The New National Dream:
A Vision for Digital Infrastructure in Canada

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State of DI in Canada Today

- DI is fundamental to contemporary research in almost all fields
  - *No longer solely the sciences and engineering, but rapidly expanding into humanities and social sciences*

- DI is increasingly complex (and very expensive)
  - *No university can provide everything their researchers need to be successful*

State of DI in Canada Today

- Our national organizations (CANARIE, Compute Canada) do good jobs on their respective pieces

- Problems:
    - *Policy gap, fragmented approaches, overlapping jurisdictions, multiple voices, inconsistent funding, focus is on equipment rather than people, …*

What's Missing

- A national vision for DI
- A coordinated approach
- A single locus of responsibility
- Public policy
- Funding to sustain success

Compute Canada

National organization for high performance computing

- WestGrid (British Columbia, Alberta, Saskatchewan, Manitoba)

- SHARCNET (Ontario)

- SciNet (Ontario)

- HPCVL (Ontario)

- CLUMEQ (Quebec)

- RQCHP (Quebec)

- ACEnet (Nova Scotia, New Brunswick, Prince Edward Island, Newfoundland and Labrador)

compute • calcul
C A N A D A

Compute Canada: Today

- CFI funding in 2002 was for half of the consortia
  - Money has run out and the facilities are dated

- CFI funding in 2006 (National Platforms Fund) was for the other half
  - All the money will be spent by the end of 2011

- No new CFI NPF program on the horizon

Compute Canada: Plans

- September: Submission to Major Science Initiatives (MSI)
  - $185M available and the request may be $100M

- October: Submission to NSERC Major Resources Support Program
  - Current funding is $2M/year for 5 years

- November: Submission to SSHRC Partnership Program

- December: CFI LEF/NIF call expected

CANARIE

- CANARIE is at the tail end of its 5-year funding cycle
  - Mandate renewal discussions are underway

- Current model is to provide a research network backbone and build out digital infrastructure

- CANARIE has an agenda that is critical to, but independent of, Compute Canada

WHAT DO SATELLITE IMAGES OF ARCTIC SEA ICE, 3-D MODELS OF THE HUMAN HEART, AND VIDEO OF A MASSIVE TRAFFIC JAM HAVE IN COMMON?

They are joining the torrent of digital data that flows across the CANARIE high-speed network

[Ottawa, Ontario March 4 2011] CANARIE, Canada's Advanced Research and Innovation Network, today announced an extension of Canada's advanced digital infrastructure to eight institutions engaged in cutting-edge digital research. Scientists and researchers at these institutions are leveraging the CANARIE high-speed, high-capacity network to access large, sophisticated data sets and collaborate with national and international peers.

Data that flows over the network is used by scientists and researchers across the country as the basis for groundbreaking research that positively impacts the health and well-being of Canadians.

Hot off the press …

Computing methods used to study 'servers' in human brain

- June 6, 2011 – Researchers hope to learn about diseases that damage the brain, including Alzheimer's and stroke
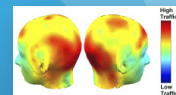
Unveiling the secrets of antimatter

- June 6, 2011 – Canadian-lead team of scientists capture, store antimatter particles in CERN project

Today's Reality

- Compute Canada would not be possible without the research network that CANARIE provides

- CANARIE needs the research users of Compute Canada to push the performance boundaries of Canada's state-of-the-art networking

- The current arrangement is not the best
  - Legacy decisions from many years ago
  - Money fragmented in multiple places
  - The funding model is not sustainable

Brave New World?

- Is Canada prepared to make a bold change to the research landscape?
- Create a vision for digital infrastructure for Canada
- Consider bringing Compute Canada and CANARIE closer together, perhaps even into one organization
- Simplify!
- Involve key stakeholders: Industry Canada, CFI, tri-council agencies, provinces, HPC consortia, ORANs, CUCCIO, CARL, industry, ...

