

# 拡張された登録コマンドを使用した Cisco IOS の Certificate Enrollment の設定例

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## はじめに

このドキュメントでは、拡張された証明書自動登録コマンドの使用方法について説明しています。この機能は、ルータでの証明書の管理を容易にすることを目的とした拡張です。証明書自動登録機能では、crypto ca trustpoint コマンドに 5 つの新しいサブコマンドが追加されています。ip-address ( ca-trustpoint )、password ( ca-trustpoint )、serial-number、subject-name、および usage の 5 つです。これらのコマンドは証明書の要求に対して新しいオプションを提供し、このコマンドを使用すると、それぞれプロンプトを介することなく、設定のフィールドを指定できます。ただし、この機能が有効になっていない場合は、デフォルトでやはりプロンプトが表示されます。ユーザは、事前にすべての必要な情報を設定にロードできます。これにより、各ルータはブート時に証明書を自動的に取得できます。

トラストポイント Certification Authority ( CA; 認証局 ) は、ID CA と信頼できるルート CA の機能を結合し、これらに代わるものです。したがって、crypto ca trustpoint コマンドは、crypto ca identity コマンドと crypto ca trusted-root コマンドを置き換えるものになります。このドキュメントでは、auto-enroll regenerate コマンドと rsakey label コマンドについても解説しています。

PIX/ASA 7.x での同じシナリオに関する詳細については、『[ASDM を使用して Microsoft Windows CA から ASA のデジタル証明書を取得する方法](#)』を参照してください。

Cisco VPN 3000 シリーズ コンセントレータを使用する場合の同様のシナリオについては、『[Cisco VPN 3000 Concentrator 4.7.x でデジタル証明書および SSL 証明書を取得するための設定](#)』を参照してください。

## 前提条件

### 要件

このドキュメントに関しては個別の要件はありません。

### 使用するコンポーネント

この文書の情報は、次のソフトウェアとハードウェアのバージョンに適用されます。

- Cisco 7204、2611、および 1720 ルータ
- Microsoft スタンドアロン証明書サーバ
- Cisco IOS® ソフトウェア リリース 12.2(12.10)T および 12.2.11T

本書の情報は、特定のラボ環境にあるデバイスに基づいて作成されたものです。このドキュメントで使用するすべてのデバイスは、初期（デフォルト）設定の状態から起動しています。稼働中のネットワークで作業を行う場合、コマンドの影響について十分に理解したうえで作業してください。

### 表記法

ドキュメント表記の詳細は、『[シスコテクニカルティップスの表記法](#)』を参照してください。

## 背景説明

証明書登録コマンドに加えて、次のさまざまな証明書登録拡張コマンドについて説明します。

- **crypto ca trustpoint** —使用するルータが必要がある CA を宣言します。
- **subject-name [x.500-name]** —証明書要求のサブジェクト名を規定します。subject-name サブコマンドを使用しない場合は、デフォルトで、ルータの Fully Qualified Domain Name (FQDN; 完全修飾ドメイン名) が使用されます。これは、ca-trustpoint 設定モードで使用されます。たとえば、x.500 の名前の形式は subject-name OU=ROME, O=ITALY です。
- **IP アドレス (IP アドレス | インターフェイス)** —点を打たれた IP アドレスをか証明書要求に含まれているインターフェイスを規定します。これは、ca-trustpoint 設定モードで使用されます。
- **パスワードストリング** —証明書のための取り消しパスワードを規定します。これは、ca-trustpoint 設定モードで使用されます。このドキュメントでは Certificate Revocation List (CRL; 証明書失効リスト) は使用しないので、すべてのパスワードは「none」に設定されます。
- **シリアル番号[どれも]** —シリアル番号が証明書要求に含んでいる必要があるかどうか規定します。これは、ca-trustpoint 設定モードで使用されます。
- **使用状況 method1 [method2, [method3]]** —証明書のための意図されていた使用を規定します。使用できるオプションは、Internet Key Exchange (IKE; インターネット キー エクスチェンジ)、SSL クライアント、および SSL サーバです。このドキュメントでの使用方法は

