

US LHC Tier2 Activity for February 2010

Overview

This report shows USLHC Tier2 reliability and usage during February 2010 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
ATLAS T2 Federations			ATLAS	ATLAS	ATLAS		
US-AGLT2	98%	81%	2,063,706	88%	1,817,535	389,088	2,063,706
US-MWT2	100%	98%	1,442,195	89%	1,277,739	448,358	1,539,496
US-NET2	99%	99%	449,603	83%	373,791	268,128	449,603
US-SWT2	98%	91%	946,142	86%	813,864	558,835	1,119,074
US-WT2	99%	97%	893,314	87%	774,439	330,624	893,461
CMS T2s			CMS	CMS	CMS		
T2_US_Caltech	99%	98%	775,933	76%	591,772	403,200	1,862,385
T2_US_Florida*	100%	98%	291,885	66%	191,585	403,200	1,076,374
T2_US_MIT	99%	86%	692,431	85%	585,815	403,200	1,005,060
T2_US_Nebraska	100%	99%	735,547	67%	494,097	403,200	1,618,455
T2_US_Purdue*	100%	100%	564,620	41%	230,277	403,200	1,283,109
T2_US_UCSD	93%	93%	962,455	70%	673,458	403,200	1,193,694
T2_US_Wisconsin	98%	98%	740,083	60%	447,623	403,200	850,522

* Denotes a federation with month-specific notes below.

Column header definitions are given below.

February specifics:

- Overall, the reliability numbers are all within the MoU commitments and many sites are well-above their CPU pledges.

- There has been a historic low in CMS production activity; the CPU usage at many CMS sites is mostly analysis. Analysis generally has lower CPU efficiency, as it is I/O dominated. Sites with less analysis activity (Florida and Purdue, for example) had lower CPU utilization than normal. As demonstrated by the fact that opportunistic VOs were able to use the resources, there was sufficient CPU if there was more CMS demand.

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)
 - Reliability/Availability cells 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.

In future the WLCG will be moving to a new unit of measuring performance of a CPU, changing from SpectInt2000 (SI2K) to SpectInt2006 (SI2006). This will need a slight adjustment of our calculation codes.

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 February 2010, this constant varies between 1.521 and 3.196.