Digital Infrastructure Canada
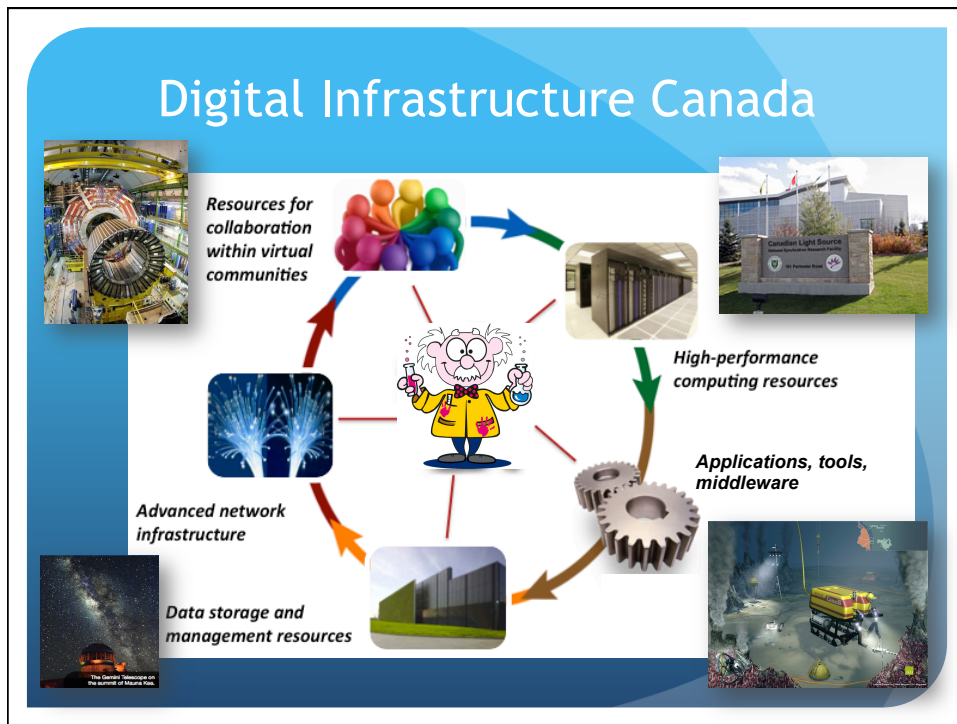
International trend – Integrating Research Infrastructure

EU - Policy coordinating body for research infrastructure (ESFRI)
  – Developed an integrated roadmap of RI to meet the needs of researchers
  – Over 1.9B Euros budgeted for Research Infrastructure under FP7

Nordic countries: NORDUnet's strategy calls for an integrated e-infrastructure
  – NORDUnet currents hosts the data grid facility (NDGF) and is headed by NORDUnet's CEO

Australia: National Research Infrastructure Council (NRIC) ensures an integrated approach to digital infrastructure
  – Allocated close to AUS $400M from 2010-2014 on research infrastructure

US: National Science Foundation has released a framework that calls for integrated cyberinfrastructure
  – CIF21 has been allocated $117M in NSF's budget request for FY2012

Netherlands: In 2009 organized all research infrastructure entities under a single organization, SURF; Operates, develops and innovates all aspects of digital research infrastructure including SURFnet

Benefits

- Single unified voice for all aspects of digital infrastructure

- Balanced investment across the components of digital infrastructure

- One-stop shopping for researchers

- Leverage state-of-the-art infrastructure for competitive advantage

- Better able to collaborate nationally and internationally

- Build the skilled community able to help Canada compete in academia, industry, and government

Universities

- What role should university IT play?
  - In the national DI strategy
  - In the ongoing conversation

- Questions to consider:
  - How important is it for university IT groups to be in the HPC hardware business?
  - Are you and your researchers receptive to using national rather than regional or local infrastructure?

Status

- Nothing has been decided

- "Tiger" team working on a position paper that will go to the Compute Canada and CANARIE Boards of Directors

- Start a community consultation, especially with Compute Canada stakeholders

- Seeking your input

The Tiger Team

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