Configuring a Router−to−Router LAN−to−LAN Tunnel with a Router Initiating IKE Aggressive Mode

Document ID: 20641

Contents

Introduction

Cisco IOS® Software Release 12.2(8)T introduces the functionality of the router to initiate Internet Key Exchange (IKE) in aggressive mode. For more information see Bug ID CSCdt30808 (registered customers only) in the Bug Toolkit. Before, the router was able to respond to a tunnel negotiation request of aggressive mode, but it was never able to initiate it.

Prerequisites

Requirements

There are no specific prerequisites for this document.

Components Used

The information in this document is based on the software and hardware versions below.

- Cisco IOS 12.2(8)T was used on both routers, although it is not necessary to have it on the receiving router.

Note: This configuration was tested with Cisco IOS Software Release12.2(13)T1. All aspects of the configuration remain the same.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Conventions

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

Background Information

Note: The new command−line interface (CLI) commands are as follows:

- **crypto isakmp peer** < **address** <*x.x.x.x*> | **hostname** <*name*> >
- **set aggressive−mode client−endpoint** < **fqdn** <*name*> | **ipv4−address** <*x.x.x.x*> | **user−fqdn** <*name*> >
- **set aggressive−mode password** <*password*>

In the sample configuration below, RouterA and RouterB have a LAN−to−LAN tunnel between them. RouterA will always be the tunnel initiating router, and it has been configured in this example to initiate in aggressive mode. RouterB simply has a dynamic crypto map to accept the tunnel parameters from RouterA, although it could also have had a standard LAN−to−LAN tunnel configuration applied.

Note: In this example, RouterB does not have to be running Cisco IOS Software Release 12.2(8)T to accept the tunnel parameters from RouterA. As mentioned above, the routers have always accepted an aggressive mode request, they have just never been able to initiate it.

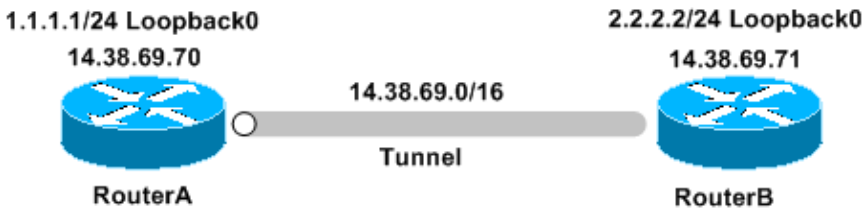
Configure

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

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

Network Diagram

This document uses the network setup shown in the diagram below.



Configurations

This document uses these configurations:

- RouterA
- RouterB

RouterA
Building configuration... Current configuration : 1253 bytes !

```
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname RouterA
!
!
memory-size iomem 10
ip subnet-zero
!
!
!
!
crypto isakmp policy 1
 hash md5
 authentication pre-share
crypto isakmp keepalive 30 5
!
crypto isakmp peer address 14.38.69.71
 set aggressive-mode password cisco123
 set aggressive-mode client-endpoint ipv4-address 14.38.69.70
!
!
crypto ipsec transform-set myset esp-3des esp-md5-hmac
!
crypto map mymap 1 ipsec-isakmp
 set peer 14.38.69.71
 set transform-set myset
 match address 100
!
!
!
interface Loopback0
 ip address 1.1.1.1 255.255.255.0
!
interface Ethernet0/0
 ip address 14.38.69.70 255.255.0.0
 half-duplex
 crypto map mymap
!
interface BRI0/0
 no ip address
 shutdown
!
interface Ethernet0/1
 no ip address
 shutdown
 half-duplex
!
ip classless
ip route 0.0.0.0 0.0.0.0 14.38.69.71
ip http server
!
!
access-list 100 permit ip 1.1.1.0 0.0.0.255 2.2.2.0 0.0.0.255
!
call rsvp-sync
!
!
mgcp profile default
!
dial-peer cor custom
!
!
line con 0
```

```
 exec-timeout 0 0
line aux 0
line vty 0 4
 login
!
!
end
```

