

## First Nation networks help protect Indigenous languages and culture

*Kevin Burton*

**A**tantic Canada's First Nation Help Desk provides broadband services to 30 Mi'kmaq, Maliseet, and Innu First Nation communities in Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland and Labrador. The Help Desk is administered by Mi'kmaw Kina'matnewey which has the distinction of being the first Indigenous educational self-governance organization in Canada, formed by an Act of Parliament in 1999. Kina'matnewey means "teaching and learning" in the Mi'kmaw language.

The network currently handles more than two million DNS requests (people going to various web page addresses or using various network services) per day. The focus of this article will be to share how the network has developed and to highlight what that means to the communities that it serves.

Geography and economics play a critical role in the availability of any community's bandwidth. Although communities in Atlantic Canada do not face the same connectivity challenges as they do in the North, service in some of our First Nation communities is still not on par with the rest of Canada. All but one of the First Nation communities in our WAN (Wide Area Network) are blessed to have fibre optic connectivity. The one community without fibre is the Innu community of Natuashish, located on the north coast of Labrador. Natuashish was established in 2002 to replace the former Davis Inlet community. In the summer of 2018, the community is scheduled to replace their copper T1 lines (with 1.5 MB throughout) with radio-transmitted 20 MB Ethernet service. In lay terms this means that while Natuashish will have not full fibre delivery, the community should see an enormous improvement in bandwidth that will address some of the barriers of the digital divide experienced by residents there.

### **Our model**

The Atlantic First Nation Help Desk has successfully increased bandwidth in First Nations communities in our region since 2003. The economic sustainability of our model can be attributed in large part to its design.

The network is designed as a "spoke and hub" model. The core infrastructure is located in the Membertou Data Centre in Membertou (NS) First Nation. While it is expensive to purchase state of the art routers, switches, and firewalls, it is less expensive and more effective than having to replicate these devices at each location individually. Moreover, our infrastructure has two Internet service providers (ISPs) serving the network. We have a 2 GB service from Bell and another 2 GB Canarie link (Canadian subsidized bandwidth for health and education) that is delivered by Eastlink.

From the core, like spokes from a hub, circuits arrive in 30 communities in four different provinces. The community "point of presence" (POP) is almost always in the community health centre. Health centres are selected because of the importance of data privacy and because they are typically well staffed and supervised. From the health centre, there are further "spokes" that go into schools and Band offices. Traffic for each sector never "touches" traffic from other sectors because it is separated into "virtual local area networks" (VLANs). Being able to run "dark fibre" between community buildings is not something that the telecommunications company (telco) can or will do. In Canada, an organization has to be designated as a "non-dominant carrier" by the Canadian Radio-television and Telecommunications Commission (CRTC) in order to build a community fibre loop.

Organizing the network in this manner eliminates the silos that used to exist in First Nations communities where multiple satellite dishes in the community were used to serve different sectors. With shared services, shared costs are also possible. In our communities, bandwidth ranges from 30 MB minimum up to 200 MB. Circuits into the communities range from \$535/month to \$740/month.

In addition to economies of scale, there are other advantages to operating a wide area network. Clinical health videoconferences, for example, are not transmitted over the public Internet so the conferences are more secure. Student and health records can be

stored in First Nation locations thus complying with the Ownership, Control, Access, and Possession (OCAP) principles asserted by the Assembly of First Nations (AFN).

### **High-speed Internet versus broadband**

While some First Nation networks in Canada have become ISP's for their own communities, this has not been the case in Atlantic Canada. Generally speaking, residential high-speed Internet is available in the communities from various telcos. Our network clients are schools and health centres, and in some case, Band administration offices.

