

New digital lab, participation in CineGrid™ benefit students

Ryerson shines the spotlight on digital cinema



Live demo at Ryerson University involved manipulation of film in real time over 5 Gbps connection from Toronto to Prague.

Taking advantage of an advanced optical "lightpath" linking it to partners all over the world, Ryerson University has become one of the key players in a technology transformation that will forever change the way films are made.

Film will diminish as a medium for cinema, ultimately to be replaced by digital technology that relies on ultra-fast, ultra-large bandwidth networks and advanced collaborative middleware that can allow producers and artists to share, in real time, file sets that are measured in terabytes.

"Digital cinema allows filmmakers to do everything they can already do with film, and more," said Paul Hearty, director of the Rogers Communications Centre at Ryerson University, one of the architects of the North American digital high-definition standard. "It's

a whole new medium so there is still a lot to explore, and awareness about the benefits of going digital is still growing."

Digital technology can produce very high-quality imagery – in fact, better than that of film. However, it requires significant bandwidth. Consider an image of 8.8 megapixels, 42 bits per pixel and 24 frames per second that requires 8.9 Gbps capability. Combine that with an audio track of up to 16 channels and 2.3 Mbps, which requires an additional 36.9 Mbps. This is where ultra high-speed optical networks enter the frame, as filmmakers share and manipulate the data streamed over ultra high bandwidth networks, at the Production and Post Production stages.

Ryerson University, one of the biggest media schools in Canada, is a founding member of CineGrid™, a consortium of labs worldwide, including the University of California San Diego, University of Southern California, and Keio University in Japan. Ryerson's Rogers Communications Centre, which houses the university's media schools, will soon open a new digital lab complete with state-of-the-art equipment and a 10 Gbps direct "lightpath" connection over CANARIE that will enable collaboration with other CineGrid™ participants.

CineGrid™ is an international, non-profit research consortium that focuses on the development and demonstration of networked collaborative tools using grid technologies to enable the production, use and exchange of extremely high quality digital media over photonic networks like ORION and CANARIE.

CineGrid™ networked collaborations effectively reduce or eliminate geography as a barrier to participation in film creation, so that filmmakers can remotely tap into a vast pool of resources and talented experts in post-production houses around the world. This is particularly relevant for Toronto and San Francisco, both homes to significant creative resources in post-production work, leading to growth in the local media industries, in accord with the Digital City Network Agreement, of which the two cities are a part.

With the new digital lab scheduled to be fully operational this fall, Ryerson is poised to become the hub and leader of digital cinema in Canada.

The lab will employ 4K digital cinema, which is four times as sharp and detailed as standard high-definition imagery, already being heralded as the way of the future of filmmaking.

World first — CineGrid™ demo

In a world first, Ryerson University this week participated in a transatlantic high-speed film production collaboration using advanced networking technologies.

The live demo, coordinated in Toronto by Paul Hearty, director of Ryerson's Rogers Communications Centre, was enabled by a 10 Gbps CANARIE "lightpath" linking the Toronto site to its CineGrid™ partners in Prague and California at the University of San Diego.

The demo involved the colour correcting of digital cinema content shot in Prague two days earlier. The images were sent to Toronto for remote-controlled digital colour correcting.

The colour technician was able to follow the instructions of the cinematographer and director, who were physically located an ocean away, effectively implementing changes to the film in real time.

According to Paul Hearty, the technology has the potential to place Toronto and Canada at the forefront of the emerging digital cinema movement as a leading post-production centre.

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Bringing ORION's world of discovery to more K-12 students

As students begin the new school year, several thousands will be joining the nearly 750,000 Ontario students with ultra high-speed access to ORION, bringing next-generation teaching and learning resources to classrooms across Ontario.

Three more school boards are joining ORION, now providing more than 740,000 elementary and secondary school students with access to new and exciting, interactive resources and programs.

The Waterloo Region District School Board, one of Ontario's largest boards with over 56,000 students, is the latest to connect to ORION. The Kawartha Pine Ridge District School Board and the Peterborough, Victoria, Northumberland and Clarington Catholic District School Board, representing nearly 50,000 students combined, are joining the network in a few weeks.



"Technology has forever transformed education and the way we teach and learn. We need to prepare our students for the new global economy, and ORION is a vital tool to ensure Ontario has the means to deliver high quality education so necessary for our future," said ORION President/CEO Phil Baker.



