Configuration Example of ASA VPN with Overlapping Scenarios

Contents

Related Information

Introduction

This document describes the steps used to translate the VPN traffic that travels over a LAN-to-LAN (L2L) IPsec tunnel between two Adaptive Security Appliances (ASA) in overlapping scenarios and also Port Address Translation (PAT) the internet traffic.

Prerequisites

Requirements

Make sure you have configured the Cisco Adaptive Security Appliance with IP addresses on the interfaces, and have basic connectivity before you proceed with this configuration example.

Components Used

The information in this document is based on this software version:

- Cisco Adaptive Security Appliance Software version 8.3 and later.

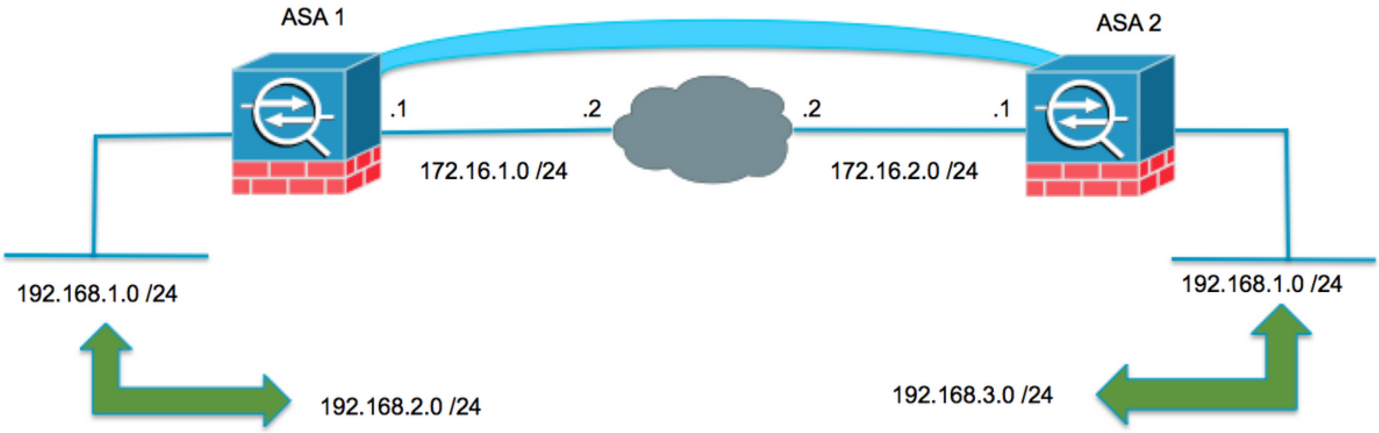
The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Background Information

Each device has a private, protected network behind it. In overlapping scenarios, communication across the VPN never happens because the packets never leave the local subnet since the traffic is sent to an IP address of the same subnet. This can be acomplished with Network Address Translation (NAT) as explained in the following sections.

Translation on both VPN Endpoints

When the VPN protected networks overlap and the configuration can be modified on both endpoints; NAT can be used to translate the local network to a different subnet when going to the remote translated subnet.



ASA 1

Create the necessary objects for the subnets in use

```
object network LOCAL
 subnet 192.168.1.0 255.255.255.0
object network XLATED-LOCAL
 subnet 192.168.2.0 255.255.255.0
object network XLATED-REMOTE
 subnet 192.168.3.0 255.255.255.0
```

Configure the NAT Statement

Create a manual statement to translate the local network to a different subnet only when going to the remote subnet (also translated)

```
nat (inside,outside) source static LOCAL XLATED-LOCAL destination static XLATED-REMOTE XLATED-
REMOTE
```

Configure the crypto ACL with the translated subnets

```
access-list VPN-TRAFFIC extended permit ip object XLATED-LOCAL object XLATED-REMOTE Rele
```

