

# Troubleshoot of Threat Grid Appliance Integration with FMC

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## Introduction

This document describes in detail Threat Grid Appliance (TGA) integration with Firepower Management Center (FMC).

## Prerequisites

## Requirements

Cisco recommends that you have knowledge of these topics:

- Firepower Management FMC
- Threat Grid Appliance Basic Configuration
- Create Certificates of Authority (CA)
- Linux/Unix

## Components Used

The information in this document is based on these software and hardware versions:

- FMC version 6.6.1
- Threat Grid 2.12.2
- CentOS 8

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

### Problem

In this used case scenario, you can see 2 issues and two error codes.

## Scenario 1

The integration fails with errors:

```
Sandbox registration failed: Peer certificate cannot be authenticated with given CA certificates (code = 60)
```

When it comes to this problem, the issue is related to the certificate that is not uploaded into FMC as a complete chain. Since the CA-signed certificate was used, the entire certificate chain combined into one single PEM file needs to be used. In another word you start with **Root CA > Intermediate Cert** (if applicable) **> Clean Int**. Please refer to [this article](#) from the official guide that describes the requirements and procedure.

If there is a multi-level signing chain of CAs, all required intermediate certificates, and the root certificate must be contained in a single file that is uploaded to the FMC.

All certificates must be PEM-encoded.

The file's newlines must be UNIX, not DOS.

If the Threat Grid appliance presents a self-signed certificate, upload the certificate you downloaded from that appliance.

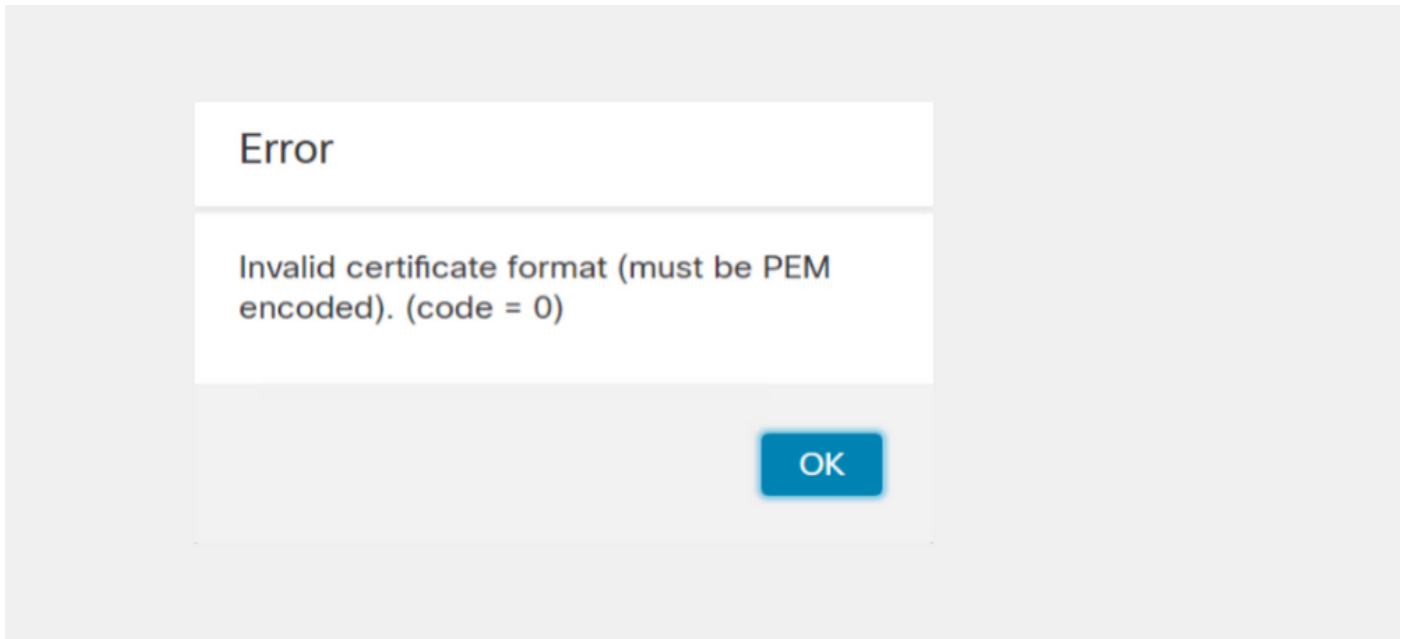
If the Threat Grid appliance presents a CA-signed certificate, upload the file that contains the certificate signing chain.

## Scenario 2

Invalid Certificate format error

```
Invalid Certificate format (must be PEM encoded) (code=0)
```

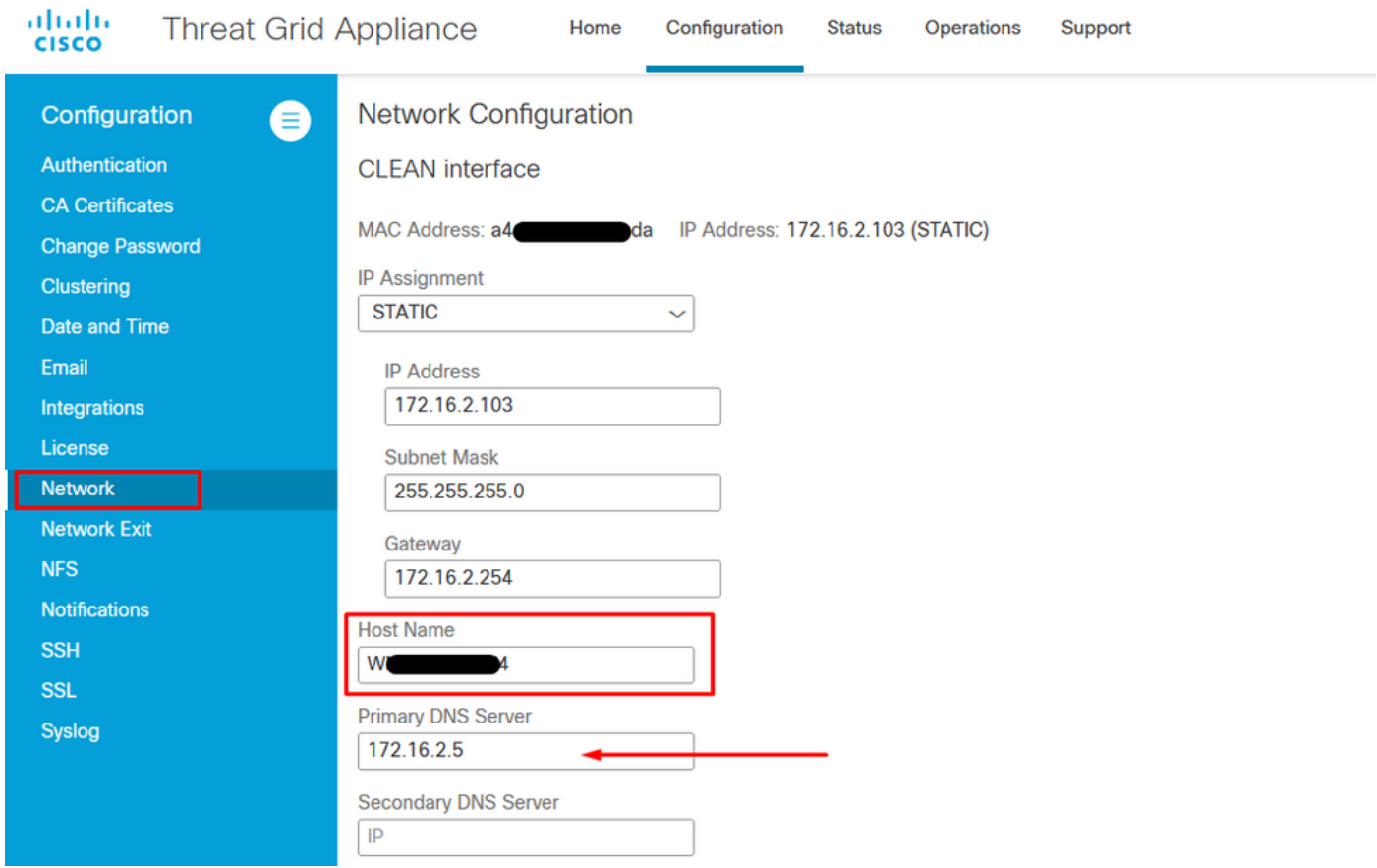
Certificate format error, as shown in the image.



