isif asia

fast facts
Project: Dili Village Telco
Lead Organization: Rowetel
Country: East Timor
Budget: 40,000 AUD

situation

Although GSM mobile telephone networks are widespread in East Timor, phone calls are too expensive for the average citizen. There are very few landlines, so even calls within the same city can be prohibitively expensive. The issue is further complicated by East Timor's lack of Internet infrastructure; it is impossible, for example, to send information directly from one side of Dili to another without first sending that information overseas. Given the current limitations of communication in East Timor, there is a need for the creation of an alternative communications network for use on the island itself.

solution

East Timor is one of the poorest countries in Asia. While mobile and fixed phone service is physically available, they are too expensive for the majority of the population. This project focused on building a "Village Telco" mesh network to provide a low cost local telephony services in Dili, the largest city in East Timor. This deployment included both a real-world pilot to test its use as well as a sustainable business model component. Rowetel staff spent three months preparing for the Dili project: designing the network, procuring equipment, preparing workshop materials and technical documentation, visiting the installation sites and installing pilot nodes.
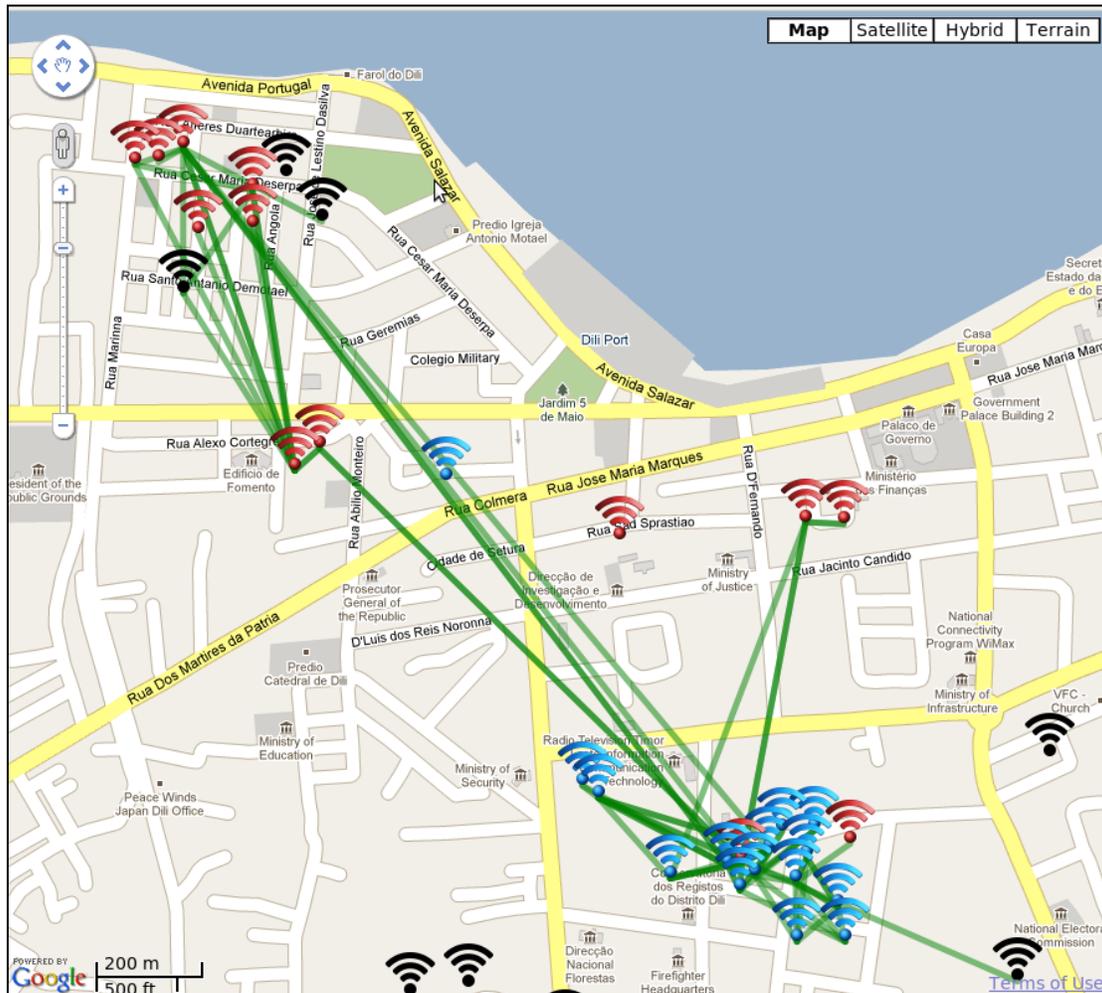
The mesh network itself is built from low cost, rugged Wi-Fi telephony devices called "Mesh Potatoes." Mesh Potatoes are devices that provide a single telephone to an end user and connect to other Mesh Potatoes via a mesh Wi-Fi network. Chinese-based Voice over Internet Protocol (VoIP) hardware manufacturer Atcom donated 100 Mesh Potatoes for this project, as well as weatherproofing materials and telephone handsets.

The project team led a workshop in April of 2010 during which significant challenges were discovered and addressed in the process of setting up several Mesh links. As Dili has no landline infrastructure, there is a significant concentration of Point-to-Point Wi-Fi networks -- direct building-to-building connections which caused interference with the Mesh Potato systems. A site survey at partner FONGTIL headquarters indicated over 40 active networks. This congestion, coupled with the omnidirectional Mesh Potato antennas, created untenable interference on several links even over relatively short distances. To address this, the team found it necessary to switch to directional antennas instead, using Nanostation 2 devices running mesh-networking software.

Wi-Fi networks are comprised of several Line of Sight (LoS) network nodes. This requirement also posed a challenge during the network installation phase, as Dili is a tropical city with many trees over 25 meters. This means a Mesh Potato near tall trees must be located at least 25 meters high to achieve a clear LoS link to other nodes in the mesh network. At some sites this presented a challenge. By the end of the construction phase, however, the team was able to deploy a 70-node Village Telco network across three sites in daily use. Local telephones calls made through the network have been extremely popular. There is significant demand for expansion. The partner group, FONGTIL, has been so impressed with the response from local participants that it has decided to invest its own funds into expanding the network in 2011/2012, after the ISIF funding is complete.

broader impact

Now, participating end-users (principally NGOs in Dili) can communicate for free. Due to training and outreach activities, there are now in excess of 20 people in East Timor capable of setting up their own local telephone connection using Village Telco technology. The Dili Village Telco is one of the most popular projects at FONGTIL – newly-empowered staff members enjoy project activities such as training, climbing trees and towers, and Mesh Potato installation.

.

Dili Telco coverage map

project contact

David Rowe
Email Address: david@rowetel.com
Rowetel
9 Nelson Ave
Flinders Park 5025
South Australia, Australia
www.rowetel.com