Relevant crypto configuration

```
crypto ikev1 enable outside
crypto ikev1 policy 1
 authentication pre-share
 encryption aes-256
 hash sha
 group 2
 lifetime 86400

crypto ipsec ikev1 transform-set AES256-SHA esp-aes-256 esp-sha-hmac
crypto ipsec security-association pmtu-aging infinite
crypto map MYMAP 10 match address VPN-TRAFFIC
crypto map MYMAP 10 set peer 172.16.2.1
crypto map MYMAP 10 set ikev1 transform-set AES256-SHA
crypto map MYMAP interface outside

tunnel-group 172.16.2.1 type ipsec-l2l
tunnel-group 172.16.2.1 ipsec-attributes
 ikev1 pre-shared-key secure_PSK
```

ASA 2

Create the necessary objects for the subnets in use

```
object network LOCAL
 subnet 192.168.1.0 255.255.255.0
object network XLATED-LOCAL
 subnet 192.168.3.0 255.255.255.0
object network XLATED-REMOTE
 subnet 192.168.2.0 255.255.255.0
```

Configure the NAT Statement

Create a manual statement to translate the local network to a different subnet only when going to the remote subnet (also translated)

```
nat (inside,outside) source static LOCAL XLATED-LOCAL destination static XLATED-REMOTE XLATED-
REMOTE
```

Configure the crypto ACL with the translated subnets

```
access-list VPN-TRAFFIC extended permit ip object XLATED-LOCAL object XLATED-REMOTE Rele
```

Relevant crypto configuration

```
crypto ikev1 enable outside
crypto ikev1 policy 1
 authentication pre-share
 encryption aes-256
 hash sha
 group 2
 lifetime 86400

crypto ipsec ikev1 transform-set AES256-SHA esp-aes-256 esp-sha-hmac
crypto ipsec security-association pmtu-aging infinite
crypto map MYMAP 10 match address VPN-TRAFFIC
crypto map MYMAP 10 set peer 172.16.1.1
crypto map MYMAP 10 set ikev1 transform-set AES256-SHA
crypto map MYMAP interface outside

tunnel-group 172.16.1.1 type ipsec-l2l
tunnel-group 172.16.1.1 ipsec-attributes
 ikev1 pre-shared-key secure_PSK
```

Verify

Use this section to confirm that your configuration works properly.

ASA 1

```
ASA1(config)# sh cry isa sa

IKEv1 SAs:

   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: 172.16.2.1
    Type    : L2L             Role    : initiator
    Rekey   : no              State   : MM_ACTIVE

There are no IKEv2 SAsASA1(config)# show crypto ipsec sa
```

```
interface: outside
    Crypto map tag: MYMAP, seq num: 10, local addr: 172.16.1.1

      access-list VPN-TRAFFIC extended permit ip 192.168.2.0 255.255.255.0 192.168.3.0
255.255.255.0
      local ident (addr/mask/prot/port): (192.168.2.0/255.255.255.0/0/0)
      remote ident (addr/mask/prot/port): (192.168.3.0/255.255.255.0/0/0)
      current_peer: 172.16.2.1


      #pkts encaps: 9, #pkts encrypt: 9, #pkts digest: 9
      #pkts decaps: 9, #pkts decrypt: 9, #pkts verify: 9
      #pkts compressed: 0, #pkts decompressed: 0
      #pkts not compressed: 9, #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
      #TFC rcvd: 0, #TFC sent: 0
      #Valid ICMP Errors rcvd: 0, #Invalid ICMP Errors rcvd: 0
      #send errors: 0, #recv errors: 0

      local crypto endpt.: 172.16.1.1/0, remote crypto endpt.: 172.16.2.1/0
      path mtu 1500, ipsec overhead 74(44), media mtu 1500
      PMTU time remaining (sec): 0, DF policy: copy-df
      ICMP error validation: disabled, TFC packets: disabled
      current outbound spi: F90C149A
      current inbound spi : 6CE656C7

    inbound esp sas:
      spi: 0x6CE656C7 (1827034823)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={L2L, Tunnel, IKEv1, }
         slot: 0, conn_id: 16384, crypto-map: MYMAP
         sa timing: remaining key lifetime (kB/sec): (3914999/28768)
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x000003FF
    outbound esp sas:
      spi: 0xF90C149A (4178318490)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={L2L, Tunnel, IKEv1, }
         slot: 0, conn_id: 16384, crypto-map: MYMAP
         sa timing: remaining key lifetime (kB/sec): (3914999/28768)
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x00000001
```

