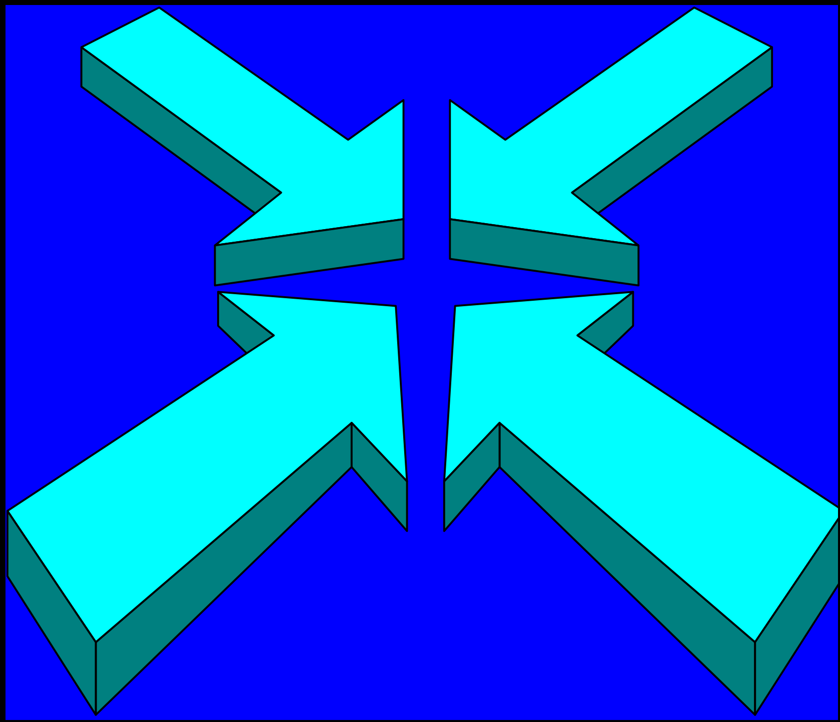
Skybridge A Global Solution

Peter Boorman



Who is Peter Boorman?

- Ex-President Northwestel Inc
- Ex-President & CEO of NMI Mobility Inc.
- Ex-CEO Northwestel Cable Inc
- Ex-CEO of Pangnirtung Cable TV Ltd.
- Ex-Director Ardicom Digital Communications Ltd.
- Ex-Director Andron Ltd.
- President Global Wireless Satelite Networks Inc.
- President Med-a-Globe International Networks Inc.
- President Intersol Communications Inc.