RouterB

```
Building configuration...

Current configuration : 1147 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname RouterB
!
!
ip subnet-zero
!
!
!
!
crypto isakmp policy 1
 hash md5
 authentication pre-share
crypto isakmp key cisco123 address 14.38.69.70
crypto isakmp keepalive 30 5
!
!
crypto ipsec transform-set myset esp-3des esp-md5-hmac
!
crypto dynamic-map mymap 10
 set transform-set myset
!
!
crypto map mainmap 1 ipsec-isakmp dynamic mymap
!
!
!
interface Loopback0
 ip address 2.2.2.2 255.255.255.0
!
interface FastEthernet0/0
 ip address 14.38.69.71 255.255.0.0
 duplex auto
 speed auto
 crypto map mainmap
!
interface Serial0/0
 no ip address
 shutdown
 no fair-queue
!
interface FastEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
ip classless
```

```
ip route 0.0.0.0 0.0.0.0 14.38.69.70
no ip http server
!
!
call rsvp-sync
!
!
mgcp profile default
!
dial-peer cor custom
!
!
line con 0
 exec-timeout 0 0
 speed 115200
line aux 0
line vty 0 4
 login
!
!
end
```

Verify

This section provides information you can use to confirm your configuration is working properly.

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

- **show crypto ipsec sa** Shows the phase 2 security associations.
- **show crypto isakmp sa** Shows the phase 1 security associations

Troubleshoot

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

Troubleshooting Commands

Note: Before issuing **debug** commands, please see Important Information on Debug Commands.

- **debug crypto ipsec** Shows the IPSec negotiations of phase 2.
- **debug crypto isakmp** Shows the ISAKMP negotiations of phase 1.
- **debug crypto engine** Shows the traffic that is encrypted.

