ASA 5505 と ASA/PIX との間の LAN-to-LAN トンネル設定例

内容

概要

このドキュメントでは、Cisco セキュリティ アプライアンス（ASA/PIX）と適応型セキュリティ アプライアンス（ASA）5505 との間の LAN-to-LAN（サイトツーサイト）IPSec トンネルの設定例を紹介しています。

前提条件

要件

このドキュメントに特有の要件はありません。

使用するコンポーネント

このドキュメントの情報は、次のソフトウェアとハードウェアのバージョンに基づいています。

- ソフトウェア バージョン 7.x 以降が稼働する Cisco 5500 シリーズ ASA
- ソフトウェア バージョン 7.x 以降が稼働する Cisco 5505 ASA

このドキュメントの情報は、特定のラボ環境にあるデバイスに基づいて作成されました。このドキュメントで使用するすべてのデバイスは、初期（デフォルト）設定の状態から起動しています。対象のネットワークが実稼働中である場合には、どのようなコマンドについても、その潜在的な影響について確実に理解しておく必要があります。

関連製品

この設定は、次のバージョンのハードウェアとソフトウェアにも使用できます。

- ソフトウェア バージョン 7.x 以降が稼働する Cisco 500 シリーズ PIX セキュリティ アプライアンス
- ソフトウェア バージョン 7.x 以降が稼働する Cisco 5505 ASA

表記法

ドキュメント表記の詳細については、『シスコ テクニカル ティップスの表記法』を参照してください。

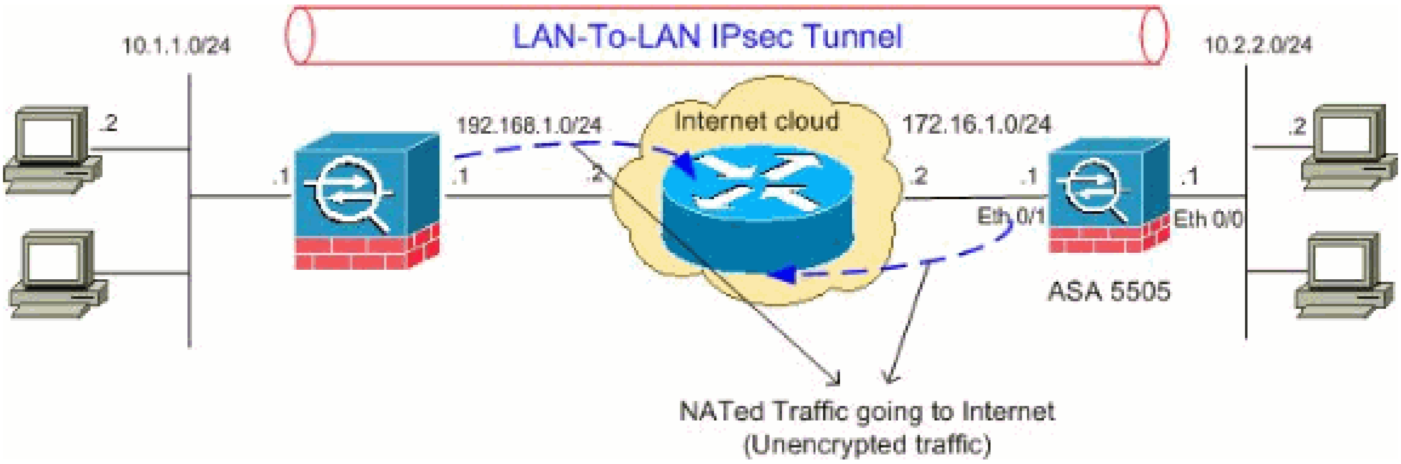
設定

このセクションでは、このドキュメントで説明する機能を設定するために必要な情報を提供しています。

注：このセクションで使用されているコマンドの詳細を調べるには、Command Lookup Tool（登録ユーザ専用）を参照してください。一部ツールについては、ゲスト登録のお客様にはアクセスできない場合がありますことをご了承ください。

