确定由于证书问题导致的ASA智能许可故障

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简介

本文档介绍如何确定由于证书握手失败导致的ASA智能许可故障。

先决条件

要求

本文档没有任何特定的要求。

使用的组件

本文档不限于特定的软件和硬件版本。

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。

背景信息

本文档介绍如何应对2016年3月和2018年10月发生的更改，在这些更改中，主机tools.cisco.com的Web服务器被迁移到不同的根证书颁发机构(CA)证书。迁移后，某些ASA（自适应安全设备）设备在注册ID令牌或尝试更新当前授权时无法连接到智能软件许可门户(托管在tools.cisco.com上)。这被确定为与证书相关的问题。具体而言，提交给ASA的新证书由不同于ASA预期并预加载的中间CA进行签名。

问题

尝试向智能软件许可门户注册ASAv时，注册失败，出现连接或通信故障。show license registration和call-home test profile license命令显示这些输出。

<#root>

ASAv#

show license registration

        Registration Status: Retry In Progress.
        Registration Start Time: Mar 22 13:25:46 2016 UTC
        Registration Status: Retry In Progress.
        Registration Start Time: Mar 22 13:25:46 2016 UTC
        Last Retry Start Time: Mar 22 13:26:32 2016 UTC.
        Next Scheduled Retry Time: Mar 22 13:45:31 2016 UTC.
        Number of Retries: 1.
        Last License Server response time: Mar 22 13:26:32 2016 UTC.
        Last License Server response message:

Communication message send response error

<#root>

ASAv#

call-home test profile License

INFO: Sending test message to DDCEService
ERROR: Failed:

CONNECT_FAILED(35)

但是，ASAv可以解析tools.cisco.com并通过TCP ping在TCP端口443上连接。

系统日志和调试输出

尝试注册后ASAv上的Syslog输出可显示以下内容：

<#root>

%ASA-3-717009: Certificate validation failed. No suitable trustpoints found to validate
 certificate serial number: 250CE8E030612E9F2B89F7058FD, subject name:
 cn=VeriSign Class 3 Public Primary Certification Authority - G5,ou=(c) 2006 VeriSign\, Inc.
 - For authorized use only,ou=VeriSign Trust Network,o=VeriSign\, Inc.,c=US, issuer name:
 ou=Class 3 Public Primary Certification Authority,o=VeriSign\, Inc.,c=US .
%ASA-3-717009: Certificate validation failed. No suitable trustpoints found to validate
 certificate serial number: 513FB9743870B73440418699FF, subject name:

 cn=Symantec Class 3 Secure Server CA - G4

,ou=Symantec Trust Network,o=Symantec

Corporation,c=US, issuer name: cn=VeriSign Class 3 Public Primary Certification Authority
- G5,ou=(c) 2006 VeriSign\, Inc. - For authorized use only,ou=VeriSign Trust Network,
o=VeriSign\, Inc.,c=US .

有关详细信息，请在尝试其他注册时运行这些debug命令。发现安全套接字层错误。

```
debug license 255
debug license agent all
debug call-home all
debug ssl 255
```

具体而言，此消息被视为输出的一部分：

```
error:14090086:SSL routines:SSL3_GET_SERVER_CERTIFICATE:certificate verify
 failed@s3_clnt.c:1492
```

在默认ASAv配置中，有一个名为_SmartCallHome_ServerCA的信任点，该信任点已加载证书并颁发给使用者名称"cn=Verisign Class 3 Secure Server CA - G3"。