RouterA Debug Output

```
00:08:26: IPSEC(sa_request): ,
  (key eng. msg.) OUTBOUND local= 14.38.69.70, remote= 14.38.69.71,
    local_proxy= 1.1.1.0/255.255.255.0/0/0 (type=4),
    remote_proxy= 2.2.2.0/255.255.255.0/0/0 (type=4),
    protocol= ESP, transform= esp-3des esp-md5-hmac ,
    lifedur= 3600s and 4608000kb,
    spi= 0x4B68058A(1265108362), conn_id= 0, keysize= 0, flags= 0x400C
00:08:26: ISAKMP: received ke message (1/1)
00:08:26: ISAKMP: local port 500, remote port 500
00:08:26: ISAKMP (0:1): SA has tunnel attributes set.
00:08:26: ISAKMP (0:1): SA is doing unknown authentication!
00:08:26: ISAKMP (1): ID payload
```

```
        next-payload : 13
        type         : 1
        protocol     : 17
        port         : 500
        length       : 8
00:08:26: ISAKMP (1): Total payload length: 12
00:08:26: ISAKMP (0:1): Input = IKE_MESG_FROM_IPSEC, IKE_SA_REQ_AM
Old State = IKE_READY  New State = IKE_I_AM1

00:08:26: ISAKMP (0:1): beginning Aggressive Mode exchange
00:08:26: ISAKMP (0:1): sending packet to 14.38.69.71 (I) AG_INIT_E.XCH....
Success rate is 0 percent (0/5)
vpn-2611a1#
00:08:36: ISAKMP (0:1): retransmitting phase 1 AG_INIT_EXCH...
00:08:36: ISAKMP (0:1): incrementing error counter on sa: retransmit phase 1
00:08:36: ISAKMP (0:1): retransmitting phase 1 AG_INIT_EXCH
00:08:36: ISAKMP (0:1): sending packet to 14.38.69.71 (I) AG_INIT_EXCH
00:08:37: ISAKMP (0:1): received packet from 14.38.69.71 (I) AG_INIT_EXCH
00:08:37: ISAKMP (0:1): processing SA payload. message ID = 0
00:08:37: ISAKMP (0:1): SA using tunnel password as pre-shared key.
00:08:37: ISAKMP (0:1): Checking ISAKMP transform 1 against priority 1 policy
00:08:37: ISAKMP:      encryption DES-CBC
00:08:37: ISAKMP:      hash MD5
00:08:37: ISAKMP:      default group 1
00:08:37: ISAKMP:      auth pre-share
00:08:37: ISAKMP:      life type in seconds
00:08:37: ISAKMP:      life duration (VPI) of  0x0 0x1 0x51 0x80
00:08:37: ISAKMP (0:1): atts are acceptable. Next payload is 0
00:08:37: ISAKMP (0:1): processing vendor id payload
00:08:37: ISAKMP (0:1): vendor ID is Unity
00:08:37: ISAKMP (0:1): processing vendor id payload
00:08:37: ISAKMP (0:1): vendor ID is DPD
00:08:37: ISAKMP (0:1): processing vendor id payload
00:08:37: ISAKMP (0:1): speaking to another IOS box!
00:08:37: ISAKMP (0:1): processing vendor id payload
00:08:37: ISAKMP (0:1): processing KE payload. message ID = 0
00:08:37: ISAKMP (0:1): processing ID payload. message ID = 0
00:08:37: ISAKMP (0:1): processing NONCE payload. message ID = 0
00:08:37: ISAKMP (0:1): SA using tunnel password as pre-shared key.
00:08:37: ISAKMP (0:1): SKEYID state generated
00:08:37: ISAKMP (0:1): processing HASH payload. message ID = 0
00:08:37: ISAKMP (0:1): SA has been authenticated with 14.38.69.71
00:08:37: ISAKMP (0:1): IKE_DPD is enabled, initializing timers
00:08:37: ISAKMP: Locking DPD struct 0x82702444
    from crypto_ikmp_dpd_ike_init, count 1
00:08:37: ISAKMP (0:1): sending packet to 14.38.69.71 (I) QM_IDLE
00:08:37: ISAKMP (0:1): Input = IKE_MESG_FROM_PEER, IKE_AM_EXCH
Old State = IKE_I_AM1  New State = IKE_P1_COMPLETE

00:08:37: IPSEC(key_engine): got a queue event...
00:08:37: IPSec: Key engine got KEYENG_IKMP_MORE_SAS message
00:08:37: ISAKMP: received ke message (6/1)
00:08:37: ISAKMP: received KEYENG_IKMP_MORE_SAS message
00:08:37: ISAKMP (0:1): sending packet to 14.38.69.71 (I) QM_IDLE
00:08:37: ISAKMP (0:1): purging node -1844394438
00:08:37: ISAKMP (0:1): Sending initial contact.

00:08:37: ISAKMP (0:1): received packet from 14.38.69.71 (I) QM_IDLE
00:08:37: ISAKMP (0:1): processing HASH payload. message ID = 133381228
00:08:37: ISAKMP (0:1): processing NOTIFY RESPONDER_LIFETIME protocol 1
        spi 0, message ID = 133381228, sa = 82701CDC
00:08:37: ISAKMP (0:1): processing responder lifetime
00:08:37: ISAKMP (0:1): deleting node 133381228 error
    FALSE reason "informational (in) state 1"
00:08:37: ISAKMP (0:1): Input = IKE_MESG_FROM_PEER, IKE_INFO_NOTIFY
Old State = IKE_P1_COMPLETE  New State = IKE_P1_COMPLETE