ネットワーク図

このドキュメントでは、次のネットワーク セットアップを使用します。



設定

このドキュメントでは、次の構成を使用します。

- Cisco 5505 ASA の設定
- Cisco 5510 ASA の設定

Cisco 5505 ASA の設定

`ASA5505#show running-config`
`: Saved`

```
:
ASA Version 8.0(2)
!
hostname ASA5505
enable password 8Ry2YjIyt7RRXU24 encrypted
names
!
interface Vlan1
 no nameif
 no security-level
 no ip address
!
interface Vlan2
 nameif outside
 security-level 0
 ip address 172.16.1.1 255.255.255.0
!
interface Vlan3
 nameif inside
 security-level 100
 ip address 10.2.2.1 255.255.255.0
!
interface Ethernet0/0
 switchport access vlan 3
!
interface Ethernet0/1
 switchport access vlan 2
!
interface Ethernet0/2
 shutdown
!
interface Ethernet0/3
 shutdown
!
interface Ethernet0/4
 shutdown
!
interface Ethernet0/5
 shutdown
!
interface Ethernet0/6
 shutdown
!
interface Ethernet0/7
 shutdown
!
passwd 2KFQnbNIdI.2KYOU encrypted
boot system disk0:/asa802-k8.bin
ftp mode passive
access-list 100 extended permit ip 10.2.2.0
255.255.255.0 10.1.1.0 255.255.255.0

!--- Access-list for interesting traffic (Site to Site)
to be !--- encrypted between ASA 5505 and ASA/PIX
networks. access-list nonat extended permit ip 10.2.2.0
255.255.255.0 10.1.1.0 255.255.255.0

!--- Access-list for traffic to bypass the network
address !--- translation (NAT) process. pager lines 24
mtu inside 1500 mtu outside 1500 no failover icmp
unreachable rate-limit 1 burst-size 1 asdm image
disk0:/asdm-602.bin no asdm history enable arp timeout
14400 nat-control global (outside) 1 interface
nat (inside) 0 access-list nonat
nat (inside) 1 0.0.0.0 0.0.0.0

!--- Specify the NAT configuration. !--- NAT 0 prevents
NAT for the ACL defined in this configuration. !--- The
nat 1 command specifies NAT for all other traffic.


route outside 10.1.1.0 255.255.255.0 172.16.1.2 1
route outside 192.168.1.0 255.255.255.0 172.16.1.2 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 0:02:0
timeout uauth 0:05:00 absolute
dynamic-access-policy-record DfltAccessPolicy
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. crypto ipsec transform-set
myset esp-3des esp-sha-hmac

!--- Define the transform set for Phase 2. crypto map
outside_map 20 match address 100

!--- Define which traffic can be sent to the IPsec peer.
crypto map outside_map 20 set peer 192.168.1.1

!--- Sets the IPsec peer. crypto map outside_map 20 set
transform-set myset

!--- Sets the IPsec transform set "myset" !--- to be
used with the crypto map entry "outside_map" crypto map
outside_map interface outside

!--- Crypto map applied to the outside interface of the
ASA crypto isakmp enable outside
crypto isakmp policy 10
 authentication pre-share
 encryption 3des
 hash sha
 group 2
 lifetime 86400

!--- PHASE 1 CONFIGURATION ---! !--- This configuration
uses isakmp policy 10. !--- These configuration commands
!--- define the Phase 1 policies that are used. telnet
timeout 5 ssh timeout 5 console timeout 0 threat-
detection basic-threat threat-detection statistics
access-list ! 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 tunnel-group 192.168.1.1
type ipsec-l2l
```

```
!--- In order to create and manage the database of
connection-specific records !--- for ipsec-l2l—IPsec
(LAN-to-LAN) 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 192.168.1.1 ipsec-attributes
 pre-shared-key *

!--- Enter the pre-shared-key in order to configure the
authentication method. prompt hostname context
Cryptochecksum:68eba159fd8e4c893f24185ffb40bb6f : end
ASA5505#
```