IKE です。これは、ca-trustpoint 設定モードで使用されます。

- **自動登録して下さい[再生]** —自動的に設定でパラメータを使用する CA からのルータ認証を要求して下さい。このコマンドでは、要求されたラベルで新しいキーが存在しない場合にのみ、新しい Rivest-Shamir-Adelman ( RSA ) キーが生成されます。このコマンドは、ca-trustpoint 設定モードで使用され、期限切れのルータ証明書を検査します。自動登録用に設定されているトラストポイントでは、ルータ証明書の有効期限が切れていると、再登録が試みられます。このコマンドの利点の 1 つとして、一部の CA で再登録の実行に新しいキーが要求されることがあります。そのため、新しいキーを生成するためにサブコマンドが使用されます。自動登録は、設定されていて有効な証明書を持たないすべてのトラストポイント CA に対し、起動時に実行されます。トラストポイント CA ( 自動登録用に設定されている ) が発行した証明書の有効期限が切れると、新しい証明書が要求されます。この機能では、証明書のシームレスな更新は行われませんが、有効期限切れからの自動回復は行われます。
- **証明書と関連付けるべきキーペア `rsa`keypair キー ラベル[キーサイズ[`encryption-key-size`]]** —規定します。このコマンドは、ca-trustpoint 設定モードで使用されます。ルータが複数の証明書サーバへの登録を要求される場合も多くあります。ところが、CA サーバごとにポリシー要件 ( キーの長さなど ) が異なることがあります。このサブコマンドを使用すると、異なるサイズの RSA キーペアを、異なる CA サーバからの ID 証明書に関連付けることができます。サブコマンドを使用しない場合は、デフォルトでルータの FQDN が使用されます。キーラベルがまだ存在しない場合、または `auto-enroll regenerate` コマンドを発行した場合は、登録の間にキーラベルが生成されます。キーを生成する場合は `key-size` を指定し、異なる暗号方式、署名キー、および証明書を要求する場合は `encryption-key-size` を指定します。次に、例を示します。

```
2611-VPN(config)#crypto ca trustpoint caserver2
2611-VPN(ca-trustpoint)#rsa
```

注: デフォルトでは、古い証明書の有効期限が切れると、自動登録機能により新しい証明書が要求されます。新しいキーが生成されるとただちに現在の証明書とキーペアは削除されるので、要求の処理が行われている間、接続できなくなる場合があります。処理が完了するまで新しいキーには対応する証明書がなく、新しい証明書が発行されるまでは、着信 IKE 接続を確立することはできません。Cisco IOS ソフトウェア リリース 12.3(7)T で導入されたキーのロールオーバーによる証明書更新機能を使用すると、証明書の有効期限が切れる前に証明書更新要求を行い、新しい証明書が使用できるようになるまで古いキーと証明書を保持できます。この機能の詳細は、『[証明書の更新のためのキーのロールオーバー](#)』を参照してください。

