

across the globe learnt about FOP from the net and came visiting Tamil Nadu to study it first hand. Two large delegations came from Nairobi, Kenya, one delegation from China, some from UK and the USA. Many of the western visitors acknowledged that FOP went beyond their own concept and programs in community policing like the Neighbourhood Watch scheme. The unique aspect of FOP is that while it integrates the police and the citizens, it affords individual as against group affiliation or empowerment offered in schemes like Citizen Security Committees and Neighbourhood Watch. Some foreign police agencies like the Canadian Mounted Police have even started Friends of Police in their jurisdictions.

In 1994, the FOP concept and movement was extended to the whole state of Tamil Nadu with a Government Order. In 2002, the idea won the inaugural 15,000 pound prestigious Queen's award for Innovation in Police Training and Development out of competition from 55 nations of the Commonwealth. Incidentally, the theme of the competition, organized to celebrate the Queen's Jubilee, was harnessing technology to overcome lifelong barriers to learning. The prize money enabled us to further develop the website, organize a pilot training project and set up a state-of-the-art multimedia training center. At the time of writing, the FOP center in Chennai has trained a record number of 45,000 FOPs and 45,000 police personnel in more than 1000 multimedia

workshops across all districts and cities in Tamil Nadu in the concepts, methods and philosophy of FOP.

Today, the concept and movement is poised to be launched all over the country. 55 lakh security guards in all private agencies all over the country are eager to be empowered as FOPs. The national micro mission set up to transform Indian police in pursuance of the Hon'ble Prime Minister Dr. Manmohan Singh's vision has recommended the FOP model for adoption in all states and Union Territories. The groundswell support for the concept and movement is heard in the whispered wishes of citizens like the mail above.

We have also initiated an e-FOP network to connect cyber-savvy netizens and IT workers to assist the police in fighting cybercrime as well as other forms of crime and disorder at the street level. Truly, digital technology enables us to disseminate an idea, establish a synergistic network, tap human intelligence and overcome lifelong barriers to learning. Digital technology enables us to tap the synergy of networking capabilities in the interest of individual, local, state, national and global security.

Dr. Philip is serving in Indian Police Service as Inspector General of Police, Tamil Nadu and Founder Director, Friends of Police (For more details, read his book, *The Friends of Police Movement: a Roadmap for Proactive People Protection* available online on icfailbooks.org, google-books.com and amazon.com. www.friendsofpolice.net, google with Friends of Police.)

Bridging Mountains (through Wireless Clouds)



CC: AirJaldi

We believe that affordable access to internet should be as readily available as are public facilities such as roads, electricity and water.

MICHAEL GINGULD

The editors of D-Content have kindly asked me to share AirJaldi's and its affiliate the Tibetan Technology Center's (TibTec) experience in bridging the digital divide with wireless technology, and to describe some of the services delivered on our networks. As I began writing this while sitting on the second floor of my house, which is wirelessly linked to our Network Operation Center (NOC) located 10 km. away, it occurred to me that what I'm asked to do is something we often do with those who make the (very worthwhile) effort to visit our hilly abode in Dharamsala:

people interested in our (AirJaldi community network usually want to know why we do this, how we do it, what is it that we exactly do, and, most importantly, so what - what change does it bring to

our area and to the rest of the world?

So, imagine yourself panting along with me, climbing up a hillside towards one of our nodes which interconnects some 10,000 users in and around Dharamsala. We sit down, open our laptops and log onto the (secured!) network. After we've checked that all is well with the network and beyond ("Hey, a new friend request on Facebook!"), after I've made you a cup of tea on my stove and after you've fought off the monkey who wanted to steal your biscuit, we begin: "Why do you guys do what you do?"

Why?

This question is asked more often than one might imagine, and in various forms. One of my favorites is a variation on the following theme: "Aren't you afraid you'll end up

We do not believe that connectivity could presently be provided free of charge.

bringing in the Silicon Valleys of P. Anderson instead of..." the ... to be filled with an allusion to something useful/beneficial, etc.