Topics of Discussion
Communications

- Where we have been
- Where we are
- Where we are going

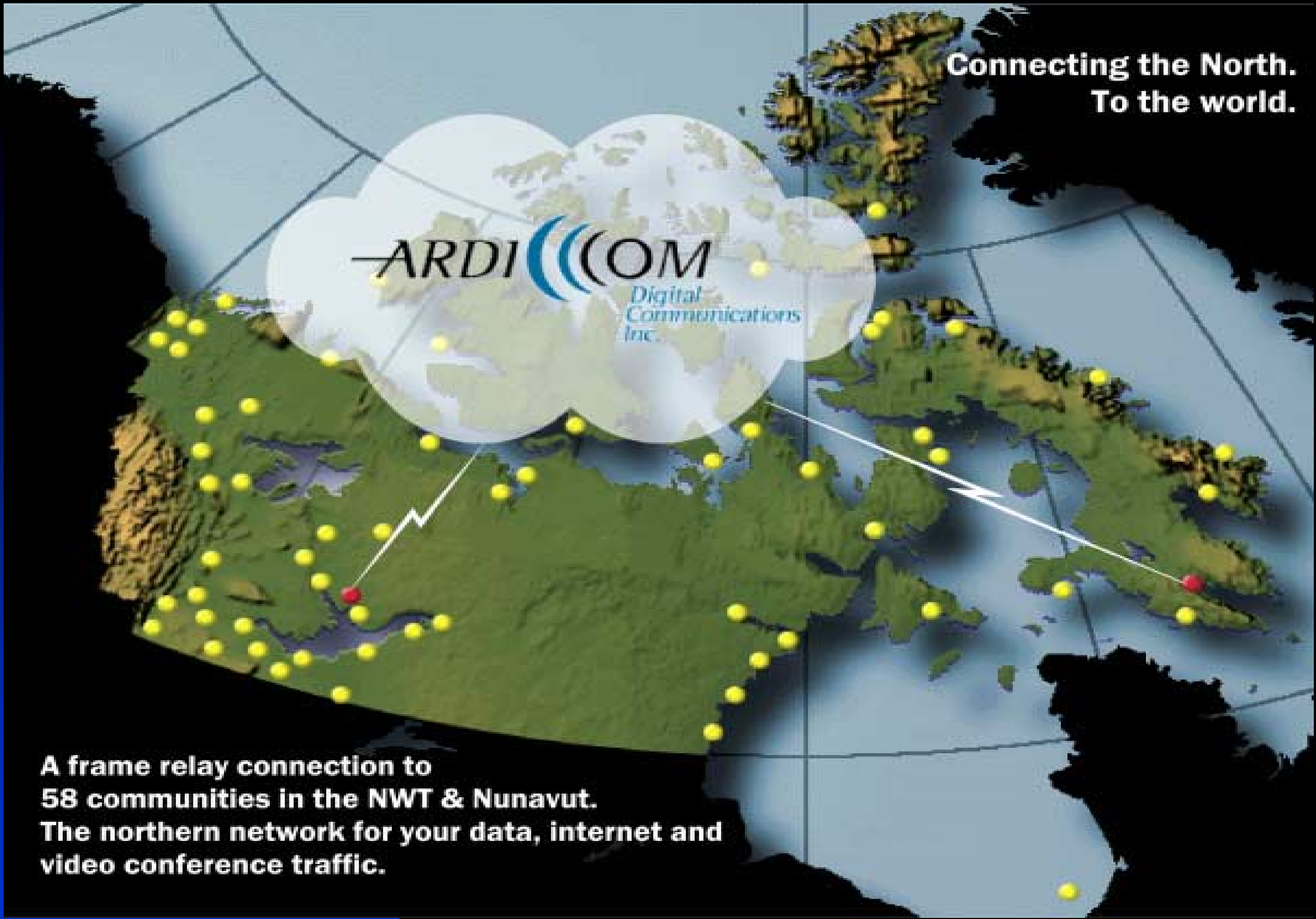
Where we have been

- Subscribers on terrestrial copper loops
- All services tariff into bundles
- Voice operates at 64 K/bits, date has to fit same timeslot
- Copper loop poorly utilized
- High speed services (DS1) very expensive
- All services distance sensitive on selling price.
- Voice over Satellite suffers from latency

Where we are

- Circuit switch services include dialup IP Data access
- Voice over the Internet possible in private networks
- Broadband IP operates over copper circuits (ADSL)
- High speed ADSL services expensive on satellite
- Frame relay eats bandwidth when applied to satellite

How do you serve remote communities?


Connecting the North.
To the world.
ARDICOM
Digital Communications Inc.
A frame relay connection to
58 communities in the NWT & Nunavut.
The northern network for your data, internet and
video conference traffic.

