

The Unified Model at Universities

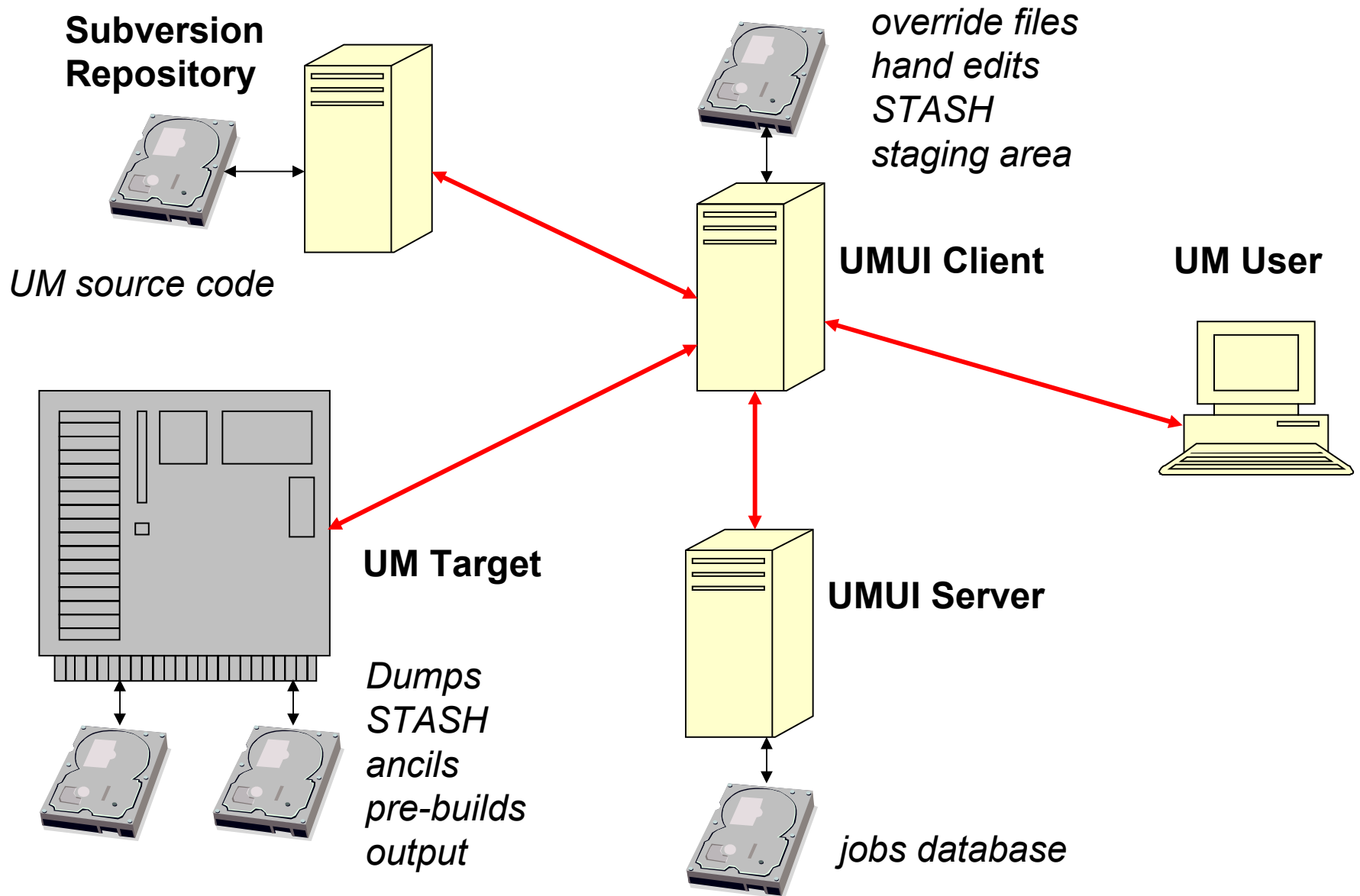
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SGI Australia





