



Proposal for a Dynamic Megatable

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The requirements



■ The goal

- Provide the management with information about **installed capacity** (per VO).
- Provide the management with information about **resource usage** (per VO).
 - This info can also be used by VO operations people in order to "monitor" their usage of the resources

■ Main focus

- Storage resources
- Computing resources

■ Dynamic view

- Information should be retrieved as dynamically as possible in order to be reliable
- The information will be made available through the WLCG accounting system



The documentation



- The technical specifications are available in the CCRC twiki in the SSWG section:
https://twiki.cern.ch/twiki/bin/view/LCG/WLCGCommonComputingReadinessChallenges#Storage_Solution_Working_Group_S
- Storage only:
 - The documentation available reports on the conclusions reached during focused meetings with developers and information providers
 - Specific solutions found to cover dCache internal specialized buffers and avoid double counting
- The document has been agreed by *storage developers, storage information providers, data management developers, ...*



The Storage Resources

- Current accounting harvests data from BDII
 - ... but many errors in data.
 - combination of Glue1.2 and 1.3
- Need to improve information providers and configuration.
- Existing Reports
 - Current status (last hour)
 - Monthly Report (like manual Tier1 reports).



WLCG Accounting Summary - 2008

			Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Total TB-months	
Disk Space - TBytes	ALICE	Allocated	1340	861	4500	17178	12884	1105	0	0	0	0	0	0	37868	
		Used	1043	573	1500	8589	6442	149	0	0	0	0	0	0	18296	
	ATLAS	Allocated	1644	1133	5188	25768	25768	8124	0	0	0	0	0	0	67625	
		Used	945	845	2119	12884	12884	3542	0	0	0	0	0	0	33219	
	CMS	Allocated	1055	756	2764	21474	21474	5945	0	0	0	0	0	0	53468	
		Used	649	608	1246	10737	10737	2371	0	0	0	0	0	0	26348	
	LHCb	Allocated	608	397	3519	17178	17178	3061	0	0	0	0	0	0	41941	
		Used	311	116	1509	8589	8589	649	0	0	0	0	0	0	19763	
	TOTAL	Allocated	4647	3147	15971	81598	77304	18235	0	0	0	0	0	0	0	200902
		Used	5896	4284	12748	81598	77304	13422	0	0	0	0	0	0	0	195252

Disk Used and Allocated per VO (Units are TB) for Tier1 in the last Hour

Entity	Reports	Architecture	VO								Total (TB)		Percentage	
			alice		atlas		cms		lhcb		Used	Alloc	Used	Alloc
CA TRIUMF		disk	0	0	230.961	500	0	0	0	0	230.961	500	38.32%	25.53%
CH CERN		multidisk	0	0.352	1.191	2.228	0	0.352	1.191	3.284	0.01%	0%		
DE-KIT		unknownArch	1.431	4.292	501.907	1505.722	1000	3000	2500	7500	4003.338	12010.014	18.0%	18.26%
ES-PIC		disk	160.784	461.147	13.793	26.851	0.784	2.543	160.404	464.747	335.764	955.08755.71%	48.76%	
FR-CCIN2P3		multidisk	0	0	30.074	48.202	51.177	84.293	0	0	81.251	133.485	0.56%	0.19%
IT-INFN		tape	0.00	0.00	1000	1000	1000	1000	1000	1000	3000	300075.30%	13.76%	
NL-CNAF		disk	11.685	51.78	0.328	10.004	23.934	434.816	0.036	6.655	35.984	503.635	5.97%	25.71%
US-T1-BNL		multidisk	0.076	0.102	12833.964	26500.100	1108.403	43099.876	0.076	1000.102	13940.510	70600.18995.37%	98.79%	
US-T1-BNL		tape	500	1500	50	150	0.00	0.00	0.00	0.00	550	1650	13.82%	7.57%
US-T1-BNL		unknownArch	50	150	50	150	50	150	100	300	250	750	1.18%	1.14%
US-T1-BNL		multidisk	0.002	0.072	0.002	0.072	0	0	0	0.004	0.144	0%	0%	
US-T1-BNL		multidisk	0	0	0	0	0.001	0.001	0	0.248	0.001	0.248	0%	0%
US-T1-BNL		tape	0	2.04	132.184	8281.704	0.00	0.00	44.752	8257.510	176.917	16521.28	4.45%	75.77%
US-T1-BNL		unknownArch	2.158	3.204	10900.257	62778.629	1.004	2.071	1.604	2.071	10905.624	52785.07570.81%	80.26%	
US-T1-BNL		multidisk	0	152.25	207.100	152.25	207.100	0.00	0.00	304.400	414.218	2.08%	0.58%	
US-T1-BNL		unknownArch	0	0	0	0	0	0	0	0	0	0	0%	0%
US-T1-BNL		multidisk	0	90.746	100.039	9.474	11.509	0	0	100.22	111.548	0.89%	0.10%	
US-T1-BNL		tape	1.292	13.604	18.81	103.601	217.604	434.597	14.78	82.571	252.286	634.373	6.34%	2.01%
US-T1-BNL		disk	0	0	0	0	0	0	0	0	0	0	0%	0%
US-T1-BNL		multidisk	0	0	0	0	0	0	0	0	0	0	0%	0%
US-T1-BNL		unknownArch	0	0	100	200	0	0	0	100	200	1.3%	0.20%	
US-T1-BNL		multidisk	0.00	0.00	0.00	0.00	23	220	0.00	0.00	23	220	0.11%	0.33%

