

# PIX/ASA 7.x 及更高版本：在静态寻址IOS路由器和动态地寻址PIX之间的动态IPSec与NAT的配置示例

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## 简介

本文提供一个配置示例，显示如何使路由器接受来自 PIX 的动态 IPSec 连接。如果私有网络 10.2.1.x 访问互联网，远程路由器执行网络地址转换(NAT)。从 10.2.1.x 经过 PIX 安全设备到达专用网络 10.1.1.x 的数据流不会执行 NAT 进程。仅当数据流 (10.1.1.x) 从 PIX 安全设备发起与具有远程网络 (10.2.1.x) 的路由器的连接时，才会建立 IPsec 隧道。PIX 可以发起到路由器的连接，但路由器无法发起到 PIX 的连接。

此配置使用 Cisco IOS® 路由器，以创建到安全设备的动态 IPsec LAN 到 LAN (L2L) 隧道，该安全设备在其公共接口（外部接口）上接收动态 IP 地址。动态主机配置协议(DHCP)提供一机制为了从服务提供商动态地分配IP地址。这样，当主机不再需要这些 IP 地址时，就可以重用它们。

有关 PIX 6.x 接受来自路由器的动态 IPsec 连接的方案的更多信息，请参阅[配置使用 NAT 的 PIX 到路由器的动态到静态 IPsec](#)。

有关路由器接受来自 PIX 6.x 防火墙的动态 IPsec 连接的方案的详细信息，请参阅[对 NAT 配置路由器到 PIX 的动态到静态 IPsec 的示例](#)。

要启用 PIX/ASA 安全设备以接受来自 Cisco IOS 路由器的动态 IPsec 连接，请参阅[静态 IOS 路由器和使用 NAT 的动态 PIX/ASA 7.x 之间 IPsec 配置示例](#)。

有关 PIX/ASA 安全设备 7.x 接受来自另一个 PIX 6.x 的动态 IPsec 连接的方案的更多信息，请参阅[配置使用 NAT 和 VPN 客户端的 PIX/ASA 7.x PIX 到 PIX 动态到静态 IPsec 配置示例](#)。

## 先决条件

### 要求

在尝试进行此配置之前，请确保 PIX 和路由器都具有 Internet 连接，以便建立 IPsec 隧道。

本文档假定您已在公共接口和专用接口上分配了 IP 地址，并且能够对远程 VPN 设备的 IP 地址执行 ping 操作。

### 使用的组件

本文档中的信息基于以下软件和硬件版本：

- 运行 Cisco IOS 软件版本 12.4 的 Cisco 3600
- PIX 515E 系列安全设备软件 7.x 及更高版本

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

### 相关产品

Cisco ASA 5500 系列版本 7.x 运行类似 PIX 版本 7.x 的软件版本。本文档中的配置适用于这两个产品系列。

### 规则

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

## 背景信息

在 PIX 上，**access-list** 和 **nat 0** 命令协同工作。当 10.1.1.0 网络上的用户访问 10.2.1.0 网络时，将使用访问列表允许 10.1.1.0 网络数据流在没有 NAT 的情况下进行加密。在路由器上，将使用 **access-list** 命令允许 10.2.1.0 网络数据流在没有 NAT 的情况下进行加密。然而，当同样用户去别处(类似互联网)时，他们翻译对外部接口 IP 地址通过端口地址转换(PAT)。

要使通过隧道的数据流不经过 PAT，而使到达 Internet 的数据流经过 PAT，则必须在 PIX 安全设备上使用以下配置命令。

```
access-list nonat permit ip 10.1.1.0 255.255.255.0 10.2.2.0 255.255.255.0
nat (inside) 0 access-list nonat
nat (inside) 1 10.1.1.0 255.255.255.0 0 0
```

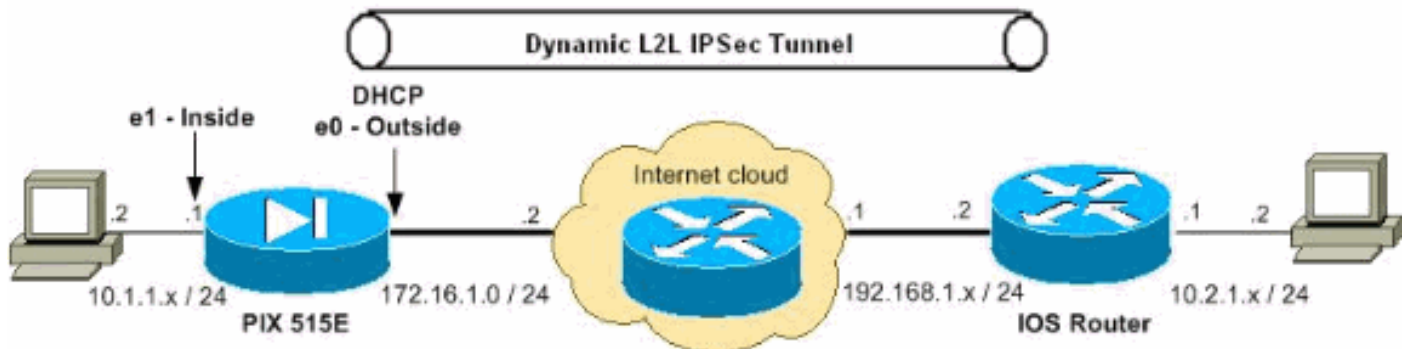
## 配置

本部分提供有关如何配置本文档所述功能的信息。

**注意：** 使用[命令查找工具](#) ([仅限注册用户](#)) 可获取有关本部分所使用命令的详细信息。

## 网络图

本文档使用以下网络设置：



## 配置

本文档使用以下配置：

- [PIX 安全设备配置](#)
- [路由器配置](#)

