

SHIPS, TRAINS, PLANES, CAR  
 THE TRANS-CANADA, INTER  
 AUTOBAHN, AIRPORT, STAT  
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 ER GAS, WATER, ELEC  
 PHONES, CABLE, CARGO, FE  
 INFORMATION COMMUNICA  
 NETWORKS, DATABASES,  
 SENSORS, TELEPRESENCE,  
 MIDDLEWARE, SERVICE-  
 ORIENTED ARCHITECTURE,  
 PERFORMANCE COMPUTING  
 WORLD WIDE WEB, GRID,  
**INFRASTRUCTURE,  
 CYBERINFRASTRUCTURE**...  
 eSCIENCE, eHEALTH, eDUC  
 eBUSINESS, WEB PORTAL,  
 GATEWAY, VIRTUAL ORGAN  
 CYBERPORT, CLOUDS, INTE  
 ELECTRICITY, SATELLITE IN



**WHAT DOES IT ALL MEAN?**

**A NEW CYBER-ERA IS BEING SHAPED. ENTIRE NEW INDUSTRIES AND NEW WAYS OF LIVING, WORKING, COMMUNICATING AND RESEARCHING ARE BEING CREATED. E-SCIENCE IS USING CYBERINFRASTRUCTURE TO ENABLE NEW RESEARCH AND DEVELOPMENT APPLICATIONS THAT WERE ONCE NOT POSSIBLE. E-HEALTH AND E-EDUCATION ARE NOW BEING INVESTIGATED. A NEW MODEL OF E-BUSINESS WILL SEE DATA SHARED BUSINESS-TO-BUSINESS AND INDUSTRIES LOCATE THEIR INFORMATION, PROCESSING AND SERVICES WHEREVER IT MAKES SENSE IN CYBERSPACE. IN THESE WAYS AND MORE, CYBERINFRASTRUCTURE SOLUTIONS ARE CREATING NEW OPPORTUNITIES FOR ALL SECTORS.**

We have built on the past 50 years of development in computers, networks, data storage, and methodologies for gathering, processing, analyzing, sharing and visualizing information. We are now on the road to bringing this together into the fundamental infrastructure—the cyberinfrastructure—which will be an ubiquitous and integral part of our lives.

**MESSAGE FROM THE PRESIDENT**

The last year has marked a significant turning point for this organization. It has represented an evolution in the way we think, operate and contribute to Alberta's information and communications technology landscape.

Cybera was established last July to provide leadership and expertise in Alberta Cyberinfrastructure for Innovation. This is an exciting role as we continue to lead the charge in both Alberta and across Canada to actively develop, support and leverage cyberinfrastructure applications.

Since the successful transition from Netera Alliance to Cybera, we've begun work on a number of academic and industry-led pilot projects that build and demonstrate cyberinfrastructure applications. In this time we've been able to support researchers who gather, share and experiment with massive amounts of data, as well as develop applications that allow Alberta industry to access compute cycles and complex analytics tools. These and future Cybera projects are selected to complement each other and build up cyberinfrastructure expertise and capabilities in Alberta.

Going forward, we will ensure that Alberta's academic and industry research and development communities have access to the cyberinfrastructure expertise and resources they will need in the years to come. We are seeking out new international partnerships, recruiting leaders, creating an international advisory committee, exploring new models for pooling cyber-resources, and investigating green cyberinfrastructure. We are building the capabilities and programs to ensure that Alberta continues to be a leader in Canada, and ultimately in the world, in the use and application of cyberinfrastructure.

This journey would not be possible without the guidance and support of Cybera's board of directors and member community. Cybera staff members were also key in making last year's transition a success and will continue to play an important role in driving Cybera activities in the future.



*Lynn Sutherland*  
**Lynn Sutherland**  
 President & CEO

**MESSAGE FROM THE CHAIR**



*Seamus O'Shea*  
**Seamus O'Shea**  
 Chair, Board of Directors

The transition from Netera to Cybera has proceeded well and we have made substantial steps towards building a base for implementing a broader mandate. Netera was a national leader over two decades in providing advanced research network infrastructure for the benefit of its members and stakeholders. Cybera's challenge is to build on Netera's legacy and support the full range of cyberinfrastructure needed to respond to the ever-growing and complex needs of Alberta's research institutions and innovators, both public and private.

