IB Fabric congestion Analysis v5.0

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Table of Contents

1. Introduction

1.1 Revision History

Table 1 tracks the revision history for this specification.

Table 1: Revision History

Revision	Date	Author	Comments
1.0	Sep 28th, 2021	Jie Wu	Initial Draft
2.0	Mar 15th, 2022	HyungKwang Choi	Fixed script bug (FEC Uncorrectable)
3.0	Apr 14th, 2022	HyungKwang Choi	Fixed script bug (Symbol BER/Err)
4.0	Apr 30th, 2022	HyungKwang Choi	Modifying BER threshold from ‘1e-12’ to ‘1e-13’
5.0	May 1th, 2022	HyungKwang Choi	Added "Max Retransmission_rate"

1.2 Glossary

Table 22 lists the terms and acronyms used in this Document.

Table 2: Terminology and Acronyms

Term	Definition

1.3 Reference

Table 23 lists the reference referred at this Document.

Table 3: Reference

Subject	Site
BER (Bit Error Rate) and Troubleshoot v1.0.pdf	My previous knowledge sharing for BER

2. Script running

```
$ python check_ib_link_errors_v5.py -h
usage: show_ib_inventory.py [-h] -i IBDIAGNET_FOLDER [-o OUTPUT_FILE] [-f] [-s] [-v]

optional arguments:
  -h, --help            show this help message and exit
  -i IBDIAGNET_FOLDER, --ibdiagnet-folder IBDIAGNET_FOLDER
                        read data from ibdiagnet2 output folder
  -o OUTPUT_FILE, --output-file OUTPUT_FILE
                        write IB SW and HCA inventory info to xlsx file
  -f, --show-ib-hosts   print detailed HCA inventory info
  -s, --show-ib-switches
                        print detailed IB switch inventory info

  -v, --version         print current script version
```

```
$ python check_ib_link_errors_v5.py -i /var/tmp/ibdiagnet2 -o Saving_data
Running command: ibdiagnet --extended_speeds all --pm_per_lane --get_phy_info --get_cable_info --pc --reset_phy_info -o ./ibdiagnet_1st_reset_phy_info/
Start to parse ibdiagnet2.net_dump ...
Start to parse ibdiagnet2.db_csv ...
Start to parse ibdiagnet2.net_dump_ext ...

INFO: The --top-n option is not set, only the first 10 records will be listed here.

LinkDowned Counters:
################################################
                        SrcDevice SrcPort           SrcGUID  LinkDownedCounter                                DstDevice            DstGUID DstPort
                         SIB30183      74 0x0c42a103000ef7c6                  4 MT4123 ConnectX6   Mellanox Technologies 0x0c42a10300389dc8       1
                         SIB30237      37 0x0c42a103000ef206                  1                              n08509 HCA-1 0x0c42a10300407088       1
MF0;G1-IB-CORE-SW05A:MCS8500/S02/U1      15 0xb8599f0300f7d9e6                  1      MF0;G1-IB-CORE-SW05A:MCS8500/L15/U1 0x0c42a103000fd750      22

XmitDidscard Counters:
################################################
                        SrcDevice SrcPort           SrcGUID  PortXmitDiscards                                DstDevice            DstGUID DstPort
                      n08509 HCA-1       1 0x0c42a10300407088              290                              SIB30237 0x0c42a103000ef206      37
                         SIB30237      37 0x0c42a103000ef206              192                              n08509 HCA-1 0x0c42a10300407088       1
                         SIB30183      74 0x0c42a103000ef7c6               87 MT4123 ConnectX6   Mellanox Technologies 0x0c42a10300389dc8       1
MF0;G1-IB-CORE-SW05A:MCS8500/L15/U1      22 0x0c42a103000fd750                4      MF0;G1-IB-CORE-SW05A:MCS8500/S02/U1 0xb8599f0300f7d9e6      15

Port FEC Uncorrectable Counters:
```

```
##################################################

                        SrcDevice SrcPort           SrcGUID  PortFECUncorrectableBlockCounter                          DstDevice           DstGUID DstPort

 MF0;G2-IB-CORE-SW6A:MCS8500/S13/U1      12 0x0c42a103000501aa                           4608243 MF0;G2-IB-CORE-SW6A:MCS8500/L12/U1 0x0c42a103000fdc30      33

MF0;G1-IB-CORE-SW04A:MCS8500/L03/U2       4 0x0c42a1030017d37c                           2402008                           SIB30064 0x0c42a103000eeca6      19

MF0;G1-IB-CORE-SW05A:MCS8500/L12/U1       2 0x0c42a103000fdbd0                           1558267                           SIB30022 0x0c42a103000be30e      16


INFO: ExcessiveBufferOverrunErrors counters are 0 on all links.


Congestion Indexes > 10:

##################################################

   SrcDevice SrcPort            SrcGUID  PortXmitWaitExt  PortXmitPktsExtended  CongestionIndexExt DstDevice           DstGUID DstPort

n00110 HCA-1       1 0x0c42a10300619450        561153409                     1         561153409.0  SIB30003 0x0c42a103001268d0      62

n00235 HCA-1       1 0x0c42a10300330432        557213155                     1         557213155.0  SIB30008 0x0c42a103000be12e       9

n00225 HCA-1       1 0x0c42a1030036bb58        463507299                     1         463507299.0  SIB30008 0x0c42a103000be12e      65


Effective BER Counters > 1e-12:

##################################################

                        SrcDevice SrcPort           SrcGUID  EffectiveBER     SymbolBER                         DstDevice           DstGUID DstPort

 MF0;G2-IB-CORE-SW6A:MCS8500/S13/U1      12 0x0c42a103000501aa  5.000000e-08 1.500000e-254 MF0;G2-IB-CORE-SW6A:MCS8500/L12/U1 0x0c42a103000fdc30      33

MF0;G1-IB-CORE-SW04A:MCS8500/L10/U2      15 0x0c42a103000fd200  3.000000e-08 1.500000e-254                          SIB30095 0x0c42a103000ef0a6      20

MF0;G1-IB-CORE-SW04A:MCS8500/L03/U2       4 0x0c42a1030017d37c  2.000000e-08  1.000000e-12                          SIB30064 0x0c42a103000eeca6      19


Symbol BER Counters > 1e-13:

##################################################

                        SrcDevice SrcPort           SrcGUID EffectiveBER    SymbolBER DstDevice           DstGUID DstPort

MF0;G1-IB-CORE-SW04A:MCS8500/L03/U2       4 0x0c42a1030017d37c 2.000000e-08 1.000000e-12  SIB30064 0x0c42a103000eeca6      19
```

