Configurazione di Cisco Secure PIX Firewall 6.0 e client VPN Cisco con IPSec

Sommario

Introduzione

Il software Cisco Secure PIX Firewall versione 6.0 e successive supporta le connessioni da Cisco VPN Client 3.x e 4.x. In questa configurazione di esempio vengono mostrate due diverse versioni di client VPN che connettono e crittografano il traffico con il PIX come endpoint del tunnel. In questa configurazione viene configurato un pool di indirizzi da assegnare per la protezione IP (IPSec).

Prerequisiti

Requisiti

In questa configurazione di esempio si presume che il PIX funzioni già con statistiche, condotti o elenchi di accesso appropriati. Questo documento non ha lo scopo di illustrare questi concetti base, ma di mostrare la connettività al PIX da un client VPN Cisco.

Componenti usati

Le informazioni fornite in questo documento si basano sulle seguenti versioni software e hardware:

- Software PIX release 6.2(1)**Nota:** questa configurazione è stata testata sul software PIX

versione 6.2(1), ma dovrebbe funzionare sulle versioni precedenti fino alla 6.0(1) e successive.
- Cisco VPN Client versione 3.6 Rel**Nota:** questa configurazione è stata testata su VPN Client v4.0 Rel, ma dovrebbe funzionare sulle versioni precedenti fino alla 3.0 e alla versione corrente.

Le informazioni discusse in questo documento fanno riferimento a dispositivi usati in uno specifico ambiente di emulazione. Su tutti i dispositivi menzionati nel documento la configurazione è stata ripristinata ai valori predefiniti. Se la rete è operativa, valutare attentamente eventuali conseguenze derivanti dall'uso dei comandi.

Convenzioni

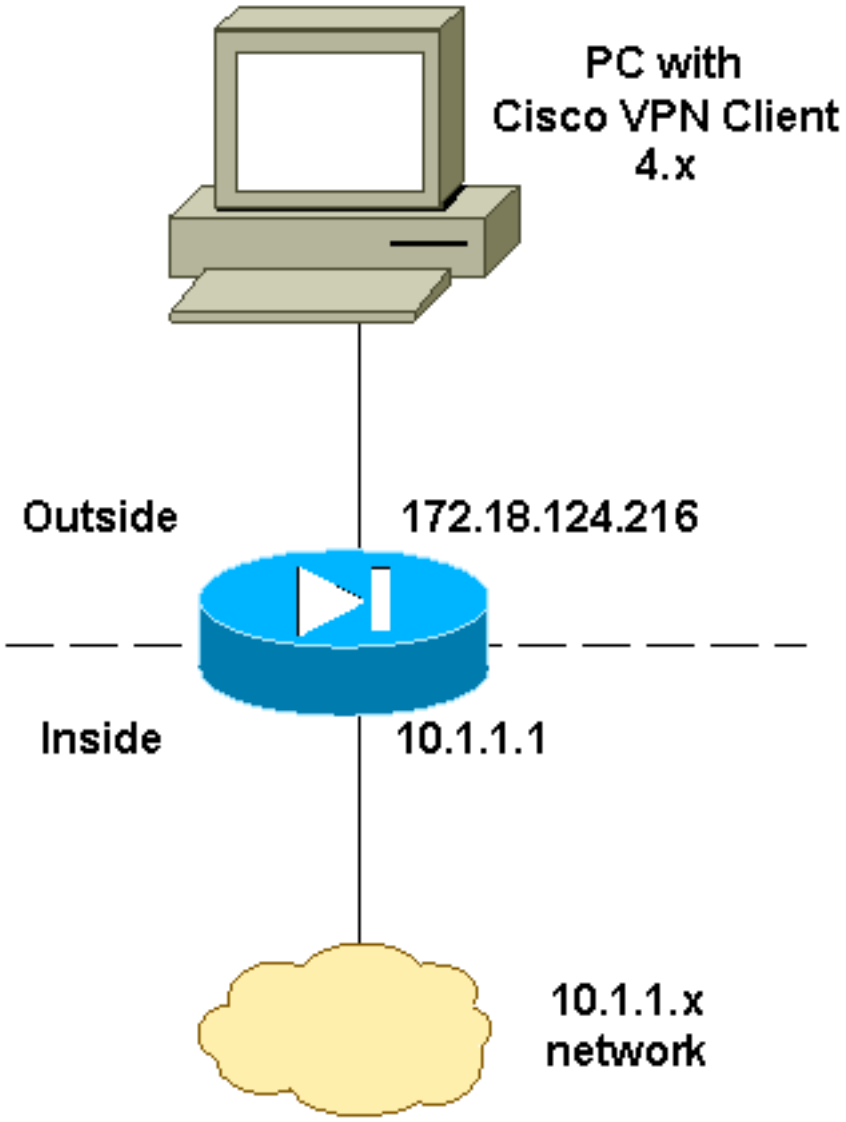
Per ulteriori informazioni sulle convenzioni usate, consultare il documento Cisco sulle convenzioni nei suggerimenti tecnici.