Many people lump "high speed Internet" and "broadband" together and do not understand that there are significant differences. High speed Internet, usually some form of digital subscriber line (DSL) is engineered to provide fast downloads with much slower upload speeds. Broadband, on the other hand, provides symmetric speeds up and down. In terms of the "information highway", there's a multi-lane highway from the cities into the communities, but only a single lane out. DSL is cheaper to provide, and can be delivered on traditional copper telephone lines, but limits the capacity of people in remote communities to upload and share information and content. Even satellite solutions can provide fast downloads and can be inexpensive, but do not allow "real time" applications due to their inherent lag and also do not support fast upload speeds. Only fibre optic technologies are able to meet the CRTC's technical specifications of broadband being a basic, essential service.

The Government of Canada recognized the need for early investment in Internet connectivity technology (ICT) for education. In 1995, Industry Canada launched the SchoolNet project in response. Regrettably, they did not remember to include First Nation communities. A half-hearted attempt was made in 1999 to use satellites to bring Internet connectivity to one (count them, one!) computer in each school. Serious efforts to address the digital divide did not begin until 2003 with the arrival of First Nations SchoolNet. In a quick succession of events, Industry Canada jettisoned SchoolNet, the program shifted to INAC national headquarters (AANDC at the time), funding was halted, and the program was shut down by 2006. Existing responsibilities were shifted to regional INAC offices, albeit with no funding.

During this period, there was some pressure from government to provide a footprint as broadly, quickly, and inexpensively as possible with high speed Internet. The regional organizations of First Nations resisted and demanded broadband.

The entire crux of how First Nation communities

use connectivity can be summarized by stating that high speed Internet relegates users to being information consumers while broadband enables people to be content producers as well as consumers.

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In the battles of high speed Internet versus broadband, there was no better illustration of the differences than videoconferencing. Videoconferencing was the "killer app" that clearly demonstrated that people who needed to have a voice needed videoconferencing. In education, it allowed teachers to interact with students in places where there were not enough students to justify a school. For the first time ever, elementary and middle school students in the small northern Ontario communities of Keewatinook Okimakanak did not have to fly away to boarding schools. In the Atlantic, advanced students in one community could attend a calculus class that was being delivered in another community. It was maddening to deal with the occasional bureaucrats with engineering degrees who sacrificed their credibility to argue that videoconferencing could be delivered via DSL. Those were probably the same ones who argued that videoconferencing could be delivered using satellite connectivity! (It cannot; the inherent lag of satellites makes them ill-suited for videoconferencing.)

### **Broadband changes lives**

It takes a conceptual shift to move from 80 years of passively consuming radio and television content into being a content producer. When given a chance, youth and Elders can lead the way. Students in Eel Ground, NB created stage plays and videos on fetal alcohol spectrum disorder and on suicide prevention to respond to challenges they were seeing in their own communities. There were 160 First Nation communities that connected via videoconference and another 500 web stream connections enabling people in these communities to see these videos and to discuss the topic of suicide. Did that effort save a life? Possibly... At least the students tried!

When Elders in an Ojibway community were being presented with the possibilities of videoconferencing, they held up their hands and said, "You don't need to explain. Our legends spoke of the time when people would be able to see and talk with people over

great distances.”

As mentioned above, the availability of videoconferencing has been important in the delivery of healthcare in First Nations communities in the Atlantic region, as well as elsewhere in Canada. Professional development sessions are routinely delivered via videoconferencing; clinical visits with physicians are made using our secure network, connections that do not depend upon the public Internet. People who are recovering from cancer and other diseases are no longer forced to travel great distances for “routine” follow up appointments. Yes, broadband connectivity can change people’s lives!

### **Connectivity and cultural continuity**

In the Atlantic region, one of the most notable ways that broadband has been used is in the development of Indigenous language applications. Those in power who maintained that less than fibre optic connectivity was “good enough” have never been in a classroom of 15 or 20 students waiting for a Mi’kmaq song or phrase to download from the Internet. Those people probably never envisioned collaborative-based learning where students work together to produce content that reflects their learning.

Mi’kmaq Kina’matnewey (MK) has developed over twenty apps designed to support and preserve the Mi’kmaq language. They can be found on the

sion), to animated legends, to an innovative app called “Tal-Tluen?” that creates complete thoughts and either speaks them or copies them to a clipboard for use in various messaging apps.

