



The SHARCNET Community: Second to none

2004 Management Update
SHARCNET Annual General Meeting
June 24, 2004



Agenda

- Organizational Update – Carmen Gicante, Executive Director
- Research and Infrastructure Update – Hugh Couchman, Scientific Director
- Financial Update – Cindy Munro, Administrative Officer



Organizational Update

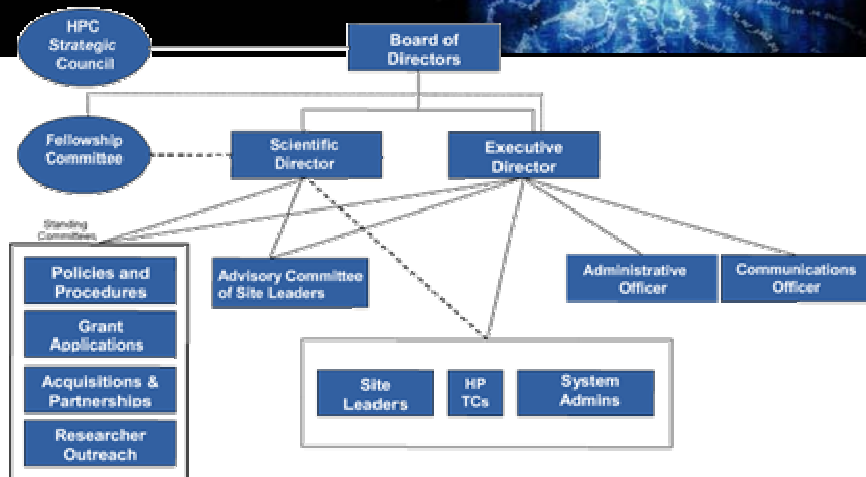
Organizational Structure

- External review by consultants
- Recommendations based on interviews with key stakeholders
- Management structure revised to reflect SHARCNET's unique academic-industrial model
- Added: Scientific Director, Standing Committees
- Revised: Role of Site Leaders (formerly Site Coordinators)

Key objectives of new structure

- Establish clear lines of communication and accountability
- Provide a direct mechanism for researcher input into the SHARCNET operational process
- Eliminate role confusion at the sites
- Improve the overall level of researcher engagement
- Ensure site representation in decision-making process

New structure



Standing Committees: Mandate

- To provide broad based advice and make recommendations to the Executive Director and the Scientific Director and to undertake specific tasks related to committee mandates
- Comprised of members of the SHARCNET researcher community, management and staff, and are designed to ensure maximum input into the organization by all stakeholders.
- Policies & Procedures
 - To compile working documents of uniform SHARCNET policies and procedures for the utilization of computational facilities
- Grant Writing
 - To compose all grant applications when required
 - To ensure that all SHARCNET interests are being adequately represented in grant writing

Standing Committees: Mandates (con't)

- Researcher Outreach
 - To discuss current techniques used to educate researchers about SHARCNET resources
 - To organize semi-annual research symposia to help build the researcher community
 - To plan new methods of researcher recruitment tailored to the individuality of each site
- Partnerships and Acquisitions
 - To make recommendations about, and to acquire, significant computational hardware and software for SHARCNET sites
 - To discuss equipment needs with all sites to ensure that equipment acquired matches local needs
 - To make recommendations regarding non-monetary equipment acquisition

Standing Committees: Current tasks

- First meetings January 2004
- Policies and Procedures
 - Discussing strategies to ensure the effective and efficient use of HPC resources (i.e. S-RAM)
- Researcher Outreach
 - Exploring ways to increase researcher engagement through the provision of new and enhanced programs and services
- Partnerships and Acquisitions
 - Working on Contributed Equipment policy
 - Preparing for upcoming CFI acquisitions
- Grant Writing
 - Pending call for proposals from ORDCF or similar granting body

Staffing Update

- Daniel Stubbs, HPTC Consultant, McMaster (July 2003)
- Hugh Couchman, Scientific Director (December 2003)
- Barbara Autterson, Administrative Assistant (April 2004)
- Site Leaders:
 - Shantanu Basu, Western
 - Deborah Stacey, Guelph
 - Ian Hamilton, Laurier
 - Akshaia Aggarwal, Windsor
 - Jeff Chen, Waterloo
 - Nikolas Provatas, McMaster
 - JJ Strybosch, Fanshawe
 - Ed Sykes, Sheridan
 - Thomas Wolf, Brock
 - William Smith, UOIT
 - Huaxiong Huang, York