### PIX 7.x

```
pixfirewall#show running-config
PIX Version 7.2(2)
!
hostname pixfirewall
enable password 8Ry2YjIyt7RRXU24 encrypted
names
!
!--- The interface dynamically learns its IP address !--
-- from the service provider. interface Ethernet0 nameif
outside security-level 0 ip address dhcp
!
interface Ethernet1
 nameif inside
 security-level 100
 ip address 10.1.1.2 255.255.255.0
!
!
!-- Output is suppressed. ! passwd 2KFQnbNIdI.2KYOU
encrypted ftp mode passive !--- This is the access list
(IPsec-traffic) used for the VPN interesting traffic !--
-- to be encrypted.
access-list IPsec-traffic extended permit ip 10.1.1.0
255.255.255.0 10.2.1.0 255.255.255.0

!--- This access list (nonat) is used for a nat zero
command that prevents !--- traffic which matches the
```

```
access list from undergoing NAT.

access-list NO-NAT extended permit ip 10.1.1.0
255.255.255.0 10.2.1.0 255.255.255.0

pager lines 24
mtu inside 1500
mtu outside 1500
no failover
icmp unreachable rate-limit 1 burst-size 1
no asdm history enable
arp timeout 14400

!--- NAT 0 prevents NAT for networks specified in the
ACL - nonat. !--- The nat 1 command specifies PAT using
the !--- outside interface for all other traffic.

global (outside) 1 interface
nat (inside) 0 access-list NO-NAT
nat (inside) 1 0.0.0.0 0.0.0.0

route outside 0.0.0.0 0.0.0.0 172.16.1.2 1

timeout xlate 3:00:00
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00
icmp 0:00:02
timeout sunrpc 0:10:00 h323 0:05:00 h225 1:00:00 mgcp
0:05:00 mgcp-pat 0:05:00
timeout sip 0:30:00 sip_media 0:02:00 sip-invite 0:03:00
sip-disconnect 0:02:00
timeout uauth 0:05:00 absolute
no snmp-server location
no snmp-server contact
snmp-server enable traps snmp authentication linkup
linkdown coldstart

!--- PHASE 2 CONFIGURATION ---! !--- The encryption
types for Phase 2 are defined here. !--- A triple single
DES encryption with !--- the md5 hash algorithm is used.
crypto ipsec transform-set DYN-TS esp-des esp-md5-hmac

!--- Define which traffic should be sent to the IPsec
peer. crypto map IPSEC 10 match address IPsec-traffic

!--- Sets the IPsec peer. crypto map IPSEC 10 set peer
192.168.1.2

!--- Sets the IPsec transform set "DYN-TS" !--- to be
used with the crypto map entry "IPSEC". crypto map IPSEC
10 set transform-set DYN-TS

!--- Specifies the interface to be used with !--- the
settings defined in this configuration. crypto map IPSEC
interface outside

!--- Enables IPsec on the outside interface. crypto
isakmp enable outside !--- PHASE 1 CONFIGURATION ---! !-
-- This configuration uses isakmp policy 10. !--- Policy
65535 is included in the configuration by default. !---
The configuration commands here define the Phase !--- 1
policy parameters that are used. crypto isakmp policy 10
```

```

authentication pre-share
encryption des
hash md5
group 1
lifetime 86400

crypto isakmp policy 65535
authentication pre-share
encryption 3des
hash sha
group 2
lifetime 86400
!--- In order to create and manage the database of
connection-specific records !--- for IPsec-L2L-IPsec
tunnels, use the tunnel-group !--- command in global
configuration mode. !--- For L2L connections the name of
the tunnel group MUST be the IP !--- address of the
IPsec peer.

tunnel-group 192.168.1.2 type ipsec-l2l

!--- Enter the pre-shared-key in IPsec-attribute
parameters !--- in order to configure the authentication
method. tunnel-group 192.168.1.2 ipsec-attributes
pre-shared-key *

telnet timeout 5
ssh timeout 5
console timeout 0
!
class-map inspection_default
match default-inspection-traffic
!
!
policy-map type inspect dns preset_dns_map
parameters
message-length maximum 512
policy-map global_policy
class inspection_default
inspect dns preset_dns_map
inspect ftp
inspect h323 h225
inspect h323 ras
inspect netbios
inspect rsh
inspect rtsp
inspect skinny
inspect esmtp
inspect sqlnet
inspect sunrpc
inspect tftp
inspect sip
inspect xdmcp
!
service-policy global_policy global
prompt hostname context
Cryptochecksum:d609c9eaf51c154f147b3b4ba3c834e0
: end
pixfirewall#

```

**路由器**

```
Router#show running-config
Current configuration : 1354 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Router
!
boot-start-marker
boot-end-marker
!
!
no aaa new-model
!
resource policy
!
!
!
ip cef
!

!--- Configuration for IKE policies. !--- Enables the
IKE policy configuration (config-isakmp) !--- command
mode, where you can specify the parameters that !--- are
used during an IKE negotiation. crypto isakmp policy 10
hash md5
authentication pre-share

!--- Specifies the preshared key "cisco123" which should
!--- be identical at both peers. This is a global !---
configuration mode command. It accepts any peer which
matches !--- the pre-shared key. crypto isakmp key
cisco123 address 0.0.0.0 0.0.0.0
!
!--- Configuration for IPsec policies. !--- Enables the
crypto transform configuration mode, !--- where you can
specify the transform sets that are used !--- during an
IPsec negotiation. crypto ipsec transform-set DYN-TS
esp-des esp-md5-hmac

!--- IPsec policy, Phase 2. crypto dynamic-map DYN 10

!--- Configures IPsec to use the transform-set !---
"DYN-TS" defined earlier in this configuration. set
transform-set DYN-TS

crypto map IPSEC 10 ipsec-isakmp dynamic DYN
!
interface Ethernet0/0
 ip address 192.168.1.2 255.255.255.0
 ip nat outside
 ip virtual-reassembly
 half-duplex
!--- Configures the interface to use the !--- crypto map
"IPSEC" for IPsec. crypto map IPSEC
!
interface FastEthernet1/0
 ip address 10.2.1.1 255.255.255.0
 ip nat inside
```

```

ip virtual-reassembly
duplex auto
speed auto
!
interface Serial2/0
no ip address
shutdown
no fair-queue
!
interface Serial2/1
no ip address
shutdown
!
interface Serial2/2
no ip address
shutdown
!
interface Serial2/3
no ip address
shutdown
!
ip http server
no ip http secure-server
!
ip route 0.0.0.0 0.0.0.0 192.168.1.1
!
ip nat inside source list 100 interface Ethernet0/0
overload
!
!--- This ACL 100 identifies the traffic flows and be
PATed !--- via the outside interface( Ethernet0/0).
access-list 100 deny ip 10.2.1.0 0.0.0.255 10.1.1.0
0.0.0.255
access-list 100 permit ip 10.2.1.0 0.0.0.255 any

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

