SAND2008-3113C

Staying Ahead of the Cro-Magnons: Managing High-Performance Computing Resources

Presented to participants of
NLIT Summit 2008 by
Heather Robideau, Sandia National Laboratories

May 2008

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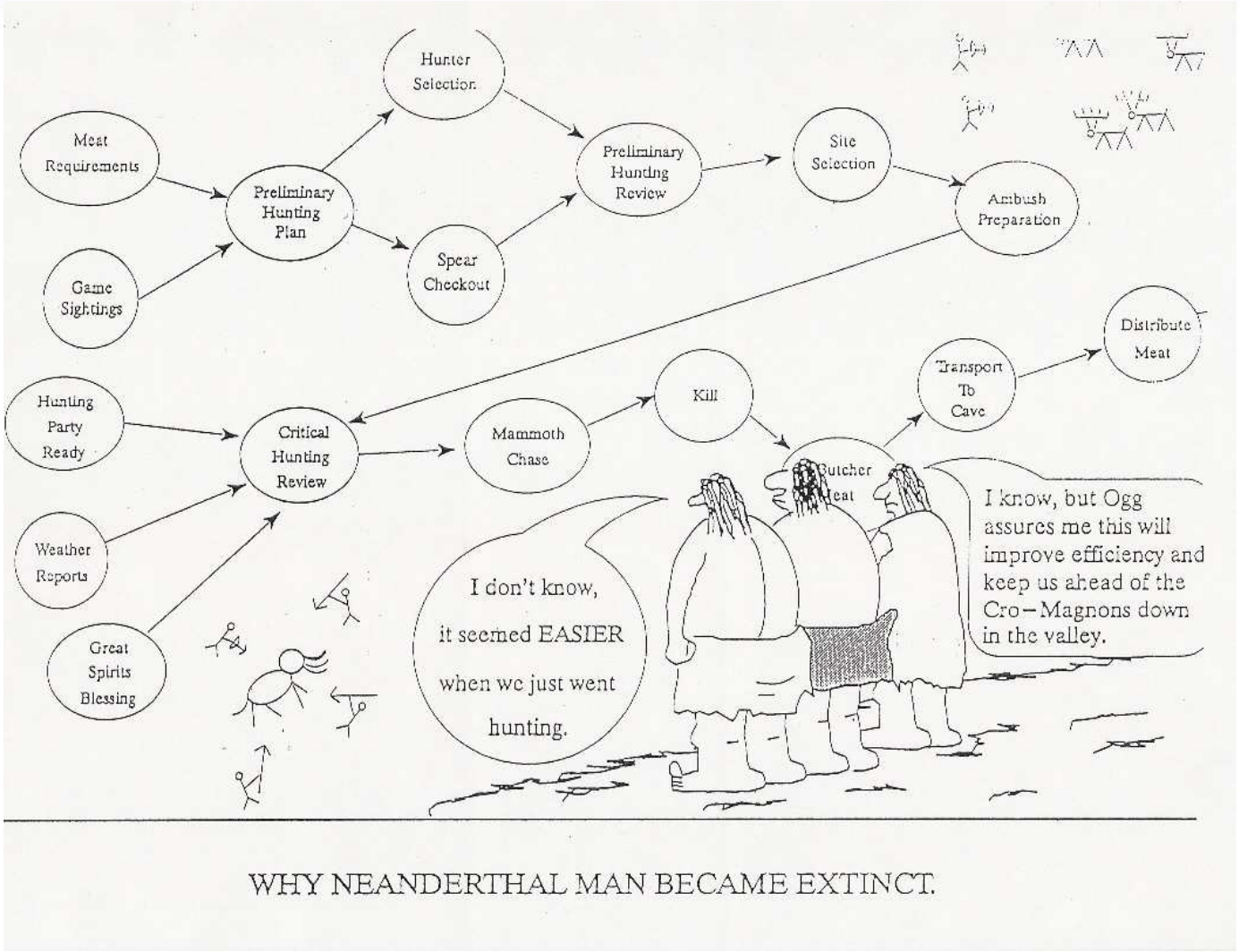
What?!?



