# Disk Storage Accounting

**LCG**

**Harry's Table**

| Period | Version 07.11.2007: 4Q2007 WLCG Service Coordination Planning for LCG Tier 1 Capacity: Planned pledges, Available and Required by Experiments for Scheduled and Service Challenge Activities | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **4Q2007** | **Tier 1 Capacity: Available vs. Required (Scheduled)** | | | | | | | | | **Scheduled Capacity Required by LHC Experiments and *Site Sep. Disk Allocations*** | | | | | | | | | | | | | | |
| WLCG | CPU KSi2K | | | Disk TB | | | Tape TB | | | ALICE | | | | ATLAS | | | | CMS | | | | LHCb | | | |
| Site | 2007/8 pledge | Installed | Required | 2007/8 pledge | Installed | Required | 2007/8 pledge | Installed | Required | CPU | Disk | *Alloc.* | Tape | CPU | Disk | *Alloc.* | Tape | CPU | Disk | *Alloc.* | Tape | CPU | Disk | *Alloc.* | Tape |
| ASGC | 1770 | 1770 | 942.4 | 900 | 432 | 340.4 | 800 | 800 | 453 | | | | | 198 | 136 | 67 | 93 | 744 | 204 | 218 | 360 | | | | |
| CC-IN2P3 | 1286 | 2568 | 1500.7 | 729 | 1394 | 753.6 | 745 | 1469 | 705 | 428 | 220 | 275 | 181 | 416 | 286 | 601 | 195 | 620 | 170 | 346 | 300 | 36.7 | 77.6 | 173 | 29 |
| FZK/GridKa | 1860 | 1864 | 2093.1 | 880 | 878 | 824.6 | 1010 | 1007 | 971.1 | 1003 | 323 | 200 | 441 | 320 | 220 | 280 | 150 | 744 | 204 | 330 | 360 | 26.1 | 77.6 | 68 | 20.1 |
| INFN/CI | | | | | | | | | | | | | | | | | | | | | | | | | |
| NDGF | | | | | | | | | | | | | | | | | | | | | | | | | |

| Disk Space - TBytes | | Jan-07 | Feb-07 | Mar-07 | Apr-07 | May-07 | Jun-07 | Jul-07 | Aug-07 | Sep-07 | Oct-07 | Nov-07 | Dec-07 | MoU pledge | total TB-months | % MoU |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | **aggregate 2007 to date*** (TB-months)** | | |
| ALICE | allocated | 13 | 14 | 20 | 20 | 20 | 18 | 18 | 18 | 20 | 20 | | | | 181 | |
| | used | 10 | 10 | 15 | 16 | 6 | 6 | 6 | 8 | 8 | 8 | | | | 93 | |
| ATLAS | allocated | 106 | 109 | 149 | 149 | 199 | 271 | 290 | 290 | 281 | 333 | | | | 2,177 | |
| | used | 48 | 86 | 108 | 127 | 157 | 241 | 205 | 233 | 205 | 281 | | | | 1,691 | |
| CMS | allocated | 75 | 82 | 76 | 100 | 103 | 109 | 100 | 100 | 307 | 290 | | | | 1,342 | |
| | used | 48 | 47 | 41 | 36 | 49 | 54 | 69 | 68 | 111 | 127 | | | | 650 | |
| LHCb | allocated | 44 | 41 | 87 | 87 | 84 | 81 | 93 | 93 | 92 | 92 | | | | 794 | |
| | used | 25 | 32 | 65 | 64 | 63 | 69 | 64 | 79 | 79 | 81 | | | | 621 | |
| TOTAL | allocated | 238 | 246 | 332 | 356 | 406 | 479 | 501 | 501 | 700 | 735 | 0 | 0 | 6,040 | 4,494 | 74% |
| | used | 131 | 175 | 229 | 243 | 275 | 370 | 344 | 388 | 403 | 497 | 0 | 0 | 4,228 | 3,055 | 72% |
| installed capacity** | | 280 | 280 | 340 | 356 | 500 | 520 | 730 | 730 | 1,394 | 1,394 | | | | | |
| disk usage as % installed*** | | 67% | 89% | 96% | 98% | 79% | 102% | 67% | 76% | 41% | 51% | n/a | n/a | | | |
| MoU pledge* | allocated | 520 | 520 | 520 | 520 | 520 | 520 | 730 | 730 | 730 | 730 | 730 | 73 | | | |
| | used | 364 | 364 | 364 | 364 | 364 | 364 | 511 | 511 | 511 | 511 | 511 | 51 | | | |

**Monthly Accounting**

- Required, installed, allocated, used – by site and experiment .... but nothing about storage classes, space tokens, ....

| | TOTALS | | T0=>T1 | T2=>T1 | T1=>T1 | T1=>T2 | T1<=T1 | Storage for T2 TByte | | | Storage for T1 TByte | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Tape Tbyte | Eff. Disk Tbyte | MByte/s | MByte/s aver. | MByte/s in | MByte/s aver. | MByte/s out | Tape1-Disk0 | Tape1-Disk1 | Tape0-Disk1 | Tape1-Disk0 | Tape1-Disk1 | Tape0-Disk1 | Cache-Disk |
| ALICE | 841.8 | 829.6 | 5.8 | 15.3 | 9.6 | 13.1 | 9.2 | 519.0 | 180.4 | 134.3 | 124.1 | 18.3 | 247.7 | |
| ATLAS | 1357.3 | 2115.3 | 109.2 | 148.6 | 116.0 | 108.2 | 143.3 | 687.2 | 261.9 | 619.5 | 273.0 | 135.2 | 464.1 | |
| CMS | 1556.9 | 800.1 | 31.5 | 15.0 | 86.2 | 96.0 | 78.2 | 673.0 | 0.0 | 43.0 | 883.9 | 0.0 | 489.5 | 27.54 |
| LHCb | 218.7 | 165.3 | 10.5 | 0.1 | 17.8 | 0.0 | 31.8 | 0.0 | 3.7 | 0.0 | 194.0 | 21.0 | 91.0 | |
| SUM | 3974.7 | 3910.2 | 157.0 | 179.0 | 229.5 | 217.3 | 262.5 | 1879.2 | 446.0 | 796.8 | 1475.0 | 174.5 | 1292.3 | 27.5 |
| With 70% Disk Efficiency | | | | | | | | | 637.1 | 1138.3 | | 249.3 | 1846.2 | 39.3 |
| Total Storage Requ. Tape | | | | | | | | 2325 | | | 1649 | | | |
| Total Storage Requ. Disk | | | | | | | | | 1775 | | | | | 2135 |
| Tape and Disk Pledges | | | | | | | | | Tape | | 3464 | Disk | | 3790 |
| Balance | | | | | | | | | -511 | | | | | -120 |

**MegaTable**
(last update Jan07)

- The MegaTable gave for each T-1 and experiment the requirements by storage class - including the disk cache "hidden" in T1D0

- But the MegaTable is a snap-shot now well out of date

*LCG*

## Questions

1. what do the sites need to know to configure their storage systems?

2. is there an agreed terminology that is also meaningful to the experiments that is used to communicate requirements and report installation and usage?

## Proposal

Presumably all of this is clear, is being formalised and brought together as part of CCRC'08 coordination

A short note should define exactly what the terms are and how they map to different storage systems

Harry's table and the monthly accounting should be extended to collect and report on this

The Automated Storage Accounting should evolve to collect and report the same set of values