EURORISNET
European Research Infrastructures Network of National Contact Points
Success Stories
Issue 3 / February 2009

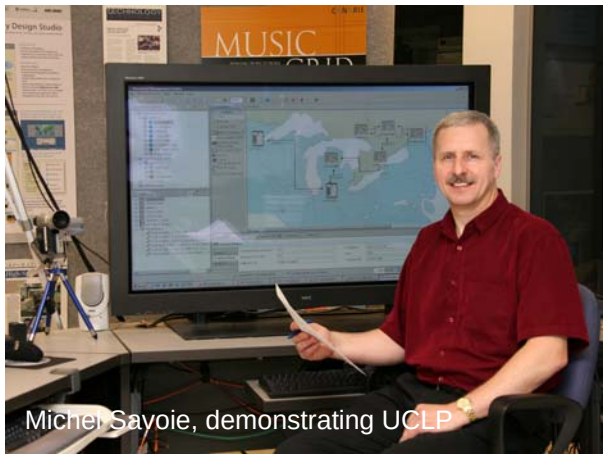
UCLP - A Software which changes the management and control of optical networks

User Controlled LightPaths (UCLP) technology fundamentally changes the management and control of optical networks. Not only does it empower users to create and manage their own Virtual Private Network (VPN), but it allows applications to support on-demand dynamic provisioning of end-to-end LightPaths or a collection of end-to-end LightPaths (i.e. VPNs or the so-called Articulated Private Networks). Previous approaches required a network operator to co-ordinate this kind of activity. The resulting network can transfer large amounts of data, support real-time multimedia exchanges, and enable globally distributed broadband computing. Users of these networks are freed to analyze the data they are collecting rather than having to worry about how to get the data in the first place.

UCLP technology is an open source software which enables network users to deploy and manage private, ultra high bandwidth IP networks. Users can create their own discipline or application-specific IP network, particularly useful in support of high-end e-science and grid applications. UCLP was developed by the Communications Research Centre Canada (CRC) in partnership with CANARIE Inc. Canada's advanced optical Internet research and education network – CAnet4, Inocybe Technologies Inc. and i2CAT Foundation in Spain.

How It Started

CRC has been involved in the development of the UCLP software since it was first conceived in 2002, under CANARIE's Directed Research Program on UCLP. The University of Ottawa was the lead contractor and partner in the initial development of UCLP software. CRC, Inocybe Technologies Inc. and i2CAT Foundation continued with on-going development. This resulted in UCLPv2, which evolved into Argia, the commercial version of the software.



Michel Savoie, demonstrating UCLP

Much of the research done at CRC on UCLP is headed by Michel Savoie, Research Program Manager for the Broadband Applications and Optical Network group. The research performed by the group is tested and applied in the Broadband Applications and Demonstration Laboratory (BADLAB). Integrated communications systems comprising fibre-optics, satcom and radio are developed in this facility, which allows the demonstration and testing of new broadband applications and services through a variety of telecommunications networks across Canada and the world.

Enabling More Efficient Use of Advanced Broadband Networks

This project has enabled CRC to establish stronger ties with EU partners, and carry out research with i2CAT Foundation to further develop the UCLP software. Furthermore, it has enabled the exchange and advancement of

technical knowledge. “Our staff members have expanded their skills and have been able to work in a virtual setting with team members from diverse cultures”, says Michel Savoie. The product grade version of UCLP - Argia - is marketed by Inocybe Technologies Inc., a startup company based in Montréal. CRC’s EU Phosphorus partners have migrated to the Argia software.

Research groups and institutions can take advantage of the capabilities of UCLP to create discipline-specific ad hoc networks in fields such as high energy physics, astronomy and bio-informatics, which increasingly rely on sharing huge amounts of data. Such sharing can now take place through the use of remote peering, employing no-cost Internet peering exchanges. Similarly, UCLP can enhance the quality of high-definition video conferencing and virtual learning applications, as audio and video signals are transferred with minimal delay.

Opening Opportunities

UCLP, which has now been adopted by international research networks, has enabled CRC’s participation in the EU Phosphorus Integrated Project under the Research Networking Testbeds associated with the 6th Framework Program. CRC serves as the only non-European domain in the Phosphorus testbed, by controlling CANARIE network elements using the UCLP software.

The Phosphorus project addresses some of the key technical challenges that enable on-demand end-to-end network services across heterogeneous multi-domains for grid and e-science applications. Phosphorus demonstrates solutions and functionalities across a testbed involving European National Research & Education Networks (NREN), GÉANT2, Cross Border Dark Fibre, GLIF connectivity infrastructure and CANARIE. The project consortium consists of 20 partners: 18 international partners from Europe and 2 partners from Canada, namely Nortel Networks and CRC.

Further benefits

Canada is a recognized leader in the development and use of advanced research networks. This position is reinforced by collaborating with international partners and being involved with international demonstrations that utilize the CANARIE network CAnet4.

References:

CRC http://www.crc.ca
CANARIE Inc. http://www.canarie.ca
Inocybe Technologies Inc. http://www.inocybe.ca
i2CAT Foundation http://www.i2cat.cat
Phosphorus http://www.ist-phosphorus.eu

By Michelle Mayer, Communications Research Centre Canada