

Introducing the Panel



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Infrastructure is essential to social and economic progress



The Challenges of Cyberinfrastructure

- ❑ It's **very** expensive! (BIG SCIENCE)
- ❑ Success will require collaboration and shared vision.
 - *CI is cost-effective only when shared across research groups and across institutions.*
 - *Must balance individual needs with shared goals and priorities.*
- ❑ A coordinated and sustained commitment on the part of government, universities and the private sector will be essential.
 - *A national strategy...*

Some Good Questions

- ❑ Do our researchers have sufficient voice/influence to contribute to the development of CI resources on our campuses?
- ❑ How can CIOs, VPs Research and individual researchers work together to ensure that our universities have the tools and resources researchers require?
- ❑ Are we paying enough attention to the personnel needs?
- ❑ What are appropriate models for funding and governance?

Some Questions Specific to University CIOs

- ❑ How can CI compete for scarce resources on campus?
 - *Costs are high, both in setting up facilities and in supporting them.*
 - *The number of users is perceived to be low.*
 - *The appetite for “more technology” is very low.*
- ❑ How do we measure the benefits?
- ❑ What priority does the institution attach to CI?

HPC, Cyberinfrastructure and the Research Community

- ❑ Scope of Cyberinfrastructure often not well defined or explained
 - Good examples of interoperating/supportive technologies in specific disciplines (particle physics, astronomy), but more general relevance/transferability is often less clear to the research community
 - Many researchers view the agenda for usability and inclusiveness as vague and unscientific: “grid”, “cloud” etc. don’t help
- ❑ Although HPC is a fairly specialized – and modular – component of Cyberinfrastructure (CI) it, and HPC-intensive disciplines, have been dominant drivers of CI
- ❑ Non traditional disciplines expect a far greater degree of abstraction (like Google); traditionalists worry that it diverts resources

HPC in the 3rd Millennium

- Evolution: central mainframes → distributed computing → 7 HPC consortia (e.g. SHARCNET), Ontario HPC Council & Compute Canada (→ ???)



Benefits of inter-campus HPC collaboration

- ❑ Increased efficiency of use and of provision – but consortia are often largely orthogonal to the CI of the institutions they encompass
- ❑ Nimble: e.g., 17 compatible, networked collaboration rooms across **SHARCNET**; CC will have over 50
- ❑ Whole greater than sum of parts \Rightarrow world competitive \Rightarrow attract leading researchers, enable world-class research
- ❑ Facilitates inter-disciplinary interaction
- ❑ Rationalized (& rational) approach to funding agencies

Challenges for HPC Providers

- ❑ Big science used to large collaborations – many individual researchers not
- ❑ Ensuring effective input from the research community – when things don't work **and** when they do
- ❑ Mission creep – can't (& shouldn't) do all of CI
- ❑ HPC as a utility vs. foster HPC innovators
- ❑ Concentration \Rightarrow support people are visible but number/researcher is the lowest in G8 by a wide margin
- ❑ Formally research projects but really enabling infrastructure – poses challenging constraints: people, networking, training

- ❑ Researchers increasingly reliant on providers \Rightarrow long term funding critical – *single point of failure*

Integration into wider CI initiatives

- ❑ To what extent should HPC remain a modular resource or become tightly integrated into other aspects of CI?
- ❑ Interaction with IT departments at campuses is variable (share machine rooms; interact with networking teams) although strong positive gradient: far fewer silos; less turf protection (also CUCCIO & CC)
- ❑ Critically dependent on key network infrastructure – ORION, CANARIE &, often, campus last mile