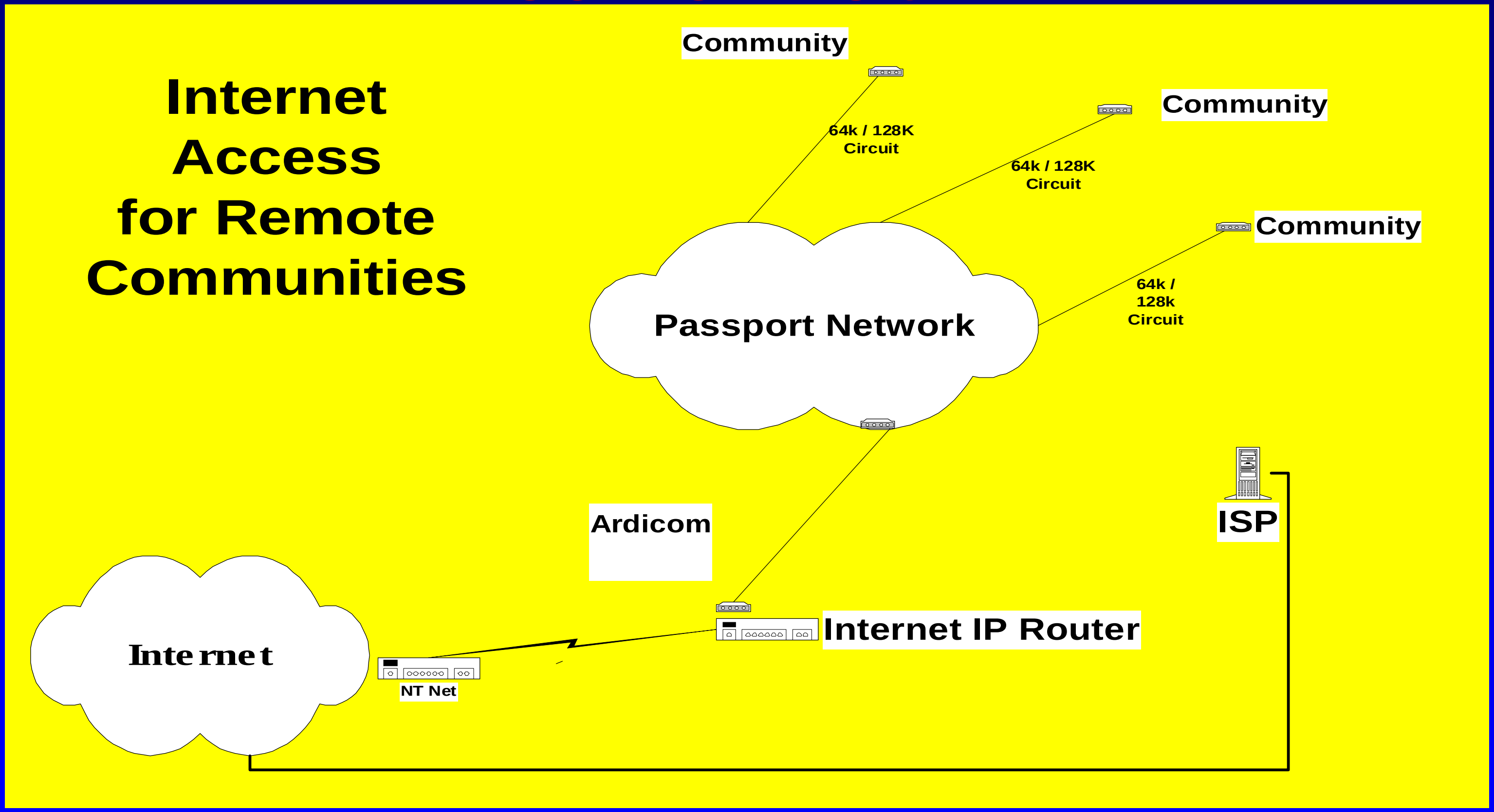
Ardicom Satellite Solution

- Unique partnership of both aboriginal partners and a Telco
- Government was anchor tenant
- Operates with low speed IP data and video only
- Based on Telco owned frame relay satellite connections
- Provides communications to 70 plus remote communities
- Voice not feasible in present network architecture

Ardicom Pitfalls

- Development has not kept pace with innovation
- Bandwidth very limited eg 64/128 Kb/s on Satellite
- Bandwidth oversubscribed in the communities
- Frame relay costly on satellite connections with only 30% payload
- Latency excessive especially between remote sites
- Poor utilization of Satellite transponder with 50% wasted assignment

Starnet =poor utilization of bandwidth!