<#root>

ASAv#

show crypto ca certificate

```
CA Certificate
  Status: Available
  Certificate Serial Number: 6ecc7aa5a7032009b8cebc2d491
  Certificate Usage: General Purpose
  Public Key Type: RSA (2048 bits)
  Signature Algorithm: SHA1 with RSA Encryption
  Issuer Name:
    cn=VeriSign Class 3 Public Primary Certification Authority - G5
    ou=(c) 2006 VeriSign\, Inc. - For authorized use only
    ou=VeriSign Trust Network
    o=VeriSign\, Inc.
    c=US
  Subject Name:

    cn=VeriSign Class 3 Secure Server CA - G3

    ou=Terms of use at https:// verisign /rpa (c)10
    ou=VeriSign Trust Network
    o=VeriSign\, Inc.
    c=US
  OCSP AIA:
    URL: http://ocsp verisign
  CRL Distribution Points:
    [1]  http://crl verisign/pca3-g5.crl
  Validity Date:
```

```
    start date: 00:00:00 UTC Feb 8 2010
    end   date: 23:59:59 UTC Feb 7 2020
  Associated Trustpoints: _SmartCallHome_ServerCA
```

但是，在前面的系统日志中，ASA指示它从智能软件许可门户获取由中间版本"cn=Symantec Class 3 Secure Server CA - G4"签署的证书。

✎ 注：主题名称相似，但有两个差异；Verisign与Symantec位于开头，G3与G4位于结尾。

解决方案

ASAv需要下载包含正确中间和/或根证书的信任池以验证链。

在版本9.5.2及更高版本中，ASAv将信任池配置为在设备本地时间10:00 PM自动导入：

<#root>

ASAv#

sh run crypto ca trustpool

```
crypto ca trustpool policy
 auto-import
```
ASAv#

 sh run all crypto ca trustpool

```
crypto ca trustpool policy
 revocation-check none
 crl cache-time 60
 crl enforcenextupdate
 auto-import
 auto-import url http://www.cisco.com/security/pki/trs/ios_core.p7b
 auto-import time 22:00:00
```

如果是初始安装，并且域名系统(DNS)查找和Internet连接尚未启动，则自动导入尚未成功，需要手动完成。

在较早版本（如9.4.x）上，设备上未配置trustpool auto-import，需要手动导入。

在任何版本上，此命令导入trustpool和相关证书：

<#root>

ASAv#

crypto ca trustpool import url http://www.cisco.com/security/pki/trs/ios_core.p7b

Root file signature verified.

```
You are about to update the current trusted certificate pool
with the 17145 byte file at http://www.cisco.com/security/pki/trs/ios_core.p7b
Do you want to continue? (y/n)
Trustpool import:
    attempted:  14
    installed:  14
    duplicates: 0
    expired:    0
    failed:     0
```

验证

通过手动命令或本地时间晚上10:00之后导入信任池后，此命令将验证信任池中是否安装了证书：

<#root>

ASAv#

```
show crypto ca trustpool policy
14 trustpool certificates installed

Trustpool auto import statistics:
    Last import result: FAILED
    Next scheduled import at 22:00:00 UTC Wed Mar 23 2016
Trustpool Policy
    Trustpool revocation checking is disabled
    CRL cache time: 60 seconds
    CRL next update field: required and enforced
    Automatic import of trustpool certificates is enabled
    Automatic import URL: http://www.cisco.com/security/pki/trs/ios_core.p7b
    Download time: 22:00:00
    Policy Overrides:
        None configured
```

注：在上一输出中，由于DNS在上次自动尝试时未运行，上次自动更新导入失败，因此它仍将上次自动导入结果显示为失败。但是，运行了手动trustpool更新，并且成功更新了trustpool（因此显示安装了14个证书）。

安装trustpool后，可以再次运行token registration命令以向智能软件许可门户注册ASAv。

<#root>

ASAv#

```
license smart register idtoken id_token force
```

如果ASAv已注册到智能软件许可门户，但授权续订失败，也可以手动尝试这些操作。

```
<#root>

ASAv#

license smart renew auth
```

根CA证书更改 — 2018年10月

tools.cisco.com的根CA证书已于2018年10月5日（星期五）更改。

如果不允许与http://www.cisco.com/security/pki/trs/ios_core.p7b通信，则当前部署的ASAv版本9.6(2)及更高版本以及运行ASA的Firepower 2100不会受到此更改的影响。 默认情况下在前面提到的所有ASA智能许可平台上启用证书自动导入功能。 "show crypto ca trustpool"的输出包含"QuoVadis Root CA 2"证书：

```
CA Certificate
  Fingerprint: 5e397bddf8baec82e9ac62ba0c54002b
  Issuer Name:
    cn=QuoVadis Root CA 2
    o=QuoVadis Limited
    c=BM
  Subject Name:
    cn=QuoVadis Root CA 2
    o=QuoVadis Limited
    c=BM
```

