

connecting those who need it most



ICT/IoT Deployments for Health Care & Disaster Relief
ICTP Trieste - May 2018

Our mission is to get the tools of Information and Communications Technologies (ICTs)
-- computing, Internet access, telephony --
to the people and organizations who need them most,
in rural and under-served areas in the developing world



Inveneo at a Glance

- San Francisco based non-profit social enterprise
- Founded in 2004, by Silicon Valley technologists
- Designs and deploys turnkey basic ICT infrastructure solutions for organizations in developing countries
- Building an ICT Entrepreneur partner & capacity-building program to 90 partners in 28 countries
- Delivering systems and projects, with partners, in 25+ countries



Bob Marsh, ICIP Training | Cameroon

Who We Serve



Rural ICT Challenges

- Power, unreliable or non-existent
- Heat, humidity & dust
- Lack of affordable Internet connectivity
- Expensive, inappropriate or inaccessible solutions
- Lack of professional IT support
- Inexperienced users and administrators



Possible Solutions

- **Very low Power consumption devices**
- **Fanless, sealed enclosures**
- **Connect to distant sites with broadband connections**
- **Use local knowledge to design appropriate, quality solutions.**
- **Build support network with local partners**
- **Build support network with local partners**
- **Use local partners to provide user training**

Solution Examples



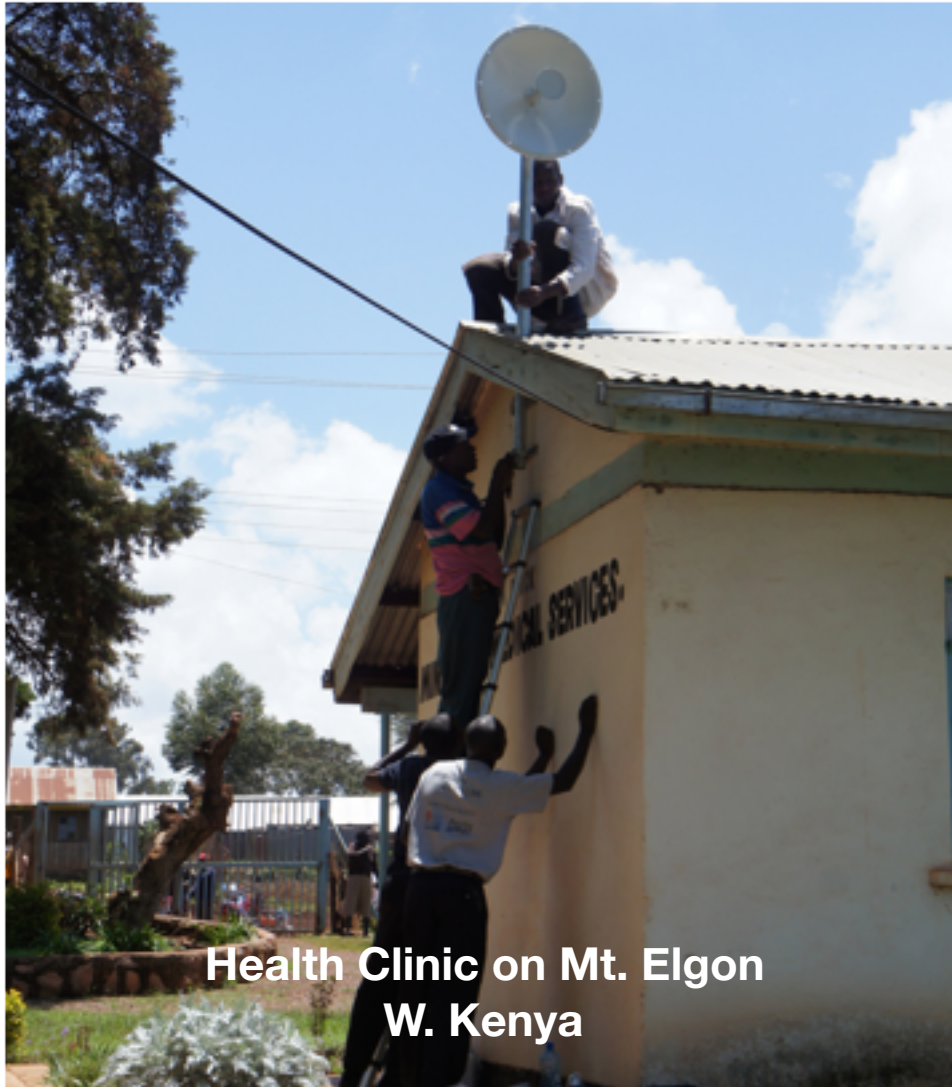
**Telecentre
Masai Mara, Kenya**



Sekenani Clinic Health Care

Clients: Cisco Systems
Location: Sekenani Gate, Masai Mara, Kenya
Project: Solar Powered Health Clinic
Sector: Health Care
Scope: 1 locations
Partner: Setright, Nairobi
Reach: 10,000 people





