

IPSec을 사용하여 Cisco Secure PIX Firewall 6.0 및 Cisco VPN 클라이언트 구성

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소개

Cisco Secure PIX Firewall Software 릴리스 6.0 이상에서는 Cisco VPN Client 3.x 및 4.x의 연결을 지원합니다. 이 샘플 컨피그레이션에서는 PIX를 터널 엔드포인트로 연결하고 트래픽을 암호화하는 두 가지 VPN 클라이언트 버전을 보여줍니다. 이 컨피그레이션에서는 주소 풀이 IPSec(IP Security)에 할당되도록 구성됩니다.

사전 요구 사항

요구 사항

이 샘플 컨피그레이션에서는 PIX가 적절한 통계, 관로 또는 액세스 목록과 함께 이미 작동한다고 가정합니다. 이 문서는 이러한 기본 개념을 설명하기 위한 것이 아니라 Cisco VPN Client에서 PIX에 대한 연결을 보여주기 위한 것입니다.

사용되는 구성 요소

이 문서의 정보는 다음 소프트웨어 및 하드웨어 버전을 기반으로 합니다.

- PIX Software 릴리스 6.2(1)**참고:** 이 설정은 PIX Software Release 6.2(1)에서 테스트되었지만, 이전 릴리스에서 6.0(1) 이후 릴리스와 함께 작동해야 합니다.

- Cisco VPN Client 버전 3.6 Rel **참고:** 이 설정은 VPN Client v4.0 Rel에서 테스트되었지만 이전 릴리스에서 3.0까지 최신 릴리스로 복구해야 합니다.

이 문서의 정보는 특정 랩 환경의 디바이스를 토대로 작성되었습니다. 이 문서에 사용된 모든 디바이스는 초기화된(기본) 컨피그레이션으로 시작되었습니다. 현재 네트워크가 작동 중인 경우, 모든 명령어의 잠재적인 영향을 미리 숙지하시기 바랍니다.

표기 규칙

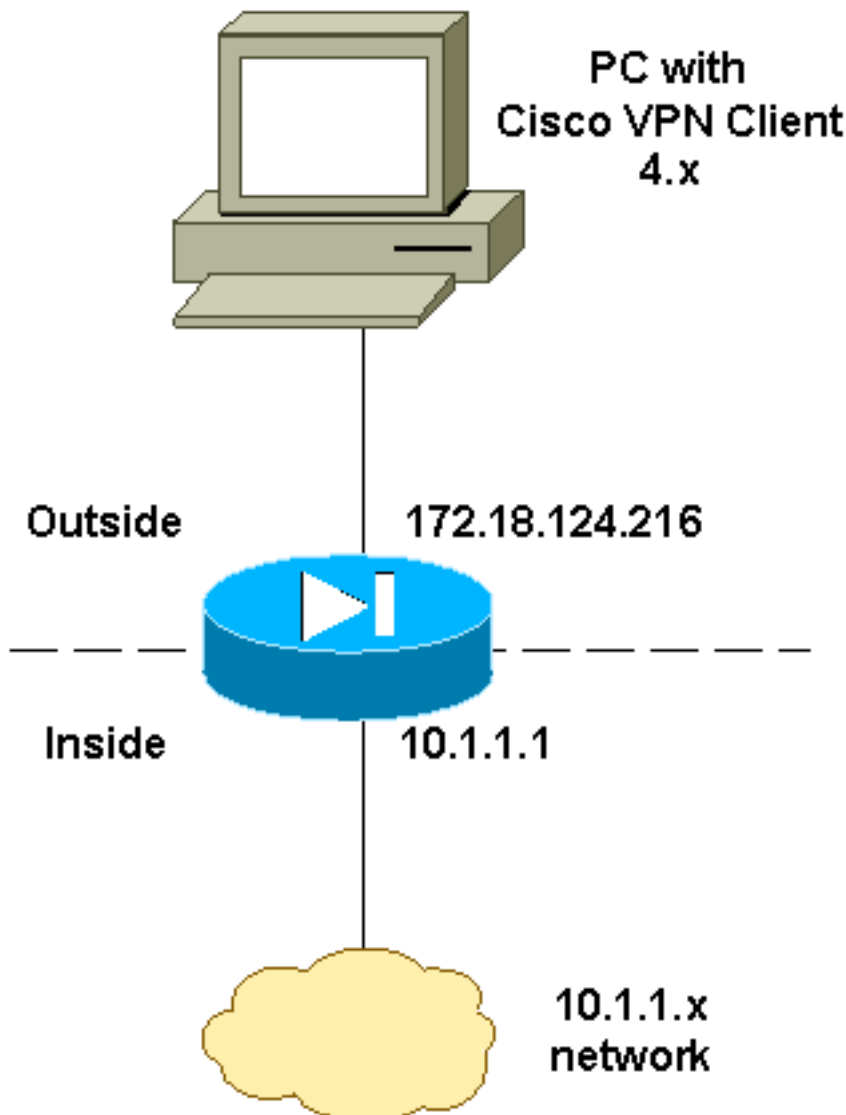
문서 규칙에 대한 자세한 내용은 [Cisco 기술 팁 표기 규칙을 참고하십시오.](#)

구성

이 섹션에는 이 문서에서 설명하는 기능을 구성하기 위한 정보가 표시됩니다.

