

Building Asset Based Telecom in the Shadow of Mt Everest

Vision of Economic Development and Preserving Sherpa Culture Becoming Reality in the Teeth of Maoist Insurgency on the Eve of 50th Anniversary of First Ascent of Everest

Classic Example of the Benefits of Edge Controlled IP Technology With Users Building Infrastructure that the Government and Telco Cannot Provide

Introduction

Walking down the mountain from Namche Bazaar on November 1, 2002 after two weeks of trekking near Mount Everest, I was glad I had come but seeing Namche and Lukla under heavy military protection and hearing stories from other trekkers about encounters with Maoists who extort transit fees from those passing through "their" territory, while I was glad I had come, I said to myself that I'd likely never come back. Little did I then know about what awaited me.

I had heard about Tsering Gyaltzen Sherpa from Dileep Argawal the CEO of WorldLink, a large ISP in Kathmandu. Going down I asked in Namche where Tsering was. The answer came back: "he left for Kathmandu this morning."

I arrived in Kathmandu on November 2 and with Dileep's help in finding Tsering, I interviewed Tsering on November 3. What he told me was so inspiring that I spent several hours a day with him every day until I left on November 7. Since my return I have invested considerable time and effort in trying to assist him in building his vision.

Arriving home, I jokingly told Dave Hughes (dave@oldcolo.com) that he had been reincarnated on the slopes of Everest. Tsering is the only person I have ever met in the 22 years that I have known the "cursor cowboy" who understands not only how to use the Internet for economic development but also for cultural preservation. Inspired by what Tsering is doing I am ready to go back and want to help out. With his efforts I

think the Solu Khumbu region of Nepal may have a promising future. Without them I think the best that it can hope for is a crash landing of its trekker and climbing based economy.

Tsering's Story

Tsering Gyaltzen Sherpa was born in the Sherpa capital Namche Bazar on August 8, 1969. He told us: I went to school in Mosoorie in the foothills of the Himalayas north of New Delhi. My college was Hansraj. I finished my bachelor's degree and began, but did not finish, work on a masters degree. Then in 1989 I went to work for a year in a carpet factory run by my uncle in Lhasa. But my father died and in 1990 I came back to Namche to be with my mother and sisters. After a couple of months I went to Kathmandu and found a job with a trekking agency where I worked until 1995. By then I had started my own family and needed better pay.

Consequently the fall of 1995 I started a bar in a lodge in Namche. The lodge was off the beaten track. Therefore, it was easy to miss. But I ran it successfully and got lots of people to visit. I met an American gentleman who said to me if I wanted to learn how to brew beer he'd write me a sponsor's letter to get a visa for a visit to the US. Also a consular official from the American embassy visited frequently in 1997. When I went to Kathmandu to apply for a visa in January 1998 I reminded him that we knew each other from Namche. Initially I thought of staying in the States for perhaps six months. I stayed for two years and flew back to Kathmandu on January 1, 2000 when because no one wanted to fly the

airfare was cheaper than normal.

I was at this time that I discovered the Internet and web browsing and became addicted. I decided that I should turn my addiction into a business. My initial idea was to open a cybercafe with a couple of computers in Namche. I thought that I could earn enough money to support my family and be able to browse to my heart's content without having to pay someone else for the privilege.

But in the summer of 2001 the Maoists blew up the repeater tower between Jiri and Lukla cutting off Namche (elevation 3446 meters) from communication with the rest of the world. It was at Danda Khara where they had a repeater tower..

[**Editor** – The place Tsering talks about looks like a ridge at an elevation of about 4000 meters about 15 kilometers north-east of Jiri and 35 kilometers southeast of Namche. My map calls it Dubi Kharka.]

It was about five days trek south east of Namche. The communication was VHF or microwave by means of a repeater tower. The tower that fed Danba Kharka was in Sayangboche (elevation 3800 meters) which, as you know, is immediately above Namche.

Reconnecting Namche with the Rest of the World

Before the destruction of the tower Namche had a couple of working cyber cafes. One guy had a Vsat that he was using for email services. It was very expensive. I thought maybe I could hook dial up to his

v-sat. But i soon found out that I didn't have a clue. While I was foundering around and trying to figure out what to do my mother got sick. We had to take her to Kathmandu for treatment. I have four sisters who were involved in businesses in Namche and the surrounding area. But they were really worried and they abandoned their business, walked to Lukla and flew to Kathmandu to visit to check up on our mother. She was OK but with no communication between Kathmandu and the mountain they had no way to find out except to go there and see for themselves.

This brought home to me that I should

focus not just on Internet but more on communication for the area as a whole. My sisters could afford the expense of travel. But there are many others up in the Solu Khumbu who cannot. (Khumbu is the name of the area in the 30 miles from Lukla North to the border with Tibet. The Solu is the area extending perhaps 20 miles south of Lukla.)

The question facing me was, with our whole economy dependent on tourism, how could we remain with out modern communication? What happens when a tourist gets sick and must be evacuated and there is no communication? One should not have to walk for several days

to get to a point where one could radio Kathmandu for a helicopter.

I had seen a VSAT in Namche but I really didn't know what it did and did not do well. In order to find out I started looking for ISPs in Kathmandu. I went to a couple of ISPs and started asking questions but they did not pay much attention to me. Finally I met with an ISP that you know and with people who taught me a lot. The problem was when I told the owner in detail what I wanted to do, he quoted me a price of 4 million rupees or approximately \$50,000 US dollars. I could not possibly afford this. I was back to square one when I came across



Figure 1: View of 6,178 meter high Kwangde Ri looking from Namche Bazar (3446 meters). From Kiarolaug (6681 to the south west to the Tibetan border are some 17 peaks 6200 to 6900 meters high blocking the view to Kathmandu in the valley (1658 meter elevation). The drop from the summit of Kwangde Ri to the Bhote Koshi River at the mountains base is about 3,300 meters - a nearly vertical wall of more than 10,000 feet, Note that a radio placed at an elevation of about 3700 meters on the ridge at the left side of the picture (in shadow from early morning sun) could receive a signal from a sending radio connected to Tsering's V-sat and then send the signal back to Namche in such a way that it could be picked up by computers with Wi-Fi cards anywhere in Namche - creating with only one relay a Wi-Fi cloud covering the entire village.



Figure 2: Looking down on Namche where almost every building can be seen nestled in a "U" shaped bowl perfect for an 802.11b cloud.

some brochures about satellite phones.

So I decided to work on phone service instead of the internet. I bought one of these phones in Kathmandu and brought it to Namche to check out and see if it would work. The phone was a company called ASIACellular Satellite System (ACeS). ACeS is co owned by PT Pasifik Satelit Nusantara of Indonesia, Lockheed Martin Global Telecommunications of the USA, the Philippines Long Distance Telephone Company and Jasmine International Overseas Ltd of Thailand. The AceS R190 mobile phone has a cradle, made specifically for it. With the use of an external antenna connected by cable, it links up with the Garuda 1 satellite that covers all of south east asia. Once the mobile phone is placed in the cradle, in-building coverage and the ability to receive calls are immediately enabled. It is a set where you use your Simm cards. We also have prepaid carrier cards.

The calls go from Namche to the Garuda satellite and are routed

through the Philipines. Calling from the Namche region to elsewhere in Nepal was very expensive. But for emergency cases it seemed to me to be a good solution. The cost for one of these phones was \$850. I bought three and took them back to Namche in the beginning of 2002. Now in Namche we faced the problem of curfews from 5pm in the evening until 5:30 am. If any emergency happened in that period of time there is no way you could call. I had to close my offices. No one could come there in the middle of the night even in an emergency.

People really needed access to a phone 24 hours a day. Suddenly it occurred to me to ask about the phone sets that you find in a hotel that enable calls to be directed to rooms. I started to ask Dileep and Pavan how these hotel front desk phones work. They are of course called PBXs. I said could I use one of these units not to link rooms in lodges but rather the lodges in Namche and towns in the Khumbu.

People assured me that it would work. So I bought three satellite phones and a Panasonic EPABX with 48 ports for \$3000 and went up to Namche in the last week of August of 2002. The EPABX, which acts as a small telephone switch, can ring a directly attached phone over a distance of 1.7 kilometers. Within Namche, where all the buildings are within a perimeter of less than one kilometer, I laid 25 lines.

COOK Report: How did you accomplish this?