```

## 清除安全关联 (SA)

在 PIX 的特权模式下使用以下这些命令：

- **clear [crypto] ipsec sa** - 删除活动 IPsec SA。关键字 crypto 是可选的。
- **clear [crypto] isakmp sa** - 删除活动 IKE SA。关键字 crypto 是可选的。

## 验证

使用本部分可确认配置能否正常运行。

[命令输出解释程序 \( 仅限注册用户 \)](#) (OIT) 支持某些 **show** 命令。使用 OIT 可查看对 show 命令输出的分析。

- [PIX 安全设备 - show 命令](#)
- [远程 IOS 路由器 - show 命令](#)

## [PIX 安全设备 - show 命令](#)

- **show crypto isakmp sa** - 显示对等体上的所有当前 IKE SA。

```
pixfirewall#show crypto isakmp sa

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

1  IKE Peer: 192.168.1.2
   Type      : L2L                Role      : initiator
   Rekey     : no                State     : MM_ACTIVE
```

- **show crypto ipsec sa** — 显示对等体上的所有当前 IPsec SA。

```
pixfirewall#show crypto ipsec sa
interface: outside
Crypto map tag: IPSEC, seq num: 10, local addr: 172.16.1.1

access-list IPSec-traffic permit ip 10.1.1.0 255.255.255.0 10.2.1.0 255.255.255.0
local ident (addr/mask/prot/port): (10.1.1.0/255.255.255.0/0/0)
remote ident (addr/mask/prot/port): (10.2.1.0/255.255.255.0/0/0)
current_peer: 192.168.1.2

#pkts encaps: 10, #pkts encrypt: 10, #pkts digest: 10
#pkts decaps: 10, #pkts decrypt: 10, #pkts verify: 10
#pkts compressed: 0, #pkts decompressed: 0
#pkts not compressed: 10, #pkts comp failed: 0, #pkts decomp failed: 0
#pre-frag successes: 0, #pre-frag failures: 0, #fragments created: 0
#PMTUs sent: 0, #PMTUs rcvd: 0, #decapsulated frgs needing reassembly: 0
#send errors: 0, #recv errors: 0

local crypto endpt.: 172.16.1.1, remote crypto endpt.: 192.168.1.2

path mtu 1500, ipsec overhead 58, media mtu 1500
current outbound spi: 537BC76F

inbound esp sas:
spi: 0x64D800CB (1691877579)
transform: esp-des esp-md5-hmac none
in use settings = {L2L, Tunnel, }
slot: 0, conn_id: 1, crypto-map: IPSEC
sa timing: remaining key lifetime (kB/sec): (4274999/3506)
IV size: 8 bytes
replay detection support: Y
outbound esp sas:
spi: 0x537BC76F (1400620911)
transform: esp-des esp-md5-hmac none
in use settings = {L2L, Tunnel, }
slot: 0, conn_id: 1, crypto-map: IPSEC
sa timing: remaining key lifetime (kB/sec): (4274999/3506)
IV size: 8 bytes
replay detection support: Y
```



## 远程 IOS 路由器 - show 命令

- **show crypto isakmp sa** - 显示对等体上的所有当前 IKE SA。

```
Router#show crypto isakmp sa
dst          src          state          conn-id slot status
192.168.1.2  172.16.1.1   QM_IDLE       2      0 ACTIVE
```

- **show crypto ipsec sa** - 显示对等体上的所有当前 IPsec SA。

```
Router#show crypto ipsec sa
interface: Ethernet0/0
  Crypto map tag: IPSEC, local addr 192.168.1.2

protected vrf: (none)
local ident (addr/mask/prot/port): (10.2.1.0/255.255.255.0/0/0)
remote ident (addr/mask/prot/port): (10.1.1.0/255.255.255.0/0/0)
current_peer 172.16.1.1 port 500
  PERMIT, flags={}
  #pkts encaps: 10, #pkts encrypt: 10, #pkts digest: 10
  #pkts decaps: 10, #pkts decrypt: 10, #pkts verify: 10
  #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.: 192.168.1.2, remote crypto endpt.: 172.16.1.1
  path mtu 1500, ip mtu 1500, ip mtu idb Ethernet0/0
  current outbound spi: 0x64D800CB(1691877579)

inbound esp sas:
  spi: 0x537BC76F(1400620911)
    transform: esp-des esp-md5-hmac ,
    in use settings ={Tunnel, }
    conn id: 2001, flow_id: SW:1, crypto map: IPSEC
    sa timing: remaining key lifetime (k/sec): (4390267/3494)
    IV size: 8 bytes
    replay detection support: Y
    Status: ACTIVE

inbound ah sas:

inbound pcp sas:

outbound esp sas:
  spi: 0x64D800CB(1691877579)
    transform: esp-des esp-md5-hmac ,
    in use settings ={Tunnel, }
    conn id: 2002, flow_id: SW:2, crypto map: IPSEC
    sa timing: remaining key lifetime (k/sec): (4390267/3492)
    IV size: 8 bytes
    replay detection support: Y
    Status: ACTIVE

outbound ah sas:

outbound pcp sas:
```

## 故障排除

本部分提供的信息可用于对配置进行故障排除。此外本部分还提供了 debug 输出示例。

[命令输出解释程序 \( 仅限注册用户 \)](#) (OIT) 支持某些 **show** 命令。使用 OIT 可查看对 show 命令输出的分析。

**注意：** 发出 **debug** 命令之前，请参阅[有关 debug 命令的重要信息](#)和 [IP 安全故障排除 - 了解和使用 debug 命令](#)。

- [PIX 安全设备 - debug 输出](#) **debug crypto ipsec 7** - 显示第 2 阶段的 IPsec 协商。 **debug crypto isakmp 7** - 显示第 1 阶段的 ISAKMP 协商。
- [远程 IOS 路由器 - debug 输出](#) **debug crypto ipsec** - 显示第 2 阶段的 IPsec 协商。 **debug crypto isakmp** - 显示第 1 阶段的 ISAKMP 协商。

