US LHC Tier2 Activity for June 2011

Overview

This report shows USLHC Tier2 reliability and usage during June 2011 as measured by OSG tools.

	Reliability	Availability	CPU Wallclock hours for Owner VO	CPU efficiency for Owner VO	CPU hours for Owner VO	MoU Pledge	Wallclock hours delivered to all OSG VOs	HEPSPEC06	Total Online Storage (GB)
ATLAS T2 Federations			ATLAS	ATLAS	ATLAS				
US-AGLT2	97%	95%	23,843,404	90%	21,439,255	5,900,716.80	23,843,405	36,163	1,910,000
US-MWT2	100%	100%	24,191,649	95%	22,962,986	5,900,716.80	24,296,416	39,577	1,434,791
US-NET2*	99%	89%	9,294,429	96%	8,924,422	5,900,716.80	9,346,452	19,035	1,100,000
US-SWT2	100%	100%	19,481,539	96%	18,637,463	5,900,716.80	19,611,353	23,220	1,260,000
US-WT2	99%	92%	11,157,339	91%	10,104,767	5,900,716.80	11,157,339	9,570	1,664,000
CMS T2s			CMS	CMS	CMS				
T2_US_Caltech	99%	99%	9,017,835	87%	7,879,533	7,236,000	9,425,940	7,760	570,000
T2_US_Florida	100%	100%	11,719,828	78%	9,116,662	7,236,000	12,992,089	7,760	570,000
T2_US_MIT*	100%	100%	7,189,388	90%	6,487,471	7,236,000	8,919,989	7,760	570,000
T2_US_Nebraska*	100%	100%	6,596,847	92%	6,075,251	7,236,000	7,796,174	7,760	570,000
T2_US_Purdue	100%	100%	24,984,486	71%	17,853,026	7,236,000	31,991,187	7,760	570,000
T2_US_UCSD	98%	98%	9,551,987	86%	8,218,233	7,236,000	13,279,256	7,760	570,000
T2_US_Wisconsin	100%	100%	13,925,776	56%	7,788,707	7,236,000	14,015,220	7,760	570,000

* Denotes a federation with month-specific notes below.

Column header definitions are given below.

June specifics:

- Overall, the reliability numbers are all within the MoU commitments on all the sites.
- T2_US_MIT, T2_US_Nebraska CMS sites had CPU hours below the MoU pledge hours, which were caused by reduced demand. Capacity was present, as evident by hours given to other VOs.
- US_NET2 had lower availability due to maintenance at Boston University and a power outage/upgrades at Harvard.

Column Definitions:

- **Reliability**. The percentage of time the site was functional excluding scheduled downtimes.
- **Availability**. The percentage of time the site was functional out of the entire month (including downtimes)
    - Both the Reliability and Availability cells are colored to match WLCG: green indicate a score between 90% and 100%; yellow indicate a score between 60% and 90%; orange indicate a score between 30% and 60%; red indicate a score between 0% and 30%
    - The WLCG MoU states that Tier 2 sites should have a reliability of 95%. The availability and reliability of a site is measured by the WLCG availability algorithm, which allows us to effectively compare numbers between OSG sites and EGEE sites.
- **CPU Wallclock hours for owner VO**. This is the sum of all "wall clock hours" for the owner VO at a site. The "owner VO" is either CMS or ATLAS. A wall clock hour is the number of hours elapsed between job start and finish, regardless of CPU utilization. This number is normalized for CPU power.
- **CPU efficiency for owner VO**. This is the average CPU utilization per job at each site for the owner VO.
- **CPU hours for the owner VO**. This is simply the wall clock hours column multiplied by the CPU efficiency. This number is normalized for CPU power.
- **MOU Pledge.** The normalized CPU hours per month pledged to the owner VO, assuming an 80% CPU efficiency. Sites should be able to provide this number of hours to the VO, but the VO may not utilize all of them.
    - The usage at sites is limited by the number of CPUs available and/or by the amount of work that the VOs need to have done. During "off-peak" months, or between major software releases, it is common to see VOs committing effort elsewhere besides running jobs.
- **Wallclock hours delivered to all OSG VOs**. This is the sum of all wall clock hours performed at the site, regardless of VO.
    - On OSG, sites can (but are not required to) allow other VOs to opportunistically use their resources. Sharing of resources is typically affected by whether there are members of another VO at the university or institution itself (e.g. CDF at MIT) and the availability of effort for configuration and support.

Units of Measurement

The WLCG measures job usage in CPU hours (the amount of time the CPU was active); OSG reports show the elapsed, or "wall" time. As jobs occupy batch slots regardless of the application's CPU usage, we report this relevant measurement. The WLCG management has agreed that this is a relevant measure and will be including this sometime in the future.

The WLCG has moved to a new unit of measuring performance of a CPU, changing from SpectInt2000 (SI2K) to SpectInt2006 (SI2006). We report figures in HEPSPEC06 to match the WLCG.

We also report the CPU efficiency, the ratio between CPU hours and wall hours.

All the usage numbers are multiplied by a normalization factor that accounts for the average relative difference in CPU power. The normalization factor used by the WLCG varies from site to site; for June 2011, this constant varies between 6.14 and 15.68.