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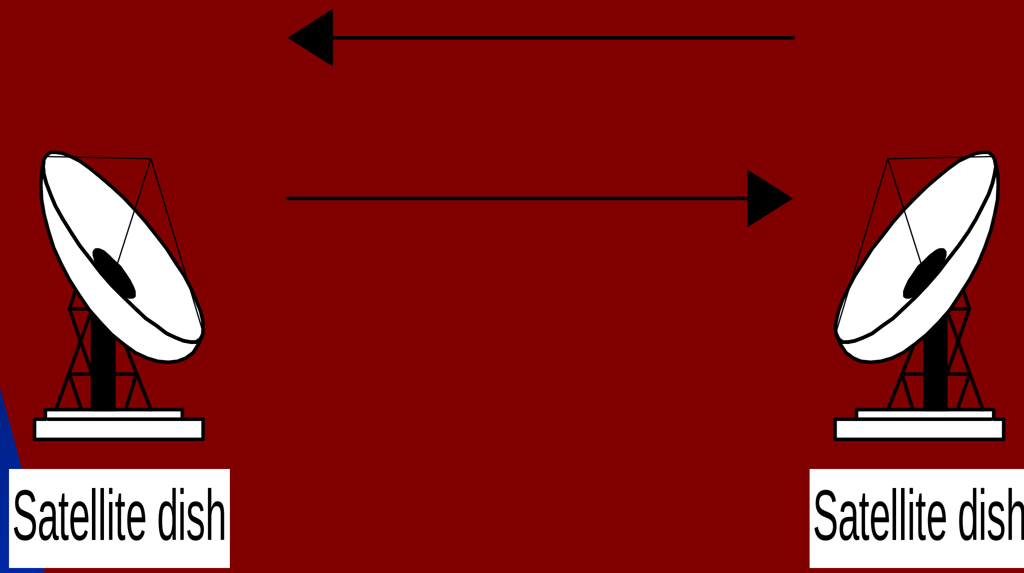
Point to Point problem



- Two transceivers for every pair of sites
- Wastes transponder power and bandwidth results increase costs