Tsering: I called a meeting and explained what I intended to do. Who is interested? I will run a line to your lodge. At first I had only five who accepted. But even before these, the first place to which I offered a connection was the army barracks which is the main center of security for us. The barracks is high on a hill overlooking the town and it would take five or ten minutes to get there on foot from the town. Now, If anything happens downtown, we can inform the army. Or if there is an emergency at night during the curfew, we can say please send someone to help and tell them where. Once people began to understand the possibilities interest increased greatly.

Phoning Home

I really needed some different capabilities than the satellite phones. Therefore I looked at Senao radio telephones that have a range of up to 80 kilometers.

Here is a product description. All SENA0 products offer the following benefits: 1. No Air-Time (It is not a cellular telephone or a satellite telephone) 2. No contract to sign (One time hardware payment) 3. No monthly basic charge (One time hardware payment) 4. No hidden cost (You pay your local land line telephone bill only) 5. No

share or busy signal (Your own line and telephone number) 6. Private & Secured telephone conversation (Voice Scrambler) 7. 12VDC and 120/220 AC power compatible (base and handset) 8. Even if phone line does not work, our products still can be used as a full duplex radio (intercom mode) see

[Editor: For example the SN 358 transmitter is 394 Mherz and the receiver 268. Base station is one watt and receiver 450 milliwatts. The range is from 12Km to 20Km with Outdoor Antenna and Booster installed.
<http://www.3dimension.com/SENAOSN358SuperLongRangeCordlessMobileTelephonesSystemsSpecs.htm>]

Tsering: I have placed these phones in Gorakshep, Gokyo, Machermo, Dole, Pangboche, Dingboche, Periche, Chukung, Lukla, and Phakding. There are four such phones in lodges in Lukla where people stay on the night before they fly back to Kathmandu. There is even a phone in a hut at the Cho La pass

which at 5330 meters is slightly higher than Everest Base camp. This pass offers a direct route from the valley and glacier of Gokyo, Dole and Machermo to Lobuche, Gorak Shep Kalapathar and Everest Base Camp. People can get caught by weather changes at Cho La. Atwo day snow stornn at that altidue of more than 17,000 feet for an ill prepared or altitude sick trekker is life threatening. Therefore an emergency radio phone is very useful. So in short you can see that I have the major trekking areas of the Solu Khumbu well covered. You can see the locations of all the phones in the map on the next page (Figure 4.). [Editor: Noticeable by its absence from Tsering's list is Tengboche Monastery. When climber Dan Mazur asked me if I had used the public phone there, I was surprised for Had not been aware of it as I passed through in October. When I asked Tsering he told me that the phone used a VSAT owned by Nepal Telecom which actual does therefore have a surviving presence in the Khumbu.]

When Nepal Telecom (NTC) had a land line it went only to Namche, and to Khumjung and Khunde right above Namche. NTC had but in these lines in late 1999. When for a while these three villages were connected to Nepal's PSTN, people would get these Senao radio telephones (from Taiwan) and take them to the high spots like Gokyo and Gorak Shep and call back down to phones where people in Namche, Khunde, and Khumjung were also connected to the PSTN. When the Maoists destroyed the repeater towers in June 2001 much farther down the mountain, the infrastructure in at Namche was left in place but cut off from the rest of the world. I'd be happy to see Nepal telecom replace the repeater tower and reconnect us but as long as the Maoist situation continues, they are unlikely to do so. It would be a much too inviting target.

COOK Report: Khumjung and Khunde are wired and connected to Namche. Why not connect them to your system?

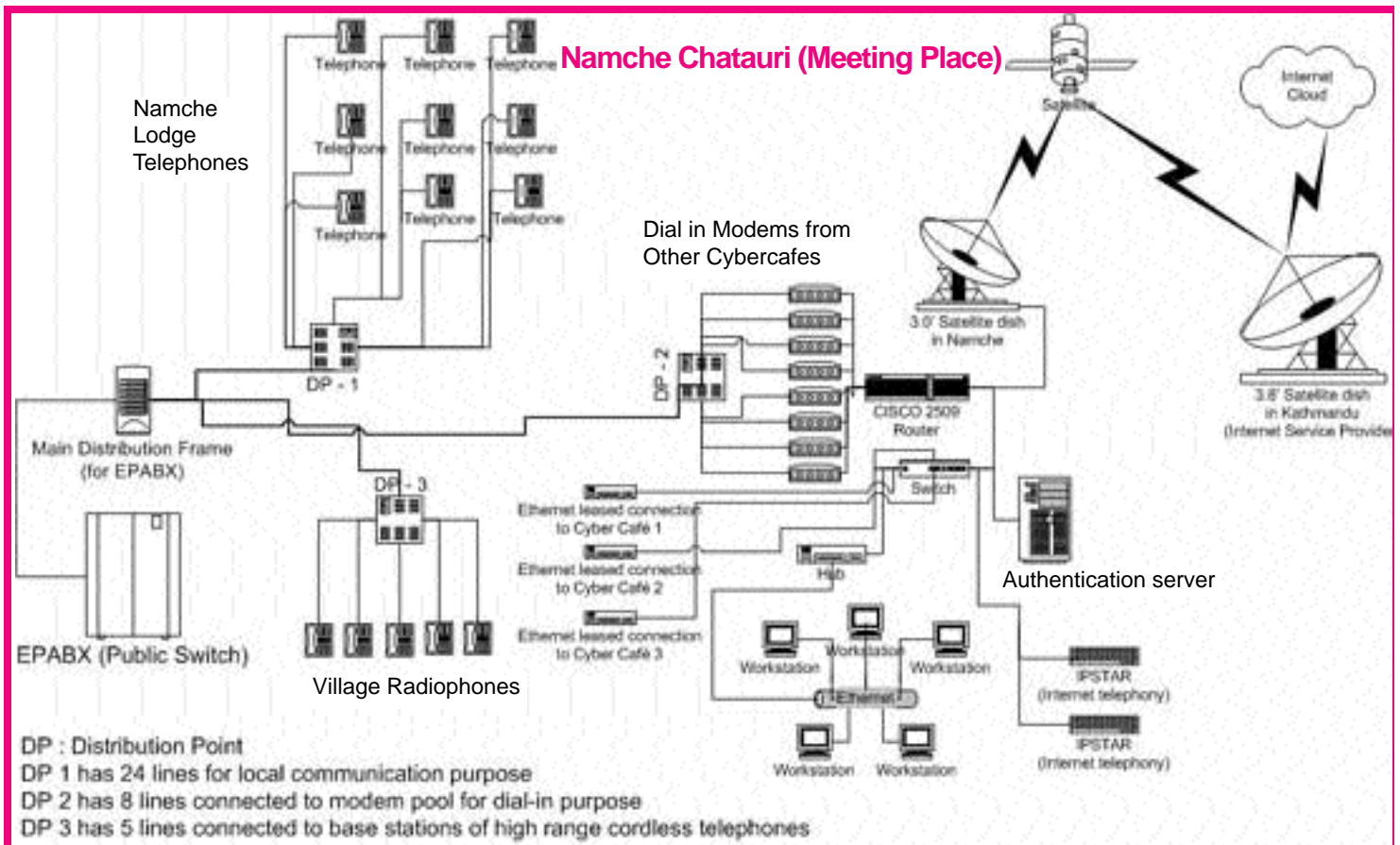


Figure 3 - Network Diagram Namche Chatauri Asset Based Telecom Network for the Solu Khumbu. Note that the legal name registered with the government in Kathmandu is **Namche Technical Services**

