Storage Accounting

John Gordon

GDB, June 2008

Status

- A Storage Accounting schema has been defined
- A single storage accounting sensor at Edinburgh queries the BDII once per day to gather information on current storage usage from all UK sites
- This sensor populates an R-GMA archiver with the gathered information
  - StorageRecords table
- The information is aggregated per VO/Site/Month as in APEL
  - Value stored is average over the number of measurements
  - Sum(measurements)/N(measurements)
- APEL-like visualisation interface has been developed
  - Grids, countries, regions
  - Only tables for country and region implemented so far
  - http://goc02.grid-support.ac.uk/accountingDisplay/

Recent Progress

- Page now displays about sites or other points in the EGEE Tree

- Lists types of storage, allocated and used for LHC VOs.

Home   **Documentation**   **Views**   **News**   **FAQ**   **About**

Resource Tree
📁 EGEE
📁 OSG
📂 Tier1
  ⊞ 📁 CA-TRIUMF
  ⊞ 📁 CH-CERN
  ⊞ 📁 DE-KIT
  ⊞ 📁 ES-PIC
  ⊞ 📁 FR-CCIN2P3
  ⊞ 📁 IT-INFN-CNAF
  ⊞ 📁 NDGF
  ⊞ 📁 NL-T1
  ⊞ 📁 TW-ASGC
  ⊞ 📁 UK-T1-RAL
  ⊞ 📁 US-FNAL-CMS
  ⊞ 📁 US-T1-BNL
📁 Tier2
📁 Unassigned

Storage Accounting Display [v2.1]

Select Interval:

[last day ▾]

VO Groups   ⦿ LHC   ○ non-LHC   ○ ALL   ○ Custom

VOs:
☐ atlas   ☐ biomed   ☐ cms   ☐ des   ☐ dteam
☐ gear   ☐ Ifae   ☐ lhcb   ☐ magic   ☐ ops
☐ pps   ☐ swetest

SEArchitecture:
☑ All
☐ castor(permanent)   ☐ disk(permanent)   ☐ disk(unknown)
☐ disk(volatile)   ☐ multi-disk(permanent)   ☐ multidisk(permanent)
☐ multidisk(unknown)   ☐ multidisk(volatile)   ☐ srm(permanent)
☐ srm_v1(permanent)   ☐ tape(permanent)   ☐ tape(unknown)
☐ unknownArch(permanent)   ☐ unknownArch(unknown)   ☐ unknownArch(volatile)

[Refresh]

Disk Usage Reported in the last Hour (TB)

- GridPP Wiki Storage Accounting
- The term Allocated is defined as GlueSAStateSpaceUsed + GlueSAStateSpaceAvailable
- The table reports what is actually published into the information system from sites.
- Storage areas that are shared by VOs are not treated in any special way.

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- The term Allocated is defined as GlueSAStateSpaceUsed + GlueSAStateSpaceAvailable
- The table reports what is actually published into the information system from sites.
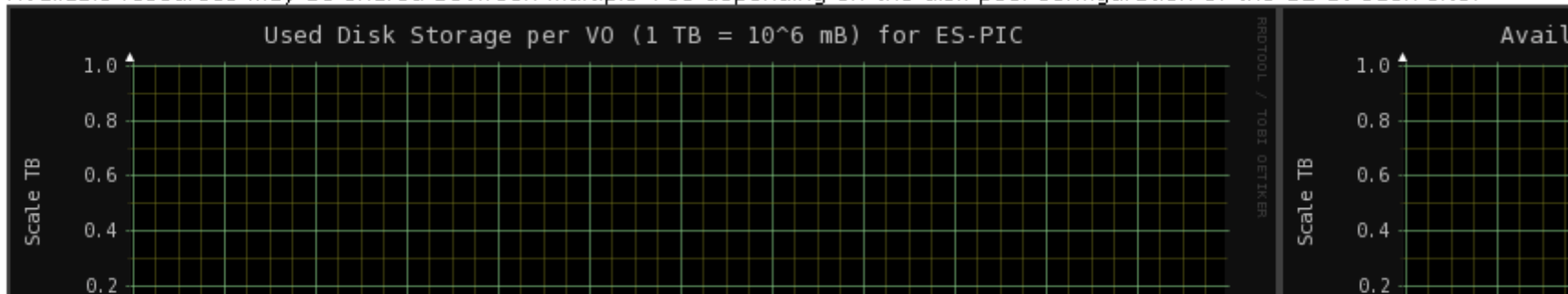- Storage areas that are shared by VOs are not treated in any special way.
- **Savannah Bug 25139** There is a problem in adding together the allocated storage for each VO at a partciluar site as it often leads to double (triple…) co
  of resources.
- **Navigation:** Click on a heading in the results table, to see the information underneath it.