## [PIX 安全设备 - debug 输出](#)

```
PIX#debug crypto isakmp 7
```

```
Feb 22 01:39:59 [IKEv1 DEBUG]: Pitcher: received a key acquire message, spi 0x0
Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, IKE Initiator: New Phase 1, Intf inside, IKE Peer 192.168.1.2 local Proxy Address 10.1.1.0, remote Proxy Address 10.2.1.0, Crypto map (IPSEC)
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, constructing ISAKMP SA payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, constructing Fragmentation VID + extended capabilities payload
Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, IKE_DECODE SENDING Message (msgid=0) with payloads : HDR + SA (1) + VENDOR (13) + NONE (0) total length : 144
Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, IKE_DECODE RECEIVED Message (msgid=0) with payloads : HDR + SA (1) + NONE (0) total length : 84
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, processing SA payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, Oakley proposal is acceptable
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, constructing ke payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, constructing nonce payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, constructing Cisco Unity VID payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, constructing xauth V6 VID payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, Send IOS VID
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, Constructing ASA spoofing IOS Vendor ID payload (version: 1.0.0, capabilities: 20000001)
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, constructing VID payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, Send Altiga/Cisco VPN3000/Cisco ASA GW VID
Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, IKE_DECODE SENDING Message (msgid=0) with payloads : HDR + KE (4) + NONCE (10) + VENDOR (13) + VENDOR (13) + VENDOR (13) + VENDOR (13) + NONE (0) total length : 224
Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, IKE_DECODE RECEIVED Message (msgid=0) with payloads : HDR + KE (4) + NONCE (10) + VENDOR (13) + VENDOR (13) + VENDOR (13) + VENDOR (13) + NONE (0) total length : 224
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, processing ke payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, processing ISA_KE payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, processing nonce payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, processing VID payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, Received Cisco Unity client VID
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, processing VID payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, Received DPD VID
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, processing VID payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, Processing IOS/PIX Vendor ID payload (version: 1.0.0, capabilities: 0000077f)
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, processing VID payload
Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, Received xauth V6 VID
Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, Connection landed on tunnel_group 192
```

.168.1.2

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Generating keys for Initiator...

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, constructing ID payload

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, constructing hash payload

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Computing hash for ISAKMP

Feb 22 01:39:59 [IKEv1 DEBUG]: IP = 192.168.1.2, Constructing IOS keep alive payload: proposal=32767/32767 sec.

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, constructing dpd vid payload

Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, IKE\_DECODE SENDING Message (msgid=0) with payloads : HDR + ID (5) + HASH (8) + IOS KEEPALIVE (128) + VENDOR (13) + NONE (0) total length : 92

Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, IKE\_DECODE RECEIVED Message (msgid=0) with payloads : HDR + ID (5) + HASH (8) + NONE (0) total length : 60

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, processing ID payload

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, processing hash payload

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Computing hash for ISAKMP

Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, Connection landed on tunnel\_group 192.168.1.2

Feb 22 01:39:59 [IKEv1]: Group = 192.168.1.2, IP = 192.168.1.2, Freeing previously allocated memory for authorization-dn-attributes

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Oakley begin quick mode

Feb 22 01:39:59 [IKEv1]: Group = 192.168.1.2, IP = 192.168.1.2, PHASE 1 COMPLETE

D

Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, Keep-alive type for this connection: DPD

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Starting P1 rekey timer: 82080 seconds.

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, IKE got SPI from key engine: SPI = 0x81004014

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, oakley constructing quick mode

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, constructing blank hash payload

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, constructing IPsec SA payload

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, constructing IPsec nonce payload

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, constructing proxy ID

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Transmitting Proxy Id:

Local subnet: 10.1.1.0 mask 255.255.255.0 Protocol 0 Port 0

Remote subnet: 10.2.1.0 Mask 255.255.255.0 Protocol 0 Port 0

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, constructing qm hash payload

Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, IKE\_DECODE SENDING Message (msgid=27072fbd) with payloads : HDR + HASH (8) + SA (1) + NONCE (10) + ID (5) + ID (5) + NOTIFY (11) + NONE (0) total length : 192

Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, IKE\_DECODE RECEIVED Message (msgid=27072fbd) with payloads : HDR + HASH (8) + SA (1) + NONCE (10) + ID (5) + ID (5) + NOTIFY (11) + NONE (0) total length : 192

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, processing hash payload

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, processing SA payload

Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, processing nonce payload  
Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, processing ID payload  
Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, processing ID payload  
Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, processing notify payload  
Feb 22 01:39:59 [IKEv1]: Group = 192.168.1.2, IP = 192.168.1.2, Responder forcing change of IPsec rekeying duration from 28800 to 3600 seconds  
Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, loading all IPSEC SAs  
Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Generating Quick Mode Key!  
Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Generating Quick Mode Key!  
Feb 22 01:39:59 [IKEv1]: Group = 192.168.1.2, IP = 192.168.1.2, Security negotiation complete for LAN-to-LAN Group (192.168.1.2) Initiator, Inbound SPI = 0x81004014, Outbound SPI = 0x07502a09  
Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, oakley constructing final quick mode  
Feb 22 01:39:59 [IKEv1]: IP = 192.168.1.2, IKE\_DECODE SENDING Message (msgid=27072fbd) with payloads : HDR + HASH (8) + NONE (0) total length : 72  
Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, IKE got a KEY\_ADD msg for SA: SPI = 0x07502a09  
Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Pitcher: received KEY\_UPDATE, spi 0x81004014  
Feb 22 01:39:59 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Starting P2 rekey timer: 3060 seconds.  
Feb 22 01:39:59 [IKEv1]: Group = 192.168.1.2, IP = 192.168.1.2, PHASE 2 COMPLETE D (msgid=27072fbd)  
Feb 22 01:40:14 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Sending keep-alive of type DPD R-U-THERE (seq number 0x280e6479)  
Feb 22 01:40:14 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, constructing blank hash payload  
Feb 22 01:40:14 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, constructing qm hash payload  
Feb 22 01:40:14 [IKEv1]: IP = 192.168.1.2, IKE\_DECODE SENDING Message (msgid=8fba0b26) with payloads : HDR + HASH (8) + NOTIFY (11) + NONE (0) total length : 80  
Feb 22 01:40:14 [IKEv1]: IP = 192.168.1.2, IKE\_DECODE RECEIVED Message (msgid=7a18c21c) with payloads : HDR + HASH (8) + NOTIFY (11) + NONE (0) total length : 80  
Feb 22 01:40:14 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, processing hash payload  
Feb 22 01:40:14 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, processing notify payload  
Feb 22 01:40:14 [IKEv1 DEBUG]: Group = 192.168.1.2, IP = 192.168.1.2, Received keep-alive of type DPD R-U-THERE-ACK (seq number 0x280e6479)