```

```
00:08:38: ISAKMP: quick mode timer expired.
00:08:38: ISAKMP (0:1): src 14.38.69.70 dst 14.38.69.71
00:08:38: ISAKMP (0:1): beginning Quick Mode exchange, M-ID of -1119238561
00:08:38: ISAKMP (0:1): sending packet to 14.38.69.71 (I) QM_IDLE
00:08:38: ISAKMP (0:1): Node -1119238561, Input = IKE_MESG_INTERNAL,
    IKE_INIT_QM Old State = IKE_QM_READY  New State = IKE_QM_I_QM1

00:08:38: ISAKMP (0:1): received packet from 14.38.69.71 (I) QM_IDLE
00:08:38: ISAKMP (0:1): processing HASH payload. message ID = -1119238561
00:08:38: ISAKMP (0:1): processing SA payload. message ID = -1119238561
00:08:38: ISAKMP (0:1): Checking IPSec proposal 1
00:08:38: ISAKMP: transform 1, ESP_3DES
00:08:38: ISAKMP:   attributes in transform:
00:08:38: ISAKMP:      encaps is 1
00:08:38: ISAKMP:      SA life type in seconds
00:08:38: ISAKMP:      SA life duration (basic) of 3600
00:08:38: ISAKMP:      SA life type in kilobytes
00:08:38: ISAKMP:      SA life duration (VPI) of  0x0 0x46 0x50 0x0
00:08:38: ISAKMP:      authenticator is HMAC-MD5
00:08:38: ISAKMP (0:1): atts are acceptable.
00:08:38: IPSEC(validate_proposal_request): proposal part #1,
  (key eng. msg.) INBOUND local= 14.38.69.70, remote= 14.38.69.71,
    local_proxy= 1.1.1.0/255.255.255.0/0/0 (type=4),
    remote_proxy= 2.2.2.0/255.255.255.0/0/0 (type=4),
    protocol= ESP, transform= esp-3des esp-md5-hmac ,
    lifedur= 0s and 0kb,
    spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x4
00:08:38: ISAKMP (0:1): processing NONCE payload. message ID = -1119238561
00:08:38: ISAKMP (0:1): processing ID payload. message ID = -1119238561
00:08:38: ISAKMP (0:1): processing ID payload. message ID = -1119238561
00:08:38: ISAKMP (0:1): Creating IPSec SAs
00:08:38:         inbound SA from 14.38.69.71 to 14.38.69.70
        (proxy 2.2.2.0 to 1.1.1.0)
00:08:38:         has spi 0x4B68058A and conn_id 2000 and flags 4
00:08:38:         lifetime of 3600 seconds
00:08:38:         lifetime of 4608000 kilobytes
00:08:38:         outbound SA from 14.38.69.70 to 14.38.69.71
        (proxy 1.1.1.0 to 2.2.2.0)
00:08:38:         has spi 1503230765 and conn_id 2001 and flags C
00:08:38:         lifetime of 3600 seconds
00:08:38:         lifetime of 4608000 kilobytes
00:08:38: ISAKMP (0:1): sending packet to 14.38.69.71 (I) QM_IDLE
00:08:38: ISAKMP (0:1): deleting node -1119238561 error FALSE reason ""
00:08:38: ISAKMP (0:1): Node -1119238561, Input = IKE_MESG_FROM_PEER,
    IKE_QM_EXCH Old State = IKE_QM_I_QM1
    New State = IKE_QM_PHASE2_COMPLETE

00:08:38: IPSEC(key_engine): got a queue event...
00:08:38: IPSEC(initialize_sas): ,
  (key eng. msg.) INBOUND local= 14.38.69.70, remote= 14.38.69.71,
    local_proxy= 1.1.1.0/255.255.255.0/0/0 (type=4),
    remote_proxy= 2.2.2.0/255.255.255.0/0/0 (type=4),
    protocol= ESP, transform= esp-3des esp-md5-hmac ,
    lifedur= 3600s and 4608000kb,
    spi= 0x4B68058A(1265108362), conn_id= 2000, keysize= 0, flags= 0x4
00:08:38: IPSEC(initialize_sas): ,
  (key eng. msg.) OUTBOUND local= 14.38.69.70, remote= 14.38.69.71,
    local_proxy= 1.1.1.0/255.255.255.0/0/0 (type=4),
    remote_proxy= 2.2.2.0/255.255.255.0/0/0 (type=4),
    protocol= ESP, transform= esp-3des esp-md5-hmac ,
    lifedur= 3600s and 4608000kb,
    spi= 0x59997B2D(1503230765), conn_id= 2001, keysize= 0, flags= 0xC
00:08:38: IPSEC(create_sa): sa created,
  (sa) sa_dest= 14.38.69.70, sa_prot= 50,
    sa_spi= 0x4B68058A(1265108362),
```

```
    sa_trans= esp-3des esp-md5-hmac , sa_conn_id= 2000
00:08:38: IPSEC(create_sa): sa created,
  (sa) sa_dest= 14.38.69.71, sa_prot= 50,
    sa_spi= 0x59997B2D(1503230765),
    sa_trans= esp-3des esp-md5-hmac , sa_conn_id= 2001
00:08:38: ISAKMP: received ke message (7/1)
00:08:38: ISAKMP: DPD received kei with flags 0x10
00:08:38: ISAKMP: Locking DPD struct 0x82702444 from
    crypto_ikmp_dpd_handle_kei_mess, count 2
```

Related Information

- **IPSec Support Page**
- **Technical Support − Cisco Systems**

Updated: Feb 02, 2006 Document ID: 20641