

# ISP in a suitcase for deployment during a natural disaster

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**WHY ARE YOU WORRIED ABOUT THE  
INTERNET DURING A NATURAL  
DISASTER?**

# Motivation

- Christchurch Earthquake 22<sup>nd</sup> February 2011
- Occurred during APRICOT 2011 in Hong Kong



# Some of you have been to Christchurch



# Christchurch Earthquake

February 22, 2011



Stuff Home The Press News Christchurch Earthquake 2011

12.51 February 22: Your Stories Quake Science Blog: Where there's a Will Quake stats

## Crowne Plaza Hotel demolition starts today

Last updated 08:48 12/12/2011

26 comments

Text Size

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DAVID HALLETT/The Press

### The Press Headlines

- Christchurch quake anniversary: Live updates
- We will mourn, share sadness and remember
- Much work to yet be done in Christchurch
- From the midst of chaos, a friendship
- Hospital escapee faces cemetery theft charges
- Pacific Blue plane in emergency landing
- Quake victims' interment site officially unveiled
- On the run in gown and handcuffs
- Grieving gather for unveiling
- Handcuffed man flees police in gown
- Founding father features in exhibition
- Man threatening harm sparks callout
- Pellet gun sparks IRD incident
- Christchurch crime stop

### Stuff Headlines

- Christchurch quake anniversary: Live updates
- Forty minutes of hell that we still feel
- Much work to yet be done in Christchurch
- From the midst of chaos, a friendship
- Global remembrance of the Christchurch quake
- Pacific Blue plane in emergency landing
- 72-year-old claims to be world's shortest man

# Mobile technology takes centre stage in disaster relief

“Rescue missions after the Sri Lankan tsunami and Haitian earthquake were boosted by using mobile phone networks, satellites and other computer software”

*Kate Bulkley The Guardian, Friday 18 June 2010 11.07 BST*

# Layer 5 – 8 and beyond

Assuming the network is operational, what can we do with it?

- Christchurch Recovery Map
  - <http://eq.org.nz/>
- Student Volunteer Army
  - <http://www.facebook.com/StudentVolunteerArmy>
- Trade Me
  - <http://www.trademe.co.nz/christchurch-earthquake-support>

# Christchurch Recovery Map

**HOME** **REPORTS** **SUBMIT A REPORT** **GET ALERTS** **CONTACT US** **ABOUT** **VOLUNTEERS**

## Kiwibank Branch in Avonhead PostShop: OPEN VERIFIED

🕒 13:32 Feb 27 2011 📍 210 Withells Road, Christchurch 8042, New Zealand

💰 ATM/Money centre

**Description**  
Kiwibank Branch in Avonhead PostShop is open. Hours not specified - assume normal business hours.

**News Source Link**  
<http://www.kiwibank.co.nz/canterbury-earthquake/>

Credibility:

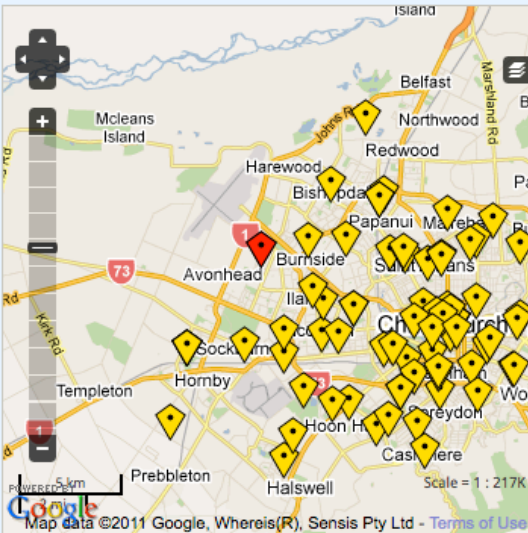
**Leave A Comment**

Name:

Email:

Comments:

**Map**



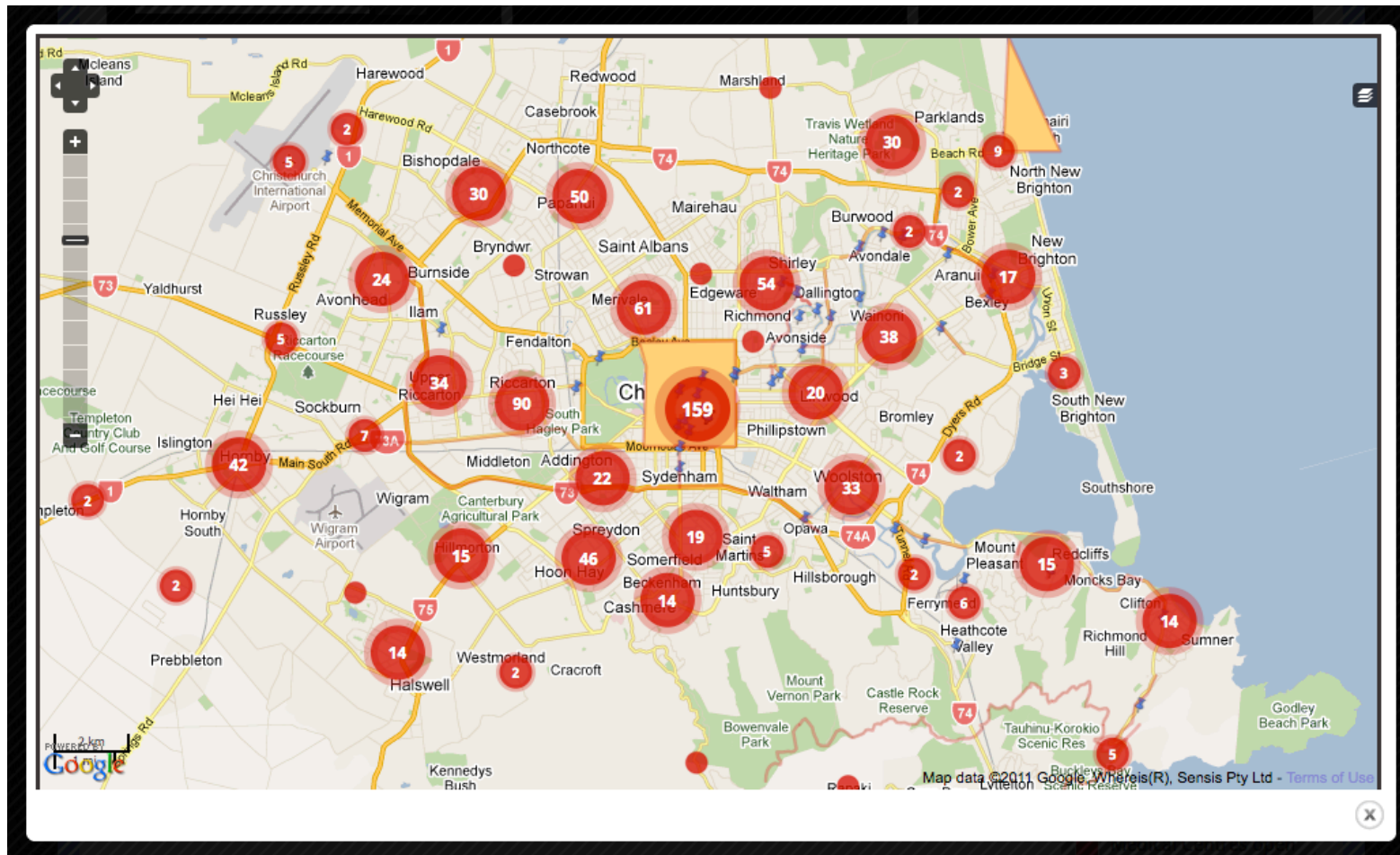
Wider map

**Additional Reports**

- Avonhead Pharmacy is open (inc Sunday)** 🕒 13:36 Feb 26, 2011  
📍 210 Withells Road, Avonhead, 0 Kms
- Kiwibank Branch in Avonhead PostShop: OPEN** 🕒 13:32 Feb 27, 2011  
📍 210 Withells Road, Christchurch 8042, New Zealand, 0 Kms



# Christchurch Recovery Map



# Trademe Earthquake Support



**trademe**   
Where Kiwis Buy and Sell [Login](#) [Register](#)

[Home](#) [Browse](#) [Sell](#) [My Trade Me](#) [Community](#) [Help](#) [Motors](#) [Property](#) [Jobs](#)

All items   [More options](#)

**Buying**  
[Watchlist](#)  
[Items I won](#)  
[Items I lost](#)  
[My favourites](#)  
[Recently viewed](#)

**Selling**  
[List an item](#)  
[Items I'm selling](#)  
[Sold items](#)  
[Unsold items](#)

## Christchurch Earthquake Support

Spread the word:

**Need help?**  
We've set up the following categories to help those affected by the quake:

- [Emergency accommodation](#)
- [Help for businesses](#)
- [Transport](#)
- [Lost & found pets](#)
- [Volunteers available](#) (or make a request)
- [Other](#)

[View all](#)

**Want to help?**  
List offers of assistance. Please include your location in the title. **There are no listing fees.**

- [Emergency accommodation](#)
- [Help for businesses](#)
- [Transport](#)
- [Lost & found pets](#)
- [Volunteer labour](#) (or browse requests)
- [Other](#)

**More resources**

**New Zealand Government Appeal**  
The Government has launched the Christchurch Earthquake Appeal to help the communities, families and people of Canterbury.

**LandCheck**  
The Canterbury Earthquake Recovery Authority has set up LandCheck to assist Christchurch property owners determine the status of their land following the devastating earthquakes.

**Red Cross**  
You can support those affected by the earthquake by making a donation to the [Red Cross 2011 Earthquake Appeal](#).

**Quake News and Updates**  
The Canterbury Earthquake Recovery Authority is the Government agency coordinating the recovery and rebuilding effort.

# Student Volunteer Army

facebook  Search 



## UC Student Volunteer Army

Community Organization · Youth Organization · Disaster Relief · Christchurch, New Zealand



Wall UC Student Volunteer Army · Everyone (Top Posts) 

Share:  Post  Photo  Video

Write something...

# Liquifaction



# A New Environment

- The Internet became the way that people communicated and shared information about their new environment

# Supply and Demand of essential information

- Organisations/individuals which have information to provide need to have a reliable way to access the Internet
- Organisations/individuals which are in need of information need to have reliable access to the internet.

# Supply

- Banks
- Service Stations
- Hospitals
- GPs
- Civil Defence
- Supermarkets
- Libraries
- Schools
- People looking for family members

# Demand

- People looking for family members
- Organisations wanting to relocate and carry on with business
- Hospitals
- Organisations who have to relocate to the effected area temporarily



# New Environment

- Nothing is the same
- You can't rely on existing infrastructure being available
- How many of you are ready for weeks with no electricity, running water, sewage?