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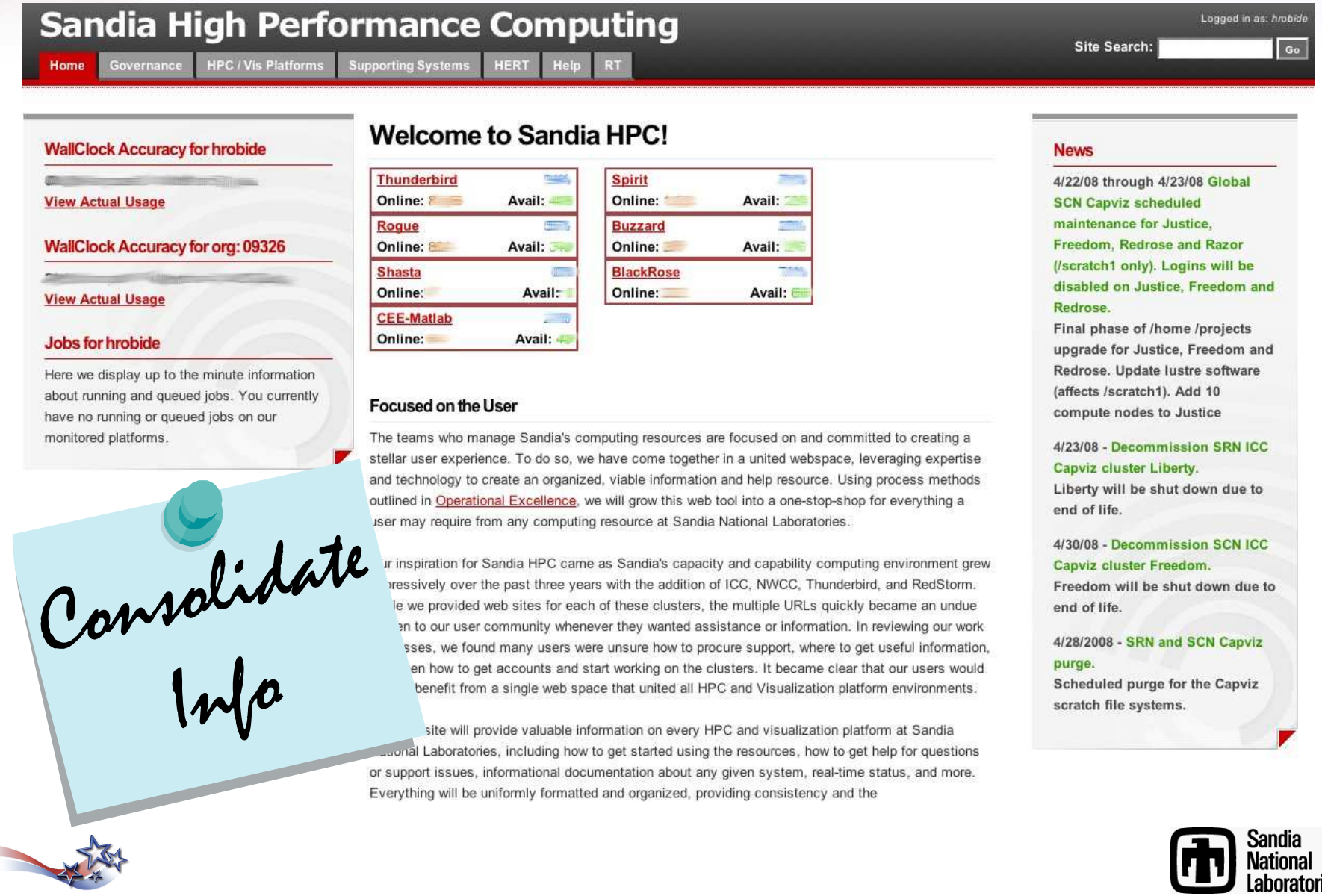
Getting Started . . .



