



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
SSLENC CONTEXT_CREATED 258225 Summary
SSLENC 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.



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.