"ORION helps address a critical need for school boards that require a high-speed infrastructure in order to prepare students with the necessary skills for the digital world that we live in today," said Ron Plaizier, Chief Information Officer of the Kawartha Pine Ridge board. "Interactive, multimedia content is being introduced to

the Ontario curriculum at a rapid rate, requiring stable and reliable access to new standard tools and resources, such as advanced videoconferencing, that provide students with access to distant resources and expertise."

"We are very excited at the prospect of connecting our students to the ORION network," said Sean Heuchert, Manager of Information Technology at the Peterborough Catholic board. "This resource will put our students at the cutting edge and give them access to learning opportunities never before possible."

"We are enjoying the improved access to Internet resources," said Mark Carbone, Assistant Manager, IT Services, at the Waterloo Region board. "The bandwidth increase has been a significant improvement for the staff and students in our Board."



A total of 16 boards have now joined ORION, which is moving closer to its goal of providing all of Ontario's 1.9 million K-12 students with access to the network and the special resources and capabilities that it enables, including innovative learning programs from the Canadian Space Agency, the Royal Ontario Museum, the Royal Conservatory of Music, and more.

Technology and next-generation network tools and resources are changing profoundly the world of learning. One classroom in Dryden recently used ORION to participate in a live, remote open heart surgery conducted at Mount Carmel West Hospital in Columbus, Ohio. The Royal Conservatory of Music relies on ORION and advanced networks to provide real-time music lessons.

Several ORION-connected schools participate in the annual global Megaconference Jr., linking schools and students from all over the world by multi-point videoconferencing technology. Boards can access unconstrained bandwidth to participate fully in such innovative programs as the Virtual Researchers on Call (VROC) and Advanced Broadband Enabled Learning (ABEL) programs. School boards gain the ability to share a high-bandwidth platform with other boards to collaborate and share resources and achieve savings and efficiencies.

ORION has made it easier for more school boards to connect to the network by adjusting its 2008 access fees to encourage more of Ontario's 72 school boards to connect. For more information, read the release at www.orion.on.ca/recent-releases.html.

People on the move...

Alan Anderson has been appointed project manager of CONCERT, the Consortium on New Media, Creative and Entertainment Research and Development in the Toronto Region. The University of Windsor recently announced the appointment of **Dr. Ranjana Bird** as Vice-President, Research. She is currently Dean of Graduate Studies at the University of Waterloo and will begin her five-year term on October 1. The University of Waterloo has announced that **Bruce Campbell**, former Manager, Science Computing, has been named Director, Network Services in the Information Systems Technology department, replacing **Roger Watt** who recently retired. **Jan Donio**, who has served as Executive Director of Corporate and Information Services since 2005, will be winding down her responsibilities at the Council of Ontario Universities, where she has been working part-time since accepting the position of Vice-President, Information Systems and Operational Change Management at the United Way of Greater Toronto in February. **Peter Marshall** recently stepped down from his position as Advanced Networks Applications Specialist at CANARIE Inc. to pursue other opportunities. **Dr. Michael Owen**, former Associate Vice-President, Research and International Development and Professor at the Faculty of Education at Brock University, becomes Vice-President of Research and Graduate Studies at the Ontario College of Art & Design, effective October 1. **Kevin Pashuk** is the new Chief Information Officer at Sheridan College, having recently left the Northern Ontario School of Medicine as Director of Technology. **Prof. Pekka Sinervo** will end his term as dean of the Faculty of Arts and Science at the University of Toronto on June 30, 2008, one year early, in order to refocus on his leading scholarship in particle physics at a time when one of his long-term research projects, the ATLAS experiment at the Large Hadron Collider in Geneva, Switzerland, is scheduled to begin data-taking in spring 2008. The University of Toronto announced the appointment of **Professor R. Paul Young** as Vice-President, Research. Currently Chair of the Department of Civil Engineering, Prof. Young will begin his term on November 1.

ORION Technical Workshop

IPv6 and IP Television (IPTV) will be the primary themes at the next ORION Technical Workshop, **Tuesday, November 13, 2007**.

In partnership with VSNL International and Ryerson University, the one-day workshop will be held at Ryerson's International Living Learning Centre (ILLC) in downtown Toronto.

Internet Protocol version 6 (IPv6) is a network layer protocol which will succeed IPv4, the current version of the Internet Protocol. IPv6 supports a much greater number of IP addresses as well as enhanced routing and network auto-configuration. IPTV refers to multi-channel digital television signals streamed or downloaded over the Internet and received or displayed on desktops or television monitors. Colleges and universities, for example are beginning to deploy IPTV services on campus.