Health Clinic on Mt. Elgon
W. Kenya



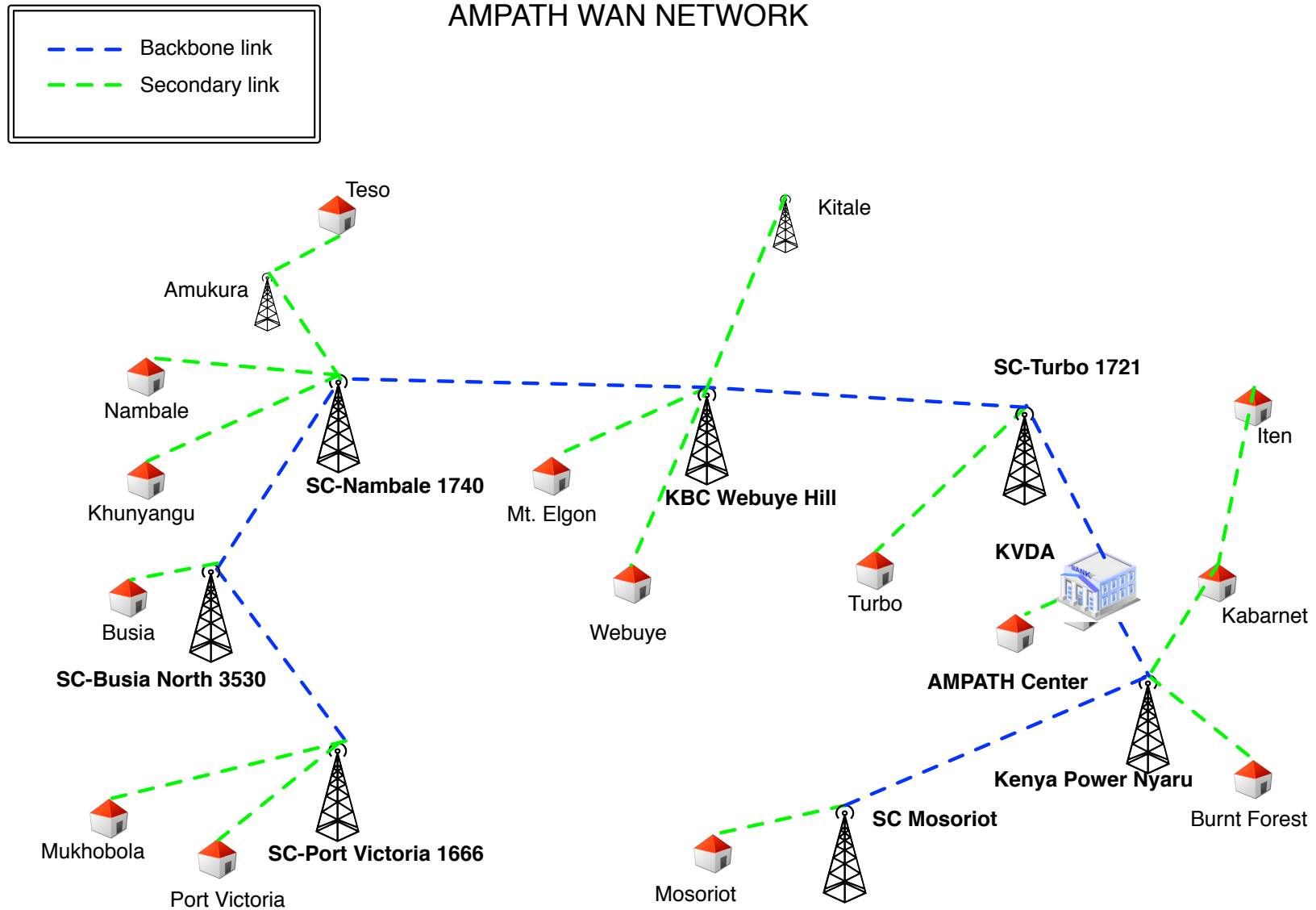
Inveneo & WinAfrique core team
Eldoret, Kenya

