

Site monitoring

SAM, ASAP, HS06

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6/Mar/2018, ATLAS ADC sites jamboree

SAM and ASAP

- WLCG SAM (Service Availability Monitoring, [link](#))
 - Test **fundamental functionalities** of sites
 - Calculate the Availability and the Reliability (A/R) based on the test results
 - Generate monthly reports
- ASAP (ATLAS Site Availability and Performance, [link](#))
 - A combined metric of the hammercloud (HC) results and the switcher information (i.e. downtime)
 - Used to monitor the availability of sites for **the actual ATLAS jobs**

A/R

Services

Availability = UP period / (Total period - UNKOWN period)

Reliability = UP period / (Total period - UNKOWN period - Scheduled downtime)

Sites

The site A/R is defined by the ATLAS_CRITICAL profile, defined as:

(CREAM-CE + ARC-CE + HTCONDOR-CE + GLOBUS) *
(all SRMv2 + all SRM + all GRIDFTP)

It means, at least one CE and all SEs have to be OK.

Other profiles

Other profiles are used for monitoring but not used for the site A/R

- ATLAS_GENERAL
 - All ETF test results
- ATLAS_HTTP
 - Webdav test results
- ATLAS_AnalysisAvailability
 - ASAP results for analysis queues
- ATLAS_ProductionAvailability
 - ASAP results for production queues

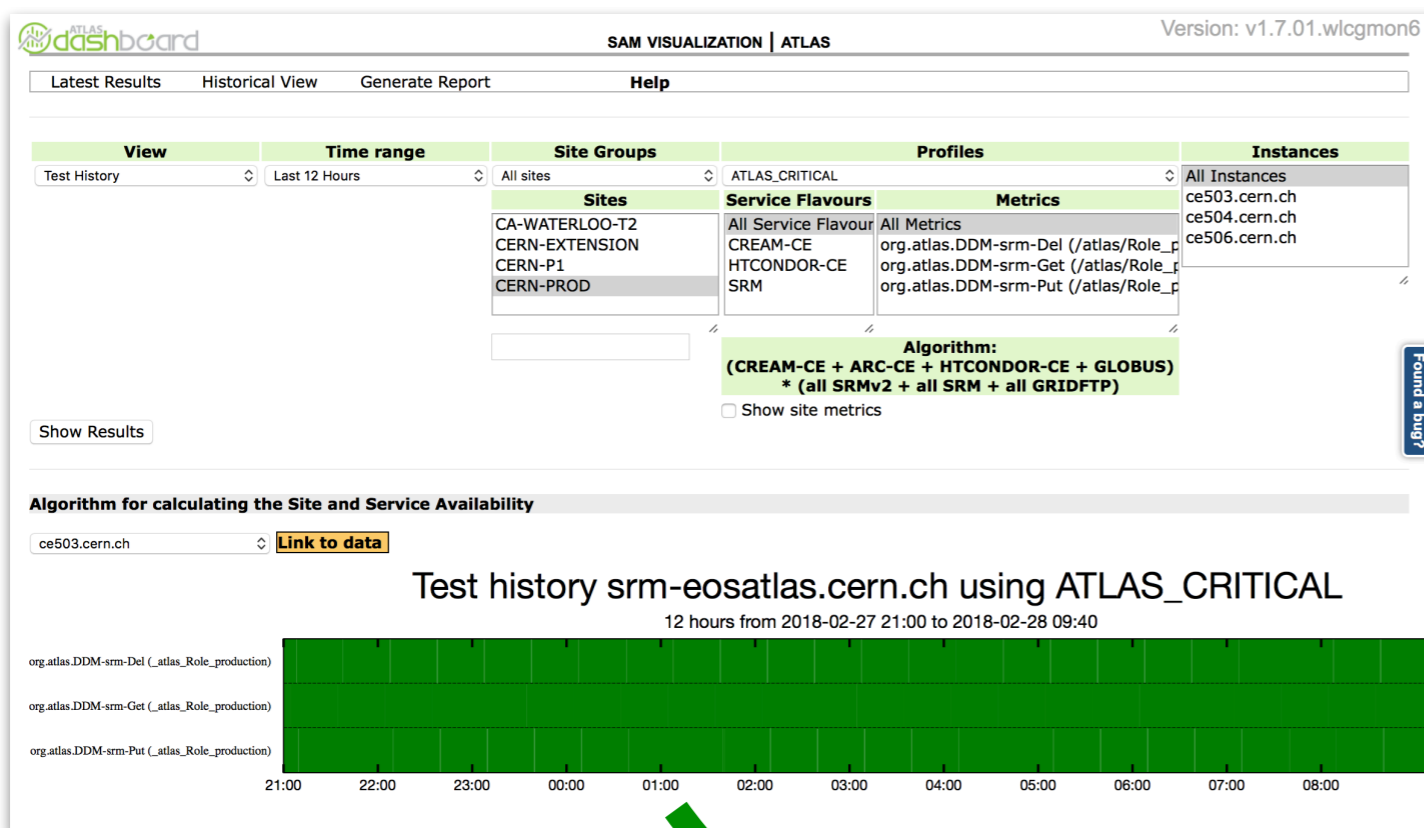
Probes

- **SE services** (frequency ~30 mins)
 - GET, PUT and DEL operations over ATLASDATADISK, ATLASSCRATCHDISK, ATLASGROUPDISK, and ATLASLOCALGROUPDISK
 - ATLASDATADISK is used for ATLAS_CRITICAL
 - DN is: /DC=ch/DC=cern/OU=Organic Units/OU=users/CN=ddmadmin/CN=531497/CN=Robot:ATLAS Data Management with /atlas/ Role=production
- **CE services** (frequency ~1h)
 - SW space (check cvmfs working and list directories in \$VO_ATLAS_SW_DIR)
 - Job submit
 - DN is: /DC=ch/DC=cern/OU=Organic Units/OU=users/CN=ddmadmin/CN=531497/CN=Robot:ATLAS Data Management with /atlas/ Role=lcgadmin (which is supposed to be given highest priority by sites' CEs)

