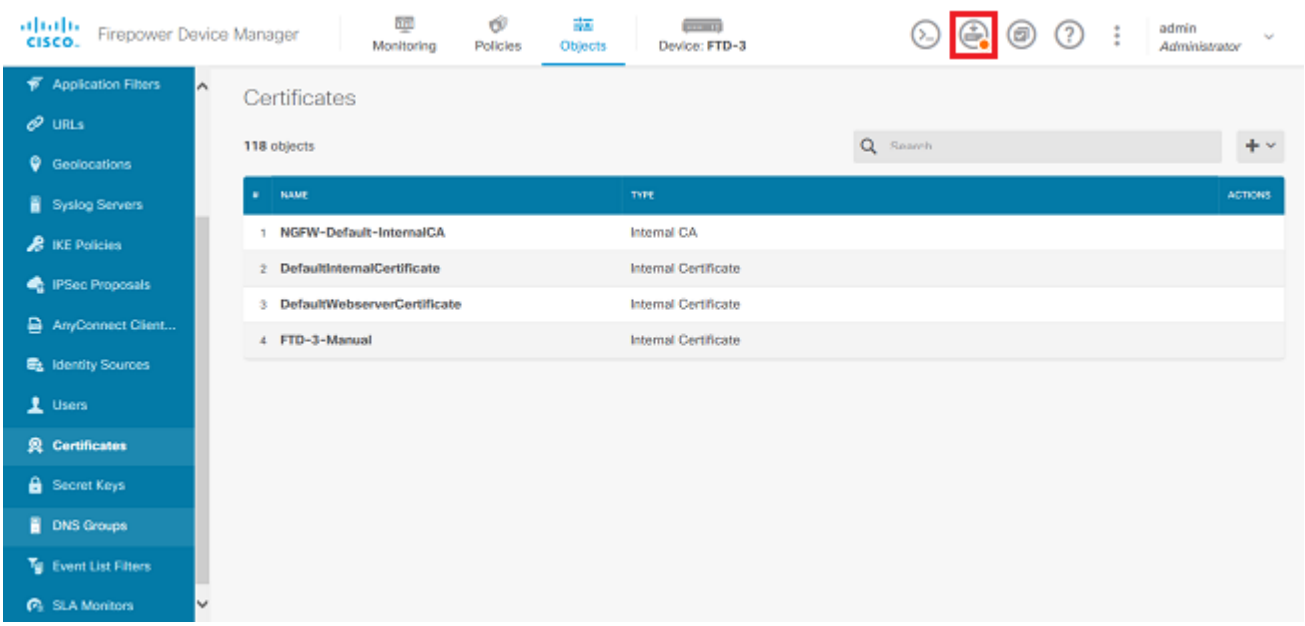
4.在弹出窗口中，单击Replace Certificate，如图所示。



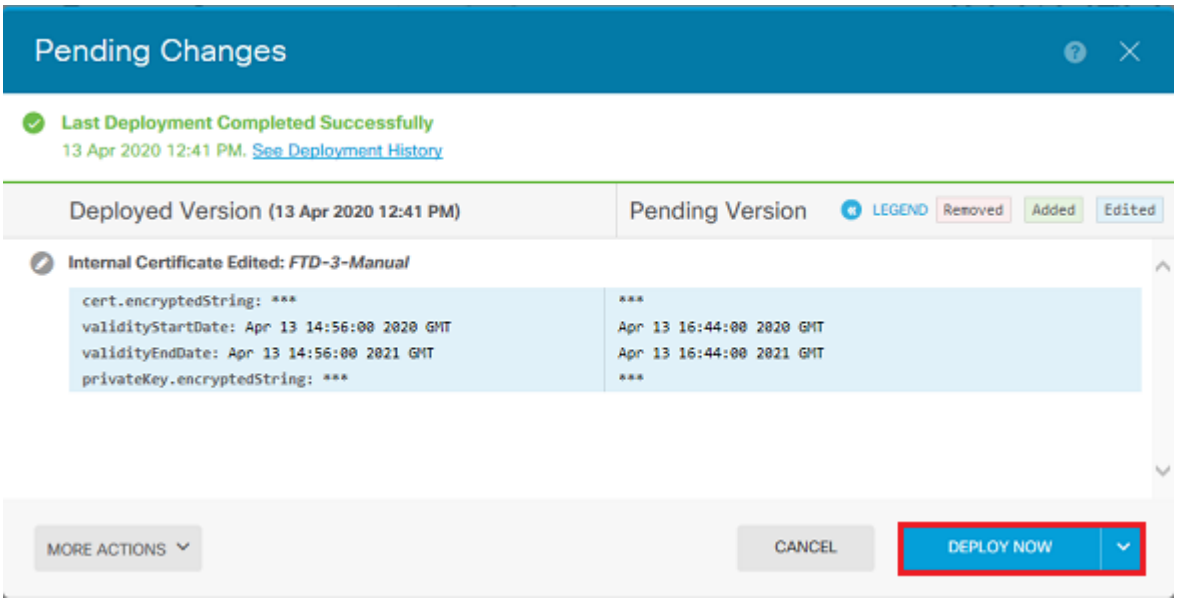
5.上传或复制并粘贴PEM格式的身份证书和私钥。如图所示，完成后单击OK。



6.单击屏幕右上角的Pending Changes按钮（如图所示）。



7.单击Deploy Now按钮，如图所示。



常见OpenSSL操作

从PKCS12文件提取身份证书和私钥

管理员可以接收需要导入到FTD的PKCS12文件。FDM当前不支持导入PKCS12文件。要导入PKCS12文件中包含的证书和私钥，必须使用OpenSSL之类的工具从PKCS12中提取各个文件。您需要用于加密PKCS12的密码。

