

The New Gammasphere DAQ and on-line Sorting

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GS Upgrades

- **LBL:**
- *New DAQ*
- Mario (later Torben)
- More CPU power
- Obsolete/slow VME CPUs
- Obsolete VxWorks OS and SUN OS

- **ANL:**
- *New on-line sorting*
- Torben
- Daphne too old
- VMS too old
- ORNL sorter quite old
- Would like to go to Unix/Linux

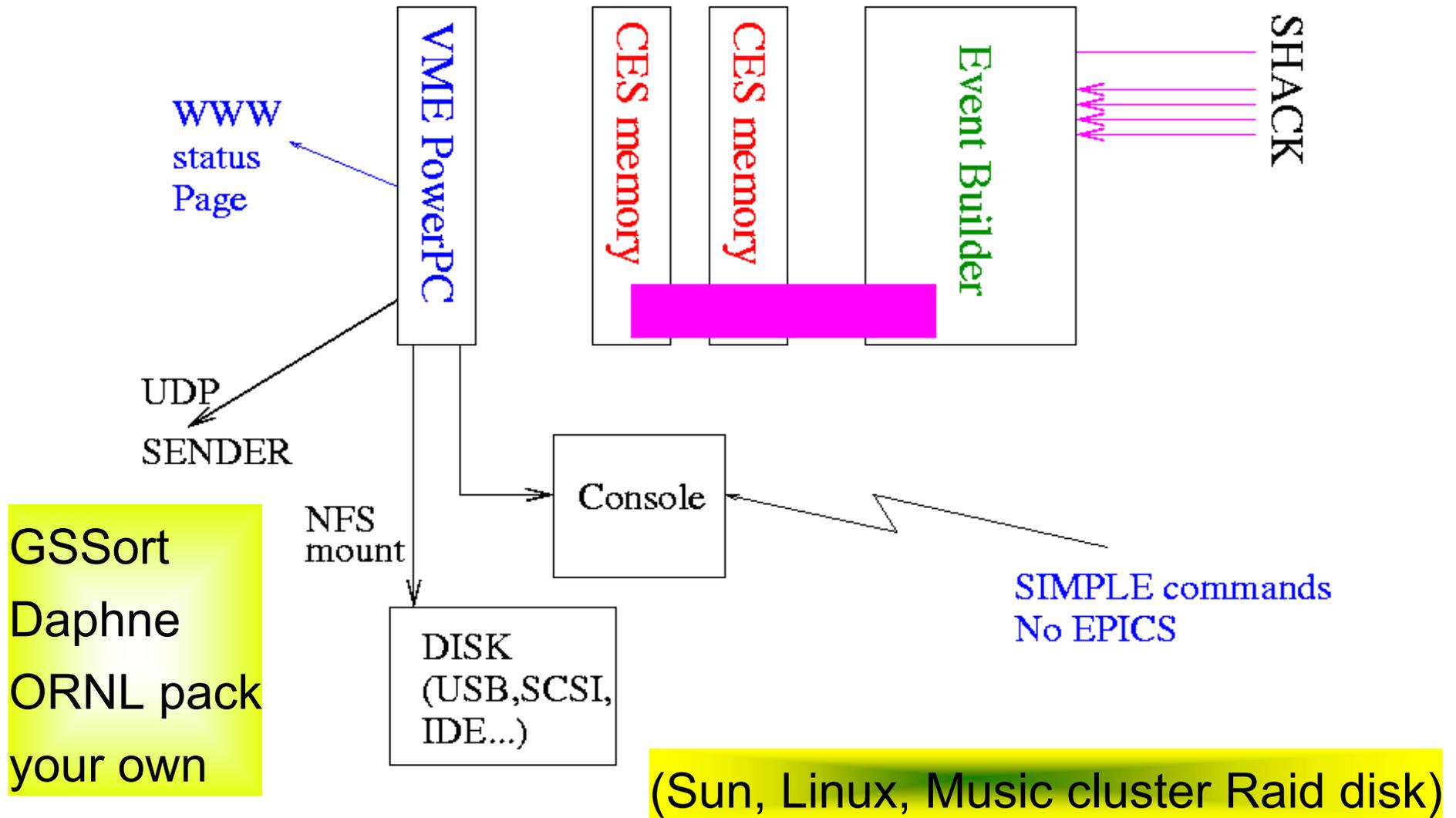


[1]: New DAQ

- Reuse old Weizeorick Event builder
- Reuse (two) old CES memories
- New PowerPC VME processor from CES electronics
- New(er) version on VxWorks from Windriver
- Has sender like old DAQ (backward compatibility)
- Control/load from modern Sun (Solaris 9/10)
- **Data goes to (USB) DISK! (no more 8mm tapes)**



