

## Computation and Data Committee Report to the CASCA Board, June 2012

Current Committee membership:

James Wadsley (McMaster U.) (Chair)	Term ends: 31 June 2013
Jonathan Dursi (CITA/SciNet)	Term ends: 31 June 2014
J. J. Kavelaars (HIA/NRC/CADC):	Term ends: 31 June 2014
Jason Fiege (U. Manitoba)	Term ends: 31 June 2013

### Status of Computing in Canada: Update

The situation in terms of hardware funding has not improved, with no clear indications on new funding. As described in prior reports from this committee, we expect no new CFI funded systems available to users before 2016. By 2016 all current systems will be old and far behind the leading edge and Canada as a whole will be something like an order of magnitude below the G10 average in HPC capability per GDP. Some current consortia are likely to have essentially no functioning CFI funded systems by this time. Due to the connection between systems and operating expenses (e.g. CFI overhead funds), many experienced staff could be lost and thus large regions of Canada will be without local staff or systems. Compute Canada was awarded NSERC MRS money at the level of \$ 2M per year for the period 2007-2012, but the program is being phased out. MRS money provided an important match to CFI's MSI operating fund program which, by design, will cover no more than 40% of such costs for a given organization. It seems unlikely that CFI's MSI program will be able to pick up the slack or maintain our staffing levels which are substantially below levels in other countries as it is.

CFI has recently been recommending consolidating systems at significantly fewer sites. However, many sites currently have staff who both oversee hardware and provide direct user support as such consolidation is likely to remove local staff. The mid-size clusters (~ 1000 nodes) currently present at many universities are a valuable, nationally available resource well suited to the needs of most Canadian users. Most other countries have similar levels of on campus computing as a complement to their supercomputer centres. Since all computing beyond desktops is now CFI funded, the proposed centralization would gut mid-level computing and leave a hollowed out computing ecosystem with only desktop computing and high-end HPC. It is widely felt that CFI is responding haphazardly partly due to its own funding uncertainties and that CFI does not have a coherent HPC strategy that makes sense.

Compute Canada is undergoing a dramatic reorganization. This reflects a response to pre-conditions imposed by CFI associated with MSI funding and a feeling within the consortia and the Compute Canada board (University VPR associated with consortia) that Compute Canada was not effective. The immediate impact is that the Compute Canada Executive Director Susan Baldwin has been let go with no permanent replacement. A statement from the board indicated major changes to the organization which could include incorporation as a not-for-profit and a new board that would include industry and government figures similar to the CANARIE board and CFI has convened an expert panel to recommend a new structure. A key concern over all these new requirements is the lack of any guarantees that Compute Canada would be funded in a more stable, long term even after the reorganization. Provincial governments have also been asking for consolidation so that Compute Ontario and a single Quebec consortium are in development.

Canada has had essentially no lobbying for Computing for several years. This was intended to be a task undertaken by Compute Canada. Until recently, CFI had actively discouraged direct contact between Compute Canada and government (e.g. Industry Canada). However, contrasting prior lobbying success following the HPC LRP in 2005 which resulted in the NPF and several years of solid funding with what occurred after lobbying ended it seems that it was poor advice and should have been disregarded. Compute Canada is being reorganized and it is unclear what lobbying

mechanisms or committees will be built into the new organization. There will likely be a group within Compute Canada tasked with lobbying and/or representing researchers (the function of the CPAC group in the old Compute Canada).

**The CDC recommends that CASCA seek to have a formal representative within Compute Canada as part of a committee that represents researcher groups such as CASCA, CAP and other similar disciplinary groups. This would allow CASCA to encourage and support HPC lobbying activities and be part of a united front regarding the need for sustained HPC infrastructure in Canada.**

## **CADC Computing Update**

As discussed in prior reports, funding for all computing hardware is being channeled through Compute Canada, making CADC dependent on Compute Canada for both storage and data processing. Currently most of these facilities are provided through Westgrid. Several major CADC projects and activities (e.g. CANFAR's VOSpace Virtual Observatory) depend on the continued health of Compute Canada infrastructure. If current trends persist it will force painful transitions within CADC and we may have to renege on existing commitments.

In addition, several projects are people-intensive and need funding to support their ongoing development. For projects such as CANFAR, CANARIE (whose budget has been reduced) has provided this support, partly at a cost of developing somewhat more generic frameworks than Astronomy might prefer. A CREATE grant proposal involving HIA, McMaster, Toronto and Montreal is being developed (a letter of intent was just submitted through Montreal). A goal of this program (if funded) would be to extend the CANFAR framework that enables the storage and process of large data sets such as those originating from ALMA and large simulations and to train researchers (especially students) to be able to access these data and use remote processing frameworks.

There are several opportunities that the expertise present within the CADC could afford to Canadian astronomy, as long as the computing infrastructure is available. An example is the stepping up to host the PanStarrs public data collection which would give Canadians preferred access to PanStarrs data. In the future, we could use this mechanism to gain closer involvement with other experiments, such as handling Euclid data. However, this would require a significantly stronger commitment by Canada to providing sustained, computing infrastructure including data storage. Data storage is currently a secondary aspect of what Compute Canada does.