

# PIX/ASA 7.x and above : Enhanced Spoke-to-Spoke IPsec VPN Configuration Example

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## Introduction

This document describes how to configure LAN-to-LAN sessions between PIX Firewalls. It demonstrates a configuration for static and dynamic LAN-to-LAN tunnels with spoke-to-spoke connectivity through the hub PIX Firewall. PIX version 7.0 improves support for spoke-to-spoke VPN communications as it provides the ability for encrypted traffic to enter and leave the same interface.

The **same-security-traffic** command permits traffic to enter and exit the same interface when you use it with the *intra-interface* keyword which enables spoke-to-spoke VPN support. Refer to the "Permitting Intra-Interface Traffic" section in the Cisco Security Appliance Command Line Configuration Guide for more information.

This document provides a sample configuration on how to enable the hub PIX (PIX1) Security Appliance to accept dynamic IPsec connections from the PIX2 and establish the static IPsec connection with the PIX3. PIX1 or PIX3 will not establish the IPsec connection with the PIX2 until the PIX2 initiates the connection with PIX1.

**Note:** In PIX version 7.2 and later, the *intra-interface* keyword allows all traffic to enter and exit the same interface, and not just IPsec traffic.

## Prerequisites

### Requirements

The hub PIX Firewall needs to run code version 7.0 or later.

**Note:** Refer to the Guide for Cisco PIX 6.2 and 6.3 Users Upgrading to Cisco PIX Software Version 7.0 for more information on how to upgrade to PIX Firewall version 7.0.

## Components Used

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

- PIX – 515 version 7.0.1 and later (PIX1)

**Note:** The hub PIX (PIX1) configuration can also be used with the Cisco ASA 5500 Series Security Appliance.

- PIX – 501 version 6.3.4 (PIX2)
- PIX – 515 version 6.3.4 (PIX3)

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

## Conventions

Refer to the Cisco Technical Tips Conventions for more information on document conventions.

## Configure

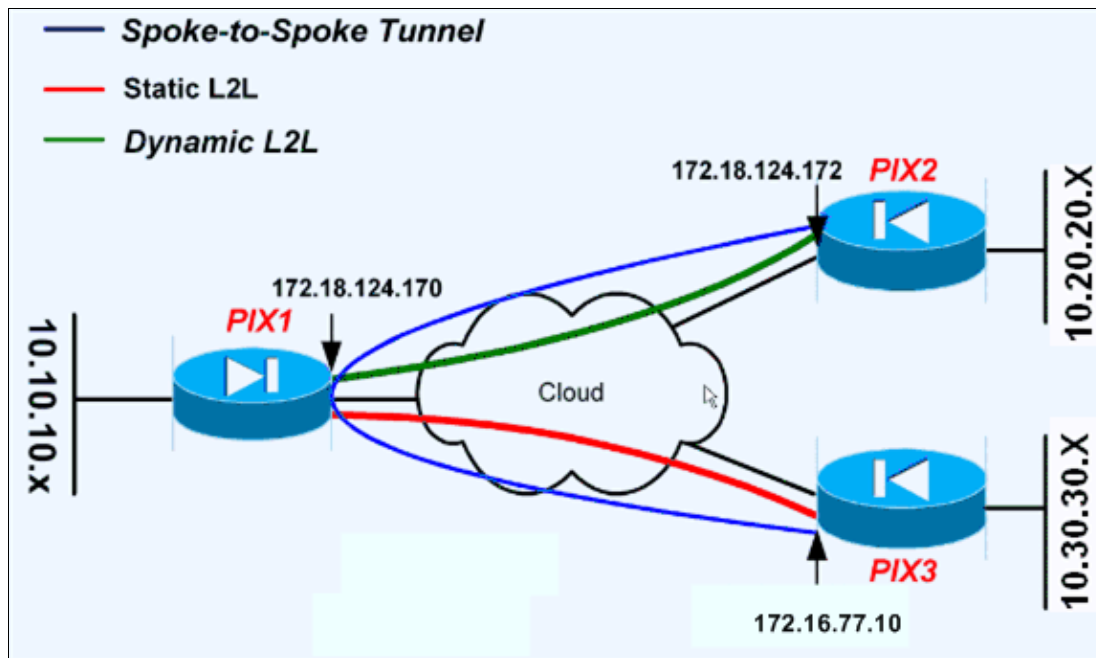
This section presents you with the information you can use in order to configure the features this document describes.

