

Mikrotiks in a Disaster

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Emergency Response Unit



A bit about me

- Interest in electronics & radio from young age
- Ham Radio ticket for more than 35yrs
- IT industry for more than 30yrs
- AREC, CD and SAR for more than 20yrs
- With Red Cross IT & T ERU since it formed about 10yrs ago

About Red Cross

- National Societies (192 world wide)
- International
 - ICRC
 - Federation
 - FACT
 - ERUs
 - RDRTs

ERU

Emergency Response Unit

What is an ERU

- Standardisation
 - Equipment
 - Training
- Ready to be deployed globally at short notice.
- Self-sufficient for 1 month and can be deployed for up to 4 months.

Introduction of Mikrotiks

- About 5 years ago we introduced Mikrotiks into the standard equipment
 - The RB751 as a small office router
 - The RB1200 for larger operations
 - The SXT5 for point to point links
- (we continued to use Ruckus for large scale Wifi)

Why Mikrotik

- Old standard in particular the Linksys WRT54G had become obsolete
- Cost effective and very flexible (in particular the SXT much less expensive than the Ruckus bridge)

Standards change with times

- Due to the consistency of RouterOS we have moved from specifying devices to a general specification of minimum functionality
- Now using
 - RB962
 - CRS125-24-1S
 - SXTG-5HPacD-HG
 - mAP2-2nD

Types of ERU

- ERUs
 - Relief & Cash distribution (6)
 - Basic Health Care (7)
 - Water, Sanitation, Hygiene (WASH/WatSan)
 - MSN₁₅ (4) MSN₂₀ (5) MSN₄₀ (4)
 - Field Hospital/Rapid Response Hospital (3/1)
 - **IT and Telecommunications (5)**
 - Logistics (5)
 - Base camp (2)



IT&T ERU Deployments

- **Sri Lanka & Indonesia – Tsunami 2004 – Spain**
- **Niger – Sahel Food Crisis 2005 – Denmark**
- **Pakistan – Earthquake 2005 – Denmark**
- **Indonesia – Earthquake 2006 – Denmark**
- **Philippines – Typhoon 2006 – Denmark**
- **Mozambique – Cyclone 2007 – Spain**
- **Uganda – Floods 2007 – Denmark**
- **Haiti – Hurricanes & Flooding 2008 – Austria/NZ**
- **Haiti – Earthquake 2010 – Spain/USA**
- **Philippines – Super Typhoon 2013/14 – NZ/USA/Denmark**
- **Nepal – Earthquake 2015 – NZ/USA/(Austria)**
- **Dominica – Hurricane 2017 – NZ/USA**
- **Bangladesh – people movements - various**



Philippines

- Nov 8 2013
 - Max sustained winds of 235 kph and gusts of up to 275 kph
 - Massive storm surge (as bad as a tsunami)
 - 16,000,00 people affected (estimated)
 - 6,300 deaths (estimated)
 - 4,100,000 displaced
 - 1,100,000 homes damaged or destroyed
 - As well as massive destruction to commerce, infrastructure, livelihoods





Nepal

- 7.9 Quake 25 April 2015
- 7.4 Quake 12 May 2015
- 57 affected districts (14 severely affected)



SITUATION



5.6 MILLION
people affected



17,932
people injured



638,979
houses destroyed



8,857
people killed



300,639
houses damaged



4,085
school buildings
destroyed

RESPONSE



7,970
Red Cross
volunteers
deployed



75,551 PEOPLE
received health
services including
medical care,
first aid and
psycho-social
support



866,473
water and
sanitation items
(ORS, Aqua Tab,
soap, hygiene kits)
distributed for
620,742 people
3.7 MILLION LITRES of
safe water distributed



35,042
unconditional cash grants
(15,000 Rupees each)
distributed for 175,210 people



27,820 RELIEF KITS
(2 tarpaulins, 2 blankets, 1 kitchen set,
1 shelter toolkit) distributed for 139,100 people



111,150
tarpaulins distributed
for 555,750 people



Domica

- 2 strong Hurricanes
- Small island, pretty much completely decimated
- Smaller response

IT&T ERU Responses

- To support the IFRC and national societies response, recovery and capacity building
 - IT&T ERU's from NZ, USA Denmark, (some staff from Austria)
 - Eg Nepal - 20 staff over 5 weeks (12 from NZ)
 - About 1 Tonne of equipment