네트워크 다이어그램

이 문서에서는 다음 네트워크 설정을 사용합니다.



PIX 구성

참고: [명령 조회 도구](#) ([등록된](#) 고객만 해당)를 사용하여 이 문서에 사용된 명령에 대한 자세한 내용을 확인하십시오.

PIX

```
PIX Version 6.2(1)
nameif ethernet0 outside security0
nameif ethernet1 inside security100
enable password OnTrBUG1Tp0edmkr encrypted
passwd 2KFQnbNIdI.2KYOU encrypted
hostname goss-d3-pix515b
domain-name rtp.cisco.com
fixup protocol ftp 21
fixup protocol http 80
fixup protocol h323 1720
fixup protocol rsh 514
fixup protocol smtp 25
fixup protocol sqlnet 1521
fixup protocol sip 5060
fixup protocol skinny 2000
names
!
!--- Access list to avoid Network Address Translation
(NAT) !--- on the IPSec packets. access-list 101 permit
ip 10.1.1.0 255.255.255.0 10.1.2.0 255.255.255.0
pager lines 24
interface ethernet0 auto
interface ethernet1 auto
mtu outside 1500
mtu inside 1500
!
!--- IP addresses on the interfaces ip address outside
172.18.124.216 255.255.255.0 ip address inside 10.1.1.1
255.255.255.0 ip audit info action alarm ip audit attack
action alarm ip local pool ippool 10.1.2.1-10.1.2.254
no failover
failover timeout 0:00:00
failover poll 15
failover ip address outside 0.0.0.0
failover ip address inside 0.0.0.0
pdm history enable
arp timeout 14400
!
!--- Binding ACL 101 to the NAT statement to avoid NAT
!--- on the IPSec packets. nat (inside) 0 access-list
101
!
!--- Default route to the Internet. route outside
0.0.0.0 0.0.0.0 172.18.124.1 1 timeout xlate 3:00:00
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00 rpc
0:10:00 h323 0:05:00 sip 0:30:00 sip_media 0:02:00
timeout uauth 0:05:00 absolute aaa-server TACACS+
protocol tacacs+ aaa-server RADIUS protocol radius http
server enable http 1.2.3.5 255.255.255.255 inside no
snmp-server location no snmp-server contact snmp-server
community public no snmp-server enable traps floodguard
enable ! !--- The sysopt command avoids conduit !--- on
the IPSec encrypted traffic.

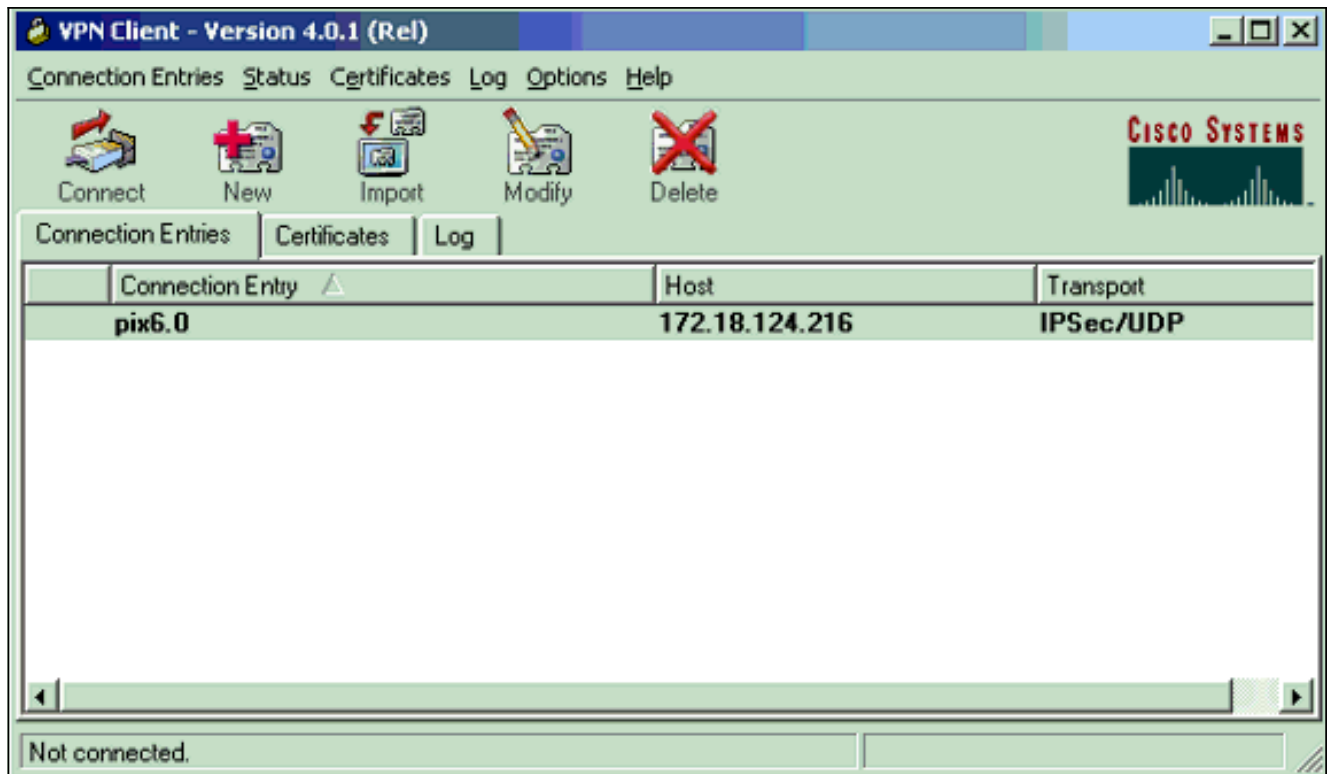
sysopt connection permit-ipsec
no sysopt route dnat
!
```

```
!--- Phase 2 encryption type crypto ipsec transform-set
myset esp-des esp-md5-hmac
crypto dynamic-map dynmap 10 set transform-set myset
crypto map mymap 10 ipsec-isakmp dynamic dynmap
!
!--- Binding the IPsec engine on the outside interface.
crypto map mymap interface outside
!
!--- Enabling Internet Security Association and !--- Key
Management Protocol (ISAKMP) key exchange. isakmp enable
outside
isakmp identity address
!
!--- ISAKMP policy for VPN Client running 3.x or 4.x
code. isakmp policy 10 authentication pre-share
isakmp policy 10 encryption des
isakmp policy 10 hash md5
isakmp policy 10 group 2
isakmp policy 10 lifetime 86400
!
!--- IPsec group configuration for either VPN Client.
vpngroup vpn3000 address-pool ippool
vpngroup vpn3000 dns-server 10.1.1.2
vpngroup vpn3000 wins-server 10.1.1.2
vpngroup vpn3000 default-domain cisco.com
vpngroup vpn3000 idle-time 1800
vpngroup vpn3000 password *****
!--- To allow simultaneous access to the !--- internal
network and to the Internet. vpngroup vpn3000 split-
tunnel 101
telnet timeout 5
ssh timeout 5
terminal width 80
Cryptochecksum:94da63fc0bb8ce167407b3ea21c6642c
: end
[OK]
```

