Progress on developing of ChorusDB for combined data from electronic detector and emulsion scanning

Roumen TSENOV,

Chorus Collaboration meeting

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Inputs

Electronic data

- **ZEBRA structure (FZ files)**
  - **- raw events (DAQ)**
  - **- processed events**
    - **- CHORAL - few passes**
      - **- maxi-DST**
        (~ 1 TB for 94/97 data)
      - **- mini-DST (STEV bank)**
        (~ 10 GB for 94/97 data)
    - **- CHANT**
      - **- maxi-DST**
      - **- mini-DST (to be defined!)**
- **files are on tapes**

Scanning data

- **Scan-back procedure data (finding track on CS, SS and in bulk emulsion)**
- **Scanning one track (per event) in bulk emulsion (Phase I)**
  - Every scanning lab has its own format
- **Net-Scan data**

  (Nagoya and CERN)
  - data are stored in Objectivity/DB™
  - similar formats in both Labs
  - vertex is located in ~ 10% of events and they are NetScan-ed).
  - data volume: ~1.4 Mb/event raw data from which ~300 kb/event are left after some preliminary track finding.

Data volume to be kept on disk

Input: 2.3x10^6 emulsion trigger events

- **Event headers: < 100 Mb**
- **NetScan data : ~ 10 % of all events, 300 kb/event ’ 60 Gb**
- **Last CHORAL mini-DST: < 5 Gb**
- **CHANT mini-DST with re-processed data: ~ ? Gb**

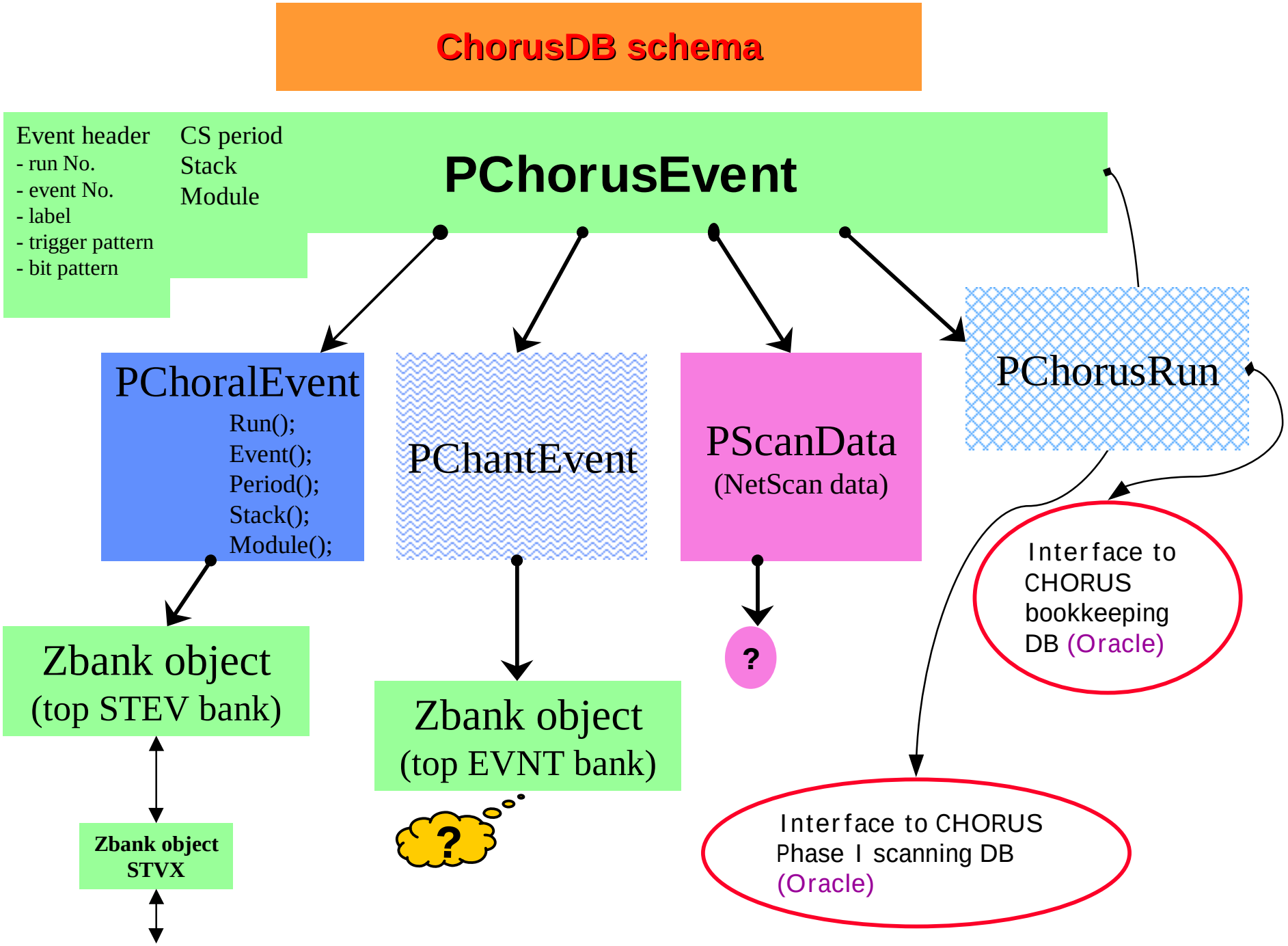
  (depends on available disk space and access performance)

Note: Chorus Oracle data bases for CHORAL/CHANT processing bookkeeping data (**cerndb1/pubv5 accessible via chinfo**) and Phase I **scanning data** reside elsewhere.