pkcs12file.pfx是需要解包的PKCS12文件。

```
openssl pkcs12 -info -in pkcs12file.pfx
Enter Import Password: [PKCS12-passcode]
MAC Iteration 1
MAC verified OK
PKCS7 Encrypted data: pbeWithSHA1And40BitRC2-CBC, Iteration 2048
Certificate bag
Bag Attributes
    localKeyID: 28 20 C1 B4 08 1E 65 2E 4D 1D F9 F3 25 07 62 F7 D9 96 A7 F4
    friendlyName: ftd3.example.com
subject=/O=Cisco Systems/OU=TAC/CN=ftd3.example.com
issuer=/O=Cisco Systems TAC/CN=VPN Root CA
-----BEGIN CERTIFICATE-----
MIIErTCCApWgAwIBAgIIa5PmhHEIRQUwDQYJKoZIhvcNAQELBQAwMjEaMBgGA1UE
ChMRQ2lzY28gU3lzdGVtcyBUQUMxFDASBgNVBAMTC1ZQTiBSb290IENBMB4XDTIw
MDQxMzE2NDQwMFoXDTIxMDQxMzE2NDQwMFowQTEWMBQGA1UEChMNQ2lzY28gU3lz
dGVtczEMMAoGA1UECxMDVEFDMRkwFwYDVQQDExBmdGQzLmV4YW1wbGUuY29tMIIB
IjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEAnGpzMjuf+HtRG5ZYf80V6V1s
SyF7XhRxjRl8OwUih5wBz6qNntQkd0JPog+CFqEXswTpeI7ibPMtaTEVUEzcBpGb
myNz+A6jgNqAkTvaFMZV/RrWqCNkt08ULEbIX+f67TMMBhtfZ2dpapEP2wQ2DVqN
Bqotoz3/8CrZOIcpzVqL6hOziJFBgdiWJEYBoFuE1jmmsjI3qd39ib9+t6LhkS5O
QpQDTgvIiD1bYpPiWKpSOg1PZDnX8b740s0pVKVXTsujQqSqH1va9BB6hK1JCoZa
HrP9YOxO9+MpVMH33R9vRl3SOEF6kpZ6VEdGI4s6/IRvaM1zlBcK1ON/N2+mjwID
```

```
AQABo4G3MIG0MAkGA1UdEwQCMAAwHQYDVR0OBBYEFMcvjL0XiSTzNADJ/ptNb/cd
zB8wMB8GA1UdIwQYMBaAFHekzDnhi4O727mjLXuwCRVFgyguMAsGA1UdDwQEAwIF
oDAdBgNVHSUEFjAUBggrBgEFBQcDAQYIKwYBBQUHAwIwGwYDVR0RBBQwEoIQZnRk
My5leGFtcGxlLmNvbTAeBglghkgBhvhCAQ0EERYPeGNhIGNlcnRpZmljYXRlMA0G
CSqGSIb3DQEBCwUAA4ICAQCjjrMjruGH5fpcFND8qfuVU0hkszCwq2O1oMqMrvXn
gENKcXxxT27z6AHnQXeX3vhDcY3zs+FzFSoP5tRRPmy/413HAN+QEP2L9MQVD9PH
f5OrQ/Ke5c16hMOJO8daR7wNzvFkcbicKCLRH0EvEoIOSPKsLyGSSxGmh6QXfZcM
GX3jG9Krglugp2UEqOug9HPTpgsbuNcHw8xXgFp6IAlOLrytwrLeMIh5V+Vh5pll
yTl9wo5VADoYKgN4O8D21TeJIj6KB7YnYFB5wMgPGR5h5wx1qNq/MFixwfMXM4Tl
Rk3EOdSTENqzq2ZwnqJ4HCoqar7ASlQ5Zub5NY4+QfEpt8UHfYszp/e1BA+TviUC
DXGBUlbadlnEfi5Jl8G+/vZl6ykcmXe9hokKYxY8cg/U7170n/FbAmdYwRYgMAE4
RWfBp0voNzn97cG+qzogo7j/0kTfYu3O9DzdU3uy+R8JJkBrerktrZR7w7OfP61O
IAs86N5Zb18U14Gfc9m0eXHbN+/OB31JNhvWeyZfAbtgU1qstzvb2bc2GBoJJ1XC
YRQ1ft1FxHpn4zMkjI2Px0yam/bROn0FoMCesHvvtcgcGjFJgZduZyBJ9u1EZ2H5
uwNEJFOiV0GV+UBRigpjXEaUfJj4yMwaMYerZcZQVJfZ75+8SS5rfGfpMwTiT47I
ng==
-----END CERTIFICATE-----
Certificate bag
Bag Attributes: <No Attributes>
subject=/O=Cisco Systems TAC/CN=VPN Root CA
issuer=/O=Cisco Systems TAC/CN=VPN Root CA
-----BEGIN CERTIFICATE-----
MIIFQzCCAyugAwIBAgIIQgRS/woJDigwDQYJKoZIhvcNAQELBQAwMjEaMBgGA1UE
ChMRQ2lzY28gU3lzdGVtcyBUQUMxFDASBgNVBAMTC1ZQTiBSb290IENBMB4XDTIw
MDQwNTIzMTYwMFoXDTMwMDQwNTIzMTYwMFowMjEaMBgGA1UEChMRQ2lzY28gU3lz
dGVtcyBUQUMxFDASBgNVBAMTC1ZQTiBSb290IENBMIICIjANBgkqhkiG9w0BAQEF
AAOCAg8AMIICCgKCAgEAxhTBKiB1xzLg2Jr48h/2u84RcWahOTmPYCNGYZg0PvSf
JOpKvAu5tz4z625Yx1nBtjSsEgzF+qETpSplEhjW2NxIclxuNirfrmSJQfIw51yT
PaFv7u+VhgyYbYsSxGAB/m6RWWpiNbg8SDoUACU7R/bvp1Rb8W6tXk/rsTljc7L2
c/G5MeDLNmc/i/M1zuMjhj0tCphsJPhvNII7lcNj6K0pvg2yB/Md7PXOZnLaz9pf
GgpjpH0zzKhdIMW/KII64IRpo8KVhpE5X2sFohjzot4u8/t2oP846z/CXmlHQcgp
g5BgZMGqro0l5rcq0PjtK9Tqg7q013Vf0kMlsofMp+Bu1CiFDpawF/j8uSPuswEs
rzvJ+8GbOY1WEHtohgNGjPO0q8wnKQu0C47Ft1UMpdSwUsMMze0X43dyp/WoZtLW
4v/Pn/NibE3aoPOaMhIo4CdwSBHZOgVag4INqVsuFX1uPKD25WhrlO9LQ93P/sN3
FhoAh98HKOcuQ64Ua3AaShdzornD+G2J2pd1Nf1DahlzlskIMtlURSWdLjsHLKft