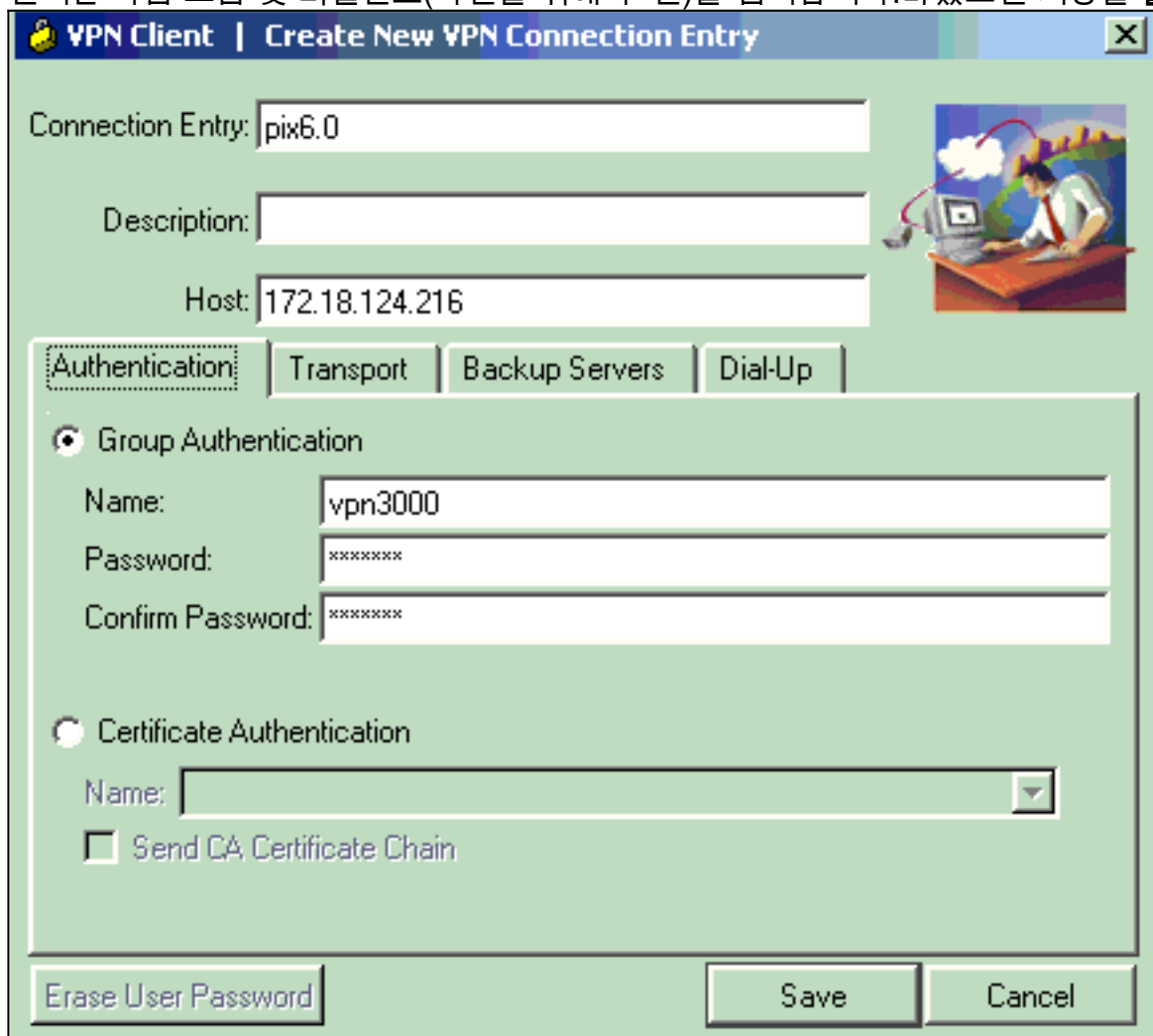
[Cisco VPN 클라이언트 구성](#)

