



Computing Model and Resources for 2009 & 2010

**DRAFT
WLCG-MB
31.3.2009**

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Executive Summary:

- CERN requirements match pledges reasonable well, some surplus in CPU resources
- T1 pledges resources match requirements reasonably well
- T2 pledges resources match requirements reasonably well
- CMS needs the planned upgrades planned for 2010

History & next steps:

- Draft presented to CMS-MB on 30.3.09
- Draft presented to WLCG-MB on 31.3.09
- Get approval from CMS-CRB on Friday, April 3rd
- Finalize C-RRB docs in WLCG-MB with spokespeople on April 10th
- C-RRB on April 28th



Planning values...

- LHC running time: 6×10^6 sec
 - Oct'09 - Mar'10: 1.7×10^6 sec, duty cycle 0.2
 - Apr'10 - Sep'10: 4.3×10^6 sec, duty cycle 0.5
- Data taking rate: 300 Hz
- Re-reconstructions: 3 in '09, 3 in '10
- Event size: constant for '09 & '10
- CPU times: assume higher lumi in '10
 - RecoCPU increases from 100 to 200 HS06.s in '10
 - SimuCPU increases from 360 to 540 HS06.s in '10
- Assume 40% overlap in PD-sets
 - Our MC studies have uncertainties
- Added storage for COSMICS runs in 2009

For this planning exercise:

- **2009 run: ends March '10, 2010 run: starts April '10**
- Conversion factor to HEP-SPEC: 4 HEP-SPEC = 1kSi2k
(see Jan 27th WLCG-MB)



Some changes for the startup year

Affecting T0 CPU:

- added 1 re-reco for 2009/2010 each
- add capacity for instantaneous reconstruction of express stream
- reco to finish in $2 \times$ runtime (as if duty cycle is 0.5)
- first data taking: increase CAF based monitoring & commissioning activity to 25%/20% of total (nominal was 10%)

Affecting T0 2009 tape:

- show only increment on top of what we store now

Affecting T1 2009 CPU:

- finish each re-reco in 1 month, previously was: re-recos spread over full year

Affecting T2 2009 CPU:

- Require 1,5 more MC events than RAW, because of frequent software changes and bug fixes
- Produce MC events in 8 months: resources and CMSSW are available \geq August