This error is due to the wrong formatting of the combined PEM certificate created on the Windows machine that uses OpenSSL. It is highly recommended to use a Linux machine to create this certificate.

**Integration**

Step 1. Configure the TGA, as shown in the images.



ADMIN interface

MAC Address: 40: [REDACTED] 80 IP Address: 10 [REDACTED] 8.30 (STATIC)

IP Assignment

STATIC

IP Address

10 [REDACTED] 30

Subnet Mask

255.255.255.192

Gateway

10 [REDACTED] 1

Host Name

TG-M5

Save

Activate

Host (A)

Security

Host (uses parent domain if left blank):

W [REDACTED] M4

Fully qualified domain name (FQDN):

W [REDACTED] .com

IP address:

172.16.2.103

Update associated pointer (PTR) record

Host (A) Security

Host (uses parent domain if left blank):  
TG-M5

Fully qualified domain name (FQDN):  
TC[REDACTED].com

IP address:  
10[REDACTED].18.30

Update associated pointer (PTR) record

## Internal CA-signed Certificates for Clean Admin interface

Step 1. Generate the private key which is used for both admin and clean interface.

```
openssl ecparam -name secp521r1 -genkey -out private-ec-key.pem
```

Step 2. Generate CSR.

### Clean interface

Step 1. Navigate to the CSR creation and use the private key generated.

```
openssl req -new -key private-ec-key.pem -out MYCSR.csr
```

**Note:** The CN name must be entered for CSR and must match the hostname of the Clean interface defined under 'Network'. A DNS entry must be present on the DNS server which resolves the Clean interface hostname.

## Configuration

[Authentication](#)[CA Certificates](#)[Change Password](#)[Clustering](#)[Date and Time](#)[Email](#)[Integrations](#)[License](#)[Network](#)[Network Exit](#)[NFS](#)[Notifications](#)[SSH](#)[SSL](#)[Syslog](#)

## Network Configuration

## CLEAN interface

MAC Address: a4[REDACTED]da IP Address: 172.16.2.103 (STATIC)

IP Assignment

STATIC

IP Address

172.16.2.103

Subnet Mask

255.255.255.0

Gateway

172.16.2.254

Host Name

W[REDACTED]4

Primary DNS Server

172.16.2.5

Secondary DNS Server

IP

## Admin Interface

Step1. Navigate to the CSR creation and use the private key generated.

```
openssl req -new -key private-ec-key.pem -out MYCSR.csr
```

**Note:** The CN name must be entered for CSR and must match the 'hostname' of the 'admin interface' defined under 'Network'. A DNS entry must be present on the DNS server which resolves the clean interface hostname.

## ADMIN interface

MAC Address: 40[REDACTED]80 IP Address: 10[REDACTED]8.30 (STATIC)

IP Assignment

STATIC

IP Address

10[REDACTED]30

Subnet Mask

255.255.255.192

Gateway

10[REDACTED].1

Host Name

TG-M5

[Save](#)[Activate](#)

Step 2. CSR is to be signed by CA. Download the certificate in DER format with the CER extension.

Step 3. Convert CER to PEM.

```
openssl x509 -inform DER -outform PEM -in xxxx.cer -out yyyy.pem
```

### Clean interface CSR and CER to PEM

```
C:\Users\Administrator\Downloads\TG\FMC>openssl req -new -key step7-1-private-ec-key.pem -out clean-csr.csr
You are about to be asked to enter information that will be 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 will be a default value,
If you enter '.', the field will be 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]:PPJ
Organizational Unit Name (eg, section) []:IT
Common Name (e.g. server FQDN or YOUR name) []:WMP[REDACTED].com
Email Address []:

Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:Cisco@123
An optional company name []:PPJ

C:\Users\Administrator\Downloads\TG\FMC>openssl x509 -inform DER -outform PEM -in Clean-interface_CSR_CA-signed_DER_CER.cer -out Clean-interface_CSR_CA-signed_DER_PEM.pem
```

### Admin interface CSR and CER to PEM

```
C:\Users\Administrator\Downloads\TG\FMC>openssl req -new -key step7-1-private-ec-key.pem -out Admin-interface_CSR.csr
You are about to be asked to enter information that will be 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 will be a default value,
If you enter '.', the field will be 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]:PPJ
Organizational Unit Name (eg, section) []:IT
Common Name (e.g. server FQDN or YOUR name) []:TG-[REDACTED].com
Email Address []:

Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:Cisco@123
An optional company name []:PPJ

C:\Users\Administrator\Downloads\TG\FMC>openssl x509 -inform DER -outform PEM -in Admin-interface_CSR_CA-signed_DER_CER.cer -out Admin-interface_CSR_CA-signed_DER_PEM.pem
```

### Proper format of the Certificate for FMC

If you already got provided with certificates and they are in CER/CRT format and readable when a text editor is used, you can just simply change the extension to PEM.

If the certificate is not readable you need to convert the DER format to PEM readable format.

```
openssl x509 -inform DER -outform PEM -in xxxx.cer -out yyyy.pem
```

## PEM

Example of PEM readable format, as shown in the image.

```
1 |-----BEGIN CERTIFICATE----- ←
2 MII FozCCA4ugAwIBAgITGQAAAA Lex/EgACaWIAAAAAAAAAjANBgkqhkiG9w0BAQUF
3 ADAaMRgwFgYDVQQDEw9Ub21EZW1vIFJvb3QgQ0EwHhcNMTQwMjA3MTQwMTU3WncN
4 MjQwMjA3MTQxMTU3WjBKMRIwEAYK CZImiZPyLGQBGRYCC2Ux FzAVBgoJkiaJk/Is
5 ZAEZFgd0b21kZW1vMRswGQYDVQQDExJUB21EZW1vIElzc3VpbmcgQ0EwggEiMA0G
6 CSqGSIb3DQEBAQUAA4IBDwAwggEKAoIBAQCDC8XmXxLHo0M/521CFtI4DSN6qVNaN
7 8jxujS4PSSRnQtaqpbjbcAZpvbYysNt2uWA40urkxY2nyn4SMY/21S4L9x10u8su
8 W+/4T2dcFgQKzFiNyqVklOp9vRKnCKjceD+FRKXbPCSZyy4Hhz/XCgwPRfaobx+q
9 aV1fSnW0P [REDACTED] a2MHx60jf
10 BhdyONMrZxmQeYgFPumd2o3x+lyq1406hIF7LLGFAoDdqi3R31D9OPb7+Dm2ezv0
11 OKkbCHdjl3inB3D1tg1L8mZeIEte+07RvlQXr33um06zeYi4okbaHZLvAgMBAAGj
12 ggGwMIIBrDAQBgkrBgEEAYI3FQEEAwIBADAdBgNVHQ4EFgQU0+wPInpDnoqnuI1x
13 BtUbIGLdS1UwgYsGA1UdIASBgZCBgDB+BgorBgEEAYKdZwEBMHAwPgYIKwYBBQUH
14 AgIwMh4wAFQAbwBtAEQA ZQBtAG8AIAABQAG8AbABpAGMAeQA gAFMAdABhAHQA ZQBt
15 AGUAbgB0MC4GCCsGAQUFBwIBFiJodHRwOi8vcGtpLnRvbWR1bW8uc2UvcGtpL2Nw
16 cy5odG0AMBkGCSsGAQQBgjcUA gQMhGoAUwB1AGIAQwBBMAsGA1UdDwQEAwIBhjAP
17 BgNVHRMBAf8EBTADAQH/MB8GA1UdIwQYMBaAFL00e0rG2ExZ1dmboIuLwgGgPr5e
18 MEIGA1UdH [REDACTED] y5zZS9wa2kvVG9t
19 RGVtbyUyMFJvb3Q1MjBDQS5jcmwwTQYIKwYBBQUHAQEETA/MD0GCCsGAQUFBzAC
20 hjFodHRwOi8vcGtpLnRvbWR1bW8uc2UvcGtpL1RvbUR1bW81MjBSb290JTIwQ0Eu
21 Y3J0MA0GCSqGSIb3DQEBBQUAA4ICAQBbkNHalbx3kpkOXCV3nQ9R4CyG61WI90gL
22 57uGRcpulSqUu790J5s4x1W8rhm32db7qvHDPaYED23gudpOSHyUywZTFbwzm92c
23 e1wZpyJH6nsuqNFDTYQTdWAq8zwCrl dcUFRW301mkPuhENjttqCIJ9KeLrwCaM/p
24 QVy7qWoTU14/BY+OsLXDGURXrGejcVs8ZQy4bqhmh0TfelTcAOAX47pVt8XdnWFe
25 Vnu/rwuOnfvlyiWW62cknAATAagnLXdbFWIxnVS1booZmYXXQqelF xJV1bhNdWM9
26 tgdq3t2qBXj3P7XiD+OWfzkABGMJrmki55LNpl0/oV+Kw3DuyGYLurq6TWW1Ji8J
27 94GJm9VQBx1PylFQn0hILcxgr+LAIKX0PqXTyRCp1/UGH1ih05S1F4GvPEj0s1BA
28 ebRkDrN2vU+9kq8UXOhzxierQDmJkCOpSUWV6Pk6/OP72vxIuAQQNdY++cJRwzi+
29 adWp6cZBzW5h3OdKlyEDdjNB75rzQcwMlerYTABSIAK6KCTNb7OF4kTW1B5R1WqD
30 VXYboYebf0ym5CiNmDKUXqQMI45FIztDhYjJqn1NeroJUZnUYa9y63zuJy2uyQeG
31 EVWpXscPOfrcrCfSuvx0KsMiLxuclfvJyCAJqBMG++LgWxhb247CvhSDK2wZrq0+
32 Q70p0WaYww==
```

