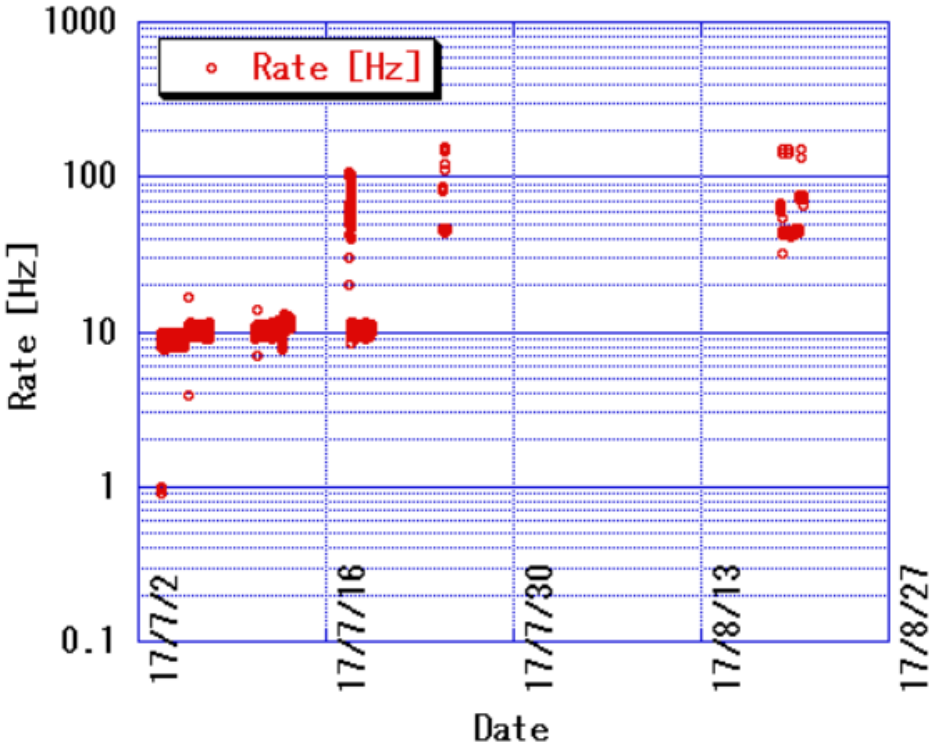
Operation experience in GCRT

S. Yamada

Overview



- Basically, smooth operation by experiment shifters **with help of sub-detector experts.** Thank you very much !

- Experts took care DAQ status until 10:00PM in evening shifts. After that experiment shifters dealt with trouble alone (sometimes w/ CDC or TOP experts).
- some troubles during owl shifts which caused rather long deadtime(hours).
  - 7/11 : GUI froze. (memory leak)
  - 7/19 : Data corruption on TOP COPPER. (00ff error)
  - 7/25 : Nshm trouble
  - 8/22 : LDAP server down

GCRT status in August is not completely covered in this talk.

A. Errors detected by FTSW

	# of runs	**runtime [s]**	Comment
CDC b2llost	23	1867	Only occurred in cpr2014d (according to Nanae-san)
CDC b2llost (Aug.)	1?		cpr2046d
CDC error	3	3534	
CDC terr	3	7813	
TOP b2llost	36	3033	TOP experts and Nakao-san prepared a new firmware to fix the problem.
TOP ttlost	1	4119	
ECL error	2	1687	O0=06400008 00000000 0007658c error no-info
ECL FEE busy	2	0	
ECL ttlost (Aug.)	Many		
KLM terr	3	335	
KLM ttlost	8	6524	
KLM ttlost (Aug.)	Many		

- Basically, shifters could resume data-taking by restarting a run
- ☎ : ECL error and ECL FEE busy : Nakao-san fixed
- ☎ : KLM ttlost stopped data-taking shortly -> Shifters excluded KLM with the help of Isar.