VPN 클라이언트를 사용하여 새 연결을 생성하려면 다음 단계를 완료합니다.

1. VPN Client를 시작한 다음 New(새로 만들기)를 클릭하여 새 연결을 생성합니다

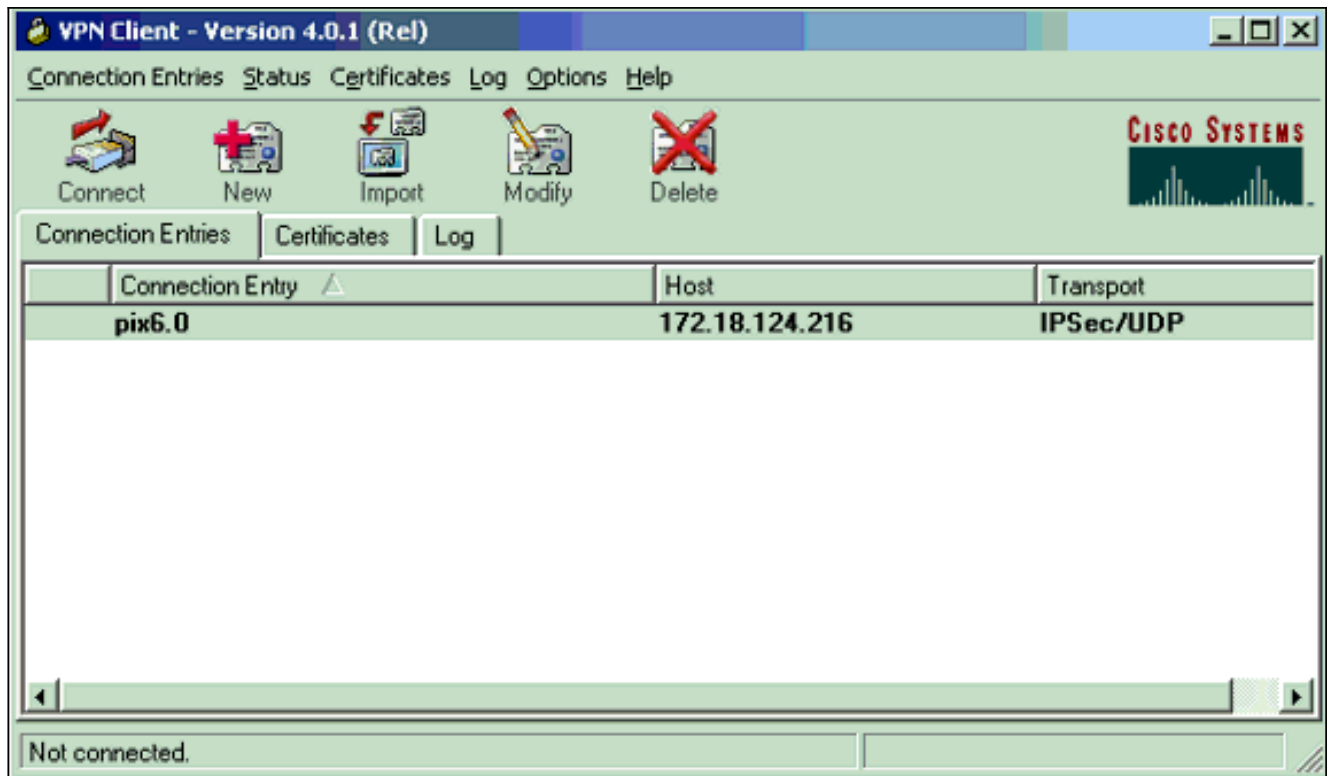


2. 새 연결에 대한 구성 정보를 입력합니다. Connection Entry(연결 항목) 필드에서 항목에 이름을 지정합니다. Host 필드에 PIX의 공용 인터페이스의 IP 주소를 입력합니다. Authentication(인증) 탭을 선택한 다음 그룹 및 비밀번호(확인을 위해 두 번)를 입력합니다. 마쳤으면 저장을 클릭합



니다.

3. Connect(연결)를 클릭하여 PIX에 연결합니다



다음을 확인합니다.

이 섹션을 사용하여 컨피그레이션이 제대로 작동하는지 확인합니다.

Output [Interpreter 도구](#) (등록된 고객만 해당)(OIT)는 특정 **show** 명령을 지원합니다. OIT를 사용하여 **show** 명령 출력의 분석을 봅니다.

- **show crypto isakmp sa** - 피어에서 현재 IKE(Internet Key Exchange) 보안 연결(SA)을 모두 봅니다.
- **show crypto ipsec sa** - 현재 SA에서 사용하는 설정을 봅니다.

문제 해결

이 섹션에서는 컨피그레이션 문제를 해결할 수 있습니다.

문제 해결 명령

참고: debug 명령을 사용하기 전에 디버그 [명령에 대한 중요 정보](#)를 참조하십시오.

- **debug crypto ipsec** - 2단계의 IPSec 협상을 확인하는 데 사용됩니다.
- **debug crypto isakmp** - 1단계의 ISAKMP 협상을 확인하는 데 사용됩니다.
- **debug crypto engine** - 암호화된 트래픽을 표시합니다.

