News Release

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Winning vendors announced

BC and Alberta launch $44 million e-research investment

(8 May 2003) – Three major computer companies have been selected to build the $44 million research infrastructure of WestGrid (Western Canada Research Grid), project leaders announced today as part of the official WestGrid launch, held simultaneously in Edmonton and Vancouver.

Hewlett Packard, IBM and SGI will each contribute to an extensive interoperable set of research facilities that will span the two provinces, eight institutions, and be accessible to researchers across Canada. The resulting "grid" of high performance computers and advanced scientific visualization facilities will support research that requires access to massive computing power, and is driven by many of the scientific and medical questions emerging today.

"What we are doing here in Canada matches any innovative project of this nature in the world," says WestGrid Chief Technology Officer, Richard Foster." We are building a grid of advanced computing tools for research with a very leading edge approach to the way that researchers will be able to power their research." In addition to the $44 capital costs, several million have been committed to operating costs, bringing to total project value to over $48 million.

"The WestGrid launch represents a great step forward for Canada that goes far beyond a pooled resource of great computing power," says Paul Tsaparis, president and CEO, HP Canada Co. "WestGrid is all about making western Canada a destination of choice for world-class researchers who can then build upon the region's reputation for world-class science. In addition, WestGrid's new computing capabilities will be a resource for both pure and applied research – making western Canada better positioned to expand its government and private sector collaboration."

"IBM is proud to be included in this research initiative," says Ed Kilroy, president of IBM Canada Ltd. "WestGrid represents a wonderful opportunity to employ grid technology to provide high performance computing capabilities to eight of western Canada's leading institutions, and also to support Canadians' contributions to leading-edge research of global significance."

"SGI has long been engaged with a number of the WestGrid member institutions," says SGI Canada president Martin Pinard. "We are honoured to be part of the unprecedented new level of functionality that this bold project enables. We believe WestGrid represents an exciting

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Canadian model for the future of what has been termed ‘intelligent-infrastructure.’ SGI is committed to working with WestGrid to ensure not only initial success and but also ongoing growth in order to meet the exploding data challenges of 21st-century science.”

The participating institutions include: University of British Columbia, Simon Fraser University, New Media Innovation Centre, TRIUMF physics laboratory, University of Alberta, University of Calgary, University of Lethbridge and The Banff Centre. The distributed resources are connected by the research networks in BC (BCNet), Alberta (NeteraNet), and Canada (CA*net).

“This CFI investment in partnership with the provinces, the private sector, and the institutions will enable researchers and students from across Canada to perform leading-edge research in new and more efficient ways,” said Dr David W. Strangway, president and CEO of the Canada Foundation for Innovation (CFI). CFI has contributed $12 million to the project, plus $3.6 million in essential operating costs over the three years of the implementation.

The Alberta Ministry of Innovation and Science, through the Alberta Science and Research Investment Program, is contributing approximately $6 million to this project over the next three years. The BC Ministry of Advanced Education, through the BC Knowledge Development Fund, is also contributing approximately $6 million over the same period.

“We invest in partnerships such as this through B.C.’s Knowledge Development Fund to build on our vision of world-class research and development clusters across British Columbia,” says Shirley Bond, B.C.’s advanced education minister. “Initiatives such as the WestGrid project are integral to that vision. They help make B.C. and Alberta global magnets for R&D activity and investment.”

WestGrid will enable an astronomer in Lethbridge to send data via a computer that will be processed by the most appropriate computing system on the grid, invisible to the user. Physicists at the TRIUMF research laboratory in Vancouver will be able to process data on the basic building blocks of the universe in collaboration with laboratories around the world. Visualization experts at Simon Fraser University will be able to work with artists at The Banff Centre and share results with colleagues at the University of Calgary. Medical scientists at UBC will be able create visualizations with the New Media Innovation Centre and collaborate with doctors at the University of Alberta. Researchers will have access to resources that no single institution could afford, and will be able to participate in national and international collaborations with world-class e-research facilities.

www.westgrid.ca

Contact:
Mary Anne Moser
Communications
WestGrid
(403) 949-3306

Monica Krake
Manager of Communications
NewMIC (New Media Innovation Centre)
(604) 806-5113

Backgrounder

Project Description

WestGrid is a $44 million capital project, supported by another $4 million in operating costs, to purchase and install an innovative computing infrastructure across BC and Alberta over the next two years. It is designed to make powerful computing facilities for both computation and visually rich collaboration available to researchers.