Ampath Kenya Health Care

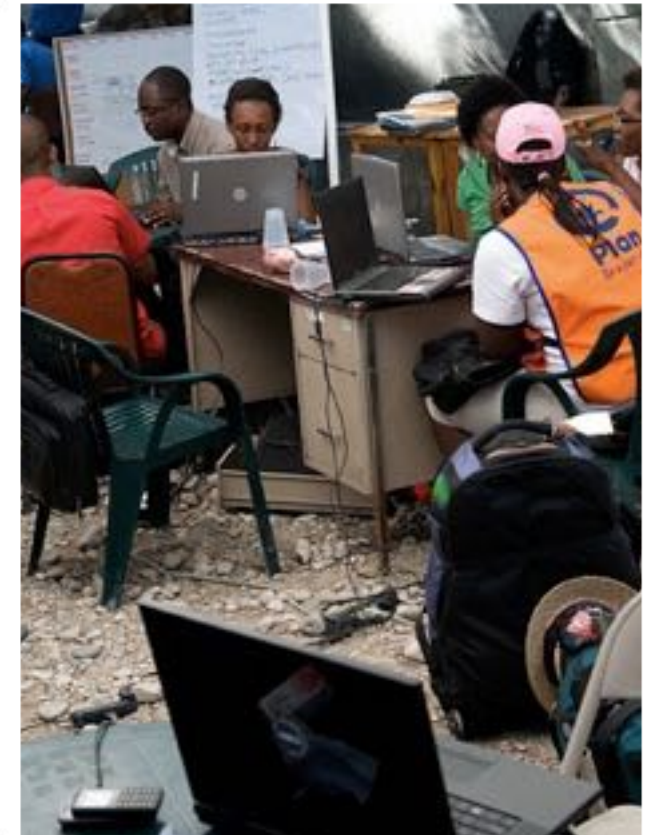
Clients: AMPATH Foundation, USA
Location: Eldoret region to Lake Victoria, Kenya
Project: Ampath WAN Health Network
Sector: Health Care, HIV/AIDS
Scope: 33 locations
Partner: Setright Nairobi
Reach: 300,000 people