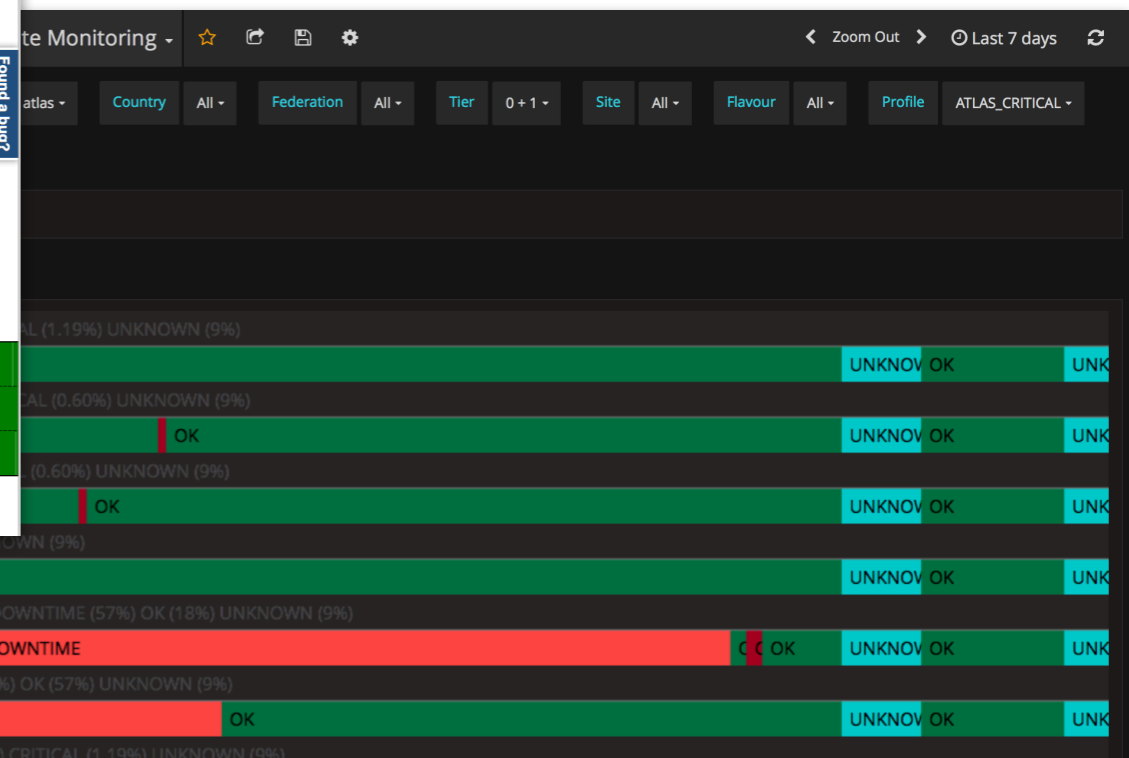
Monitoring

- Several dashboards (listed in [twiki](#)) for SAM and ASAP
- Sites can import data from Nagios API to own monitors
- Detailed information (test logs) can be reachable
- New monitor (MONIT) is being prepared

WLCG dashboard ([link](#))




MONIT in preparation ([link](#))



Monthly reports [\(link\)](#)

Monthly reports are generated and sent on 1st in the following month. Sites can use the numbers to show the performance, for example, to the funding agency of the country.

(Sites can ignore if they don't use these numbers...)



Tier-2 Availability and Reliability Report
ATLAS

Federation Summary - Sorted by Name

Color coding: N/A <30% <60% <90% >=90%

Availability Algorithm: (CREAM-CE + ARC-CE + HTCNDOR-CE + GLOBUS) * (all SRMv2 + all SRM + all GRIDFTP)

January 2018

Federation	Availability	Reliability	Federation	Availability	Reliability
AT-HEPHY-VIENNA-UIBK	97%	97%	JP-Tokyo-ATLAS-T2	93%	94%
AU-ATLAS	100%	100%	PL-TIER2-WLCG	74%	74%
CA-EAST-T2	64%	97%	PT-LIP-LCG-Tier2	69%	69%
CA-WEST-T2	97%	97%	RO-LCG	98%	99%
CH-CHIPP-CSCS	97%	97%	RU-RDIG	88%	93%
CN-IHEP	98%	100%	SE-SNIC-T2	83%	83%
CZ-Prague-T2	82%	92%	SI-SiGNET	99%	99%
DE-DESY-GOE-ATLAS-T2	100%	100%	SK-Tier2-Federation	94%	96%
DE-DESY-RWTH-CMS-T2	100%	100%	T2-LATINAMERICA	100%	100%
DE-FREIBURG WUPPERTAL	87%	88%	TR-Tier2-federation	55%	55%
DE-MCAT	96%	98%	TW-FTT-T2	100%	100%
ES-ATLAS-T2	100%	100%	UK-London-Tier2	85%	86%
FR-GRIF	97%	97%	UK-NorthGrid	98%	98%
FR-IN2P3-CPPM	100%	100%	UK-ScotGrid	99%	99%
FR-IN2P3-LAPP	93%	98%	UK-SouthGrid	95%	97%
FR-IN2P3-LPC	85%	99%	US-AGLT2	99%	99%
FR-IN2P3-LPSC	92%	100%	US-MWT2	99%	99%
IL-HEPTier-2	99%	99%	US-NET2	91%	91%
IT-INFN-T2	97%	97%	US-SWT2	83%	83%

