

# BCNET Reports

## The Future: BCNET's 2007/2008 Operational Plan

BCNET is proposing the delivery of a number of key initiatives that will transform advanced network infrastructure within the next fiscal year. The projects are outlined in BCNET's 2007/2008 operational plan, a blueprint of activities for advanced network development within BC. Here are a few of the project highlights from the 2007/2008 BCNET operational plan:

### High-Speed Links Interconnecting Major Cities in BC

BCNET has planned the completion of the BCNET 2010 Project—providing high-speed inter-city links connecting all five BC Transit Exchanges. By March 2007, Vancouver, Victoria, Kamloops and Kelowna will have advanced network access through these inter-city connections.

The implementation of the inter-city links have been designed to coincide with the CANARIE ROADM project—a 10 gigabit fibre network from Calgary to Seattle. BCNET negotiated an additional spur from CANARIE that will extend from Kamloops to Kelowna. Additionally, BCNET is procuring a new circuit to Prince George, providing the north with increased network capacity.

### Aerospace for BC

Through the BCNET 2010 Project, the new BCIT Aerospace and Technology Campus will obtain fibre and connections to the regional and national advanced research networks. The fibre installation will take place

along the new RAV line and should be completed in 2007/2008. In the meantime, BCNET is installing temporary services for the campus, which will guarantee immediate connectivity.

### Greater Internet Bandwidth for BCNET Members

Once again, BCNET will be renegotiating Internet transit provider contracts towards the end of 2007 to guarantee the lowest costs for its members. BCNET anticipates that member costs will remain the same, but available member transit bandwidth should increase, providing more Internet capacity for universities and institutes across BC.

### Leading-edge Technologies for Today's Campuses

Two important technology projects are being pursued, which will improve collaboration on BC's campuses. Project management will be implemented to make sure all the resources are utilized and the project is completed within the defined scope, time and cost constraints.

The EduRoam Project, short for educational roaming, will authorize faculty and staff to use wireless networks at educational facilities across the country.

A high definition video conferencing project will enable campuses with high-end communication tools for improved collaboration.



#### BCNET MEMBERS:

##### Founding Members:

Simon Fraser University  
University of British Columbia  
University of Victoria

##### Core Members:

British Columbia Institute of  
Technology  
Thompson Rivers University  
University of Northern British  
Columbia

##### Higher Education Members

Emily Carr Institute  
Great Northern Way Campus  
Okanagan College  
Royal Roads University





### BCNET Research Organization

#### Members:

BC Cancer Research Centre

CBC

Department of Oceans and Fisheries, Government of Canada

Environment Canada, Government of Canada

Genome Sciences Centre

Herzberg Institute of Astrophysics, National Research Council, Government of Canada

Institute for Fuel Cell Innovation, National Research Council, Government of Canada

Interior Health Authority

Pacific Forestry Centre, Natural Resources Canada, Government of Canada

Provincial Health Services Authority

Vancouver Island Health Authority

Northern Health Authority

TRIUMF

## The ROADM Project: Boundless Bandwidth for BC and Canada

CANARIE is acquiring new fibre networks in British Columbia, southern Alberta, southern Ontario and Quebec that will be the largest bandwidth breakthrough to hit Canada since CA\*net 4. Entitled ROADM (Reconfigurable, Optical Add-Drop Multiplexer) networks, this project will build an optical network that will reach across Canada and areas of the US.

BCNET has been partnering with CANARIE to jointly manage the project for Western Canada. Both parties will deploy a minimum 32-channel ROADM network capacity between Calgary-Vancouver-Seattle that can be interconnected to the existing optical networks deployed by CANARIE, BCNET and Pacific Northwest Gigapop (PNWGP).

“The bottleneck of scarce bandwidth will soon be solved,” says Michael Hrybyk, President and CEO of BCNET. “This new network will open up new opportunities for collaborative research and education between institutions. Here in BC, we’re also using the network to connect regional centres and buy fibre locally to connect hospitals, municipal offices and libraries, in addition to universities and other research institutions. It’s an excellent way to leverage CA\*net 4 and the new ROADM network to serve local centres.”

The network is being driven by a voracious demand among BC’s science and higher education communities and their international partners for high-bandwidth, dedicated network connections (called lightpaths), as well as for greater control over the network itself.

### ROADM Project Partners

BCNET, CANARIE and Netera have joined forces to tightly manage the ROADM project deliverables and timelines for Western Canada. The western portion of the ROADM project will connect Calgary, Kelowna, Kamloops, Vancouver, Victoria and Seattle. To date, the project is on track, the fibre installation is complete and the team is planning for the next phase of the project.

