First Nations Emergency Services Society of BC (FNESS)

Broadband Internet Connectivity via Satellite

Background

SUMMARY

Norsat became the official satellite service provider for FNESS in 2011, serving the 17 First Nations communities involved in the program.   Prior to Norsat's involvement, the infrastructure for satellite connectivity lacked a long term service provider, however, since 2011, over 2300 residents have been given broadband internet access, which they use for social connectivity, health care, education, emergency services and more.

The First Nations' Emergency Services Society of British Columbia (FNESS) is incorporated under the Society Act of British Columbia with a mission to assist First Nations in developing and sustaining safer and healthier communities through a variety of programs and services, including round 2 of the National Satellite Initiative (NSIR2). The NSIR2 program brings satellite (C-band) broadband internet connectivity to members of remote First Nations communities, and in 2008 FNESS successfully bid to manage the project. FNESS works in collaboration with the First Nations Technology Council (FNTC), to ensure that the NSIR2 program will provide internet access to First Nations communities for years to come.

Problem

Many of BC's First Nations communities are located in remote areas, which lack access to terrestrial communications networks. Residents of these communities often need to travel at least 90 minutes to reach the nearest city and for many, access is only available via boat or airplane, making the journey long and often difficult.   The physical distance and lack of connectivity leaves these communities without access to essential emergency services, health care, educational resources, and everyday communications.

To mitigate this problem, FNESS required a communication solution that would improve the quality of life for residents by giving all remotely located communities a high-speed broadband internet connection. They needed this solution to be implemented quickly to maintain connectivity, while remaining scalable so that it could be extended to additional communities as needed in the future. They needed a connection that was reliable enough to serve as the sole source of access to emergency services, health care, education and commerce. FNESS also required training and support for the communities involved so that sense of network ownership could be established and maintained.

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Solution

Norsat worked to meet the project requirements of FNESS through four major activities:

• Network design and implementation

• Equipment installation and maintenance

• Connectivity expansion and improvement

• Community support and training

Norsat consulted with FNESS, and the residents of these communities to design a satellite communication network that would provide consistent broadband internet connectivity to meet all of their requirements. The network was designed to be easily operated and maintained, but can also be extended to include new locations. Additionally, the reliability and quality of the network was designed to enable faster connections and video conferencing capabilities.

In order to set up internet access as soon as possible, Norsat immediately sent a crew of six technicians in three teams to visit all 17 communities and establish a new satellite network within the existing infrastructure. The Norsat team installed modern gateway servers with firewall protection, caching capabilities and Ethernet switches. The newly installed equipment can be remotely administrated and monitored, which allows the team to check system status and perform maintenance from external locations. Each home and office was equipped with a receiver unit, which provides residents with a local internet connection. The network gives each community between one and six wireless access points, and a gateway server which provides a security firewall and improves performance with caching for all houses and offices within these communities.

After establishing the integrity and longevity of the satellite network, Norsat began to focus on expansion and support for the project. Through a second round of site visits, Norsat installed complete video conferencing solutions in 10 communities. The package includes conferencing equipment, new 40 Watt BUCs (Block Upconverters), TVs, and cameras. Additionally, 49 new homes and offices were equipped with receiver units, enabling more community residents to gain broadband internet access.

Throughout the project, Norsat provided end to end support for the communities involved, with a dedicated customer service representative, regular site visits, and technical telephone support. Norsat regularly monitors the performance of the access points and gateway servers, performing preventive maintenance and routine service as needed. Norsat also manages bandwidth ensure fair allocation between the communities and prevent bottlenecks. Additionally, Norsat created the FNESS user portal, a website that provides a space for community members to access information, discuss problems or successes, and post responses.

In November 2011, Norsat arranged a multi-day training session in their Richmond office, and invited 27 community technicians and representatives to participate in a 2-day session. Attendees learned how to operate the satellite terminals and perform basic trouble shooting and maintenance of the community network. Basic adjustments and maintenance tasks can now be completed by people living right in the community. Norsat continues to be actively involved in maintaining the communication system in top condition.

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Results

Each of the 17 communities involved in the program now has a broadband internet access point and every home and office has a receiver unit, enabling the 2300 residents of these communities to access the internet quickly and easily. The network infrastructure is continuously updated and maintained by Norsat's dedicated customer service engineers and the Company remains committed to training new community members in satellite terminal operation so that community technicians can perform basic maintenance. The newly installed remote administration capability enables the Norsat support team to not only respond quickly when problems arise, but actually perform preventive maintenance to fix problems before they occur. The network has resulted in improvements to emergency services, health care, education, commercial activity and social connectivity as described below.