Knowledge and innovation are fuelling Alberta's new economy as we increasingly recognize that these are critical components to adding value and thereby ensuring our competitive position in a rapidly changing world. Alberta's newly elected government recognizes that responding positively to this challenge is key to our future prosperity and quality of life. The government has confirmed its commitment to its 20-year strategic plan, which highlights a vision to create the "environment and infrastructure that enables knowledge and technology to invigorate our traditional economic strengths and to create new economic opportunities."

Cybera's role involves planning and implementing the advanced networks needed to implement this vision and coordinating with other initiatives, such as SuperNet, to ensure seamless support for Alberta's innovation system. It involves creating the national and regional computational grids that are now a critical factor for success in research and development. It includes other leading-edge tools, such as middleware (workflow management tools, collaborative environments, visualization systems, etc.) and the full range of training and support needed to maximize the productivity of our researchers and businesses.

Over the last year Cybera has begun broadening its client base by initiating conversations with potential future partners in the public and private sectors. It has conducted forums for discussion and created venues for celebrating leading Alberta research and development achievements. It has recruited an international team of world experts in cyberinfrastructure to advise us on the strategy most likely to lead to long-term success. It has successfully supported Alberta researchers to apply for national funding for network-enabled projects, highlighting the value added by cyberinfrastructure in leading research in a wide range of fields.

Cybera has shown this year that Netera's record of achievement is in good hands and we can look forward with confidence. On behalf of the board, members and stakeholders, I congratulate the management and staff on their dedication, commitment and talent capably applied in the best interests of Alberta.

**A CLOSER LOOK AT CYBERINFRASTRUCTURE**

Cyberinfrastructure is the integration of:

- High speed data networks
- High performance computers and clusters
- Massive data repositories
- Middleware
- Software applications

- Visualization
- Advanced collaboration
- Sensor networks

These components are deployed as services via web interfaces and utilities, similar to electrical and transportation grids, hubs and networks.

**A YEAR IN TRANSITION**

Cybera was created as a result of the hard work of the Cyberinfrastructure Task Force, led by the CIOs of the Universities of Alberta and Calgary; Paul Sorenson and Harold Esche. The task force recommended the creation of a single entity to provide leadership and expertise in the broad area of "Cyberinfrastructure in Alberta." The task force included representation from the Alberta Heritage Foundation for Medical Research (AHFMR), Alberta Ingenuity, the Informatics Circle of Research Excellence (iCORE), the Ministry of Advanced Education and Technology, WestGrid, Netera Alliance, the Universities of Alberta, Calgary and Lethbridge, and Athabasca University.

The five-year business plan, bylaws, and board of directors were determined in summer 2007. The vision is to build on the 14-year history of Cybera's predecessors: Netera Alliance (2000) and WURCNet (1993). Netera Alliance officially transitioned into Cybera Inc. in June 2007 to integrate and leverage past provincial information and communications technology investments as well as acquire new resources through partnerships with public and private sector partners.

**NEW PROJECTS | ACADEMIC**

**CANADIAN SPACE SCIENCE DATA PORTAL**

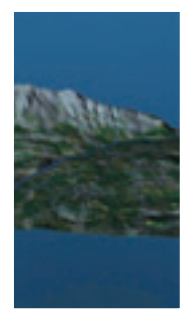
The goal of this project is to enable and simplify researcher access to space science analytic tools and data. The Canadian Space Science Data Portal (CSSDP) stands to shape the development of the space science community as well as help refine productivity safeguards for Canadian industries impacted by space weather phenomena. The expected result is a seamless interface that supports and strengthens Canadian efforts in international space missions, space data analytics and space science discoveries. A collaborative virtual organization of space science researchers from across North America will shape the development of the CSSDP. The project is innovative as it leverages a combination of research domain specialists, development experts and cyberinfrastructure. Canada will benefit by maintaining a competitive role and reputation in the international space science community. Research findings from this project will have influential industry applications, allowing electrical, airline, pipeline and other satellite-sensitive sectors to better protect their systems from the disruptive impacts of space weather fluctuations.

