

CANARIE

2002-2003 ANNUAL REPORT



CANARIE IS MAKING A DIFFERENCE

FOR ALL CANADIANS · IN EVERY SECTOR · AROUND THE WORLD

In 2002, the Government of Canada recognized CANARIE as one of the organizations leading innovation in Canada.



To our members, partners and stakeholders,

The *first wave* of the Internet brought with it email and file sharing and the basics of a global standard for interconnecting computers. The *second wave* saw the emergence of the World Wide Web and a global standard for providing access to multimedia material. Continued growth in the power of networks and computers, combined with new networking and software standards, is now generating the *next* phase in the development of the Internet, a *third wave* of innovative network infrastructure and applications that is leading organizations to actually change the way they *do* things.

Whether they are in research, industry, education, health or government, organizations are discovering ways to exploit the power of networks to integrate their own IT-enabled processes with those of others outside the organization. The cumulative effect of such process integration will ultimately transform how all organizations function, and therefore all of society.

Ten years ago, when the *first wave* of the Internet was getting established and the *second wave* was still on the horizon, Canada trailed the United States and Europe by most measures of networking activity. The formation of CANARIE in 1993 was part of a visionary attempt by industry, academia and the federal government through Industry Canada to change this state of affairs and address the opportunities inherent in the emerging technology. The country has truly been changed by these collective efforts.



Among the hundreds of projects CANARIE has sponsored over the last 10 years, perhaps the best indicator of how far we've come is the growth and development of our national research and education network, CA*net. Four generations of development later, CA*net 4 is a world-leading platform for collaboration and innovation and Canada's researchers, scientists and educators are using the network to develop advanced applications and explore how the *third wave* will generate economic, social and cultural benefits for all Canadians.

What we now see as the signal achievements of our first decade, such as the growth of CA*net, were in 1993 sensed only as a remote possibility. In celebrating CANARIE's 10th anniversary, therefore, it is important to recognize not only the efforts of the thousands of individuals who have turned these possibilities into reality through participating in our projects, but also the dreams of those who saw the long-term potential of the Internet and wanted to ensure that Canada took advantage of that potential.

With that in mind, in this year's report we have invited contributions from 10 well-known Canadians and friends of Canada to help us celebrate the past 10 years and to underscore the importance of having and communicating a vision of what can be. The objective is not to collect accolades for CANARIE's role, but rather to underscore the fact that it is the dreams and aspirations of those communities, organizations and individuals with whom we work, including those outside Canada, that are the bedrock of the organization. CANARIE has always been a people-centred, vision-driven organization, and we are proud of having helped to empower the visionaries to push the boundaries of what is possible.

Sometimes, progress is made in small but significant steps. Over the past year, for example, several CANARIE-supported projects have shown such advances:

- Students in rural Alberta have begun to take virtual courses in physics and mathematics, meaning they no longer have to leave their communities to acquire the requisite credits needed to enter university.
- The BC Cancer Agency has begun including digital X-rays and other medical images in a patient's electronic health record, thereby helping doctors to provide faster and better treatment.
- Experts in over 30 participating institutions and companies are developing a country-wide network of linked E-learning libraries that give students and teachers online access to multimedia learning material for school projects and course curricula.
- A Toronto company is working with researchers across Canada to use CA*net 4 to test broadband delivery of frequently used municipal services.
- A Quebec-based consortium of academic, industrial and government members is launching a bilingual, integrated web portal for the thousands of small- and medium-sized companies working in Canada's metal sector.
- A Montreal company is developing a new interactive computer simulation program that connects mathematics students from across Canada.
- In St. John's, Newfoundland, educators are using music to demonstrate the value of broadband-enabled learning for students in Iqaluit and across Canada.

While much has been accomplished through projects such as these over the past 10 years, the task of creating Canada's future is far from finished. In some ways, the easy part is behind us. The *third wave* brings enormous potential for benefits to all Canadians in many sectors such as education, health and business; but changing how we do things, the essence of the *third wave*, requires vision, leadership and a lot of hard work. Ten years from now we hope to look back and celebrate Canadian leadership in using networks to enable transformations across the breadth of society. The health, prosperity and well-being of Canadians could be at stake. The *third wave* is there for us. It can be used to learn more, to invent new ways of producing and delivering goods and services and new approaches to managing our society.

Over the past 10 years, over 250 people have participated as members of CANARIE's Board of Directors, its committees and staff. These individuals have not only played key roles in implementing programs and keeping the organization running, they have also acted as ambassadors for our shared vision within Canada and abroad. Members of staff have played a special role as ambassadors abroad through their roles on technical working groups, councils and policy forums in other countries. They also bring the world to Canada through organizing our annual workshops and conferences.

A special thank you, therefore, is appropriate to recognize the contributions of both current and outgoing members of the Board, its committees and staff. CANARIE wouldn't be where it is today without their collective contributions.

Andrew K. Bjerring
President and CEO

Jean-Marie Toulouse
Chair of the Board



Hon. Allan Rock

Minister, Industry Canada



CANARIE helps brand Canada as a global leader in network research. In partnership with the Government of Canada and Canada's public and private sectors, CA*net 4 and CANARIE's advanced research programs have become a symbol of and a catalyst for Canadian innovation.

As Minister of Industry, I am proud to be part of the Government of Canada's commitment to provide all Canadians with broadband access, and to create a network research environment second to none in the world. CANARIE has delivered advanced broadband networks and applications that have stimulated economic growth, increased Canada's international competitiveness and brought many benefits to our education and healthcare sectors.

