

# 使用增强注册命令的 Cisco IOS 证书注册配置示例

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## 简介

本文档演示如何使用增强的证书自动注册命令。此功能是旨在简化路由器证书管理的增强功能。证书自动注册功能在 `crypto ca trustpoint` 命令中引入了五个新的子命令。这些命令包括 `ip-address` (`ca-trustpoint`)、`password` (`ca-trustpoint`)、`serial-number`、`subject-name` 和 `usage`。这些命令为证书请求提供了新的选项，并让用户能够在配置中指定字段，而不必浏览提示。然而，如果未启用此功能，提示行为仍保留为默认行为。用户可以在配置中预先加载所有必要信息。这样，每个路由器便可以在引导时自动获取其证书。

信任点证书颁发机构(CA)组合并且替换标识和可信的根CA的功能。因此，`crypto ca trustpoint` 命令已不再使用 `crypto ca identity` 和 `crypto ca trusted-root` 命令。同时，本文档还对 `auto-enroll regenerate` 和 `rsa-key label` 命令进行了探讨。

请参阅[如何使用 ASA 上的 ASDM 从 Microsoft Windows CA 获得数字证书](#)，以便了解有关 PIX/ASA 7.x 中的相同方案的详细信息。

请参阅[配置 Cisco VPN 3000 集中器 4.7.x 以获得数字证书和 SSL 证书](#)，以便了解有关 Cisco VPN 3000 系列集中器中的相同方案的详细信息。

# 先决条件

## 要求

本文档没有任何特定的要求。

## 使用的组件

本文档中的信息适用于以下软件和硬件版本。

- Cisco 7204、2611 和 1720 路由器
- Microsoft 独立证书服务器
- Cisco IOS® 软件版本 12.2(12.10)T 和 12.2.11T

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。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

## 规则

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

## 背景信息

除证书注册命令之外，本文档还讨论了以下各种证书注册增强命令：

- **crypto ca trustpoint** - 声明路由器应使用的 CA。
- **subject-name [x.500-name]** - 在证书请求中指定主题名称。如果未使用 **subject-name** 子命令，默认情况下，将使用路由器的完全限定域名 (FQDN)。该命令用于 ca-trustpoint 配置模式。例如，x.500 name 格式为 subject-name OU=ROME, O=ITALY。
- **IP-address (IP-address|interface)** - 指定证书请求中包含的点分 IP 地址或接口。该命令用于 ca-trustpoint 配置模式。
- **password string** - 指定证书的撤销口令。该命令用于 ca-trustpoint 配置模式。因为证书撤销列表(CRL)没有用于本文，所有密码设置对“无”。
- **serial-number [none]** - 指定证书请求中是否应包括序号。该命令用于 ca-trustpoint 配置模式。
- **usage method1 [method2, [method3]]** - 指定证书的目标用途。可用的选项是Internet Key Exchange (IKE)、SSL客户端和Ssl服务器。本文档中用法为 IKE。该命令用于 ca-trustpoint 配置模式。
- **auto-enroll [regenerate]** - 从 CA 自动请求使用配置中的参数的路由器证书。只有当新密钥不用请求的标签，存在此命令生成一新的Rivest Shamir Adelman (RSA)密钥。该命令用于 ca-trustpoint 配置模式，可检查过期的路由器证书。当路由器证书过期时，为自动注册配置的信任点将尝试重新注册。该命令的优点之一在于，某些 CA 需要新密钥才能进行重新注册。因此，该子命令用于生成新密钥。对于已配置的没有有效证书的任何信任点 CA，将在启动时执行自动注册。当信任点 CA（已针对自动注册进行配置）颁发的证书过期时，将请求新证书。虽然此功能不提供无缝证书续订功能，但它提供无人值守的从过期后恢复的功能。
- **rsakeypair key-label [key-size [encryption-key-size]]** - 指定与证书关联的密钥对。该命令用于 ca-trustpoint 配置模式。在许多情况下，路由器可能需要在多台证书服务器上注册。然而，每台 CA 服务器都可能具有不同的策略要求（例如，密钥长度）。该子命令允许关联大小各异的 RSA 密钥对，以便标识来自不同 CA 服务器的证书。如果未使用此子命令，默认情况下，将使

用路由器 FQDN。如果密钥标签已不存在，或者如果已发出自动注册重新生成命令，则会在注册期间生成密钥标签。指定 key-size 以便生成密钥，并指定 encryption-key-size 以便请求单独加密、签名密钥和证书。例如：

```
2611-VPN(config)#crypto ca trustpoint caserver2
2611-VPN(ca-trustpoint)#rsakeypair tacvpn 512 512
```

**注意：**默认情况下，自动注册功能会在旧证书过期后请求新证书。当为此请求提供服务时，可能会断开连接，这是因为在生成新密钥之后将立即删除当前证书和密钥对。在完成此过程之前，新密钥没有与之匹配的证书，因此无法建立传入 IKE 连接，直到已颁发新证书为止。通过 Cisco IOS 软件版本 12.3(7)T 中引入的证书续订功能的密钥滚动，可以在证书过期之前发出证书续订请求，并保留旧密钥和证书，直到新证书可用为止。有关此功能的更多信息，请参阅[证书续订的密钥滚动](#)。

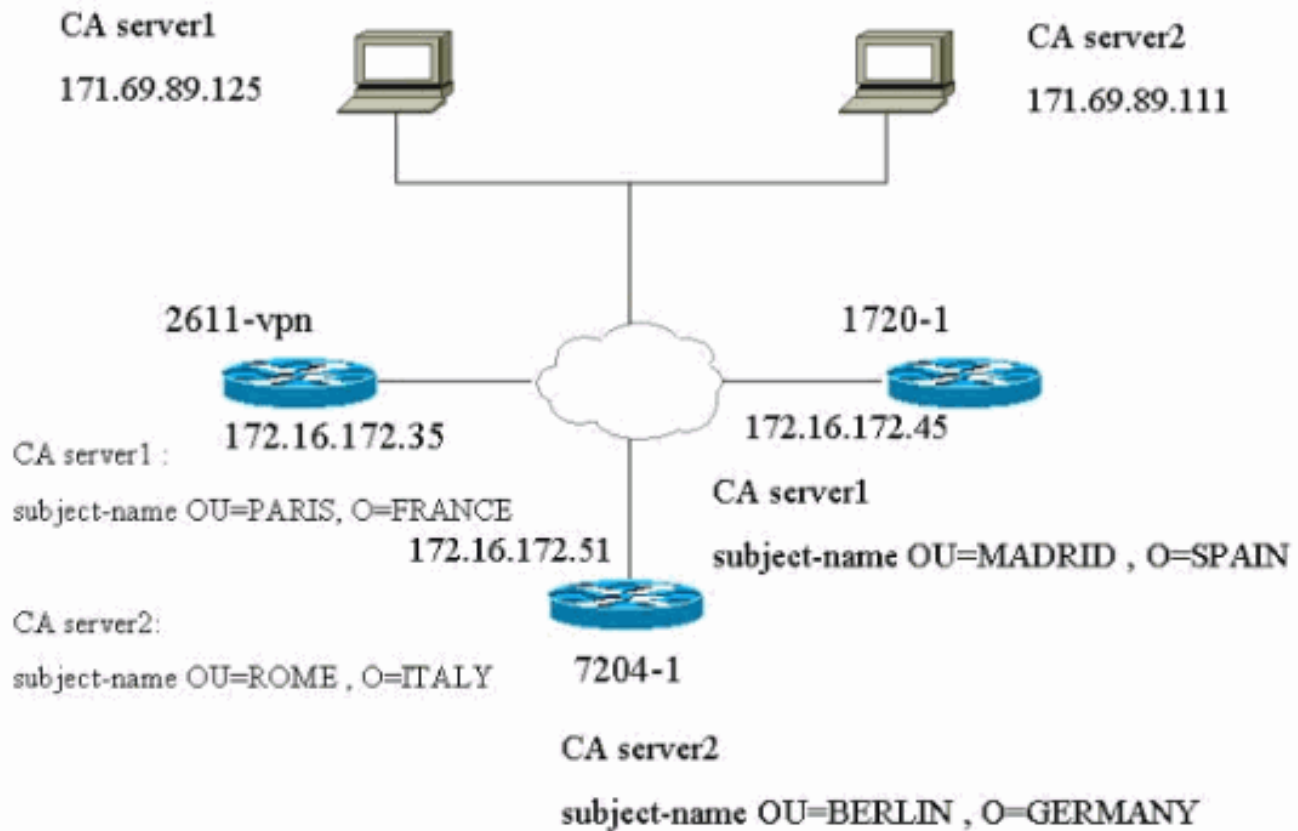
## 配置

本部分提供了用于配置本文档所述功能的信息。

**注意：**有关本文档所用命令的详细信息，请使用[命令查找工具](#)（[仅限注册用户](#)）。

## 网络图

此网络图显示实验室中采用的路由器、CA 服务器以及路由器从两台 CA 服务器获得的身份证书的主题名称。



## 配置

本文档使用以下配置。2611-VPN 路由器是在 CA 服务器 1 和 CA 服务器 2 上注册的中心路由器。2611-1 路由器在 CA 服务器 1 上注册，7204-1 路由器在 CA 服务器 2 上注册。

- [两台不同 CA 服务器上的 2611-VPN 中心路由器配置和证书](#)
- [CA 服务器 1 上的 1720-1 路由器配置和证书](#)
- [CA 服务器 2 上的 7204-1 路由器配置和证书](#)

### 两台不同 CA 服务器上的 2611-VPN 中心路由器配置和证书

```
show verify
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-IK8S-M), Version
12.2(12.10)T,
  MAINTENANCE INTERIM SOFTWARE
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Fri 27-Sep-02 21:25 by ccai
Image text-base: 0x80008098, data-base: 0x819B8124

ROM: System Bootstrap, Version 11.3(2)XA4, RELEASE
SOFTWARE (fcl)
ROM: C2600 Software (C2600-IK8S-M), Version
```

```
12.2(12.10)T,
  MAINTENANCE INTERIM SOFTWARE

2611-VPN uptime is 18 hours, 16 minutes
System returned to ROM by reload
System restarted at 04:00:46 UTC Sun Oct 27 2002
System image file is "flash:c2600-ik8s-mz.122-12.10.t"

cisco 2611 (MPC860) processor (revision 0x203) with
59392K/6144K
  bytes of memory.
Processor board ID JAD03456979 (1914264035)
M860 processor: part number 0, mask 49
Bridging software.
X.25 software, Version 3.0.0.
  2 Ethernet/IEEE 802.3 interface(s)
  4 Low-speed serial(sync/async) network interface(s)
  1 Virtual Private Network (VPN) Module(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash
(Read/Write)

Configuration register is 0x2102

2611-VPN#show run
Building configuration...

Current configuration : 15431 bytes
!
! Last configuration change at 22:09:05 UTC Sun Oct 27
2002
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2611-VPN
!
!
memory-size iomem 10
ip subnet-zero
!
!
ip domain name cisco.com
ip host caserver2 171.69.89.111
ip host caserver1 171.69.89.125
!
!
crypto ca trustpoint caserver1
enrollment retry period 5
enrollment mode ra
enrollment url
http://171.69.89.125:80/certsrv/mscep/mscep.dll
usage ike
serial-number
fqdn 2611-vpn.cisco.com
ip-address Ethernet0/0
password 7 1107160B12
subject-name OU=PARIS O=FRANCE
crl optional
rsa-keypair ciscovpn
auto-enroll regenerate
!
```

```

crypto ca trustpoint caserver2
enrollment retry period 5
enrollment mode ra
enrollment url
http://171.69.89.111:80/certsrv/mscep/mscep.dll
usage ike
serial-number
fqdn 2611-vpn.cisco.com
ip-address Ethernet0/0
password 7 130B181C0E
subject-name OU=ROME O=ITALY
rsakeypair tacvpn
auto-enroll regenerate
crypto ca certificate chain caserver1
certificate ca 0E7EC1B68A2F14BD4C4515AF44C45732
 308202BE 30820268 A0030201 0202100E 7EC1B68A 2F14BD4C
4515AF44 C4573230
 0D06092A 864886F7 0D010105 05003076 310B3009 06035504
06130255 53310B30
!--- Certificate is abbreviated for easier viewing. quit
certificate 6103EE0A0000000000038 3082040F 308203B9
A0030201 02020A61 03EE0A00 00000000 38300D06 092A8648
86F70D01 01050500 3076310B 30090603 55040613 02555331
0B300906 03550408 13024341 3111300F 06035504 07130853
616E204A 6F736531 16301406 0355040A !--- Certificate is
abbreviated for easier viewing. quit certificate
6104020F0000000000039 3082040F 308203B9 A0030201 02020A61
04020F00 00000000 39300D06 092A8648 86F70D01 01050500
3076310B 30090603 55040613 02555331 0B300906 03550408
13024341 3111300F 06035504 07130853 616E204A 6F736531
16301406 0355040A !--- Certificate is abbreviated for
easier viewing. quit crypto ca certificate chain
caserver2
certificate 3DAA90590000000000033
 308203CF 30820379 A0030201 02020A3D AA905900 00000000
33300D06 092A8648
 86F70D01 01050500 3061310B 30090603 55040613 02555331
13301106 03550408
 130A6361 6C69666F 726E6961 3111300F 06035504 07130873
616E206A 6F736531
!--- Certificate is abbreviated for easier viewing. quit
certificate 3DAA867D0000000000032 308203CF 30820379
A0030201 02020A3D AA867D00 00000000 32300D06 092A8648
86F70D01 01050500 3061310B 30090603 55040613 02555331
13301106 03550408 130A6361 6C69666F 726E6961 3111300F
06035504 07130873 616E206A 6F736531 !--- Certificate is
abbreviated for easier viewing. quit certificate ca
3E34CD199392A0914621EA778B13F357 30820284 3082022E
A0030201 0202103E 34CD1993 92A09146 21EA778B 13F35730
0D06092A 864886F7 0D010105 05003061 310B3009 06035504
06130255 53311330 11060355 0408130A 63616C69 666F726E
69613111 300F0603 55040713 0873616E !--- Certificate is
abbreviated for easier viewing. quit ! crypto isakmp
policy 10 hash md5 crypto isakmp identity hostname ! !
crypto ipsec transform-set myset esp-des esp-md5-hmac !
crypto map vpn 10 ipsec-isakmp set peer 172.16.172.45
set transform-set myset match address 101 crypto map vpn
20 ipsec-isakmp set peer 172.16.172.51 set transform-set
myset match address 102 crypto map vpn 30 ipsec-isakmp
set peer 172.16.172.53 set transform-set myset match
address 103 ! mta receive maximum-recipients 0 ! ! ! !
interface Ethernet0/0 ip address 172.16.172.35
255.255.255.240 half-duplex crypto map vpn ! interface
Ethernet0/1 ip address 192.168.4.1 255.255.255.0 half-

```

```
duplex ! interface Serial1/0 no ip address shutdown !
interface Serial1/1 no ip address shutdown ! interface
Serial1/2 no ip address shutdown ! interface Serial1/3
no ip address shutdown ! ip classless ip route 0.0.0.0
0.0.0.0 172.16.172.33 ip http server ! access-list 101
permit ip 192.168.4.0 0.0.0.255 20.1.1.0 0.0.0.255
access-list 102 permit ip 192.168.4.0 0.0.0.255 3.3.3.0
0.0.0.255 access-list 103 permit ip 192.168.4.0
0.0.0.255 200.1.1.0 0.0.0.255 access-list 169 deny ip
host 172.16.172.60 any access-list 169 deny ip host
172.16.172.61 any access-list 169 deny ip host
172.16.172.62 any access-list 169 permit ip any any !
call rsvp-sync ! ! mgcp profile default ! ! ! dial-peer
cor custom ! ! ! ! ! line con 0 line aux 0 line vty 0 4
login ! ! end
```

## CA 服务器 1 上的 1720-1 路由器配置和证书

### show verify

```
Cisco Internetwork Operating System Software
IOS (tm) C1700 Software (C1700-K9SY7-M), Version
12.2(11)T, RELEASE
SOFTWARE (fcl)
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Wed 31-Jul-02 12:28 by ccai
Image text-base: 0x80008124, data-base: 0x80D1654C
ROM: System Bootstrap, Version 12.0(3)T, RELEASE
SOFTWARE (fcl)
```

```
1720-1 uptime is 18 hours, 50 minutes
System returned to ROM by reload at 12:03:01 UTC Fri Oct
25 2002
System restarted at 03:28:54 UTC Sun Oct 27 2002
System image file is "flash:c1700-k9sy7-mz.122-11.T.bin"
```

```
cisco 1720 (MPC860T) processor (revision 0x601) with
44237K/4915K bytes
of memory.
Processor board ID JAD0449013N (791802990), with
hardware revision
0000
MPC860T processor: part number 0, mask 32
Bridging software.
X.25 software, Version 3.0.0.
1 Ethernet/IEEE 802.3 interface(s)
1 FastEthernet/IEEE 802.3 interface(s)
1 Serial network interface(s)
1 Virtual Private Network (VPN) Module(s)
WIC T1-DSU
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash
(Read/Write)
```

```
Configuration register is 0x2102
```

```
1720-1#show run
```

```
Building configuration...
```

```
Current configuration : 8177 bytes
!
! Last configuration change at 21:05:50 UTC Sun Oct 27
2002
! NVRAM config last updated at 04:03:16 UTC Tue Oct 26
2004
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 1720-1
!
!
username cisco password 0 cisco
ip subnet-zero
!
!
no ip domain lookup
ip domain name tac.com
ip host caserver1 171.69.89.125
!
!

crypto ca trustpoint caserver1
enrollment retry count 5
enrollment retry period 2
enrollment mode ra
enrollment url
http://171.69.89.125:80/certsrv/mscep/mscep.dll
usage ike
serial-number
ip-address FastEthernet0
subject-name OU=MADRID O=SPAIN
crl optional
rsakeypair ipsecpki
auto-enroll 100 regenerate
crypto ca certificate chain caserver1
certificate ca 0E7EC1B68A2F14BD4C4515AF44C45732
 308202BE 30820268 A0030201 0202100E 7EC1B68A 2F14BD4C
4515AF44
C4573230
 0D06092A 864886F7 0D010105 05003076 310B3009 06035504
06130255
53310B30
!--- Certificate is abbreviated for easier viewing. quit
certificate 611652F7000000000003A 30820407 308203B1
A0030201 02020A61 1652F700 00000000 3A300D06 092A8648
86F70D01 01050500 3076310B 30090603 55040613 02555331
0B300906 03550408 !--- Certificate is abbreviated for
easier viewing. quit certificate 61165F5B000000000003B
30820407 308203B1 A0030201 02020A61 165F5B00 00000000
3B300D06 092A8648 86F70D01 01050500 3076310B 30090603
55040613 02555331 0B300906 03550408 !--- Certificate is
abbreviated for easier viewing. quit ! crypto isakmp
policy 10 hash md5 crypto isakmp identity hostname ! !
crypto ipsec transform-set myset esp-des esp-md5-hmac
crypto map vpn 10 ipsec-isakmp set peer 172.16.172.35
set transform-set myset match address 102 ! ! ! !
interface Loopback0 ip address 20.1.1.1 255.255.255.0 !
```



```
interface Ethernet0 no ip address shutdown half-duplex !
interface FastEthernet0 ip address 172.16.172.45
255.255.255.240 speed auto crypto map vpn ! interface
Serial0 no ip address no keepalive shutdown ! ip
classless ip route 0.0.0.0 0.0.0.0 172.16.172.33 ip http
server ! ! access-list 1 permit 10.1.1.0 0.0.0.255
access-list 102 permit ip 20.1.1.0 0.0.0.255 192.168.4.0
0.0.0.255 ! ! line con 0 line aux 0 line vty 0 4 login !
ntp clock-period 17179867 ntp master 1 end
```

## CA 服务器 2 上的 7204-1 路由器配置和证书

### show verify

```
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-JK903S-M), Version
12.2(11)T1,
RELEASE SOFTWARE (fc2)
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Sat 28-Sep-02 12:29 by ccai
Image text-base: 0x60008940, data-base: 0x61D72000
ROM: System Bootstrap, Version 12.1(20000824:081033)
[dbeazley-cosmos_e_LATEST
101], DEVELOPMENT SOFTWARE
```

```
7204-1 uptime is 1 hour, 16 minutes
System returned to ROM by reload at 23:22:25 PST Sat Oct
25 2003
System restarted at 21:07:06 PST Sat Oct 26 2002
System image file is "slot0:c7200-jk9o3s-mz.122-
11.T1.bin"
```

```
cisco 7204VXR (NPE300) processor (revision D) with
122880K/40960K bytes
of memory.
Processor board ID 23663249
R7000 CPU at 262Mhz, Implementation 39, Rev 2.1, 256KB
L2, 2048KB L3
Cache
4 slot VXR midplane, Version 2.3
```

```
Last reset from power-on
 Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology
Corp).
TN3270 Emulation software.
4 Ethernet/IEEE 802.3 interface(s)
1 HSSI network interface(s)
125K bytes of non-volatile configuration memory.
```

```
20480K bytes of Flash PCMCIA card at slot 0 (Sector size
128K).
4096K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x2102
```

```
7204-1#show run
```

```
Building configuration...

Current configuration : 8245 bytes
!
version 12.2
service timestamps debug datetime
service timestamps log datetime
no service password-encryption
service udp-small-servers
service tcp-small-servers
no service dhcp
!
hostname 7204-1
!
boot system flash slot
boot system flash slot0:c7200-jk9o3s-mz.122-11.T1.bin
logging buffered 50000 debugging
enable secret 5 $1$l0d0$bXKx.l0gHbotsggIli0ULO
enable password tajmahal
!
username cisco password 0 cisco
clock timezone PST -7
ip subnet-zero
!

no ip domain lookup
ip domain name cisco.com
ip host caserver2 171.69.89.111
!
!
ip vrf test
no ip cef
ip audit notify log
ip audit po max-events 100
!
crypto ca trustpoint caserver2
enrollment retry period 2
enrollment mode ra
enrollment url
http://171.69.89.111:80/certsrv/mscep/mscep.dll
usage ike
serial-number
ip-address none
password 7 151C040201
subject-name OU=BERLIN O=GERMANY
crl optional
rsakeypair ciscotac
auto-enroll regenerate
crypto ca certificate chain caserver2
certificate 3DA1D131000000000031
  308203AA 30820354 A0030201 02020A3D A1D13100 00000000
31300D06
092A8648
  86F70D01 01050500 3061310B 30090603 55040613 02555331
13301106
03550408
!--- Certificate is abbreviated for easier viewing. quit
certificate 3DA1C8FA0000000000030 308203AA 30820354
A0030201 02020A3D A1C8FA00 00000000 30300D06 092A8648
86F70D01 01050500 3061310B 30090603 55040613 02555331
13301106 03550408 !--- Certificate is abbreviated for
easier viewing. quit certificate ca
```

```
3E34CD199392A0914621EA778B13F357 30820284 3082022E
A0030201 0202103E 34CD1993 92A09146 21EA778B 13F35730
OD06092A 864886F7 OD010105 05003061 310B3009 06035504
06130255 53311330 !--- Certificate is abbreviated for
easier viewing. quit ! crypto isakmp policy 10 hash md5
crypto isakmp identity hostname ! crypto ipsec
transform-set myset esp-des esp-md5-hmac ! crypto map
vpn 10 ipsec-isakmp set peer 172.16.172.35 set
transform-set myset match address 101 ! ! ! voice call
carrier capacity active ! ! ! interface Ethernet1/0 no
ip address duplex half ! interface Ethernet1/1 ip
address 172.16.172.51 255.255.255.240 no ip redirects
duplex half crypto map vpn ! interface Ethernet1/2 ip
address 3.3.3.2 255.255.255.0 no keepalive duplex half !
interface Ethernet1/3 no ip address duplex half !
interface Hssi4/0 ip address 200.1.1.1 255.255.255.0
load-interval 30 fair-queue 64 16 0 hssi dce serial
restart_delay 0 clockrate 1524705 ! ip classless ip
route 0.0.0.0 0.0.0.0 172.16.172.49 no ip http server ip
pim bidir-enable ! ! access-list 101 permit ip 3.3.3.0
0.0.0.255 192.168.4.0 0.0.0.255 ! snmp-server community
public RO snmp-server enable traps tty ! ! call rsvp-
sync ! ! mgcp profile default ! dial-peer cor custom ! !
! ! gatekeeper shutdown ! ! line con 0 exec-timeout 0 0
line aux 0 line vty 0 4 privilege level 15 password
cisco login line vty 5 15 login ! no scheduler max-task-
time ! end 7204-1# 7204-1# 7204-1#show crypto ca
```

#### certificate

Certificate

```
Status: Available
Certificate Serial Number: 3DA1D131000000000031
Certificate Usage: Encryption
Issuer:
CN = vpn
OU = cisco
O = tac
L = san jose
ST = california
C = US
Subject:
Name: 7204-1.cisco.com
Serial Number: 01691291
OU = "BERLIN O=GERMANY"
OID.1.2.840.113549.1.9.2 = 7204-1.cisco.com
OID.2.5.4.5 = 1691291
CRL Distribution Point:
http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl
Validity Date:
start date: 17:16:57 PST
Oct 26 2002
end date: 17:26:57
PST Oct 26 2003
renew date: 17:26:55 PST
Oct 26 2003
Associated Trustpoints: caserver2
```

Certificate

```
Status: Available
Certificate Serial Number: 3DA1C8FA000000000030
Certificate Usage: Signature
Issuer:
CN = vpn
OU = cisco
```

O = tac  
L = san jose  
ST = california  
C = US  
**Subject:**  
**Name: 7204-1.cisco.com**  
**Serial Number: 01691291**  
**OU = "BERLIN O=GERMANY"**  
OID.1.2.840.113549.1.9.2 = 7204-1.cisco.com  
OID.2.5.4.5 = 1691291  
CRL Distribution Point:  
<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>  
Validity Date:  
start date: 17:16:55 PST Oct 26 2002  
end date: 17:26:55 PST Oct 26 2003  
**Associated Trustpoints: caserver2**

CA Certificate

Status: Available  
Certificate Serial Number:  
3E34CD199392A0914621EA778B13F357  
Certificate Usage: Signature  
Issuer:  
CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US  
Subject:  
CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US  
CRL Distribution Point:  
<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>  
Validity Date:  
start date: 21:19:50 PST Dec 6 2001  
end date: 21:29:42 PST Dec 6 2003  
Associated Trustpoints: caserver2

7204-1#show crypto key mypubkey rsa

% Key pair was generated at: 13:55:35 PST Oct 25 2002  
**Key name: ciscotac**  
**Usage: Signature Key**  
Key Data:  
305C300D 06092A86 4886F70D 01010105 00034B00 30480241  
0099BC9C  
175AD748  
C991D24E 4F328960 997CADCB E665B876 4C53E2A0 449CA082  
4C503E05  
87604F32  
EECDF7B5 5CA0ADB6 2C664F9D 883EBAD6 671C6A8F A0C5D9EE  
23020301  
0001  
% Key pair was generated at: 13:55:35 PST Oct 25 2002  
**Key name: ciscotac**  
**Usage: Encryption Key**  
Key Data:  
305C300D 06092A86 4886F70D 01010105 00034B00 30480241

```
00D4FE8A
3DE940E6
 42277A82 87DDDA45 A0F77AE4 AF47D91F BA134F65 92886D3B
7489BEBB
DE650EA1
 029A5A5C 72F39FCA A83BC018 246B0D1D 270DBCf2 B9B29587
21020301
0001
% Key pair was generated at: 22:07:13 PST Oct 26 2002
Key name: ciscotac.server
Usage: Encryption Key
Key Data:
 307C300D 06092A86 4886F70D 01010105 00036B00 30680261
00E47825
7E60D6AC
 4C078368 925191FD 2B2AAC50 6A6D6AF1 8A01C9B6 D21C4C80
05DD8277
D63F60B1
 01A2DDCF 407BE088 D333FE1D 4F5DE892 47970454 A50C54EC
B962FEE4
A9BF5197
 4C2B0656 503E0045 BB3168C4 2228155A B6BF0385 0B493FC5
79020301
0001
7204-1#
7204-1#
7204-1#
7204-1#
```

## 验证

以下各部分提供如何确定在发出以下 **show** 命令时配置是否有效。这些命令会对 CA 进行验证，并确认身份证书（路由器证书）是否由该 CA 服务器颁发。

[命令输出解释程序（仅限注册用户）](#) (OIT) 支持某些 **show** 命令。使用 OIT 可查看对 **show** 命令输出的分析。

- **show crypto ca certificate** - 显示有关证书、证书颁发机构证书和所有注册机构证书的信息。请在 EXEC 模式下使用 **show crypto ca certificates** 命令。
- **crypto ca authenticate** - 验证证书颁发机构（检索 CA 证书）。请在全局配置模式下使用 **crypto ca authenticate** 命令。
- **show crypto key mypubkey rsa** - 显示路由器的 RSA 公钥。请在 EXEC 模式下使用 **show crypto key mypubkey rsa** 命令。
- **show crypto isakmp sa** —显示所有当前互联网密钥交换安全关联(SAS)在对等体。请在 EXEC 模式下使用 **show crypto isakmp sa** 命令。
- **show crypto ipsec sa** - 显示当前 IPsec SA 所采用的设置。请在 EXEC 模式下使用 **show crypto ipsec sa** 命令。
- **show clock** - 显示路由器上的当前系统时间。
- **calendar set hh:mm:ss day month year** - 设置日历系统时间。有关路由器上的各种时钟和设置外部时间源的详细信息，请参阅[执行基本系统管理](#)。

有关与 CA 互操作性、IPsec 和 IKE 相关的更多命令，请参阅 [SR：第 4 部分：IP 安全与加密和证书颁发机构互操作性命令](#)。

下面显示 **show crypto ca certificate** 命令的输出。

2611-VPN#show crypto ca certificate

Certificate

Status: Available

Certificate Serial Number: 3DAA9059000000000033

Certificate Usage: Encryption

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

Subject:

*!--- The received certificate from CA server2 contains the !--- FQDN, IP address, and subject name. The renew date !--- states when the next enroll date is. Name: 2611-vpn.cisco.com*

**IP Address: 172.16.172.35**

**Serial Number: 721959E3**

**OU = "ROME O=ITALY"**

OID.1.2.840.113549.1.9.2 = 2611-vpn.cisco.com

OID.1.2.840.113549.1.9.8 = 172.16.172.35

OID.2.5.4.5 = 721959E3

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

Validity Date:

