



TOPTRG Status

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TOPTRG Status



Successfully porting TOPTRG FW from UT3 to UT4, including

- Slot decision logic: tested with Pulser
- Combined decision logic: not tested yet
- TOP FEE trigger path: no link down observed in ~24 hours
- VME readout and related scripts: restore all features + link down monitor
- Aurora link between two UT4s: tested with Pulser
- TOP-GDL link: upgraded to 64b66b 12G
- TOP-GRL link (8b10b 5G) and CDC-TOP matching data format: consider to upgrade
- Belle2link: b2tt/b2clk up, need further test in global run



TOP FEE trigger path test



TS counter SLOT/SCROD 1/A : 31485611
TS counter SLOT/SCROD 1/B : 34781655
TS counter SLOT/SCROD 1/C : 34335038
TS counter SLOT/SCROD 1/D : 34461152
TS counter SLOT/SCROD 2/A : 33451578
TS counter SLOT/SCROD 2/B : 36947373
TS counter SLOT/SCROD 2/C : 33945139
TS counter SLOT/SCROD 2/D : 36330216
TS counter SLOT/SCROD 3/A : 34038619
TS counter SLOT/SCROD 3/B : 35174508
TS counter SLOT/SCROD 3/C : 34166691
TS counter SLOT/SCROD 3/D : 34897191
TS counter SLOT/SCROD 4/A : 36870294
TS counter SLOT/SCROD 4/B : 33589113
TS counter SLOT/SCROD 4/C : 34345576
TS counter SLOT/SCROD 4/D : 36203381
TS counter SLOT/SCROD 5/A : 34441297
TS counter SLOT/SCROD 5/B : 34375013
TS counter SLOT/SCROD 5/C : 34960628
TS counter SLOT/SCROD 5/D : 35257632
TS counter SLOT/SCROD 6/A : 34797098
TS counter SLOT/SCROD 6/B : 35152290
TS counter SLOT/SCROD 6/C : 34645434
TS counter SLOT/SCROD 6/D : 28596864
TS counter SLOT/SCROD 7/A : 34295975
TS counter SLOT/SCROD 7/B : 34850951
TS counter SLOT/SCROD 7/C : 34116466
TS counter SLOT/SCROD 7/D : 35032322
TS counter SLOT/SCROD 8/A : 35155100
TS counter SLOT/SCROD 8/B : 35211914
TS counter SLOT/SCROD 8/C : 34071253
TS counter SLOT/SCROD 8/D : 33251335

TS counter SLOT/SCROD 9/A : 35436668
TS counter SLOT/SCROD 9/B : 34838566
TS counter SLOT/SCROD 9/C : 33125311
TS counter SLOT/SCROD 9/D : 34144496
TS counter SLOT/SCROD 10/A : 36482973
TS counter SLOT/SCROD 10/B : 33697811
TS counter SLOT/SCROD 10/C : 37686532
TS counter SLOT/SCROD 10/D : 14188786
TS counter SLOT/SCROD 11/A : 32960613
TS counter SLOT/SCROD 11/B : 36042499
TS counter SLOT/SCROD 11/C : 33756216
TS counter SLOT/SCROD 11/D : 35140729
TS counter SLOT/SCROD 12/A : 33400953
TS counter SLOT/SCROD 12/B : 33078658
TS counter SLOT/SCROD 12/C : 34652181
TS counter SLOT/SCROD 12/D : 34835916
TS counter SLOT/SCROD 13/A : 35762284
TS counter SLOT/SCROD 13/B : 33269801
TS counter SLOT/SCROD 13/C : 33514124
TS counter SLOT/SCROD 13/D : 35904721
TS counter SLOT/SCROD 14/A : 35753324
TS counter SLOT/SCROD 14/B : 36018036
TS counter SLOT/SCROD 14/C : 34688360
TS counter SLOT/SCROD 14/D : 35400485
TS counter SLOT/SCROD 15/A : 35856632
TS counter SLOT/SCROD 15/B : 33816215
TS counter SLOT/SCROD 15/C : 35277577
TS counter SLOT/SCROD 15/D : 33597294
TS counter SLOT/SCROD 16/A : 35421935
TS counter SLOT/SCROD 16/B : 42388023
TS counter SLOT/SCROD 16/C : 33606439
TS counter SLOT/SCROD 16/D : 33881053

TOP PMT replacement work fixed the trigger path problems on s04b, s06a, s08c, s13d.

All TOPFEE-TOPTRG data links are up.

TOP high rate test with ~5MHz/PMT

All links are working at bandwidth (~127MHz per BS).