The workshop is geared to CIO's, IT directors, network managers, and other IT specialists from ORION's member institutions, including universities, colleges, school boards, and other research and education organizations. Attendees can expect an update from ORION's **Sam Mokbel**, Senior Director, Engineering and Network Operations, on new network deployments and services; a CANARIE network update by **René Hatem**, Chief Technology Officer; presentations on new network technologies such as QoS, MPLS, IPv6, VPN, multicasting and security; and a keynote presentation by **Yves Poppe**, Director, Business Development IP Services of VSNL International. Case studies and a roundtable discussion on new applications will also be included. Learn more at www.orion.on.ca/techworkshop07.

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The digital image maintains the film format's maximum fidelity, yet real-time collaboration at the production and post-production levels requires much greater bandwidth. The ultra high bandwidth of CANARIE and other R&E networks permits filmmakers and technicians to see, hear and manipulate the same material in real time with no time lag, no matter where they are physically located.

What does the new digital lab and participation in CineGrid™ mean for Ryerson film and image arts students?

Connecting through a 10 Gbps "lightpath" over CANARIE to Calit2 and other film schools will enable collaboration on projects with other students, hands-on training with next-generation equipment, and practical experience with what is reputed to become the new standard medium of the industry.

Instruction can be carried on remotely, with international experts able to conduct seminars and workshops from anywhere in the world, reducing the cost of travel. In this way, Ryerson can build a network of creative experts in specific skills (the biggest challenge for media schools), thereby improving the quality of educational training for students.

The university is currently acquiring new equipment to support the facility, including a Dalsa 4K digital sensor camera. It has a 16-bit per colour channel and produces images 4000 pixels wide by 2000 pixels high, broader and sharper than the traditional film image. (Interestingly, Dalsa is another Ontario success story: the digital imaging company originated in Waterloo by a University of Waterloo alumnus and now has branches around the world).

According to Hearty, the minimum requirements for participating in CineGrid™ enabled digital cinema are 4K AV user-driven configuration and connection at both ends; two-way AV interactive telepresence (each participant has to see and hear the same information at the same time); new tool development for collaborating and managing resources; consistent low response delay; and top-quality tools to ensure commonality of the viewing and listening experience.

"Creatives have to be able to use the technology easily since they don't have the same skills base to draw on as engineers do. It has to be affordable and it has to be secure," continued Hearty.

"One of the biggest challenges we've encountered so far is how to ensure filmmakers can give creative direction and maintain creative control at the same time. We still require the development of new digital security tools to protect intellectual property rights."

In order to promote digital filmmaking among the Toronto cinema community at large, Ryerson will encourage industry professionals and other groups interested in the new medium to come to the lab to experiment and learn.

However, other practical uses for the medium exist. The new technology has yet to be fully explored and it will likely be some time before its full potential is realized. In the meantime, Ryerson film and image arts students will participate in the experimentation and learn to use the new medium of cinema. For more information on CineGrid™, visit www.cinegrid.org.

ORION launches re-designed Web site, e-newsletter

As the R&E community gets back into the full swing of things again after the summer, September is the perfect time to unveil ORION's new look.

An exciting new feature of the re-designed Web site is the interactive **orionXchange**, a mini portal to help users find resources, communicate ideas, post upcoming events, and share success stories with colleagues. As such, this mini site is ready for contributions from researchers, scientists and educators. We look forward to seeing how this initiative will grow and help create synergies between colleagues.



The official ORION e-newsletter, has also received a makeover, along with a new name, the ORION Research and Education News. Previous editions are still available from the newsletter archive page.

We hope you will enjoy browsing the new Web site, and look forward to hearing your feedback. Tell us what you think about it by emailing info@orion.on.ca.

More institutions connecting to ORION

ORION is busy connecting new organizations to the network this fall, including the world-renowned Perimeter Institute, and the Royal Ontario Museum (ROM), one of Canada's most important cultural institutions, celebrating its recent expansion with a virtual expansion to the global grid of research and education (R&E) networks.

The Perimeter Institute for Theoretical Physics is an independent, non-profit research centre in Waterloo, where international scientists cluster to contemplate and calculate the very essence of space, time, matter, and information. In addition to research into foundational issues, the Institute also provides educational outreach activities for students, teachers, and members of the general public across Canada and beyond.