**start date: 00:26:30 UTC Oct 27 2002**

**end date: 00:36:30 UTC Oct 27 2003**

**renew date: 00:36:28 UTC Oct 27 2003**

**Associated Trustpoints: caserver2**

Certificate

Status: Available

Certificate Serial Number: 3DAA867D0000000000032

Certificate Usage: Signature

Issuer:

CN = vpn

OU = cisco

O = tac

L = San Jose ST = California C = US

Subject:

**Name: 2611-vpn.cisco.com**

**IP Address: 172.16.172.35**

**Serial Number: 721959E3**

**OU = "ROME O=ITALY"**

OID.1.2.840.113549.1.9.2 = 2611-vpn.cisco.com

OID.1.2.840.113549.1.9.8 = 172.16.172.35

OID.2.5.4.5 = 721959E3

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

Validity Date:

**start date: 00:26:28 UTC Oct 27 2002**

**end date: 00:36:28 UTC Oct 27 2003**

**Associated Trustpoints: caserver2**

CA Certificate

Status: Available

Certificate Serial Number: 3E34CD199392A0914621EA778B13F357

Certificate Usage: Signature

Issuer:

CN = vpn

OU = cisco

O = tac

L = San Jose ST = California C = US

Subject:  
CN = vpn  
OU = cisco  
O = tac  
L = San Jose ST = California C = US  
CRL Distribution Point:  
<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>  
Validity Date:  
start date: 04:19:50 UTC Dec 7 2001  
end date: 04:29:42 UTC DEC 7 2003  
Associated Trustpoints: caserver2

#### CA Certificate

Status: Available  
Certificate Serial Number: 0E7EC1B68A2F14BD4C4515AF44C45732  
Certificate Usage: Signature  
Issuer:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US  
Subject:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US  
CRL Distribution Point:  
<http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl>  
Validity Date:  
start date: 20:52:48 UTC Sep 17 2002  
end date: 21:02:37 UTC Sep 17 2017  
Associated Trustpoints: caserver1

#### Certificate

Status: Available  
Certificate Serial Number: 6103EE0A0000000000038  
Certificate Usage: Signature  
Issuer:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US  
Subject:  
**Name: 2611-vpn.cisco.com**  
**IP Address: 172.16.172.35**  
**Serial Number: 721959E3**  
**OU = "PARIS O=FRANCE"**  
OID.1.2.840.113549.1.9.2 = 2611-vpn.cisco.com  
OID.1.2.840.113549.1.9.8 = 172.16.172.35  
OID.2.5.4.5 = 721959E3  
CRL Distribution Point:  
<http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl>  
Validity Date:  
start date: 03:33:05 UTC Oct 26 2002  
end date: 03:43:05 UTC Oct 26 2003  
**Associated Trustpoints: caserver1**

#### Certificate

Status: Available  
Certificate Serial Number: 6104020F000000000039  
Certificate Usage: Encryption  
Issuer:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US  
Subject:

*!--- The received certificate from CA server2 contains the !--- FQDN, IP address, and subject name. The renew date !--- states when the next enroll date is. Name: 2611-vpn.cisco.com*

**IP Address: 172.16.172.35**  
**Serial Number: 721959E3**  
**OU = "PARIS O=FRANCE"**  
OID.1.2.840.113549.1.9.2 = 2611-vpn.cisco.com  
OID.1.2.840.113549.1.9.8 = 172.16.172.35  
OID.2.5.4.5 = 721959E3  
CRL Distribution Point:  
<http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl>  
Validity Date:  
**start date: 03:33:10 UTC Oct 26 2002**  
**end date: 03:43:10 UTC Oct 26 2003**  
**renew date: 03:43:05 UTC Oct 26 2003**  
**Associated Trustpoints: caserver1**

2611-VPN#show crypto key mypubkey rsa

% Key pair was generated at: 00:14:06 UTC Mar 1 1993

**Key name: ciscovpn**

**Usage: Signature Key**

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00A2DE57 2C7A4555  
BF87D3CC 4A260DBF 56574554 472FC72C 0461A35B E41B5B53 BE81A47E 264A68D7  
08662555 27E4E301 2AF04B1C E472F70B 74DF38A0 6EB286F9 01020301 0001

% Key pair was generated at: 00:14:10 UTC Mar 1 1993

Key name: ciscovpn

**Usage: Encryption Key**

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00D10224 8CBEC2D7  
B517DF99 7363717D 6F6CA0F1 83FB7874 E60BB169 CD4AD9CA 92E04143 16D4D253  
5CBF212F FF6268A5 329AB988 2655568C 8EC19017 6F4A4C86 43020301 0001

% Key pair was generated at: 00:14:59 UTC Mar 1 1993

**Key name: tacvpn**

**Usage: Signature Key**

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00AB2884 22A070D0  
A8C84C3E CD45A382 F4CDB158 5B31B624 5C92632C 5DC1977E 686E1C18 DA16BE57  
6FBA9518 4D2F01B8 0D59528D 447014D3 02D5A631 84E54CD4 FB020301 0001

% Key pair was generated at: 00:15:00 UTC Mar 1 1993

Key name: tacvpn

**Usage: Encryption Key**

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00AB7576 9D0A2D65  
7BB9B465 AF227B73 2B83AFD6 3791FA54 3A2DB845 55E4540F 35972460 B87C613E  
82DBC4D2 51E6F9A7 07164C57 B02D28B8 93F8D50F D5C3444F 01020301 0001

% Key pair was generated at: 22:02:57 UTC Oct 27 2002

Key name: ciscovpn.server

**Usage: Encryption Key**

Key Data:

307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00D42A5E 4C9D27F1  
195CC537 7CF9E390 935DFBA3 2DA01B3B C5E50620 57B902A3 50876FA1 1A9D83FD  
0EB437F7 E0568EB7 830A46FA E9D9BA4F 3E8B132D F24A08B8 E2154944 36829D64  
E48077EF 224BF142 A3A92672 F0BC57F5 063EF64A 8B775979 CD020301 0001



## RSA 密钥对重新生成

7204-1 路由器上的这些命令演示如何使用 **auto-enroll regenerate** 和 **rsa key label** 命令。该图显示在路由器上声明 CA 之后以及在发出 **crypto ca authenticate ca server** 命令之后的事件序列。仅当已验证 CA 之后，才能运行 **auto-enroll** 命令。在验证 CA 之后，路由器将自动在 CA 服务器上注册。无需发出 **crypto ca enroll ca server** 命令。一旦身份证书过期，路由器将自动在 CA 服务器上注册。随着此命令的引入，身份（路由器）证书过期之后，无需在 CA 服务器上进行手动注册。

如果您在路由器上使用 **calendar set** 命令来设置日历系统，您无需在该路由器上使用外部时间源（NTP 服务器）即可设置正确时间。重新加载路由器会使系统时钟与日历系统同步。

**注意：** **calendar set** 命令无法用于 1700 和 2600 路由器。请在这些路由器上使用外部时间源。

CA 在路由器上配置。此输出详细说明在 7204-1 路由器上自动注册身份证书和重新生成 RSA 密钥对的过程。此输出中的某些区域显示为粗体，以强调重要信息。

```
crypto ca trustpoint caserver2
enrollment retry period 2
enrollment mode ra
enrollment url http://171.69.89.111:80/certsrv/mscep/mscep.dll
usage ike
serial-number
ip-address none
password 7 151C040201
subject-name OU=BERLIN O=GERMANY
crl optional
rsa keypair ciscotac
auto-enroll regenerate
!--- Execute this command to authenticate the CA by obtaining !--- the CA's self-signed
certificate which contains the CA's public key. Because !--- the CA signs its own certificate,
the CA's public key should be manually !--- authenticated by contacting the CA administrator to
compare the CA certificate's !--- fingerprint. Note that after you execute the command the
router immediately !--- enrolls with the CA server to obtain its identity certificate. 7204-
1(config)#crypto ca authenticate caserver2
Certificate has the following attributes:
Fingerprint: A1E8B61A FD1A66D6 2DE35501 99C43D83
% Do you accept this certificate? [yes/no]:
Oct 27 06:45:09: CRYPTO_PKI: Sending CA Certificate Request:
GET /certsrv/mscep/mscep.dll/pkiclient.exe?operation=GetCACert&message;=caserver2
HTTP/1.0

Oct 27 06:45:09: CRYPTO_PKI: can not resolve server name/IP address
Oct 27 06:45:09: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
Oct 27 06:45:09: CRYPTO_PKI: http connection opened
Oct 27 06:45:10: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Sun, 27 Oct 2002 02:19:09 GMT
Content-Length: 2811
Content-Type: application/x-x509-ca-ra-cert

Content-Type indicates we have received CA and RA certificates.
Oct 27 06:45:10: CRYPTO_PKI:crypto_process_ca_ra_cert(trustpoint=caserver2)
Oct 27 06:45:10: CRYPTO_PKI:CA and RA certs (cert data):
 30 82 0A F7 06 09 2A 86 48 86 F7 0D 01 07 02
A0
```

```
hex data omitted
03 13 0B 73 6A 76 70 6E 70 y
Trustpoint CA certificate accepted.
7204-1(config)#6B 69 2D 72 61 30 81
9F 30 0D 06 09 2A 86 48 86 F7 0D 01 01 01
05 00
hex data omitted
A9 13 93 1E E6 E1 E4 30 07 31 00
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: subject name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: issuer name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: serial number = 3E
34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: subject name =
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D
01
hex data omitted
70 6B 69 2D 72 61
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: issuer name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: serial number = 14
6C F2 85 00 00 00 00 09
Oct 27 06:45:10: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: subject name =
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D
01
hex data omitted
70 6B 69 2D 72 61
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: issuer name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: serial number = 14
6C F1 A9 00 00 00 00 08
Oct 27 06:45:10: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: subject name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: issuer name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 27 06:45:10: CRYPTO_PKI: InsertCertData: serial number = 3E
34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57
Oct 27 06:45:10: CRYPTO_PKI: transaction GetCACert completed
Oct 27 06:45:10: CRYPTO_PKI: CA certificate received.
Oct 27 06:45:10: CRYPTO_PKI: CA certificate
received.
```

```
Oct 27 06:45:10: CRYPTO_PKI: crypto_pki_authenticate_tp_cert()
Oct 27 06:45:10: CRYPTO_PKI: trustpoint caserver2 authentication status
= 2
Oct 27 06:45:12: CRYPTO_PKI: InsertCertData: subject name =
 30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 27 06:45:12: CRYPTO_PKI: InsertCertData: issuer name =
 30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 27 06:45:12: CRYPTO_PKI: InsertCertData: serial number = 3E
34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57
Oct 27 06:45:12: CRYPTO_PKI: crypto_process_ra_certs(trust_point=caserver2)

7204-1#% Time to Re-enroll trust_point caserver2
Can not select my full public key (ciscotac)% Start certificate enrollment
..
% The subject name in the certificate will
be: OU=BERLIN O=GERMANY
% The subject name in the certificate will
be: 7204-1.cisco.com
% The serial number in the certificate will
be: 01691291
% Certificate request sent to Certificate
Authority
% The certificate request fingerprint will
be displayed.
% The 'show crypto ca certificate' command
will also show the fingerprint.
Signing Certificate Reqeust Fingerprint:
E92A4B6C D213B9A9 4AD07064 23BFABA1
Oct 27 06:46:32: CRYPTO_PKI: Sending CA Certificate Request:
GET /certsrv/mscep/mscep.dll/pkiclient.exe?operation=GetCACert&message=caserver2
HTTP/1.0

Oct 27 06:46:32: CRYPTO_PKI: can not resolve server name/IP address
Oct 27 06:46:32: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
Oct 27 06:46:32: CRYPTO_PKI: http connection opened
Oct 27 06:46:33: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Sun, 27 Oct 2002 02:20:32 GMT
Content-Length: 2811
Content-Type: application/x-x509-ca-ra-cert

Content-Type indicates we have received CA and RA certificates.
Oct 27 06:46:33: CRYPTO_PKI:crypto_process_ca_ra_cert(trustpoint=caserver2)
Oct 27 06:46:33: CRYPTO_PKI:CA and RA certs (cert data):
 30 82 0A F7 06 09 2A 86 48 86 F7 0D 01 07 02
A0
hex data omitted
Encryption Certi0A 06 03
55 04 03 13 03 76 70 6E 30 1E 17 0D 30 32
30 39
hex data omitted
A9 13 93 1E E6 E1 E4 30 07 31 00
Oct 27 06:46:33: CRYPTO_PKI: InsertCertData: subject name =
 30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
```

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: serial number = 3E  
34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D  
01  
hex data omitted  
70 6B 69 2D 72 61

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: serial number = 14  
6C F2 85 00 00 00 00 09

Oct 27 06:46:33: CRYPTO\_PKI: WARNING: Certificate, private key or CRL  
was not found while selecting CRL

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D  
01  
hex data omitted  
70 6B 69 2D 72 61

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: serial number = 14  
6C F1 A9 00 00 00 00 08

Oct 27 06:46:33: CRYPTO\_PKI: WARNING: Certificate, private key or CRL  
was not found while selecting CRL

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D  
01  
hex data omitted  
70 6B 69 2D 72 61

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: serial number = 14  
6C F1 A9 00 00 00 00 08

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D  
01  
hex data omitted  
70 6B 69 2D 72 61

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: serial number = 14  
6C F2 85 00 00 00 00 09

Oct 27 06:46:33: CRYPTO\_PKI: InsertCertData: subject name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E

```
Oct 27 06:46:33: CRYPTO_PKI: InsertCertData: issuer name =
 30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
  hex data omitted
 76 70 6E
Oct 27 06:46:33: CRYPTO_PKI: InsertCertData: serial number = 3E
34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57
Oct 27 06:46:33: CRYPTO_PKI: crypto_process_ra_certs(trust_point=caserver2)
Oct 27 06:46:33: CRYPTO_PKI: transaction PKCSReq completed
Oct 27 06:46:33: CRYPTO_PKI: status:
Oct 27 06:46:33: CRYPTO_PKI: All sockets are closed for trustpoint
caserver2.
Oct 27 06:46:33: CRYPTO_PKI:Write out pkcs#10 content:319
 30 82 01 3B 30 81 E6 02 01 00 30 4C 31 19
30 17
  hex data omitted
  FB EE 80 3D 5D 62 B9 BD 85 24 03 49 6D 2C
98
Oct 27 06:46:33: CRYPTO_PKI:Enveloped Data for trustpoint caserver2...
 30 80 06 09 2A 86 48 86 F7 0D 01 07 03 A0 80
30
  hex data omitted
 00 00 00 00
Oct 27 06:46:33: CRYPTO_PKI:Signed Data for trustpoint caserver2 (1410
bytes)
 30 80 06 09 2A 86 48 86 F7 0D 01 07 02 A0
80 30
  hex data omitted

 00 00
Oct 27 06:46:33: CRYPTO_PKI: can not resolve server name/IP address
Oct 27 06:46:33: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
Oct 27 06:46:33: CRYPTO_PKI: http connection opened
Oct 27 06:46:35: CRYPTO_PKI:Write out pkcs#10 content:319
 30 82 01 3B 30 81 E6 02 01 00 30 4C 31 19
30 17
  hex data omitted
  A0 F6 FB F3 9F E3 3C AF AB BE 24 9F 30 11
10
ificate Request Fingerprint:
 3B7DB296 E21FCDD8 3B4E29D4 A472A4A7
Oct 27 06:47:03: CRYPTO_PKI:Enveloped Data for trustpoint caserver2...
 30 80 06 09 2A 86 48 86 F7 0D 01 07 03 A0 80
30
  hex data omitted
 00 00 00 00
Oct 27 06:47:03: CRYPTO_PKI:Signed Data for trustpoint caserver2 (1410
bytes)
 30 80 06 09 2A 86 48 86 F7 0D 01 07 02 A0
80 30
  hex data omitted

  B1 B3 DB 54 0F F9 4A 5D 56 45 00 00 00 00
00
 00 00
Oct 27 06:47:03: CRYPTO_PKI: can not resolve server name/IP address
Oct 27 06:47:03: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
Oct 27 06:47:03: CRYPTO_PKI: http connection opened
Oct 27 06:47:05: CRYPTO_PKI: received msg of 1930 bytes
Oct 27 06:47:05: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Sun, 27 Oct 2002 02:20:35 GMT
```

Content-Length: 1784  
Content-Type: application/x-pki-message

Oct 27 06:47:05: CRYPTO\_PKI:Received pki message (PKCS7) for trustpoint caserver2: 1784 bytes

30 82 06 F4 06 09 2A 86 48 86 F7 0D 01 07 02

A0

hex data omitted

4E 15 B3 43 58 17 42 73

Oct 27 06:47:05: CRYPTO\_PKI: InsertCertData: subject name =

30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D

01

hex data omitted

70 6B 69 2D 72 61

Oct 27 06:47:05: CRYPTO\_PKI: InsertCertData: issuer name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hex data omitted

76 70 6E

Oct 27 06:47:05: CRYPTO\_PKI: InsertCertData: serial number = 14

6C F1 A9 00 00 00 00 08

Oct 27 06:47:05: CRYPTO\_PKI: WARNING: Certificate, private key or CRL was not found while selecting CRL

Oct 27 06:47:05: CRYPTO\_PKI: signed attr: pki-message-type:

13 01 33

Oct 27 06:47:05: CRYPTO\_PKI: signed attr: pki-status: 13

01 30

Oct 27 06:47:05: CRYPTO\_PKI: signed attr: pki-recipient-nonce:

04 10 46 C3 F3 B9 FA 5B B6 C0 D9 55 1D B6

E6 57

7E 67

Oct 27 06:47:05: CRYPTO\_PKI: signed attr: pki-transaction-id:

13 20 33 33 36 34 31 39 32 38 35 37 37 33

43 38

39 34 46 35 46 35 30 41 32 45 46 38 31 37

33 35

32 37

Oct 27 06:47:05: CRYPTO\_PKI: status = 100: certificate is granted

Oct 27 06:47:05: CRYPTO\_PKI:Verified signed data for trustpoint caserver2 (1217 bytes):

30 82 04 BD 06 09 2A 86 48 86 F7 0D 01 07

03 A0

hex data omitted

BE

Oct 27 06:47:05: CRYPTO\_PKI:Decrypted enveloped content:

30 82 03 D9 06 09 2A 86 48 86 F7 0D 01 07

02 A0

hex data omitted

AF 15 F0 AD BF 22 7A 41 72 49 5D 31 00

Oct 27 06:47:05: CRYPTO\_PKI: InsertCertData: subject name =

30 4E 31 10 30 0E 06 03 55 04 05 13 07 31 36

39

hex data omitted

42 45 52 4C 49 4E 20 4F 3D 47 45 52 4D 41

4E 59

Oct 27 06:47:05: CRYPTO\_PKI: InsertCertData: issuer name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hex data omitted

76 70 6E

Oct 27 06:47:05: CRYPTO\_PKI: InsertCertData: serial number = 61

11 C6 69 00 00 00 00 34

Oct 27 06:47:05: CRYPTO\_PKI: WARNING: Certificate, private key or CRL

was not found while selecting CRL  
Oct 27 06:47:05: CRYPTO\_PKI: InsertCertData: subject name =  
30 4E 31 10 30 0E 06 03 55 04 05 13 07 31 36  
39  
hex data omitted  
42 45 52 4C 49 4E 20 4F 3D 47 45 52 4D 41  
4E 59  
Oct 27 06:47:05: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E  
Oct 27 06:47:05: CRYPTO\_PKI: InsertCertData: serial number = 61  
11 C6 69 00 00 00 00 34  
Oct 27 06:47:05: **%CRYPTO-6-CERTRET: Certificate  
received from Certificate Authority**  
Oct 27 06:47:15: CRYPTO\_PKI: received msg of 1930 bytes  
Oct 27 06:47:15: CRYPTO\_PKI: HTTP response header:  
HTTP/1.1 200 OK  
Server: Microsoft-IIS/5.0  
Date: Sun, 27 Oct 2002 02:21:05 GMT  
Content-Length: 1784  
Content-Type: application/x-pki-message

Oct 27 06:47:15: CRYPTO\_PKI:Received pki message (PKCS7) for trustpoint  
caserver2: 1784 bytes  
30 82 06 F4 06 09 2A 86 48 86 F7 0D 01 07 02  
A0  
hex data omitted  
79 37 99 3A AD 1F 3B 2F  
Oct 27 06:47:15: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D  
01  
hex data omitted  
70 6B 69 2D 72 61  
Oct 27 06:47:15: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E  
Oct 27 06:47:15: CRYPTO\_PKI: InsertCertData: serial number = 14  
6C F1 A9 00 00 00 00 08  
Oct 27 06:47:15: CRYPTO\_PKI: WARNING: Certificate, private key or CRL  
was not found while selecting CRL  
Oct 27 06:47:15: CRYPTO\_PKI: signed attr: pki-message-type:  
13 01 33  
Oct 27 06:47:15: CRYPTO\_PKI: signed attr: pki-status: 13  
01 30  
Oct 27 06:47:15: CRYPTO\_PKI: signed attr: pki-recipient-nonce:  
04 10 66 D6 56 C7 8C CB 3D A3 E7 B6 84 F8  
EE 80  
65 18  
Oct 27 06:47:15: CRYPTO\_PKI: signed attr: pki-transaction-id:  
13 20 33 33 46 33 36 30 36 45 39 37 31 43  
35 34  
34 46 39 32 36 34 36 30 46 42 46 30 42 35  
37 39  
35 32  
Oct 27 06:47:15: CRYPTO\_PKI: status = 100: certificate is granted  
Oct 27 06:47:15: CRYPTO\_PKI:Verified signed data for trustpoint caserver2  
(1217 bytes):  
30 82 04 BD 06 09 2A 86 48 86 F7 0D 01 07  
03 A0

```
hex data omitted
7A 43 16 55 C5 57 97 DF FE D4 3A 0C 14 24
5D D1
96
Oct 27 06:47:15: CRYPTO_PKI:Decrypted enveloped content:
30 82 03 D9 06 09 2A 86 48 86 F7 0D 01 07
02 A0
hex data omitted
94 01 57 71 AC A9 92 C8 2D F8 24 31 00
Oct 27 06:47:15: CRYPTO_PKI: InsertCertData: subject name =
30 4E 31 10 30 0E 06 03 55 04 05 13 07 31 36
39
hex data omitted
42 45 52 4C 49 4E 20 4F 3D 47 45 52 4D 41
4E 59
Oct 27 06:47:15: CRYPTO_PKI: InsertCertData: issuer name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 27 06:47:15: CRYPTO_PKI: InsertCertData: serial number = 61
12 3C 0A 00 00 00 00 00 35
Oct 27 06:47:15: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL
Oct 27 06:47:15: CRYPTO_PKI: InsertCertData: subject name =
30 4E 31 10 30 0E 06 03 55 04 05 13 07 31 36
39
hex data omitted
42 45 52 4C 49 4E 20 4F 3D 47 45 52 4D 41
4E 59
Oct 27 06:47:15: CRYPTO_PKI: InsertCertData: issuer name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 27 06:47:15: CRYPTO_PKI: InsertCertData: serial number = 61
12 3C 0A 00 00 00 00 00 35
Oct 27 06:47:15: CRYPTO_PKI: All enrollment requests completed for trustpoint
caserver2.
Oct 27 06:47:15: CRYPTO_PKI: All enrollment requests completed for
trustpoint caserver2.
Oct 27 06:47:15: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL
Oct 27 06:47:15: CRYPTO_PKI: All enrollment
requests completed for trustpoint caserver2.
7204-1#
7204-1#
!--- View detailed information on certificate. 7204-1#show crypto ca certificate
Certificate
Status: Available
Certificate Serial Number: 61123C0A0000000000035
Certificate Usage: Encryption
Issuer:
CN = vpn
OU = cisco
O = tac
L = san jose
ST = california
C = US
Subject:
Name: 7204-1.cisco.com
Serial Number: 01691291
OU = "BERLIN O=GERMANY"
OID.1.2.840.113549.1.9.2
```



= 7204-1.cisco.com

OID.2.5.4.5 = 1691291

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

Validity Date:

**start date: 19:11:05**

**PST Oct 26 2002**

**end date:**

**19:21:05 PST Oct 27 2002**

**renew date: 19:20:35**

**PST Oct 27 2002**

*!--- Note that the certificate issued here is only !--- valid for a day. The router !--- auto-enrolls at the renew date given. Associated Trustpoints: caserver2*

Certificate

Status: Available

Certificate Serial Number: 6111C66900000000034

Certificate Usage: Signature

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

**Subject:**

**Name: 7204-1.cisco.com**

**Serial Number: 01691291**

**OU = "BERLIN O=GERMANY"**

**OID.1.2.840.113549.1.9.2**

= 7204-1.cisco.com

OID.2.5.4.5 = 1691291

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

Validity Date:

**start date: 19:10:35 PST**

**Oct 26 2002**

**end date: 19:20:35 PST Oct**

**27 2002**

**Associated Trustpoints: caserver2**

CA Certificate

Status: Available

Certificate Serial Number: 3E34CD199392A0914621EA778B13F357

Certificate Usage: Signature

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

**Subject:**

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

Validity Date:

**start date: 21:19:50 PST Dec 6 2001**

**end date: 21:29:42 PST Dec 6 2003**

**Associated Trustpoints: caserver2**

7204-1#show cry key mypubkey rsa

% Key pair was generated at: 13:55:35 PST

Oct 25 2002

*!--- Note that the RSA key pairs are regenerated once the router !--- has reenrolled for the certificates.* Key name: ciscotac Usage: Signature Key Key Data: 305C300D 06092A86 4886F70D 01010105 00034B00 30480241 0099BC9C 175AD748 C991D24E 4F328960 997CADCB E665B876 4C53E2A0 449CA082 4C503E05 87604F32 EECDF7B5 5CA0ADB6 2C664F9D 883EBAD6 671C6A8F A0C5D9EE 23020301 0001 % Key pair was generated at: 13:55:35 PST Oct 25 2002 Key name: ciscotac Usage: Encryption Key Key Data: 305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00D4FE8A 3DE940E6 42277A82 87DDDA45 A0F77AE4 AF47D91F BA134F65 92886D3B 7489BEBB DE650EA1 029A5A5C 72F39FCA A83BC018 246B0D1D 270DBC2F B9B29587 21020301 0001 % Key pair was generated at: 22:07:13 PST Oct 26 2002 Key name: ciscotac.server Usage: Encryption Key Key Data: 307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00E47825 7E60D6AC 4C078368 925191FD 2B2AAC50 6A6D6AF1 8A01C9B6 D21C4C80 05DD8277 D63F60B1 01A2DDCF 407BE088 D333FE1D 4F5DE892 47970454 A50C54EC B962FEE4 A9BF5197 4C2B0656 503E0045 BB3168C4 2228155A B6BF0385 0B493FC5 79020301 0001 7204-1# *!--- The router configuration with the certificates.* 7204-1#show run

Building configuration...