Cisco 5510 ASA の設定

```
ASA5510#show running-config
: Saved
:
ASA Version 8.0(2)
!
hostname ASA5510
enable password 8Ry2YjIyt7RRXU24 encrypted
names
!
interface Ethernet0/0
 nameif inside
 security-level 100
 ip address 10.1.1.1 255.255.255.0
!
interface Ethernet0/1
 nameif outside
 security-level 0
 ip address 192.168.1.1 255.255.255.0
!
interface Ethernet0/2
 shutdown
 no nameif
 no security-level
 no ip address
!
interface Ethernet0/3
 shutdown
 no nameif
 no security-level
 no ip address
!
interface Management0/0
 shutdown
 no nameif
 no security-level
 no ip address
!
passwd 2KFQnbNIdI.2KYOU encrypted
ftp mode passive
access-list 100 extended permit ip 10.1.1.0
255.255.255.0 10.2.2.0 255.255.255.0

!--- Access-list for interesting traffic (Site to Site)
```

```
to be !--- encrypted between ASA 5505 and ASA/PIX
networks. access-list nonat extended permit ip 10.1.1.0
255.255.255.0 10.2.2.0 255.255.255.0

!--- Access-list for traffic to bypass the network
address !--- translation (NAT) process. pager lines 24
mtu inside 1500 mtu outside 1500 no failover icmp
unreachable rate-limit 1 burst-size 1 asdm image
disk0:/asdm-522.bin no asdm history enable arp timeout
14400 nat-control global (outside) 1 interface
nat (inside) 0 access-list nonat
nat (inside) 1 0.0.0.0 0.0.0.0

!--- Specify the NAT configuration. !--- NAT 0 prevents
NAT for the ACL defined in this configuration. !--- The
nat 1 command specifies NAT for all other traffic.


route outside 10.2.2.0 255.255.255.0 192.168.1.2 1
route outside 172.16.1.0 255.255.255.0 192.168.1.2 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
dynamic-access-policy-record DfltAccessPolicy
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. crypto ipsec transform-set
myset esp-3des esp-sha-hmac

!--- Define the transform set for Phase 2. crypto map
outside_map 20 match address 100

!--- Define which traffic can be sent to the IPsec peer.
crypto map outside_map 20 set peer 172.16.1.1

!--- Sets the IPsec peer. crypto map outside_map 20 set
transform-set myset

!--- Sets the IPsec transform set "myset" !--- to be
used with the crypto map entry "outside_map" crypto map
outside_map interface outside

!--- Crypto map applied to the outside interface of the
ASA crypto isakmp enable outside
crypto isakmp policy 10
 authentication pre-share
 encryption 3des
 hash sha
 group 2
 lifetime 86400

!--- PHASE 1 CONFIGURATION ---! !--- This configuration
uses isakmp policy 10. !--- These configuration commands
!--- define the Phase 1 policies that are used. crypto
isakmp policy 65535 authentication pre-share encryption
```

```
3des hash sha group 2 lifetime 86400 telnet timeout 5
ssh timeout 5 console timeout 0 threat-detection basic-
threat threat-detection statistics access-list ! 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 tunnel-group 172.16.1.1 type
ipsec-l2l

!--- In order to create and manage the database of
connection-specific records !--- for ipsec-l2l—IPsec
(LAN-to-LAN) 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 172.16.1.1 ipsec-attributes
 pre-shared-key *
!--- Enter the pre-shared-key in order to configure the
authentication method. prompt hostname context
Cryptochecksum:d41d8cd98f00b204e9800998ecf8427e : end
ASA5510#
```

確認

ここでは、設定が正常に機能しているかどうかを確認します。

アウトプット インタープリタ ツール（登録ユーザ専用）（OIT）は、特定の show コマンドをサポートします。OIT を使用して、show コマンドの出力の分析を表示します。