Consolidate Info

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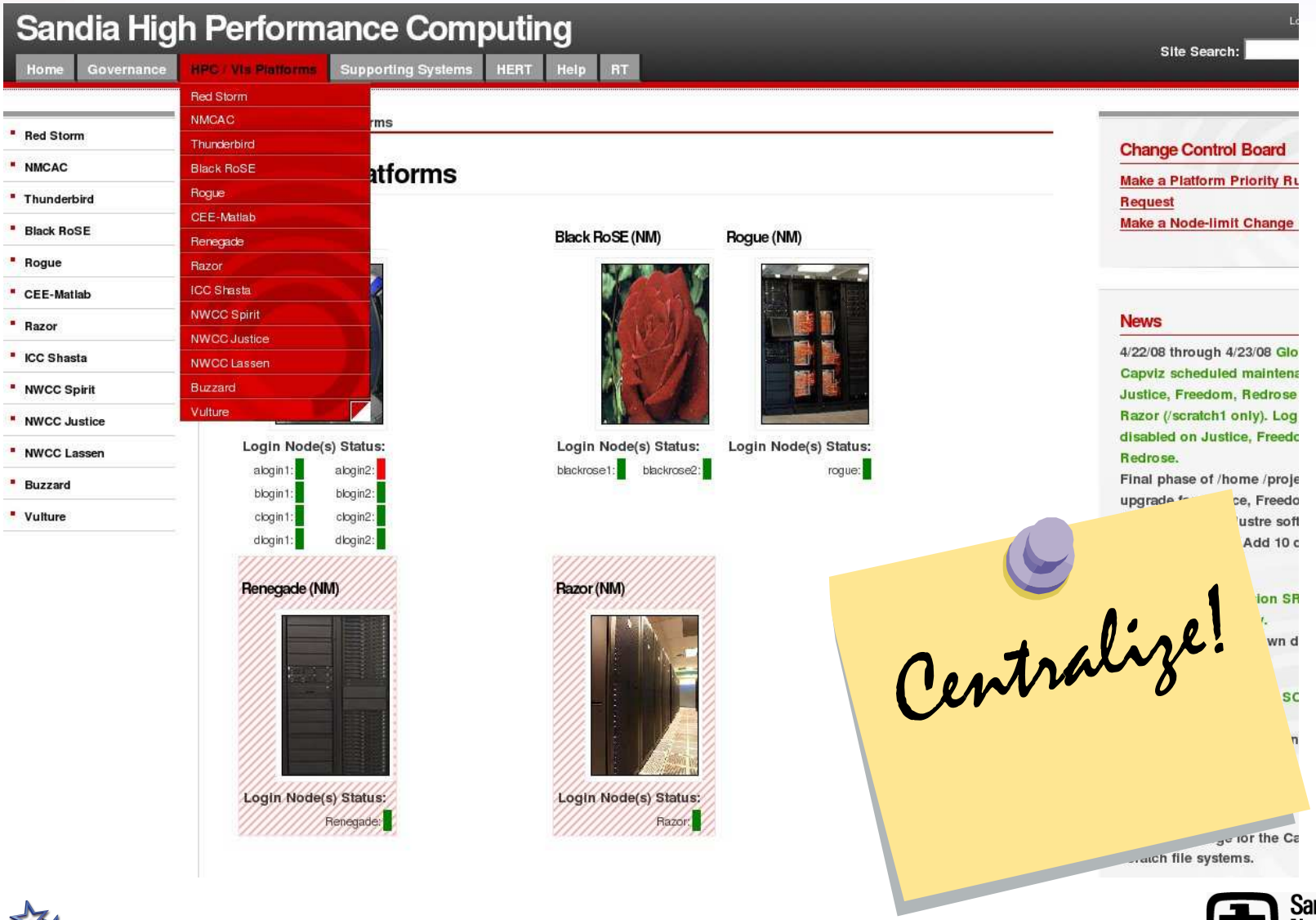
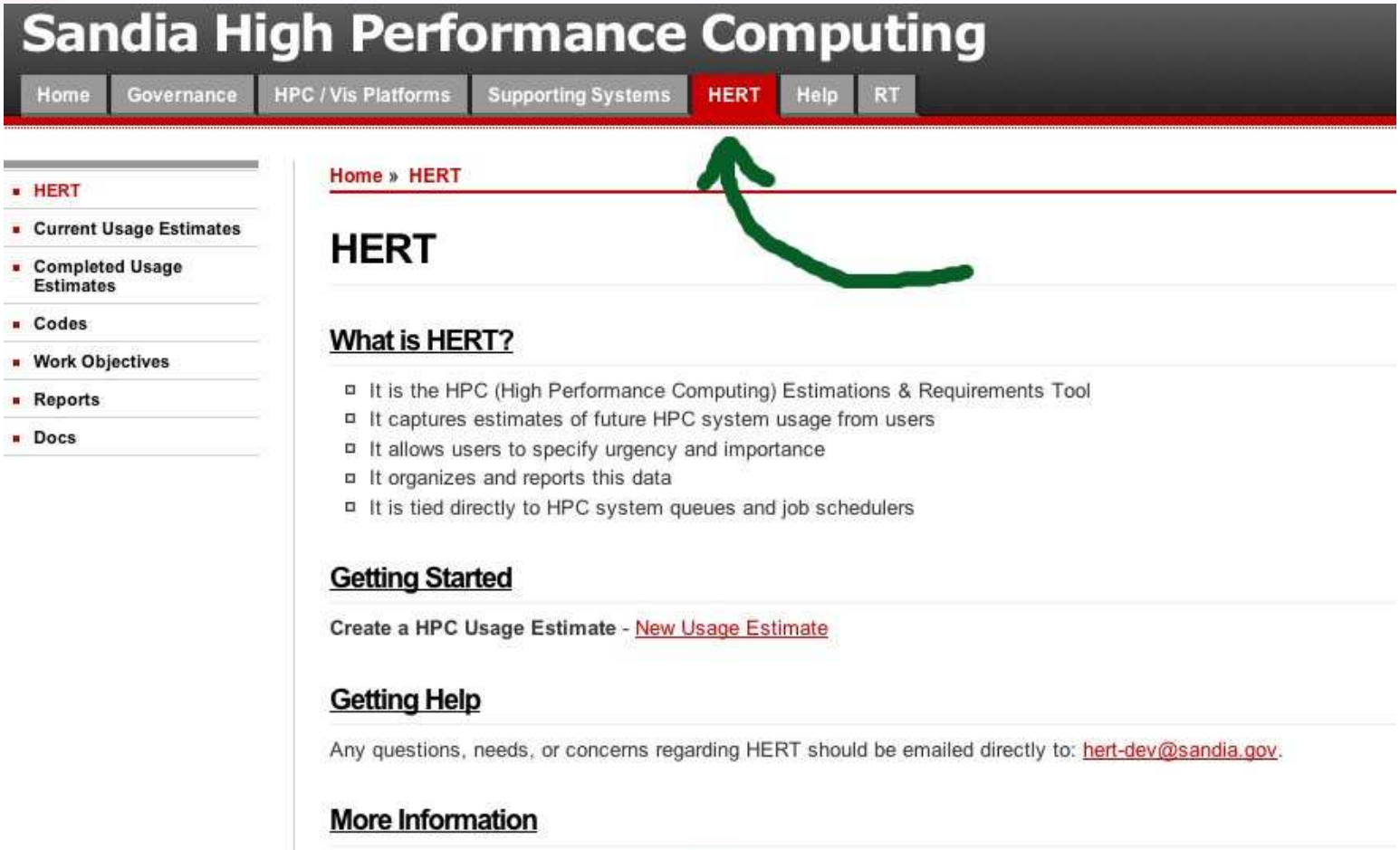
Getting Started



