Offline Trigger Software Update

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STAR Collaboration Meeting

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Trigger data

TrgDataType : c structure(s) defined in trgStructures.h

All L0, L1 and L2 trigger information
> trigger word, action word, token, bunch Id, busy…
> trigger detector data (1 + 5 pre and post crossing)
> DSM/L1/L2 processed data (emc trigger data, etc)

Prepared by trigger group (Zoran, offline part : Herb)

Represent STAR trigger hardware evolution

Version	Year	Size
0x11	2000	4,952 byte
0x13	2002	6,369 byte
0x20	2003	19,704 byte

(1.7K byte if we drop pre & post crossings)

TrgDataType
2001 and new changes in 2003

1 action word   ⟶   3 action words

1 trigger word   ⟶   3 trigger words (+DB to get trigger ID)

1 detector busy status ⟶   3 detector busy status

Token, Bunch Id & Spin bits

CTB

MWC

ZDC

BBC

FPD

Prototype barrel EMC trigger data

    ⟶   Barrel + endcap EMC high tower data

           Barrel + endcap EMC jet trigger data

Old and new high level DSMs (Vertex, Multiplicity, FPD)

Also some clean up has been done

2003 Trigger Offline Software

Action Word   (Herb, Zoran, Jeff, Jerome)
Combine 3 action words to the action word

Trigger Id   (Jeff*2, Herb, Jerome, Jamie, Gene, Jon, Thomas)
Read Trigger Word, Talk to DB, get trigger ID

BBC data   (Akio, Jerome, Thomas)
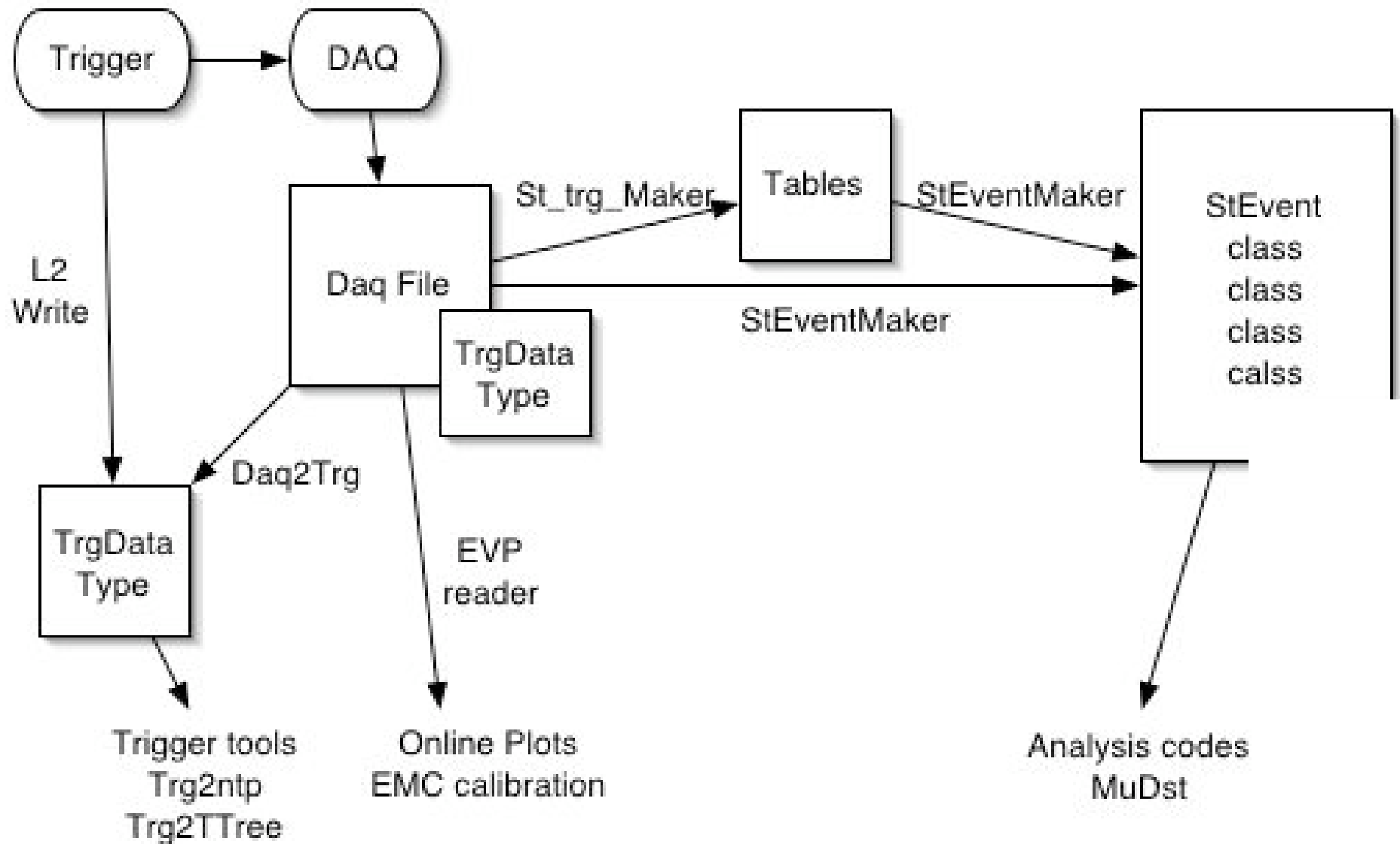Bank changes & Increased # of PMT

…

These are just small piece…
Many new & important information is currently lost in StEvent
And also it is getting messy

Trigger data and (semi) offline software

2003 Trigger Offline Software

All other trigger data (Mirko, Akio, Jerome, Thomas, Les)