SHARCNET High Performance Computing Strategic Council

- First meeting: November 2003
- Tasked with providing guidance and advice to the SHARCNET Board
- Comprised of international experts in HPC-related disciplines and industries
- Participating institutions and organizations:
 - CANARIE, C3, ORANO, Trojan Technologies, Bank of Montreal, Bell Canada, Suncor Energy Products, University of Toronto, Ontario Ministry of Economic Development and Trade, Laboratory for Scientific Computation (Michigan), Center for Computational Research (Buffalo), Hewlett Packard, Pittsburgh Supercomputing Center, Intel, Integrated Manufacturing Technology Institute (NRC), Platform Computing



HPC Council: Key outcomes

- Research
- Management and Organization
- Outreach and Engagement
- Technical
- Next meeting: November 2004

Provincial HPC Coordination Committee

- SHARCNET signed an MOU with HPCVL in November 2004
- Agreement to coordinate in the provision of HPC services in the province
- Members of SHARCNET, HPCVL and Centre for Computational Biology (Sick Kids) have formed provincial HPC Coordination Committee
- Currently drafting recommendations for the provision of HPC in the province, to be presented to ORDCF
- Opportunity to shape Ontario HPC landscape – leading to a provincial strategy

Funding update

- CFI
 - Notionally awarded \$19.3M in March 2004
 - Pending OIT match (within context of provincial strategy)
- ORDCF
 - Proposal deferred pending provincial strategy for HPC and appropriate funding mechanism
 - Current funds for Chairs and Fellowships expended, new funding required to continue and extend to new partners

C3.ca and role of regional consortia

- C3.ca has agreed to recognize regional consortia as members of the C3 Board
- One representative of regional consortia will become a member of Board pending revision of bylaws
- SHARCNET has been instrumental in this effort
- Regional consortia have formed a subcommittee of C3 Board and will meet quarterly to discuss issues and share information related to the provision of HPC in Canada

Web Portal: Project reporting

- SHARCNET is required to submit regular reports to its funding agencies
- SHARCNET must substantiate its value for researcher community
- Imperative that researcher community provide regular reports via SHARCNET Web Portal, including:
 - Publication citations
 - Student retention and training
 - Research highlights



Customer Satisfaction Survey

- **Ivey Client Field Project (ICFP)**
 - To evaluate SHARCNET's current levels of service, make recommendations for improvement
- **Rationale**
 - Continued satisfaction of researcher community is vital to success of SHARCNET
 - Researcher participation in survey will be critical to service levels and future programs
- **Timeline**
 - Fall 2003



Research and Infrastructure Update

Research and innovation

- **SHARCNET supports the innovative science of over 200 national and international research groups:**
 - Traditional areas: Physics, Chemistry, Engineering, Astrophysics
 - Emerging areas: Bioinformatics, Biocomputation, Finance, Medical
 - High Performance Computing Tools: Grid, Visualization
- **Comprehensive effort underway to account for research outcomes and successes**

HQP: Chairs Program

- **15 Chair positions allocated in original funding mandate, 12 filled as of January 2004 (a \$2.4M investment)**
- **8 new Chairs appointed in 2003 (4 from outside of Canada)**
 - **Dr. Jonathon Stone, McMaster; Dr. Hermann Eberl, Guelph (Germany); Dr. Matheus Grasselli, McMaster; Dr. Bartosz Protas, McMaster (California); Dr. James Wadsley, McMaster; Dr. Eugene Kim, Windsor; Dr. David Garfinkle, Guelph (Oakland); Dr. Gabriel Moreno-Hagelsieb, Wilfrid Laurier (Mexico)**
- **1 Chair outstanding**
- **Expansion of program to new partners pending funding outcomes**



HQP: Fellowships Program

- To recruit and support research personnel who utilize HPC (a \$2.6M investment)
- In 2003, SHARCNET awarded 49 fellowships (nearly \$1M):
 - 19 Undergraduate
 - 21 Graduate
 - 6 Post-doctoral
 - 2 Teaching relief
 - 1 Visiting fellow
- Expansion of program to new partners pending funding outcomes



HQP: Community-wide training

- April 2003-March 2004, over 300 researchers and students attended SHARCNET training workshops and seminars, including:
 - Annual Fall Workshop 2003
 - EXCELeRate2004 events
 - Ongoing local training workshops
 - Local researcher outreach
- To date, SHARCNET has provided over 1000 person-days training in high performance computing tools and techniques