3. Before running.

3.1 What it does

The script is used to collect & sort up which causes Fabric Congestion from ibdiagnet.

Parsing 4 files (ibdiagnet2.log, ibdiagnet2.net_dump, ibdiagnet2.db_csv,ibdiagnet2.net_dump_ext) from Ibdiagnet, then extract PM info which causes Fabric Congestion.

```
LinkDownedCounter  > 0
PortXmitDiscards > 0
ExcessiveBufferOverrunErrors > 0
PortFECUncorrectableBlockCounter   > 0
Effective BER > 1e-12
Symbol BER > 1e-13   or (Symbol Err > 0)
congestion indexes = PortXmitWaitExt / PortXmitPktsExtended > 10
```

3.2 Usage.

First command, It clears all Fabric PM stats and port Phy info.
The second, it collects the count accumulated.

```
ibdiagnet -r --pc --pm_pause_time 600 -P all=1 --extended_speeds all --pm_per_lane --reset_phy_info  --get_phy_info  --get_cable_info

ibdiagnet -r                          -P all=1 --extended_speeds all --pm_per_lane                   --get_phy_info  --get_cable_info
```

3.3 Python installation.

```
[root@mtbc-r740-06 ~]# python3 --version
Python 3.6.8
Prerequisites:
Python 3.8+
Pandas library
OpenPyXL library

[root@mtbc-r740-06 ~]# pip3 install pandas
[root@mtbc-r740-06 ~]# pip3 install openpyxl

[root@mtbc-r740-06 ~]# pip3 list
DEPRECATION: The default format will switch to columns in the future. You can use --format=(legacy|columns) (or define a
format=(legacy|columns) in your pip.conf under the [list] section) to disable this warning.
backports.entry-points-selectable (1.1.1)
certifi (2021.10.8)
chardet (3.0.4)
charset-normalizer (2.0.10)
distlib (0.3.4)
filelock (3.4.0)
idna (2.10)
importlib-metadata (4.8.2)
importlib-resources (5.4.0)
numpy (1.19.5)
pandas (1.1.5)  <===========
pip (9.0.3)
platformdirs (2.4.0)
pynetbox (6.5.0)
PySocks (1.6.8)
python-dateutil (2.8.2)
pytz (2021.3)
```

```
requests (2.27.1)
setuptools (39.2.0)
six (1.16.0)
typing-extensions (4.0.1)
urllib3 (1.25.6)
virtualenv (20.10.0)
zipp (3.6.0)
```

4. Fabric Congestion key factors

4.1 LinkDownCounter > 0

- File location & Command

./ibdiagnet2.pm:link_down_counter=0x00000000
./ibdiagnet2.db_csv

```
[root@My_test_lab ~]# perfquery 5 13
# Port counters: Lid 5 port 13 (CapMask: 0x5300)
PortSelect:......................13
CounterSelect:...................0x0000
SymbolErrorCounter:..............0
LinkErrorRecoveryCounter:........0
LinkDownedCounter:...............0  <==================
PortRcvErrors:...................0
PortRcvRemotePhysicalErrors:.....0
PortRcvSwitchRelayErrors:........0
PortXmitDiscards:................0
PortXmitConstraintErrors:........0
PortRcvConstraintErrors:.........0
CounterSelect2:..................0x00
LocalLinkIntegrityErrors:........0
ExcessiveBufferOverrunErrors:....0
QP1Dropped:......................0
VL15Dropped:.....................0
PortXmitData:....................1596816
PortRcvData:.....................1596888
PortXmitPkts:....................22178
PortRcvPkts:.....................22179
PortXmitWait:....................0
```