JqSOoLIs2stU8HutUZ4h6Lv2+da554zVjpRTQiYh/lyNexDsd1m6PH7mQj+iL8/9
c2qDhuich3cxl1jIN0LdB+/jQqkfzmx9ziB1PXnIshNRbflLLrNfdDO9agqQsvsC
AwEAAaNdMFswDAYDVR0TBAUwAwEB/zAdBgNVHQ4EFgQUd6TMOeGLg7vbuaMte7AJ
FUWDKC4wHwYDVR0jBBgwFoAUd6TMOeGLg7vbuaMte7AJFUWDKC4wCwYDVR0PBAQD
AgEGMA0GCSqGSIb3DQEBCwUAA4ICAQC6B+Y3obatEZqv0RQz1MS6oOumCgNWGi8d
kcRDxkY2F+zw3pBFa54Sin1OfRPJvZvLNJV5OdXmvH5luh6KJDMVrLMWNiSgI7Tn
OipqKraokS2Oo0STwQ7Q9Wk1xCrwxMfTuDJFMe8OqabFAU557O5PDXPtFEutn0xz
Ou8VMLBRy+gDc+0WARsjFj+0gUOc2Wj3gQ81GlyoPYgufWRnztN5rQxWzFLSsCNN
jnIesjQv0vF3nY7SH5QasPN25AydsGE0DFgp7rZLN2BH7G9rhi5hEn3Bv9ALZCQ6
p7O2FZly5lxuzuA/wPnR89HiIkSF13OMTpnOIl3d6dO7s3bwyNja8JikYTCflle5
2CSsz4Cn/BlwfWyAcLN3HxUjG4Ev2818fWWpkYmuxujpKDFFzF0skpKAK53tNKPf
pn4+w5FyLo18o0AydtPoKjYkDqbvG/SRPbt92mdTIF7E6J+o8J6OV3YL+IyrZ+u0
MYqPd45Oi4cgHdMFICAndN3PYScrrGYHawfVxp+R+G4dTJWdMvthh3ftSOmkiKJ8
m1NH7WYST1kYcTbcokZiOIcZa+VVv5UOLIt/hDOVG7xqZ0lpMQKkYUBzg5LbGINm
8ypfhQ1faI5fQRxpxTIsmDv9rQzxBjuCyKn+23FkkUhFJtOD989UUypO8H9vDoJr
yzm9JOpMrg==
-----END CERTIFICATE-----
PKCS7 Data
Shrouded Keybag: pbeWithSHA1And3-KeyTripleDES-CBC, Iteration 2048
Bag Attributes
    localKeyID: 28 20 C1 B4 08 1E 65 2E 4D 1D F9 F3 25 07 62 F7 D9 96 A7 F4
    friendlyName: ftd3.example.com
Key Attributes: <No Attributes>
Enter PEM pass phrase: [private-key-passcode]
Verifying - Enter PEM pass phrase: [private-key-passcode]
-----BEGIN ENCRYPTED PRIVATE KEY-----
MIIFDjBABgkqhkiG9w0BBQ0wMzAbBgkqhkiG9w0BBQwwDgQISCA8TOogup4CAggA
```

```
MBQGCCqGSIb3DQMHBAgKqoTuZzoXsASCBMgOTEb24ENJl4/qh3GpsE2C2OCnJeid
ptDDIFdyOV4A+su3OJWzlnHrCuIhjR8+/p/NOWlA73x47R4T6+u4w4/ctHkvEbQj
gZJZzFWTed9HqidhcKxxOoM/w6/uDv/opc6/rlIZiaKp6FO9hOibqlGI9kjxkWQC
EQR8cM1U2yi0vagL8pOYdeujCrzBtorRp9BMJelCP1Mw9tOEbAC4mmuedzs+86r1
xadK7qHBuWUJcO3SLXLCmX5yLSGteWcoaPZnIKO9UhLxpUSJTkWLHr2VtE1ACMRc
RlPBXMLb7OnMtPTqctl58+Q/axtQCWUs8caHs3LvVfOnRG+War49/F8Ii8mqnNnb
M6ZTwTOZ1sn0f4ohVePrW/kkdlQavJbPa+0dzjZvs88ClEXAJ/XIegfSWifJAXqP
3d37VonXX7YRocJ4kzhkuE/SUDsu1sMC0hbM81uZcWiBbDAT2jjlKgfoxubtnuFq
un4EJD73K9RWeA+7IVmEceRTBMyfD+ZwZHOBuFls+wZEmzYqw+cuc+I8XEFVOMl8
P3ah28Nno0jXMk4MpfFJlYMCmMq66xj5gZtcVZxOGCOswOCKU0JiFFQTEmmVf9/C
65a96np7YCI8s6UnUWi5Zp/NrbN31HkP0wt7+1DFGFit1pTTGvOFchtLYWeB3Kj0
h/C/R7ciq6ZNCzwBrbztGV8jG1l5NSslwKbTGiiwCYw0N8c09TXQbO4rMomFDAv8
aef1aBsjMqEUkzOZK0U2ZgTxMline8pqNs/BhWBCYGSNmnWDJ7UmdkdqCpKIubp0
qtmFX/DtSu9J2yevfV+3/YCwnSRkr02oTGs1jJkEM2wzTaAeEQfShQMCHQPHtc4O
w94fQH/DJ/lKsmSVwBLQLEKRl/nIDz36kmA27+1nVtX42PbEaIaFgucU4xHKx3zN
mgSdbz7ikgiggNm+Dxq9GmYs+FuogaiiNdtvqNIHGq+LaQDwIPBBXmajXPhHVaq8
fNl7vEB+aret+PmqCiQYlHqe5TXcv6j7+VF4RTVpt5au9iX74sZ1qUROTuBHQhRK
3XpHfGXpe/OOGdW3LeifNLvrrQwyICoV9h7MNSpykbn/5wEpX671SqfZgrH6wNbP
VI9A+cSAAT1bWkuywx2uEo+9g1w/IFzdOcJ3aGCeAl84XuPRfQhHe/Aj7q6l6uqB
W3Kt+kMJ9j8AIyQD58SvfpC7bGb26jE/+Mm1Peh+HmyjIF/zv/FQPwPf+TRpcM8/
QCyhIRk3mx+8a1YLqK+hOMjWWBDEHX2mvbdKickK/jhwRdR/WmFOALq51phgtZlz
Zedl5UbPqWahJsjoO9N5pp7Uq5iV0/xq4Ml+/xQIYo2GIrqyat4AdB2B6K8K3xQd
Pip/Q2/ttdKLyEDP3U/6rsu74zo3b/iXe2MZWTTfzH5zgneUwLwnuBAbGT3oMSQ/
OKXnhcmUGu8XvLEfU/PITvGzKr06o12/hHJtzXQ8eNPDJbvcD/okRRKZpmjH+ijp
FPD/WgQ/vmO9HdCWW3flhqceqfHff8ClCJYFLxsgZp4M3G+WyQTky4J8+6uTn/mj
yyZ5JCZdlt42haSNqU/ynioCjh5XY4m8WMZsOJBNPjKZiUX/vqVcc+/nodl7VRZy
ELk=
-----END ENCRYPTED PRIVATE KEY-----
```

