Broadband Communications North Inc. (BCN)

Successful Broadband Infrastructure Projects and Partnerships

Assembly of First Nations
February 5th 2014
Agenda

1. Brief introduction of BCN
2. Overview of common infrastructure
3. What is Broadband?
4. Reasons for why partnerships are important & challenges
5. Successful infrastructure projects and partnerships in Manitoba
6. Lessons learned
History of BCN

- Incorporated in 2002 as a not-for-profit.
- Initially created to access funding which targeted 28 un-served and underserved communities.
- BCN now services 49 First Nations and remote communities in Manitoba.
- BCN’s board of Directors includes representatives from tribal councils, political territorial organizations and independent First Nation communities.
- BCNs network is one of the most geographically separated broadband networks in Canada. The network spans over 1000Km and includes almost all remote and isolated Manitoban First Nation communities.
BCN Goals

- Expand/Upgrade capacity to service un-served or under-served First Nation communities

- Foster economic development (i.e. community owned and operated ISPs)

- Actively support enterprise clients in their delivery of services, such as Telehealth, e-health, and education

- Support communities
  - Skills/knowledge transfer
BCN Services

- Service Include:
  - High Speed Internet (ISP, Retail, Enterprise)
  - Dedicated bandwidth / data prioritization
  - Helpdesk (for enterprise and retail)
  - Service Level Agreements (SLA)
  - Special Applications (ex. Video Conferencing)
What is a Broadband Network?

- Building infrastructure that connects point A to B, C, etc.
  - “links in a chain”
- Physical infrastructure is required but there are many unseen aspects, such as:
  - Support staff (technicians)
  - Network architecture
  - Server infrastructure
  - Vendors
  - Suppliers
  - Maintenance and lifecycle
Infrastructure – Terrestrial Network

- Microwave towers are used to access nearby networks – such as fiber optic breakouts.
- Connections are engineer back to the clients networks to ensure full Quality of Service for telehealth calls

- Pros:
  - High Bandwidth
  - Low monthly costs
  - Low latency
  - High reliability

- Cons:
  - Expensive. Construction difficulties.
  - Line of sight – generally must be 30-50km from connecting network
  - Weather (lightning strikes)
  - RF Interference (mitigated w/ licensed freq.)
Infrastructure – Satellite Network

- BCN uses C-Band satellite earth stations in remote locations.
- Connections are engineer back to the clients network to ensure full Quality of Service is delivered for telehealth calls

- Pros:
  - Low capital costs & easier to install
  - Can be deployed anywhere in the satellite coverage area
  - Bandwidth sufficient for enterprise and some community use

- Cons:
  - High latency
  - Extremely high monthly costs
  - Bandwidth limitations
Infrastructure – Local Loop

- In each community a tower is installed which broadcast wireless signals to Customer Premise Equipment (CPE) for connectivity.

- CPE’s are installed on the building and connected to the clients internal network.
Infrastructure

BCN operates a hybrid network comprised of:

- C-Band Satellite segment
- Terrestrial segment (microwave, fiber optic, etc.)

- Within the community, a tower broadcasts the Internet signal wirelessly to home and business users.
- In order to provide quality and reliability, BCN actively monitors and controls all segments of the network.
### CORE FOUNDATION

#### Demand from Communities

1. **Network**
   - Broadband connectivity and related access fees, broadband infrastructure, routers, switches, wiring, wireless, NOC & monitoring

2. **Technology Platform**
   - Desktops, servers, portable devices, appliances, operating systems, DBMS's

3. **Applications**
   - Data collection, reporting (e.g., FNITP, PMSE), GIS, E-learning, telehealth, video-conferencing, VoIP, content repos., WWW (Internet)

4. **Drivers**
   - Community needs, funder requirements, mgmt needs, Ec. dev., job creation, safety, health, emergency response, etc.