## DER

Example of DER readable format, as shown in the image



```

1 0, ENO£0, ETX< ETXSTX SOH STX STX DC3 EM NUL NUL NUL STX BÇñ NUL &-
  NUL NUL NUL NUL NUL STX 0
2 ACK *tHt÷
3 SOH SOH ENO ENO NUL 0 SUB1 CAN 0 SYN ACK ETX U EOT ETX DC3 SI. CA0 RSETB
4 140207140157Z ETB
5 240207141157Z0J1 DC2 0 DLE ACK
6 ' &% "ò, d SOH EM SYN STX se1 ETB 0 NAK ACK
7 ' &% "ò, d SOH EM SYN BEL 1 ESC 0 EM ACK ETX U EOT ETX DC3 DC2
  Issuing CA0, SOH" 0
8 ACK *tHt÷
9 SOH SOH SOH ENO NUL ETX, SOH SI NUL 0, SOH
10 STX, SOH SOH NUL Åñy-Å±èÐÏùÛP... Ž ETX HP^TÐ
11 ò<n. SI I$gBÖ^¥, Ûp ACK i>¶2°Ûv» NUL 8òèäÅ$Ê~ DC2 3/òÖ. VI ÷ GS t»È. [ièOg\SYNEOT
12 ÌXÊ¥d. Š)¥ DC2 $BS "Üx?...DYÛ<$"È. BEL +?×
13 FFSTIEö"o US^i]_ Ju' ?£1Um US^BEòFÁ...>EDÛÖ;) EOT òcoúO NAK; Á·'òÁ"ZØÁñèHB ACK ETB
  r8Ó+g EM y^ ENO=IÚñú\^*×:„{, ±... STX EY^ -ÑBPý8òùø9¶{; ò8@ESCBS wc-x$BEL pð¶
14 Kòf^
  K^ûNÑ¥I ETB }i f'y^, cFÚGS' i STX ETX SOH NUL SOH £, SOH °0, SOH -0 DLE ACK
  +ACK SOH EOT SOH, 7 NAK SOH EOT ETX STX SOH NUL 0 GS ACK ETX U GS SOH EOT SYNEOT DC4 Ói
  SI"zCžŠ$ ,kq ACK ÕESC bÝKU0< ACK ETX UGS EOT f0€0~ACK
15 +ACK SOH EOT SOH, g SOH SOH 0p0> ACK BS+ACK SOH ENO ENO BEL STX STX 02 RS 0 NUL I NUL o
  NUL m NUL D NUL e NUL m NUL o NUL NUL P NUL o NUL l NUL i NUL c NUL y NUL
  NUL S NUL t NUL a NUL t NUL e NUL m NUL e NUL n NUL t 0. ACK BS+ACK SOH ENO ENO BEL STX SOH
  SYN' .htm NUL 0 EM ACK
  +ACK SOH EOT SOH, 7 DC4 STX EOT EERS
16 NUL S NUL u NUL b NUL C NUL A 0 VI ACK ETX U GS SI EOT EOT ETX STX SOH +0 SI ACK ETX U GS
  DC3 SOH SOH y EOT ENO 0 ETX SOH SOH y 0 US ACK ETX U GS # EOT CAN 0 SYN € DC4 ¶4 {JÈØLYÖÙ>
  << Å SOH > *^0B ACK ETX U GS SI SEOT:0907.5.3+1