Setting up the equipment outlines the second phase of the project, which began in November. Fibre characterization tests will be done to prepare for the building and tuning of equipment for the wide area optical network. Final installation of all equipment is expected to be on time for February and March 2007.

The new network is built around a recent generation of optical equipment based on technology from Nortel Networks called Reconfigurable Optical Add/Drop Multiplexing (ROADM). The ROADM network will deliver 72, 10-gigabit per second (Gbps) optical wavelengths and will have enough capacity to accommodate all users for at least another decade.



## New Connections

Many organizations have been inquiring about the benefits of connecting to the BCNET Transit Exchange for the advantages of peering with the academic community and acquiring redundant solutions. Over the last quarter, BCNET has connected The City of Kamloops, Telnetphone and Rackforce Hosting.

### A Collaborative Research Project: TelnetPhone

TelnetPhone, a Voice Over Internet Protocol (VOIP) organization, recently connected to the Vancouver Transit Exchange to peer with the university community in support of a collaborative research project with UBC's Dept of Psychology. This research is being conducted by Dr. Jennifer Shapka as part of her Developmental Change and Information Technology Lab (DCTech Lab). Dr. Shapka is a professor in the Department of Educational and Counselling Psychology and Special Education (ECPS) at the University of British Columbia (UBC).

This study will examine how teenagers use the Internet, including the amount of time they spend online and the kinds of websites they visit. TelnetPhone is providing the backend ADSL link for the project.

### The City of Kamloops

The installation is currently in process to link The City of Kamloops to the Kamloops Transit Exchange. The City of Kamloops has been building the Kamloops Community Network a publicly owned and operated utility providing businesses and citizens with low cost, high speed communications.

### RackForce Hosting

RackForce is connecting to each of the five BCNET Transit Exchange sites and contracting with local Internet Service Providers at each exchange. They are expanding their service model to include bundled ISP services for their customers at each of the Exchange sites.

### New Corporate Partner

An up and coming next generation broadband networks company named **Zeugma Systems** recently joined BCNET as a Corporate Partner. Zeugma is interested in using BCNET's advanced research network as a platform for testing their next generation networking products.

## NEW CONNECTIONS:

**The City of Kamloops**

**TelnetPhone**

**Rackforce Hosting**



## Lightpath Services Agreements

BEST-Score Project

Canadian Lightsource Project



## Implementing New Lightpath Services for Science

BCNET's Network Engineers have been building lightpaths for regional and national research projects. Over the last quarter, lightpath services were implemented for the BEST-Score Project and the Canadian Lightsource Project.

### The Canadian Lightsource Project

A CANARIE funded project centred out of the University of Saskatchewan is now being extended to BC and Ontario.

Researchers at the Canadian Light Source (CLS) are using beams of synchrotron light to examine the structure of molecules and the relationships between atoms.

Their colleagues at the University of Alberta are leading a project to investigate how advanced networks like CA\*net 4 can be used to collect the data generated from the synchrotron experiments and distribute it to researchers across Canada so they can use the data to understand important biological processes at the molecular level. The experiments will lead to innovations in environmental, agricultural and health sciences.

### The BEST-Score Project

This project uses high definition videoconferencing for studying collaboration over distance. UBC and RISQ are the project participants that are using the high definition videoconference facilities, while researchers observe and study their interactions.

## Delivering Robust Network Infrastructure for BC's Universities

University network traffic is growing and the trend is expected to continue, therefore a network strategy to ensure ongoing reliability is imperative. BCNET has planned to implement a more robust network infrastructure for its members and delivered on their promise over the last quarter.

The installation of separate "transit" links into each of the university sites, including UVic, UBC, SFU and BCIT was designed to provide insurance against any sudden interruptions in service. Currently, each university site has dark fibre along one conduit.

Now, a separate transit link will connect to each site along a completely different path and link to another transit service provider. These connections provide transit services through a diverse path ensuring a more distributed network environment and back-up service plan.

### Project Status

The implementation plans and project timelines are completed for each of the sites, including UBC, UVic, SFU and BCIT. Plans will include multiple sites, such as SFU's campuses in Burnaby, Harbour Centre and Surrey with their own redundant transit connections.

