Mikrotiks in a Disaster

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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)

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
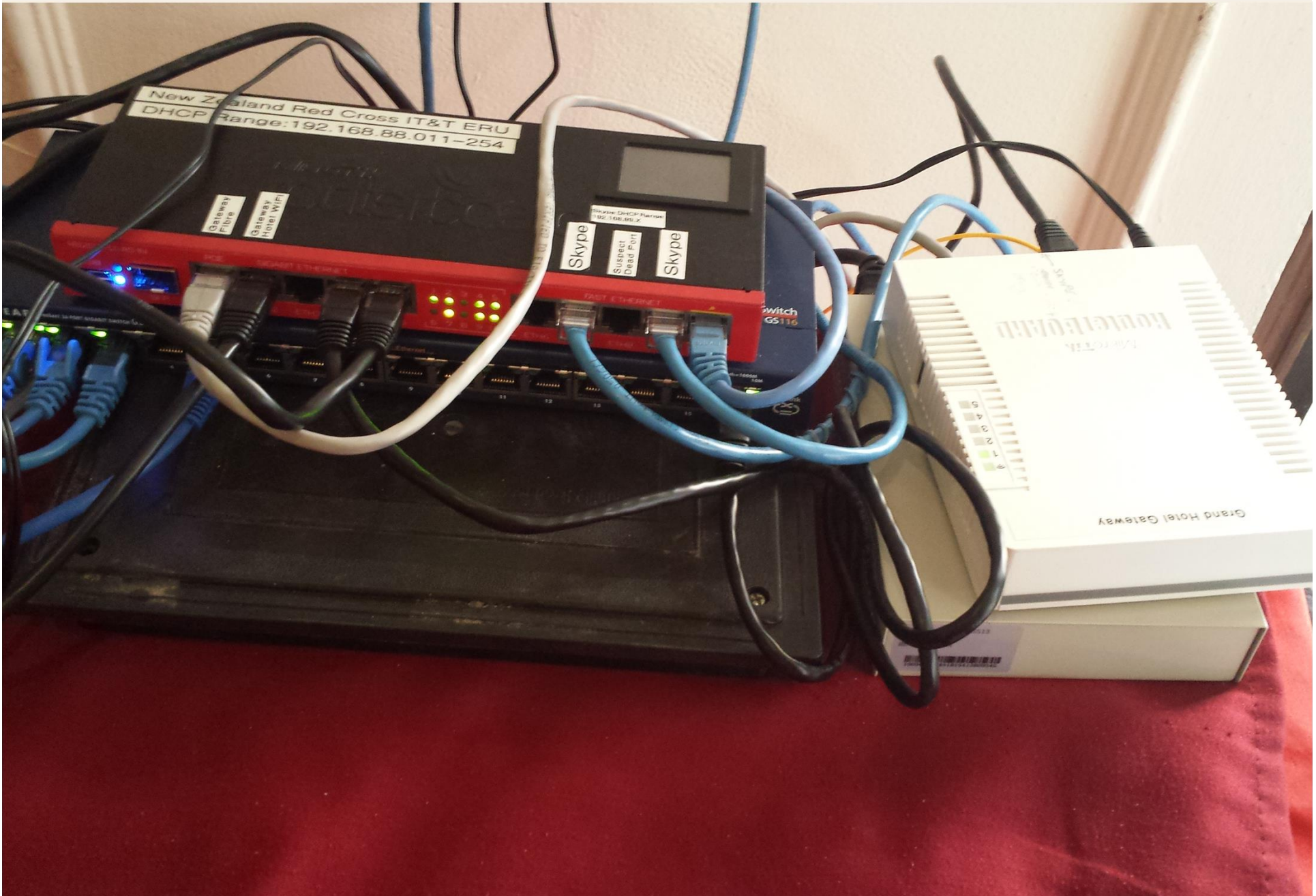
Phillipines