**HOW DO YOU ENSURE ACCESS TO THE  
INTERNET IN A COMPLETELY NEW  
ENVIRONMENT?**

# Requirements

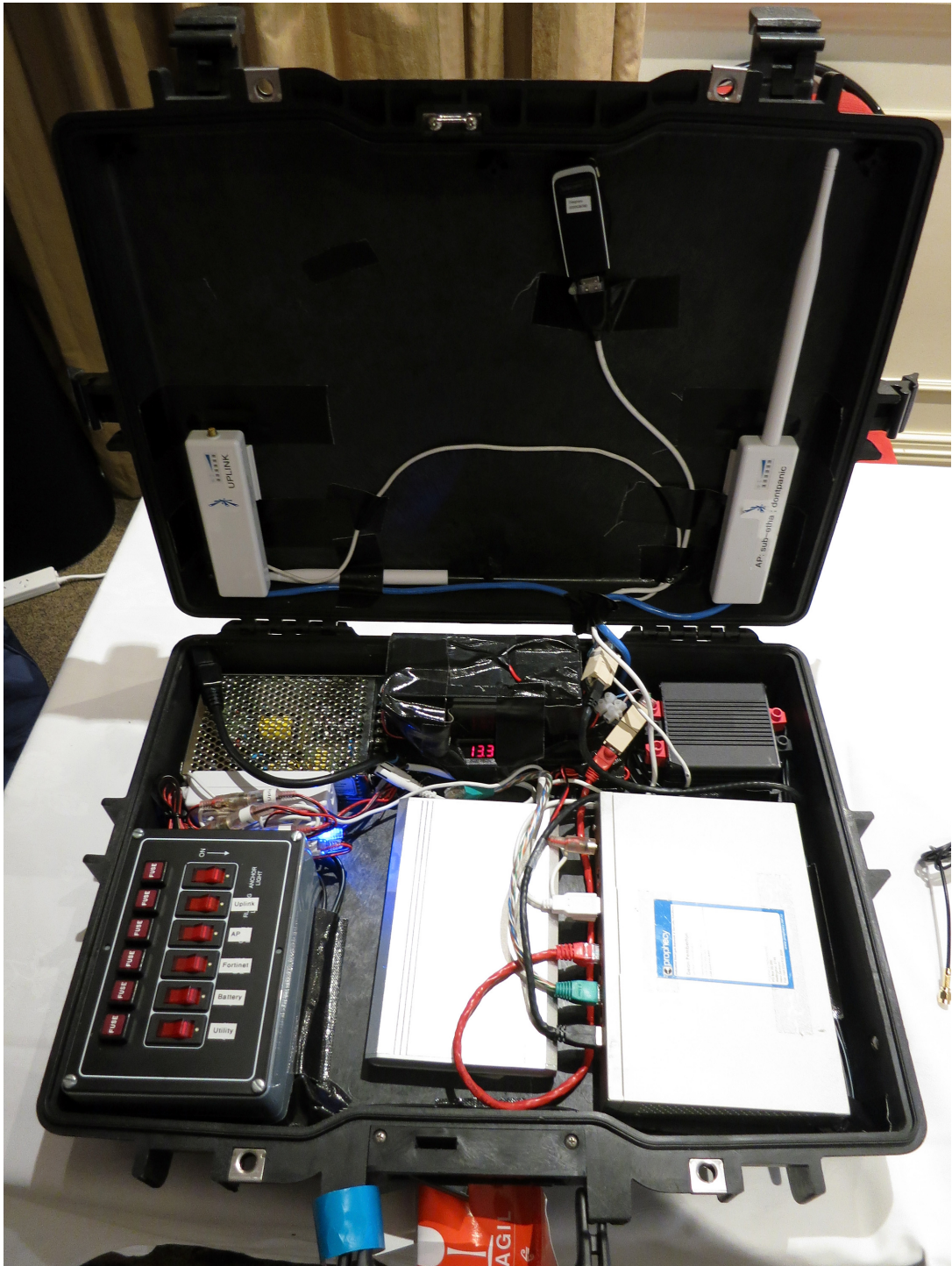
- Cheap
- Easy
- Modular
- Must be flexible enough to make use of whatever infrastructure is available

# So how hard is this?

- Given that we know what we are trying to achieve
- Is it possible to build a unit which anyone could put together?

The important thing is actually doing  
it!

- Yeah there are places you can buy these things.
- But the most important thing is actually doing it



