

排除FXOS Firepower设备上的ASA智能许可证故障

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简介

本文档介绍Firepower可扩展操作系统(FXOS)上的自适应安全设备(ASA)智能许可功能。

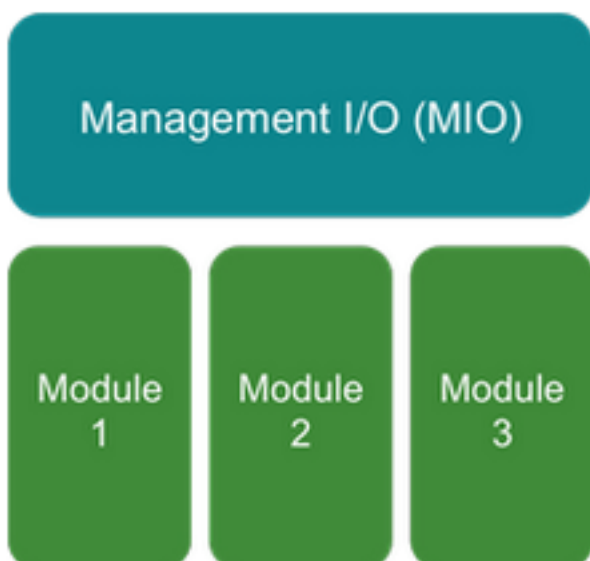
背景信息

当机箱上安装了ASA时，会使用FXOS上的智能许可。对于Firepower威胁防御(FTD)和Firepower管理中心(FMC)，智能许可检查FMC和[FTD智能许可证注册和故障排除](#)。

本文档主要介绍FXOS机箱能够直接访问互联网的场景。如果FXOS机箱无法访问Internet，则需要考虑卫星服务器或永久许可证保留(PLR)。有关离线管理的详细信息，请查看FXOS[配置指南](#)。

智能许可架构

机箱组件的高级概述：



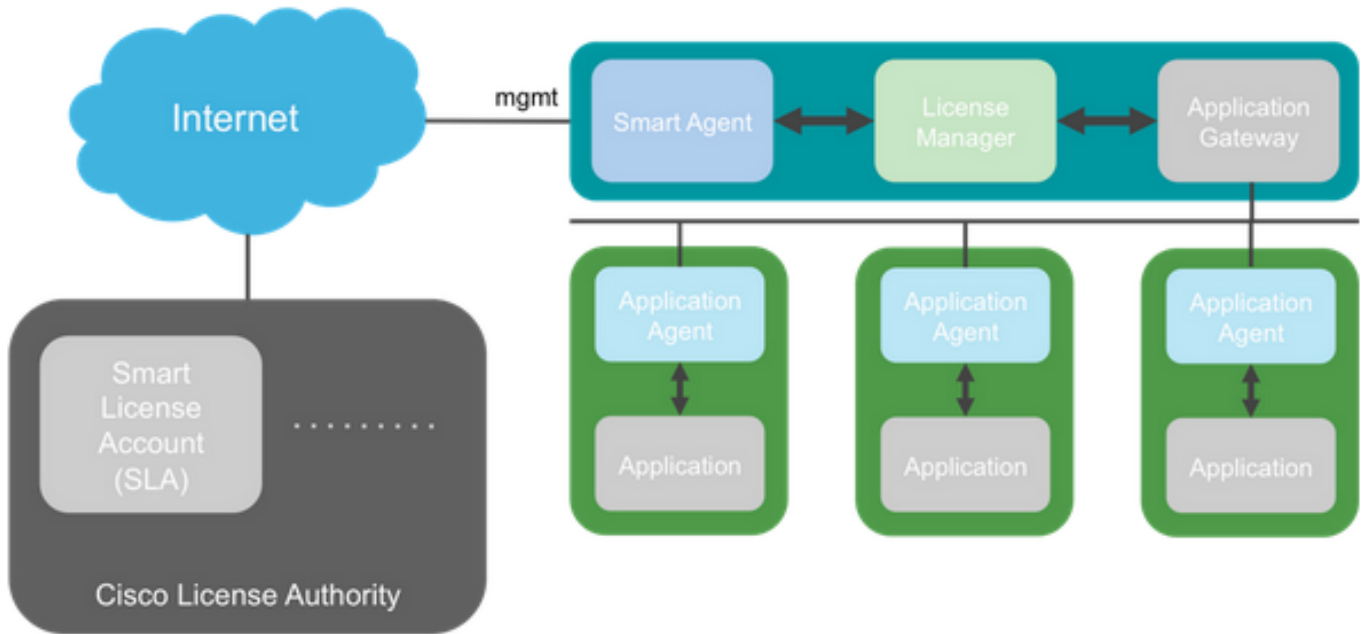
- 管理输入/输出(MIO)和单个模块都在智能许可中扮演角色

- MIO本身运行不需要任何许可证
- 每个模块上的SA应用需要获得许可

FXOS管理引擎是MIO。MIO包含三个主要组件：

- 智能代理
- 许可证管理器
- AppAG

整体架构



命名法

期限

- 思科许可证颁发机构
- 智能许可证帐户
- 令牌ID
- 授权
- 产品激活密钥(PAK)

描述

- 智能许可的思科许可证后端。维护所有产品许可相关信息。这包括授权和设备信息。
- 具有设备的所有授权的帐户。
- 注册设备时，标识符用于区分智能许可证帐户。
- 相当于许可证。对应于单个功能或整个功能层。
- 较旧的许可机制。连接到单个设备。

智能代理状态

状态

- 未配置
- 未识别
- 已注册
- 已授权
- 不合规(OOC)
- 授权已过期

描述

- 未启用智能许可。
- 智能许可已启用，但智能代理尚未联系思科进行注册。
- 代理已联系思科许可机构并已注册。
- 当座席收到不合规状态以响应授权授权请求时。
- 当代理收到OOC状态以响应授权授权请求时。
- 如果座席在90天内未与思科通信。

ASA授权

以下是受支持的ASA授权：

- 标准层
- 多情景
- 强加密(3DES)
- 移动/服务提供商(GTP)

配置

按照以下文档中的说明进行操作：

- [智能软件许可 \(ASA v、Firepower上的ASA \)](#)
- [ASA许可证管理](#)

在任何功能层配置之前：

```
asa(config-smart-lic)# show license all
Smart licensing enabled: Yes
```

```
Compliance status: In compliance
```

```
Overall licensed status: Invalid (0)
```

```
No entitlements in use
```

```
Serial Number: FCH12345ABC
```

```
License mode: Smart Licensing
```

```
Licensed features for this platform:
```

```
Maximum Physical Interfaces      : Unlimited
Maximum VLANs                   : 1024
Inside Hosts                    : Unlimited
Failover                        : Active/Active
Encryption-DES                  : Enabled
Encryption-3DES-AES            : Enabled
Security Contexts              : 10
Carrier                         : Disabled
AnyConnect Premium Peers       : 20000
AnyConnect Essentials          : Disabled
Other VPN Peers                : 20000
Total VPN Peers                : 20000
AnyConnect for Mobile          : Enabled
AnyConnect for Cisco VPN Phone : Enabled
Advanced Endpoint Assessment    : Enabled
Shared License                  : Disabled
Total TLS Proxy Sessions       : 15000
Cluster                        : Enabled
```

```
*****
```

```
*                               WARNING                               *
*                               *                                   *
*   THIS DEVICE IS NOT LICENSED WITH A VALID FEATURE TIER ENTITLEMENT   *
*                               *                                   *
*****
```

配置标准层：

```
asa(config)# license smart
INFO: License(s) corresponding to an entitlement will be activated only after an entitlement
request has been authorized.
asa(config-smart-lic)# feature tier standard
asa(config-smart-lic)# show license all
```

Smart licensing enabled: Yes

Compliance status: In compliance

Overall licensed status: Authorized (3)

Entitlement(s):

Feature tier:

Tag: regid.2015-10.com.cisco.FIREPOWER_4100_ASA_STANDARD,1.0_7d7f5ee2-1398-4b0e-aced-b3f7fblcacfc

Version: 1.0

Enforcement mode: Authorized

Handle: 1

Requested time: Tue, 04 Aug 2020 07:58:13 UTC

Requested count: 1

Request status: Complete

Serial Number: FCH12345ABC

License mode: Smart Licensing

Licensed features for this platform:

Maximum Physical Interfaces : Unlimited

Maximum VLANs : 1024

Inside Hosts : Unlimited

Failover : Active/Active

Encryption-DES : Enabled

Encryption-3DES-AES : Enabled

Security Contexts : 10

Carrier : Disabled

AnyConnect Premium Peers : 20000

AnyConnect Essentials : Disabled

Other VPN Peers : 20000

Total VPN Peers : 20000

AnyConnect for Mobile : Enabled

AnyConnect for Cisco VPN Phone : Enabled

Advanced Endpoint Assessment : Enabled

Shared License : Disabled

Total TLS Proxy Sessions : 15000

Clustertext

故障转移 (高可用性)

正如《ASA配置指南》中所述，每个Firepower设备都必须向许可证颁发机构或卫星服务器注册。从

ASA CLI验证：

```
asa# show failover | include host
```

```
    This host: Primary - Active
```

```
    Other host: Secondary - Standby Ready
```

```
asa# show license all
```

```
Smart licensing enabled: Yes
```

```
Compliance status: In compliance
```

```
Overall licensed status: Authorized (3)
```

```
Entitlement(s):
```

```
Feature tier:
```

```
    Tag: regid.2015-10.com.cisco.FIREPOWER_4100_ASA_STANDARD,1.0_7d7f5ee2-1398-4b0e-aced-  
b3f7fblcacfc
```

```
    Version: 1.0
```

```
    Enforcement mode: Authorized
```

```
    Handle: 1
```

```
    Requested time: Tue, 04 Aug 2020 07:58:13 UTC
```

```
    Requested count: 1
```

```
    Request status: Complete
```

```
Serial Number: FCH12345ABC
```

```
License mode: Smart Licensing
```

```
Licensed features for this platform:
```

```
Maximum Physical Interfaces      : Unlimited  
Maximum VLANs                   : 1024  
Inside Hosts                     : Unlimited  
Failover                         : Active/Active  
Encryption-DES                   : Enabled  
Encryption-3DES-AES             : Enabled  
Security Contexts                : 10  
Carrier                          : Disabled  
AnyConnect Premium Peers        : 20000  
AnyConnect Essentials           : Disabled  
Other VPN Peers                  : 20000  
Total VPN Peers                  : 20000  
AnyConnect for Mobile           : Enabled  
AnyConnect for Cisco VPN Phone  : Enabled  
Advanced Endpoint Assessment    : Enabled  
Shared License                   : Disabled  
Total TLS Proxy Sessions        : 15000  
Cluster                          : Enabled
```

```
Failover cluster licensed features for this platform:
```

```
Maximum Physical Interfaces      : Unlimited  
Maximum VLANs                   : 1024  
Inside Hosts                     : Unlimited  
Failover                         : Active/Active  
Encryption-DES                   : Enabled  
Encryption-3DES-AES             : Enabled  
Security Contexts                : 20  
Carrier                          : Disabled  
AnyConnect Premium Peers        : 20000  
AnyConnect Essentials           : Disabled
```

```
Other VPN Peers           : 20000
Total VPN Peers           : 20000
AnyConnect for Mobile     : Enabled
AnyConnect for Cisco VPN Phone : Enabled
Advanced Endpoint Assessment : Enabled
Shared License             : Disabled
Total TLS Proxy Sessions  : 15000
Cluster                   : Enabled
```