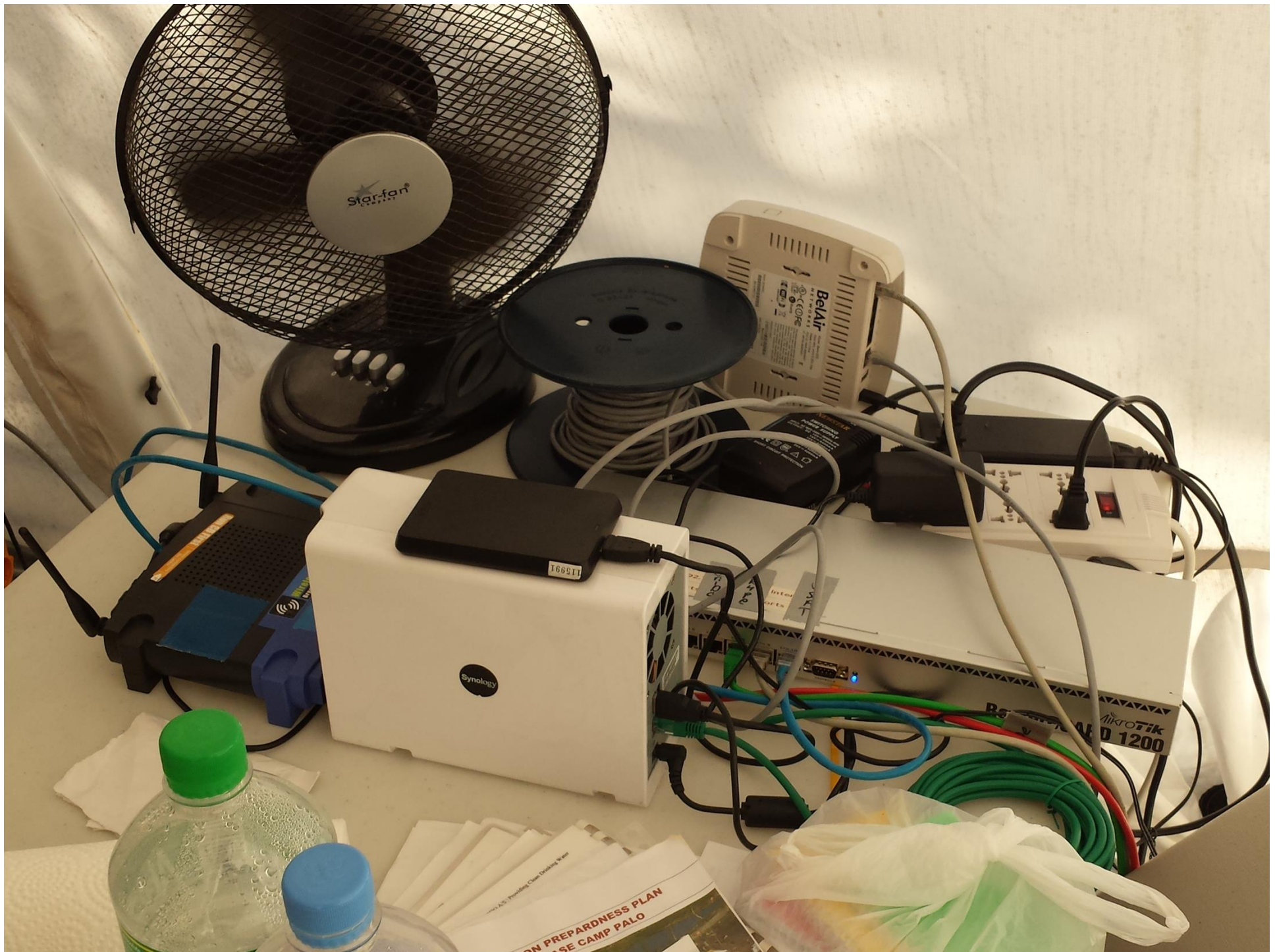


IT&T Response - IT

- Internet - VSATs
- Setting up IT and Internet in the Offices and ERU Camps
- Supporting IT and Internet in the Offices and ERU Camps
- Providing IT and Disaster Communications Capacity Building for NRCS for future events
- Training and Documentation
- Other

Uses for the power of Mikrotik

- Fail over
 - Failover between unstable local provider and alternatives such as VSAT, hotel wifi, 3/4G
- Load balancing
 - Between VSAT and local provider, or 2 local providers



