

PAT を実行し LAN 間 IPSec トンネルを通す IOS ルータの設定例

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概要

このドキュメントでは、LAN-to-LAN IPSec トンネルの確立が許可されるように Port Address Translation (PAT) を設定するサンプルが紹介されています。ここでは、パブリック IP アドレス (すべてのトラフィック上で PAT を実行するために Cisco IOS® ルータで使用) を 1 つだけ使用し、VPN コンセントレータを使用せずに IPSec トンネルを通過するというシナリオを使用します。

12.2(13)T よりも前の Cisco IOS ソフトウェア リリースが稼働する VPN ゲートウェイでは、カプセル化セキュリティ ペイロード (ESP) スルーを許可するには、PAT を実行するルータで IPSec パススルー機能が必要です。

注: この機能は [ソフトウェア アドバイザリ \(登録ユーザのみ \)](#) のネットワーク アドレス変換 (NAT) サポートによる IPSec として知られています。

ローカル (PAT 適用対象) ピアからトンネルを起動するには、設定は必要ありません。リモートピアからトンネルを起動するには、次のコマンドが必要です。

- `ip nat inside source static esp inside_ip interface interface`
- `ip nat inside` ソース スタティック UDP (ユーザ・ データグラム・ プロトコル) `inside_ip 500`
インターフェイス インターフェイス 500

12.2(13)T 以降の Cisco IOS ソフトウェア リリースが稼働する VPN ゲートウェイでは、IPSec トライクは User Data Protocol (UDP) ポート 4500 のパケットにカプセル化されます。この機能は [IPSec NAT 透過](#) と呼ばれるものです。ローカル (PAT 適用対象) ピアからトンネルを起動するには、設定は必要ありません。

リモートピアからトンネルを起動するには、次のコマンドが必要です。

- ip nat inside source static udp inside_ip 4500 interface interface 4500
- ip nat inside ソース スタティック UDP (ユーザ・データグラム・プロトコル) inside_ip 500 インターフェイス インターフェイス 500

[IPSec NAT 透過を無効にするには、no crypto ipsec nat-transparency udp-encaps コマンドを発行します。](#)

前提条件

要件

このドキュメントに関する固有の要件はありません。

使用するコンポーネント

このドキュメントの情報は、Cisco IOS ソフトウェア リリース 12.3(7)T1 に基づくものです。

このドキュメントの情報は、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、クリアな (デフォルト) 設定で作業を開始しています。ネットワークが稼働中の場合は、コマンドが及ぼす潜在的な影響を十分に理解しておく必要があります。

表記法

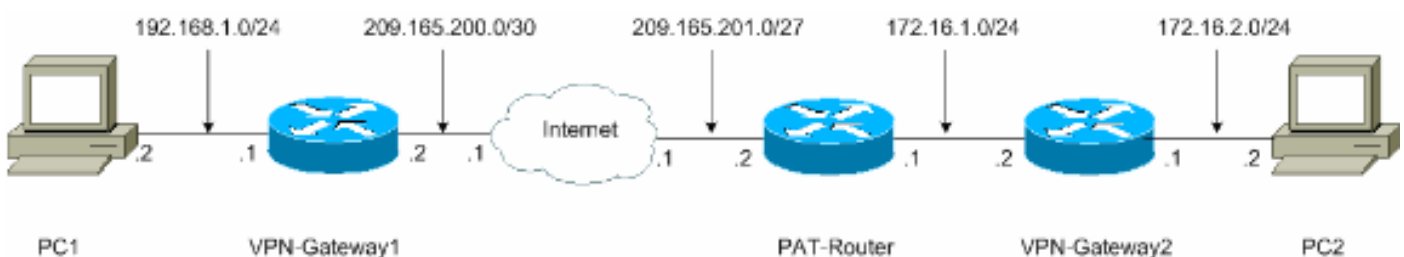
ドキュメント表記の詳細は、『[シスコテクニカルティップスの表記法](#)』を参照してください。

設定

この項では、このドキュメントで説明する機能の設定に必要な情報を提供します。

ネットワーク図

このドキュメントでは、次のネットワーク構成を使用しています。



IPSec NAT 透過を伴う場合の設定

このドキュメントでは、次の設定を使用します。

- [VPN-Gateway1](#)
- [PAT-Router](#)
- [VPN-Gateway2](#)

VPN-Gateway1

```
VPN-Gateway1#show running-config
Building configuration...

Current configuration : 1017 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname VPN-Gateway1
!

!--- VPN Gateway1 and VPN Gateway2 can be any devices
that !--- perform IPsec. For detailed information on
configuring IPsec !--- refer to IPsec Technology Support
Information. !--- IPsec configuration between VPN
Gateway1 and VPN Gateway2 !--- is beyond the scope of
this document. boot-start-marker boot-end-marker !!
clock timezone EST 0 no aaa new-model ip subnet-zero !!
ip audit po max-events 100 no ftp-server write-enable !
!!!! !--- IKE policies (phase 1). crypto isakmp
policy 10
 authentication pre-share
crypto isakmp key cisco123 address 209.165.201.2
!
!
crypto ipsec transform-set basic esp-des esp-md5-hmac
!
!--- IPsec policies (phase 1). crypto map mymap 10
ipsec-isakmp
 set peer 209.165.201.2
 set transform-set basic
 match address 101
!
!
!
interface Ethernet0/0
 ip address 192.168.1.1 255.255.255.0
!
interface Serial1/0
 ip address 209.165.200.2 255.255.255.252
 serial restart-delay 0
 crypto map mymap
!
ip classless
ip route 0.0.0.0 0.0.0.0 209.165.200.1
no ip http server
no ip http secure-server
!
!
!
access-list 101 permit ip 192.168.1.0 0.0.0.255
172.16.2.0 0.0.0.255
```

```
access-list 101 remark Crypto ACL
```

```
!  
!  
!  
control-plane  
!  
!  
line con 0  
line aux 0  
line vty 0 4  
!  
!  
end
```

PAT-Router

```
PAT-Router#show running-config
```

```
Building configuration...
```

```
Current configuration : 971 bytes
```

```
!  
version 12.3  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname PAT-Router  
!  
boot-start-marker  
boot-end-marker  
!  
!  
clock timezone EST 0  
no aaa new-model  
ip subnet-zero  
!  
!  
ip audit po max-events 100  
no ftp-server write-enable  
!  
!  
!  
no crypto isakmp enable  
!  
!  
!  
interface Ethernet0/0  
 ip address 172.16.1.1 255.255.255.0  
!--- This declares the interface as inside for NAT  
purposes. ip nat inside  
!  
interface Serial1/0  
 ip address 209.165.201.2 255.255.255.224  
!--- This declares the interface as !--- outside for NAT  
purposes. ip nat outside  
 serial restart-delay 0  
!  
ip classless  
ip route 0.0.0.0 0.0.0.0 209.165.201.1  
ip route 172.16.0.0 255.255.0.0 172.16.1.2  
no ip http server  
no ip http secure-server  
!  
ip nat inside source list 1 interface Serial1/0 overload
```

```

!--- This allows PAT to be used for regular Internet
traffic. ip nat inside source static udp 172.16.1.2 4500
interface Serial1/0 4500
!--- This permits IPSec traffic destined for the
Serial1/0 !--- interface to be sent to the inside IP
address 172.16.1.2. ip nat inside source static udp
172.16.1.2 500 interface Serial1/0 500
!--- This allows UDP traffic for the Serial1/0 interface
to be !--- statically mapped to the inside IP address
172.16.1.2. !--- This is required for the Internet
Security Association !--- and Key Management Protocol
(ISAKMP) negotiation to be !--- initiated from VPN-
Gateway1 to VPN-Gateway2. !! access-list 1 permit
172.16.0.0 0.0.255.255
!
!
!
control-plane
!
!
line con 0
line aux 0
line vty 0 4
!
!
end

```

VPN-Gateway2

```

VPN-Gateway2#show running-config
Building configuration...

Current configuration : 986 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname VPN-Gateway2
!

!--- VPN Gateway1 and VPN Gateway2 can be any devices !-
-- that perform IPSec. For detailed information on !---
IPSec configuration refer to IPSec Technology Support
Information. !--- IPSec configuration between VPN
Gateway1 and VPN Gateway2 !--- is beyond the scope of
this document. boot-start-marker boot-end-marker !!
clock timezone EST 0 no aaa new-model ip subnet-zero !!
ip audit po max-events 100 no ftp-server write-enable !
!!!! !--- IKE policies (phase 1). crypto isakmp
policy 10
 authentication pre-share
crypto isakmp key cisco123 address 209.165.200.2
!
!
crypto ipsec transform-set basic esp-des esp-md5-hmac
!
!--- IPSec policies (phase 1). crypto map mymap 10
ipsec-isakmp
 set peer 209.165.200.2
 set transform-set basic
 match address 101
!
!

```

```

!
interface Ethernet0/0
 ip address 172.16.1.2 255.255.255.0
  crypto map mymap
!
interface Ethernet1/0
 ip address 172.16.2.1 255.255.255.0
!
ip classless
ip route 0.0.0.0 0.0.0.0 172.16.1.1
no ip http server
no ip http secure-server
!
!
!
access-list 101 permit ip 172.16.2.0 0.0.0.255
192.168.1.0 0.0.0.255
access-list 101 remark Crypto ACL
!
!
!
control-plane
!
!
line con 0
line aux 0
line vty 0 4
!
!
end

```

IPSec NAT 透過を伴わない場合の設定

- [VPN-Gateway1](#)
- [PAT-Router](#)
- [VPN-Gateway2](#)

VPN-Gateway1

```

VPN-Gateway1#show running-config
Building configuration...

Current configuration : 1017 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname VPN-Gateway1
!

!--- VPN Gateway1 and VPN Gateway2 can be any devices !-
-- that perform IPSec. For detailed information on !---
IPSec configuration refer to IPSec Technology Support
Information. !--- IPSec configuration between VPN
Gateway1 and VPN Gateway2 !--- is beyond the scope of
this document. boot-start-marker boot-end-marker !!
clock timezone EST 0 no aaa new-model ip subnet-zero !!
ip audit po max-events 100 no ftp-server write-enable !
!!!! !--- IKE policies (phase 1). crypto isakmp
policy 10

```

```
authentication pre-share
crypto isakmp key cisco123 address 209.165.201.2
!
!
crypto ipsec transform-set basic esp-des esp-md5-hmac
!
!--- IPsec policies (phase 1). crypto map mymap 10
ipsec-isakmp
  set peer 209.165.201.2
  set transform-set basic
  match address 101
!
!
!
interface Ethernet0/0
  ip address 192.168.1.1 255.255.255.0
!
interface Serial1/0
  ip address 209.165.200.2 255.255.255.252
  serial restart-delay 0
  crypto map mymap
!
ip classless
ip route 0.0.0.0 0.0.0.0 209.165.200.1
no ip http server
no ip http secure-server
!
!
!
access-list 101 permit ip 192.168.1.0 0.0.0.255
172.16.2.0 0.0.0.255
access-list 101 remark Crypto ACL
!
!
!
control-plane
!
!
line con 0
line aux 0
line vty 0 4
!
!
end
```

PAT-Router

```
PAT-Router#show running-config
Building configuration...

Current configuration : 971 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname PAT-Router
!
boot-start-marker
boot-end-marker
!
!
clock timezone EST 0
no aaa new-model
```

```

ip subnet-zero
!
!
ip audit po max-events 100
no ftp-server write-enable
!
!
!
!
no crypto isakmp enable
!
!
!
interface Ethernet0/0
 ip address 172.16.1.1 255.255.255.0
 !--- This declares the interface as inside for NAT
 purposes. ip nat inside
!
interface Serial1/0
 ip address 209.165.201.2 255.255.255.224
 !--- This declares the interface as !--- outside for NAT
 purposes. ip nat outside
 serial restart-delay 0
!
ip classless
ip route 0.0.0.0 0.0.0.0 209.165.201.1
ip route 172.16.0.0 255.255.0.0 172.16.1.2
no ip http server
no ip http secure-server
!
ip nat inside source list 1 interface Serial1/0 overload
!--- This allows PAT to be used for regular Internet
 traffic. ip nat inside source static esp 172.16.1.2
interface Serial1/0
!--- This permits the IPSec ESP tunnel mode !---
 destined for the Serial1/0 interface to be sent !--- to
 the inside IP address 172.16.1.2. The "esp" !--- option
 allows a single ESP tunnel-mode !--- VPN setup to be
 possible. ip nat inside source static udp 172.16.1.2 500
interface Serial1/0 500
!--- This allows UDP traffic for the Serial1/0 !---
 interface to be statically mapped to the inside !--- IP
 address 172.16.1.2. This is required !--- for the ISAKMP
 negotiation to be initiated !--- from VPN-Gateway1 to
 VPN-Gateway2. !! access-list 1 permit 172.16.0.0
0.0.255.255
!
!
!
control-plane
!
!
line con 0
line aux 0
line vty 0 4
!
!
end

