



# Resources at Tier-1 and Tier-2 Centres

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# Tier 1 Centres

<i>Centre</i>	<i>Experiments served with priority</i>			
	<i>ALICE</i>	<i>ATLAS</i>	<i>CMS</i>	<i>LHCb</i>
TRIUMF, Canada		X		
GridKA, Germany	X	X	X	X
CC_IN2P3, France	X	X	X	X
CNAF, Italy	X	X	X	X
NIKHEF/ SARA, NL	X	X		X
Nordic Data Grid Facility	X	X	X	
ASCC, Taipei		X	X	
RAL, UK	X	X	X	X
BNL, US		X		
FNAL, US			X	
PIC, Spain		X	X	X



# Tier 1 Requirements

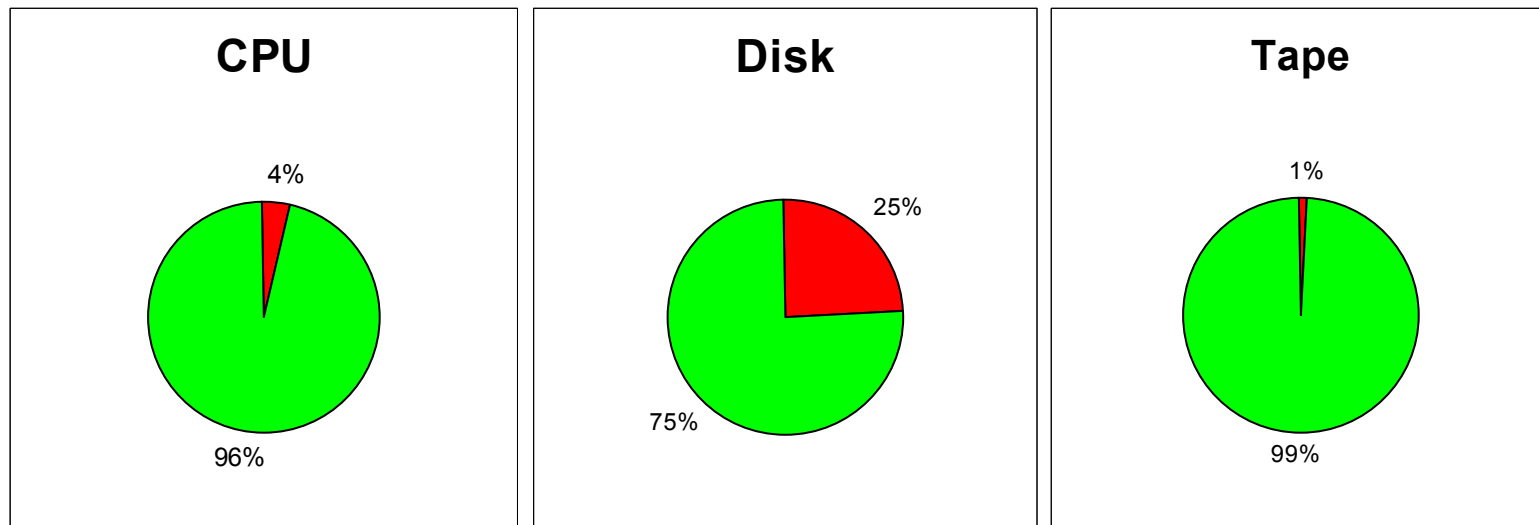
- The table below shows the requirements of the experiments in all T1 centres, excluding CERN, extracted from the Computing Models presented for the LHCC review in January.
- The requirements are for the first year of full capacity running, 2008 for ATLAS, CMS, LHCb; 2009 for ALICE.

Requirements for Reference Year	ATLAS 2008	CMS 2008	LHCb 2008	ALICE 2009
CPU (kSI2K)	27000	15000	4400	14000
Disk (Tbytes)	15500	7800	2400	6500
Tape (Tbytes)	10000	12900	2100	6400
Number of T1s	10	7	6	6



# External Tier 1 Capacity Plans 2008

- Preliminary plans for CPU, disk and tape capacity have been collected from all external Tier 1 centres.
  - The match of planned capacity with the total T1 requirements of the experiments for 2008 is encouraging for CPU and tape.
  - Disk requirements have risen dramatically (500-800%) between the 2000 and 2005 Computing Reviews. The planning of the centres has clearly not yet quite caught up.