4.2 PortXmitDiscards > 0

- File location & Command

./ibdiagnet2.pm:port_xmit_discard=0x00000000
./ibdiagnet2.db_csv

```
[root@My_test_lab ~]# perfquery 5 13
# Port counters: Lid 5 port 13 (CapMask: 0x5300)
PortSelect:......................13
CounterSelect:...................0x0000
SymbolErrorCounter:..............0
LinkErrorRecoveryCounter:........0
LinkDownedCounter:...............0
PortRcvErrors:...................0
PortRcvRemotePhysicalErrors:.....0
PortRcvSwitchRelayErrors:........0
PortXmitDiscards:................0  <==================
PortXmitConstraintErrors:........0
PortRcvConstraintErrors:.........0
CounterSelect2:..................0x00
LocalLinkIntegrityErrors:........0
ExcessiveBufferOverrunErrors:....0
QP1Dropped:......................0
VL15Dropped:.....................0
PortXmitData:....................1596816
PortRcvData:.....................1596888
PortXmitPkts:....................22178
PortRcvPkts:.....................22179
PortXmitWait:....................0

ibportstate 5 79 reset
```

```
ibportstate 5 79 query
ibportstate 5 79 disable
ibportstate 5 79 enable
```

4.3 port_fec_uncorrectable_block_counter > 0

- File location & Command

./ibdiagnet2.pm:port_fec_uncorrectable_block_counter=0x00000000
./ibdiagnet2.db_csv

```
[root@My_test_lab ~]# perfquery -T 5 13
# PortExtendedSpeedsCounters counters: Lid 5 port 13
PortSelect:......................13
CounterSelect:...................0x0000000000000000
SyncHeaderErrorCounter:..........0
UnknownBlockCounter:.............0
ErrorDetectionCounterLane0:......0
ErrorDetectionCounterLane1:......0
ErrorDetectionCounterLane2:......0
ErrorDetectionCounterLane3:......0
ErrorDetectionCounterLane4:......0
ErrorDetectionCounterLane5:......0
ErrorDetectionCounterLane6:......0
ErrorDetectionCounterLane7:......0
ErrorDetectionCounterLane8:......0
ErrorDetectionCounterLane9:......0
ErrorDetectionCounterLane10:.....0
ErrorDetectionCounterLane11:.....0
FECCorrectableBlockCtrLane0:.....0
FECCorrectableBlockCtrLane1:.....0
FECCorrectableBlockCtrLane2:.....0
FECCorrectableBlockCtrLane3:.....0
FECCorrectableBlockCtrLane4:.....0
FECCorrectableBlockCtrLane5:.....0
FECCorrectableBlockCtrLane6:.....0
FECCorrectableBlockCtrLane7:.....0
FECCorrectableBlockCtrLane8:.....0
FECCorrectableBlockCtrLane9:.....0
FECCorrectableBlockCtrLane10:....0
FECCorrectableBlockCtrLane11:....0
FECUncorrectableBlockCtrLane0:...0
FECUncorrectableBlockCtrLane1:...0
FECUncorrectableBlockCtrLane2:...0
FECUncorrectableBlockCtrLane3:...0
FECUncorrectableBlockCtrLane4:...0
FECUncorrectableBlockCtrLane5:...0
FECUncorrectableBlockCtrLane6:...0
FECUncorrectableBlockCtrLane7:...0
FECUncorrectableBlockCtrLane8:...0
FECUncorrectableBlockCtrLane9:...0
FECUncorrectableBlockCtrLane10:..0
FECUncorrectableBlockCtrLane11:..0

# mlxlink -d lid-3 -pc 36

# mlxlink -d lid-3 -m -c -e -p 36 --show_device  --show_serdes_tx     --show_fec   --show_ber_monitor
```

- Tips

> to get ‘fec_uncorrectable_block_counter’, you have to add below options while running ibdiagnet
--extended_speeds all

> below extra fields are collected when you add the options “--extended_speeds all”

```
sync_header_error_counter=0x00000000
unknown_block_counter=0x00000000
fec_corrected_symbol_counter_total=0x0000000000000000
fec_corrected_symbol_counter_lane[0]=0x00000000
fec_corrected_symbol_counter_lane[1]=0x00000000
```

```
fec_corrected_symbol_counter_lane[2]=0x00000000
fec_corrected_symbol_counter_lane[3]=0x00000000
port_fec_correctable_block_counter=0x00008281
port_fec_uncorrectable_block_counter=0x00000000
port_fec_corrected_symbol_counter=0x00008292
```