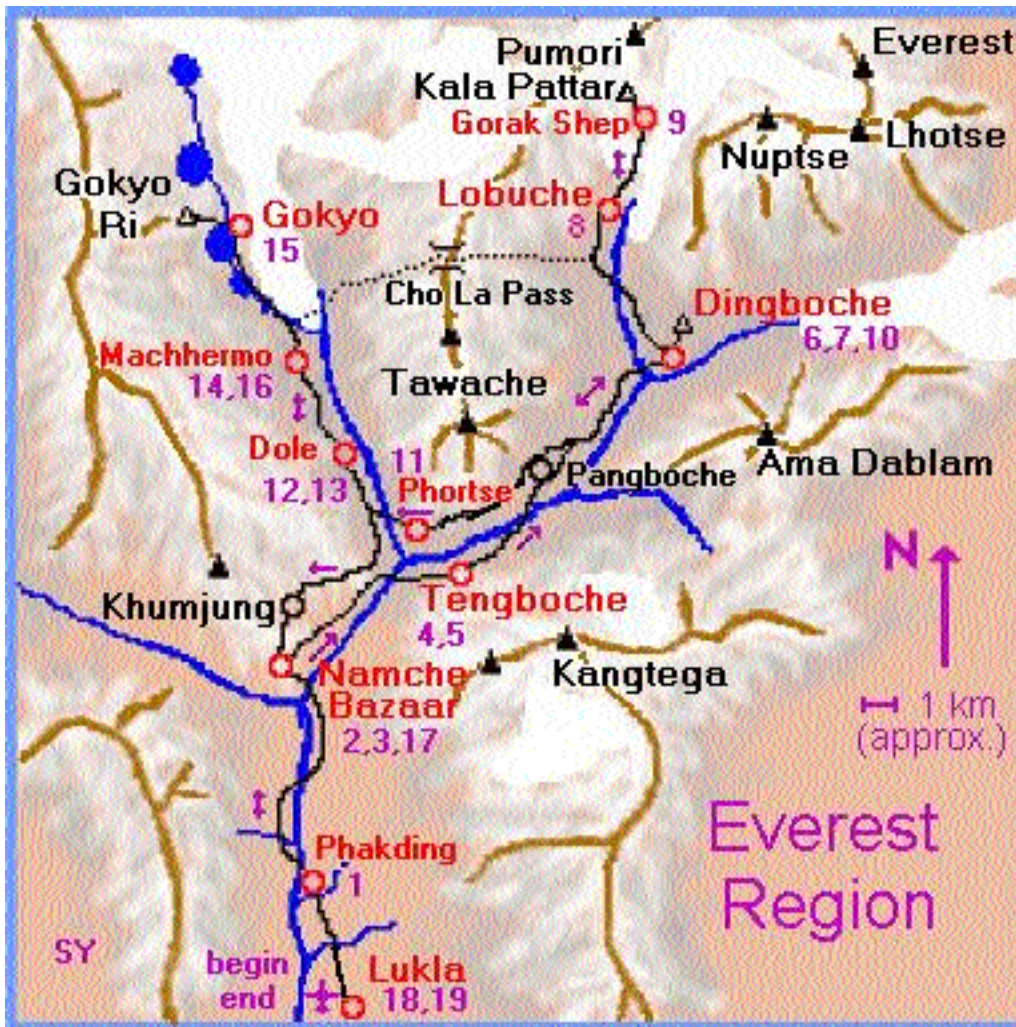


Figure 4: Map of Namche Chatauri Region found at <http://www.vic.com/nepal/map1.html>. Created by Scott Yost to describe 1994 trek. The only villages covered by Tsering's phones not shown above are Thame, Periche and Chukung. Used with permission.

Tsering: It would not be a good idea because if NTC ever did decide to re-establish their business I would be in trouble. In Namche I have put in new lines at a cheaper cost than what they paid. People in Namche wanted to use the existing copper lines. I said that we better put in our own wire in order to be independent should NTC ever return. If someone wanted to take it out, it would not be a big problem because we still would have our own system. Now as far as cordless phones were concerned, the lodge owners whom I mentioned earlier had the cordless sets already. I told them to bring their sets to my office and let me plug them in to my set up where I would be able to switch calls between them. In the first week of September we brought up a phone system based on the EPABX and connecting the region's wireless phones to each other by means of the

EPABX.

COOK Report: How did you connect Thame? And how are you using the PBX ports?

Tsering: By radio phone. We use 4 of the 48 PBX ports for administrative purposes. 25 are used for lodges and the army barracks. Fifteen ports for the radio phones. One port for each radiophone in each village. We put new phones at the highest places (Gokyo, Cho La, and Gorak Shep) and in Thame. The other phones were already in place by their respective lodge owners to tie into the NTC infrastructure between late 1999 and May 2001 when the Maoists destroyed the tower below Lukla. I charge each radio phone lodge 500 rupees or less than seven dollars a month to connect to my PABX. This system gives al-

most complete coverage of all the trekking routes of the Solu Khumbu.

Now with the 48 ports on the EPABX we could support up to 24 simultaneous voice communications. Then you can go outside the PBX by means of a CO line. Therefore if you want to call outside the Solu Khumbu, you dial zero an operator will pick up. Then by means of the satellite phone the operator will dial the number you want in Kathmandu or elsewhere in the world. If you are in Namche and want to dial another village you just dial the three digit extension number for the phone in that village.

The PBX speaks to the radiotelephones by means of a distribution point which in this case is a radio base station for the telephones. This is DP 3 on the network map on the preceding page. From DP 2 there are a total of 8 CO lines to modems and to a Cisco 2509 router. The router is hooked to an Ethernet running to 3 cyber cafes - containing perhaps a total of 15 to 20



Figure 5: Tsering Gyaltzen Sherpa November 5, 2002 in Kathmandu

computers - and to a switch with IPStar internet telephony gateways. (This configuration became possible only when we save up on satellite phones and switched to a VSAT.) The switch also attaches to an authentication server. DP 1 attaches the 25 landline telephones. The three DPs are in turn attached to a main distribution frame that is attached to the PBX.

When someone wants to dial off the mountain he dials O. Someone in my office picks up the phone at the PBX and uses an administrative port of the PBX to dial the number of one of the three satellite phones. The dial tone changes from a pulse tone to a DTMF signal. With that tone the person coming into the PBX can dial an international number.

Unfortunately the first satellite phones we got didn't work well. The interface was poor. The phone would not tally the call and after about 3 calls, boom! You have smoke coming out of the phone. Seven satellite phones got blown up and I send them for repair to



Figure 6: Granfather and grandson - Pal Dorje Sherpa (also called Gaga Gyalzen) and Tsering in Namche Bazar on Dcemebr 20, 2002



Figure 7: Gaga Gyalzen and the VSAT of Namche. Gaga is the only surviving Sherpa from Hillary's 1953 climb

the Philippines. That was three months ago. None have been returned. All this happened in August and September of this year.

At this point we decided to look at a VSAT for communication with the outside world. I came back to Kathmandu in September and Pavan helped me research VSAT possibilities. Finally we found a second hand one that had been used and outgrown by a foreign NGO. We selected Squanet an ISP specializing in V-sat installations as our Internet service provider. We left Kathmandu with the VSAT for Namche only on the 25th of September. We got it up to Namche and found that it wouldn't work. The ODU, which is the device that generates the power for the data to be transmitted to the satellite, was broken. I had to go back to Kathmandu for two weeks to get it repaired.

We were able to fly back to Namche only on October 15th with a new ODU. Then the biggest problem was that we never had a spectrum to pin point the aim to the satellite and had to do it manually instead. It took us three days to do it. Finally we managed to bring up the connection and went online with Internet at 128 kbs for the first time on October 19, 2002.

COOK Report: Dileep Argawal of WorldLink told me by email in August and September that you had a PBX and were trying to put in a VSAT. According to him the Maoists came

to you and said you better not do it. True?

Tsering: Not quite accurate. Let me explain. The Maosits blew the repeater tower 18 months ago and people in Namche have been getting demands from the Maoists for ransom. Since I was building a communications business up there and obviously had some money I was very scared that I would be the first target. I was afraid that if they tried to force me to give them money I simple could not because I did not have it. If I didn't give them ransom, would they sneak into Namche to try to destroy what I am doing. Of course with the military presence there that would not be easy.

But I have to walk the trail between Namche and Lukla a lot and I fear that they may target me there demanding money. The army could not protect me on the trail. At the same time I have been borrowing a lot of money and must pay interest. If anything happened it

would take a lifetime for me to pay them back. I went from the idea of a big VSAT to a satellite phone a year ago because the satellite phones were so small. Finally when the satellite phones were not working I got the used VSAT for a considerable saving over the price that I would have had to pay last year. With the help of Square Network we overcame the fear of the Maoists and successfully brought the VSAT up the mountain.

We then distributed Internet connectivity by dial up to three other Cyber cafes in Namche. For voice our only option was Net2Phone which wasn't very compatible with our phone system and did not work well. We looked around and found something called IPStar. It bridges from the Internet to the PSTN and we found the voice quality to be far superior to the PSTN but there are delays in the transmittal of the voice. <http://www.ipstar-dsg.com/interstarpr.htm> It is an Ether-

phone. You plug an ordinary phone into it and it into an Ethernet that carries TCP/IP. It is made by DSG, Inc. of Taiwan. Since we are using the VSAT at a cost of about \$2500 a month the IPSTAR can be plugged in and replace the satellite phone. Each IPSTAR device costs about \$200 and the per minute charges are much less than the satellite phone. With this set up people can and are calling anywhere.

