

# Ometepe Freenet Red Libre de Ometepe

## Project Plan

May 2004

## Summary

### Goal:

To provide sustainable Internet access to commercial users, and access without on-going costs to schools and government offices on Ometepe.

### Method:

A wide-area terrestrial network using Wireless Ethernet (802.11b, WiFi) will connect Ometepe users together. A VSAT terminal installed at Finca Magdalena will provide access to the Internet.

Through a partnership with the Ometepe Freenet project of the Bainbridge Ometepe Sister Islands Association (Islas Hermanas), which will provide repeaters to broaden the coverage of the terrestrial network and equipment for non-commercial users, Internet access will be made available to any school or government office within range of the network.

The initial consortium of commercial users will be Hotel Villa Paraiso, Hotel Istián and Finca Magdalena. As a demonstration, the consortium will provide Internet access to Instituto Nacional Jaime Martza in Balgüe. Additional commercial users, both resellers and private users will be added whenever possible. Schools and government offices will be encouraged to apply to various organizations, including Islas Hermanas, for funding to buy the equipment required to connect to the network.

The cost of the purchase [lease] and installation of the VSAT terminal, approximately US\$10,000, will be underwritten by Lisa Giles and David Mitchell. Commercial and private users will share the monthly cost (approximately US\$600 initially).

## Internet access on Ometepe in 2004

Nearly all Internet access on the island is via dial-up connections over microwave connections to the mainland. Dial-up data rates seldom exceed 24,000 bits per second (24 kbps.), and because of the analog nature of the connection real throughput is less than 2,400 Bytes per second (2.4 kBps.). Depending on the location of the modem on the mainland, the cost can be C\$0.75 or more per minute. Access by cellular phone is possible, especially using the newer PCS technology available through Enitel, but both speed and cost are similar to the older “land-line/microwave” technology.

## Satellite Internet access

High-speed, “always-up” access is available through the use of Very Small Aperture Terminal (VSAT) equipment. Using a parabolic dish antenna, VSAT equipment communicates with satellites in geo-synchronous orbit approximately 39,000 km above the Earth. At this distance the satellites orbit the Earth once per day, and are always above a fixed point on the ground.

VSAT access is available on two frequencies, Ku-band at 10-18 GHz. and C-band at 3.7-6.5 GHz. Ku-band equipment is more susceptible to interference from clouds and rain. Ku-band equipment is used by “consumer-grade” services like Starband and DirecWay. C-band connections are more reliable in all but the most severe weather conditions. Since C-band is used for commercial service, the equipment is more expensive and because of the lower frequencies the antennas are larger. C-band VSAT access offers data rates from 64 kbps. to 1.5 mbps. In addition to the higher speed than dial-up, the all-digital connection is more efficient than analog modem connections.

Because of the long distance the signals must travel to and from the satellite (78,000 km round trip) VSAT access introduces a factor called latency. Latency can interfere with some Internet services, although satellite access vendors have taken measures to reduce the problem.

## Terrestrial network

The project will use Wireless Ethernet, or WiFi technology to create a high-speed redundant network on Ometepe. WiFi was developed in the 1990s to offer an alternative to wired Ethernet networking in offices, but it was quickly extended to provide point-to-point connections at distances as large as 30 km. WiFi equipment is standardized, inexpensive and easily available.

WiFi signals are limited to line-of-sight, which means that two stations that wish to communicate with each other must be able to see each other. For example, a hill between two stations, or even a single tree, would prevent communication.