Re-computation

- When a site find that the A/R is wrong due to problems in the monitoring infrastructure (e.g. invalid proxy certificate), the site can request the re-computation (i.e. overwrite the site-status in a certain period and update the official report)
- A request has to be submitted via GGUS up to 10 calendar days after the announcement of the reports of a given month, which normally occurs on 1st of the following month.

For more details, please see this [Link](#)

Recent changes

- Selection of queues for CE tests.
 - Chosen according to “etf_default” flag in AGIS
- GRIDFTP test is added (in testing)
- Support for Docker container for the cvmfs test
- Removed CE test with the pilot role
- Remove dependence on BDII
- Remove Frontier Squid test from CE metric
- Compatibility updates for AGIS, vofeed etc.
- Several bug fixes

Future improvements

- New monitoring dashboards in MONIT.
- Monitoring by ADCoS shifters
- Automatic email notification to cloud mailing-lists
- Adding more probes
 - More protocols (xrootd and http)
 - Include them in the ATLAS_CRITICAL profile according to new AGIS(?) information about “production” protocol per site
 - Rucio prove
 - Will not be in the ATLAS_CRITICAL
- Restructuring the SE test
 - GET, PUT and DEL in a sequence

HS06

Extraction of data

- Data is taken from ES (atlas-kibana.mwt2.org), from 1/Nov 2017 to 31/Jan 2018
- Jobs are chosen by following requirements
 - It is “finished”
 - It runs on a GRID site (not cloud or HPC)
 - Single core
 - Hammercloud job with 25 events
- Core power (HS06) is taken from AGIS
 - Jan.2018 data is taken from [/afs/cern.ch/atlas/GRID/AGIS/SchedConfCache/](https://afs.cern.ch/atlas/GRID/AGIS/SchedConfCache/)
 - Queues whose HS06 was different from Nov.2017 were eliminated
- Number of produced events per second per core is calculated as “nevents / wall_time”

Ranking (single core)