Well, one would surely not want to go down in history with this kind of medal on one's chest. Seriously, the "why" question is indeed an important one, because in many ways it dictates the way in which one goes about one's work. I believe that knowledge is one of the most important resources available to humanity. Moreover, it has the wonderful qualities of being non-rivalled (we can consume as much of it as we want to without depriving others), it encourages synergy (more of it and more of us engaging in consuming it usually results in more of it) and... well, it's almost a public good, right? Well, not exactly - knowledge, or the ability to consume it, does not meet an additional condition for being a pure "public good" - it is not always non-excludable. In other words, one can be prevented from consuming it if one has not secured the right to access it (through payment or otherwise).

For us, the task of providing Internet access to rural areas (and we will also deal with what exactly, in our minds, this consists of) is ultimately one of reducing the excludability issue. No, we do not believe that connectivity could presently be provided free of charge. We do believe, howev-

er, that we can greatly increase peoples' access to affordable and viable connectivity services, thereby contributing in time to making the Internet a ubiquitous piece of infrastructure - just like roads, water and electricity.

OK, you go on, "What are the main constraints to making this vision an every day reality?"

Our experience (and others') to date points to the following set of constraints:

>> Expensive supply vs. low demand - most readily-available technologies for providing broadband access are too expensive for deployment in rural areas where the users tend to be physically dispersed and few in number.

>> Problematic supporting infrastructure - any equipment one decides to deploy needs to be powered. Power supply in rural areas tends to be erratic - it does not always flow through the grid, and when it does, wild fluctuations can challenge the best of power supplies. Many a piece of equipment has not survived these conditions, or needs to live with/behind expensive protection and backup devices.

>> Problems in securing needed local resources: networks need to be managed and maintained. Finding and keeping skilled and suitable workers for these tasks is a challenge in rural areas.

How?

[inset image of our router mounted with an antenna]
"Yes, all well known problems", you say, as we drink one more chai in a local chai

shop near our office at the Tibetan Children's Village complex, "What you do, then, is to basically just find ways to overcome these constraints, in order to provide Internet to rural areas in an affordable manner, right?"

Yes, basically correct, I reply, but getting this right requires adhering to two basic principles: common sense and sensible practices. In other words, finding the right technologies and then making them viable and accessible. Let me try and elaborate on these without being too technical.

Our networks, in particular our largest network in Dharamsala, extend existing Internet broadband services (often available only in cities and towns and their close vicinity) by interconnecting wireless "nodes" (routers, antennas, power supply) to form a network that provides coverage and Internet access to a given area. Our network in Dharamsala, for example, presently covers a radius of about 70 km.

The basic principle for creating these nodes and the network is rather simple and straightforward: go forth and find, modify and deploy equipment that together creates networks that are:

- >> physically durable - able to withstand the extreme weather conditions and equally extreme power fluctuations that typify many rural areas.
- >> Technically viable - by viable we mean platforms that can provide broadband traffic to many users in a satisfactory and secure manner. Halfway solu-

tions, such as ones that provide limited bandwidth to a small number of computers, tend to be bad ambassadors for connectivity, as their limited capabilities and high costs do not encourage expansion nor enable it, and surely do not demonstrate the full capabilities of connectivity to users.

>> Affordable - remember, we are trying to serve relatively few customers. We cannot go overboard with expensive equipment that will not enable us to return our investment and turn our network into a viable enterprise.

"Ah" you say "but this leaves out many great pieces of equipment!"

Right you are, I say (as we walk downstairs to our office and lab), but it also forces us to embark on an exciting search for alternatives.. When we reach our destination, you take a swig of water (thinking about the way up again...), charge your laptop and I pull out a few of our routers and go on to explain how we go about choosing and using them:

Following intensive searching and testing, we fit selected hardware platforms with power supplies and charge controllers capable of handling wide power fluctuations. We ensure that each node is supported by a battery backup and, in places where electricity supply is erratic or non-existent, with a solar charger. We use a variety of antennas to enable significant extension of the nodes' range and area of coverage.

Often, the original software of

the routers is replaced, or enhanced by firmware that greatly expands the nodes' ability to optimize traffic, recover from various problems or enable remote troubleshooting. We also ensure that our nodes are fitted with high-level network encryption.