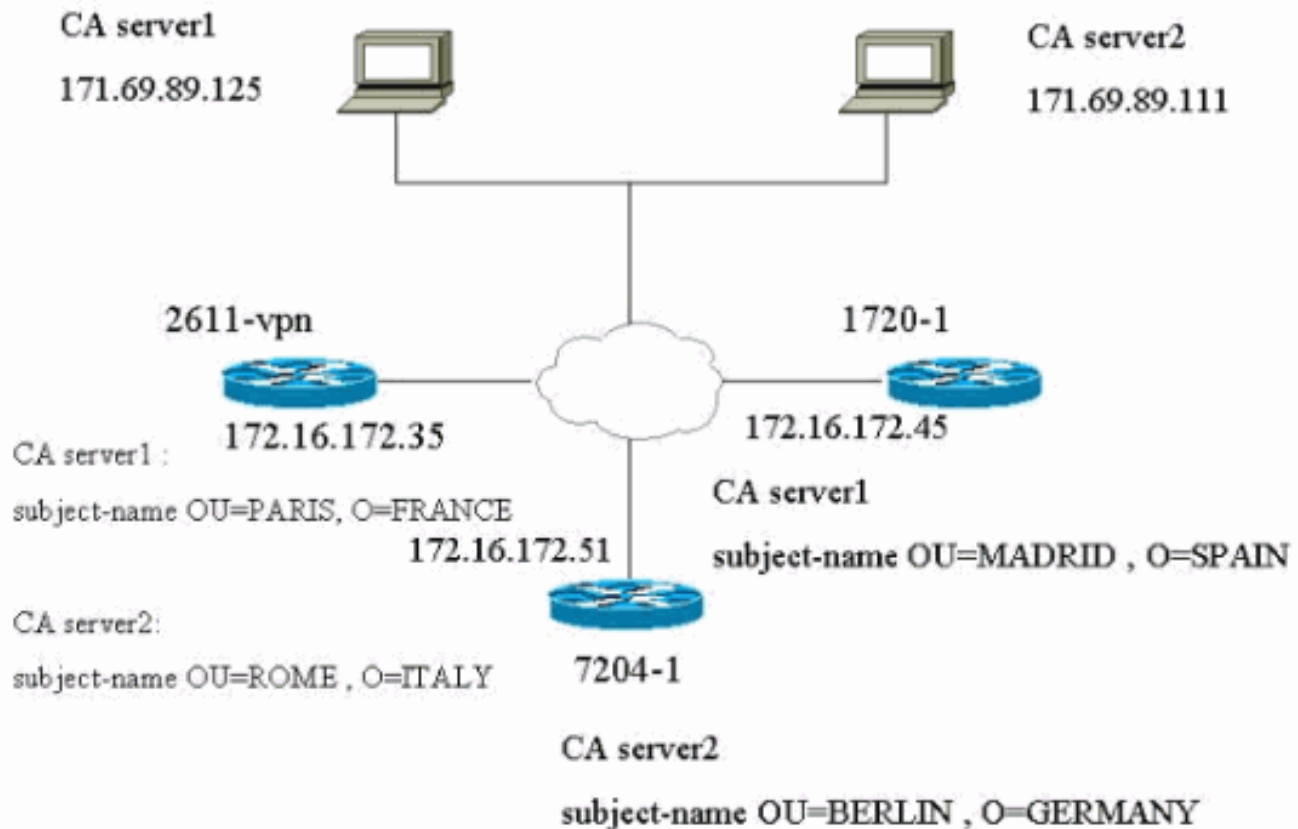
## 設定

このセクションでは、このドキュメントで説明する機能を設定するために必要な情報について記載しています。

注: このドキュメントで使用されているコマンドの詳細を調べるには、[Command Lookup Tool](#) ( [登録ユーザ専用](#) ) を使用してください。

## ネットワーク図

次のネットワークダイアグラムは、ラボで使用したルータ、CA サーバ、およびルータが 2 つの CA サーバから取得した ID 証明書のサブジェクト名が示されています。



## 設定

このドキュメントでは、次の設定を使用します。2611-VPN ルータはハブ ルータで、CA server1 と CA server2 の両方に登録されます。2611-1 ルータは CA server1 に登録され、7204-1 ルータは CA server2 に登録されます。

- [2611-VPN ハブ ルータの設定と 2 つの異なる CA サーバからの証明書](#)
- [1720-1 ルータの設定と CA Server1 からの証明書](#)
- [7204-1 ルータの設定と CA Server2 からの証明書](#)

### 2611-VPN ハブ ルータの設定と 2 つの異なる CA サーバからの証明書

```
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
```

## 1720-1 ルータの設定と CA Server1 からの証明書

### 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
rsa keypair 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
```

## 7204-1 ルータの設定と CA Server2 からの証明書

### show verify

```
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-JK9O3S-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
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# 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 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#
7204-1#
7204-1#
7204-1#
```

## 確認

以降のセクションでは、下記の show コマンドを実行したときに設定が動作するかどうかを確認しています。これらのコマンドにより、CA が検証され、CA サーバによって ID 証明書 ( ルータ証明書 ) が発行されたかどうかを確認されます。

[Output Interpreter Tool](#) ( OIT ) ( [登録ユーザ専用](#) ) では、特定の show コマンドがサポートされています。OIT を使用して、show コマンド出力の解析を表示できます。

- **show crypto ca certificate** — 証明書、認証局の証明書および登録局 証明書についての情報を示します。show crypto ca certificates コマンドは EXEC モードで使用します。
- **crypto ca authenticate** — 認証局 ( CA ) を認証して下さい ( CA の証明書を取得して下さい )。crypto ca authenticate コマンドはグローバル コンフィギュレーション モードで使用します。
- **show crypto key mypubkey rsa** — ルータの RSA 公開キーを示します。show crypto key mypubkey rsa コマンドは EXEC モードで使用します。
- **show crypto isakmp sa** — ピアですべての現在のインターネット 鍵 交換 セキュリティ アソシエーション ( SAS ) を示します。show crypto isakmp sa コマンドは EXEC モードで使用します。
- **show crypto ipsec sa** — 現在の IPsec SA によって使用される設定を示します。show crypto ipsec sa コマンドは EXEC モードで使用します。
- **show clock** — ルータの現在のシステムの時刻を示します。
- **calendar set hh: mm: ss 日月年** — カレンダ システム時間を設定します。さまざまなクロック およびルータでの外部時刻ソースの設定の詳細は、『[基本的なシステム管理の実行](#)』を参照してください。

CA インターオペラビリティに、IPSec 関する追加コマンドに関してはおよび IKE は、[SR を示します: Part 4: IPセキュリティおよび暗号化および認証局 \(CA\) インターオペラビリティコマンド](#)

。

次の出力は、show crypto ca certificate コマンドのものです。

```
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: 3DAA867D000000000032
```

```
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: 6103EE0A000000000038  
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 キーペア再作成

7204-1 ルータの次のコマンドでは、auto-enroll regenerate および rsakey label コマンドの使用方法が示されています。図には、ルータで CA が宣言された後、および crypto ca authenticate ca server コマンドを発行した後のイベントのシーケンスが示されています。auto-enroll コマンドは、CA を認証した後でのみ機能します。CA が認証されると、ルータでは自動的に CA サーバの登録が行われます。crypto ca enroll ca server コマンドを実行する必要はありません。ID証明が切れれば、ルータは CA サーバによって自動的に登録します。このコマンドの導入によって識別（ルータ）証明書が切れれば手動で CA サーバによって登録する必要がありません。