Emergency Services

Access to emergency services has improved dramatically since network installation, representing a breakthrough for communities without telephone access. In these communities, 911 phone calls can now be placed through internet based tools such as Skype, and the time for ambulance arrival has decreased from up to three hours to approximately one hour. This improvement is due mainly to an ability to place emergency calls without lengthy travel time.   Since implementation of the network, community members now access emergency services in response to a variety of emergency health problems, and receive treatment and advice faster than previously possible. In some communities, early warning for disasters, such as storms or earthquakes can be rapidly communicated using email or social networking. Community emergency plans can now be utilized through outside communications.

Health Care

Residents are now able to benefit from new health care resources through Internet access and video conferencing equipment.   Some community members use the video equipment to connect directly their health care provider, obtaining early diagnoses for improved health outcomes. Video based medicine has the added advantage of reducing the cost and health risks associated with travelling distances for medical advice. Other community members use the video conferencing systems to participate in public health forums, which provide information and real time responses to health care problems and questions, and still others find internet research invaluable as a source of information about health, nutrition and diet related issues.

Emergency Services Success Stories

» When a 17 year old member of a remote community began experiencing unexpected seizure-like symptoms, his concerned family used Skype to phone a health care professional.   The medical representative was able to provide explanations of the symptoms, advice for immediate treatment, and then follow up by arranging a doctor's visit. Following this visit, regular online communication with health care professionals was established to monitor the condition of the patient . Thanks to the quick reaction of his family and subsequent treatment, no long term symptoms are expected.

» During a site visit, a health care professional sustained a serious bump to the head and a concussion was suspected. An emergency phone call was made to 911, again using Skype, and the emergency representative was able to quickly provide first aid advice and guidance for treatment. Through the quick response time of the community members present and the 911 operator, no long term harm came to the patient.

» During heavy spring rains, a serious risk of flooding arose and communities used video conference equipment to remotely meet with FNESS & community emergency teams, discuss the plan of action, solidify as a team, and ultimately take action to mitigate flooding risks. Video conferencing and internet connectivity was essential to ensuring these actions were taken in a timely manner, and communicated to the relevant parties.

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Health Care Success Stories

» *Nutritious Food Options.* *When one community noted their lack of healthy food choices, they used the Internet to research options for healthier eating. They found a suitable option for a fruit and vegetable delivery service that provides nutritious food options in locations where these items are difficult to purchase, and registered for the program. They then conducted further research to successfully bid for government funding for the program, and now manage regular deliveries through the online interface.*

» *Water Quality Monitoring.* *Ensuring well water is safe to drink is essential for community health, and most communities participate in the Safety Drinking Water program. Trained community technicians take water samples, conduct simple tests, and use an online interface to communicate with the treatment facility and rapidly obtain results and advice. On at least one occasion, negative water quality results were noted, and the affected community notified immediately. This quick response time prevented potentially serious or life-threatening cases of waterborne illness.to mitigate flooding risks. Video conferencing and internet connectivity was essential to ensuring these actions were taken in a timely manner, and communicated to the relevant parties.*

Most communities receive regular visits from health care professionals, who take advantage of the internet to improve the timeliness and quality of patient care. Many doctors and nurses take notes on laptop computers while visiting patients and send this information back to their offices immediately after visits, maintaining connectivity with their office throughout visits. Many also send prescriptions directly to pharmacies directly at the point of patient visit, providing medicine faster than previously possible. Even the scheduling of medical visits has improved through Internet access as community administrators now post Health Care Representative visiting schedules online through facebook and email.

Education

Access to educational resources has broadened with network installation. Popular UBC Learning Circles are broadcast through video conferencing software on topics ranging from bullying to addiction, and attendance ranges up to 80 people for a single community. Learning Circles provide an opportunity for community members to openly discuss solutions to common problems, and the sessions are a great way to increase awareness of difficult issues. Session topics can be chosen by participants, who communicate with organizers online to influence the topics presented.

Students are major beneficiaries of new educational resources. Many communities have established learning centres in their schools, featuring a bank of several internet enabled computers. These centres are used to conduct research for projects, complete assignments and in many cases, submit coursework online. Online assignment submission makes it easier for students keep up with work during bad weather, and enables faster feedback from teachers. Students also use the learning centres for extra –curricular educational activities like studying for learners permits or driving exams. Adult educational access has also improved and many residents are now embarking on higher education programs and learning new skills, which can be used to further their careers.

> ## Adult Education Success Stories

Although students remain the major users of educational internet resources, a growing number of adults are also taking advantage of the convenience and flexibility the internet can bring to continuing education.

» *Safety Certification.* *Some adults have used the internet to receive safety certifications including WHMIS (Workplaces Hazardous Materials Information Systems) and ICS 100 (Incident & Command Systems), gaining a workplace advantage without travelling long distances to the nearest city to complete the certification*

» *Skills upgrade.* *Online education makes going back to school a realistic possibility for adults, many of whom take advantage of online classes to complete high school diplomas or post-secondary certificates*

» *Education for pleasure.* *Community members are now learning new skills online simply for pleasure. Popular topics include free-lance writing, social development and small vessel boat operation.*

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Business and Commercial

With the nearest town often over 90 km away, residents of remote communities can be at a disadvantage conducting business due to difficult weather, transportation, time commitments and safety issues. Through the NSIR2 network communities can now engage in inter-band business as well as commercial activities through email and video resources. Most band offices take advantage of the network to broadcast community messages through email, facebook or other social media outlets, and many use video conferencing to discuss policy and budgets, share documents, and hold inter-band meetings. Many small businesses operating in these communities take advantage of the Internet to run debit and credit card machines, pay bills online, and send emails.