Table Summaries

disk	172.469	512.907	245.082	637.255	24.718	437.158	160.44	471.402	802.709	1958.722	1.46%	1.22%
multidisk	0.078	0.520	13286.226	27058.750	1516.304	43403.13	0.076	1000.703	14617.864	71463.118	36.2%	44.36%
tape	501.282	1515.644	1200.776	9515.305	1217.004	1434.507	1056	5329340.087	3979.203	21805.633	9.95%	13.54%
unknownArch	53.589	157.400	17452.195	54434.351	1074.004	3372.071	12001.604	7802.071	11181.862	65765.988	2.46%	40.85%
TOTAL	727.427	2196.572	32196.248	91545.669	3636.23	48646.957	3821.652	18614.262	40381.557	100993.461		
disk	28.62%	26.10%	40.86%	27.43%	4.1%	22.32%	26.62%	24.07%				
multidisk	0%	0%	90.97%	27.08%	0.02%	60.74%	0%	1.4%				
tape	12.6%	6.95%	30.18%	43.64%	30.6%	6.58%	26.63%	42.83%				
unknownArch	0.25%	0.24%	82.39%	82.77%	5.07%	5.13%	12.28%	11.86%				
TOTAL	1.8%	1.36%	79.73%	56.86%	9%	30.22%	9.46%	11.56%				

			Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Total TB-months
Tape Space - TBytes	ALICE	Used	0	0	0	2147	2147	500	0	0	0	0	0	0	4794
	ATLAS	Used	500	500	500	2147	2147	500	0	0	0	0	0	0	6294
	CMS	Used	500	500	50	2147	2147	500	0	0	0	0	0	0	5844
	LHCb	Used	500	500	500	2147	2147	500	0	0	0	0	0	0	6294
	TOTAL	Used	1500	1500	1050	8588	8588	2000	0	0	0	0	0	0	23226

The Storage Resources

■ **GlueSA class**

- Online resources only. GlueSAs do not overlap.
- *Shared spaces as one GlueSA with multiple GlueSAAccessControlBaseRule*
- GlueSAReservedOnlineSize
 - Space physically allocated to a VO (or a set of VOs) – Installed capacity
- *GlueSATotalOnlineSize (in GB = 10^9 bytes)*
 - Total Online Space available at a given moment (it does not account for broken disk servers, draining pools, etc.)
- GlueSAUsedOnlineSize (in GB = 10^9 bytes)
 - Size occupied by files that are not candidates for garbage collection – Resources usage
- *GlueSAFreeOnlineSize (in GB = 10^9 bytes)*
 - Free = Total - Used
- *GlueSACapability*
 - Key/value pair to publish agreed characteristics of Storage Area, i.e. access=read, network=WAN-LAN, etc.



The Computing Resources



- Expressed in terms of KSI2000 per federation in current Megatable
- APEL provides already the information about resources usage
- **Ongoing work** to make information published about installed capacity more reliable (see presentation of Steve Traylen at GDB)
- *GridMap already provides the information per region. Ongoing work (in collaboration) to provide a view per federation and an interface to retrieve data.*
- **Proposal:** *Publish static pledges and the dynamic view in the current Megatable format (by federation) – provide APEL plug-in*
 - *It allows for easily spotting discrepancies*
 - *Profit of the presence of a technical student who will be at CERN till the end of August.*



The schedule

Storage

Dynamic information providers for CASTOR

already available by J. Jensen

- They will be installed at CERN
- Few minor corrections needed

Dynamic information providers for dCache available by R. Trompert

- Need to verify with dCache developers that pinned files usage info is available, and other details
- 2-3 weeks to implement the proposal
- The changes will be reflected also in the new official dCache information providers by P. Millar

Dynamic information providers for DPM available

- A few weeks to implement the proposal

Information already available for StoRM

- Probable minor additions for VOInfoPath

Computing resources

Provide a working prototype by the end of July 2008 ?





Thank You



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