# Overview

Uplinks

Control

Downlinks

Power

# Case

- Pelican Case 1495





# Power

- Mains
- 12V
- Battery
- Solar
- Generator
- Car



Power

# Power

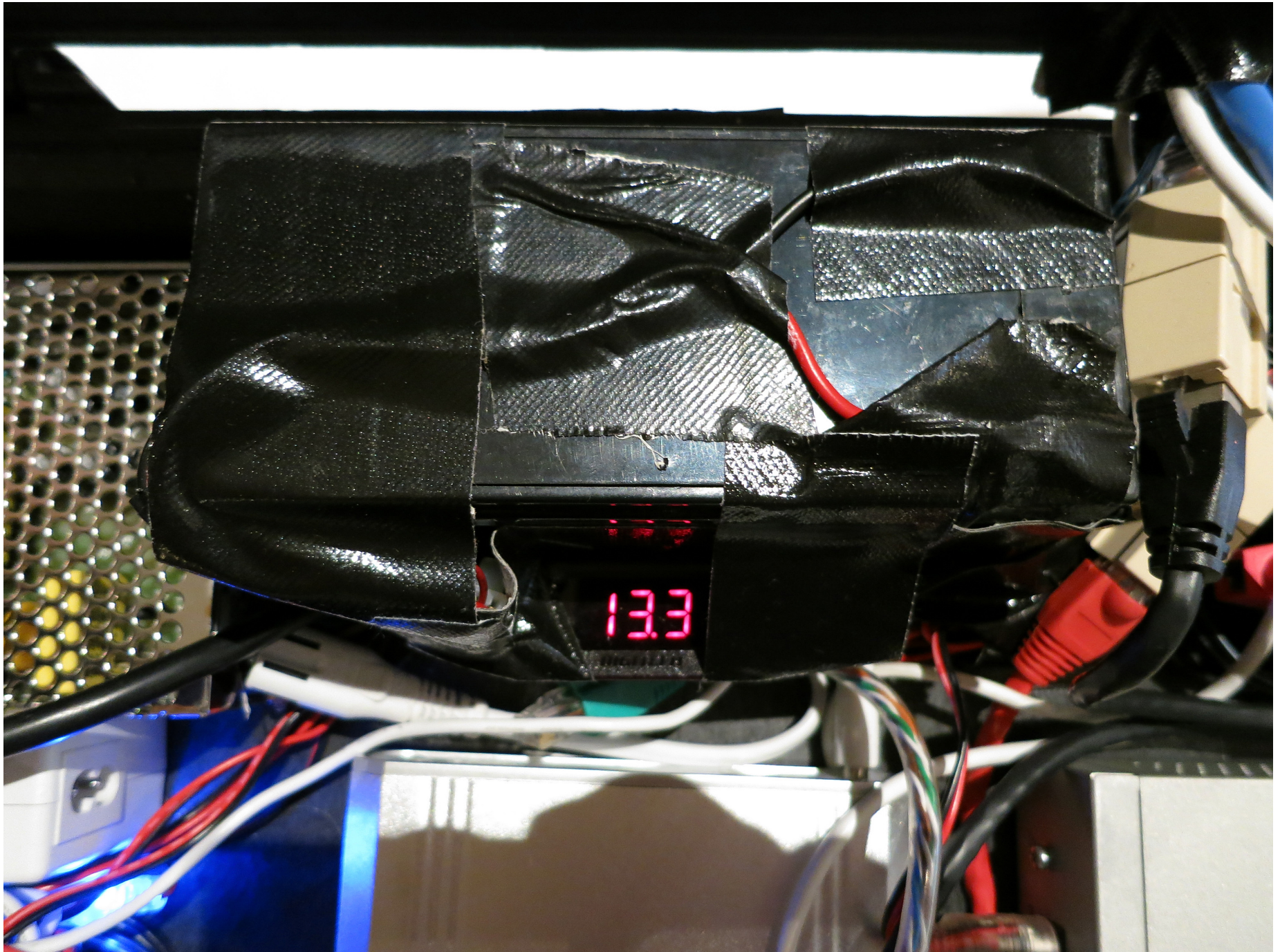
- Mains Power into a 60W switchmode supply



# Power

- 12V Sealed Lead Acid





# Power

- Battery backup unit
- BBM-1225 (Battery backup Mod 12/24V - 25A)  
Charger



# Power

- Car charging
- Any 12V battery – Alligator Clips



# Power

- Modular – Keep all connectors standard and simple
- These ones have LEDs so you can see what is 'live'



