

USQCD Allocation Process

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(SPC member since 2004-2010;
Chair for 2007-2008 & 2008-2009)

Timeline

- The USQCD Allocation year starts July 1 and runs to June 30 the following year:
 - use this year's dates as example.
- February 5: Call for Proposals.
- March 20: proposals due.
- April 26: SPC sends reports to Pls, after careful reading and ~3 phone meetings.

- May 14–15: All Hands' Meeting—
 - in other years held late March–mid-May;
 - other dates hinge on this;
 - SPC, ExecCom availability;
 - 5-6 weeks each for each step—writing, reviewing, response; 3 for allocation.
- May 28: recommendations to ExecCom.
- June 6 (5 days late): allocations announced.

Call for Proposals

<http://www.usqcd.org/meetings/allHands2009/>

- lays out policies (e.g., Type A, B, C projects; data sharing; rebalancing; web page).
- gives guidelines for proposals (put total request in abstract; explain code; discuss storage; scientific case).
- states available CPU (and now storage) resources.

Resources

- Allocate in 6n node-hours:
 - standard benchmarks to convert;
 - pick mid-range CPU every couple years.
- Node-hours on QCDOC and existing clusters known “exactly.”
- Clusters to be deployed estimated; accurate within -5 to $+20\%$.

- Leadership-class machines:
 - INCITE year is January 1-December 31.
 - USQCD allocates current year's INCITE, which is an underestimate. Real INCITE is half this year's award plus half next year's; conservative, but manageable.
 - Time from early-science, or discretionary queues, have been hard to predict and can be difficult to manage.

Two Examples

- 2008-2009 BG/P at ANL
- ANL told ExecCom to expect 25-50 M BG/P core-hours via ESP:
 - 6.2–13.5 M 6n nd-hrs.
- USQCD received more than 300 M BG/P ~ 80 M 6n node-hour.
- LQCD+INCITE: 60 M 6n
- 2009-2010 XT5 at ORNL
- ORNL has awarded USQCD 2.5 M XT5 core-hours via PESP:
 - 1.4 M 6n node-hours.
- Even if USQCD gets 3–4 times this, it will be easy to manage.
- LQCD+INCITE: 100 M 6n

SPC Deliberations

- SPC listens carefully to round-table discussions before formulating allocations.
- Telephone meetings closed.
- Each member draws up his/her ideal program, which are averaged to reach final allocations.
- Outliers & special cases discussed.

- Individual “ideal programs” drawn up assuming that they remain internal to SPC:
 - similar to anonymous refereeing.
- High-minded: SPC members know which topics are strategically important.
- Strict average and an algorithm to remove conflict of interest: agree within standard deviation (2007-2008, 2008-2009).