Current configuration : 8367 bytes

```
!  
! Last configuration change at 23:45:33 PST Sat Oct 26 2002  
! NVRAM config last updated at 23:43:25 PST Sat Oct 26 2002  
!  
version 12.2  
service timestamps debug datetime  
service timestamps log datetime  
no service password-encryption  
service udp-small-servers  
service tcp-small-servers  
no service dhcp  
!  
hostname 7204-1  
!  
boot system flash slot  
boot system flash slot0:c7200-jk9o3s-mz.122-11.T1.bin  
logging buffered 50000 debugging  
enable secret 5 $1$GdwM$YPQYieph20DPAhQeNvHa30  
enable password ipsecpki  
!  
username cisco password 0 cisco  
clock timezone PST -7  
ip subnet-zero  
!  
!  
no ip domain lookup  
ip domain name cisco.com  
ip host caserver2 171.69.89.111  
!  
!  
ip vrf test  
no ip cef  
ip audit notify log  
ip audit po max-events 100  
!  
crypto ca trustpoint caserver2  
enrollment retry period 2  
enrollment mode ra  
enrollment url http://171.69.89.111:80/certsrv/mscep/mscep.dll  
usage ike  
serial-number  
ip-address none  
password 7 151C040201  
subject-name OU=BERLIN O=GERMANY  
crl optional
```

```

rsakeypair ciscotac
auto-enroll regenerate
crypto ca certificate chain caserver2
certificate 61123C0A0000000000035
  308203AA 30820354 A0030201 02020A61 123C0A00 00000000 35300D06
092A8648
  86F70D01 01050500 3061310B 30090603 55040613 02555331 13301106
03550408
!--- Certificate is abbreviated for easier viewing. quit certificate 6111C6690000000000034
308203AA 30820354 A0030201 02020A61 11C66900 00000000 34300D06 092A8648 86F70D01 01050500
3061310B 30090603 55040613 02555331 13301106 03550408 !--- Certificate is abbreviated for easier
viewing. quit certificate ca 3E34CD199392A0914621EA778B13F357 30820284 3082022E A0030201
0202103E 34CD1993 92A09146 21EA778B 13F35730 0D06092A 864886F7 0D010105 05003061 310B3009
06035504 06130255 53311330 !--- Certificate is abbreviated for easier viewing. quit ! crypto
isakmp policy 10 hash md5 crypto isakmp identity hostname ! ! crypto ipsec transform-set myset
esp-des esp-md5-hmac ! crypto map vpn 10 ipsec-isakmp set peer 172.16.172.35 set transform-set
myset match address 101 ! ! ! voice call carrier capacity active ! ! ! ! ! ! ! ! ! ! ! ! ! ! !
interface Ethernet1/0 no ip address duplex half ! interface Ethernet1/1 ip address 172.16.172.51
255.255.255.240 no ip redirects duplex half crypto map vpn ! interface Ethernet1/2 ip address
3.3.3.2 255.255.255.0 no keepalive duplex half ! interface Ethernet1/3 no ip address duplex half
! interface Hssi4/0 ip address 200.1.1.1 255.255.255.0 load-interval 30 fair-queue 64 16 0 hssi
dce serial restart_delay 0 clockrate 1524705 ! ip classless ip route 0.0.0.0 0.0.0.0
172.16.172.49 no ip http server ip pim bidir-enable ! ! access-list 101 permit ip 3.3.3.0
0.0.0.255 192.168.4.0 0.0.0.255 ! snmp-server community public RO snmp-server enable traps tty !
! call rsvp-sync ! ! mgcp profile default ! dial-peer cor custom ! ! ! ! gatekeeper shutdown ! !
line con 0 exec-timeout 0 0 line aux 0 line vty 0 4 privilege level 15 password cisco login line
vty 5 15 login ! no scheduler max-task-time ! end !--- The system clock is used to view the
time. 7204-1#show clock
23:54:39.059 PST Sat Oct 26 2002
7204-1#show clock
23:58:08.127 PST Sat Oct 26 2002
7204-1#show clock
*19:35:57.227 PST Sat Oct 26 2002
7204-1#
7204-1#
7204-1#
7204-1#show crypto ca certificate
CA Certificate
Status: Available
Certificate Serial Number: 3E34CD199392A0914621EA778B13F357
Certificate Usage: Signature
Issuer:
CN = vpn
OU = cisco
O = tac
L = san jose
ST = california
C = US
Subject:
CN = vpn
OU = cisco
O = tac
L = san jose
ST = california
C = US
CRL Distribution Point:
http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl
Validity Date:
start date: 21:19:50 PST Dec 6 2001
end date: 21:29:42 PST Dec 6 2003
Associated Trustpoints: caserver2
Certificate
Status: Available
Certificate Serial Number: 6111C6690000000000034

```

Certificate Usage: Signature  
Issuer:  
CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US  
Subject:  
Name: 7204-1.cisco.com  
Serial Number: 01691291  
OU = "BERLIN O=GERMANY"  
OID.1.2.840.113549.1.9.2 = 7204-1.cisco.com  
OID.2.5.4.5 = 1691291  
CRL Distribution Point:  
<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>  
Validity Date:  
start date: 19:10:35 PST Oct 26 2002  
end date: 19:20:35 PST Oct 27 2002  
Associated Trustpoints: caserver2

Certificate

Status: Available  
Certificate Serial Number: 61123C0A000000000035  
Certificate Usage: Encryption  
Issuer:  
CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US  
Subject:  
Name: 7204-1.cisco.com  
Serial Number: 01691291  
OU = "BERLIN O=GERMANY"  
OID.1.2.840.113549.1.9.2 = 7204-1.cisco.com  
OID.2.5.4.5 = 1691291  
CRL Distribution Point:  
<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>  
Validity Date:  
start date: 19:11:05 PST Oct 26 2002  
end date: 19:21:05 PST Oct 27 2002  
renew date: 19:20:35 PST Oct 27 2002  
Associated Trustpoints: caserver2

*!--- The system clock is used to view the time. 7204-1#show clock*

\*19:38:33.387 PST Sat Oct 26 2002  
7204-1#show clock  
\*19:38:34.735 PST Sat Oct 26 2002  
7204-1#  
7204-1#  
7204-1#  
7204-1#show clock  
\*19:45:09.735 PST Sat Oct 26 2002  
7204-1#show clock  
7204-1#show clock  
\*17:28:30.662 PST Sun Oct 27 2002  
7204-1#show clock  
\*17:28:48.646 PST Sun Oct 27 2002  
7204-1#  
7204-1#show clock  
\*17:41:15.410 PST Sun Oct 27 2002  
7204-1#  
7204-1#show clock  
\*18:08:45.430 PST Sun Oct 27 2002

```
7204-1#show clock
*18:24:54.702 PST Sun Oct 27 2002
7204-1#show clock
*18:37:13.322 PST Sun Oct 27 2002
7204-1# show clock
*18:47:53.270 PST Sun Oct 27 2002
7204-1# show clock
*18:58:56.202 PST Sun Oct 27 2002
7204-1# show clock
*19:10:27.746 PST Sun Oct 27 2002
7204-1# show clock
*19:10:31.254 PST Sun Oct 27 2002
7204-1# show clock
*19:10:32.658 PST Sun Oct 27 2002
7204-1# show clock
*19:15:44.054 PST Sun Oct 27 2002
7204-1# show clock
*19:15:48.054 PST Sun Oct 27 2002
7204-1# show clock
*19:15:49.606 PST Sun Oct 27 2002
7204-1#show clock
*19:17:02.882 PST Sun Oct 27 2002
7204-1#show clock
*19:17:15.722 PST Sun Oct 27 2002
7204-1#
7204-1#
7204-1#
  show clock
*19:17:26.038 PST Sun Oct 27 2002
7204-1#show clock
*19:17:27.170 PST Sun Oct 27 2002
7204-1#show clock
*19:17:28.418 PST Sun Oct 27 2002
7204-1#show clock
*19:18:50.650 PST Sun Oct 27 2002
7204-1#show debug
Cryptographic Subsystem:
  Crypto PKI Msg debugging is on
  Crypto PKI Trans debugging is on
7204-1#
7204-1#
*19:19:16.574 PST Sun Oct 27 2002
7204-1#show clock
*19:19:22.202 PST Sun Oct 27 2002
7204-1#show clock
*19:19:23.762 PST Sun Oct 27 2002
7204-1#show clock
*19:19:25.354 PST Sun Oct 27 2002
7204-1#show clock
*19:19:28.202 PST Sun Oct 27 2002
7204-1#show clock
*19:19:34.482 PST Sun Oct 27 2002
7204-1#show clock
*19:19:53.118 PST Sun Oct 27 2002
7204-1#show clock
*19:19:55.014 PST Sun Oct 27 2002
7204-1#show clock
*19:20:28.654 PST Sun Oct 27 2002
7204-1#show clock
*19:20:32.770 PST Sun Oct 27 2002
!--- The certificate renew date is 19:20:35 PST !--- Oct 27 2002. At the following time the
router automatically enrolls !--- with CA server2 in order to obtain another identity
certificate !--- before the current identity certificate expires. The router also !---
regenerates the RSA key pair. 7204-1#show clock
```

\*19:20:34.182 PST Sun Oct 27 2002

7204-1#show clock

Time to re-enroll

trust\_point caserver2

Can not select my full public

key (ciscotac)

\*19:20:35.314 PST Sun Oct 27

2002

7204-1#% Start certificate enrollment

..

% The subject name in the certificate will

be: OU=BERLIN O=GERMANY

% The subject name in the certificate will

be: 7204-1.cisco.com

% The serial number in the certificate will

be: 01691291

% Certificate request sent to Certificate Authority

% The certificate request fingerprint will be displayed.

% The 'show crypto ca certificate' command will also show the fingerprint.

\*Oct 28 02:20:35: %SSH-5-DISABLED: SSH 1.5 has been disabled

\*Oct 28 02:20:35: %CRYPTO-6-AUTOGEN: Generated new 512 bit key pair

Signing Certificate Request Fingerprint:

2EF6D7F3 AF5B4491 E254E6D0 229878CF

\*Oct 28 02:20:35: %SSH-5-ENABLED: SSH 1.5 has been enabled

\*Oct 28 02:20:36: %CRYPTO-6-AUTOGEN: Generated new 512 bit key pair

\*Oct 28 02:20:36: CRYPTO\_PKI: Insert Selfsigned Certificate:

30 82 01 4A 30 81 F5 02 20 35 45 35 42 44 43

39

hex data omitted

9F 2C DB 5F FA DC A2 DC E3 49 6D 28 C8 F8

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: subject name =

30 21 31 1F 30 1D 06 09 2A 86 48 86 F7 0D 01

09

02 16 10 37 32 30 34 2D 31 2E 63 69 73 63

6F 2E

l number =

35 45 35 42 44 43 39 45 30 32 45 38 41 36

42 31

45 39 46 45 32 42 33 31 45 46 45 43 45 34

38 46

\*Oct 28 02:20:36: CRYPTO\_PKI: Sending CA Certificate Request:

GET /certsrv/mscep/mscep.dll/pkiclient.exe?operation=GetCACert&message=caserver2

HTTP/1.0

63 6F 6D

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: issuer name =

30 21 31 1F 30 1D 06 09 2A 86 48 86 F7 0D

01 09

02 16 10 37 32 30 34 2D 31 2E 63 69 73 63

6F 2E

63 6F 6D

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: seria

Encryption Certificate Request Fingerprint:

58D999C4 BA8F34FD F5C10A30 81D7A054

\*Oct 28 02:20:36: CRYPTO\_PKI: can not resolve server name/IP address

\*Oct 28 02:20:36: CRYPTO\_PKI: Using unresolved IP Address 171.69.89.111

\*Oct 28 02:20:36: CRYPTO\_PKI: http connection opened

\*Oct 28 02:20:36: CRYPTO\_PKI: HTTP response header:

HTTP/1.1 200 OK

Server: Microsoft-IIS/5.0

Date: Mon, 28 Oct 2002 02:20:43 GMT

Content-Length: 2811

Content-Type: application/x-x509-ca-ra-cert

Content-Type indicates we have received CA and RA certificates.

\*Oct 28 02:20:36: CRYPTO\_PKI:crypto\_process\_ca\_ra\_cKI:CA and RA certs  
(cert data):

30 82 0A F7 06 09 2A 86 48 86 F7 0D 01 07 02

A0

82 0A E8 30 82 0A E4ert(trustpoint=caserver2)

\*Oct 28 02:20:36: CRYPTO\_P 02 01 01 31 00 30 0B 06 09

hex data omitted

A9 13 93 1E E6 E1 E4 30 07 31 00

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: subject name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hex data omitted

76 70 6E

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: issuer name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hex data omitted

76 70 6E

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: serial number =

3E 34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: subject name =

30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D

01

hex data omitted

70 6B 69 2D 72 61

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: issuer name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hex data omitted

76 70 6E

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: serial number =

14 6C F2 85 00 00 00 00 00 09

\*Oct 28 02:20:36: CRYPTO\_PKI: WARNING: Certificate, private key or CRL  
was not found while selecting CRL

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: subject name =

30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D

01

hex data omitted

70 6B 69 2D 72 61

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: issuer name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hex data omitted

76 70 6E

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: serial number =

14 6C F1 A9 00 00 00 00 00 08

\*Oct 28 02:20:36: CRYPTO\_PKI: WARNING: Certificate, private key or CRL  
was not found while selecting CRL

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: subject name =

30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D

01

hex data omitted

70 6B 69 2D 72 61

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: issuer name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hex data omitted

76 70 6E

\*Oct 28 02:20:36: CRYPTO\_PKI: InsertCertData: serial number =

14 6C F1 A9 00 00 00 00 00 08

```
*Oct 28 02:20:36: CRYPTO_PKI: InsertCertData: subject name =
 30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D
01
hex data omitted
 70 6B 69 2D 72 61
*Oct 28 02:20:36: CRYPTO_PKI: InsertCertData: issuer name =
 30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
 76 70 6E
*Oct 28 02:20:36: CRYPTO_PKI: InsertCertData: serial number =
14 6C F2 85 00 00 00 00 09
*Oct 28 02:20:36: CRYPTO_PKI: InsertCertData: subject name =
 30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
 76 70 6E
*Oct 28 02:20:36: CRYPTO_PKI: InsertCertData: issuer name =
 30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
 76 70 6E
*Oct 28 02:20:36: CRYPTO_PKI: InsertCertData: serial number =
3E 34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57
*Oct 28 02:20:36: CRYPTO_PKI: crypto_process_ra_certs(trust_point=caserver2)
*Oct 28 02:20:36: CRYPTO_PKI: transaction PKCSReq completed
*Oct 28 02:20:36: CRYPTO_PKI: status:
*Oct 28 02:20:36: CRYPTO_PKI:Write out pkcs#10 content:319
 30 82 01 3B 30 81 E6 02 01 00 30 4C 31 19
30 17
hex data omitted
 9A 0E DE 86 AB 85 DD 67 79 6B 67 1F 2B 53
51
*Oct 28 02:20:36: CRYPTO_PKI:Enveloped Data for trustpoint caserver2...
 30 80 06 09 2A 86 48 86 F7 0D 01 07 03 A0 80
30
hex data omitted
 00 00 00 00
*Oct 28 02:20:36: CRYPTO_PKI:Signed Data for trustpoint caserver2 (1410
bytes)
 30 80 06 09 2A 86 48 86 F7 0D 01 07 02 A0
80 30
hex data omitted
 00 00
*Oct 28 02:20:36: CRYPTO_PKI: can not resolve server name/IP address
*Oct 28 02:20:36: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
*Oct 28 02:20:36: CRYPTO_PKI: http connection opened
*Oct 28 02:20:38: CRYPTO_PKI:Write out pkcs#10 content:319
 30 82 01 3B 30 81 E6 02 01 00 30 4C 31 19
30 17
hex data omitted
 1E 74 00 9F A9 C1 ED 00 3C 7F 72 E3 61 D5
84
*Oct 28 02:20:38: CRYPTO_PKI:Enveloped Data for trustpoint caserver2...
 30 80 06 09 2A 86 48 86 F7 0D 01 07 03 A0 80
30
hex data omitted
 04 08 5A 0B 69 47 5E C6 23 4C 00 00 00 00
00 00
 00 00 00 00
*Oct 28 02:20:38: CRYPTO_PKI:Signed Data for trustpoint caserver2 (1410
bytes)
 30 80 06 09 2A 86 48 86 F7 0D 01 07 02 A0
80 30
```



```
hex data omitted
65 86 05 93 84 87 9F 8D B4 5F 00 00 00 00
00 00
00 00
*Oct 28 02:20:38: CRYPTO_PKI: can not resolve server name/IP address
*Oct 28 02:20:38: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
*Oct 28 02:20:39: CRYPTO_PKI: http connection opened
*Oct 28 02:20:40: %AMDP2_FE-5-LATECOLL: Ethernet1/1 transmit error
*Oct 28 02:20:41: %SCHED-3-STUCKTMR: Sleep with expired timer 63B997A8,
time 0x51A21B4 (00:00:00 ago).
-Process= "Crypto PKI RECV ", ipl= 4, pid= 92
-Traceback= 6064AD0C 6064B0C8 607237BC 60725E60 60796C00 6079C2B0 61CCF6D4
61CC9838 61CC9944 61CC864C 60630A98 60630A84
*Oct 28 02:20:41: CRYPTO_PKI: received msg of 1930 bytes
*Oct 28 02:20:41: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Mon, 28 Oct 2002 02:20:46 GMT
Content-Length: 1784
Content-Type: application/x-pki-message

*Oct 28 02:20:41: CRYPTO_PKI:Received pki message (PKCS7) for trustpoint
caserver2: 1784 bytes
30 82 06 F4 06 09 2A 86 48 86 F7 0D 01 07 02
A0
hex data omitted
A0 82 04 AE 30 82 04 AA 02 01 00 31 81 9E
30 81
*Oct 28 02:20:41: %CRYPTO-6-CERTRET: Certificate received from Certificate
Authority
*Oct 28 02:20:51: CRYPTO_PKI: received msg of 1930 bytes
*Oct 28 02:20:51: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Mon, 28 Oct 2002 02:20:49 GMT
Content-Length: 1784
Content-Type: application/x-pki-message

*Oct 28 02:20:51: CRYPTO_PKI:Received pki message (PKCS7) for trustpoint
caserver2: 1784 bytes
30 82 06 F4 06 09 2A 86 48 86 F7 0D 01 07 02
A0
hex data omitted
ED 9F 4E 20 DB 91 A7 55
*Oct 28 02:20:51: CRYPTO_PKI: InsertCertData: subject name =
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D
01
hex data omitted
70 6B 69 2D 72 61
*Oct 28 02:20:51: CRYPTO_PKI: InsertCertData: issuer name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
*Oct 28 02:20:51: CRYPTO_PKI: InsertCertData: serial number =
14 6C F1 A9 00 00 00 00 00 08
*Oct 28 02:20:51: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL
*Oct 28 02:20:51: CRYPTO_PKI: signed attr: pki-message-type:
13 01 33
*Oct 28 02:20:51: CRYPTO_PKI: signed attr: pki-status: 13
01 30
```

\*Oct 28 02:20:51: CRYPTO\_PKI: signed attr: pki-recipient-nonce:  
04 10 CE AB A0 E3 52 BD BF 95 D9 F8 DB 1A  
07 D9  
FA C6

\*Oct 28 02:20:51: CRYPTO\_PKI: signed attr: pki-transaction-id:  
13 20 35 31 43 35 43 43 37 33 42 42 30 31  
38 41  
33 35 35 39 34 39 39 43 39 30 42 31 44 32  
37 38  
31 30

\*Oct 28 02:20:51: **CRYPTO\_PKI: status = 100:  
certificate is granted**

\*Oct 28 02:20:51: **CRYPTO\_PKI:Verified signed  
data for trustpoint caserver2 (1217 bytes):**  
30 82 04 BD 06 09 2A 86 48 86 F7 0D 01 07  
03 A0

hex data omitted

3A 74 B6 8F F8 E5 29

\*Oct 28 02:20:52: CRYPTO\_PKI: WARNING: Certificate, private key or  
CRL was not found while selecting CRL

\*Oct 28 02:21:02: **CRYPTO\_PKI: All enrollment  
requests completed for trustpoint caserver2.**

7204-1#

7204-1#

7204-1#**show crypto ca certificate**

Certificate

Status: Available

Certificate Serial Number: 053859FC0000000000039

Certificate Usage: Encryption

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

Subject:

**Name: 7204-1.cisco.com**

**Serial Number: 01691291**

**OU = "BERLIN O=GERMANY"**

**OID.1.2.840.113549.1.9.2**

**= 7204-1.cisco.com**

**OID.2.5.4.5 = 1691291**

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

Validity Date:

start date: 19:10:49 PST

*!--- Another identity certificate is !--- received and the renew date is now different. Oct 27  
2002*

**end date: 19:20:49**

**PST Oct 28 2002**

**renew date: 19:20:46 PST**

**Oct 28 2002**

**Associated Trustpoints: caserver2**

Certificate

Status: Available

Certificate Serial Number: 05384E3F0000000000038

Certificate Usage: Signature

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US  
Subject:  
Name: 7204-1.cisco.com  
Serial Number: 01691291  
OU = "BERLIN O=GERMANY"  
OID.1.2.840.113549.1.9.2 = 7204-1.cisco.com  
OID.2.5.4.5 = 1691291  
CRL Distribution Point:  
http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl  
Validity Date:  
start date: 19:10:46 PST Oct 27 2002  
end date: 19:20:46 PST Oct 28 2002  
Associated Trustpoints: caserver2  
CA Certificate  
Status: Available  
Certificate Serial Number: 3E34CD199392A0914621EA778B13F357  
Certificate Usage: Signature  
Issuer:  
CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US  
Subject:  
CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US  
CRL Distribution Point:  
http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl  
Validity Date:  
start date: 21:19:50 PST Dec 6 2001  
end date: 21:29:42 PST Dec 6 2003  
Associated Trustpoints: caserver2

7204-1# show crypto key mypubkey rsa

%

*!--- The RSA key pair was regenerated at the time of !--- certificate auto-enroll. Key pair was generated at: 19:20:35 PST*

**Oct 27 2002**

Key name: ciscotac

Usage: Signature Key

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00A540B1  
062AEF70

081605F2 F81402EE A52DEAF4 05462747 CCE21BCC 8A1A21B0 C7BDF333  
90728D48

68D46B81 19FC15EE 33045A3F 7BE50D85 FDD9F3DE 55E29F6F 67020301  
0001

% Key pair was generated at: 19:20:35 PST Oct 27 2002

Key name: ciscotac

Usage: Encryption Key

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00A9F8A8  
4E5AA9AF

22D9B0E0 B3754D5A 4387995D 23B09D8F E9AB70B7 CDF A126A 63A25EAF  
055065EB

C076B36B 5A034A9D CE82206B 031C8231 B85DE829 E35FF874 39020301  
0001

% Key pair was generated at: 19:20:36 PST Oct 27 2002

```
Key name: ciscotac.server
Usage: Encryption Key
Key Data:
 307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00E47825
7E60D6AC
 4C078368 925191FD 2B2AAC50 6A6D6AF1 8A01C9B6 D21C4C80 05DD8277
D63F60B1
 01A2DDCF 407BE088 D333FE1D 4F5DE892 47970454 A50C54EC B962FEE4
A9BF5197
 4C2B0656 503E0045 BB3168C4 2228155A B6BF0385 0B493FC5 79020301
0001
7204-1#
7204-1#
7204-1#
!--- The router configuration with the new identity certificates. 7204-1# 7204-1#show run
Building configuration...
Current configuration : 8245 bytes
!
version 12.2
service timestamps debug datetime
service timestamps log datetime
no service password-encryption
service udp-small-servers
service tcp-small-servers
no service dhcp
!
hostname 7204-1
!
boot system flash slot
boot system flash slot0:c7200-jk9o3s-mz.122-11.T1.bin
logging buffered 50000 debugging
enable secret 5 $1$GdwM$YPQYieph20DPAhQeNvHa30
enable password ipsecpki
!
username cisco password 0 cisco
clock timezone PST -7
ip subnet-zero
!
!
no ip domain lookup
ip domain name cisco.com
ip host caserver2 171.69.89.111
!
!
ip vrf test
no ip cef
ip audit notify log
ip audit po max-events 100
!
crypto ca trustpoint caserver2
enrollment retry period 2
enrollment mode ra
enrollment url http://171.69.89.111:80/certsrv/mscep/mscep.dll
usage ike
serial-number
ip-address none
password 7 094241071C
subject-name OU=BERLIN O=GERMANY
crl optional
rsaкеypair ciscotac
auto-enroll regenerate
crypto ca certificate chain caserver2
certificate 053859FC000000000039
308203AA 30820354 A0030201 02020A05 3859FC00 00000000 39300D06
```

092A8648

```
!--- Certificate is abbreviated for easier viewing. quit certificate 05384E3F000000000038
308203AA 30820354 A0030201 02020A05 384E3F00 00000000 38300D06 092A8648 86F70D01 01050500
3061310B 30090603 55040613 02555331 13301106 03550408 !--- Certificate is abbreviated for easier
viewing. quit certificate ca 3E34CD199392A0914621EA778B13F357 30820284 3082022E A0030201
0202103E 34CD1993 92A09146 21EA778B 13F35730 0D06092A 864886F7 0D010105 05003061 310B3009
06035504 06130255 53311330 !--- Certificate is abbreviated for easier viewing. quit ! crypto
isakmp policy 10 hash md5 crypto isakmp identity hostname - ! ! crypto ipsec transform-set myset
esp-des esp-md5-hmac ! crypto map vpn 10 ipsec-isakmp set peer 172.16.172.35 set transform-set
myset match address 101 ! ! ! voice call carrier capacity active ! ! interface Ethernet1/0 no ip
address duplex half ! interface Ethernet1/1 ip address 172.16.172.51 255.255.255.240 no ip
redirects duplex half crypto map vpn !interface Ethernet1/2 ip address 3.3.3.2 255.255.255.0 no
keepalive duplex half ! interface Ethernet1/3 no ip address duplex half ! interface Hssi4/0 ip
address 200.1.1.1 255.255.255.0 load-interval 30 fair-queue 64 16 0 hssi dce serial
restart_delay 0 clockrate 1524705 ! ip classless ip route 0.0.0.0 0.0.0.0 172.16.172.49 no ip
http server ip pim bidir-enable ! ! access-list 101 permit ip 3.3.3.0 0.0.0.255 192.168.4.0
0.0.0.255 ! snmp-server community public RO snmp-server enable traps tty ! ! call rsvp-sync ! !
mgcp profile default ! dial-peer cor custom ! ! ! ! gatekeeper shutdown ! ! line con 0 exec-
timeout 0 0 line aux 0 line vty 0 4 privilege level 15 password cisco login line vty 5 15 login
! no scheduler max-task-time ! end 7204-1# 7204-1#
```

此输出显示 1720-1 路由器上用于显示 RSA 密钥重新生成的 **show crypto ca certificate** 命令。

```
1720-1#
1720-1#show crypto ca certificate
CA Certificate
Status: Available
Certificate Serial Number: 0E7EC1B68A2F14BD4C4515AF44C45732
Certificate Usage: Signature
Issuer:
CN = SJVPNTAC-CAServer
OU = TAC-VPN-SJ
O = Cisco Systems
L = San Jose
ST = CA
C = US
Subject:
CN = SJVPNTAC-CAServer
OU = TAC-VPN-SJ
O = Cisco Systems
L = San Jose
ST = CA
C = US
CRL Distribution Point:
http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl
Validity Date:
start date: 20:52:48 UTC Sep 17 2002
end date: 21:02:37 UTC Sep 17 2017
Associated Trustpoints: caserver1
```

```
Certificate
Status: Available
Certificate Serial Number: 611652F700000000003A
Certificate Usage: Signature
Issuer:
CN = SJVPNTAC-CAServer
OU = TAC-VPN-SJ
O = Cisco Systems
L = San Jose
ST = CA
C = US
Subject:
Name: 1720-1.tac.com
```

**IP Address: 172.16.172.45**  
**Serial Number: 2F31F46E**  
**OU = "MADRID O=SPAIN"**  
OID.1.2.840.113549.1.9.2 = 1720-1.tac.com  
OID.1.2.840.113549.1.9.8 = 172.16.172.45  
OID.2.5.4.5 = 2F31F46E  
CRL Distribution Point:  
http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl  
Validity Date:  
start date: 03:53:11 UTC Oct 26 2002  
end date: 04:03:11 UTC Oct 26 2003  
**Associated Trustpoints: caserver1**

Certificate  
Status: Available  
Certificate Serial Number: 61165F5B00000000003B  
Certificate Usage: Encryption  
Issuer:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US  
Subject:  
**Name: 1720-1.tac.com**  
**IP Address: 172.16.172.45**  
**Serial Number: 2F31F46E**  
**OU = "MADRID O=SPAIN"**  
OID.1.2.840.113549.1.9.2 = 1720-1.tac.com  
OID.1.2.840.113549.1.9.8 = 172.16.172.45  
OID.2.5.4.5 = 2F31F46E  
CRL Distribution Point:  
http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl  
**Validity Date:**  
**start date: 03:53:14 UTC Oct 26 2002**  
**end date: 04:03:14 UTC Oct 26 2003**  
**renew date: 04:03:11 UTC Oct 26 2003**  
**Associated Trustpoints: caserver1**

此输出显示 1720-1 路由器上的 **show crypto key** 命令。

```
1720-1#show crypto key mypubkey rsa
% Key pair was generated at: 00:49:35 UTC Mar 1 1993
Key name: ipsecpki
Usage: Signature Key
Key Data:
305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00D3D4B1 CC3DC9DE
04373E6C F3ADA37B DBE56BD4 C9945889 E24626DF D0CC45FE 7CBA196C 1DB10C15
EE6332F8 A614561E 991549DD 787E4D7C 30ECC465 B0D67BEA E1020301 0001
% Key pair was generated at: 00:49:36 UTC Mar 1 1993
Key name: ipsecpki
Usage: Encryption Key
Key Data:
305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00C6D61D D126D546
678D5C7D A99E9D22 E2B7C82E 72D69478 3A241FE9 A5F5B761 81A6A85D 9389FD03
D27D58CF 21122EF5 8B3F4278 B2C71C58 DD0E5485 B00A02AE 0B020301 0001
% Key pair was generated at: 21:30:31 UTC Oct 27 2002
Key name: ipsecpki.server
Usage: Encryption Key
Key Data:
307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00DB0878 020052BA
```

```
BE67DEBF 001DA215 D6EB8CA9 8DD5B077 A27809D7 792166C4 5F1F2AD4 F4BE813B
087E1747 4677570B 7F692A78 D897951A B37A1A0B 1E167044 F6ADA763 67AECAE6
BF2D9AF3 0EA492B5 1E601EAF 7E280B80 091A2D89 2116685A 59020301 0001
```

## 当 RSA 密钥对不存在时

在自动注册期间，如果 RSA 密钥对不存在，则会在注册期间自动生成一对通用密钥，如此输出所示。此示例在启动时并未在 7204-1 路由器上进行证书配置，并且未生成 RSA 密钥对。

```
show run
Building configuration...
Current configuration : 1828 bytes
!
version 12.2
service timestamps debug datetime
service timestamps log datetime
no service password-encryption
service udp-small-servers
service tcp-small-servers
no service dhcp
!
hostname 7204-1
!
boot system flash slot
boot system flash slot0:c7200-jk9o3s-mz.122-11.T1.bin
logging buffered 50000 debugging
enable secret 5 $1$GdwM$YPQYieph20DPAhQeNvHa30
enable password ipsecpki
!
username cisco password 0 cisco
clock timezone PST -7
ip subnet-zero
!
!
no ip domain lookup
ip domain name cisco.com
ip host caserver2 171.69.89.111
!
!
ip vrf test
no ip cef
ip audit notify log
ip audit po max-events 100
!
crypto isakmp policy 10
hash md5
crypto isakmp identity hostname
!
!
crypto ipsec transform-set myset esp-des esp-md5-hmac
!
crypto map vpn 10 ipsec-isakmp
set peer 172.16.172.35
set transform-set myset
match address 101
!
!
voice call carrier capacity active
!
!
interface Ethernet1/0
```

```
no ip address
duplex half
!
interface Ethernet1/1
ip address 172.16.172.51 255.255.255.240
no ip redirects
duplex half
crypto map vpn
!
interface Ethernet1/2
ip address 3.3.3.2 255.255.255.0
no keepalive
duplex half
!
interface Ethernet1/3
no ip address
duplex half
!
interface Hssi4/0
ip address 200.1.1.1 255.255.255.0
load-interval 30
fair-queue 64 16 0
hssi dce
serial restart_delay 0
clockrate 1524705
!
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.172.49
no ip http server
ip pim bidir-enable
!
!
access-list 101 permit ip 3.3.3.0 0.0.0.255 192.168.4.0 0.0.0.255
!
snmp-server community public RO
snmp-server enable traps tty
!
!
call rsvp-sync
!
!
mgcp profile default
!
dial-peer cor custom
!
!
!
!
gatekeeper
shutdown
!
!
line con 0
exec-timeout 0 0
line aux 0
line vty 0 4
privilege level 15
password cisco
login
line vty 5 15
login
!
no scheduler max-task-time
!
```



```
end

7204-1#show clock
*17:18:44.780 PST Mon Oct 28 2002
7204-1#conf t
7204-1#show crypto key mypubkey rsa
7204-1#show cry key mypubkey rsa
!--- An RSA key pair has not been generated. 7204-1#show cry key mypubkey rsa
7204-1#
7204-1#
7204-1#
7204-1#
7204-1#configure terminal
!--- Defining the CA server communication parameters. Enter configuration commands, one per
line. End with CNTL/Z. 7204-1(config)#crypto ca trustpoint caserver2
7204-1(ca-trustpoint)# enrollment retry period 2
7204-1(ca-trustpoint)# enrollment mode ra
7204-1(ca-trustpoint)# enrollment url http://171.69.89.111:80/certsrv/mscep/mscep.dll
7204-1(ca-trustpoint)# usage ike
7204-1(ca-trustpoint)# serial-number
7204-1(ca-trustpoint)# ip-address none
7204-1(ca-trustpoint)# password 7 030A540503
7204-1(ca-trustpoint)# subject-name OU=BERLIN O=GERMANY
7204-1(ca-trustpoint)# crl optional
7204-1(ca-trustpoint)# rsakeypair ciscotac
7204-1(ca-trustpoint)# auto-enroll regenerate
7204-1(ca-trustpoint)#
7204-1(ca-trustpoint)#^Z
7204-1#
7204-1#
7204-1#
7204-1#
7204-1#
*Oct 29 00:19:39: %SYS-5-CONFIG_I: Configured from console by consolesh
clo
7204-1#show clock
*17:19:42.656 PST Mon Oct 28 2002
7204-1#show run
Building configuration...
Current configuration : 2131 bytes
!
version 12.2
service timestamps debug datetime
service timestamps log datetime
no service password-encryption
service udp-small-servers
service tcp-small-servers
no service dhcp
!
hostname 7204-1
!
boot system flash slot
boot system flash slot0:c7200-jk9o3s-mz.122-11.T1.bin
logging buffered 50000 debugging
enable secret 5 $1$GdwM$YPQYieph20DPAhQeNvHa30
enable password ipsecpki
!
username cisco password 0 cisco
clock timezone PST -7
ip subnet-zero
!
!
no ip domain lookup
ip domain name cisco.com
```

```
ip host caserver2 171.69.89.111
!
!
ip vrf test
no ip cef
ip audit notify log
ip audit po max-events 100
!
crypto ca trustpoint caserver2
enrollment retry period 2
enrollment mode ra
enrollment url http://171.69.89.111:80/certsrv/mscep/mscep.dll
usage ike
serial-number
ip-address none
password 7 000A1C0801
subject-name OU=BERLIN O=GERMANY
crl optional
rsakeypair ciscotac
auto-enroll regenerate
crypto isakmp policy 10
hash md5
crypto isakmp identity hostname
!
!
crypto ipsec transform-set myset esp-des esp-md5-hmac
!
crypto map vpn 10 ipsec-isakmp
set peer 172.16.172.35
set transform-set myset
match address 101
!
!
!
voice call carrier capacity active
!
!
!
!
!
!
!
q
7204-1#debug crypto pki transactions
Crypto PKI Trans debugging is on
7204-1#
7204-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
7204-1(config)#crypto ca authenticate
caserver2
Certificate has the following attributes:
Fingerprint: A1E8B61A FD1A66D6 2DE35501 99C43D83
% Do you accept this certificate? [yes/no]:
*Oct 29 00:20:56: CRYPTO_PKI: Sending CA Certificate Request:
GET /certsrv/mscep/mscep.dll/pkiclient.exe?operation=GetCACert&message=caserver2
HTTP/1.0
*Oct 29 00:20:56: CRYPTO_PKI: can not resolve server name/IP address
*Oct 29 00:20:56: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
*Oct 29 00:20:56: CRYPTO_PKI: http connection opened
*Oct 29 00:20:56: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Tue, 29 Oct 2002 00:21:02 GMT
Content-Length: 2811
```

Content-Type: application/x-x509-ca-ra-cert

Content-Type indicates we have received CA and RA certificates.