```

VPN-Gateway2

```

VPN-Gateway2#show running-config
Building configuration...

Current configuration : 986 bytes

```



```
!  
version 12.3  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname VPN-Gateway2  
!  
  
!--- VPN Gateway1 and VPN Gateway2 can be any devices !-  
-- that perform IPsec. For detailed information on !---  
IPsec configuration refer to IPsec Technology Support  
Information. !--- IPsec configuration between VPN  
Gateway1 and VPN Gateway2 !--- is beyond the scope of  
this document. boot-start-marker boot-end-marker ! !  
clock timezone EST 0 no aaa new-model ip subnet-zero ! !  
ip audit po max-events 100 no ftp-server write-enable !  
! ! ! ! !--- IKE policies (phase 1). crypto isakmp  
policy 10  
  authentication pre-share  
crypto isakmp key cisco123 address 209.165.200.2  
!  
!  
crypto ipsec transform-set basic esp-des esp-md5-hmac  
no crypto ipsec nat-transparency udp-encaps  
!  
!--- IPsec policies (phase 1). crypto map mymap 10  
ipsec-isakmp  
  set peer 209.165.200.2  
  set transform-set basic  
  match address 101  
!  
!  
!  
interface Ethernet0/0  
  ip address 172.16.1.2 255.255.255.0  
  crypto map mymap  
!  
interface Ethernet1/0  
  ip address 172.16.2.1 255.255.255.0  
!  
ip classless  
ip route 0.0.0.0 0.0.0.0 172.16.1.1  
no ip http server  
no ip http secure-server  
!  
!  
!  
access-list 101 permit ip 172.16.2.0 0.0.0.255  
192.168.1.0 0.0.0.255  
access-list 101 remark Crypto ACL  
!  
!  
!  
control-plane  
!  
!  
line con 0  
line aux 0  
line vty 0 4  
!  
!  
end
```

確認

このセクションでは、設定が正しく動作していることを確認するための情報を提供しています。

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。

- [IPSec NAT 透過を伴う場合の確認](#)
- [IPSec NAT 透過を伴わない場合の確認](#)

[IPSec NAT 透過を伴う場合の確認](#)

- **show crypto isakmp sa** : ピアにおける現在のインターネット鍵交換 (IKE) セキュリティアソシエーション (SA) をすべて表示します。VPN-Gateway1#**show crypto isakmp sa**

```
dst          src          state         conn-id slot
209.165.200.2 209.165.201.2 QM_IDLE      1      0
```

```
VPN-Gateway2#show crypto isakmp sa
```

```
dst          src          state         conn-id slot
209.165.200.2 172.16.1.2   QM_IDLE      1      0
```

- **show crypto ipsec sa** : ピア間に構築された IPSec SA を表示します。VPN-Gateway1#**show crypto ipsec sa**

```
!--- This command is issued after a ping !--- is attempted from PC2 to PC1. interface:
Serial1/0 Crypto map tag: mymap, local addr. 209.165.200.2 protected vrf: local ident
(addr/mask/prot/port): (192.168.1.0/255.255.255.0/0/0) remote ident (addr/mask/prot/port):
(172.16.2.0/255.255.255.0/0/0) current_peer: 209.165.201.2:4500 PERMIT,
flags={origin_is_acl,} #pkts encaps: 6, #pkts encrypt: 6, #pkts digest: 6 #pkts decaps: 6,
#pkts decrypt: 6, #pkts verify: 6 #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.: 209.165.200.2, remote crypto endpt.:
209.165.201.2 path mtu 1500, media mtu 1500 current outbound spi: 9CCA0619 inbound esp sas:
spi: 0x4E6B990F(1315674383) transform: esp-des esp-md5-hmac , in use settings ={Tunnel UDP-
Encaps, } slot: 0, conn id: 2000, flow_id: 5, crypto map: mymap crypto engine type:
Software, engine_id: 1 sa timing: remaining key lifetime (k/sec): (4602622/3489)
ike_cookies: 8973C578 9C7DEB45 5C9BE6DC 7F737D09 IV size: 8 bytes replay detection support:
Y inbound ah sas: inbound pcp sas: outbound esp sas: spi: 0x9CCA0619(2630485529) transform:
esp-des esp-md5-hmac , in use settings ={Tunnel UDP-Encaps, } slot: 0, conn id: 2001,
flow_id: 6, crypto map: mymap crypto engine type: Software, engine_id: 1 sa timing:
remaining key lifetime (k/sec): (4602622/3489) ike_cookies: 8973C578 9C7DEB45 5C9BE6DC
7F737D09 IV size: 8 bytes replay detection support: Y outbound ah sas: outbound pcp sas:
VPN-Gateway2#show crypto ipsec sa
```

```
!--- This command is issued after a ping !--- is attempted from PC2 to PC1. interface:
Ethernet0/0 Crypto map tag: mymap, local addr. 172.16.1.2 protected vrf: local ident
(addr/mask/prot/port): (172.16.2.0/255.255.255.0/0/0) remote ident (addr/mask/prot/port):
(192.168.1.0/255.255.255.0/0/0) current_peer: 209.165.200.2:4500 PERMIT,
flags={origin_is_acl,} #pkts encaps: 23, #pkts encrypt: 23, #pkts digest: 23 #pkts decaps:
16, #pkts decrypt: 16, #pkts verify: 16 #pkts compressed: 0, #pkts decompressed: 0 #pkts not
compressed: 0, #pkts compr. failed: 0 #pkts not decompressed: 0, #pkts decompress failed: 0
#send errors 7, #recv errors 0 local crypto endpt.: 172.16.1.2, remote crypto endpt.:
209.165.200.2 path mtu 1500, media mtu 1500 current outbound spi: 4E6B990F inbound esp sas:
spi: 0x9CCA0619(2630485529) transform: esp-des esp-md5-hmac , in use settings ={Tunnel UDP-
Encaps, } slot: 0, conn id: 2000, flow_id: 1, crypto map: mymap crypto engine type:
Software, engine_id: 1 sa timing: remaining key lifetime (k/sec): (4384024/3481)
ike_cookies: 5C9BE6DC 7F737D09 8973C578 9C7DEB45 IV size: 8 bytes replay detection support:
Y inbound ah sas: inbound pcp sas: outbound esp sas: spi: 0x4E6B990F(1315674383) transform:
```

```
esp-des esp-md5-hmac , in use settings ={Tunnel UDP-Encaps, } slot: 0, conn id: 2001,
flow_id: 2, crypto map: mymap crypto engine type: Software, engine_id: 1 sa timing:
remaining key lifetime (k/sec): (4384024/3481) ike_cookies: 5C9BE6DC 7F737D09 8973C578
9C7DEB45 IV size: 8 bytes replay detection support: Y outbound ah sas: outbound pcp sas:
```

- **show ip nat translations** : アクティブな NAT 変換を表示します。PAT-Router#**show ip nat translations**

```
Pro Inside global      Inside local      Outside local      Outside global
udp 209.165.201.2:500  172.16.1.2:500    ---                ---
udp 209.165.201.2:4500 172.16.1.2:4500  ---                ---
```

IPSec NAT 透過を伴わない場合の確認

- **show crypto isakmp sa** : 現在ピアにあるすべての IKE SA を表示します。VPN-Gateway1#**show crypto isakmp sa**

```
dst          src          state          conn-id slot
209.165.200.2 209.165.201.2 QM_IDLE        1      0
```

```
VPN-Gateway2#show crypto isakmp sa
```

```
dst          src          state          conn-id slot
209.165.200.2 172.16.1.2    QM_IDLE        1      0
```

- **show crypto ipsec sa** : ピア間に構築された IPSec SA を表示します。VPN-Gateway1#**show crypto ipsec sa**

```
!--- This command is issued after a ping !--- is attempted from PC2 to PC1. interface:
Serial1/0 Crypto map tag: mymap, local addr. 209.165.200.2 protected vrf: local ident
(addr/mask/prot/port): (192.168.1.0/255.255.255.0/0/0) remote ident (addr/mask/prot/port):
(172.16.2.0/255.255.255.0/0/0) current_peer: 209.165.201.2:500 PERMIT,
flags={origin_is_acl,} #pkts encaps: 21, #pkts encrypt: 21, #pkts digest: 21 #pkts decaps:
15, #pkts decrypt: 15, #pkts verify: 15 #pkts compressed: 0, #pkts decompressed: 0 #pkts not
compressed: 0, #pkts compr. failed: 0 #pkts not decompressed: 0, #pkts decompress failed: 0
#send errors 4, #recv errors 0 local crypto endpt.: 209.165.200.2, remote crypto endpt.:
209.165.201.2 path mtu 1500, media mtu 1500 current outbound spi: E89A0245 inbound esp sas:
spi: 0xB5F867BC(3052955580) transform: esp-des esp-md5-hmac , in use settings ={Tunnel, }
slot: 0, conn id: 2000, flow_id: 7, crypto map: mymap crypto engine type: Software,
engine_id: 1 sa timing: remaining key lifetime (k/sec): (4538665/3553) ike_cookies: 8973C578
DD91CB42 5C9BE6DC 63813771 IV size: 8 bytes replay detection support: Y inbound ah sas:
inbound pcp sas: outbound esp sas: spi: 0xE89A0245(3902407237) transform: esp-des esp-md5-
hmac , in use settings ={Tunnel, } slot: 0, conn id: 2001, flow_id: 8, crypto map: mymap
crypto engine type: Software, engine_id: 1 sa timing: remaining key lifetime (k/sec):
(4538665/3553) ike_cookies: 8973C578 DD91CB42 5C9BE6DC 63813771 IV size: 8 bytes replay
detection support: Y outbound ah sas: outbound pcp sas: VPN-Gateway2#show crypto ipsec sa
```

```
!--- This command is issued after a ping !--- is attempted from PC2 to PC1. interface:
Ethernet0/0 Crypto map tag: mymap, local addr. 172.16.1.2 protected vrf: local ident
(addr/mask/prot/port): (172.16.2.0/255.255.255.0/0/0) remote ident (addr/mask/prot/port):
(192.168.1.0/255.255.255.0/0/0) current_peer: 209.165.200.2:500 PERMIT,
flags={origin_is_acl,} #pkts encaps: 5, #pkts encrypt: 5, #pkts digest: 5 #pkts decaps: 5,
#pkts decrypt: 5, #pkts verify: 5 #pkts compressed: 0, #pkts decompressed: 0 #pkts not
compressed: 0, #pkts compr. failed: 0 #pkts not decompressed: 0, #pkts decompress failed: 0
#send errors 1, #recv errors 0 local crypto endpt.: 172.16.1.2, remote crypto endpt.:
209.165.200.2 path mtu 1500, media mtu 1500 current outbound spi: B5F867BC inbound esp sas:
spi: 0xE89A0245(3902407237) transform: esp-des esp-md5-hmac , in use settings ={Tunnel, }
slot: 0, conn id: 2000, flow_id: 3, crypto map: mymap crypto engine type: Software,
engine_id: 1 sa timing: remaining key lifetime (k/sec): (4572084/3561) ike_cookies: 5C9BE6DC
63813771 8973C578 DD91CB42 IV size: 8 bytes replay detection support: Y inbound ah sas:
inbound pcp sas: outbound esp sas: spi: 0xB5F867BC(3052955580) transform: esp-des esp-md5-
hmac , in use settings ={Tunnel, } slot: 0, conn id: 2001, flow_id: 4, crypto map: mymap
crypto engine type: Software, engine_id: 1 sa timing: remaining key lifetime (k/sec):
(4572084/3561) ike_cookies: 5C9BE6DC 63813771 8973C578 DD91CB42 IV size: 8 bytes replay
detection support: Y outbound ah sas: outbound pcp sas:
```

- **show ip nat translations** : アクティブな NAT 変換を表示します。PAT-Router#`show ip nat translations`
- | Proto | Inside global | Inside local | Outside local | Outside global |
|-------|-------------------|----------------|---------------|----------------|
| udp | 209.165.201.2:500 | 172.16.1.2:500 | --- | --- |
| esp | 209.165.201.2:0 | 172.16.1.2:0 | --- | --- |

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。

PAT を取り込んだ LAN-to-LAN IPSec トンネルをこのドキュメントの説明どおりに設定しても問題が起こる場合は、Cisco テクニカル サポート による分析用に、各デバイスの **debug** 出力と **show** コマンドの出力を収集してください。

この設定に関連するトラブルシューティング情報を次に示します。トラブルシューティングのその他の情報に関しては、[IP Security Troubleshooting - Understanding and Using debug Commands](#) および [NAT の動作確認と NAT の基本的なトラブルシューティング](#)を参照して下さい

。

debug コマンドとサンプル出力が、このセクションで示されています。

- [IPSec NAT 透過を伴う場合のトラブルシューティング](#)
- [IPSec NAT 透過を伴わない場合のトラブルシューティング](#)