**MILESTONES**

- September 2007 Cybera pilot project initiated
- October 2007 CSSDP presented at Cybera Cyberinfrastructure Summit in Banff
- November 2007 Expression of Interest submitted to CANARIE's Network-Enabled Platforms (NEP) fund
- February 2008 Proposal submitted to CANARIE's NEP fund
- March 2008 CSSDP pilot project prototype demonstrated at Cybera's Lunch 'n Learn event in Edmonton
- April 2008 CSSDP receives approval from CANARIE for a two-year project worth more than \$1 million

**NEW PROJECTS | INDUSTRY**

**EDM STUDIO**



EDM Studio is a Calgary-based company that has started working with Cybera to process large and complex computer simulations and animations that are installed in museums and interpretive centres. Cybera and its partners are able to provide access to massive computing power, allowing EDM to run its interactive simulations faster and easier. As a result, EDM doesn't have to maintain high-end computing and data centres of its own. Instead, EDM is able to use cyberinfrastructure to save money and time. This project exemplifies how business can access and take advantage of outsourced compute power, so that they don't have to own and manage their own infrastructure—they use cyberinfrastructure.

**MILESTONES**

- April 2008 Cybera pilot project initiated

**GEOCHRONOS**

The goal of this project is to develop a gateway to equip earth observation scientists with tools to develop new collaborative approaches to data analysis. The expected result is an innovative platform that will harness the benefits of social networking technologies and extend them into the scientific community. Researchers will be able to monitor natural resources in cooperative ways to minimize our environmental impacts and contribute to an improved quality of life for all Canadians. This project is innovative as it represents a critical collaborative building block for a globally distributed and expanding research community. With this project, Canada has an opportunity to maintain a competitive and influential role within the global earth observation research community. GeoChronos aims to remain at the international forefront of discovering technologically innovative solutions related to issues of biodiversity, cumulative land use impact, climate change and pollution impacts on ecosystems.

**MILESTONES**

- September 2007 Cybera pilot project initiated
- October 2007 GeoChronos presented at Cybera Cyberinfrastructure Summit in Banff
- November 2007 Expression of Interest submitted to CANARIE's NEP fund
- February 2008 Proposal submitted to CANARIE's NEP fund
- March 2008 GeoChronos pilot project prototype demonstrated at Cybera's Lunch 'n Learn event in Edmonton
- April 2008 GeoChronos receives approval from CANARIE for a two-year project worth more than \$1 million
- April 2008 Cybera pilot project proof-of-concept prototype demonstrated

**EEE (ECOSYS EXPERIMENT ENVIRONMENT)**

The Ecosys Modeling Program is dedicated to the construction and testing of a comprehensive mathematical model ("ecosys") of natural and managed ecosystems (agriculture, forests, savannah, grassland, tundra, desert). The long-term objectives of this program are to provide a means to anticipate ecosystem behaviour under different environmental conditions (soils, climates and management practices). This research program supports planning for the impacts of climate, land use practices and soil management on primary productivity, soil and atmospheric quality and associated resource requirements (e.g. water, fertilizer) of terrestrial ecosystems as part of several national and international research programs. As part of Cybera's Ecosys Experiment Environment (EEE) project, the Grid Research Centre has developed a system that facilitates researchers in conducting an "ecosys experiment." By incorporating various cyberinfrastructure components, the system eliminates the dependence on a programmer. The project incorporates workflow management, metascheduling, grid middleware, data management and reusable web portlets.

**MILESTONES**

- September 2007 Cybera pilot project initiated
- March 2008 EEE pilot project prototype demonstrated at Cybera's Lunch 'n Learn event in Edmonton
- April 2008 EEE pilot project completed and in use

**CURRENT PROJECT MANAGEMENT**

**WESTGRID**

WestGrid is a \$60 million project that operates high performance computing (HPC), collaboration and visualization infrastructure across western Canada. It encompasses 14 partner institutions across British Columbia, Alberta, Saskatchewan and Manitoba.