As a not-for-profit corporation supported by its members, project partners and the Government of Canada, CANARIE has funded numerous advanced Internet applications projects, providing nearly 1,000 companies with the opportunity to achieve business success through innovation.

A central component of those projects is Canada's National Research and Innovation Network, CA*net 4. Building on the success of CA*net 3, in 2002 the Government of Canada invested \$110 million to keep Canadian researchers at the forefront of technological innovation. It will advance Canadians' quality of life while enhancing this country's opportunities in the global knowledge-based economy.

Demonstrating CANARIE's cooperative nature, CA*net 4 was built and continues to be developed in partnership with the private sector and various provincial research networks. Through this initiative, CANARIE will provide Canadian researchers with a network that will enable them to innovate and collaborate with their peers in Canada and around the world to develop and test new applications and technologies.

CANARIE plays an important role in helping Canada achieve the goal of being among the top five countries in the world for research and development performance by the year 2010. CANARIE's partnership with other Canadian leaders is fundamental to achieving this.

We all know that Canadian businesses are no longer competing just within Canada; we are competing with the world. We will have to produce new and better products and services if we are going to succeed. To that end, the future work of CANARIE will be instrumental in providing our researchers with the tools to remain at the leading edge of innovation.

Small- and medium-sized companies are the engine of Canada's economy, representing 80% of all jobs. With CANARIE's help, these companies are discovering how E-business can help them to grow, innovate and compete globally.



Nancy Hughes Anthony

President/CEO, Canadian Chamber of Commerce
Co-Chair, Canadian e-Business Initiative

Small- and medium-sized enterprises (SMEs) are a key engine of Canada's economy, and with CANARIE's help, an increasing number are discovering how Internet business solutions can drive up revenues while reducing costs.

As President of the Canadian Chamber of Commerce and co-chair of the Canadian e-Business Initiative (CeBI), I recognize how critical it is for SMEs to tap into the potential of networks and applications to improve efficiency across their entire business, from sales and marketing to human resources and customer relations. An increasing number of the Chamber's 170,000 members are adopting E-business solutions to improve their relationships with both customers and suppliers.

The results of this transformation will have a profound impact on Canadian innovation and productivity.

But there is still much to be done. The SME sector still lags well behind their U.S. counterparts in E-business adoption. For some SMEs, there are several barriers to E-business adoption that we at CeBI, of which CANARIE is a member, are working to address. Our goal at CeBI is to demonstrate that E-business makes good business sense and is critical to Canada's economic well-being. We are doing that by providing evidence of bottom-line impact on firms. CANARIE is an important partner in achieving this goal.

Through its E-business Program, CANARIE is accelerating the adoption of E-business by working with SMEs to develop Internet business solutions that are tailored to meet their company's specific needs. CANARIE is developing practical solutions that enable SMEs to accelerate their transition to E-business.

Together with CANARIE, we will continue our efforts to promote E-business development knowing that the return on investment will bring greater economic prosperity for Canadian business and for Canada.



Vinton Cerf is widely known as one of the “Fathers of the Internet.” His groundbreaking work on TCP/IP protocols provided the foundation for the development of CANARIE and other advanced Internet organizations. Today, CANARIE works collaboratively with the Canadian research and business communities to bring the benefits of advanced networks and applications to all Canadians.

I have had the privilege of observing and even participating in some aspects of the CANARIE/CA*net development.

Throughout the long evolution of CA*net and CANARIE I have been impressed by the commitment of the Canadian Government to high capacity computer networking and by the vision, skill and determination of the engineers who built and continue to evolve and operate CA*net.

In this age of information, it seems impossible to overstate the importance of computing and communications technologies. This Canadian effort has placed Canada in good company at the forefront of international communications research.

CA*net has robust linkages to the other research networks in North America, including the Internet2 vBNS+ network and the U.S. Defense Research and Engineering Network that WorldCom supports. The CANARIE program has served as an effective engine of cooperation between the Canadian research and business communities and has offered a glimpse of the future for those who wish to see and experience it.

CANARIE has blazed cultural trails with a variety of online cultural activities, exploring ways in which high performance networking can enhance and transform our appreciation of traditional and digitally-enhanced media. Moreover, CANARIE has instituted an aggressive and robust program of sponsored research, offering opportunities to illuminate the paths we may follow into a nascent future.

We are just beginning to recognize the enormous power of networking of high performance computers—we are becoming increasingly dependent on these technologies in our daily personal, business and governmental lives. The resilience and security of these systems and their ability to grow in scale are critical to their ability to meet increasing demand. The CA*net 4 network and its predecessors have proven to be instrumental in helping the research community to explore performance and security challenges while discovering new applications that high performance networking enables.

Canadians can be justly proud of the success of CANARIE and I join them in honoring its past and celebrating its future.

As our broadband infrastructure in Canada expands and as market pressures for greater efficiency and convenience make themselves felt, the momentum driving our world-leading innovations in broadband applications will grow dramatically. The challenge will be to bring these innovative technologies into the mainstream, for the benefit of Canadians and for companies that export these technologies.



Terry Matthews

Chairman & CEO
March Networks Corp.

Broadband networks and the applications that run on them offer an unprecedented opportunity for enhanced communications, information management and improved efficiencies for consumers, governments and businesses alike.

As a world leader in connectivity, Canada is ideally positioned to champion the development and commercialization of these emerging technologies. Last year was a banner year for broadband worldwide, with the number of subscribers growing from 30 million to well over 40 million. By 2006, the number of broadband subscribers worldwide is predicted to reach 140 million. Broadband is becoming a revolution in communications.