# Power

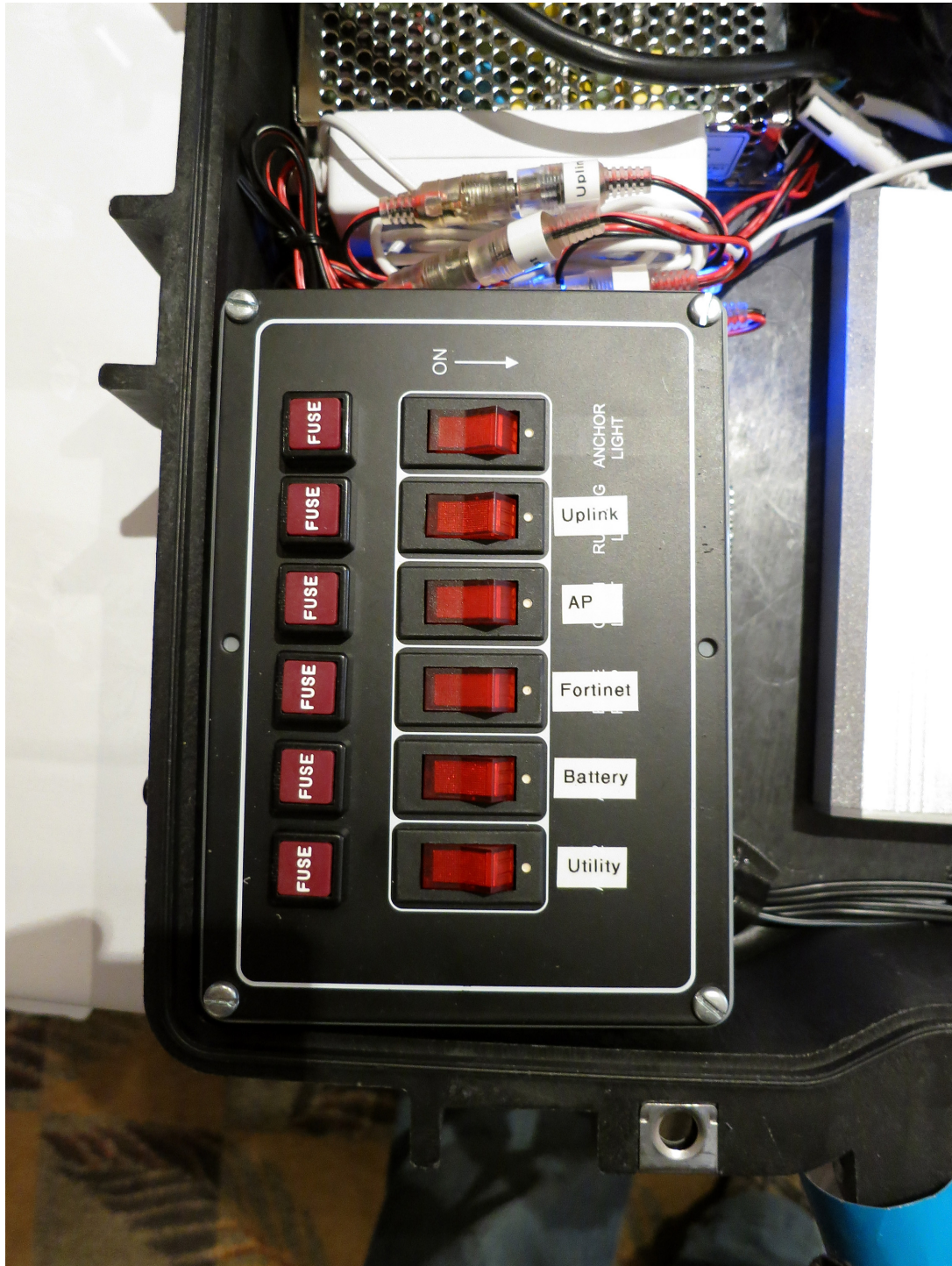
- HyperJuice
- Powers Macbook
- USB charger





# Power

- Need 12V for some things, but runs a bit hotter to charge the battery
- Float charge



# Power

- Solar?
- Backup Generator?

# Uplinks

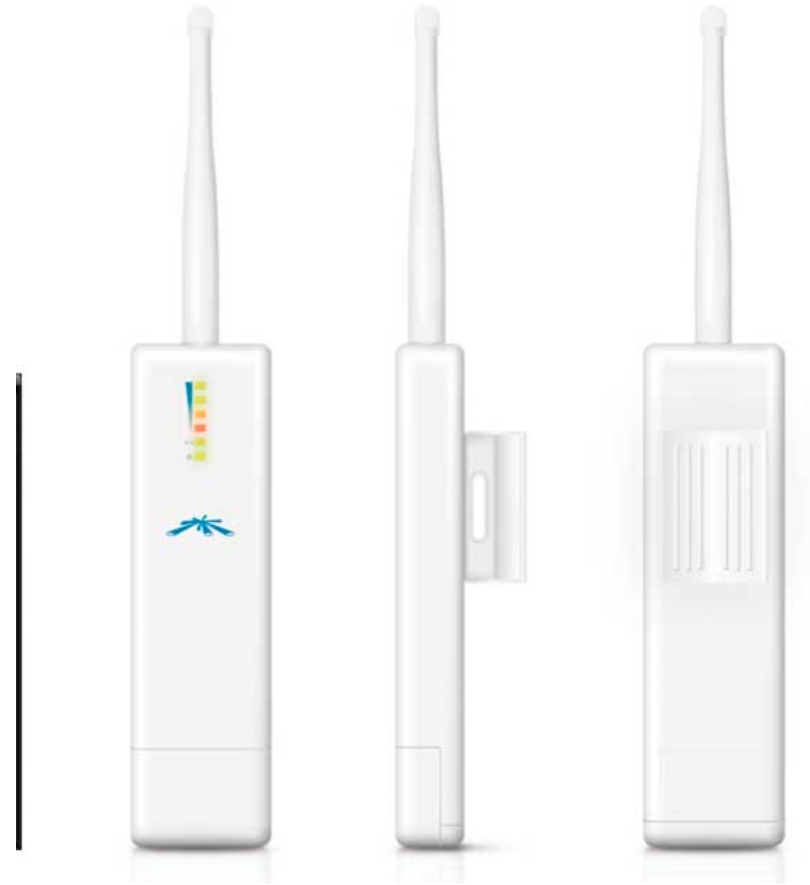
- Ethernet
- 802.11
- Cellular
- Satellite



Uplinks

# Uplinks

- Wireless
- Ubiquiti Picostation2 HP



# Uplinks

- 3G
- Choose lots of carriers
- External Antenna?



