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IOS Router to Pass a LAN−to−LAN IPSec Tunnel via PAT Configuration Example

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Introduction

This document provides a sample configuration for Port Address Translation (PAT) to allow a LAN−to−LAN IPSec tunnel to be established. It applies to scenarios that have only one public IP address (used in a Cisco IOS® router to perform PAT on all traffic) and need to pass an IPSec tunnel through it.

For VPN Gateways that run Cisco IOS Software Releases earlier than 12.2(13)T, the IPSec passthrough feature is needed on the router that performs PAT to allow Encapsulating Security Payload (ESP) through.

Note: This feature is known as IPSec through Network Address Translation (NAT) support in Software Advisory.

In order to initiate the tunnel from the local (PATed) peer, no configuration is needed. In order to initiate the tunnel from the remote peer, these commands are needed:

- **ip nat inside source static *esp inside_ip* interface *interface***
- **ip nat inside source static udp *inside_ip* 500 interface *interface* 500**

For VPN Gateways that run a Cisco IOS Software Release later than 12.2(13)T, IPSec traffic is encapsulated into User Data Protocol (UDP) port 4500 packets. This feature is known as IPSec NAT Transparency . In order to initiate the tunnel from the local (PATed) peer, no configuration is needed.

In order to initiate the tunnel from the remote peer, these commands are needed:

- **ip nat inside source static *udp inside_ip* 4500 interface *interface* 4500**
- **ip nat inside source static *udp inside_ip* 500 interface *interface* 500**

Issue the **no crypto ipsec nat−transparency udp−encaps** command to disable IPSec NAT Transparency.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on Cisco IOS Software Release 12.3(7)T1.

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

Conventions

For more information on document conventions, refer to Cisco Technical Tips Conventions.

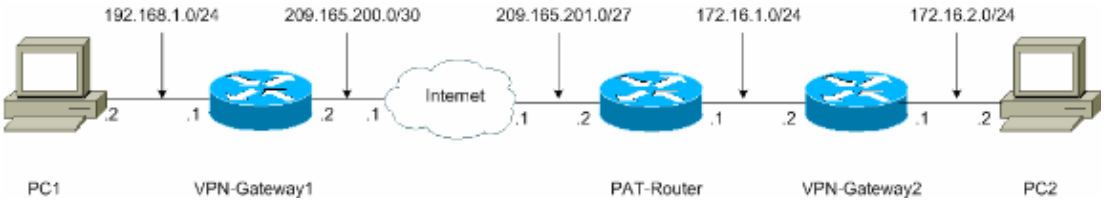
Configure

In this section, you are presented with the information to configure the features described in this document.

Note: To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

Network Diagram

This document uses this network setup:



Configurations with IPSec NAT Transparancy

This document uses these configurations:

- 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
```

Configurations without IPSec NAT Transparency

- 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
```

Verify

These sections provide information you can use to confirm your configuration is working properly.

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

- Verify with IPSec NAT Transparency
- Verify without IPSec NAT Transparency

Verify with IPSec NAT Transparency

- **show crypto isakmp sa** Displays all current Internet Key Exchange (IKE) security associations (SA) at a peer.

```
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** Displays IPSec SAs built between peers.

```
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** Displays active NAT translations.

```
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    ---                ---
```

Verify without IPSec NAT Transparency

- **show crypto isakmp sa** Displays all current IKE SAs at a peer.

```
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** Displays IPSec SAs built between peers.

```
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** Displays active NAT translations.

```
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     ---                ---
esp 209.165.201.2:0    172.16.1.2:0       ---                ---
```

Troubleshoot

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

If you have set up a LAN−to−LAN IPSec Tunnel that involves PAT (as described in this document) and you continue to experience problems, gather the **debug** output from each device and the output from the **show** commands for analysis by Cisco Technical Support.

This is troubleshooting information relevant to this configuration. For additional information on troubleshooting, please see IP Security Troubleshooting − Understanding and Using debug commands and Verifying NAT Operation and Basic NAT Troubleshooting.

debug commands and sample output are shown in these sections.

- Troubleshoot with IPSec NAT Transparency
- Troubleshoot without IPSec NAT Transparency

Note: Before issuing **debug** commands, refer to Important Information on Debug Commands.

Troubleshoot with IPSec NAT Transparency

- **debug crypto ipsec** Displays the IPSec negotiations of Phase 2.
- **debug crypto isakmp** Displays the ISAKMP negotiations of Phase 1.
- **debug ip nat detail** Examines NAT being performed by the router.

This is sample command output.

```
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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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(2630485529), 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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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 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]
```

Troubleshooting without IPSec NAT Transparency

- **debug crypto ipsec** Displays the IPSec negotiations of Phase 2.
- **debug crypto isakmp** Displays the ISAKMP negotiations of Phase 1.
- **debug ip nat detail** Examines NAT being performed by the router.

This is sample command output.

```
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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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
```

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                    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_MESG_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_MESG_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_MESG_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
```

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*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_MESG_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_MESG_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_MESG_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,
```

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                    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_MESG_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_MESG_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
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*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_MESG_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_MESG_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_MESG_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_MESG_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
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                      my_port 500 peer_port 500 (I) MM_KEY_EXCH
*Jun 27 09:50:00.059: ISAKMP:(0:1:SW:1):Input = IKE_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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_MESG_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
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*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_MESG_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):
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                      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->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]
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*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]
```

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