Inclusion of Usage Estimation Tool



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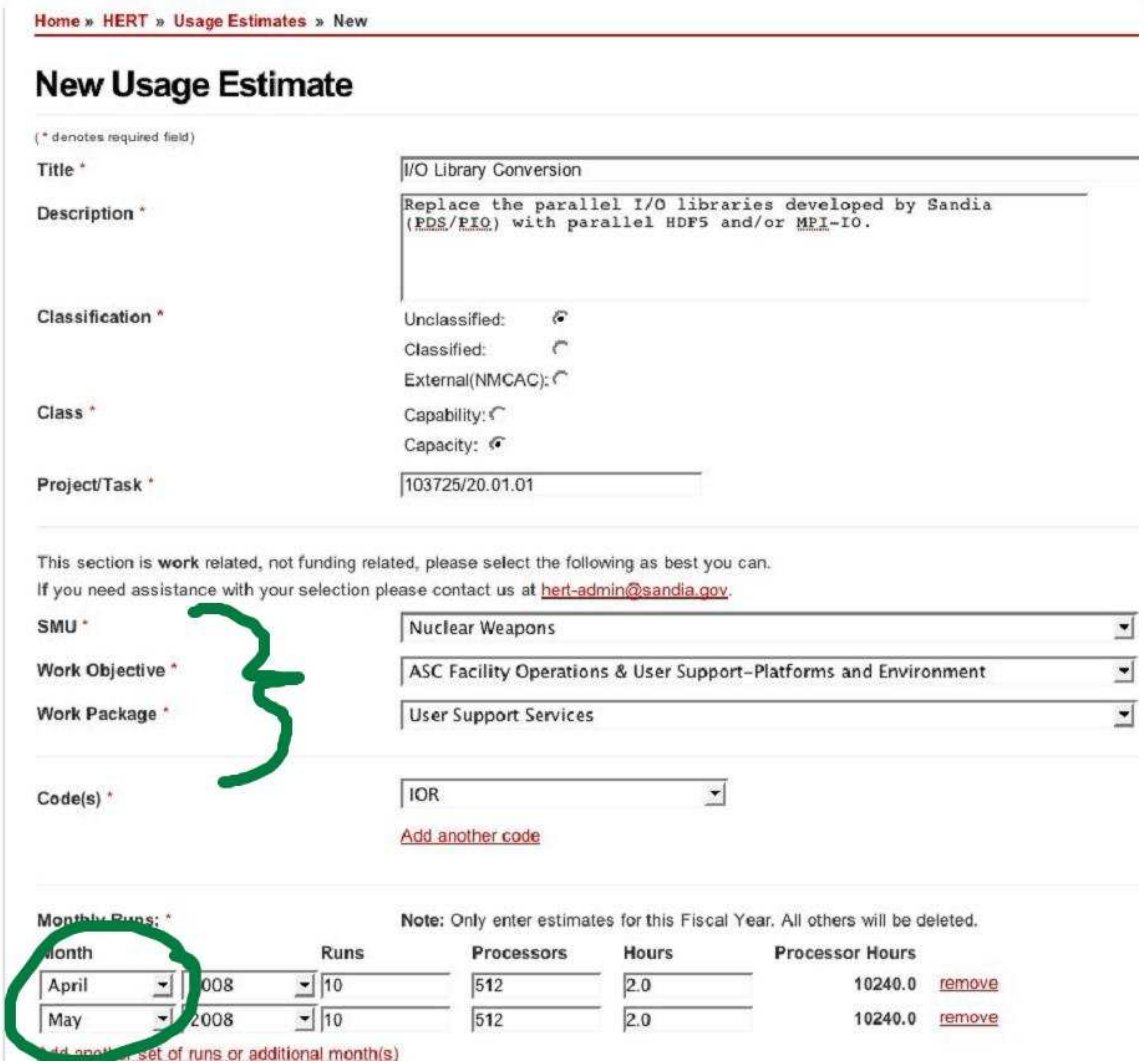
Enter "New Usage Estimate"



Home » HERT » Usage Estimates » New

New Usage Estimate

(* denotes required field)

Title * I/O Library Conversion

Description * Replace the parallel I/O libraries developed by Sandia (PDS/PIO) with parallel HDF5 and/or MPI-IO.

Classification * Unclassified: ◉ Classified: ○ External(NMCAC): ○

Class * Capability: ○ Capacity: ◉

Project/Task * 103725/20.01.01

This section is **work** related, not funding related, please select the following as best you can.
If you need assistance with your selection please contact us at hert-admin@sandia.gov.

SMU * Nuclear Weapons

Work Objective * ASC Facility Operations & User Support–Platforms and Environment

Work Package * User Support Services

Code(s) * IOR

Add another code

Monthly Runs: * **Note:** Only enter estimates for this Fiscal Year. All others will be deleted.

Month		Runs	Processors	Hours	Processor Hours	
April	2008	10	512	2.0	10240.0	remove
May	2008	10	512	2.0	10240.0	remove

Add another set of runs or additional month(s)

⇨ Workload Characterization

⇨ Estimates by month

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View Usage Estimate

⇨Used data to defer milestones

⇨07 data led directly to 08 HPC procurements

Home » HERT » Usage Estimates » I/O Library Conversion

I/O Library Conversion

HERT Estimate Identifier	2190
SPOC Considered?	No
Title	I/O Library Conversion
Description	Replace the parallel I/O libraries developed by Sandia (PDS/PIO) with parallel HDF5 and/or MPI-IO.
Classification	Unclassified
SMU	Nuclear Weapons
Work Objective	ASC Facility Operations & User Support-Platforms and Environment
Work Package	User Support Services
Project/Task	103725/20.01.01
P/T SMU	NW
P/T Description	USER SUPPORT SERVICES
Code(s)	▫ IOR

Processor Hours

Month	Runs	Processors	Hours	Processor Hours
4/2008	10.0	512.0	2.0	10,240.0
5/2008	10.0	512.0	2.0	10,240.0
Total				20,480.0

Class	Capacity
Machine	N/A
Additional Users	N/A
High Importance Request	N/A
Comment	N/A
Milestone	N/A
Created By	Heather Robideau
Created Date	April 30, 2008 14:21

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Management Involvement

Home » HERT » Reports » SPOC Considered Estimates

SPOC Considerations

Classification: Classified / Unclassified / All

Class: Capacity / Capability / All

Completed: Yes / No / All

Valid For Range:

Start: **Month:** 4 **Year:** 2008

End: **Month:** 4 **Year:** 2008

Generate Report | Get Report in CSV

Update Priorities

Legend

Classified	Denoted by pink background and **bold** text
Capability	Runs on ASC Red Storm
Small Black/Red	Fits estimates above the solid green line
Large Black/Red	Fits estimates above the solid blue line
Jumbo Black/Red	Fits estimates above the solid red line
Capacity	Runs on any other machine
Capacity Line of Demarcation:	Fits estimates above the solid green line

Note: Max Proc Count represents the maximum number of processors an estimate will use on the platform.