对于新部署，您可以发出"crypto ca trustpool import default"命令并下载包含QuoVadis证书的默认思科证书捆绑包。 如果不起作用，您可以手动安装证书：

```
asa(config)# crypto ca trustpoint QuoVadisRootCA2
asa(config-ca-trustpoint)# enrollment terminal
asa(config-ca-trustpoint)# crl configure
asav(config-ca-crl)# crypto ca authenticate QuoVadisRootCA2
Enter the base 64 encoded CA certificate.
End with the word "quit" on a line by itself

-----BEGIN CERTIFICATE-----
MIIFtzCCA5+gAwIBAgICBQkwDQYJKoZIhvcNAQEFBQAwRTELMAkGA1UEBhMCQkOx
GTAXBgNVBAoTEFF1b1ZhZGlzIExpbWl0ZWQxGzAZBgNVBAMTElF1b1ZhZGlzIFJv
b3QgQ0EgMjAeFw0wNjExMjQxODI3MDBaFw0zMTExMjQxODIzMzNaMEUxCzAJBgNV
BAYTAkJNMRkwFwYDVQQKExBRdW9WYWRpcyBMaW1pdGVkMRswGQYDVQQDExJRdW9W
YWRpcyBSb290IENBIDIwggIiMA0GCSqGSIb3DQEBAQUAA4ICDwAwggIKAoICAQCa
GMpLlA0ALa8DKYrwD4HIrkwZhR0In6spRIXzL4GtMh6QRr+jhiYaHv5+HBg6XJxg
Fyo6dIMzMH1hVBHL7avg5tKifvVrbxi3Cgst/ek+7wrGsxDp3MJGF/hd/aTa/55J
WpzmM+Yklvc/ulsrHHo1wtZn/qtmUIttKGAr79dgw8eTvI02kfN/+NsRE8Scd3bB
rrcCaoF6qUWD4gXmuVbBlDePSHFjIuwXZQeVikvfj8ZaCuWw419eaxGrDPmF60Tp
+ARz8un+XJiM9XOva7R+zdRcAitMOeGylZUtQofX1bOQQ7dsE/He3fbE+Ik/0XX1
ksOR1YqIOJDs3G3eicJlcZaLDQP9nL9bFqyS2+r+eXyt66/3FsvbzSUr5R/7mp/i
Ucw6UwxI5g69ybR2BlLmEROFcmMDBOAENisgGQLodKcftslWZvB1JdxnwQ5hYIiz
PtGo/KPaHbDRsSNU30R2be1B2MGyIrZTHN81Hdyhdyox5C315eXbyOD/5YDXC2Og
/zOhD7osFRXql7PSorW+8oyWHhqPHWykYTe5hnMz15eWniN9gqRMgeKh0bpnX5UH
```