备用设备：

```
asa# show failover | i host
      This host: Secondary - Standby Ready
      Other host: Primary - Active
```

```
asa# show license all
```

Smart licensing enabled: Yes

Compliance status: In compliance

Overall licensed status: Not applicable in standby state

No entitlements in use

Serial Number: FCH12455DEF

License mode: Smart Licensing

Licensed features for this platform:

```
Maximum Physical Interfaces : Unlimited
Maximum VLANs               : 1024
Inside Hosts                : Unlimited
Failover                    : Active/Active
Encryption-DES              : Enabled
Encryption-3DES-AES        : Disabled
Security Contexts          : 10
Carrier                     : Disabled
AnyConnect Premium Peers    : 20000
AnyConnect Essentials       : Disabled
Other VPN Peers             : 20000
Total VPN Peers             : 20000
AnyConnect for Mobile       : Enabled
AnyConnect for Cisco VPN Phone : Enabled
Advanced Endpoint Assessment : Enabled
Shared License              : Disabled
Total TLS Proxy Sessions    : 15000
Cluster                     : Enabled
```

Failover cluster licensed features for this platform:

```
Maximum Physical Interfaces : Unlimited
Maximum VLANs               : 1024
Inside Hosts                : Unlimited
Failover                    : Active/Active
Encryption-DES              : Enabled
Encryption-3DES-AES        : Enabled
Security Contexts          : 20
Carrier                     : Disabled
AnyConnect Premium Peers    : 20000
AnyConnect Essentials       : Disabled
Other VPN Peers             : 20000
```

```
Total VPN Peers : 20000
AnyConnect for Mobile : Enabled
AnyConnect for Cisco VPN Phone : Enabled
Advanced Endpoint Assessment : Enabled
Shared License : Disabled
Total TLS Proxy Sessions : 15000
Cluster : Enabled
```

案例研究：FP2100上的ASA HA许可证

- 在2100上，ASA通过ASA接口（而不是FXOS管理）与思科智能许可门户（云）通信
- 您需要将两个ASA注册到思科智能许可门户（云）

在这种情况下，HTTP本地身份验证用于外部接口：

```
ciscoasa(config)# show run http
http server enable
http 0.0.0.0 0.0.0.0 outside
ciscoasa(config)# show run aaa
aaa authentication http console LOCAL
ciscoasa(config)# show run username
username cisco password ***** pbkdf2
```

如果启用3DES/AES许可证，则只能通过ASDM连接到ASA。对于尚未注册的ASA，这只能在已注册的 management-only。根据配置指南：“在连接到许可证颁发机构或卫星服务器之前，管理连接可以使用强加密(3DES/AES)，因此您可以启动ASDM。请注意，ASDM访问仅在使用默认加密的仅管理接口上可用。在连接并获取强加密许可证之前，不允许直通流量”。在其他情况下，您可以获得：

```
ciscoasa(config)# debug ssl 255
debug ssl enabled at level 255.
error:1408A0C1:SSL routines:ssl3_get_client_hello:no shared cipher
```

要克服ASA在面向互联网的接口上仅配置了管理功能，因此可以进行ASDM连接：

```
interface Ethernet1/2
management-only
nameif outside
security-level 100
ip address 192.168.123.111 255.255.255.0 standby 192.168.123.112
```




Cisco ASDM 7.10(1)



Cisco ASDM 7.10(1) provides an intuitive graphical user interface that makes it easy to set up, configure and manage your Cisco security appliances.

Cisco ASDM can run as a local application or as a Java Web Start application.

Run Cisco ASDM as a local application

When you run Cisco ASDM as a local application, it connects to your security appliance from your desktop using SSL. Running Cisco ASDM as an application has these advantages:

- You can invoke ASDM from a desktop shortcut. No browser is required.
- One desktop shortcut allows you to connect to *multiple* security appliances.

[Install ASDM Launcher](#)

Run Cisco ASDM as a Java Web Start application

Java Web Start is required to run ASDM, but it is not installed on this computer.

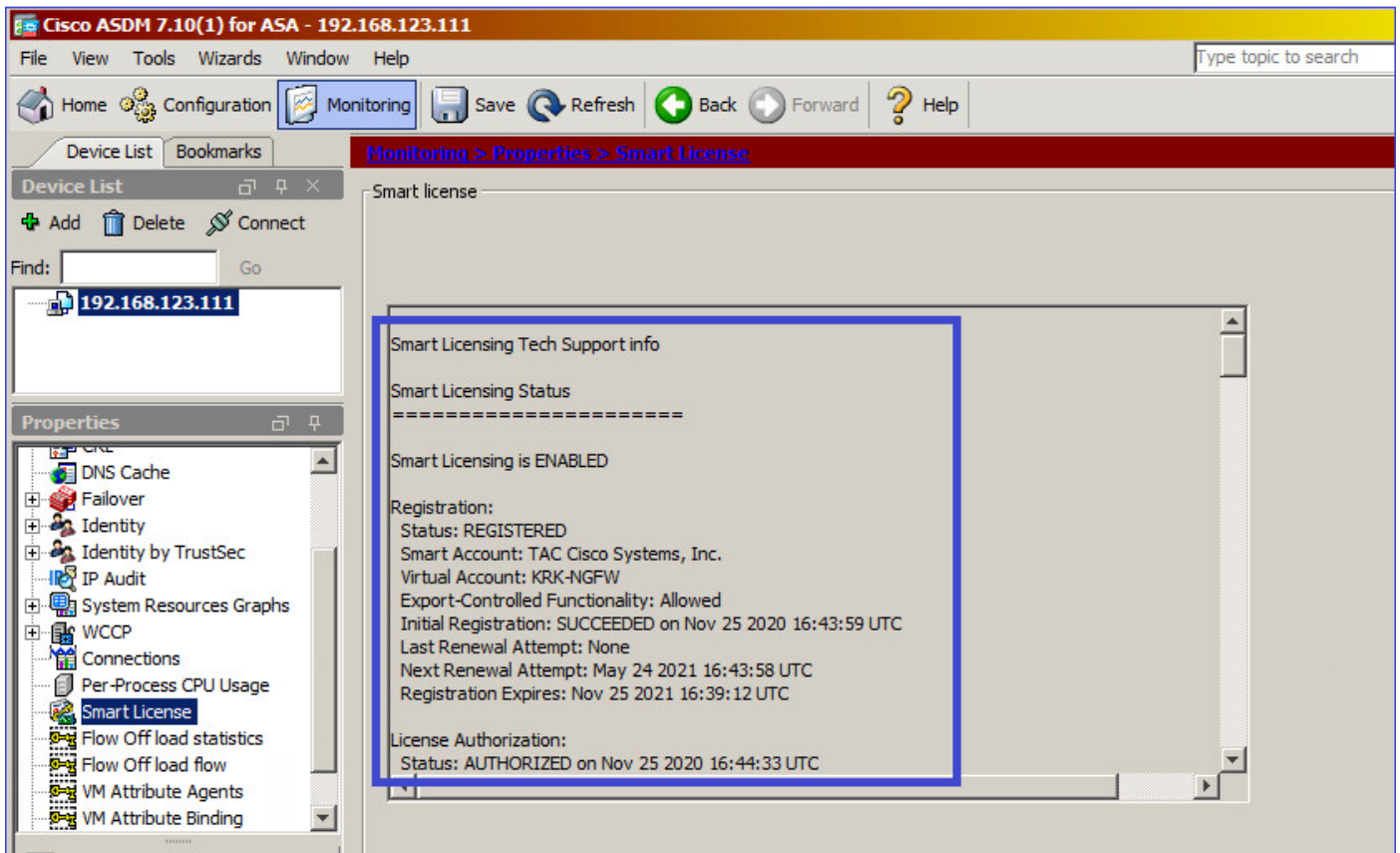
[Install Java Web Start](#)

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在主ASA上配置智能许可：

The screenshot displays the Cisco ASDM 7.10(1) interface for ASA - 192.168.123.111. The navigation path is Configuration > Device Management > Licensing > Smart Licensing. The 'Smart Licensing' page includes a 'Device List' on the left with '192.168.123.111' selected. The main configuration area shows 'Enable Smart license configuration' checked, with 'Feature Tier' set to 'standard' and 'Context' set to '(1-38)'. Below this, the 'Registration Status' is 'UNREGISTERED', and there are buttons for 'Register', 'Renew ID Certificate', and 'Renew Authorization'. A 'Smart License Registration' dialog box is open in the foreground, showing an 'ID Token' field and a 'Register' button.

导航至 Monitoring > Properties > Smart License 要检查注册状态：



主ASA CLI验证：

```
ciscoasa/pri/act# show license all
```

```
Smart Licensing Status
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:
```

```
Status: REGISTERED
```

```
Smart Account: Cisco Systems, Inc.
```

```
Virtual Account: NGFW
```

```
Export-Controlled Functionality: Allowed
```

```
Initial Registration: SUCCEEDED on Nov 25 2020 16:43:59 UTC
```

```
Last Renewal Attempt: None
```

```
Next Renewal Attempt: May 24 2021 16:43:58 UTC
```

```
Registration Expires: Nov 25 2021 16:39:12 UTC
```

```
License Authorization:
```

```
Status: AUTHORIZED on Nov 25 2020 16:47:42 UTC
```

```
Last Communication Attempt: SUCCEEDED on Nov 25 2020 16:47:42 UTC
```

```
Next Communication Attempt: Dec 25 2020 16:47:41 UTC
```

```
Communication Deadline: Feb 23 2021 16:42:46 UTC
```

```
Utility:
```

```
Status: DISABLED
```

```
Data Privacy:
```

```
Sending Hostname: yes
```

```
Callhome hostname privacy: DISABLED
```

```
Smart Licensing hostname privacy: DISABLED
```

```
Version privacy: DISABLED
```

Transport:
Type: Callhome

License Usage
=====

Firepower 2100 ASA Standard (FIREPOWER_2100_ASA_STANDARD):
Description: Firepower 2100 ASA Standard
Count: 1
Version: 1.0
Status: AUTHORIZED

Product Information
=====

UDI: PID:FPR-2140,SN:JAD12345ABC

Agent Version
=====

Smart Agent for Licensing: 4.3.6_rel/38

```
ciscoasa/pri/act# show run license  
license smart  
feature tier standard
```

```
ciscoasa/pri/act# show license features  
Serial Number: JAD12345ABC  
Export Compliant: YES
```

