

ac3's Capabilities to support NCRIS

Background

ac3 is an advanced computing centre, established in 2000 by the NSW State Government, and 8 NSW-based Universities. **ac3** operates as an independent company jointly, with the NSW State Government holding 57 per cent equity, and with University partners holding the remainder.

ac3 is required to operate as a self-sustaining business. The bulk of its business is derived from the provision of managed services and co-location for government and the private sector.

Generic Services provided by ac3

Co-location services

ac3 operates two highly secure, highly available, and well connected data centres:

- **Security:** the ATP data centre is accredited to the 7799 data centre security standard, and as such **ac3** is entrusted by quite a few organisations to host sensitive databases.
- **Availability:** **ac3**'s power and air-conditioning infrastructure has a high degree of redundancy, with virtually all single points of failure eliminated.
- **Communications:** dual redundant gigabit links to two different Optus exchanges, which are managed by Optus on a 24x7x365 basis; connections to AARNet, CeNTIE.

Managed Services

ac3 provides managed services on a 24x7x365 basis to over 70 organisations, including six of the state's universities — Sydney, UNSW, UTS, Macquarie, Wollongong and Newcastle. These services are based around the ITIL framework, and include:

- Incident Management
- Change Management
- Backups
- Supply of hardware
- Operating system support (Solaris, Windows, Linux)
- Asset Management
- Database administration
- Network design and management
- Security consulting and management
- Storage design and management
- Business Continuity
- Project Management

ac3 is well placed to serve the research community where high levels of security and availability are required.

Support for eResearch

ac3 services a broad range of research communities. While the bulk of the support that is presently provided is computationally oriented (involving the parallel computing systems at **ac3** and the APAC NF), our participation in the APAC grid program has fostered a growing range of activity in the data arena. The disciplines supported are:

- **Computational services:** chemistry, physics, materials science, nanotechnology, photonics, engineering, earth systems science, biosciences, geosciences, mathematics, high energy physics,
- **Data services:** bioinformatics, astronomy, geosciences, earth systems science.

In broad terms, the services provided to users comprise:

- Systems administration: managed services, collocation, software installation and maintenance,
- User support and helpdesk facilities for users of local (**ac3**) and national (APAC) HPC systems,
- Computational services: parallelisation, programming development and support, scripting,

- Data services: data storage, management, curation, distributed access (SRB), portal development, workflows, OpenDAP services, GIS services,
- Visualisation services: VTK, ARCGIS, etc
- Access Grid: operation support for users (at partner sites)

ac3 has key relationships with a number of organisations including:

- 30 NSW Government agencies — contractual relationship for managed services.
- ARC Centres of Excellence—Centre for Ultrahigh-bandwidth Devices for Optical Systems and Centre for Free Radical Chemistry and Biotechnology
- ARC Networks—Parasitology, Earth Systems Science, Molecular and Materials Structure
- SIRCA — Securities Industry Research Centre of the Asia Pacific
- CMCRC — a member of the Capital Markets Cooperative Research Centre
- ANSTO—Australian Nuclear Science and Technology Organisation (just commencing).

Research Facilities operated by ac3

January 2004

Computational Facilities

- Dell Cluster: 152 node (308 CPU) Intel Xeon based Beowulf Cluster, 308GB RAM (total), 1.09TFlops.
- SGI Origin 2400, 64 CPU, 32GB RAM (50GFlops peak).
- SGI Power Challenge, 28 CPU, 4GB RAM (11GFlops peak).
- NEC SX5, 2 CPU, 12GB RAM, 16GFlops.

Storage

- 1.2 TB RAID 5 Storage.
- IBM 3494 tape silo, 4*Magstar 3590 tape drives (4TB total).

Network

- 1 Gbit connection to GrangeNet.
- 1Gbit to CeNTIE
- 1 Gbit link to Optus

Early 2007

Computational Facilities

- Dell Cluster: 186 node (376 CPU) Intel Xeon based Beowulf Cluster, 376 GB RAM (total), 1.2TFlops.
- SGI Altix 4700, 16 CPUs, 1.6GHz, 32GB RAM.
- NEC SX5, 2 CPU, 12GB RAM, 16GFlops.
- New capability system to be installed in early 2007: 256 processor, 512GB-1TB RAM, approx 2 TFlops (allocated funds \$1.1M, RFP in preparation)

Storage

- 3.2 TB RAID 5 Storage.
- 1*60 Tape silo, 3*LTO2 drives, running through TSM (6TB total).

Network

- 1 Gbit connection to AARNet3.
- 1 Gbit to CeNTIE
- Redundant 1 Gbit connections to Optus