I Am a Sherpa

Affordable international phone rates have a lot of implications for Sherpas. Most of our people leave the Solu Khumbu and Nepal and go abroad to study. Of those who do only 10% ever return. I want them to come back where they belong. I mean a Sherpa does not belong to America. To be frank they belong here. I want them to bring what they learn back here and not practice it somewhere else. Money is not everything.

Figure 8: View through the cockpit window of a Buddha Airline mountain flight at about 8:30 am on November 5, 2002. The summit of Everest is the dark triangular area sticking out above the clouds at the very top of the picture on the opposite page just between the first and second column of text.

The summit of Lhotse is hidden in the flying saucer shaped cloud as is the summit of Nuptse and the Nuptse ridge extending into the picture on this page. Kalaphathar is the flying saucer shapped grey blue area at the foot of Pumori to the immediate right. Base camp is behind the summit of the mountain in the foreground.

The Khumbu Glacier flows past kalapathar toward the bottom right. The plane is flying at a height of about 22,000 feet and has just passed over Namche Bazar to the lower left. The icfall from the Western Cwm is hidden behind the Nuptse ridge.



With what we have done here I may be able to start getting people to come home. With this intention I started giving computer classes to people. I have about 17 students at the moment. I am starting all the way from basic course to hardware repair in Namche. They need to be in the 21st century. The thing is I am not changing them culturally. The culture is here in Namche. They are there – abroad - and I want them to come home.

COOK Report: You are like my friend Dave Hughes.

Tsering: The reason I am teaching computers is that we need to create a fundamental level of computer literacy over here. It exists in the states and if I want my people to come home it better exist over here. I don't want my people to feel that they have to go all the way to America to join the computer age. With good internet and a good web and af-

fordable phone Sherpas can see that life here is not that bad and that they don't have to sacrifice all links with the modern world if they return. Of every 100 who come back to see us 30 may stay. This is education and we can use it for development of the area. There are approximately 90,000 Sherpas in the world. Half of this number live outside of Nepal. I want to create a more attractive climate in which to live in the Solu Khumbu. With better telecommunications it will become easier and much more attractive for them to come home

I even talked to the school in Khumjung and I was thinking about writing to the Himalayan Trust about this project. They have seven computers up there but they don't have a computer teacher. Also the seven they have are all outdated. They won't even run windows 95.

COOK Report: But the Sherpa community sees you succeeding so they will loan you money?

Tsering: Yes. A lot of people are willing to trust me and I am even thinking about applying to a bank for a loan. We are thinking about a lot of projects including a web site. For if you browse the web regarding a place that you are thinking about visiting, you must be able to find precise and up-to-date news.

COOK Report: There is a lot of misinformation. When Dileep Argawal told me about your efforts with the VSAT, he said: "Namche is under the control of the Maoists." I spent from October 19 to November 2, 2002 on the trails between Lukla and Dingboche. I spent two nights in Namche. While the Maoists are in the Solu Khumbu, they certainly do not control Namche. Still when you have rumors like this, pretty soon trekkers will be afraid to come.

Tsering: True. The Sherpa community thrives on tourism. Tourism goes down and we are hurt. Not only us. The



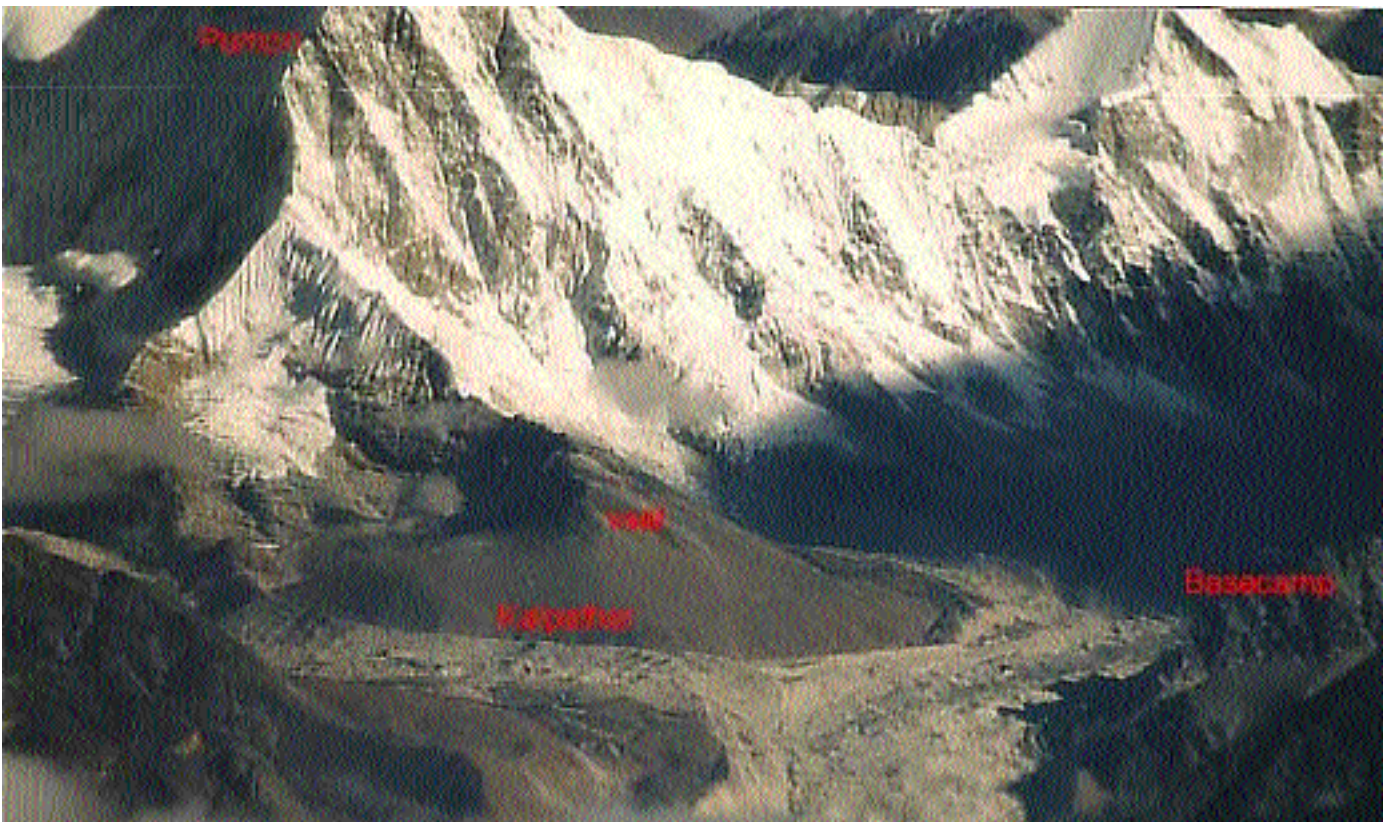


Figure 9: Top View shows the icefall, base camp, Khumbu Glacier and very edge of Kalapathar. Bottom view shows most of Pumori, all of Kalapathar, location of planned VSAT at top of Kalapathar and basecamp

whole kingdom is harmed. I am a Sherpa. I am also a Nepali. I think it is my duty to try to do something positive in the face of these difficulties. One small but important thing will be a web site giving full and accurate information about the Solu Khumbu. The rules. The trails. Porter availability. Weather.

COOK Report: And you'd give information about the lodges and those who run them? Families of Namche. History and culture.

Tsering: Oh yes. You bet. I am thinking of giving free online listings of all the hotels and lodges from Gorak Shep to Lukla and doing online booking for them. Also there is a lot of misinformation out there about Sherpa culture. I believe that I can supply both much information and accurate information. Certainly 50% of what I have seen on the web - and I have looked very carefully - is baloney. I will do something about this. I will start by telling the story of my granddaddy who at age 83 is, I believe, the oldest climbing Sherpa still alive. He climbed first on Mount Everest in the 1950s and has been to the south col (7960 meters) 37 times.

But we must also look at trekking and climbing expeditions. If my friends and relatives were going on an expedition then I'd be worried. I am thinking that it ought to be possible to give up-dated information on the web site about the progress of all treks and expeditions on a daily basis. The towns connected to my system simply have to phone in at the end of the day.