License mode: Smart Licensing

Licensed features for this platform:
Maximum Physical Interfaces : Unlimited
Maximum VLANs : 1024
Inside Hosts : Unlimited
Failover : Active/Active
Encryption-DES : Enabled
Encryption-3DES-AES : Enabled
Security Contexts : 2
Carrier : Disabled
AnyConnect Premium Peers : 10000
AnyConnect Essentials : Disabled
Other VPN Peers : 10000
Total VPN Peers : 10000
AnyConnect for Mobile : Enabled
AnyConnect for Cisco VPN Phone : Enabled
Advanced Endpoint Assessment : Enabled
Shared License : Disabled
Total TLS Proxy Sessions : 10000
Cluster : Disabled

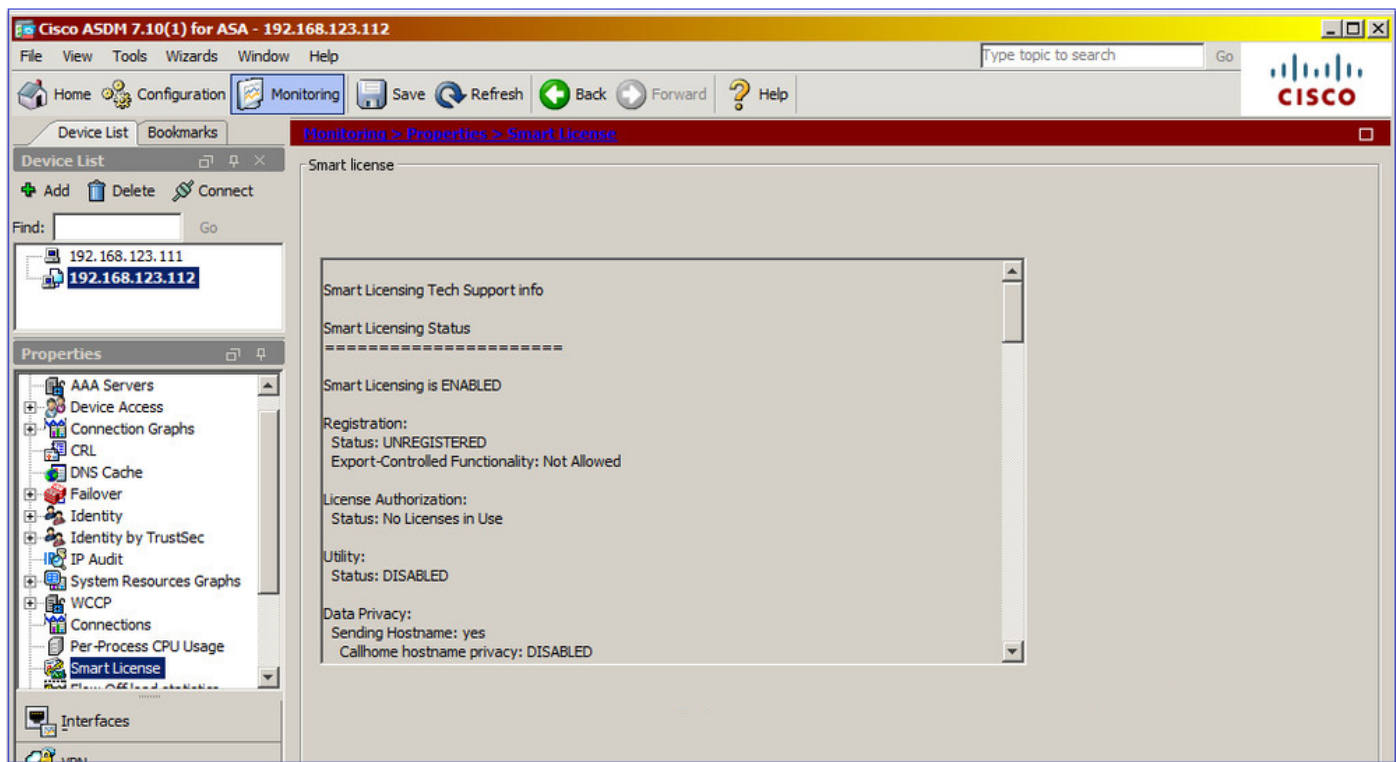
Failover cluster licensed features for this platform:
Maximum Physical Interfaces : Unlimited
Maximum VLANs : 1024
Inside Hosts : Unlimited
Failover : Active/Active
Encryption-DES : Enabled
Encryption-3DES-AES : Enabled
Security Contexts : 4
Carrier : Disabled
AnyConnect Premium Peers : 10000
AnyConnect Essentials : Disabled

Other VPN Peers : 10000
 Total VPN Peers : 10000
 AnyConnect for Mobile : Enabled
 AnyConnect for Cisco VPN Phone : Enabled
 Advanced Endpoint Assessment : Enabled
 Shared License : Disabled
 Total TLS Proxy Sessions : 10000
 Cluster : Disabled

通过ASDM连接到备用ASA (仅当已为ASA配置了备用IP时才可能如此)。备用ASA显示为 UNREGISTERED 这是预期结果，因为它尚未注册到智能许可门户：

The screenshot shows the Cisco ASDM interface for configuration. The left sidebar shows the navigation tree with 'Smart Licensing' selected. The main pane displays the 'Smart Licensing' configuration page. The 'Registration Status' is highlighted as 'UNREGISTERED'. Below this, there are buttons for 'Register', 'Renew ID Certificate', and 'Renew Authorization'. At the bottom, the 'Effective Running Licenses' table is shown.

License Feature	License Value	License Duration
Maximum Physical Interfaces	Unlimited	
Maximum VLANs	1024	
Inside Hosts	Unlimited	
Failover	Active/Active	
Encryption-DES	Enabled	
Encryption-3DES-AES	Enabled	
Security Contexts	4	
Carrier	Disabled	
AnyConnect Premium Peers	10000	
AnyConnect Essentials	Disabled	
Other VPN Peers	10000	
Total VPN Peers	10000	
AnyConnect for Mobile	Enabled	
AnyConnect for Cisco VPN Phone	Enabled	
Advanced Endpoint Assessment	Enabled	



备用ASA CLI显示：

```
ciscoasa/sec/stby# show license all
```

```
Smart Licensing Status
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:
Status: UNREGISTERED
Export-Controlled Functionality: Not Allowed
```

```
License Authorization:
Status: No Licenses in Use
```

```
Utility:
Status: DISABLED
```

```
Data Privacy:
Sending Hostname: yes
Callhome hostname privacy: DISABLED
Smart Licensing hostname privacy: DISABLED
Version privacy: DISABLED
```

```
Transport:
Type: Callhome
```

```
License Usage
=====
```

```
No licenses in use
```

```
Product Information
=====
```

```
UDI: PID:FPR-2140,SN:JAD123456A
```

```
Agent Version
=====
Smart Agent for Licensing: 4.3.6_rel/38
ciscoasa/sec/stby# show run license
license smart
feature tier standard
```

在备用ASA上启用的许可证功能：

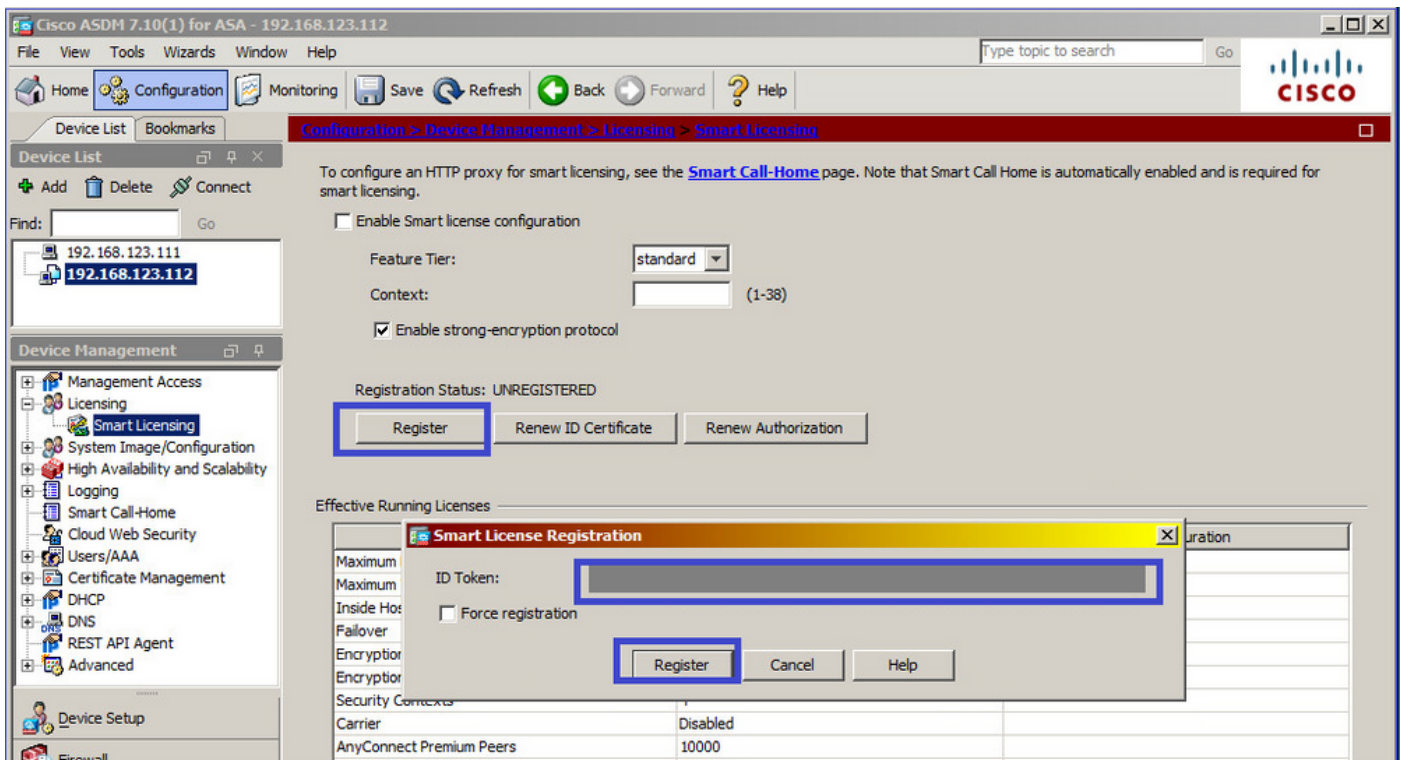
```
ciscoasa/sec/stby# show license features
Serial Number: JAD123456A
Export Compliant: NO
```