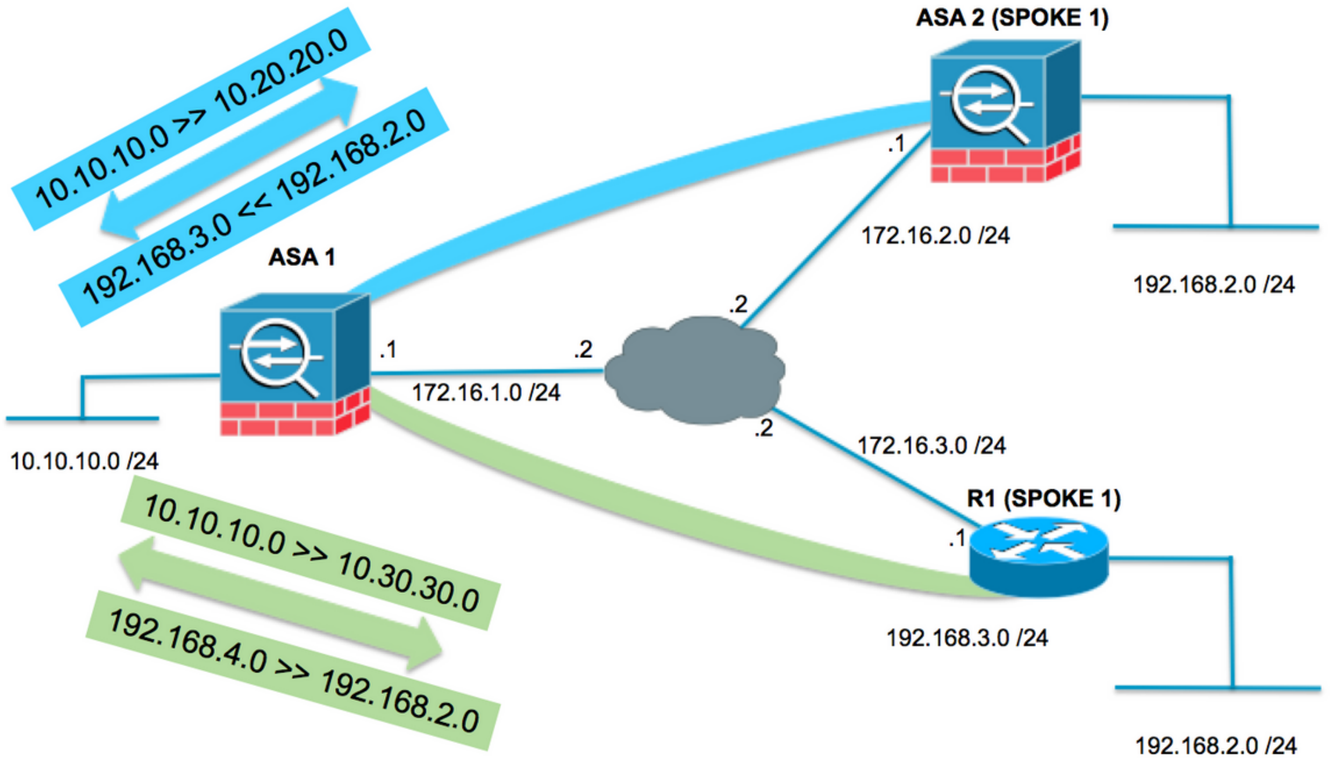
ASA 2

```
ASA2(config)# show crypto isa sa

IKEv1 SAs:

   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: 172.16.1.1
    Type    : L2L             Role    : responder
    Rekey   : no              State   : MM_ACTIVE

There are no IKEv2 SAsASA2(config)# show crypto ipsec sa
interface: outside
```

```
    Crypto map tag: MYMAP, seq num: 10, local addr: 172.16.2.1

      access-list VPN-TRAFFIC extended permit ip 192.168.3.0 255.255.255.0 192.168.2.0 
255.255.255.0
      local ident (addr/mask/prot/port): (192.168.3.0/255.255.255.0/0/0)
      remote ident (addr/mask/prot/port): (192.168.2.0/255.255.255.0/0/0)
      current_peer: 172.16.1.1


      #pkts encaps: 9, #pkts encrypt: 9, #pkts digest: 9
      #pkts decaps: 9, #pkts decrypt: 9, #pkts verify: 9
      #pkts compressed: 0, #pkts decompressed: 0
      #pkts not compressed: 9, #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
      #TFC rcvd: 0, #TFC sent: 0
      #Valid ICMP Errors rcvd: 0, #Invalid ICMP Errors rcvd: 0
      #send errors: 0, #recv errors: 0

      local crypto endpt.: 172.16.2.1/0, remote crypto endpt.: 172.16.1.1/0
      path mtu 1500, ipsec overhead 74(44), media mtu 1500
      PMTU time remaining (sec): 0, DF policy: copy-df
      ICMP error validation: disabled, TFC packets: disabled
      current outbound spi: 6CE656C7
      current inbound spi : F90C149A

    inbound esp sas:
      spi: 0xF90C149A (4178318490)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={L2L, Tunnel, IKEv1, }
         slot: 0, conn_id: 12288, crypto-map: MYMAP
         sa timing: remaining key lifetime (kB/sec): (4373999/28684)
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x000003FF
    outbound esp sas:
      spi: 0x6CE656C7 (1827034823)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={L2L, Tunnel, IKEv1, }
         slot: 0, conn_id: 12288, crypto-map: MYMAP
         sa timing: remaining key lifetime (kB/sec): (4373999/28683)
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x00000001
```

