



*HPCx User Group:
Current Status & Phase 3 Upgrade*

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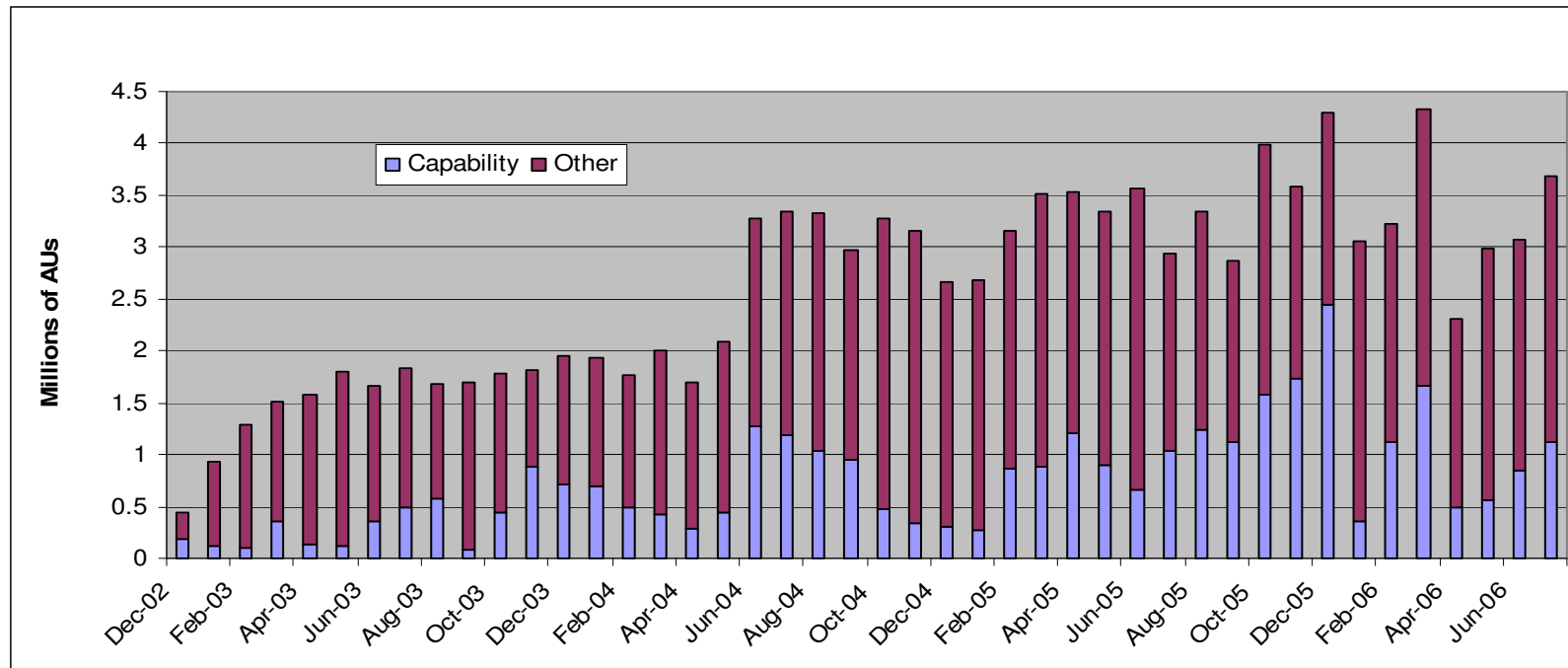


- HPCx Status
 - Usage
 - Events
- Upgrade to Phase 3
- Plans for 2007
- Summary

HPCx Status



- *Targets: >75% utilisation with half of this on capability jobs*



- *Maximum utilisation for this year was in March - 84%*
- *Fall-off in April, followed by return to average of 70%*
- *Capability use this year is 27% of total*

End of CSAR Service

- **CSAR closed on 30th June 2006**
 - collaborated closely with them to ensure minimal disruption to users
- **12 projects transferred to HPCx**
 - remaining time for 8 others transferred to corresponding projects on HPCx
- **4 CSAR projects deferred by EPSRC until HECToR with the agreement of PIs**
 - UK resources increase again with Phase 3 upgrade
- **All tasks completed in time for closure of CSAR**