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。

IPSec NAT 透過を伴う場合のトラブルシューティング

- **debug crypto ipsec** : フェーズ 2 の IPSec ネゴシエーションを表示します。
- **debug crypto isakmp** : フェーズ 1 の ISAKMP ネゴシエーションを表示します。
- **debug ip nat detail** : ルータで実行中の NAT を検証します。

次に、サンプルのコマンド出力を示します。

```
VPN-Gateway1#debug crypto ipsec
Crypto IPSEC debugging is on
VPN-Gateway1#debug crypto isakmp
Crypto ISAKMP debugging is on
VPN-Gateway1#show debug
Cryptographic Subsystem:
  Crypto ISAKMP debugging is on
  Crypto IPSEC debugging is on
```

```
!--- These debugs appeared after a ping !--- was attempted from PC2 to PC1. *Jun 27
09:31:36.159: ISAKMP (0:0): received packet from 209.165.201.2 dport 500 sport 500 Global (N)
NEW SA *Jun 27 09:31:36.159: ISAKMP: Created a peer struct for 209.165.201.2, peer port 500 *Jun
27 09:31:36.159: ISAKMP: Locking peer struct 0x2C50610, IKE refcount 1 for
crypto_isakmp_process_block *Jun 27 09:31:36.159: ISAKMP: local port 500, remote port 500 *Jun
27 09:31:36.559: insert sa successfully sa = 290B720 *Jun 27 09:31:36.559:
ISAKMP:(0:1:SW:1):Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:31:36.559:
ISAKMP:(0:1:SW:1):Old State = IKE_READY New State = IKE_R_MM1 *Jun 27 09:31:36.619:
ISAKMP:(0:1:SW:1): processing SA payload. message ID = 0 *Jun 27 09:31:36.619:
ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1): vendor
ID seems Unity/DPD but major 157 mismatch *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1): vendor ID is
NAT-T v3 *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27
09:31:36.619: ISAKMP:(0:1:SW:1): vendor ID seems Unity/DPD but major 123 mismatch *Jun 27
09:31:36.619: ISAKMP:(0:1:SW:1): vendor ID is NAT-T v2 *Jun 27 09:31:36.619: ISAKMP: Looking for
```

a matching key for 209.165.201.2 in default : success *Jun 27 09:31:36.619:
ISAKMP:(0:1:SW:1):found peer pre-shared key matching 209.165.201.2 *Jun 27 09:31:36.619:
ISAKMP:(0:1:SW:1): local preshared key found *Jun 27 09:31:36.619: ISAKMP : Scanning profiles
for xauth ... *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1):Checking ISAKMP transform 1 against
priority 10 policy *Jun 27 09:31:36.619: ISAKMP: encryption DES-CBC *Jun 27 09:31:36.619:
ISAKMP: hash SHA *Jun 27 09:31:36.619: ISAKMP: default group 1 *Jun 27 09:31:36.619: ISAKMP:
auth pre-share *Jun 27 09:31:36.619: ISAKMP: life type in seconds *Jun 27 09:31:36.619: ISAKMP:
life duration (VPI) of 0x0 0x1 0x51 0x80 *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1):atts are
acceptable. Next payload is 0 *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1): processing vendor id
payload *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1): vendor ID seems Unity/DPD but major 157
mismatch *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1): vendor ID is NAT-T v3 *Jun 27 09:31:36.619:
ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1): vendor
ID seems Unity/DPD but major 123 mismatch *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1): vendor ID is
NAT-T v2 *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PROCESS_MAIN_MODE *Jun 27 09:31:36.619: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM1 New State =
IKE_R_MM1 *Jun 27 09:31:36.771: ISAKMP:(0:1:SW:1): constructed NAT-T vendor-03 ID *Jun 27
09:31:36.771: ISAKMP:(0:1:SW:1): sending packet to 209.165.201.2 my_port 500 peer_port 500 (R)
MM_SA_SETUP *Jun 27 09:31:36.771: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PROCESS_COMPLETE *Jun 27 09:31:36.771: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM1 New State =
IKE_R_MM2 *Jun 27 09:31:37.179: ISAKMP (0:134217729): received packet from 209.165.201.2 dport
500 sport 500 Global (R) MM_SA_SETUP *Jun 27 09:31:37.179: ISAKMP:(0:1:SW:1):Input =
IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:31:37.179: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM2
New State = IKE_R_MM3 *Jun 27 09:31:38.199: ISAKMP:(0:1:SW:1): processing KE payload. message ID
= 0 *Jun 27 09:31:38.199: ISAKMP:(0:1:SW:1): processing NONCE payload. message ID = 0 *Jun 27
09:31:38.759: ISAKMP: Looking for a matching key for 209.165.201.2 in default : success *Jun 27
09:31:38.759: ISAKMP:(0:1:SW:1):found peer pre-shared key matching 209.165.201.2 *Jun 27
09:31:38.759: ISAKMP:(0:1:SW:1):SKEYID state generated *Jun 27 09:31:38.759: ISAKMP:(0:1:SW:1):
processing vendor id payload *Jun 27 09:31:38.759: ISAKMP:(0:1:SW:1): vendor ID is Unity *Jun 27
09:31:38.759: ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27 09:31:38.759:
ISAKMP:(0:1:SW:1): vendor ID is DPD *Jun 27 09:31:38.759: ISAKMP:(0:1:SW:1): processing vendor
id payload *Jun 27 09:31:38.759: ISAKMP:(0:1:SW:1): speaking to another IOS box! *Jun 27
09:31:38.759: ISAKMP:received payload type 17 *Jun 27 09:31:38.759: ISAKMP:received payload type
17 *Jun 27 09:31:38.759: ISAKMP (0:134217729): NAT found, the node outside NAT *Jun 27
09:31:38.759: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE *Jun 27
09:31:38.759: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM3 New State = IKE_R_MM3 *Jun 27
09:31:38.891: ISAKMP:(0:1:SW:1): sending packet to 209.165.201.2 my_port 500 peer_port 500 (R)
MM_KEY_EXCH *Jun 27 09:31:38.891: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PROCESS_COMPLETE *Jun 27 09:31:38.891: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM3 New State =
IKE_R_MM4 *Jun 27 09:31:40.071: ISAKMP (0:134217729): received packet from 209.165.201.2 dport
4500 sport 4500 Global (R) MM_KEY_EXCH *Jun 27 09:31:40.071: ISAKMP:(0:1:SW:1):Input =
IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:31:40.071: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM4
New State = IKE_R_MM5 *Jun 27 09:31:40.199: ISAKMP:(0:1:SW:1): processing ID payload. message ID
= 0 *Jun 27 09:31:40.199: ISAKMP (0:134217729): ID payload next-payload : 8 type : 1 address :
172.16.1.2 protocol : 17 port : 0 length : 12 *Jun 27 09:31:40.199: ISAKMP:(0:1:SW:1):: peer
matches *none* of the profiles *Jun 27 09:31:40.199: ISAKMP:(0:1:SW:1): processing HASH payload.
message ID = 0 *Jun 27 09:31:40.199: ISAKMP:(0:1:SW:1): processing NOTIFY_INITIAL_CONTACT
protocol 1 spi 0, message ID = 0, sa = 290B720 *Jun 27 09:31:40.199: ISAKMP:(0:1:SW:1):SA
authentication status: authenticated *Jun 27 09:31:40.199: ISAKMP:(0:1:SW:1): Process initial
contact, bring down existing phase 1 and 2 SA's with local 209.165.200.2 remote 209.165.201.2
remote port 4500 *Jun 27 09:31:40.231: IPSEC(key_engine): got a queue event with 1 kei messages
*Jun 27 09:31:40.399: ISAKMP:(0:1:SW:1):SA authentication status: authenticated *Jun 27
09:31:40.399: ISAKMP:(0:1:SW:1):SA has been authenticated with 209.165.201.2 *Jun 27
09:31:40.399: ISAKMP:(0:1:SW:1):Detected port floating to port = 4500 *Jun 27 09:31:40.399:
ISAKMP: Trying to insert a peer 209.165.200.2/209.165.201.2/4500/, and inserted successfully.
*Jun 27 09:31:40.399: ISAKMP:(0:1:SW:1):: peer matches *none* of the profiles *Jun 27
09:31:40.399: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE *Jun 27
09:31:40.399: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM5 New State = IKE_R_MM5 *Jun 27
09:31:40.459: ISAKMP:(0:1:SW:1):SA is doing pre-shared key authentication using id type
ID_IPV4_ADDR *Jun 27 09:31:40.459: ISAKMP (0:134217729): ID payload next-payload : 8 type : 1
address : 209.165.200.2 protocol : 17 port : 0 length : 12 *Jun 27 09:31:40.459:
ISAKMP:(0:1:SW:1):Total payload length: 12 *Jun 27 09:31:40.459: ISAKMP:(0:1:SW:1): sending
packet to 209.165.201.2 my_port 4500 peer_port 4500 (R) MM_KEY_EXCH *Jun 27 09:31:40.459:
ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_COMPLETE *Jun 27 09:31:40.459:
ISAKMP:(0:1:SW:1):Old State = IKE_R_MM5 New State = IKE_P1_COMPLETE *Jun 27 09:31:40.539:

ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PHASE1_COMPLETE *Jun 27 09:31:40.539:
ISAKMP:(0:1:SW:1):Old State = IKE_P1_COMPLETE New State = IKE_P1_COMPLETE *Jun 27 09:31:40.999:
ISAKMP (0:134217729): received packet from 209.165.201.2 dport 4500 sport 4500 Global (R)
QM_IDLE *Jun 27 09:31:40.999: ISAKMP: set new node 1546295295 to QM_IDLE *Jun 27 09:31:40.999:
ISAKMP:(0:1:SW:1): processing HASH payload. message ID = 1546295295 *Jun 27 09:31:40.999:
ISAKMP:(0:1:SW:1): processing SA payload. message ID = 1546295295 *Jun 27 09:31:40.999:
ISAKMP:(0:1:SW:1):Checking IPsec proposal 1 *Jun 27 09:31:40.999: ISAKMP: transform 1, ESP_DES
*Jun 27 09:31:40.999: ISAKMP: attributes in transform: *Jun 27 09:31:40.999: ISAKMP: encaps is
61443 (Tunnel-UDP) *Jun 27 09:31:40.999: ISAKMP: SA life type in seconds *Jun 27 09:31:40.999:
ISAKMP: SA life duration (basic) of 3600 *Jun 27 09:31:40.999: ISAKMP: SA life type in kilobytes
*Jun 27 09:31:40.999: ISAKMP: SA life duration (VPI) of 0x0 0x46 0x50 0x0 *Jun 27 09:31:40.999:
ISAKMP: authenticator is HMAC-MD5 *Jun 27 09:31:40.999: ISAKMP:(0:1:SW:1):atts are acceptable.
*Jun 27 09:31:40.999: IPSEC(validate_proposal_request): proposal part #1, (key eng. msg.)
INBOUND local= 209.165.200.2, remote= 209.165.201.2, local_proxy= 192.168.1.0/255.255.255.0/0/0
(type=4), remote_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des
esp-md5-hmac (Tunnel-UDP), lifedur= 0s and 0kb, spi= 0x0(0), conn_id= 0, keysize= 0, flags=
0x400 *Jun 27 09:31:40.999: IPSEC(kei_proxy): head = mymap, map->ivrf = , kei->ivrf = *Jun 27
09:31:40.999: ISAKMP:(0:1:SW:1): processing NONCE payload. message ID = 1546295295 *Jun 27
09:31:40.999: ISAKMP:(0:1:SW:1): processing ID payload. message ID = 1546295295 *Jun 27
09:31:40.999: ISAKMP:(0:1:SW:1): processing ID payload. message ID = 1546295295 *Jun 27
09:31:40.999: ISAKMP:(0:1:SW:1): asking for 1 spis from ipsec *Jun 27 09:31:40.999:
ISAKMP:(0:1:SW:1):Node 1546295295, Input = IKE_MSG_FROM_PEER, IKE_QM_EXCH *Jun 27 09:31:40.999:
ISAKMP:(0:1:SW:1):Old State = IKE_QM_READY New State = IKE_QM_SPI_STARVE *Jun 27 09:31:41.031:
IPSEC(key_engine): got a queue event with 1 kei messages *Jun 27 09:31:41.031:
IPSEC(spi_response): getting spi 1315674383 for SA from 209.165.200.2 to 209.165.201.2 for prot
3 *Jun 27 09:31:41.079: ISAKMP: received ike message (2/1) *Jun 27 09:31:42.039:
ISAKMP:(0:1:SW:1): sending packet to 209.165.201.2 my_port 4500 peer_port 4500 (R) QM_IDLE *Jun
27 09:31:42.039: ISAKMP:(0:1:SW:1):Node 1546295295, Input = IKE_MSG_FROM_IPSEC, IKE_SPI_REPLY
*Jun 27 09:31:42.039: ISAKMP:(0:1:SW:1):Old State = IKE_QM_SPI_STARVE New State = IKE_QM_R_QM2
*Jun 27 09:31:42.311: ISAKMP (0:134217729): received packet from 209.165.201.2 dport 4500 sport
4500 Global (R) QM_IDLE *Jun 27 09:31:42.311: IPsec: Flow_switching Allocated flow for flow_id
134217733 *Jun 27 09:31:42.311: IPsec: Flow_switching Allocated flow for flow_id 134217734 *Jun
27 09:31:43.339: %CRYPTO-5-SESSION_STATUS: Crypto tunnel is UP . Peer 209.165.201.2:4500 Id:
172.16.1.2 *Jun 27 09:31:43.339: ISAKMP: Locking peer struct 0x2C50610, IPSEC refcount 1 for for
stuff_ke *Jun 27 09:31:43.339: ISAKMP:(0:1:SW:1): Creating IPsec SAs *Jun 27 09:31:43.339:
inbound SA from 209.165.201.2 to 209.165.200.2 (f/i) 0/ 0 (proxy 172.16.2.0 to 192.168.1.0) *Jun
27 09:31:43.339: has spi 0x4E6B990F and conn_id 2000 and flags 400 *Jun 27 09:31:43.339:
lifetime of 3600 seconds *Jun 27 09:31:43.339: lifetime of 4608000 kilobytes *Jun 27
09:31:43.339: has client flags 0x10 *Jun 27 09:31:43.339: outbound SA from 209.165.200.2 to
209.165.201.2 (f/i) 0/0 (proxy 192.168.1.0 to 172.16.2.0) *Jun 27 09:31:43.339: has spi -
1664481767 and conn_id 2001 and flags 408 *Jun 27 09:31:43.339: lifetime of 3600 seconds *Jun 27
09:31:43.339: lifetime of 4608000 kilobytes *Jun 27 09:31:43.339: has client flags 0x10 *Jun 27
09:31:43.339: ISAKMP:(0:1:SW:1):deleting node 1546295295 error FALSE reason "quick mode done
(await)" *Jun 27 09:31:43.339: ISAKMP:(0:1:SW:1):Node 1546295295, Input = IKE_MSG_FROM_PEER,
IKE_QM_EXCH *Jun 27 09:31:43.339: ISAKMP:(0:1:SW:1):Old State = IKE_QM_R_QM2 New State =
IKE_QM_PHASE2_COMPLETE *Jun 27 09:31:43.359: IPSEC(key_engine): got a queue event with 2 kei
messages *Jun 27 09:31:43.359: IPSEC(initialize_sas): , (key eng. msg.) INBOUND local=
209.165.200.2, remote= 209.165.201.2, local_proxy= 192.168.1.0/255.255.255.0/0/0 (type=4),
remote_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-
hmac (Tunnel-UDP), lifedur= 3600s and 4608000kb, spi= 0x4E6B990F(1315674383), conn_id=
134219728, keysize= 0, flags= 0x400 *Jun 27 09:31:43.359: IPSEC(initialize_sas): , (key eng.
msg.) OUTBOUND local= 209.165.200.2, remote= 209.165.201.2, local_proxy=
192.168.1.0/255.255.255.0/0/0 (type=4), remote_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4),
protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel-UDP), lifedur= 3600s and 4608000kb, spi=
0x9CCA0619(2630485529), conn_id= 134219729, keysize= 0, flags= 0x408 *Jun 27 09:31:43.359:
IPSEC(kei_proxy): head = mymap, map->ivrf = , kei->ivrf = *Jun 27 09:31:43.359:
IPSEC(crypto_ipsec_sa_find_ident_head): reconnecting with the same proxies and 209.165.201.2
*Jun 27 09:31:43.359: IPSEC(mtree_add_ident): src 192.168.1.0, dest 172.16.2.0, dest_port 0 *Jun
27 09:31:43.359: IPSEC(create_sa): sa created, (sa) sa_dest= 209.165.200.2, sa_prot= 50, sa_spi=
0x4E6B990F(1315674383), sa_trans= esp-des esp-md5-hmac , sa_conn_id= 134219728 *Jun 27
09:31:43.359: IPSEC(create_sa): sa created, (sa) sa_dest= 209.165.201.2, sa_prot= 50, sa_spi=
0x9CCA0619(2630485529), sa_trans= esp-des esp-md5-hmac , sa_conn_id= 134219729 *Jun 27
09:32:33.359: ISAKMP:(0:1:SW:1):purging node 1546295295 VPN-Gateway2#debug crypto ipsec
Crypto IPSEC debugging is on

VPN-Gateway2#debug crypto isakmp

Crypto ISAKMP debugging is on

VPN-Gateway2#show debug

Cryptographic Subsystem:

Crypto ISAKMP debugging is on

Crypto IPSEC debugging is on

VPN-Gateway2#

!--- These debugs appeared after a ping !--- was attempted from PC2 to PC1. *Jun 27
09:31:35.447: IPSEC(sa_request): , (key eng. msg.) OUTBOUND local= 172.16.1.2, remote=
209.165.200.2, local_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), remote_proxy=
192.168.1.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel),
lifedur= 3600s and 4608000kb, spi= 0x9CCA0619(263048529), conn_id= 0, keysize= 0, flags= 0x400A
*Jun 27 09:31:35.455: ISAKMP: received ke message (1/1) *Jun 27 09:31:35.455:
ISAKMP:(0:0:N/A:0): SA request profile is (NULL) *Jun 27 09:31:35.455: ISAKMP: Created a peer
struct for 209.165.200.2, peer port 500 *Jun 27 09:31:35.455: ISAKMP: Locking peer struct
0x2C42438, IKE refcount 1 for isakmp_initiator *Jun 27 09:31:35.455: ISAKMP: local port 500,
remote port 500 *Jun 27 09:31:35.487: ISAKMP: set new node 0 to QM_IDLE *Jun 27 09:31:35.487:
insert sa successfully sa = 2CB1E80 *Jun 27 09:31:35.487: ISAKMP:(0:1:SW:1):Can not start
Aggressive mode, trying Main mode. *Jun 27 09:31:35.487: ISAKMP: Looking for a matching key for
209.165.200.2 in default : success *Jun 27 09:31:35.487: ISAKMP:(0:1:SW:1):found peer pre-shared
key matching 209.165.200.2 *Jun 27 09:31:35.487: ISAKMP:(0:1:SW:1): constructed NAT-T vendor-03
ID *Jun 27 09:31:35.487: ISAKMP:(0:1:SW:1): constructed NAT-T vendor-02 ID *Jun 27 09:31:35.487:
ISAKMP:(0:1:SW:1):Input = IKE_MSG_FROM_IPSEC, IKE_SA_REQ_MM *Jun 27 09:31:35.487:
ISAKMP:(0:1:SW:1):Old State = IKE_READY New State = IKE_I_MM1 *Jun 27 09:31:35.487:
ISAKMP:(0:1:SW:1): beginning Main Mode exchange *Jun 27 09:31:35.487: ISAKMP:(0:1:SW:1): sending
packet to 209.165.200.2 my_port 500 peer_port 500 (I) MM_NO_STATE *Jun 27 09:31:36.607: ISAKMP
(0:134217729): received packet from 209.165.200.2 dport 500 sport 500 Global (I) MM_NO_STATE
*Jun 27 09:31:36.607: ISAKMP:(0:1:SW:1):Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27
09:31:36.607: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM1 New State = IKE_I_MM2 *Jun 27
09:31:36.687: ISAKMP:(0:1:SW:1): processing SA payload. message ID = 0 *Jun 27 09:31:36.687:
ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27 09:31:36.687: ISAKMP:(0:1:SW:1): vendor
ID seems Unity/DPD but major 157 mismatch *Jun 27 09:31:36.687: ISAKMP:(0:1:SW:1): vendor ID is
NAT-T v3 *Jun 27 09:31:36.687: ISAKMP: Looking for a matching key for 209.165.200.2 in default :
success *Jun 27 09:31:36.687: ISAKMP:(0:1:SW:1):found peer pre-shared key matching 209.165.200.2
*Jun 27 09:31:36.687: ISAKMP:(0:1:SW:1): local preshared key found *Jun 27 09:31:36.687: ISAKMP
: Scanning profiles for xauth ... *Jun 27 09:31:36.687: ISAKMP:(0:1:SW:1):Checking ISAKMP
transform 1 against priority 10 policy *Jun 27 09:31:36.687: ISAKMP: encryption DES-CBC *Jun 27
09:31:36.687: ISAKMP: hash SHA *Jun 27 09:31:36.687: ISAKMP: default group 1 *Jun 27
09:31:36.687: ISAKMP: auth pre-share *Jun 27 09:31:36.687: ISAKMP: life type in seconds *Jun 27
09:31:36.687: ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80 *Jun 27 09:31:36.687:
ISAKMP:(0:1:SW:1):atts are acceptable. Next payload is 0 *Jun 27 09:31:36.687:
ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27 09:31:36.687: ISAKMP:(0:1:SW:1): vendor
ID seems Unity/DPD but major 157 mismatch *Jun 27 09:31:36.687: ISAKMP:(0:1:SW:1): vendor ID is
NAT-T v3 *Jun 27 09:31:36.687: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PROCESS_MAIN_MODE *Jun 27 09:31:36.687: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM2 New State =
IKE_I_MM2 *Jun 27 09:31:36.795: ISAKMP:(0:1:SW:1): sending packet to 209.165.200.2 my_port 500
peer_port 500 (I) MM_SA_SETUP *Jun 27 09:31:36.795: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PROCESS_COMPLETE *Jun 27 09:31:36.795: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM2 New State =
IKE_I_MM3 *Jun 27 09:31:38.727: ISAKMP (0:134217729): received packet from 209.165.200.2 dport
500 sport 500 Global (I) MM_SA_SETUP *Jun 27 09:31:38.727: ISAKMP:(0:1:SW:1):Input =
IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:31:38.727: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM3
New State = IKE_I_MM4 *Jun 27 09:31:38.807: ISAKMP:(0:1:SW:1): processing KE payload. message ID
= 0 *Jun 27 09:31:38.807: ISAKMP:(0:1:SW:1): processing NONCE payload. message ID = 0 *Jun 27
09:31:38.807: ISAKMP: Looking for a matching key for 209.165.200.2 in default : success *Jun 27
09:31:38.807: ISAKMP:(0:1:SW:1):found peer pre-shared key matching 209.165.200.2 *Jun 27
09:31:38.807: ISAKMP:(0:1:SW:1):SKEYID state generated *Jun 27 09:31:38.807: ISAKMP:(0:1:SW:1):
processing vendor id payload *Jun 27 09:31:38.807: ISAKMP:(0:1:SW:1): vendor ID is Unity *Jun 27
09:31:38.807: ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27 09:31:38.807:
ISAKMP:(0:1:SW:1): vendor ID is DPD *Jun 27 09:31:38.807: ISAKMP:(0:1:SW:1): processing vendor
id payload *Jun 27 09:31:38.807: ISAKMP:(0:1:SW:1): speaking to another IOS box! *Jun 27
09:31:38.807: ISAKMP:received payload type 17 *Jun 27 09:31:38.807: ISAKMP (0:134217729): NAT
found, the node inside NAT *Jun 27 09:31:38.807: ISAKMP:received payload type 17 *Jun 27
09:31:38.807: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE *Jun 27