## New Partnerships, Extensive Opportunities: Phase II of the UBC Medical Expansion Program

A unique partnership between BCNET, the UBC Medical School and the Provincial Health Authorities has created an exclusive network which facilitates real time, distance learning at clinical medical campuses across the province. This unprecedented cooperation between government, academia and BCNET is providing an interconnected, tightly monitored network that will enable medical student training in remote communities across the province.

### The Connection

The cooperation began earlier this year when representatives from BCNET, the UBC Medical School and the Provincial Health Authorities came together to discuss viable technological and networking solutions for the program's expansion into clinical settings. It was through this collaboration that they discovered a common Telus network gateway where BCNET could interconnect all three parties. BCNET's connection to the Telus Private Network Gateway, a network that connects all six of the BC Health Authorities from Prince George to Victoria, provided the interconnection to BC's universities, the Health Authorities and BCNET.

Now, the second phase of the UBC medical expansion program is successfully underway, training third and fourth year medical students in clinical academic settings. With the recent expansion and technological developments, students have gained new opportunities to spend a significant amount of time in hospital- and community-based clinical settings throughout the province.

### Flawless Quality of Service for Videoconferencing

The program depends on an extremely high quality network to deliver a visually and acoustically perfect learning environment. To ensure that students receive the flawless quality of service that is necessary for detailed observation, such as viewing specimens over videoconferencing monitors, BCNET provided UBC access to network monitoring tools that continually monitor the network's health and performance. Initially provided for the first phase of the medical expansion program, the monitoring system has since been adopted by the Health Authorities as their quality of service verification tool for the clinical academic network.

Through the use of BCNET's performance measurement tools, technicians can view charts that track data packets travelling over the network and are notified of any network or equipment failures. If a failure does occur, IT staff at each of the participating clinical sites is alerted instantaneously to ensure the appropriate corrective measures are taken and that students have a seamless experience.

### Looking to the Future

The partnership between BC's universities and the Provincial Health Authorities opens up an array of opportunities for future initiatives. Said David Lampron, Fraser Medical Program Technical Operations Manager, UBC Faculty of Medicine, "The network and monitoring capacity that BCNET has brought to the table is only going to increase in value and could very well serve as the foundation for other initiatives which will rely on the same type of interconnectivity between the Health Authorities and academic institutions."



**David Lampron, Vancouver Fraser Medical Program Technical Operations Manager, UBC Faculty of Medicine**

"BCNET has played a pivotal role in the design and rollout of the interconnected Distributed Medical ProgramAV/MPAACT networks. The network monitoring has provided the medical program with the ability to troubleshoot this highly complex network and delivered the Health Authorities a new approach and insight into their own networks."



### Keynote Speaker:

**Carl Wieman, Nobel Prize Laureate**



**Carl Wieman**, a Nobel-prize winning American physicist and the 2004 United States Professor of the Year, will be headlining the BCNET 2007 Conference.

### Conference Sponsors:

**CANARIE**

**Ministry of Labour and Citizens' Services**

**CISCO**

**SGI**

**MetroBridge**

## BCNET Launches its 7<sup>th</sup> Annual Conference: *Making Connections: Sharing Knowledge for Greater Innovation*



BCNET is hosting its 7<sup>th</sup> annual conference, known as Western Canada's premier technology event for research & higher education, on April 17 & 18, 2007, at SFU Harbour Centre in Vancouver, British Columbia. This year's theme, *Making Connections: Sharing Knowledge for Greater Innovation*, highlights the goals of the event: to introduce new ideas, and share experiences to enhance research, teaching & learning through technology.

### BCNET's Conference Program Committee

Volunteers for the BCNET Conference Program Committee have been meeting monthly to guide the development of the program, recommend keynote speakers, conference tracks and evaluate speaker submissions. Made up of representatives from industry, government, academia and industry associations the Conference Program Committee, is helping to inject new ideas into this year's event.

### Conference Goals

The goal of the conference is to stimulate critical thinking about new and better ways to apply super high-performance networks and applications technologies to boost productivity and innovation within the higher education and research community.

The program will unlock windows of discovery into the achievements of others and open critical discussions through interactive forums such as workshops, roundtables, panels and open-question lectures. Industry showcases, leading-edge guest speakers and networking opportunities are among other highlights of the event.

### Conference Tracks: Something for Everyone

The conference will bring together thought leaders in learning, collaboration, health, advanced media, high-performance networking and computing technologies. Sessions will explore the many opportunities and developments in high-performance networking and real life research projects which harness the power of these networks for science and innovation. Learning and collaboration technologies tracks will take a look at today's applications, the future and how these tools can enhance everyday learning.