Broadband has an important role to play, especially in the healthcare industry, where high speed, instantaneous collaboration, always-on data and research sharing, patient monitoring, video consultation, online education and electronic health records offer exciting opportunities for innovation as well as reduced costs. Broadband offers an opportunity for improved access and generally improved healthcare service delivery for Canadians everywhere.

The March Networks Home Telehealth Solution, for example, is an innovative approach to enable healthcare providers to conduct virtual home visits over a secure, interactive broadband network. Its business model combines the strengths of the private and public sectors to deliver seamless, cost-effective healthcare services to patients at home. The system uses low cost and readily available bandwidth over two-way satellite, telephone and cable lines.

The strength of this partnership model was recently demonstrated through the largest home telehealth trial in Canada. It was made possible through the collaboration of March Networks, We Care Home Health Services, Aliant Telecom, CANARIE and the University of Calgary Health Telematics Unit. The trial resulted in high satisfaction ratings from both frontline nurse and patient participants and underlined the potential for broadband-based healthcare innovation.

Moving forward, public/private partnerships like these and the involvement of organizations such as CANARIE will encourage the growth of the broadband infrastructure and the widespread development of significant new applications across all industries and sectors of Canadian society.

We must all work to ensure that the full potential of broadband is realized by developing meaningful and tangible applications for the benefit of Canadians. We must continue to drive ever harder the development of innovative and pioneering new health services and applications. It is crucial, in my view, that we leverage the strength of the new broadband communications infrastructure to ensure that we capture the advantages that new applications and services can provide for Canada's healthcare system.



Senator Richard Alston

Minister for Communications,
Information Technology and the Arts
Commonwealth of Australia



Australia is developing a next-generation research and education network with help from Canada. CANARIE's unique approach to network development, particularly its use of dark fibre to shape the way communities are connected, is influencing broadband policy in Australia.

The Australian Government is committed to ensuring that its citizens derive the maximum economic and social benefits from the use of broadband technologies. The development of a competitive and sustainable broadband market will be one of the major policy challenges ahead as the Government works to promote growth and development in the Australian information and communications technologies sector.

Fast, always-on Internet and next-generation broadband technologies will become the roads and railways of the 21st century—helping to overcome the tyranny of distance in countries like Australia and Canada.

The Australian Government is currently considering a report by the Broadband Advisory Group (BAG), which will help our broadband policy framework capture and disseminate the economic and social benefits provided by broadband services.

The Group was ably supported by a group of Global Advisers, including CANARIE's President and CEO Andrew Bjerring. Dr. Bjerring was able to draw on his rich experiences of establishing the successive CANARIE networks to contribute innovative and challenging ideas to the reporting process—a contribution which is reflected in the final report by the BAG.

CANARIE's approach to the development of networks, particularly the use of dark fibre and the capacity of communities to shape the way they are connected, provides an important source of research for the Government in formulating its response to the BAG Report.

The necessary balance between the roles of the private and public sectors is also a crucial lesson for the Australian Government to take from the CANARIE experience. Building a national network and the widespread use of innovative technologies requires a national vision.

Amongst the key recommendations of the BAG was the need to continue to establish a next-generation Australian Research and Education Network. Australia's existing Research and Education Network (AARNet) has worked extensively with CANARIE on sharing ideas for innovation in network building and design.

This sort of collaboration will be important in the continued development of broadband technologies and networks. CANARIE not only has been an excellent model to assist Australia in that development, but has provided a valuable source of information to guide our own work. We look forward to continuing this relationship as Australia moves to implement its National Broadband Strategy.

Canada realized early on that extending broadband to communities, universities and research institutions is only the first step. Through its work in developing broadband applications in health, learning and business, it is helping to deliver the tangible benefits that matter most to citizens—quality of life and prosperity.



Prof. Shumpei Kumon

Executive Director
Center for Global Communications,
International University of Japan

I want to congratulate CANARIE on its 10th anniversary, and acknowledge the extraordinary efforts your organization has made to promote broadband research and education networks around the world.

In Japan, we have often looked to the United States as a model in terms of telecommunications regulation and deployment of the Internet. Its ideology of independence and competition has served us well.

But it has been Canada's unique collaborative approach to broadband networks that has allowed us to strike a healthy balance.

I have been highly impressed by Canada's heroic efforts in several areas. The first has been the Government's support of CANARIE, which acts as a catalyst in bringing all levels of government together with academia and the private sector to build the infrastructure and applications necessary for an information society. Increasingly, countries around the world are recognizing that the best model for broadband networks is one that complements both the needs of the market and the needs of a civil society. Canada has championed this balance.

At the local level, Canada is a role model in the construction of broadband community networks. Its work in the deployment of condominium fibre networks in local municipalities is ensuring that the benefits of broadband are available to all, and that citizens share information communications systems as a community. It's an example Japan is following.

Globally, CANARIE and Canada have set a high standard for advanced networking and collaboration. Your contribution to international working groups is helping other countries overcome many technical challenges in the area of advanced networks.

Canada also realized early on that extending broadband to communities, universities and research institutions is only the first step. Through its work in developing broadband applications in health, learning and business, it is helping to deliver the tangible benefits that matter most to citizens—quality of life and prosperity.

Canada's visionary approach has inspired our initiatives here in Japan, and in countries around the world. We applaud CANARIE for its accomplishments and its leadership.



The Miramichi area is becoming a provincial hub for E-learning. At our schools, teachers are developing online courses in physics, economics, geography, and political science that are making it possible for students in rural areas to participate in virtual classes.