09:31:38.807: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM4 New State = IKE_I_MM4 *Jun 27
09:31:38.935: ISAKMP:(0:1:SW:1):Send initial contact *Jun 27 09:31:38.935: ISAKMP:(0:1:SW:1):SA
is doing pre-shared key authentication using id type ID_IPV4_ADDR *Jun 27 09:31:38.935: ISAKMP
(0:134217729): ID payload next-payload : 8 type : 1 address : 172.16.1.2 protocol : 17 port : 0
length : 12 *Jun 27 09:31:38.935: ISAKMP:(0:1:SW:1):Total payload length: 12 *Jun 27
09:31:38.935: ISAKMP:(0:1:SW:1): sending packet to 209.165.200.2 my_port 4500 peer_port 4500 (I)
MM_KEY_EXCH *Jun 27 09:31:38.935: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PROCESS_COMPLETE *Jun 27 09:31:38.935: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM4 New State =
IKE_I_MM5 *Jun 27 09:31:40.307: ISAKMP (0:134217729): received packet from 209.165.200.2 dport
4500 sport 4500 Global (I) MM_KEY_EXCH *Jun 27 09:31:40.307: ISAKMP:(0:1:SW:1):Input =
IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:31:40.307: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM5
New State = IKE_I_MM6 *Jun 27 09:31:40.367: ISAKMP:(0:1:SW:1): processing ID payload. message ID
= 0 *Jun 27 09:31:40.367: ISAKMP (0:134217729): ID payload next-payload : 8 type : 1 address :
209.165.200.2 protocol : 17 port : 0 length : 12 *Jun 27 09:31:40.367: ISAKMP:(0:1:SW:1):
processing HASH payload. message ID = 0 *Jun 27 09:31:40.367: ISAKMP:(0:1:SW:1):SA
authentication status: authenticated *Jun 27 09:31:40.367: ISAKMP:(0:1:SW:1):SA has been
authenticated with 209.165.200.2 *Jun 27 09:31:40.367: ISAKMP:(0:1:SW:1):: peer matches *none*
of the profiles *Jun 27 09:31:40.367: ISAKMP:(0:1:SW:1):Setting UDP ENC peer struct 0x2940710
sa= 0x2CB1E80 *Jun 27 09:31:40.367: ISAKMP: Trying to insert a peer
172.16.1.2/209.165.200.2/4500/, and inserted successfully. *Jun 27 09:31:40.367:
ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE *Jun 27 09:31:40.367:
ISAKMP:(0:1:SW:1):Old State = IKE_I_MM6 New State = IKE_I_MM6 *Jun 27 09:31:40.367: ISAKMP:
sending nat keepalive packet to 209.165.200.2(4500) *Jun 27 09:31:40.395:
ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_COMPLETE *Jun 27 09:31:40.395:
ISAKMP:(0:1:SW:1):Old State = IKE_I_MM6 New State = IKE_P1_COMPLETE *Jun 27 09:31:40.475:
ISAKMP:(0:1:SW:1):beginning Quick Mode exchange, M-ID of 1546295295 *Jun 27 09:31:40.507:
ISAKMP:(0:1:SW:1): sending packet to 209.165.200.2 my_port 4500 peer_port 4500 (I) QM_IDLE *Jun
27 09:31:40.507: ISAKMP:(0:1:SW:1):Node 1546295295, Input = IKE_MSG_INTERNAL, IKE_INIT_QM *Jun
27 09:31:40.507: ISAKMP:(0:1:SW:1):Old State = IKE_QM_READY New State = IKE_QM_I_QM1 *Jun 27
09:31:40.507: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PHASE1_COMPLETE *Jun 27
09:31:40.507: ISAKMP:(0:1:SW:1):Old State = IKE_P1_COMPLETE New State = IKE_P1_COMPLETE *Jun 27
09:31:41.887: ISAKMP (0:134217729): received packet from 209.165.200.2 dport 4500 sport 4500
Global (I) QM_IDLE *Jun 27 09:31:41.887: ISAKMP:(0:1:SW:1): processing HASH payload. message ID
= 1546295295 *Jun 27 09:31:41.887: ISAKMP:(0:1:SW:1): processing SA payload. message ID =
1546295295 *Jun 27 09:31:41.887: ISAKMP:(0:1:SW:1):Checking IPsec proposal 1 *Jun 27
09:31:41.887: ISAKMP: transform 1, ESP_DES *Jun 27 09:31:41.887: ISAKMP: attributes in
transform: *Jun 27 09:31:41.887: ISAKMP: encaps is 61443 (Tunnel-UDP) *Jun 27 09:31:41.887:
ISAKMP: SA life type in seconds *Jun 27 09:31:41.887: ISAKMP: SA life duration (basic) of 3600
*Jun 27 09:31:41.887: ISAKMP: SA life type in kilobytes *Jun 27 09:31:41.887: ISAKMP: SA life
duration (VPI) of 0x0 0x46 0x50 0x0 *Jun 27 09:31:41.887: ISAKMP: authenticator is HMAC-MD5 *Jun
27 09:31:41.887: ISAKMP:(0:1:SW:1):atts are acceptable. *Jun 27 09:31:41.887:
IPSEC(validate_proposal_request): proposal part #1, (key eng. msg.) INBOUND local= 172.16.1.2,
remote= 209.165.200.2, local_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), remote_proxy=
192.168.1.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel-
UDP), lifedur= 0s and 0kb, spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x400 *Jun 27
09:31:41.887: IPSEC(kei_proxy): head = mymap, map->ivrf = , kei->ivrf = *Jun 27 09:31:41.887:
ISAKMP:(0:1:SW:1): processing NONCE payload. message ID = 1546295295 *Jun 27 09:31:41.887:
ISAKMP:(0:1:SW:1): processing ID payload. message ID = 1546295295 *Jun 27 09:31:41.887:
ISAKMP:(0:1:SW:1): processing ID payload. message ID = 1546295295 *Jun 27 09:31:41.887: IPsec:
Flow_switching Allocated flow for flow_id 134217729 *Jun 27 09:31:41.887: IPsec: Flow_switching
Allocated flow for flow_id 134217730 *Jun 27 09:31:41.947: %CRYPTO-5-SESSION_STATUS: Crypto
tunnel is UP . Peer 209.165.200.2:4500 Id: 209.165.200.2 *Jun 27 09:31:41.947: ISAKMP: Locking
peer struct 0x2C42438, IPSEC refcount 1 for for stuff_ke *Jun 27 09:31:41.947:
ISAKMP:(0:1:SW:1): Creating IPsec SAs *Jun 27 09:31:41.947: inbound SA from 209.165.200.2 to
172.16.1.2 (f/i) 0/ 0 (proxy 192.168.1.0 to 172.16.2.0) *Jun 27 09:31:41.947: has spi 0x9CCA0619
and conn_id 2000 and flags 400 *Jun 27 09:31:41.947: lifetime of 3600 seconds *Jun 27
09:31:41.947: lifetime of 4608000 kilobytes *Jun 27 09:31:41.947: has client flags 0x10 *Jun 27
09:31:41.947: outbound SA from 172.16.1.2 to 209.165.200.2 (f/i) 0/0 (proxy 172.16.2.0 to
192.168.1.0) *Jun 27 09:31:41.947: has spi 1315674383 and conn_id 2001 and flags 408 *Jun 27
09:31:41.947: lifetime of 3600 seconds *Jun 27 09:31:41.947: lifetime of 4608000 kilobytes *Jun
27 09:31:41.947: has client flags 0x10 *Jun 27 09:31:41.947: ISAKMP:(0:1:SW:1): sending packet
to 209.165.200.2 my_port 4500 peer_port 4500 (I) QM_IDLE *Jun 27 09:31:41.947:
ISAKMP:(0:1:SW:1):deleting node 1546295295 error FALSE reason "" *Jun 27 09:31:41.947:
ISAKMP:(0:1:SW:1):Node 1546295295, Input = IKE_MSG_FROM_PEER, IKE_QM_EXCH *Jun 27 09:31:41.947:


```
ISAKMP:(0:1:SW:1):Old State = IKE_QM_I_QM1 New State = IKE_QM_PHASE2_COMPLETE *Jun 27
09:31:41.955: IPSEC(key_engine): got a queue event with 2 kei messages *Jun 27 09:31:41.955:
IPSEC(initialize_sas): , (key eng. msg.) INBOUND local= 172.16.1.2, remote= 209.165.200.2,
local_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), remote_proxy= 192.168.1.0/255.255.255.0/0/0
(type=4), protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel-UDP), lifedur= 3600s and
4608000kb, spi= 0x9CCA0619(2630485529), conn_id= 134219728, keysize= 0, flags= 0x400 *Jun 27
09:31:41.955: IPSEC(initialize_sas): , (key eng. msg.) OUTBOUND local= 172.16.1.2, remote=
209.165.200.2, local_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), remote_proxy=
192.168.1.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel-
UDP), lifedur= 3600s and 4608000kb, spi= 0x4E6B990F(1315674383), conn_id= 134219729, keysize= 0,
flags= 0x408 *Jun 27 09:31:41.955: IPSEC(kei_proxy): head = mymap, map->ivrf = , kei->ivrf =
*Jun 27 09:31:41.955: IPSEC(crypto_ipsec_sa_find_ident_head): reconnecting with the same proxies
and 209.165.200.2 *Jun 27 09:31:41.955: IPSEC(mtree_add_ident): src 172.16.2.0, dest
192.168.1.0, dest_port 0 *Jun 27 09:31:41.955: IPSEC(create_sa): sa created, (sa) sa_dest=
172.16.1.2, sa_prot= 50, sa_spi= 0x9CCA0619(2630485529), sa_trans= esp-des esp-md5-hmac ,
sa_conn_id= 134219728 *Jun 27 09:31:41.955: IPSEC(create_sa): sa created, (sa) sa_dest=
209.165.200.2, sa_prot= 50, sa_spi= 0x4E6B990F(1315674383), sa_trans= esp-des esp-md5-hmac ,
sa_conn_id= 134219729 VPN-Gateway2# *Jun 27 09:32:31.979: ISAKMP:(0:1:SW:1):purging node
1546295295 PAT-Router#debug ip nat detail
IP NAT detailed debugging is on
PAT-Router#show debug
Generic IP:
    IP NAT detailed debugging is on
PAT-Router#
!--- The "i" in this line indicates the packet is traveling from the !--- inside to the outside
(from a NAT perspective) interface. The number in !--- the brackets is the identification number
in the IP packet. This is !--- useful when correlating information with sniffer traces taken
with a !--- network analyzer while troubleshooting problems. *Jun 27 09:31:35.375: NAT*: i: udp
(172.16.1.2, 500) -> (209.165.200.2, 500) [66] !--- The "s" in this next line shows the source
address of the packet and how it is !--- being translated. *Jun 27 09:31:35.375: NAT*:
s=172.16.1.2->209.165.201.2, d=209.165.200.2 [66] *Jun 27 09:31:36.475: NAT*: o: udp
(209.165.200.2, 500) -> (209.165.201.2, 500) [66] *Jun 27 09:31:36.475: NAT*: s=209.165.200.2,
d=209.165.201.2->172.16.1.2 [66] *Jun 27 09:31:36.683: NAT*: i: udp (172.16.1.2, 500) ->
(209.165.200.2, 500) [67] *Jun 27 09:31:36.683: NAT*: s=172.16.1.2->209.165.201.2,
d=209.165.200.2 [67] *Jun 27 09:31:38.595: NAT*: o: udp (209.165.200.2, 500) -> (209.165.201.2,
500) [67] *Jun 27 09:31:38.595: NAT*: s=209.165.200.2, d=209.165.201.2->172.16.1.2 [67] *Jun 27
09:31:38.823: NAT*: i: udp (172.16.1.2, 4500) -> (209.165.200.2, 4500) [68] *Jun 27
09:31:38.823: NAT*: s=172.16.1.2->209.165.201.2, d=209.165.200.2 [68] *Jun 27 09:31:40.163:
NAT*: o: udp (209.165.200.2, 4500) -> (209.165.201.2, 4500) [68] *Jun 27 09:31:40.163: NAT*:
s=209.165.200.2, d=209.165.201.2->172.16.1.2 [68] *Jun 27 09:31:40.255: NAT*: i: udp
(172.16.1.2, 4500) -> (209.165.200.2, 4500) [69] *Jun 27 09:31:40.255: NAT*: s=172.16.1.2-
>209.165.201.2, d=209.165.200.2 [69] *Jun 27 09:31:40.395: NAT*: i: udp (172.16.1.2, 4500) ->
(209.165.200.2, 4500) [70] *Jun 27 09:31:40.395: NAT*: s=172.16.1.2->209.165.201.2,
d=209.165.200.2 [70] *Jun 27 09:31:41.747: NAT*: o: udp (209.165.200.2, 4500) -> (209.165.201.2,
4500) [69] *Jun 27 09:31:41.747: NAT*: s=209.165.200.2, d=209.165.201.2->172.16.1.2 [69] *Jun 27
09:31:41.839: NAT*: i: udp (172.16.1.2, 4500) -> (209.165.200.2, 4500) [71] *Jun 27
09:31:41.839: NAT*: s=172.16.1.2->209.165.201.2, d=209.165.200.2 [71] *Jun 27 09:31:43.463:
NAT*: i: udp (172.16.1.2, 4500) -> (209.165.200.2, 4500) [72] *Jun 27 09:31:43.463: NAT*:
s=172.16.1.2->209.165.201.2, d=209.165.200.2 [72] *Jun 27 09:31:43.523: NAT*: o: udp
(209.165.200.2, 4500) -> (209.165.201.2, 4500) [70] *Jun 27 09:31:43.523: NAT*: s=209.165.200.2,
d=209.165.201.2->172.16.1.2 [70] *Jun 27 09:33:27.975: NAT*: i: udp (172.16.1.2, 4500) ->
(209.165.200.2, 4500) [73] *Jun 27 09:33:27.975: NAT*: s=172.16.1.2->209.165.201.2,
d=209.165.200.2 [73] *Jun 27 09:33:28.067: NAT*: o: udp (209.165.200.2, 4500) -> (209.165.201.2,
4500) [71] *Jun 27 09:33:28.067: NAT*: s=209.165.200.2, d=209.165.201.2->172.16.1.2 [71] *Jun 27
09:33:28.115: NAT*: i: udp (172.16.1.2, 4500) -> (209.165.200.2, 4500) [74] *Jun 27
09:33:28.115: NAT*: s=172.16.1.2->209.165.201.2, d=209.165.200.2 [74] *Jun 27 09:33:28.167:
NAT*: o: udp (209.165.200.2, 4500) -> (209.165.201.2, 4500) [72] *Jun 27 09:33:28.167: NAT*:
s=209.165.200.2, d=209.165.201.2->172.16.1.2 [72] *Jun 27 09:33:28.227: NAT*: i: udp
(172.16.1.2, 4500) -> (209.165.200.2, 4500) [75] *Jun 27 09:33:28.227: NAT*: s=172.16.1.2-
>209.165.201.2, d=209.165.200.2 [75] *Jun 27 09:33:28.283: NAT*: o: udp (209.165.200.2, 4500) ->
(209.165.201.2, 4500) [73] *Jun 27 09:33:28.283: NAT*: s=209.165.200.2, d=209.165.201.2-
>172.16.1.2 [73] *Jun 27 09:33:28.355: NAT*: i: udp (172.16.1.2, 4500) -> (209.165.200.2, 4500)
[76] *Jun 27 09:33:28.355: NAT*: s=172.16.1.2->209.165.201.2, d=209.165.200.2 [76] *Jun 27
09:33:28.407: NAT*: o: udp (209.165.200.2, 4500) -> (209.165.201.2, 4500) [74] *Jun 27
```

