Quarterly R&D HPCS Summary Report
For The HPC Board

Submitted by: R&D HPCS Implementation Team

Q3 FY 10

Utilization By Site and Project

	Princeton				
	Planned Hours	Hours made available	Hours used	% EMP Allocation	Allocation used
EMP Project					
Advanced Data Assimilation R&D					
Air Quality					
BLDR-Climate					
BLDR-Grants					
Climate Model Calibration					
Climate Scenario Analysis	1,519,586	1,518,895	625,149	10.0%	4.12%
Climate Scenario Generation	3,039,171	3,037,789	8,510,497	20.0%	56.03%
Climate Test Bed					
Climate Prediction Center					
DTC					
DTC-Grants					
ESMF and Software Infrastructure Development	759,793	759,447	259,979	5.0%	1.71%
Global Reanalysis					
HMTB					
Infrastructure					
JCSDA					
CFS Reanalysis					
Next Generation Global Model Dev.					
Next-generation Ocean Model R & D	2,279,379	2,278,342	1,416,558	15.0%	9.33%
Observing Systems R&D					
Rapid Refresh					
Reforecasting Research and Development					
Regional Reanalysis					
Seasonal Climate Modeling R & D	1,519,586	1,518,895	833,376	10.0%	5.49%
Long-term Climate Model R & D	6,078,343	6,075,578	2,667,877	40.0%	17.56%
Hurricane Forecast Improvement					
Totals	15,195,857	15,188,946	14,313,435	100.0%	94.2%
Total Planned hours	15,195,857				
Total actual hours	15,188,946				
Cores	7970				
Hours per quarter	2,184				
Planned utilization	90%				
Null time (hrs)	1.87				
Downtime (hrs)	737.20				
Actual availability	96.96%				
Variances					
Hrs available Vs planned	-6,911.27				
Hrs used Vs available	-875,510.77				
EMP allocation not used	-5.76%				
Currency	61%				
Variables					
Constants					

	Boulder				
	Planned Hours	Hours made available	Hours used	% EMP Allocation	Allocation used
EMP Project					
Advanced Data Assimilation R&D					
Air Quality	485,759	500,767	850,688	8.0%	13.59%
BLDR-Climate	971,518	1,001,534	794,612	16.0%	12.69%
BLDR-Grants	1,032,238	1,064,130	1,213,549	17.0%	19.39%
Climate Model Calibration					
Climate Scenario Analysis					
Climate Scenario Generation					
Climate Test Bed					
Climate Prediction Center					
DTC	485,759	500,767	2,119	8.0%	0.03%
DTC-Grants	485,759	500,767	1,846	8.0%	0.03%
ESMF and Software Infrastructure Development					
Global Reanalysis					
HMTB	60,720	62,596	369,463	1.0%	5.90%
Infrastructure			9,648		
JCSDA	182,160	187,788	0	3.0%	0.00%
CFS Reanalysis					
Next Generation Global Model Dev.	485,759	500,767	1,053,056	8.0%	16.82%
Next-generation Ocean Model R & D					
Observing Systems R&D	303,599	312,979	7,367	5.0%	0.12%
Rapid Refresh	1,092,958	1,126,726	1,324,426	18.0%	21.16%
Reforecasting Research and Development					
Regional Reanalysis	485,759	500,767	5,469	8.0%	0.09%
Seasonal Climate Modeling R & D					
Long-term Climate Model R & D					
Hurricane Forecast Improvement					
Totals	6,071,987	6,259,589	5,632,243	100.0%	89.8%
Total Planned hours	6,071,987				
Total actual hours	6,259,589				
Cores	3372				
Hours per quarter	2,184				
Planned utilization	85%				
Null time (hrs)	0				
Downtime (hrs)	113				
Actual availability	100.00%				
Variances					
Hrs available Vs planned	187,602.12				
Hrs used Vs available	-627,346.56				
EMP allocation not used	-10.18%				
Currency	11.65%				
Variables					
Constants					