Y

Trustpoint CA certificate accepted.

7204-1(config)#

\*Oct 29 00:20:56: CRYPTO\_PKI:crypto\_process\_ca\_ra\_cert(trustpoint=caserver2)

\*Oct 29 00:20:56: CRYPTO\_PKI: WARNING: Certificate, private key or CRL

was not found while selecting CRL

\*Oct 29 00:20:56: CRYPTO\_PKI: WARNING: Certificate, private key or CRL

was not found while selecting CRL

\*Oct 29 00:20:56: CRYPTO\_PKI: transaction GetCACert completed

\*Oct 29 00:20:56: CRYPTO\_PKI: CA certificate

received.

\*Oct 29 00:20:56: CRYPTO\_PKI: **CA certificate received.**

\*Oct 29 00:20:56: CRYPTO\_PKI: crypto\_pki\_authenticate\_tp\_cert()

\*Oct 29 00:20:56: CRYPTO\_PKI: trustpoint caserver2 authentication status

= 2

\*Oct 29 00:20:58: CRYPTO\_PKI: crypto\_process\_ra\_certs(trust\_point=caserver2)

7204-1(config)#

7204-1#show crypto key mypubkey rsa

*!--- The RSA key pair has not yet been generated. !--- Only the CA has been authenticated.* 7204-

1#show crypto ca certificate

*!--- Only the CA certificate has been received.* CA Certificate Status: Available Certificate

Serial Number: 3E34CD199392A0914621EA778B13F357 Certificate Usage: Signature Issuer: CN = vpn OU

= cisco O = tac L = san jose ST = california C = US Subject: CN = vpn OU = cisco O = tac L = san

jose ST = california C = US CRL Distribution Point: http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl

Validity Date: start date: 21:19:50 PST Dec 6 2001 end date: 21:29:42 PST Dec 6 2003 **Associated**

**Trustpoints: caserver2**

7204-1# Time to Re-enroll trust\_point caserver2

Can not select my full public key (ciscotac)

Can not select my full public key (ciscotac)

Can not select my full public key (ciscotac)%

% Start certificate enrollment ..

% The subject name in the certificate will

be: OU=BERLIN O=GERMANY

% The subject name in the certificate will

be: 7204-1.cisco.com

% The serial number in the certificate will

be: 01691291

% Certificate request sent to Certificate

Authority

% The certificate request fingerprint will

be displayed.

% The 'show crypto ca certificate' command

will also show the fingerprint.

key mypubkey

rsa Fingerprint: 6FD37B13 7329725C B524C666 2CFB08BB

\*Oct 29 00:22:13: %SSH-5-ENABLED: SSH 1.5 has been enabled

\*Oct 29 00:22:13: %CRYPTO-6-AUTOGEN: Generated new 512 bit key pair

\*Oct 29 00:22:13: CRYPTO\_PKI: Sending CA Certificate Request:

GET /certsrv/mscep/mscep.dll/pkiclient.exe?operation=GetCACert&message=caserver2

HTTP/1.0

\*Oct 29 00:22:13: CRYPTO\_PKI: can not resolve server name/IP address

\*Oct 29 00:22:13: CRYPTO\_PKI: Using unresolved IP Address 171.69.89.111

\*Oct 29 00:22:13: CRYPTO\_PKI: http connection opened

\*Oct 29 00:22:14: CRYPTO\_PKI: HTTP response header:

HTTP/1.1 200 OK

Server: Microsoft-IIS/5.0

Date: Tue, 29 Oct 2002 00:22:20 GMT

Content-Length: 2811

Content-Type: application/x-x509-ca-ra-cert

Content-Type indicates we have received CA and RA certificates.

```
*Oct 29 00:22:14: CRYPTO_PKI:crypto_process_ca_ra_cert(trustpoint=caserver2)
*Oct 29 00:22:14: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL
*Oct 29 00:22:14: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL
*Oct 29 00:22:14: CRYPTO_PKI: crypto_process_ra_certs(trust_point=caserver2)
*Oct 29 00:22:14: CRYPTO_PKI: transaction PKCSReq completed
*Oct 29 00:22:14: CRYPTO_PKI: status:
*Oct 29 00:22:14: CRYPTO_PKI: All sockets are closed for trustpoint
caserver2.
*Oct 29 00:22:14: CRYPTO_PKI: can not resolve server name/IP address
*Oct 29 00:22:14: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
*Oct 29 00:22:14: CRYPTO_PKI: http connection opened
*Oct 29 00:22:16: CRYPTO_PKI: received msg of 1930 bytes
*Oct 29 00:22:16: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Tue, 29 Oct 2002 00:22:22 GMT
Content-Length: 1784
Content-Type: application/x-pki-message
```

```
*Oct 29 00:22:16: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL
*Oct 29 00:22:16: CRYPTO_PKI: status = 100: certificate is granted
*Oct 29 00:22:16: CRYPTO_PKI: WARNING: Certificate, private key or
CRL was not found while selecting CRL
*Oct 29 00:22:16: CRYPTO_PKI: All enrollment
requests completed for trustpoint caserver2.
*Oct 29 00:22:16: CRYPTO_PKI: All enrollment requests completed for
trustpoint caserver2.
*Oct 29 00:22:16: %CRYPTO-6-CERTRET: Certificate received from Certificate
Authority
*Oct 29 00:22:16: CRYPTO_PKI: All enrollment
requests completed for trustpoint caserver2.
*Oct 29 00:22:16: %CRYPTO-4-NOAUTOSAVE: Configuration was modified.
Issue "write memory" to save new certificate
*Oct 29 00:22:16: CRYPTO_PKI: WARNING: Certificate, private key or
CRL was not found while selecting CRL
*Oct 29 00:22:16: CRYPTO_PKI: All enrollment requests completed for
trustpoint caserver2.
```

**% Key pair was generated at: 17:22:13 PST**

**Oct 28 2002**

**Key name: ciscotac**

**Usage: General Purpose Key**

Key Data:

```
305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00B05722
43B43599
A2506398 A2205406 755D3AA2 9888FD4C 76CF3C78 CA91BA4A 5EDB4BF8
121A924D
A093D24C 282085BD 3ED9AD76 4CD8C7AD 0EA5582C 70D4E5AF FD020301
0001
```

**% Key pair was generated at: 17:22:13 PST Oct 28 2002**

Key name: ciscotac.server

Usage: Encryption Key

Key Data:

```
307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00CE8A87
0698C6DF
D13D7CF8 C5504394 24D23E0E 2B8367AE 11E6F5AF BD5B6A27 11E63F99
EB768894
A234A6FD 54B90A93 F352B551 08FC32E7 5D0B1F68 2E42974A 4BEB7A9C
```

EA989DD1

35267E59 D1C84CC5 DA436E72 8BAB6B3B 60D0AB62 129FAB02 1F020301

0001

7204-1#

7204-1#

7204-1#

7204-1#**show crypto key mypubkey rsa**

% Key pair was generated at: 17:22:13 PST Oct 28 2002

Key name: ciscotac

*!--- As defined in the configuration, a general !--- purpose RSA key pair.* Usage: General  
Purpose Key was generated during auto-enrollment. Key Data: 305C300D 06092A86 4886F70D 01010105  
00034B00 30480241 00B05722 43B43599 A2506398 A2205406 755D3AA2 9888FD4C 76CF3C78 CA91BA4A  
5EDB4BF8 121A924D A093D24C 282085BD 3ED9AD76 4CD8C7AD 0EA5582C 70D4E5AF FD020301 0001 % Key pair  
was generated at: 17:22:13 PST Oct 28 2002 Key name: ciscotac.server Usage: Encryption Key Key  
Data: 307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00CE8A87 0698C6DF D13D7CF8 C5504394  
24D23E0E 2B8367AE 11E6F5AF BD5B6A27 11E63F99 EB768894 A234A6FD 54B90A93 F352B551 08FC32E7  
5D0B1F68 2E42974A 4BEB7A9C EA989DD1 35267E59 D1C84CC5 DA436E72 8BAB6B3B 60D0AB62 129FAB02  
1F020301 0001 7204-1# 7204-1# 7204-1# 7204-1#**show crypto ca certificate**

Certificate

Status: Available

Certificate Serial Number: 09F246B8000000000003C

Certificate Usage: General Purpose

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

Subject:

Name: 7204-1.cisco.com

Serial Number: 01691291

OU = "BERLIN O=GERMANY"

OID.1.2.840.113549.1.9.2 = 7204-1.cisco.com

OID.2.5.4.5 = 1691291

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

Validity Date:

start date: 17:12:22 PST Oct 28 2002

end date: 17:22:22 PST Oct 29 2002

Associated Trustpoints: caserver2

CA Certificate

Status: Available

Certificate Serial Number: 3E34CD199392A0914621EA778B13F357

Certificate Usage: Signature

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

Subject:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

Validity Date:

start date: 21:19:50 PST Dec 6 2001

end date: 21:29:42 PST Dec 6 2003

Associated Trustpoints: caserver2

7204-1#

7204-1#

*!--- Generates an RSA usage-key pair.* 7204-1# 7204-1# 7204-1#**show run**

Building configuration...

Current configuration : 2139 bytes

```
!  
version 12.2  
service timestamps debug datetime  
service timestamps log datetime  
no service password-encryption  
service udp-small-servers  
service tcp-small-servers  
no service dhcp  
!  
hostname 7204-1  
!  
boot system flash slot  
boot system flash slot0:c7200-jk9o3s-mz.122-11.T1.bin  
logging buffered 50000 debugging  
enable secret 5 $1$GdwM$YPQYieph20DPAhQeNvHa30  
enable password ipsecpki  
!  
username cisco password 0 cisco  
clock timezone PST -7  
ip subnet-zero  
!  
no ip domain lookup  
ip domain name cisco.com  
ip host caserver2 171.69.89.111  
!  
!  
ip vrf test  
no ip cef  
ip audit notify log  
ip audit po max-events 100  
!  
crypto ca trustpoint caserver2  
enrollment retry period 2  
enrollment mode ra  
enrollment url http://171.69.89.111:80/certsrv/mscep/mscep.dll  
usage ike  
serial-number  
ip-address none  
password 7 0608002F49  
subject-name OU=BERLIN O=GERMANY  
crl optional  
rsakeypair ciscotac 512 512
```

```
!--- The RSA key pair defined is for usage-keys. auto-enroll regenerate crypto isakmp policy 10  
hash md5 crypto isakmp identity hostname ! ! crypto ipsec transform-set myset esp-des esp-md5-  
hmac ! crypto map vpn 10 ipsec-isakmp set peer 172.16.172.35 set transform-set myset match  
address 101 ! ! ! voice call carrier capacity active ! ! interface Ethernet1/0 no ip address  
duplex half ! interface Ethernet1/1 ip address 172.16.172.51 255.255.255.240 no ip redirects  
duplex half crypto map vpn ! interface Ethernet1/2 ip address 3.3.3.2 255.255.255.0 no keepalive  
duplex half ! interface Ethernet1/3 no ip address duplex half ! interface Hssi4/0 ip address  
200.1.1.1 255.255.255.0 load-interval 30 fair-queue 64 16 0 hssi dce serial restart_delay 0  
clockrate 1524705 ! ip classless ip route 0.0.0.0 0.0.0.0 172.16.172.49 no ip http server ip pim  
bidir-enable ! ! access-list 101 permit ip 3.3.3.0 0.0.0.255 192.168.4.0 0.0.0.255 ! snmp-server  
community public RO snmp-server enable traps tty ! ! call rsvp-sync ! ! mgcp profile default !  
dial-peer cor custom ! ! ! ! gatekeeper shutdown ! ! line con 0 exec-timeout 0 0 line aux 0 line  
vty 0 4 privilege level 15 password cisco login line vty 5 15 login ! 7204-1# 7204-1# 7204-1#  
7204-1#% Time to Re-enroll trust_point caserver2% You must authenticate the Certificate  
Authority before you can enroll with it. sh cry ke 7204-1#show crypto key mypubkey rsa
```

```
!--- There is no RSA key pair on the router at this time. 7204-1# 7204-1#show clock
*17:27:54.232 PST Mon Oct 28 2002
7204-1#show crypto ca certificate
7204-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
7204-1(config)# crypto ca authenticate caserver2
7204-1#show d
*Oct 29 00:28:17: %SYS-5-CONFIG_I: Configured from console by consoleebug
Cryptographic Subsystem:
  Crypto PKI Trans debugging is on
7204-1#
7204-1#
7204-1#configure terminal
7204-1(config)#crypto ca authenticate caserver2
Certificate has the following attributes:
Fingerprint: A1E8B61A FD1A66D6 2DE35501 99C43D83
% Do you accept this certificate? [yes/no]:
*Oct 29 00:28:33: CRYPTO_PKI: Sending CA Certificate Request:
GET /certsrv/mscep/mscep.dll/pkiclient.exe?operation=GetCACert&message=-caserver2
HTTP/1.0
*Oct 29 00:28:33: CRYPTO_PKI: can not resolve server name/IP address
*Oct 29 00:28:33: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
*Oct 29 00:28:33: CRYPTO_PKI: http connection opened
*Oct 29 00:28:34: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Tue, 29 Oct 2002 00:28:40 GMT
Content-Length: 2811
Content-Type: application/x-x509-ca-ra-cert
```

Content-Type indicates we have received CA and RA certificates.

```
*Oct 29 00:28:34: CRYPTO_PKI:crypto_process_ca_ra_cert(trustpoint=caserver2)
*Oct 29 00:28:34: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL
*Oct 29 00:28:34: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL
*Oct 29 00:28:34: CRYPTO_PKI: transaction GetCACert completed
*Oct 29 00:28:34: CRYPTO_PKI: CA certificate received.
*Oct 29 00:28:34: CRYPTO_PKI: CA certificate received.
*Oct 29 00:28:34: CRYPTO_PKI: crypto_pki_authenticate_tp_cert()
*Oct 29 00:28:34: CRYPTO_PKI: trustpoint caserver2 authentication status
= 2
% Please answer 'yes' or 'no'.
% Do you accept this certificate? [yes/no]:
```

```
Y
Trustpoint CA certificate accepted.
7204-1(config)#
7204-1(config)#
7204-1(config)#
7204-1(config)#
*Oct 29 00:28:40: CRYPTO_PKI: crypto_process_ra_certs(trust_point=caserver2)
7204-1(config)#
7204-1(config)#
7204-1(config)#
7204-1(config)#
7204-1(config)#
7204-1(config)#
7204-1(config)#
7204-1(config)#
7204-1(config)#
7204-1(config)#% Time to Re-enroll trust_point
caserver2
Can not select my full public key (ciscotac)
```

Can not select my full public key (ciscotac)  
Can not select my full public key (ciscotac)%  
Start certificate enrollment ..  
% The subject name in the certificate will  
be: OU=BERLIN O=GERMANY  
% The subject name in the certificate will  
be: 7204-1.cisco.com  
% The serial number in the certificate will  
be: 01691291  
% Certificate request sent to Certificate  
Authority  
% The certificate request fingerprint will  
be displayed.  
% The 'show crypto ca certificate' command  
will also show the fingerprint.  
\*Oct 29 00:29:10: %CRYPTO-6-AUTOGEN: Generated new 512 bit key pair  
Signing Certificate Reqeust Fingerprint:  
D3EA83A5 B255CDA0 C65BF99D 4C1A978B  
\*Oct 29 00:29:10: %SSH-5-ENABLED: SSH 1.5 has been enabled  
\*Oct 29 00:29:10: %CRYPTO-6-AUTOGEN: Generated new 512 bit key pair  
\*Oct 29 00:29:10: CRYPTO\_PKI: Sending CA Certificate Request:  
GET /certsrv/mscep/mscep.dll/pkiclient.exe?operation=GetCACert&message=caserver2  
HTTP/1.0

\*Oct 29 00:29:10: CRYPTO\_PKI: can not resolve server name/IP address  
\*Oct 29 00:29:10: CRYPTO\_PKI: Using unresolved IP Address 171.69.89.111  
\*Oct 29 00:29:11: CRYPTO\_PKI: http connection opened  
\*Oct 29 00:29:11: CRYPTO\_PKI: HTTP response header:  
HTTP/1.1 200 OK  
Server: Microsoft-IIS/5.0  
Date: Tue, 29 Oct 2002 00:29:17 GMT  
Content-Length: 2811  
Content-Type: application/x-x509-ca-ra-cert

Content-Type indicates we have received CA and RA certificates.

\*Oct 29 00:29:11: CRYPTO\_PKI:crypto\_process\_ca\_ra\_cert(trustpoint=caserver2)  
\*Oct 29 00:29:11: CRYPTO\_PKI: WARNING: Certificate, private key or CRL  
was not found while selecting CRL  
\*Oct 29 00:29:11: CRYPTO\_PKI: WARNING: Certificate, private key or CRL  
was not found while selecting CRL  
\*Oct 29 00:29:11: CRYPTO\_PKI: crypto\_process\_ra\_certs(trust\_point=caserver2)  
\*Oct 29 00:29:11: CRYPTO\_PKI: transaction PKCSReq completed  
\*Oct 29 00:29:11: CRYPTO\_PKI: status:  
\*Oct 29 00:29:11: CRYPTO\_PKI: All sockets are closed for trustpoint  
caserver2.  
\*Oct 29 00:29:11: CRYPTO\_PKI: can not resolve server name/IP address  
\*Oct 29 00:29:11: CRYPTO\_PKI: Using unresolved IP Address 171.69.89.111  
\*Oct 29 00:29:11: CRYPTO\_PKI: http connection opened  
Encryption Certificate Request Fingerprint:  
3258F1D9 0412BFA8 2FD14FBC B7345089  
\*Oct 29 00:29:13: CRYPTO\_PKI: can not resolve server name/IP address  
\*Oct 29 00:29:13: CRYPTO\_PKI: Using unresolved IP Address 171.69.89.111  
\*Oct 29 00:29:13: CRYPTO\_PKI: http connection opened  
\*Oct 29 00:29:15: CRYPTO\_PKI: received msg of 1930 bytes  
\*Oct 29 00:29:15: CRYPTO\_PKI: HTTP response header:  
HTTP/1.1 200 OK  
Server: Microsoft-IIS/5.0  
Date: Tue, 29 Oct 2002 00:29:19 GMT  
Content-Length: 1784  
Content-Type: application/x-pki-message



\*Oct 29 00:29:15: CRYPTO\_PKI: WARNING: Certificate, private key or CRL was not found while selecting CRL  
\*Oct 29 00:29:15: CRYPTO\_PKI: status = 100: certificate is granted  
\*Oct 29 00:29:15: CRYPTO\_PKI: WARNING: Certificate, private key or CRL was not found while selecting CRL  
\*Oct 29 00:29:15: %CRYPTO-6-CERTRET: Certificate received from Certificate Authority  
\*Oct 29 00:29:25: CRYPTO\_PKI: received msg of 1930 bytes  
\*Oct 29 00:29:25: CRYPTO\_PKI: HTTP response header:  
HTTP/1.1 200 OK  
Server: Microsoft-IIS/5.0  
Date: Tue, 29 Oct 2002 00:29:21 GMT  
Content-Length: 1784  
Content-Type: application/x-pki-message

\*Oct 29 00:29:25: CRYPTO\_PKI: WARNING: Certificate, private key or CRL was not found while selecting CRL  
\*Oct 29 00:29:25: CRYPTO\_PKI: status = 100: certificate is granted  
\*Oct 29 00:29:25: CRYPTO\_PKI: WARNING: Certificate, private key or CRL was not found while selecting CRL  
\*Oct 29 00:29:25: CRYPTO\_PKI: All enrollment requests completed for trustpoint caserver2.  
\*Oct 29 00:29:25: CRYPTO\_PKI: All enrollment requests completed for trustpoint caserver2.  
\*Oct 29 00:29:25: %CRYPTO-6-CERTRET: Certificate received from Certificate Authority  
\*Oct 29 00:29:25: CRYPTO\_PKI: All enrollment requests completed for trustpoint caserver2.  
\*Oct 29 00:29:25: %CRYPTO-4-NOAUTOSAVE: Configuration was modified. Issue "write memory" to save new certificate  
\*Oct 29 00:29:25: CRYPTO\_PKI: WARNING: Certificate, private key or CRL was not found while selecting CRL  
\*Oct 29 00:29:25: CRYPTO\_PKI: All enrollment requests completed for trustpoint caserver2.  
7204-1(config)#  
7204-1(config)#^Z  
7204-1#  
7204-1#  
7204-1#  
7204-1#  
\*Oct 29 00:30:32: %SYS-5-CONFIG\_I: Configured from console by console  
7204-1#

*!---- An RSA usage-key pair was generated.* 7204-1#show crypto key mypubkey rsa  
% Key pair was generated at: 17:29:10 PST

Oct 28 2002

Key name: ciscotac

Usage: Signature Key

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00E29E58  
FD93989D

F6997DA1 D191123C 661FEB81 789522EE 0CB8D5AD 8A4E9DED E5CDCFDC  
78829A68

41962AD9 5D51AA21 F1C31271 23A7EA4D 6F632CD1 2CFD95C9 D3020301  
0001

% Key pair was generated at: 17:29:10 PST Oct 28 2002

Key name: ciscotac

Usage: Encryption Key

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 009FB6F5  
73B9C0D7

0BF59C1F 579606A6 E4CEE4AD 8BC307B9 3EC3955B 5FA1B355 665750E2  
EC09F8EF

2B5F1D72 0E2FDB8B 0AA16911 492A749F 08113C64 6A203BB7 A9020301  
0001

% Key pair was generated at: 17:29:11 PST Oct 28 2002

Key name: ciscotac.server

Usage: Encryption Key

Key Data:

307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00CE8A87  
0698C6DF

D13D7CF8 C5504394 24D23E0E 2B8367AE 11E6F5AF BD5B6A27 11E63F99  
EB768894

A234A6FD 54B90A93 F352B551 08FC32E7 5D0B1F68 2E42974A 4BEB7A9C  
EA989DD1

35267E59 D1C84CC5 DA436E72 8BAB6B3B 60D0AB62 129FAB02 1F020301  
0001

7204-1#

7204-1#

7204-1#

7204-1#**show crypto ca certificate**

Certificate

Status: Available

Certificate Serial Number: 09F8AC9500000000003E

Certificate Usage: Encryption

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

Subject:

Name: 7204-1.cisco.com

Serial Number: 01691291

OU = "BERLIN O=GERMANY"

OID.1.2.840.113549.1.9.2 = 7204-1.cisco.com

OID.2.5.4.5 = 1691291

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

Validity Date:

start date: 17:19:21 PST Oct 28 2002

end date: 17:29:21 PST Oct 29 2002

renew date: 17:29:19 PST Oct 29 2002

Associated Trustpoints: caserver2

Certificate

Status: Available

Certificate Serial Number: 09F8A45E000000000003D

Certificate Usage: Signature

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

Subject:

Name: 7204-1.cisco.com

Serial Number: 01691291

OU = "BERLIN O=GERMANY"

OID.1.2.840.113549.1.9.2 = 7204-1.cisco.com

OID.2.5.4.5 = 1691291

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

Validity Date:

start date: 17:19:19 PST Oct 28 2002

end date: 17:29:19 PST Oct 29 2002

Associated Trustpoints: caserver2

CA Certificate

Status: Available

```
Certificate Serial Number: 3E34CD199392A0914621EA778B13F357
Certificate Usage: Signature
Issuer:
CN = vpn
OU = cisco
O = tac
L = san jose
ST = california
C = US
Subject:
CN = vpn
OU = cisco
O = tac
L = san jose
ST = california
C = US
CRL Distribution Point:
http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl
Validity Date:
start date: 21:19:50 PST Dec 6 2001
end date: 21:29:42 PST Dec 6 2003
Associated Trustpoints: caserver2
7204-1#
```