在本示例中，将创建三个单独的文件：

一个用于身份证书。您可以判断这是身份证书，因为subject=/O=Cisco Systems/OU=TAC/CN=ftd3.example.com。

```
subject=/O=Cisco Systems/OU=TAC/CN=ftd3.example.com
issuer=/O=Cisco Systems TAC/CN=VPN Root CA
-----BEGIN CERTIFICATE-----
MIIErTCCApWgAwIBAgIIa5PmhHEIRQUwDQYJKoZIhvcNAQELBQAwMjEaMBgGA1UE
ChMRQ2lzY28gU3lzdGVtcyBUQUMxFDASBgNVBAMTC1ZQTiBSb290IENBMB4XDTIw
MDQxMzE2NDQwMFoXDTIxMDQxMzE2NDQwMFowQTEWMBQGA1UEChMNQ2lzY28gU3lz
dGVtczEMMAoGA1UECxMDVEFDMRkwFwYDVQQDExBmdGQzLmV4YW1wbGUuY29tMIIB
IjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEAnGpzMjuf+HtRG5ZYf80V6V1s
SyF7XhRxjRl8OwUih5wBz6qNntQkd0JPog+CFqEXswTpeI7ibPMtaTEVUEzcBpGb
myNz+A6jgNqAkTvaFMZV/RrWqCNkt08ULEbIX+f67TMMBhtfZ2dpapEP2wQ2DVqN
Bqotoz3/8CrZOIcpzVqL6hOziJFBgdiWJEYBoFuE1jmmsjI3qd39ib9+t6LhkS50
QpQDTgvIiD1bYpPiWKpSOg1PZDnX8b740s0pVKVXTsujQqSqH1va9BB6hK1JCoZa
HrP9YOxO9+MpVMH33R9vRl3SOEF6kpZ6VEdGI4s6/IRvaM1zlBcK1ON/N2+mjwID
AQABo4G3MIG0MAkGA1UdEwQCMAAwHQYDVR0OBBYEFMcvjLOXiSTzNADJ/ptNb/cd
zB8wMB8GA1UdIwQYMBaAFHekzDnhi4O727mjLXuwCRVFgyguMAsGA1UdDwQEAwIF
oDAdBgNVHSUEFjAUBggrBgEFBQcDAQYIKwYBBQUHAwIwGwYDVR0RBBQwEoIQZnRk
My5leGFtcGxlLmNvbTAeBglghkgBhvhCAQ0EERYPeGNhIGNlcnRpZmljYXRlMA0G
CSqGSIb3DQEBCwUAA4ICAQCjjrMjruGH5fpcFND8qfuVU0hkszCwq2O1oMqMrvXn
gENKcXxxT27z6AHnQXeX3vhDcY3zs+FzFSoP5tRRPmy/413HAN+QEP2L9MQVD9PH
f5OrQ/Ke5c16hMOJO8daR7wNzvFkcbicKCLRH0EvEoIOSPKsLyGSSxGmh6QXfZcM
GX3jG9Krglugp2UEqOug9HPTpgsbuNcHw8xXgFp6IAlOLrytwrLeMIh5V+Vh5pll
yTl9wo5VADoYKgN4O8D21TeJIj6KB7YnYFB5wMgPGR5h5wx1qNq/MFixwfMXM4Tl
```

```
Rk3EOdSTENqzq2ZwnqJ4HCoqar7ASlQ5Zub5NY4+QfEpt8UHfYszp/e1BA+TviUC
DXGBUlbadlnEfi5Jl8G+/vZl6ykcmXe9hokKYxY8cg/U717On/FbAmdYwRYgMAE4
RWfBpOvoNzn97cG+qzogo7j/OkTfYu3O9DzdU3uy+R8JJkBrerktrZR7w7OfP61O
IAs86N5Zb18U14Gfc9mOeXHbN+/OB31JNhvWeyZfAbtgU1qstzvb2bc2GBoJJ1XC
YRQ1ft1FxHpn4zMkjI2PxOyam/bROnOFoMCesHvvtcgcGjFJgZduZyBJ9u1EZ2H5
uwNEJFOiVOGV+UBRigpjXEaUfJj4yMwaMYerZcZQVJfZ75+8SS5rfGfpMwTiT47I
ng==
-----END CERTIFICATE-----
```