Software infrastructure at CERN

- **Objectivity/DB™ , version 5.1.2 (Linux RedHat 5.1)**
  upgrade to version 5.2.1 (Linux RedHat 6.1) foreseen.
- **Data server , shd98.cern.ch (Digital UNIX)**
  ~70 Gb of RAID disk space, up to 300 Gb when needed.
- **Tools for storing/accessing data**
  - Zbank persistent class;
  - converter from ZEBRA structure (bank tree) to associated Zbank persistent objects and vise-versa (mixed C++ and Fortran);
  - service routines;
  - prototype schema;
  - prototype federated DB, populated with ~0.5 x 10^6 Choral events (STEV banks) and 100 NetScan (version 1998) events.

ChorusDB schema



Stages of realization

Already passed:

- **Converter: ZEBRA bank tree 1 C++ objects 1 Objectivity/DB and vise versa**
- **Prototype ChorusDB :**

  100 NetScan events + ~0.5 x 10^6 Choral events (1543 runs)

  1.4 Gb of disk space
- **Tools for mixed (Fortran + C++) writing/reading ChorusDB**

Coming "soon":

- **Procedure for keeping synchronized ChorusDB at CERN and Nagoya NetScan DB**
- **Optimization of ChorusDB structure**
- **Chant SCAN module (**ChorusDB as an input stream**)**
- **Promotion of the prototype to a production DB and populating it with what is available at that time**
- **Interfaces to Chorus ORACLE DBs from within CHANT and ChorusDB**

ChorusDB (prototype) structure

Electronic data

Data-base ChorusEventDir
- container ChorusEvents
- container ChorusEventsNS

Data-base ChoralData
- containers RunXXXX (now 1534 of them)