Hub and Spoke Topology with Overlapping Spokes

In the folloing topology, both spokes have the same subnet that needs to be protected over the IPsec tunnel towards the Hub. To facilitate the management on the spokes the NAT configuration to workaround the overlapping problem is performed on the Hub only.



ASA1

Create the necessary objects for the subnets in use

```
object network LOCAL
 subnet 10.10.10.0 255.255.255.0
object network SPOKES-NETWORK
 subnet 192.168.2.0 255.255.255.0
object network LOCAL-XLATE-TO-SPOKE1
 subnet 10.20.20.0 255.255.255.0
object network LOCAL-XLATE-TO-SPOKE2
 subnet 10.30.30.0 255.255.255.0
object network REMOTE-XLATE-SPOKE1
 subnet 192.168.3.0 255.255.255.0
object network REMOTE-XLATE-SPOKE2
 subnet 192.168.4.0 255.255.255.0
```

Create manual statements to translate:

- The local network 10.10.10.0 /24 to 10.20.20.0 /24 when going to the SPOKE1 (192.168.2.0 /24).
- The SPOKE1 network 192.168.2.0 /24 to 192.168.3.0 /24 when coming to 10.20.20.0 /24.
- The local network 10.10.10.0 /24 to 10.30.30.0 /24 when going to the SPOKE3 (192.168.2.0 /24).
- The SPOKE2 network 192.168.2.0 /24 to 192.168.4.0 /24 when coming to 10.30.30.0 /24.

```
nat (inside,outside) source static LOCAL LOCAL-XLATE-SPOKE1 destination static REMOTE-XLATE-
SPOKE1 SPOKES-NETWORK
nat (inside,outside) source static LOCAL LOCAL-XLATE-SPOKE2 destination static REMOTE-XLATE-
SPOKE2 SPOKES-NETWORK
```

Configure the crypto ACL with the translated subnets

```
access-list VPN-to-SPOKE1 extended permit ip object LOCAL-XLATE-SPOKE1 object SPOKES-NETWORKS
access-list VPN-to-SPOKE2 extended permit ip object LOCAL-XLATE-SPOKE2 object SPOKES-NETWORKS
```