```

## Difference between certificate created in Windows vs Linux

A simple side-by-side comparison of both certificates next to each other you can use the **Compare** plugin in Notepad ++ revealed the encoded difference in line #68. On the left, you can see the certificate created in Windows, on the right you can find the certificate generated on the Linux machine. The one on the left has carriage return which makes that certificate PEM invalid for FMC. However, you cannot tell the difference in text editor except for that one line in Notepad ++.

```
1 -----BEGIN CERTIFICATE-----
2 MIIFcTCCAImGAWIBAgIQGCG5G13w7PzAoqHtLtdqDANBqkqhkiG9w0BAQsFADBL
3 MRhMEQYKZImiZPyLQG8GRYDy29tMRhMEQYKZImiZPyLQG8GRYDChBqR8wHQYD
4 VQ0QEXzWcGotv0L0LUtFRdk2NF8P5U9LUN8MB4XDtIxMDIxHjEwMzc10FOxDTI2
5 MDIxMjEwNDc1NVowS2ETMBEGCgmsJomT8ixkARKWA2NvtETMBEGCgmsJomT8ixk
6 ARkWA3BwaJEFMB0GA1UEAxMwChBqLvdJt1L1RUQ5NjRjR0T0PSC1DQ5xDTJ1BSUe
7 KoZlHvcNAQE8BQADggIPADCCAgCGgIBALD7GjxJ2Vmn7AGCKH+s+HfYogNfT1QR
8 ngyZp0ReF6AipKubU+MrEny+KgmXsvjF581M055PEwYhIzfn0iXQioyIXR55
9 Pj07cku5GyFodsAyCpQ04LiDuIbydy77j9mFzurn+hKaMKSPXQ9jD+1JR82Z3JR
10 Hosa3c
11 xa5qAX1yUyMwvFzPpLqgE1mHmXk81646RmJHffk1f5bFbQdkHOYUmt/FuuPd0+Q3CQ
12 KrC8naXNCsN9D/9weTU6MkX8G146RmJHffk1f5bFbQdkHOYUmt/FuuPd0+Q3CQ
13 gkeQHT18nxjF6mJ9ekfirYNGKLCqAFNU2dMDNVtQhmVAPyizf+pp1vdrjPIS7NL
14 fsc24Chs6kHc3Lbt77910nsMgt0jP7VvrvJNJSYQR1whn6QSMcM/Vf97k5tI1iqq
15 pgaIM7rLfoTadC126K1PfuHg3TYJgreiR38jat0FDfQkTE6ku0m964f0v08tX/5
16 V6vrupE56C6kbk0WiZ8oJ0iB181nh1UUGLdc7wzKz5xwoa+0aaU+OvUpAREkHGdQ
17 c55KxIgfndMClig6fAfoBxGiYUfQn+Pudt0mKvxd0SCKxam0++tFXyBKnmA5h2
18 GC3w0wEXe0a1AgMBAAGJUTBPMAsGA1UdDwQEAwIBhJAPBgnVHRMBAF8EBTADAQH/
19 MB0GA1UdDgQWB8T425e9pCs7DXH6mXqmz3jw0DAQ8gkrBgEEAYI3FQEEAwIB
20 ADANBgkqhkiG9w0BAQsFAAOCAQEAAUxUGT0eji25y1bYo1qTvwEUKxz0XoRzPUG
21 QDhRs1Xbt7u4hyShLPIneYa1LNZ474m15yYDrU1N1JLSW8YpTwLk2qhc76us02i
22 BosRXfBT9xQV8M7ZLcYec12Imvnl0Xk62fCVJGCSIG8I7d7xwgyPiorH7U0Kzy5
23 RAfXtQ/ANciJmcJ6C1xcX1EYE0z1eI19k+Goz6bWj5mmzRsG02/e8MAd0HutbEXB
24 8aZieTLPQ0TIjy/6ZQ85+Q1Gza9ws5pz+zK2PNeiEVyfrbF0c03eAhnkXoYxR
25 JekATeLRb03TYDGSEm/e6akRIcFZQYQ0e/9Taflw5JGGV871wzLmyqIAVL10
26 rRSFo1jeTUB8y1yHX8FRh9CzdkRVDExue40mhpYauQZT1y1K1fAgrFy26pvefle
27 xaF7xXBY/dzFk8Q71YGc+2LLecQ6d8PrVmK6mQ4mdAtGqj/cU+na/toCZKgn8v
28 R6fEMFDL19tq540g/WUsGLSC+akcZxk+HfVzaFxy/aeVamQ4jT1uh/+t7j0YyyH
29 VNg0nMyX4TKrRH0cOHRV8W35MpUv11yqR9i511bv8M9EF4cRnMyk3JWAK2deS1z
30 82fbaV7E7cgtLdazp6/C+zfq180E7Iyr3Gjw3Rvc75KpzTDQAL0ZmLkygkQWqUx
31 5rQhNyg=
32 -----END CERTIFICATE-----
33 -----BEGIN CERTIFICATE-----
34 MIIF2cCA80gAWIBAgITEgAAACMxw4RLZFMFAAAAAAIAZANBgkqhkiG9w0BAQsF
35 ADBLMRhMEQYKZImiZPyLQG8GRYDy29tMRhMEQYKZImiZPyLQG8GRYDChBqR8w
36 HQYDVQ0QEXzWcGotv0L0LUtFRdk2NF8P5U9LUN8MB4XDtIxMDIxHjEwMzc10FOx
37 DTIzMDMxOTwNDENfowWzELMAKGA1UEBHMCCUUEEzARBgNVBAGTC1NvbWU3RjR0
38 dGUxODAKBgNVBAoTA1BQ5jELMAKGA1UECmSCMScVQXHDAA8BgNVBAITEjNDUD10ND
39 ME00LmBwa15jb20wZzZswEAVHkoZiZj0CAQYK4EEACMDgYyABAHAh1K1XffqxkD
40 Y7eL2A2wu+HFxAnh2k4w9Vj3T83xfVovNEv7/umIHwEhE2/QGnL7g5t910U
41 Zheq7eVkhQhp+CL1CuenzxUikwYUw1frPPT00QClfUXLUkXyQobRPubJfOXwn1d
42 zHtknPtm/sMj7AVG1JpD41WdVwVjVCS60CA14wggIqMCEGCSsGAQQBgjCUAgUQ
43 HhIAVwB1AGIAUwB1AHIAgB1AH1wgcQGCSsGAQUFBwEBB1G3MIG0MIgXBggrBgEF
44 BQcwAoaBpGxkYXA6Ly8vQ049cHBqLvdJt1L1RUQ5NjRjR0T0PSC1DQ5xDTJ1BSUe
45 Q049UH/
46 dXJhdG1vbi1xeQz1wG0sK81646RmJHffk1f5bFbQdkHOYUmt/FuuPd0+Q3CQ
47 bGFzc21jZj0aWZpY2F0aW9uQXV0aG9yaXRSMB0GA1UdDgQNBBSYfwZzXcHhf4C
48 5VF07F2j7qrjTA0BgNVH08BAF8EBAMCB4AwgdgGA1UdHwS80DCBzTCB9yC8x6CB
49 xIaBwMkYXA6Ly8vQ049cHBqLvdJt1L1RUQ5NjRjR0T0PSC1DQ5xDTJ1XSU4t50VE
50 OTY0UE9JTG8sQ049Q0RQLENOPV81YmXpYyUyMEt1eSUyMfH1cnZpY2VzLENOPVW1
51 cnZpY2VzLENOPUNvbmZpZ3VYXRpb24sREM9cHBqLERTPMhVbT9jZj0aWZpY2F0
52 ZVJldm9jYXRpb25MaXN0P2Jhc2U/b2JqZWN0O2xhc3M9Y1JMRG1zdHJpYnV0aW9u
53 UG9pbG9wHwYVDR0jBBgwFoAUwNkrHvaQrOw18R3up16s5t48NAwEwYVDR01BAwW
54 CgYIKwYBBQUHAWewDQYKozZihvcNAQELBQADggIBAKNvp1wcjLLI/qfTLj4hXcTA
55 Lcc2alyd9t
56 MhFHm1xqqv050c3Hsp0z002jnk7rk+fxsnmmqyieH40tZwsc1wocqsyo6f8e
57 gZVUsBNxonbHNEETStUynJZ82Kb41m7HbVdo4yvdQYRyBu3f5eU9CKHMDMqrx2u
58 qEFpw70tc8Jk0EX1eo02Fty2FIAAkd8a01V4rFOTFot1R5WHUCHiyy1FSU68D0Gng
59 y1jVWJLj11+66fXKZHD4k1o+KRCYZFLv+28YJEAUNY+sn1kOnL+4b/mvg1kxRhHoK
60 gT87WYBnMpME8af2H3uDrmv3zXBuCEe81vvytTBy0d6VLQmRcyFENESVrN6umF6
61 szZpJLH6gIceNshPhXIDSK6PvSYBe2EuReHYvC9Ua9y26KqRqL7CHzxMjXP+H
62 ZiqaC1KGRfN4Tgu6435yNaU080sq8d+rYEMIGAvBvJ0n7eC+06paFB6t4kwxuXCS
63 Cy/I28kshRF2a7vD3m0BBSc/EXeIeLUQsXuClootE2tmY8wYRXW4dc2wIC1j1b2e
64 rck8xiK0XyGx1TrebDFw7nD546g50J3psbwhIow6Tq2TMh3Tz0qpvx34VJicT+Jp
65 6K/1pp0jp7ueB/ML/VDX
66 -----END CERTIFICATE-----
67
68
```

Copy the newly created/converted PEM certificate for RootCA and CLEAN interface to your Linux machine and remove the carriage return from the PEM file.

```
sed -i 's/\r//' <file.crt>
```

Example, **sed -i 's/\r//' OPADMIN.pem.**

Verify if the carriage return is present.

```
od -c <file.crt>
```

Certificates that still have carriage return presented, as shown in the image.



```
[admin@localhost Desktop]$ od -c MRJCA.cer
0000000  -   -   -   -   -   B   E   G   I   N           C   E   R   T   I
0000020  F   I   C   A   T   E   -   -   -   -   -   \r  \n  M   A   T   I   I
0000040  G   t   D   C   C   B   Z   y   g   A   w           \r  \n  B   A   I   g   I
0000060  T   R   Q   A   A   A   P   n   p   l   y   I   n   B   O   h   j
0000100  Z   a   w   A   E   A   A   A   A   +   T   A   N   B   O   g   k
0000120  q   h   k   i   G   9   w   0   B   A   Q   s   F   \r  \n  I   m   A
0000140  D   B   O   M   R   U   w   E   w   Y   K   C   Z   I   \r  \n  j   Y
0000160  Z   P   y   L   G   Q   B   G   R   Y   F   T   G   9   m   j   Y
0000200  U   w   x   F   z   A   V   B   g   o   J   k   i   a   j   k
0000220  /   I   s   Z   A   E   Z   F   g   d   P   c   2   9   j   j   \r
0000240  \n  L   W   p   v   M   R   w   w   G   g   Y   D   V   Q   Q
0000260  D   E   x   N   P   c   2   9   j   L   W   p   v   L   U   N
0000300  D   T   l   R   E   Q   z   A   y   L   U   N   B   M   B   4
0000320  X   D   T   I   x   M   D   Q   w   N   D   I   x   M   j   U   N
0000340  x  \r  \n  M   l   o   X   D   T   I   z   M   D   Q   j   w   N
0000360  D  \r  \n  I   x   M   j   U   x   M   l   o   w   J   j   E   k   M
0000400  C   I   G   A   l   U   E   A   x   M   b   T   V   J   K   L
0000420  U   F   N   H   C   l   U   R   y   l   N   N   S   0   w   M
0000440  S   5   q  \r  \n  d   C   5   q   d   G   d   y   b   3   V
0000460  w   M   I   I   B   I   j   A   N   B   g   k   q   h   k   i
0000500  G   9   w   0   B   A   Q   E   F   A   A   0   C   A   Q   8
0000520  A   M   I   I   B   C   g   K   C   A   Q   E   A   s   g   4
0000540  Z   s   m   o   Y  \r  \n  w   T   2   Q   Y   0   7   h   h
0000560  z   d   8   b   +   K   b   s   U   M   c   Q   Q   0   5   0
0000600  p   o   g   q   v   e   l   Q   5   2   G   7   T   m   w   e
0000620  +   v   m   q   +   E   Y   H   W   b   B   T   y   D   9   9
0000640  K   D   l   x   R   o   l  \r  \n  0   S   y   I   g   3   W
0000660  k   i   l   M   p   I   l   u   P   i   0   E   U   H   d   A
0000700  c   2   T   q   A   d   w   0   r   e   E   M   k   H   l   F
0000720  n   Q   5   4   G   J   l   w   Z   6   S   o   h   I   9   J
0000740  2   8   h   /   L   k   R   f   8  \r  \n  Z   3   5   B   q
0000760  q   F   o   x   p   s   8   s   0   k   p   7   1   o   7   H
0001000  A   1   b   x   q   b   4   5   t   t   U   U   N   n   /   i
```