We do a seasonal business. In season everyone's lodge will be packed. During the off season, no matter what you do, no one will come. We have gotten by with no online booking but still I think you would feel much more secure if you knew in advance that a place was available.

No one comes in the Monsoon. But I would like to change that. We have a marvelous festival at the end of June and beginning of July when for 8 days eight families are chosen and these families must prepare a feast for the entire vil-

The Living Legend

Gyalzen Sherpa (Pal Dorje Sherpa) known as Gyalzen Mahajen in the Khumbu region was born in 1920 A.D. in Namche Bazaar. Uneducated due to lack of schools in the Khumbu during that time, he spent his childhood herding yaks and collecting firewood. At the age of 22 he got married to a sherpa girl from Namche Bazaar named Pemba Lhaki Sherpa and were blessed with 9 children but unfortunately only 2 out of nine survived.

Sherpas have been recruited as high altitude porters by expeditions as early as the 1920s. Because Nepal was closed to westerners, Darjeeling, near Kachenjunga in India was the base of all major climbing expeditions. Lots of people during his time migrated from the Khumbu to Darjeeling in search of mountaineering jobs. The fancy clothing and wrist watches of those sherpas who had returned from such expedition attracted him very much to climbing. But, being the youngest he was compelled to remain back in the Khumbu and take over his family business of yak herding and salt trading. Nevertheless, his passion for joining a climbing expedition from Darjeeling stayed in his dreams.

However, where there is will there is a way. When Nepal opened its borders to westerners in the early 1950s, expeditions began recruiting climbing Sherpas from Nepal instead of Darjeeling. As a result he got his first break in the year 1952 when the Swiss Expedition to Mount Everest guided by Tenzing Norgay Sherpa hired him as a high altitude porter. On his very first expedition he hauled oxygen and other necessary climbing supplies three times to south col at the height of 26000 feet.

After 1952 was no looking back for him. He accompanied numerous expeditions including the historic successful British expedition led by Lord John Hunt which placed Tenzing Norgay Sherpa and Sir. Edmund Hillary on the summit on May 29th 1953. Being a part of the successful expedition he was honored by Her Majesty Queen Elizabeth II's Coronation Medal. He was also honored by the 1965 Indian Everest expedition which placed the first Indian on the top of the world.

He continued his remarkable journey till the early 1970s. He began climbing as a high altitude porter and retired as a Sirdar (Head guide). After his retirement he devoted all his time for the development of the Sherpa community. He was chosen as the Chorinba (community leader of the monastery) and served the people of Khumbu for 35 years from 1965 till 2000. He lives now at the age of 83 live with his family in Namche Bazar. He is one of the oldest surviving climbers in the world. A living legend for the Sherpa community. -- List of his major expeditions 1952: Swiss Expedition 1953: British Expedition 1955: Indian Expedition 1956: Yeti Expedition 1959: First Cho-oyu Woman's Expedition 1960: Indian Expedition 1962: Indian Expedition 1965: Indian Expedition



Figure 10: Tsering's Grandfather in the headquarters of Namche Chatauri which houses the central switching equipment for his small telecom company.

lage. Why shouldn't someone come then, for that feast and live with a Sherpa family and perhaps study Buddhism?

COOK Report: If you do this successfully and do it well and with the detail of which you speak after a full year you will have enough presence so that people who are ready to visit Nepal would feel confident in dealing directly with you and with your financial representative in North America or Europe or Japan or Australia. Not just for lodge reservations but also for guides and porters. If you do this, then much more of the money that people like myself pay to visit Nepal and go trekking will actually get there. I came with a large international adventure travel company in 1999. I have heard estimates that perhaps as much of 80% of what I paid never even reached Nepal. You could be

doing some powerful things.

Tsering: I hope so.

COOK Report: Where are you going over the next six months?

Tsering: I am still working on the computer classes. I have students ranging in age from 15 to 60. I am also looking to find a Tibetan font that I could load into my computer. Sherpas are actually Tibetan to be frank. Our script is Tibetan. However, ninety percent of Sherpas who are younger than I (say 35) can neither read nor write Tibetan.

If we are to preserve our culture, we must change this. We do read and write Nepali but our script our language is Tibetan. A lot of the kids in Namche avoid their own language and speak Nepalese

instead. I don't like this. If you are a Sherpa, be proud of it. Speak Tibetan. I want my sons to be proud of being a Sherpa. I want them to understand that they belong in the Solu Khumbu and not in some other part of the country or the world. I intend to slowly expand the system I have built. I am not into making money. It is enough for me to be able to pay my bills. When you die you don't take your money with you.

COOK Report: Do you consider yourself to be a Buddhist?

Tsering: Yes I am a Buddhist. I'd like to create things that my sons would understand and want to build on. I'd like to be remembered in Namche for doing something that really made a difference to my people.

Launching Joint Projects for Telecommunications in the Khumbu

SquareNet and WorldLink Enter Separate Projects for VSAT from Basecamp and Wireless Internet in the Rest of the Khumbu with Namche Chatauri (Meeting Place) aka NTS

Part Two

Not Just an Interview Anymore

On November 4th, at a follow up meeting in Kathmandu I introduced Tsering (again with Dileep's help) to Gaurab Upadhaya who is an IT consultant and well known member of the Kathmandu geek community. Tsering told me that he had just had a meeting on a new possible project. Extending his radio telephone systems to the area's base camps. I returned to the United States on November 9th and, on December 1, Tsering arrived back in Kathmandu from a two-week visit to India. By then the project had considerably evolved and during the next week Tsering and SquareNet set about completing all the paperwork necessary for a project to put a VSAT and radios at Everest base camp in time for

the start of the climbing season that marks the 50th anniversary of Hillary's first ascent on May 29, 1953.

Estimates are that 25 expeditions and as many as 1000 people will converge on base camp between mid March and the start of the monsoon in early June. On December 8 Tsering told me in email that he had nearly completed a "joint venture with a Kathmandu based company [Square Networks] has been proposed by SPCC (Sagarmatha Pollution Control Committee) and Ministry of Tourism to establish internet/email access from Everest base camp" for the spring climbing season.

He wrote; "Since base camp is on a glacier, it is impossible for us to install VSAT at base camp. After a thorough survey, we decided to put the v-sat on the nearest line of sight solid ground which is Kalapathar. We will get to Kalapathar

from base camp via radios. At base camp we shall be having 5 laptops and each expedition team will be assigned to a particular laptop at particular time. Well the only problem which we believe would face is the power. However, we have sort of figured out a system but we are not 100% sure weather it would work 100%. We would highly appreciate your ideas on this issue." I and a small team of people are giving Tsering the help he asked for.

On December 11 Square Network Pvt. Ltd. and the Sagarmatha Pollution Control Committee (SPCC) signed a contract with the Ministry of Tourism obligating Square Network and the SPCC to provide connectivity at base camp for the spring and fall climbing seasons for a total of six months a year for the next five years. Formed in 1994, with support from the World Wildlife Fund, the SPCC is officially recognized by the au-

thorities in Kathmandu as an NGO. It is staffed by Sherpas and has for quite a few years been responsible for working on environmental issues in the Khumbu and especially the issue of pollution at Everest and the South Col which by 1989 had come to look like a garbage dump.

When an expedition goes through Namche, it pays a several thousand dollar "trash fee" to the SPCC. At base camp the expedition's gear is tabulated and when the expedition brings out what it brought in (especially oxygen bottles) it receives most of the deposit back. The SPCC is responsible as well for keeping the ice fall open and expedition pay it a toll for use of its ropes and ladders on the ice fall in return. Using public funds, the government in Kathmandu has been supporting the cost of the SPCC. Given the downturn in the economy and the general political situation, the central government's ability to continue to do so is limited. Income from the base camp Internet project will supplement the SPCC's funding shortfall.

Tsering says that he and Square Network (SNet) are each investing 15,000 dollars in the project. The idea being that they will have the VSAT and radios set up at Kalapathar and base camp by late February. They will then approach expeditions to sell the access for the season at a rate to be determined to recover costs. Likely to be several thousand dollars per expedition per season. The idea is to have each expedition pay as it comes through Namche. Access likely will also be sold on a per use basis. Another place to generate income will be at the shelter that at the top of Kalapathar will contain the VSAT since this is the destination for almost all trekkers, who climb it for the views of Everest, Nupste Lohtse and Pumori that are far better there than what be seen from base camp.

