Displaying TSN Statistics

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Ingress Statistics

show interface tsn ingress stats

```
TSN_Switch # show interface Gig1/4 tsn ingress stats 1002
                Latest          Accumulated
                ------          ------------
Unexpected      0               0
In-Window       254476          267372
Early           0               0
Late            0               9003
```

Notes on Ingress counters

- Unexpected (Unexpected packets)

    - The number of packets that matched global VLAN and DMAC

    - flow enable bit NOT set or

    - corresponding portmap bit in the flow table NOT set

- In-Window (In Window Bin)

    - The number of packets that arrived within flow's defined window

- Early (Early Bin)

    - The number of packets that arrived before the flow's defined window

- Late (Late Bin)

    - The number of packets that arrived after the flow's defined window

Note Use 'show tsn flow details' for defined ingress window for all TSN flows.

The values under

```
Latest
```

are reset after every read.

Egress Statistics

Use this command to see per flow egress counters. This will show if there are errors on egress because of timing sync errors.

show interface tsn flow stats

```
TSN_Switch# show interface Gig1/5 tsn flow-stats 1001
Flow ID : 1001 (0x3E9)

Frame Type         Latest        Accumulated
──────────         ──────────    ─────────────
TSN Queue xmit     0             0
TSN Queue rcv      0             0
TSN xmit timing                  0
TSN Unreleased                   0
```

Notes on Egress counters

- TSN Queue xmit (nTransmittedTfFrames)

    - This is a clear-on-read counter

    - This counter is increased

        - if a frame belonging to <flow-id> is a time-triggered (TT) frame AND

        - is transmitted to TXM's output queue

- TSN Queue rcv (nReceivedTtFrames)

    - This is a clear-on-read counter

    - This counter is increased

        - if a frame belonging to <flow-id> is a time-triggered (TT) frame AND...

            - is received correctly, frame size correct, crc correct

- TSN xmit timing (nTimingError)

    - This is NOT a clear-on-read counter

    - This counter is increased when

        - window is closed or...

        - synchronization is not established

- flushing of TT buffer not completed

- TSN Unreleased (nUnreleased)

    - This is NOT a clear-on-read counter

    - This counter is increased when

        - a frame is received for a flow that is dispatched before the most recent frame is dispatched to all ports

✎

Note Ensure that flow ID <flow_id> exists with an egress interface

Use the following variation of the egress statistics command to see per interface egress counters. This shows all bytes and frames that have successfully egressed. This is for TSN and Best Effort Ethernet frames. No flow id required because its for all interfaces.

```
TSN_Switch# show interface Gig1/5 tsn egress counters
Status             Count
──────────────    ───────────────
Number of Rx frames   0
Number of Rx bytes    0
Number of Tx frames   0
Number of Tx bytes    0
```

Notes on counters

- These are counters maintained by TSN egress logic and apply to all Ethernet frames, not just TSN frames.

- Number of frames received by the Egress logic

- Number of bytes received by the Egress logic

- Number of frames transmitted by the Egress logic

- Number of bytes transmitted by the Egress logic

Use this variation to see per interface egress error counters.**show int tsn egress error**

```
#show int <intf_name><intf_num> tsn egress error

Error                                      Count
------------------------------------------ ---------------
Traffic engineering params mismatch (drop)  0
Broadcast frames not allowed (drop)         0
Size error (drop)                           0
CRC error at TSN Rx (drop)                  0
Flow not found (drop)                       0
Flow policing error (drop)                  296544
Memory unavailable (drop)                   0
```

Notes on counters

- These are NOT clear-on-read registers

- Traffic engineering params mismatch (drop) (nDropNonCiscoErrors)

- Broadcast frames not allowed (drop) (nBroadcastErrors)

- Size error (drop) (nSizeErrors)

- CRC error at TSN Rx (nCrcErrors)

- Flow not found (nFlowNotFoundErrors)

- Flow policing error (nFlowPolicingErrors)

- Memory unavailable (nPartitionDrop)

Use this command to show TSN related egress errors on the interface.**show int tsn egress details**

```
#show int <intf_name><intf_num> tsn egress details

Port status counter              Latest        Accumulated
--------------------             ----------    ------------
Runt frames                      0             0
Start of frame delimiter error   0             0
Alignment error                  0             0
MII error                        0             0

Port status flag                 SET/UNSET
-------------------------------  ----------
Max age drop flag                UNSET
No space in TSN queue flag       UNSET
Flow is not a TSN flow flag      UNSET
TSN time check fail flag         UNSET
Do not allow broadcast frame flag UNSET
```

Notes on counters

- Port status counter shown above are clear-on-read registers

- Port status flag shown above are NOT clear-on-read registers. These are boolean counters that will have either SET or UNSET value.

- Runt frames (nRuntFrames)

- Start of frame delimiter error (nSofErrors)

- Alignment error (nAlignmentErrors)

- MII error (nMiiErrors)

Notes on implementation

- No check whether the port in question is part of a TSN flow

- These error counters are global counters and not related to any particular flow

- These error counters are across all existing TSN flows

Clear statistics counts

clear tsn flow_stats flowsclear tsn stats interface <intf_name><intf_num>

- When this CLI is executed reset all software accumulators for MAC-level diagnostics counters. These accumulators are per port.

Best Effort statistics

show tsn be_stats

```
TSN_switch1#show tsn be_stats
Status          Latest          Accumulated     Latest          Accumulated
   Latest          Accumulated
                (Port 1-8)      (Port 1-8)      (Port 9-16)     (Port 9-16)
   (Port 17-24)    (Port 17-24)
--------------  --------------  --------------  --------------  --------------
   --------------  --------------
BE Rx frames    109             150             0               0
   0               0
BE Tx frames    109             150             0               0
   0               0
```