Certificate after you run that through a Linux machine.

```

[admin@localhost Desktop]$ od -c MRJCA.pem
00000000  -  -  -  -  -  B  E  G  I  N  C  E  R  T  I
00000020  F  I  C  A  T  E  -  -  -  -  \n  M  I  I  G
00000040  t  D  C  C  B  Z  y  g  A  w  I  B  A  g  I  T
00000060  R  Q  A  A  A  P  n  p  l  y  n  B  O  h  j  Z
00000100  a  w  A  E  A  A  A  A  +  T  A  N  B  g  k  q
00000120  h  k  i  G  9  w  0  B  A  Q  s  F  \n  A  D  B
00000140  O  M  R  U  w  E  w  Y  K  C  Z  I  m  i  Z  P
00000160  y  L  G  Q  B  G  R  Y  F  T  G  9  j  Y  U  w
00000200  x  F  z  A  V  B  g  o  J  k  i  a  J  k  /  I
00000220  s  Z  A  E  Z  F  g  d  P  c  2  9  j  \n  L  W
00000240  p  v  M  R  w  w  G  g  Y  D  V  Q  Q  D  E  x
00000260  N  P  c  2  9  j  L  W  p  v  L  U  N  D  T  l
00000300  R  E  Q  z  A  y  L  U  N  B  M  B  4  X  D  T
00000320  I  x  M  D  Q  w  N  D  I  x  M  j  U  x  \n  M
00000340  l  o  X  D  T  I  z  M  D  Q  w  N  D  I  x  M
00000360  j  U  x  M  l  o  w  J  j  E  k  M  C  I  G  A
00000400  l  U  E  A  x  M  b  T  V  J  K  L  U  F  N  U
00000420  C  l  U  R  y  l  N  N  S  0  w  M  S  5  q  \n
00000440  d  C  5  q  d  G  d  y  b  3  V  w  M  I  I  B
00000460  I  j  A  N  B  g  k  q  h  k  i  G  9  w  0  B
00000500  A  Q  E  F  A  A  O  C  A  Q  8  A  M  I  I  B
00000520  C  g  K  C  A  Q  E  A  s  g  4  Z  s  m  o  Y
00000540  \n  w  T  2  Q  Y  0  7  h  h  z  d  8  b  +  K
00000560  b  s  U  M  c  Q  Q  0  5  0  p  o  g  q  v  e
00000600  l  Q  5  2  G  7  T  m  w  e  +  v  m  q  +  E
00000620  Y  H  W  b  B  T  g  D  9  9  K  D  l  x  R  o
00000640  l  \n  0  S  y  I  g  l  3  W  k  i  l  M  p  I  l
00000660  u  P  i  0  E  U  H  d  A  c  2  T  q  A  d  w
00000700  O  r  e  E  M  k  H  l  F  n  Q  5  4  G  J  l
00000720  w  Z  6  S  o  h  I  9  J  2  8  h  /  L  k  R
00000740  f  8  \n  Z  3  5  B  q  q  F  o  x  p  s  8  s
00000760  0  k  p  7  l  o  7  H  A  l  b  x  q  b  4  5
00010000  t  t  U  U  N  n  /  i  V  7  Z  l  y  a  J  X

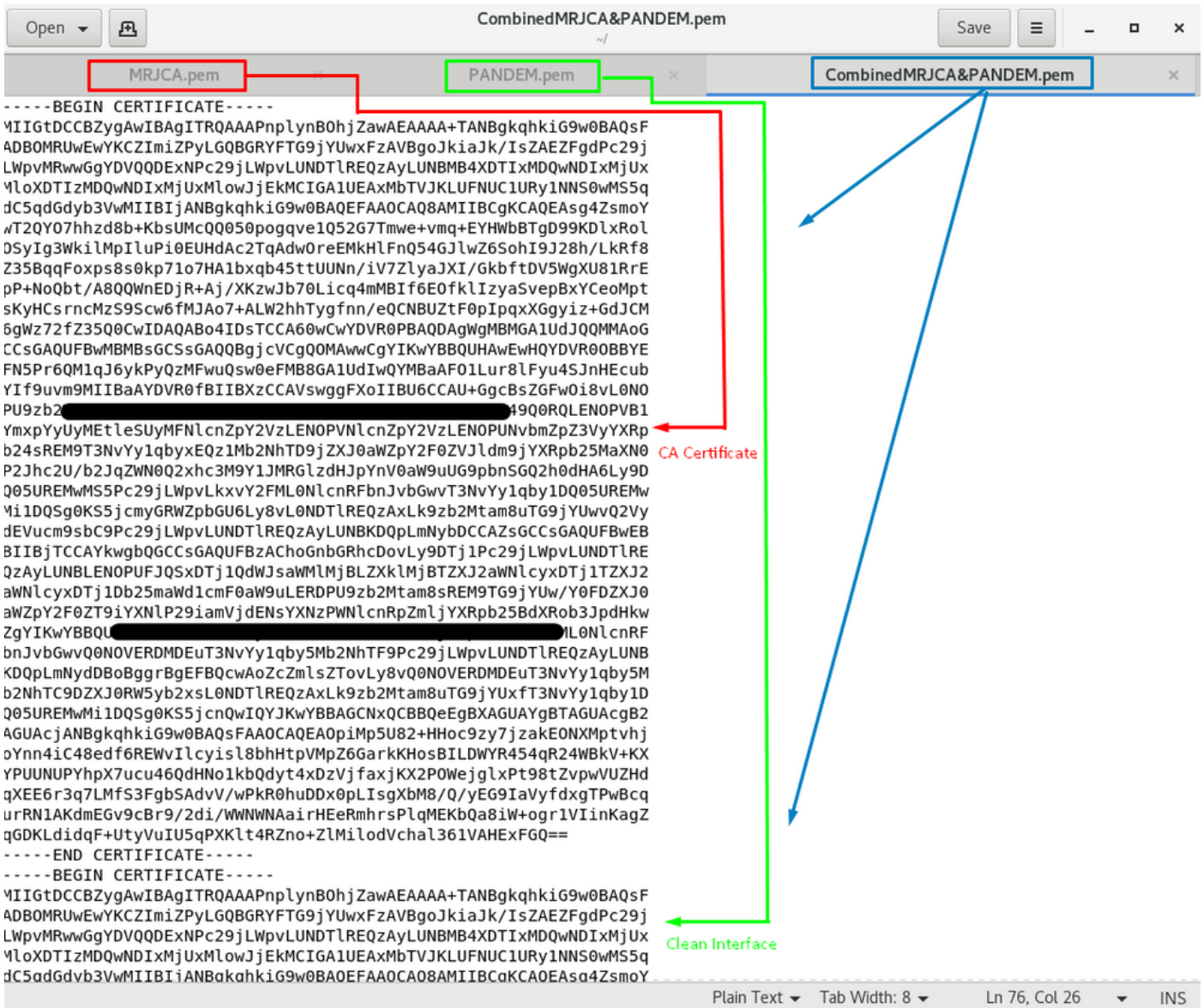
```

For FMC combine Root\_CA and the no-carriage certificate on a Linux machine use the next command.

```
cat <root_ca_file.pem> <clean-int-no-carriage.pem> > <combined_root-ca_clean.pem>
```

Example, **cat Clean-interface\_CSR\_CA-signed\_DER\_CER\_PEM\_no-carriage.pem Root-CA.pem > combine.pem.**

Or you can also open a new text editor in your Linux machine and combine both Clean certificates with carriage return removed into one file and save it with.PEM extension. You must have your CA certificate on top and the Clean Interface certificate on the bottom.