디버그 출력 샘플

다음은 Cisco VPN 3.0.x Client에서 생성된 올바른 디버그 샘플입니다.

```
goss-d3-pix515b#debug crypto isakmp
```

```
goss-d3-pix515b#debug crypto ipsec
goss-d3-pix515b#debug crypto engine
goss-d3-pix515b#show debug
debug crypto ipsec 1
debug crypto isakmp 1
debug crypto engine
debug fover status
    tx      Off
    rx      Off
    open    Off
    cable   Off
    txdmp   Off
    rxdmp   Off
    ifc     Off
    rxip    Off
    txip    Off
    get     Off
    put     Off
    verify  Off
    switch  Off
    fail    Off
    fmsg    Off
goss-d3-pix515b# goss-d3-pix515b#
crypto_isakmp_process_block: src 172.18.124.96, dest 172.18.124.216
OAK_AG exchange
ISAKMP (0): processing SA payload. message ID = 0

ISAKMP (0): Checking ISAKMP transform 1 against priority 10 policy
ISAKMP:      encryption 3DES-CBC
ISAKMP:      hash SHA
ISAKMP:      default group 2
ISAKMP:      extended auth pre-share
ISAKMP:      life type in seconds
ISAKMP:      life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are not acceptable. Next payload is 3
ISAKMP (0): Checking ISAKMP transform 2 against priority 10 policy
ISAKMP:      encryption 3DES-CBC
ISAKMP:      hash MD5
ISAKMP:      default group 2
ISAKMP:      extended auth pre-share
ISAKMP:      life type in seconds
ISAKMP:      life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are not acceptable. Next payload is 3
ISAKMP (0): Checking ISAKMP transform 3 against priority 10 policy
ISAKMP:      encryption 3DES-CBC
ISAKMP:      hash SHA
ISAKMP:      default group 2
ISAKMP:      auth pre-share
ISAKMP:      life type in seconds
ISAKMP:      life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are not acceptable. Next payload is 3
ISAKMP (0): Checking ISAKMP transform 4 against priority 10 policy
ISAKMP:      encryption 3DES-CBC
ISAKMP:      hash MD5
ISAKMP:      default group 2
ISAKMP:      auth pre-share
ISAKMP:      life type in seconds
ISAKMP:      life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are not acceptable. Next payload is 3
ISAKMP (0): Checking ISAKMP transform 5 against priority 10 policy
ISAKMP:      encryption DES-CBC
ISAKMP:      hash SHA
ISAKMP:      default group 2
ISAKMP:      extended auth pre-share
```

```
ISAKMP:      life type in seconds
ISAKMP:      life duration (VPI) of  0x0 0x20 0xc4 0x9b
ISAKMP (0):  atts are not acceptable. Next payload is 3
ISAKMP (0):  Checking ISAKMP transform 6 against priority 10 policy
ISAKMP:      encryption DES-CBC
ISAKMP:      hash MD5
ISAKMP:      default group 2
ISAKMP:      extended auth pre-share
ISAKMP:      life type in seconds
ISAKMP:      life duration (VPI) of  0x0 0x20 0xc4 0x9b
ISAKMP (0):  atts are not acceptable. Next payload is 3
ISAKMP (0):  Checking ISAKMP transform 7 against priority 10 policy
ISAKMP:      encryption DES-CBC
ISAKMP:      hash SHA
ISAKMP:      default group 2
ISAKMP:      auth pre-share
ISAKMP:      life type in seconds
ISAKMP:      life duration (VPI) of  0x0 0x20 0xc4 0x9b
ISAKMP (0):  atts are not acceptable. Next payload is 3
ISAKMP (0):  Checking ISAKMP transform 8 against priority 10 policy
ISAKMP:      encryption DES-CBC
ISAKMP:      hash MD5
ISAKMP:      default group 2
ISAKMP:      auth pre-share
ISAKMP:      life type in seconds
ISAKMP:      life duration (VPI) of  0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are acceptable. Next payload is 0