一个用于颁发CA证书。由于subject=/O=Cisco Systems TAC/CN=VPN根CA，您可以判断这是CA证书。这与之前看到的身份证书中的颁发者值相同：

```
subject=/O=Cisco Systems TAC/CN=VPN Root CA
issuer=/O=Cisco Systems TAC/CN=VPN Root CA
-----BEGIN CERTIFICATE-----
MIIFQzCCAyugAwIBAgIIQgRS/woJDigwDQYJKoZIhvcNAQELBQAwMjEaMBgGA1UE
ChMRQ2lzY28gU3lzdGVtcyBUQUMxFDASBgNVBAMTC1ZQTiBSb290IENBMB4XDTIw
MDQwNTIzMTYwMFoXDTMwMDQwNTIzMTYwMFowMjEaMBgGA1UEChMRQ2lzY28gU3lz
dGVtcyBUQUMxFDASBgNVBAMTC1ZQTiBSb290IENBMIICIjANBgkqhkiG9w0BAQEF
AAOCAg8AMIICCgKCAgEAxhTBKiB1xzLg2Jr48h/2u84RcWahOTmPYCNGYZg0PvSf
JOpKvAu5tz4z625Yx1nBtjSsEgzF+qETpSplEhjW2NxIclxuNirfrmSJQfIw51yT
PaFv7u+VhgyYbYsSxGAB/m6RWWpiNbg8SDoUACU7R/bvp1Rb8W6tXk/rsTljc7L2
c/G5MeDLNmc/i/M1zuMjhj0tCphsJPhvNII7lcNj6K0pvg2yB/Md7PXOZnLaz9pf
GgpjpH0zzKhdIMW/KII64IRpo8KVhpE5X2sFohjzot4u8/t2oP846z/CXmlHQcgp
g5BgZMGqro0l5rcq0PjtK9Tqg7q013Vf0kMlsofMp+Bu1CiFDpawF/j8uSPuswEs
rzvJ+8GbOY1WEHtohgNGjPO0q8wnKQu0C47Ft1UMpdSwUsMMze0X43dyp/WoZtLW
4v/Pn/NibE3aoPOaMhIo4CdwSBHZOgVag4INqVsuFX1uPKD25WhrlO9LQ93P/sN3
FhoAh98HKOcuQ64Ua3AaShdzornD+G2J2pd1Nf1DahlzlskIMtlURSWdLjsHLKft
JqSOoLIs2stU8HutUZ4h6Lv2+da554zVjpRTQiYh/lyNexDsd1m6PH7mQj+iL8/9
c2qDhuich3cxl1jIN0LdB+/jQqkfzmx9ziB1PXnIshNRbflLLrNfdDO9agqQsvsC
AwEAAaNdMFswDAYDVR0TBAUwAwEB/zAdBgNVHQ4EFgQUd6TMOeGLg7vbuaMte7AJ
FUWDKC4wHwYDVR0jBBgwFoAUd6TMOeGLg7vbuaMte7AJFUWDKC4wCwYDVR0PBAQD
AgEGMA0GCSqGSIb3DQEBCwUAA4ICAQC6B+Y3obatEZqv0RQz1MS6oOumCgNWGi8d
kcRDxkY2F+zw3pBFa54Sin1OfRPJvZvLNJV5OdXmvH5luh6KJDMVrLMWNiSgI7Tn
OipqKraokS2Oo0STwQ7Q9Wk1xCrwxMfTuDJFMe8OqabFAU557O5PDXPtFEutn0xz
Ou8VMLBRy+gDc+0WARsjFj+0gUOc2Wj3gQ81GlyoPYgufWRnztN5rQxWzFLSsCNN
jnIesjQv0vF3nY7SH5QasPN25AydsGE0DFgp7rZLN2BH7G9rhi5hEn3Bv9ALZCQ6
p7O2FZly5lxuzuA/wPnR89HiIkSF13OMTpnOIl3d6dO7s3bwyNja8JikYTCflle5
2CSsz4Cn/BlwfWyAcLN3HxUjG4Ev2818fWWpkYmuxujpKDFFzFOskpKAK53tNKPf
pn4+w5FyLo18oOAydtPoKjYkDqbvG/SRPbt92mdTIF7E6J+o8J6OV3YL+IyrZ+u0
MYqPd45Oi4cgHdMFICAndN3PYScrrGYHawfVxp+R+G4dTJWdMvthh3ftSOmkiKJ8
m1NH7WYST1kYcTbcokZiOIcZa+VVv5UOLIt/hDOVG7xqZOlpMQKkYUBzg5LbGINm
8ypfhQ1faI5fQRxpxTIsmDv9rQzxBjuCyKn+23FkkUhFJtOD989UUypO8H9vDoJr
yzm9JOpMrg==
-----END CERTIFICATE-----
```