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09:33:28.407: NAT*: s=209.165.200.2, d=209.165.201.2->172.16.1.2 [74] *Jun 27 09:33:28.455:
NAT*: i: udp (172.16.1.2, 4500) -> (209.165.200.2, 4500) [77] *Jun 27 09:33:28.455: NAT*:
s=172.16.1.2->209.165.201.2, d=209.165.200.2 [77] *Jun 27 09:33:28.487: NAT*: o: udp
(209.165.200.2, 4500) -> (209.165.201.2, 4500) [75] *Jun 27 09:33:28.487: NAT*: s=209.165.200.2,
d=209.165.201.2->172.16.1.2 [75]
```

IPSec NAT 透過を伴わない場合のトラブルシューティング

- **debug crypto ipsec** : フェーズ 2 の IPSec ネゴシエーションを表示します。
- **debug crypto isakmp** : フェーズ 1 の ISAKMP ネゴシエーションを表示します。
- **debug ip nat detail** : ルータで実行中の NAT を検証します。

次に、サンプルのコマンド出力を示します。

```
VPN-Gateway1#debug crypto ipsec
Crypto IPSEC debugging is on
VPN-Gateway1#debug crypto isakmp
Crypto ISAKMP debugging is on
VPN-Gateway1#show debug
Cryptographic Subsystem:
  Crypto ISAKMP debugging is on
  Crypto IPSEC debugging is on
```

