

MACSec Using EAP-TLS Authentication

Table 1: Feature History Table

Feature Name	Release Information	Feature Description
MACsec Using EAP-TLS Authentication	Release 7.3.1	IEEE 802.1X authentication mechanism for Port-Based Network Access Control is the first line of defense against outside attack. It is also one of the most commonly targeted attack vectors, which makes it a security priority. In this release, EAP-TLS, a certificate-based authentication method is used to send client information through IEEE 802.1X, thereby resulting in a secured network connection.

V

Note MACsec Using EAP-TLS Authentication is supported only on the following variants of Cisco NCS 540 routers:

- N540-24Z8Q2C-SYS
- N540-24Z8Q2C-M

This chapter describes how to achieve MACSec encryption between two Routers using the 802.1X port-based authentication with Extensible Authentication Protocol-Transport Layer Security (EAP-TLS). EAP-TLS allows mutual authentication using certificates, between the authentication server and the client, and generates the Master Session Key (MSK). This MSK is used to derive the Connectivity Association Key (CAK), and the corresponding Connectivity Association Key Name (CKN) is derived from the EAP session ID.

Configure MACSec Encryption Using EAP-TLS Authentication, on page 2

Configure MACSec Encryption Using EAP-TLS Authentication

The system supports certificate-based MACsec encryption using both local and remote EAP-TLS authentications.

Restrictions for MACSec Using EAP-TLS Authentication

- The system does not support certificate-based (EAP-TLS) MACsec encryption on sub-interfaces.
- The system does not support MACSec using EAP-TLS authentication in multi-auth host mode.

You must also follow the guidelines and restrictions applicable to EAP-TLS session. For details, see the #unique 208 section in the 802.1X Port-Based Authentication chapter.

Prerequisites

For MACSec using EAP-TLS authentication, you must first configure a EAP-TLS session. For more information on configuring EAP-TLS session, see the following topics in the 802.1X Port-Based Authentication chapter:

- 802.1X with Remote RADIUS Authentication
- 802.1X with Local EAP Authentication
- Router as 802.1X Supplicant

The MKA participant with 802.1X PAE role as **authenticator** acts as the key server and the **supplicant** acts as the non-key server.

Configure MACSec EAP on an Interface

The following section describes the steps to configure MACSec EAP on an interface.

Configuration Example

```
Router#configure
Router(config)#interface HundredGigE 0/1/1/2
Router(config-if)#macsec eap
Router(config-if)#commit
```

Running Configuration

```
Router#show run interface HundredGigE 0/1/1/2
interface HundredGigE 0/1/1/2
macsec eap
!
```

You can also configure MACSec EAP on an interface by specifying the configured MACSec policy name.

Configuration Example

Router(config-if) #macsec eap policy test-macsec-policy

Running Configuration

```
Router#show run interface HundredGigE 0/1/1/2
interface HundredGigE 0/1/1/2
macsec eap policy test-macsec-policy
!
```

Verify MACSec EAP Configuration on an Interface

You can use these commands to verify the MACSec EAP configuration:

show macsec mka session interface

Sample output:

Router# show macsec mka session interface HundredGigE 0/1/1/2

Interface-Name	e Local-TxSCI	#Peers	Status	Key-Server	PSK/EAP	CKN	
Hu0/1/12	0201.9ab0.85af/0001	1	Secured	YES	EAP	A94399	

· show macsec mka session interface detail

Sample output:

Router# show macsec mka session interface HundredGigE 0/1/1/2 detail

```
MKA Detailed Status for MKA Session
```

Status	: SECURED - Secured MKA Session with MACsec
Local Tx-SCI	: 0201.9ab0.85af/0001
Local Tx-SSCI	: 2
Interface MAC Address	: 0201.9ab0.85af
MKA Port Identifier	: 1
Interface Name	: Hu0/1/1/2
CAK Name (CKN)	: A94399EE68B2A455F85527A4309485DA
CA Authentication Mode	: EAP
Keychain	: NA (EAP mode)
Member Identifier (MI)	: 3222A4A7678A6BDA553FDB54
Message Number (MN)	: 114
Authenticator	: YES
Key Server	: YES
MKA Cipher Suite	: AES-128-CMAC
Configured MACSec Cipher Suite	: GCM-AES-XPN-256
Latest SAK Status	: Rx & Tx
Latest SAK AN	: 1
Latest SAK KI (KN)	: 3222A4A7678A6BDA553FDB540000001 (1)
Old SAK Status	: No Rx, No Tx
Old SAK AN	: 0
Old SAK KI (KN)	: RETIRED (0)
SAK Transmit Wait Time	: Os (Not waiting for any peers to respond)
SAK Retire Time	: Os (No Old SAK to retire)
Time to SAK Rekey	: NA
MKA Policy Name	: *DEFAULT POLICY*
Key Server Priority	: 16
Delay Protection	: FALSE
Replay Window Size	: 64
Include ICV Indicator	: FALSE
Confidentiality Offset	: 0
Algorithm Agility	: 80C201

```
SAK Cipher Suite
                              : 0080C20001000004 (GCM-AES-XPN-256)
MACsec Capability
                              : 3 (MACsec Integrity, Confidentiality, &
Offset)
MACsec Desired
                              : YES
# of MACsec Capable Live Peers
                              : 1
# of MACsec Capable Live Peers Responded : 1
Live Peer List:
                  MN Rx-SCI (Peer) SSCI KS-Priority
MI
 _____
86B47DE76B42D9D7AB6805F7 113 0257.3fae.5cda/0001 1 16
Potential Peer List:
MI MN Rx-SCI (Peer) SSCI KS-Priority
_____
Peers Status:
Last Tx MKPDU : 2018 Mar 01 13:36:56.450
Peer Count : 1
RxSCI : 02573FAE5CDA0001
RxSCI
MI : 86B47DE76B42D9D7AB6805F7
Peer CAK : Match
Latest Rx MKPDU : 2018 Mar 01 13:36:56.450

    show macsec mka summary

Sample output:
Router#show macsec mka summary
_____
Interface-Name Status Cipher-Suite KeyChain PSK/EAP CKN
```

Hu0/1/12	Secured	GCM-AES-XPN-256	NA(EAP mode)	EAP	A94399

Total MACSec Sessions : 1 Secured Sessions : 1 Pending Sessions : 0