Relevant crypto configuration

```
crypto ikev1 enable outside
crypto ikev1 policy 1
 authentication pre-share
 encryption aes-256
 hash sha
 group 2
 lifetime 86400

crypto ipsec ikev1 transform-set AES256-SHA esp-aes-256 esp-sha-hmac
crypto ipsec security-association pmtu-aging infinite
crypto map MYMAP 10 match address VPN-to-SPOKE1
crypto map MYMAP 10 set peer 172.16.2.1
crypto map MYMAP 10 set ikev1 transform-set AES256-SHA
crypto map MYMAP 20 match address VPN-to-SPOKE2
crypto map MYMAP 20 set peer 172.16.3.1
crypto map MYMAP 20 set ikev1 transform-set AES256-SHA
crypto map MYMAP interface outside

tunnel-group 172.16.2.1 type ipsec-l2l
tunnel-group 172.16.2.1 ipsec-attributes
 ikev1 pre-shared-key secure_PSK
tunnel-group 172.16.3.1 type ipsec-l2l
tunnel-group 172.16.3.1 ipsec-attributes
 ikev1 pre-shared-key secure_PSK
```

ASA2 (SPOKE1)

Configure the crypto ACL going to the translated subnet (10.20.20.0 /24)

```
access-list VPN-TRAFFIC extended permit ip 192.168.2.0 255.255.255.0 10.20.20.0 255.255.255.0
```

Relevant crypto configuration

```
crypto ikev1 enable outside
crypto ikev1 policy 1
 authentication pre-share
 encryption aes-256
 hash sha
 group 2
 lifetime 86400

crypto ipsec ikev1 transform-set esp-aes-256 esp-sha-hmac
crypto ipsec security-association pmtu-aging infinite
crypto map MYMAP 10 match address VPN-TRAFFIC
crypto map MYMAP 10 set peer 172.16.1.1
crypto map MYMAP 10 set ikev1 transform-set AES256-SHA
crypto map MYMAP interface outside

tunnel-group 172.16.1.1 type ipsec-l2l
tunnel-group 172.16.1.1 ipsec-attributes
 ikev1 pre-shared-key secure_PSK
```

R1 (SPOKE2)

Configure the crypto ACL going to the translated subnet (10.30.30.0 /24)

```
ip access-list extended VPN-TRAFFIC
```

```
 permit ip 192.168.2.0 0.0.0.255 10.30.30.0 0.0.0.255
```

Relevant crypto configuration

```
crypto isakmp policy 1
 encr aes 256
 authentication pre-share
 group 2

crypto isakmp key secure_PSK address 172.16.1.1

crypto ipsec transform-set AES256-SHA esp-aes 256 esp-sha-hmac
 mode tunnel

crypto map MYMAP 10 ipsec-isakmp
 set peer 172.16.1.1
 set transform-set AES256-SHA
 match address VPN-TRAFFIC

interface GigabitEthernet0/1
 ip address 172.16.3.1 255.255.255.0
 duplex auto
 speed auto
 media-type rj45
 crypto map MYMAP
```