- Position funded by ARCNESS
- Design, Implementation and Support role
- Assist Universities to use the UM
- Funding for a 30% part-time position for two years
- August 2007 – August 2009

UM Architecture



Considerations

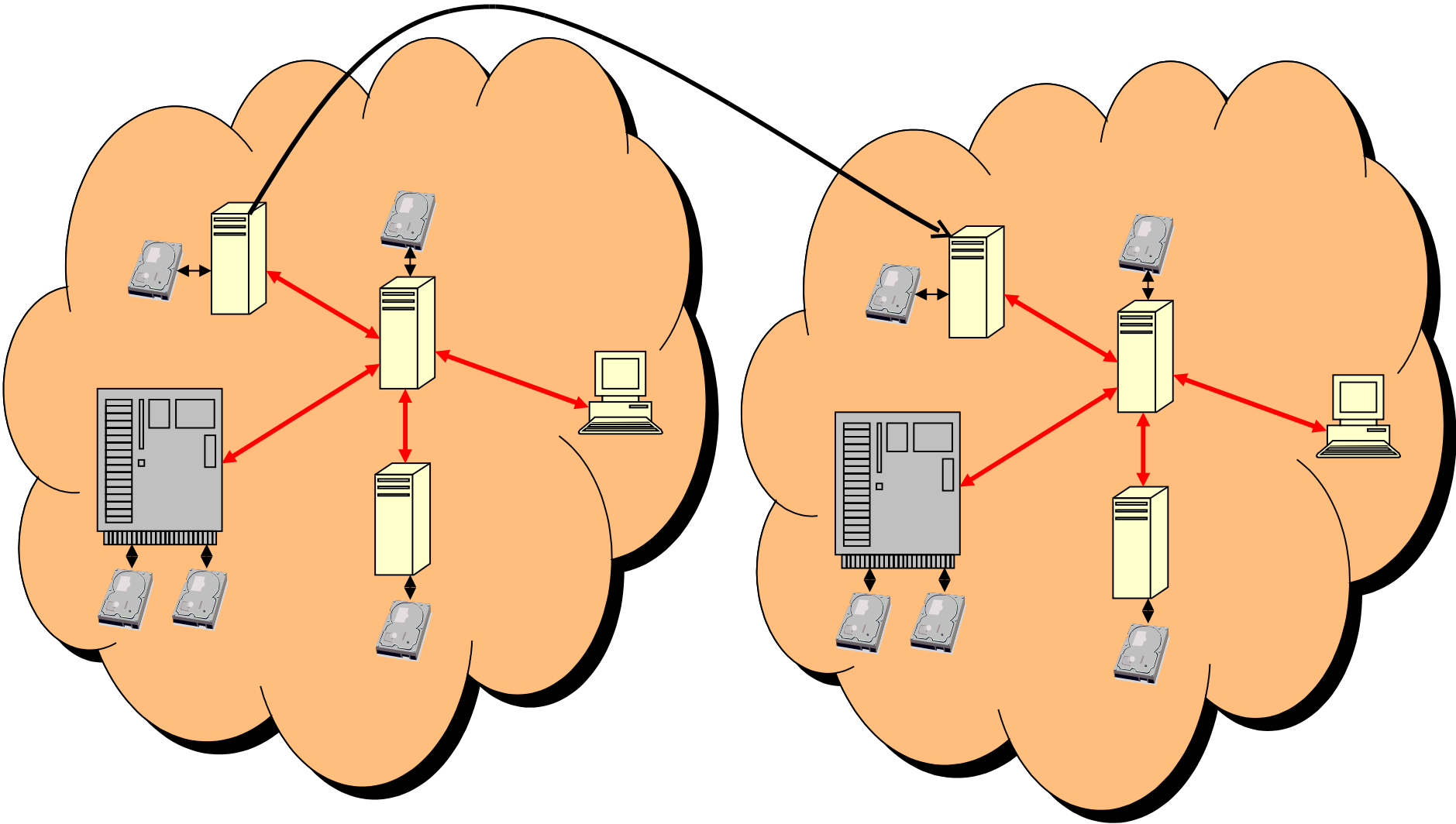
- Need an architecture that works efficiently in a diverse environment
 - Geographically – Australia, New Zealand
 - Hardware, Software resources
 - Security policies
- Minimal local support
- Limited remote support