- **show crypto isakmp sa：ピア上の現在の IKE セキュリティ アソシエーション（SA）をすべて表示します。**
- **show crypto ipsec sa**：現在の IPSec SA をすべて表示します。

このセクションには、次のモデル用の確認設定例を示します。

- Cisco 5505 ASA
- Cisco 5510 ASA

Cisco 5505 ASA の設定

```
ASA5505#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: 192.168.1.1
    Type    : L2L             Role    : initiator
    Rekey   : no              State   : MM_ACTIVE
```

```
ASA5505#show crypto ipsec sa
interface: outside
    Crypto map tag: outside_map, seq num: 20, local
addr: 172.16.1.1

      access-list 100 permit ip 10.2.2.0 255.255.255.0
10.1.1.0 255.255.255.0
      local ident (addr/mask/prot/port):
(10.2.2.0/255.255.255.0/0/0)
      remote ident (addr/mask/prot/port):
(10.1.1.0/255.255.255.0/0/0)
      current_peer: 192.168.1.1

      #pkts encaps: 4, #pkts encrypt: 4, #pkts digest: 4
      #pkts decaps: 4, #pkts decrypt: 4, #pkts verify: 4
      #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
      #send errors: 0, #recv errors: 0

      local crypto endpt.: 172.16.1.1, remote crypto
endpt.: 192.168.1.1

      path mtu 1500, ipsec overhead 58, media mtu 1500
      current outbound spi: A0411DE6

    inbound esp sas:
      spi: 0x8312C39C (2199045020)
         transform: esp-3des esp-sha-hmac none
         in use settings ={L2L, Tunnel, }
         slot: 0, conn_id: 8192, crypto-map: outside_map
         sa timing: remaining key lifetime (kB/sec):
(3824999/27807)
         IV size: 8 bytes
         replay detection support: Y
    outbound esp sas:
      spi: 0xA0411DE6 (2688622054)
         transform: esp-3des esp-sha-hmac none
         in use settings ={L2L, Tunnel, }
         slot: 0, conn_id: 8192, crypto-map: outside_map
         sa timing: remaining key lifetime (kB/sec):
(3824999/27807)
         IV size: 8 bytes
         replay detection support: Y
```

Cisco 5510 ASA の設定

```
ASA5510#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: 172.16.1.1
    Type    : L2L             Role    : responder
    Rekey   : no              State   : MM_ACTIVE
```

```
ASA5510#show crypto ipsec sa
interface: outside
    Crypto map tag: outside_map, seq num: 20, local
addr: 192.168.1.1

      access-list 100 permit ip 10.1.1.0 255.255.255.0
10.2.2.0 255.255.255.0
      local ident (addr/mask/prot/port):
(10.1.1.0/255.255.255.0/0/0)
      remote ident (addr/mask/prot/port):
(10.2.2.0/255.255.255.0/0/0)
      current_peer: 172.16.1.1

      #pkts encaps: 4, #pkts encrypt: 4, #pkts digest: 4
      #pkts decaps: 4, #pkts decrypt: 4, #pkts verify: 4
      #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
      #send errors: 0, #recv errors: 0

      local crypto endpt.: 192.168.1.1, remote crypto
endpt.: 172.16.1.1

      path mtu 1500, ipsec overhead 58, media mtu 1500
      current outbound spi: 8312C39C

    inbound esp sas:
      spi: 0xA0411DE6 (2688622054)
         transform: esp-3des esp-sha-hmac none
         in use settings ={L2L, Tunnel, }
         slot: 0, conn_id: 8192, crypto-map: outside_map
         sa timing: remaining key lifetime (kB/sec):
(4274999/27844)
         IV size: 8 bytes
         replay detection support: Y
    outbound esp sas:
      spi: 0x8312C39C (2199045020)
         transform: esp-3des esp-sha-hmac none
         in use settings ={L2L, Tunnel, }
         slot: 0, conn_id: 8192, crypto-map: outside_map
         sa timing: remaining key lifetime (kB/sec):
(4274999/27844)
         IV size: 8 bytes
         replay detection support: Y
```