New DAQ Layout in VME crate



New DAQ Experience...

- *ANL Add: external data, E and T alignments*
- Arrived in ~alpha state -- much **debugging** of code
- Many **crashes** -- *no error messages!!*
- *Much of the code rewritten to match old DAQ*
- *Interrupt vector --> polling*
- **New utilities** have been written (energy and time alignments, time windows, modeflags, ratewatch, www status pages, Watchdog (ebreset)...
- More stable now, but long events and high rates are still a problem:
corrupt CES memory content

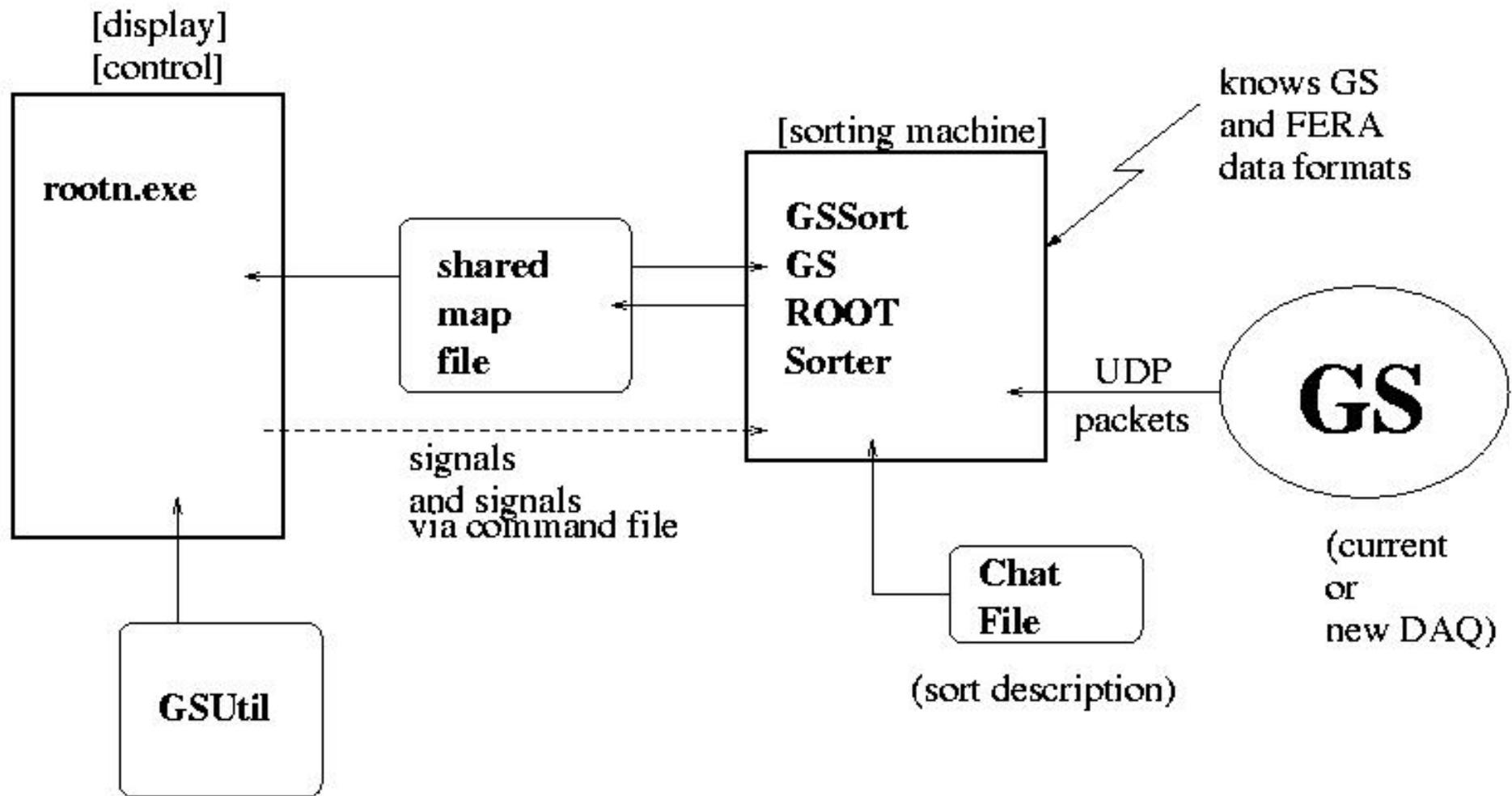
New DAQ Experience...