WestGrid was the first resource provider in Canada to adopt a grid-enabled system for its HPC, collaboration and scientific visualization resources. Its user community extends across Canada in disciplines ranging from the sciences and engineering to arts and humanities. WestGrid has a cohesive team of technical staff and system architects to support these users.

During 2007-08, Cybera provided project management to WestGrid through a variety of administration and communications activities. These included:

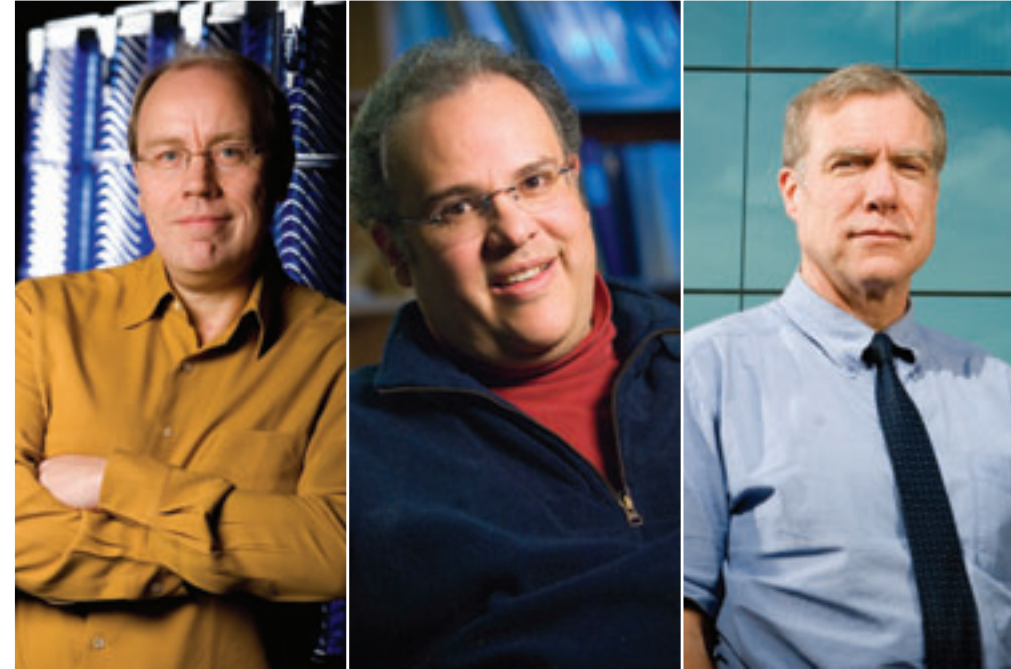
- Annual seminar series
- Annual conference
- Website
- Intranet for working groups
- Researcher surveys
- Financial administration

**GRID RESEARCH CENTRE**

The Grid Research Centre (GRC), located at the University of Calgary, is an important resource related to research and development of grid computing, high performance computing, cloud computing, and the middleware that brings these technologies together to form cyberinfrastructure.

In addition to working with Cybera, the GRC currently conducts project work, technical research and development with groups such as HP Labs, Los Alamos National Lab, CANARIE and the University of Bath.

Grid computing reflects a revolution in the way information and communications technology is used to pursue research in the sciences, engineering, medicine and the humanities. The GRC is a leader in the research and development of applications to monitor and manage cyberinfrastructure. The evolution of grid computing into sustained "platforms" for innovation and discovery is central to the vision of Cybera, and therefore the expertise contained in partner organizations such as the GRC are critical to the success of Cybera.