トラブルシュート

ここでは、設定のトラブルシューティングに使用できる情報を示します。

次のようなコマンドを使用します。

- **clear crypto isakmp sa : フェーズ 1 SA をクリアします。注意：clear crypto isakmp sa コマンドは、アクティブな VPN トンネルをすべてクリアするので、運用に重大な影響を及ぼす場合があります。**PIX/ASA ソフトウェアのバージョン 8.0(3) 以降からは、**clear crypto isakmp sa <peer ip address> コマンドを使用して、個々の IKE SA をクリアできます。**8.0(3)よりも

前のソフトウェアバージョンでは、vpn-sessiondb logoff tunnel-group *<tunnel-group-name>コマンドを使用して、1つのトンネルのIKEおよびIPsec SAをクリアできま*す。

```
ASA5505#vpn-sessiondb logoff tunnel-group 192.168.1.1
Do you want to logoff the VPN session(s)? [confirm] Y
INFO: Number of sessions from TunnelGroup "192.168.1.1" logged off : 1

ASA5505# Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, P
itcher: received key delete msg, spi 0xaa157573
Jan 19 13:58:43 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, Connection termi
nated for peer 192.168.1.1.  Reason: Administrator Reset  Remote Proxy 10.1.1.0,
 Local Proxy 10.2.2.0
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, IKE SA MM:
116f1ccf rcv'd Terminate: state MM_ACTIVE  flags 0x0021c042, refcnt 1, tuncnt 1
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, sending de
lete/delete with reason message
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng blank hash payload
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng IPSec delete payload
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng qm hash payload
Jan 19 13:58:43 [IKEv1]: IP = 192.168.1.1, IKE_DECODE SENDING Message (msgid=c17
46fb4) with payloads : HDR + HASH (8) + DELETE (12) + NONE (0) total length : 68
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, Active uni
t receives a delete event for remote peer 192.168.1.1.

Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, IKE Deleti
ng SA: Remote Proxy 10.1.1.0, Local Proxy 10.2.2.0
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, IKE SA MM:
116f1ccf terminating:  flags 0x0121c002, refcnt 0, tuncnt 0
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, sending de
lete/delete with reason message
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng blank hash payload
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng IKE delete payload
Jan 19 13:58:43 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng qm hash payload
Jan 19 13:58:43 [IKEv1]: IP = 192.168.1.1, IKE_DECODE SENDING Message (msgid=a7e
78fac) with payloads : HDR + HASH (8) + DELETE (12) + NONE (0) total length : 80
Jan 19 13:58:43 [IKEv1 DEBUG]: Pitcher: received key delete msg, spi 0xaa157573
Jan 19 13:58:43 [IKEv1 DEBUG]: Pitcher: received key delete msg, spi 0x746fe476
Jan 19 13:58:43 [IKEv1]: IP = 192.168.1.1, Received encrypted packet with no mat
ching SA, dropping
```

- clear crypto ipsec sa peer *<peer IP address>* : 必要なフェーズ 2 SA をクリアします。

```
ASA5505(config)#clear ipsec sa peer 192.168.1.1
ASA5505(config)# IPSEC: Deleted inbound decrypt rule, SPI 0x8030618F
    Rule ID: 0xD4E56A18
IPSEC: Deleted inbound permit rule, SPI 0x8030618F
    Rule ID: 0xD4DF4110
IPSEC: Deleted inbound tunnel flow rule, SPI 0x8030618F
    Rule ID: 0xD4DAE1F0
IPSEC: Deleted inbound VPN context, SPI 0x8030618F
    VPN handle: 0x00058FBC
IPSEC: Deleted outbound encrypt rule, SPI 0x0D6CDEEB
    Rule ID: 0xD4DA4348
IPSEC: Deleted outbound permit rule, SPI 0x0D6CDEEB
    Rule ID: 0xD4DAE7A8
IPSEC: Deleted outbound VPN context, SPI 0x0D6CDEEB
    VPN handle: 0x0005633C
```