Save whole TrgDataType as-is in StEvent

StTriggerData class in StEvent to wrap TrgDataType
  User-friendly access functions (can be added later)
  Abstract interface
  Year by year (or version by version) implementation
  Another implementation for MC with setXXX functions
  Experts can get the whole TrgDataType
                    and develop & debug access functions

No data loss   new data & detector
                    pre & post crossing information
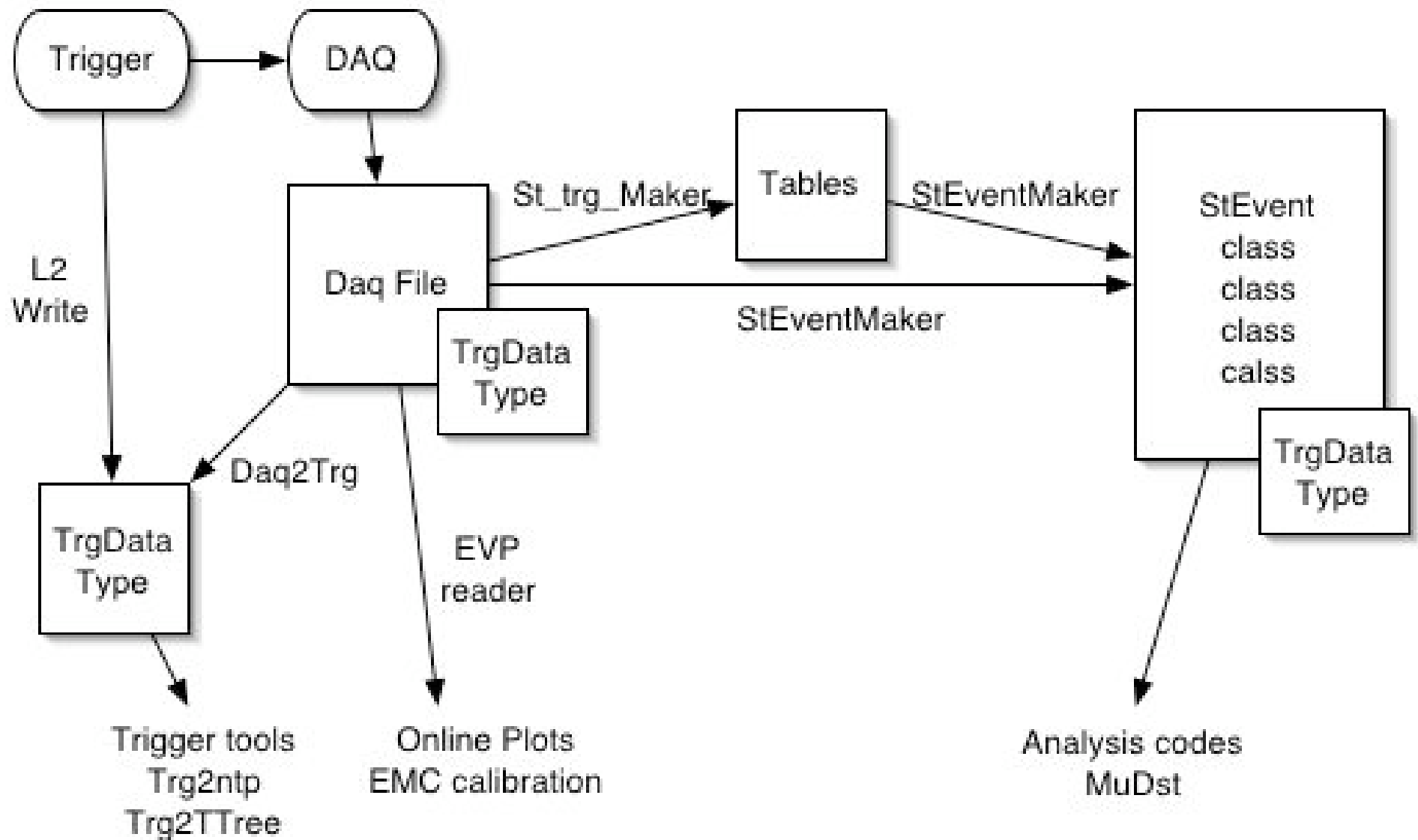No more 2 (or even 3) representation for the same data
No wait for production
No re-production for just a bug or a bit we missed
No more hack and slash in old messy code

Keep old structures as is

Trigger data and (semi) offline software

And more…

Simulation:

BBC geom. & simulator (Yiqun, Mikhail, Joanna, Akio, Les, Maxim)

Bug uncovered and fixed last week

EMC trigger (Renee, Piotr, barrel EMC group)

FPD geometry (Yiqun)

Old detectors (CTB, ZDC…) (?)

Simulation of trigger (?)

(Really) Fast Detector Simulator ?

For event generator (no geant) level simulations

Scaler boards data (Hank, Jeff*2, Joanna, Akio)

> few T bytes

Files on disk, summary in DB, backup to HPSS, online analysis

Semi-offline software:

Trigger data readers   readTrg, etc… (Hank, trigger group)

trg2ntp(Eleanor, Zoran, Akio)

trg2TTree(Frank), daq2trg(Akio, Frank, Tonko)

EVPReader is now in CVS. These should be in CVS too?

Summary

Test productions / fast offline running with minimal change

<div style="text-align: center;">Thanks to many people</div>

The whole trigger data will be kept in StEvent   StTriggerData

Simulations for trigger and trigger detectors

          Good progress (See Joanna's talk)

          Many more things to do

Many useful tools are available… Make it more available to people

    Trigger is evolving

    More and more people need to be looking at trigger data

    Including scaler boards data