## 当身份证书过期时

2611-VPN 未配置外部时间源，并且使用系统时钟跟踪时间。在路由器上声明 CA 服务器 2，验证 CA 服务器，并且 2611-VPN 路由器将在 CA 服务器上自动注册其身份证书。配置 CA 服务器，以便颁发有效日期仅为一天的身份证书。一旦证书过期，路由器将在 CA 服务器上自动注册，此输出显示了相关事件序列。

```
2611-VPN#clock set 19:30:00 26 oct 2002
!--- Sets the system clock. 2611-VPN# 2611-VPN(config)#crypto ca trustpoint caserver2
!--- Declares the CA server communication parameters. 2611-VPN(ca-trustpoint)# enrollment retry
period 5
2611-VPN(ca-trustpoint)# enrollment mode ra
2611-VPN(ca-trustpoint)# enrollment url url http://171.69.89.111:80/certsrv/mscep/
mscep.dll
2611-VPN(ca-trustpoint)# usage ike
2611-VPN(ca-trustpoint)# serial-number
2611-VPN(ca-trustpoint)# fqdn 2611-vpn.cisco.com
2611-VPN(ca-trustpoint)# ip-address Ethernet0/0
2611-VPN(ca-trustpoint)# password 7 12170A1917
2611-VPN(ca-trustpoint)# subject-name OU=ROME O=ITALY
2611-VPN(ca-trustpoint)# crl optional
2611-VPN(ca-trustpoint)# rsakeypair tacvpn
2611-VPN(ca-trustpoint)# auto-enroll regenerate
2611-VPN(ca-trustpoint)#
Oct 26 19:30:53.772: CRYPTO_PKI:Insert Selfsigned Certificate:
 30 82 01 4E 30 81 F9 02 20 38 42 33 34 38 41
44
Hex data omitted
AF 16 7B C1 4E 61 99 24 86 55 30 0D 96 91
4D 47
70 62
Oct 26 19:30:53.820: CRYPTO_PKI: InsertCertData: subject name =
 30 23 31 21 30 1F 06 09 2A 86 48 86 F7 0D 01
09
02 16 12 32 36 31 31 2D 76 70 6E 2E 63 69
73 63
```

```
6F 2E 63 6F 6D
Oct 26 19:30:53.828: CRYPTO_PKI: InsertCertData: issuer name =
 30 23 31 21 30 1F 06 09 2A 86 48 86 F7 0D 01
09
 02 16 12 32 36 31 31 2D 76 70 6E 2E 63 69
73 63
 6F 2E 63 6F 6D
Oct 26 19:30:53.832: CRYPTO_PKI: InsertCertData: serial number =
 38 42 33 34 38 41 44 39 38 39 38 34 34 32
44 34
 45 46 30 39 32 33 43 39 39 42 34 46 36 46
30 39
2611-VPN(config)#crypto ca authenticate caserver2
!--- Authenticates the CA server. Certificate has the following attributes: Fingerprint:
A1E8B61A FD1A66D6 2DE35501 99C43D83 % Do you accept this certificate? [yes/no]: Oct 26
19:31:10.936: CRYPTO_PKI: Sending CA Certificate Request: GET
/certsrv/mscep/mscep.dll/pkiclient.exe?operation=GetCACert&message;=caserver2 HTTP/1.0 Oct 26
19:31:10.940: CRYPTO_PKI: can not resolve server name/IP address Oct 26 19:31:10.940:
CRYPTO_PKI: Using unresolved IP Address 171.69.89.111 Oct 26 19:31:10.944: CRYPTO_PKI: http
connection opened Oct 26 19:31:11.401: CRYPTO_PKI: HTTP response header: HTTP/1.1 200 OK Server:
Microsoft-IIS/5.0 Date: Sun, 27 Oct 2002 02:30:22 GMT Content-Length: 2811 Content-Type:
application/x-x509-ca-ra-cert Content-Type indicates we have received CA
and RA certificates.
Oct 26 19:31:11.405: CRYPTO_PKI:crypto_process_ca_ra_cert(trustpoint=caserver2)
Oct 26 19:31:11.405: CRYPTO_PKI:CA and RA certs (cert data):
 30 82 0A F7 06 09 2A 86 48 86 F7 0D 01 07 02
A0
 hex data omitted
 55 04 0A 13 05 63 69 73 63 6F 31 0C 30 0A
06y
Trustpoint CA certificate accepted.
2611-VPN(config)# 03
 55 04 0B 13 03 74 61 63 31 14 30 12 06 03
55 04
 hex data omitted
 A9 13 93 1E E6 E1 E4 30 07 31 00
Oct 26 19:31:11.801: CRYPTO_PKI: InsertCertData: subject name =
 30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
 hex data omitted
 76 70 6E
Oct 26 19:31:11.813: CRYPTO_PKI: InsertCertData: issuer name =
 30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
 hex data omitted
 76 70 6E
Oct 26 19:31:11.825: CRYPTO_PKI: InsertCertData: serial number =
3E 34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57
Oct 26 19:31:11.865: CRYPTO_PKI: InsertCertData: subject name =
 30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D
01
 hex data omitted
 70 6B 69 2D 72 61
Oct 26 19:31:11.885: CRYPTO_PKI: InsertCertData: issuer name =
 30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
 hex data omitted
 76 70 6E
Oct 26 19:31:11.897: CRYPTO_PKI: InsertCertData: serial number =
14 6C F2 85 00 00 00 00 09
Oct 26 19:31:11.901: CRYPTO_PKI: WARNING: Certificate, private key or
CRL was not found while selecting CRL
Oct 26 19:31:11.941: CRYPTO_PKI: InsertCertData: subject name =
 30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D
```

```
01
  hex data omitted
  70 6B 69 2D 72 61
Oct 26 19:31:11.957: CRYPTO_PKI: InsertCertData: issuer name =
  30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
  hex data omitted
  76 70 6E
Oct 26 19:31:11.969: CRYPTO_PKI: InsertCertData: serial number =
  14 6C F1 A9 00 00 00 00 08
Oct 26 19:31:11.977: CRYPTO_PKI: WARNING: Certificate, private key or
CRL was not found while selecting CRL
Oct 26 19:31:11.981: CRYPTO_PKI: InsertCertData: subject name =
  30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
  hex data omitted
  76 70 6E
Oct 26 19:31:11.998: CRYPTO_PKI: InsertCertData: issuer name =
  30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
  hex data omitted
  76 70 6E
Oct 26 19:31:12.010: CRYPTO_PKI: InsertCertData: serial number =
  3E 34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57
Oct 26 19:31:12.014: CRYPTO_PKI: transaction GetCACert completed
Oct 26 19:31:12.014: CRYPTO_PKI: CA certificate
received.
Oct 26 19:31:12.014: CRYPTO_PKI: CA certificate received.
Oct 26 19:31:12.030: CRYPTO_PKI: crypto_pki_authenticate_tp_cert()
Oct 26 19:31:12.030: CRYPTO_PKI: trustpoint caserver2
authentication status = 2
Oct 26 19:31:13.837: CRYPTO_PKI: InsertCertData: subject name =
  30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
  hex data omitted
  76 70 6E
Oct 26 19:31:13.849: CRYPTO_PKI: InsertCertData: issuer name =
  30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
  hex data omitted
  76 70 6E
Oct 26 19:31:13.861: CRYPTO_PKI: InsertCertData: serial number =
  3E 34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57
  % Time to Re-enroll trust_point caserver2
Can not select my full public key (tacvpn)%
Start certificate enrollment ..
% The subject name in the certificate will
be: OU=ROME O=ITALY
% The fully-qualified domain name in the certificate
will be: 2611-vpn.cisco.com
% The subject name in the certificate will
be: 2611-vpn.cisco.com
% The serial number in the certificate will
be: 721959E3% Certificate request sent to Certificate Authority
% The certificate request fingerprint will
be displayed.
% The 'show crypto ca certificate' command
will also show the fingerprint.
  Signing Certificate Reqeust Fingerprint:
  00599B4B 62BAAE44 1706AF6E CD689B5D
Oct 26 19:32:43.532: CRYPTO_PKI: Sending CA Certificate Request:
GET /certsrv/mscep/mscep.dll/pkiclient.exe?operation=GetCACert&message;=caserver2
HTTP/1.0
```

Oct 26 19:32:43.532: CRYPTO\_PKI: can not resolve server name/IP address  
Oct 26 19:32:43.532: CRYPTO\_PKI: Using unresolved IP Address 171.69.89.111  
Oct 26 19:32:43.540: CRYPTO\_PKI: http connection opened  
Oct 26 19:32:44.032: CRYPTO\_PKI: HTTP response header:  
HTTP/1.1 200 OK  
Server: Microsoft-IIS/5.0  
Date: Sun, 27 Oct 2002 02:31:55 GMT  
Content-Length: 2811  
Content-Type: application/x-x509-ca-ra-cert

Content-Type indicates we have received CA and RA certificates.

Oct 26 19:32:44.032: CRYPTO\_PKI:crypto\_process\_ca\_ra\_cert(trustpoint=caserver2)  
Oct 26 19:32:44.032: CRYPTO\_PKI:CA and RA certs (cert data):

30 82 0A F7 06 09 2A 86 48 86 F7 0D 01 07 02

A0

hex data omitted

61 6C 69 66 6F 72 6E 69 61 31 11 3

Encryption Certificate Request Fingerprint:

798894EE 357D6023 FD4F6C4E 75BF9611

hex data omitted

A9 13 93 1E E6 E1 E4 30 07 31 00

Oct 26 19:32:44.489: CRYPTO\_PKI: InsertCertData: subject name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hex data omitted

76 70 6E

Oct 26 19:32:44.505: CRYPTO\_PKI: InsertCertData: issuer name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hexdata omitted

76 70 6E

Oct 26 19:32:44.517: CRYPTO\_PKI: InsertCertData: serial number =

3E 34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57

Oct 26 19:32:44.557: CRYPTO\_PKI: InsertCertData: subject name =

30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D

01

hex data omitted

70 6B 69 2D 72 61

Oct 26 19:32:44.573: CRYPTO\_PKI: InsertCertData: issuer name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hex data omitted

76 70 6E

Oct 26 19:32:44.589: CRYPTO\_PKI: InsertCertData: serial number =

14 6C F2 85 00 00 00 00 09

Oct 26 19:32:44.593: CRYPTO\_PKI: WARNING: Certificate, private key or  
CRL was not found while selecting CRL

Oct 26 19:32:44.641: CRYPTO\_PKI: InsertCertData: subject name =

30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D

01

hex data omitted

70 6B 69 2D 72 61

Oct 26 19:32:44.657: CRYPTO\_PKI: InsertCertData: issuer name =

30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53

31

hex data omitted

76 70 6E

Oct 26 19:32:44.669: CRYPTO\_PKI: InsertCertData: serial number =

14 6C F1 A9 00 00 00 00 08

Oct 26 19:32:44.677: CRYPTO\_PKI: WARNING: Certificate, private key or  
CRL was not found while selecting CRL

Oct 26 19:32:44.681: CRYPTO\_PKI: InsertCertData: subject name =

```
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D
01
hex data omitted
70 6B 69 2D 72 61
Oct 26 19:32:44.697: CRYPTO_PKI: InsertCertData: issuer name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
63 69 73 63 6F 31 0C 30 0A 06 03 55 04 03 13
03
76 70 6E
Oct 26 19:32:44.710: CRYPTO_PKI: InsertCertData: serial number =
14 6C F1 A9 00 00 00 00 08
Oct 26 19:32:44.718: CRYPTO_PKI: InsertCertData: subject name =
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D
01
hex data omitted
70 6B 69 2D 72 61
Oct 26 19:32:44.730: CRYPTO_PKI: InsertCertData: issuer name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 26 19:32:44.742: CRYPTO_PKI: InsertCertData: serial number =
14 6C F2 85 00 00 00 00 09
Oct 26 19:32:44.750: CRYPTO_PKI: InsertCertData: subject name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 26 19:32:44.762: CRYPTO_PKI: InsertCertData: issuer name =
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53
31
hex data omitted
76 70 6E
Oct 26 19:32:44.774: CRYPTO_PKI: InsertCertData: serial number =
3E 34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57
Oct 26 19:32:44.778: CRYPTO_PKI: crypto_process_ra_certs(trust_point=caserver2)
Oct 26 19:32:44.782: CRYPTO_PKI: transaction PKCSReq completed
Oct 26 19:32:44.782: CRYPTO_PKI: status:
Oct 26 19:32:44.974: CRYPTO_PKI:Write out pkcs#10 content:347
30 82 01 57 30 82 01 01 02 01 00 30 67 31
15 30
hex data omitted
E0 7C A2 40 42 6B 87 AA 59 25 01
Oct 26 19:32:45.102: CRYPTO_PKI:Enveloped Data for trustpoint caserver2...
30 80 06 09 2A 86 48 86 F7 0D 01 07 03 A0 80
30
hex data omitted
00 00 00 00
Oct 26 19:32:45.383: CRYPTO_PKI:Signed Data for trustpoint caserver2
(1448 bytes)
30 80 06 09 2A 86 48 86 F7 0D 01 07 02 A0
80 30
hex data omitted
00 00 00 00 00 00 00 00
Oct 26 19:32:45.571: CRYPTO_PKI: can not resolve server name/IP address
Oct 26 19:32:45.571: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
Oct 26 19:32:45.579: CRYPTO_PKI: http connection opened
Oct 26 19:32:47.779: CRYPTO_PKI:Write out pkcs#10 content:347
30 82 01 57 30 82 01 01 02 01 00 30 67 31
15 30
hex data omitted
C0 71 E0 1C B9 47 E7 DB 0E 8A 61
```

Oct 26 19:32:47.907: CRYPTO\_PKI:Enveloped Data for trustpoint caserver2...  
30 80 06 09 2A 86 48 86 F7 0D 01 07 03 A0 80  
30  
hex data omitted  
00 00 00 00

Oct 26 19:32:48.191: CRYPTO\_PKI:Signed Data for trustpoint caserver2  
(1448 bytes)  
30 80 06 09 2A 86 48 86 F7 0D 01 07 02 A0  
80 30  
hex data omitted  
00 00 00 00 00 00 00 00

Oct 26 19:32:48.380: CRYPTO\_PKI: can not resolve server name/IP address  
Oct 26 19:32:48.380: CRYPTO\_PKI: Using unresolved IP Address 171.69.89.111  
Oct 26 19:32:48.452: CRYPTO\_PKI: http connection opened  
Oct 26 19:32:50.483: CRYPTO\_PKI: received msg of 1972 bytes  
Oct 26 19:32:50.483: CRYPTO\_PKI: HTTP response header:  
HTTP/1.1 200 OK  
Server: Microsoft-IIS/5.0  
Date: Sun, 27 Oct 2002 02:31:59 GMT  
Content-Length: 1826  
Content-Type: application/x-pki-message

Oct 26 19:32:50.487: CRYPTO\_PKI:Received pki message (PKCS7) for trustpoint  
caserver2: 1826 bytes  
30 82 07 1E 06 09 2A 86 48 86 F7 0D 01 07 02  
A0  
hex data omitted  
  
80 82 04 08 71 23 FE

Oct 26 19:32:51.465: %CRYPTO-6-CERTRET:  
**Certificate received from Certificate Authority**

Oct 26 19:33:11.469: CRYPTO\_PKI: received msg of 1972 bytes  
Oct 26 19:33:11.469: CRYPTO\_PKI: HTTP response header:  
HTTP/1.1 200 OK  
Server: Microsoft-IIS/5.0  
Date: Sun, 27 Oct 2002 02:32:02 GMT  
Content-Length: 1826  
Content-Type: application/x-pki-message

Oct 26 19:33:11.473: CRYPTO\_PKI:Received pki message (PKCS7) for trustpoint  
caserver2: 1826 bytes  
30 82 07 1E 06 09 2A 86 48 86 F7 0D 01 07 02  
A0  
hex data omitted  
54 25

Oct 26 19:33:11.734: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D  
01  
hex data omitted  
  
70 6B 69 2D 72 61

Oct 26 19:33:11.750: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
  
76 70 6E

Oct 26 19:33:11.762: CRYPTO\_PKI: InsertCertData: serial number =  
14 6C F1 A9 00 00 00 00 08  
Oct 26 19:33:11.770: CRYPTO\_PKI: WARNING: Certificate, private key or  
CRL was not found while selecting CRL  
Oct 26 19:33:11.842: CRYPTO\_PKI: signed attr: pki-message-type:



13 01 33  
Oct 26 19:33:11.842: CRYPTO\_PKI: signed attr: pki-status:  
13 01 30  
Oct 26 19:33:11.846: CRYPTO\_PKI: signed attr: pki-recipient-nonce:  
04 10 E0 59 89 15 0A E0 C5 2D 2B 44 82 72  
7B E7  
4D EF  
Oct 26 19:33:11.850: CRYPTO\_PKI: signed attr: pki-transaction-id:  
13 20 41 45 32 37 39 37 41 32 33 41 41 32  
44 45  
30 32 38 37 45 38 34 39 35 45 36 37 30 34  
33 38  
34 30  
Oct 26 19:33:11.854: CRYPTO\_PKI: status = 100: certificate is granted  
Oct 26 19:33:11.854: CRYPTO\_PKI: Verified signed data for trustpoint  
caserver2 (1259 bytes):  
30 82 04 E7 06 09 2A 86 48 86 F7 0D 01 07  
03 A0  
hex data omitted  
1B D5 43 D5 E3 88 F6 F5 D5 09 45  
Oct 26 19:33:12.191: CRYPTO\_PKI: Decrypted enveloped content:  
30 82 03 FE 06 09 2A 86 48 86 F7 0D 01 07  
02 A0  
hex data omitted  
54 DD C1 E0 03 85 EC B3 E9 B0 63 3D FF F2  
C9 7F  
  
Oct 26 19:33:12.355: CRYPTO\_PKI: InsertCertData: subject name =  
30 6B 31 11 30 0F 06 03 55 04 05 13 08 37 32  
31  
hex data omitted  
0C 52 4F 4D 45 20 4F 3D 49 54 41 4C 59  
Oct 26 19:33:12.371: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13  
02 55 53 31  
hex data omitted  
76 70 6E  
Oct 26 19:33:12.383: CRYPTO\_PKI: InsertCertData: serial number =  
61 1C 41 E0 00 00 00 00 00 37  
Oct 26 19:33:12.391: CRYPTO\_PKI: WARNING: Certificate, private key or  
CRL was not found while selecting CRL  
Oct 26 19:33:12.407: CRYPTO\_PKI: InsertCertData: subject name =  
30 6B 31 11 30 0F 06 03 55 04 05 13 08 37 32  
31  
39 35 39 45 33 31 1C 30 1A 06 09  
Oct 26 19:33:12.459: CRYPTO\_PKI: WARNING: Certificate, private key  
or CRL was not found while selecting CRL  
Oct 26 19:33:22.503: **CRYPTO\_PKI: All enrollment  
requests completed for trustpoint caserver2.**

2611-VPN#show crypto ca certificate

Certificate

Status: Available

Certificate Serial Number: 611C41E00000000000037

Certificate Usage: Encryption

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

Subject:

**Name: 2611-vpn.cisco.com**

*!--- The subject name, IP address, and serial !--- numbers of the certificate issued by CA server2. IP Address: 172.16.172.35*

**Serial Number: 721959E3**  
**OU = "ROME O=ITALY"**  
**OID.1.2.840.113549.1.9.2**  
**= 2611-vpn.cisco.com**  
**OID.1.2.840.113549.1.9.8**  
**= 172.16.172.35**  
**OID.2.5.4.5 = 721959E3**  
**CRL Distribution Point:**  
**http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl**  
**Validity Date:**  
**start date: 02:22:02 UTC**  
**Oct 27 2002**  
**end date: 02:32:02**  
**UTC Oct 28 2002**

*!--- CA server2 issued a certificate with a !--- validity period of one day. !--- The renew date indicates the time for reenrollment !--- with the CA server. renew date: 02:31:59 UTC*

**Oct 28 2002**  
**Associated Trustpoints: caserver2**  
Certificate  
Status: Available  
Certificate Serial Number: 611C3624000000000036  
Certificate Usage: Signature  
Issuer:  
CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US  
**Subject:**  
**Name: 2611-vpn.cisco.com**  
**IP Address: 172.16.172.35**  
**Serial Number: 721959E3**  
**OU = "ROME O=ITALY"**  
**OID.1.2.840.113549.1.9.2 = 2611-vpn.cisco.com**  
**OID.1.2.840.113549.1.9.8 = 172.16.172.35**  
**OID.2.5.4.5 = 721959E3**  
**CRL Distribution Point:**  
**http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl**  
**Validity Date:**  
**start date: 02:21:59 UTC Oct 27 2002**  
**end date: 02:31:59 UTC Oct 28 2002**  
**Associated Trustpoints: caserver2**

CA Certificate  
Status: Available  
Certificate Serial Number: 3E34CD199392A0914621EA778B13F357  
Certificate Usage: Signature  
Issuer:  
CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US  
**Subject:**  
CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US

CRL Distribution Point:  
http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl  
Validity Date:  
start date: 04:19:50 UTC Dec 7 2001  
end date: 04:29:42 UTC Dec 7 2003  
Associated Trustpoints: caserver2

CA Certificate

Status: Available  
Certificate Serial Number: 0E7EC1B68A2F14BD4C4515AF44C45732  
Certificate Usage: Signature  
Issuer:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US  
Subject:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US

CRL Distribution Point:  
http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl  
Validity Date:  
start date: 20:52:48 UTC Sep 17 2002  
end date: 21:02:37 UTC Sep 17 2017

**Associated Trustpoints: caserver1**

Certificate

Status: Available  
Certificate Serial Number: 6103EE0A0000000000038  
Certificate Usage: Signature  
Issuer:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US  
Subject:

**Name: 2611-vpn.cisco.com**

**IP Address: 172.16.172.35**

**Serial Number: 721959E3**

**OU = "PARIS O=FRANCE"**

OID.1.2.840.113549.1.9.2 = 2611-vpn.cisco.com

OID.1.2.840.113549.1.9.8 = 172.16.172.35

OID.2.5.4.5 = 721959E3

CRL Distribution Point:  
http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl  
Validity Date:

start date: 03:33:05 UTC Oct 26 2002  
end date: 03:43:05 UTC Oct 26 2003

**Associated Trustpoints: caserver1**

Certificate

Status: Available  
Certificate Serial Number: 6104020F0000000000039  
Certificate Usage: Encryption  
Issuer:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose

ST = CA  
C = US  
Subject:  
Name: 2611-vpn.cisco.com  
IP Address: 172.16.172.35  
Serial Number: 721959E3  
OU = "PARIS O=FRANCE"  
OID.1.2.840.113549.1.9.2 = 2611-vpn.cisco.com  
OID.1.2.840.113549.1.9.8 = 172.16.172.35  
OID.2.5.4.5 = 721959E3  
CRL Distribution Point:  
http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl  
**Validity Date:**  
**start date: 03:33:10 UTC**  
**Oct 26 2002**  
**end date: 03:43:10**  
**UTC Oct 26 2003**  
**renew date: 03:43:05 UTC**  
**Oct 26 2003**  
**Associated Trustpoints: caserver1**

2611-VPN#show crypto key mypubkey rsa  
% Key pair was generated at: 00:14:06 UTC  
Mar 1 1993

**Key name: ciscovpn**  
**Usage: Signature Key**

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00A2DE57  
2C7A4555  
BF87D3CC 4A260DBF 56574554 472FC72C 0461A35B E41B5B53 BE81A47E  
264A68D7  
08662555 27E4E301 2AF04B1C E472F70B 74DF38A0 6EB286F9 01020301  
0001

% Key pair was generated at: 00:14:10 UTC Mar 1 1993

**Key name: ciscovpn**  
**Usage: Encryption Key**

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00D10224  
8CBEC2D7  
B517DF99 7363717D 6F6CA0F1 83FB7874 E60BB169 CD4AD9CA 92E04143  
16D4D253  
5CBF212F FF6268A5 329AB988 2655568C 8EC19017 6F4A4C86 43020301  
0001

% Key pair was generated at: 00:14:59 UTC Mar 1 1993

*!--- The RSA key pair is generated during !--- the next auto reenroll . Key name: tacvpn  
!--- This key pair was generated before the system !--- clock was set, hence the 1993 date.*

**Usage: Signature Key**

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00AB2884  
22A070D0  
A8C84C3E CD45A382 F4CDB158 5B31B624 5C92632C 5DC1977E 686E1C18  
DA16BE57  
6FBA9518 4D2F01B8 0D59528D 447014D3 02D5A631 84E54CD4 FB020301  
0001

% Key pair was generated at: 00:15:00 UTC Mar 1 1993

**Key name: tacvpn**  
**Usage: Encryption Key**

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00AB7576  
9D0A2D65  
7BB9B465 AF227B73 2B83AFD6 3791FA54 3A2DB845 55E4540F 35972460  
B87C613E  
82DBC4D2 51E6F9A7 07164C57 B02D28B8 93F8D50F D5C3444F 01020301

```
0001
% Key pair was generated at: 22:02:57 UTC Oct 27 2002
Key name: ciscovpn.server
Usage: Encryption Key
Key Data:
 307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00D42A5E
4C9D27F1
 195CC537 7CF9E390 935DFBA3 2DA01B3B C5E50620 57B902A3 50876FA1
1A9D83FD
 0EB437F7 E0568EB7 830A46FA E9D9BA4F 3E8B132D F24A08B8 E2154944
36829D64
 E48077EF 224BF142 A3A92672 F0BC57F5 063EF64A 8B775979 CD020301
0001
2611-VPN#
2611-VPN#
2611-VPN# show clock
19:29:20.304 UTC Sun Oct 27 2002
2611-VPN#
2611-VPN#
2611-VPN#
!--- The certificate from CA server2 expired and the router is !--- reenrolling automatically
without user intervention. 2611-VPN# Time to Re-enroll trust_point caserver2 Can not select my
full public key (tacvpn)% Start certificate enrollment ..
% The subject name in the certificate will
be: OU=ROME O=ITALY
% The fully-qualified domain name in the certificate
will be: 2611-vpn.cisco.com
% The subject name in the certificate will
be: 2611-vpn.cisco.com
% The serial number in the certificate will
be: 721959E3% Certificate request sent to Certificate Authority
% The certificate request fingerprint will
be displayed.
% The 'show crypto ca certificate' command
will also show the fingerprint.
Oct 28 02:32:01.210: %CRYPTO-6-AUTOGEN: Generated new 512 bit key pair
Oct 28 02:32:02.924: %CRYPTO-6-AUTOGEN: Generated new 512 bit key pair
Oct 28 02:32:02.944: CRYPTO_PKI: Sending CA Certificate Request:
GET /certsrv/mscep/mscep.dll/pkiclient.exe?operation=GetCACert&message=-caserver2
HTTP/1.0
Oct 28 02:32:02.944: CRYPTO_PKI: can not resolve server name/IP address
Oct 28 02:32:02.944: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
  Signing Certificate Reqeust Fingerprint:
  99E260CF 476B54E1 B6486AF3 98FD0F02
Oct 28 02:32:02.952: CRYPTO_PKI: http connection opened
Oct 28 02:32:03.461: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Mon, 28 Oct 2002 09:31:15 GMT
Content-Length: 2811
Content-Type: application/x-x509-ca-ra-cert

Content-Type indicates we have received CA and RA certificates.
Oct 28 02:32:03.461: CRYPTO_PKI:crypto_process_ca_ra_cert(trustpoint=caserver2)
Oct 28 02:32:03.461: CRYPTO_PKI:CA and RA certs (cert data):
 30 82 0A F7 06 09 2A 86 48 86 F7 0D 01 07 02
A0
 hex data omitted
 00 9D B4 04 E9 46 13 45 37 10 59 AE B1 F7 39
C1
 73 D3 F2 DB 0C 95 5A F7 C9 F
Encryption Certificate Request Fingerprint:
BE1C5800 A6F895FF AC8DBAF9 0DED9356
```

A9 13 93 1E E6 E1 E4 30 07 31  
00  
hex data omitted  
Oct 28 02:32:03.922: CRYPTO\_PKI: InsertCertData: subject name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E  
Oct 28 02:32:03.934: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
13 30 11 06 03 55 04 08 13 0A 63 61 6C 69  
66 6F  
72 6E 69 61 31 11 30 0F 06 03 55 04 07 13  
08 73  
61 6E 20 6A 6F 73 65 31 0C 30 0A 06 03 55  
04 0A  
13 03 74 61 63 31 0E 30 0C 06 03 55 04 0B  
13 05  
63 69 73 63 6F 31 0C 30 0A 06 03 55 04 03  
13 03  
76 70 6E  
Oct 28 02:32:03.946: CRYPTO\_PKI: InsertCertData: serial number =  
3E 34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57  
Oct 28 02:32:03.990: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D  
01  
hex data omitted  
70 6B 69 2D 72 61  
Oct 28 02:32:04.006: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E  
Oct 28 02:32:04.018: CRYPTO\_PKI: InsertCertData: serial number =  
14 6C F2 85 00 00 00 00 09  
Oct 28 02:32:04.026: CRYPTO\_PKI: WARNING: Certificate, private key or  
CRL was not found while selecting CRL  
Oct 28 02:32:04.066: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D  
01  
hex data omitted  
70 6B 69 2D 72 61  
Oct 28 02:32:04.082: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
13 30 11 06 03 55 04 08 13 0A 63 61 6C 69  
66 6F  
72 6E 69 61 31 11 30 0F 06 03 55 04 07 13  
08 73  
61 6E 20 6A 6F 73 65 31 0C 30 0A 06 03 55  
04 0A  
13 03 74 61 63 31 0E 30 0C 06 03 55 04 0B  
13 05  
63 69 73 63 6F 31 0C 30 0A 06 03 55 04 03  
13 03  
76 70 6E  
Oct 28 02:32:04.094: CRYPTO\_PKI: InsertCertData: serial number =  
14 6C F1 A9 00 00 00 00 08  
Oct 28 02:32:04.098: CRYPTO\_PKI: WARNING: Certificate, private key or  
CRL was not found while selecting CRL  
Oct 28 02:32:04.106: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D

01  
hex data omitted  
70 6B 69 2D 72 61  
Oct 28 02:32:04.122: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E  
Oct 28 02:32:04.134: CRYPTO\_PKI: InsertCertData: serial number =  
14 6C F1 A9 00 00 00 00 08  
Oct 28 02:32:04.138: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D  
01  
hex data omitted  
70 6B 69 2D 72 61  
Oct 28 02:32:04.154: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
13 30 11 06 03 55 04 08 13 0A 63 61 6C 69  
66 6F  
72 6E 69 61 31 11 30 0F 06 03 55 04 07 13  
08 73  
61 6E 20 6A 6F 73 65 31 0C 30 0A 06 03 55  
04 0A  
13 03 74 61 63 31 0E 30 0C 06 03 55 04 0B  
13 05  
63 69 73 63 6F 31 0C 30 0A 06 03 55 04 03  
13 03  
76 70 6E  
Oct 28 02:32:04.166: CRYPTO\_PKI: InsertCertData: serial number =  
14 6C F2 85 00 00 00 00 09  
Oct 28 02:32:04.174: CRYPTO\_PKI: InsertCertData: subject name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E  
Oct 28 02:32:04.186: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
13 30 11 06 03 55 04 08 13 0A 63 61 6C 69  
66 6F  
72 6E 69 61 31 11 30 0F 06 03 55 04 07 13  
08 73  
61 6E 20 6A 6F 73 65 31 0C 30 0A 06 03 55  
04 0A  
13 03 74 61 63 31 0E 30 0C 06 03 55 04 0B  
13 05  
63 69 73 63 6F 31 0C 30 0A 06 03 55 04 03  
13 03  
76 70 6E  
Oct 28 02:32:04.202: CRYPTO\_PKI: InsertCertData: serial number =  
3E 34 CD 19 93 92 A0 91 46 21 EA 77 8B 13 F3 57  
Oct 28 02:32:04.202: CRYPTO\_PKI: crypto\_process\_ra\_certs(trust\_point=caserver2)  
Oct 28 02:32:04.206: CRYPTO\_PKI: transaction PKCSReq completed  
Oct 28 02:32:04.206: CRYPTO\_PKI: status:  
Oct 28 02:32:04.399: CRYPTO\_PKI:Write out pkcs#10 content:347  
30 82 01 57 30 82 01 01 02 01 00 30 67 31  
15 30  
hex data omitted  
79 A3 FC A6 13 E5 35 5B 6E 48 6D  
Oct 28 02:32:04.527: CRYPTO\_PKI:Enveloped Data for trustpoint caserver2...  
30 80 06 09 2A 86 48 86 F7 0D 01 07 03 A0 80  
30  
hex data omitted

```
04 08 69 29 B2 72 10 92 09 AF 00 00 00 00 00
00
00 00 00 00
Oct 28 02:32:04.807: CRYPTO_PKI:Signed Data for trustpoint caserver2
(2129 bytes)
30 80 06 09 2A 86 48 86 F7 0D 01 07 02 A0
80 30
hex data omitted
F0 20 30 3F 15 41 BD A6 F5 00 00 00 00 00
00
00
Oct 28 02:32:05.080: CRYPTO_PKI: can not resolve server name/IP address
Oct 28 02:32:05.084: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
Oct 28 02:32:05.088: CRYPTO_PKI: http connection opened
Oct 28 02:32:07.292: CRYPTO_PKI:Write out pkcs#10 content:347
30 82 01 57 30 82 01 01 02 01 00 30 67 31
15 30
13 06 03 55 04 0B 13 0C 52 4F 4D 45 20 4F
3D 49
hex data omitted
A5 FF 13 4A CF B0 2B 0C A8 7D BF
Oct 28 02:32:07.416: CRYPTO_PKI:Enveloped Data for trustpoint caserver2...
30 80 06 09 2A 86 48 86 F7 0D 01 07 03 A0 80
30
hex data omitted
00 00 00 00
Oct 28 02:32:07.716: CRYPTO_PKI:Signed Data for trustpoint caserver2
(2129 bytes)
30 80 06 09 2A 86 48 86 F7 0D 01 07 02 A0
80 30
hex data omitted
0A F2 8F 78 FB 4E 6B C2 CB 00 00 00 00 00
00
00
Oct 28 02:32:07.989: CRYPTO_PKI: can not resolve server name/IP address
Oct 28 02:32:07.989: CRYPTO_PKI: Using unresolved IP Address 171.69.89.111
Oct 28 02:32:08.049: CRYPTO_PKI: http connection opened
Oct 28 02:32:10.064: CRYPTO_PKI: received msg of 2012 bytes
Oct 28 02:32:10.064: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Mon, 28 Oct 2002 09:31:20 GMT
Content-Length: 1866
Content-Type: application/x-pki-message

Oct 28 02:32:10.064: CRYPTO_PKI:Received pki message (PKCS7) for trustpoint
caserver2: 1866 bytes
30 82 07 46 06 09 2A 86 48 86 F7 0D 01 07 02
A0
hex data omitted
6D DB 94 FF 71 DD A0 E6 1B E9 31 66 76 D2 5C
FC
Oct 28 02:32:11.070: %CRYPTO-6-CERTRET:
Certificate received from Certificate Authority
Oct 28 02:32:31.075: CRYPTO_PKI: received msg of 2012 bytes
Oct 28 02:32:31.075: CRYPTO_PKI: HTTP response header:
HTTP/1.1 200 OK
Server: Microsoft-IIS/5.0
Date: Mon, 28 Oct 2002 09:31:23 GMT
Content-Length: 1866
Content-Type: application/x-pki-message
```



