

Sustain and grow funding.

Ensure adequate computing resources.

Focus on production, not computing research.

Partner with other agencies.

Don't forget data, or high throughput, and the cloud.

Create and use roadmaps.

Integrate everything and expose costs to users.

Software matters, so support it.

Make small investments in new kinds hardware and software.

Sustain the CI via continuity in funding.

Box 2.2: The upshot of this is that the advanced computing facilities of the near future are liable to look significantly different from today. Consideration must be given to ensuring that the programs and algorithms being written today that need to scale into these new regimes are designed with these differences in mind and that early facilities should be available as such machines come online to allow validation of the portability of such codes.

6.1.3 Skills and Workforce Sustainable and effective cyberinfrastructure depends critically on the skills and expertise of domain scientists and of committed and well trained advanced computing professionals. Even if they are not directly responsible for code development and workflow management, scientists using advanced computing need to be generally knowledgeable about these matters. For their part, technical staff members not only deploy and operate facilities, but also support community toolkits and codes, serve as keepers of institutional knowledge and expertise, and manage and ensure data security and provenance. Unlike hardware, with a lifetime of a few years, the human infrastructure of people's experiences in operating such systems has a lifetime of decades. Despite their importance, these staff often lack clear academic career paths and are dependent on an uncertain stream of funding for support.

NSF could consider establishing one or more FFRDCs to support national cyberinfrastructure for research. Working with NSF, industry, and academia, such cyberinfrastructure FFRDCs could develop a strategic plan for cyberinfrastructure that meets evolving community needs, tracks technology developments, and provides a roadmap for NSF's directorates. The FFRDCs would also deploy and operate general or domain specific cyberinfrastructure for the national community