"Perimeter has joined the ORION network to better support scientific collaboration opportunities and to improve access to researcher services such as SHARCNET, the high performance computing consortium," said John McCormick, director of information technology at the Institute. "Specific collaboration projects include seminar participation via videoconferencing, Access Grid, and



Mediasite technologies where the presenter may be located either at Perimeter or at a remote site." Perimeter Institute will also use its ORION connection to expand its educational outreach programs to students, teachers and the general public.

The Royal Ontario Museum, now celebrating its new landmark building is moving to connect to ORION later this fall.

The Waterloo Region District School Board, one of Ontario's largest with nearly 60,000 students, the Kawartha Pine Ridge District School Board, and the Peterborough, Victoria, Northumberland and Clarington Catholic District School Board are the latest to join ORION. More than 740,000 Ontario students are now connected to the network, with several more school boards making plans to connect shortly.



ORION also completed connections to support Trent University's participation in the SHARCNET distributed computing consortium. Also about to finalize their SHARCNET links are the Ontario College of Art & Design (OCAD), and Lakehead and Laurentian Universities.

showcase

Peering with ORION enhances performance

One of the benefits of connecting to the ORION network is the significant performance enhancements ORION members achieve as a direct result of ORION's peering agreements with Internet Service Providers (ISPs) and content providers.

ORION peering agreements are credited for diverting up to 20 per cent of ORION's data traffic to directly peered network links, representing significant savings for ORION institutions as well as enhanced performance.

"ORION's peering agreements have already resulted in significant cost savings for our network's users," says Senior Director of Engineering and Network Operations, Sam Mokbel. "This is a win-win for all the players involved. The transmission of data is much more efficient, consuming less bandwidth, and performance is enhanced significantly."

Peering, in which networks agree to exchange traffic for mutual benefit and reduced transit costs, has been in place among larger networks for a while. A new trend in the Internet marketplace, and in the R&E network community, is for similar sized service providers to interconnect directly and exchange settlement free data traffic between their two networks.

The benefits to service providers are enhanced performance for customers, and lower cost for sending and receiving data.

This physical connection between networks takes place at Internet exchange points such as Toronto's TORIX at 151 Front Street West or at a private facility. Data exchanged is limited to the two peered networks and their directly attached customers. The data is not allowed

to transit to external service providers and thus bypasses potential bottlenecks.

ORION has free peering arrangements at its Toronto Front Street facilities with numerous Internet service providers, content providers, and web hosting companies. Among the major Internet companies that ORION peers with are Rogers, Shaw, Allstream, Videotron, Q9, and Akamai. Google is the latest organization that now peers directly with ORION.

The benefit for ORION members is that they have direct access to resources available on the networks of these peers over the ORION network. All traffic exchanged between ORION and its settlement-free peers is free of charge and contributes to lowering the overall Internet access costs of members.

ORION Research and Discovery News

The ORION Research and Discovery News provides news and information of interest to users of the Ontario Research and Innovation Optical Network and to the worldwide research and education community.

ORION is an advanced high-speed fibre optic network that connects research and education institutions to each other and to colleagues around the world. ORION is owned and operated by the Optical Regional Advanced Network of Ontario (ORANO). Visit our web site www.orion.on.ca or write the Editor at info@orion.on.ca. Subscribe at www.orion.on.ca/newsletter/subscribe.html.

ORION moves London PoP

ORION undertook a major move of its Point of Presence (PoP) in London this summer, moving all the equipment and fibre to another building on the University of Western Ontario (UWO) campus. The move was completed in phases over a two-week period and was necessary because the university is moving its central computing facilities to a new building currently under construction and slated for completion by summer 2008. The ORION PoP move took place this summer so as not to interfere with UWO's major IT move next summer, and to ensure uninterrupted connectivity to institutions that connect to ORION at the London PoP. The equipment was shifted from the central computer room at UWO's Natural Sciences building to the University College building, which is more centrally located from a fibre and physical access perspective.

Netera becomes Cybera

Alberta's Netera Alliance is now part of Cybera Inc., a new organization created to support research discoveries and public-private partnerships across the province. Its mandate will be to provide provincial leadership by coordinating, integrating, leveraging and sustaining investments in cyberinfrastructure (CI) technologies in Alberta. Cybera will facilitate access to ICT resources, including existing ICT tools around the province as well as new resources acquired through partnerships with Alberta's four universities, other public and private sector partners, and Netera Alliance. Visit www.netera.ca and www.cybera.ca.