Using the Meta Network to Plan the Implementation of the Basecamp Project

By December 8 I had already gotten a lively discussion going with Pavan Shakya and Tsering on a web-based con-

ferencing system known as The Meta Network. On the preceding day I had gathered a few folk together in a private conference as well. These included my long time friend and wireless guru Dave Hughes and Mike Trest a San Diego VoIP and satellite expert and two others on the American side. In Nepal, Subodh Manandhar, Director, Business Development of Square Network. Gaurab Raj Upadhaya President of Lahai Consulting and Organizer of SANOG meeting that will take place between January 23 and 28th in Kathmandu. Tsering Sherpa, Director of Namche Chatauri, Pavan Shakya Technical Consultant WorldLink and Dileep Argawal, President and CEO of WorldLink.

Since then many extraordinary things have happened. Dave Hughes (finished with his current NSF wireless project and waiting to hear about the outcome of his application of the next project) has spent most of the past two weeks trying to make sure the links succeed. Dave and I have helped Tsering envision where he may want to take the project next.

It has become very clear that what is needed in addition to the web site described by Tsering to facilitate security and trekking in the area in the first part of this report is a true community network with a radio link to the school founded by Hillary at Khumjung above Namche. A second radio linked to the school and positioned still higher could have a line of sight shot to most of the schools in the Khumbu.

Schools in the Khumbu do not do a good job of instruction in English and Sherpa children tend to drop out in their early teens. If they drop out without a decent knowledge of English they are very likely condemned to working as porters on the trails. If they learn English they may hope to become a guide. Dave Hughes has articulated a plan whereby using Tsering's VSAT link the kids could be taught by an outside teacher a course in understanding the Internet and the technology behind it as a result of which they would have to learn English.

World's Highest Internet Access Point

This however is for the post climbing season. The next 60 days will see the creation of the world's highest internet link at basecamp (17,000 feet) and Kalapathar (18,500 feet).

On December 16 Hughes requested of Cisco through Jim Forster Distinguished Engineer a pair of 350 Radios.

This is a request for a pair of radios to support ... a project which will give Internet access, wirelessly, to the scores of Mount Everest bound climbers and trekkers in the season of the 50th Anniversary of the first climb by Sir Edmund Hillary and Tensing Norgay, of the highest mountain in the world, May, 1953

The high altitude (18,000 feet) 'connection' will be from the last base camp on the Khumba glacier at the base of 29,000 foot Everest, from which all hardy climbers make their attempts to gain the summit. Its already reported that over 25 climbing parties will be converging on that base camp between March and June – the three month climbing season. As many as 1,000 climbers, support personnel, and trekkers are expected to stop there, in the open, in their tents. As well as hardy reporters who have/will ALSO attend the public ceremonies in Kathmandu, and perhaps Namche (center of the Sherpa country through which climbing parties pass).

The plan, is to install an Internet VSAT base unit on Kalapathar step of 23,000 foot Pumori Mountain, together with an 802.11b Access Point that is 1,500 feet higher than the Base Camp on the glacier (which is why they won't put the VSAT there – possible movement of the ground) and link it Line of Sight, 1,500 feet down to either a directional or omni antenna and Client radio at the Base Camp where a 5 computer 'Cyber Tent' will be in place, so that, all three months of the celebrity season, climbers and trekkers can reach the rest of the world by email, browser and limited (by bandwidth – which may be 16-32kbs up, 64

down) file transfer.

All climbing in Sagarmatha National Park, is controlled by the NGO SPCC (Sagarmatha Pollution Control Committee) of Nepal (based in Namche) which issues licenses and permits, promotes tourism, and which is the 'umbrella' organization over the Base Camp operations. The team is undertaking this bold 'cyber mountain' operation, as a 'benefit' to the SPCC. Any income over costs paid by the climbing parties for the use of the link will go to the SPCC. Which undertaking may be repeated every year for 5 years during climbing seasons, is led by visionary Sherpa Tsering Gyaltzen of Namche, in partnership with Square Networks (SNet) an experienced ISP operation from Kathmandu. Tsering and SNet are putting up \$30,000 themselves to do this.

They have not settled on an imaginative name for the 'project' itself, though several are being considered – 'The Virtual Yeti,' 'The Virtual Snow Lions' (they are afraid the Chinese government, occupying Tibet, will complain, since the Snow Lion is on the Tibetan flag).

They have done their homework regarding the VSAT, which is lined up. A similar VSAT has been set up and is operating in Namche. I have enclosed a jpeg of it, (with the last surviving Sherpa who was on the 1952-53 expedition. He, himself has been to 26,000 feet on the South Col. He is 83.)

The dish for this expedition will be smaller than the Namche one, pictured. [Editor as Figure 5 in this article.]

The satellite setup will be a SHIRON INTERSKY REMOTE GATEWAY RG384A

A technical description of it was posted in our web discussions.

"The InterSKY^a Remote Gateway integrates a L-Band VSAT modulator and DVB-S receiver into a low-cost, efficient ground terminal. The Gateway supplies a complete solution for providing two-way Internet, Intranet, and private WAN satellite connectivity based on standard

DVB/MPEG-2 protocols. The remote gateway also has router functionality."

"Upon receiving a transmission, the user terminal performs DVB-S demodulation, FEC decoding, PID demultiplexing, and filtering. The Gateway reconstructs IP datagrams from DVB/TS cells and routes them to the appropriate PCs through the shared LAN. Upon transmission, the Gateway collects IP datagrams from all PCs, then processes and transmits them to the Hub through the outdoor unit. Therefore, the Remote Gateway operates as a router."

They originally wanted to buy, and use, a pair of WaveWireless Speednet 8200's 2.4ghz to make the link between the base of the VSAT on Kalapathar, and the Base Camp encampment. Only because they had some 'experience' with it. Its costly, not 802.11b, 32db radio, WaveWireless is pretty shakey. So they asked my technical advice. I said that a 100mw Cisco 350 Bridge, configured as an Access Point talking to a 350 Workplace Bridge as a client radio, with 8 Mac address capability, (for 5 computers) with two good gain antennas, would be better.

We also have discussed power, and the harsh environment.

The Cisco 350 requires from 24 to 40 volts DC. (I wish I had a good handle on power consumption 'always on.')

So 25 or less feet of LMR400 type cable would work (rather than putting the radio outside in an enclosure and running the power over Ethernet to it)

The Workplace Bridge needs 110v, so I suggested a vehicle power inverter 12 volts in, 110 and proper connector out. And another 20 -25 feet of RF cable, while the radio is inside the Cyber Tent, in a closed box, perhaps with batteries, for trickle heat.

Temperature can get down to -25 Celsius, some snow days, no rain, just altitude. And clean (absolutely no vegetation there!) line of sight between the two points. And no known interference from ANYTHING. Power at the VSAT site to

be solar panels and gel cell batteries. Power at the Base Camp from recharging batteries and generator.

So what is requested is at least:

- a. 1 350 Cisco Bridge, 24-40 Volts DC
- b. 1 350 Cisco Workplace Bridge (8 Mac addresses able), 110 volts.
- c. 2 Cisco Directional Antennas AIR-ANT 1949 (13.5 dBi)
- d. 1 Cisco Omni Antenna AIR-ANT 1728 (5.2dBi) (this one because they are not entirely sure that the glacier movement at the base camp will throw the 2d directional antenna off too often. But the gain is less, and infrequent snow storms may attenuate the signal too much to stay connected)
- e. 2 20 foot cables with correct connectors for the radios and antennas. AIR-CAB020LL-R (1.3 dBi line loss)

They would have to supply a small Hub with at least 8 ports, I think.

Now one of your Cisco representatives in Brisbane, Australia, Phillip Smith, is supposed to be coming to the first meeting of the South Asia Network Operations Group (SANOG) in Kathmandu, the end of January. Kathmandu is where SNet's offices and ISP is, and where one of SNet's 'engineers' will go up the mountain (about 100 miles) to install the VSAT and radios and stay, along with Tsering's Sherpa 'engineer' (using the term lightly) through the project.

It occurs to me that Smith might be able to carry the radios (not a lot of weight/bulk – they and the 18 inch antennas and the 40 feet of cable can fit in one suitcase – I've sure traveled like THAT many times) into Kathmandu. [Editor's note: they will come from Cisco's main office in India.]