Other topics will explore the leading IT issues on campuses today such as security, identity management and disaster recovery, and provide a forum for inter institutional collaborations and conversations with industry. Workshops present opportunities to engage, debate and discuss the key issues, challenges and successes for IT.

## The 2007 BCNET Broadband Innovation Challenge

For the fourth year running, BCNET is promoting a competition for students to demonstrate innovative applications which make use of advanced networks. Formerly known as the **Coollest Applications Contest**, the competition has been repositioned to better reflect its goals and to present a more professional image.

The goal of the competition is to promote student innovation and demonstrate the utilization of British Columbia's super broadband research networks.

The competition is being managed by a steering committee made up of academia, government and industry. The steering committee will be assisting BCNET with promoting the competition to students and judging the contestants.

Contestants will be selected on their ability to demonstrate the best and most innovative applications that make use of super broadband research networks. The challenge is to demonstrate how the project application is unique, commercially viable, and technically complex as well as how it demands super high bandwidth connectivity. Students will also be judged on their ability to proficiently present their application and clearly show its value.

Winners will be awarded with cash prizes from monies raised through industry sponsors. Last year, BCNET industry sponsors contributed over \$9,000 in cash prize monies, which were distributed to the top place winners.

BCNET is soliciting higher education students across British Columbia, to participate in the challenge, including full-time and part-time graduate and undergraduate students doing honours thesis work or working on major course projects. Co-op students may submit a project they worked on during a work-term, as long as the application is non-commercialized and fits all other criteria. Applications may also be submitted by a group of students from one or more of the above categories.



### The 2007 BCNET Broadband Innovation Challenge Sponsors:

Industry Canada

SGI

Matrix Professional Video Systems



## BCNET Committees

Network Research Advisory Committee

Network Planning Advisory Committee

Applications Advisory Committee

## BCNET Working Groups

Western ROADM

Health Network

Identity Management

Disaster Recovery

Collaborations and Learning Technologies

High Performance Computing

## Network Project Update from BCNET's Committees and Working Groups

### Network Research Advisory Committee (NRAC)

Over the past several months, NRAC has been evaluating many new directions in network research. Due to a lack of interest in implementing the XRNet equipment, NRAC is investigating some alternative plans. One strategy is to use the Emulab's experimental research network, a testbed for network research activity.

The **Virtual Public Place Project** is a new initiative which aims to create a 24/7 virtual public meeting place between UBC and BCIT. Using high definition video streaming and videoconferencing monitors over advanced networks, students will be able to interact between campuses around the clock.

The committee continues to focus on the evaluation and implementation of tools that will enable researchers and IT staff to closely monitor and enhance network performance.

### Network Planning Advisory Committee (NPAC)

NPAC has recently formed two new working groups: the Western ROADM Working Group and the Health Network Working Group.

Outside these areas of interest, NPAC is reviewing a series of network security policies that will be finalized before the end of 2006.

### Network Security

Beyond its core goal of ensuring the ongoing protection of the BCNET network, the group is actively engaged in sharing best practices and developing security policies and guidelines which protect BCNET and its members.

By closely monitoring the network, the group is able to minimize security risks, recognize incidents and violations when they occur and initiate appropriate action. In addition to password administration and the formalization of policies into an overall Network Security Plan, the group is working to expand system security logging and conduct regular risk and vulnerability assessments of the network.

### Western ROADM Project Working Group

Formed in September with representatives from CANARIE, Netera and BCNET, the working group meets weekly to oversee the progress of the Western ROADM Project. It will ensure that the needs and interests of BCNET and CANARIE are mutually communicated while also defining the operational processes, shared management responsibilities and roles of CANARIE and BCNET.

### Health Network Working Group

After meeting for the first time this November, the group has committed to overseeing strategic networking issues between the BC Health Authorities and BCNET core members. Initially a discussion group, it will cover topics of mutual interest, including the use of the Western ROADM network, local metro fibre and transit and peering services by the Health Authorities.

As a reciprocal endeavour between BCNET and the Health Authorities, the group will also develop and engage in activities aimed at increasing both groups' level of involvement with each other, beginning with the Health Authorities' participation in the BCNET 2007 Annual Conference.