> Clear FEC counters
#perfquery -x -R 0x20 1 (lid 20)

> with 'Perfquery' command, you will see 'FECUncorrectableBlockCtrLaneXXXX'. Those are sum of .. FECCorrectableBlockCtrLaneX/FECUncorrectableBlockCtrLaneX vs. port_fec_correctable_block_counter / port_fec_uncorrectable_block_counter

4.4 excessive_buffer_errors > 0

- File location & Command

./ibdiagnet2.pm: port_fec_uncorrectable_block_counter=0x0000044c
./ibdiagnet2.db_csv

4.5 CongestionIndex >= 10

- File location & Command

./ibdiagnet2.pm: port_xmit_wait, port_xmit_pkts
./ibdiagnet2.db_csv

```
[root@My_test_lab ~]# perfquery 5 13
# Port counters: Lid 5 port 13 (CapMask: 0x5300)
PortSelect:......................13
CounterSelect:...................0x0000
SymbolErrorCounter:..............0
LinkErrorRecoveryCounter:........0
LinkDownedCounter:...............0
PortRcvErrors:...................0
PortRcvRemotePhysicalErrors:.....0
PortRcvSwitchRelayErrors:........0
PortXmitDiscards:................0
PortXmitConstraintErrors:........0
PortRcvConstraintErrors:.........0
CounterSelect2:..................0x00
LocalLinkIntegrityErrors:........0
ExcessiveBufferOverrunErrors:....0
QP1Dropped:......................0
VL15Dropped:.....................0
PortXmitData:....................1596816
PortRcvData:.....................1596888
PortXmitPkts:....................22178
PortRcvPkts:.....................22179
PortXmitWait:....................0
```

- Explanation on fabric 'Congestion Indexes'

[PortXmitWait and Symbol Errors | Salesforce]

PortXmitWait - This is not an error counter. It is a very high-resolution counter that is incremented every internal clock tick of the device whenever there is a packet queued on an output port, and this packet cannot be sent. This can happen whenever there is some temporary congestion in the fabric. For instance, if two nodes are sending to one node you can see this counter increment, or if there is a node mismatch in rates you can see this counter increment. When the counter increments it does not mean that any packets dropped. Packets are just stored in the buffer of the port until they can be sent. Therefore, it is natural to see these PortXmitWait counters increment under normal conditions.

- How to math PortXmitWait

  CongestionIndex >= 10
  => PortXmitWaitExt/PortXmitPktsExtended

- How to troubleshoot

xmit_waits in the cluster, but it seems like that may have been resolved by switch reboots and a switch replacement.

4.6 BER (Symbol/Effective)

- File location & Command

ibdiagnet2.net_dump_ext
 - Effective BER Counters > 1e-12, Symbol BER Counters > 1e-13 , Symbol Err > 0
ibdiagnet2.db_csv