AMPATH WAN NETWORK

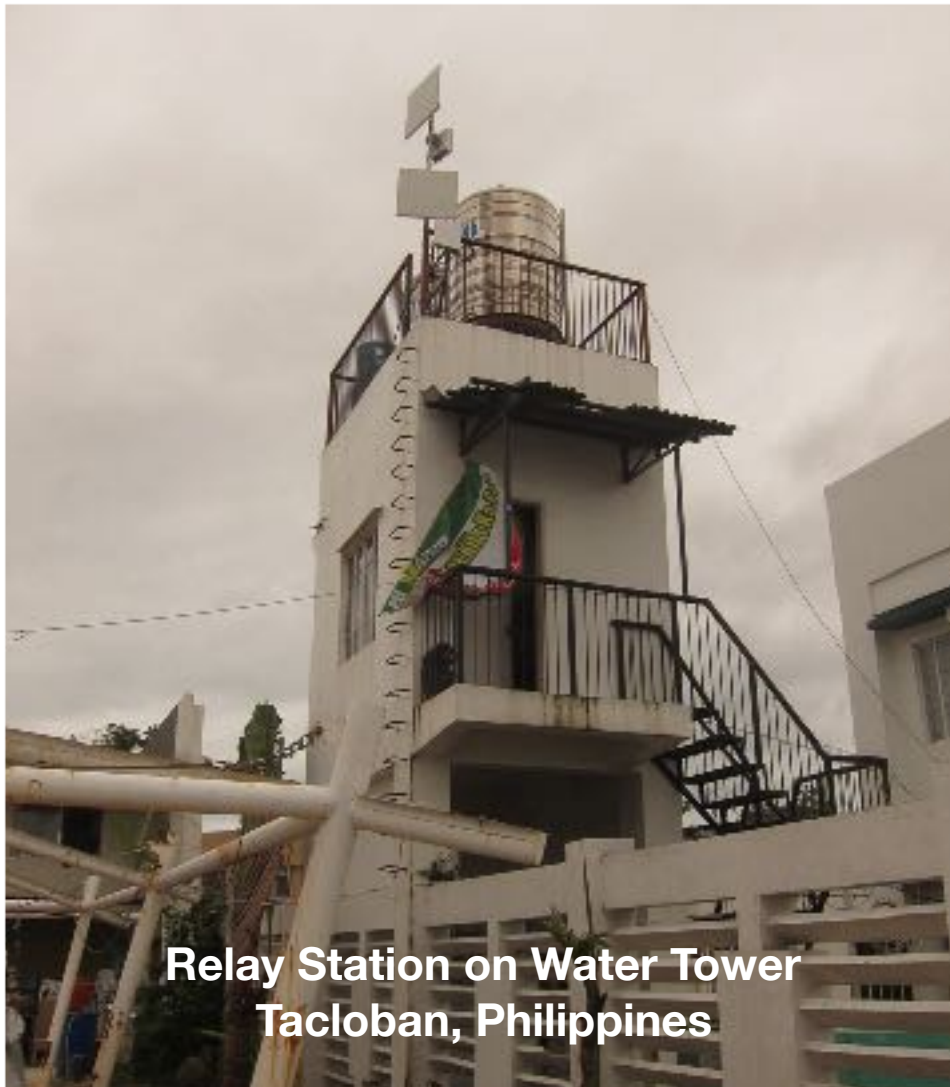


Ampath Network Diagram, Kenya



Clients:	NetHope, 18 major NGOS including Care, CHF, WVI
Location:	Port au Prince
Project:	Battery-powered broadband network spanning PaP
Sector:	Emergency Relief
Scope:	23 locations
Partners:	MultiLink, Access Haiti. HTG, NetHope
Reach:	200,000 people