License mode: Smart Licensing

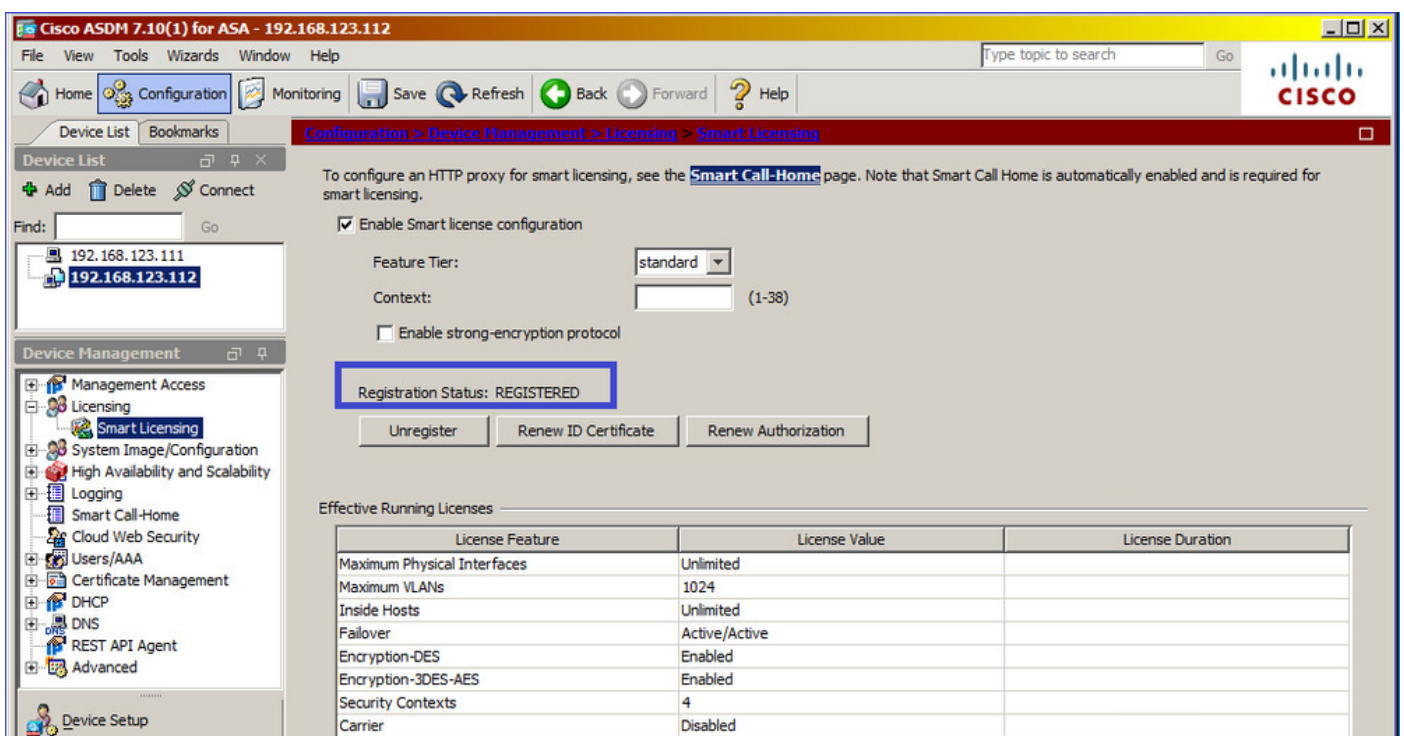
```
Licensed features for this platform:
Maximum Physical Interfaces : Unlimited
Maximum VLANs : 1024
Inside Hosts : Unlimited
Failover : Active/Active
Encryption-DES : Enabled
Encryption-3DES-AES : Disabled
Security Contexts : 2
Carrier : Disabled
AnyConnect Premium Peers : 10000
AnyConnect Essentials : Disabled
Other VPN Peers : 10000
Total VPN Peers : 10000
AnyConnect for Mobile : Enabled
AnyConnect for Cisco VPN Phone : Enabled
Advanced Endpoint Assessment : Enabled
Shared License : Disabled
Total TLS Proxy Sessions : 10000
Cluster : Disabled
```

```
Failover cluster licensed features for this platform:
Maximum Physical Interfaces : Unlimited
Maximum VLANs : 1024
Inside Hosts : Unlimited
Failover : Active/Active
Encryption-DES : Enabled
Encryption-3DES-AES : Enabled
Security Contexts : 4
Carrier : Disabled
AnyConnect Premium Peers : 10000
AnyConnect Essentials : Disabled
Other VPN Peers : 10000
Total VPN Peers : 10000
AnyConnect for Mobile : Enabled
AnyConnect for Cisco VPN Phone : Enabled
Advanced Endpoint Assessment : Enabled
Shared License : Disabled
Total TLS Proxy Sessions : 10000
Cluster : Disabled
```

注册备用ASA:



备用ASA的结果是 REGISTERED:



备用ASA上的CLI验证 :

```
ciscoasa/sec/stby# show license all
```

```
Smart Licensing Status
=====
```

```
Smart Licensing is ENABLED
```

Registration:

Status: REGISTERED
Smart Account: Cisco Systems, Inc.
Virtual Account: NGFW
Export-Controlled Functionality: Allowed
Initial Registration: SUCCEEDED on Nov 25 2020 17:06:51 UTC
Last Renewal Attempt: None
Next Renewal Attempt: May 24 2021 17:06:51 UTC
Registration Expires: Nov 25 2021 17:01:47 UTC

License Authorization:

Status: AUTHORIZED on Nov 25 2020 17:07:28 UTC
Last Communication Attempt: SUCCEEDED on Nov 25 2020 17:07:28 UTC
Next Communication Attempt: Dec 25 2020 17:07:28 UTC
Communication Deadline: Feb 23 2021 17:02:15 UTC

Utility:

Status: DISABLED

Data Privacy:

Sending Hostname: yes
Callhome hostname privacy: DISABLED
Smart Licensing hostname privacy: DISABLED
Version privacy: DISABLED

Transport:

Type: Callhome

License Usage

=====

No licenses in use

Product Information

=====

UDI: PID:FPR-2140,SN:JAD123456AX

Agent Version

=====

Smart Agent for Licensing: 4.3.6_rel/38

ciscoasa/sec/stby# **show license feature**

Serial Number: JAD123456A
Export Compliant: YES

License mode: Smart Licensing

Licensed features for this platform:

Maximum Physical Interfaces : Unlimited
Maximum VLANs : 1024
Inside Hosts : Unlimited
Failover : Active/Active
Encryption-DES : Enabled
Encryption-3DES-AES : Enabled
Security Contexts : 2
Carrier : Disabled
AnyConnect Premium Peers : 10000
AnyConnect Essentials : Disabled
Other VPN Peers : 10000
Total VPN Peers : 10000
AnyConnect for Mobile : Enabled
AnyConnect for Cisco VPN Phone : Enabled
Advanced Endpoint Assessment : Enabled
Shared License : Disabled

Total TLS Proxy Sessions : 10000
Cluster : Disabled

Failover cluster licensed features for this platform:

Maximum Physical Interfaces : Unlimited

Maximum VLANs : 1024

Inside Hosts : Unlimited

Failover : Active/Active

Encryption-DES : Enabled

Encryption-3DES-AES : Enabled

Security Contexts : 4

Carrier : Disabled

AnyConnect Premium Peers : 10000

AnyConnect Essentials : Disabled

Other VPN Peers : 10000

Total VPN Peers : 10000

AnyConnect for Mobile : Enabled

AnyConnect for Cisco VPN Phone : Enabled

Advanced Endpoint Assessment : Enabled

Shared License : Disabled

Total TLS Proxy Sessions : 10000

Cluster : Disabled

ASA集群

如果设备许可证不匹配，则不会形成集群：

```
Cluster unit unit-1-1 transitioned from DISABLED to CONTROL  
New cluster member unit-2-1 rejected due to encryption license mismatch
```

成功的集群设置：

```
asa(config)# cluster group GROUP1  
asa(cfg-cluster)# enable  
Removed all entitlements except per-unit entitlement configuration before joining cluster as data unit.
```

```
Detected Cluster Control Node.  
Beginning configuration replication from Control Node.  
.  
Cryptochecksum (changed): ede485ad d7fb9644 2847deaf ba16830b  
End configuration replication from Control Node.
```

集群控制节点：

```
asa# show cluster info | i state  
This is "unit-1-1" in state CONTROL_NODE  
Unit "unit-2-1" in state DATA_NODE
```

```
asa# show license all
```

```
Smart licensing enabled: Yes
```

Compliance status: In compliance

Overall licensed status: Authorized (3)

Entitlement(s):

Feature tier:

Tag: regid.2015-10.com.cisco.FIREPOWER_4100_ASA_STANDARD,1.0_7d7f5ee2-1398-4b0e-aced-b3f7fb1cacfc

Version: 1.0

Enforcement mode: Authorized

Handle: 2

Requested time: Mon, 10 Aug 2020 08:12:38 UTC

Requested count: 1

Request status: Complete

Serial Number: FCH12345ABC

License mode: Smart Licensing

Licensed features for this platform:

Maximum Physical Interfaces	: Unlimited
Maximum VLANs	: 1024
Inside Hosts	: Unlimited
Failover	: Active/Active
Encryption-DES	: Enabled
Encryption-3DES-AES	: Enabled
Security Contexts	: 10
Carrier	: Disabled
AnyConnect Premium Peers	: 20000
AnyConnect Essentials	: Disabled
Other VPN Peers	: 20000
Total VPN Peers	: 20000
AnyConnect for Mobile	: Enabled
AnyConnect for Cisco VPN Phone	: Enabled
Advanced Endpoint Assessment	: Enabled
Shared License	: Disabled
Total TLS Proxy Sessions	: 15000
Cluster	: Enabled

Failover cluster licensed features for this platform:

Maximum Physical Interfaces	: Unlimited
Maximum VLANs	: 1024
Inside Hosts	: Unlimited
Failover	: Active/Active
Encryption-DES	: Enabled
Encryption-3DES-AES	: Enabled
Security Contexts	: 20
Carrier	: Disabled
AnyConnect Premium Peers	: 20000
AnyConnect Essentials	: Disabled
Other VPN Peers	: 20000
Total VPN Peers	: 20000
AnyConnect for Mobile	: Enabled
AnyConnect for Cisco VPN Phone	: Enabled
Advanced Endpoint Assessment	: Enabled
Shared License	: Disabled
Total TLS Proxy Sessions	: 15000
Cluster	: Enabled

群集数据单元 :

asa# **show cluster info | i state**

This is "unit-2-1" in state DATA_NODE
Unit "unit-1-1" in state CONTROL_NODE

asa# **show license all**

Smart licensing enabled: Yes

Compliance status: In compliance

Overall licensed status: Authorized (3)

Entitlement(s):

Strong encryption:

Tag: regid.2015-10.com.cisco.FIREPOWER_4100_ASA_ENCRYPTION,1.0_052986db-c5ad-40da-97b1-ee0438d3b2c9

Version: 1.0

Enforcement mode: Authorized

Handle: 3

Requested time: Mon, 10 Aug 2020 07:29:45 UTC

Requested count: 1

Request status: Complete

Serial Number: FCH12345A6B

License mode: Smart Licensing

Licensed features for this platform:

Maximum Physical Interfaces	: Unlimited
Maximum VLANs	: 1024
Inside Hosts	: Unlimited
Failover	: Active/Active
Encryption-DES	: Enabled
Encryption-3DES-AES	: Enabled
Security Contexts	: 10
Carrier	: Disabled
AnyConnect Premium Peers	: 20000
AnyConnect Essentials	: Disabled
Other VPN Peers	: 20000
Total VPN Peers	: 20000
AnyConnect for Mobile	: Enabled
AnyConnect for Cisco VPN Phone	: Enabled
Advanced Endpoint Assessment	: Enabled
Shared License	: Disabled
Total TLS Proxy Sessions	: 15000
Cluster	: Enabled