**Note:** Use the Command Lookup Tool ( registered customers only) to obtain more information on the commands used in this section.

**Note:** For a PIX Security Appliance 7.x LAN-to-LAN (L2L) VPN configuration, you must specify the <name> of the tunnel group as the **Remote peer IP Address** in the **tunnel-group <name> type ipsec-l2l** command for creating and managing the database of connection-specific records for IPsec.

## Network Diagram

This document uses this network setup:



**Note:** The IP addressing schemes used in this configuration are not legally routable on the Internet. They are RFC 1918 addresses which have been used in a lab environment.

## Configurations

This document uses these configurations:

- PIX1
- PIX2
- PIX3

PIX1
<pre> PIX Version 7.0(1) no names ! interface Ethernet0 nameif outside security-level 0 ip address 172.18.124.170 255.255.255.0 ! interface Ethernet1 nameif inside security-level 100 ip address 10.10.10.1 255.255.255.0 !  !--- Output Suppressed  enable password 9jNfZuG3TC5tCVH0 encrypted passwd OnTrBUG1Tp0edmkr encrypted hostname PIX1 domain-name cisco.com boot system flash:/image.bin ftp mode passive  !--- Use this command in order to permit traffic to enter and exit the !--- same interface for IPsec traffic.</pre>

```
same-security-traffic permit intra-interface

!--- Access-list for interesting traffic to be
!--- encrypted between hub and spoke (PIX3) networks.

access-list 100 extended permit ip 10.10.10.0 255.255.255.0 10.30.30.0 255.255.255.0

!--- Access-list for interesting traffic to be
!--- encrypted between spoke (PIX2) and spoke (PIX3) networks.

access-list 100 extended permit ip 10.20.20.0 255.255.255.0 10.30.30.0 255.255.255.0

!--- Access-list for traffic to bypass the network address translation (NAT) process.

access-list nonat extended permit ip 10.10.10.0 255.255.255.0 10.30.30.0 255.255.255.0
access-list nonat extended permit ip 10.10.10.0 255.255.255.0 10.20.20.0 255.255.255.0
access-list nonat extended permit ip 10.20.20.0 255.255.255.0 10.30.30.0 255.255.255.0

!--- Output Suppressed

nat-control
global (outside) 1 interface

!--- Bypass the NAT process for IPsec traffic.

nat (inside) 0 access-list nonat
nat (inside) 1 10.10.10.0 255.255.255.0

!--- The default gateway to the Internet.

route outside 0.0.0.0 0.0.0.0 172.18.124.1 1

!--- Output Suppressed

!--- Configuration of IPsec Phase 2.

crypto ipsec transform-set myset esp-3des esp-sha-hmac

!--- IPsec configuration for the dynamic LAN-to-LAN tunnel.

crypto dynamic-map cisco 20 set transform-set myset

!--- IPsec configuration that binds dynamic map to crypto map.

crypto map mymap 20 ipsec-isakmp dynamic cisco

!--- IPsec configuration for the static LAN-to-LAN tunnel.

crypto map mymap 10 match address 100
crypto map mymap 10 set peer 172.16.77.10
crypto map mymap 10 set transform-set myset

!--- Crypto map applied to the outside interface of the PIX.

crypto map mymap interface outside
isakmp identity address

!--- Configuration of IPsec Phase 1.
```

```
isakmp enable outside

!--- Configuration of ISAKMP policy.

isakmp policy 10 authentication pre-share
isakmp policy 10 encryption 3des
isakmp policy 10 hash md5
isakmp policy 10 group 2
isakmp policy 10 lifetime 86400
isakmp policy 65535 authentication pre-share
isakmp policy 65535 encryption 3des
isakmp policy 65535 hash sha
isakmp policy 65535 group 2
isakmp policy 65535 lifetime 86400
telnet timeout 5
ssh 0.0.0.0 0.0.0.0 outside
ssh timeout 60
ssh version 1
console timeout 0

!--- Configuration of the tunnel-group policy for remote
!--- access tunnels (dynamic tunnels).

tunnel-group DefaultRAGroup type ipsec-ra
tunnel-group DefaultRAGroup general-attributes

!--- Disables group authentication for dynamic remote-access tunnels.

authentication-server-group none
tunnel-group DefaultRAGroup ipsec-attributes

!--- Defines the pre-shared secret used for
!--- IKE authentication for the dynamic tunnel.

pre-shared-key *

!--- Configuration of the tunnel-group for the static LAN-to-LAN tunnel.
!--- The name of the tunnel-group MUST be the IP address of the remote peer.
!--- The tunnel fails if the tunnel-group has any other name.

tunnel-group 172.16.77.10 type ipsec-l2l
tunnel-group 172.16.77.10 ipsec-attributes

!--- Defines the pre-shared secret used for
!--- IKE authentication for the static tunnel.

pre-shared-key *
!
class-map inspection_default
match default-inspection-traffic
!
!
policy-map global_policy
class inspection_default
inspect dns maximum-length 512
inspect ftp
inspect h323 h225
inspect h323 ras
inspect http
inspect netbios
inspect rsh
inspect rtsp
inspect skinny
inspect esmtp
inspect sqlnet
inspect sunrpc
```

```
inspect tftp
inspect sip
inspect xdmcp
!
service-policy global_policy global
Cryptochecksum:7167c0647778b77f8d1d2400d943b825
```