Current Solution

- **Dedicated umuiserver at each site**
 - subversion
 - fcm
 - umui client, server and database
 - UM support tools: xconv etc
 - remote access for support
 - local back-up policy
- **Installations at:**
 - SGI Melbourne office
 - UNSW
 - University of Melbourne
 - ANU
 - Monash University

Current Solution

- **single subversion repository**
 - UM version 6.3.1
 - located at UNSW
 - managed and backed-up by UNSW IT staff (Martin Thompson)
 - remotely available by user-name / password, access policy
- **single UM target**
 - SGI Altix, ac at NCI
 - AMIP UM 6.3.1 pre-build
- **UKCA group created** (Frank Mills)
 - <http://alliance.anu.edu.au>
 - ukca@alliance.anu.edu.au



BoM/CSIRO/CAWCR

Universities

Future

- Need to integrate our separate UM installations
 - share source code
 - version upgrades
 - local site modifications
 - code development
 - single subversion repository

Future

- Need to integrate our separate UM installations
 - shared compute resources at NCI (ac, xe, ??)
 - common storage area
 - libraries (gcom)
 - pre-builds
 - dumps, ancils, STASH
 - This has been started (together with Martin Dix)
 - common area, *~access* and group *access on ac and xe*
 - *common gcom libraries*
 - *common umdir: start dumps, ancil files*
 - *common pre-builds: eg. AMIP*

Future

- Need to integrate our separate UM installations
 - shared umui database
 - simplifies sharing of jobs
- UM user Training
 - Very much needed!
 - current discussions with Gregg Roth to upgrade the UM 6.6 course to 7.1 (UKCA)
 - ASAP
- Compile and Run the UM on the umuiserver
 - local code development, debugging
 - allows more efficient use of NCI resources
 - improves turnaround for builds, debugging etc
 - UM user training

Thank You!



UM (ACCESS) on NCI

- The Universities use the supercomputer facilities at NCI for running the UM.
- A **limited** amount of computer time is available at any given time, and for any given project.
- Computer time is only allocated after submitting a **comprehensive** research plan, detailing the need for using the multiprocessor computer.
- You have to **reapply** for computer time **each** year.
- You only get allocated a **fraction** of the computer time you ask for.
- Computer time is allocated for each quarter of a year. You **can't** roll over unused computer time from one quarter into the next quarter. Use it or lose it principle.
- The amount of unused computer time each year goes **against** you when applying for computer time next year.