Haiti disaster network **Relief Projects**



**Relay Station on Water Tower
Tacloban, Philippines**



**Inveneo Engineer @ cell tower
Tacloban, Philippines**

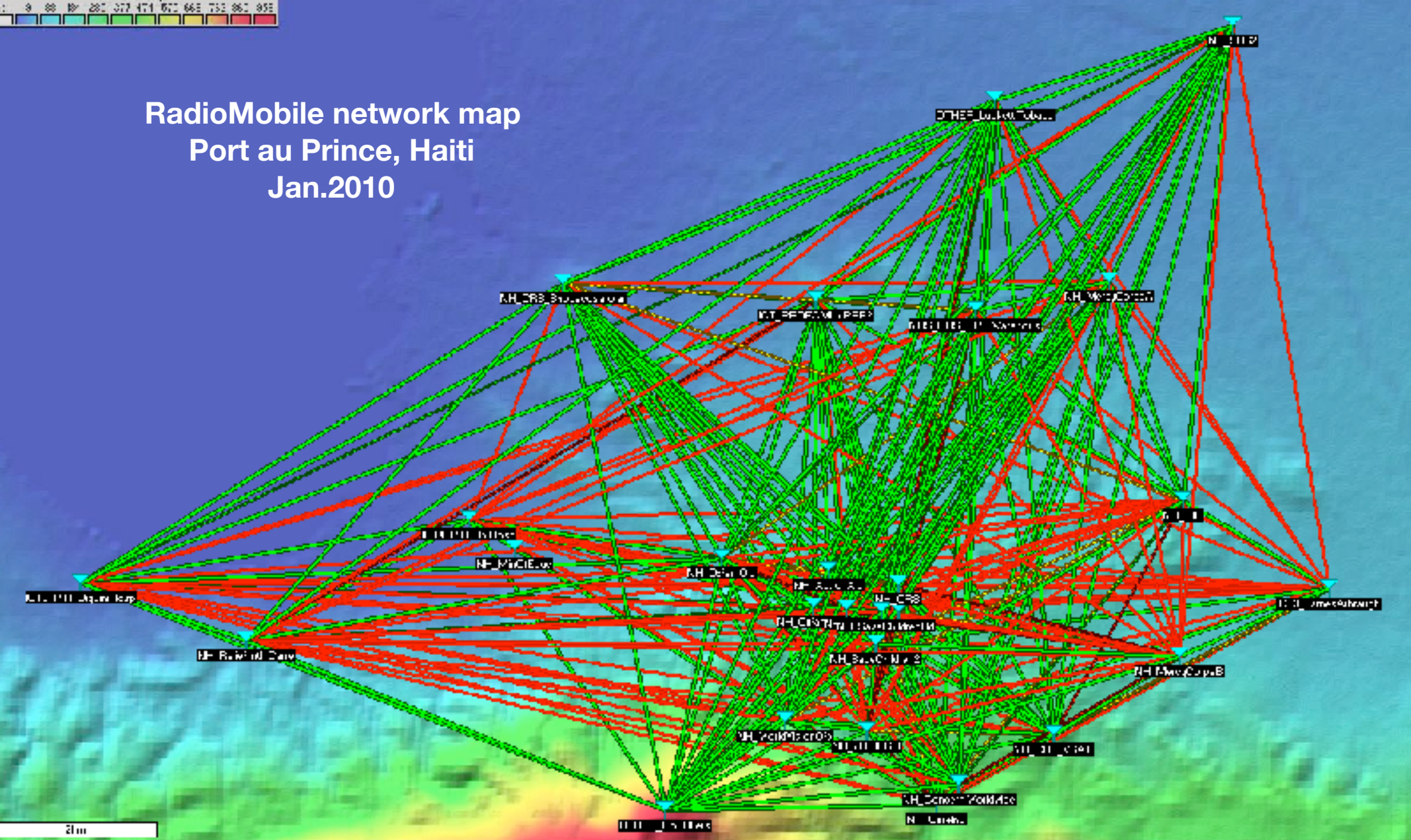
Typhoon Haiyan

Relief Projects

Clients:	United Methodist Communications, Nethope
Location:	Tacloban, Philippines
Project:	Typhoon Haiyan Relief communications
Sector:	Emergency Relief
Scope:	15 locations
Partner:	Local ISPs, UN WFP/ETC
Reach:	50,000 people in region