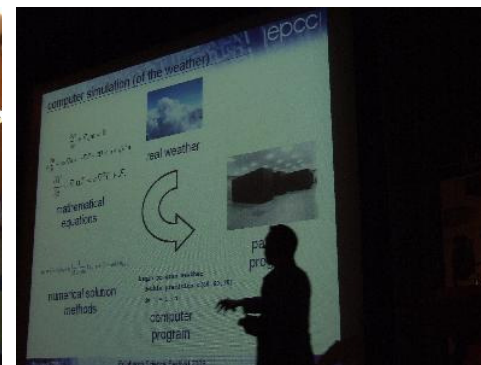


Usage Highlights



- Phase 2A hardware has proven very reliable
 - MTBF for technology more than 1000 hours during 2006
- Improved memory capacity & bandwidth helped many codes
 - saw up to 2x increase over Phase 2 despite slower clock
- Some codes sensitive to slightly higher latencies
 - but these benefited from Simultaneous Multi-Threading
- Currently ~53 active research consortia, 700 external users
- A number of recent months have had record usage
 - e.g., March delivered more than 4M AUs, representing utilisation of more than 84%

- For the second year in a row, HPCx gave a talk at the Edinburgh International Science Festival:
 - *Supercomputing: the Rise of the Machines*
- Very successful event
 - with a general audience of more than 100 attendees



Upgrade to Phase 3



Initial Upgrade to POWER 5



- Phase 2 was successfully replaced by a POWER 5-based system in 4Q2005 (Phase 2A)
 - complete replacement of entire HPCx computing infrastructure with minimal downtime
- **Benefits**
 - 2x memory per processor and (almost) 2x memory
 - enhanced performance for user codes
- **Development System installed in Jan 2006**
 - 192 CPUs with separate queue structure
 - improving turnaround time for jobs using small numbers of processors
 - mainly used by NERC

Phase 2A



- Phase 2A configuration
 - p5-575 dual core compute nodes
 - each node has 16 CPUs (1.5 GHz) + 32 GBytes
 - Phase 2A has total of 96 nodes → 1536 CPUs
 - total memory of 3 TBytes

Upgrade to Phase 3



- Phase 3 upgrade will involve adding additional p5-575 frames to meet performance targets
 - expecting a total of 20 compute frames, i.e., 2560 processors
- Important preliminary work on switch cabling
 - completed in April during maintenance session
- Significant system software upgrade in May
- Initial Phase 3 frames arrived at start of August

- 16 October: performance benchmark testing
- late October: 10-day reliability test
- 1 November: full production service

Proposed Initial Queue Configuration



Region	Capability (256-1024)	Capacity (32-128)	Development	Interactive	TOTAL
CPU's	1536	800	192	32	2560

- More than pro-rata growth planned for Capacity region due to:
 - expected additional load transferred from CSAR
 - occasional back-log of smaller jobs (particularly 128s)
 - modest demand for jobs of 1024+ CPU's
- HPCx believe that this proposed configuration should best match the current workload
 - but we will monitor this carefully
- *Your comments would be welcomed*

- Looking for user input on a number of topics
 - email support@hpcx.ac.uk
- System libraries
 - IBM want to know user priorities to guide development
 - MPI? ScaLAPACK? PESSL? BLAS? ...
- Training courses
 - we are able to give courses at other sites
 - do you have a local community who would benefit?
- Technical reports
 - 2006: SMT, data transfer, Phase 2A, POWER5, ...
 - looking for input for 2007 topics

- 2006 has been a busy year so far
 - CSAR users have been accommodated
 - although HPCx is now full
 - System has been successfully upgraded to POWER 5
- Upgrade to Phase 3 is on target and should further improve the service to users
 - providing a capability system through 2008
 - extra processors should help throughput
- For 2006, focus remains on:
 - producing Capability Science from POWER 5
 - ensuring high quality research outputs
- Contact us if you have any comments / suggestions

Any Questions?