Configurazione

In questa sezione vengono presentate le informazioni necessarie per configurare le funzionalità descritte più avanti nel documento.

Esempio di rete

Nel documento viene usata questa impostazione di rete:



Configurazione del PIX

Nota: per ulteriori informazioni sui comandi menzionati in questo documento, usare lo strumento di ricerca dei comandi (solo utenti registrati).

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
```

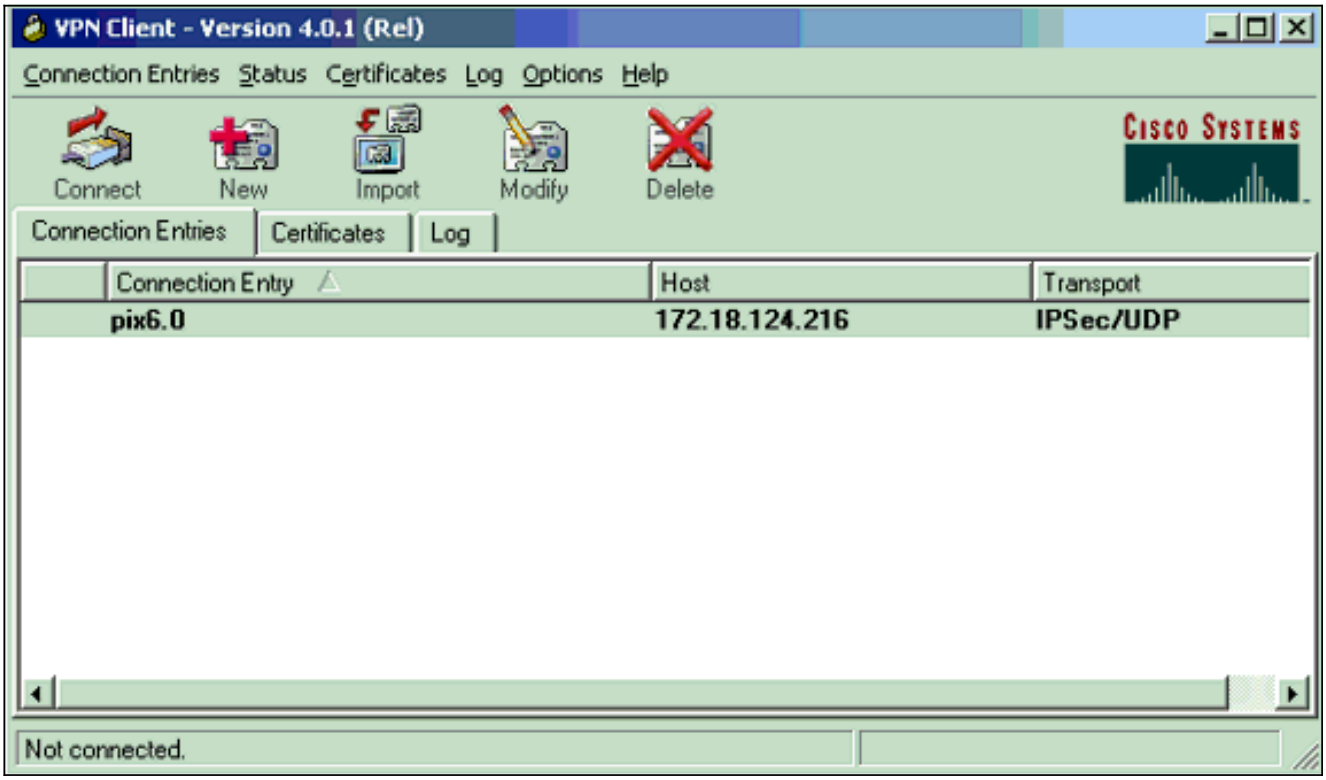
```
(NAT) !--- on the IPSec packets. access-list 101 permit
ip 10.1.1.0 255.255.255.0 10.1.2.0 255.255.255.0
pager lines 24
interface ethernet0 auto
interface ethernet1 auto
mtu outside 1500
mtu inside 1500
!
!--- IP addresses on the interfaces ip address outside
172.18.124.216 255.255.255.0 ip address 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]
```

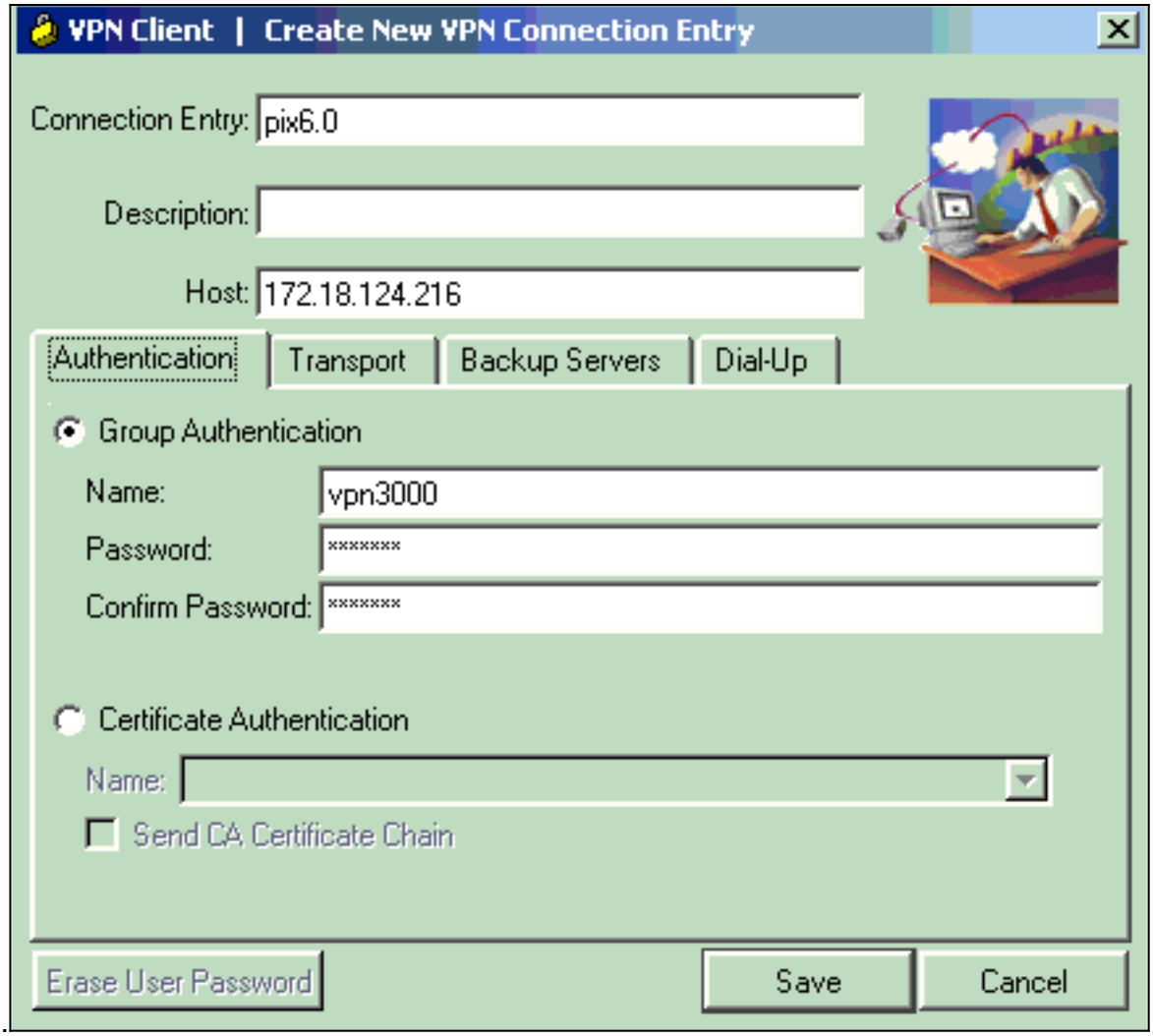
Configurare il client VPN Cisco

Completare questi passaggi per creare una nuova connessione utilizzando il client VPN.