2x70= mega $$$$$$

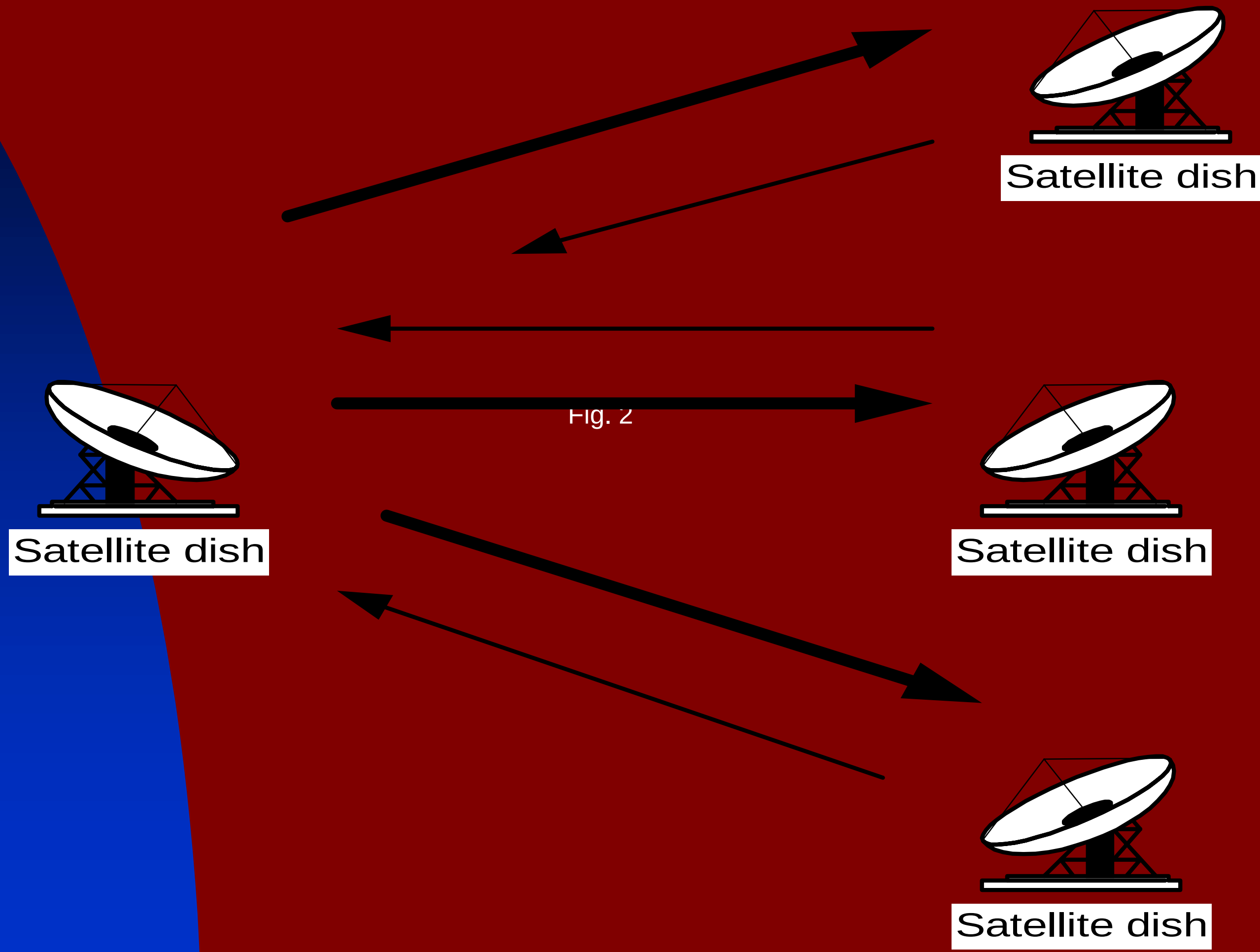


Fig. 2

What This Means

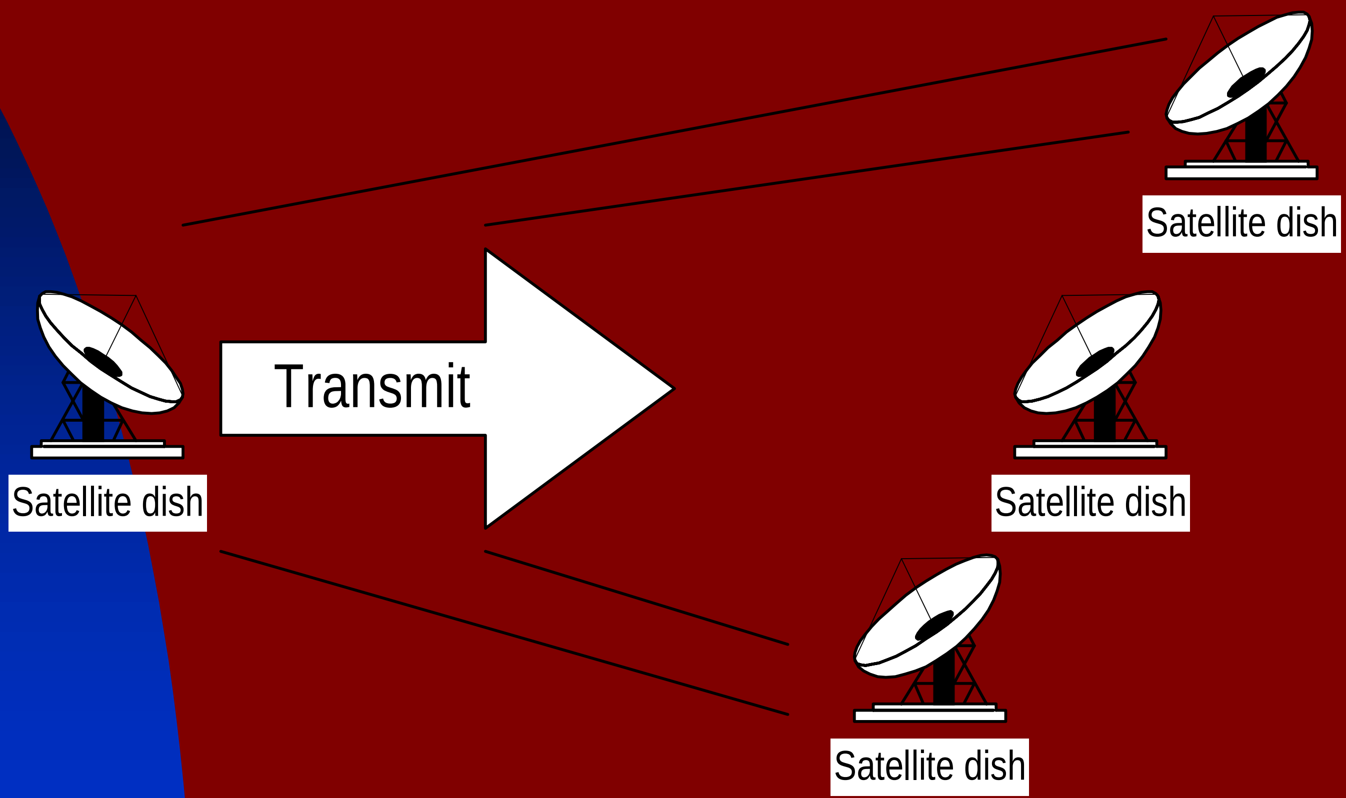
- Most traffic - essentially IP based, must be converted to frame and back to IP traffic, This takes time and requires costly equipment.
- Quality of service to each location is maintained by the provider, not the user. The provider will inevitably have different ideas about QOS than the user
- The user must pay for leased lines from the provider's facility to the remote drop. These reoccurring costs and the satellite bandwidth reoccurring costs are essentially the "gross operating costs" of the network