- debug crypto isakmp sa *<debug level>* : ISAKMP SA のネゴシエーションをデバッグします

o

```
ASA5505(config)#debug crypto isakmp 7
ASA5505(config)# Jan 19 13:39:49 [IKEv1]: IP = 192.168.1.1, IKE_DECODE RECEIVED
Message (msgid=0) with payloads : HDR + SA (1) + VENDOR (13) + VENDOR (13) + VEN
DOR (13) + NONE (0) total length : 188
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing SA payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Oakley proposal is acceptable
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing VID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Received NAT-Traversal ver 02 V
ID
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing VID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Received NAT-Traversal ver 03 V
ID
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing VID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Received Fragmentation VID
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, IKE Peer included IKE fragmenta
tion capability flags:  Main Mode:        True  Aggressive Mode:  True
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing IKE SA payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, IKE SA Proposal # 1, Transform
# 1 acceptable  Matches global IKE entry # 2
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, constructing ISAKMP SA payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, constructing NAT-Traversal VID
ver 02 payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, constructing Fragmentation VID
+ extended capabilities payload
Jan 19 13:39:49 [IKEv1]: IP = 192.168.1.1, IKE_DECODE SENDING Message (msgid=0)
with payloads : HDR + SA (1) + VENDOR (13) + VENDOR (13) + NONE (0) total length
 : 128
Jan 19 13:39:49 [IKEv1]: IP = 192.168.1.1, IKE_DECODE RECEIVED Message (msgid=0)
 with payloads : HDR + KE (4) + NONCE (10) + VENDOR (13) + VENDOR (13) + VENDOR
(13) + VENDOR (13) + NAT-D (130) + NAT-D (130) + NONE (0) total length : 304
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing ke payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing ISA_KE payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing nonce payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing VID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Received Cisco Unity client VID
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing VID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Received xauth V6 VID
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing VID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Processing VPN3000/ASA spoofing
 IOS Vendor ID payload (version: 1.0.0, capabilities: 20000001)
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing VID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Received Altiga/Cisco VPN3000/C
isco ASA GW VID
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing NAT-Discovery payloa
d
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, computing NAT Discovery hash
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, processing NAT-Discovery payloa
d
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, computing NAT Discovery hash
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, constructing ke payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, constructing nonce payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, constructing Cisco Unity VID pa
yload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, constructing xauth V6 VID paylo
ad
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Send IOS VID
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Constructing ASA spoofing IOS V
endor ID payload (version: 1.0.0, capabilities: 20000001)
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, constructing VID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Send Altiga/Cisco VPN3000/Cisco
 ASA GW VID
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, constructing NAT-Discovery payl
```

```
oad
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, computing NAT Discovery hash
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, constructing NAT-Discovery payl
oad
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, computing NAT Discovery hash
Jan 19 13:39:49 [IKEv1]: IP = 192.168.1.1, Connection landed on tunnel_group 192
.168.1.1
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, Generating
 keys for Responder...
Jan 19 13:39:49 [IKEv1]: IP = 192.168.1.1, IKE_DECODE SENDING Message (msgid=0)