Then, during the days he is there at the conference, Smith could both turn over the radios AND help SNet configure them the first time, the SNet engineer being present. . . . The set up of the radios, with only a point to point link could be set up in advance. Only tricky part is to insure the Bridge as Access Point is

configured for more than 1 mile range (which is why I would NOTask for a 350 AP radio, which is hardcoded for 1 mile or less), and with the IP addresses which come from SNet from the VSAT operation. In such a simple network, but where reliability will be an issue, if I were setting it all up, I would prefer a set of 7-10 static IP addresses (5 for 5 computers, one for Workplace radio, one for Access Point radio, one for laptop used for trouble shooting and setup on Kalapathar VSAT/Radio site) rather than further complicate things with DHCP and or NAT. The IP set would have to come from the VSAT IP source.

They do intend to install and test the VSAT a month before its needed – in February. So this might be tested then too.

So this is the first letter, Jim, to request a Cisco, in-kind, grant to the Virtual Yeti project on Mount Everest.

[**Editor:** SNet and Tsering have named the project Everest Surfer. The five person technical staff in base camp will consist of two SNet engineers and two engineers for the SPCC. Tsering will be in over all charge.]

I am sure there will be other questions. And I *really* would like a Cisco RF engineer's judgment about how the radios can be expected to operate, if inside tents and insulated boxes, in that environment down to -20 Celsius.

If I weren't 74 I would go up there and install the radios myself at 18,000 feet. But I am awaiting another grant from the NSF which will take me into Alaska and other exotic places for 4 more years, until I am 78. Gotta conserve my energy, which those Sherpa's don't seem to need to! <grin>.

But this is a great initiative, and I hope Cisco can help out. Cause if they use Cisco stuff, I am sure Tsering, in Namche, will set about building a wireless network for general community use, and to give links to all the lodges where trekkers and climbers stay before plunging into the high high world of icefalls and mythical snowmen. I leave the pub-

licity in Cisco's behalf, to you. It could start when Smith is there, taking a picture or two. (and if you watch TV you will notice Edmund Hillary, with a wooden ice axe, in a car commercial – implying the car can 'do' Everest! Nuts, this is real. You MIGHTget Hillary into a Cisco commercial, saying "I sure wish I had had a Cisco on top of Everest! I could have sent the world photos from the top!") Oh well. Lots of potential in this story.

Dave Hughes
Old Colorado City Communications

Cisco Comes Through and Nepali Competitors Cooperate

On December 20 Jim Forster informed Dave Hughes that Cisco would grant the radios which will be delivered in Kathmandu on January 23 at the beginning of the SANOG conference. They will be presented to the SPCC which will become their legal owner. The VSAT and radio configuration will be tested in Kathmandu and in February the radios, VSAT and assorted equipment weighing about 1200 pounds will be taken to Namche and as soon as Yak trains can wade through the winter snow to base camp. Cisco to its great credit is supplying a third radio so that the project will have a spare.

Meanwhile Hughes has taken a pair of the Cisco 350 radios, configured them in his own office linked them to the Internet with static IP numbers has given those the Virtual Yetis in Nepal (Subodh, Tsering and Pavan) logins and passwords so that they can come in over the Internet and be taught remotely using the Meta Network how to use them. Dave notes that there are always operational foibles that are not well covered by the manuals and is giving the "yetis" in Nepal the benefit of his eight years of field experience in the installation and operation of no license radios and IP networks.

Mike Trest, who was involved with the development of the protocol used by the Israeli VSAT, [the SHIRON INTERSKY REMOTE GATEWAY] knows VSATs

like Dave knows radios. He has generously begun to work with VSAT contacts in Israel. He has suggested requesting that they allocate the satellite IP address block now. He will then provide network address plan and a POWER POINT graphic for the project that shows the allocation of public IP addresses and for private NAT addresses.

Dileep Agrawal realizing the potential for increasing the performance of information technology in Nepal, has agreed to loan Pavan to keep Tsering's Namche Chatauri operating while Tsering is at base camp with a full time SquareNet engineer over seeing the operation there. SquareNet will have complete responsibility for the base camp operation. In return Dave Hughes will explore with Dileep the goal of a 2 megabit link wireless link from Namche to Kathmandu (using Redline 5.2 Ghz unlicensed radios). They are exploring the feasibility of the link knowing that it will be a real technical and economic challenge given the altitude and inaccessibility of the locations, reliability of power and presence of Maoist insurgents who destroyed the NTC tower 18 months ago. If this can be done, it can provide a transformative broadband highway to the Khumbu.

Subodh Manandhar, understanding that successful operation of an Everest VSAT will make SquareNet a world leader in high altitude installation and operation at base camps, has agreed to undertake cooperation with Hughes and Trest and Tsering in setting up a rigorous testing and installation plan online, in Kathmandu and on the mountain to ensure that nothing falls through a crevasse and that this unprecedented high profile high altitude installation is successful.

Going forward the intent is that Square Network's authority will be in base camp(s) and WorldLink's in wireless communication on the mountain. The projects in the Khumbu will be run on a non-profit basis. In order to do this careful planning will have to be done on both business models and accounting for income and use of cash flows to fund future development.

So far I have organized and coordinated

the development of the project using the Virginia based Meta Network from my home in New Jersey. It has been an interesting experience in pushing the art of the possible. On the American side Dave is in Colorado and Mike is in California. Individuals in Massachusetts and Virginia are observing and may become active in the future. At noon in New Jersey it is 11pm in Kathmandu. The VSAT involves coordination between Kathmandu and Namche Bazar which is a 35 minute plane ride and two day walk from Kath-

mandu. Communication across different cultures and management styles and an average of 12 time zones in the face of a complex task and frigid schedules has been an interesting experience. My hope is that it will make a difference and will as a result be worth the effort.

In the meantime, Dave Hughes is awaiting news of another NSF grant for development and testing of advanced radios. It is too early to predict what will happen but when the project passes

through the critical period of the next 60 days, it is possible that the Khumbu which contains four of the six highest mountains in the world, may become a testing place for the development of some of the world's most advanced radios. The goal is also the preservation of the economic stability of the area, the preservation of sherpa culture, and an opportunity to try to establish a sane and sustainable development policy for the most sacred and beautiful region on earth. It will take time and lots of effort.

Some Background on Telecom and Policy in Nepal

On December 22 we asked on our VoIP list: What would it take to convince the Nepal Telecommunications Company and government to allow Tsering to do VoIP since they are unable to provide any service there? If it benefits the people, costs less and is more secure and maintainable especially in the rural areas why not support it rather continue to forbid it where he operates.

This is an area of the country where neither the government nor the phone company can bring communications. Especially in view of the importance of this area to the economy of Nepal why not cheer these guys on? Supposing they offered to pay the phone company a portion of the revenues in return for permission?.

They will never bring telecom to rural areas unless they get behind Tsering's efforts.

Brough Turner replied: Off hand, I don't know how you could convince anyone at Nepal Telecom -- However, if there were a way to reach someone higher up in the government -- specifically someone involved in, and favorable to, the decision to allow competition beginning in 2004 -- then you might have a chance. There are, after all, many studies that show that improved tele-density drives economic growth, for example:

J. Alleman & Y. Park, 1995, Telecommunications & Economic Growth: Econometric Evidence, Telecommunications Infrastructure Conference, U. of Michigan, March 1995.

http://www.colorado.edu/engineering/alleman/print_files/parkky.pdf

G. Madden & S. Savage, 1998, CEE Telecommunications Investment and Economic Growth, Information, Economics and Policy 10, 173-195.

(Sorry, can't find a URL)

A. Cieslik & M. Kaniewska, 2002, Telecommunications Infrastructure and Regional Economic Development: The Case of Poland, ITS 13th Regional European Conference, Madrid, September 2002.

<http://userpage.fu-berlin.de/~jmueller/its/madrid/program/papers/Cieslik.pdf>

Many other studies -- see slide 4 here:

<http://www.citi.columbia.edu/divide/kenny.pdf>

If you seriously want to get involved in Nepalese politics, then the first step is to find out who in the government already is on your side. Then talk to them about what additional ammunition they need.

On December 25th **Gaurab Upadhaya**: speaking from Kathmandu, I would suggest that instead of lobbying at the national level, get local permission. Chief District Officer is as good as Prime Minister at district level. And specially if it is meant for the period of jubilee celebration only - get some of the mounteering groups to lobby - and it could be done.