Failover cluster licensed features for this platform:

Maximum Physical Interfaces	: Unlimited
Maximum VLANs	: 1024
Inside Hosts	: Unlimited
Failover	: Active/Active
Encryption-DES	: Enabled
Encryption-3DES-AES	: Enabled
Security Contexts	: 20
Carrier	: Disabled
AnyConnect Premium Peers	: 20000
AnyConnect Essentials	: Disabled
Other VPN Peers	: 20000
Total VPN Peers	: 20000
AnyConnect for Mobile	: Enabled

```
AnyConnect for Cisco VPN Phone      : Enabled
Advanced Endpoint Assessment        : Enabled
Shared License                      : Disabled
Total TLS Proxy Sessions            : 15000
Cluster                             : Enabled
```

验证与调试

机箱(MIO)验证命令摘要：

```
FPR4125# show license all
FPR4125# show license techsupport
FPR4125# scope monitoring
FPR4125 /monitoring # scope callhome
FPR4125 /monitoring/callhome # show expand
FPR4125# scope system
FPR4125 /system # scope services
FPR4125 /system/services # show dns
FPR4125 /system/services # show ntp-server
FPR4125# scope security
FPR4125 /security # show trustpoint
FPR4125# show clock
FPR4125# show timezone
FPR4125# show license usage
```

配置验证：

```
FPR4125-1# scope system
FPR4125-1 /system # scope services
FPR4125-1 /system/services # show configuration
```

ASA验证命令摘要：

```
asa# show run license
asa# show license all
asa# show license entitlement
asa# show license features
asa# show tech-support license
asa# debug license 255
```

机箱(MIO)验证命令的输出示例

```
FPR4125-1# show license all
```

```
Smart Licensing Status
=====
```

```
Smart Licensing is ENABLED
```

Registration:

Status: REGISTERED
Smart Account: TAC Cisco Systems, Inc.
Virtual Account: EU TAC
Export-Controlled Functionality: ALLOWED
Initial Registration: SUCCEEDED on Dec 10 2018 23:30:02 UTC
Last Renewal Attempt: SUCCEEDED on Mar 12 2020 23:16:11 UTC
Next Renewal Attempt: Sep 08 2020 23:16:10 UTC
Registration Expires: Mar 12 2021 23:11:09 UTC

License Authorization:

Status: AUTHORIZED on Aug 04 2020 07:58:46 UTC
Last Communication Attempt: SUCCEEDED on Aug 04 2020 07:58:46 UTC
Next Communication Attempt: Sep 03 2020 07:58:45 UTC
Communication Deadline: Nov 02 2020 07:53:44 UTC

License Conversion:

Automatic Conversion Enabled: True
Status: Not started

Export Authorization Key:

Features Authorized:
<none>

Utility:

Status: DISABLED

Data Privacy:

Sending Hostname: yes
Callhome hostname privacy: DISABLED
Smart Licensing hostname privacy: DISABLED
Version privacy: DISABLED

Transport:

Type: Callhome

License Usage

=====

Firepower 4100 ASA Standard (FIREPOWER_4100_ASA_STANDARD):

Description: Firepower 4100 ASA Standard
Count: 1
Version: 1.0
Status: AUTHORIZED
Export status: NOT RESTRICTED

Product Information

=====

UDI: PID:FPR-4125-SUP,SN:JAD12345678

Agent Version

=====

Smart Agent for Licensing: 4.6.9_rel/104

Reservation Info

=====

License reservation: DISABLED

FPR4125-1# **scope monitoring**

FPR4125-1 /monitoring # **scope callhome**

FPR4125-1 /monitoring/callhome # **show expand**

Callhome:
Admin State: Off
Throttling State: On
Contact Information:
Customer Contact Email:
From Email:
Reply To Email:
Phone Contact e.g., +1-011-408-555-1212:
Street Address:
Contract Id:
Customer Id:
Site Id:
Switch Priority: Debugging
Enable/Disable HTTP/HTTPS Proxy: Off
HTTP/HTTPS Proxy Server Address:
HTTP/HTTPS Proxy Server Port: 80
SMTP Server Address:
SMTP Server Port: 25

Anonymous Reporting:
Admin State

Off

Callhome periodic system inventory:
Send periodically: Off
Interval days: 30
Hour of day to send: 0
Minute of hour: 0
Time last sent: Never
Next scheduled: Never

Destination Profile:
Name: full_txt
Level: Warning
Alert Groups: All,Cisco Tac,Diagnostic,Environmental
Max Size: 5000000
Format: Full Txt
Reporting: Smart Call Home Data

Name: short_txt
Level: Warning
Alert Groups: All,Cisco Tac,Diagnostic,Environmental
Max Size: 5000000
Format: Short Txt
Reporting: Smart Call Home Data

Name: SLProfile
Level: Normal
Alert Groups: Smart License
Max Size: 5000000
Format: Xml
Reporting: Smart License Data

Destination:
Name Transport Protocol Email or HTTP/HTTPS URL Address

SLDest **Https** <https://tools.cisco.com/its/service/oddce/services/DDCEService>

FPR4125-1# **scope system**
FPR4125-1 /system # **scope services**
FPR4125-1 /system/services # **show dns**
Domain Name Servers:

IP Address: 172.16.200.100
FPR4125-1 /system/services # **show ntp-server**

```
NTP server hostname:
  Name
  -----
  10.62.148.75
Server
  172.18.108.14
  172.18.108.15
Time Sync Status
-----
Unreachable Or Invalid Ntp
Time Synchronized
Candidate
```

```
FPR4125-1# scope security
FPR4125-1 /security # show trustpoint
Trustpoint Name: CHdefault
Trustpoint certificate chain: -----BEGIN CERTIFICATE-----
MIIFTzCCA5+gAwIBAgICBQkwDQYJKoZIhvcNAQEFBQAwRTElMAkGA1UEBhMCQk0x
...
8eOx79+Rj1QqCyXBJhnEUhAFZdWCEOrCMc0u
-----END CERTIFICATE-----
Cert Status: Valid
Trustpoint Name: CiscoLicRoot
Trustpoint certificate chain: -----BEGIN CERTIFICATE-----
MIIDITCCAqmgAwIBAgIBATANBgkqhkiG9w0BAQsFADAYMQ4wDAYDVQQKEwVDaXNj
...
QYYWqUCT4ElNEKt1J+hvc5MuNbWlYv2uAnUVb3GbsvDW199/KA==
-----END CERTIFICATE-----
Cert Status: Valid
Trustpoint Name: CSC02099SUDI
Trustpoint certificate chain: -----BEGIN CERTIFICATE-----
MIIDITCCAqmgAwIBAgIJAZozWHjOFsHBMA0GCSqGSIb3DQEBCwUAMC0xDjAMBgNV
...
PKkmBlNQ9hQcNM3CSzVvEAK0CCEo/NJ/xzZ6WX1/f8Df1eXbFg==
-----END CERTIFICATE-----
Cert Status: Valid
Trustpoint Name: CSC0BA2099SUDI
Trustpoint certificate chain: -----BEGIN CERTIFICATE-----
MIIDQTCaimgAwIBAgIJAAZa8V7plOvhMA0GCSqGSIb3DQEBCwUAMD0xDjAMBgNV
...
b/JPEAZkbji0RQTWLyfR82LWFL00
-----END CERTIFICATE-----
Cert Status: Valid
```

```
FPR4125-1# show clock
Tue Aug 4 09:55:50 UTC 2020
FPR4125-1# show timezone
Timezone:
```

```
FPR4125-1# scope system
FPR4125-1 /system # scope services
FPR4125-1 /system/services # show configuration
scope services
  create ssh-server host-key rsa
  delete ssh-server host-key ecdsa
  disable ntp-authentication
  disable telnet-server
  enable https
  enable ssh-server
  enter dns 192.0.2.100
  enter ip-block 0.0.0.0 0 https
  exit
  enter ip-block 0.0.0.0 0 ssh
  exit
  enter ntp-server 10.62.148.75
```

```

        set ntp-sha1-key-id 0
!       set ntp-sha1-key-string
exit
    enter ntp-server 172.18.108.14
        set ntp-sha1-key-id 0
!       set ntp-sha1-key-string
exit
    enter ntp-server 172.18.108.15
        set ntp-sha1-key-id 0
!       set ntp-sha1-key-string
exit
scope shell-session-limits
    set per-user 32
    set total 32
exit
scope telemetry
    disable
exit
scope web-session-limits
    set per-user 32
    set total 256
exit
set domain-name ""
set https auth-type cred-auth
set https cipher-suite "ALL:!DHE-PSK-AES256-CBC-SHA:!EDH-RSA-DES-CBC3-SHA:!
EDH-DSS-DES-CBC3-SHA:!DES-CBC3-
SHA:!ADH:!3DES:!EXPORT40:!EXPORT56:!LOW:!MEDIUM:!NULL:!RC4:!MD5:!IDEA:+HIGH:+EXP"
set https cipher-suite-mode high-strength
set https crl-mode strict
set https keyring default
set https port 443
set ssh-server host-key ecdsa secp256r1
set ssh-server host-key rsa 2048
set ssh-server kex-algorithm diffie-hellman-group14-sha1
set ssh-server mac-algorithm hmac-sha1 hmac-sha2-256 hmac-sha2-512
set ssh-server encrypt-algorithm aes128-cbc aes128-ctr aes192-cbc aes192-ctr aes256-cbc
aes256-ctr chacha20-poly1305_openssh_com
set ssh-server rekey-limit volume none time none
set ssh-client kex-algorithm diffie-hellman-group14-sha1
set ssh-client mac-algorithm hmac-sha1 hmac-sha2-256 hmac-sha2-512
set ssh-client encrypt-algorithm aes128-ctr aes192-ctr aes256-ctr
set ssh-client rekey-limit volume none time none
set ssh-client stricthostkeycheck disable
    set timezone ""
exit

```

FPR4125-1# **show license usage**

License Authorization:

Status: AUTHORIZED on Aug 04 2020 07:58:46 UTC

Firepower 4100 ASA Standard (FIREPOWER_4100_ASA_STANDARD):

Description: Firepower 4100 ASA Standard

Count: 1

Version: 1.0

Status: AUTHORIZED

Export status: NOT RESTRICTED

验证命令的ASA示例输出


```
asa# show run license
license smart
feature tier standard
```

```
asa# show license all
```

```
Smart licensing enabled: Yes
```

```
Compliance status: In compliance
```

```
Overall licensed status: Authorized (3)
```

```
Entitlement(s):
```

```
Feature tier:
```

```
Tag: regid.2015-10.com.cisco.FIREPOWER_4100_ASA_STANDARD,1.0_7d7f5ee2-1398-4b0e-aced-
b3f7fblcacfc
```

```
Version: 1.0
```

```
Enforcement mode: Authorized
```

```
Handle: 1
```

```
Requested time: Tue, 04 Aug 2020 07:58:13 UTC
```

```
Requested count: 1
```

```
Request status: Complete
```

```
Serial Number: FCH12345ABC
```

```
License mode: Smart Licensing
```

```
Licensed features for this platform:
```