B. Errors related to COPPERs

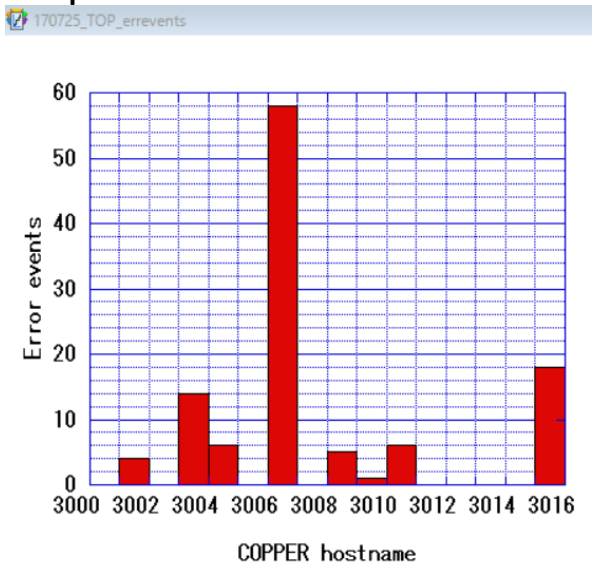
- Errors which shifters can recover from by restarting data-taking
  - CRC error in cpr2027b “ff00ff00”
  - Failed to start a DAQ process because a network port is occupied by other process.
- Errors ☎ : shifters could not fix the problem.
  - 1 time : CRC errors(“00ff00ff”) repeatedly from cpr3016b in run3513-3516 -> exclude TOP
  - 5 times : CDCTRG/ECLTRG COPPERs received data which corrupted during b2link data-transmission.
  - 4 times : No data from a ECLTRG COPPER

Other data corrupted events (Jun.15-Jul.24)

# of error events	Corrupted in COPPER	Corrupted in belle2link
TOP	112	0

- We ignore the data-corruption inside data (not in header/trailer) in GCRT to continue data-takin for longer time.
- You can check in analysis whether it is an error event or not by EventMetaData->getErrorFlag() (if the return value is nonzero -> error event)

Dependence on TOP’s COPPERs



C. Errors related to HLT

- Errors ☎ : shifters could not fix the problem.
  - 1 time : No data are recorded because HLT DQM module (bKLMDQM) crashed.
    - Itoh-san restarted HLT
  - 3 times : ECL Unpacker error "Error message "Corrupted data from ECL collector“
    - ECL people somehow fixed the problem.
  - Several times in August : HLT reported TOP unpacker errors.

D. Errors related to DAQ configuration

Improper mask/unmask DAQ components.
-> lead to the situation where FIFO almost-full in COPPER (->BUSY in FTSW)
or no data are recorded after run-start.

- Errors ☎ : shifters could not fix the problem.
  - 3 time : COPPER/HSLB were not properly masked or unmasked.
  - 2 times : eb0(readout PCs) were not properly masked or unmasked.
  - 2 times : ECL FTSW remains LOCAL (should be GLOBAL in combined data-taking).

These are simple error but it is difficult to find the cause of the error by shifters.
-> Check or help to find the problem by run control system is preferred.

D. Errors related to slow control system

- Errors ☎ : shifters could not fix the problem.
  - 1 time : ttdctrl(interfae between pocket ttd and runctrl) crashed.
    - Konno-san restarted.
  - 1 time : run-controller GUI froze.
    - Konno-san restarted.
  - Several times : network shared memory was down. RC GUI had many “null boxes”.
    - Konno-san restarted.
  - A few times : DQM froze
    - Shifters restarted with the help of experts.

F. Other troubles

- Errors ☎ : shifters could not fix the problem.
  - 2 times : TOP HV tripped.
    - TOP experts fixed the problem.
  - 2 times : Some TRG system trouble.
    - Nakazawa-san did something to fix the problem.

What experts asked shifters to do :

- Start/stop a run
- Include/exclude sub-detectors
- Mask/unmask a certain COPPER or FEE
- Detailed error report (ECL ttlost or KLM ttlost or CDC b2llost ? Etc.)
- Restart DQM/Event-display window
- Restart TOP HV monitor

If these will be task of experiment shifters in phase II run, experts needs to prepare instructions.

Summary

- GCRT in July and August has been performed smoothly thanks to the efforts of shifters and TRG, detector and DAQ experts.
- It is the first time to fully rely on non-expert shifters to operate the system.

  -> good practice for the phase-II beam run.
- But still we have a certain amount of downtime due to errors, which will not be allowed in the phase-II 24hrs/7days operation.
  - Errors detected by FTSW (ttlost, b2llost, ferr etc)
  - Data corruption on COPPER
  - Mis-configuration in masking/unmasking COPPER, HSLB and readout PC
  - Slow control/monitor system errors (nshm down, DQM window, TOP HV ctrl window etc)
  - Detector-related errors (TOP HV trip, TOP and ECL data corruption)
- We should reduce those errors as much as possible before the phase II run and also consider to minimize the downtime even when those errors occur.
  - Non-stop DAQ ?
  - More documents or support system for shifters to deal with problems
  - Smooth contact with experts (which experts should be called ?)