HQP: Staff Training

- **Intel Software College Workshop (York)**
 - Training on tools and technologies for processors, from compilers to libraries
 - Attended by HPC Consultants D. McCaughan and B. Ge and selected researchers
- **New Methods for Petascale Computing (Pittsburgh)**
 - Focused on how to develop applications for Petaflop systems
 - Attended by HPC Consultant D.Stubbs and SD
- **CAST (Brisbane)**
 - Feedback/guidance to HP on development and support issues for large-scale computing; product roadmaps & technical presentations; peer interaction
 - Attended by SD and ED



HQP: Staff Training

- **HPCS2004 (Winnipeg)**
 - 18th annual symposium on HPC systems and applications
 - Attended by SHARCNET HPC Consultants, ED, CO
 - SHARCNET will host HPCS2005
- **AccessGrid Retreat (Ryerson)**
 - Remote collaboration environments
 - Attended by Doug Roberts, Mark Hahn & SD



Integration of resources and resource allocation

- Staff working to develop integrated, transparent access to all SHARCNET resources, including:
 - Uniform accounts and logins
 - Improved web portal functionality and security (mailing list subscription, project and problem tracking)
- Exploring closer cooperation with other HPC networks
- Developing network-wide policies for systems usage, particularly in the areas of job submission/queuing and storage



Infrastructure: SHARCNET network

- Link between clusters at Guelph, Western and McMaster enabled Fall 2003
- IP traffic now routing; performance testing and optimization continue
- Plan to connect all 11 sites via 1 Gb/s and 10 Gb/s
- AccessGrid remote collaboration technology also being evaluated

A background image showing a complex network of glowing blue nodes and connections, resembling a data network or a molecular structure.

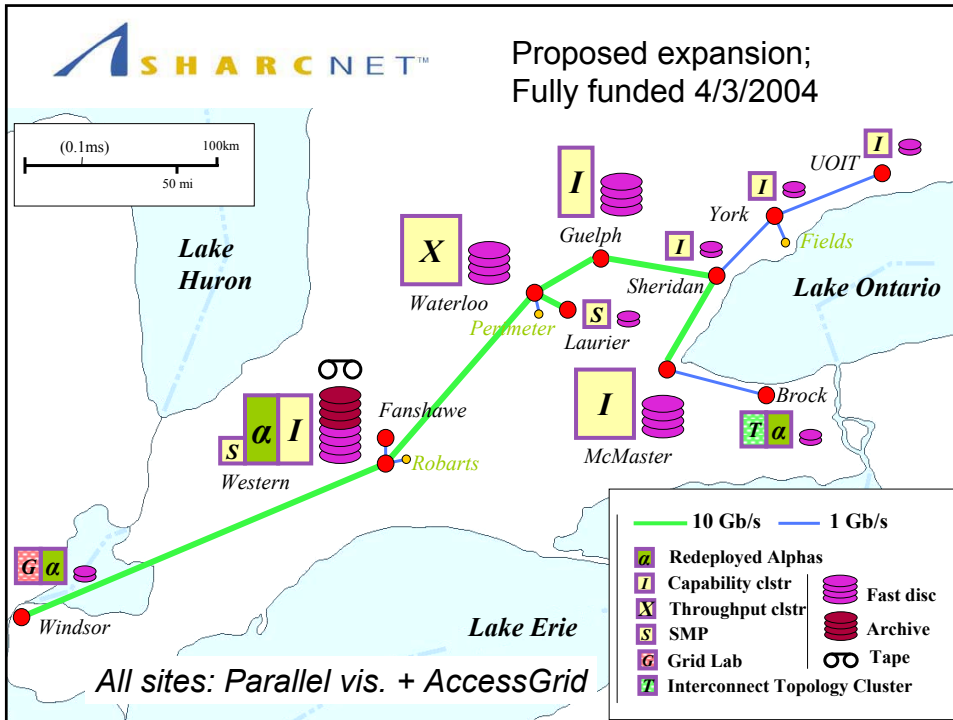
Infrastructure: Contributed equipment

- In 2003, 12 individual researchers donated ~180 processors to existing SHARCNET installations
- Additional contributions totaling over 200 processors have recently been installed or are pending including:
 - Wilfrid Laurier Xeon cluster
 - Windsor GridLab
 - McMaster Opteron cluster (112: 330+)
- Contributions are managed by SHARCNET and available for use by all community members

A background image showing a complex network of glowing blue nodes and connections, resembling a data network or a molecular structure.