The Miramichi region is a living example of how broadband networks and applications are creating new learning opportunities for young Canadians. In December 2002, students from the Miramichi School District joined students from schools in Northern Quebec, Ontario, Alberta and Hong Kong for a live, interactive "Virtual Classroom" session. Using advanced video conferencing technology, our students were given a rare glimpse into how students elsewhere in Canada, and around the world, live and learn.

CANARIE was one of several organizations that made this demonstration possible. It helped bring participants together, and through its CA*net 4 network, provided a broadband link to the greater global community.

Such possibilities are becoming the norm in our small, yet technologically advanced community. With a population of less than 20,000, the Miramichi area is becoming a provincial hub for E-learning. At our schools, teachers are developing online courses in physics, economics, geography and political science that are making it possible for students in rural areas to participate in virtual classes.

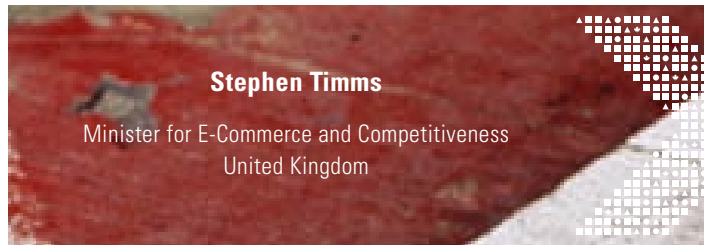
Through the innovative use of broadband, the Miramichi School District is overcoming the challenges of distance and limited resources. We serve 21 schools, two alternate sites, and 7,000 students, including nearly 600 First Nations students, the highest enrollment in the province. Our five high schools are connected to an E-learning broadband network that, through Fredericton, links to the world via CA*net 4.

Broadband connectivity and the applications they enable are emerging as critical tools in learning, and it's exciting to see how our students and teachers are beginning to use them. Starting this year, students at two of our schools will be able to listen to and discuss world issues with a variety of people including a chief executive officer, a CNN news anchor, an economist, and the president of the Canadian Space Agency via video link from locations across Canada and the United States. Another of our high schools has designed and implemented an Internet-based radio station.

We have also used these technologies to help CANARIE celebrate its 10th anniversary. We arranged interviews with ten Grade 10 students, and ten 10-year-olds to discuss the Internet: how they use it, how it's affected their lives, and how they see it evolving in the future.

We congratulate CANARIE on its accomplishments over this past decade, and thank it for helping to create an environment that both inspires and excites the next generation.

The United Kingdom plans to build a research and education network modelled on CA*net 4—the most advanced broadband network in the world. Canada has also attracted attention for its success in leveraging public sector broadband networks to extend access to schools and municipalities.



Stephen Timms

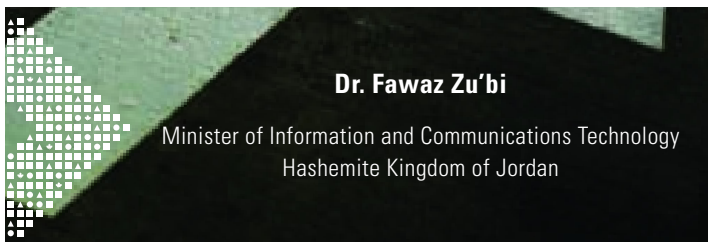
Minister for E-Commerce and Competitiveness
United Kingdom

During my visit to Canada in January 2003, I was struck over and over by the similarities in our approaches to promoting information and communications technologies. It is no surprise to me that there are so many examples of Canada/UK cooperation in the business world and in academia. We both have grasped the importance of broadband as a means of promoting growth in productivity and economic performance.

CANARIE and its partners should take great pride in their contribution to Canada's innovation strategy which has contributed to the development of one of the most extensive and competitive broadband markets in the world. Your CA*net network and applications programme have been a remarkable series of innovative leaps which have added value in all sorts of areas including E-learning and E-health. As well, your work to increase research Internet speeds has been immensely impressive.

Promotion of broadband is very high on my agenda. My Department has established a £30-million fund for Regional Development Agencies and the Devolved Administrations to kindle innovative ways of extending broadband networks. Last November we set up a Broadband Task Force whose purpose is to stimulate economic development by making broadband more widely available. The focus is on helping public sector organisations to aggregate their individual requirements in order to encourage private sector investment.

But we can certainly learn from Canada and from CANARIE. For example, we have plans to build a network modelled on CA*net 4 by first building an optical link to Chicago to connect to CA*net 4 and other research and education networks. I have high hopes for this project and am confident that we will see a good deal more co-operation between us as the networks continue to develop.



Dr. Fawaz Zu'bi

Minister of Information and Communications Technology
Hashemite Kingdom of Jordan



The Jordanian government recently launched a program called "Connecting Jordanians." Inspired by CANARIE's CA*net 4 and Industry Canada's "Connecting Canadians" initiative, the program aims to connect every school, college, university and IT community centre in the country by 2005 via a high speed broadband fibre-optic communications network.

As Jordan's Minister of Information and Communications Technology (ICT), I am privileged to help achieve the ambitious goals arising from His Majesty King Abdullah II's vision of a new Jordan demonstrating global leadership and prosperity. My Ministry realizes that effectively harnessing the enormous potential of ICT to speed Jordan's growth requires that we partner with the world's top global innovators and performers. Canada came to our attention early.

Jordan is using ICT to improve the lives of its citizens, not just their wages. Canada's deep technological and business experience in supplying advanced telecommunications services is complemented by the creative ways it uses ICTs to enhance family and community well-being.