Priority	Title	Total Processor Hours	Time Frame	Work Objective	Work Package	Capability	Milestone	Max Proc Count	Requestor	SPOC Consid
35	**SGT crash simulations**	**3,000,000.0**	**Nov 2007 - Jun 2008**	**ASC Computational Systems & Software Environment**	**L2 Milestone (FY08) Deliver post-processing tools that enable verification & validation of FY08 simulations**	**Yes**	**N/A**	**2500**	[redacted]	**Demote**
36	3D ALEGRA radiation magnetohydrodynamics simulations of wire array z-pinch implosions for ICF applications	576,000.0	Apr 2008	Inertial Confinement Fusion (ICF) Ignition & High Yield Campaign	ICF Ignition and High Yield	Yes	N/A	600	[redacted]	Demote
1	Testing Aleph: plasma sheath simulations and arc modeling	480,000.0	Nov 2007 - Dec 2008	ASC Physics and Engineering Models	P&EM Other	No	N/A	100	[redacted]	Demote
22	**First Principle Simulation of Electromagnetic Pulse**	**432,000.0**	**Jan 2008 - Sep 2008**	**ASC Computational Systems & Software Environment**	**L2 Milestone (FY08) Deliver post-processing tools that enable verification & validation of FY08 simulations**	**Yes**	**N/A**	**1500**	[redacted]	**Demote**

Sandia Platform Oversight Committee

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Reports

Home » HERT » Reports » SPOC Considered Estimates

SPOC Considerations

Classification: Classified / Unclassified / All

Class: Capacity / Capability / All

Completed: Yes / No / All

Valid For Range:

Month: 4 Year: 2008

Month: 4 Year: 2008

effect of RedStorm Swing different than current

Report | Get Report in CSV

riorities

c Count represents the maximum number of processors an estimate will use on the platform.

Legend

Classified	Denoted by pink background and **bold** text
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Small Black/Red	Fits estimates above the solid green line
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	le	Total Processor Hours	Time Frame	Work Objective	Work Package	Capability	Milestone	Max Proc Count	Requestor	SPOC Considered?
	st Principle nulation of ectromagnetic lse	432,000.0	Jan 2008 - Sep 2008	ASC Computational Systems & Software Environment	L2 Milestone (FY08) Deliver post-processing tools that enable verification & validation of FY08 simulations	Yes	N/A	1500	[redacted]	Demote
5	ulsed Power HEDP code development, testing, and employment.	200.0	Dec 2007 - Sep 2008	Inertial Confinement Fusion (ICF) Ignition & High Yield Campaign	ICF Ignition and High Yield	Yes	N/A	100	[redacted]	Demote
35	SGT crash simulations	3,000,000.0	Nov 2007 - Jun 2008	ASC Computational Systems & Software Environment	L2 Milestone (FY08) Deliver post-processing tools that enable verification & validation of FY08 simulations	Yes	N/A	2500	[redacted]	Demote
39	Presto pervasive failure ASC level 2 milestone	360,000.0	Sep 2007, Dec 2007 - Aug 2008	ASC Integrated Codes-Code Development and Applications	L2 Milestone (FY08) Predictive failure capabilities in SIERRA mechanics	Yes	N/A	3000	[redacted]	Demote

Requests above the green line can be met; those below cannot be met

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It HERTs so Good . . .

- Most important points:
  - This software is helping users, system administrators, & managers to organize, prioritize, and submit jobs to all high-performance computing systems
  - We, SNL, are using HERT as a prototype to tie compute requirements directly to management of machine resources via interfaces provided by the Moab Cluster Software suite
  - HERT reports are being used as prototype of job accounting summaries from job usage databases (Gold, AIRS)
  - Management is able to identify work that is getting done, as well as work that is NOT getting done!

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Questions?

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  - http://www.sandia.gov

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