The Importance of Distributed ARC HQP

White Paper submitted to NDRIO
By Compute Ontario
14 Dec 2020

Executive Summary:

ARC infrastructure has become a commodity. What differentiates highly successful computational research is not the raw number of cycles consumed, but the acumen with which those cycles are used. Advanced research computing is now, more than ever, about people more than machines.

The highly-qualified personnel (HQP) of the Compute Canada Federation (CCF) apply their research computing expertise to architect, operate and continually optimize world-class ARC technology systems as well as to support researchers and their trainees in making effective and efficient use of the same systems. Both functions (ARC operations and ARC support) are critical - there is not much value in having well-run cutting-edge systems unless researchers get the support they need to make good use of them (and vice-versa). A truly national ARC system must view both operations and support as integral and connected parts of the same national endeavour. Distributed HQP form an important and valuable part of the ARC ecosystem which needs to be recognized, continued and enhanced.

Background:

There are currently only 5 institutions which host national ARC systems but there are HQP at 34 institutions across the country who all perform essential functions that directly support national ARC systems and services (including user support, training and system administration). For example, in 2020, support tickets from researchers were answered by HQP located at 30 different institutions, no host-site appears in the top 4 list of institutions which responded to researcher tickets, and three of the national systems are run by teams of HQP distributed across multiple institutions. *All* of the national systems benefit from key teams (e.g. Research Support, Storage, Scheduling, Networking and more) which are made-up of HQP from across the country. The notion that some HQP are "only providing local support" reflects a fundamental misunderstanding of their national contributions and, paradoxically, assumes that supporting a "local" researcher is not a "national" activity despite the fact that all researchers are local to their institution.

Embedding HQP in the diverse community of universities, colleges and research hospitals (all with unique needs and experience) provides personal contact and engagement with researchers (NDRIO's key customer). This, in turn, results in an enhanced understanding of their continually evolving requirements that is extremely difficult to duplicate with a centralized, remote organization. Distributed HQP help ensure that national services (including training) are also meeting local needs and keep the research community current on the opportunities afforded them by the national research computing platform.

The value of local interactions is recognized by XSEDE (funded by NSF to support open-science research computing across the US) through their highly successful *Campus Champions* program which has just celebrated ten years and supports "600+ Campus Champions at 300+ US colleges, universities, and other research-focused institutions, whose role is to help researchers at their institutions to use research computing, especially (but not exclusively) large scale and high end computing."

Benefits of Distributed ARC HQP:

The benefits of locating ARC HQP at institutions include:

- **Improved recruitment, retention and development of HQP**. Making use of HQP distributed across the country greatly increases the size and diversity of the available talent pool. The vast majority of HQP in the CCF highly appreciate the benefits of being located at research institutions which include regular engagement and interaction with researchers and students, a dynamic academic environment and multiple opportunities to learn and develop (e.g. through campus courses, invited speakers, workshops etc.) whilst also being part of a national team.
- **Better understanding** of the continually and rapidly evolving needs of researchers as a result of ongoing direct contact. Our ARC "customers" (faculty, PDFs, students etc.) work at the institutions and distributed staff means their perspectives and needs are properly articulated throughout the ecosystem.
- **Locally-informed and tailored services** for researchers such as: update sessions, drop-in hours, workshops, training, and consultations for ARC "newbies" to experts.
- **Enhanced understanding** of the mission, culture and operations of the various institutions which cover a diverse portfolio of research types and needs.
- **Direct liaison with institutional research and grant admin officers** (e.g. to increase awareness of national services and assist with grant applications which use ARC and sometimes require specialized HW and/or contributed systems).
- **Maximizing use of diverse HQP talent** which can exist anywhere in the country and should be applied to help researchers as well as being given the opportunity to develop and contribute to the larger national teams.
- **In-person training and contact.** Online training and support for researchers is important and has been widely and successfully used in ARC for the past two decades. But it remains true that in-person training and support are highly-effective and should not be abandoned. Universities, colleges and schools would all have switched to virtual learning if it truly worked as well.
- **Faster identification and resolution of complicated user issues.** Email ticketing systems are essential and work very well but are subject to mis-communication and delays – especially in the case of difficult problems requiring multiple back-and-forth emails.
- **Increased regional and institutional engagement** as a result of HQP helping to build a DRI culture distributed across a range of institutions.