Infrastructure: Proposed expansion

- CFI-OIT
 - New partners: Waterloo, Brock, UOIT, York
 - Additional Capacity
 - Storage
 - Network
 - Compute Upgrades
 - Additional Capabilities
 - Visualization
 - Total investment
 - ~\$49M (OIT decision pending)
- Subcommittee of Partnerships and Acquisitions Committee struck to evaluate technology choices and make recommendations



SHARCNET™

Pilots and pre-market product development

- **Sepia Pilot** – a scalable distributed visualization cluster (HP)
 - To enable visualization of very large datasets, such as those produced on SHARCNET's large clusters
 - Two programmers have been evaluating system and developing applications since last fall
- **XC Beta** – HP's next-generation Linux-based cluster software stack
 - Provides cluster management tools, new user environment and integration
 - Upcoming versions will include "Lustre" parallel file system
 - Proposed for most systems in CF12 proposal
 - Upgrades for test funded by Sustaining Fund
 - Currently testing on half of Western I2 cluster ("Spinner")
- **MPI2 development/testing with HP**
 - Efficient single-sided communications on SC, XC ...

C3 Long Range Plan

- Goal to establish long-term, sustainable funding for HPC in Canada
- Supports consortium model
- Proposes a Tier 1 national facility
- Full report expected late summer, prelude to lobbying effort
- Comments invited (visit www.c3.ca)

HPCS2005

- SHARCNET will host *HPCS2005: the 19th International Symposium on HPC Systems and Applications*
- May 15-18, 2005 at the University of Guelph
- Event Chair: Dr. Deborah Stacey, Guelph
- Program Chair: Dr. Ilias Kotsireas, Wilfrid Laurier
- Visit: <http://www.sharcnet.ca/events/hpcs2005>





Financial Update

Financial Update: Chairs and Fellowships

- **Fellowships Program:**
 - Total allocated \$4,101,636 on 123 Fellowships over 5 rounds (cash and matching dollars)
 - Program completed
 - Awaiting renewed funding (ORDCF) to re-establish program

Financial Update: Chairs and Fellowships

- **Chairs Program:**
 - Total allocated \$2,380,000 on 13 Chairs
 - Program completed
 - Awaiting renewed funding (ORDCF) to re-establish program

Fellowships Program

Fellowship Type	# of Fellowships	Allocated
Teaching Relief	8	\$125,000
Post Doctoral Fellows/Senior Visitors	32	\$1,325,383
Graduate Students	43	\$1,045,808
Undergrad Students	40	\$200,684
Subtotal	123	\$2,696,875
Matching Contributions	--	\$1,404,761
Total	123	\$4,101,636

Chairs Program

Chair Theme	# of Chairs	Allocated
Computational Materials	4	\$845,833
Computational Finance	4	\$805,000
Biocomputing/Bioinformatics	3	\$420,000
High Performance Computing Tools	2	\$309,167
Total	13	\$2,380,000

Sustaining Fund: Details

<i>Sustaining Fund @March 31, 2004</i>	
Total Budget (HP Sustaining Fund + Interest)	3,789,064
Expenses:	
McMaster GS160	675,944
McMaster GS160 upgrade	125,500
UWO/Guelph DS10s	41,036
UWO NIC cards	30,895
UWO Itanium Cluster	781,881
Fanshawe DS10s/20s	70,507
Sheridan ES45	90,847
Procure switches for network	26,283
Sepia equip and staffing	82,800
CSLG license renewal	49,640
Platform Linux to Redhat services	29,363
Addl disk for UWO cluster	10,908
XC Beta test equipment	125,277
Kingston memory for UWO/Spinner	72,288
Develop Testbed at Guelph	46,333
McMaster co-funded 192 cpu Opteron cluster	150,000
Maintenance and Misc.	49,240
Total Spent to March 31, 2004:	2,458,741
Committed*	1,280,323
Balance as Uncommitted:	50,000