Partner Institutions

University of British Columbia
TRIUMF
University of Alberta
University of Lethbridge
Simon Fraser University
New Media Innovation Centre
University of Calgary
The Banff Centre

Project Leaders

Jonathan Borwein, Simon Fraser University
Grenfell Patey, University of British Columbia
Jonathan Schaeffer, University of Alberta
Brian Unger, University of Calgary
Michel Vetterli, Simon Fraser University/TRIUMF

Technical Configuration

IBM: IBM will provide a large Linux computing farm using Intel Xeon processors at the University of British Columbia and TRIUMF. This facility will include 1000 cpus (3 GHz) in the BladeCentre configuration, as well as 10 TB of disk and 108 TB of online tape. The UBC/TRIUMF centre will be used for loosely coupled parallel computing jobs, including numerical simulations in chemistry and physics, and the analysis of large-scale data sets from subatomic physics. • IBM will also provide a network storage facility at Simon Fraser University. This will consist of 24 TB of disk and 140 TB of online tape. The SFU centre will be the large-scale storage facility for WestGrid.

Hewlett Packard: Hewlett Packard will supply a Cluster of Multiprocessors (CluMP) at the University of Calgary. This will consist of 128 AlphaServer SC45 processors (4 cpu per node) connected by a high speed Quadrics interconnect. Four Terabytes of disk storage will also be available. The U of C centre will be used for tightly coupled parallel computing jobs that need a small number of processors.

SGI: Silicon Graphics will supply a 256 cpu shared memory machine as well as 5 TB of disk and 10 TB of tape at the University of Alberta. This facility will be used for tightly coupled parallel computing jobs that need a large number of processors and/or large amounts of memory. • SFU will also house a state-of-the-art visualization server, provided by Silicon Graphics.

Other companies: • YottaYotta Inc, based in Edmonton, will be using its NetStorage product as a foundation for a prototype Storage Wide Area Network (SWAN). YottaYotta has developed

the world's first distributed block system for storage networks and, with it, the capability to page support massively parallel data access and transfer both in single site and multi-site configurations. YottaYotta will be working with WestGrid researchers to develop new protocols and software. • BigBangwidth, of Edmonton, and Netera Alliance (Alberta's research network organization and project manager for WestGrid) are collaborating to bring lightpaths to the desktop within WestGrid and to thereby enable high-performance access for bandwidth-intensive research applications. BigBangwidth manufacturers the BroadLAN (broadband local area network) system and has developed technology for the on-demand allocation of lightpaths in local area networks.

Grid services (the interface that makes these linked facilities accessible from anywhere) will be provided by WestGrid technical staff.

What is a computing grid?

Computing grids are geographically separated computers or computer clusters; they are linked so their processing power can be combined to act as one massive computer. They can be spread out over provinces, countries or around the world, depending on how computers are set up to communicate with one another. The linked machines share applications, data and computational resources.

The term "grid" comes from electricity utility grids, which supply millions of users with power from a grid of power distribution systems, in a way that is invisible to the user. A good analogy for understanding the interests driving grid computing appeared in *The Economist*:

> Imagine that every time you plugged in a toaster, you had to decide which power station should supply the electricity. Worse still, you could select only from those power stations that were built by the company that made the toaster. If the power station chosen happened to be running at full capacity, no toast.

That same sort of transparency is the goal of grid computing projects. However, a computing grid is more extensive than an electrical grid, because the distributed nodes both use and provide resources. The toaster not only consumes electricity, it also provides it.

Although still in its infancy, the grid is, in effect, a set of software tools. When combined with hardware, these tools let users tap processing power off distributed computers as easily as electrical power can be drawn from the electricity grid. Many scientific problems that require truly massive amounts of computation – designing drugs from their protein blueprints, forecasting local weather patterns months ahead, simulating the airflow around an aircraft, processing data in particle physics experiments – are being developed for grids. Designs for grids intend to enable users to get processing power off the grid as it is required.

Grid computing may have commercial applications in a variety of industries, including aircraft engine design, crash test simulation, computer animation, calculation of fluid dynamics for the oil and gas industry and semiconductor chip design. Many life sciences research projects are also trying to exploit the potential of grid computing. It is now possible, for example, for people to add the computing power of their personal computers to computations involved in cancer, AIDS, smallpox or anthrax research, to name a few.