oycR7hYQe7xFSkyyBNKr79X9DFHOUGoIMfmR2gyPZFwDwzqLID9ujWc9Otb+fVuI
yV77zGHcizN3OOQyNQliBJIWENieJ0f7OyHj+OsdWwIDAQABo4GwMIGtMA8GA1Ud
EwEB/wQFMAMBAf8wCwYDVR0PBAQDAgEGMB0GA1UdDgQWBBQahGK8SEwzJQTU7tD2
A8QZRtGUazBuBgNVHSMEZzBlgBQahGK8SEwzJQTU7tD2A8QZRtGUa6FJpEcwRTEL
MAkGA1UEBhMCQk0xGTAXBgNVBAoTEFF1b1ZhZGlzIExpbWl0ZWQxGzAZBgNVBAMT
ElF1b1ZhZGlzIFJvb3QgQ0EgMoICBQkwDQYJKoZIhvcNAQEFBQADggIBAD4KFk2f
BluornFdLwUvZ+YTRYPENvbzwCYMDbVHZF34tHLJRqUDGCdViXh9duqWNIAXINzn
g/iN/Ae42l9NLmeyhP3ZRPx3UIHmfLTJDQtyU/h2BwdBR5YM++CCJpNVjP4iH2Bl
fF/nJrP3MpCYUNQ3cVX2kiF495V5+vgtJodmVjB3pjd4M1IQWK4/YY7yarHvGH5K
WWPKjaJW1acvvFYfzznB4vsKqBUsfU16Y8Zsl0Q80m/DShcK+JDSV6IZUaUtlOHa
B0+pUNqQjZRG4T7wlP0QADj1O+hA4bRuVhogzG9Yje0uRY/W6ZM/57Es3zrWIozc
hLsib9D45MY56QSIPMO661V6bYCZJPVsAfv4l7CUW+v9Om/xd2gNNWQjrLhVoQPR
TUIZ3Ph1WVaj+ahJefivDrkRoHy3au0OOLYmYjgahwz46P0u05B/B5EqHdZ+XIWD
mbA4CD/pXvk1B+TJYm5Xf6dQlfe6yJvmjqIBxdZmv3lh8zwc4bmCXF2gw+nYSL0Z
ohEUGW6yhhtoPkg3Goi3XZZenMfvJ2II4pEZXNLxId26F0KCl3GBUzGpn/Z9Yr9y
4aOTHcyKJloJOND01w2AFrR4pTqHTI2KpdVGl/IsELm8VCLAAVBpQ570su9t+Oza
8eOx79+Rj1QqCyXBJhnEUhAFZdWCE0rCMc0u
-----END CERTIFICATE-----

quit

INFO: Certificate has the following attributes:
Fingerprint: 5e397bdd f8baec82 e9ac62ba 0c54002b
Do you accept this certificate? [yes/no]: yes

Trustpoint CA certificate accepted.

% Certificate successfully imported

运行ASA的4100/9300平台

此问题影响现场运行依赖Firepower可扩展操作系统(FXOS)提供智能许可信息的ASA的大约4100/9300:

受影响的设备：

<#root>

FP9300-1-A-A-A /license # show license all

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

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: TAC Cisco Systems, Inc.
  Virtual Account: CALO
  Export-Controlled Functionality: Allowed
  Initial Registration: SUCCEEDED on Jul 01 18:37:38 2018 UTC
  Last Renewal Attempt: FAILED on Oct 09 17:32:59 2018 UTC