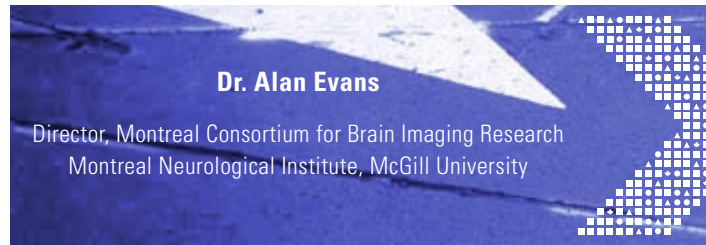
The people at CANARIE understand this balance. With support from the Canadian International Development Agency they have helped formulate a digital inclusion strategy to involve all Jordanians in developing and harnessing ICT. A key element of Jordan's economic and social development agenda, the Connecting Jordanians Initiative is being expressed through a growing suite of business, community, youth engagement and infrastructure programs.

CANARIE's greatest contribution, however, was in demonstrating the value and practicality of building an integrated and pervasive broadband network to connect Jordan's public learning sector. CANARIE's comprehensive analysis, *Forging the Future*, has allowed me to secure the approval of His Majesty and the Government to proceed with the Broadband Learning Network as a priority national development project. The Government expects to connect its public universities at gigabit speeds by June 2003 and its schools, colleges and telecentres at 100 megabits by the 2004 school year-end.

Jordan's ICT investments will translate into expanding sales of technology, applications, content and services. I hope to see effective partnerships between Canadian and Jordanian investors and producers to secure new markets.

My sincere thanks to CANARIE and the Canadian experts and businesses that it brought to Jordan, for their support. Our work together is best exemplified by His Majesty's message to the 2003 World Economic Forum: collaboration between nations is the best way to peace and prosperity.

Dr. Alan Evans is a specialist in brain mapping, a new field that relies on sophisticated computer techniques and high speed networking to unravel the basic mechanisms of psychiatric disorders, neurological diseases and social ills. CA*net 4 helps make this research possible.



Brain mapping is doing for our understanding of the human brain what early explorers did for our knowledge of the world. It is allowing us to unravel the basic mechanisms of psychiatric disorders like schizophrenia, neurological diseases like Alzheimer's and social ills like addiction and stress.

Increasingly, the vast amounts of brain mapping information being collected around the world are being consolidated into centralized libraries which can yield far more than any one laboratory.

The key to this globalization of brain mapping is the high speed telecommunication of big datasets, combined with a universally accepted framework for comparing results. This brain framework is much like latitude and longitude providing a universal way to map global geography and climate.

Canada has one of the fastest telecommunication networks in the world with CANARIE's CA*net 4. It is ideally placed to play a leading role in the international networking of brain research databases.

We have heard much in the past decade about the Human Genome Project and the importance of identifying three billion letters in a long chain which make up the entire human genetic code. This was a massive computational challenge. Yet, it was only the first step.

We now have to understand what the genes do in the living body. Since 60% of our genes code for brain proteins, this is where the greatest challenges and opportunities lie. Brain imaging will provide the basis of a "Human Phenome Project," the study of the relationship between genes and brain function in normal brain and disease.

The future of this work will rest heavily on the technical infrastructure of high performance computing and broadband telecommunications. The information technology challenges will dwarf those that surrounded the Human Genome Project. Canada is already an international centre for this brain database network, receiving huge datasets from Japan, the United States and Europe for processing and distribution to the rest of the world.

The presence of CA*net 4 and CANARIE at the forefront of this revolution will ensure that Canada remains a leader in the most important developments in medical research.

WHAT IS CA*net 4?

A World First

The world's most advanced broadband network
The first national optical infrastructure devoted to research and education



CA*net 4: Canada's National Research and Innovation Network

CA*net 4 is the fourth generation of Canada's ultra high-bandwidth research and education network. In partnership with advanced research networks in every province, it connects Canadian research facilities, educational institutions, hospitals and private research labs to each other and to their international peers, and is becoming an essential tool for researchers and educators engaged in collaborative work.

The design of CA*net 4 also supports high-bandwidth, *private* connections known as *lightpaths*, which are controlled by end-users without the intervention of a network operator. The result is an effective, cost-efficient infrastructure that keeps Canada at the leading-edge of communications technology while delivering the benefits of that leadership position to Canadian researchers and businesses.

CA*net 4 and Canada's provincial research networks interconnect to virtually all international research networks, including Internet 2 in the United States and GÉANT in Europe. The global reach of the network helps Canadian researchers stay at the forefront of research in fields like bioinformatics, high-energy physics, genomics, astronomy, E-learning and the performing arts. It also provides Canadian businesses with a direct competitive advantage wherever new products can be designed and tested using CA*net 4's unique capacity and design.

CA*net 4 is a part of a smarter, more competitive Canada, positioned to lead the way into the future through collaborative research using advanced networks.

The Benefit to Canadians

CA*net 4 is helping Canada's brightest minds develop the next-generation of web services. This Third Wave of the Internet will bring dramatic improvements in how we live, learn and do business. Take a look at what's coming:

- > Remote diagnostics
 - > Electronic patient records
 - > Virtual nursing
 - > Online multimedia libraries for students and teachers
 - > A new role for high schools in scientific research
 - > One-stop portals for university registration and administration
 - > Online permit applications
 - > Electronic tax filing
 - > E-manufacturing for small companies
 - > Remote access to supercomputing
- And much more...

PROGRAM ACTIVITY

E-learning: \$28 million

To encourage the development and use of broadband applications in education and training.

eduSource Canada: A bilingual pan-Canadian network of linked E-learning libraries (repositories) that is accessible to all Canadians.