**pixfirewall#debug crypto ipsec 7**

IPSEC: New embryonic SA created @ 0x01B84200,  
SCB: 0x028BB1D8,  
Direction: inbound  
SPI : 0xAD0608C2  
Session ID: 0x00000004  
VPIF num : 0x00000002  
Tunnel type: l2l  
Protocol : esp  
Lifetime : 240 seconds  
IPSEC: New embryonic SA created @ 0x029956A0,  
SCB: 0x0291BAD0,  
Direction: outbound  
SPI : 0x9BEF30FB

Session ID: 0x00000004  
VPIF num : 0x00000002  
Tunnel type: l2l  
Protocol : esp  
Lifetime : 240 seconds  
IPSEC: Completed host OBSA update, SPI 0x9BEF30FB  
IPSEC: Creating outbound VPN context, SPI 0x9BEF30FB  
Flags: 0x00000005  
SA : 0x029956A0  
SPI : 0x9BEF30FB  
MTU : 1500 bytes  
VCID : 0x00000000  
Peer : 0x00000000  
SCB : 0x0291BAD0  
Channel: 0x01727178  
IPSEC: Completed outbound VPN context, SPI 0x9BEF30FB  
VPN handle: 0x0001C9AC  
IPSEC: New outbound encrypt rule, SPI 0x9BEF30FB  
Src addr: 10.1.1.0  
Src mask: 255.255.255.0  
Dst addr: 10.2.1.0  
Dst mask: 255.255.255.0  
Src ports  
Upper: 0  
Lower: 0  
Op : ignore  
Dst ports  
Upper: 0  
Lower: 0  
Op : ignore  
Protocol: 0  
Use protocol: false  
SPI: 0x00000000  
Use SPI: false  
IPSEC: Completed outbound encrypt rule, SPI 0x9BEF30FB  
Rule ID: 0x029197A8  
IPSEC: New outbound permit rule, SPI 0x9BEF30FB  
Src addr: 172.16.1.1  
Src mask: 255.255.255.255  
Dst addr: 192.168.1.2  
Dst mask: 255.255.255.255  
Src ports  
Upper: 0  
Lower: 0  
Op : ignore  
Dst ports  
Upper: 0  
Lower: 0  
Op : ignore  
Protocol: 50  
Use protocol: true  
SPI: 0x9BEF30FB  
Use SPI: true  
IPSEC: Completed outbound permit rule, SPI 0x9BEF30FB  
Rule ID: 0x02996888  
IPSEC: Completed host IBSA update, SPI 0xAD0608C2  
IPSEC: Creating inbound VPN context, SPI 0xAD0608C2  
Flags: 0x00000006  
SA : 0x01B84200  
SPI : 0xAD0608C2  
MTU : 0 bytes  
VCID : 0x00000000  
Peer : 0x0001C9AC  
SCB : 0x028BB1D8

Channel: 0x01727178  
IPSEC: Completed inbound VPN context, SPI 0xAD0608C2  
VPN handle: 0x00020724  
IPSEC: Updating outbound VPN context 0x0001C9AC, SPI 0x9BEF30FB  
Flags: 0x00000005  
SA : 0x029956A0  
SPI : 0x9BEF30FB  
MTU : 1500 bytes  
VCID : 0x00000000  
Peer : 0x00020724  
SCB : 0x0291BAD0  
Channel: 0x01727178  
IPSEC: Completed outbound VPN context, SPI 0x9BEF30FB  
VPN handle: 0x0001C9AC  
IPSEC: Completed outbound inner rule, SPI 0x9BEF30FB  
Rule ID: 0x029197A8  
IPSEC: Completed outbound outer SPD rule, SPI 0x9BEF30FB  
Rule ID: 0x02996888  
IPSEC: New inbound tunnel flow rule, SPI 0xAD0608C2  
Src addr: 10.2.1.0  
Src mask: 255.255.255.0  
Dst addr: 10.1.1.0  
Dst mask: 255.255.255.0  
Src ports  
Upper: 0  
Lower: 0  
Op : ignore  
Dst ports  
Upper: 0  
Lower: 0  
Op : ignore  
Protocol: 0  
Use protocol: false  
SPI: 0x00000000  
Use SPI: false  
IPSEC: Completed inbound tunnel flow rule, SPI 0xAD0608C2  
Rule ID: 0x02918E30  
IPSEC: New inbound decrypt rule, SPI 0xAD0608C2  
Src addr: 192.168.1.2  
Src mask: 255.255.255.255  
Dst addr: 172.16.1.1  
Dst mask: 255.255.255.255  
Src ports  
Upper: 0  
Lower: 0  
Op : ignore  
Dst ports  
Upper: 0  
Lower: 0  
Op : ignore  
Protocol: 50  
Use protocol: true  
SPI: 0xAD0608C2  
Use SPI: true  
IPSEC: Completed inbound decrypt rule, SPI 0xAD0608C2  
Rule ID: 0x02997CD0  
IPSEC: New inbound permit rule, SPI 0xAD0608C2  
Src addr: 192.168.1.2  
Src mask: 255.255.255.255  
Dst addr: 172.16.1.1  
Dst mask: 255.255.255.255  
Src ports  
Upper: 0  
Lower: 0

```
Op : ignore
Dst ports
  Upper: 0
  Lower: 0
Op : ignore
Protocol: 50
Use protocol: true
SPI: 0xAD0608C2
Use SPI: true
IPSEC: Completed inbound permit rule, SPI 0xAD0608C2
Rule ID: 0x029964F0
```