** For details, please refer to my previous knowledge sharing (BER (Bit Error Rate) and Troubleshoot v1.0.pdf)

```
> on a switch.

  TestLab [standalone: master] # show interfaces ib 10/1/14

  IB15/1/4 state:
    Logical port state       : Active
    Physical port state      : LinkUp
    Current line rate        : 200.0 Gbps
    Supported speeds         : sdr, qdr, fdr, edr, hdr
    Speed                    : hdr
    Supported widths         : 1X, 2X, 4X
    Width                    : 4X
    Max supported MTUs       : 4096
    MTU                      : 4096
    VL capabilities          : VL0 - VL7
    Operational VLs          : VL0 - VL3
    Description              :
    IB Subnet                : infiniband-default
    Phy-profile              : high-speed-ber
    Width reduction mode     : Not supported
    Telemetry sampling       : Disabled
    Telemetry threshold      : Disabled
    Telemetry record         : Disabled
    Telemetry threshold level: N/A bytes

    RX:
      Bytes               : 3480
      Packets             : 13
      Errors              : 7
      Symbol errors       : 735  <====
      VL15 dropped packets: 0

    TX:
      Bytes            : 11232
      Packets          : 39
      Wait             : 0
```

```
    Discarded packets: 0


TestLab [standalone: master] # show interfaces ib 10/1/14 link-diagnostics
------------------------------------------------------------------------
Interface      Code      Status
------------------------------------------------------------------------
IB10/1/14       15        Bad signal integrity

[root@NVIDIA]# perfquery 199 14
# Port counters: Lid 199 port 14 (CapMask: 0x5300)
PortSelect:......................14
CounterSelect:...................0x0000
SymbolErrorCounter:.............38  <=======
LinkErrorRecoveryCounter:........0
LinkDownedCounter:...............0
PortRcvErrors:...................0

[root@NVIDIA]# mlxlink -d lid-199 -p 14 -c -e -m

Operational Info
----------------
State                           : Active
Physical state                  : LinkUp
Speed                           : IB-HDR
Width                           : 4x
FEC                             : LL-FEC (271,257) + PLR
Loopback Mode                   : No Loopback
Auto Negotiation                : ON

Supported Info
--------------
Enabled Link Speed              : 0x00000061 (HDR,EDR,SDR)
Supported Cable Speed           : 0x00000061 (HDR,EDR,SDR)

Troubleshooting Info
--------------------
Status Opcode                   : 15
Group Opcode                    : PHY FW
Recommendation                  : Bad signal integrity.  <======

Physical Counters and BER Info
------------------------------
Time Since Last Clear [Min]     : 143.1   <=== important to math BER rate
Effective Physical Errors       : 122     <========== This used for symbol error calculation
Raw Physical Errors Per Lane    : 73506956266,43017712645,42717472449,58570852076
Effective Physical BER          : 7E-8
Raw Physical BER                : 1E-4
Link Down Counter               : 0
Link Error Recovery Counter     : 0

EYE Opening Info
----------------
Physical Grade                  :   1894,  2031,  2412,  2097
Height Eye Opening [mV]         :    N/A,   N/A,   N/A,   N/A
Phase  Eye Opening [psec]       :    N/A,   N/A,   N/A,   N/A

Module Info
-----------
Identifier                      : QSFP28
Compliance                      : N/A
Cable Technology                : 850 nm VCSEL
Cable Type                      : Active cable (active copper / optics)
OUI                             : Mellanox
Vendor Name                     : Mellanox
Vendor Part Number              : P35346-001
Vendor Serial Number            : THY1120057
Rev                             : A1
Wavelength [nm]                 : 850
Transfer Distance [m]           : 30
Attenuation (5g,7g,12g) [dB]    : N/A
FW Version                      : 38.100.59
Digital Diagnostic Monitoring   : Yes
Power Class                     : 5.0 W max
CDR RX                          : ON,ON,ON,ON
CDR TX                          : ON,ON,ON,ON
LOS Alarm                       : N/A
Temperature [C]                 : 53 [-10..80]
Voltage [mV]                    : 3232.9 [3100..3500]
Bias Current [mA]               : 7.240,7.326,7.346,7.258 [5.492..8.5]
Rx Power Current [dBm]          : -2,-2,-2,-2 [-12..6]  <== check if RX level is proper or not.
```

```
  Tx Power Current [dBm]          : -2,-2,-2,0 [-14..6]
```

- How to troubleshoot

Symbol errors indicate a physical layer issue. These are typically able to be cleared by reseating or replacing the cable.

```
#(ibportstate <lid number> <port number> reset)
Ex)
#Ibportstate 5 79 query
#ibportstate 5 79 disable
#ibportstate 5 79 enable

> After Cable replacement or port change, Please check the status.

    Mlxlink -d lid-<lid number> <portnumber>
Ex)
# mlxlink -d lid-3 -pc 36 <=== port counter clear
# mlxlink -d lid-3 -p 36 --show_device  --show_serdes_tx     --show_fec   --show_ber_monitor
# mlxlink -d lid-3 -m -c -e -p 36  ç== FEC uncorrectable/physical error counter
```

4.6 PortRcvErrors

- How to troubleshoot

These are typically able to be cleared by reseating or replacing the cable.

5. PM tips for switches “IB/Ethernet/SX6036” from sysdump

5.1 From : Ethernet/IB switch

- From sysdump ‘Sysinfo.txt’

1. Please find sysinfo.txt file from sysdump

➢ **Ethernet switch**

```
Eth1/1:
  Admin state                             : Enabled
  Operational state                       : Up
  Last change in operational status       : 2w 1d and 2:07:50 ago (1 oper change)
  Boot delay time                         : 0 sec
  Description                             : N\A
  Mac address                             : 24:8a:07:81:04:ec
  MTU                                     : 9000 bytes (Maximum packet size 9022 bytes)
  Fec                                     : auto
  Flow-control                            : receive off send off
  Actual speed                            : 40 Gbps
  Auto-negotiation                        : Enabled
  Width reduction mode                    : Unknown
  Switchport mode                         : trunk
  MAC learning mode                       : Enabled
  Last clearing of "show interface" counters: 00:20:48
  60 seconds ingress rate                 : 506180208 bits/sec, 63272526 bytes/sec, 41173 packets/sec   <= See ingress/ egress difference
  60 seconds egress rate                  :   2349264 bits/sec,   293658 bytes/sec,  4457 packets/sec

  Rx:
    53228689              packets
    53095932              unicast packets
    132309                multicast packets
    448                   broadcast packets
    80359739790           bytes
    809713                discard packets    <==== check if it's increases or not.
    0                     error packets      <====
    0                     fcs errors
    0                     undersize packets
    0                     oversize packets
    0                     pause packets
    0                     unknown control opcode
    0                     symbol errors   <====

  Tx:
    4493032               packets
    4317677               unicast packets
    175355                multicast packets
    0                     broadcast packets
    1056276187            bytes
    0                     discard packets      <====
    0                     error packets
    0                     hoq discard packets   <====
```