Rebalancing

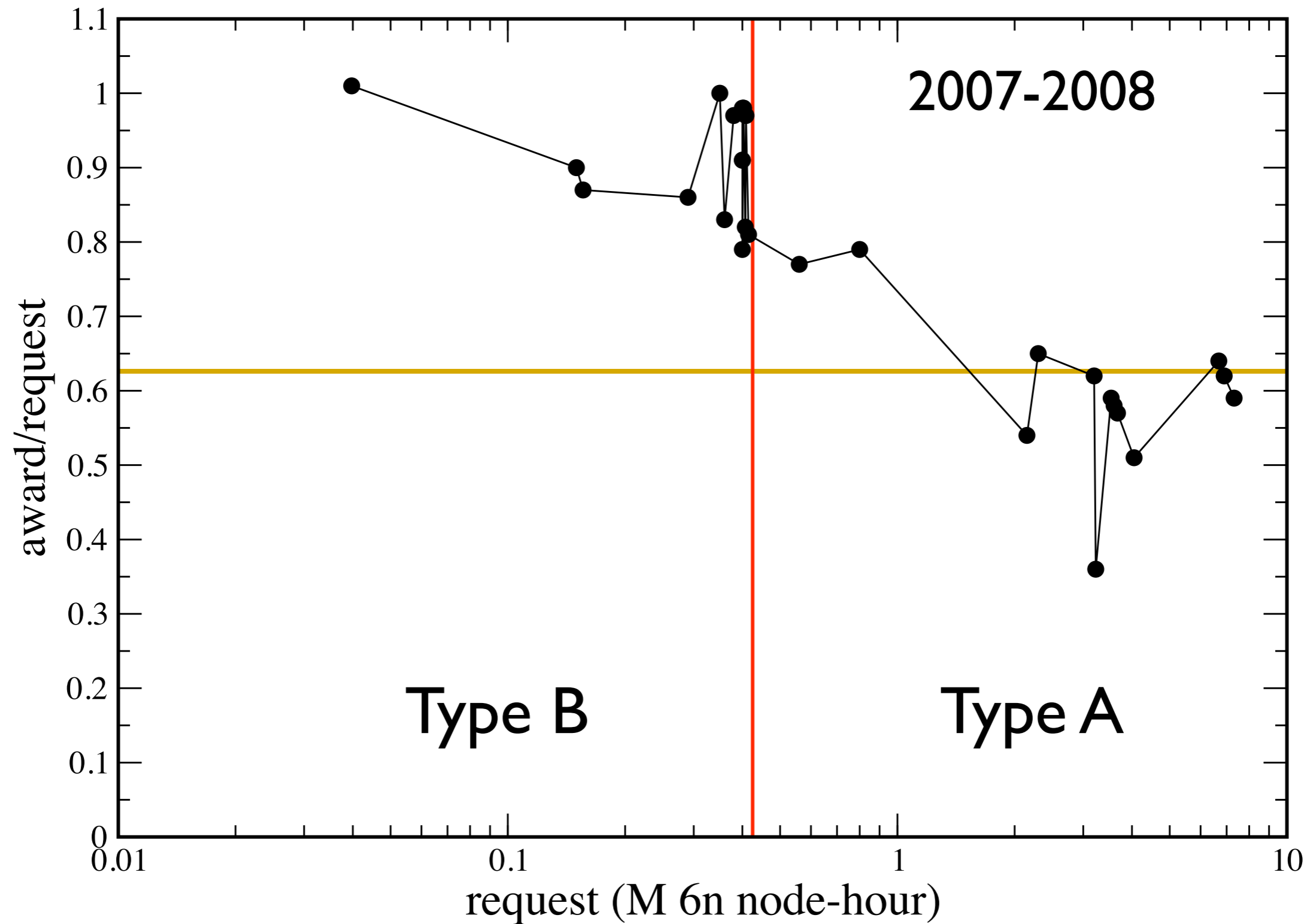
- The SPC rebalances allocations, when the total USQCD resource changes:
 - new cluster earlier or more capable;
 - increase in INCITE award;
 - extra early-use or discretionary time.
- Rebalancing anticipated while writing and reviewing proposals.

- Works well with 10-25% increases.
- Difficult last year, but put extra BG/P into lattice generation to be mined later.
- Quasi-formal communication with BG/P-ready (and QCDOC-ready) PIs—
 - trading horses in midstream.
- Running on leadership-class machines stays faithful to INCITE proposal.

Achieving Balance

- Not with central planning or quotas.
- Whitepapers lay out central themes.
- Proposals prepared by scientists, keenly aware of priorities, innovative by nature.
- SPC composed of mix of highly-respected members of the USQCD Collaboration.
- Balance will change as science progresses.

Aspirations vs. Reality



2008-2009 Allocations

initial program

- All projects' allocations on internal web page linked from 2008 All Hands' home.
- Breakdown by topic, of 57.9 M 6n nd-hrs:

topic	M 6n	%	M 6n	%
configs	19.5	34	asqtad → SM clover → NP	DWF → SM & NP
SM	15.6	27	26.8	46
NP	13.5	23	21.8	38
thermo	4.2	7.2	4.2	7.2
BSM	5.1	8.8	5.1	8.8

2008-2009 Allocations

final program w/ extra BG/P, XT4, J/ψ

- All projects' allocations on internal web page linked from 2008 All Hands' home.
- Breakdown by topic, of 150 M 6n nd-hrs:

topic	M 6n	%	M 6n	%
configs	83.2	55	asqtad → SM clover → NP	DWF → SM & NP
SM	27.3	18	82.9	55
NP	25.2	17	53.4	36
thermo	7.2	4.8	7.2	4.8
BSM	7.1	4.7	7.1	4.7

2009-2010 Allocations

initial program, w/ discretionary 43 M BG/P

- All projects' allocations on internal page to be linked from 2009 All Hands' home soon.
- Breakdown by topic, of 140.5 M 6n nd-hrs:

topic	M 6n	%	M 6n	%
configs	41.3	29	asqtad → SM clover → NP	DWF → SM & NP
SM	43.5	31	54.9	39
NP	35.2	25	65.2	46
thermo	10.3	7.3	10.3	7.3
BSM	10.2	7.3	10.2	7.3

Conversion Chart

- | QCDOC node-hour = 0.122 6n node-hour
- | qcd node-hour = 0.498 6n node-hour
- | pion node-hour = 0.683 6n node-hour
- | 6n node-hour = 1 6n node-hour (no complaints here)
- | kaon node-hour = 1.757 6n node-hour
- | 7n node-hour = 3.1 6n node-hour
- | J/Psi node-hour = 4.04 6n node-hour
- | BG/P core-hour = 0.27 6n node-hour
- | XT4 core-hour = 0.56 6n node-hour