## 远程 IOS 路由器 - debug 输出

```
Router#debug crypto isakmp
*Feb 22 13:51:57.319: ISAKMP (0:0): received packet from 172.16.1.1 dport 500 sport 500 Global (N) NEW SA
*Feb 22 13:51:57.319: ISAKMP: Created a peer struct for 172.16.1.1, peer port 500
*Feb 22 13:51:57.319: ISAKMP: New peer created peer = 0x64C2864C peer_handle = 0x80000005
*Feb 22 13:51:57.319: ISAKMP: Locking peer struct 0x64C2864C, IKE refcount 1 for crypto_isakmp_process_block
*Feb 22 13:51:57.319: ISAKMP: local port 500, remote port 500
*Feb 22 13:51:57.323: insert sa successfully sa = 65166F40
*Feb 22 13:51:57.323: ISAKMP:(0:0:N/A:0):Input = IKE_MSG_FROM_PEER, IKE_MM_EXCH
*Feb 22 13:51:57.323: ISAKMP:(0:0:N/A:0):Old State = IKE_READY New State = IKE_R_MM1

*Feb 22 13:51:57.323: ISAKMP:(0:0:N/A:0): processing SA payload. message ID = 0
*Feb 22 13:51:57.327: ISAKMP:(0:0:N/A:0): processing vendor id payload
*Feb 22 13:51:57.327: ISAKMP:(0:0:N/A:0): vendor ID seems Unity/DPD but major 194 mismatch
*Feb 22 13:51:57.327: ISAKMP:(0:0:N/A:0):found peer pre-shared key matching 172.16.1.1
*Feb 22 13:51:57.327: ISAKMP:(0:0:N/A:0): local preshared key found
*Feb 22 13:51:57.327: ISAKMP : Scanning profiles for xauth ...
*Feb 22 13:51:57.327: ISAKMP:(0:0:N/A:0):Checking ISAKMP transform 1 against priority 10 policy
*Feb 22 13:51:57.327: ISAKMP:          default group 1
*Feb 22 13:51:57.327: ISAKMP:          encryption DES-CBC
*Feb 22 13:51:57.327: ISAKMP:          hash MD5
*Feb 22 13:51:57.327: ISAKMP:          auth pre-share
*Feb 22 13:51:57.327: ISAKMP:          life type in seconds
*Feb 22 13:51:57.327: ISAKMP:          life duration (VPI) of 0x0 0x1 0x51 0x80
*Feb 22 13:51:57.331: ISAKMP:(0:0:N/A:0):atts are acceptable. Next payload is 3
*Feb 22 13:51:57.415: ISAKMP:(0:1:SW:1): processing vendor id payload
*Feb 22 13:51:57.415: ISAKMP:(0:1:SW:1): vendor ID seems Unity/DPD but major 194 mismatch
*Feb 22 13:51:57.419: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_MAIN_MODE
*Feb 22 13:51:57.419: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM1 New State = IKE_R_MM1

*Feb 22 13:51:57.423: ISAKMP:(0:1:SW:1): sending packet to 172.16.1.1 my_port 500 peer_port 500 (R) MM_SA_SETUP
*Feb 22 13:51:57.423: ISAKMP:(0:1:SW:1):Input = IKE_MSG_INTERNAL, IKE_PROCESS_COMPLETE
*Feb 22 13:51:57.423: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM1 New State = IKE_R_MM2
```

\*Feb 22 13:51:57.427: ISAKMP (0:134217729): received packet from 172.16.1.1 dport 500 sport 500 Global (R) MM\_SA\_SETUP  
\*Feb 22 13:51:57.427: ISAKMP:(0:1:SW:1):Input = IKE\_MSG\_FROM\_PEER, IKE\_MM\_EXCH  
\*Feb 22 13:51:57.431: ISAKMP:(0:1:SW:1):Old State = IKE\_R\_MM2 New State = IKE\_R\_MM3  
  
\*Feb 22 13:51:57.431: ISAKMP:(0:1:SW:1): processing KE payload. message ID = 0  
\*Feb 22 13:51:57.539: ISAKMP:(0:1:SW:1): processing NONCE payload. message ID = 0  
\*Feb 22 13:51:57.539: ISAKMP:(0:1:SW:1):found peer pre-shared key matching 172.16.1.1  
\*Feb 22 13:51:57.543: ISAKMP:(0:1:SW:1):SKEYID state generated  
\*Feb 22 13:51:57.543: ISAKMP:(0:1:SW:1): processing vendor id payload  
\*Feb 22 13:51:57.543: ISAKMP:(0:1:SW:1): vendor ID is Unity  
\*Feb 22 13:51:57.543: ISAKMP:(0:1:SW:1): processing vendor id payload  
\*Feb 22 13:51:57.543: ISAKMP:(0:1:SW:1): vendor ID seems Unity/DPD but major 46 mismatch  
\*Feb 22 13:51:57.543: ISAKMP:(0:1:SW:1): vendor ID is XAUTH  
\*Feb 22 13:51:57.543: ISAKMP:(0:1:SW:1): processing vendor id payload  
\*Feb 22 13:51:57.547: ISAKMP:(0:1:SW:1): speaking to another IOS box!  
\*Feb 22 13:51:57.547: ISAKMP:(0:1:SW:1): processing vendor id payload  
\*Feb 22 13:51:57.547: ISAKMP:(0:1:SW:1):vendor ID seems Unity/DPD but hash mismatch  
\*Feb 22 13:51:57.547: ISAKMP:(0:1:SW:1):Input = IKE\_MSG\_INTERNAL, IKE\_PROCESS\_MAIN\_MODE  
\*Feb 22 13:51:57.547: ISAKMP:(0:1:SW:1):Old State = IKE\_R\_MM3 New State = IKE\_R\_MM3  
  
\*Feb 22 13:51:57.551: ISAKMP:(0:1:SW:1): sending packet to 172.16.1.1 my\_port 500 peer\_port 500 (R) MM\_KEY\_EXCH  
\*Feb 22 13:51:57.551: ISAKMP:(0:1:SW:1):Input = IKE\_MSG\_INTERNAL, IKE\_PROCESS\_COMPLETE  
\*Feb 22 13:51:57.551: ISAKMP:(0:1:SW:1):Old State = IKE\_R\_MM3 New State = IKE\_R\_MM4  
  