➢ **IB Switch**

```
IB1/13 state:
    Logical port state          : Active
    Physical port state         : LinkUp
    Current line rate           : 56.0 Gbps
    Supported speeds            : sdr, ddr, qdr, fdr10, fdr
    Speed                       : fdr
    Supported widths            : 1X, 4X
    Width                       : 4X
    Max supported MTUs          : 4096
    MTU                         : 4096
    VL capabilities             : VL0 - VL7
    Operational VLs             : VL0 - VL7
    Description                 : ibs1#1
    IB Subnet                   : infiniband-default
    Phy-profile                 : high-speed-ber
    Width reduction mode        : Disabled

    RX bytes                    : 631437720
    RX packets                  : 7998549
```

```
    RX errors                   : 0   <====
    Symbol errors               : 0   <====
    VL15 dropped packets        : 0

    TX bytes                    : 7724808536
    TX packets                  : 5211828
    TX wait                     : 260003439   <===
    TX discarded packets        : 0
```

5.1 From : SX6036

- From sdkdump

```
.............................................
Port Performance Counters
.............................................
Port 0x12300 - IEEE 802.3 Counters Group
================================================
frames_transmitted_ok                   0
frames_received_ok                      0
frame_check_sequence_errors             0
alignment_errors                        0
octets_transmitted_ok                   0
octets_received_ok                      0
multicast_frames_xmitted_ok             0
broadcast_frames_xmitted_ok             0
multicast_frames_received_ok            0
broadcast_frames_received_ok            0
in_range_length_errors                  0
out_of_range_length_field               0
frame_too_long_errors                   0
symbol_error_during_carrier             0
mac_control_frames_transmitted          0
mac_control_frames_received             0
unsupported_opcodes_received            0
pause_mac_ctrl_frames_received          0
pause_mac_ctrl_frames_transmitted       0

 Port 0x12300 - RFC 2863 Counters Group
================================================
if_in_octets                            0
if_in_ucast_pkts                        0
if_in_discards                          0
if_in_errors                            0
if_in_unknown_protos                    0
if_out_octets                           0
if_out_ucast_pkts                       0
if_out_discards                         0
if_out_errors                           0
if_in_multicast_pkts                    0
if_in_broadcast_pkts                    0
if_out_multicast_pkts                   0
if_out_broadcast_pkts                   0

 Port 0x12300 - RFC 2819 Counters Group
================================================
ether_stats_drop_events                 0
ether_stats_octets                      0
ether_stats_pkts                        0
ether_stats_broadcast_pkts              0
ether_stats_multicast_pkts              0
ether_stats_crc_align_errors            0
ether_stats_undersize_pkts              0
ether_stats_oversize_pkts               0
ether_stats_fragments                   0
ether_stats_jabbers                     0
ether_stats_collisions                  0
ether_stats_pkts64octets                0
ether_stats_pkts65to127octets           0
ether_stats_pkts128to255octets          0
ether_stats_pkts256to511octets          0
ether_stats_pkts512to1023octets         0
ether_stats_pkts1024to1518octets        0
ether_stats_pkts1519to2047octets        0
ether_stats_pkts2048to4095octets        0
ether_stats_pkts4096to8191octets        0
ether_stats_pkts8192to10239octets       0

 Port 0x12300 - RFC 3635 Counters Group
================================================
dot3stats_alignment_errors              0
dot3stats_fcs_errors                    0
dot3stats_single_collision_frames       0
dot3stats_multiple_collision_frames     0
dot3stats_sqe_test_errors               0
dot3stats_deferred_transmissions        0
```

```
dot3stats_late_collisions                0
dot3stats_excessive_collisions           0
dot3stats_internal_mac_transmit_errors   0
dot3stats_carrier_sense_errors           0
dot3stats_frame_too_longs                0
dot3stats_internal_mac_receive_errors    0
dot3stats_symbol_errors                  0
dot3control_in_unknown_opcodes           0
dot3in_pause_frames                      0
dot3out_pause_frames                     0

 Port 0x12300 - CLI Counters Group
================================================
port_rx_octets                           0
port_rx_frames                           0
port_rx_jumbo                            0
port_rx_unicast                          0
port_rx_multicast                        0
port_rx_broadcast                        0
port_rx_no_buffer                        0
port_rx_fcs_errors                       0
port_rx_runt                             0
port_rx_other_errors                     0
port_tx_octets                           0
port_tx_frames                           0
port_tx_jumbo                            0
port_tx_unicast                          0
port_tx_multicast                        0
port_tx_broadcast                        0
port_tx_errors                           0

 Port 0x12300 - EXTENDED Counters Group
================================================
tx_wait                                  0
ecn_marked                               0
no_buffer_discard_mc                     0
rx_ebp                                   0
tx_ebp                                   0
rx_buffer_almost_full                    0
rx_buffer_full                           0
tx_stats_pkts64octets                    0
tx_stats_pkts65to127octets               0
tx_stats_pkts128to255octets              0
tx_stats_pkts256to511octets              0
tx_stats_pkts512to1023octets             0
tx_stats_pkts1024to1518octets            0
tx_stats_pkts1519to2047octets            0
tx_stats_pkts2048to4095octets            0
tx_stats_pkts4096to8191octets            0
tx_stats_pkts8192to10239octets           0

 Port 0x12300 - DISCARD Counters Group
================================================
ingress_general                          0
ingress_policy_engine                    0
ingress_vlan_membership                  0
ingress_tag_frame_type                   0
egress_vlan_membership                   0
loopback_filter                          0
egress_general                           0
egress_link_down                         0
egress_hoq                               0
port_isolation                           0
egress_policy_engine                     0
ingress_tx_link_down                     0
egress_stp_filter                        0
egress_hoq_stall                         0
egress_sll                               0    <== "ingress_discard_all " Please find below

 Port 0x12300 - PER PRIO Counters Group
================================================

Prio 0
.............................
rx_octets                                0