- Extremely large local loops are being provided via an extremely small backbone signal. Most often only 64Kb/s. To attempt to load 3 or more 1.5mb/s local loops via a 64k backbone is simply the exact recipe for disaster.
- It may be advantageous to backhaul naked Internet traffic off-network to a provider. This way the corporate part of the network maintains its integrity and is not clogged with civilian traffic. And inversely, the at home Internet user does not suffer when corporate traffic increases.
- The majority of the grief in a network of this design revolves around getting information (or flowing information) into the remote community. The inward signal bandwidth is usually the choke point. Traditionally the out-going signal from the remote community requires less bandwidth

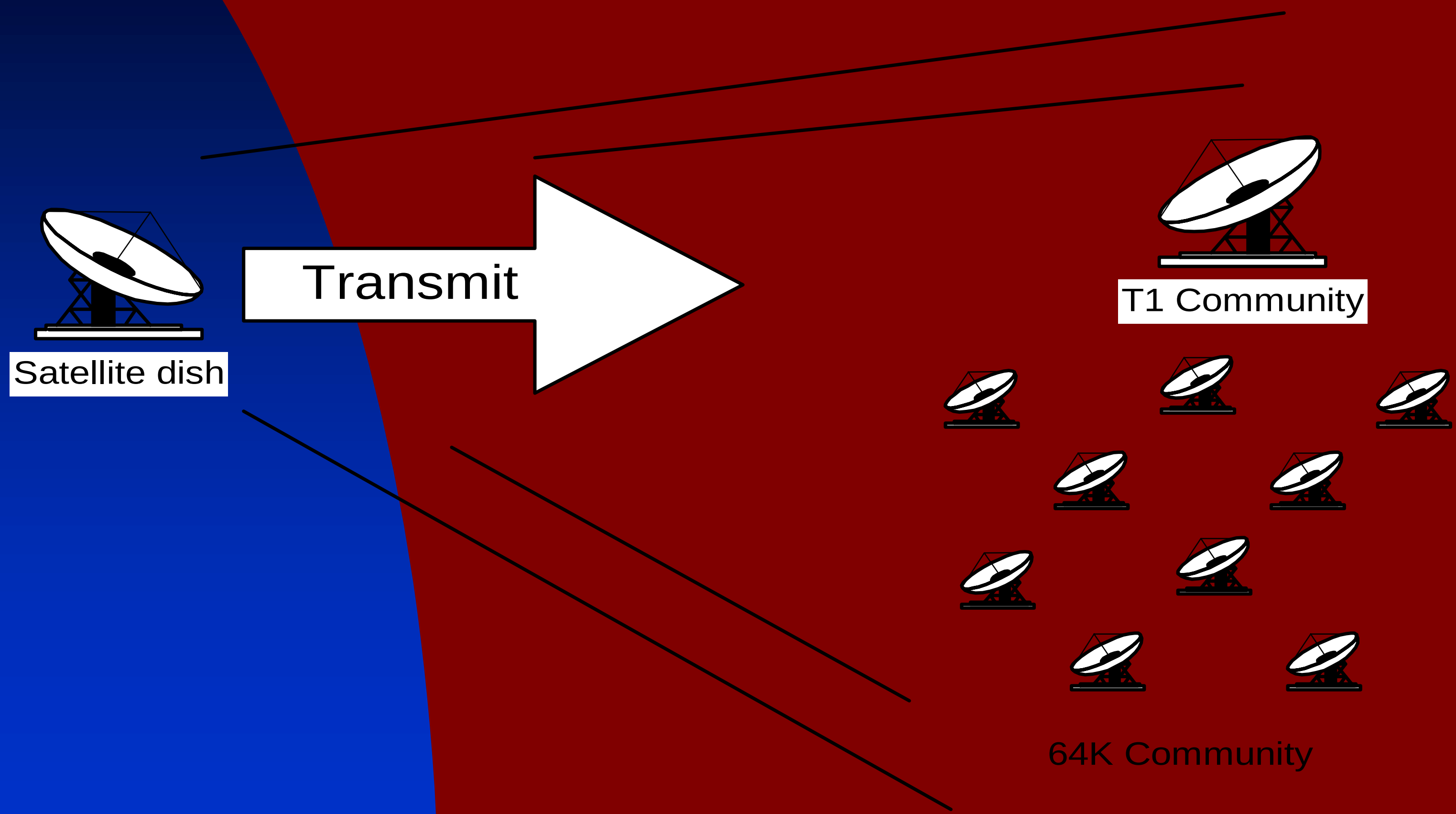
Point to Ponder

Referring to point #1 above, transmitting a carrier to the satellite incurs reoccurring expense. Receiving from the satellite does not. Therefore if a single dynamic broadcast signal was used (much like a television broadcast), then it stands to reason that it would be extremely more cost effective. Because of the cost effectiveness of the single broadcast signal, it can be advantageous to increase the size of the main broadcast (or hub) carrier and make it larger. This enables the end user to benefit dynamically well beyond what was possible in the legacy network, while saving the provider, and hence the customer, reoccurring costs.

