Real-Time Resolution for IPsec Tunnel Peer

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After a user specifies a host name (instead of an IP address) for remote IP Security (IPsec) peer, the Real-Time Resolution for IPsec Tunnel Peer feature allows the host name to be domain name server (DNS) resolved before the router establishes the IPsec tunnel. Thus, the router can immediately discover whether the IP address of the peer has changed.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the "Feature Information for Real-Time Resolution for IPsec Tunnel Peer" section on page 7.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

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Secure DNS Requirement

It is recommended that you use this feature only with secure DNS and when the DNS responses can be authenticated. Otherwise, an attacker can spoof or forge DNS responses and have access to Internet Key Exchange (IKE) authentication data, such as a certificate. If an attacker has a certificate that is trusted by the initiating host, the attacker can successfully establish Phase 1 IKE security association (SA), or the attacker can try to guess the preshared key that is shared between the initiator and the actual responder.

DNS Initiator

DNS names resolution for remote IPsec peers works only if they are used as an initiator. The first packet that is to be encrypted triggers a DNS lookup; after the DNS lookup is complete, subsequent packets triggers IKE.

Information About Real-Time Resolution for IPsec Tunnel Peer

To configure real-time resolution for your IPsec peer, you should understand the following concept:

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Real-Time Resolution Through Secure DNS

When specifying the host name of a remote IPsec peer through the **set peer** command, you can also issue the **dynamic** keyword, which defers DNS resolution of the host name until right before the IPsec tunnel has been established. Deferring resolution enables the Cisco IOS software to detect whether the IP address of the remote IPsec peer has changed. Thus, the software can contact the peer at the new IP address.

If the **dynamic** keyword is not issued, the host name is resolved immediately after it is specified. So, the Cisco IOS software cannot detect an IP address change and, therefore, attempts to connect to the IP address that it previously resolved.

DNS resolution assures users that their established IPsec tunnel is secure and authenticated.

How to Configure Real-Time Resolution

This section contains the following task:

- Configuring Real-Time Resolution for IPsec Peers, page 2

Configuring Real-Time Resolution for IPsec Peers

Use this task to configure a router to perform real-time DNS resolution with a remote IPsec peer; that is, the host name of peer is resolved through a DNS lookup right before the router establishes a connection (an IPsec tunnel) with the peer.

Prerequisites

Before creating a crypto map, you should perform the following tasks:

- Define Internet Security Association Key Management Protocol (ISAKMP) policies.
- Define IPsec transform sets.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **crypto map** *map-name seq-num* **ipsec-isakmp**
4. **match address** *access-list-id*
5. **set peer** {*host-name* [**dynamic**] | *ip-address*}
6. **set transform-set** *transform-set-name1* [*transform-set-name2...transform-set-name6*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**crypto map** *map-name seq-num* **ipsec-isakmp** **Example:** `Router(config)# crypto map secure_b 10 ipsec-isakmp`	Specifies the crypto map entry to create (or modify) and enters crypto map configuration mode.
Step 4	**match address** *access-list-id* **Example:** `Router(config-crypto-m)# match address 140`	Names an extended access list. This access list determines which traffic should be protected by IPsec and which traffic should not be protected by IPsec in the context of this crypto map entry.

	Command or Action	Purpose
Step 5	**set peer** {*host-name* [**dynamic**] [**default**] | *ip-address* [**default**] } **Example:** `Router(config-crypto-m)# set peer b.cisco.com dynamic`	Specifies a remote IPsec peer. This is the peer to which IPsec-protected traffic can be forwarded. • The *host-name* argument specifies the IPsec peer by its hostname. This is the peer's hostname concatenated with its domain name (for example, myhost.example.com). • The optional **dynamic** keyword allows the hostname of the IPsec peer to be resolved through a domain name server (DNS) lookup immediately before the router establishes the IPsec tunnel. • The optional **default** keyword designates that the first peer is the default peer if there are multiple IPsec peers. • The *ip-address* argument specifies the IPsec peer by its IP address. Repeat this step if there are multiple remote peers.
Step 6	**set transform-set** *transform-set-name1* [*transform-set-name2...transform-set-name6*] **Example:** `Router(config-crypto-m)# set transform-set myset`	Specifies which transform sets are allowed for this crypto map entry. List multiple transform sets in order of priority (highest priority first).