**Note:** You need to configure the **sysopt connection permit-ipsec** command in order to permit all inbound IPsec authenticated cipher sessions. In the PIX 7.0 version of the code the **sysopt** commands do not show up in the running configuration. In order to verify if **sysopt connection permit-ipsec** is enabled, execute the **show running-config sysopt** command.

## PIX2

```
PIX Version 6.3(4)
interface ethernet0 auto
interface ethernet1 100full
nameif ethernet0 outside security0
nameif ethernet1 inside security100
enable password 8Ry2YjIyt7RRXU24 encrypted
passwd 2KFQnbNIdI.2KYOU encrypted
hostname PIX2
domain-name cisco.com
fixup protocol dns maximum-length 512
fixup protocol ftp 21
fixup protocol h323 h225 1720
fixup protocol h323 ras 1718-1719
fixup protocol http 80
fixup protocol rsh 514
fixup protocol rtsp 554
fixup protocol sip 5060
fixup protocol sip udp 5060
fixup protocol skinny 2000
fixup protocol smtp 25
fixup protocol sqlnet 1521
fixup protocol tftp 69
names

!--- Access-list to encrypt traffic between PIX2 and PIX1 networks.
access-list 100 permit ip 10.20.20.0 255.255.255.0 10.10.10.0 255.255.255.0

!--- Access-list to encrypt traffic between PIX2 and PIX3 networks.
access-list 100 permit ip 10.20.20.0 255.255.255.0 10.30.30.0 255.255.255.0

!--- Access-list to bypass the NAT process.
access-list nonat permit ip 10.20.20.0 255.255.255.0 10.10.10.0 255.255.255.0
access-list nonat permit ip 10.20.20.0 255.255.255.0 10.30.30.0 255.255.255.0
pager lines 24
mtu outside 1500
mtu inside 1500
ip address outside 172.18.124.172 255.255.255.0
ip address inside 10.20.20.1 255.255.255.0
ip audit info action alarm
ip audit attack action alarm
pdm history enable
arp timeout 14400
global (outside) 1 interface

!--- Bypass the NAT process for IPsec traffic.
nat (inside) 0 access-list nonat
```

```

nat (inside) 1 10.20.20.0 255.255.255.0 0 0
route outside 0.0.0.0 0.0.0.0 172.18.124.1 1

!--- Output Suppressed

!--- Permit all inbound IPsec authenticated cipher sessions.

sysopt connection permit-ipsec

!--- Defines IPsec encryption and authentication alogrithms.

crypto ipsec transform-set myset esp-3des esp-sha-hmac

!--- Defines crypto map.

crypto map mymap 10 ipsec-isakmp
crypto map mymap 10 match address 100
crypto map mymap 10 set peer 172.18.124.170
crypto map mymap 10 set transform-set myset

!--- Apply crypto map on the outside interface.

crypto map mymap interface outside
isakmp enable outside

!--- Defines the pre-shared secret used for IKE authentication.

isakmp key ***** address 172.18.124.170 netmask 255.255.255.255 no-xauth
isakmp identity address

!--- The ISAKMP policy configuration.

isakmp policy 10 authentication pre-share
isakmp policy 10 encryption 3des
isakmp policy 10 hash md5
isakmp policy 10 group 2
isakmp policy 10 lifetime 86400
telnet timeout 5
ssh timeout 5
console timeout 0
terminal width 80
Cryptochecksum:fb2e89ab9da0ae93d69e345a4675ff38