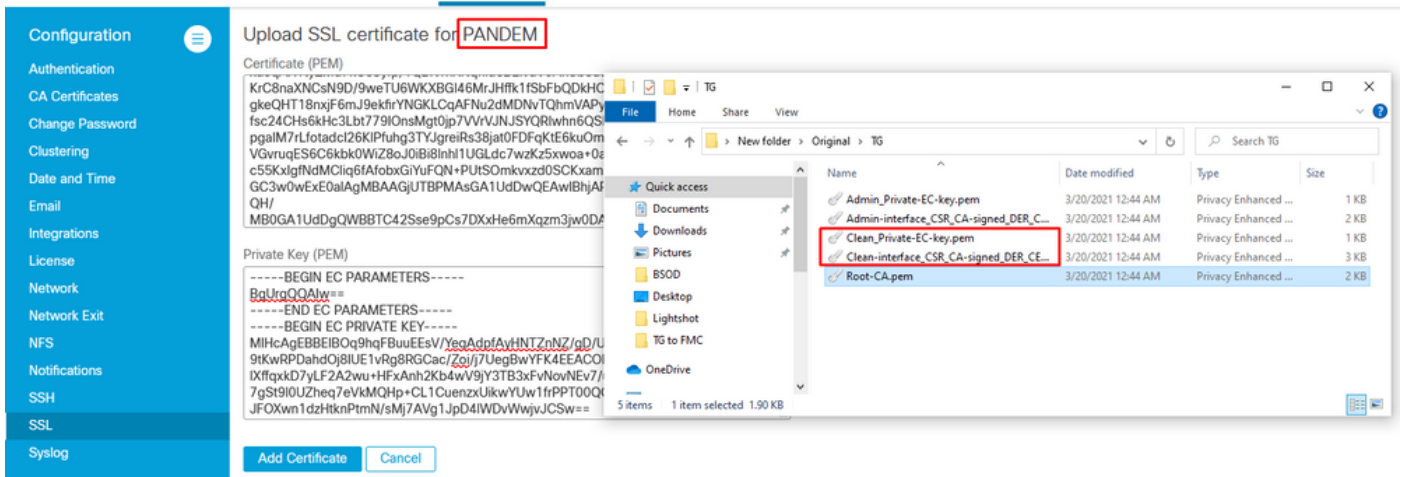


This must be your certificate that you later upload to your FMC to integrate with the TG appliance.

### Certificate upload to TG appliance and FMC

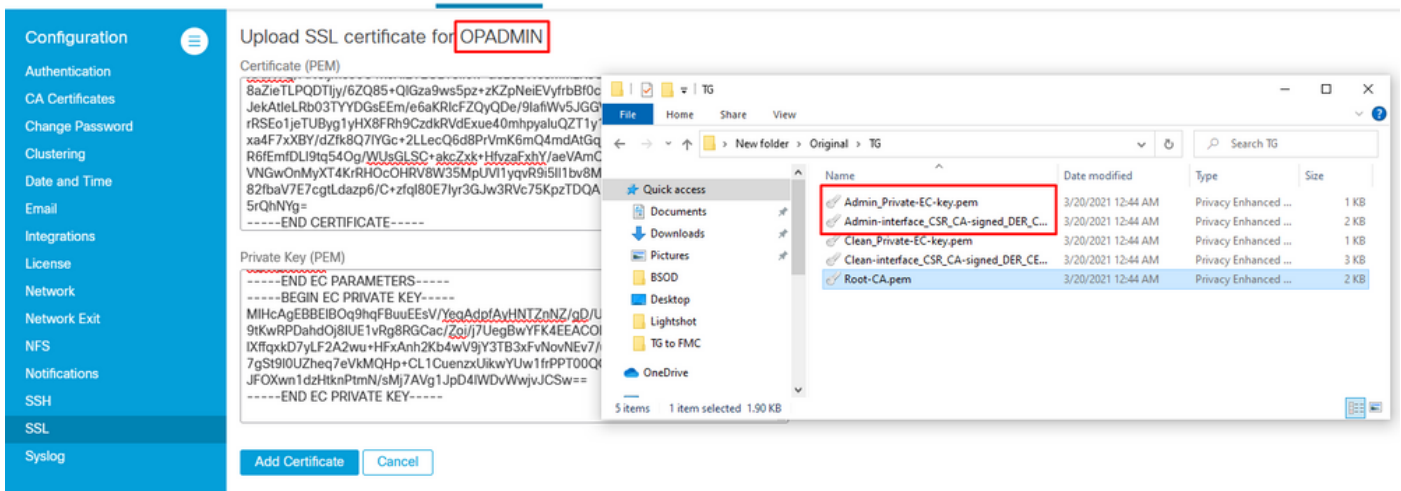
### Upload certificate for a clean interface

Navigate to **Configuration > SSL > PANDEM - Actions Upload New Certificate > Add Certificate**, as shown in the image.



## Upload certificate for an admin interface

Navigate to **Configuration > SSL > OPADMIN - Actions Upload New Certificate > Add Certificate**, as shown in the image.



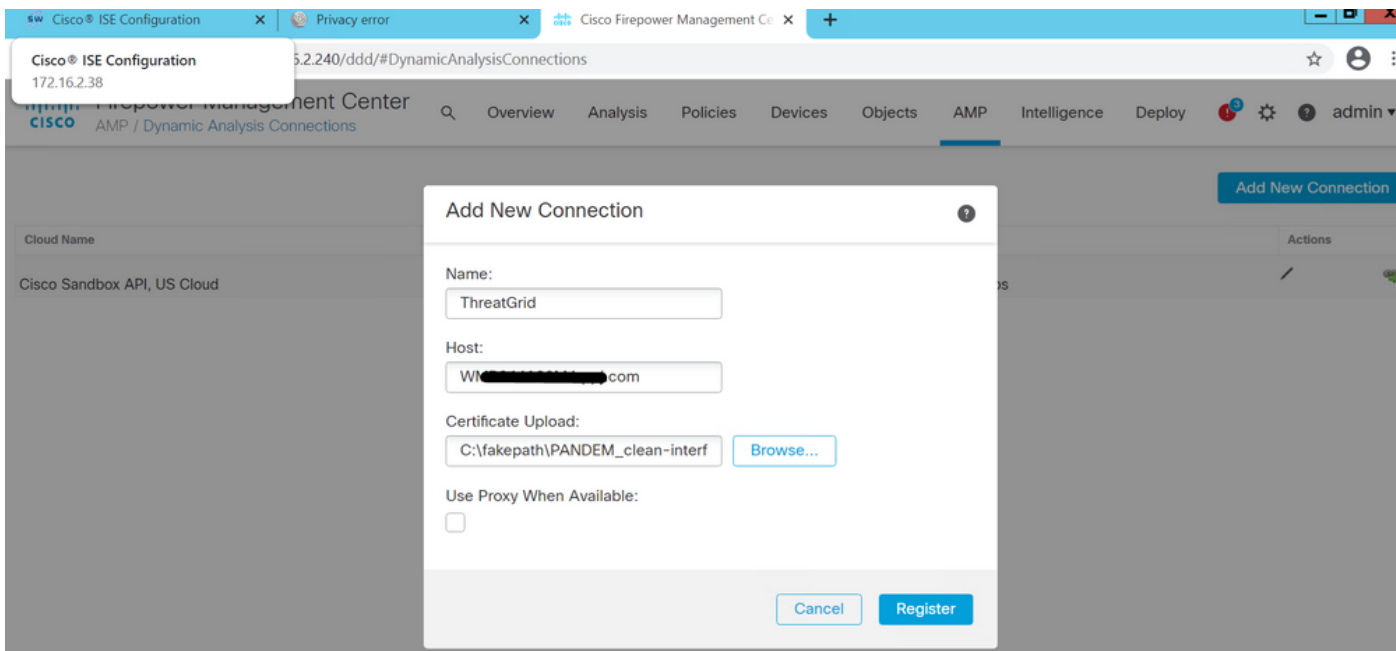
## Upload certificate to FMC

In order to upload the certificate to the FMC, navigate to **AMP > Dynamic Analysis Connections > Add New Connection**, then fill in the required information.