nevents/ sec CPU type

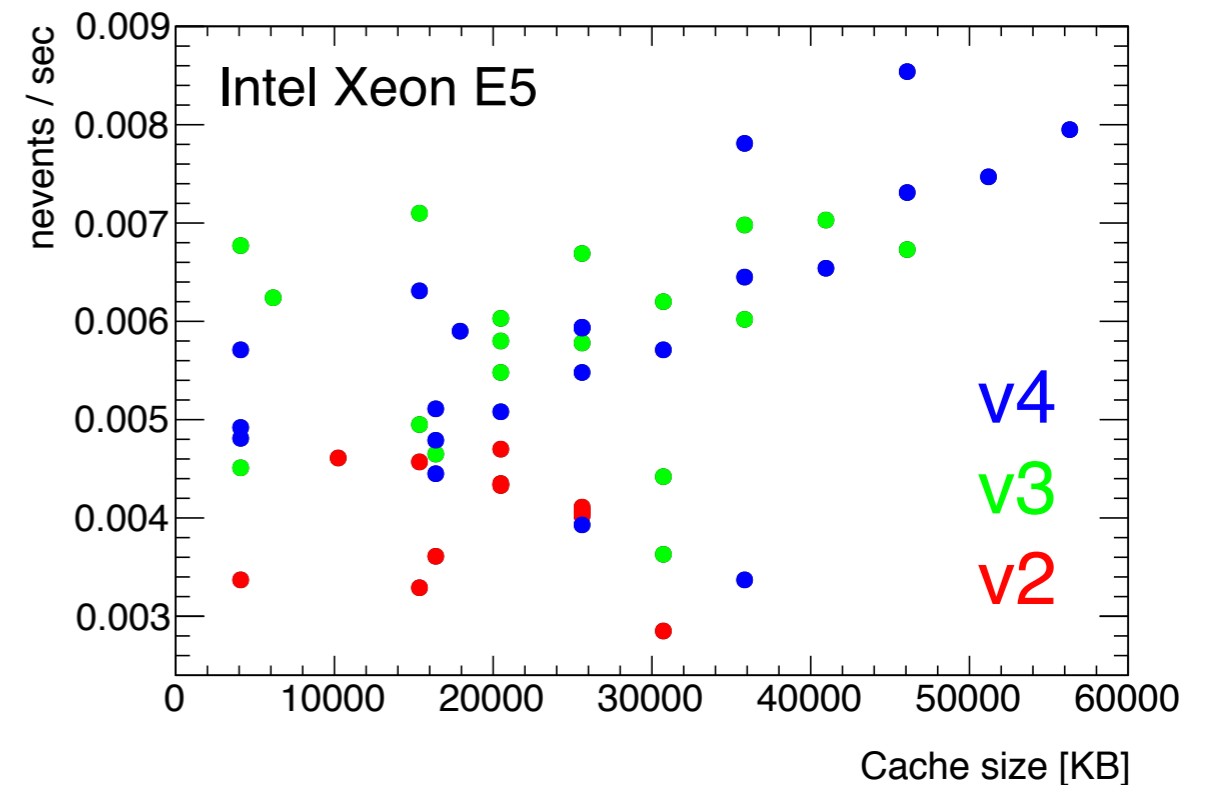
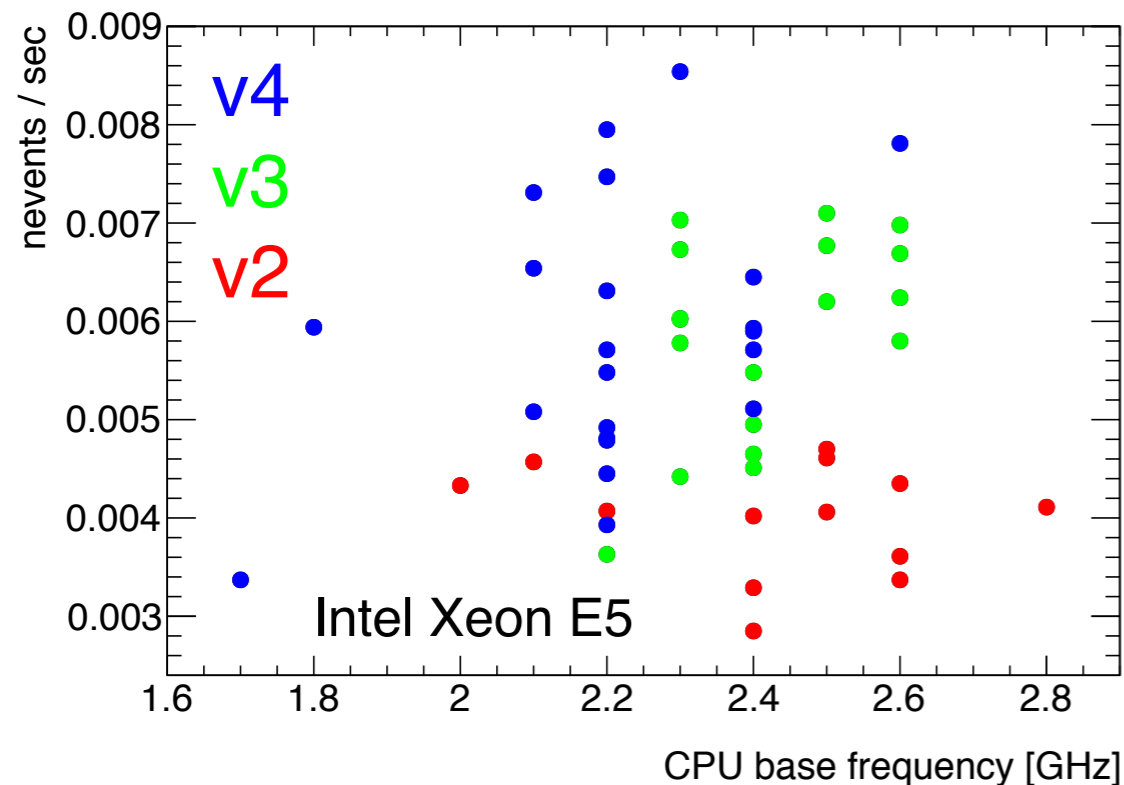
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CPU frequency and L3 cache size

(for single core jobs)

The CPU performance is compared for a CPU family (Intel Xeon E5)



