Computing report – CMS PSI

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26/8/05 CSCS-Manno

CMS-PSI:

- 10 senior physicists (7-pixels, 3-ecal)
- 1 postdoc
- 4 graduate students (shared with ETHZ&UniZ)
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Past and present activities

Initially our activities were very "detector-design" oriented:
- simulation of pixel detector occupancies, data rates, expected position resolution, ...
- development of the pixel simulation software
- development of the pixel hit reconstruction software.

More recently (last 3-4 years) we have moved to **Hight Level Trigger** (HLT) studies, mostly pixel oriented:
- primary vertex reconstruction using pixel hits
- isolation triggers with pixel tracks (taus)
- track finding seeds from pixel tracks.

Present interest:

$H(susy) \rightarrow \tau\tau \rightarrow 2\ \tau$-jets (with Imperial, Pisa, ...)

$H(susy) \rightarrow \tau\tau \rightarrow \mu + \tau$-jet (with Warsaw)

Mostly concentrated around HLT studies, some "offline" work as well.

How have we been doing things?

Some MC production were “private”, on lxplus/lxbatch.

About 1M events per channel were produced for us “officially” during the so called DC04.
DSTs are being analyzed now, they are located at CERN, INFN, FNAL, ...

Todays analysis model:

- run the CMS reconstruction code (ORCA) in batch in the center where the DSTs are located,
- create ROOT trees,
- copy the trees and analyze them at home (PSI).

Some limited use of CRAB was made (no always successful).
An attempt is made now to use the ASAP/lcg2 tool.

No use of any CSCS facilities have been made until now.

Future

For CMS data analysis we plan to be involved in **2-3 channels**:

- H(susy) $\rightarrow \tau\tau \rightarrow$ 2 τ-jets (with Imperial, Pisa, ...)
- H(susy) $\rightarrow \tau\tau \rightarrow \mu + \tau$-jet (with Warsaw,...)
- .....

This translates into 4-5 active users ("power users") doing analysis.
We have defined a "power user" as:
for T2 activities – **CPU 15kSi2k, disk 3.5Tbyte** (CMS estimate)
for local analysis – **CPU 3-5kSi2k, disk 1-3Tbyte** (ETHZ/PSI estimate).

So total	CPU(kSi2k)	Disk(Tbytes)
T2	3 * 15	3 * 3.5
local	5 * 5	5 * 3

One channel :
Data rate - **1-3Hz**
Data in 1 year of low-luminosity (20fb-1) – **1-3 10^7 events**
MC events – **10-20M events** per channel.

Our preferred analysis model for T2 and T3

1) We do not care where the CPU is. It does not have to be at PSI.
   We prefer that it is not at PSI!

2) Most data and MC should be located where the CPU is.

3) CPU services without the CMS software installed and maintained are (almost) useless.

For T2 all this will be provided by CSCS.

Can we assume/hope that at least some of the T3 functionality is also provided by CSCS?
In this case we would just have at PSI a very modest facility for code development and “pixel” specific tasks.

If CSCS cannot be used for T3 activities we will probably aim at having a common T3 cluster together with ETHZ (UniZ?).

Manno will be part of the LHC Grid and provide services
to the LHC community.

Is there any chance that part of the CSCS resources will be available to Swiss LHC members for T3 activities?
One of our colleagues asked:
“Will CSCS provide something like a lxplus/lxbatch capability?”.

Will we have the option to store large files with intermediate results, e.g. MC simHit/digis (output from CMS/OSCAR) at CSCS?

Answers to Christians questions

1. Use CSCS as T2, use CSCS as T3 or build a common cluster ETHZ/PSI.
   So (c) and (b) from the list.
   (c) 80% CPU, 50% disk
   (b) 20% CPU, 50% disk.

2. 4-5 active users.

3. Use CMS estimates.

4. For T2 activities use
   5 * 0.8 * 15 kSI2k, 5 * 0.5 * 3.5 Tbytes

5. The number of “active” users will stay approximately constant in time at PSI.