Entity	Reports	Architecture	VO						Total (TB)		Percentage	
			atlas		cms		lhcb					
	▾		Used	Alloc	Used	Alloc	Used	Alloc	Used	Alloc	Used	Alloc
🗄 pic	▾	multidisk	86.332	111.787	86.245	130.189	35.465	35.533	208.041	277.51	100%	100%
		tape	1000	1000	1000	1000	1000	1000	3000	3000	100%	100%
Table Summaries												
		multidisk	86.332	111.787	86.245	130.189	35.465	35.533	208.041	277.51	6.48%	8.47%
VO Totals (TB)		tape	1000	1000	1000	1000	1000	1000	3000	3000	93.52%	91.53%
		TOTAL	1086.332	1111.787	1086.245	1130.189	1035.465	1035.533	3208.041	3277.51		
		multidisk	41.5%	40.28%	41.46%	46.91%	17.05%	12.8%				
Percentage		tape	33.33%	33.33%	33.33%	33.33%	33.33%	33.33%				
		TOTAL	33.86%	33.92%	33.86%	34.48%	32.28%	31.6%				

<div align="center">Disk Used and **Allocated** per VO (Units are TB) for ES-PIC in the last Hour</div>

Available resources may be shared between multiple VOs depending on the disk pool configuration of the SE at each site.

Used Disk Storage per VO (1 TB = 10^6 mB) for ES-PIC   Avail

http://goc02.grid-support.ac.uk/storageAccounting-v2.2/index.php?loc=3&qrytype=2&entityID=374&entityName='Tier1'

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

Entity	Reports	Architecture	alice Used	alice Alloc	atlas Used	atlas Alloc	cms Used	cms Alloc	lhcb Used	lhcb Alloc	Total (TB) Used	Total (TB) Alloc	Percentage Used	Percentage Alloc
CA-TRIUMF		disk	0	0	0	0	0	0	0	0	0	0	0%	0%
CH-CERN		multidisk	0	0.436	1.191	2.311	0	0.436	0	0.436	1.191	3.62	0.08%	0.2%
		unknownArch	1.431	4.292	2.384	7.153	0.954	2.861	2.384	7.153	7.153	21.458	8.12%	7.09%
DE-KIT		disk	0.771	31.265	142.885	148.062	7.764	16.501	45.039	55.749	196.459	251.578	56.43%	52.84%
ES-PIC		multidisk	0.00	0.00	86.332	111.787	86.245	130.189	35.465	35.533	208.041	277.51	14.5%	15.3%
		tape	0	0	1000	1000	1000	1000	1000	1000	3000	3000	95.02%	85.87%
FR-CCIN2P3		disk	3.836	5.661	39.91	50.144	36.336	78.589	71.593	90.164	151.675	224.559	43.57%	47.16%
IT-INFN-CNAF	Tier1	multidisk	500	500	501.267	516.322	50.132	191.163	1.44	5.222	1052.839	1212.707	73.38%	66.88%
		tape	0.00	0.00	50	150	0.00	0.00	0.00	0.00	50	150	1.58%	4.29%
		unknownArch	0.048	0.143	0.048	0.143	0.048	0.143	0.095	0.286	0.238	0.715	0.27%	0.24%
NDGF		multidisk	0.012	0.022	0	0	0	0	0	0	0.012	0.022	0%	0%
NL-T1		multidisk	0	0	0	0	0.001	0.001	0	1.85	0.001	1.851	0%	0.1%
		tape	0	0.419	1.57	1.573	0	0	1.048	1.049	2.617	3.041	0.08%	0.09%
		unknownArch	2.111	3.204	52.419	52.967	1.595	2.071	1.595	2.071	57.721	60.313	65.51%	19.94%
TW-ASGC		multidisk	0	0	0.013	60.059	0.013	60.059	0.00	0.00	0.026	120.118	0%	6.62%
		unknownArch	0	0	0	0	0	0	0	0	0	0	0%	0%
UK-T1-RAL		multidisk	0	0	90.746	100.039	9.474	11.509	72.373	85.823	172.594	197.372	12.03%	10.89%
		tape	1.292	13.604	9.827	79.759	50.767	182.808	42.889	64.58	104.774	340.752	3.32%	9.75%
US-FNAL-CMS		disk	0	0	0	0	0	0	0	0	0	0	0%	0%
US-T1-BNL		disk	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0	0	0%	0%
		multidisk	0	0	0	0	0	0	0	0	0	0	0%	0%
		unknownArch	0.00	0.00	0.00	0.00	23	220	0.00	0.00	23	220	26.1%	72.73%