```

## PIX3

```

PIX Version 6.3(4)
interface ethernet0 auto
interface ethernet1 auto
interface ethernet2 auto shutdown
interface ethernet3 auto shutdown
interface ethernet4 auto shutdown
interface ethernet5 auto shutdown
nameif ethernet0 outside security0
nameif ethernet1 inside security100
nameif ethernet2 intf2 security4
nameif ethernet3 intf3 security6
nameif ethernet4 intf4 security8
nameif ethernet5 intf5 security10
enable password 8Ry2YjIyt7RRXU24 encrypted
passwd 2KFQnbNIdI.2KYOU encrypted
hostname PIX3
domain-name cisco.com

```

```

fixup protocol dns maximum-length 512
fixup protocol ftp 21
fixup protocol h323 h225 1720
fixup protocol h323 ras 1718-1719
fixup protocol http 80
fixup protocol rsh 514
fixup protocol rtsp 554
fixup protocol sip 5060
fixup protocol sip udp 5060
fixup protocol skinny 2000
fixup protocol smtp 25
fixup protocol sqlnet 1521
fixup protocol tftp 69
names

!--- Access-list to encrypt traffic between PIX3 and PIX1 networks.

access-list 100 permit ip 10.30.30.0 255.255.255.0 10.10.10.0 255.255.255.0

!--- Access-list to encrypt traffic between PIX3 and PIX2 networks.

access-list 100 permit ip 10.30.30.0 255.255.255.0 10.20.20.0 255.255.255.0

!--- Access-list to bypass the NAT process.

access-list nonat permit ip 10.30.30.0 255.255.255.0 10.10.10.0 255.255.255.0
access-list nonat permit ip 10.30.30.0 255.255.255.0 10.20.20.0 255.255.255.0
pager lines 24
mtu outside 1500
mtu inside 1500
mtu intf2 1500
mtu intf3 1500
mtu intf4 1500
mtu intf5 1500
ip address outside 172.16.77.10 255.255.-255.0
ip address inside 10.30.30.1 255.255.255.0

!--- Output Suppressed

global (outside) 1 interface

!--- Binds ACL nonat to the NAT statement in order to
!--- avoid NAT on the IPsec packets.

nat (inside) 0 access-list nonat
nat (inside) 1 10.30.30.0 255.255.255.0 0 0
route outside 0.0.0.0 0.0.0.0 172.16.77.1 1

!--- Output Suppressed

!--- Permits all inbound IPsec authenticated cipher sessions.

sysopt connection permit-ipsec

!--- Defines IPsec encryption and authentication algorithms.

crypto ipsec transform-set myset esp-3des esp-sha-hmac

!--- Defines crypto map.

crypto map mymap 10 ipsec-isakmp

```

```

crypto map mymap 10 match address 100
crypto map mymap 10 set peer 172.18.124.170
crypto map mymap 10 set transform-set myset

!--- Applies crypto map on the outside interface.

crypto map mymap interface outside
isakmp enable outside

!--- Defines the pre-shared secret key used for IKE authentication.

isakmp key ***** address 172.18.124.170 netmask 255.255.255.0 no-xauth
isakmp identity address

!--- Defines the ISAKMP policy.

isakmp policy 10 authentication pre-share
isakmp policy 10 encryption 3des
isakmp policy 10 hash md5
isakmp policy 10 group 2
isakmp policy 10 lifetime 86400
telnet timeout 5
ssh 0.0.0.0 0.0.0.0 outside
ssh timeout 5
console timeout 0
terminal width 80
Cryptochecksum:cb5c245112db607e3a9a85328d1295db

```

## Hairpinning or U-turn

This feature is useful for VPN traffic that enters an interface but is then routed out of that same interface. For example, if you have a hub and spoke VPN network, where the security appliance is the hub and remote VPN networks are spokes, in order for one spoke to communicate with another spoke, traffic must go into the security appliance and then out again to the other spoke.