一个用于私钥：

```
-----BEGIN ENCRYPTED PRIVATE KEY-----
MIIFDjBABgkqhkiG9w0BBQ0wMzAbBgkqhkiG9w0BBQwwDgQIScA8TOogup4CAggA
MBQGCCqGSIb3DQMHBAgKqoTuZzoXsASCBMgOTEb24ENJl4/qh3GpsE2C2OCnJeid
ptDDIFdyOV4A+su3OJWzlnHrCuIhjR8+/p/NOWlA73x47R4T6+u4w4/ctHkvEbQj
gZJZzFWTed9HqidhcKxxOoM/w6/uDv/opc6/rlIZiaKp6FO9hOibqlGI9kjxkWQC
```

```
EQR8cM1U2yi0vagL8pOYdeujCrzBtorRp9BMJelCP1Mw9t0EbAC4mmuedzs+86r1
xadK7qHBuWUJcO3SLXLCmX5yLSGteWcoaPZnIKO9UhLxpUSJTkWLHr2VtE1ACMRc
RlPBXMLb70nMtPTqctl58+Q/axtQCWUs8caHs3LvVf0nRG+War49/F8Ii8mqnNnb
M6ZTwTOZ1sn0f4ohVePrW/kkdlQavJbPa+0dzjZvs88ClEXAJ/XIegfSWifJAXqP
3d37VonXX7YRocJ4kzhkuE/SUDsu1sMC0hbM81uZcWiBbDAT2jjlKgfoxubtnuFq
un4EJD73K9RWeA+7IVmEceRTBMyfD+ZwZHOBuFls+wZEmzYqw+cuc+I8XEFVOMl8
P3ah28NnoOjXMk4MpfFJlYMCmMq66xj5gZtcVZxOGCOswOCKU0JiFFQTEmmVf9/C
65a96np7YCI8s6UnUWi5Zp/NrbN31HkPOwt7+1DFGFit1pTTGvOFchtLYWeB3Kj0
h/C/R7ciq6ZNCzwBrbztGV8jG1l5NSslwKbTGiiwCYwON8cO9TXQbO4rMomFDAv8
aef1aBsjMqEUkzOZKOU2ZgTxMline8pqNs/BhWBCYGSNmnWDJ7UmdkdqCpKIubp0
qtmFX/DtSu9J2yevfV+3/YCwnSRkr02oTGs1jJkEM2wzTaAeEQfShQMCHQPHtc4O
w94fQH/DJ/lKsmSVwBLQLEKRl/nIDz36kmA27+1nVtX42PbEaIaFgucU4xHKx3zN
mgSdbz7ikgiggNm+Dxq9GmYs+FuogaiiNdtvqNIHGq+LaQDwIPBBXmajXPhHVaq8
fNl7vEB+aret+PmqCiQYlHqe5TXcv6j7+VF4RTVpt5au9iX74sZ1qUROTuBHQhRK
3XpHfGXpe/OOGdW3LeifNLvrrQwyICoV9h7MNSpykbn/5wEpX671SqfZgrH6wNbP
VI9A+cSAAT1bWkuywx2uEo+9g1w/IFzdOcJ3aGCeAl84XuPRfQhHe/Aj7q6l6uqB
W3Kt+kMJ9j8AIyQD58SvfpC7bGb26jE/+Mm1Peh+HmyjIF/zv/FQPwPf+TRpcM8/
QCyhIRk3mx+8a1YLqK+hOMjWWBDEHX2mvbdKickK/jhwRdR/WmFOALq51phgtZlz
Zedl5UbPqWahJsjoO9N5pp7Uq5iVO/xq4Ml+/xQIYo2GIrqyat4AdB2B6K8K3xQd
Pip/Q2/ttdKLyEDP3U/6rsu74zo3b/iXe2MZWTTfzH5zgneUwLwnuBAbGT3oMSQ/
OKXnhcmUGu8XvLEfU/PITvGzKrO6o12/hHJtzXQ8eNPDJbvcD/okRRKZpmjH+ijp
FPD/WgQ/vmO9HdCWW3flhqceqfHff8ClCJYFLxsgZp4M3G+WyQTky4J8+6uTn/mj
yyZ5JCZdlt42haSNqU/ynioCjh5XY4m8WMZsOJBNPjKZiUX/vqVcc+/nodl7VRZy
ELk=
-----END ENCRYPTED PRIVATE KEY-----
```

注意：私钥已加密，FDM不接受加密的私钥。

要解除对私钥的加密，请将加密的私钥复制到文件中，然后运行以下openssl命令：

```
openssl rsa -in encrypted.key -out unencrypted.key
Enter pass phrase for encrypted.key: [private-key passphrase]
writing RSA key
```

- encrypted.key是保存加密私钥的文件的名称。
- unencrypted.key是包含未加密密钥的文件的名称。

未加密的私钥现在显示-----BEGIN RSA PRIVATE KEY-----而不是-----BEGIN ENCRYPTED PRIVATE KEY-----，如以下示例所示：

```
-----BEGIN RSA PRIVATE KEY-----
MIIEpAIBAAKCAQEAnGpzMjuf+HtRG5ZYf8OV6V1sSyF7XhRxjRl8OwUih5wBz6qN
ntQkdOJPog+CFqEXswTpeI7ibPMtaTEVUEzcBpGbmyNz+A6jgNqAkTvaFMZV/RrW
qCNktO8ULEbIX+f67TMMBhtfZ2dpapEP2wQ2DVqNBqotoz3/8CrZOIcpzVqL6hOz
iJFBgdiWJEYBoFuE1jmmsjI3qd39ib9+t6LhkS5OQpQDTgvIiD1bYpPiWKpSOg1P
ZDnX8b74OsOpVKVXTsujQqSqH1va9BB6hK1JCoZaHrP9YOxO9+MpVMH33R9vRl3S
OEF6kpZ6VEdGI4s6/IRvaM1zlBcK1ON/N2+mjwIDAQABAoIBAEQzCd1KMBrosdmk
eRvoMPiaemBbze2cXlJWXZ2orICSXhvMOokBGJFDQXN47ZCuVqYAqOecjU9RzGgE
```

