

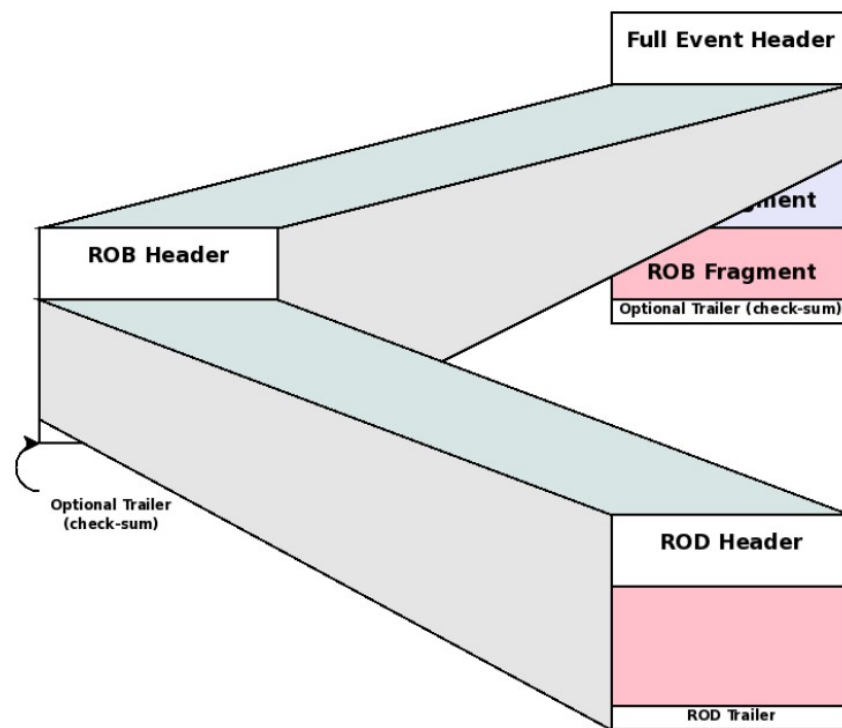


Reading DAQ raw data format

Mauro Villa, Silvia Biondi, Riccardo Ridolfi
riccardo.ridolfi@bo.infn.it

Requirements for raw data files and event format

- **Redundancy** to check event consistency of detector data is needed;
- The event format must have a **modular** structure;
- The event format must provide information about **run type**;
- The **basic** unit should be a **fragment**.



Software

It reads data stream coming from detectors **event by event** and it stores useful information into few classes, one for each detector

Example for trigger:

```
class TrgEvent {  
  
public:  
    u_int channelId;  
    u_int tv_sec;  
    u_int tv_usec;  
    u_int eventNumber;  
    u_int liveTime;  
    u_int timeSinceLastTrigger;  
    u_int clockCounter;  
    u_int eventCounter;  
    u_int BCOofTrigger;  
    u_int spillNrAndTrgFineDelay;  
    u_int PMTsAndBusy;  
  
    void PrintTrgData();  
};
```

The Event Reader class

The EventReader class fits the **modular** structure of the binary file. The main functions are:

- **void getNextEvent()** which looks for the next event to be read;
- **char* ReadInEvent()** which loads the whole event;
- **void getXXXData(unsigned int **p)** which stores information into different classes.

At present this is only a “skeleton” of the code that will be included in SHOE!

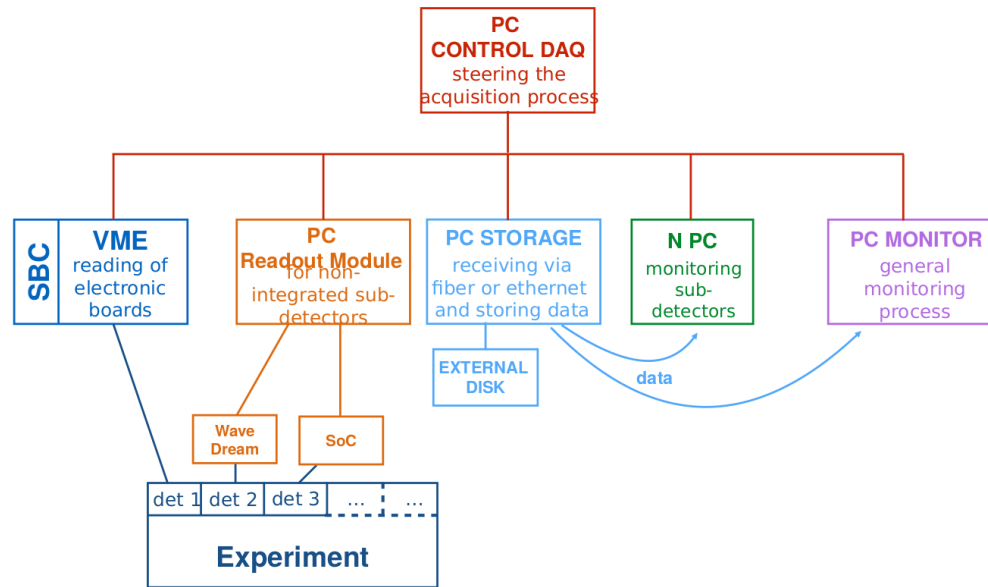
Software

The code provides a **C++ pointer** to each class and a printing method which is useful also for monitoring purposes



it is necessary to **avoid** processing **useless information** during the acquisition phase!

Thank for your attention!



Detector	Board(s)	DAQ channels	max event rate (kHz)	Event size (bytes)
Trigger	V2495	1	10	40 B
Start Counter	DreamWave	4	1	8.2 kB
Beam Monitor	TDC	36	5	0.1 kB
Vertex detector	SoC on DEx	$4 \cdot 10^6$	2	0.9 kB
Inner tracker	SoC on DEx	$28 \cdot 10^6$	2	2.1 kB
Outer tracker	Custom	$6 \cdot 10^3$	2	0.5 kB
$\Delta E/\Delta x$	DreamWave	80	1	8.4 kB
Calorimeter	QDC	400	2	1.7 kB
Total DAQ	Storage PC	-	1	22 kB