rx_uc_frames                             0
rx_mc_frames                             0
rx_bc_frames                             0
rx_frames                                0
tx_octets                                0
tx_uc_frames                             0
tx_mc_frames                             0
tx_bc_frames                             0
tx_frames                                0
rx_pause                                 0
rx_pause_duration                        0
tx_pause                                 0
tx_pause_duration                        0
rx_pause_transition                      0
rx_discard                               0

Prio 1
.............................
rx_octets                                0
```

```
rx_uc_frames                            0
rx_mc_frames                            0
rx_bc_frames                            0
rx_frames                               0
tx_octets                               0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
rx_pause                                0
rx_pause_duration                       0
tx_pause                                0
tx_pause_duration                       0
rx_pause_transition                     0
rx_discard                              0

Prio 2
..............................
rx_octets                               0
rx_uc_frames                            0
rx_mc_frames                            0
rx_bc_frames                            0
rx_frames                               0
tx_octets                               0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
rx_pause                                0
rx_pause_duration                       0
tx_pause                                0
tx_pause_duration                       0
rx_pause_transition                     0
rx_discard                              0

Prio 3
..............................
rx_octets                               0
rx_uc_frames                            0
rx_mc_frames                            0
rx_bc_frames                            0
rx_frames                               0
tx_octets                               0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
rx_pause                                0
rx_pause_duration                       0
tx_pause                                0
tx_pause_duration                       0
rx_pause_transition                     0
rx_discard                              0

Prio 4
..............................
rx_octets                               0
rx_uc_frames                            0
rx_mc_frames                            0
rx_bc_frames                            0
rx_frames                               0
tx_octets                               0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
rx_pause                                0
rx_pause_duration                       0
tx_pause                                0
tx_pause_duration                       0
rx_pause_transition                     0
rx_discard                              0

Prio 5
..............................
rx_octets                               0
rx_uc_frames                            0
rx_mc_frames                            0
rx_bc_frames                            0
rx_frames                               0
tx_octets                               0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
rx_pause                                0
rx_pause_duration                       0
tx_pause                                0
tx_pause_duration                       0
rx_pause_transition                     0
rx_discard                              0

Prio 6
..............................
rx_octets                               0
```

```
rx_uc_frames                            0
rx_mc_frames                            0
rx_bc_frames                            0
rx_frames                               0
tx_octets                               0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
rx_pause                                0
rx_pause_duration                       0
tx_pause                                0
tx_pause_duration                       0
rx_pause_transition                     0
rx_discard                              0

Prio 7
..............................
rx_octets                               0
rx_uc_frames                            0
rx_mc_frames                            0
rx_bc_frames                            0
rx_frames                               0
tx_octets                               0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
rx_pause                                0
rx_pause_duration                       0
tx_pause                                0
tx_pause_duration                       0
rx_pause_transition                     0
rx_discard                              0

 Port 0x12300 - PER TC Counters Group
================================================

TC 0
..............................
tx_octet                                0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
tx_queue                                0
tx_no_buffer_discard_uc                 0
tx_wred_discard                         0

TC 1
..............................
tx_octet                                0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
tx_queue                                0
tx_no_buffer_discard_uc                 0
tx_wred_discard                         0

TC 2
..............................
tx_octet                                0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
tx_queue                                0
tx_no_buffer_discard_uc                 0
tx_wred_discard                         0

TC 3
..............................
tx_octet                                0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
tx_queue                                0
tx_no_buffer_discard_uc                 0
tx_wred_discard                         0

TC 4
..............................
tx_octet                                0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
tx_queue                                0
tx_no_buffer_discard_uc                 0
tx_wred_discard                         0

TC 5
..............................
```

```
tx_octet                                0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
tx_queue                                0
tx_no_buffer_discard_uc                 0
tx_wred_discard                         0

TC 6
.............................
tx_octet                                0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
tx_queue                                0
tx_no_buffer_discard_uc                 0
tx_wred_discard                         0

TC 7
.............................
tx_octet                                0
tx_uc_frames                            0
tx_mc_frames                            0
tx_bc_frames                            0
tx_frames                               0
tx_queue                                0
tx_no_buffer_discard_uc                 0
tx_wred_discard                         0
```