LOGIC Case-Study Generator: Working with paramedic trainees to design case studies from learning object repositories that can be reused.

The Inclusive Learning Exchange: Adaptive technologies for disabled students.

Advanced Broadband Enabled Learning Project: A model of professional learning programs that exploits the full potential of broadband technology.

Interactive Multimedia Learning System for Mathematics on Broadband Networks: Computer simulations to support collaborative learning among Grades 7 to 9 math students.

Rural Advanced Communities of Learners: Virtual courses in mathematics, physics and French for students in rural northern Alberta.

Language Learning Environment and Resource Network: Online tools that make it easier to teach and learn new languages.

Pan-Canadian Health Informatics Collaboratory: A virtual learning environment that provides distance-based education and training for health professionals.

SportWeb Online Education Project: A virtual community where coaches and athletes can meet online to create and share multimedia educational resources.

Broadband Enabled Lifelong Learning Environment: Development and launch of Canada's largest web-based collection of teaching materials (<http://alexandria.netera.ca>).

Barrier-free Broadband Learning Environments: Identifying potential barriers and solutions to the use of broadband networks for learners with disabilities.

Distance Coaching System: Developing E-training models for adult learners that emulate personal mentoring.

LearnCanada: Online tools to facilitate professional development for K-12 teachers.

Modular Tool for Integration of Contents: Presenting museum and heritage information in a way that is useful to educators.

New Integrated Multimedia Learning Environment for Internet Training: Using videoconferencing and the Internet to deliver distance education to post-secondary students.

Partnerships for Learning, Innovation and Technology: Working with graduate students to evaluate interactive broadband video for collaborative learning.

Portal for Online Objects in Learning: A platform and tools that enable teachers and students to share multimedia learning objects online.

SavoirNet: A university distance learning course on instructional technologies, using interactive broadband and digital television.

Virtual Veterinary Medicine Learning Commons: The first large-scale virtual community of educators and students in veterinary medicine.

E-business: \$28 million

To develop practical solutions that enable small- and medium-sized businesses to accelerate their transition to E-business.

Canada's Online Project Repository: A bilingual online registry where the food services, pharmacy and other industries can access standardized product data and images.

The Collaborative Community Trading Platform: An electronic order management solution that helps small- and medium-sized manufacturers manage inventory levels and supplier information.

Commodity-based Internet Procurement Pricing Engine Design and Development: Online tools that open up global sales opportunities for lumber mills.

Electronic Trade Show Platform: A virtual trade show platform for the sporting goods industry.

Hydro Vantage E-business Application: E-business processes and technologies that improve decision-making for the hydro electric industry.

MyLegalAnswers: A web-based system that provides basic legal information over the Internet to the general public.

NetMetal: An integrated business-to-business portal for the metals sector.

Projux: A web-based infrastructure that allows clusters of independent consultants and contractors to collaborate.

Sourcing Management and Requisition Tool (SMaRT): An E-procurement platform that improves supply chain management for the shipbuilding and repair industries.

Supply Chain Event Management Solutions for Mid-Sized Complex Manufacturers: E-procurement solutions to help manufacturers better manage supply chain event management.

The Managed Workplace: E-business platform that helps small- and medium-sized companies manage their information and communications technologies infrastructures.

Trustmark: A seal of approval for vendor web sites that adhere to good online business practices.

Venngo Project: Virtual Business Networks that use Internet-based software solutions.

E-content: \$6 million

To accelerate the creation and distribution of innovative and interactive content.

Moveable Feast: Virtual spaces for entertainment, work and learning.

Municipalities on Demand: Testing broadband delivery of frequently used municipal services.

Music Path: Examining how the marriage of music and videoconferencing can change music education and performance.

Performance Space Meets Cyberspace: Developing a model for delivering live, interactive performances in public spaces.

The Ring: Developing and testing an online game that raises awareness of child pornography among Grades 8 and 9 students.

E-health: \$5 million

To accelerate adoption of advanced networking technologies and applications that improve patient care while reducing costs.

Bycast: Technology advancement that enables the BC Cancer Agency to add medical images to patients' electronic health records.

The Caretinuum Project: Using wireless technology to support community-based disease management, medication management and clinical research trials.

Community Health Information Network: Connecting health care centres in the Waterloo region.

The Diabetes Self-Management Network: A virtual network that links patients online with their diabetes management team.

Home Telehealth Service Pilot: Demonstrated how nurses can visit more patients in their homes using E-health technologies.

Marine Interactive Satellite Technologies: Successfully demonstrated technology that links ships at sea with health providers on shore.

Remote Access Virtual Nurse Project: A virtual network where nurses specializing in heart health can share ideas and experience.

Policy and Peer Permission System Development: A software product that protects digital medical records, while making it easy for health care professionals to access the information they need.

Telehealth Readiness Framework: Evaluated the telehealth readiness of rural and remote communities.

Directed Research: \$975,000

Jointly funded by CANARIE and Cisco Canada Inc., the program will help Canada become a world leader in the design, development, delivery and use of technology for user control of lightpaths on CA*net 4. (Projects begun in 2003)

CA*net 4: \$110 million

Intelligent Systems: \$9 million

Advanced Network Applications, Services and Technologies (ANAST): \$8 million

Learnware: \$11 million

ABOUT CANARIE

CANARIE is Canada's advanced Internet organization, a not-for-profit corporation that facilitates the development and use of next-generation research networks and the applications and services that run on them. By promoting collaboration among key sectors and by partnering with similar initiatives around the world, CANARIE stimulates innovation and growth and helps to deliver social, cultural and economic benefits to all Canadians.