# Uplinks

- Satellite
- BGAN
- Connection of last resort







# Uplinks

- Other?
- What uplink options am I forgetting?
- Where could you go and still be disconnected?

# Control

- Fortinet 50B
- Routing, failover, access control
- Captive portal
- Users
- UTM

Control



# Downlinks

- Ethernet
- 802.11



Downlinks

# Can you get it on a plane?

- 12kg – so not carry on at the moment
- But with the MSDSs they didn't mind it checkin



# Does this solve the problem?

- It certainly goes a long way to giving people access to the internet in the absence of traditional infrastructure
- It gives organisations and individuals an ability to access internet resources while they work out how to survive in their new environment

Can you do even better?

A lot of people do much the same as I  
do



<http://www.flickr.com/photos/bendeckrau/>

Some people do even better



# SolarNetOne

- <http://www.gnuveau.net/cgi-bin/wiki.cgi>



**Internet-in-a-box for areas without electricity**

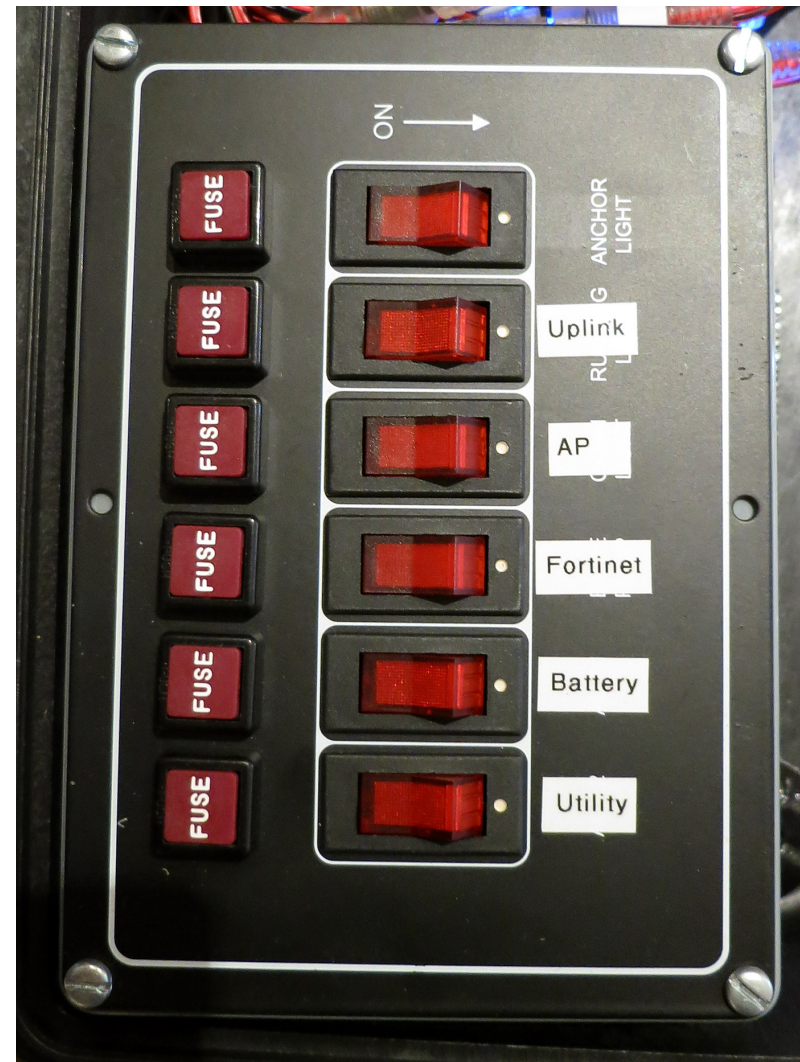
# Ignition networks



Nice and easy to use in a crisis



# A little bit different



# Questions