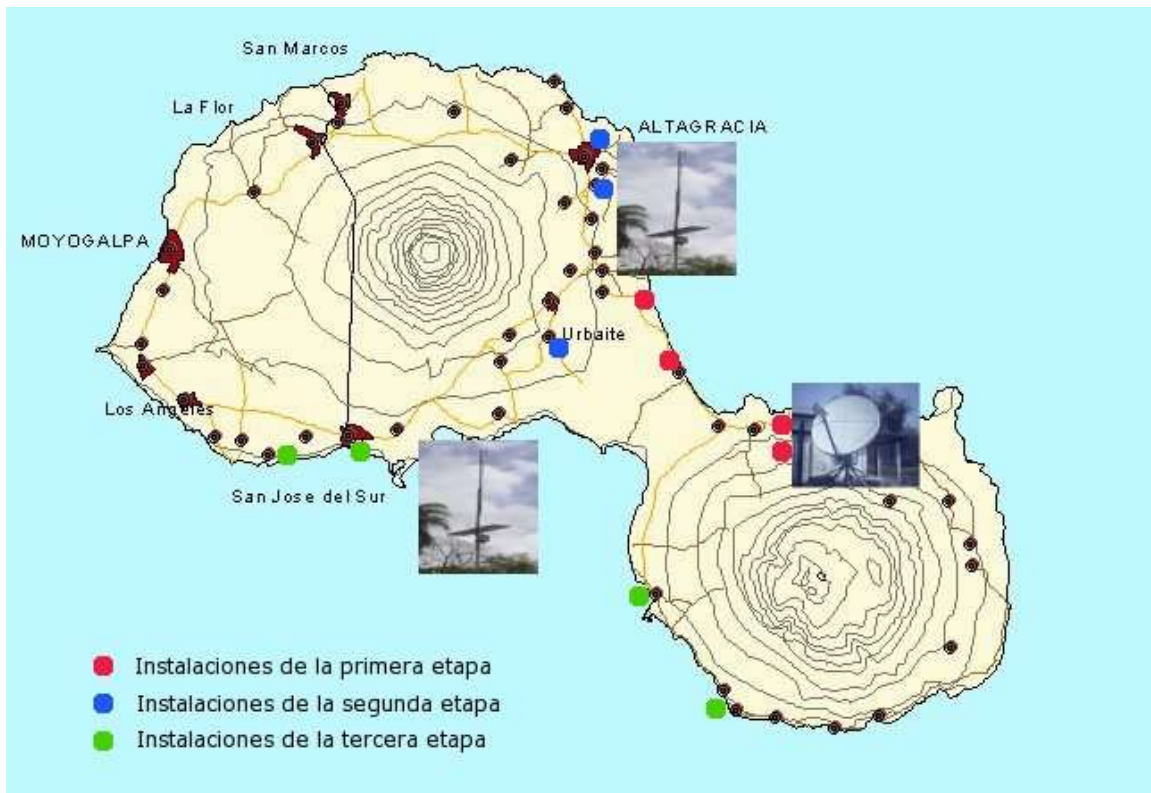


For that reason, the Ometepe terrestrial network will use repeaters to link locations that are not in line-of-site. Located where it can see two or more stations that cannot see each other, a repeater receives and re-transmits signals from each station.



In May of 2000 the Sister Islands Association installed a repeater on a hill above the Instituto Nacional Ladaslao Chwalbinski in Altagracia. Powered by two solar panels and a battery, the repeater will extend Internet access into the town of Altagracia.

A second repeater, tentatively located on Sinecapa, a hill to the East of San José del Sur, will provide access to San Ramón, Mérida, San José del Sur, San Lázaro and perhaps Los Angeles.



## Types of users

There will be three types of users; commercial, private and non-commercial. Commercial users will pay a monthly fee equal to a pro-rated share of the Provider Monthly Charge based on the number of rental workstations the user has, plus a maintenance fee of US\$20.00, a VSAT equipment fee of US\$20.00 and a Freenet contribution of US\$10.00.

For example:

The Provider Monthly Charge is US\$600.00. There are four commercial users. Commercial users one and two has two workstations that are for rent to clients. Commercial users three and four have one workstation each for rent to clients (six workstations total). Commercial users one and two would each pay 1/3 of the Provider Monthly Charge, or US\$200.00 plus US\$50.00 or US\$250.00. Commercial users three and four would each pay 1/6 of the Provider Monthly Charge or US\$100.00 plus US\$50.00 or US\$150.00.

Private users are households, businesses or NGOs that do not make workstations available for rent to clients. Each private user may have only one connected workstation. Private users will pay US\$25.00 per month allocated as follows:

- US\$10.00 per month applied against the Provider Monthly Charge (thereby reducing the total charge for commercial users)
- US\$5.00 per month maintenance fee
- US\$5.00 per month Freenet contribution
- US\$5.00 per month VSAT equipment fee

Non-commercial users are schools and Nicaraguan government offices. They will pay no monthly fee.

The VSAT equipment fee will be used to repay the cost of the purchase of the equipment. When the full purchase price of the equipment is repaid, the VSAT equipment fee will be split between the maintenance fund and the Freenet contribution.

The maintenance fund will be used to pay for maintenance of the VSAT equipment and the repeaters and will be administered by the consortium of commercial users. The Freenet fund will be administered by the Bainbridge Ometepe Sister Islands Association and will be used to construct additional repeaters as needed, and to provide grants to non-commercial users to buy workstations and access equipment. All users will be responsible for purchasing their own equipment to access the network.

## Patrons

Private individuals who facilitate access for non-commercial users to the Freenet, for example by hosting repeaters on their property, will be entitled to access to the Freenet at no monthly cost.

## Design Philosophy

The Ometepe Freenet is designed using Free Software [Software Libre] in order to reduce cost and to make the operation of the system as transparent as possible. When possible hardware is purchased ready to use (off-the-shelf) to keep maintenance and expansion as simple as possible.

## Community Benefits

Visitors to Ometepe are increasingly asking for access to the Internet while they are on the island. For hospitality businesses the ability to meet these needs means more revenue and more satisfied customers.

Access to the Internet by schools will add to the resources available to teachers and students alike, and will make possible closer cooperation between Ometepe schools and schools in other parts of the world, including on Bainbridge Island.

The Nicaraguan government spends nearly 70 per cent of the taxes it collects to service its foreign debt. This leaves little money available to provide services to its citizens. By offering free access to the Internet to government offices on Ometepe, the project will, in a modest way, help the government of Nicaragua to better serve its citizens.

The project itself will provide part-time employment for one person, who will do system maintenance and collection of fees. But more wide-spread access to the Internet could stimulate additional jobs, for example Web-site design and remote systems administration.

## Responsibilities

This project is in partnership between the Sister Islands Association (Islas Hermanas) and a voluntary group of Ometepe merchants. The merchant group will provide access to the Internet to non-commercial users of the Ometepe Freenet. In exchange, Islas Hermanas will permit commercial traffic on the Ometepe Freenet, pay for the cost of construction of repeaters to extend Freenet coverage, and offer assistance to non-commercial users in buying access equipment. Funds for this support will come from the Islas Hermanas Ometepe Freenet project fund, so long as that fund is available.