Table Summaries

			alice Used	alice Alloc	atlas Used	atlas Alloc	cms Used	cms Alloc	lhcb Used	lhcb Alloc	Total Used	Total Alloc	% Used	% Alloc
		disk	4.608	36.927	182.795	198.206	44.1	95.09	116.632	145.914	348.135	476.137	6.92%	7.82%
		multidisk	500.012	500.458	679.549	790.519	145.865	393.357	109.278	128.864	1434.704	1813.198	28.53%	29.79%
VO Totals (TB)		tape	1.292	14.024	1061.396	1231.332	1050.767	1182.808	1043.937	1065.629	3157.392	3493.793	62.79%	57.41%

CONDOR

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OSG

a_Storage

S

_Tier3

OSG-Prod-SE

srm_v1

S

-WC1-CE2
-WC1-SE

e

-WC1-CE

ier2

Disk Used and **Allocated** per VO (Units are TB) for OSG in the last Hour									
Entity	Reports	Architecture	atlas		cms		Total (TB)		Percentage	
			Used	Alloc	Used	Alloc	Used	Alloc	Used	Alloc
BNL_ATLAS_1		multidisk	0	0	0	0	0	0	0%	0%
		unknownArch	0.00	0.00	23	220	23	220	100%	100%
CIT_CMS_T2		unknownArch	0	0	0	0	0	0	0%	0%
FNAL_FERMIGRID		disk	1.305	3.909	1.305	3.909	2.611	7.817	10%	8.59%
		unknownArch	0	0	0	0	0	0	0%	0%
GLOW-CMS		disk	0	0	0	0	0	0	0%	0%
		unknownArch	0	0	0	0	0	0	0%	0%
HEPGRID_UERJ		disk	0	0	0	0	0	0	0%	0%
		unknownArch	0	0	0	0	0	0	0%	0%
MIT_CMS		unknownArch	0	0	0	0	0	0	0%	0%
Nebraska		disk	0	0	0	0	0	0	0%	0%
Purdue-Lear		disk	0.00	0.00	0	0	0	0	0%	0%
		unknownArch	0	0	0	0	0	0	0%	0%
Purdue-RCAC		unknownArch	0	0	0	0	0	0	0%	0%
SPRACE		disk	1.075	1.74	1.075	1.74	2.149	3.48	8.23%	3.82%
		unknownArch	0	0	0	0	0	0	0%	0%
TTU-ANTAEUS		disk	7.031	20.484	7.031	20.484	14.063	40.969	53.86%	45.03%
UCLA_Saxon_Tier3		disk	0.001	0.048	0.001	0.048	0.002	0.096	0.01%	0.11%
UCR-HEP		disk	0.022	6.56	0.022	6.56	0.044	13.12	0.17%	14.42%
UCSDT2		disk	0.739	2.106	0.739	2.106	1.479	4.211	5.66%	4.63%
		unknownArch	0	0	0	0	0	0	0%	0%
UCSDT2-B		disk	0.37	1.053	0.37	1.053	0.739	2.106	2.83%	2.31%
		unknownArch	0	0	0	0	0	0	0%	0%
UFlorida-HPC		disk	0.083	0.225	0.083	0.225	0.165	0.45	0.63%	0.49%
		unknownArch	0	0	0	0	0	0	0%	0%
Uflorida-IHEPA		unknownArch	0	0	0	0	0	0	0%	0%
Uflorida-PG		unknownArch	0	0	0	0	0	0	0%	0%
USCMS-FNAL-WC1-CE		disk	0	0	0	0	0	0	0%	0%
USCMS-FNAL-WC1-CE2		disk	0	0	0	0	0	0	0%	0%
Vanderbilt		disk	2.429	9.371	2.429	9.371	4.859	18.741	18.61%	20.6%

Table Summaries

Storage Accounting for 2008 (max storage per month)