    Failure reason: Failed to authenticate server

解决步骤

要解决此问题，您需要创建新的信任点并在FXOS中输入证书数据：

```
<#root>

FPR-2-A /license # scope security
FPR-2-A /security # enter trustpoint QuoVadisRootCA2
FPR-2-A /security/trustpoint* # set certchain
Enter lines one at a time. Enter ENDOFBUF to finish. Press ^C to abort.
Trustpoint Certificate Chain:    (THIS PART NEEDS TO BE COPY/PASTED)
>
-----BEGIN CERTIFICATE-----
MIIFtzCCA5+gAwIBAgICBQkwDQYJKoZIhvcNAQEFBQAwRTELMAkGA1UEBhMCQkOx
GTAXBgNVBAoTEFF1b1ZhZGlzIExpbWl0ZWQxGzAZBgNVBAMTElF1b1ZhZGlzIFJv
b3QgQ0EgMjAeFw0wNjExMjQxODI3MDBaFw0zMTExMjQxODIzMzNaMEUxCzAJBgNV
BAYTAkJNMRkwFwYDVQQKExBRdW9WYWRpcyBMaW1pdGVkMRswGQYDVQQDExJRdW9W
YWRpcyBSb290IENBIDIwggIiMA0GCSqGSIb3DQEBAQUAA4ICDwAwggIKAoICAQCa
GMpLlA0ALa8DKYrwD4HIrkwZhR0In6spRIXzL4GtMh6QRr+jhiYaHv5+HBg6XJxg
Fyo6dIMzMH1hVBHL7avg5tKifvVrbxi3Cgst/ek+7wrGsxDp3MJGF/hd/aTa/55J
WpzmM+Yklvc/ulsrHHo1wtZn/qtmUIttKGAr79dgw8eTvIO2kfN/+NsRE8Scd3bB
rrcCaoF6qUWD4gXmuVbBlDePSHFjIuwXZQeVikvfj8ZaCuWw419eaxGrDPmF6OTp
+ARz8un+XJiM9XOva7R+zdRcAitMOeGylZUtQofX1bOQQ7dsE/He3fbE+Ik/0XX1
ksOR1YqIOJDs3G3eicJlcZaLDQP9nL9bFqyS2+r+eXyt66/3FsvbzSUr5R/7mp/i
Ucw6UwxI5g69ybR2BlLmEROFcmMDBOAENisgGQLodKcftslWZvB1JdxnwQ5hYIiz
PtGo/KPaHbDRsSNU3OR2be1B2MGyIrZTHN81Hdyhdyox5C315eXbyOD/5YDXC2Og
/zOhD7osFRXql7PSorW+8oyWHhqPHWykYTe5hnMz15eWniN9gqRMgeKh0bpnX5UH
oycR7hYQe7xFSkyyBNKr79X9DFHOUGoIMfmR2gyPZFwDwzqLID9ujWc9Otb+fVuI
yV77zGHcizN300QyNQliBJIWENieJOf7OyHj+OsdWwIDAQABo4GwMIGtMA8GA1Ud
EwEB/wQFMAMBAf8wCwYDVR0PBAQDAgEGMB0GA1UdDgQWBBQahGK8SEwzJQTU7tD2
A8QZRtGUazBuBgNVHSMEZzBlgBQahGK8SEwzJQTU7tD2A8QZRtGUa6FJpEcwRTEL
MAkGA1UEBhMCQkOxGTAXBgNVBAoTEFF1b1ZhZGlzIExpbWl0ZWQxGzAZBgNVBAMT
ElF1b1ZhZGlzIFJvb3QgQ0EgMoICBQkwDQYJKoZIhvcNAQEFBQADggIBAD4KFk2f
BluornFdLwUvZ+YTRYPENvbzwCYMDbVHZF34tHLJRqUDGCdViXh9duqWNIAXINzn
g/iN/Ae42l9NLmeyhP3ZRPx3UIHmfLTJDQtyU/h2BwdBR5YM++CCJpNVjP4iH2Bl
fF/nJrP3MpCYUNQ3cVX2kiF495V5+vgtJodmVjB3pjd4M1IQWK4/YY7yarHvGH5K
WWPKjaJW1acvvFYfzznB4vsKqBUsfU16Y8Zsl0Q80m/DShcK+JDSV6IZUaUtl0Ha
BO+pUNqQjZRG4T7wlPOQADj1O+hA4bRuVhogzG9Yje0uRY/W6ZM/57Es3zrWIozc
hLsib9D45MY56QSIPMO661V6byYCZJPVsAfv4l7CUW+v90m/xd2gNNWQjrLhVoQPR
TUIZ3Ph1WVaj+ahJefivDrkRoHy3au000LYmYjgahwz46POuO5B/B5EqHdZ+XIWD
mbA4CD/pXvk1B+TJYm5Xf6dQlfe6yJvmjqIBxdZmv3lh8zwc4bmCXF2gw+nYSLOZ
ohEUGW6yhhtoPkg3Goi3XZZenMfvJ2II4pEZXNLxId26FOKCl3GBUzGpn/Z9Yr9y
4aOTHcyKJloJONDO1w2AFrR4pTqHTI2KpdVGl/IsELm8VCLAAVBpQ570su9t+Oza
8eOx79+Rj1QqCyXBJhnEUhAFZdWCEOrCMcOu
-----END CERTIFICATE-----
>ENDOFBUF

<---manually type this on a new line after the ----END OF CERTIFICATE---- line and press ENTER
```