## Network Project Update from BCNET's Committees and Working Groups

### Applications Advisory Committee

The Applications Advisory Committee (APAC) continues to provide the BCNET Board of Directors with recommendations on the development and implementation of applications and technologies that take advantage of the network. The committee recently welcomed BCNET Board member Mark Roman, CIO and Associate Vice President Computing and Systems Services, University of Victoria, to join the group as its new chair. Mark brings with him a new approach to project management, which will require working groups to compose a small project charter before any initiative can be undertaken. This process will enable the working groups to gain the monetary and human resources that are necessary for project implementation.

### Disaster Recovery Working Group (DRWG)

The DRWG is currently restructuring its mandate to more effectively address the needs of BCNET member institutions in terms of disaster recovery and business continuity planning. The group will meet in December to redefine its goals and begin planning for the 2007 BCNET conference.

### Collaborations and Learning Technologies

Over the past few months, the Collaborations and Learning Technologies working groups (CTWG and LTWG) have been exploring new opportunities for collaborative projects.

After meeting for the first time in October to discuss the groups' similarities, they are now actively pursuing a possible group merge.

The LTWG, which previously spent time comparing ongoing projects at each member's campuses, initiated the joint meeting with CTWG to avoid any duplication in project efforts. A final decision regarding the merge will be made during a joint meeting at the end of November.

Separately, both groups continue to investigate emerging technologies that enhance the collaborative abilities of researchers and students at BCNET member institutions. The CTWG is currently experimenting with both low-end desktop and high-definition videoconferencing equipment, while the LTWG remains interested in the implementation of Pachyderm, a web-based authoring application that increases the sharing capabilities of both students and teachers.

### High Performance Computing

The High Performance Computing Working Group (HPCWG) acts as a forum for researchers to come together twice a year, discuss HPC initiatives throughout the province and provide feedback to BCNET on the infrastructure and middleware needs of researchers. The group is currently expanding its membership to better represent the wider HPC community in BC.

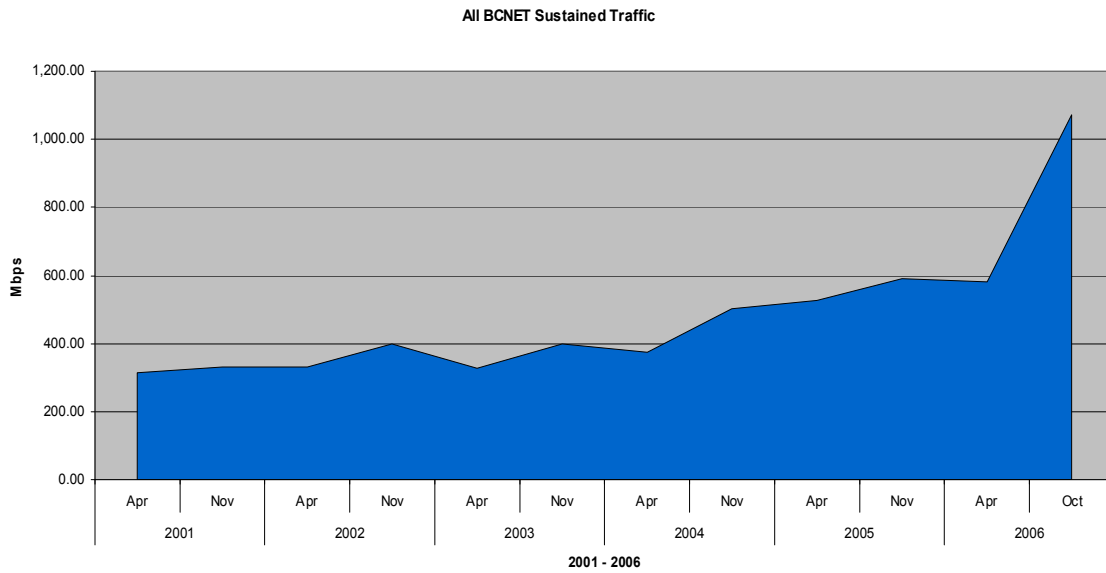
### Identity Management Working Group

Members of the Identity Management Working Group (IMWG) are leveraging BCNET for identity management initiatives across the province and embracing the complexity of authentication. Moving beyond the working group and BCNET member institutions, the IMWG are currently involved in a Provincial Government initiative that aims to build a network infrastructure that supports interoperability within the public sector.

The group also continues to implement EduRoam at each of BCNET's member campuses to address the issue of inter-institutional roaming. Recently, the BCNET Board of Directors accepted EduRoam as a high priority project.

BCNET Network Usage Reports:

Total BCNET network usage including CA\*net4 and transit traffic



There is a steady increase in use of the Canadian research network, CA\*net 4.