Use the **same-security-traffic** command to allow traffic to enter and exit the same interface.

```
securityappliance(config)#same-security-traffic permit intra-interface
```

## Verify

This section provides information you can use in order to confirm your configuration works properly.

The Output Interpreter Tool ( registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

In order to test communication between the two private networks between PIX3 and PIX1, you can initiate a **ping** from one of the private networks.

In this configuration:

- For static LAN-to-LAN, the ping is sent from behind the PIX3 network (10.30.30.x) to the PIX1 network (10.10.10.x).
- For the dynamic LAN-to-LAN tunnel, a ping is sent from the PIX2 network (10.20.20.x) to the PIX1 network (10.10.10.x).
- **show crypto isakmp sa** Displays all current IKE security associations (SAs) at a peer.
- **show crypto ipsec sa** Displays all current SAs.

This section shows example verification configurations for:

- PIX1
- PIX2
- PIX3

```
PIX1

show crypto isakmp sa

Active SA: 2
Rekey SA: 0 (A tunnel will report 1 Active and 1 Rekey SA during rekey)
Total IKE SA: 2

!--- Static LAN-to-LAN tunnel establishment.

1 IKE Peer: 172.16.77.10
Type: L2L Role : responder
Rekey : no State: MM_ACTIVE

!--- Dynamic LAN-to-LAN tunnel establishment.

2 IKE Peer: 172.18.124.172
Type: user Role: responder
Rekey : no State: MM_ACTIVE

PIX1(config)#show crypto ipsec sa
interface: outside
Crypto map tag: cisco, local addr: 172.18.124.170

!--- IPsec SA for networks between PIX2 and PIX1.

local ident (addr/mask/prot/port): (10.10.10.0/255.255.255.0/0/0)
remote ident (addr/mask/prot/port): (10.20.20.0/255.255.255.0/0/0)
current_peer: 172.18.124.172
dynamic allocated peer ip: 0.0.0.0

#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: 9, #pkts comp failed: 0, #pkts decomp failed: 0
#send errors: 0, #recv errors: 0

local crypto endpt.: 172.18.124.170, remote crypto endpt.: 172.18.124.172

path mtu 1500, ipsec overhead 60, media mtu 1500
current outbound spi: 2C4400C7

inbound esp sas:
spi: 0x6D29993F (1831442751)
transform: esp-3des esp-sha-hmac
in use settings ={RA, Tunnel, }
slot: 0, conn_id: 7, crypto-map: cisco
sa timing: remaining key lifetime (sec): 28413
IV size: 8 bytes
replay detection support: Y

outbound esp sas:
spi: 0x2C4400C7 (742654151)
transform: esp-3des esp-sha-hmac
in use settings ={RA, Tunnel, }
```

slot: 0, conn\_id: 7, **crypto-map: cisco**  
sa timing: remaining key lifetime (sec): 28411  
IV size: 8 bytes  
replay detection support: Y

*!--- IPsec SA for networks between PIX2 and PIX3.*

Crypto map tag: **cisco**, local addr: 172.18.124.170

**local ident (addr/mask/prot/port): (10.30.30.0/255.255.255.0/0/0)**  
**remote ident (addr/mask/prot/port): (10.20.20.0/255.255.255.0/0/0)**  
current\_peer: 172.18.124.172  
dynamic allocated peer ip: 0.0.0.0

**#pkts encaps: 9, #pkts encrypt: 9, #pkts digest: 9**  
**#pkts decaps: 13, #pkts decrypt: 13, #pkts verify: 13**  
#pkts compressed: 0, #pkts decompressed: 0  
#pkts not compressed: 9, #pkts comp failed: 0, #pkts decomp failed: 0  
#send errors: 0, #recv errors: 0

**local crypto endpt.: 172.18.124.170, remote crypto endpt.: 172.18.124.172**

path mtu 1500, ipsec overhead 60, media mtu 1500  
current outbound spi: 9D40B1DC