The router and other components are mostly mounted on low masts placed on rooftops or high places. The easily installed nodes are small and unobtrusive and their low emitted radiation and power requirements make for a very low ecological footprint.

The network is centrally controlled by a management and support system, which allows operators to manage the network and maximize its abilities, as described in the table below.

"OK, this is the common sense part, what about sensible practices?" you chip in, almost dozing off and hoping I won't be so long-winded. Some members of our small team, mostly members of the local Tibetan and Indian community, steal knowing glances at you as they continue to prepare a router for installation. As for sensible practices, I retort, what we mean by this is having the ability to take the geeky developments and make them accessible to people like most of us here, who have some basic knowledge of the ways of holding a spanner and configuring a router, but don't often submit patches to the Linux Kernel. Doing this is the task of our training and capacity-building team, who develop simple and well-practiced deployment and network management methodologies, and deliver these through practical, hands-on

courses given at our AirJaldi Network Academy.

What?

"Great," you say, as we walk upstairs towards our small NOC, located near a computer classroom and housing the upstream providers' modems, home-brewed switches and a number of PC-based Linux servers, as well as an impressive array of truck batteries to ensure continuous power supply during those times when the greed bulks under a thunder storm or some other calamity, "your networks provide internet to rural areas in an affordable manner. Is there anything else to it apart from that? Any difference from other offerings 'out there'?"

Good question. Our network delivers broadband internet connectivity: a typical user will get an RJ45 connection to their premise, which is basically the point where the wireless backbone becomes wired again. They can then choose to connect one or more computers to it, and extend it further inside their premises. There are places where our connection is the only broadband connection available, and there are places where it is a reliable and trusted alternative to other offerings. In addition, we provide our users with a range of additional services, such as Intranet conferencing capabilities (VoIP solutions for STD calls are technically easily implemented, but which we do not use at present for legal reasons), off-sight storage and file-sharing, local and network-wide hosting facilities, and



CC: AirJaldi

various security features.

We are also in process of installing additional services our local server in Dharamsala, including large knowledge repositories and locally-hosted community/group webpages. These will be easily accessible to all connected users of our networks.

However, you need to remember that our main focus is on providing viable pipes -connectivity. The possibilities for what flows through these pipes are numerous - from the data of environmental sensors to live relays of public events, to a review of the latest good math book out there.

So what?

In the evening, after a good shower, we share an espresso at the local cafe. As we gaze reflectively into the sun setting over McLeod Ganj, our small hometown, you go back to where we began the discussion and the day: "So, at the end of the day, are you aspiring to turn this into a local version of Silicon Valley? What changes do you bring to rural areas? Will or can these changes be beneficial, or will they just create wider gaps?" To some extent, it all depends on what and how one implements networks, and no less important, on WHY one engages in provision of affordable broadband networks.

We believe, and can prove, that broadband connectivity can be provided with relatively simple technology, one that does not necessitate huge investments, huge towers and a huge customer base to cover these investments. If knowledge is indeed one of the most

valuable of human assets, then our efforts to make it accessible stand a good chance of narrowing gaps.

We believe that affordable access to Internet should be as readily available as are public facilities such as roads, electricity and water. Like these, access to it brings with it a range of possibilities and influences. One deals with these influences not through prevention of access to resources, but rather through increased e access.

So we do hope that in hindsight, our work will be marked not by bringing silicon implements to new places; maybe it won't make areas reached by our networks new Silicon vallies; it might nevertheless help to lower some mountainous barriers and bring closer the days when, as the prophet said "... The plowman shall overtake the reaper, and the treader of grapes him that soweth seed; and the mountains shall drop sweet wine..." (The Bible, Amos, 9:13).

As you sway in your bus rushing down the steep curves towards the plain, we hope you take with you at least some of our enthusiasm for making all of this a reality.

For those of you who want to continue this tour, to talk or maybe even to visit: good places to start are:
www.airjaldi.com
www.tibtec.org
www.tcv.org.in

Michael Ginguld is CEO, Air Jaldi, Dharamsala, Himachal Pradesh. He can be contacted at michael@airjaldi.net