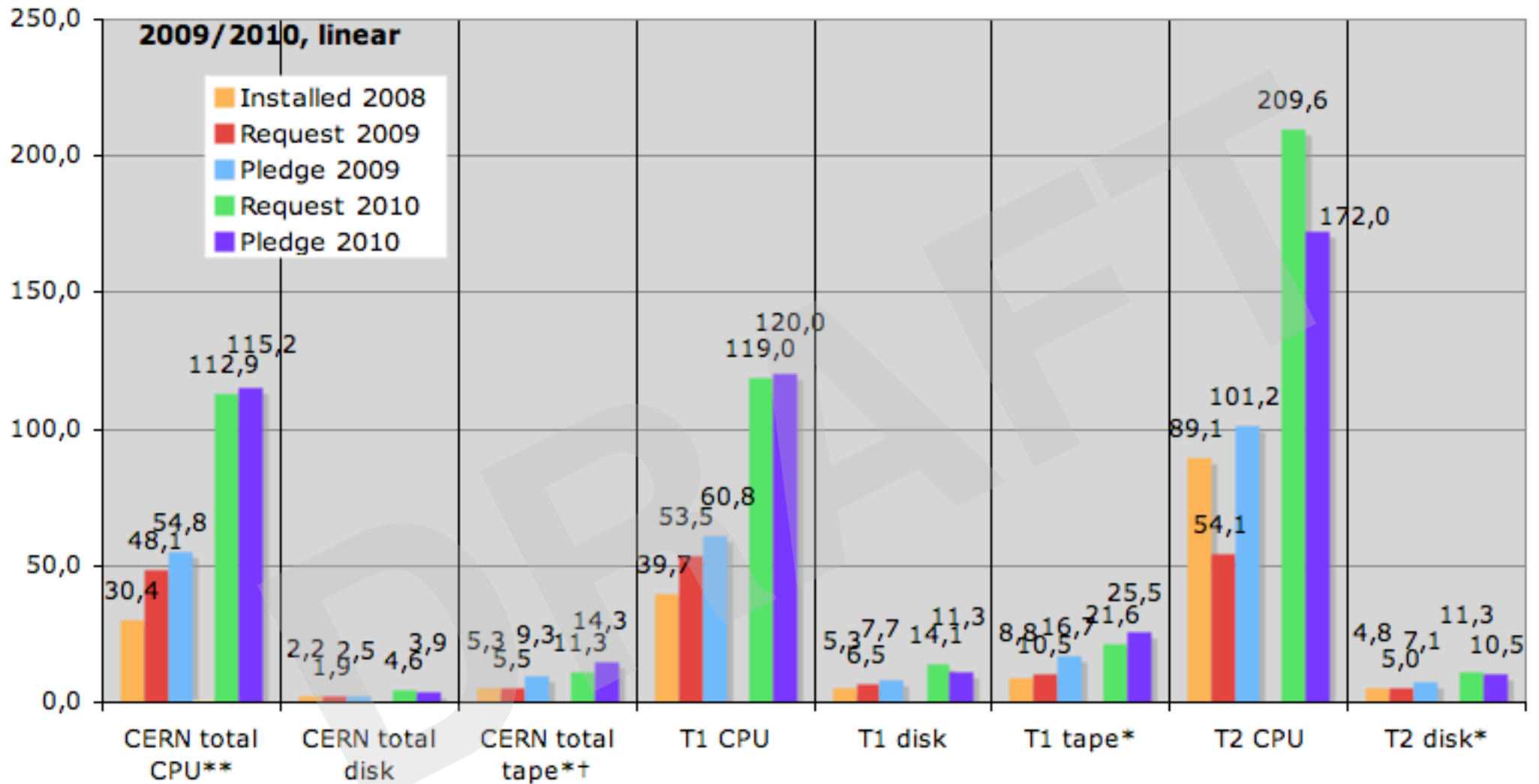


DRAFT CMS Resource Requirements (1)

	2008 Installed	2009 Request	Pledge	2010 Request	Potential Pledge
T0 CPU		33,1	39,2	66,2	76,4
CAF CPU		11,0	15,6	42,6	38,8
CERN total CPU**	30,4	48,1	54,8	112,9	115,2
T0 disk		0,4	0,2	1,1	0,5
CAF disk		1,5	2,3	3,5	3,4
CERN total disk	2,2	1,9	2,5	4,6	3,9
T0 tape		2,5	7,3	8,7	11,1
CAF tape		1,2	2,0	2,6	3,2
CERN total tape*†	5,3	5,5	9,3	11,3	14,3
T1 CPU	39,7	53,5	60,8	119,0	120,0
T1 disk	5,3	6,5	7,7	14,1	11,3
T1 tape*	8,8	10,5	16,7	21,6	25,5
T2 CPU	89,1	54,1	101,2	209,6	172,0
T2 disk*	4,8	5,0	7,1	11,3	10,5
* for 2009 added storage for CRAFT&CRUZET data: 1.8 PB(T0), 0.9PB(T1), 0.5PB(T2)					
† only storage increment shown, need to review what is actually stored					
** included in request: 4 kHepSpec06 used for CMS VO boxes					
Units: kHEPSPEC06, PB					