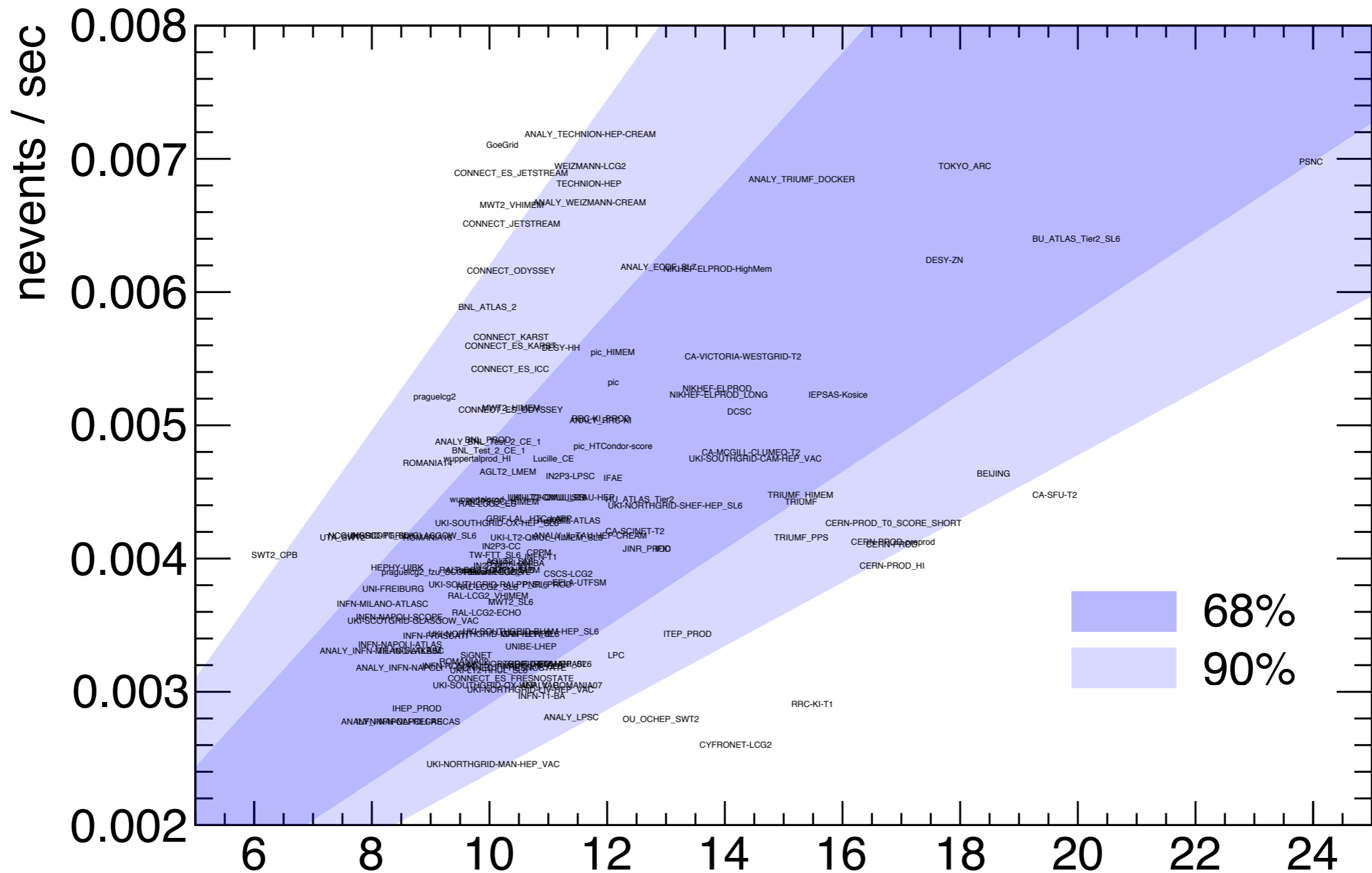
○ nevents/sec correlate with the generation, the clock and the cache size.

X axis : core power (HS06 per core)

Y axis : nevents / sec for hammercloud jobs with 25 events

Medians of the nevents / sec for each queues are plotted here,

single core
T0,T1,T2



HS06

Summary

- SAM and ASAP check the fundamental and overall functionalities of sites
- Several improvements are planned including
 - Monitoring by ADCoS shifters
 - Automatic notifications
 - etc
- Clear correlation between the HS06 (declared in AGIS) and the nevents / sec for hammercloud jobs
 - If your queues are outside of the distribution band in page 15, **please check if HS06 in AGIS is correct !**

Links related to issues on HS06

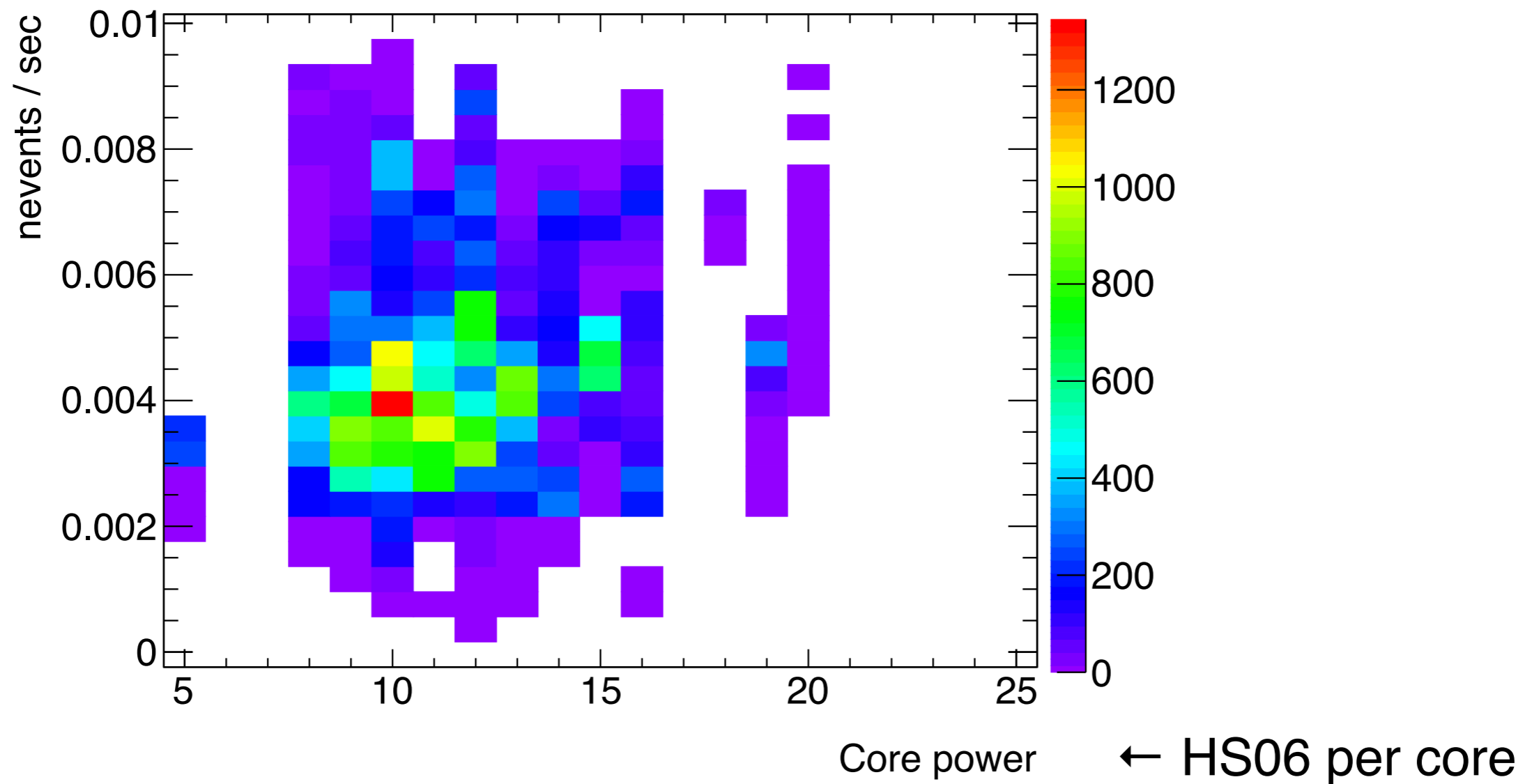
[1] https://indico.cern.ch/event/579473/contributions/2429484/attachments/1399234/2134565/20170120_jamboree_benchmark.pdf