**inbound esp sas:**

spi: 0xEE6F6479 (4000277625)  
**transform: esp-3des esp-sha-hmac**  
in use settings =**{RA, Tunnel, }**  
slot: 0, conn\_id: 7, **crypto-map: cisco**  
sa timing: remaining key lifetime (sec): 28777  
IV size: 8 bytes  
replay detection support: Y

**outbound esp sas:**

spi: 0x9D40B1DC (2638262748)  
**transform: esp-3des esp-sha-hmac**  
in use settings =**{RA, Tunnel, }**  
slot: 0, conn\_id: 7, **crypto-map: cisco**  
sa timing: remaining key lifetime (sec): 28777  
IV size: 8 bytes  
replay detection support: Y

Crypto map tag: **mymap**, local addr: 172.18.124.170

*!--- IPsec SA for networks between PIX3 and PIX1.*

**local ident (addr/mask/prot/port): (10.10.10.0/255.255.255.0/0/0)**  
**remote ident (addr/mask/prot/port): (10.30.30.0/255.255.255.0/0/0)**  
current\_peer: 172.16.77.10

**#pkts encaps: 4, #pkts encrypt: 4, #pkts digest: 4**  
**#pkts decaps: 4, #pkts decrypt: 4, #pkts verify: 4**  
#pkts compressed: 0, #pkts decompressed: 0  
#pkts not compressed: 4, #pkts comp failed: 0, #pkts decomp failed: 0  
#send errors: 0, #recv errors: 0

**local crypto endpt.: 172.18.124.170, remote crypto endpt.: 172.16.77.10**

path mtu 1500, ipsec overhead 60, media mtu 1500  
current outbound spi: BE57D878

**inbound esp sas:**

spi: 0xAF25D7DB (2938492891)

```
transform: esp-3des esp-sha-hmac
in use settings ={L2L, Tunnel, }
slot: 0, conn_id: 6, crypto-map: mymap
sa timing: remaining key lifetime (kB/sec): (4274999/27145)
IV size: 8 bytes
replay detection support: Y
```

**outbound esp sas:**

```
spi: 0xBE57D878 (3193428088)
transform: esp-3des esp-sha-hmac
in use settings ={L2L, Tunnel, }
slot: 0, conn_id: 6, crypto-map: mymap
sa timing: remaining key lifetime (kB/sec): (4274999/27144)
IV size: 8 bytes
replay detection support: Y
```

Crypto map tag: **cisco**, local addr: 172.18.124.170

*!--- IPsec SA for networks between PIX2 and PIX3.*

```
local ident (addr/mask/prot/port): (10.20.20.0/255.255.255.0/0/0)
remote ident (addr/mask/prot/port): (10.30.30.0/255.255.255.0/0/0)
current_peer: 172.16.77.10
```

```
#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: 9, #pkts comp failed: 0, #pkts decomp failed: 0
#send errors: 0, #recv errors: 0
```

local crypto endpt.: **172.18.124.170**, remote crypto endpt.: **172.16.77.10**

```
path mtu 1500, ipsec overhead 60, media mtu 1500
current outbound spi: 963766A1
```

**inbound esp sas:**

```
spi: 0x1CD1B5B7 (483505591)
transform: esp-3des esp-sha-hmac
in use settings ={L2L, Tunnel, }
slot: 0, conn_id: 6, crypto-map: cisco
sa timing: remaining key lifetime (kB/sec): (4274999/28780)
IV size: 8 bytes
replay detection support: Y
```

**outbound esp sas:**

```
spi: 0x963766A1 (2520213153)
transform: esp-3des esp-sha-hmac
in use settings ={L2L, Tunnel, }
slot: 0, conn_id: 6, crypto-map: cisco
sa timing: remaining key lifetime (kB/sec): (4274999/28780)
IV size: 8 bytes
replay detection support: Y
```