NbXYfUsD6+P91k+/Gj1RiCNLBHBwdgewzw1quTxP54zSpAVlIXyQ+FolTzjH1yfW
7iHhuSujYsAYLWPy4Yg3NpU2IdzeQoK5ViuSTTNx8LHYBKw1Qf7HVaQTfmsWOAyg
/vjZqjRkukqKM41srgkO/HjPnEBDuUWVTehzMCk1etijENc7ttISzYIEMNPthe60
NpidXAHoJ1lJM6HB9ZraBH5fu7MZJZOOn6YVKQuCdWOWfnKiNQCDsXq7X5EWsaj3
cgyjWlkCgYEAy33k1wxp7WEqg1zEwqOVq7AtoL6i4V9QCenMThQAHwNAAUGGOSIF
JhpKyApm/BUogSIOMzIPse+NgAA66TRn4qfkbpvTI98CeCUxiUPcbRmqZnYxCOfp
Pzosv5OnBLltoIOprIO2S5a261w6JGNAfD95tCjCYYrB8Cw/HbZOLPUCgYEAxMbZ
KVyosBxaAIFQinHaff3fVSTsEOZFpLCBbLybgLcP8LsLdahBsj6HK/hAffKXOdvM
35CAM7ZL/WCI1Jb+dx4YcD9q8lbVMu4HTvSl2deTZoZrBG2iFX6OSsn2rLKAH+cH
uLSHCNAj9cj9syldZErGLZtBQpJPtpLRd6iyOvMCgYBP/zoLYJHOBBLWeY3QioLO
cABABTG7L+EjRIpQ14QErR5oX/4IT9t+Uy+63HwH9blqqpyye6e359jUzUJbk4KT
lDU1VoT2wSETYmvK7qalLUXT6fr12FtVw+T7m2w5azwxshDuBQmRRbq7ZBJnY61i
KwIJVUy1U/tSE9LsN1McUQKBgQClc4ykeoRbj3sdcZ2GyrQru4pMzP6wNu3Xy5EH
HI6ja0i74ImCJDcY5/o/vjx7qb39qBJa5+TjliPOp5xlI5BSF7vOpV4G5XvdlsYO
XSYWRGxriBnzXzspV3/M4oPGMVAJgve7Fg90GY4i2xx1yBH+geCf+CqnDt53ZHs7
YVz6gQKBgQDG42tZZ1kNAnOx/k1lUlZrEeF8iqdsyVcRf4fAvqsPbY3+kdae+8Or
+cQpVoeWzOQLUkA6eMsiTLmcWYb62qMgdpluyKoOciPG9+2AGNTvQp/ig34pF2F/
9OGuVYlA1p7mkP8Vb1Mo1ugVOzUqAIjHKiGUzBWVsxOZsGa+SY47uw==
-----END RSA PRIVATE KEY-----

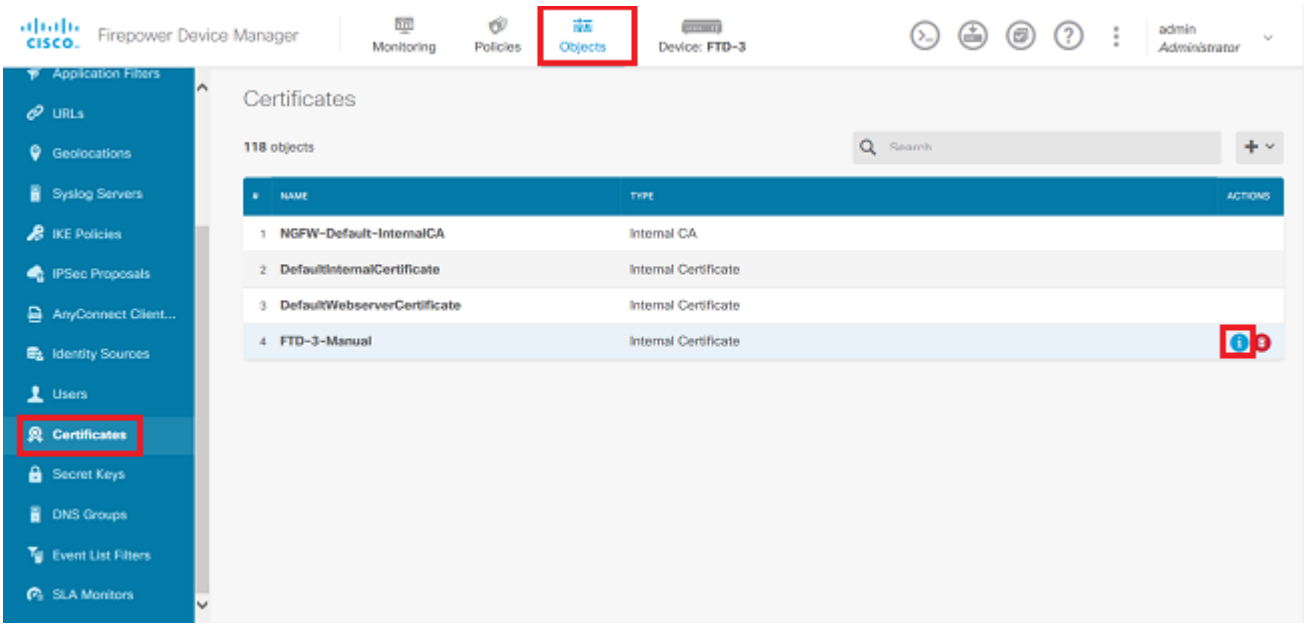
一旦私钥解密，可以上传身份和私钥文件，或者复制身份和私钥文件并将其粘贴到FDM中（使用前面提到的“手动注册”部分中的步骤3）。可以使用前面提到的受信任CA证书安装步骤安装颁发CA。