[2] <https://twiki.cern.ch/twiki/bin/view/LCG/AccountingFAQ>

Backup

nevents / sec v.s. HS06

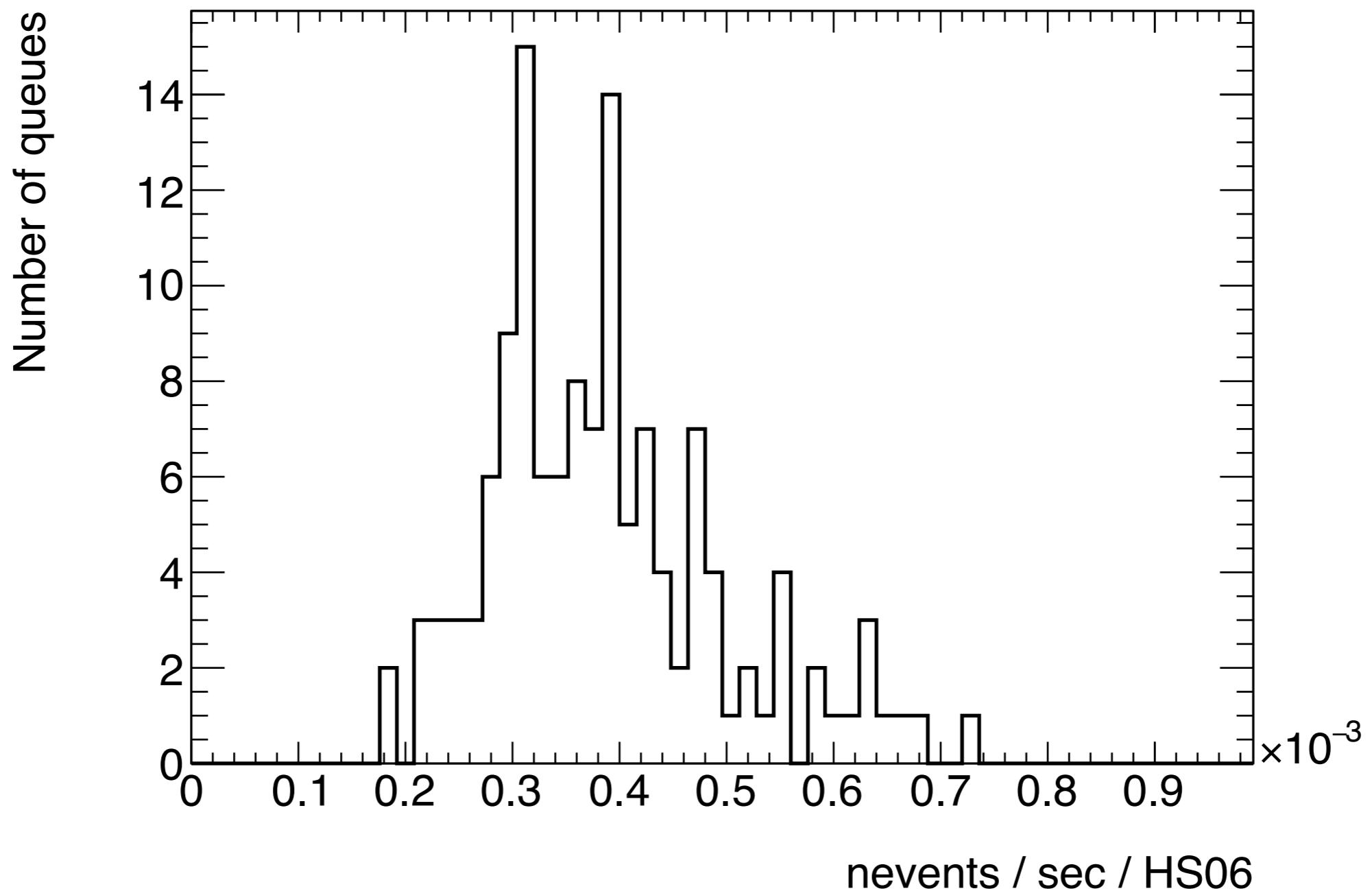
Hammercloud jobs with single core
One entry is a job



Median per site

evgen, Grid, single core
T0, T1 and T2

Instead of plotting jobs, the median values in “nevents / sec” per site are plotted here. An entry corresponds to a site.