Verify

ASA 1

```
ASA1(config)# show crypto isakmp sa

IKEv1 SAs:

   Active SA: 2
    Rekey SA: 0 (A tunnel will report 1 Active and 1 Rekey SA during rekey)
Total IKE SA: 2

1   IKE Peer: 172.16.3.1
    Type    : L2L             Role    : responder
    Rekey   : no              State   : MM_ACTIVE
2   IKE Peer: 172.16.2.1
    Type    : L2L             Role    : responder
    Rekey   : no              State   : MM_ACTIVE

There are no IKEv2 SAsASA1(config)# show crypto ipsec sa
interface: outside
    Crypto map tag: MYMAP, seq num: 10, local addr: 172.16.1.1

      access-list VPN-to-SPOKE1 extended permit ip 10.20.20.0 255.255.255.0 192.168.2.0
255.255.255.0
      local ident (addr/mask/prot/port): (10.20.20.0/255.255.255.0/0/0)
      remote ident (addr/mask/prot/port): (192.168.2.0/255.255.255.0/0/0)
      current_peer: 172.16.2.1


      #pkts encaps: 10, #pkts encrypt: 9, #pkts digest: 10
      #pkts decaps: 10, #pkts decrypt: 9, #pkts verify: 10
      #pkts compressed: 0, #pkts decompressed: 0
      #pkts not compressed: 9, #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
      #TFC rcvd: 0, #TFC sent: 0
      #Valid ICMP Errors rcvd: 0, #Invalid ICMP Errors rcvd: 0
      #send errors: 0, #recv errors: 0

      local crypto endpt.: 172.16.1.1/0, remote crypto endpt.: 172.16.2.1/0
      path mtu 1500, ipsec overhead 74(44), media mtu 1500
      PMTU time remaining (sec): 0, DF policy: copy-df
      ICMP error validation: disabled, TFC packets: disabled
      current outbound spi: 79384296
      current inbound spi : 2189BF7A

    inbound esp sas:
      spi: 0x2189BF7A (562675578)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={L2L, Tunnel, IKEv1, }
         slot: 0, conn_id: 12288, crypto-map: MYMAP
         sa timing: remaining key lifetime (kB/sec): (3914999/28618)
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x000003FF
    outbound esp sas:
      spi: 0x79384296 (2033730198)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={L2L, Tunnel, IKEv1, }
         slot: 0, conn_id: 12288, crypto-map: MYMAP
         sa timing: remaining key lifetime (kB/sec): (3914999/28618)
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x00000001

    Crypto map tag: MYMAP, seq num: 20, local addr: 172.16.1.1

      access-list VPN-to-SPOKE2 extended permit ip 10.30.30.0 255.255.255.0 192.168.2.0
255.255.255.0
      local ident (addr/mask/prot/port): (10.30.30.0/255.255.255.0/0/0)
      remote ident (addr/mask/prot/port): (192.168.2.0/255.255.255.0/0/0)
      current_peer: 172.16.3.1


      #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: 4, #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
      #TFC rcvd: 0, #TFC sent: 0
      #Valid ICMP Errors rcvd: 0, #Invalid ICMP Errors rcvd: 0
      #send errors: 0, #recv errors: 0

      local crypto endpt.: 172.16.1.1/0, remote crypto endpt.: 172.16.3.1/0
      path mtu 1500, ipsec overhead 74(44), media mtu 1500
      PMTU time remaining (sec): 0, DF policy: copy-df
      ICMP error validation: disabled, TFC packets: disabled
      current outbound spi: 65FDF4F5
      current inbound spi : 05B7155D

    inbound esp sas:
      spi: 0x05B7155D (95884637)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={L2L, Tunnel, IKEv1, }
         slot: 0, conn_id: 8192, crypto-map: MYMAP
         sa timing: remaining key lifetime (kB/sec): (3914999/2883)
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x0000001F
    outbound esp sas:
      spi: 0x65FDF4F5 (1711142133)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={L2L, Tunnel, IKEv1, }
         slot: 0, conn_id: 8192, crypto-map: MYMAP
         sa timing: remaining key lifetime (kB/sec): (3914999/2883)
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x00000001
```

ASA2 (SPOKE1)

```
ASA2(config)# show crypto isakmp sa

IKEv1 SAs:

   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: 172.16.1.1
    Type    : L2L             Role    : initiator
    Rekey   : no              State   : MM_ACTIVE

There are no IKEv2 SAsASA2(config)# show crypto ipsec sa
interface: outside
    Crypto map tag: MYMAP, seq num: 10, local addr: 172.16.2.1

      access-list VPN-TRAFFIC extended permit ip 192.168.2.0 255.255.255.0 10.20.20.0
255.255.255.0
      local ident (addr/mask/prot/port): (192.168.2.0/255.255.255.0/0/0)
      remote ident (addr/mask/prot/port): (10.20.20.0/255.255.255.0/0/0)
      current_peer: 172.16.1.1


      #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: 9, #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
      #TFC rcvd: 0, #TFC sent: 0
      #Valid ICMP Errors rcvd: 0, #Invalid ICMP Errors rcvd: 0
      #send errors: 0, #recv errors: 0

      local crypto endpt.: 172.16.2.1/0, remote crypto endpt.: 172.16.1.1/0
      path mtu 1500, ipsec overhead 74(44), media mtu 1500
      PMTU time remaining (sec): 0, DF policy: copy-df
      ICMP error validation: disabled, TFC packets: disabled
      current outbound spi: 2189BF7A
      current inbound spi : 79384296

    inbound esp sas:
      spi: 0x79384296 (2033730198)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={L2L, Tunnel, IKEv1, }
         slot: 0, conn_id: 8192, crypto-map: MYMAP
         sa timing: remaining key lifetime (kB/sec): (4373999/28494)
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x000003FF
    outbound esp sas:
      spi: 0x2189BF7A (562675578)
         transform: esp-aes-256 esp-sha-hmac no compression
         in use settings ={L2L, Tunnel, IKEv1, }
         slot: 0, conn_id: 8192, crypto-map: MYMAP
         sa timing: remaining key lifetime (kB/sec): (4373999/28494)
         IV size: 16 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x00000001
```