ISAKMP (0):  processing KE payload. message ID = 0

ISAKMP (0):  processing NONCE payload. message ID = 0

ISAKMP (0):  processing ID payload. message ID = 0
ISAKMP (0):  processing vendor id payload

ISAKMP (0):  processing vendor id payload

ISAKMP (0):  remote peer supports dead peer detection

ISAKMP (0):  processing vendor id payload

ISAKMP (0):  speaking to a Unity client

ISAKMP:  Created a peer node for 172.18.124.96
ISAKMP (0):  ID payload
      next-payload : 10
      type         : 1
      protocol     : 17
      port         : 500
      length       : 8
ISAKMP (0):  Total payload length: 12
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.96, dest 172.18.124.216
OAK_AG exchange
ISAKMP (0):  processing HASH payload. message ID = 0
ISAKMP (0):  processing NOTIFY payload 24578 protocol 1
      spi 0, message ID = 0
ISAKMP (0):  processing notify INITIAL_CONTACT
IPSEC(key_engine): got a queue event...
IPSEC(key_engine_delete_sas): rec'd delete notify from ISAKMP
IPSEC(key_engine_delete_sas): delete all SAs shared
      with 172.18.124.96

ISAKMP (0):  SA has been authenticated
return status is IKMP_NO_ERROR
```



```
crypto_isakmp_process_block: src 172.18.124.96, dest 172.18.124.216
ISAKMP_TRANSACTION exchange
ISAKMP (0:0): processing transaction payload
    from 172.18.124.96. message ID = 0
ISAKMP: Config payload CFG_REQUEST
ISAKMP (0:0): checking request:
ISAKMP: attribute    IP4_ADDRESS (1)
ISAKMP: attribute    IP4_NETMASK (2)
ISAKMP: attribute    IP4_DNS (3)
ISAKMP: attribute    IP4_NBNS (4)
ISAKMP: attribute    ADDRESS_EXPIRY (5)
    Unsupported Attr: 5
ISAKMP: attribute    APPLICATION_VERSION (7)
    Unsupported Attr: 7
ISAKMP: attribute    UNKNOWN (28672)
    Unsupported Attr: 28672
ISAKMP: attribute    UNKNOWN (28673)
    Unsupported Attr: 28673
ISAKMP: attribute    UNKNOWN (28674)
ISAKMP: attribute    UNKNOWN (28676)
ISAKMP: attribute    UNKNOWN (28679)
    Unsupported Attr: 28679
ISAKMP (0:0): responding to peer config from 172.18.124.96.
    ID = 525416177
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.96, dest 172.18.124.216
OAK_QM exchange
oakley_process_quick_mode:
OAK_QM_IDLE
ISAKMP (0): processing SA payload. message ID = 805890102

ISAKMP : Checking IPsec proposal 1

ISAKMP: transform 1, ESP_3DES
ISAKMP:  attributes in transform:
ISAKMP:    authenticator is HMAC-MD5
ISAKMP:    encaps is 1
ISAKMP:    SA life type in seconds
ISAKMP:    SA life duration (VPI) of  0x0 0x20 0xc4 0x9b
IPSEC(validate_proposal): transform proposal (prot 3, trans 3,
    hmac_alg 1) not supported

ISAKMP (0): atts not acceptable. Next payload is 0
ISAKMP (0): skipping next ANDED proposal (1)
ISAKMP : Checking IPsec proposal 2

ISAKMP: transform 1, ESP_3DES
ISAKMP:  attributes in transform:
ISAKMP:    authenticator is HMAC-SHA
ISAKMP:    encaps is 1
ISAKMP:    SA life type in seconds
ISAKMP:    SA life duration (VPI) of  0x0 0x20 0xc4 0x9b
IPSEC(validate_proposal): transform proposal (prot 3, trans 3,
    hmac_alg 2) not supported

ISAKMP (0): atts not acceptable. Next payload is 0
ISAKMP (0): skipping next ANDED proposal (2)
ISAKMP : Checking IPsec proposal 3

ISAKMP: transform 1, ESP_3DES
ISAKMP:  attributes in transform:
ISAKMP:    authenticator is HMAC-MD5
ISAKMP:    encaps is 1
ISAKMP:    SA life type in seconds
```