	Gaithersburg				
	Planned Hours	Hours made available	Hours used	% EMP Allocation	Allocation used
EMP Project					
Advanced Data Assimilation R&D					
Air Quality					
BLDR-Climate					
BLDR-Grants					
Climate Model Calibration					
Climate Scenario Analysis					
Climate Scenario Generation					
Climate Test Bed	660,762	677,756	781,128	12.0%	13.83%
Climate Prediction Center	110,127	112,959	10,532	2.00%	0.19%
DTC					
DTC-Grants					
ESMF and Software Infrastructure Development					
Global Reanalysis					
HMTB	660,762	677,756	397,278	12.0%	7.03%
Infrastructure					
JCSDA	660,762	677,756	743,460	12.0%	13.16%
CFS Reanalysis	2,973,431	3,049,903	2,935,296	54.0%	51.97%
Next Generation Global Model Dev.					
Next-generation Ocean Model R & D					
Observing Systems R&D					
Rapid Refresh					
Reforecasting Research and Development					
Regional Reanalysis					
Seasonal Climate Modeling R & D	110,127	112,959	231,778	2.0%	4.10%
Long-term Climate Model R & D					
Hurricane Forecast Improvement	330,381	338,878	2,848	6.00%	0.05%
Totals	5,506,353	5,647,969	5,102,320	100.0%	90.3%
Total Planned hours	5,506,353				
Total actual hours	5,647,969				
Cores	2736				
Hours per quarter	2,184				
Planned utilization	95%				
Null time (hrs)	0.00				
Downtime (hrs)	21.50				
Actual availability	99.50%				
Variances					
Hrs available Vs planned	141,615.28				
Hrs used Vs available	-545,648.12				
EMP allocation not used	-9.66%				
Currency	27.35%				
Variables					
Constants					

EMP Projects Normalized Across all of the R&D HPC Sub-Systems

	Normalized	
	% EMP Allocation	Allocation used
EMP Project		
Advanced Data Assimilation R&D		
Air Quality	0.93%	1.58%
BLDR-Climate	1.86%	1.48%
BLDR-Grants	1.98%	2.26%
Climate Model Calibration		
Climate Scenario Analysis	6.10%	2.51%
Climate Scenario Generation	12.20%	34.18%
Climate Test Bed	3.28%	3.78%
Climate Prediction Center	0.55%	0.05%
DTC	0.93%	0.00%
DTC-Grants	0.93%	0.00%
ESMF and Software Infrastructure Development	3.05%	1.04%
Global Reanalysis		
HMTB	3.40%	2.61%
Infrastructure	0.00%	0.00%
JCSDA	3.63%	3.60%
CFS Reanalysis	14.77%	14.21%
Next Generation Global Model Dev.	0.93%	1.96%
Next-generation Ocean Model R & D	9.15%	5.69%
Observing Systems R&D	0.58%	0.01%
Rapid Refresh	2.10%	2.46%
Reforecasting Research and Development		
Regional Reanalysis	0.93%	0.01%
Seasonal Climate Modeling R & D	6.65%	4.47%
Long-term Climate Model R & D	24.40%	10.71%
Hurricane Forecast Improvement	1.64%	0.01%
Totals	100%	92.66%

Discussion
Princeton: **Boulder:** **Gaithersburg:**

Summary

Utilization of Storage Resources			
	Disk (TB)	Tape Archive (TB)	
	Available	Available	Used
Princeton	717	22,955	18,899
Boulder	800	N/A	575
Gaithersburg	47.04	2,700	629

Discussion
Princeton: archive disk capacity = 112TB Fast scratch file system = 59TB Long term scratch file system = 60TB Concern regarding growing data storage due to use of ORNL systems **Boulder**: Gaithersburg: Concern regarding the risk of running out of tape capacity before new system at site B becomes available in 2011.

Summary

System Availability (for SLTs)				
	Q1	Q2	Q3	Q4
Princeton	96.25%	98.47%	96.96%	
Gaithersburg	99.37%	99.69%	99.5%	
Boulder	100%	99.95%	100%	

Planned HPC Availability is 97%

Scientific Data Availability				
	Q1	Q2	Q3	Q4
Princeton (HSMS)	98.39%	99.36%	98.54%	
Gaithersburg	99.46%	99.74%	98.9%	
Boulder	99.99%	99.43%	99.61	

Planned Scientific Data Availability is 99%

Discussion

$$Availability = \frac{TimePerMonth - NullTime - DownTime}{TimePerMonth - NullTime}$$

Princeton:

Boulder:

Gaithersburg:

Summary

System Life Throughput			
	Planned	**Delivered**	**Variance**
WS-1A	3,840	3,919	+79
WS-2A	3,896	3,976	+80
WS-3A	13,967	14,294	+327
WS-3B	19,362	19,810	+448
WS-4	25,533	26,973	+1,440
WS-5	3,075	3,351	+276
WS-6	16,360	17,110	+750
WS-7	12,077	18,656	+6,579
WS-8	7,020	8,309	+1,289
WS-9	3,893	4,709	+816

Discussion

$$SLT_i = \sum_j \frac{T_{i,j} A_{i,j}}{B_{i,j}}$$

SLT = System Life Throughput
T = total wall-clock Time during system configuration j
A = Availability
B = workstream Benchmark time
i = WS number
j = system configuration period

Princeton:
Boulder:

Gaithersburg:

Summary

User Experience

Princeton:
Boulder:

Gaithersburg:

Appendix

August 4, 2006, edited by Ron Bewtra

Agreed to
Measure Categori