Uses for Mikrotiks

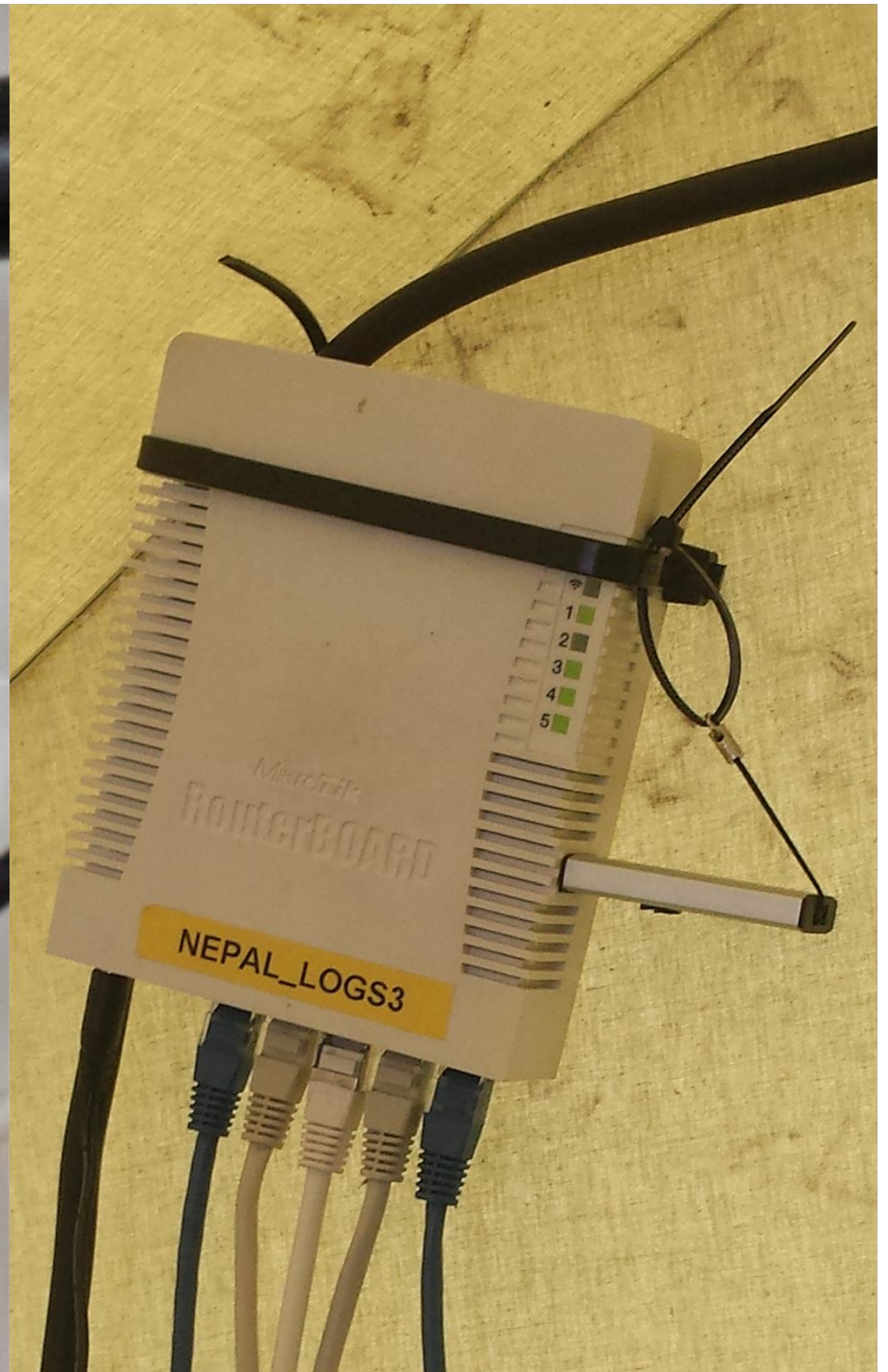
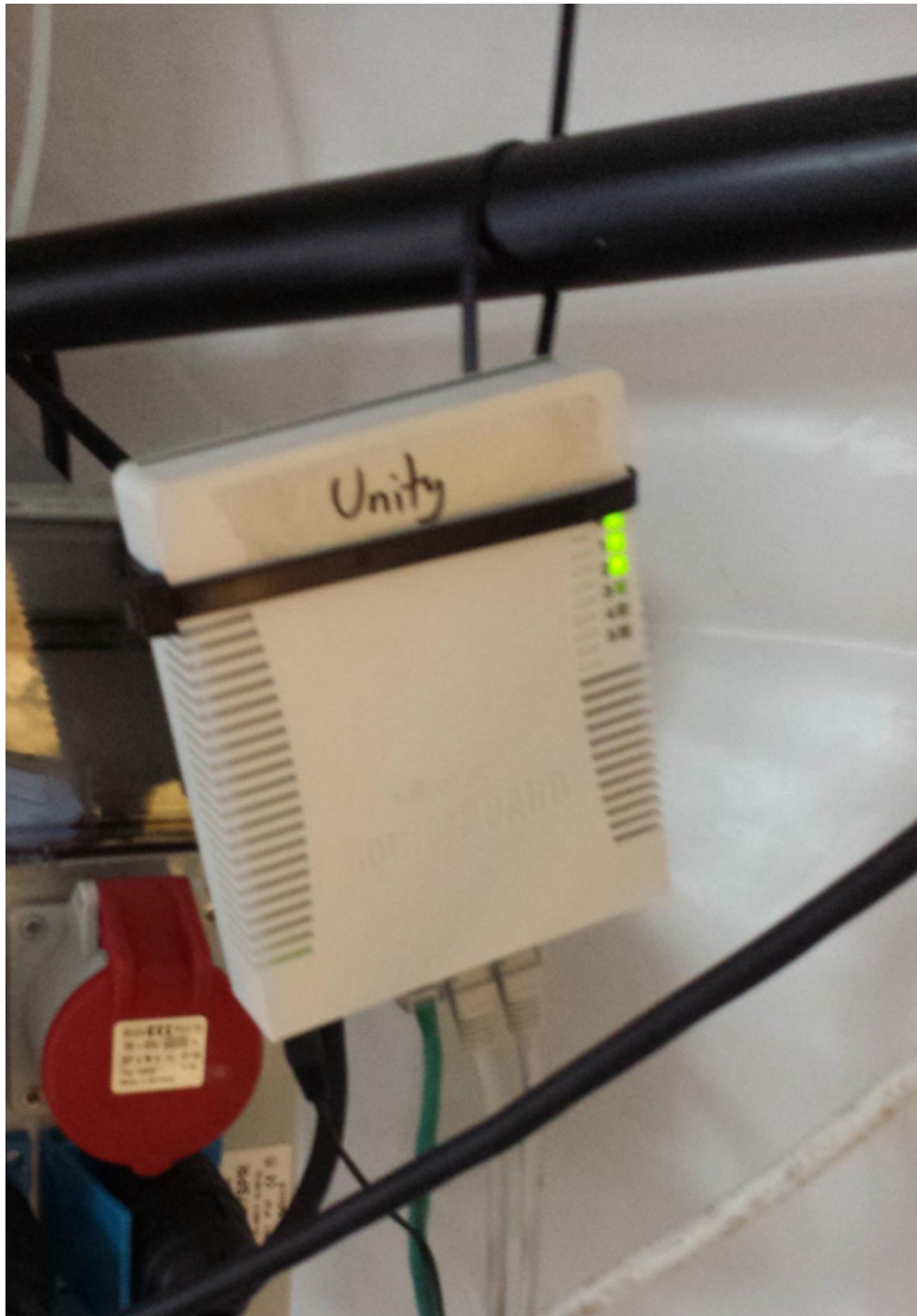
- Gateway routers for VSAT, Wifi, Mobile and local provider Internet connections
- Access Points
- P2P links
- Usually we have a very limited connection and a lot of users so various forms of throttling and filtering are essential