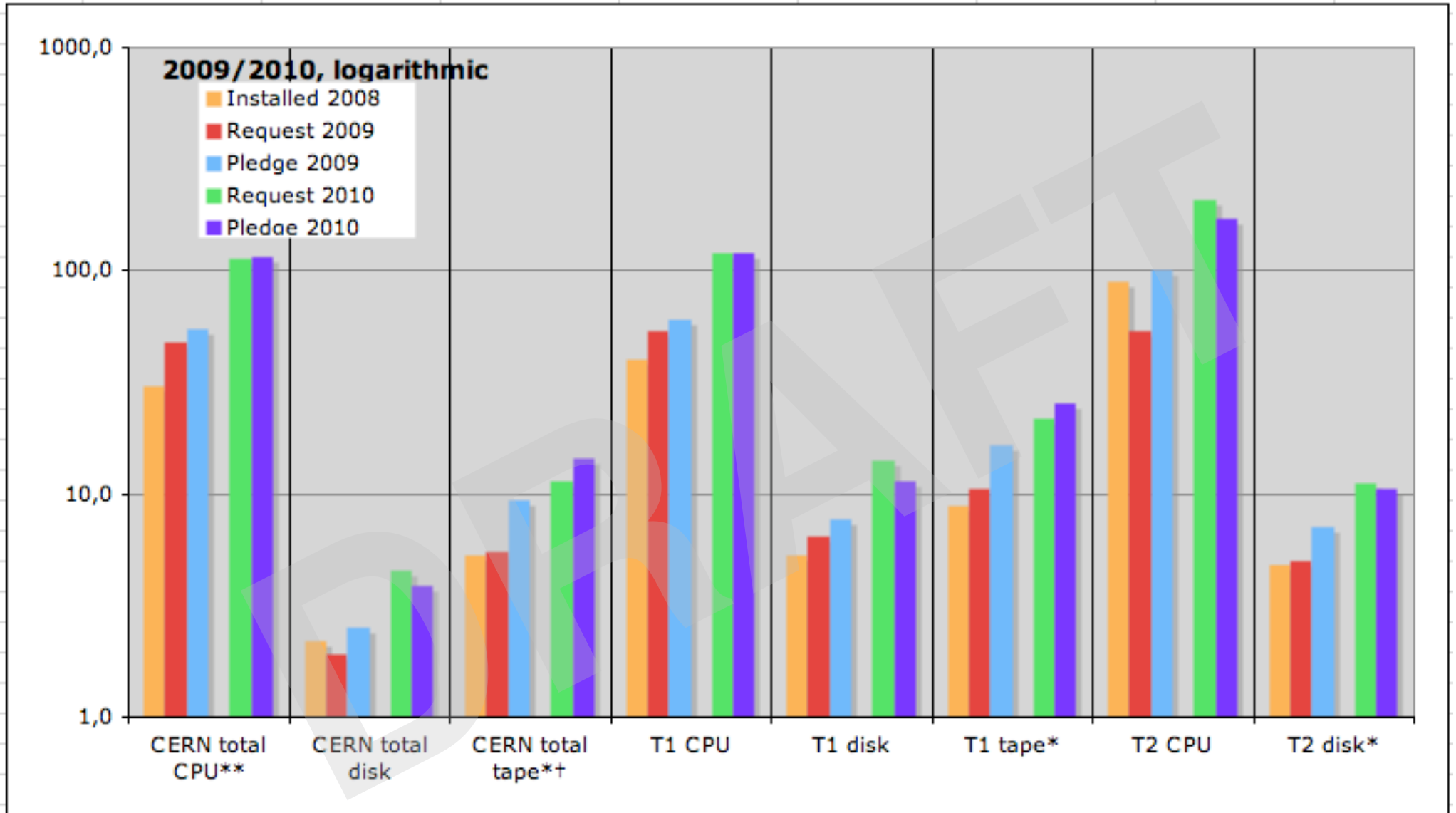


DRAFT CMS Resource Requirements (2)





DRAFT CMS Resource Requirements (3)





Comments on the requirements

CERN:

- Need 88/100% (in '09/'10) of CPU requested for “old” running scenario
- We need 75/115% of disk requested for “old” running scenario
- Tape: only the increment for '09/'10 shown, we need to review which of current data can be deleted

In summary: CERN resources match pledges reasonable well, some surplus in CPU resources, increased disk needs in 2010.

T1:

- CPU pledges are reasonably justified by our request (note: our '09 request goes up because we want re-reco to finish in 1 month)
- Disk pledges are reasonably justified by our request
- Tape pledges are reasonably justified by our request (we need to review which of current data can be deleted)

T2:

- 2009: Disk & CPU have to build up for 2010,
 - 2010 MC will be started in 2009,
- 2010 Disk & CPU request matches pledges reasonable well
- T2 resource pledge still incomplete



Important Comments

- **Pledges are official for 2009 as agreed in the C-RRB**
- **2010 pledges will be agreed in the next C-RRB**
 - **For now: educated guesses, based on**
 - Direct information from some sites
 - Scaling to CMS part from total upgrade plans
- **Pledges not corrected for Italian (non-) upgrade plans**
 - Not confirmed increase for '09:
3.2 MHEPSPEC06, 640TB disk, 750 TB tape



ToDo

- **Estimate resource requirements by quarter**
 - **Will assume a resource usage profile:**
 - Linear: storage related resources
 - More front loaded than linear:
where we need enough resources to look immediately to
the first data



Appendix



CMS VO Boxes (26.3.09)

• Build machines:	26	
• CRAB:	3	
• DBS & Frontier:	16	
• DQM:	1	
• iCMS:	4	
• Integration testbed	2	
• Job robot machine	1	
• PhEDEx:	2	
• Production Agents:	13	
• SAWM:	1	
• TagCollector, Repository:	2	
• WebTools:	9	
• Pool:	1	
• Total:	81	= 925 kSi2K, 3700 kHepSpec06