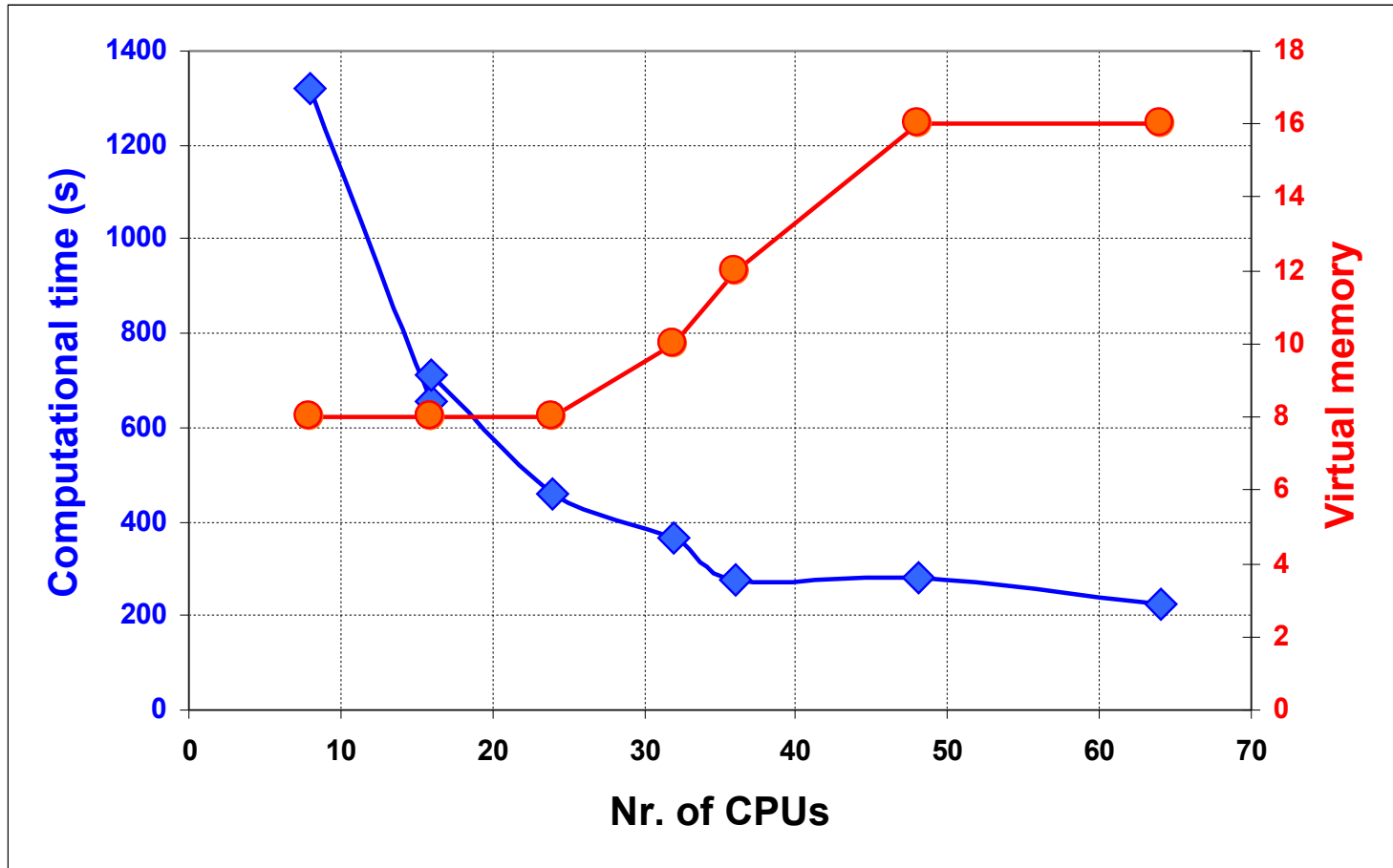
Therefore it is essential to find the **optimum** computational settings for running the UM at NCI.

Benchmarking

- Test run is Martin Dix' AMIP simulation (but with a lot of STASH switched off)
- Run the AMIP simulation for 2 days several times using various
 - number of processors
 - different amount of specified walltime
 - different amount of memory
- Run the AMIP simulation once for a whole month in order to check whether you can extrapolate the findings for 2 days to 1 month

The lower the requested number of CPUs, the quicker your simulation will be allocated the required CPUs

The lower the requested amount of walltime and memory, the more likelier you will move up the queue.



Note:

- 1) The simulation of one month took 14.7 times longer than that of 2 days.
Hence the results can be extrapolated to other simulation times.
- 2) The maximum number of CPUs is set by NCI at 64. Special permission is required to use more than 64 CPUs.

University of Melbourne

- Setup, run and verify Martin Dix' AMIP simulation.
- Run the AMIP simulation various times with slightly different initial conditions and/or resolutions.
- Include UKCA – investigate impact of ozone changes on the climate.
- Setup, run and verify a regional domain model (RCM) for Australia.
- Run RCM under various forcings to obtain insights on the impact of climate change on Australia.

Currently involved are Frank Drost and Roger Dargaville.