#### Human Resources

- **Champions**
  - Community members, leaders, stakeholders, managers, government, educators, youth, staff, FNS IT-RMOs (7)

- **End Users**
  - Employees, community members, educators, students, medical staff, patients, funders, general public

- **Information Management**
  - Receive training, data entry/retrieval, reporting, communication, content creation, feedback

- **Project Mgmt.**
  - Outreach, research, Project charter, WBS, application selection, project delivery, hiring/training, evaluations

#### Activities

- **Tech Services**
  - IT Project Mgmt., providing IT perspective to Project Manager's application selection process, select and purchase equipment, meeting requirements, application support, outsourcing 2nd level support, Help Desk, on-site repair, database management, ensuring levels of service, planning for upgrades, network security, etc.

- **Systems Support**
  - Consultants, IT managers, Desktop/server support, CISSP's, Computer techs, application support, DBA's

- **Network Support**
  - Cisco specialists, consultants, Telcos, engineers, network support analysts, CISSP's, wiring technicians, NOC staff

- **Layers**

#### Benefits to Communities
Defining Broadband

- High speed internet?
- Who is responsible for broadband?
  - Were telephones and electrical systems delivered in this way?

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<th>Canadian definitions of broadband:</th>
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<tr>
<td>Industry Canada (old def.)</td>
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<td>Industry Canada (2011)</td>
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<td>CRTC (2011):</td>
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The CRTC anticipates that this target will be reached through a combination of private investments, targeted government funding and public-private partnerships.
What is Broadband?

- A flexible definition is needed...
- Providing broadband requires that the following criteria are met:

- High Quality
- Reliable
- Equitable
- Responsive
- Scalable
Challenges in Manitoba

Numerous technical challenges in providing service to remote locations:

A. Limited or non-existent backhaul infrastructure (i.e. connections to the community).

B. Limited or no community telecom infrastructure (i.e. connections to the home).

C. Remoteness challenges:
   - Travel difficulties, weather issues, shipping, accommodations

D. Sustainability – small consumer base, high cost of delivery.
Successful Partnership

• Partnership with Communities
  ◦ Individual Bands – Community ISPs
  ◦ Community champions

• BCN Board of Directors
  ◦ Not-for-profit
  ◦ Brings together Tribal Councils, Political Organizations, and Independent First Nation Communities

• National and regional partners
  ◦ AFN Technical Working group – policy
  ◦ Collaboration with the Assembly of Manitoba Chief
    • UofW training program, Telehealth, etc.
Successful Partnerships cont’d

- Manitoba First Nations Regional Telehealth Partnership (MFNRTTP)
  - Excellent example of a federal, provincial, First Nation partnership
  - The partnership has been a major supporter of First Nations connectivity in Manitoba
  - Promotes and supports Telehealth deployment and use
  - Oversees and coordinates operational Telehealth activities
  - Builds collaborative relationships with health care providers and First Nation communities
  - Funded by First Nations Inuit Health

- Members include:
  - First Nations Inuit Health Branch (Region and National)
  - Assembly of Manitoba Chiefs
  - MBTelehealth
  - Manitoba Health
  - Telehealth Service Providers for First Nation Communities
    - (ex. CTCs)
  - BCN
Successful Partnerships cont’d

- Yearly growth in telehealth usage, fiscal year 2011/12 to 2013/14.
  - (only 9 months of data for 2013/14)
Successful Infrastructure Projects

- Industry Canada, NICSN
  - A collaborative effort involving Keewaytinook Okimakanak (KO), Kativik Regional Council (KRG), Keewatin Tribal Council (KTC), Telesat Canada and Industry Canada to allocate public benefit satellite space on Anik F2

- Canadian-Manitoba Infrastructure Secretariat (MRIF)
  - Original BCN network build

- Industry Canada, Broadband Canada Fund
  - Expansion of BCN network (2 new communities) and lifecycle of old microwave technology
Lessons Learned

- 50% funding or partial funding (several funders required for 100%)
  - Need to shop around to fully fund.

- Difficulty in meeting funders administrative/reporting requirements

- Wrong criteria for evaluating broadband project submissions
  - # of homes vs dollars spent
  - Need to lobby funders now before programs are set

- Problems associated with including broadband in funding envelope targeted at roads, water, sewer, etc. (AANDC - FNIF)

- Problems associated with network planning based on funding programs rather than engineering / business requirements.
  - “Shovel ready” projects needed.
Questions?

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