CA*net 4, Canada's national research and innovation network, is developed and operated by CANARIE.

CANARIE positions Canada as the global leader in advanced networking, and is supported by its members, project partners and the Government of Canada.

MEASURING THE IMPACT

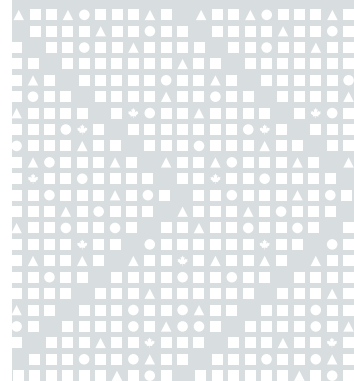
A snapshot of CANARIE achievements

Total Funding 1993-2003: \$362 million

CA*net 4 Connections

Universities	80+
Colleges	50+
Schools	2000+
Research centres	40+
Hospitals	12
Government departments	7
Museums, art galleries	4
International connectivity	40+
Projects funded	225+
Companies participating	1000+
Jobs created	Thousands

CANARIE
 110 O'Connor Street, 4th Floor
 Ottawa, Ontario, Canada
 K1P 5M9
 T: (613) 943-5454
 F: (613) 943-5443
www.canarie.ca
info@canarie.ca



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CANARIE

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École des hautes études commerciales de Montréal

MANAGEMENT DISCUSSION AND ANALYSIS

Overview:

This past fiscal year was a strategically important and successful one for CANARIE Inc. CA*net 4 was launched and is renowned as a world-leading platform for collaboration and innovation. Canada's researchers, scientists, and educators are using the network to develop advanced applications and explore how advanced networks will generate economic, social and cultural benefits for all Canadians. In 2002, the Government of Canada recognized CANARIE as one of the organizations leading innovation in the country. The accompanying financial statements represent activities as approved by the board during the year.

Statement of Operations:

Revenues for the year ended March 31, 2003 were approximately \$44 million. This increase in revenue from 2002 was due to an increase in Phase 3 project undertakings, but primarily to the penultimate wind-up activities of CA*net 3 and the launch and build of CA*net 4, Canada's National Research and Innovation Network. Excess of revenues over expenses of \$568,747 declined nearly 32% from the 2001/2002 figure. This was due, as expected, to diminishing Phase II royalty income, as well as increased non-eligible expenditures pertaining to Phase 4 planning activities.

Statement of Financial Position:

The decrease in assets and liabilities of \$12M was due largely to increased Program spending as well as the expenditures associated with the CA*net 4 network installation. CA*net 4 funds earned \$4.14M in interest during the fiscal year, and this resulted (after net expenses in the year) in a balance in the Restricted Revenue for CA*net 4 account at year-end of \$105.3M. Next Generation Network (NGN) funds earned interest of \$315,000 and net spending approached \$12.4M in the fiscal year to leave a balance in NGN Restricted Revenue of \$4.4M. The CA*net Institute Restricted Revenue ended the fiscal year at \$691,715 while the balance in E-content advance funding was \$1.3M. Net assets as at March 31, 2003 were \$6.8M, an increase of approximately 10% overall from the \$6.2M at the end of the previous year.

Statement of Changes in Net Assets:

The excess of revenues over expenses of approximately \$569,000 was allocated as follows: the restricted net assets for future competitions increased by a net amount of \$487,021 to \$4,243,302. The amount invested in capital assets decreased by \$143,062 to leave \$116,232 as a result of a change in the amortization policy which will be applied in future periods. The resultant effect on unrestricted net assets was an increase by \$224,788 to produce a fiscal year-end balance of \$746,588.

Audited financial statements are available to members through the CANARIE office.

CANARIE Inc.
Statement of Operations
Year ended March 31

	2003	2002
Revenues		
Government assistance	\$ 21,883,637	\$ 16,894,022
Next Generation Networks assistance	12,396,348	8,376,644
CA*net 4 assistance	8,877,564	-
Royalties	504,970	755,458
Membership fees	326,250	300,000
CA*net Institute assistance	106,561	256,099
Other	176,355	144,740
	<u>44,271,685</u>	<u>26,726,963</u>
Expenses		
Advanced Networks	(10,200)	-
Technology and Applications Development	(4,159)	-
Advanced Applications Development	20,381,526	14,233,099
BCE Learnware Program	308,235	1,092,240
Non BCE Learnware Program Part I	34,452	193,599
Non BCE Learnware Program Part II	212,072	1,149,334
Next Generation Networks	12,396,348	8,376,644
CA*net Institute	106,561	256,099
E-content	673,613	106,714
OLT	90,944	-
SIP	7,524	-
CA*net 4	8,877,564	-
Operational expenses	628,458	476,583
	<u>43,702,938</u>	<u>25,884,312</u>
Excess of revenues over expenses for the year	<u>\$ 568,747</u>	<u>\$ 842,651</u>