## PIX2

```
PIX2(config)#show crypto isakmp sa
```

```
Total : 1
```

```
Embryonic : 0
```

dst	src	state	pending	created
172.18.124.170	172.18.124.172	QM_IDLE	0	2

```
PIX2(config)#show crypto ipsec sa
```

```
interface: outside
```

```
Crypto map tag: mymap, local addr. 172.18.124.172
```

```
!--- IPsec SA created between networks for PIX2 and PIX3.
```

```
local ident (addr/mask/prot/port): (10.20.20.0/255.255.255.0/0/0)
```

```
remote ident (addr/mask/prot/port): (10.30.30.0/255.255.255.0/0/0)
```

```
current_peer: 172.18.124.170:500
```

```
PERMIT, flags={origin_is_acl,}
```

```
#pkts encaps: 4, #pkts encrypt: 4, #pkts digest 4
```

```
#pkts decaps: 4, #pkts decrypt: 4, #pkts verify 4
```

```
#pkts compressed: 0, #pkts decompressed: 0
```

```
#pkts not compressed: 0, #pkts compr. failed: 0, #pkts decompress failed: 0
```

```
#send errors 1, #recv errors 0
```

```
local crypto endpt.: 172.18.124.172, remote crypto endpt.: 172.18.124.170
```

```
path mtu 1500, ipsec overhead 56, media mtu 1500
```

```
current outbound spi: 38cf2399
```

```
inbound esp sas:
```

```
spi: 0xb37404c2(3010725058)
```

```
transform: esp-3des esp-sha-hmac ,
```

```
in use settings ={Tunnel, }
```

```
slot: 0, conn id: 4, crypto map: mymap
```

```
sa timing: remaining key lifetime (k/sec): (4607999/28765)
```

```
IV size: 8 bytes
```

```
replay detection support: Y
```

```
inbound ah sas:
```

```
inbound pcp sas:
```

```
outbound esp sas:
```

```
spi: 0x38cf2399(953099161)
```

```
transform: esp-3des esp-sha-hmac ,
```

```
in use settings ={Tunnel, }
```

```
slot: 0, conn id: 3, crypto map: mymap
```

```
sa timing: remaining key lifetime (k/sec): (4607999/28765)
```

```
IV size: 8 bytes
```

```
replay detection support: Y
```

```
outbound ah sas:
```

```
outbound pcp sas:
```

```
!--- IPsec SA created between networks PIX1 and PIX2.
```

```
local ident (addr/mask/prot/port): (10.20.20.0/255.255.255.0/0/0)
```

```
remote ident (addr/mask/prot/port): (10.10.10.0/255.255.255.0/0/0)
```

```
current_peer: 172.18.124.170:500
```

```
PERMIT, flags={origin_is_acl,}
```

```
#pkts encaps: 4, #pkts encrypt: 4, #pkts digest 4
```

```
#pkts decaps: 4, #pkts decrypt: 4, #pkts verify 4
```

```
#pkts compressed: 0, #pkts decompressed: 0
```

```
#pkts not compressed: 0, #pkts compr. failed: 0, #pkts decompress failed: 0
```

```

#send errors 1, #recv errors 0

local crypto endpt.: 172.18.124.172, remote crypto endpt.: 172.18.124.170
path mtu 1500, ipsec overhead 56, media mtu 1500
current outbound spi: fffd0c20

inbound esp sas:
spi: 0x1a2a994b(438999371)
transform: esp-3des esp-sha-hmac ,
in use settings ={Tunnel, }
slot: 0, conn id: 1, crypto map: mymap
sa timing: remaining key lifetime (k/sec): (4607999/28717)
IV size: 8 bytes
replay detection support: Y

inbound ah sas:

inbound pcp sas:

outbound esp sas:
spi: 0xffffd0c20(4294773792)
transform: esp-3des esp-sha-hmac ,
in use settings ={Tunnel, }
slot: 0, conn id: 2, crypto map: mymap
sa timing: remaining key lifetime (k/sec): (4607999/28717)
IV size: 8 bytes
replay detection support: Y

outbound ah sas:

outbound pcp sas:

```

### PIX3

```

PIX3(config)#show crypto isakmp sa
Total : 1
Embryonic : 0
dst          src          state          pending        created
172.18.124.170 172.16.77.10 QM_IDLE        0              2

PIX3(config)#show crypto ipsec sa

interface: outside
Crypto map tag: mymap, local addr. 172.16.77.10

!--- IPsec SA created between networks PIX3 and PIX2.

local ident (addr/mask/prot/port): (10.30.30.0/255.255.255.0/0/0)
remote ident (addr/mask/prot/port): (10.20.20.0/255.255.255.0/0/0)
current_peer: 172.18.124.170:500
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 decompress failed: 0
#send errors 1, #recv errors 0