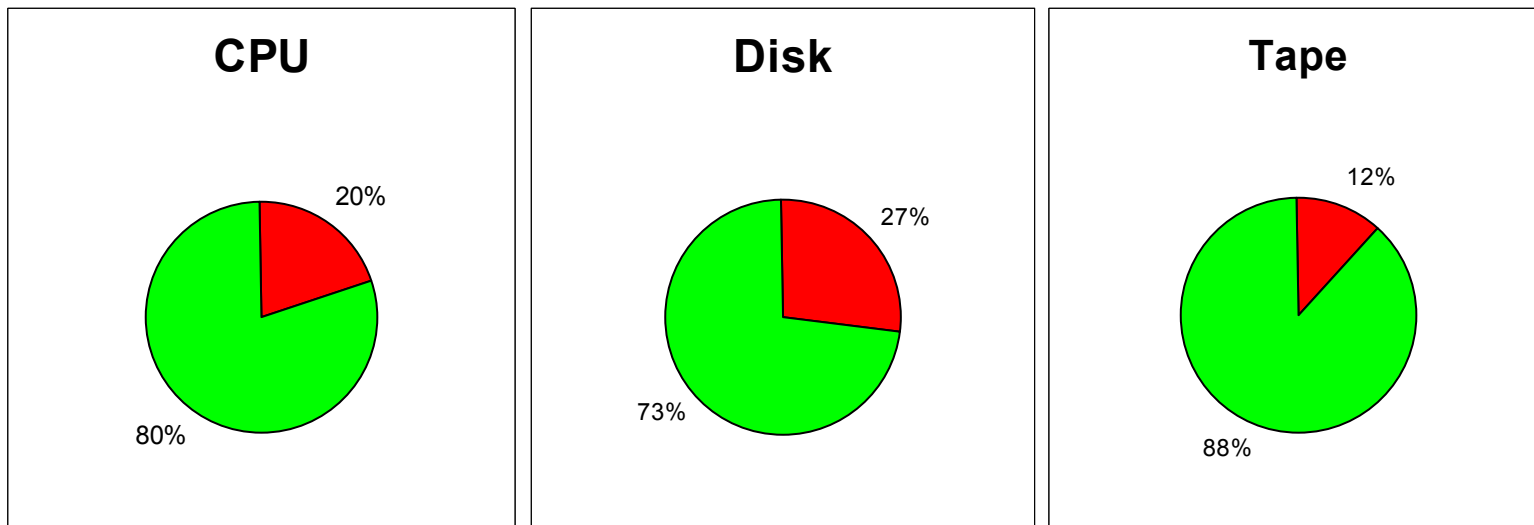


 Planned capacity       Unsatisfied requirement



# External Tier 1 Capacity Plans 2009

- The corresponding 2009 figures look worse but:
  - Some Tier 1s have not yet published 2009 figures - for these the 2008 figures are used unchanged.
  - The capacity plan figures thus represent the presently known lower limit.



 Planned capacity       Unsatisfied requirement



## Tier 1 Capacity per Experiment

- Not all experiments are equally well covered.
- Work is still required to balance out too high and too low offers in certain areas.

Capacity in Reference Year		ATLAS 2008	CMS 2008	LHCb 2008	ALICE 2009
CPU (kSI2K)	Planned	22267	13040	5907	11678
	Required	27000	15000	4400	14000
	Balance	-18%	-13%	34%	-17%
Disk (Tbytes)	Planned	10901	5819	2165	5310
	Required	15500	7800	2400	6500
	Balance	-30%	-25%	-10%	-18%
Tape (Tbytes)	Planned	11001	9179	2261	7202
	Required	10000	12900	2100	6400
	Balance	10%	-29%	8%	13%



## Tier 2 Centres

- Information on the Tier 2 centres is much less advanced compared to the Tier 1 centres.
- We have a list of proposed centres, but many of them are not yet confirmed.
- We got some numbers on planned capacities, but most of these are probably not up to date.
  - With the exception of CSCS, Switzerland, and the UK T2s
- The next slide shows part of the list of Tier 2s.
  - I will add the full list to the minutes (together with the latest capacity planning figures for T1 and T2)
- Please provide me with updates ASAP!!
  - The signatures to the MoU require the capacity tables to be available.
  - Signing the MoU is planned for autumn of this year!



# Tier 2 Centres

<i>Institution</i>	<i>Experiments served with</i>				<i>Representative to LHC Computing Grid Collaboration</i>	<i>Funding Agencies</i>
	<i>ALICE</i>	<i>ATLAS</i>	<i>CMS</i>	<i>LHCb</i>		
CSCS, Switzerland		X	X	X	M-C. Sawley (alt.: C. Grab)	CHIPP
FZU AS, Prague, Czech Rep.	X	X			M. Lokajicek	
Hungarian Tier-2 Federation, Hungary - KFKI, Budapest - SZTAKI, Budapest - Eotvos Univ., Budapest - Debrecen Univ.	X		X		G. Vesztergombi, KFKI	NKTH
Polish Tier-2 Federation, Poland - Krakow, Poland - Warszawa, Poland	X X	X		X X	Ryszard Gokieli	Ministry of Scient. Research and Information Tech.
Russian Tier-2 cluster , Russian Fed	X	X	X	X		Ministry of Science
HEP-IL Federation, Israel - Technion, Haifa - Weizmann, Rehovot - Tel Aviv Univ.		X			L. Levinson, Weizmann	
Pakistan Tier-2 - PAEC - NCP - NUST - COMSATS			X			PAEC
<i>Brazilian Tier-2 Federation</i> - UFRJ - UERJ - CBPF		X	X	X		CNPq





# Tier 2 Centres

<i>RWTH, Aachen, Germany</i>			X			
GSI, Darmstadt, Germany	X				Peter Malzacher	BMBF
<i>Freiburg Univ., Germany</i>		X				
DESY, Hamburg, Germany		X	X		Volker Gültzow	BMBF
<i>Mainz Univ., Germany</i>		X				
<i>MPI/LMU, Munich, Germany</i>		X				
<i>Univ. Wuppertal, Germany</i>		X				
UIBK, Innsbruck, Austria		X				BBWK
ATLAS Federation, Spain - IFIC, Valencia - IFAE, Barcelona - UAM, Madrid		X				MEC
LHCb Federation, Spain - UB, Barcelona - USC, Santiago				X		MEC
CMS Federation, Spain - CIEMAT, Madrid - IFCA, Santander			X			MEC