Maximum Physical Interfaces	: Unlimited
Maximum VLANs	: 1024
Inside Hosts	: Unlimited
Failover	: Active/Active
Encryption-DES	: Enabled
Encryption-3DES-AES	: Enabled
Security Contexts	: 10
Carrier	: Disabled
AnyConnect Premium Peers	: 20000
AnyConnect Essentials	: Disabled
Other VPN Peers	: 20000
Total VPN Peers	: 20000
AnyConnect for Mobile	: Enabled
AnyConnect for Cisco VPN Phone	: Enabled
Advanced Endpoint Assessment	: Enabled
Shared License	: Disabled
Total TLS Proxy Sessions	: 15000
Cluster	: Enabled

```
asa# show license entitlement
```

```
Entitlement(s):
```

```
Feature tier:
```

```
Tag: regid.2015-10.com.cisco.FIREPOWER_4100_ASA_STANDARD,1.0_7d7f5ee2-1398-4b0e-aced-
b3f7fblcacfc
```

```
Version: 1.0
```

```
Enforcement mode: Authorized
```

```
Handle: 1
```

```
Requested time: Tue, 04 Aug 2020 07:58:13 UTC
```

```
Requested count: 1
```

```
Request status: Complete
```

```
asa# show license features
```

Serial Number: FCH12345ABC

License mode: Smart Licensing

Licensed features for this platform:

Maximum Physical Interfaces	: Unlimited
Maximum VLANs	: 1024
Inside Hosts	: Unlimited
Failover	: Active/Active
Encryption-DES	: Enabled
Encryption-3DES-AES	: Enabled
Security Contexts	: 10
Carrier	: Disabled
AnyConnect Premium Peers	: 20000
AnyConnect Essentials	: Disabled
Other VPN Peers	: 20000
Total VPN Peers	: 20000
AnyConnect for Mobile	: Enabled
AnyConnect for Cisco VPN Phone	: Enabled
Advanced Endpoint Assessment	: Enabled
Shared License	: Disabled
Total TLS Proxy Sessions	: 15000
Cluster	: Enabled

asa# **show tech-support license**

Smart licensing enabled: Yes

Compliance status: In compliance

Overall licensed status: Authorized (3)

Entitlement(s):

Feature tier:

Tag: regid.2015-10.com.cisco.FIREPOWER_4100_ASA_STANDARD,1.0_7d7f5ee2-1398-4b0e-aced-b3f7fblcacfc

Version: 1.0

Enforcement mode: Authorized

Handle: 1

Requested time: Tue, 04 Aug 2020 07:58:13 UTC

Requested count: 1

Request status: Complete

成功注册

输出来自机箱管理器用户界面(UI):

Smart Licensing is ENABLED

Utility:

Status: DISABLED

Data Privacy:

Sending Hostname: yes

Callhome hostname privacy: DISABLED

Smart Licensing hostname privacy: DISABLED

Version privacy: DISABLED

Transport:

Type: Callhome

Registration:

Status: REGISTERED

Smart Account: TAC Cisco Systems, Inc.

Virtual Account: EU TAC

Export-Controlled Functionality: ALLOWED

Initial Registration: SUCCEEDED on Dec 10 2018 23:30:02 UTC

Last Renewal Attempt: SUCCEEDED on Mar 12 2020 23:16:11 UTC

Next Renewal Attempt: Sep 08 2020 23:16:10 UTC

Registration Expires: Mar 12 2021 23:11:09 UTC

License Authorization:

Status: AUTHORIZED on Jul 05 2020 17:49:15 UTC

Last Communication Attempt: SUCCEEDED on Jul 05 2020 17:49:15 UTC

Next Communication Attempt: Aug 04 2020 17:49:14 UTC

Communication Deadline: Oct 03 2020 17:44:13 UTC

License Conversion:

Automatic Conversion Enabled: True

Status: Not started

Export Authorization Key:

Features Authorized:

<none>

Cisco Success Network: DISABLED

过期的授权

输出来自机箱管理器UI:

Smart Licensing is ENABLED

Utility:

Status: DISABLED

Data Privacy:

Sending Hostname: yes

Callhome hostname privacy: DISABLED

Smart Licensing hostname privacy: DISABLED

Version privacy: DISABLED

Transport:

Type: Callhome

Registration:

Status: REGISTERED

Smart Account: Cisco SVS temp - request access through licensing@cisco.com

Virtual Account: Sample Account

Export-Controlled Functionality: ALLOWED

Initial Registration: SUCCEEDED on Nov 22 2019 08:17:30 UTC

Last Renewal Attempt: FAILED on Aug 04 2020 07:32:08 UTC

Failure reason: Agent received a failure status in a response message. Please check the Agent log file for the detailed message.

Next Renewal Attempt: Aug 04 2020 08:33:48 UTC

Registration Expires: Nov 21 2020 08:12:20 UTC

License Authorization:

Status: AUTH EXPIRED on Aug 04 2020 07:10:16 UTC

Last Communication Attempt: FAILED on Aug 04 2020 07:10:16 UTC
Failure reason: Data and signature do not match
Next Communication Attempt: Aug 04 2020 08:10:14 UTC
Communication Deadline: DEADLINE EXCEEDED

License Conversion:
Automatic Conversion Enabled: True
Status: Not started

Export Authorization Key:
Features Authorized:
<none>

Last Configuration Error
=====
Command : register idtoken
ZDA2MjFlODktYjllMS00NjQwLTk0MmUtYmVkyWU2NzIyZjYwLTE1ODIxODY2%0AMzEwODV8K2RWVTNURGFik0tDYUhosjg3bjFsdYtwbU1SUi81N20rQTVPN2lT%0AdEtvYz0%3D%0A
Error : Smart Agent already registered

Cisco Success Network: DISABLED

机箱CLI的输出示例

未注册

```
firepower# show license all
```

```
Smart Licensing Status  
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:  
  Status: UNREGISTERED
```

```
License Authorization:  
  Status: No Licenses in Use
```

```
License Usage  
=====
```

```
No licenses in use
```

```
Product Information  
=====  
UDI: PID:F9K-C9300-SUP-K9,SN:JAD12345678
```

```
Agent Version  
=====  
Smart Agent for Licensing: 1.2.2_throttle/6
```

注册正在进行中

```
firepower# scope license
```

```
firepower /license # register idtoken
```

```
firepower /license # show license all
```

```
Smart Licensing Status  
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:
```

```
Status: UNREGISTERED - REGISTRATION PENDING  
Initial Registration: First Attempt Pending
```

```
License Authorization:
```

```
Status: No Licenses in Use
```

```
License Usage
```

```
=====
```

```
No licenses in use
```

```
Product Information
```

```
=====
```

```
UDI: PID:F9K-C9300-SUP-K9,SN:JAD12345678
```

```
Agent Version
```

```
=====
```

```
Smart Agent for Licensing: 1.2.2_throttle/6
```

注册错误

```
firepower /license # show license all
```

```
Smart Licensing Status  
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:
```

```
Status: UNREGISTERED - REGISTRATION FAILED  
Initial Registration: FAILED on Aug 04 04:46:47 2020 UTC  
Failure reason: HTTP transport failed
```

```
License Authorization:
```

```
Status: No Licenses in Use
```

```
License Usage
```

```
=====
```

```
No licenses in use
```

```
Product Information
```

```
=====
```

```
UDI: PID:F9K-C9300-SUP-K9,SN:JAD12345678
```

```
Agent Version
```

=====

Smart Agent for Licensing: 1.2.2_throttle/6

评估期

```
firepower# show license all
```

Smart Licensing Status

=====

Smart Licensing is ENABLED

Registration:

Status: REGISTERING - REGISTRATION IN PROGRESS

Initial Registration: FAILED on Aug 04 04:46:47 2020 UTC

Next Registration Attempt: Aug 04 05:06:16 2020 UTC

License Authorization:

Status: EVALUATION MODE

Evaluation Period Remaining: 89 days, 14 hours, 26 minutes, 20 seconds

License Usage

=====

(ASA-SSP-STD):

Description:

Count: 1

Version: 1.0

Status: EVALUATION MODE

Product Information

=====

UDI: PID:F9K-C9300-SUP-K9,SN:JAD12345678

Agent Version

=====

Smart Agent for Licensing: 1.2.2_throttle/6

FXOS机箱(MIO)上的常见许可证问题

注册错误：令牌无效

```
FPR4125-1# show license all
```

Smart Licensing Status

=====

Smart Licensing is ENABLED

Registration:

Status: UNREGISTERED - REGISTRATION FAILED

Export-Controlled Functionality: NOT ALLOWED

Initial Registration: FAILED on Aug 07 2020 06:39:24 UTC

Failure reason: {"token":["The token 'ODNmNTExMTAtY2YzOS00Mzc1LWEzNWtYmNiMm

```
UyNzM4ZmFjLTE1OTkxMTkz%0ANDk0NjR8NkJJdWZpQzRDbmtPR0xBWlVpUzZqMjlySn15QUczT2M0YVI  
vcmxm%0ATGczND0%3D%0B' is not valid. " ] }
```

建议步骤

1. 检查call-home URL是否指向CSSM。
2. 登录CSSM并检查令牌是从此处生成还是已过期。

注册错误：产品已注册

```
FPR4125-1# show license all
```

```
Smart Licensing Status  
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:
```

```
Status: UNREGISTERED - REGISTRATION FAILED
```

```
Export-Controlled Functionality: Not Allowed
```

```
Initial Registration: FAILED on Aug 07 01:30:00 2020 UTC
```

```
Failure reason: {"sudi":["The product 'firepower.com.cisco.  
FPR9300,1.0_ed6dadbe-c965-4aeb-ab58-62e34033b453' and sudi {"suvi"=>nil,  
"uid"=>nil, "host_identifier"=>nil, "udi_pid"=>"FPR9K-SUP",  
"udi_serial_number"=>"JAD1234567S", "udi_vid"=>nil, "mac_address"=>nil}  
have already been registered." ] }
```

建议步骤

1. 登录CSSM。
2. 查看 Product Instances 选项卡。
3. 通过SN找到旧的注册实例并将其删除。
4. 此问题可能是由以下两种原因造成的：在时间/日期设置不正确时（例如，未配置NTP服务器）无法自动更新。在卫星和生产服务器之间切换时，操作顺序错误，例如，先更改URL，然后发出“取消注册”命令

注册错误：日期偏移量超出限制

```
FPR4125-1# show license all
```

```
Smart Licensing Status  
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:
```

```
Status: UNREGISTERED - REGISTRATION FAILED
```

```
Export-Controlled Functionality: Not Allowed
```

```
Initial Registration: FAILED on Aug 07 01:30:00 2020 UTC
```

```
Failure reason: {"timestamp":["The device date '1453329321505' is offset beyond the allowed  
tolerance limit." ] }
```