with payloads : HDR + KE (4) + NONCE (10) + VENDOR (13) + VENDOR (13) + VENDOR (
13) + VENDOR (13) + NAT-D (130) + NAT-D (130) + NONE (0) total length : 304
Jan 19 13:39:49 [IKEv1]: IP = 192.168.1.1, IKE_DECODE RECEIVED Message (msgid=0)
 with payloads : HDR + ID (5) + HASH (8) + IOS KEEPALIVE (128) + VENDOR (13) + N
ONE (0) total length : 96
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, processing
 ID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, processing
 hash payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, Computing
hash for ISAKMP
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Processing IOS keep alive paylo
ad: proposal=32767/32767 sec.
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, processing
 VID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, Received D
PD VID
Jan 19 13:39:49 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, Automatic NAT De
tection Status:     Remote end is NOT behind a NAT device     This   end is NOT
behind a NAT device
Jan 19 13:39:49 [IKEv1]: IP = 192.168.1.1, Connection landed on tunnel_group 192
.168.1.1
Jan 19 13:39:49 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, Freeing previous
ly allocated memory for authorization-dn-attributes
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng ID payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng hash payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, Computing
hash for ISAKMP
Jan 19 13:39:49 [IKEv1 DEBUG]: IP = 192.168.1.1, Constructing IOS keep alive pay
load: proposal=32767/32767 sec.
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng dpd vid payload
Jan 19 13:39:49 [IKEv1]: IP = 192.168.1.1, IKE_DECODE SENDING Message (msgid=0)
with payloads : HDR + ID (5) + HASH (8) + IOS KEEPALIVE (128) + VENDOR (13) + NO
NE (0) total length : 96
Jan 19 13:39:49 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, PHASE 1 COMPLETE
D
Jan 19 13:39:49 [IKEv1]: IP = 192.168.1.1, Keep-alive type for this connection:
DPD
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, Starting P
1 rekey timer: 73440 seconds.
Jan 19 13:39:49 [IKEv1]: IP = 192.168.1.1, IKE_DECODE RECEIVED Message (msgid=94
21905f) with payloads : HDR + HASH (8) + SA (1) + NONCE (10) + ID (5) + ID (5) +
 NOTIFY (11) + NONE (0) total length : 196
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, processing
 hash payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, processing
 SA payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, processing
 nonce payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, processing
 ID payload
```

```
Jan 19 13:39:49 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, Received remote
IP Proxy Subnet data in ID Payload:   Address 10.1.1.0, Mask 255.255.255.0, Prot
ocol 0, Port 0
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, processing
 ID payload
Jan 19 13:39:49 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, Received local I
P Proxy Subnet data in ID Payload:   Address 10.2.2.0, Mask 255.255.255.0, Proto
col 0, Port 0
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, processing
 notify payload
Jan 19 13:39:49 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, QM IsRekeyed old
 sa not found by addr
Jan 19 13:39:49 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, Static Crypto Ma
p check, checking map = outside_map, seq = 20...
Jan 19 13:39:49 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, Static Crypto Ma
p check, map outside_map, seq = 20 is a successful match
Jan 19 13:39:49 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, IKE Remote Peer
configured for crypto map: outside_map
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, processing
 IPSec SA payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, IPSec SA P
roposal # 1, Transform # 1 acceptable  Matches global IPSec SA entry # 20
Jan 19 13:39:49 [IKEv1]: Group = 192.168.1.1, IP = 192.168.1.1, IKE: requesting
SPI!
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, IKE got SP
I from key engine: SPI = 0x826ff027
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, oakley con
stucting quick mode
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng blank hash payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng IPSec SA payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng IPSec nonce payload
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, constructi
ng proxy ID
Jan 19 13:39:49 [IKEv1 DEBUG]: Group = 192.168.1.1, IP = 192.168.1.1, Transmitti
```

