

Current HPC Situation

Few if any existing HPC organizations have as their primary mission either education or direct research support. Rather, the general paradigm for organizations that provide HPC support -- both regionally and nationally -- is to make hardware, software and documentation available and to conduct occasional seminars, but to provide little or no one-on-one education to assist current HPC users in learning HPC methodologies, let alone to introduce these technologies to researchers with appropriate applications but no HPC expertise. OU's situation is quite common: the level of interest in HPC -- over 50 researchers and support staff, representing roughly 20 organizations and projects -- substantially exceeds the number of research projects currently making effective use of HPC.

Researchers, especially student researchers, encounter several barriers to HPC utilization. Among these are:

- HPC technologies are complex and idiosyncratic, so that learning to use them effectively requires substantial familiarity with the range of possible architectures and behaviors -- or, alternatively, ongoing access to persons with such expertise.
- Documentation for HPC systems is written in jargon appropriate for experienced HPC users, and typically is directed toward computer scientists and/or computational scientists, rather than toward HPC novices with strong mathematics, science and/or engineering backgrounds but little software development or hardware experience.
- HPC centers typically do not have staff whose mission is to help non-users to learn about HPC technologies and thereby to become users.
- The remoteness of HPC resources, combined with the large size of academic HPC centers, results in considerable inconvenience in the use of center resources for software development; for example, a job submitted to an HPC batch queue at a national HPC center may wait hours or even days before commencing execution.

By providing such services, OSCER will represent a unique contribution to the computing needs of OU. In addition, OSCER will naturally lead some researchers to making greater and more effective use of high performance communication technologies such as Internet2.