1. Avviare il client VPN e quindi fare clic su **Nuovo** per creare una nuova connessione.

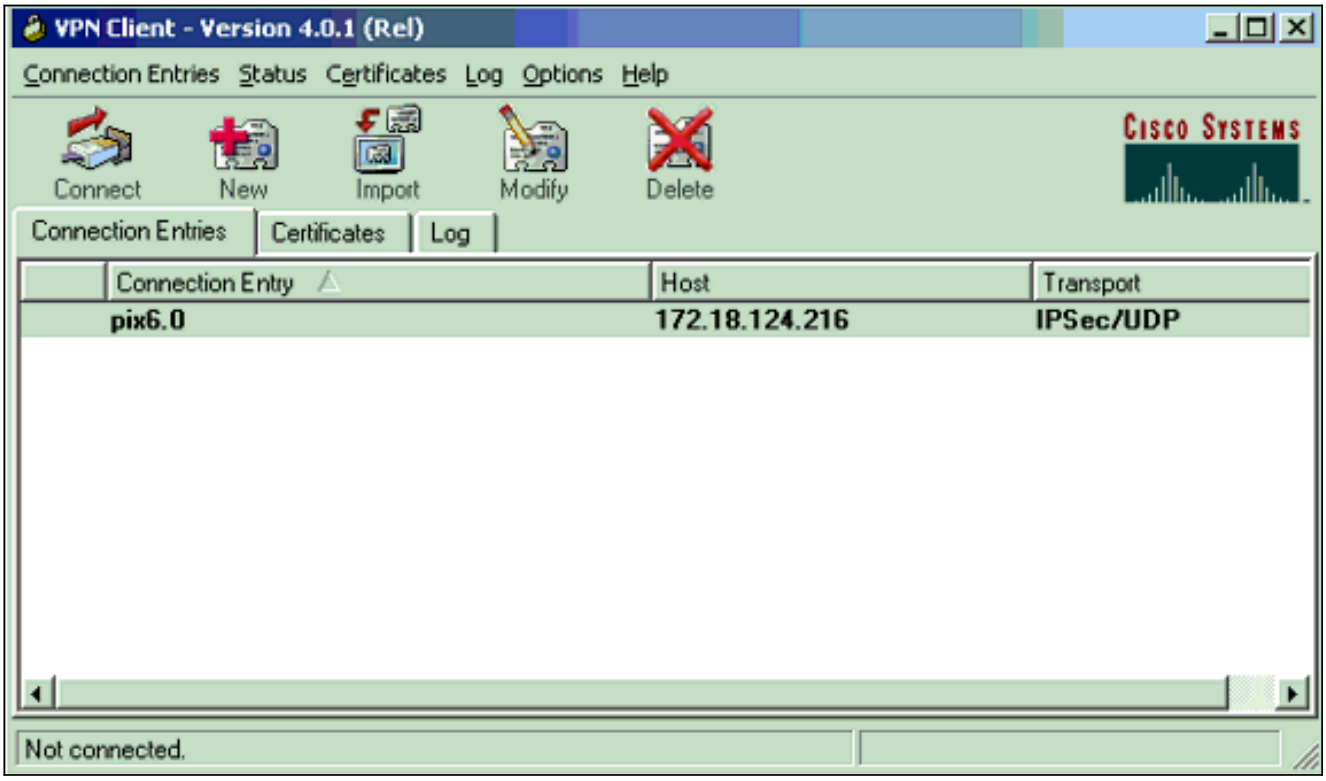


2. Immettere le informazioni di configurazione per la nuova connessione.Nel campo Voce di connessione assegnare un nome alla voce.Nel campo Host, immettere l'indirizzo IP dell'interfaccia pubblica del PIX.Scegliere la scheda **Autenticazione**, quindi immettere il gruppo e la password (due volte - per la conferma).Al termine, fare clic su



Salva.

3. Fare clic su **Connect** (Connetti) per collegarsi al PIX.



Verifica

Per verificare che la configurazione funzioni correttamente, consultare questa sezione.

Lo strumento Output Interpreter (solo utenti registrati) (OIT) supporta alcuni comandi **show**. Usare l'OIT per visualizzare un'analisi dell'output del comando **show**.

- **show crypto isakmp sa**: visualizza tutte le associazioni di sicurezza (SA) IKE (Internet Key Exchange) correnti in un peer.
- **show crypto ipsec sa**: visualizza le impostazioni utilizzate dalle associazioni di protezione correnti.

Risoluzione dei problemi

Utilizzare questa sezione per risolvere i problemi relativi alla configurazione.

Comandi per la risoluzione dei problemi

Nota: consultare le informazioni importanti sui comandi di debug prima di usare i comandi di **debug**.

- **debug crypto ipsec**: da utilizzare per visualizzare le negoziazioni IPSec della fase 2.
- **debug crypto isakmp**: da utilizzare per visualizzare le negoziazioni ISAKMP della fase 1.
- **debug crypto engine**: visualizza il traffico crittografato.

Output di esempio del comando debug

Di seguito viene riportato un esempio di debug corretto generato con il client Cisco VPN 3.0.x:

```
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
ISAMKP (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#
```

Informazioni correlate

- Pagine di supporto IPSec
- Riferimenti per i comandi di Cisco Secure PIX Firewall
- Cisco PIX serie 500 Security Appliance - Pagina di supporto
- RFC (Request for Comments)
- Documentazione e supporto tecnico – Cisco Systems