Oct 28 02:32:31.079: CRYPTO\_PKI:Received pki message (PKCS7) for trustpoint  
caserver2: 1866 bytes  
30 82 07 46 06 09 2A 86 48 86 F7 0D 01 07 02  
A0  
hex data omitted  
95 4B D4 80 86 DC 91 FF F2 C8 30 CF 20 42 07  
BE  
BA F2 B1 6A 9A 24 FC 46 35 61  
Oct 28 02:32:31.343: CRYPTO\_PKI: InsertCertData: subject name =  
30 81 83 31 20 30 1E 06 09 2A 86 48 86 F7 0D  
01  
hex data omitted  
70 6B 69 2D 72 61  
Oct 28 02:32:31.359: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
76 70 6E  
Oct 28 02:32:31.375: CRYPTO\_PKI: InsertCertData: serial number =  
14 6C F1 A9 00 00 00 00 08  
Oct 28 02:32:31.379: CRYPTO\_PKI: WARNING: Certificate, private key or  
CRL was not found while selecting CRL  
Oct 28 02:32:31.451: CRYPTO\_PKI: signed attr: pki-message-type:  
13 01 33  
Oct 28 02:32:31.455: CRYPTO\_PKI: signed attr: pki-status:  
13 01 30  
Oct 28 02:32:31.455: CRYPTO\_PKI: signed attr: pki-recipient-nonce:  
04 10 0C CF 22 65 E3 50 72 E0 0C 59 42 A2  
54 6F  
1F 6B  
Oct 28 02:32:31.459: CRYPTO\_PKI: signed attr: pki-transaction-id:  
13 20 34 39 36 31 38 32 36 35 37 42 33 39  
33 34  
44 45 38 34 33 44 43 33 42 31 42 33 36 32  
41 46  
34 33  
Oct 28 02:32:31.467: **CRYPTO\_PKI:**  
**status = 100: certificate is granted**  
Oct 28 02:32:31.467: CRYPTO\_PKI:Verified signed data for trustpoint  
caserver2 (1299 bytes):  
30 82 05 0F 06 09 2A 86 48 86 F7 0D 01 07  
03 A0  
hex data omitted  
  
0B 7E 8B 1F 53 17 7E 13 BC 62 9A 3E F5 13 44  
D6  
2C CE 8F  
Oct 28 02:32:31.800: CRYPTO\_PKI:Decrypted enveloped content:  
30 82 03 FE 06 09 2A 86 48 86 F7 0D 01 07  
02 A0  
hex data omitted  
EF 3D 6E 15 63 C3 3C F9 79 54 BA 6D 57 68 5B  
43  
31 00  
Oct 28 02:32:31.988: CRYPTO\_PKI: InsertCertData: subject name =  
30 6B 31 11 30 0F 06 03 55 04 05 13 08 37 32  
31  
hex data omitted  
0C 52 4F 4D 45 20 4F 3D 49 54 41 4C 59  
Oct 28 02:32:32.000: CRYPTO\_PKI: InsertCertData: issuer name =  
30 61 31 0B 30 09 06 03 55 04 06 13 02 55 53  
31  
hex data omitted  
63 69 73 63 6F 31 0C 30 0A 06 03 55 04 03 13

03

76 70 6E

Oct 28 02:32:32.016: CRYPTO\_PKI: InsertCertData: serial number =  
06

Oct 28 02:32:32.116: CRYPTO\_PKI:removing superceded cert serial #:  
611C41E00000000000037

Oct 28 02:32:32.120: CRYPTO\_PKI:removing superceded cert serial #:  
611C36240000000000036

**Oct 28 02:32:42.121: CRYPTO\_PKI:**

**All enrollment requests completed for trustpoint caserver2.**

2611-VPN#show crypto key mypubkey rsa

% Key pair was generated at: 00:14:06 UTC Mar 1 1993

Key name: ciscovpn

Usage: Signature Key

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00A2DE57  
2C7A4555

BF87D3CC 4A260DBF 56574554 472FC72C 0461A35B E41B5B53 BE81A47E  
264A68D7

08662555 27E4E301 2AF04B1C E472F70B 74DF38A0 6EB286F9 01020301  
0001

% Key pair was generated at: 00:14:10 UTC Mar 1 1993

Key name: ciscovpn

Usage: Encryption Key

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00D10224  
8CBEC2D7

B517DF99 7363717D 6F6CA0F1 83FB7874 E60BB169 CD4AD9CA 92E04143  
16D4D253

5CBF212F FF6268A5 329AB988 2655568C 8EC19017 6F4A4C86 43020301  
0001

% Key pair was generated at: 02:32:01 UTC Oct 28 2002

**Key name: tacvpn**

**Usage: Signature Key**

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00BFC0C4  
6217E11E

96447AE7 3579A8AC 0E3354BD 54080ABD 32A94C9D CAF009A DD441CD4  
7962C6E8

82A6C63D DCBF454A 342B0815 3C7FF706 583316D3 ABF7E53D 51020301  
0001

*!--- The RSA key pair was regenerated with the !--- reenroll of the identity certificate. % Key  
pair was generated at: 02:32:02*

**UTC Oct 28 2002**

**Key name: tacvpn**

**Usage: Encryption Key**

Key Data:

305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00E65D19  
513BCF3C

486F722E 9E9EB410 E26A8BA0 F492C824 AF276EB4 53F5D22C 5BE90B52  
91889E0E

C896DF08 E4D3A899 B8F6C8CE 9884B4EE 49C787D5 DFFC9907 29020301  
0001

% Key pair was generated at: 11:33:57 UTC Oct 28 2002

Key name: ciscovpn.server

Usage: Encryption Key

Key Data:

307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00BBD14F  
A16AE1D8

98D25643 0A5BCA1B BE3809DA EED3672B A0CA07F3 E221A31C 3D64B59B  
62A145B1

82BE03D5 5D7FA248 064BA826 CFC35CAB 330CDCDD 8994F95D 450580DC  
2B003FE1

EB834755 AC083989 4F058F63 2E00CD3A 720075F2 500D38DE C1020301

0001

2611-VPN# show crypto ca certificate

Certificate

Status: Available

Certificate Serial Number: 06C28C8B00000000003B

Certificate Usage: Encryption

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

**Subject:**

**Name: 2611-vpn.cisco.com**

**IP Address: 172.16.172.35**

**Serial Number: 721959E3**

**OU = "ROME O=ITALY"**

OID.1.2.840.113549.1.9.2 = 2611-vpn.cisco.com

OID.1.2.840.113549.1.9.8 = 172.16.172.35

OID.2.5.4.5 = 721959E3

CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

**Validity Date:**

**start date: 09:21:23**

UTC Oct 28 2002

*!--- The CA server2 issued a new !--- identity certificate with a new renew date. end date:*

**09:31:23**

UTC Oct 29 2002

**renew date: 09:31:20**

UTC Oct 29 2002

**Associated Trustpoints: caserver2**

Certificate

Status: Available

Certificate Serial Number: 06C2807F000000000003A

Certificate Usage: Signature

Issuer:

CN = vpn

OU = cisco

O = tac

L = san jose

ST = california

C = US

**Subject:**

**Name: 2611-vpn.cisco.com**

**IP Address: 172.16.172.35**

**Serial Number: 721959E3**

**OU = "ROME O=ITALY"**

OID.1.2.840.113549.1.9.2

= 2611-vpn.cisco.com

OID.1.2.840.113549.1.9.8

= 172.16.172.35

OID.2.5.4.5 = 721959E3

/CRL Distribution Point:

<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>

**Validity Date:**

**start date: 09:21:20 UTC Oct 28 2002**

**end date: 09:31:20 UTC Oct 29 2002**

**Associated Trustpoints: caserver2**

CA Certificate

Status: Available

Certificate Serial Number: 3E34CD199392A0914621EA778B13F357

Certificate Usage: Signature

Issuer:

CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US  
Subject:  
CN = vpn  
OU = cisco  
O = tac  
L = san jose  
ST = california  
C = US  
CRL Distribution Point:  
<http://tac-2hq8cg5ti0h/CertEnroll/vpn.crl>  
Validity Date:  
start date: 04:19:50 UTC Dec 7 2001  
end date: 04:29:42 UTC Dec 7 2003  
**Associated Trustpoints: caserver2**

CA Certificate

Status: Available  
Certificate Serial Number: 0E7EC1B68A2F14BD4C4515AF44C45732  
Certificate Usage: Signature  
Issuer:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US  
Subject:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US  
CRL Distribution Point:  
<http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl>  
Validity Date:  
start date: 20:52:48 UTC Sep 17 2002  
end date: 21:02:37 UTC Sep 17 2017  
**Associated Trustpoints: caserver1**

Certificate

Status: Available  
Certificate Serial Number: 6103EE0A0000000000038  
Certificate Usage: Signature  
Issuer:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US  
**Subject:**  
**Name: 2611-vpn.cisco.com**  
**IP Address: 172.16.172.35**  
**Serial Number: 721959E3**  
**OU = "PARIS O=FRANCE"**  
OID.1.2.840.113549.1.9.2 = 2611-vpn.cisco.com  
OID.1.2.840.113549.1.9.8 = 172.16.172.35  
OID.2.5.4.5 = 721959E3  
CRL Distribution Point:  
<http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl>

Validity Date:  
start date: 03:33:05 UTC Oct 26 2002  
end date: 03:43:05 UTC Oct 26 2003

**Associated Trustpoints: caserver1**

Certificate

Status: Available  
Certificate Serial Number: 6104020F000000000039  
Certificate Usage: Encryption

Issuer:  
CN = SJVPNTAC-CAServer  
OU = TAC-VPN-SJ  
O = Cisco Systems  
L = San Jose  
ST = CA  
C = US

**Subject:**

**Name: 2611-vpn.cisco.com**  
**IP Address: 172.16.172.35**  
**Serial Number: 721959E3**  
**OU = "PARIS O=FRANCE"**  
**OID.1.2.840.113549.1.9.2**  
**= 2611-vpn.cisco.com**  
**OID.1.2.840.113549.1.9.8**  
**= 172.16.172.35**

**OID.2.5.4.5 = 721959E3**  
CRL Distribution Point:  
<http://ca-server/CertEnroll/SJVPNTAC-CAServer.crl>

Validity Date:  
start date: 03:33:10 UTC Oct 26 2002  
end date: 03:43:10 UTC Oct 26 2003  
renew date: 03:43:05 UTC Oct 26 2003  
Associated Trustpoints: caserver1

*!--- Router with the new certificate !--- after automatic reenrollment. 2611-VPN#show run*

Building configuration...

Current configuration : 15523 bytes

```
!  
! Last configuration change at 19:31:48 UTC Sat Oct 26 2002  
! NVRAM config last updated at 23:37:39 UTC Sun Oct 27 2002  
!  
version 12.2  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname 2611-VPN  
!  
!  
memory-size iomem 10  
ip subnet-zero  
!  
!  
ip domain name cisco.com  
ip host caserver2 171.69.89.111  
ip host caserver1 171.69.89.125  
!  
!  
crypto ca trustpoint caserver1  
enrollment retry period 5  
enrollment mode ra  
enrollment url http://171.69.89.125:80/certsrv/mscep/mscep.dll  
usage ike  
serial-number  
fqdn 2611-vpn.cisco.com  
ip-address Ethernet0/0
```

```

password 7 011D090A5E
subject-name OU=PARIS O=FRANCE
crl optional
rsakeypair ciscovpn
auto-enroll regenerate
!
crypto ca trustpoint caserver2
enrollment retry period 5
enrollment mode ra
enrollment url http://171.69.89.111:80/certsrv/mscep/mscep.dll
usage ike
serial-number
fqdn 2611-vpn.cisco.com
ip-address Ethernet0/0
password 7 151C040201
  subject-name OU=ROME O=ITALY
crl optional
rsakeypair tacvpn
auto-enroll regenerate
crypto ca certificate chain caserver1
certificate ca 0E7EC1B68A2F14BD4C4515AF44C45732
  308202BE 30820268 A0030201 0202100E 7EC1B68A 2F14BD4C 4515AF44
C4573230
  0D06092A 864886F7 0D010105 05003076 310B3009 06035504 06130255
53310B30
  !--- Certificate is abbreviated for easier viewing. quit certificate 6103EE0A0000000000038
3082040F 308203B9 A0030201 02020A61 03EE0A00 00000000 38300D06 092A8648 86F70D01 01050500
3076310B 30090603 55040613 02555331 0B300906 03550408 !--- Certificate is abbreviated for easier
viewing. quit certificate 6104020F00000000000039 3082040F 308203B9 A0030201 02020A61 04020F00
00000000 39300D06 092A8648 86F70D01 01050500 3076310B 30090603 55040613 02555331 0B300906
03550408 !--- Certificate is abbreviated for easier viewing. quit crypto ca certificate chain
caserver2 certificate 06C28C8B0000000000003B 308203CF 30820379 A0030201 02020A06 C28C8B00 00000000
3B300D06 092A8648 86F70D01 01050500 3061310B 30090603 55040613 02555331 13301106 03550408 !---
Certificate is abbreviated for easier viewing. 97363 quit certificate 06C2807F0000000000003A
308203CF 30820379 A0030201 02020A06 C2807F00 00000000 3A300D06 092A8648 !--- Certificate is
abbreviated for easier viewing. quit certificate ca 3E34CD199392A0914621EA778B13F357 30820284
3082022E A0030201 0202103E 34CD1993 92A09146 21EA778B 13F35730 0D06092A 864886F7 0D010105
05003061 310B3009 06035504 06130255 53311330 !--- Certificate is abbreviated for easier viewing.
quit ! crypto isakmp policy 10 hash md5 crypto isakmp identity hostname ! ! crypto ipsec
transform-set myset esp-des esp-md5-hmac ! crypto map vpn 10 ipsec-isakmp set peer 172.16.172.45
set transform-set myset match address 101 crypto map vpn 20 ipsec-isakmp set peer 172.16.172.51
set transform-set myset match address 102 crypto map vpn 30 ipsec-isakmp set peer 172.16.172.53
set transform-set myset match address 103 ! ! ! ! ! ! ! ! ! ! ! mta receive maximum-recipients
0 ! ! ! ! interface Ethernet0/0 ip address 172.16.172.35 255.255.255.240 half-duplex crypto map
vpn interface Ethernet0/1 ip address 192.168.4.1 255.255.255.0 half-duplex ! interface Serial1/0
no ip address shutdown ! interface Serial1/1 no ip address shutdown ! interface Serial1/2 no ip
address shutdown ! interface Serial1/3 no ip address shutdown ! ip classless ip route 0.0.0.0
0.0.0.0 172.16.172.33 ip http server ! ! access-list 101 permit ip 192.168.4.0 0.0.0.255
20.1.1.0 0.0.0.255 access-list 102 permit ip 192.168.4.0 0.0.0.255 3.3.3.0 0.0.0.255 access-list
103 permit ip 192.168.4.0 0.0.0.255 200.1.1.0 0.0.0.255 access-list 169 deny ip host
172.16.172.60 any access-list 169 deny ip host 172.16.172.61 any access-list 169 deny ip host
172.16.172.62 any access-list 169 permit ip any any ! call rsvp-sync ! ! mgcp profile default !
! ! dial-peer cor custom ! line con 0 exec-timeout 0 0 line aux 0 line vty 0 4 login ! ! end
2611-VPN#

```

## 故障排除

本部分提供的信息可用于对配置进行故障排除。

## 故障排除命令

[命令输出解释程序工具 \( 仅限注册用户 \)](#) 支持某些 **show** 命令，使用此工具可以查看对 **show** 命令输出的分析。

**注意：** 在发出 **debug** 命令之前，请参阅[有关 debug 命令的重要信息](#)。

- **debug crypto pki transaction**
- **debug crypto pki messages**
- **debug crypto ipsec**
- **debug crypto isakmp**

## 路由器上的调试

此输出显示三个路由器的 IKE 和 IPsec 调试。在与 IPsec 对等体进行 IKE 协商期间，2600 路由器必须决定要使用的 CA 服务器。在测试方案中，1720-1 和 7204 发起通往 2600 VPN 路由器的 IPsec 隧道。

此输出使用 **show crypto** 命令显示 2611-VPN 路由器上的 IKE/IPsec 调试。

```
2611-VPN#show debug
```

```
Cryptographic Subsystem:
```

```
  Crypto ISAKMP debugging is on
```

```
  Crypto IPSEC debugging is on
```

```
!--- Debugs on the router when the 1720-1 router has initiated !--- an IPsec tunnel to the
router. Oct 27 22:20:23.337: ISAKMP (0:0): received packet from 172.16.172.45 dport 500 sport
500 (N) NEW SA Oct 27 22:20:23.337: ISAKMP: local port 500, remote port 500 Oct 27 22:20:23.341:
ISAKMP (0:408): Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH Oct 27 22:20:23.341: ISAKMP (0:408): Old
State = IKE_READY New State = IKE_R_MM1 Oct 27 22:20:23.341: ISAKMP (0:408): processing SA
payload. message ID = 0 Oct 27 22:20:23.341: ISAKMP (0:408): Checking ISAKMP transform 1 against
priority 10 policy Oct 27 22:20:23.341: ISAKMP: encryption DES-CBC Oct 27 22:20:23.341: ISAKMP:
hash MD5 Oct 27 22:20:23.345: ISAKMP: default group 1 Oct 27 22:20:23.345: ISAKMP: auth RSA sig
Oct 27 22:20:23.345: ISAKMP: life type in seconds Oct 27 22:20:23.345: ISAKMP: life duration
(VPI) of 0x0 0x1 0x51 0x80 Oct 27 22:20:23.345: ISAKMP (0:408): atts are acceptable. Next
payload is 3 Oct 27 22:20:23.389: ISAKMP (0:408): Input = IKE_MSG_INTERNAL,
IKE_PROCESS_MAIN_MODE Oct 27 22:20:23.389: ISAKMP (0:408): Old State = IKE_R_MM1 New State =
IKE_R_MM1 Oct 27 22:20:23.389: ISAKMP (0:408): sending packet to 172.16.172.45 my_port 500
peer_port 500 (R) MM_SA_SETUP Oct 27 22:20:23.393: ISAKMP (0:408): Input = IKE_MSG_INTERNAL,
IKE_PROCESS_COMPLETE Oct 27 22:20:23.393: ISAKMP (0:408): Old State = IKE_R_MM1 New State =
IKE_R_MM2 Oct 27 22:20:23.538: ISAKMP (0:408): received packet from 172.16.172.45 dport 500
sport 500 (R) MM_SA_SETUP Oct 27 22:20:23.538: ISAKMP (0:408): Input = IKE_MSG_FROM_PEER,
IKE_MM_EXCH Oct 27 22:20:23.538: ISAKMP (0:408): Old State = IKE_R_MM2 New State = IKE_R_MM3 Oct
27 22:20:23.542: ISAKMP (0:408): processing KE payload. message ID = 0 Oct 27 22:20:23.582:
ISAKMP (0:408): processing NONCE payload. message ID = 0 Oct 27 22:20:23.626: ISAKMP (0:408):
SKEYID state generated Oct 27 22:20:23.630: ISAKMP (0:408): processing CERT_REQ payload. message
ID = 0 Oct 27 22:20:23.630: ISAKMP (0:408): peer wants a CT_X509_SIGNATURE cert Oct 27
22:20:23.634: ISAKMP (0:408): peer want cert issued by CN = SJPNTAC-CAServer,
OU = TAC-VPN-SJ,
O = Cisco Systems,

L = San Jose, ST = CA, C = US
!--- The router has determined that the !--- IPsec peer sends a certificate !--- that CA server1
has issued. Oct 27 22:20:23.642: ISAKMP (0:408): Choosing trustpoint caserver1 as issuer
Oct 27 22:20:23.642: ISAKMP (0:408): processing vendor id payload
Oct 27 22:20:23.642: ISAKMP (0:408): vendor ID is Unity
Oct 27 22:20:23.642: ISAKMP (0:408): processing vendor id payload
Oct 27 22:20:23.646: ISAKMP (0:408): vendor ID is DPD
Oct 27 22:20:23.646: ISAKMP (0:408): processing vendor id payload
```

```
Oct 27 22:20:23.646: ISAKMP (0:408): speaking to another IOS box!
Oct 27 22:20:23.646: ISAKMP (0:408): Input = IKE_MSG_INTERNAL,
IKE_PROCESS_MAIN_MODE
Oct 27 22:20:23.646: ISAKMP (0:408): Old State = IKE_R_MM3 New State = IKE_R_MM3

Oct 27 22:20:23.666: ISAKMP (0:408): sending packet to 172.16.172.45
my_port 500 peer_port 500 (R)
MM_KEY_EXCH
Oct 27 22:20:23.670: ISAKMP (0:408): Input = IKE_MSG_INTERNAL, IKE_PROCESS_COMPLETE
Oct 27 22:20:23.670: ISAKMP (0:408): Old State = IKE_R_MM3 New State = IKE_R_MM4

Oct 27 22:20:24.207: ISAKMP (0:408): received packet from 172.16.172.45
dport 500 sport 500 (R)
MM_KEY_EXCH
Oct 27 22:20:24.219: ISAKMP (0:408): Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH
Oct 27 22:20:24.219: ISAKMP (0:408): Old State = IKE_R_MM4 New State = IKE_R_MM5

Oct 27 22:20:24.223: ISAKMP (0:408): processing ID payload. message ID = 0
Oct 27 22:20:24.223: ISAKMP (408): Process ID payload
type : 2
FQDN name : 1720-1.tac.com
protocol : 17
port : 500
length : 14
Oct 27 22:20:24.223: ISAKMP (0:408): processing CERT payload. message ID = 0
Oct 27 22:20:24.223: ISAKMP (0:408): processing a CT_X509_SIGNATURE cert
Oct 27 22:20:24.267: ISAKMP (0:408): peer's pubkey isn't cached
Oct 27 22:20:24.319: ISAKMP (0:408): cert approved with warning
!--- Subject name of 1720-1 router's !--- certificates from CA server1. !--- FQDN of 1720-1. Oct
27 22:20:24.383: ISAKMP (0:408): OU = MADRID O=SPAIN
Oct 27 22:20:24.419: ISAKMP (0:408): processing SIG payload. message ID = 0
Oct 27 22:20:24.419: ISAKMP (408): sa->peer.name = , sa->peer.id.id.fqdn.fqdn =
1720-1.tac.com
Oct 27 22:20:24.475: ISAKMP (0:408): processing NOTIFY INITIAL_CONTACT protocol 1
spi 0, message ID = 0, sa = 82F6FE80
Oct 27 22:20:24.475: ISAKMP (0:408): Process initial contact, bring down existing phase
1 and 2 SA's

with local 172.16.172.35 remote 172.16.172.45
Oct 27 22:20:24.479: ISAKMP (0:408): SA has been authenticated with 172.16.172.45
Oct 27 22:20:24.479: ISAKMP (0:408): Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE
Oct 27 22:20:24.479: ISAKMP (0:408): Old State = IKE_R_MM5 New State = IKE_R_MM5

Oct 27 22:20:24.479: IPSEC(key_engine): got a queue event...
Oct 27 22:20:24.483: ISAKMP (0:408): SA is doing RSA signature authentication using
id type ID_FQDN
Oct 27 22:20:24.483: ISAKMP (408): ID payload
next-payload : 6
type : 2
FQDN name : 2611-vpn.cisco.com
protocol : 17
port : 0
length : 22
Oct 27 22:20:24.483: ISAKMP (408): Total payload length: 26
Oct 27 22:20:24.495: ISKAMP: growing send buffer from 1024 to 3072
Oct 27 22:20:24.507: ISAKMP (0:408): using the caserver1 trustpoint's
keypair to sign
Oct 27 22:20:24.956: ISAKMP (0:408): sending packet to 172.16.172.45
my_port 500 peer_port 500 (R)
MM_KEY_EXCH
Oct 27 22:20:24.956: ISAKMP (0:408): Input = IKE_MSG_INTERNAL,
IKE_PROCESS_COMPLETE
Oct 27 22:20:24.956: ISAKMP (0:408): Old State = IKE_R_MM5 New State =
IKE_P1_COMPLETE
```



Oct 27 22:20:24.960: ISAKMP (0:408): Input = IKE\_MSG\_INTERNAL,  
IKE\_PHASE1\_COMPLETE  
Oct 27 22:20:24.960: ISAKMP (0:408): Old State = IKE\_P1\_COMPLETE  
New State = IKE\_P1\_COMPLETE

Oct 27 22:20:25.168: ISAKMP (0:408): received packet from 172.16.172.45  
dport 500 sport 500 (R)  
QM\_IDLE

Oct 27 22:20:25.172: ISAKMP: set new node -2090109070 to QM\_IDLE  
Oct 27 22:20:25.192: ISAKMP (0:408): processing HASH payload. message ID = -2090109070  
Oct 27 22:20:25.192: ISAKMP (0:408): processing SA payload. message ID = -2090109070  
Oct 27 22:20:25.192: ISAKMP (0:408): Checking IPsec proposal 1  
Oct 27 22:20:25.192: ISAKMP: transform 1, ESP\_DES  
Oct 27 22:20:25.192: ISAKMP: attributes in transform:  
Oct 27 22:20:25.192: ISAKMP: encaps is 1  
Oct 27 22:20:25.192: ISAKMP: SA life type in seconds  
Oct 27 22:20:25.196: ISAKMP: SA life duration (basic) of 3600  
Oct 27 22:20:25.196: ISAKMP: SA life type in kilobytes  
Oct 27 22:20:25.196: ISAKMP: SA life duration (VPI) of 0x0 0x46 0x50 0x0  
Oct 27 22:20:25.196: ISAKMP: authenticator is HMAC-MD5  
Oct 27 22:20:25.196: ISAKMP (0:408): atts are acceptable.  
Oct 27 22:20:25.196: IPSEC(validate\_proposal\_request): proposal part #1,  
(key eng. msg.) INBOUND local= 172.16.172.35, remote= 172.16.172.45,  
local\_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),  
remote\_proxy= 20.1.1.0/255.255.255.0/0/0 (type=4),  
protocol= ESP, transform= esp-des esp-md5-hmac ,  
lifedur= 0s and 0kb,  
spi= 0x0(0), conn\_id= 0, keysize= 0, flags= 0x2  
Oct 27 22:20:25.200: ISAKMP (0:408): processing NONCE payload. message ID = -2090109070  
Oct 27 22:20:25.200: ISAKMP (0:408): processing ID payload. message ID = -2090109070  
Oct 27 22:20:25.204: ISAKMP (0:408): processing ID payload. message ID = -2090109070  
Oct 27 22:20:25.204: ISAKMP (0:408): asking for 1 spis from ipsec  
Oct 27 22:20:25.204: ISAKMP (0:408): Node -2090109070, Input = IKE\_MSG\_FROM\_PEER,  
IKE\_QM\_EXCH  
Oct 27 22:20:25.204: ISAKMP (0:408): Old State = IKE\_QM\_READY New State =  
IKE\_QM\_SPI\_STARVE  
Oct 27 22:20:25.204: IPSEC(key\_engine): got a queue event...  
Oct 27 22:20:25.208: IPSEC(spi\_response): getting spi 2951036365 for SA  
from 172.16.172.35 to 172.16.172.45 for prot 3  
Oct 27 22:20:25.208: ISAKMP: received ke message (2/1)  
Oct 27 22:20:25.493: ISAKMP (0:408): sending packet to 172.16.172.45  
my\_port 500 peer\_port 500 (R)  
QM\_IDLE

Oct 27 22:20:25.493: ISAKMP (0:408): Node -2090109070, Input = IKE\_MSG\_FROM\_IPSEC,  
IKE\_SPI\_REPLY  
Oct 27 22:20:25.493: ISAKMP (0:408): Old State = IKE\_QM\_SPI\_STARVE New State =  
IKE\_QM\_R\_QM2  
Oct 27 22:20:25.577: ISAKMP (0:408): received packet from 172.16.172.45 dport 500  
sport 500 (R)  
QM\_IDLE