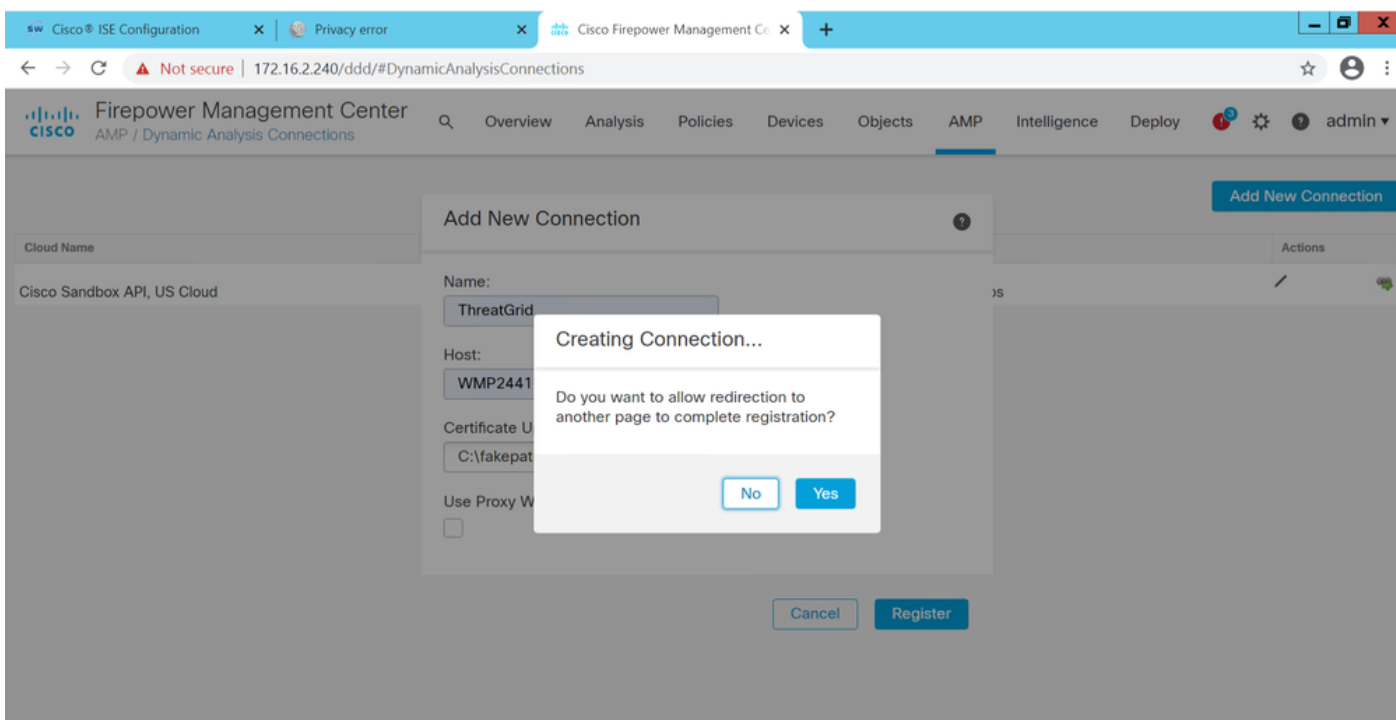
**Name:** Any name to identify.

**Host:** Clean-interface FQDN as defined when the CSR for clean-interface is generated

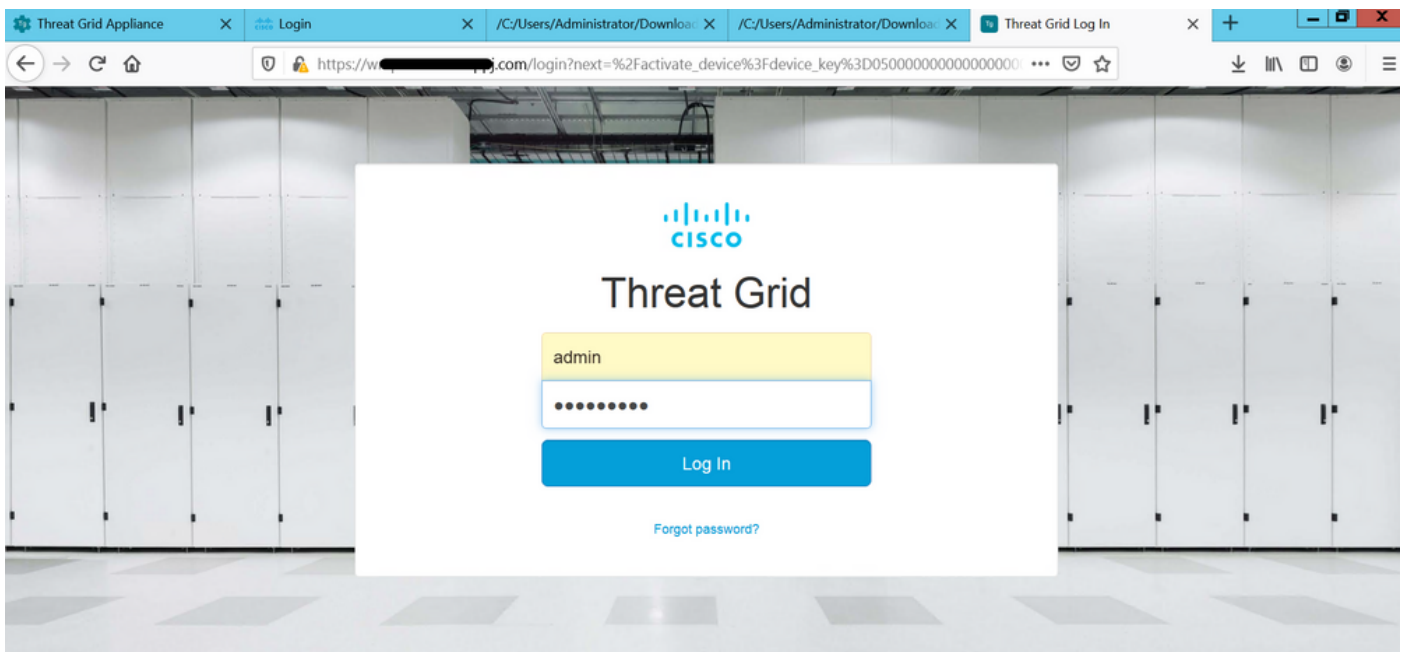
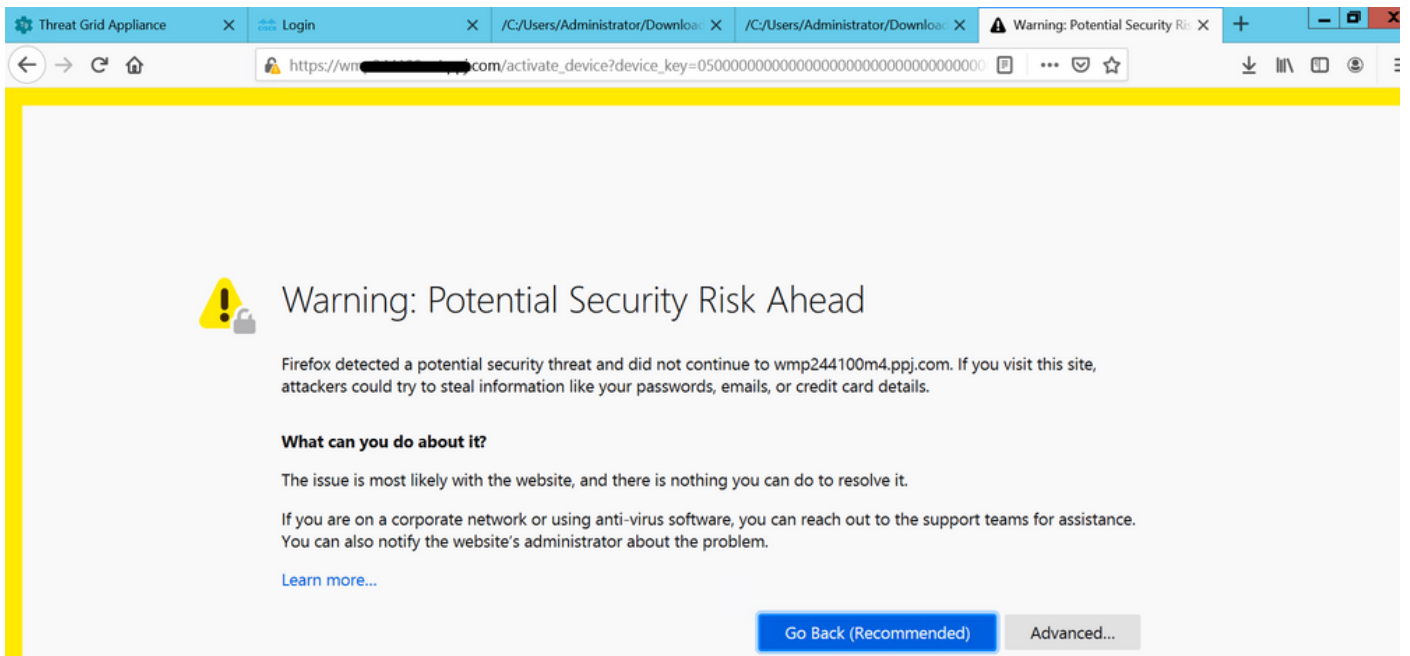
**Certificate:** The combined certificate of ROOT\_CA and clean interface\_no-carriage.



