

DF Bit Override Functionality with IPsec Tunnels

The DF Bit Override Functionality with IPsec Tunnels feature allows you to configure the setting of the DF bit when encapsulating tunnel mode IPsec traffic on a global or per-interface level. Thus, if the DF bit is set to clear, routers can fragment packets regardless of the original DF bit setting.

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Prerequisites for DF Bit Override Functionality with IPsec Tunnels

IPsec must be enabled on your router.

Restrictions for DF Bit Override Functionality with IPsec Tunnels

Performance Impact

Because each packet is reassembled at the process level, a significant performance impact occurs at a high data rate. Two major caveats are as follows:

- The reassemble queue can fill up and force fragments to be dropped.
- The traffic is slower because of the process switching.

DF Bit Setting Requirement

If several interfaces share the same crypto map using the local address feature, these interfaces must share the same DF bit setting.

Feature Availability

This feature is available only for IPsec tunnel mode. (IPsec transport mode is not affected because it does not provide an encapsulating IP header.)

Information About DF Bit Override Functionality with IPsec Tunnels

Feature Overview

The DF Bit Override Functionality with IPsec Tunnels feature allows you to specify whether your router can clear, set, or copy the Don't Fragment (DF) bit from the encapsulated header. A DF bit is a bit within the IP header that determines whether a router is allowed to fragment a packet.

Some user configurations have hosts that perform the following functions:

- Set the DF bit in packets they send
- Use firewalls that block Internet Control Message Protocol (ICMP) errors from outside the firewall, preventing hosts from learning about the maximum transmission unit (MTU) size outside the firewall
- Use IP Security (IPsec) to encapsulate packets, reducing the available MTU size

If your configurations have hosts that prevent you from learning about the available MTU size, you can configure your router to clear the DF bit and fragment the packet.



Note In compliance with RFC 2401, this feature can be configured globally or per interface. If both levels are configured, the interface configuration will override the global configuration.

How to Configure DF Bit Override Functionality with IPsec Tunnels

Configuring the DF Bit for the Encapsulating Header in Tunnel Mode

To set the DF bit for the encapsulating header in tunnel mode, perform the following steps.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **crypto ipsec df-bit** [**clear** | **set** | **copy**]

DETAILED STEPS

Procedure

	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 ipsec df-bit** [**clear** | **set** | **copy**] **Example:** `Router (config)# crypto ipsec df-bit set`	Sets the DF bit for the encapsulating header in tunnel mode for all interfaces. To set the DF bit for a specified interface, use the **crypto ipsec df-bit** command in interface configuration mode. **Note** DF bit interface configuration settings override all DF bit global configuration settings.

Verifying DF Bit Setting

To verify the current DF Bit settings on your router, use the **show running-config** command in EXEC mode.

Configuration Examples for DB Bit Override Functionality with IPsec Tunnels

DF Bit Setting Configuration Example

In following example, the router is configured to globally clear the setting for the DF bit and copy the DF bit on the interface named FastEthernet. Thus, all interfaces except FastEthernet will allow the router to send packets larger than the available MTU size; FastEthernet will allow the router to fragment the packet.

```
crypto isakmp policy 1
   hash md5
   authentication pre-share
crypto isakmp key Delaware address 192.168.10.66
crypto isakmp key Key-What-Key address 192.168.11.19
!
!
crypto ipsec transform-set exampleset ah-md5-hmac esp-des
crypto ipsec df-bit clear
```

```
!
!
crypto map armadillo 1 ipsec-isakmp
set peer 192.168.10.66
set transform-set exampleset
match address 101
!
crypto map basilisk 1 ipsec-isakmp
set peer 192.168.11.19
set transform-set exampleset
match address 102
!
!
interface FastEthernet
   ip address 192.168.10.38 255.255.255.0
   ip broadcast-address 0.0.0.0
   media-type 10BaseT
   crypto map armadillo
   crypto ipsec df-bit copy
!
interface FastEthernet1
   ip address 192.168.11.75 255.255.255.0
   ip broadcast-address 0.0.0.0
   media-type 10BaseT
   crypto map basilisk
!
interface Serial0
   no ip address
   ip broadcast-address 0.0.0.0
   no ip route-cache
   no ip mroute-cache
```

Additional References

The following sections provide references related to the DF Bit Override Functionality with IPsec Tunnels feature.

Related Documents

Related Topic	Document Title
Internet Key Exchange and IPsec networks	Configuring Internet Key Exchange for IPsec VPNs
IPsec network commands	Cisco IOS Security Command Reference

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing standards has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS XE releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing standards has not been modified by this feature.	--

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/techsupport

Feature Information for DF Bit Override Functionality with IPsec Tunnels

The following table provides release information about the feature or features described in this module. This table 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.

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

Table 1: Feature Information for DF Bit Override Functionality with IPsec Tunnels

Feature Name	Releases	Feature Information
DF Bit Override Functionality with IPsec Tunnels	Cisco IOS XE Release 2.1	This feature allows users to specify whether their router can clear, set, or copy the Don't Fragment (DF) bit from the encapsulated header. A DF bit is a bit within the IP header that determines whether a router is allowed to fragment a packet. The following commands were introduced or modified: **crypto ipsec df-bit**.