接下来，确认更改，然后续订许可证：

```
FPR-2-A /security/trustpoint* # comm
FPR-2-A /security/trustpoint # scope license
FPR-2-A /license # scope licdebug
```

```
FPR-2-A /license/licdebug # renew
```

您现在必须确认许可已续订：

<#root>

```
FP9300-1-A-A-A /license/licdebug # show license all

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

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: TAC Cisco Systems, Inc.
  Virtual Account: CALO
  Export-Controlled Functionality: Allowed
  Initial Registration: SUCCEEDED on Jul 01 18:37:38 2018 UTC

  Last Renewal Attempt: SUCCEEDED on Oct 09 17:39:07 2018 UTC

  Next Renewal Attempt: Apr 07 17:39:08 2019 UTC
  Registration Expires: Oct 09 17:33:07 2019 UTC

License Authorization:
  Status: AUTHORIZED on Oct 09 17:39:12 2018 UTC
  Last Communication Attempt: SUCCESS on Oct 09 17:39:12 2018 UTC
  Next Communication Attempt: Nov 08 17:39:12 2018 UTC
  Communication Deadline: Jan 07 17:33:11 2019 UTC
```

需要符合联邦信息处理标准(FIPS)的ASA软件安装

对于需要FIPS合规性的基于ASA的平台，QuoVadis根CA 2证书的导入可能会因不符合签名加密要求而失败，并且以下消息可以显示：

```
Do you accept this certificate? [yes/no]: yes

Trustpoint CA certificate is not FIPS compliant.
% Error in saving certificate: status = FAIL
```

作为适用于FIPS兼容的ASA安装的解决方法，请导入HydrantID SSL ICA G2中间证书。HydrantID SSL ICA G2证书如下所示，并符合sha256WithRSAEncryption签名算法要求，请参阅本文中显示的文档，以便根据您的平台加载证书：

```
-----BEGIN CERTIFICATE-----
```

MIIGxDCCBKygAwIBAgIUdRcWd4PQQ361VsNXlG5FY7jr06wwDQYJKoZIhvcNAQEL
BQAwRTELMAkGA1UEBhMCQk0xGTAXBgNVBAoTEFF1b1ZhZGlzIExpbWl0ZWQxGzAZ
BgNVBAMTElF1b1ZhZGlzIFJvb3QgQ0EgMjAeFw0xMzEyMTcxNDI1MTBaFw0yMzEy
MTcxNDI1MTBaMF4xCzAJBgNVBAYTAlVTMTAwLgYDVQQKEydIeWRyYW50SUQgKEF2
YWxhbmNoZSBDbG91ZCBDb3Jwb3JhdGlvbikxHTAbBgNVBAMTFEh5ZHJhbnRJRCBT
U0wgSUNBIEcyMIICIjANBgkqhkiG9w0BAQEFAAOCAg8AMIICCgKCAgEA9p1ZOA9+
H+tgdln+STF7bdOxvnOERYyjo8ZbKumzigNePSwbQYVWuso76GI843yjaX2rhnO+
JtONVJM41jVctf9qwacVduR7CEiOqJgpAUJyZUuB9IpFWF1Kz14O3Leh6URuRZ43
RzHaRmNtzkxttGBuOtAg+ilOuwiGAo9VQLgdONlqQFcrbp97/fO8ZIqiPrbhLxCZ
fXkYi3mktZVRFKXG62FHAuH1sLDXCKba3avDcUR7ykG4ZXcmp6kl14UKa8JHOHPE
NYyr0R6oHELOGZMox1nQcFwuYMX9sJdAUU/9SQVXyA6u6Ytx1pZiC8qhXM1IE0OT
Q9+q5ppffSUDMC4V/5If5A6snKVP78M8qd/RMVswcjMUMEnov+wykwCbDLD+IReM
A57XX+HojN+8XFTL9Jwge3z3ZlMwL7E54W3cI7f6cxO5DVwoKxkdk2jRIg37oqSl
SU3z/bA9UXjHcTl/6BoLho2p9rWm6oljANPeQuLHyGJ3hc19N8nDo2IATp70klGP
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-----END CERTIFICATE-----

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