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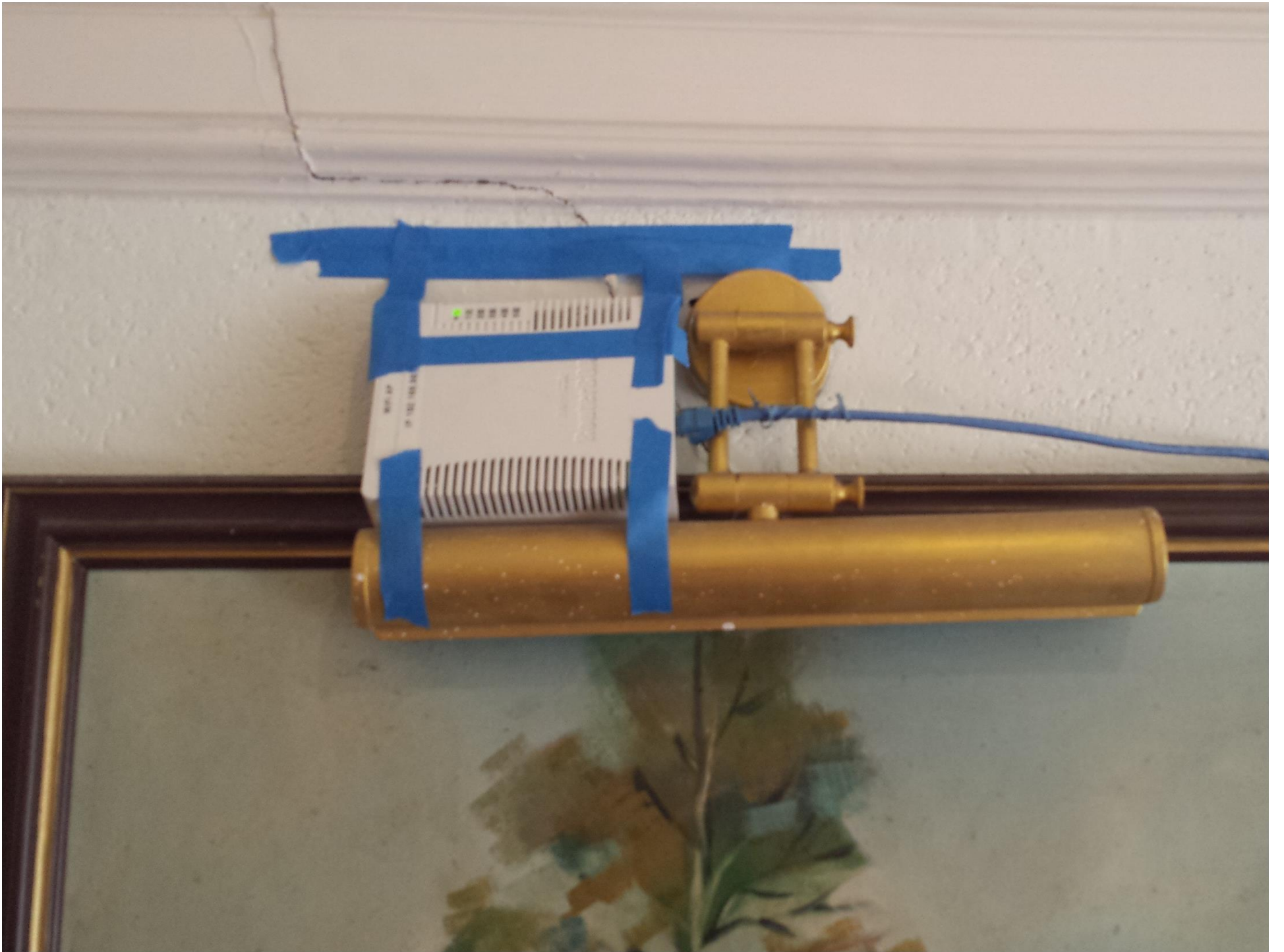- Various RB751's in tents
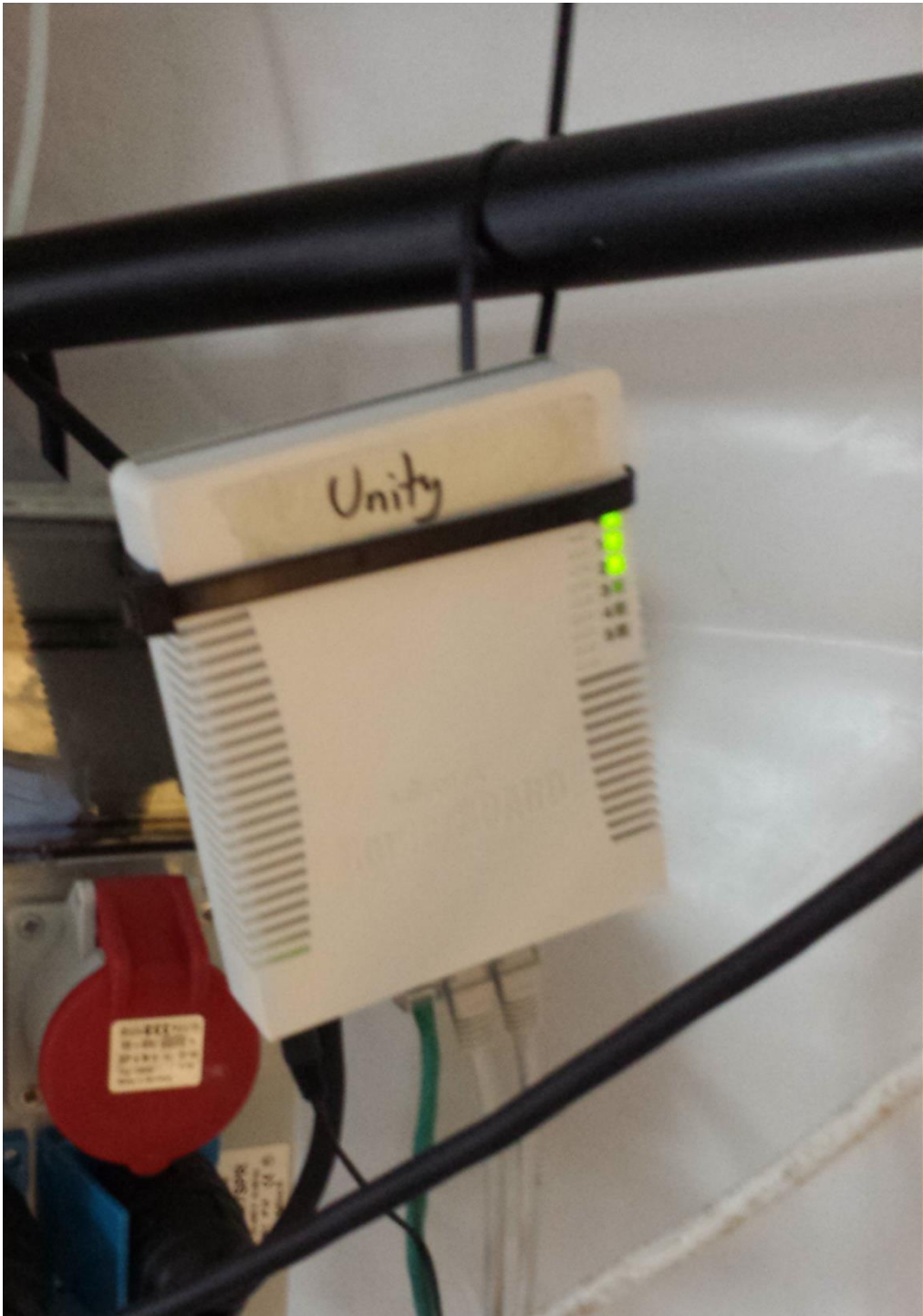
Nepal

- 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 Dominca 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

Internet

Internet

Public IP

xDSL Router

.1

MikroTik 3G Router

.1

Management Laptop

.2   .2

10.50.0.0/29

FortiGate 60E Firewall

10.50.0.8/29

Tripp Lite Serial
OOB Access

Trunk

FortiSwitch

MUM
MikroTik User Meeting

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