建议步骤

检查时间/日期配置，确保配置了NTP服务器。

注册错误：无法解析主机

```
FPR4125-1# show license all

Smart Licensing Status
=====

Smart Licensing is ENABLED

Registration:
  Status: REGISTERING - REGISTRATION IN PROGRESS
  Export-Controlled Functionality: NOT ALLOWED
  Initial Registration: FAILED on Aug 07 2020 06:58:46 UTC
    Failure reason: Failed to resolve host
  Next Registration Attempt: Aug 07 2020 07:16:42 UTC
Registration Error: Failed to resolve host
```

建议步骤

1. 检查callhome SLDest URL是否正确(scope monitoring > scope callhome > show expand(E))
2. 例如，从CLI检查MIO DNS服务器配置是否正确：

```
FPR4125-1# scope system
FPR4125-1 /system # scope services
FPR4125-1 /system/services # show dns
Domain Name Servers:
  IP Address: 172.31.200.100
```

3. 尝试从机箱CLI ping `tools.cisco.com` 并查看它是否解决：

```
FPR4125-1# connect local-mgmt
FPR4125-1(local-mgmt)# ping tools.cisco.com
```

4. 尝试从机箱CLI ping DNS服务器：

```
FPR4125-1# connect local-mgmt
FPR4125-1(local-mgmt)# ping 172.31.200.100
PING 172.31.200.100 (172.31.200.100) from 10.62.148.225 eth0: 56(84) bytes of data.
^C
--- 172.31.200.100 ping statistics ---
4 packets transmitted, 0 received, 100% packet loss, time 3001ms
```

5. 启用机箱(MIO)管理接口上的捕获（仅适用于FP41xx/FP93xx），并在您对运行ping测试时检查

DNS通信 tools.cisco.com:

```
FPR4125-1# connect fxos
FPR4125-1 (fxos) # ethanalyzer local interface mgmt capture-filter "udp port 53" limit-captured-frames 0 limit-frame-size 10000
Capturing on 'eth0'
  1 2020-08-07 08:10:45.252955552 10.62.148.225 172.31.200.100 DNS 75 Standard query 0x26b4 A
tools.cisco.com
  2 2020-08-07 08:10:47.255015331 10.62.148.225 172.31.200.100 DNS 75 Standard query 0x26b4 A
tools.cisco.com
  3 2020-08-07 08:10:49.257160749 10.62.148.225 172.31.200.100 DNS 75 Standard query 0x5019 A
tools.cisco.com
  4 2020-08-07 08:10:51.259222753 10.62.148.225 172.31.200.100 DNS 75 Standard query 0x5019 A
tools.cisco.com
```

注册错误：无法验证服务器

```
FPR4125-1# show license all

Smart Licensing Status
=====

Smart Licensing is ENABLED

Registration:
Status: UNREGISTERED - REGISTRATION FAILED
Export-Controlled Functionality: Not Allowed
Initial Registration: FAILED on Aug 07 2020 06:58:46 UTC
Failure reason: Failed to authenticate server
```

建议步骤

1.检查MIO信任点CHdefault是否具有正确的证书，例如：

```
FPR4125-1# scope security
FPR4125-1 /security # show trustpoint
Trustpoint Name: CHdefault
Trustpoint certificate chain: -----BEGIN CERTIFICATE-----
MIIFtzCCA5+gAwIBAgICBQkwDQYJKoZIhvcNAQEFBQAwRTElMAkGA1UEBhMCQk0x
...
8e0x79+Rj1QqCyXBJhnEUhAFZdWCEOrCMc0u
-----END CERTIFICATE-----
Cert Status: Valid
```

2.检查NTP服务器和时区是否设置正确。服务器与客户端之间的证书验证需要相同时间。为此，请使用NTP同步时间。例如，FXOS UI验证：

Overview Interfaces Logical Devices Security Engine **Platform Settings**

NTP

- SSH
- SNMP
- HTTPS
- AAA
- Syslog
- DNS
- FIPS and Common Criteria
- Access List
- MAC Pool
- Resource Profiles
- Network Control Policy
- Chassis URL

Time Synchronization Current Time

Set Time Source








Set Time Manually


Date: 08/07/2020 (mm/dd/yyyy)

Time: 8:57 AM (hh:mm)

NTP Server Authentication: Enable

Use NTP Server

NTP Server	Server Status	Actions
172.18.108.15	Candidate	 
172.18.108.14	Synchronized	 
10.62.148.75	Unreachable/Invalid 	 

 Use same settings on Firepower Management Center managing this application in case you are running a Firepower Threat Defense Device.

CLI验证

```
FPR4125-1# scope system
FPR4125-1 /system # scope services
FPR4125-1 /system/services # show ntp-server
```

NTP server hostname:

Name	Time Sync Status
10.62.148.75	Unreachable Or Invalid Ntp Server
172.18.108.14	Time Synchronized
172.18.108.15	Candidate

启用捕获并检查MIO和 tools.cisco.com. 此处您有以下几种选择：

- 您可以关闭到FXOS UI的HTTPS会话，然后在CLI上为HTTPS设置捕获过滤器，例如：

```
FPR4100 (fxos)# ethanalyzer local interface mgmt capture-filter "tcp port 443" limit-captured-frames 50
Capturing on eth0
2017-01-12 13:09:44.296256 10.62.148.37 -> 72.163.4.38 TCP 43278 > https [SYN] Seq=0 Len=0 MSS=1460 TSV=206433871 TSER=0 WS=9
2017-01-12 13:09:44.452405 72.163.4.38 -> 10.62.148.37 TCP https > 43278 [SYN,ACK] Seq=0 Ack=1 Win=32768 Len=0 MSS=1380 TSV=2933962056 TSER=206433871
2017-01-12 13:09:44.452451 10.62.148.37 -> 72.163.4.38 TCP 43278 > https [ACK] Seq=1 Ack=1 Win=5840 Len=0 TSV=206433887 TSER=2933962056
2017-01-12 13:09:44.453219 10.62.148.37 -> 72.163.4.38 SSL Client Hello
2017-01-12 13:09:44.609171 72.163.4.38 -> 10.62.148.37 TCP https > 43278 [ACK] Seq=1 Ack=518 Win=32251 Len=0 TSV=2933962263 TSER=206433887
2017-01-12 13:09:44.609573 72.163.4.38 -> 10.62.148.37 SSL Continuation Data
2017-01-12 13:09:44.609595 10.62.148.37 -> 72.163.4.38 TCP 43278 > https [ACK] Seq=518 Ack=1369 Win=8208 Len=0 TSV=206433902 TSER=2933962264
```

```
2017-01-12 13:09:44.609599 72.163.4.38 -> 10.62.148.37 SSL Continuation Data
2017-01-12 13:09:44.609610 10.62.148.37 -> 72.163.4.38 TCP 43278 > https [ACK] Seq=518 Ack=2737
Win=10944 Len=0 TSV=206433902 TSER=2933962264
```

- 此外，如果保持FXOS UI打开，可以在捕获中指定目标IP(72.163.4.38和173.37.145.8是tools.cisco.com 服务器)。强烈建议以pcap格式保存捕获并在Wireshark中进行检查。以下是成功注册的示例：

```
FPR4125-1(fxos)# ethalyzer local interface mgmt capture-filter "tcp port 443 and (host
72.163.4.38 or host 173.37.145.8)" limit-captured-frames 0 limit-frame-size 10000 write
workspace:///SSL.pcap
Capturing on 'eth0'
  1 2020-08-07 08:39:02.515693672 10.62.148.225 173.37.145.8 TCP 74 59818 443 [SYN] Seq=0
Win=29200 Len=0 MSS=1460 SACK_PERM=1 TSval=800212367 TSecr=0 WS=512
  2 2020-08-07 08:39:02.684723361 173.37.145.8 10.62.148.225 TCP 60 443 59818 [SYN, ACK]
Seq=0 Ack=1 Win=8190 Len=0 MSS=1330
  3 2020-08-07 08:39:02.684825625 10.62.148.225 173.37.145.8 TCP 54 59818 443 [ACK] Seq=1
Ack=1 Win=29200 Len=0
  4 2020-08-07 08:39:02.685182942 10.62.148.225 173.37.145.8 TLSv1 571 Client Hello
...
 11 2020-08-07 08:39:02.854525349 10.62.148.225 173.37.145.8 TCP 54 59818 443 [ACK] Seq=518
Ack=3991 Win=37240 Len=0
```

- 将pcap文件导出到远程FTP服务器的步骤：

```
FPR4125-1# connect local-mgmt
FPR4125-1(local-mgmt)# dir
1 56936 Aug 07 08:39:35 2020 SSL.pcap
1 29 May 06 17:48:02 2020 blade_debug_plugin
1 19 May 06 17:48:02 2020 bladelog
1 16 Dec 07 17:24:43 2018 cores
2 4096 Dec 07 17:28:46 2018 debug_plugin/
1 31 Dec 07 17:24:43 2018 diagnostics
2 4096 Dec 07 17:22:28 2018 lost+found/
1 25 Dec 07 17:24:31 2018 packet-capture
2 4096 Sep 24 07:05:40 2019 techsupport/

Usage for workspace://
3999125504 bytes total
284364800 bytes used
3509907456 bytes free
FPR4125-1(local-mgmt)# copy workspace:///SSL.pcap ftp://ftp_user@10.62.148.41/SSL.pcap
Password:
FPR4125-1(local-mgmt)#
```

No.	Time	Source	Destination	Protocol	Length	Server Name	Info
4	2020-08-07 10:39:02.68...	10.62.148.225	173.37.145.8	TLSv1_	571	tools.cisco.com	Client Hello
13	2020-08-07 10:39:03.02...	173.37.145.8	10.62.148.225	TLSv1_	78		Server Hello, Certificate, Server Hello Done
15	2020-08-07 10:39:03.02...	10.62.148.225	173.37.145.8	TLSv1_	372		Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
18	2020-08-07 10:39:03.19...	173.37.145.8	10.62.148.225	TLSv1_	99		Encrypted Handshake Message
43	2020-08-07 10:39:11.20...	10.62.148.225	173.37.145.8	TLSv1_	571	tools.cisco.com	Client Hello
52	2020-08-07 10:39:11.54...	173.37.145.8	10.62.148.225	TLSv1_	78		Server Hello, Certificate, Server Hello Done
54	2020-08-07 10:39:11.55...	10.62.148.225	173.37.145.8	TLSv1_	372		Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
57	2020-08-07 10:39:11.72...	173.37.145.8	10.62.148.225	TLSv1_	99		Encrypted Handshake Message
80	2020-08-07 10:39:14.51...	10.62.148.225	72.163.4.38	TLSv1_	571	tools.cisco.com	Client Hello
89	2020-08-07 10:39:14.83...	72.163.4.38	10.62.148.225	TLSv1_	78		Server Hello, Certificate, Server Hello Done
91	2020-08-07 10:39:14.84...	10.62.148.225	72.163.4.38	TLSv1_	372		Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
94	2020-08-07 10:39:15.00...	72.163.4.38	10.62.148.225	TLSv1_	99		Encrypted Handshake Message

注册错误：HTTP传输失败

```
FPR4125-1# show license all
```

```
Smart Licensing Status
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:
```

```
Status: UNREGISTERED - REGISTRATION FAILED
Export-Controlled Functionality: Not Allowed
Initial Registration: FAILED on Aug 07 2020 06:58:46 UTC
Failure reason: HTTP transport failed
```