- We have used it successfully if for some experiments!
- Every experiment reveals something new that needs to be 'improved'...
- Sender has problems, other smaller problems, TODO list has items; but it is functional.
- Needs to work well with GSSort (the on-line sorting software) since all alignments are done in GSSort, not in VME processor.
- Good logging of what happened during experiment
- **Drawback: NO EPICS, so not as intuitive to use!**

[2]: NEW on-line sorting

- Why
- Daphne only runs on VMS
 - ORNL too old to run on new suns
 - Would like more platform independent sorting
 - • **ROOT from CERN seems like a good choice** (it runs on many platforms, feature rich, maintained, commonly used, but ~difficult)
 - GSSort based on ROOT for display and some data manipulation.
 - GS sort engine is mine

GammaSphere GSSort/GSUtil ROOT sorter



Display spectra
create 2D windows

start, stop, update, zap etc
via signals to GSSort

GSSort can read tapes
and disk files as well.

Chat script: the core of the sort

- Specify everything that the sort should do in clear language!
(serves as sort documentation) [no need to read code]
- Input source (net,disk,tape)
- Output (shared mapfile, compressed platform-independent rootfile)
- Bin most used spectra (ehi, elo, eside, tge, tbgo, tac2, hitpatterns, etc) by default
- Declare your own pev's (based on FERA data)
- Manipulate pev's
- 1D and 2D plotting
- Declare and apply 1D and 2D conditions



Chat script

- **USE NAMES NOT NUMBERS: Named pev's**
- **User-friendly FERAS processing (most FERA types supported, user only needs to know VSN and type)**
- **Almost English like processing commands. Mostly, NO RECOMPILATION of sorting program is required (example next)**
- **You can add you own specialized code if needed in such a way that you can upgrade the main code when a new version of GSSort comes online**
- **GSSort runs on both Suns and Linux machines**

Simple chat file example: Ion-chamber

```
input net 1101
beta      0.0549
hiresdatamult 0.3333333333333333
```