ILA Status: Idle

Name Value

SLOT 1-8

> ts_cnt_f9_after_2[111:96]	21
> ts_cnt_f9_after_3[95:80]	21
> ts_cnt_f9_after_4[79:64]	21
> ts_cnt_f9_after_5[63:48]	21
> ts_cnt_f9_after_6[47:32]	21
> ts_cnt_f9_after_7[31:16]	12
> ts_cnt_f9_after[15:0]	21
frame9_sync	1
frame_sync	0

1,022	1,024	1,026	1,028	1,030	1,032	1,034
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				
1092 1093 1094 1095	1096 1097 1098 1099	1100 0 1 2				
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				

ILA Status: Idle

Name Value

SLOT 9-16

> ts_cnt_f9_after_2[111:96]	272
> ts_cnt_f9_after_3[95:80]	1272
> ts_cnt_f9_after_4[79:64]	1272
> ts_cnt_f9_after_5[63:48]	1272
> ts_cnt_f9_after_6[47:32]	1272
> ts_cnt_f9_after_7[31:16]	1094
> ts_cnt_f9_after[15:0]	1272
frame9_sync	1
frame_sync	1

1,022	1,024	1,026	1,028	1,030	1,032	1,034
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				
1092 1093 1094 1095	1096 1097 1098 1099	1100 0 1 2				
1270 1271 1272 1273	1274 1275 1276 1277	1278 0 1 2 3				



Upgrade TOPTRG-GRL link



bit	0	1	2	3	4	5	6	7
[0:7]	Flag slot 1-8							
[8:15]	Hit numbers slot 1							
[16:23]	Hit numbers slot 2							
[24:31]	Hit numbers slot 3							
[32:39]	Hit numbers slot 4							
[40:47]	Hit numbers slot 5							
[48:55]	Hit numbers slot 6							
[56:63]	Hit numbers slot 7							

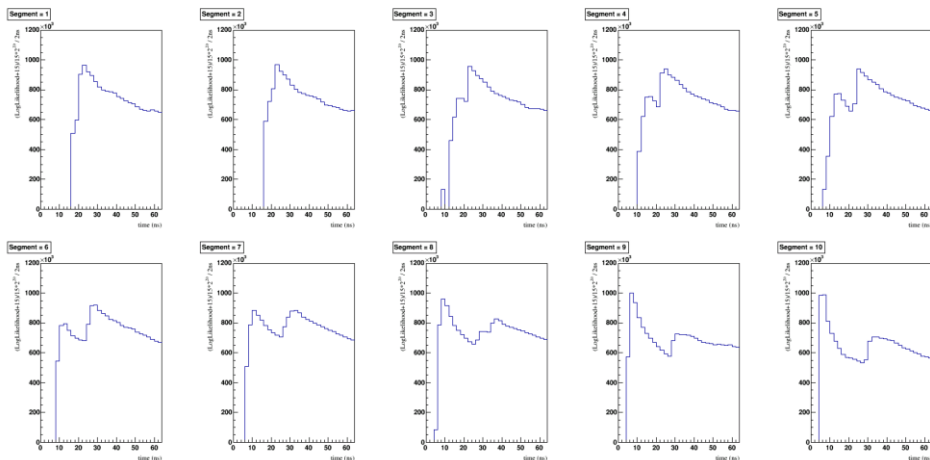
bit	0	1	2	3	4	5	6	7
[64:71]	Hit numbers slot 8							
[72:79]	MSB 11 bits of slot T0							
[80:87]				T0 slot 1-8				
[88:95]								
[96:103]								
[104:111]								
[112:119]								
[120:127]				Spare 5bits				

Current TOPTRG-GRL link uses 8B10B 5G protocol.
We have to send MSB 11 bits of all slot T0s due to bandwidth limit.

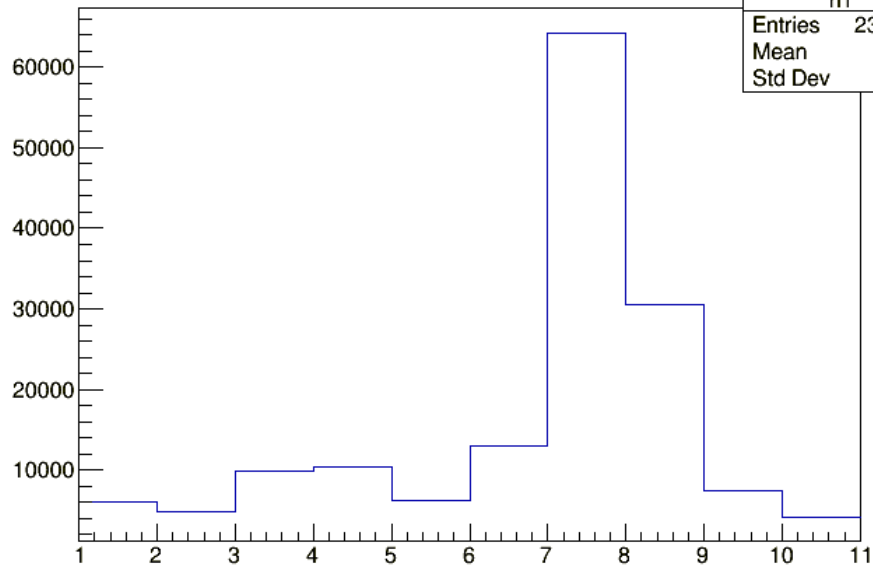
However, we don't actually have good solution to choose the MSB 11 bits.

Is it possible to upgrade to higher rate?

$$8+8*8+16*8=200 \text{ bits@127MHz} = 4 \times 6.35 \text{ Gbps}$$



segmentisimtrg



Current PDFs don't have good resolution.
We are working to extract PDFs from data.
Plan to add as a part of calibration framework.