prsunny@SYD26-0101-0708-15T1:~$ show int counters ←= check ingress_discard_all

```
IFACE STATE RX_OK RX_BPS RX_UTIL RX_ERR RX_DRP RX_OVR TX_OK TX_BPS TX_UTIL TX_ERR TX_DRP TX_OVR
----------- ------- --------- -------- --------- -------- -------- -------- --------- -------- --
Ethernet0 U 77401644 N/A N/A 0 0 0 612546543 N/A N/A 0 0 0
Ethernet4 U 82013052 N/A N/A 0 0 0 548287581 N/A N/A 0 0 0
Ethernet8 U 75445567 N/A N/A 0 0 0 640693267 N/A N/A 0 0 0
Ethernet12 U 75069284 N/A N/A 0 0 0 590180253 N/A N/A 0 0 0
Ethernet16 U 81110674 N/A N/A 0 0 0 512705461 N/A N/A 0 0 0
Ethernet20 U 74303484 N/A N/A 0 0 0 560971127 N/A N/A 0 0 0
Ethernet24 U 83767004 N/A N/A 0 0 0 567398414 N/A N/A 0 0 0
Ethernet28 U 89491970 N/A N/A 0 0 0 527621910 N/A N/A 0 0 0
Ethernet32 U 77686352 N/A N/A 0 0 0 529482801 N/A N/A 0 0 0
Ethernet36 U 77047095 N/A N/A 0 0 0 446032780 N/A N/A 0 0 0
Ethernet40 U 81180399 N/A N/A 0 0 0 522866000 N/A N/A 0 0 0
Ethernet44 U 83906899 N/A N/A 0 0 0 521436128 N/A N/A 0 0 0
Ethernet48 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet52 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet56 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet60 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet64 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet68 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet72 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet76 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet80 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet84 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet88 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet92 X 0 N/A N/A 0 0 0 0 N/A N/A 0 0 0
Ethernet96 U 869161966 N/A N/A 0 0 0 100500628 N/A N/A 0 0 0
Ethernet100 U 860994567 N/A N/A 0 0 0 104002217 N/A N/A 0 0 0
Ethernet104 U 901131138 N/A N/A 0 0 0 97657185 N/A N/A 0 0 0
Ethernet108 U 815075863 N/A N/A 0 0 0 114106192 N/A N/A 0 0 0
Ethernet112 U 823447607 N/A N/A 0 0 0 92292313 N/A N/A 0 0 0
Ethernet116 U 857305589 N/A N/A 0 0 0 99577287 N/A N/A 0 0 0
Ethernet120 U 828557210 N/A N/A 0 0 0 103516688 N/A N/A 0 0 0
Ethernet124 U 728265885 N/A N/A 0 0 0 103008124 N/A N/A 0 0 0

 Port 0x10300 - DISCARD Counters Group
================================================
ingress_general                         0
ingress_policy_engine                   0
ingress_vlan_membership                 0
ingress_tag_frame_type                  97164
egress_vlan_membership                  0
loopback_filter                         0
egress_general                          0
egress_link_down                        0
egress_hoq                              0
port_isolation                          0
egress_policy_engine                    4158013
ingress_tx_link_down                    0
egress_stp_filter                       0
egress_hoq_stall                        0
egress_sll                              0
ingress_discard_all                     346428  ←=== SN2700s with the reason of egress_policy_engine. If possible, please modify the default
ACL rule to permit all.
```

6. Causing Fabric degradation

6.1 Link speed downgrade

- From ibdiagnet2.log

With ‘ibdiagnet2.log’, sometimes we can see ‘link speed downgrade’. This can cause congestion.

```
Speed / Width checks
-I- Link Speed Check (Compare to supported link speed)
-E- Links Speed Check finished with errors
-E- Link: S7cfe9003009e90a0/N7cfe9003009e90a0/P21<-->skyway-hpci:ib-gw/U1/P1 - Unexpected actual link speed 10
(enable_speed1="2.5 or 5 or 10 or 14 or 25 or FDR10", enable_speed2="2.5 or 5 or 10 or 14 or 25 or 50" therefore final speed
should be 25)
```