- debug crypto ipsec sa <debug level>：IPSec SA のネゴシエーションをデバッグします。

```
ASA5505(config)#debug crypto ipsec 7
ASA5505(config)# IPSEC: New embryonic SA created @ 0xD4E56E18,
    SCB: 0xD4E56CF8,
    Direction: inbound
    SPI      : 0x8030618F
    Session ID: 0x00006000
    VPIF num  : 0x00000001
    Tunnel type: l2l
    Protocol   : esp
    Lifetime   : 240 seconds
IPSEC: New embryonic SA created @ 0xD4E57AD8,
    SCB: 0xD4DAE608,
    Direction: outbound
    SPI      : 0x0D6CDEEB
    Session ID: 0x00006000
    VPIF num  : 0x00000001
    Tunnel type: l2l
    Protocol   : esp
    Lifetime   : 240 seconds
IPSEC: Completed host OBSA update, SPI 0x0D6CDEEB
IPSEC: Creating outbound VPN context, SPI 0x0D6CDEEB
    Flags: 0x00000005
    SA   : 0xD4E57AD8
    SPI  : 0x0D6CDEEB
    MTU  : 1500 bytes
    VCID : 0x00000000
    Peer : 0x00000000
    SCB  : 0x015E69CB
    Channel: 0xD3D60A98
IPSEC: Completed outbound VPN context, SPI 0x0D6CDEEB
    VPN handle: 0x0005633C
IPSEC: New outbound encrypt rule, SPI 0x0D6CDEEB
    Src addr: 10.2.2.0
    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 outbound encrypt rule, SPI 0x0D6CDEEB
    Rule ID: 0xD4DA4348
IPSEC: New outbound permit rule, SPI 0x0D6CDEEB
    Src addr: 172.16.1.1
    Src mask: 255.255.255.255
    Dst addr: 192.168.1.1
    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: 0x0D6CDEEB
    Use SPI: true
IPSEC: Completed outbound permit rule, SPI 0x0D6CDEEB
    Rule ID: 0xD4DAE7A8
IPSEC: Completed host IBSA update, SPI 0x8030618F
IPSEC: Creating inbound VPN context, SPI 0x8030618F
    Flags: 0x00000006
    SA   : 0xD4E56E18
    SPI  : 0x8030618F
    MTU  : 0 bytes
    VCID : 0x00000000
    Peer : 0x0005633C
    SCB  : 0x015DD135
    Channel: 0xD3D60A98
IPSEC: Completed inbound VPN context, SPI 0x8030618F
    VPN handle: 0x00058FBC
IPSEC: Updating outbound VPN context 0x0005633C, SPI 0x0D6CDEEB
    Flags: 0x00000005
    SA   : 0xD4E57AD8
    SPI  : 0x0D6CDEEB
    MTU  : 1500 bytes
    VCID : 0x00000000
    Peer : 0x00058FBC
    SCB  : 0x015E69CB
    Channel: 0xD3D60A98
IPSEC: Completed outbound VPN context, SPI 0x0D6CDEEB
    VPN handle: 0x0005633C
IPSEC: Completed outbound inner rule, SPI 0x0D6CDEEB
    Rule ID: 0xD4DA4348
IPSEC: Completed outbound outer SPD rule, SPI 0x0D6CDEEB
    Rule ID: 0xD4DAE7A8
IPSEC: New inbound tunnel flow rule, SPI 0x8030618F
    Src addr: 10.1.1.0
    Src mask: 255.255.255.0
    Dst addr: 10.2.2.0
    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 0x8030618F
    Rule ID: 0xD4DAE1F0
IPSEC: New inbound decrypt rule, SPI 0x8030618F
    Src addr: 192.168.1.1
    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: 0x8030618F
    Use SPI: true
IPSEC: Completed inbound decrypt rule, SPI 0x8030618F
    Rule ID: 0xD4E56A18
IPSEC: New inbound permit rule, SPI 0x8030618F
    Src addr: 192.168.1.1
```

関連情報

- Cisco ASA 5500 シリーズ適応型セキュリティ アプライアンスに関するサポート ページ
- Cisco PIX 500 シリーズ セキュリティ アプライアンス サポート ページ
- 一般的な L2L およびリモート アクセス IPsec VPN のトラブルシューティング方法について
- IPSec ネゴシエーション/IKE プロトコルに関するサポート ページ