\*Feb 22 13:51:57.559: ISAKMP (0:134217729): received packet from 172.16.1.1 dport 500 sport 500 Global (R) MM\_KEY\_EXCH  
\*Feb 22 13:51:57.559: ISAKMP:(0:1:SW:1):Input = IKE\_MSG\_FROM\_PEER, IKE\_MM\_EXCH  
\*Feb 22 13:51:57.559: ISAKMP:(0:1:SW:1):Old State = IKE\_R\_MM4 New State = IKE\_R\_MM5  
  
\*Feb 22 13:51:57.563: ISAKMP:(0:1:SW:1): processing ID payload. message ID = 0  
\*Feb 22 13:51:57.563: ISAKMP (0:134217729): ID payload  
    next-payload : 8  
    type : 1  
    address : 172.16.1.1  
    protocol : 17  
    port : 500  
    length : 12  
\*Feb 22 13:51:57.563: ISAKMP:(0:1:SW:1):: peer matches \*none\* of the profiles  
\*Feb 22 13:51:57.563: ISAKMP:(0:1:SW:1): processing HASH payload. message ID = 0  
\*Feb 22 13:51:57.567: ISAKMP:received payload type 17  
\*Feb 22 13:51:57.567: ISAKMP:(0:1:SW:1): processing vendor id payload  
\*Feb 22 13:51:57.567: ISAKMP:(0:1:SW:1): vendor ID is DPD  
\*Feb 22 13:51:57.567: ISAKMP:(0:1:SW:1):SA authentication status:  
    authenticated  
\*Feb 22 13:51:57.567: ISAKMP:(0:1:SW:1):SA has been authenticated with 172.16.1.1  
\*Feb 22 13:51:57.567: ISAKMP: Trying to insert a peer 192.168.1.2/172.16.1.1/500 /, and inserted successfully 64C2864C.  
\*Feb 22 13:51:57.567: ISAKMP:(0:1:SW:1):Input = IKE\_MSG\_INTERNAL, IKE\_PROCESS\_MAIN\_MODE  
\*Feb 22 13:51:57.567: ISAKMP:(0:1:SW:1):Old State = IKE\_R\_MM5 New State = IKE\_R



\_MM5

```
*Feb 22 13:51:57.571: ISAKMP:(0:1:SW:1):SA is doing pre-shared key authentication using id type ID_IPV4_ADDR
*Feb 22 13:51:57.571: ISAKMP (0:134217729): ID payload
    next-payload : 8
    type          : 1
    address       : 192.168.1.2
    protocol      : 17
    port          : 500
    length        : 12
*Feb 22 13:51:57.571: ISAKMP:(0:1:SW:1):Total payload length: 12
*Feb 22 13:51:57.575: ISAKMP:(0:1:SW:1): sending packet to 172.16.1.1 my_port 500 peer_port 500 (R) MM_KEY_EXCH
*Feb 22 13:51:57.575: ISAKMP:(0:1:SW:1):Input = IKE_MESG_INTERNAL, IKE_PROCESS_COMPLETE
*Feb 22 13:51:57.575: ISAKMP:(0:1:SW:1):Old State = IKE_R_MM5 New State = IKE_P1_COMPLETE
*Feb 22 13:51:57.579: ISAKMP:(0:1:SW:1):Input = IKE_MESG_INTERNAL, IKE_PHASE1_COMPLETE
*Feb 22 13:51:57.579: ISAKMP:(0:1:SW:1):Old State = IKE_P1_COMPLETE New State = IKE_P1_COMPLETE
*Feb 22 13:51:57.583: ISAKMP (0:134217729): received packet from 172.16.1.1 dport 500 sport 500 Global (R) QM_IDLE
*Feb 22 13:51:57.583: ISAKMP: set new node 328663488 to QM_IDLE
*Feb 22 13:51:57.587: ISAKMP:(0:1:SW:1): processing HASH payload. message ID = 328663488
*Feb 22 13:51:57.587: ISAKMP:(0:1:SW:1): processing SA payload. message ID = 328663488
*Feb 22 13:51:57.587: ISAKMP:(0:1:SW:1):Checking IPsec proposal 1
*Feb 22 13:51:57.587: ISAKMP: transform 1, ESP_DES
*Feb 22 13:51:57.591: ISAKMP: attributes in transform:
*Feb 22 13:51:57.591: ISAKMP: SA life type in seconds
*Feb 22 13:51:57.591: ISAKMP: SA life duration (basic) of 28800
*Feb 22 13:51:57.591: ISAKMP: SA life type in kilobytes
*Feb 22 13:51:57.591: ISAKMP: SA life duration (VPI) of 0x0 0x46 0x50 0x0
*Feb 22 13:51:57.595: ISAKMP: encaps is 1 (Tunnel)
*Feb 22 13:51:57.595: ISAKMP: authenticator is HMAC-MD5
*Feb 22 13:51:57.595: ISAKMP:(0:1:SW:1):atts are acceptable.
*Feb 22 13:51:57.595: ISAKMP:(0:1:SW:1): processing NONCE payload. message ID = 328663488
*Feb 22 13:51:57.595: ISAKMP:(0:1:SW:1): processing ID payload. message ID = 328663488
*Feb 22 13:51:57.599: ISAKMP:(0:1:SW:1): processing ID payload. message ID = 328663488
*Feb 22 13:51:57.599: ISAKMP:(0:1:SW:1): processing NOTIFY_INITIAL_CONTACT protocol 1
    spi 0, message ID = 328663488, sa = 65166F40
*Feb 22 13:51:57.599: ISAKMP:(0:1:SW:1):SA authentication status:
    authenticated
*Feb 22 13:51:57.599: ISAKMP:(0:1:SW:1): Process initial contact, bring down existing phase 1 and 2 SA's with local 192.168.1.2 remote 172.16.1.1 remote port 500
*Feb 22 13:51:57.599: ISAKMP:(0:1:SW:1): asking for 1 spis from ipsec
*Feb 22 13:51:57.603: ISAKMP:(0:1:SW:1):Node 328663488, Input = IKE_MESG_FROM_PEER, IKE_QM_EXCH
*Feb 22 13:51:57.603: ISAKMP:(0:1:SW:1):Old State = IKE_QM_READY New State = IKE_QM_SPI_STARVE
*Feb 22 13:51:57.603: ISAKMP: received ke message (2/1)
*Feb 22 13:51:57.611: ISAKMP: Locking peer struct 0x64C2864C, IPSEC refcount 1 for stuff_ke
*Feb 22 13:51:57.611: ISAKMP:(0:1:SW:1): Creating IPsec SAs
```

```

*Feb 22 13:51:57.611:      inbound SA from 172.16.1.1 to 192.168.1.2 (f/i)  0
/ 0
      (proxy 10.1.1.0 to 10.2.1.0)
*Feb 22 13:51:57.611:      has spi 0x1BB01835 and conn_id 0 and flags 2
*Feb 22 13:51:57.611:      lifetime of 28800 seconds
*Feb 22 13:51:57.611:      lifetime of 4608000 kilobytes
*Feb 22 13:51:57.611:      has client flags 0x0
*Feb 22 13:51:57.611:      outbound SA from 192.168.1.2 to 172.16.1.1 (f/i)  0
/0
      (proxy 10.2.1.0 to 10.1.1.0)
*Feb 22 13:51:57.611:      has spi 1995623635 and conn_id 0 and flags A
*Feb 22 13:51:57.611:      lifetime of 28800 seconds
*Feb 22 13:51:57.611:      lifetime of 4608000 kilobytes
*Feb 22 13:51:57.611:      has client flags 0x0
*Feb 22 13:51:57.615: ISAKMP:(0:1:SW:1): sending packet to 172.16.1.1 my_port 50
0 peer_port 500 (R) QM_IDLE
*Feb 22 13:51:57.615: ISAKMP:(0:1:SW:1):Node 328663488, Input = IKE_MESG_FROM_IP
SEC, IKE_SPI_REPLY
*Feb 22 13:51:57.615: ISAKMP:(0:1:SW:1):Old State = IKE_QM_SPI_STARVE  New State
= IKE_QM_R_QM2
*Feb 22 13:51:57.619: ISAKMP: Locking peer struct 0x64C2864C, IPSEC refcount 2 f
or from create_transforms
*Feb 22 13:51:57.619: ISAKMP: Unlocking IPSEC struct 0x64C2864C from create_tran
sforms, count 1
*Feb 22 13:51:57.631: ISAKMP (0:134217729): received packet from 172.16.1.1 dpor
t 500 sport 500 Global (R) QM_IDLE
*Feb 22 13:51:57.635: ISAKMP:(0:1:SW:1):deleting node 328663488 error FALSE reas
on "QM done (await)"
*Feb 22 13:51:57.635: ISAKMP:(0:1:SW:1):Node 328663488, Input = IKE_MESG_FROM_PE
ER, IKE_QM_EXCH
*Feb 22 13:51:57.635: ISAKMP:(0:1:SW:1):Old State = IKE_QM_R_QM2  New State = IK
E_QM_PHASE2_COMPLETE