```

local crypto endpt.: 172.16.77.10, remote crypto endpt.: 172.18.124.170  
path mtu 1500, ipsec overhead 56, media mtu 1500  
current outbound spi: 8282748

**inbound esp sas:**

spi: 0x28c9b70a(684308234)  
**transform: esp-3des esp-sha-hmac ,**  
in use settings ={Tunnel, }  
slot: 0, conn id: 1, crypto map: mymap  
sa timing: remaining key lifetime (k/sec): (4607998/28775)  
IV size: 8 bytes  
replay detection support: Y

inbound ah sas:

inbound pcp sas:

**outbound esp sas:**

spi: 0x8282748(136849224)  
**transform: esp-3des esp-sha-hmac ,**  
in use settings ={Tunnel, }  
slot: 0, conn id: 2, crypto map: mymap  
sa timing: remaining key lifetime (k/sec): (4607999/28775)  
IV size: 8 bytes  
replay detection support: Y

outbound ah sas:

outbound pcp sas:

*!--- IPsec SA created between networks PIX3 and PIX1.*

local ident (addr/mask/prot/port): (10.30.30.0/255.255.255.0/0/0)  
remote ident (addr/mask/prot/port): (10.10.10.0/255.255.255.0/0/0)  
current\_peer: 172.18.124.170:500  
PERMIT, flags={origin\_is\_acl,}  
#pkts encaps: 4, #pkts encrypt: 4, #pkts digest 4  
#pkts decaps: 4, #pkts decrypt: 4, #pkts verify 4  
#pkts compressed: 0, #pkts decompressed: 0  
#pkts not compressed: 0, #pkts compr. failed: 0, #pkts decompress failed: 0  
#send errors 1, #recv errors 0

local crypto endpt.: 172.16.77.10, remote crypto endpt.: 172.18.124.170  
path mtu 1500, ipsec overhead 56, media mtu 1500  
current outbound spi: f415cec9

**inbound esp sas:**

spi: 0x12c5caf1(314952433)  
**transform: esp-3des esp-sha-hmac ,**  
in use settings ={Tunnel, }  
slot: 0, conn id: 3, crypto map: mymap  
sa timing: remaining key lifetime (k/sec): (4607999/28763)  
IV size: 8 bytes  
replay detection support: Y

inbound ah sas:

```
inbound pcp sas:

outbound esp sas:
spi: 0xf415cec9(4095069897)
transform: esp-3des esp-sha-hmac ,
in use settings ={Tunnel, }
slot: 0, conn id: 4, crypto map: mymap
sa timing: remaining key lifetime (k/sec): (4607999/28763)
IV size: 8 bytes
replay detection support: Y

outbound ah sas:

outbound pcp sas:
```

## Troubleshoot

This section provides information you can use in order to troubleshoot your configuration.

### Troubleshooting Commands

Certain **show** commands are supported by the Output Interpreter Tool ( registered customers only) , which allows you to view an analysis of **show** command output.

**Note:** Refer to Important Information on Debug Commands before you issue **debug** commands.

Perform PIX commands in config mode:

- **clear crypto isakmp sa** Clears the Phase 1 SAs
- **clear crypto ipsec sa** Clears the Phase 2 SAs

The **debug** commands for VPN tunnels:

- **debug crypto isakmp sa** Debugs ISAKMP SA negotiations.
- **debug crypto ipsec sa** Debugs IPsec SA negotiations.

---

## Related Information

- [Cisco PIX 500 Series Security Appliances Support Page](#)
- [Documentation for PIX Firewall](#)
- [Cisco Secure PIX Firewall Command References](#)
- [IPsec Negotiation/IKE Protocols](#)
- [Cisco VPN Client – Product Support](#)
- [Requests for Comments \(RFCs\)](#)
- [Cisco Secure PIX Firewall Frequently Asked Questions](#)
- [Technical Support & Documentation – Cisco Systems](#)