From left to right:

Researcher: Dr. Robert Rankin  
 Project: Canadian Space Science Data Portal (CSSDP)

Researcher: Dr. Arturo Sánchez-Azofeifa  
 Project: GeoChronos

Researcher: Dr. Robert Grant  
 Project: Ecosys Experiment Environment (EEE)



## BOARD OF DIRECTORS

- **Seamus O'Shea (Chair)**  
University of Lethbridge
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- **Brian Unger**  
University of Calgary
- **Lynn Sutherland**  
Cybera Inc. (ex officio)
- **Lee Kruszewski**  
Government of Alberta (ex officio)

## STAFF

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Maggie Eakin, Office Coordinator  
Dale Hudjik, Project Manager  
Natasha Kapty, Senior Systems Manager  
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Lynn Sutherland, President & CEO  
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## MEMBERSHIP & OUTREACH ACTIVITIES

### MEMBERSHIP

Cybera membership is now at 23 organizations and growing; welcoming three new members to its organization this year:

- IBM
- Keewatin Career Development Corporation
- Nortel

IBM and Nortel are prominent players in the Canadian technology sector, while Keewatin Career Development Corporation is the regional management organization for Indian and Northern Affairs Canada's First Nations SchoolNet program for Alberta and Saskatchewan.

Cybera members currently employ or interact with a majority of Alberta users taking advantage of Cybera's cyberinfrastructure services and solutions. Cybera's members include non-profit organizations that support research enabled by technology, companies that supply and use cyberinfrastructure, and government departments and ministries that support users and research enabled by technology. **For more information on becoming a member, please visit our website: [www.cybera.ca/membership](http://www.cybera.ca/membership).**

### MEMBERSHIP BENEFITS

Cybera members enjoy a suite of benefits, including access to CyberaNet, Alberta's high-speed, high-bandwidth advanced network. Members also receive complimentary access to Cybera's Cyberports at the University of Alberta and the University of Calgary. The Cyberports are leading edge data-sharing and videoconferencing facilities that allow participants to effectively collaborate over distance.

Other member benefits include:

- Access to cyberinfrastructure resources and integrated Cybera services, cyberinfrastructure expertise, training, and project management
- Increased opportunities for collaboration or building strategic relationships with key decision makers, the business community, academic researchers and IT professionals
- Increased human resource, technical capacity and cyberinfrastructure expertise
- Improved visibility with participants in cyberinfrastructure
- Access to a province-wide technology test-bed
- Increased access to capital and funding through pilot projects

### OUTREACH ACTIVITIES

Cybera strives to meet its members' needs, concerns and questions about cyberinfrastructure in Alberta. Last year the organization launched two new outreach initiatives to compliment Cybera's online presence, which includes a website, blog and presence on slideshare.net, an online medium for sharing presentations.

A yearly summit was launched in Banff at the Banff Springs Hotel on October 11 and 12, 2007. The event brought together cyberinfrastructure visionaries, practitioners and architects. Attendees represented academia, business and not-for-profit organizations. The summit showcased cyberinfrastructure innovations on a global scale—that is, it highlighted what others are doing, what is possible, why cyberinfrastructure is critical and how far it can take us. Future summits will continue to bridge knowledge gaps, spark collaborations and share cyberinfrastructure success stories.

The second major outreach initiative launched last year was a Cyberinfrastructure Lunch 'n Learn Series. The inaugural event was hosted at the University of Alberta and brought together Cybera members and stakeholders for an afternoon of talks, networking and a Cybera pilot project showcase. The first lunch 'n learn featured a keynote talk by Cambrian House CEO Michael Sikorsky on crowdsourcing, which is a technique of harnessing the power of crowds over the Internet. Cybera also made use of the event as a launching pad for three pilot project videos. The videos were shot on location in Edmonton and Calgary and feature interviews with lead researchers and support personnel. The videos are practical examples of how three University of Alberta professors use cyberinfrastructure to cut costs, shorten timelines and delve into new research areas. The videos are available online at [www.cybera.ca/projects](http://www.cybera.ca/projects).