```

Router#**debug crypto ipsec**

```

*Feb 22 13:57:41.187: IPSEC(validate_proposal_request): proposal part #1,
      (key eng. msg.) INBOUND local= 192.168.1.2, remote= 172.16.1.1,
      local_proxy= 10.2.1.0/255.255.255.0/0/0 (type=4),
      remote_proxy= 10.1.1.0/255.255.255.0/0/0 (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
*Feb 22 13:57:41.187: Crypto mapdb : proxy_match
      src addr      : 10.2.1.0
      dst addr      : 10.1.1.0
      protocol      : 0
      src port      : 0
      dst port      : 0
*Feb 22 13:57:41.191: IPSEC(key_engine): got a queue event with 1 kei messages
*Feb 22 13:57:41.191: IPSEC(key_engine): got a queue event with 1 kei messages
*Feb 22 13:57:41.191: IPSEC(spi_response): getting spi 2616144123 for SA
      from 192.168.1.2 to 172.16.1.1 for prot 3
*Feb 22 13:57:41.199: IPSEC(key_engine): got a queue event with 2 kei messages
*Feb 22 13:57:41.199: IPSEC(initialize_sas): ,
      (key eng. msg.) INBOUND local= 192.168.1.2, remote= 172.16.1.1,
      local_proxy= 10.2.1.0/255.255.255.0/0/0 (type=4),
      remote_proxy= 10.1.1.0/255.255.255.0/0/0 (type=4),
      protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel),
      lifedur= 28800s and 4608000kb,
      spi= 0x9BEF30FB(2616144123), conn_id= 0, keysize= 0, flags= 0x2
*Feb 22 13:57:41.203: IPSEC(initialize_sas): ,
      (key eng. msg.) OUTBOUND local= 192.168.1.2, remote= 172.16.1.1,
      local_proxy= 10.2.1.0/255.255.255.0/0/0 (type=4),
      remote_proxy= 10.1.1.0/255.255.255.0/0/0 (type=4),

```

```
protocol= ESP, transform= esp-des esp-md5-hmac (Tunnel),
lifedur= 28800s and 4608000kb,
spi= 0xAD0608C2(2902853826), conn_id= 0, keysize= 0, flags= 0xA
*Feb 22 13:57:41.203: Crypto mapdb : proxy_match
src addr      : 10.2.1.0
dst addr      : 10.1.1.0
protocol      : 0
src port      : 0
dst port      : 0
*Feb 22 13:57:41.203: IPsec: Flow_switching Allocated flow for sibling 80000005
*Feb 22 13:57:41.207: IPSEC(policy_db_add_ident): src 10.2.1.0, dest 10.1.1.0, d
est_port 0
*Feb 22 13:57:41.207: IPSEC(create_sa): sa created,
(sa) sa_dest= 192.168.1.2, sa_proto= 50,
sa_spi= 0x9BEF30FB(2616144123),
sa_trans= esp-des esp-md5-hmac , sa_conn_id= 2002
*Feb 22 13:57:41.207: IPSEC(create_sa): sa created,
(sa) sa_dest= 172.16.1.1, sa_proto= 50,
sa_spi= 0xAD0608C2(2902853826),
sa_trans= esp-des esp-md5-hmac , sa_conn_id= 2001
*Feb 22 13:57:41.475: IPSEC(key_engine): got a queue event with 1 kei messages
*Feb 22 13:57:41.475: IPSEC(key_engine_enable_outbound): rec'd enable notify fro
m ISAKMP
*Feb 22 13:57:41.475: IPSEC(key_engine_enable_outbound): enable SA with spi 2902
853826/50
```

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