*for UWO Storage, WLU Xeons, Windsor Grid Lab, and staff salaries

Financial Update: Donor Equipment

Equipment Contributions by SHARCNET Researchers						
Name	Equipment	Date	Researcher		SHARCNET	TOTAL
			Cash Contributed	Grant Source	Cash Contributed	CASH
McMaster University:						
Botton	ACS dual AMD	Nov, 2003	\$24,198	CFI New Opps	\$0	\$24,198
Craig	28 cpus + misc. serial farm	Feb, 2003	\$68,629	CFI New Opps	\$0	\$68,629
Earn	34 cpus serial farm	Feb, 2003	\$46,960	CFI New Opps	\$0	\$46,960
Provatat	16 cpus	Dec, 2002	\$234,721	CFI New Opps	\$0	\$234,721
Provatat	switch	Dec, 2002	\$3,058	CFI New Opps	\$0	\$3,058
Shi	16 cpus SC40	Aug, 2001	\$190,000	CFI New Opps	\$72,741	\$262,741
Sills	upgrade GS160	Nov, 2002	\$245,543	CFI New Opps	\$122,454	\$367,997
Wilkinson	ACS dual AMD	Nov, 2003	\$24,527	CFI New Opps	\$0	\$24,527
Golding	20 spus serial farm	Feb, 2003	\$27,624	Regular CFI	\$0	\$27,624
Couchman	16 cpus serial farm	Feb, 2003	\$26,069	NSERC	\$0	\$26,069
Kallin, Sorensen, Craig, Pelinosky & Wadsley	192 cpus Opteron (1.8 Ghz with Myrinet network)	April, 2004	\$500,000	CFI New Opps	\$150,000	\$650,000
Subtotal:			\$1,391,328		\$345,195	\$1,736,523
The University of Western Ontario:						
Ma	2 ES45s and 32 Gb RAM	Feb, 2003	\$200,000	CFI New Opps	\$5,000	\$205,000
Steinbrickner	4 ES40s and 4 Gb RAM	June, 2001	\$252,072	CFI New Opps	\$0	\$252,072
Wahl	1 rx5670 / 2 rx2600	Dec, 2003	\$151,000	CFI New Opps	\$1,200	\$152,200
Subtotal:			\$603,072		\$6,200	\$609,272
Total:			\$1,994,400		\$351,395	\$2,345,795

Note: This reflects cash contributions only. In-kind vendor contributions are documented separately.

CFI Financials: Status Complete

CFI Project*	January 1, 2001 to December 31, 2002			
Expenses	Total Budget	Total Actual	Total Inkind	Total Actual
ES40's/storage arrays/rack	11,073,575	8,201,135	3,093,957	11,295,091
Renovations	400,000	319,618	0	319,618
UPS	318,927	244,379	67,968	312,347
Alpha SC	4,647,036	3,385,878	1,401,480	4,787,358
Software	300,000	286,867	0	286,867
Network Equipment	1,176,437	817,358	119,330	936,688
Total	17,915,975	13,255,235	4,682,735	17,937,970
Source of Funds				
CFI	6,616,620	5,954,958	0	5,954,958
OIT	6,616,620	5,954,958	0	5,954,958
McMaster University	0	21,995	0	21,995
Matching (vendor disc.)	4,682,735	0	4,682,735	4,682,735
Holdback		1,323,324		1,323,324
Total	17,915,975	13,255,235	4,682,735	17,937,970
Rev-Exp	0	0	0	0

ORDCF Financials: Overview

SHARCNET	
ORDCF Project	
Five year project: Jan 1, 2001 to Dec 31, 2005	
Total Project Budget:	25,436,892
Total Spent to March 31, 2004:	16,266,176
Balance:	9,170,716

Note: Percent of budget spent at March 31, 2004 = 64% or ~2/3rds

ORDCF Financials: Status Ongoing January 1, 2001 - December 31, 2005

ORDCF Project		
Cumulative January 1, 2001 to March 31*, 2004		
Expenses	Total Budget	Total Actual
CASH		
Salaries and Benefits	5,850,600	4,047,006
Facilities & Equip	3,214,048	3,957,482
Other Direct Res Exp	111,000	321,274
Mgmt and Admin	853,700	539,327
Subtotal	10,029,348	8,865,089
IN-KIND		
Principal Researchers	839,430	1,004,767
Facilities & Equip	2,393,928	3,196,708
Applicant Overhead	3,187,588	3,199,612
Subtotal	6,420,946	7,401,087
Total	16,450,294	16,266,176
Source of Funds	Total Budget	Total Actual
Institutional	5,623,362	5,664,888
Industrial	5,266,959	5,668,666
ORDCF	5,559,973	4,939,344
Total	16,450,294	16,272,898
Rev - Exp	0	6,722

*estimates used where institutional financial reports not submitted

Keynote address

- Dr. Russ Miller