### CYBERA MEMBERS (2007-08)

• Alberta Education

• Alberta Ingenuity

• Alberta Library

• Athabasca University

• The Banff Centre

• Bell Canada

• Cisco Systems Canada

• Edmonton Public Library

• Government of Alberta

• Grande Yellowhead Regional School Division #35

• IBM

• iCORE

• Keewatin Career Development Corporation

• Mount Royal College

• National Research Council

• Nortel

• SAIT Polytechnic

• SMART Technologies

• TELUS

• TRILabs

• University of Alberta

• University of Calgary

• University of Lethbridge



## SERVICES & SOLUTIONS

### CYBERANET ACTIVITIES

Cybera's mandate is to integrate, expand and enhance investments in networks, data storage, distributed computing, remote instrumentation, visualization and collaboration to serve as platforms for innovation in Alberta for both research and business endeavours. Some of the top connectivity activities of the 2007-2008 year include:

#### WESTERN ROADM

Cybera, BCNet and CANARIE installed the western ROADM (reconfigurable optical add-drop multiplexer) connection, which created a multi-wavelength link connecting Calgary, Kelowna, Vancouver, Victoria and Seattle. This is an extremely high-bandwidth system that sends 72 wavelengths down a single optical fibre, with a capacity of 10 Gbps per wavelength. Cybera owns two wavelengths, and was responsible for the Calgary hookups. This new network uses Nortel's Common Photonic Layer, and extends about 1,100 kilometers from Calgary to Seattle.

#### CANARIE POINT OF PRESENCE (POP) RELOCATION

Cybera and CANARIE moved the CANARIE Point of Presence (PoP) from premises in downtown Calgary to the Cybera PoP in the University of Calgary data centre. This required moving major pieces of equipment and then reconnecting and reconfiguring to ensure seamless connections to the CANARIE national network. The move was very successful, and resulted in the CANARIE equipment being located right beside Cybera's central router, giving considerable improvements in maintainability and costs.

#### HIGH-DEFINITION UPGRADE TO CYBERPORTS

As part of Cybera's continuing commitment to embrace leading-edge collaboration tools, Cybera replaced its H.323 videoconferencing systems with new LifeSize high-definition units. Both the Edmonton and Calgary Cyberports were upgraded, and the results have been excellent, with a huge improvement in video quality and responsiveness. HD videoconferencing has seen a big leap forward in the past year, and Cybera is now able to facilitate HD quality videoconferences across Alberta, Canada and overseas.

#### PEERING WITH KEEWATIN CAREER DEVELOPMENT CORPORATION

Keewatin Career Development Corporation is the regional management organization for Indian and Northern Affairs Canada's First Nations SchoolNet program for Alberta and Saskatchewan. They have signed a contribution agreement with Indian and Northern Affairs Canada to provide administration of a program for First Nations Schools. Cybera is now peering with Keewatin so that programs can be disseminated through CyberaNet across Alberta and nationwide with the CANARIE network.

#### SERVER HOSTING FOR AURORA COLLEGE

Due to the poor state of connectivity to the Northwest Territories, Cybera has been hosting one of Aurora College's servers in Calgary. Aurora College is the community-based college system in the Northwest Territories, and also operates the Aurora Research Institute. There is considerable demand for web access, but connectivity in the far north is very low-bandwidth so it's advantageous for the college to position a server at a high-bandwidth location.



### CYBERPORT / COLLABORATION ACTIVITIES

Cybera maintains and manages two Cyberports, one at the University of Calgary and one at the University of Alberta. The primary role of these facilities is to give members the opportunity to collaborate with colleagues over distance. The Cyberports can be used to connect to institutions around the province, country and world using high-definition video technology and the CyberaNet high-speed network.

Any Cybera member can book the Cyberports free of charge. For booking at the Calgary location, please email Maggie Eakin at [eakin@cybera.ca](mailto:eakin@cybera.ca). For bookings in Cybera's Edmonton location, email Brendan Procé at [bproce@cybera.ca](mailto:bproce@cybera.ca). Cybera supports videoconferencing using LifeSize units as well as Access Grid technology.

#### Member Institution Videoconferencing Sessions using CyberaNet:

(January 2007 to May 2008)

- Mount Royal College 80
- SAIT 65
- University of Alberta 193
- University of Calgary 264
- University of Lethbridge 710

#### International Videoconferencing Destinations Using CyberaNet:

(January 2007 to May 2008)

- Australia
- Brazil
- Egypt
- Germany
- Mexico
- Singapore
- United Arab Emirates
- United States



### CYBERPORT HIGHLIGHTS

Cybera's Cyberports hosted an array of interesting videoconferences over the past year. For example, participants in Calgary were able to view an experiment in remote ultrasound technology. The technology supported a remote surgery conducted over videoconference using CyberaNet and CANARIE's national network. A physician located in Calgary was able to witness and participate in a surgery that took place in Devon Island, Nunavut.