			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 - bytes	ALICE	Allocated	1340	861	4500	17178	12884	1096	0	0	0	0	0	0	37859
		Used	1043	573	1500	8589	6442	148	0	0	0	0	0	0	18295
	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	5939	0	0	0	0	0	0	53462
		Used	649	608	1246	10737	10737	2371	0	0	0	0	0	0	26348
	LHCb	Allocated	608	397	3519	17178	17178	3054	0	0	0	0	0	0	41934
		Used	311	116	1509	8589	8589	648	0	0	0	0	0	0	19762
	TOTAL	**Allocated**	4647	3147	15971	81598	77304	18213	0	0	0	0	0	0	200880
		Used	5896	4284	12748	81598	77304	13418	0	0	0	0	0	0	195248

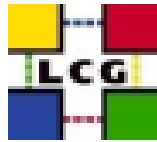|			Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Total TB-months
Tape space - bytes	ALICE	Used	0	0	0	2147	2147	160	0	0	0	0	0	0	4454
	ATLAS	Used	500	500	500	2147	2147	500	0	0	0	0	0	0	6294
	CMS	Used	500	500	50	2147	2147	500	0	0	0	0	0	0	5844
	LHCb	Used	500	500	500	2147	2147	500	0	0	0	0	0	0	6294
	TOTAL	**Used**	1500	1500	1050	8588	8588	1660	0	0	0	0	0	0	22886

But the data is not good.

WLCG Accounting Summary

April 2008
Centre   PIC

Please report accounting data in the shaded cells and return the report to lcg.office@cern.ch

			Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08
Disk Space - TBytes	ALICE	allocated							
		used							
	ATLAS	allocated	113	221	224	224			
		used	105	136	140	143			
	CMS	allocated	126	187	176	176			
		used	66	96	82	62			
	LHCb	allocated	29	156	149	149			
		used	27	31	38	40			
	TOTAL	allocated	268	564	549	549	0	0	
		used	198	263	260	245	0	0	
		installed capacity**	268	694	597	597			
disk usage as % installed***			106%	54%	62%	59%	n/a	n/a	n/a
MoU pledge^		allocated	220	220	220	970	970	970	9
		used	154	154	154	679	679	679	6

		Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08
Tape Space Used - TBytes	ALICE							
	ATLAS	40	46	55	75			
	CMS	142	191	338	280			
	LHCb	24	23	26	25			
	TOTAL	206	260	419	380	0	0	
	installed capacity**	240	293	427	520			
tape usage as % installed***		86%	89%	98%	73%	n/a	n/a	n/a
MoU pledge^	used	240	240	240	950	950	950	9

Notes - disk and tape tables
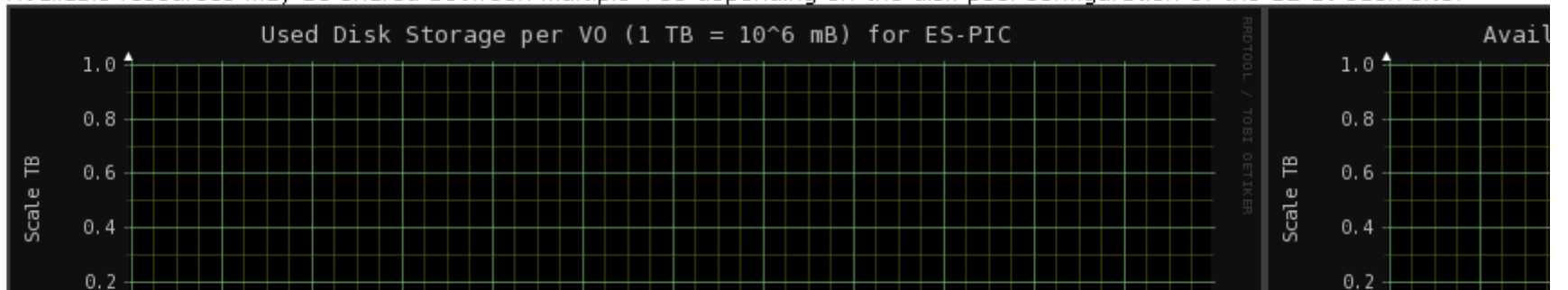Space used/allocated at end of the calendar month

Refresh

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- Navigation: Click on a heading in the results table, to see the information underneath it.

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

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Used Disk Storage per VO (1 TB = 10^6 mB) for ES-PIC

Scale TB   1.0   0.8   0.6   0.4   0.2

Avail

Scale TB   1.0   0.8   0.6   0.4   0.2

But the data is not good.

- Published values, don't agree with monthly accounts.
- Needs work to reconcile with Tier1s
- Information Providers need work
- Storage Tokens/Spaces need recording

- This work has started
- There will be a proposal soon to MB on reporting.