



# Configuring Data Encryption

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## Finding Feature Information

## Prerequisites for Configuring Data Encryption

- Cisco 1260, 3500, 3600, 801, 1140, 1310, and 1520 series access points support Datagram Transport Layer Security (DTLS) data encryption.
- You can use the switch to enable or disable DTLS data encryption for a specific access point or for all access points.
- Non-Russian customers who use the Cisco switch do not need a data DTLS license.

## Restrictions for Configuring Data Encryption

- Encryption limits throughput at both the switch and the access point, and maximum throughput is desired for most enterprise networks.
- If your switch does not have a data DTLS license and if the access point associated with the switch has DTLS enabled, the data path will be unencrypted.
- In images that do not have a DTLS license, the DTLS commands are not available.

# Information About Data Encryption

The switch enables you to encrypt Control and Provisioning of Wireless Access Points (CAPWAP) control packets (and optionally, CAPWAP data packets) that are sent between the access point and the switch using DTLS. DTLS is a standards-track Internet Engineering Task Force (IETF) protocol based on TLS. CAPWAP control packets are management packets exchanged between a switch and an access point while CAPWAP data packets encapsulate forwarded wireless frames. CAPWAP control and data packets are sent over separate UDP ports: 5246 (control) and 5247 (data). If an access point does not support DTLS data encryption, DTLS is enabled only for the control plane, and a DTLS session for the data plane is not established.

## How to Configure Data Encryption

### Configuring Data Encryption (CLI)

#### SUMMARY STEPS

1. **configure terminal**
2. **ap link-encryption**
3. **end**
4. **show ap link-encryption**
5. **show wireless dtls connections**

#### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	<b>ap link-encryption</b>  <b>Example:</b> Switch(config)# <b>ap link-encryption</b>	Enables data encryption for all access points or a specific access point by entering this command. The default value is disabled.  Changing the data encryption mode requires the access points to rejoin the switch.
<b>Step 3</b>	<b>end</b>  <b>Example:</b> Switch(config)# <b>end</b>	Returns to privileged EXEC mode. Alternatively, you can also press <b>Ctrl-Z</b> to exit global configuration mode.
<b>Step 4</b>	<b>show ap link-encryption</b>  <b>Example:</b> Switch# <b>show ap link-encryption</b>	Displays the encryption state of all access points or a specific access point. This command also shows authentication errors, which track the number of integrity check failures and replay errors. Relay errors help in tracking the number of times the access point receives the same packet.

	Command or Action	Purpose
<b>Step 5</b>	<b>show wireless dtls connections</b>  <b>Example:</b> Switch# show wireless dtls connections	Displays a summary of all active DTLS connections.  <b>Note</b> If you experience any problems with DTLS data encryption, enter the <b>debug dtls ap {all   event   trace}</b> command to debug all DTLS messages, events, or traces.

## Configuring Data Encryption (GUI)

- Step 1** Choose **Configuration > Wireless > Access Points > All APs**.  
The All APs page is displayed.
- Step 2** Click the name of the access point for which you want to enable data encryption.  
The **AP > Edit** page is displayed.
- Step 3** Click the **Advanced** tab.
- Step 4** Select or unselect the **Data Encryption** check box.  
**Note** Changing the data encryption mode requires the access points to reassociate with the switch.
- Step 5** Click **Apply**.
- Step 6** Click **Save Configuration**.

## Configuration Examples for Configuring Data Encryption

### Displaying Data Encryption States for all Access Points: Examples

This example shows how to display the encryption state of all access points or a specific access point. This command also shows authentication errors, which track the number of integrity check failures and replay errors. Relay errors help in tracking the number of times the access point receives the same packet:

```
Switch# show ap link-encryption
```

AP Name	Encryption State	Dnstream Count	Upstream Count	Last Update
3602a	Enabled	0	0	Never

This example shows how to display a summary of all active DTLS connections:

```
Switch# show wireless dtls connections
```

AP Name	Local Port	Peer IP	Peer Port	Ciphersuite
3602a	Capwap_Ctrl	10.10.21.213	46075	TLS_RSA_WITH_AES_128_CBC_SHA
3602a	Capwap_Data	10.10.21.213	46075	TLS_RSA_WITH_AES_128_CBC_SHA