Social Connectivity and Well being

Certainly the most common use of internet in these communities, and arguably the most valuable, has been for convenience, pleasure and social connectivity using email, Facebook, Skype, Google and other internet resources. Day to day practicalities are also now more convenient as many people take advantage of online banking and bill paying to organize their finances.

The internet has proven to be a powerful troubleshooting resource for many communities. For example, on one occasion phone service unexpectedly became unavailable in many communities. These communities were able to set up meetings and communicate with service providers to coordinate problem resolution online rather than travelling into the nearest city. Likewise, when the power went out at a Water Treatment facility, community technicians contacted the help desk online, and the customer support team was able to turn on a generator to keep service running. A remote training session was then conducted online, educating the community technicians on the correct procedure for handling problems of that nature in the future.

Communication linkages taken for granted by urban dwellers are relatively new in BC's remote First Nations, but have rapidly become a part of community life. Many community residents now indicate that the Internet is integral for their day to day activities and find it hard to imagine a future without it. Common uses of internet for pleasure include the use of search engines for news and research, video chatting with remotely located family members, and emailing to stay in touch.

Business and Commercial Success Story
ONLINE TOURISM COMES TO THE WEST COAST TRAIL

Ditidaht nation is pursuing an exciting opportunity for revenue generation through tourism to beautiful BC. The nation, which owns property along Vancouver Island's popular West Coast Trail, has used the land to construct a series of comfortable campsites complete with canvas tents, cooking facilities and recreational options like fishing and boating. Despite using only word of mouth for promotion, the endeavor received over 60 bookings in its first year, and the organizers decided to tap into the enormous growth potential the business could realize through an online presence. The nation has registered a website (www.westcoasttrail.com) and developed an online booking system for the campsites, which they anticipate will be popular with weekend visitors from nearby Victoria and Vancouver. Through the new website, the nation hopes to eventually increase the number of campsites available, offer a variety of package options to visitors, and increase recreational activities. Internet access from Ditidaht nation will be essential to the long term success of this project, which has the potential to provide employment and revenue to residents of the community.

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Opportunities for the Future

The NSIR2 program has had a positive impact on the community members involved; however, as broadband internet is increasingly viewed as an essential service, we remain aware that opportunities for expansion and improvement exist. The NSIR2 network was designed to meet the current needs of the 17 communities involved, but as communities grow, there is an opportunity to invest in increased bandwidth to add in new communities and increase connection speeds for existing communities.

Training programs are essential to ensure that communities have at least one trained technician on site to maintain the community network and satellite terminals. In some communities, the nearest technician is externally located and when connectivity problems arise, communities are forced to wait hours or even days for assistance. As trained community members move or are unable to remain in their position as technician, training for new technicians will maintain a sense of system ownership within the community and ensure continuous connectivity.

Through the NSIR2 network, many community members now have access to the Internet for the first time, and without appropriate training, may be exposed to the risks inherent to this new resource. Online bullying has become a problem for some communities and a few residents have fallen victim to online scams. Without education, some community members are frustrated by the vastness of the Internet, and don't maximize their use of the tool. Educational programs that shed light on the dark side of the internet and provide assistance in navigating the many resources available will be an important to ensure communities takes full advantage of the health, education and communication resources provided by Internet access.

Finally, many more of BC's First Nations community members still lack internet and computer access entirely. Extending network services and increasing access to computers is essential to ensuring BC's First Nations have the same advantages as their urban counterparts. As new buildings are constructed in the 17 NSIR2 communities, network expansion will provide access to these new homes and offices. For other communities without internet access, the

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expansion of the NSIR2 network into new locations has the potential to provide dramatic safety and quality of life improvements.   Norsat is committed to working with FNESS and FNTC to find solutions that provide improved broadband internet access for First Nations Communities.

Organizational Information

FNESS is funded under the Canada Strategic Infrastructure Fund and funding for the NSIR2 project will continue to flow until 2014. FNESS works in partnership with the First Nations' Technology Council (FNTC), who provide technical and project management expertise to facilitate longevity and community technical planning with all of the NSIR2 Communities so that they may continue to receive internet service beyond 2014.

Norsat is proud to work alongside FNESS, FNTC, Infrastructure Canada and BC's First Nations Communities to provide broadband internet connectivity. For more information about this and other remote connectivity projects, please visit www.norsat.com

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