



Computing Resources Requirements for 2009

Matthias Kasemann



CMS Assumptions* and Goals for 2009

- **2009 will be the startup year of data taking**
 - use model parameters as previously defined for '08 ('07) in our original computing model, i.e.
 - duty cycle, trigger rate, event size, number of re-reconstructions, fraction of analysis based on RECO/RAW
- **Assume low luminosity for the 1st part (50%), higher luminosity for the remaining part (affects CPU times for event processing)**
- **Increase MC fraction to 100% of RAW data collected as in the original computing model**

2008 resource usage and data remaining from 2008:

- **In 2008 we did not use all the storage resources**
- **2008 data will not be included in '09 analysis for higher statistics**
- **In 2008 we used most of the CPU resources during peak activity in May**

***for details see backup slide**



Summary for 2009 resource requirements

- We have used the original CMS computing model to review the computing resources needs for 2009, taking into account that it will be the startup year of LHC data taking.
- **CMS needs the planned resources upgrades at CERN and the Tier-1 and Tier-2 centers for 2009.**

The detailed result is of this re-evaluation for 2009 is:

- **CPU**
 - needs are close to the pledged values at CERN and higher at the T1 and T2 centers due to the bigger event sample to process and analyze than originally planned for 2009 and the expected increase in luminosity during 2009.
- **DISK storage:**
 - at CERN and the Tier-1 and Tier-2 the pledged resources will be required by CMS.
- **Tape storage:**
 - RAW data needs are reduced at CERN.
 - Currently Big samples of 2008 commissioning and MC data are stored at CERN.
 - **In summary CMS will probably need the pledged tape space at CERN.**
 - **At the Tier-1 centers the pledged tape resources are required.**



Backup slides



Why justify 2009 requirements?

- **The WLCG project requests from each experiment an justification of the computing resources request for 2009 taking into account the LHC delay,**
 - And the resource consumption in 2008
- **The main reason for this is to justify the continued construction of the T0-T1-T2 infrastructure and to present this to the next WLCG-OB (27.10.08) and C-RRB (11.11.2008)**
 - This is not meant to be a computing model review
 - The primary intent is not to argue for much more resources (unless justified)



Detailed model parameters used for 2009

- 1) For 2008 the number of events handled and stored were adjusted in the spreadsheet to reflect the storage space actually used and take into account that not much of '08 data needs to be preserved and included into '09 analysis.
 - 65M RAW and 162M MC (5d), data occupy tape space though....
- 2) 2009: reduce LHC duty cycle to '08 planning value: 0.7 -> 0.5
- 3) 2009: increase trigger rate to '08 planning value: 200 -> 300 Hz
- 4) 2009: increase MC event fraction back to 100%
 - back to the original computing model
 - these shifts startup scenario from 2008 to 2009
 - results in 1280M RAW and 1280M MC events (was 1260M RAW and 75% MC previously)
- 5) 2009: increase nReco to '08 planning value: 2 -> 3
- 6) 2009: use 50% '08- and 50% '09-CPU times
- 7) 2009: use RECO fraction for analysis from '08
 - parameters as planned for LHC startup year

	2009		
	orig req	new req	Pledge
T0 CPU	9,8	7,9	5,4
CAF CPU	3,9	3,6	5,0
CERN total	13,7	11,4	10,4
T0 Disk	0,2	0,3	0,4
CAF disk	2,3	2,0	2,3
CERN total	2,5	2,3	2,7
T0 tape	7,3	3,8	7,7
CAF tape	2,0	1,5	3,4
CERN total	9,3	5,3	11,1
T1 CPU	16,3	17,1	15,2
T1 disk	9,7	8,4	7,7
T1 tape	15,0	13,0	16,7
T2 CPU	28,1	26,6	25,3
T2 disk	5,7	6,2	7,1
Units are in MSI2k, PB			