ISAKMP: SA life duration (VPI) of 0x0 0x20 0xc4 0x9b
IPSEC(validate_proposal): transform proposal (prot 3, trans 3,
 hmac_alg 1) not supported

ISAKMP (0): atts not acceptable. Next payload is 0
ISAKMP : Checking IPsec proposal 4

ISAKMP: transform 1, ESP_3DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-SHA
ISAKMP: encaps is 1
ISAKMP: SA life type in seconds
ISAKMP: SA life duration (VPI) of 0x0 0x20 0xc4 0x9b
IPSEC(validate_proposal): transform proposal (prot 3, trans 3,
 hmac_alg 2) not supported

ISAKMP (0): atts not acceptable. Next payload is 0
ISAKMP : Checking IPsec proposal 5

ISAKMP: transform 1, ESP_DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-MD5
ISAKMP: encaps is 1
ISAKMP: SA life type in seconds
ISAKMP: SA life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are acceptable.
ISAKMP (0): bad SPI size of 2 octets!
ISAKMP : Checking IPsec proposal 6

ISAKMP: transform 1, ESP_DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-SHA
ISAKMP: encaps is 1
ISAKMP: SA life type in seconds
ISAKMP: SA life duration (VPI) of 0x0 0x20 0xc4 0x9b
IPSEC(validate_proposal): transform proposal (prot 3, trans 2,
 hmac_alg 2) not supported

ISAKMP (0): atts not acceptable. Next payload is 0
ISAKMP (0): skipping next ANDED proposal (6)
ISAKMP : Checking IPsec proposal 7

ISAKMP: transform 1, ESP_DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-MD5
ISAKMP: encaps is 1
ISAKMP: SA life type in seconds
ISAKMP: SA life duration (VPI) of 0x0 0x20 0xc4 0x9b

ISAKMP (0): atts are acceptable.

IPSEC(validate_proposal_request): proposal part #1,
 (key eng. msg.) dest= 172.18.124.216, src= 172.18.124.96,
 dest_proxy= 172.18.124.216/255.255.255.255/0/0 (type=1),
 src_proxy= 10.1.2.1/255.255.255.255/0/0 (type=1),
 protocol= ESP, transform= esp-des esp-md5-hmac ,
 lifedur= 0s and 0kb,
 spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x4

ISAKMP (0): processing NONCE payload. message ID = 805890102

ISAKMP (0): processing ID payload. message ID = 805890102
ISAKMP (0): ID_IPV4_ADDR src 10.1.2.1 prot 0 port 0
ISAKMP (0): processing ID payload. message ID = 805890102
ISAKMP (0): ID_IPV4_ADDR dst 172.18.124.216 prot 0 port 0
IPSEC(key_engine): got a queue event...