(from current
experiment)

```
lecroy 21-22
silena 25
```

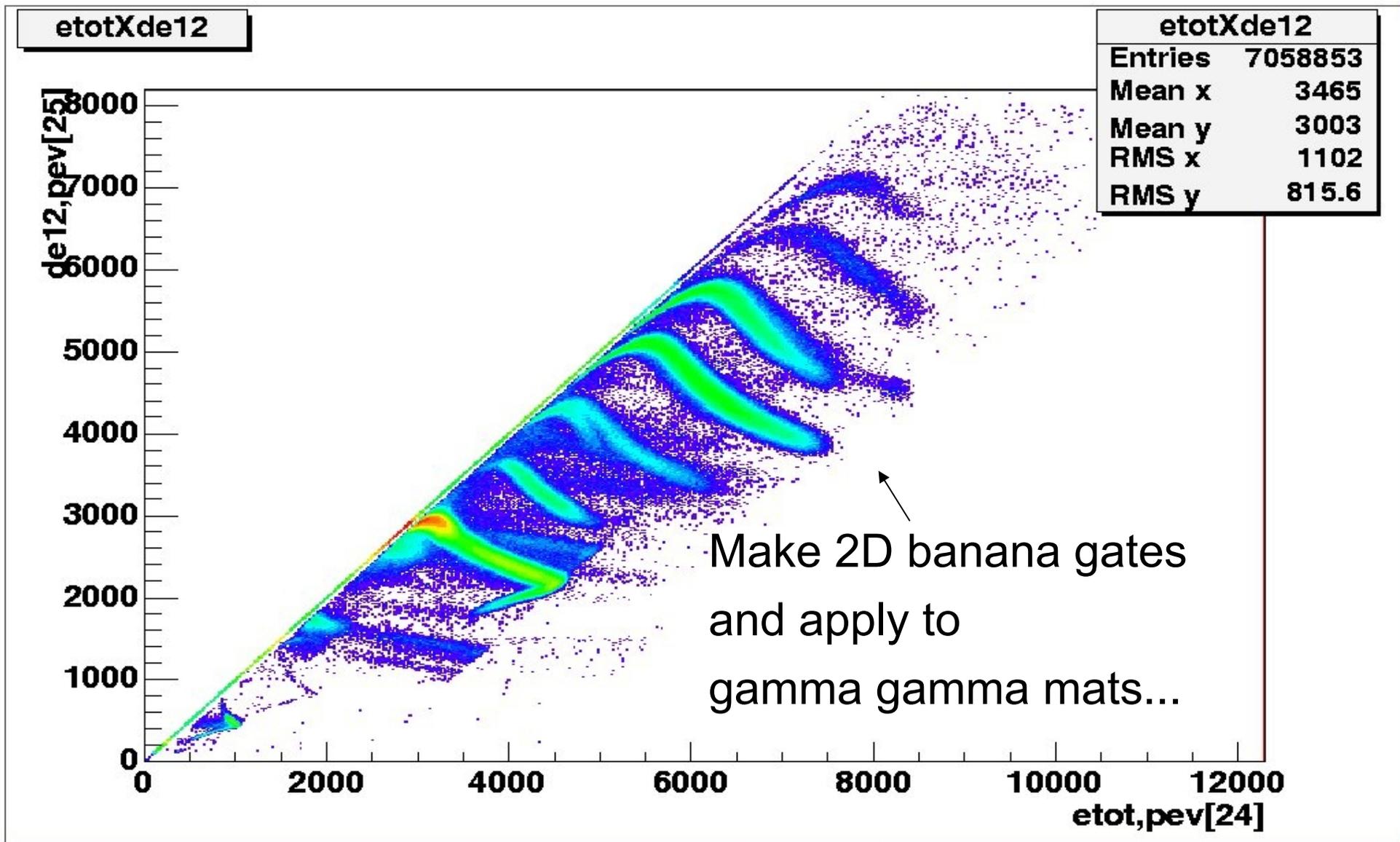
```
ferapev 25 0 de1
ferapev 25 1 de2
ferapev 25 2 de3
```

```
mkpev etot
modpev addpev etot 0 1 de1
modpev addpev etot 0 1 de2
modpev addpev etot 0 1 de3
```

```
mkpev de12
modpev addpev de12 0 1 de1
modpev addpev de12 0 1 de2
```

```
binpev2d etot 512 0 12287 de12 512 0 8191
```

Type: d2(“etotXde12”)



'GSUtil' macros inside rootn.exe

- Startsort, stopsort
- Macros for simple display are available (d1, d2 md1)
- Zap all or individual spectra
- 'Printevents' (debug print interpreted data)
- Pjx, pjy
- Gate (gam x gam matrix with background subtract)
- E and T alignment tools
- Latest: 'Dareks Bar' (GUI)
- New DAQ and GSSort documented on WWW



Future

- **MAKE the NEW DAQ more stable. EB problem? New version of VxWorks? May need expert help!? Sender has a small problem.**
- **EPICS GUI for the new DAQ. (manpower!?)**
- **Expand GSSort with more utilities -- as we discover the need for them**
- **Create a version of GSSort for GRETINA ('GTSort'). Same look and feel, shared resources...**
- **GSSort is open-source and down-loadable from <http://www.phy.anl.gov/gs>**
- **Please contribute to GSSort/GSUtil!**

