



## Monitor SSL Hardware Acceleration

Use the `show counters` command in the CLI to evaluate TLS crypto acceleration behavior. This command lists a variety of metrics that inform you about normal activity, alerts, and potential fatal issues.



**Note** Use the `show counters description` command to see explanations for each counter. To view only counters related to TLS crypto acceleration, use `show counters description | include TLS_TRK`.

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## Informational Counters

If a system under load is working well, you should see large counts for the following counters. Because there are 2 sides to the tracker process per connection, you can see these counters increase by 2 per connection. The `PRIV_KEY_RECV` and `SECU_PARAM_RECV` counters are the most important, and are highlighted. The `CONTEXT_CREATED` and `CONTEXT_DESTROYED` counters relate to the allocation of cryptographic chip memory.

```
> show counters
Protocol      Counter                               Value      Context
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SSENC        CONTEXT_CREATED                       258225     Summary
SSENC        CONTEXT_DESTROYED                     258225     Summary
TLS_TRK      OPEN_SERVER_SESSION                   258225     Summary
TLS_TRK      OPEN_CLIENT_SESSION                   258225     Summary
TLS_TRK      UPSTREAM_CLOSE                         516450     Summary
TLS_TRK      DOWNSTREAM_CLOSE                       516450     Summary
TLS_TRK      FREE_SESSION                           516450     Summary
TLS_TRK      CACHE_FREE                             516450     Summary
TLS_TRK      PRIV_KEY_RECV                           258225     Summary
TLS_TRK      NO_KEY_ENABLE                           258225     Summary
TLS_TRK      SECU_PARAM_RECV                          516446     Summary
TLS_TRK      DECRYPTED_ALERT                         258222     Summary
TLS_TRK      DECRYPTED_APPLICATION                   33568976   Summary
TLS_TRK      ALERT_RX_CNT                           258222     Summary
TLS_TRK      ALERT_RX_WARNING_ALERT                  258222     Summary
TLS_TRK      ALERT_RX_CLOSE_NOTIFY                  258222     Summary
```

TCP_PRX	OPEN_SESSION	516450	Summary
TCP_PRX	FREE_SESSION	516450	Summary
TCP_PRX	UPSTREAM_CLOSE	516450	Summary
TCP_PRX	DOWNSTREAM_CLOSE	516450	Summary
TCP_PRX	FREE_CONN	258222	Summary
TCP_PRX	SERVER_CLEAN_UP	258222	Summary
TCP_PRX	CLIENT_CLEAN_UP	258222	Summary

## Alert Counters

We implemented the following counters according to the TLS 1.2 specification. FATAL or BAD alerts could indicate issues; however, ALERT\_RX\_CLOSE\_NOTIFY is normal.

For details, see [RFC 5246 section 7.2](#).

TLS_TRK	ALERT_RX_CNT	311	Summary
TLS_TRK	ALERT_TX_CNT	2	Summary
TLS_TRK	ALERT_TX_IN_HANDSHAKE_CNT	2	Summary
TLS_TRK	ALERT_RX_IN_HANDSHAKE_CNT	2	Summary
TLS_TRK	ALERT_RX_WARNING_ALERT	308	Summary
TLS_TRK	ALERT_RX_FATAL_ALERT	3	Summary
TLS_TRK	ALERT_TX_FATAL_ALERT	2	Summary
TLS_TRK	ALERT_RX_CLOSE_NOTIFY	308	Summary
TLS_TRK	ALERT_RX_BAD_RECORD_MAC	2	Summary
TLS_TRK	ALERT_TX_BAD_RECORD_MAC	2	Summary
TLS_TRK	ALERT_RX_BAD_CERTIFICATE	1	Summary

## Error Counters

These counters indicate system errors. These counts should be low on a healthy system. The BY\_PASS counters indicate packets that have been passed directly to or from the inspection engine (Snort) process (which runs in software) without decryption. The following example lists some of the bad counters.

Counters with a value of 0 are not displayed. To view a complete list of counters, use the command **show counters description | include TLS\_TRK**

```
> show counters
```

Protocol	Counter	Value	Context
TCP_PRX	BYPASS_NOT_ENOUGH_MEM	2134	Summary
TLS_TRK	CLOSED_WITH_INBOUND_PACKET	2	Summary
TLS_TRK	ENC_FAIL	82	Summary
TLS_TRK	DEC_FAIL	211	Summary
TLS_TRK	DEC_CKE_FAIL	43194	Summary
TLS_TRK	ENC_CB_FAIL	4335	Summary
TLS_TRK	DEC_CB_FAIL	909	Summary
TLS_TRK	DEC_CKE_CB_FAIL	818	Summary
TLS_TRK	RECORD_PARSE_ERR	123	Summary
TLS_TRK	IN_ERROR	44948	Summary
TLS_TRK	ERROR_UPSTREAM_RECORD	43194	Summary
TLS_TRK	INVALID_CONTENT_TYPE	123	Summary
TLS_TRK	DOWNSTREAM_REC_CHK_ERROR	123	Summary
TLS_TRK	DECRYPT_FAIL	43194	Summary
TLS_TRK	UPSTREAM_BY_PASS	127	Summary
TLS_TRK	DOWNSTREAM_BY_PASS	127	Summary

# Fatal Counters

The fatal counters indicate serious errors. These counters should be at or near 0 on a healthy system. The following example lists the fatal counters.

```
> show counters
Protocol      Counter                               Value  Context
CRYPTO        RING_FULL                             1      Summary
CRYPTO        ACCELERATOR_CORE_TIMEOUT              1      Summary
CRYPTO        ACCELERATOR_RESET                     1      Summary
CRYPTO        RSA_PRIVATE_DECRYPT_FAILED              1      Summary
```

The RING\_FULL counter is not a fatal counter, but indicates how often the system overloaded the cryptographic chip. The ACCELERATOR\_RESET counter is the number of times the TLS crypto acceleration process failed unexpectedly, which also causes the failure of pending operations, which are the numbers you see in ACCELERATOR\_CORE\_TIMEOUT and RSA\_PRIVATE\_DECRYPT\_FAILED.

If you have persistent problems, disable TLS crypto acceleration ( or **config hwCrypto disable**) and work with Cisco TAC to resolve the issues.



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**Note** You can do additional troubleshooting using the **show snort tls-offload** and **debug snort tls-offload** commands. Use the **clear snort tls-offload** command to reset the counters displayed in the **show snort tls-offload** command to zero.

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