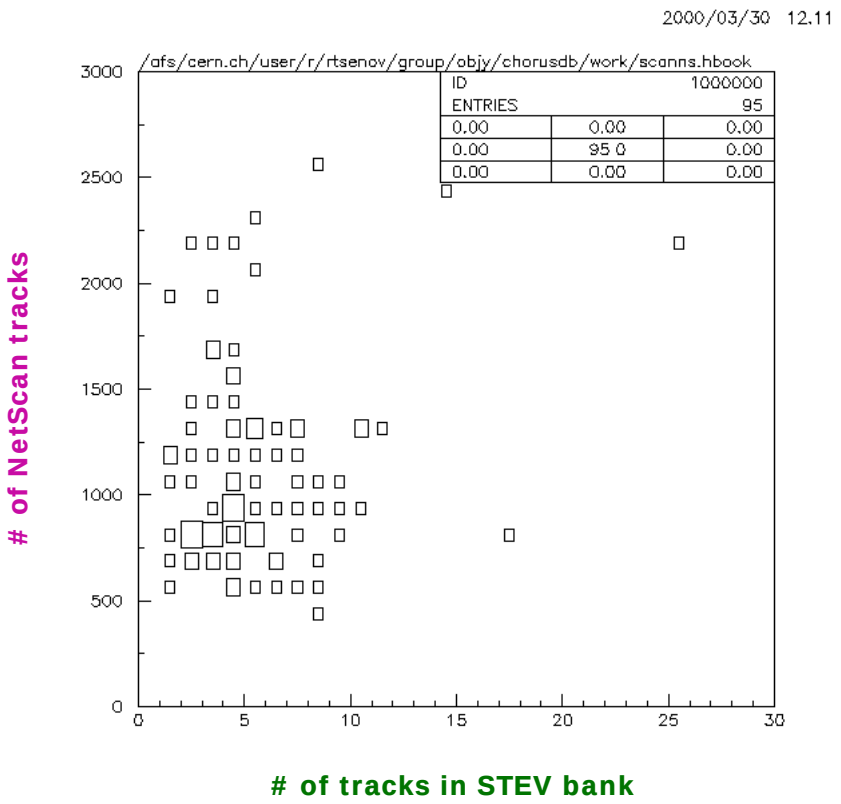
NetScan data

Data-base processedLocal

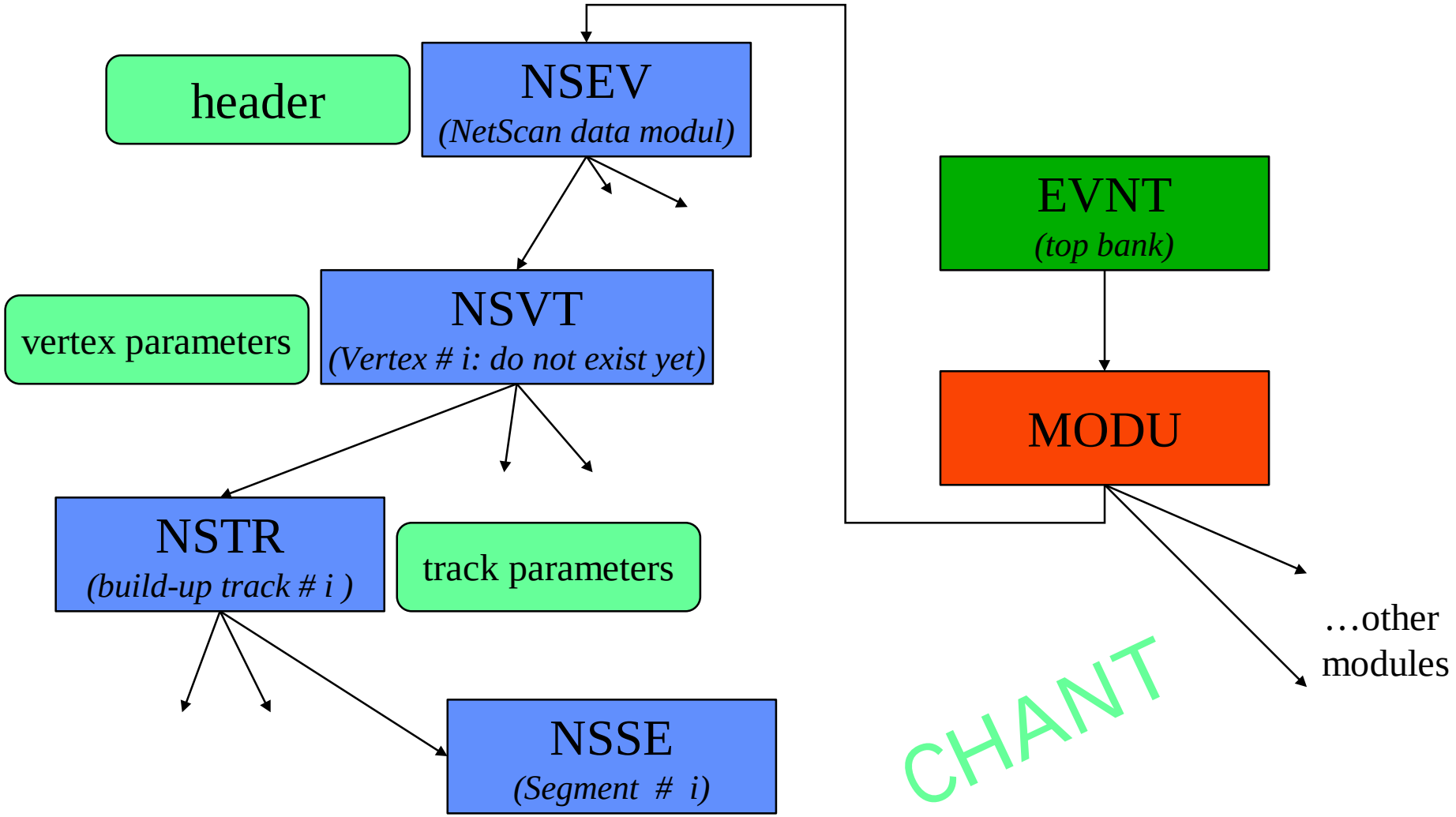
Data-base rawLocal

```
-rw-r--r--   1 objsrvv5 v5 1395851264 Mar 29 10:49 ChoralData.ChorusFD.DB
-rw-r--r--   1 objsrvv5 v5   65085440 Mar 29 10:49 ChorusEventDir.ChorusFD.DB
-rw-r--r--   1 objsrvv5 v5        185 Mar 30 15:33 ChorusFD
-rw-r--r--   1 objsrvv5 v5    1433600 Mar 30 15:33 ChorusFD.FDDB
-rw-r--r--   1 objsrvv5 v5     499712 Mar 23 17:59 System.ChorusFD.DB
-rw-r--r--   1 objsrvv5 v5  100114432 Mar 29 10:49 processedLocal.ChorusFD.DB
-rw-r--r--   1 objsrvv5 v5   73678848 Mar 23 18:00 rawLocal.ChorusFD.DB
```

First demonstration



Proposed ZEBRA bank structure of NetScan data
(SCAN module in CHANT)



Conclusions

- Prototype ChorusDB under Objectivity/DB™ for combined data is there;
- Concept of converting data from FZ files to persistent objects and back, using mixed Fortran & C++ environment, proven successful;
- Chant SCAN module under preparation;
- Work is going on;
- Next milestone: synchronizing CERN and Nagoya schema and populating the prototype with more NetScan events