The L’nui.suti Mi’kmaq dictionary app that had more than 5,000 downloads in its first month after being released was recently modified for the Maliseet language by the Mi’kmaq-Wolastoqey Centre of the University of New Brunswick. Why re-invent the wheel? If the hard and expensive work of coding has been done, why not plug in different recordings and different words to expand the impact?

The Help Desk’s website has lessons, songs, posters, and prayers. Every year there is a live Christmas videoconference concert. Even schools from communities that have mostly lost their language participate, many of them using the songs that are found on the website.

What can students produce when given a voice? Can First Nation youth write, perform, and deliver powerful and professional music videos? You bet they can! Take a look at two recent music videos from Eskasoni First Nation in Nova Scotia:

What about learning about the residential school experience? Do you suppose that it is more powerful to read about it in a book or a tribunal transcript than it is to create and share the experience through video



*Image courtesy of Kevin Burton*

*Eskasoni First Nation youth music videos available at <https://www.youtube.com/watch?v=QfDtxhsS31A>  
<https://www.youtube.com/watch?v=UkUxIFw5vOg>*

Apple or Android stores by searching for “Mikmaq.” They can also be seen on the lower left side of the Help Desk’s aging website, <http://firstnationhelp.com>. Applications range from a dictionary (L’nui’suti) to Robert Munsch books (developed with permis-

the way that the students of We’koqma’q have done with “Magit’s Doll”?

There is so much to be done! And, if one of our missions is to protect the Mi’kmaq language and the way that language mediates thoughts, we have



<https://vimeo.com/143251875>

to start at the beginning, with very young children. This is why Mi'kmaw Kina'matnewey partnered with Sprig Learning and the Nova Scotia Department of Education and Early Childhood Development to create, "Antle Discovers His Voice." This program began in 2017 and uses a holistic approach to learning and assessment to measure and support oral language learning for students aged 3-6 years old. This program combines an iPad with an engaging moose puppet named Antle to measure language usage and fluency in the home, school, and community. The app asks teachers, parents, grandparents, Elders, and, of course, students about their use of the language. The resulting data is shared through Sprig Learning's cloud-based learning platform. Teachers and parents

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then login using their own secure accounts and are directed to personalized learning activities for their children and students that promote language development – in both Mi'kmaw and English. The children love the opportunity to complete Antle-branded activities with their families and friends, while teachers and parents enjoy knowing that all this effortless work is promoting early literacy and accelerating language learning.

See "Antle Discovers His Voice" in action at: <https://vimeo.com/256123183>.

## **The information highway must flow both ways**

We have largely won the battle for bandwidth, and now that we have climbed that hill, we are beginning to see what is possible on the other side. We have paved the information highway, and it's made of fibre, not copper. When the traffic on the four-lane super highway starts to become congested, we can widen it to six or eight lanes. Most importantly, the highway flows in both directions. Information does not just come down into the communities any more. People in the communities no longer have to travel real roads or by air to access employment and educational opportunities.

It is interesting that many people cite modern media as the catalyst for the loss of traditional knowledge, language and culture. It is true that if we wait



Image courtesy of Kevin Burton

for traditional broadcasters to provide that content, the language and culture will be lost. However, if Indigenous people take control of producing content, and if they have the connectivity to share and upload content to others, then there will be a powerful means of reconnecting across generations. "Ownership, Control, Access, and Possession" is not just a catchphrase; it is a formula for cultural survival. ●

*Kevin Burton is Director of Atlantic Canada's First Nation Help Desk and a member of the Mi'kmaw Kina'matnewey community.*

*\*\*An earlier version of this article stated that Eastlink is a subsidiary of Bell Canada. This is incorrect. Eastlink is a telecommunications based in Atlantic Canada. This error also appears in the print version of Northern Public Affairs. We apologize for this error.*