验证

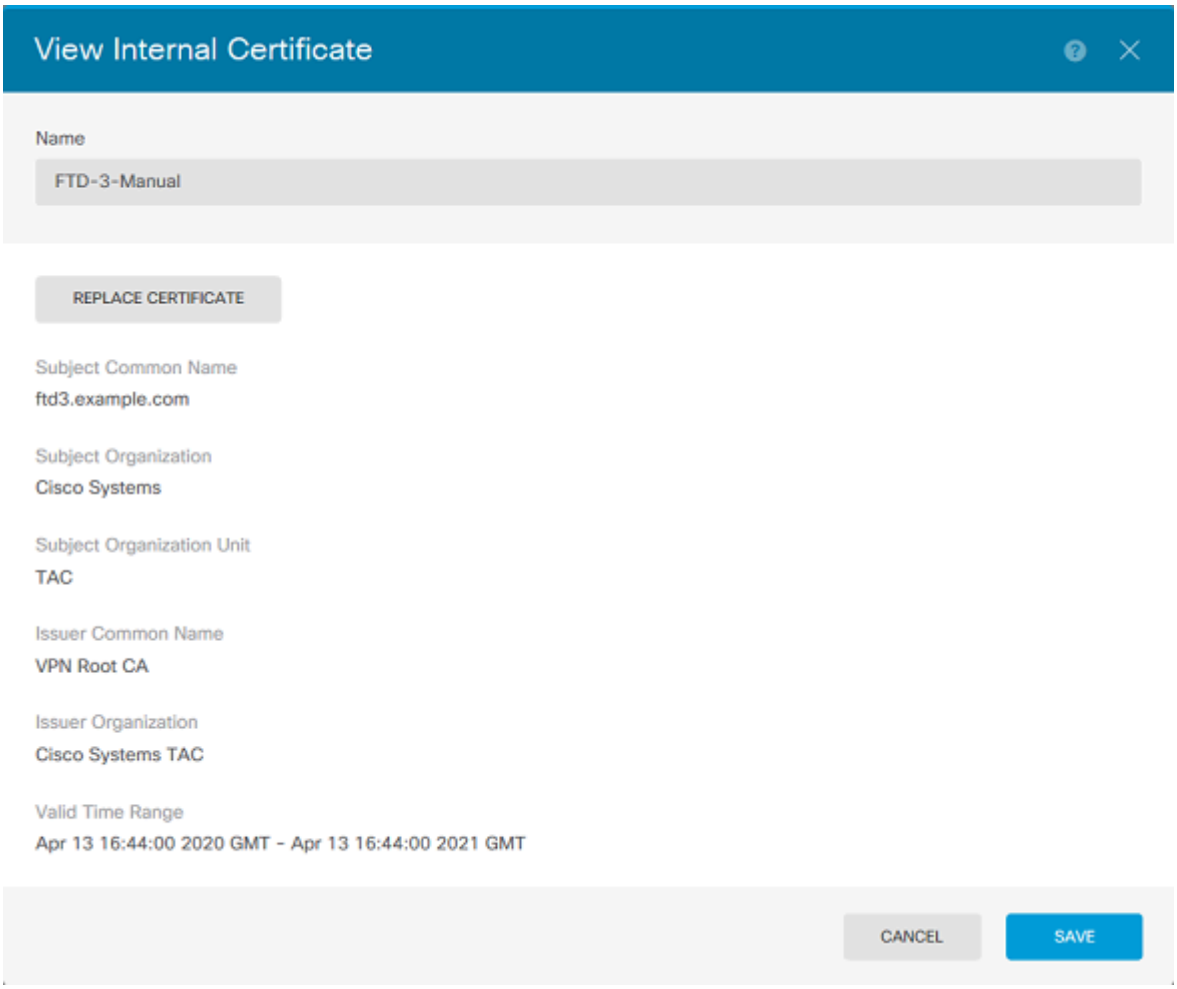
使用本部分可确认配置能否正常运行。

查看FDM中安装的证书

1.定位至对象>证书。将鼠标悬停在要验证的证书上，然后点击view按钮，如图所示。



2.弹出窗口提供有关证书的其他详细信息，如图所示。



在CLI中查看已安装的证书

您可以使用FDM中的CLI控制台或SSH进入FTD，然后运行命令show crypto ca certificates以验证证书是否已应用到设备，如图所示。



示例输出：

```
> show crypto ca certificates

Certificate
  Status: Available
  Certificate Serial Number: 6b93e68471084505
  Certificate Usage: General Purpose
  Public Key Type: RSA (2048 bits)
  Signature Algorithm: SHA256 with RSA Encryption
  Issuer Name:
```

```
    cn=VPN Root CA
    o=Cisco Systems TAC
  Subject Name:
    cn=ftd3.example.com
    ou=TAC
    o=Cisco Systems
  Validity Date:
    start date: 16:44:00 UTC Apr 13 2020
    end   date: 16:44:00 UTC Apr 13 2021
  Storage: config
  Associated Trustpoints: FTD-3-Manual
```



注意：身份证书仅与AnyConnect等服务一起使用时在CLI中显示。受信任的CA证书在部署后即会出现。

故障排除

本部分提供的信息可用于对配置进行故障排除。

调试命令

如果出现SSL证书安装故障，在通过SSH连接FTD后，可以从诊断CLI运行调试：debug crypto ca 14

在FTD的早期版本中，以下调试可用且建议用于故障排除：

debug crypto ca 255

debug crypto ca message 255

debug crypto ca transaction 255

常见问题

导入ASA导出的PKCS12

当您尝试从OpenSSL中导出的ASA PKCS12中提取身份证书和私钥时，可能会收到类似以下内容的错误：

```
openssl pkcs12 -info -in asaexportedpkcs12.p12
6870300:error:0D0680A8:asn1 encoding routines:ASN1_CHECK_TLEN:wrong tag:tasn_dec.c:1220:
6870300:error:0D07803A:asn1 encoding routines:ASN1_ITEM_EX_D2I:nested asn1 error:tasn_dec.c:386:Type=PK
```

要解决此问题，必须先将pkcs12文件转换为DER格式：

```
openssl enc -base64 -d -in asaexportedpkcs12.p12 -out converted.pfx
```

完成后，可按照本文档前面的Extracting Identity certificate and private key from PKCS12 file部分中的步骤导入身份证书和私钥。

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