建议步骤

1. 检查call-home URL是否正确。您可以从FXOS UI或CLI(scope monitoring > show callhome detail expand)影响。
2. 启用捕获并检查MIO和 tools.cisco.com 如本文档的“验证服务器失败”部分所示。

注册错误：无法连接到主机

```
FPR4125-1# show license all
```

```
Smart Licensing Status
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:
```

```
Status: UNREGISTERED - REGISTRATION FAILED
Export-Controlled Functionality: Not Allowed
Initial Registration: FAILED on Aug 07 2020 06:58:46 UTC
Failure reason: Couldn't connect to host
```

建议步骤

1. 如果启用代理配置，请检查代理URL和端口是否配置正确。

2. 启用捕获并检查MIO和 tools.cisco.com 如本文档的“验证服务器失败”部分所示。

注册错误：HTTP服务器返回错误代码>= 400

```
FPR4125-1# show license all
```

```
Smart Licensing Status  
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:
```

```
Status: UNREGISTERED - REGISTRATION FAILED
```

```
Export-Controlled Functionality: Not Allowed
```

```
Initial Registration: FAILED on Aug 07 2020 06:58:46 UTC
```

```
Failure reason: HTTP server returns error code >= 400. Contact proxy server admin if proxy configuration is enabled
```

建议步骤

1. 如果启用代理配置，请联系代理服务器管理员了解代理设置。
2. 启用捕获并检查MIO和 tools.cisco.com 如本文档的“验证服务器失败”部分所示。尝试从FXOS CLI重新注册（“force”选项）：

```
FPR4125-1 /license # register idtoken
```

```
ODNmNTExMTAtY2YzOS00Mzc1LWEzNWmtYmNiMmUyNzM4ZmFjLTE1OTkxMTkz%0ANDk0NjR8NkJJdWZpQzRDbmtPR0xBW1VpU  
zZqMjlySn15QUczT2M0YVIVcmxm%0ATGczND0%3D%0A force
```

注册错误：分析后端响应消息失败

```
FPR4125-1# show license all
```

```
Smart Licensing Status  
=====
```

```
Smart Licensing is ENABLED
```

```
Registration:
```

```
Status: UNREGISTERED - REGISTRATION FAILED
```

```
Export-Controlled Functionality: Not Allowed
```

```
Initial Registration: FAILED on Aug 07 2020 06:58:46 UTC
```

```
Failure reason: Parsing backend response message failed
```

建议步骤

1. 稍后自动重试尝试。请使用“renew”立即重试。

```
FPR4125-1# scope license
FPR4125-1 /license # scope licdebug
FPR4125-1 /license/licdebug # renew
```

2.检查call-home URL是否正确。

ASA - 1xxx/21xx系列的许可证问题

注册错误：通信消息发送错误

```
ciscoasa# show license all

Smart Licensing Status
=====

Smart Licensing is ENABLED

Registration:
Status: REGISTERING - REGISTRATION IN PROGRESS
Export-Controlled Functionality: NOT ALLOWED
Initial Registration: FAILED on Aug 07 2020 11:29:42 UTC
Failure reason: Communication message send error
Next Registration Attempt: Aug 07 2020 11:46:13 UTC
```

建议步骤

1.检查DNS设置

```
ciscoasa# show run dns
```

2.尝试ping tools.cisco.com.在本例中，使用管理接口：

```
ciscoasa# ping management tools.cisco.com
      ^
ERROR: % Invalid Hostname
```

3.检查路由表：

```
ciscoasa# show route management-only
```

确保已启用许可证，例如：

```
ciscoasa# show run license
license smart
feature tier standard
```

```
feature strong-encryption
```

4.在路由到路由器的接口上启用捕获 `tools.cisco.com` (如果捕获时没有任何IP过滤器 , 请确保在进行捕获时没有打开ASDM , 以避免不必要的捕获噪音)。

```
ciscoasa# capture CAP interface management match tcp any any eq 443
```

警告 : 数据包捕获可能会对性能产生负面影响。

5.在注册过程中临时启用系统日志级别7 (调试) 并检查ASA系统日志消息 :

```
ciscoasa(config)# logging buffer-size 10000000
ciscoasa(config)# logging buffered 7
ciscoasa(config)# logging enable
ciscoasa# show logging
%ASA-7-717025: Validating certificate chain containing 3 certificate(s).
%ASA-7-717029: Identified client certificate within certificate chain. serial number:
3000683B0F7504F7B244B3EA7FC00927E960D735, subject name: CN=tools.cisco.com,O=Cisco Systems\,
Inc.,L=San Jose,ST=CA,C=US.
%ASA-7-717030: Found a suitable trustpoint _SmartCallHome_ServerCA to validate certificate.
%ASA-6-717028: Certificate chain was successfully validated with warning, revocation status was
not checked.
%ASA-6-717022: Certificate was successfully validated. serial number:
3000683B0F7504F7B244B3EA7FC00927E960D735, subject name: CN=tools.cisco.com,O=Cisco Systems\,
Inc.,L=San Jose,ST=CA,C=US.
%ASA-6-725002: Device completed SSL handshake with server management:10.62.148.184/22258 to
173.37.145.8/443 for TLSv1.2 session
```

尝试重新注册 :

```
ciscoasa # license smart register idtoken
```

附加权利的特殊要求

- 在配置任何附加授权之前 , 需要获取有效的功能层授权
- 在释放功能层授权之前 , 需要释放所有附加授权

重新启动操作期间的授权状态

- 权限状态保存在闪存中
- 在启动期间 , 将从闪存中读取此信息 , 并根据保存的实施模式设置许可证
- 启动配置基于此缓存的授权信息应用
- 每次重新启动后都会再次请求授权

联系Cisco TAC支持

FP41xx/FP9300

如果本文档中提到的所有项目均失败，请从机箱CLI收集这些输出并联系思科TAC:

输出1:

```
FPR4125-1# show license techsupport
```

输出2:

```
FPR4125-1# scope monitoring
FPR4125-1 /monitoring # scope callhome
FPR4125-1 /monitoring/callhome # show detail expand
```

输出3:

FXOS机箱支持套件

```
FPR4125-1# connect local-mgmt
FPR4125-1(local-mgmt)# show tech-support chassis 1 detail
```

输出4 (强烈推荐) :

从机箱CLI捕获Ethanalyzer

FP1xxx/FP21xx

输出1:

```
ciscoasa# show tech-support license
```

输出2:

```
ciscoasa# connect fxos admin
firepower-2140# connect local-mgmt
firepower-2140(local-mgmt)# show tech-support fprm detail
```

常见问题(FAQ)

在FP21xx上，机箱(FCM)GUI上的Licensing选项卡位于何处？

从9.13.x开始，FP21xx支持2个ASA模式：

- 设备
- Platform

在设备模式下，没有机箱UI。在平台模式下，有一个机箱UI，但从ASA CLI或ASDM配置许可证。另一方面，在FPR4100/9300平台上，必须在FCM中通过GUI或FXOS CLI配置许可证，并且必须从ASA CLI或ASDM请求ASA授权。

参考资料:

- [ASA许可证管理](#)
- [Firepower 4100/9300的逻辑设备](#)
- [许可证：智能软件许可 \(ASA、Firepower上的ASA\)](#)
- [使用ASDM和Firepower机箱管理器的ASA平台模式部署](#)

如何启用强加密许可证？

如果FCM注册中使用的令牌具有启用此令牌后注册的产品允许导出控制功能的选项，则此功能将自动启用。

如果在FCM级别上的导出控制功能和ASA级别上的相关Encryption-3DES-AES被禁用，如何启用强加密许可证？

如果令牌未启用此选项，请取消注册FCM并使用启用此选项的令牌再次注册它。

如果生成令牌时，使用此令牌注册的产品上的“允许导出控制功能”选项不可用，您能做什么？

请与您的思科客户团队联系。

是否必须在ASA级别配置强加密功能？

仅当FCM与2.3.0之前的卫星服务器集成时，功能强加密选项才是必需的。只有当您必须配置此功能时，才会出现这种情况。

在FCM和智能许可云之间的路径中必须允许哪些IP？

FXOS使用地址<https://tools.cisco.com/> (端口443) 与许可云通信。地址<https://tools.cisco.com/>被解析为以下IP地址：

- 72.163.4.38
- 173.37.145.8

为什么会出现“Out of Compliance”错误？

在以下情况下，设备可能会不合规：

- 过度使用 (设备使用不可用的许可证)
- 许可证过期 — 基于时间的许可证已过期
- 缺少通信 — 设备无法联系许可机构进行重新授权

要验证您的帐户是否处于或接近不合规状态，必须将Firepower机箱当前使用的授权与智能帐户中的授权进行比较。

在不合规状态下，可以对需要特殊许可证的功能进行配置更改，但操作不会受到影响。例如，超过标准许可证限制后，已经存在的情景继续运行，您可以修改其配置，但无法添加新情景。

为什么添加许可证后仍然出现“Out of Compliance (合规性)”错误？

默认情况下，设备每30天与许可证颁发机构进行通信以检查授权。如果要手动触发它，必须执行以下步骤：

对于FPR1000/2100平台，必须通过ASDM或CLI完成：

```
ASA# license smart renew auth
```

对于FPR4100/9300平台，必须通过FXOS CLI完成：

```
FP4100# scope system
FP4100 /system # scope license
FP4100 /license # scope licdebug
FP4100 /license/licdebug # renew
```

为什么没有在ASA级别使用许可证？

确保在ASA级别上配置了ASA授权，例如：

```
ASA(config)# license smart
ASA(config-smart-lic)# feature tier standard
```

为什么即使在配置ASA授权后，许可证仍然未使用？

如果您部署了ASA主用/备用故障转移对并检查了备用设备上的许可证使用情况，则此状态为预期状态。

根据《配置指南》，配置会复制到备用设备，但备用设备不使用配置；它保持缓存状态。只有主用设备会向服务器请求许可证。许可证会汇聚到由故障转移对共享的单个故障转移许可证中，并且此汇聚许可证也缓存在备用设备上，以便将来成为主用设备时使用。仅供参考：[故障切换或ASA集群许可证](#)。

如果FCM无法访问Internet，您可以做什么？

您也可以选择内部部署思科智能软件管理器（以前称为思科智能软件管理器卫星）。这是思科智能许可的一个组件，可与思科智能软件管理器配合使用。它为您购买和使用的思科许可证提供接近实时的可视性和报告功能。它还安全敏感型组织提供了一种访问思科SSM功能子集的方法，而无需使用直接互联网连接来管理其客户群。

在哪里可以找到有关思科内部智能软件管理器的详细信息？

您可以在FXOS配置指南中找到此信息：

- [为Firepower 4100/9300机箱配置智能许可证卫星服务器](#)
- [将Firepower机箱管理器注册配置为本地智能软件管理器](#)

相关信息

- [Cisco ASA系列常规操作CLI配置指南](#)
- [ASA许可证管理](#)
- [技术支持和文档 - Cisco Systems](#)

关于此翻译

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请注意：即使是最好的机器翻译，其准确度也不及专业翻译人员的水平。

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