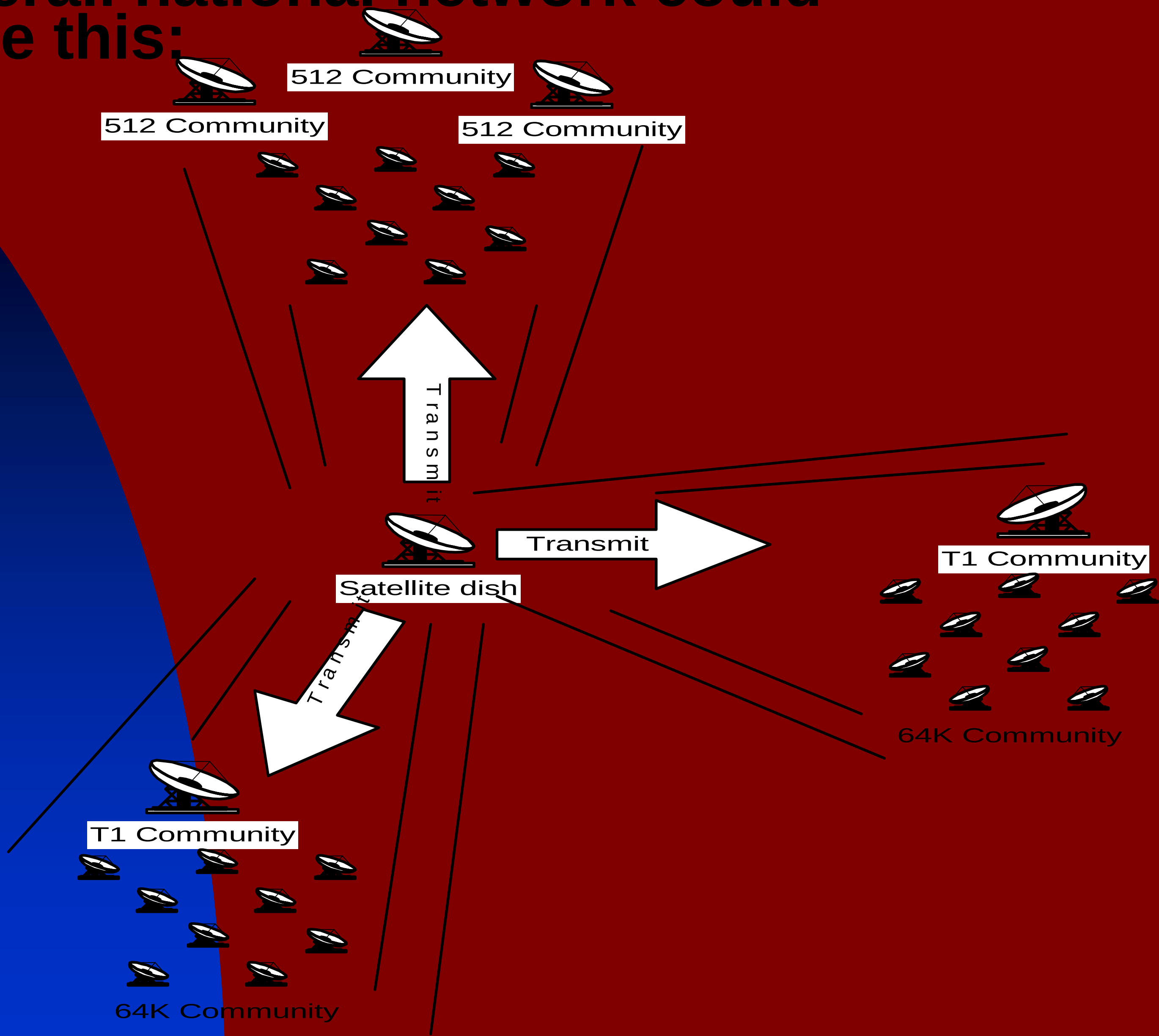
Using the same multi-site configuration as above, but with dynamic broadcast signal sharing.



In the case of most larger networks there are two large bandwidth sites and three more medium bandwidth sites. If three hub transmitters were setup and the remainder of the sites distributed amongst them, maximum efficiency should be attained. The proposed setup would be as follows.



The overall national network could look like this:



Therefore:

	Hub Transmitter	Remote Site
A	2076Kb/s	1 x 1.5Mb/s + 9 x 64K
B	2076Kb/s	1 x 1.5Mb/s + 9 x 64K
C	2076Kb/s	3 x 512kb/s + 9 x 64K
	6228Kb/s	6264Kb/s

Total = 12492Kb/s

for the purposes of this example we can assume that a QPSK Viterbi 1/2 rate satellite signal shall be 1:1 - 1 Khz = 1 Kb/s of throughput. Now if we assume that the going rate for 1 Khz of satellite space is around $18 per month then

12492Kb/s = 12492Khz

12492Khz x $18 = $224,856

Where we are going

- Voice over the Internet (VOIP) will replace circuit switch voice
- Voice video and data will operate on the same connection
- VOIP will occupy 75% less bandwidth than circuit switch
- Wireless services will dominate or replace copper services
- Medium speed multimedia services affordable on satellite
- All services could become flat rate billed

All Canadians should have equal and affordable access to communications!!