I can pitch in with the Nepal Telecommunications Authority and the Ministry of S&T if required. If required a letter from the S&T Ministry can be requested. This would make working at local level easier. If Tsering is looking to use it as a long term usage, it will definitely require permissions and it would be a tricky issue. And a thorny one as well

Getting Ready for Telecom at Base Camp

Having Done His Research, Dave Hughes Writes a Problem Solving Essay

Marlon Shafer is a neat Wireless ISP in Grant County Washington. Yesterday he wrote of his trials and tribulations trying to get, by car/truck into the Washington State back country to install there a radio serving rural folks.

I thought I would REALLY show him installation hardship. From the research I have done, and Gordon's reports from his trip, and the gasped-out experiences by others who attempt to get the 'Everest Base Camp' area of Nepal, from Kathmandu and 'civilization.'

04-JAN-2003 09:59
Dave Hughes (dafydd)

Ok Marlon. What you described is merely good training for a project in Nepal I have in mind for you...

Fly into Lukla where un-maintained Russian helicopters have problems, or overloaded small airplanes try not to run off the end of the short landing strip. Struggle up for 2 days to 11,000 feet to Namche by foot - and if you are lucky, you have a Yak carry your stuff. Try to rest and get acclimated to the altitude in a \$5 a night all food included dorm room, where everybody snores. Get out of the way of 2 drunken Brits who pull the wires out of the satellite ODU in the middle of the night, which was your last email link back home from the Sherpa 'cyber cafe' where you have to keep your overcoat and gloves on lest your fingers get too numb to type.

Have trouble with the Sagarmatha Pollution Control Committee's permit for you to enter the 'park.' Start out at 6AM again for a 35 or so kilometer trek, with Sherpas and Yaks carrying your radio and tools. Lose a Sherpa over the side who was carrying your pack and sleeping bag. And you think: your only RPC-TNC adapters went with him. And wonder what you will do if the Maoist's step out on the trail and demand your money....

Start feeling the effects of foolishly eating a heaping plate of 'dahlbat' - lentils and rice that Sherpas eat as a staple (and are more immune to the little bugs that get in it) and sharing a bite of weird looking Yak steak with that enthusiastic Brit who wants to 'eat native.' Not knowing that hunk of Yak might have been out in the open for days...

Start really struggling when you pass 15,000 feet, find you can't breathe, your legs are like lead, and you have diarrhea. Stop, exhausted, in Periche for two days trying to get acclimated more, while your throat gets so sore you can't talk. Drink so much you gotta pee all the time.

Struggle up 2 more days through a hard snow to Lobouche, where you can't find a lodge. Sleep in a tent. Get out of your sleeping bag 6 times in the night to go to the bathroom. No, no stools, just outhouses where you have to bend over. Toilet paper? Don't make me laugh. Temperature maybe 10 below. Can't sleep anyway - severe headaches, and you wonder if you are getting altitude sickness. A Dane says you have it, a German says you don't. Stumble into tiny Gorak Shep after another hard day's climb, between giant avalanches roaring down across the trail. Find only two tiny buildings called 'lodges.' REALLY primitive.

And have someone point out the way to the top of Kala Pathar, where you must install the radio at the base of a VSAT. You are already at 17,500 feet. Kala Pathar looked like a nice simple climb on the map and photograph. 'Only' another 1,000 feet up over about 2,000 feet horizontal. You are so tired it looks impossible. Take three steps, and rest. Two steps, and rest. Struggling to get air. Get up there just as the sun is going down. Time for one great look at Mount Everest - another 11,000 feet HIGHER than you are. Just before the weather closes in

over it again, and you won't see it for 2 more days.

Look down 2km away on the Khumbu glacier at 18,000 feet where the base camp - and proposed 'cyber cafe' are - to serve the well equipped climbing parties to communicate to the outside world. Where you will have to put your SECOND radio. Except it starts snowing again and you lose sight of it. Try to calculate in your muddled mind, where you have to aim your directional antenna, so that over 90 days with the glacier moving three feet a day, that its antenna down there won't move out of the antenna zone you are aiming up here. Try not to pull out your laptop and use it, because you are not sure when it can be recharged. And you you know that you HAVE to use it to configure the radios.

Remember you haven't been near a shower for over 10 days now. Crawl into the shelter or tent and try to get some sleep, while your head aches...and the Sherpa guide - the only one who can speak English and porters talk all night. Fall asleep wondering who has the static IP addresses and what the sub net mask is coming out of the VSAT router...And wondering whether the batteries and solar panels will keep things up. No way to 'call home' voice. Until and unless you get all the radios working, you can't communicate anywhere.

Tall slender Pumori Mountain gleaming white to its 23,000 foot summit, towers over you. And you nervously look past it - to Chinese Tibet.

I'll spare you the rest...like the Japanese television team that got everything up there to the base camp, and set up to broadcast back to Japan from about 4 points, but somebody stole one of their units.

Then realize you have to trek down the same way you came up, under the same conditions of trail, weather, altitude,

dangers.

See? Good training Marlon.

COOK Report: I haven't laughed so hard in weeks..... It doesn't have to be that bad. But without real careful preparation it will be. Guaranteed.

Had a phone conversation with Don Mitchell now retired from NSF but while there overseer of Dave's wireless grants. Don said: Well...one thing about being the man's program manager. You will get calls from him at 10 and 11 at night lasting one or two hours. And he is cranky as hell...complaining a blue streak about all the difficulties and why it is impossible to do whatever.... and how could he ever have let you drag him into whatever mess he is staring at.

When I hear Dave all het up like this, I breathe easier and relax. It is HIS way of solving a problem. Whenever he vents in such a way it means he is defining the problem down to the last small degree. Chopped it into parts and that he won't rest until it is vanquished. Those virtual yetis at base camp better watch out. Dave will take the issues by storm.... the way he did the hill in Korea 51 years ago.

A Final Word

Editor: It has been a time consuming but rewarding experience to have put together the current planning team. Barring a global disaster I am convinced that this article is only chapter one in what should be an on-going investment in Nepal in general and the Sherpas of the Khumbu in particular. The planning on the Meta Network will continue and I intend to go back myself in late April and early May to reconnoiter the scene. On Christmas eve with Dave Farber's help I announced the project to the world.

To: "Dave Farber"
<farber@cis.upenn.edu>
From: Gordon Cook <cook@cookreport.com>
Subject: Merry Christmas from Mount Everest

Dave please share this with IP

I received this card received from Namche Bazar (20 kilometers as the crow flies from the summit of Everest) about 2 hours ago. Sent in the middle of the night Nepal time from the Sherpa capital (3440 meters elevation) by v-sat to Kathmandu and from there to the global Internet. Sent by Tsering Gyaltzen Sherpa, the grandson of the only surviving Sherpa who was on Hillary's 1953 first as-

cent. In June 2001 Maoist insurgents cut Namche's only telecom link to Kathmandu. Since then Tsering has put a small telecom company on the mountainside and via a v-sat rejoined the Solu Khumbu to the rest of the world in October 2002. Dave Hughes, I and 2 other Americans are rendering technical assistance to Tsering via the Internet. Tsering will have a 802.11b link from Everest base camp (approx 5600 meters) to a vsat on Kalapathar at the foot of Pumori and from there to the global Internet. It will be in place in time for the beginning of the climbing season in March. At the request of Dave Hughes Cisco has agreed to make a grant-in-kind of the radios necessary to link a small LAN at base camp to the V-sat at Kalapathar. Aside from grant of the radios, the base camp installation will be a jointly funded effort by a Kathmandu ISP, the Shepa community and the Sagarmatha PCC. Tsering is a real inspiration. With efforts like this, there is, I believe, hope for the future. Via a direct Internet link to a pair of radios identical to those that Cisco is providing, Dave Hughes began today to train Tsering and two assistants who will set them up on the Khumbu glacier at 17,500 feet in about 60 days.

<http://www.interesting-people.org/archives/interesting-people/200212/msg00106.html>

A

Note to our Subscribers.

While the "Everest" story certainly has elements related strongly to international VoIP issues, it falls a bit outside the normal scope of our coverage. While it is not likely immediately to affect anyone's bottom line, it may well be indicative of where telecom is going. From that point of view we believe it may be worth your attention.

A Shorter March Issue Coming

The March issue will be brief. It will feature an interview with Farooq Hussain explaining why IPv6 is unlikely to be massively deployed - ever. It may also contain an interview about broadband in Sweden and in India. The target length is about 20 pages.