Ranking (8 cores)

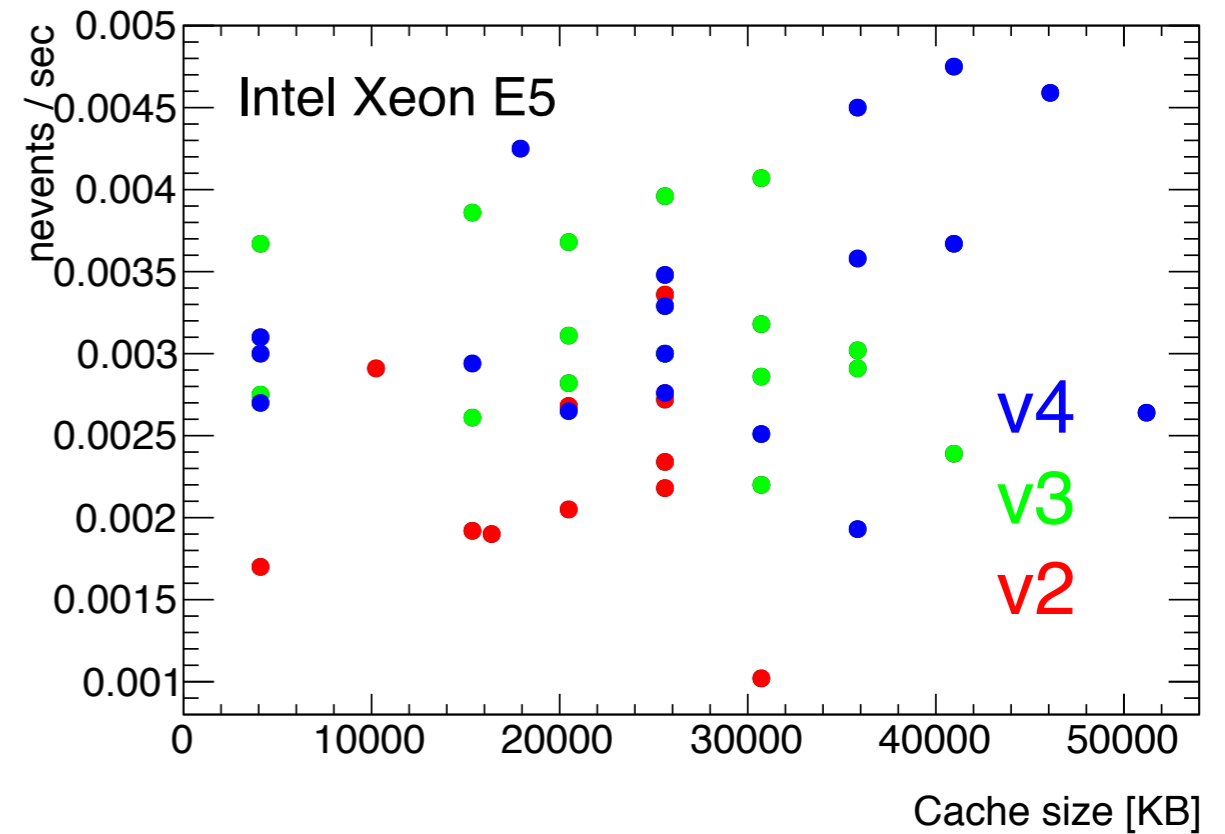
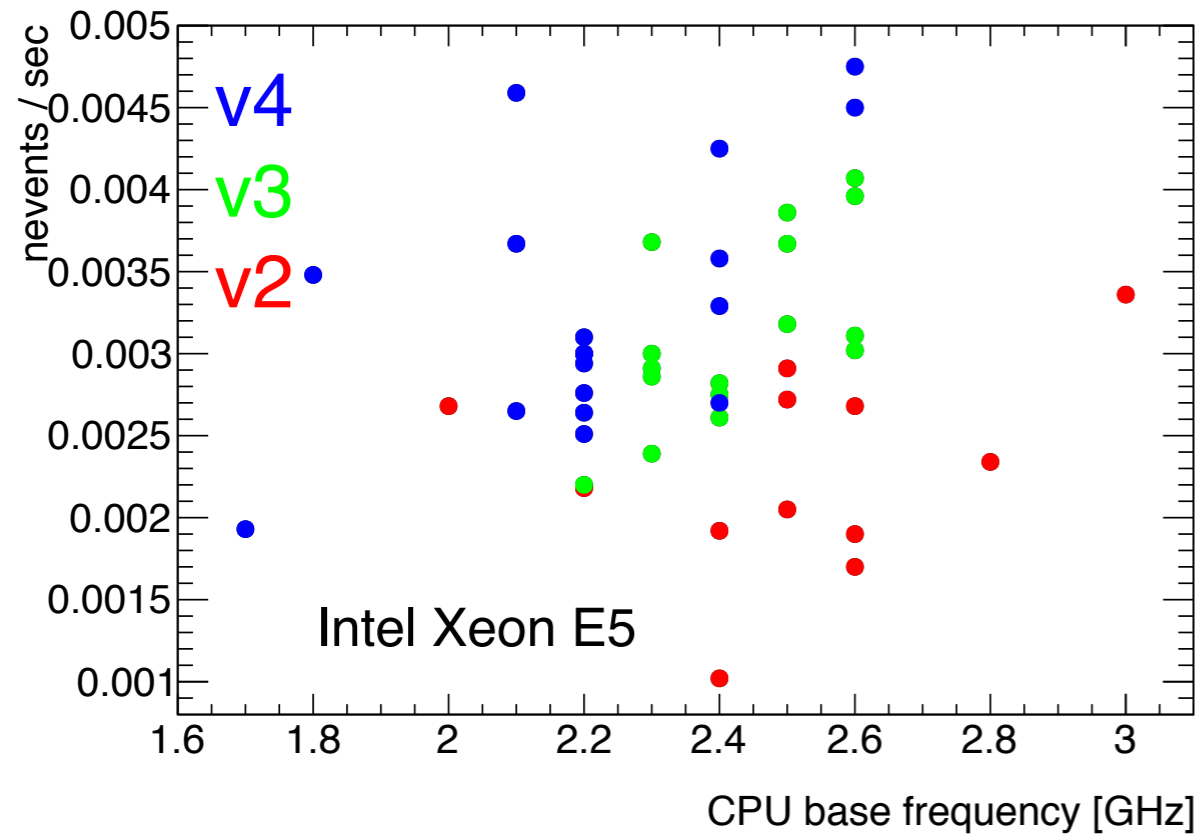
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0.00247	Xeon	E5430	@ 2.66GHz	6144	KB
0.00246	Xeon	E5-2670 0	@ 2.60GHz	20480	KB
0.00246	Xeon	X5650	@ 2.67GHz	12288	KB
0.00242	Xeon	L5520	@ 2.27GHz	8192	KB
0.00239	Xeon	E5-2698 v3	@ 2.30GHz	40960	KB
0.00236	Opteron Six-Core	2431		512	KB
0.00234	Xeon	E5-2680 v2	@ 2.80GHz	25600	KB
0.00233	Xeon	X5560	@ 2.80GHz	8192	KB
0.00231	Opteron	6320		2048	KB
0.00231	Xeon	L5420	@ 2.50GHz	6144	KB
0.00229	Xeon	E5620	@ 2.40GHz	12288	KB
0.00228	Xeon	L5630	@ 2.13GHz	12288	KB
0.00227	Xeon	E5645	@ 2.40GHz	12288	KB
0.00225	Intel Core	i7-5960X CPU	@ 3.00GHz	20480	KB
0.00225	Intel Core	i7 CPU 860	@ 2.80GHz	8192	KB
0.00220	Xeon	E5-2658A v3	@ 2.20GHz	30720	KB
0.00218	Xeon	E5-2660 v2	@ 2.20GHz	25600	KB
0.00217	Xeon	X5355	@ 2.66GHz	4096	KB
0.00217	Xeon	E5420	@ 2.50GHz	6144	KB
0.00216	Opteron	6176		512	KB
0.00213	Xeon	E5410	@ 2.33GHz	6144	KB
0.00211	Opteron	6172		512	KB
0.00210	Xeon	E5506	@ 2.13GHz	4096	KB