Once the New Connection is registered, a pop-up is displayed, click on the **Yes** button.

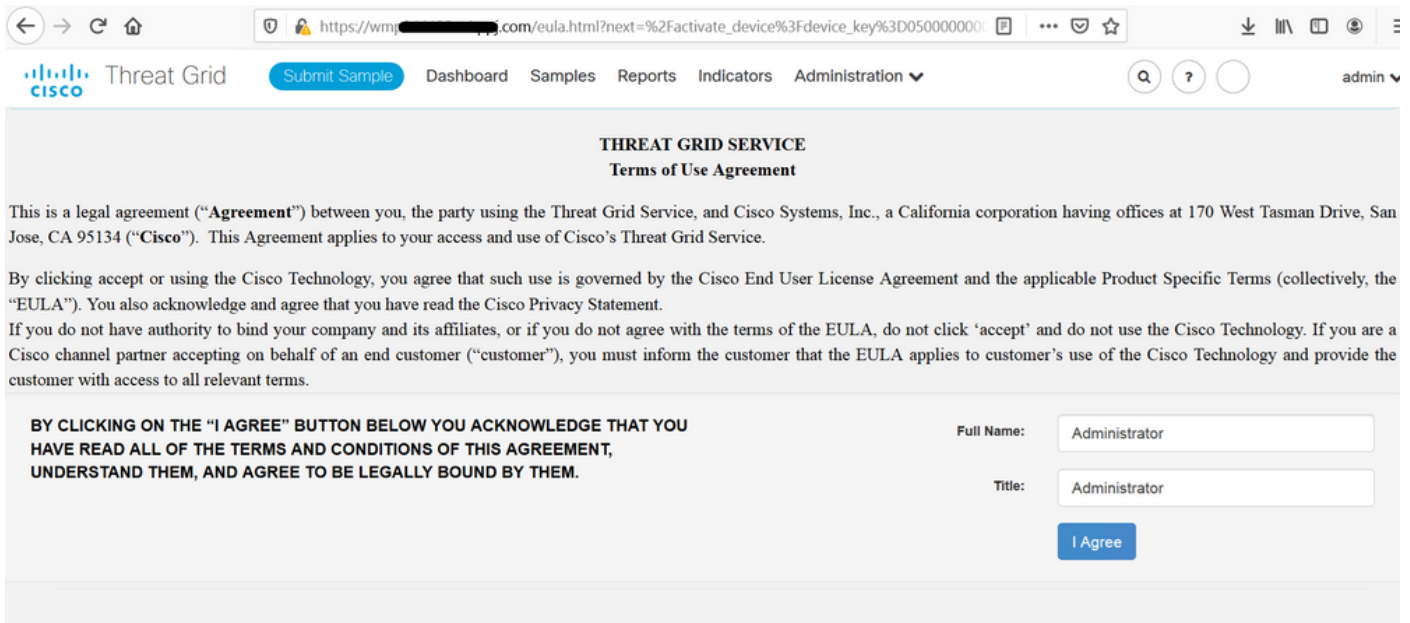


The page redirects to TG Clean interface and login prompt, as shown in the images.

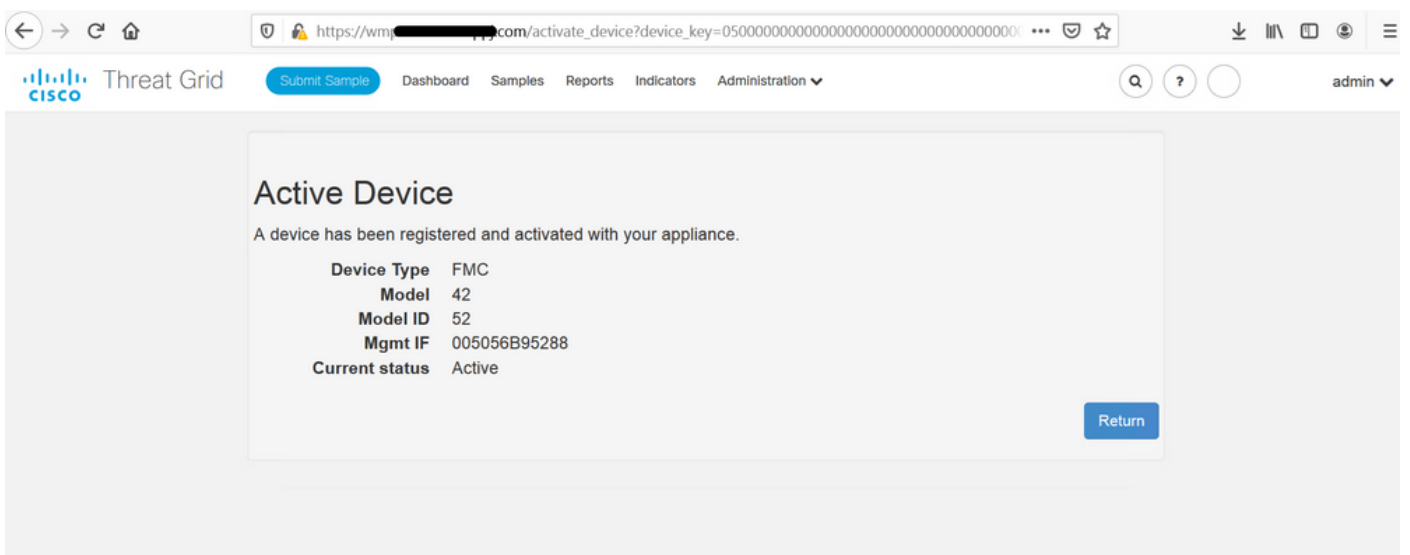


Accept the EULA.

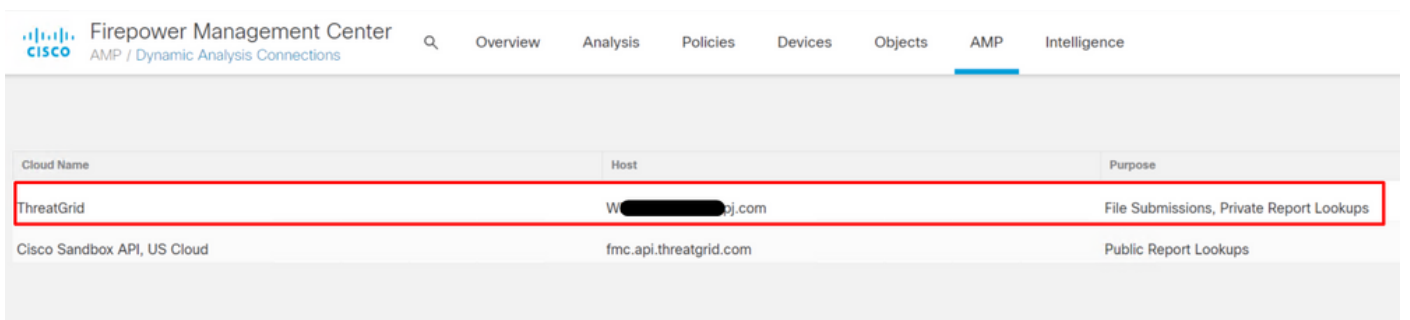




Successful integration displays an active device, as shown in the image.



Click **Return**, back to FMC with successful TG integration, as shown in the image.



## Related Information

- [Firepower Management Center Configuration Guide, Version 6.6](#)
- [Technical Support & Documentation - Cisco Systems](#)