Oct 27 22:20:25.669: ISAKMP (0:408): Creating IPsec SAs  
Oct 27 22:20:25.669: inbound SA from 172.16.172.45 to 172.16.172.35  
(proxy 20.1.1.0 to 192.168.4.0)  
Oct 27 22:20:25.669: has spi 0xAFE53DCD and conn\_id 420 and flags 2  
Oct 27 22:20:25.669: lifetime of 3600 seconds  
Oct 27 22:20:25.669: lifetime of 4608000 kilobytes  
Oct 27 22:20:25.669: has client flags 0x0  
Oct 27 22:20:25.673: outbound SA from 172.16.172.35 to 172.16.172.45  
(proxy 192.168.4.0 to 20.1.1.0 )  
Oct 27 22:20:25.673: has spi 563992317 and conn\_id 421 and flags A  
Oct 27 22:20:25.673: lifetime of 3600 seconds  
Oct 27 22:20:25.673: lifetime of 4608000 kilobytes  
Oct 27 22:20:25.673: has client flags 0x0

```
Oct 27 22:20:25.673: ISAKMP (0:408): deleting node -2090109070 error FALSE reason
"quick mode done (await())"
Oct 27 22:20:25.673: ISAKMP (0:408): Node -2090109070, Input = IKE_MSG_FROM_PEER,
IKE_QM_EXCH
Oct 27 22:20:25.677: ISAKMP (0:408): Old State = IKE_QM_R_QM2 New State =
IKE_QM_PHASE2_COMPLETE
Oct 27 22:20:25.677: IPSEC(key_engine): got a queue event...
Oct 27 22:20:25.677: IPSEC(initialize_sas): ,
(key eng. msg.) INBOUND local= 172.16.172.35, remote= 172.16.172.45,
local_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),
remote_proxy= 20.1.1.0/255.255.255.0/0/0 (type=4),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 3600s and 4608000kb,
spi= 0xAF53DCD(2951036365), conn_id= 420, keysize= 0, flags= 0x2
Oct 27 22:20:25.681: IPSEC(initialize_sas): ,
(key eng. msg.) OUTBOUND local= 172.16.172.35, remote= 172.16.172.45,
local_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),
remote_proxy= 20.1.1.0/255.255.255.0/0/0 (type=4),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 3600s and 4608000kb,
spi= 0x219DD6FD(563992317), conn_id= 421, keysize= 0, flags= 0xA
Oct 27 22:20:25.681: IPSEC(add mtree): src 192.168.4.0, dest 20.1.1.0, dest_port 0
```

```
Oct 27 22:20:25.681: IPSEC(create_sa): sa created,
(sa) sa_dest= 172.16.172.35, sa_prot= 50,
sa_spi= 0xAF53DCD(2951036365),
sa_trans= esp-des esp-md5-hmac , sa_conn_id= 420
Oct 27 22:20:25.685: IPSEC(create_sa): sa created,
(sa) sa_dest= 172.16.172.45, sa_prot= 50,
sa_spi= 0x219DD6FD(563992317),
sa_trans= esp-des esp-md5-hmac , sa_conn_id= 421
```

```
Oct 27 22:20:26.070: ISAKMP (0:407): purging SA., sa=82F7ADE0, delme=82F7ADE0
2611-VPN#
2611-VPN#
2611-VPN#
2611-VPN#
```

```
!--- Debugs on the router when the 7204-1 router has initiated !--- an IPSec tunnel to the
router. Oct 27 22:32:02.740: ISAKMP (0:0): received packet from 172.16.172.51 dport 500 sport
500 (N) NEW SA Oct 27 22:32:02.740: ISAKMP: local port 500, remote port 500 Oct 27 22:32:02.740:
ISAKMP (0:412): Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH Oct 27 22:32:02.744: ISAKMP (0:412): Old
State = IKE_READY New State = IKE_R_MM1 Oct 27 22:32:02.744: ISAKMP (0:412): processing SA
payload. message ID = 0 Oct 27 22:32:02.744: ISAKMP (0:412): Checking ISAKMP transform 1 against
priority 10 policy Oct 27 22:32:02.744: ISAKMP: encryption DES-CBC Oct 27 22:32:02.744: ISAKMP:
hash MD5 Oct 27 22:32:02.744: ISAKMP: default group 1 Oct 27 22:32:02.748: ISAKMP: auth RSA sig
Oct 27 22:32:02.748: ISAKMP: life type in seconds Oct 27 22:32:02.748: ISAKMP: life duration
(VPI) of 0x0 0x1 0x51 0x80 Oct 27 22:32:02.748: ISAKMP (0:412): atts are acceptable. Next
payload is 3 Oct 27 22:32:02.792: ISAKMP (0:412): Input = IKE_MSG_INTERNAL,
IKE_PROCESS_MAIN_MODE Oct 27 22:32:02.792: ISAKMP (0:412): Old State = IKE_R_MM1 New State =
IKE_R_MM1 Oct 27 22:32:02.792: ISAKMP (0:412): sending packet to 172.16.172.51 my_port 500
peer_port 500 (R) MM_SA_SETUP Oct 27 22:32:02.796: ISAKMP (0:412): Input = IKE_MSG_INTERNAL,
IKE_PROCESS_COMPLETE Oct 27 22:32:02.796: ISAKMP (0:412): Old State = IKE_R_MM1 New State =
IKE_R_MM2 Oct 27 22:32:02.820: ISAKMP (0:412): received packet from 172.16.172.51 dport 500
sport 500 (R) MM_SA_SETUP Oct 27 22:32:02.820: ISAKMP (0:412): Input = IKE_MSG_FROM_PEER,
IKE_MM_EXCH Oct 27 22:32:02.824: ISAKMP (0:412): Old State = IKE_R_MM2 New State = IKE_R_MM3 Oct
27 22:32:02.824: ISAKMP (0:412): processing KE payload. message ID = 0 Oct 27 22:32:02.868:
ISAKMP (0:412): processing NONCE payload. message ID = 0 Oct 27 22:32:02.908: ISAKMP (0:412):
SKEYID state generated Oct 27 22:32:02.912: ISAKMP (0:412): processing CERT_REQ payload. message
ID = 0 Oct 27 22:32:02.912: ISAKMP (0:412): peer wants a CT_X509_SIGNATURE cert Oct 27
22:32:02.916: ISAKMP (0:412): peer want cert issued by CN = vpn,
OU = cisco, O = tac,
```

```
L = san jose, ST = california, C = US
```

```
!--- The router has determined that the !--- IPSec peer is sending a certificate !--- that CA
```

*server2 has issued.* Oct 27 22:32:02.924: ISAKMP (0:412): **Choosing trustpoint caserver2 as issuer**  
Oct 27 22:32:02.928: ISAKMP (0:412): processing vendor id payload  
Oct 27 22:32:02.928: ISAKMP (0:412): vendor ID is Unity  
Oct 27 22:32:02.928: ISAKMP (0:412): processing vendor id payload  
Oct 27 22:32:02.928: ISAKMP (0:412): vendor ID is DPD  
Oct 27 22:32:02.928: ISAKMP (0:412): processing vendor id payload  
Oct 27 22:32:02.928: ISAKMP (0:412): speaking to another IOS box!  
Oct 27 22:32:02.932: ISAKMP (0:412): Input = IKE\_MESG\_INTERNAL,  
IKE\_PROCESS\_MAIN\_MODE  
Oct 27 22:32:02.932: ISAKMP (0:412): Old State = IKE\_R\_MM3 New State = IKE\_R\_MM3  
  
Oct 27 22:32:02.952: ISAKMP (0:412): sending packet to 172.16.172.51 my\_port 500  
peer\_port 500  
(R) MM\_KEY\_EXCH  
Oct 27 22:32:02.952: ISAKMP (0:412): Input = IKE\_MESG\_INTERNAL,  
IKE\_PROCESS\_COMPLETE  
Oct 27 22:32:02.952: ISAKMP (0:412): Old State = IKE\_R\_MM3 New State = IKE\_R\_MM4  
  
Oct 27 22:32:03.016: ISAKMP (0:412): received packet from 172.16.172.51 dport 500  
sport 500  
(R) MM\_KEY\_EXCH  
Oct 27 22:32:03.032: ISAKMP (0:412): Input = IKE\_MESG\_FROM\_PEER, IKE\_MM\_EXCH  
Oct 27 22:32:03.032: ISAKMP (0:412): Old State = IKE\_R\_MM4 New State = IKE\_R\_MM5  
  
Oct 27 22:32:03.032: ISAKMP (0:412): processing ID payload. message ID = 0  
Oct 27 22:32:03.032: ISAKMP (412): Process ID payload  
type : 2  
FQDN name : 7204-1.cisco.com  
protocol : 17  
port : 500  
length : 16  
Oct 27 22:32:03.032: ISAKMP (0:412): processing CERT payload. message ID = 0  
Oct 27 22:32:03.036: ISAKMP (0:412): processing a CT\_X509\_SIGNATURE cert  
Oct 27 22:32:03.076: ISAKMP (0:412): peer's pubkey isn't cached  
Oct 27 22:32:03.129: ISAKMP (0:412): cert approved with warning  
*!---* *Subject name of 7204-1 router's certificate issued by CA server2.* Oct 27 22:32:03.189:  
ISAKMP (0:412): **OU = BERLIN O=GERMANY**  
Oct 27 22:32:03.229: ISAKMP (0:412): processing SIG payload. message ID = 0  
*!---* *FQDN of 7204-1.* Oct 27 22:32:03.229: ISAKMP (412): **sa->peer.name = , sa->peer\_id.id.id\_fqdn.fqdn = 7204-1.cisco.com**  
Oct 27 22:32:03.265: ISAKMP (0:412): processing NOTIFY INITIAL\_CONTACT protocol 1 spi 0, message ID = 0, sa = 82F69D84  
Oct 27 22:32:03.269: ISAKMP (0:412): **Process initial contact, bring down existing phase 1 and 2 SA's with local**  
  
**172.16.172.35 remote 172.16.172.51**  
Oct 27 22:32:03.269: ISAKMP (0:412): **SA has been authenticated with 172.16.172.51**  
Oct 27 22:32:03.269: ISAKMP (0:412): Input = IKE\_MESG\_INTERNAL, IKE\_PROCESS\_MAIN\_MODE  
Oct 27 22:32:03.269: ISAKMP (0:412): Old State = IKE\_R\_MM5 New State = IKE\_R\_MM5  
  
Oct 27 22:32:03.269: IPSEC(key\_engine): got a queue event...  
Oct 27 22:32:03.273: ISAKMP (0:412): SA is doing RSA signature authentication using id type ID\_FQDN  
Oct 27 22:32:03.273: ISAKMP (412): ID payload  
next-payload : 6  
type : 2  
FQDN name : 2611-vpn.cisco.com  
protocol : 17  
port : 0  
length : 22  
Oct 27 22:32:03.273: ISAKMP (412): Total payload length: 26  
Oct 27 22:32:03.285: ISKAMP: growing send buffer from 1024 to 3072  
Oct 27 22:32:03.297: ISAKMP (0:412): using the caserver2 trustpoint's keypair to sign

Oct 27 22:32:03.762: ISAKMP (0:412): sending packet to 172.16.172.51 my\_port 500  
peer\_port 500  
(R) MM\_KEY\_EXCH

Oct 27 22:32:03.762: ISAKMP (0:412): Input = IKE\_MSG\_INTERNAL, IKE\_PROCESS\_COMPLETE  
Oct 27 22:32:03.766: ISAKMP (0:412): Old State = IKE\_R\_MM5 New State = IKE\_P1\_COMPLETE

Oct 27 22:32:03.766: ISAKMP (0:412): Input = IKE\_MSG\_INTERNAL, IKE\_PHASE1\_COMPLETE  
Oct 27 22:32:03.766: ISAKMP (0:412): Old State = IKE\_P1\_COMPLETE New State =  
IKE\_P1\_COMPLETE

Oct 27 22:32:03.790: ISAKMP (0:412): received packet from 172.16.172.51 dport 500  
sport 500  
(R) QM\_IDLE

Oct 27 22:32:03.790: ISAKMP: set new node 1631242332 to QM\_IDLE

Oct 27 22:32:03.810: ISAKMP (0:412): processing HASH payload. message ID = 1631242332  
Oct 27 22:32:03.810: ISAKMP (0:412): processing SA payload. message ID = 1631242332  
Oct 27 22:32:03.810: ISAKMP (0:412): Checking IPsec proposal 1  
Oct 27 22:32:03.810: ISAKMP: transform 1, ESP\_DES  
Oct 27 22:32:03.810: ISAKMP: attributes in transform:  
Oct 27 22:32:03.810: ISAKMP: encaps is 1  
Oct 27 22:32:03.814: ISAKMP: SA life type in seconds  
Oct 27 22:32:03.814: ISAKMP: SA life duration (basic) of 3600  
Oct 27 22:32:03.814: ISAKMP: SA life type in kilobytes  
Oct 27 22:32:03.814: ISAKMP: SA life duration (VPI) of 0x0 0x46 0x50 0x0  
Oct 27 22:32:03.814: ISAKMP: authenticator is HMAC-MD5  
Oct 27 22:32:03.814: ISAKMP (0:412): atts are acceptable.  
Oct 27 22:32:03.818: IPSEC(validate\_proposal\_request): proposal part #1,  
(key eng. msg.) INBOUND local= 172.16.172.35, remote= 172.16.172.51,  
local\_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),  
remote\_proxy= 3.3.3.0/255.255.255.0/0/0 (type=4),  
protocol= ESP, transform= esp-des esp-md5-hmac ,  
lifedur= 0s and 0kb,  
spi= 0x0(0), conn\_id= 0, keysize= 0, flags= 0x2

Oct 27 22:32:03.818: ISAKMP (0:412): processing NONCE payload. message ID = 1631242332  
Oct 27 22:32:03.822: ISAKMP (0:412): processing ID payload. message ID = 1631242332  
Oct 27 22:32:03.822: ISAKMP (0:412): processing ID payload. message ID = 1631242332  
Oct 27 22:32:03.822: ISAKMP (0:412): asking for 1 spis from ipsec  
Oct 27 22:32:03.822: ISAKMP (0:412): Node 1631242332, Input = IKE\_MSG\_FROM\_PEER,  
IKE\_QM\_EXCH

Oct 27 22:32:03.822: ISAKMP (0:412): Old State = IKE\_QM\_READY New State =  
IKE\_QM\_SPI\_STARVE

Oct 27 22:32:03.822: IPSEC(key\_engine): got a queue event...  
Oct 27 22:32:03.826: IPSEC(spi\_response): getting spi 3365950736 for SA  
from 172.16.172.35 to 172.16.172.51 for prot 3  
Oct 27 22:32:03.826: ISAKMP: received ke message (2/1)  
Oct 27 22:32:04.090: ISAKMP (0:412): sending packet to 172.16.172.51 my\_port 500  
peer\_port 500  
(R) QM\_IDLE

Oct 27 22:32:04.094: ISAKMP (0:412): Node 1631242332, Input =  
IKE\_MSG\_FROM\_IPSEC, IKE\_SPI\_REPLY

Oct 27 22:32:04.094: ISAKMP (0:412): Old State = IKE\_QM\_SPI\_STARVE New State =  
IKE\_QM\_R\_QM2

Oct 27 22:32:04.102: ISAKMP (0:412): received packet from 172.16.172.51  
dport 500 sport 500  
(R) QM\_IDLE

Oct 27 22:32:04.190: ISAKMP (0:412): Creating IPsec SAs  
Oct 27 22:32:04.190: inbound SA from 172.16.172.51 to 172.16.172.35  
(proxy 3.3.3.0 to 192.168.4.0)  
Oct 27 22:32:04.190: has spi 0xC8A05510 and conn\_id 422 and flags 2  
Oct 27 22:32:04.190: lifetime of 3600 seconds  
Oct 27 22:32:04.190: lifetime of 4608000 kilobytes  
Oct 27 22:32:04.190: has client flags 0x0  
Oct 27 22:32:04.194: outbound SA from 172.16.172.35 to 172.16.172.51  
(proxy 192.168.4.0 to 3.3.3.0 )

```

Oct 27 22:32:04.194: has spi -788374095 and conn_id 423 and flags A
Oct 27 22:32:04.194: lifetime of 3600 seconds
Oct 27 22:32:04.194: lifetime of 4608000 kilobytes
Oct 27 22:32:04.194: has client flags 0x0
Oct 27 22:32:04.194: ISAKMP (0:412): deleting node 1631242332 error FALSE
    reason "quick mode done
    (await())"
Oct 27 22:32:04.194: ISAKMP (0:412): Node 1631242332, Input =
    IKE_MSG_FROM_PEER, IKE_QM_EXCH
Oct 27 22:32:04.198: ISAKMP (0:412): Old State = IKE_QM_R_QM2 New State =
    IKE_QM_PHASE2_COMPLETE
Oct 27 22:32:04.198: IPSEC(key_engine): got a queue event...
Oct 27 22:32:04.198: IPSEC(initialize_sas): ,
    (key eng. msg.) INBOUND local= 172.16.172.35, remote= 172.16.172.51,
    local_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),
    remote_proxy= 3.3.3.0/255.255.255.0/0/0 (type=4),
    protocol= ESP, transform= esp-des esp-md5-hmac ,
    lifedur= 3600s and 4608000kb,
    spi= 0xC8A05510(3365950736), conn_id= 422, keysize= 0, flags= 0x2
Oct 27 22:32:04.202: IPSEC(initialize_sas): ,
    (key eng. msg.) OUTBOUND local= 172.16.172.35, remote= 172.16.172.51,
    local_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),
    remote_proxy= 3.3.3.0/255.255.255.0/0/0 (type=4),
    protocol= ESP, transform= esp-des esp-md5-hmac ,
    lifedur= 3600s and 4608000kb,
    spi= 0xD1025DB1(3506593201), conn_id= 423, keysize= 0, flags= 0xA
Oct 27 22:32:04.202: IPSEC(add mtree): src 192.168.4.0, dest 3.3.3.0, dest_port 0

Oct 27 22:32:04.202: IPSEC(create_sa): sa created,
    (sa) sa_dest= 172.16.172.35, sa_prot= 50,
    sa_spi= 0xC8A05510(3365950736),
    sa_trans= esp-des esp-md5-hmac , sa_conn_id= 422
Oct 27 22:32:04.206: IPSEC(create_sa): sa created,
    (sa) sa_dest= 172.16.172.51, sa_prot= 50,
    sa_spi= 0xD1025DB1(3506593201),
    sa_trans= esp-des esp-md5-hmac , sa_conn_id= 423
2611-VPN#
2611-VPN#
2611-VPN#show crypto en conn ac

    ID Interface
IP-Address State Algorithm
Encrypt Decrypt
411 Ethernet0/0
172.16.172.35 set HMAC_MD5+DES_56_CB
0 0
412 Ethernet0/0
172.16.172.35 set HMAC_MD5+DES_56_CB
0 0
420 Ethernet0/0
172.16.172.35 set HMAC_MD5+DES_56_CB
0 8
421 Ethernet0/0
172.16.172.35 set HMAC_MD5+DES_56_CB
8 0
422 Ethernet0/0
172.16.172.35 set HMAC_MD5+DES_56_CB
0 9
423 Ethernet0/0
172.16.172.35 set HMAC_MD5+DES_56_CB
9 0
2611-VPN#
2611-VPN#
2611-VPN#

```

2611-VPN#

2611-VPN#show crypto map

Crypto Map "vpn" 10 ipsec-isakmp

Peer

= 172.16.172.45

Extended

IP access list 101

access-list 101 permit ip 192.168.4.0 0.0.0.255 20.1.1.0 0.0.0.255

Current

peer: 172.16.172.45

Security

association lifetime: 4608000 kilobytes/3600 seconds

PFS

(Y/N): N

Transform

sets={

myset,

}

Crypto Map "vpn" 20 ipsec-isakmp

Peer

= 172.16.172.51

Extended

IP access list 102

access-list 102 permit ip 192.168.4.0 0.0.0.255 3.3.3.0 0.0.0.255

Current

peer: 172.16.172.51

Security

association lifetime: 4608000 kilobytes/3600 seconds

PFS

(Y/N): N

Transform

sets={

myset,

}

Crypto Map "vpn" 30 ipsec-isakmp

Peer = 172.16.172.53

Extended

IP access list 103

access-list 103 permit ip 192.168.4.0 0.0.0.255 200.1.1.0 0.0.0.255

Current

peer: 172.16.172.53

Security

association lifetime: 4608000 kilobytes/3600 seconds

PFS

(Y/N): N

Transform

sets={

myset,

}

Interfaces

using crypto map vpn:

Ethernet0/0

2611-VPN#show crypto isa sa

dst

src

state conn-id

```
slot
172.16.172.35 172.16.172.51
QM_IDLE
412 0
172.16.172.35 172.16.172.45
QM_IDLE
411 0
2611-VPN#show crypto ipsec sa
interface: Ethernet0/0
  Crypto map tag: vpn, local
  addr. 172.16.172.35
  local ident (addr/mask/prot/port):
(192.168.4.0/255.255.255.0/0/0)
  remote ident (addr/mask/prot/port):
(200.1.1.0/255.255.255.0/0/0)
  current_peer: 172.16.172.53:500
  PERMIT, flags={origin_is_acl,}
  #pkts encaps: 0, #pkts encrypt:
0, #pkts digest 0
  #pkts decaps: 0, #pkts decrypt:
0, #pkts verify 0
  #pkts compressed: 0, #pkts
decompressed: 0
  #pkts not compressed: 0, #pkts
compr. failed: 0
  #pkts not decompressed: 0,
#pkts decompress failed: 0
  #send errors 0, #recv errors
0
  local crypto endpt.:
172.16.172.35, remote crypto endpt.: 172.16.172.53
  path mtu 1500, media
mtu 1500
  current outbound spi:
0
  inbound esp sas:
  inbound ah sas:
  inbound pcp sas:
  outbound esp sas:
  outbound ah sas:
  outbound pcp sas:
  local ident (addr/mask/prot/port):
(192.168.4.0/255.255.255.0/0/0)
  remote ident (addr/mask/prot/port):
(3.3.3.0/255.255.255.0/0/0)
  current_peer: 172.16.172.51:500
  PERMIT, flags={origin_is_acl,}
  #pkts encaps: 9, #pkts encrypt:
9, #pkts digest 9
  #pkts decaps: 9, #pkts decrypt:
9, #pkts verify 9
  #pkts compressed: 0, #pkts
decompressed: 0
  #pkts not compressed: 0, #pkts
compr. failed: 0
  #pkts not decompressed: 0,
#pkts decompress failed: 0
  #send errors 0, #recv errors
0
  local crypto endpt.:
172.16.172.35, remote crypto endpt.: 172.16.172.51
  path mtu 1500, media
mtu 1500
  current outbound spi:
```

```
D1025DB1
inbound esp sas:
spi: 0xC8A05510(3365950736)
transform:
esp-des esp-md5-hmac ,
in
use settings ={Tunnel, }
slot:
0, conn id: 422, flow_id: 3, crypto map: vpn
sa
timing: remaining key lifetime (k/sec): (4607998/3519)
IV
size: 8 bytes
replay
detection support: Y
inbound ah sas:
inbound pcp sas:
outbound esp sas:
spi: 0xD1025DB1(3506593201)
transform:
esp-des esp-md5-hmac ,
in
use settings ={Tunnel, }
slot:
0, conn id: 423, flow_id: 4, crypto map: vpn
sa
timing: remaining key lifetime (k/sec): (4607998/3519)
IV
size: 8 bytes
replay
detection support: Y
outbound ah sas:
outbound pcp sas:
local ident (addr/mask/prot/port):
(192.168.4.0/255.255.255.0/0/0)
remote ident (addr/mask/prot/port):
(20.1.1.0/255.255.255.0/0/0)
current_peer: 172.16.172.45:500
PERMIT, flags={origin_is_acl,}
#pkts encaps: 8, #pkts encrypt:
8, #pkts digest 8
#pkts decaps: 8, #pkts decrypt:
8, #pkts verify 8
#pkts compressed: 0, #pkts
decompressed: 0
#pkts not compressed: 0, #pkts
compr. failed: 0
#pkts not decompressed: 0,
#pkts decompress failed: 0
#send errors 0, #recv errors
0
local crypto endpt.:
172.16.172.35, remote crypto endpt.: 172.16.172.45
path mtu 1500, media
mtu 1500
current outbound spi:
5F57E177
inbound esp sas:
spi: 0xC7DB301B(3353030683)
transform:
esp-des esp-md5-hmac ,
in
use settings ={Tunnel, }
slot:
```



```
0, conn id: 420, flow_id: 1, crypto map: vpn
sa
timing: remaining key lifetime (k/sec): (4607998/3410)
IV
size: 8 bytes
replay
detection support: Y
inbound ah sas:
inbound pcp sas:
outbound esp sas:
spi: 0x5F57E177(1599594871)
transform:
esp-des esp-md5-hmac ,
in
use settings ={Tunnel, }
slot:
```

```
0, conn id: 421, flow_id: 2, crypto map: vpn
sa
timing: remaining key lifetime (k/sec): (4607998/3409)
IV
size: 8 bytes
replay
detection support: Y
outbound ah sas:
outbound pcp sas:
2611-VPN#
2611-VPN#
```

此输出使用 **show crypto** 命令显示 1720-1 路由器上的 IKE/IPSec 调试。此输出发起通往 2611-VPN 路由器的 IPSec 隧道。

```
Oct 27 22:21:04.994: IPSEC(sa_request): ,
(key eng. msg.) OUTBOUND local= 172.16.172.45, remote= 172.16.172.35,
local_proxy= 20.1.1.0/255.255.255.0/0/0 (type=4),
remote_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 3600s and 4608000kb,
spi= 0x219DD6FD(563992317), conn_id= 0, keysize=
0, flags= 0x400C
Oct 27 22:21:04.998: ISAKMP: received ke message (1/1)
Oct 27 22:21:04.998: ISAKMP: local port 500, remote port 500
Oct 27 22:21:05.002: ISAKMP (0:3): Input = IKE_MSG_FROM_IPSEC, IKE_SA_REQ_MM
Oct 27 22:21:05.002: ISAKMP (0:3): Old State = IKE_READY New
State = IKE_I_MM1
Oct 27 22:21:05.002: ISAKMP (0:3): beginning Main Mode exchange
Oct 27 22:21:05.002: ISAKMP (0:3): sending packet to 172.16.172.35
(I) MM_NO_STATE
Oct 27 22:21:05.062: ISAKMP (0:3): received packet from 172.16.172.35
(I) MM_NO_STATE
Oct 27 22:21:05.062: ISAKMP (0:3): Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH
Oct 27 22:21:05.066: ISAKMP (0:3): Old State = IKE_I_MM1 New
State = IKE_I_MM2
Oct 27 22:21:05.066: ISAKMP (0:3): processing SA payload. message ID
= 0
Oct 27 22:21:05.066: ISAKMP (0:3): Checking ISAKMP transform 1 against
priority 10 policy
Oct 27 22:21:05.066: ISAKMP: encryption
DES-CBC
Oct 27 22:21:05.066: ISAKMP: hash MD5
Oct 27 22:21:05.066: ISAKMP: default
group 1
Oct 27 22:21:05.066: ISAKMP: auth RSA
sig
```

Oct 27 22:21:05.066: ISAKMP: life type  
in seconds  
Oct 27 22:21:05.070: ISAKMP: life duration  
(VPI) of 0x0 0x1 0x51 0x80  
Oct 27 22:21:05.070: ISAKMP (0:3): atts are acceptable. Next payload  
is 0  
Oct 27 22:21:05.190: ISAKMP (0:3): Input = IKE\_MESG\_INTERNAL, IKE\_PROCESS\_MAIN\_MODE  
Oct 27 22:21:05.190: ISAKMP (0:3): Old State = IKE\_I\_MM2 New  
State = IKE\_I\_MM2  
Oct 27 22:21:05.202: ISAKMP (0:3): sending packet to 172.16.172.35.  
(I) MM\_SA\_SETUP  
Oct 27 22:21:05.202: ISAKMP (0:3): Input = IKE\_MESG\_INTERNAL, IKE\_PROCESS\_COMPLETE  
Oct 27 22:21:05.202: ISAKMP (0:3): Old State = IKE\_I\_MM2 New  
State = IKE\_I\_MM3  
Oct 27 22:21:05.338: ISAKMP (0:3): received packet from 172.16.172.35  
(I) MM\_SA\_SETUP  
Oct 27 22:21:05.342: ISAKMP (0:3): Input = IKE\_MESG\_FROM\_PEER, IKE\_MM\_EXCH  
Oct 27 22:21:05.342: ISAKMP (0:3): Old State = IKE\_I\_MM3 New  
State = IKE\_I\_MM4  
Oct 27 22:21:05.342: ISAKMP (0:3): processing KE payload. message ID  
= 0  
Oct 27 22:21:05.466: ISAKMP (0:3): processing NONCE payload. message  
ID = 0  
Oct 27 22:21:05.490: ISAKMP (0:3): SKEYID state generated  
Oct 27 22:21:05.490: ISAKMP (0:3): processing CERT\_REQ payload. message  
ID = 0  
Oct 27 22:21:05.490: ISAKMP (0:3): peer wants a CT\_X509\_SIGNATURE cert  
Oct 27 22:21:05.494: ISAKMP (0:3): peer want cert issued by CN = vpn,  
OU = cisco, O = tac, L = san jose, ST = california, C = US  
Oct 27 22:21:05.498: ISAKMP (0:3): processing CERT\_REQ payload. message  
ID = 0  
Oct 27 22:21:05.498: ISAKMP (0:3): peer wants a CT\_X509\_SIGNATURE cert  
Oct 27 22:21:05.502: ISAKMP (0:3): **peer want  
cert issued by CN = SJVPNTAC-CAServer, OU = TAC-VPN-SJ, O = Cisco Systems,  
L = San Jose, ST = CA, C = US**  
Oct 27 22:21:05.506: ISAKMP (0:3): Choosing  
**trustpoint caserver1 as issuer**  
Oct 27 22:21:05.506: ISAKMP (0:3): processing vendor id payload  
Oct 27 22:21:05.506: ISAKMP (0:3): vendor ID is Unity  
Oct 27 22:21:05.510: ISAKMP (0:3): processing vendor id payload  
Oct 27 22:21:05.510: ISAKMP (0:3): vendor ID is DPD  
Oct 27 22:21:05.510: ISAKMP (0:3): processing vendor id payload  
Oct 27 22:21:05.510: ISAKMP (0:3): speaking to another IOS box!  
Oct 27 22:21:05.510: ISAKMP (0:3): processing vendor id payload  
Oct 27 22:21:05.510: I.!!!  
Success rate is 60 percent (3/5), round-trip min/avg/max = 4/5/8 ms  
1720-1#SAKMP (0:3): Input = IKE\_MESG\_INTERNAL, IKE\_PROCESS\_MAIN\_MODE  
Oct 27 22:21:05.510: ISAKMP (0:3): Old State = IKE\_I\_MM4 New  
State = IKE\_I\_MM4  
Oct 27 22:21:05.514: ISAKMP (0:3): Send initial contact  
Oct 27 22:21:05.514: ISAKMP (0:3): SA is doing RSA signature authentication  
using id type ID\_FQDN  
Oct 27 22:21:05.514: ISAKMP (3): ID payload  
next-payload : 6  
type  
: 2  
protocol  
: 17  
port  
: 500  
length  
: 18  
Oct 27 22:21:05.514: ISAKMP (3): Total payload length: 22  
Oct 27 22:21:05.530: ISKAMP: growing send buffer from 1024 to 3072