Uses for the power of Mikrotik

- We have been using simple and interface Queues to manage limited available traffic
- Have used layer 7 filters and connection based filters to block traffic (eg blocked Windows Updates based on Connection filter for known Windows Updates DNS names)
- A script to identify most mobile devices based on host name from DHCP and put them in a list & give lower priority

Phillipines

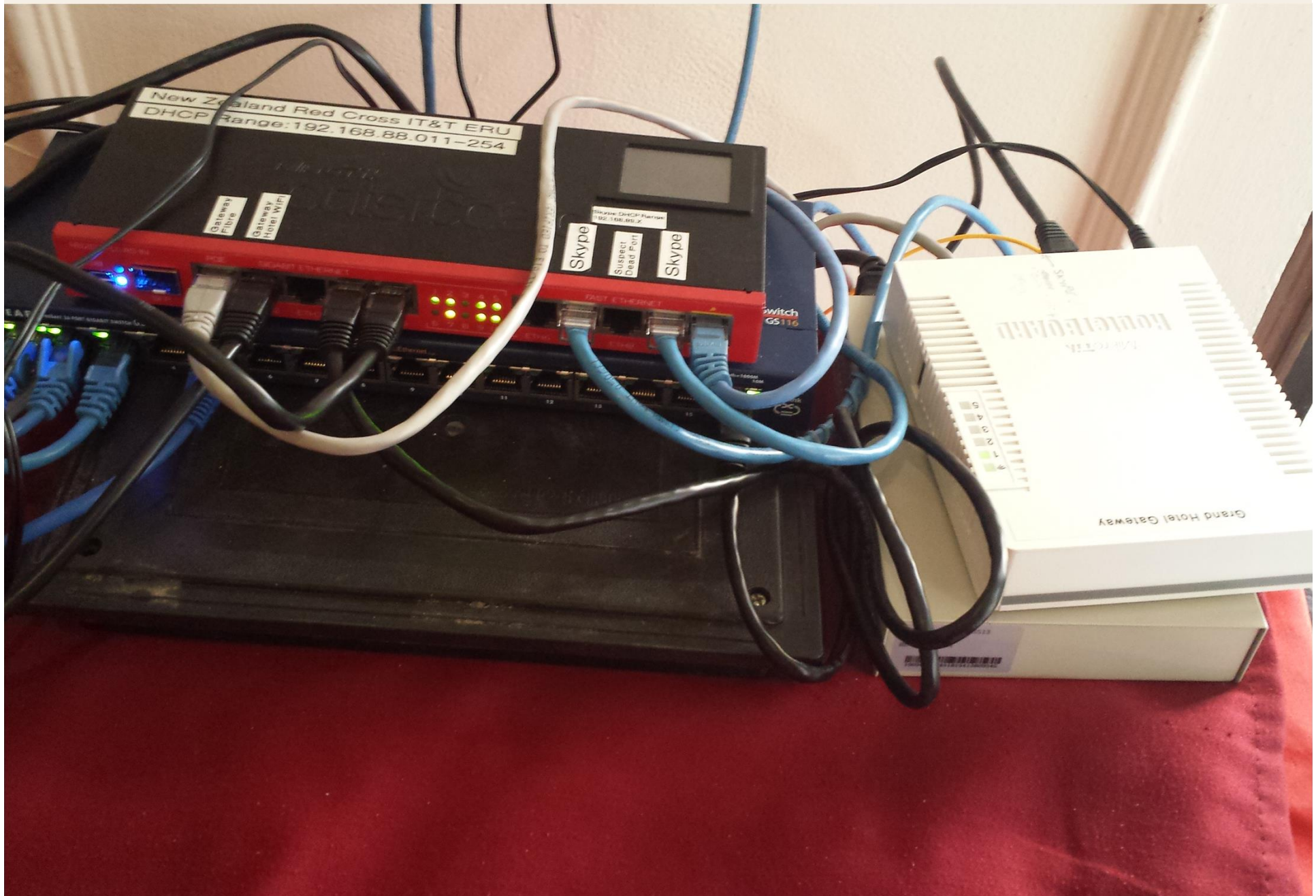
- RB1200 at Logistics/Warehouse base in Cebu
- RB1200 in tent at Base Camp
- Various RB751's in tents