R1 (SPOKE2)

```
R31show crypto isakmp sa
IPv4 Crypto ISAKMP SA
dst             src             state          conn-id status
172.16.1.1      172.16.3.1      QM_IDLE           1001 ACTIVE

IPv6 Crypto ISAKMP SAR1#show crypto ipsec sa

interface: GigabitEthernet0/1
    Crypto map tag: MYMAP, local addr 172.16.3.1

   protected vrf: (none)
   local  ident (addr/mask/prot/port): (192.168.2.0/255.255.255.0/0/0)
   remote ident (addr/mask/prot/port): (10.30.30.0/255.255.255.0/0/0)
   current_peer 172.16.1.1 port 500
     PERMIT, flags={origin_is_acl,}
    #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.: 172.16.3.1, remote crypto endpt.: 172.16.1.1
     plaintext mtu 1438, path mtu 1500, ip mtu 1500, ip mtu idb GigabitEthernet0/1
     current outbound spi: 0x5B7155D(95884637)
     PFS (Y/N): N, DH group: none

     inbound esp sas:
      spi: 0x65FDF4F5(1711142133)
        transform: esp-256-aes esp-sha-hmac ,
        in use settings ={Tunnel, }
        conn id: 1, flow_id: SW:1, sibling_flags 80004040, crypto map: MYMAP
        sa timing: remaining key lifetime (k/sec): (4188495/2652)
        IV size: 16 bytes
        replay detection support: Y
        Status: ACTIVE(ACTIVE)

     inbound ah sas:

     inbound pcp sas:

     outbound esp sas:
      spi: 0x5B7155D(95884637)
        transform: esp-256-aes esp-sha-hmac ,
        in use settings ={Tunnel, }
        conn id: 2, flow_id: SW:2, sibling_flags 80004040, crypto map: MYMAP
        sa timing: remaining key lifetime (k/sec): (4188495/2652)
        IV size: 16 bytes
        replay detection support: Y
        Status: ACTIVE(ACTIVE)

     outbound ah sas:

     outbound pcp sas:
```

Troubleshoot

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

Clear Security Associations

When you troubleshoot, be sure to clear existing SAs after you make a change. In the privileged mode of the PIX, use these commands:

- **clear crypto ipsec sa** - Deletes the active IPsec SAs.
- **clear crypto isakmp sa** - Deletes the active IKE SAs.

Review NAT Configuration

- **show nat detail** - Displays the NAT configuration with the object(s) / object-group(s) expanded

Troubleshooting Commands

Use this section to confirm that your configuration works properly.

The Cisco CLI Analyzer (registered customers only) supports certain **show** commands. Use the Cisco CLI Analyzer in order to view an analysis of **show** command output.

> **Note**: Refer to Important Information on Debug Commands and IP Security Troubleshooting - Understanding and Using debug Commands before you use **debug** commands.

- **debug crypto ipsec** - Displays the IPsec negotiations of Phase 2.
- **debug crypto isakmp** - Displays the ISAKMP negotiations of Phase 1.

Related Information

- **NAT Configuration Guide**
- **Most Common L2L and Remote Access IPsec VPN Troubleshooting Solutions**
- **IPsec Negotiation/IKE Protocols**
- **Technical Support & Documentation - Cisco Systems**