```
!--- These debugs appeared after a ping !--- was attempted from PC2 to PC1. *Jun 27
09:49:58.351: ISAKMP (0:0): received packet from 209.165.201.2 dport 500 sport 500 Global (N)
NEW SA *Jun 27 09:49:58.351: ISAKMP: Created a peer struct for 209.165.201.2, peer port 500 *Jun
27 09:49:58.351: ISAKMP: Locking peer struct 0x2C50328, IKE refcount 1 for
crypto_isakmp_process_block *Jun 27 09:49:58.351: ISAKMP: local port 500, remote port 500 *Jun
27 09:49:58.991: insert sa successfully sa = 29D2E80 *Jun 27 09:49:58.991:
ISAKMP:(0:1:SW:1):Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:49:58.991:
ISAKMP:(0:1:SW:1):Old State = IKE_READY New State = IKE_R_MM1 *Jun 27 09:49:59.151:
ISAKMP:(0:1:SW:1): processing SA payload. message ID = 0 *Jun 27 09:49:59.151: ISAKMP: Looking
for a matching key for 209.165.201.2 in default : success *Jun 27 09:49:59.151:
ISAKMP:(0:1:SW:1):found peer pre-shared key matching 209.165.201.2 *Jun 27 09:49:59.151:
ISAKMP:(0:1:SW:1): local preshared key found *Jun 27 09:49:59.151: ISAKMP : Scanning profiles
for xauth ... *Jun 27 09:49:59.151: ISAKMP:(0:1:SW:1):Checking ISAKMP transform 1 against
priority 10 policy *Jun 27 09:49:59.151: ISAKMP: encryption DES-CBC *Jun 27 09:49:59.151:
ISAKMP: hash SHA *Jun 27 09:49:59.151: ISAKMP: default group 1 *Jun 27 09:49:59.151: ISAKMP:
auth pre-share *Jun 27 09:49:59.151: ISAKMP: life type in seconds *Jun 27 09:49:59.151: ISAKMP:
life duration (VPI) of 0x0 0x1 0x51 0x80 *Jun 27 09:49:59.151: ISAKMP:(0:1:SW:1):atts are
acceptable. Next payload is 0 *Jun 27 09:49:59.151: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PROCESS_MAIN_MODE *Jun 27 09:49:59.151: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM1 New State =
IKE_R_MM1 *Jun 27 09:49:59.223: ISAKMP:(0:1:SW:1): sending packet to 209.165.201.2 my_port 500
peer_port 500 (R) MM_SA_SETUP *Jun 27 09:49:59.223: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PROCESS_COMPLETE *Jun 27 09:49:59.223: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM1 New State =
IKE_R_MM2 *Jun 27 09:49:59.711: ISAKMP (0:134217729): received packet from 209.165.201.2 dport
500 sport 500 Global (R) MM_SA_SETUP *Jun 27 09:49:59.711: ISAKMP:(0:1:SW:1):Input =
IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:49:59.711: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM2
New State = IKE_R_MM3 *Jun 27 09:49:59.763: ISAKMP:(0:1:SW:1): processing KE payload. message ID
= 0 *Jun 27 09:49:59.763: ISAKMP:(0:1:SW:1): processing NONCE payload. message ID = 0 *Jun 27
09:49:59.911: ISAKMP: Looking for a matching key for 209.165.201.2 in default : success *Jun 27
09:49:59.911: ISAKMP:(0:1:SW:1):found peer pre-shared key matching 209.165.201.2 *Jun 27
09:49:59.911: ISAKMP:(0:1:SW:1):SKEYID state generated *Jun 27 09:49:59.911: ISAKMP:(0:1:SW:1):
processing vendor id payload *Jun 27 09:49:59.911: ISAKMP:(0:1:SW:1): vendor ID is Unity *Jun 27
09:49:59.911: ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27 09:49:59.911:
ISAKMP:(0:1:SW:1): vendor ID is DPD *Jun 27 09:49:59.911: ISAKMP:(0:1:SW:1): processing vendor
id payload *Jun 27 09:49:59.911: ISAKMP:(0:1:SW:1): speaking to another IOS box! *Jun 27
09:49:59.911: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE *Jun 27
09:49:59.911: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM3 New State = IKE_R_MM3 *Jun 27
09:50:00.051: ISAKMP:(0:1:SW:1): sending packet to 209.165.201.2 my_port 500 peer_port 500 (R)
MM_KEY_EXCH *Jun 27 09:50:00.051: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PROCESS_COMPLETE *Jun 27 09:50:00.051: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM3 New State =
IKE_R_MM4 *Jun 27 09:50:00.743: ISAKMP (0:134217729): received packet from 209.165.201.2 dport
```

500 sport 500 Global (R) MM_KEY_EXCH *Jun 27 09:50:00.743: ISAKMP:(0:1:SW:1):Input =
IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:50:00.743: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM4
New State = IKE_R_MM5 *Jun 27 09:50:00.811: ISAKMP:(0:1:SW:1): processing ID payload. message ID
= 0 *Jun 27 09:50:00.811: ISAKMP (0:134217729): ID payload next-payload : 8 type : 1 address :
172.16.1.2 protocol : 17 port : 500 length : 12 *Jun 27 09:50:00.811: ISAKMP:(0:1:SW:1):: peer
matches *none* of the profiles *Jun 27 09:50:00.811: ISAKMP:(0:1:SW:1): processing HASH payload.
message ID = 0 *Jun 27 09:50:00.811: ISAKMP:(0:1:SW:1): processing NOTIFY_INITIAL_CONTACT
protocol 1 spi 0, message ID = 0, sa = 29D2E80 *Jun 27 09:50:00.811: ISAKMP:(0:1:SW:1):SA
authentication status: authenticated *Jun 27 09:50:00.811: ISAKMP:(0:1:SW:1): Process initial
contact, bring down existing phase 1 and 2 SA's with local 209.165.200.2 remote 209.165.201.2
remote port 500 *Jun 27 09:50:00.811: ISAKMP:(0:1:SW:1):SA authentication status: authenticated
*Jun 27 09:50:00.811: ISAKMP:(0:1:SW:1):SA has been authenticated with 209.165.201.2 *Jun 27
09:50:00.811: ISAKMP: Trying to insert a peer 209.165.200.2/209.165.201.2/500/, and inserted
successfully. *Jun 27 09:50:00.811: ISAKMP:(0:1:SW:1):: peer matches *none* of the profiles *Jun
27 09:50:00.811: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE *Jun 27
09:50:00.811: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM5 New State = IKE_R_MM5 *Jun 27
09:50:00.851: IPSEC(key_engine): got a queue event with 1 kei messages *Jun 27 09:50:00.963:
ISAKMP:(0:1:SW:1):SA is doing pre-shared key authentication using id type ID_IPV4_ADDR *Jun 27
09:50:00.963: ISAKMP (0:134217729): ID payload next-payload : 8 type : 1 address : 209.165.200.2
protocol : 17 port : 500 length : 12 *Jun 27 09:50:00.963: ISAKMP:(0:1:SW:1):Total payload
length: 12 *Jun 27 09:50:00.963: ISAKMP:(0:1:SW:1): sending packet to 209.165.201.2 my_port 500
peer_port 500 (R) MM_KEY_EXCH *Jun 27 09:50:00.963: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PROCESS_COMPLETE *Jun 27 09:50:00.963: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM5 New State =
IKE_P1_COMPLETE *Jun 27 09:50:01.043: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL,
IKE_PHASE1_COMPLETE *Jun 27 09:50:01.043: ISAKMP:(0:1:SW:1):Old State = IKE_P1_COMPLETE New
State = IKE_P1_COMPLETE *Jun 27 09:50:01.403: ISAKMP (0:134217729): received packet from
209.165.201.2 dport 500 sport 500 Global (R) QM_IDLE *Jun 27 09:50:01.403: ISAKMP: set new node
1689610294 to QM_IDLE *Jun 27 09:50:01.403: ISAKMP:(0:1:SW:1): processing HASH payload. message
ID = 1689610294 *Jun 27 09:50:01.403: ISAKMP:(0:1:SW:1): processing SA payload. message ID =
1689610294 *Jun 27 09:50:01.403: ISAKMP:(0:1:SW:1):Checking IPsec proposal 1 *Jun 27
09:50:01.403: ISAKMP: transform 1, ESP_DES *Jun 27 09:50:01.403: ISAKMP: attributes in
transform: *Jun 27 09:50:01.403: ISAKMP: encaps is 1 (Tunnel) *Jun 27 09:50:01.403: ISAKMP: SA
life type in seconds *Jun 27 09:50:01.403: ISAKMP: SA life duration (basic) of 3600 *Jun 27
09:50:01.403: ISAKMP: SA life type in kilobytes *Jun 27 09:50:01.403: ISAKMP: SA life duration
(VPI) of 0x0 0x46 0x50 0x0 *Jun 27 09:50:01.403: ISAKMP: authenticator is HMAC-MD5 *Jun 27
09:50:01.403: ISAKMP:(0:1:SW:1):atts are acceptable. *Jun 27 09:50:01.403:
IPSEC(validate_proposal_request): proposal part #1, (key eng. msg.) INBOUND local=
209.165.200.2, remote= 209.165.201.2, local_proxy= 192.168.1.0/255.255.255.0/0/0 (type=4),
remote_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-
hmac (Tunnel), lifedur= 0s and 0kb, spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x2 *Jun 27
09:50:01.403: IPSEC(kei_proxy): head = mymap, map->ivrf = , kei->ivrf = *Jun 27 09:50:01.403:
ISAKMP:(0:1:SW:1): processing NONCE payload. message ID = 1689610294 *Jun 27 09:50:01.403:
ISAKMP:(0:1:SW:1): processing ID payload. message ID = 1689610294 *Jun 27 09:50:01.403:
ISAKMP:(0:1:SW:1): processing ID payload. message ID = 1689610294 *Jun 27 09:50:01.403:
ISAKMP:(0:1:SW:1): asking for 1 spis from ipsec *Jun 27 09:50:01.403: ISAKMP:(0:1:SW:1):Node
1689610294, Input = IKE_MSG_FROM_PEER, IKE_QM_EXCH *Jun 27 09:50:01.403: ISAKMP:(0:1:SW:1):Old
State = IKE_QM_READY New State = IKE_QM_SPI_STARVE *Jun 27 09:50:01.443: IPSEC(key_engine): got
a queue event with 1 kei messages *Jun 27 09:50:01.443: IPSEC(spi_response): getting spi
3052955580 for SA from 209.165.200.2 to 209.165.201.2 for prot 3 *Jun 27 09:50:01.463: ISAKMP:
received ke message (2/1) *Jun 27 09:50:01.971: ISAKMP:(0:1:SW:1): sending packet to
209.165.201.2 my_port 500 peer_port 500 (R) QM_IDLE *Jun 27 09:50:01.971: ISAKMP:(0:1:SW:1):Node
1689610294, Input = IKE_MSG_FROM_IPSEC, IKE_SPI_REPLY *Jun 27 09:50:01.971:
ISAKMP:(0:1:SW:1):Old State = IKE_QM_SPI_STARVE New State = IKE_QM_R_QM2 *Jun 27 09:50:02.303:
ISAKMP (0:134217729): received packet from 209.165.201.2 dport 500 sport 500 Global (R) QM_IDLE
*Jun 27 09:50:02.303: IPsec: Flow_switching Allocated flow for flow_id 134217735 *Jun 27
09:50:02.303: IPsec: Flow_switching Allocated flow for flow_id 134217736 *Jun 27 09:50:03.203:
%CRYPTO-5-SESSION_STATUS: Crypto tunnel is UP . Peer 209.165.201.2:500 Id: 172.16.1.2 *Jun 27
09:50:03.203: ISAKMP: Locking peer struct 0x2C50328, IPSEC refcount 1 for for stuff_ke *Jun 27
09:50:03.203: ISAKMP:(0:1:SW:1): Creating IPsec SAs *Jun 27 09:50:03.203: inbound SA from
209.165.201.2 to 209.165.200.2 (f/i) 0/ 0 (proxy 172.16.2.0 to 192.168.1.0) *Jun 27
09:50:03.203: has spi 0xB5F867BC and conn_id 2000 and flags 2 *Jun 27 09:50:03.203: lifetime of
3600 seconds *Jun 27 09:50:03.203: lifetime of 4608000 kilobytes *Jun 27 09:50:03.203: has
client flags 0x0 *Jun 27 09:50:03.203: outbound SA from 209.165.200.2 to 209.165.201.2 (f/i) 0/0
(proxy 192.168.1.0 to 172.16.2.0) *Jun 27 09:50:03.203: has spi -392560059 and conn_id 2001 and

flags A *Jun 27 09:50:03.203: lifetime of 3600 seconds *Jun 27 09:50:03.203: lifetime of 4608000 kilobytes *Jun 27 09:50:03.203: has client flags 0x0 *Jun 27 09:50:03.203:
ISAKMP:(0:1:SW:1):deleting node 1689610294 error FALSE reason "quick mode done (await)" *Jun 27 09:50:03.203: ISAKMP:(0:1:SW:1):Node 1689610294, Input = IKE_MSG_FROM_PEER, IKE_QM_EXCH *Jun 27 09:50:03.203: ISAKMP:(0:1:SW:1):Old State = IKE_QM_R_QM2 New State = IKE_QM_PHASE2_COMPLETE *Jun 27 09:50:03.231: IPSEC(key_engine): got a queue event with 2 kei messages *Jun 27 09:50:03.231: IPSEC(initialize_sas): , (key eng. msg.) INBOUND local= 209.165.200.2, remote= 209.165.201.2, local_proxy= 192.168.1.0/255.255.255.0/0/0 (type=4), remote_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel), lifedur= 3600s and 4608000kb, spi= 0xB5F867BC(3052955580), conn_id= 134219728, keysize= 0, flags= 0x2 *Jun 27 09:50:03.231: IPSEC(initialize_sas): , (key eng. msg.) OUTBOUND local= 209.165.200.2, remote= 209.165.201.2, local_proxy= 192.168.1.0/255.255.255.0/0/0 (type=4), remote_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel), lifedur= 3600s and 4608000kb, spi= 0xE89A0245(3902407237), conn_id= 134219729, keysize= 0, flags= 0xA *Jun 27 09:50:03.231: IPSEC(kei_proxy): head = mymap, map->ivrf = , kei->ivrf = *Jun 27 09:50:03.231: IPSEC(crypto_ipsec_sa_find_ident_head): reconnecting with the same proxies and 209.165.201.2 *Jun 27 09:50:03.231: IPSEC(mtree_add_ident): src 192.168.1.0, dest 172.16.2.0, dest_port 0 *Jun 27 09:50:03.231: IPSEC(create_sa): sa created, (sa) sa_dest= 209.165.200.2, sa_prot= 50, sa_spi= 0xB5F867BC(3052955580), sa_trans= esp-des esp-md5-hmac , sa_conn_id= 134219728 *Jun 27 09:50:03.231: IPSEC(create_sa): sa created, (sa) sa_dest= 209.165.201.2, sa_prot= 50, sa_spi= 0xE89A0245(3902407237), sa_trans= esp-des esp-md5-hmac , sa_conn_id= 134219729 *Jun 27 09:50:53.231: ISAKMP:(0:1:SW:1):purging node 1689610294 VPN-Gateway2#**debug crypto ipsec**
Crypto IPSEC debugging is on
VPN-Gateway2#**debug crypto isakmp**
Crypto ISAKMP debugging is on
VPN-Gateway2#**show debug**
Cryptographic Subsystem:
Crypto ISAKMP debugging is on
Crypto IPSEC debugging is on
VPN-Gateway2#

!--- These debugs appeared after a ping !--- was attempted from PC2 to PC1. *Jun 27 09:49:57.799: IPSEC(sa_request): , (key eng. msg.) OUTBOUND local= 172.16.1.2, remote= 209.165.200.2, local_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), remote_proxy= 192.168.1.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel), lifedur= 3600s and 4608000kb, spi= 0xE89A0245(3902407237), conn_id= 0, keysize= 0, flags= 0x400A *Jun 27 09:49:57.807: ISAKMP: received ke message (1/1) *Jun 27 09:49:57.807: ISAKMP:(0:0:N/A:0): SA request profile is (NULL) *Jun 27 09:49:57.807: ISAKMP: Created a peer struct for 209.165.200.2, peer port 500 *Jun 27 09:49:57.807: ISAKMP: Locking peer struct 0x2BEDC78, IKE refcount 1 for isakmp_initiator *Jun 27 09:49:57.807: ISAKMP: local port 500, remote port 500 *Jun 27 09:49:57.839: ISAKMP: set new node 0 to QM_IDLE *Jun 27 09:49:57.839: insert sa successfully sa = 2CB1E80 *Jun 27 09:49:57.839: ISAKMP:(0:1:SW:1):Can not start Aggressive mode, trying Main mode. *Jun 27 09:49:57.839: ISAKMP: Looking for a matching key for 209.165.200.2 in default : success *Jun 27 09:49:57.839: ISAKMP:(0:1:SW:1):found peer pre-shared key matching 209.165.200.2 *Jun 27 09:49:57.839: ISAKMP:(0:1:SW:1):Input = IKE_MSG_FROM_IPSEC, IKE_SA_REQ_MM *Jun 27 09:49:57.839: ISAKMP:(0:1:SW:1):Old State = IKE_READY New State = IKE_I_MM1 *Jun 27 09:49:57.839: ISAKMP:(0:1:SW:1): beginning Main Mode exchange *Jun 27 09:49:57.839: ISAKMP:(0:1:SW:1): sending packet to 209.165.200.2 my_port 500 peer_port 500 (I) MM_NO_STATE *Jun 27 09:49:59.099: ISAKMP (0:134217729): received packet from 209.165.200.2 dport 500 sport 500 Global (I) MM_NO_STATE *Jun 27 09:49:59.099: ISAKMP:(0:1:SW:1):Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:49:59.099: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM1 New State = IKE_I_MM2 *Jun 27 09:49:59.139: ISAKMP:(0:1:SW:1): processing SA payload. message ID = 0 *Jun 27 09:49:59.139: ISAKMP: Looking for a matching key for 209.165.200.2 in default : success *Jun 27 09:49:59.139: ISAKMP:(0:1:SW:1):found peer pre-shared key matching 209.165.200.2 *Jun 27 09:49:59.139: ISAKMP:(0:1:SW:1): local preshared key found *Jun 27 09:49:59.139: ISAKMP : Scanning profiles for xauth ... *Jun 27 09:49:59.139: ISAKMP:(0:1:SW:1):Checking ISAKMP transform 1 against priority 10 policy *Jun 27 09:49:59.139: ISAKMP: encryption DES-CBC *Jun 27 09:49:59.139: ISAKMP: hash SHA *Jun 27 09:49:59.139: ISAKMP: default group 1 *Jun 27 09:49:59.139: ISAKMP: auth pre-share *Jun 27 09:49:59.139: ISAKMP: life type in seconds *Jun 27 09:49:59.139: ISAKMP: life duration (VPI) of 0x0 0x1 0x51 0x80 *Jun 27 09:49:59.139: ISAKMP:(0:1:SW:1):atts are acceptable. Next payload is 0 *Jun 27 09:49:59.139: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE *Jun 27 09:49:59.139: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM2 New State = IKE_I_MM2 *Jun 27 09:49:59.259: ISAKMP:(0:1:SW:1): sending packet to 209.165.200.2 my_port 500 peer_port 500 (I) MM_SA_SETUP

*Jun 27 09:49:59.259: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_COMPLETE *Jun 27 09:49:59.259: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM2 New State = IKE_I_MM3 *Jun 27 09:49:59.919: ISAKMP (0:134217729): received packet from 209.165.200.2 dport 500 sport 500 Global (I) MM_SA_SETUP *Jun 27 09:49:59.919: ISAKMP:(0:1:SW:1):Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:49:59.919: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM3 New State = IKE_I_MM4 *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1): processing KE payload. message ID = 0 *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1): processing NONCE payload. message ID = 0 *Jun 27 09:49:59.947: ISAKMP: Looking for a matching key for 209.165.200.2 in default : success *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1):found peer pre-shared key matching 209.165.200.2 *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1):SKEYID state generated *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1): vendor ID is Unity *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1): vendor ID is DPD *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1): processing vendor id payload *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1): speaking to another IOS box! *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE *Jun 27 09:49:59.947: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM4 New State = IKE_I_MM4 *Jun 27 09:50:00.059: ISAKMP:(0:1:SW:1):Send initial contact *Jun 27 09:50:00.059: ISAKMP:(0:1:SW:1):SA is doing pre-shared key authentication using id type ID_IPV4_ADDR *Jun 27 09:50:00.059: ISAKMP (0:134217729): ID payload next-payload : 8 type : 1 address : 172.16.1.2 protocol : 17 port : 500 length : 12 *Jun 27 09:50:00.059: ISAKMP:(0:1:SW:1):Total payload length: 12 *Jun 27 09:50:00.059: ISAKMP:(0:1:SW:1): sending packet to 209.165.200.2 my_port 500 peer_port 500 (I) MM_KEY_EXCH *Jun 27 09:50:00.059: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_COMPLETE *Jun 27 09:50:00.059: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM4 New State = IKE_I_MM5 *Jun 27 09:50:00.827: ISAKMP (0:134217729): received packet from 209.165.200.2 dport 500 sport 500 Global (I) MM_KEY_EXCH *Jun 27 09:50:00.827: ISAKMP:(0:1:SW:1):Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH *Jun 27 09:50:00.827: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM5 New State = IKE_I_MM6 *Jun 27 09:50:00.859: ISAKMP:(0:1:SW:1): processing ID payload. message ID = 0 *Jun 27 09:50:00.859: ISAKMP (0:134217729): ID payload next-payload : 8 type : 1 address : 209.165.200.2 protocol : 17 port : 500 length : 12 *Jun 27 09:50:00.859: ISAKMP:(0:1:SW:1): processing HASH payload. message ID = 0 *Jun 27 09:50:00.859: ISAKMP:(0:1:SW:1):SA authentication status: authenticated *Jun 27 09:50:00.859: ISAKMP:(0:1:SW:1):SA has been authenticated with 209.165.200.2 *Jun 27 09:50:00.859: ISAKMP:(0:1:SW:1):: peer matches *none* of the profiles *Jun 27 09:50:00.859: ISAKMP: Trying to insert a peer 172.16.1.2/209.165.200.2/500/, and inserted successfully. *Jun 27 09:50:00.859: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE *Jun 27 09:50:00.859: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM6 New State = IKE_I_MM6 *Jun 27 09:50:00.919: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_COMPLETE *Jun 27 09:50:00.919: ISAKMP:(0:1:SW:1):Old State = IKE_I_MM6 New State = IKE_P1_COMPLETE *Jun 27 09:50:00.959: ISAKMP:(0:1:SW:1):beginning Quick Mode exchange, M-ID of 1689610294 *Jun 27 09:50:01.007: ISAKMP:(0:1:SW:1): sending packet to 209.165.200.2 my_port 500 peer_port 500 (I) QM_IDLE *Jun 27 09:50:01.007: ISAKMP:(0:1:SW:1):Node 1689610294, Input = IKE_MSG_INTERNAL, IKE_INIT_QM *Jun 27 09:50:01.007: ISAKMP:(0:1:SW:1):Old State = IKE_QM_READY New State = IKE_QM_I_QM1 *Jun 27 09:50:01.007: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PHASE1_COMPLETE *Jun 27 09:50:01.007: ISAKMP:(0:1:SW:1):Old State = IKE_P1_COMPLETE New State = IKE_P1_COMPLETE *Jun 27 09:50:01.839: ISAKMP (0:134217729): received packet from 209.165.200.2 dport 500 sport 500 Global (I) QM_IDLE *Jun 27 09:50:01.839: ISAKMP:(0:1:SW:1): processing HASH payload. message ID = 1689610294 *Jun 27 09:50:01.839: ISAKMP:(0:1:SW:1): processing SA payload. message ID = 1689610294 *Jun 27 09:50:01.839: ISAKMP:(0:1:SW:1):Checking IPsec proposal 1 *Jun 27 09:50:01.839: ISAKMP: transform 1, ESP_DES *Jun 27 09:50:01.839: ISAKMP: attributes in transform: *Jun 27 09:50:01.839: ISAKMP: encaps is 1 (Tunnel) *Jun 27 09:50:01.839: ISAKMP: SA life type in seconds *Jun 27 09:50:01.839: ISAKMP: SA life duration (basic) of 3600 *Jun 27 09:50:01.839: ISAKMP: SA life type in kilobytes *Jun 27 09:50:01.839: ISAKMP: SA life duration (VPI) of 0x0 0x46 0x50 0x0 *Jun 27 09:50:01.839: ISAKMP: authenticator is HMAC-MD5 *Jun 27 09:50:01.839: ISAKMP:(0:1:SW:1):atts are acceptable. *Jun 27 09:50:01.839: IPSEC(validate_proposal_request): proposal part #1, (key eng. msg.) INBOUND local= 172.16.1.2, remote= 209.165.200.2, local_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), remote_proxy= 192.168.1.0/255.255.255.0/0/0 (type=4), protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel), lifedur= 0s and 0kb, spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x2 *Jun 27 09:50:01.839: IPSEC(kei_proxy): head = mymap, map->ivrf = , kei->ivrf = *Jun 27 09:50:01.839: ISAKMP:(0:1:SW:1): processing NONCE payload. message ID = 1689610294 *Jun 27 09:50:01.839: ISAKMP:(0:1:SW:1): processing ID payload. message ID = 1689610294 *Jun 27 09:50:01.839: ISAKMP:(0:1:SW:1): processing ID payload. message ID =1689610294 *Jun 27 09:50:01.839: IPsec: Flow_switching Allocated flow for flow_id 134217731 *Jun 27 09:50:01.839: IPsec: Flow_switching Allocated flow for flow_id 134217732 *Jun 27 09:50:01.899: %CRYPTO-5-SESSION_STATUS: Crypto