At the University of Alberta, Dr. Chris Herd, Associate Professor with the University of Alberta Earth and Atmospheric Sciences department, and an associate in the Biological Sciences Department used the Edmonton Cyberport to conduct a live question-and-answer session about dinosaurs with 80 students in southern California.

The Cyberports have hosted numerous domestic and international PhD defenses as well as a math seminar between academics at the University of Calgary, University of Alberta, University of British Columbia, and University of Lethbridge.

Other interesting uses of the Cyberport facilities include the broadcasting of day-long webinars, meetings of government representatives at points across the province, the Coast-to-Coast lecture series and the WestGrid Seminar Series.

## CYBERA CONSULTING SERVICES

### MATCHING BUSINESS WITH INNOVATION

CYBERA IS A CRITICAL DRIVER OF BUSINESS INNOVATION IN ALBERTA.

Are you looking to achieve more with less? Wondering what Enterprise 2.0, Web 2.0, virtualization, and cloud computing can do to help your business innovate, save money, collaborate, and achieve results faster, greener, cheaper? Cybera is your gateway to resources and expertise in support of business innovation using cyberinfrastructure. Cybera collaborates with industry partners to capitalize on cyberinfrastructure technologies and together we solve problems, push technology and drive new developments forward.

Cybera offers you single-point access to leading edge solutions that will increase your return on investment, decrease time to market and create new opportunities to reach clients and customers in new ways.

### COLLABORATION IS KEY

Cybera specializes in bringing people together. We can connect your business, no matter the size, with experts to provide solutions, directions and options that will best fit your organization's goals and challenges. We are not here to sell you technology; we are here to help you get the most out of your investment dollar.

### ACCESS TO RESOURCES

Alberta is home to world-class computing and network infrastructure that can support leading edge developments to make your business processes more efficient, increase your bottom line and increase your return on technology investment. Cybera can match you with resources and expertise to take your operations to the next level.

### ACADEMIC CONNECTIONS

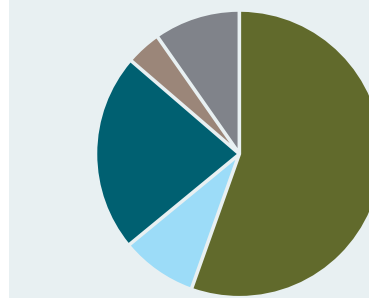
Universities offer a wealth of opportunity for collaboration, pre-competitive experimentation and expertise. Cybera has built a strong foundation in the academic sector through more than a decade of infrastructure support and cooperative projects. We can help you tap the resources that Alberta's dynamic academic sector has to offer.

### PILOT NEW TECHNOLOGIES

Nothing ventured, nothing gained. Cybera's openness and ability to test-drive new technologies means we can create a customized solution for your unique business challenges.

## FINANCIALS (unaudited)

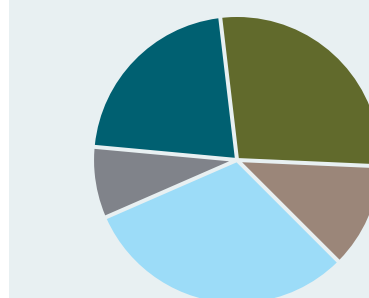
### CYBERA 2007-2008 REVENUE (\$)



Provincial Government	1,250,000
Contracted Services	428,232
Universities	200,000
Membership	89,500
Other (includes network referrals)	260,968

TOTAL REVENUE \$2,228,700

### CYBERA 2007-2008 EXPENDITURES (\$)



Grid Services	609,113
Connectivity/Systems	254,968
Project Management	663,859
Communications	201,072
Secretariat	500,739

TOTAL EXPENDITURES \$2,229,751

# CYBERA

Alberta Cyberinfrastructure for Innovation

For general questions or for more information about Cybera, please email [info@cybera.ca](mailto:info@cybera.ca).