0.00208	Opteron	4226		2048	KB
0.00207	Opteron	6174		512	KB
0.00206	Xeon	X5660	@ 2.80GHz	12288	KB
0.00205	Xeon	E5-2450 v2	@ 2.50GHz	20480	KB
0.00204	Xeon	E5-2630L 0	@ 2.00GHz	15360	KB
0.00203	Xeon	E5405	@ 2.00GHz	6144	KB
0.00199	Opteron	6378		2048	KB
0.00199	Xeon	X5675	@ 3.07GHz	12288	KB
0.00196	Opteron Quad-Core	2356		512	KB
0.00194	Xeon	E5520	@ 2.27GHz	8192	KB
0.00193	Xeon	E5-2650L v4	@ 1.70GHz	35840	KB
0.00192	Xeon	E5-2630L v2	@ 2.40GHz	15360	KB
0.00190	Xeon	E5-2650 v2	@ 2.60GHz	16384	KB
0.00190	Opteron	6376		2048	KB
0.00189	Xeon	L5640	@ 2.27GHz	12288	KB
0.00187	Xeon	E5-2630 0	@ 2.30GHz	15360	KB
0.00186	Opteron	6238		2048	KB
0.00186	Xeon	E5-2620 0	@ 2.00GHz	15360	KB
0.00181	AMD Opteron	6376		2048	KB
0.00179	AMD Opteron	6234		2048	KB
0.00176	AMD Opteron	6128		512	KB
0.00173	Opteron Quad-Core	8356		512	KB
0.00173	Opteron	6378		2048	KB
0.00173	QEMU Virtual CPU	version 2.3.1		4096	KB
0.00170	Xeon(R)	E5-2650 v2	@ 2.60GHz	4096	KB
0.00168	Opteron	6274		2048	KB
0.00166	Opteron	6282 SE		2048	KB
0.00164	Opteron	6276		2048	KB
0.00158	Intel		@ 2.20GHz	12288	KB
0.00153	Opteron	6276		512	KB
0.00153	Opteron	6272		2048	KB
0.00151	Opteron	6274		2048	KB
0.00138	Xeon	E5-2650 0	@ 2.00GHz	4096	KB
0.00102	Xeon	E5-2695 v2	@ 2.40GHz	30720	KB

CPU frequency and cache size

(8 cores)

The CPU performance is compared for a CPU family (Intel Xeon E5)



○ Newer generation is better even with the same base frequency