CANARIE Inc.
Statement of Financial Position
March 31

	2003	2002
Assets		
Current Assets		
Cash	\$ 313,327	\$ 110,479,918
Short term investments	96,912,520	23,725,267
Funding receivable	6,995,595	5,823,694
Accounts receivable	2,778,194	277,340
Prepaid expenses	9,344	9,633
CA*net 4 funding held in trust	<u>17,056,219</u>	<u>-</u>
	124,065,199	140,315,852
Capital Assets	116,232	259,294
CA*net 4 Investment in Capital Assets	<u>4,383,529</u>	<u>-</u>
	<u>\$ 128,564,960</u>	<u>\$ 140,575,146</u>
Liabilities		
Current Liabilities		
Accounts payable and accrued liabilities		
Projects	\$ 9,448,029	\$ 6,853,698
Non-project	<u>676,992</u>	<u>237,457</u>
	10,125,021	7,091,155
CA*net 4 Restricted Revenue	105,287,409	110,022,301
Next Generation Networks Restricted Revenue	4,393,892	16,475,405
CA*net Institute Restricted Revenue	691,715	778,207
E-content advance funding	<u>1,290,098</u>	<u>-</u>
	<u>121,788,135</u>	<u>134,367,068</u>
Net Assets		
Unrestricted Net Assets	746,588	521,800
Restricted Net Assets - windup of operations	1,670,703	1,670,703
Restricted Net Assets - future competitions	4,243,302	3,756,281
Invested in Capital Assets	<u>116,232</u>	<u>259,294</u>
	<u>6,776,825</u>	<u>6,208,078</u>
	<u>\$ 128,564,960</u>	<u>\$ 140,575,146</u>

CANARIE Inc.
Statement of Changes in Net Assets
Year ended March 31

2003

2002

Unrestricted Net Assets

Balance beginning of year	\$ 521,800	\$ 383,815
Excess of revenues over expenses for the year	568,747	842,651
Allocated to investment in capital assets	143,062	(9,208)
SIP project expenses from SIP fund	7,524	-
Allocate Content Fund expenses to future competitions	10,425	60,000
Transfer to Restricted Net Assets - Future Competitions	<u>(504,970)</u>	<u>(755,458)</u>
Balance at end of year	<u>\$ 746,588</u>	<u>\$ 521,800</u>

Restricted Net Assets - Windup of Operations

Balance at beginning of year	\$ 1,670,703	\$ 1,670,703
Transfer from unrestricted net assets	<u>-</u>	<u>-</u>
Balance at end of year	<u>\$ 1,670,703</u>	<u>\$ 1,670,703</u>

Restricted Net Assets - Future Competitions

Balance at beginning of year	\$ 3,756,281	\$ 3,060,823
Transfer from unrestricted net assets	504,970	755,458
Transfer Content Fund to unrestricted net assets	(10,425)	(60,000)
Transfer SIP support to unrestricted net assets	<u>(7,524)</u>	<u>-</u>
Balance at end of year	<u>\$ 4,243,302</u>	<u>\$ 3,756,281</u>

Invested in Capital Assets

Balance at beginning of year	\$ 259,294	\$ 250,086
Capital asset purchases	91,321	166,055
Amortization	<u>(234,383)</u>	<u>(156,847)</u>
Balance at end of year	<u>\$ 116,232</u>	<u>\$ 259,294</u>

CANARIE MEMBERS

CANARIE's industrial, institutional and associate members represent Canadian innovation at its best. Through their ongoing support, CANARIE is able to foster collaborative partnerships between industry, government, universities, school boards, health care organizations and others to keep Canada at the forefront of network innovations, and advanced applications.

Acadia University	Netera Alliance
Alcatel	Nortel Networks
AT&T Canada Corporation	NRC Institute for Information Technology
BCNET Networking Society	Optical Regional Advanced Network of Ontario
Bell Canada—Next Generation Services	Ottawa-Carleton District School Board
Bell Mobility	Ottawa Centre for Research and Innovation
Bell Nexxia	Parking Corporation of Vancouver / Easy Park
Big Pipe Inc.	Peel District School Board
British Columbia Institute of Technology	Precarn Inc.
C3.ca Association Inc.	Queen's University
Canadian Cable Television Association	Réseau d'informations scientifiques de Québec (RISO) inc.
Canadian Centre for Marine Communication	Rogers Communications Inc.
Canadian Library Association	Royal Roads University
Canadian Microelectronics Corporation	Ryerson University
Canadian Museum of Civilization	Seneca College
Canadian Space Agency	Shana Corporation
Canadian Wireless Telecommunications Association	Silicon Graphics Canada Inc.
Carleton University	Simon Fraser University
CATA Alliance	Société Innovatech du Grand Montréal
Centennial College	Sony of Canada Ltd.
Centre de recherche informatique de Montréal	TEAMSOF Inc.
Centre francophone d'informatisation des organisations	Telesat Canada
College of the North Atlantic	TELUS Corporation
Communications and Information Technology Ontario	The Banff Centre
Communications Research Centre Canada	TRLabs
Concordia University	University Corporation for Advanced Internet Development
Dalhousie University	Université de Moncton
École Polytechnique de Montréal	Université de Montréal
Electronic Commerce Council of Canada	Université de Sherbrooke
Electronic Data Systems Canada Inc.	Université du Québec
Ernst & Young	University College of Cape Breton
Federation of Law Societies of Canada	University of Alberta
Group Telecom	University of British Columbia
Health Canada	University of Calgary
Hexago Inc.	University of Manitoba
IBM Canada Ltd.	University of New Brunswick
Industry Canada	University of Ontario Institute of Technology
Infomagnetics Technologies Corporation	University of Ottawa
Information Technology Association of Canada	University of Prince Edward Island
Juniper Networks Inc.	University of Regina
Laval University	University of Saskatchewan
Macromedia Inc.	University of Toronto
McGill University	University of Waterloo
McMaster University	University of Western Ontario
Media Awareness Network	Ville de Brossard
Mediatrix Telecom Inc.	WEDnet
Memorial University of Newfoundland	Western Australian Interactive Virtual Environments Centre
Ministry of Enterprise, Opportunity & Innovation	York University
Ministry of Management Services	
National Library of Canada	