High Performance Scientific Computing

New Web Site

A new remodelled HPSC is now available at www.hpsc.csiro.au. This site contains numerous improvements and should provide better access to key resources for users and staff.

Software Licences – Operating Budgets

HPSC is continuing to provide access to a range of applications software on a shared basis with users meeting part costs. See website homepage for details. These costs need to be considered in 2005 project or group budgets for those wishing to access the software.

Storage Resource Broker

HPSC is now supporting the Storage Resource Broker (from the San Diego Supercomputer Centre). SRB is client-server middleware which provides users with a unified view of their data holdings (which may be distributed across a network on heterogeneous hardware resources. It also provides a Meta-data-base accompanying the data. This combination enables users to access data resources based on their attributes and/or logical names rather than their physical location.

SRB manages data in 'Zones', where each zone consists of an SRB server and some data resources. These Zones can be 'federated' so that users can seamlessly access the resources of all of the Zones in the federation. As a result, it is possible for collaborators to work and store data using distributed systems and yet see a unified view of their combined data assets.

Users of SRB can operate purely as clients to an existing Zone (and its federation partners), or if appropriate, host their own Zone and serve data resources. SRB's functionality includes parallel data transfer (i.e. the file is sent in parallel streams resulting in better performance over long-fat pipes); file replication; third-party transfer so that data movement can be unsupervised; and a wide range of client-interfaces including Unix command line, HTML, Windows, Java and WSDL.

SRB also supports multiple forms of authentication. The main ones are encrypted password and GSI grid certificates; where the latter provides integration with grid authentication.

HPSC is hosting an SRB Zone and providing data resources via the HPSC hierarchical file system. Our Zone can be federated with Zones exterior to CSIRO (such as APAC) as well as with Zones interior to CSIRO.

For more information, contact Neil.Killeen@csiro.au and/or enjoy the SRB website at www.sdsc.edu/srb.

Data Surge and Storage Policies

Total primary storage on the HPSC Datastore grew to 81 Tbyte by end of April, up from only 57 Tbyte at the start of February, representing a huge annual growth rate should it continue. All but 4 Tbyte of this data has been accessed in the last four years.

We may be seeing the predicted movement towards data intensive computing arising from the ever increasing ability to compute more details in every model along with the development of multi-scale models. These new models often increase the parameter spaces to be searched simultaneously with a substantial increase in the total data that is generated.

In the face of this growth, HPSC has modified some of its storage policies:

- For large files, both copies are now kept on high-capacity media which is more cost effective but does increase access times
- Where data can be identified as a mirror of data existing elsewhere, only one copy will be kept (as an example, the globally shared IPCC climate data falls into this category)

System Upgrades

Several of the systems in HPSC have been upgraded since the start of 2005:

- Additional processors have been delivered for the Xeon clusters to give a total complement of 168 processors: 56 Xeon with 2GB RAM, 56 Xeon with 4GB RAM and 56 Xeon EMT64s with 2GB RAM
- The two chassis containing the Xeon EMT64 processors are interconnected with infiniband for high speed MPI processing
- The disk on the Datastore has been extended to 8.75 TByte
- All files less that 1MByte are now permanently disk cached for fast access

HPSC is also contributing $500k towards a system purchase in Perth to be managed within the IVEC joint venture with local Universities. A number of users across several divisions in Perth will benefit from the acquisition.

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