Troubleshooting Tips

To display crypto map configuration information, use the **show crypto map** command.

What to Do Next

You need to apply a crypto map set to each interface through which IPsec traffic flows. Applying the crypto map set to an interface instructs the router to evaluate all the interface's traffic against the crypto map set and to use the specified policy during connection or security association (SA) negotiation on behalf of traffic to be protected by crypto.

Configuration Examples for Real-Time Resolution

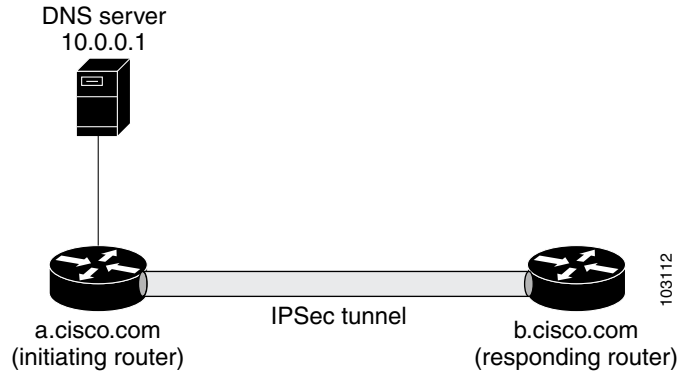
This section provides the following configuration example:

• Configuring Real-Time Resolution for an IPsec Peer: Example, page 4

Configuring Real-Time Resolution for an IPsec Peer: Example

Figure 1 and the following example illustrate how to create a crypto map that configures the host name of a remote IPsec peer to DNS resolved through a DNS lookup right before the Cisco IOS software attempts to establish a connection with that peer.

Figure 1 Real-Time Resolution Sample Topology




```
! Configure the initiating router.
hostname a.cisco.com
ip domain name cisco.com
ip name server 10.0.0.1
!
crypto map secure_b 10 ipsec-isakmp
  match address 140
  set peer b.cisco.com dynamic
  set transform-set xset
interface serial1
  ip address 30.0.0.1
  crypto map secure_b
access-list 140 permit ...
!
! Configure the responding router (the remote IPSec peer).
hostname b.cisco.com
!
crypto map secure_a 10 ipsec-isakmp
  match address 150
  set peer 30.0.0.1
  set transform-set
interface serial0/1
  ip address 40.0.0.1
  crypto map secure_a
access-list 150 ...

! DNS server configuration

b.cisco.com    40.0.0.1       # the address of serial0/1 of b.cisco.com
```

Additional References

Related Documents

Related Topic	Document Title
Crypto maps	*Security for VPNs with IPsec*
ISAKMP policies	*Configuring Internet Key Exchange for IPsec VPNs*
IPsec and IKE configuration commands	*Cisco IOS Security Command Reference*

MIBs

MIBs	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Real-Time Resolution for IPsec Tunnel Peer

Table 1 lists the release history for this feature.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 1 lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 1 Feature Information for Real-Time Resolution for IPsec Tunnel Peer

Feature Name	Releases	Feature Information
Real-Time Resolution for IPsec Tunnel Peer	11.2 12.3(4)T 12.2(18)SXD 12.3(14)T 12.2(33)SRA	After a user specifies a host name (instead of an IP address) for remote IP Security (IPsec) peer, the Real-Time Resolution for IPsec Tunnel Peer feature allows the host name to be domain name server (DNS) resolved before the router establishes the IPsec tunnel. Thus, the router can immediately discover whether the IP address of the peer has changed. This feature was introduced in Cisco IOS Release 11.2. In Cisco IOS Release 12.3(4)T, the **dynamic** keyword was added to the **set peer (IPsec)** command. In Cisco IOS Release 12.3(14)T, the **dynamic** keyword was added to the **set peer (IPsec)** command. The following command was introduced or modified: **set peer (IPsec)**.