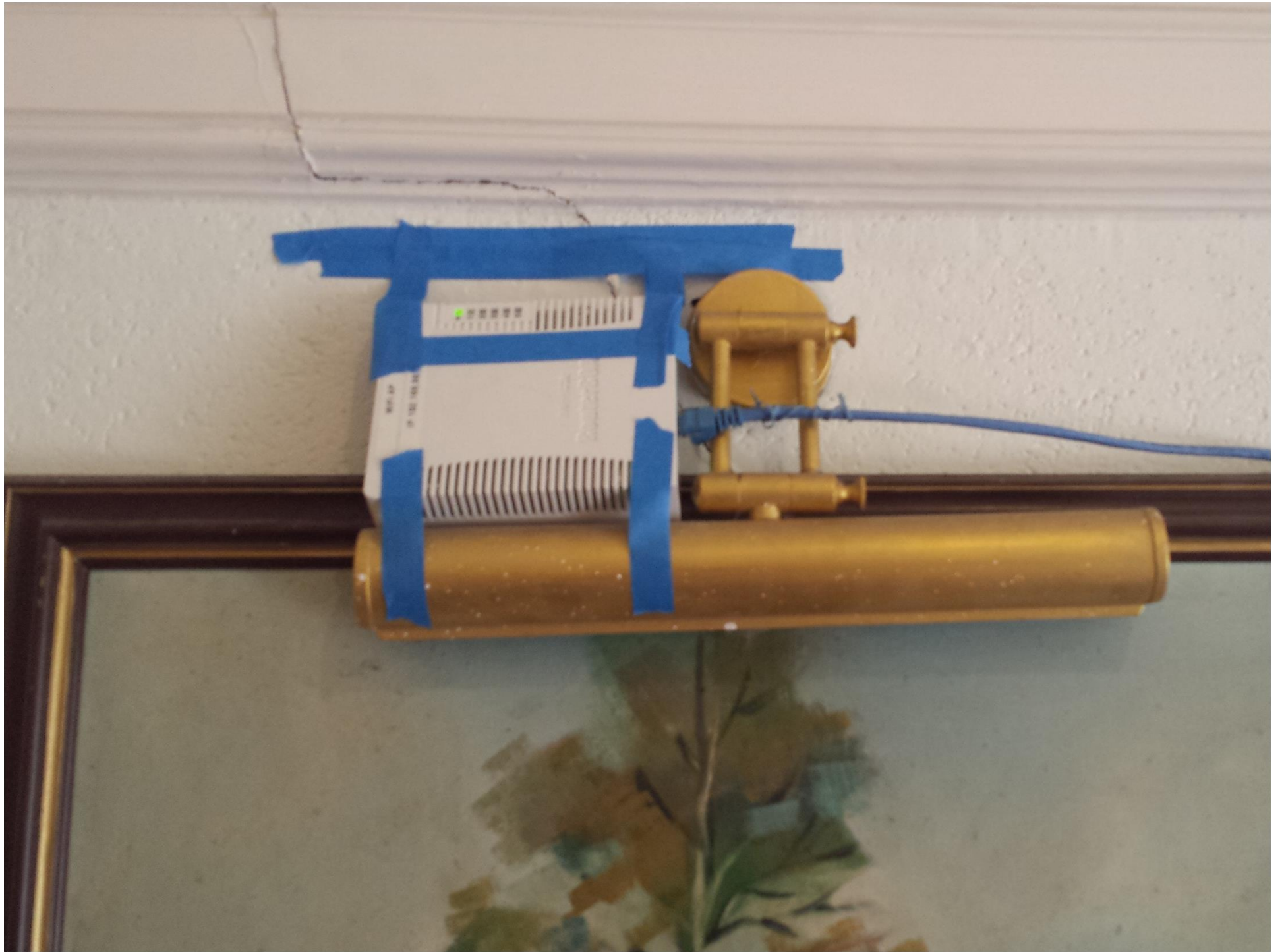


Nepal

- RB2011 at base in Kathmandu Hotel
- Various RB751s etc as Routers, Aps at base and at various camp locations
- SXT as an AP
- SXTs as a Bridge at a remote camp











Dominica

- RB2011 at Dominica Red Cros
- Various RB951s etc for APs
- SXTs for bridge to WISP provider

IT&T Response - Telecom

- Programming VHF Handheld & Mobile Radios
- Satellite Phone pool

(Not in Nepal, but on other Missions)

- VHF Mobile Radio installations
- VHF Radio Repeater systems
- HF Radio Programming
- HF Radio Installations



Training

- We have a 2 week long technical training, Mikrotik is a small part of this
- At the end there is a 'field' assessment
- 2 of the 4 exercises include using Mikrotiks





Work in the Pacific

- We also do work with National Societies in the Pacific, more capacity building and training, but also some disaster response.
- We currently have a project that will provide a “Network in Box” solution (called ZLT infrastructure). While includes a mostly end to end FortiNet product network stack, but there is also a Mikrotik component



ZLT MikroTik

- As a backup and out of band network connection the ZLT incorporates a MikroTik RB433 with 3G/4G radio's