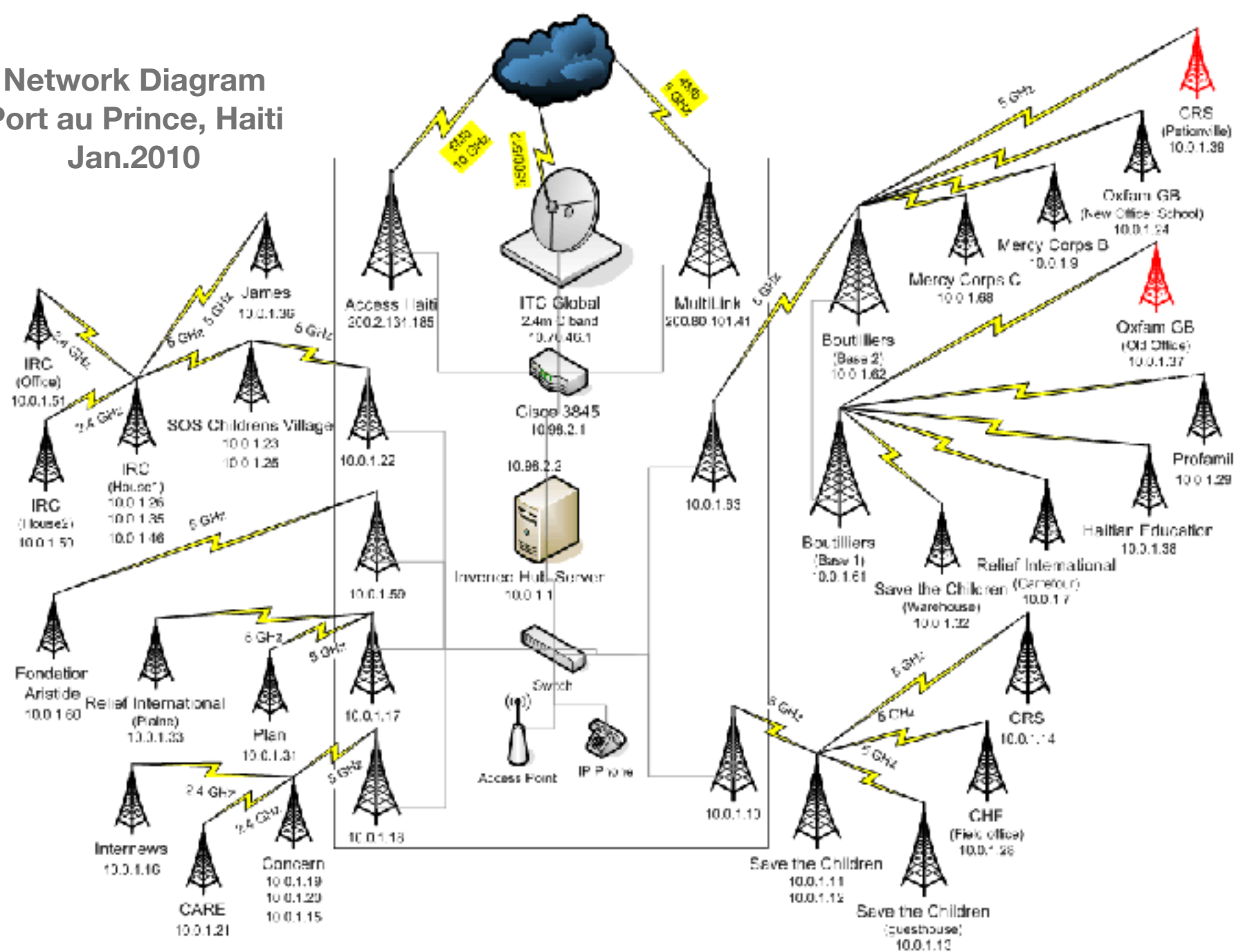


RadioMobile network map Port au Prince, Haiti Jan.2010



Coverage Mapping, Haiti

Network Diagram Port au Prince, Haiti Jan.2010



Network Topology Planning, Haiti

Solution Examples (cont.)



Connected Site
Sierra Leone



Distribution Kit @ Tower site

Ebola Emergency
Relief Projects

Clients: Facebook, Nethope, Paul Allen Family Foundation
Location: Sierra Leone & Liberia
Project: Ebola Emergency Communications Initiative (ERCI)
Sector: Emergency Relief
Scope: up to 100 locations
Partner: Damsel BC Sierra Leone, Techaide Ghana
Reach: 500,000+ people in region



Implementation Methodology

- 1. Discussion with local authorities & knowledge sources**
- 2. Select local tech support partners**
- 3. Site Survey(s)**
- 4. Sourcing appropriate equipment**
 - local preferred, with some imported
- 5. Wait until all equipment is through customs**
- 6. Install equipment & configure**
- 7. Measurement & Evaluation**
 - collect data & monitor
 - survey participants
 - analyze results and report

Devices and Monitoring Tools

- **PCs, tablets, smartphones, misc. devices**
- **Meraki Dashboard*** - Mobile Device Manager, Local AP management / monitoring / remote control VNC
- **Confluence** - Documentation
- **Freshdesk** - Support and Dispatch Ticketing*
- **Teamviewer** - remote control*
- **ArcGIS Online** - Geo analysis & data sharing (*FB team*)
- **Google Earth Pro***
- **smoke ping*** small device or other server
- **fing* & fingbox**

* (free for home/education use)