Loyalist and Seneca join HPCVL

The High Performance Computing Virtual Laboratory (HPCVL) welcomes Loyalist College and Seneca College as its newest members. Providing researchers with secure High Performance Computing (HPC) resources, tools and user support, HPCVL was originally formed as a consortium of Carleton University, Queen's University, the Royal Military College of Canada, and the University of Ottawa. It has since grown to include Ryerson University, and now Seneca College and Loyalist College. "Ontario's colleges now have a research mandate, and we are extremely pleased that Loyalist and Seneca have chosen to help further their research infrastructure by becoming partners in HPCVL," said Dr. Ken Edgecombe, Executive Director of HPCVL. Visit www.loyalistic.on.ca and www.hpcvl.org.

ePresence 4.0 released

The Knowledge Media Design Institute (KMDI) at the University of Toronto has released the latest version of ePresence Interactive Media. The software is tagged as "the world's first open source webcasting, conferencing and rich media publishing solution." With Version 4.0, users now have access to ePresenceTV, a portal that enables them to link their published presentations to the ePresence website, and attract the interest of a greater virtual audience. One of the major benefits of the software is that all presentation media are synchronized and accessible through one convenient interface. To learn more, visit <http://epresence.tv>.

CANARIE call for funding programs

CANARIE is calling for expressions of interest under its Network-Enabled Platforms Program to support eScience and other applications. CANARIE is seeking proposals addressing infrastructure at the edge of the network and the services supporting distributed communities of collaborators. These would include data, servers, sensors, equipment and other resources used by the community. Web services, Web 2.0 and workflow

tools are the most common middleware for linking these resources and supporting their ease of use. Deadline is Nov. 15. CANARIE is also inviting submissions under its "Infrastructure Extensions Program". The IEP is designed to support extensions to the network to enhance/accelerate research, enable national and international collaboration, improve access to knowledge and contribute to the development of cyber infrastructure and e-research in Canada. Specifically, connections of government labs, education institutions and other facilities are to be supported. Deadline is Nov. 1. ORION expects it may be involved in a supporting capacity in proposals from Ontario. Visit www.canarie.ca.

YouTube for scientists

A new Web site operated in partnership with the Public Library of Science (PLoS), the National Science Foundation (NSF) and the San Diego Supercomputer Center (SDSC), allows scientists to post video along with published articles in order to provide opportunities for sharing, feedback and collaboration among colleagues. Created for scientists, by scientists, SciVee allows scientists to communicate their work as a multimedia presentation incorporated with the content of their published articles. Other scientists can view uploaded presentations and engage in virtual discussions with the author and other viewers. SciVee also facilitates the creation of communities around specific articles and keywords. Visit www.scivee.tv.

VROC and ABEL partnership

The Advanced Broadband Enabled Learning (ABEL) program recently announced a new collaboration with Virtual Researcher On Call (VROC), an educational initiative of Partners in Research. Designed to link Canadian high school students in their classroom setting with top researchers and their trainees from the scientific community, VROC provides an interactive learning opportunity for students in all aspects of the natural and health sciences, technology, engineering and mathematics. ABEL will provide support for and assist in planning VROC interactions for its members when they engage in VROC sessions. Visit www.abelearn.ca and www.vroc.ca.

Megaconference IX

Students, teachers and researchers from all over the world prepare to meet in virtual space next month at Megaconference IX. The annual event, taking place on Nov. 8, connects people from across the globe, including ORION member institutions, in order to further the use of videoconferencing in education and research and to advance the art of videoconferencing technology. New for this year is the ability to view the conference in higher definition. Megaconference is the world's largest videoconferencing event with 400 locations. To register to participate, visit www.megaconference.org.

Ontario Government announces \$10-million for broadband access

Residents and businesses of 18 rural municipalities in southern Ontario will soon have access to high-speed Internet services thanks to funding from the Ontario government. A one-time, \$10-million initiative will see 18 municipalities that are ready to implement and sustain broadband capability in their communities receive funding to help with infrastructure and implementation costs. The program is a joint effort between the ministries of Agriculture, Food, and Rural Affairs, Government Services, and Small Business and Entrepreneurship. "This funding will allow municipalities to provide broadband access to their residents and businesses which will benefit the entire community," said Gerry Phillips, Minister of Government Services. Learn more at www.omafr.gov.on.ca.