正しい時刻を設定するために、calendar set コマンドを使用してルータのカレンダーシステムを設定すると、ルータの外部時刻ソース（NTP サーバ）を使用する必要はありません。ルータをリロードすると、システムクロックとカレンダーシステムの同期がとられます。

注: calendar set コマンドは、1700 および 2600 ルータでは使用できません。これらのルータでは、外部時刻ソースを使用してください。

CA はルータで設定されます。次の出力では、7204-1 ルータでの ID 証明書の自動登録および RSA キーペアの再生成が詳細に示されています。重要な情報の部分は太字で強調されています。

```
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
!--- 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: 6111C669000000000034

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 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# *!--- 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
rsaкеypair 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: 6111C669000000000034  
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: 61123C0A00000000000035  
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 Reqeust 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 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 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: 053859FC000000000039
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: 05384E3F000000000038

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 CDFA126A 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
rsakeypair 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#

```

次に示すのは 1720-1 ルータでの show crypto ca certificate コマンドの出力で、RSA キーの再生成が示されています。

```

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: 61165F5B000000000003B  
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**

次の出力には、1720-1 ルータでの show crypto key コマンドが示されています。

```
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
```

## RSA キーペアが存在しない時

自動登録の際に RSA キー ペアが存在しない場合は、次の出力が示すように、汎用キーのペアが登録中に自動的に生成されます。次の例は 7204-1 ルータに証明書の設定がない状態で開始されており、RSA キー ペアは生成されていません。

```
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)#
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: 09F8A45E00000000003D

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#
```

## ID証明が期限切れとなる時

2611-VPN には外部時刻ソースが設定されておらず、時刻のトラックにはシステム クロックが使用されます。CA server2 はルータで宣言され、CA サーバが認証されて、2611-VPN ルータでは ID 証明書のために自動的に CA サーバの登録を行います。CA サーバは、1 日間だけ有効な ID 証明書を発行するように設定されています。証明書の有効期限が切れると、ルータでは自動的に CA サーバの登録が行われ、イベントのシーケンスは次の出力で示すようになります。

```
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 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: 611C41E0000000000037

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: 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**

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
 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
 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: 06C28C8B000000000003B

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: 6103EE0A000000000038

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
rsaкеypair 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
rsaкеypair 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#
```

## トラブルシューティング

ここでは、設定のトラブルシューティングに役立つ情報について説明します。

### トラブルシューティングのためのコマンド

特定の **show** コマンドは、[Output Interpreter Tool](#) ( [登録ユーザ専用](#) ) によってサポートされています。このツールを使用すると、**show** コマンド出力の分析を表示できます。

注: **debug** コマンドを使用する前に、『[debug コマンドの重要な情報](#)』を参照してください。

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

### ルータのデバッグ

次の出力では、3つのルータからの IKE および IPSec のデバッグが示されています。2600 ルータでは、IPSec ピアとの IKE ネゴシエーション中に、使用する CA サーバを決定する必要があります。テストシナリオでは、1720-1 および 7204 が、2600-VPN ルータに対する IPSec トンネルを開始しています。

次の出力には、2611-VPN ルータでの **show crypto** コマンドを使用した IKE/IPSec のデバッグが示されています。

```
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 = SJVPNTAC-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.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_MESG_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_MESG_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_MESG_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_MESG_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 0xAF5E53DCD 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_MESG_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= 0xAF5E53DCD(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= 0xAF5E53DCD(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_MESG_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\_MSG\_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\_MSG\_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\_MSG\_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\_MSG\_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#
```

次の出力には、1720-1 ルータでの show crypto コマンドを使用した IKE/IPSec のデバッグが示されています。この出力では、2611-VPN ルータへの IPSec トンネルが開始されています。

```
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\_MESG\_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 = SJPVNTAC-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= 0xAF53DCD(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= 0xAF53DCD(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#

次の出力では、2611-VPN ルータへの IPsec トンネルを開始する show crypto コマンドを使用した、7204-1 ルータでの IKE/IPsec のデバッグが示されています。

```

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 = SJVPNTAC-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_MSG_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_MSG_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_MSG_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\_MESG\_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\_MESG\_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, keysizes=
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, keysizes=
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 pcg 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 pcg 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#
```

## [関連情報](#)

- [Cisco IOS 12.2](#)
- [Cisco IOS 12.2](#)
- [デジタル証明書を使用するルータと PIX 間の LAN-to-LAN IPSec の設定方法](#)
- [IPSec ネゴシエーション/IKE プロトコル](#)
- [テクニカル サポートとドキュメント - Cisco Systems](#)