Oct 27 22:21:05.538: ISAKMP (0:3): using the caserver1 trustpoint's  
keypair to sign  
Oct 27 22:21:05.870: ISAKMP (0:3): sending packet to 172.16.172.35  
(I) MM\_KEY\_EXCH  
Oct 27 22:21:05.870: ISAKMP (0:3): Input = IKE\_MESG\_INTERNAL, IKE\_PROCESS\_COMPLETE  
Oct 27 22:21:05.874: ISAKMP (0:3): Old State = IKE\_I\_MM4 New  
State = IKE\_I\_MM5  
Oct 27 22:21:06.630: ISAKMP (0:3): received packet from 172.16.172.35  
(I) MM\_KEY\_EXCH  
Oct 27 22:21:06.638: ISAKMP (0:3): Input = IKE\_MESG\_FROM\_PEER, IKE\_MM\_EXCH  
Oct 27 22:21:06.638: ISAKMP (0:3): Old State = IKE\_I\_MM5 New  
State = IKE\_I\_MM6  
Oct 27 22:21:06.638: ISAKMP (0:3): processing ID payload. message ID  
= 0  
Oct 27 22:21:06.638: ISAKMP (0:3): processing CERT payload. message  
ID = 0  
Oct 27 22:21:06.638: ISAKMP (0:3): processing a CT\_X509\_SIGNATURE cert  
Oct 27 22:21:06.670: ISAKMP (0:3): peer's pubkey isn't cached  
Oct 27 22:21:06.714: ISAKMP (0:3): cert approved with warning  
Oct 27 22:21:06.762: ISAKMP (0:3): **OU = PARIS**  
**O=FRANCE** <-----  
The certificate subject name from 2621-VPN router  
Oct 27 22:21:06.794: ISAKMP (0:3): processing SIG payload. message  
ID = 0  
Oct 27 22:21:06.794: ISAKMP (3): **sa->peer.name**  
**= , sa->peer\_id.id.id\_fqdn.fqdn = 2611-vpn.cisco.com**  
Oct 27 22:21:06.818: ISAKMP (0:3): SA has been  
**authenticated with 172.16.172.35**  
Oct 27 22:21:06.822: ISAKMP (0:3): Input = IKE\_MESG\_INTERNAL, IKE\_PROCESS\_MAIN\_MODE  
Oct 27 22:21:06.822: ISAKMP (0:3): Old State = IKE\_I\_MM6 New  
State = IKE\_I\_MM6  
Oct 27 22:21:06.822: ISAKMP (0:3): Input = IKE\_MESG\_INTERNAL, IKE\_PROCESS\_COMPLETE  
Oct 27 22:21:06.826: ISAKMP (0:3): Old State = IKE\_I\_MM6 New  
State = IKE\_P1\_COMPLETE  
Oct 27 22:21:06.826: ISAKMP (0:3): beginning Quick Mode exchange, M-ID  
of -2090109070  
Oct 27 22:21:06.834: ISAKMP (0:3): sending packet to 172.16.172.35  
(I) QM\_IDLE  
Oct 27 22:21:06.838: ISAKMP (0:3): Node -2090109070, Input = IKE\_MESG\_INTERNAL,  
IKE\_INIT\_QM  
Oct 27 22:21:06.838: ISAKMP (0:3): Old State = IKE\_QM\_READY New  
State = IKE\_QM\_I\_QM1  
Oct 27 22:21:06.838: ISAKMP (0:3): Input = IKE\_MESG\_INTERNAL, IKE\_PHASE1\_COMPLETE  
Oct 27 22:21:06.838: ISAKMP (0:3): Old State = IKE\_P1\_COMPLETE  
New State = IKE\_P1\_COMPLETE  
Oct 27 22:21:07.162: ISAKMP (0:3): received packet from 172.16.172.35  
(I) QM\_IDLE  
Oct 27 22:21:07.174: ISAKMP (0:3): processing HASH payload. message  
ID = -2090109070  
Oct 27 22:21:07.174: ISAKMP (0:3): processing SA payload. message ID  
= -2090109070  
Oct 27 22:21:07.174: ISAKMP (0:3): Checking IPsec proposal 1  
Oct 27 22:21:07.174: ISAKMP: transform 1, ESP\_DES  
Oct 27 22:21:07.174: ISAKMP: attributes in transform:  
Oct 27 22:21:07.174: ISAKMP: encaps is  
1  
Oct 27 22:21:07.174: ISAKMP: SA life  
type in seconds  
Oct 27 22:21:07.174: ISAKMP: SA life  
duration (basic) of 3600  
Oct 27 22:21:07.174: ISAKMP: SA life  
type in kilobytes  
Oct 27 22:21:07.178: ISAKMP: SA life  
duration (VPI) of 0x0 0x46 0x50 0x0

Oct 27 22:21:07.178: ISAKMP: authenticator  
is HMAC-MD5  
Oct 27 22:21:07.178: ISAKMP (0:3): atts are acceptable.  
Oct 27 22:21:07.178: IPSEC(validate\_proposal\_request): proposal part  
#1,  
(key eng. msg.) INBOUND local= 172.16.172.45, remote= 172.16.172.35,  
local\_proxy= 20.1.1.0/255.255.255.0/0/0 (type=4),  
remote\_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),  
protocol= ESP, transform= esp-des esp-md5-hmac ,  
lifedur= 0s and 0kb,  
spi= 0x0(0), conn\_id= 0, keysize= 0, flags= 0x4  
Oct 27 22:21:07.182: ISAKMP (0:3): processing NONCE payload. message  
ID = -2090109070  
Oct 27 22:21:07.182: ISAKMP (0:3): processing ID payload. message ID  
= -2090109070  
Oct 27 22:21:07.182: ISAKMP (0:3): processing ID payload. message ID  
= -2090109070  
Oct 27 22:21:07.230: ISAKMP (0:3): Creating IPsec SAs  
Oct 27 22:21:07.230:  
inbound SA from 172.16.172.35 to 172.16.172.45  
(proxy 192.168.4.0 to 20.1.1.0)  
Oct 27 22:21:07.230:  
has spi 0x219DD6FD and conn\_id 200 and flags 4  
Oct 27 22:21:07.234:  
lifetime of 3600 seconds  
Oct 27 22:21:07.234:  
lifetime of 4608000 kilobytes  
Oct 27 22:21:07.234:  
outbound SA from 172.16.172.45 to 172.16.172.35  
(proxy 20.1.1.0 to 192.168.4.0  
)  
Oct 27 22:21:07.234:  
has spi -1343930931 and conn\_id 201 and flags C  
Oct 27 22:21:07.234:  
lifetime of 3600 seconds  
Oct 27 22:21:07.234:  
lifetime of 4608000 kilobytes  
Oct 27 22:21:07.234: IPSEC(key\_engine): got a queue event...  
Oct 27 22:21:07.234: IPSEC(initialize\_sas): ,  
(key eng. msg.) INBOUND local= 172.16.172.45, remote= 172.16.172.35,  
local\_proxy= 20.1.1.0/255.255.255.0/0/0 (type=4),  
remote\_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),  
protocol= ESP, transform= esp-des esp-md5-hmac ,  
lifedur= 3600s and 4608000kb,  
spi= 0x219DD6FD(563992317), conn\_id= 200, keysize=  
0, flags= 0x4  
Oct 27 22:21:07.238: IPSEC(initialize\_sas): ,  
(key eng. msg.) OUTBOUND local= 172.16.172.45, remote= 172.16.172.35,  
local\_proxy= 20.1.1.0/255.255.255.0/0/0 (type=4),  
remote\_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),  
protocol= ESP, transform= esp-des esp-md5-hmac ,  
lifedur= 3600s and 4608000kb,  
spi= 0xAFE53DCD(2951036365), conn\_id= 201, keysize=  
0, flags= 0xC  
Oct 27 22:21:07.238: IPSEC(create\_sa): sa created,  
(sa) sa\_dest= 172.16.172.45, sa\_prot= 50,  
sa\_spi= 0x219DD6FD(563992317),  
sa\_trans= esp-des esp-md5-hmac , sa\_conn\_id= 200  
Oct 27 22:21:07.242: IPSEC(create\_sa): sa created,  
(sa) sa\_dest= 172.16.172.35, sa\_prot= 50,  
sa\_spi= 0xAFE53DCD(2951036365),  
sa\_trans= esp-des esp-md5-hmac , sa\_conn\_id= 201  
Oct 27 22:21:07.246: ISAKMP (0:3): sending packet to 172.16.172.35  
(I) QM\_IDLE

```
Oct 27 22:21:07.246: ISAKMP (0:3): deleting node -2090109070 error
FALSE reason ""
Oct 27 22:21:07.246: ISAKMP (0:3): Node -2090109070, Input = IKE_MESG_FROM_PEER,
IKE_QM_EXCH
Oct 27 22:21:07.246: ISAKMP (0:3): Old State = IKE_QM_I_QM1 New
State = IKE_QM_PHASE2_COMPLETE
Oct 27 22:21:07.710: ISAKMP (0:2): purging SA., sa=8182AB8C, delme=8182AB8C
```

```
1720-1# show crypto map
```

```
Crypto Map "vpn" 10 ipsec-isakmp
Peer = 172.16.172.35
Extended IP access list
102
```

```
access-list 102 permit ip 20.1.1.0 0.0.0.255 192.168.4.0 0.0.0.255
Current peer: 172.16.172.35
Security association lifetime:
4608000 kilobytes/3600 seconds
PFS (Y/N): N
Transform sets={ myset,
}
Interfaces using crypto
map vpn:
```

```
FastEthernet0
```

```
1720-1#show crypto en conn ac
```

```
Oct 27 22:21:57.246: ISAKMP (0:3): purging node -2090109070onn ac
ID Interface IP-Address
State Algorithm
Encrypt Decrypt
3 <none>
<none> set
HMAC_MD5+DES_56_CB
0 0
200 FastEthernet0 172.16.172.45 set
HMAC_MD5+DES_56_CB
0 8
201 FastEthernet0 172.16.172.45 set
HMAC_MD5+DES_56_CB
8 0
```

```
1720-1#show crypto isa sa
```

```
dst
src
state conn-id
slot
172.16.172.35 172.16.172.45 QM_IDLE
3 0
```

```
1720-1#show crypto ipsec sa
```

```
interface: FastEthernet0
Crypto map tag: vpn, local addr. 172.16.172.45
local ident (addr/mask/prot/port): (20.1.1.0/255.255.255.0/0/0)
remote ident (addr/mask/prot/port): (192.168.4.0/255.255.255.0/0/0)
current_peer: 172.16.172.35
PERMIT, flags={origin_is_acl,}
#pkts encaps: 8, #pkts encrypt: 8, #pkts digest
8
#pkts decaps: 8, #pkts decrypt: 8, #pkts verify
8
#pkts compressed: 0, #pkts decompressed: 0
#pkts not compressed: 0, #pkts compr. failed: 0,
#pkts decompress failed: 0
#send errors 2, #recv errors 0
local crypto endpt.: 172.16.172.45, remote
```

```

crypto endpt.: 172.16.172.35
path mtu 1500, media mtu 1500
current outbound spi: AFE53DCD
inbound esp sas:
spi: 0x219DD6FD(563992317)
transform: esp-des esp-md5-hmac
,
in use settings ={Tunnel,
}
slot: 0, conn id: 200, flow_id:
1, crypto map: vpn
sa timing: remaining key lifetime (k/sec): (4607998/3530)
IV size: 8 bytes
replay detection support:
Y
inbound ah sas:
inbound pcp sas:
outbound esp sas:
spi: 0xAFE53DCD(2951036365)
transform: esp-des esp-md5-hmac
,
in use settings ={Tunnel,
}
slot: 0, conn id: 201, flow_id:
2, crypto map: vpn
sa timing: remaining key
lifetime (k/sec): (4607998/3521)
IV size: 8 bytes
replay detection support:
Y
outbound ah sas:
outbound pcp sas:

```

```

1720-1#
1720-1#

```

此输出使用 **show crypto** 命令显示 7204-1 路由器上的 IKE/IPSec 调试，并发起通往 2611-VPN 路由器的 IPSec 隧道。

```

Oct 27 05:24:23: IPSEC(sa_request): ,
(key eng. msg.) OUTBOUND local= 172.16.172.51, remote= 172.16.172.35,
local_proxy= 3.3.3.0/255.255.255.0/0/0 (type=4),
remote_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 3600s and 4608000kb,
spi= 0xD1025DB1(3506593201), conn_id= 0, keysize=
0, flags= 0x400C
Oct 27 05:24:23: ISAKMP: received ke message (1/1)
Oct 27 05:24:23: ISAKMP: local port 500, remote port 500
Oct 27 05:24:23: ISAKMP (0:1): Input = IKE_MESG_FROM_IPSEC, IKE_SA_REQ_MM
Oct 27 05:24:23: ISAKMP (0:1): Old State = IKE_READY New State
= IKE_I_MM1
Oct 27 05:24:23: ISAKMP (0:1): beginning Main Mode exchange
Oct 27 05:24:23: ISAKMP (0:1): sending packet to 172.16.172.35 (I)
MM_NO_STATE
Oct 27 05:24:23: ISAKMP (0:1): received packet from 172.16.172.35 (I)
MM_NO_STATE
Oct 27 05:24:23: ISAKMP (0:1): Input = IKE_MESG_FROM_PEER, IKE_MM_EXCH
Oct 27 05:24:23: ISAKMP (0:1): Old State = IKE_I_MM1 New State
= IKE_I_MM2

Oct 27 05:24:23: ISAKMP (0:1): processing SA payload. message ID = 0

```

Oct 27 05:24:23: ISAKMP (0:1): Checking ISAKMP transform 1 against  
priority 10 policy  
Oct 27 05:24:23: ISAKMP: encryption DES-CBC  
Oct 27 05:24:23: ISAKMP: hash MD5  
Oct 27 05:24:23: ISAKMP: default group  
1  
Oct 27 05:24:23: ISAKMP: auth RSA sig  
Oct 27 05:24:23: ISAKMP: life type in  
seconds  
Oct 27 05:24:23: ISAKMP: life duration  
(VPI) of 0x0 0x1 0x51 0x80  
Oct 27 05:24:23: ISAKMP (0:1): atts are acceptable. Next payload is  
0  
Oct 27 05:24:23: ISAKMP (0:1): Input = IKE\_MESG\_INTERNAL, IKE\_PROCESS\_MAIN\_MODE  
Oct 27.!!!!  
Success rate is 80 percent (4/5), round-trip min/avg/max = 4/8/16 ms  
7204-1# 05:24:23: ISAKMP (0:1): Old State = IKE\_I\_MM2 New State  
= IKE\_I\_MM2

Oct 27 05:24:23: ISAKMP (0:1): sending packet to 172.16.172.35 (I) MM\_SA\_SETUP  
Oct 27 05:24:23: ISAKMP (0:1): Input = IKE\_MESG\_INTERNAL, IKE\_PROCESS\_COMPLETE  
Oct 27 05:24:23: ISAKMP (0:1): Old State = IKE\_I\_MM2 New State  
= IKE\_I\_MM3

Oct 27 05:24:23: ISAKMP (0:1): received packet from 172.16.172.35 (I)  
MM\_SA\_SETUP  
Oct 27 05:24:23: ISAKMP (0:1): Input = IKE\_MESG\_FROM\_PEER, IKE\_MM\_EXCH  
Oct 27 05:24:23: ISAKMP (0:1): Old State = IKE\_I\_MM3 New State  
= IKE\_I\_MM4

Oct 27 05:24:23: ISAKMP (0:1): processing KE payload. message ID = 0  
Oct 27 05:24:23: ISAKMP (0:1): processing NONCE payload. message ID  
= 0  
Oct 27 05:24:23: ISAKMP (0:1): SKEYID state generated  
Oct 27 05:24:23: ISAKMP (0:1): processing CERT\_REQ payload. message  
ID = 0  
Oct 27 05:24:23: ISAKMP (0:1): peer wants a CT\_X509\_SIGNATURE cert  
Oct 27 05:24:23: ISAKMP (0:1): **peer want cert  
issued by CN = vpn, OU = cisco, O = tac, L = san jose, ST = california,  
C = US**  
Oct 27 05:24:23: CRYPTO\_PKI: **Trust-Point caserver2  
picked up**  
Oct 27 05:24:23: ISAKMP (0:1): **Choosing trustpoint  
caserver2 as issuer**  
Oct 27 05:24:23: ISAKMP (0:1): processing CERT\_REQ payload. message  
ID = 0  
Oct 27 05:24:23: ISAKMP (0:1): peer wants a CT\_X509\_SIGNATURE cert  
Oct 27 05:24:23: ISAKMP (0:1): **peer want cert  
issued by CN = SJPNTAC-CAServer, OU = TAC-VPN-SJ, O = Cisco Systems, L  
= San Jose, ST = CA, C = US**  
Oct 27 05:24:23: ISAKMP (0:1): processing vendor id payload  
Oct 27 05:24:23: ISAKMP (0:1): vendor ID is Unity  
Oct 27 05:24:23: ISAKMP (0:1): processing vendor id payload  
Oct 27 05:24:23: ISAKMP (0:1): vendor ID is DPD  
Oct 27 05:24:23: ISAKMP (0:1): processing vendor id payload  
Oct 27 05:24:23: ISAKMP (0:1): speaking to another IOS box!  
Oct 27 05:24:23: ISAKMP (0:1): processing vendor id payload  
Oct 27 05:24:23: ISAKMP (0:1): Input = IKE\_MESG\_INTERNAL, IKE\_PROCESS\_MAIN\_MODE  
Oct 27 05:24:23: ISAKMP (0:1): Old State = IKE\_I\_MM4 New State  
= IKE\_I\_MM4

```
Oct 27 05:24:23: ISAKMP (0:1): Send initial contact
Oct 27 05:24:23: ISAKMP (0:1): SA is doing RSA signature authentication
using id type ID_FQDN
Oct 27 05:24:23: ISAKMP (1): ID payload
  next-payload : 6
  type
: 2
  protocol
: 17
  port
: 500
  length
: 20
Oct 27 05:24:23: ISAKMP (1): Total payload length: 24
Oct 27 05:24:23: ISAKMP (0:1): using the caserver2 trustpoint's keypair
to sign
Oct 27 05:24:23: ISKAMP: growing send buffer from 1024 to 3072
Oct 27 05:24:23: ISAKMP (0:1): sending packet to 172.16.172.35 (I)
MM_KEY_EXCH
Oct 27 05:24:23: ISAKMP (0:1): Input = IKE_MESG_INTERNAL, IKE_PROCESS_COMPLETE
Oct 27 05:24:23: ISAKMP (0:1): Old State = IKE_I_MM4 New State
= IKE_I_MM5

Oct 27 05:24:24: ISAKMP (0:1): received packet from 172.16.172.35 (I)
MM_KEY_EXCH
Oct 27 05:24:24: ISAKMP (0:1): Input = IKE_MESG_FROM_PEER, IKE_MM_EXCH
Oct 27 05:24:24: ISAKMP (0:1): Old State = IKE_I_MM5 New State
= IKE_I_MM6

Oct 27 05:24:24: ISAKMP (0:1): processing ID payload. message ID = 0
Oct 27 05:24:24: ISAKMP (0:1): processing CERT payload. message ID
= 0
Oct 27 05:24:24: ISAKMP (0:1): processing a CT_X509_SIGNATURE cert
Oct 27 05:24:24: ISAKMP (0:1): peer's pubkey isn't cached
Oct 27 05:24:24: CRYPTO_PKI: WARNING: Certificate, private key or CRL
was not found while selecting CRL

Oct 27 05:24:24: CRYPTO_PKI: cert revocation status unknown.
!--- The subject name of the certificate from the 2611-VPN router !--- obtained from CA server2.
Oct 27 05:24:24: ISAKMP (0:1): cert approved with warning
Oct 27 05:24:24: ISAKMP (0:1): OU = ROME O=ITALY

Oct 27 05:24:24: ISAKMP (0:1): processing SIG payload. message ID = 0
Oct 27 05:24:24: ISAKMP (1): sa->peer.name
= , sa->peer_id.id.id_fqdn.fqdn = 2611-vpn.cisco.com
Oct 27 05:24:24: ISAKMP (0:1): SA has been authenticated with 172.16.172.35
Oct 27 05:24:24: ISAKMP (0:1): Input = IKE_MESG_INTERNAL, IKE_PROCESS_MAIN_MODE
Oct 27 05:24:24: ISAKMP (0:1): Old State = IKE_I_MM6 New State
= IKE_I_MM6

Oct 27 05:24:24: ISAKMP (0:1): Input = IKE_MESG_INTERNAL, IKE_PROCESS_COMPLETE
Oct 27 05:24:24: ISAKMP (0:1): Old State = IKE_I_MM6 New State
= IKE_P1_COMPLETE

Oct 27 05:24:24: ISAKMP (0:1): beginning Quick Mode exchange, M-ID of
1631242332
Oct 27 05:24:24: ISAKMP (0:1): sending packet to 172.16.172.35 (I)
QM_IDLE
```



Oct 27 05:24:24: ISAKMP (0:1): Node 1631242332, Input = IKE\_MSG\_INTERNAL,  
IKE\_INIT\_QM

Oct 27 05:24:24: ISAKMP (0:1): Old State = IKE\_QM\_READY New State  
= IKE\_QM\_I\_QM1

Oct 27 05:24:24: ISAKMP (0:1): Input = IKE\_MSG\_INTERNAL, IKE\_PHASE1\_COMPLETE  
Oct 27 05:24:24: ISAKMP (0:1): Old State = IKE\_P1\_COMPLETE New  
State = IKE\_P1\_COMPLETE

Oct 27 05:24:24: ISAKMP (0:1): received packet from 172.16.172.35 (I)  
QM\_IDLE

Oct 27 05:24:24: ISAKMP (0:1): processing HASH payload. message ID  
= 1631242332

Oct 27 05:24:24: ISAKMP (0:1): processing SA payload. message ID =  
1631242332

Oct 27 05:24:24: ISAKMP (0:1): Checking IPsec proposal 1  
Oct 27 05:24:24: ISAKMP: transform 1, ESP\_DES  
Oct 27 05:24:24: ISAKMP: attributes in transform:  
Oct 27 05:24:24: ISAKMP: encaps is 1  
Oct 27 05:24:24: ISAKMP: SA life type  
in seconds  
Oct 27 05:24:24: ISAKMP: SA life duration  
(basic) of 3600  
Oct 27 05:24:24: ISAKMP: SA life type  
in kilobytes  
Oct 27 05:24:24: ISAKMP: SA life duration  
(VPI) of 0x0 0x46 0x50 0x0  
Oct 27 05:24:24: ISAKMP: authenticator  
is HMAC-MD5  
Oct 27 05:24:24: ISAKMP (0:1): atts are acceptable.  
Oct 27 05:24:24: IPSEC(validate\_proposal\_request): proposal part #1,  
(key eng. msg.) INBOUND local= 172.16.172.51, remote= 172.16.172.35,  
local\_proxy= 3.3.3.0/255.255.255.0/0/0 (type=4),  
remote\_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),  
protocol= ESP, transform= esp-des esp-md5-hmac ,  
lifedur= 0s and 0kb,  
spi= 0x0(0), conn\_id= 0, keysize= 0, flags= 0x4  
Oct 27 05:24:24: ISAKMP (0:1): processing NONCE payload. message ID  
= 1631242332  
Oct 27 05:24:24: ISAKMP (0:1): processing ID payload. message ID =  
1631242332  
Oct 27 05:24:24: ISAKMP (0:1): processing ID payload. message ID =  
1631242332  
Oct 27 05:24:24: ISAKMP (0:1): Creating IPsec SAs  
Oct 27 05:24:24: inbound  
SA from 172.16.172.35 to 172.16.172.51  
(proxy 192.168.4.0 to 3.3.3.0)  
Oct 27 05:24:24: has  
spi 0xD1025DB1 and conn\_id 2000 and flags 4  
Oct 27 05:24:24: lifetime  
of 3600 seconds  
Oct 27 05:24:24: lifetime  
of 4608000 kilobytes  
Oct 27 05:24:24: outbound  
SA from 172.16.172.51 to 172.16.172.35 (proxy 3.3.3.0  
to 192.168.4.0 )  
Oct 27 05:24:24: has  
spi -929016560 and conn\_id 2001 and flags C  
Oct 27 05:24:24: lifetime  
of 3600 seconds

```
Oct 27 05:24:24: lifetime
of 4608000 kilobytes
Oct 27 05:24:24: ISAKMP (0:1): sending packet to 172.16.172.35 (I)
QM_IDLE
Oct 27 05:24:24: ISAKMP (0:1): deleting node 1631242332 error FALSE
reason ""
Oct 27 05:24:24: ISAKMP (0:1): Node 1631242332, Input = IKE_MSG_FROM_PEER,
IKE_QM_EXCH
```

```
Oct 27 05:24:24: ISAKMP (0:1): Old State = IKE_QM_I_QM1 New State
= IKE_QM_PHASE2_COMPLETE
```

```
Oct 27 05:24:24: IPSEC(key_engine): got a queue event...
```

```
Oct 27 05:24:24: IPSEC(initialize_sas): ,
(key eng. msg.) INBOUND local= 172.16.172.51, remote= 172.16.172.35,
local_proxy= 3.3.3.0/255.255.255.0/0/0 (type=4),
remote_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 3600s and 4608000kb,
spi= 0xD1025DB1(3506593201), conn_id= 2000, keysize=
0, flags= 0x4
```

```
Oct 27 05:24:24: IPSEC(initialize_sas): ,
(key eng. msg.) OUTBOUND local= 172.16.172.51, remote= 172.16.172.35,
local_proxy= 3.3.3.0/255.255.255.0/0/0 (type=4),
remote_proxy= 192.168.4.0/255.255.255.0/0/0 (type=4),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 3600s and 4608000kb,
spi= 0xC8A05510(3365950736), conn_id= 2001, keysize=
0, flags= 0xC
```

```
Oct 27 05:24:24: IPSEC(create_sa): sa created,
(sa) sa_dest= 172.16.172.51, sa_prot= 50,
sa_spi= 0xD1025DB1(3506593201),
sa_trans= esp-des esp-md5-hmac , sa_conn_id= 2000
```

```
Oct 27 05:24:24: IPSEC(create_sa): sa created,
(sa) sa_dest= 172.16.172.35, sa_prot= 50,
sa_spi= 0xC8A05510(3365950736),
sa_trans= esp-des esp-md5-hmac , sa_conn_id= 2001
```

```
7204-1#
7204-1#
7204-1#
7204-1#
7204-1#
```

```
7204-1#show crypto isa sa
dst
src
state conn-id
slot
172.16.172.35 172.16.172.51 QM_IDLE
1 0
```

```
7204-1#show crypto en conn ac
```

```
ID Interface IP-Address
State Algorithm
Encrypt Decrypt
1 <none>
<none> set
HMAC_MD5+DES_56_CB 0
0
2000 Ethernet1/1 172.16.172.51
```

```
set HMAC_MD5+DES_56_CB
0 9
2001 Ethernet1/1 172.16.172.51
set HMAC_MD5+DES_56_CB
9 0
```

```
7204-1#show crypto ipsec sa
```

```
interface: Ethernet1/1
Crypto map tag: vpn, local addr. 172.16.172.51

local ident (addr/mask/prot/port): (3.3.3.0/255.255.255.0/0/0)
remote ident (addr/mask/prot/port): (192.168.4.0/255.255.255.0/0/0)
current_peer: 172.16.172.35
PERMIT, flags={origin_is_acl,}
#pkts encaps: 13, #pkts encrypt: 13, #pkts digest
13
#pkts decaps: 13, #pkts decrypt: 13, #pkts verify
13
#pkts compressed: 0, #pkts decompressed: 0
#pkts not compressed: 0, #pkts compr. failed: 0,
#pkts decompress failed: 0
#send errors 32, #recv errors 0

local crypto endpt.: 172.16.172.51, remote
crypto endpt.: 172.16.172.35
path mtu 1500, media mtu 1500
current outbound spi: C8A05510

inbound esp sas:
spi: 0xD1025DB1(3506593201)
transform: esp-des esp-md5-hmac
,
in use settings = {Tunnel,
}
slot: 0, conn id: 2000,
flow_id: 1, crypto map: vpn
sa timing: remaining key lifetime (k/sec): (4607998/3435)
IV size: 8 bytes
replay detection support:
Y

inbound ah sas:

inbound pcp sas:

outbound esp sas:
spi: 0xC8A05510(3365950736)
transform: esp-des esp-md5-hmac
,
in use settings = {Tunnel,
}
slot: 0, conn id: 2001,
flow_id: 2, crypto map: vpn
sa timing: remaining key
lifetime (k/sec): (4607998/3435)
```

IV size: 8 bytes  
replay detection support:  
Y

outbound ah sas:

outbound pcp sas:

7204-1# **show crypto en conf**

crypto engine name:  
unknown  
crypto engine type:  
software  
  
serial number: 01691291  
crypto engine state: installed  
crypto engine in slot: N/A  
  
platform: predator crypto\_engine

Encryption Process Info:  
input queue  
size: 500  
input  
queue top: 26  
input  
queue bot: 26  
input queue count:  
0

Crypto Adjacency Counts:

Lock Count: 0

Unlock Count: 0

7204-1#**show crypto map**

Crypto Map "vpn" 10 ipsec-isakmp  
Peer = 172.16.172.35  
Extended IP access list  
101

access-list 101 permit ip 3.3.3.0 0.0.0.255 192.168.4.0 0.0.0.255  
Current peer: 172.16.172.35  
Security association lifetime:  
4608000 kilobytes/3600 seconds  
PFS (Y/N): N  
Transform sets={ myset,  
}  
Interfaces using crypto  
map vpn:

Ethernet1/1

7204-1#

7204-1#

7204-1#

## [相关信息](#)

- [Cisco IOS 安全命令参考，版本 12.2](#)
- [Cisco IOS 安全配置指南，版本 12.2](#)
- [如何使用数字证书在路由器和 PIX 之间配置 LAN 到 LAN IPSec](#)
- [IPsec 协商/IKE 协议](#)
- [技术支持和文档 - Cisco Systems](#)