IPSEC(spi_response): getting spi 0x13b00d31(330304817) for SA
from 172.18.124.96 to 172.18.124.216 for prot 3

return status is IKMP_NO_ERROR

crypto_isakmp_process_block: src 172.18.124.96, dest 172.18.124.216
OAK_QM exchange

oakley_process_quick_mode:

OAK_QM_IDLE

ISAKMP (0): processing SA payload. message ID = 935083707

ISAKMP : Checking IPsec proposal 1

ISAKMP: transform 1, ESP_3DES

ISAKMP: attributes in transform:

ISAKMP: authenticator is HMAC-MD5

crypto_isakmp_process_block: src 172.18.124.96, dest 172.18.124.216
OAK_QM exchange

oakley_process_quick_mode:

OAK_QM_AUTH_AWAITmap_alloc_entry: allocating entry 1

map_alloc_entry: allocating entry 2

ISAKMP (0): Creating IPsec SAs

inbound SA from 172.18.124.96 to 172.18.124.216

(proxy 10.1.2.1 to 172.18.124.216)

has spi 330304817 and conn_id 1 and flags 4

lifetime of 2147483 seconds

outbound SA from 172.18.124.216 to 172.18.124.96

(proxy 172.18.124.216 to 10.1.2.1)

has spi 2130279708 and conn_id 2 and flags 4

lifetime of 2147483 secondsIPSEC(key_engine): got a queue event...

IPSEC(initialize_sas): ,

(key eng. msg.) dest= 172.18.124.216, src= 172.18.124.96,

dest_proxy= 172.18.124.216/0.0.0.0/0/0 (type=1),

src_proxy= 10.1.2.1/0.0.0.0/0/0 (type=1),

protocol= ESP, transform= esp-des esp-md5-hmac ,

lifedur= 2147483s and 0kb,

spi= 0x13b00d31(330304817), conn_id= 1, keysize= 0, flags= 0x4

IPSEC(initialize_sas): ,

(key eng. msg.) src= 172.18.124.216, dest= 172.18.124.96,

src_proxy= 172.18.124.216/0.0.0.0/0/0 (type=1),

dest_proxy= 10.1.2.1/0.0.0.0/0/0 (type=1),

protocol= ESP, transform= esp-des esp-md5-hmac ,

lifedur= 2147483s and 0kb,

spi= 0x7ef97d1c(2130279708), conn_id= 2, keysize= 0, flags= 0x4

return status is IKMP_NO_ERROR

crypto_isakmp_process_block: src 172.18.124.96, dest 172.18.124.216
OAK_QM exchange

oakley_process_quick_mode:

OAK_QM_AUTH_AWAITmap_alloc_entry: allocating entry 3

map_alloc_entry: allocating entry 4

ISAKMP (0): Creating IPsec SAs

inbound SA from 172.18.124.96 to 172.18.124.216

(proxy 10.1.2.1 to 0.0.0.0)

has spi 4139858833 and conn_id 3 and flags 4

lifetime of 2147483 seconds

outbound SA from 172.18.124.216 to 172.18.124.96 (

proxy 0.0.0.0 to 10.1.2.1)

has spi 1487433401 and conn_id 4 and flags 4

lifetime of 2147483 seconds

IPSEC(key_engine): got a queue event...

IPSEC(initialize_sas): ,

(key eng. msg.) dest= 172.18.124.216, src= 172.18.124.96,

dest_proxy= 0.0.0.0/0.0.0.0/0/0 (type=4),

```
src_proxy= 10.1.2.1/0.0.0.0/0/0 (type=1),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 2147483s and 0kb,
spi= 0xf6IPSEC(initialize_sas): ,
(key eng. msg.) src= 172.18.124.216, dest= 172.18.124.96,
src_proxy= 0.0.0.0/0.0.0.0/0/0 (type=4),
dest_proxy= 10.1.2.1/0.0.0.0/0/0 (type=1),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 2147483s and 0kb,
spi= 0x58a86eb9(1487433401), conn_id= 4, keysize= 0, flags= 0x4
```

```
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.96, dest 172.18.124.216
ISAKMP (0): processing NOTIFY payload 36136 protocol 1
    spi 0, message ID = 1617869510
ISAKMP (0): received DPD_R_U_THERE from peer 172.18.124.96
ISAKMP (0): sending NOTIFY message 36137 protocol 1
return status is IKMP_NO_ERR_NO_TRANS
goss-d3-pix515b#
goss-d3-pix515b#
goss-d3-pix515b#no debug crypto isakmp
goss-d3-pix515b#no debug crypto ipsec
goss-d3-pix515b#no debug crypto engine
goss-d3-pix515b#
```

[관련 정보](#)

- [IPSec 지원 페이지](#)
- [Cisco Secure PIX Firewall 명령 참조](#)
- [Cisco PIX 500 Series 보안 어플라이언스 지원 페이지](#)
- [RFC\(Request for Comments\)](#)
- [기술 지원 및 문서 - Cisco Systems](#)