```
tunnel is UP . Peer 209.165.200.2:500 Id: 209.165.200.2 *Jun 27 09:50:01.899: ISAKMP: Locking
peer struct 0x2BEDC78, IPSEC refcount 1 for for stuff_ke *Jun 27 09:50:01.899:
ISAKMP:(0:1:SW:1): Creating IPsec SAs *Jun 27 09:50:01.899: inbound SA from 209.165.200.2 to
172.16.1.2 (f/i) 0/ 0 (proxy 192.168.1.0 to 172.16.2.0) *Jun 27 09:50:01.899: has spi 0xE89A0245
and conn_id 2000 and flags 2 *Jun 27 09:50:01.899: lifetime of 3600 seconds *Jun 27
09:50:01.899: lifetime of 4608000 kilobytes *Jun 27 09:50:01.899: has client flags 0x0 *Jun 27
09:50:01.899: outbound SA from 172.16.1.2 to 209.165.200.2 (f/i) 0/0 (proxy 172.16.2.0 to
192.168.1.0) *Jun 27 09:50:01.899: has spi -1242011716 and conn_id 2001 and flags A *Jun 27
09:50:01.899: lifetime of 3600 seconds *Jun 27 09:50:01.899: lifetime of 4608000 kilobytes *Jun
27 09:50:01.899: has client flags 0x0 *Jun 27 09:50:01.899: ISAKMP:(0:1:SW:1): sending packet to
209.165.200.2 my_port 500 peer_port 500 (I) QM_IDLE *Jun 27 09:50:01.899:
ISAKMP:(0:1:SW:1):deleting node 1689610294 error FALSE reason "" *Jun 27 09:50:01.899:
ISAKMP:(0:1:SW:1):Node 1689610294, Input = IKE_MSG_FROM_PEER, IKE_QM_EXCH *Jun 27 09:50:01.899:
ISAKMP:(0:1:SW:1):Old State = IKE_QM_I_QM1 New State = IKE_QM_PHASE2_COMPLETE *Jun 27
09:50:01.907: IPSEC(key_engine): got a queue event with 2 kei messages *Jun 27 09:50:01.907:
IPSEC(initialize_sas): , (key eng. msg.) INBOUND local= 172.16.1.2, remote= 209.165.200.2,
local_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), remote_proxy= 192.168.1.0/255.255.255.0/0/0
(type=4), protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel), lifedur= 3600s and 4608000kb,
spi= 0xE89A0245(3902407237), conn_id= 134219728, keysize= 0, flags= 0x2 *Jun 27 09:50:01.907:
IPSEC(initialize_sas): , (key eng. msg.) OUTBOUND local= 172.16.1.2, remote= 209.165.200.2,
local_proxy= 172.16.2.0/255.255.255.0/0/0 (type=4), remote_proxy= 192.168.1.0/255.255.255.0/0/0
(type=4), protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel), lifedur= 3600s and 4608000kb,
spi= 0xB5F867BC(3052955580), conn_id= 134219729, keysize= 0, flags= 0xA *Jun 27 09:50:01.907:
IPSEC(kei_proxy): head = mymap, map->ivrf = , kei->ivrf = *Jun 27 09:50:01.907:
IPSEC(crypto_ipsec_sa_find_ident_head): reconnecting with the same proxies and 209.165.200.2
*Jun 27 09:50:01.907: IPSEC(mtree_add_ident): src 172.16.2.0, dest 192.168.1.0, dest_port 0 *Jun
27 09:50:01.907: IPSEC(create_sa): sa created, (sa) sa_dest= 172.16.1.2, sa_prot= 50, sa_spi=
0xE89A0245(3902407237), sa_trans= esp-des esp-md5-hmac , sa_conn_id= 134219728 *Jun 27
09:50:01.907: IPSEC(create_sa): sa created, (sa) sa_dest= 209.165.200.2, sa_prot= 50, sa_spi=
0xB5F867BC(3052955580), sa_trans= esp-des esp-md5-hmac , sa_conn_id= 134219729 *Jun 27
09:50:51.927: ISAKMP:(0:1:SW:1):purging node 1689610294 PAT-Router#debug ip nat detail
IP NAT detailed debugging is on
PAT-Router#show debug
Generic IP:
    IP NAT detailed debugging is on
PAT-Router#
!--- The "i" in this line indicates the packet is traveling from the !--- inside to the outside
(from a NAT perspective) interface. The number in !--- the brackets is the identification number
in the IP packet. This is !--- useful when correlating information with sniffer traces taken
with a !--- network analyzer while troubleshooting problems. *Jun 27 09:49:57.727: NAT*: i: udp
(172.16.1.2, 500) -> (209.165.200.2, 500) [94] !--- The "s" in this line shows the source
address of the packet and how it is !--- being translated. *Jun 27 09:49:57.727: NAT*:
s=172.16.1.2->209.165.201.2, d=209.165.200.2 [94] *Jun 27 09:49:58.927: NAT*: o: udp
(209.165.200.2, 500) -> (209.165.201.2, 500) [100] *Jun 27 09:49:58.927: NAT*: s=209.165.200.2,
d=209.165.201.2->172.16.1.2 [100] *Jun 27 09:49:59.147: NAT*: i: udp (172.16.1.2, 500) ->
(209.165.200.2, 500) [95] *Jun 27 09:49:59.147: NAT*: s=172.16.1.2->209.165.201.2,
d=209.165.200.2 [95] *Jun 27 09:49:59.755: NAT*: o: udp (209.165.200.2, 500) -> (209.165.201.2,
500) [101] *Jun 27 09:49:59.755: NAT*: s=209.165.200.2, d=209.165.201.2->172.16.1.2 [101] *Jun
27 09:49:59.947: NAT*: i: udp (172.16.1.2, 500) -> (209.165.200.2, 500) [96] *Jun 27
09:49:59.947: NAT*: s=172.16.1.2->209.165.201.2, d=209.165.200.2 [96] *Jun 27 09:50:00.667:
NAT*: o: udp (209.165.200.2, 500) -> (209.165.201.2, 500) [102] *Jun 27 09:50:00.667: NAT*:
s=209.165.200.2, d=209.165.201.2->172.16.1.2 [102] *Jun 27 09:50:00.895: NAT*: i: udp
(172.16.1.2, 500) -> (209.165.200.2, 500) [97] *Jun 27 09:50:00.895: NAT*: s=172.16.1.2-
>209.165.201.2, d=209.165.200.2 [97] *Jun 27 09:50:01.679: NAT*: o: udp (209.165.200.2, 500) ->
(209.165.201.2, 500) [103] *Jun 27 09:50:01.679: NAT*: s=209.165.200.2, d=209.165.201.2-
>172.16.1.2 [103] *Jun 27 09:50:01.787: NAT*: i: udp (172.16.1.2, 500) -> (209.165.200.2, 500)
[98] *Jun 27 09:50:01.787: NAT*: s=172.16.1.2->209.165.201.2, d=209.165.200.2 [98] *Jun 27
09:50:23.667: NAT*: i: esp (172.16.1.2, 26556) -> (209.165.200.2, 0) [99] *Jun 27 09:50:23.667:
NAT*: s=172.16.1.2->209.165.201.2, d=209.165.200.2 [99] *Jun 27 09:50:23.715: NAT*: o: esp
(209.165.200.2, -392560059) -> (209.165.201.2, 0) [104] *Jun 27 09:50:23.715: NAT*:
s=209.165.200.2, d=209.165.201.2->172.16.1.2 [104] *Jun 27 09:50:23.787: NAT*: i: esp
(172.16.1.2, 26556) -> (209.165.200.2, 0) [100] *Jun 27 09:50:23.787: NAT*: s=172.16.1.2-
>209.165.201.2, d=209.165.200.2 [100] *Jun 27 09:50:23.847: NAT*: o: esp (209.165.200.2, 581) ->
(209.165.201.2, 0) [105] *Jun 27 09:50:23.847: NAT*: s=209.165.200.2, d=209.165.201.2-
```

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>172.16.1.2 [105] *Jun 27 09:50:23.915: NAT*: i: esp (172.16.1.2, 26556) -> (209.165.200.2, 0)
[101] *Jun 27 09:50:23.915: NAT*: s=172.16.1.2->209.165.201.2, d=209.165.200.2 [101] *Jun 27
09:50:23.967: NAT*: o: esp (209.165.200.2, 581) -> (209.165.201.2, 0) [106] *Jun 27
09:50:23.967: NAT*: s=209.165.200.2, d=209.165.201.2->172.16.1.2 [106] *Jun 27 09:50:24.047:
NAT*: i: esp (172.16.1.2, 26556) -> (209.165.200.2, 0) [102] *Jun 27 09:50:24.047: NAT*:
s=172.16.1.2->209.165.201.2, d=209.165.200.2 [102] *Jun 27 09:50:24.095: NAT*: o: esp
(209.165.200.2, 581) -> (209.165.201.2, 0) [107] *Jun 27 09:50:24.095: NAT*: s=209.165.200.2,
d=209.165.201.2->172.16.1.2 [107] *Jun 27 09:50:24.207: NAT*: i: esp (172.16.1.2, 26556) ->
(209.165.200.2, 0) [103] *Jun 27 09:50:24.207: NAT*: s=172.16.1.2->209.165.201.2,
d=209.165.200.2 [103] *Jun 27 09:50:24.267: NAT*: o: esp (209.165.200.2, 581) -> (209.165.201.2,
0) [108] *Jun 27 09:50:24.267: NAT*: s=209.165.200.2, d=209.165.201.2->172.16.1.2 [108]
```

[関連情報](#)

- [IPSec に関するサポート ページ](#)
- [テクニカルサポート - Cisco Systems](#)