Demo live tools/sites

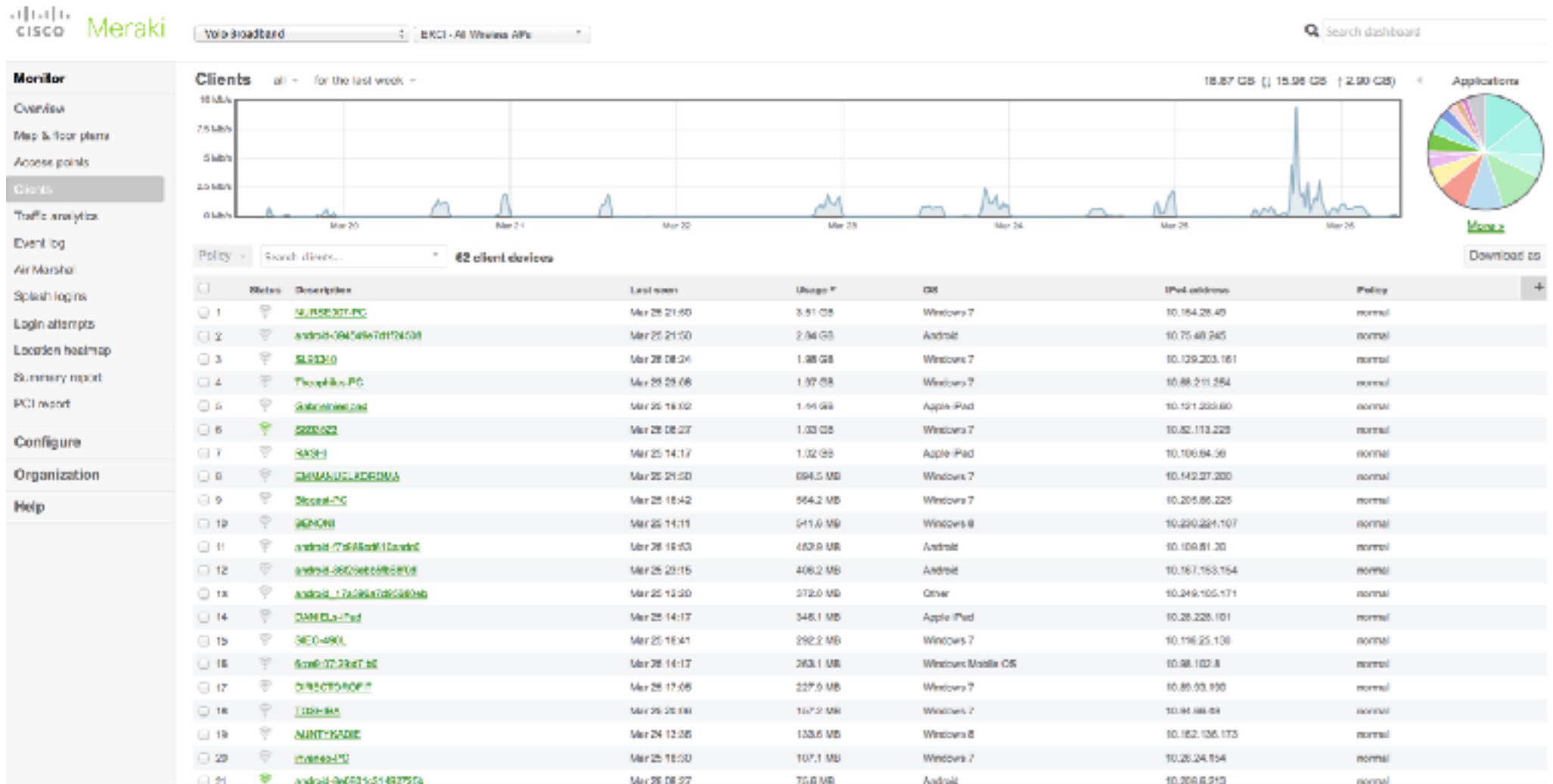
Fing



The screenshot shows the Fing mobile application interface. At the top, it displays the network name '1546 Virginia St network' and the IP range '192.168.15.0/24'. Below this, a list of discovered devices is shown, each with an icon, name, IP address, and manufacturer. The devices include a MikroTik router, an Intel laptop, a Data Robotics printer, an Asus AC3200 router, a Netgear WiFi router, an Asus RT-AC68R router, an Asus ASUS WPS Router, an HP NFI1798D7 printer, an Asus WUFIUR router, a G-PRO Computer, an ASRock media PC, a Sinia Regelsysteme WEBBOX, a Samsung SM-N950U1 smartphone, an Apple BOBS-MBP152014 laptop, a VMware WIN-H40E9_VME2U9 laptop, and a Samsung mobile device.

Icon	Device Name	IP Address	Manufacturer
Router	rizzo.internal.inveneo.org	192.168.15.1	MikroTik
Laptop	lab	192.168.15.2	Intel
Printer	ELMO	192.168.15.3	Data Robotics
Router	AC3200	192.168.15.4	Asus
WiFi	WiFi	192.168.15.5	Netgear
Router	RT-AC68R-E7F0	192.168.15.8	Asus
Router	ASUS WPS Router	192.168.15.10	Asus
Printer	NFI1798D7	192.168.15.11	HP
Router	WUFIUR, Bob, MA.	192.168.15.22	Asus
Laptop	FRAZLE2	192.168.15.25	G-PRO Computer
Laptop	media PC	192.168.15.27	ASRock
Router	WEBBOX15068754	192.168.15.90	Sinia Regelsysteme
Smartphone	samsung SM-N950U1	192.168.15.100	Samsung
Laptop	BOBS-MBP152014	192.168.15.102	Apple
Laptop	WIN-H40E9_VME2U9	192.168.15.106	VMware
Mobile	Mobile	192.168.15.108	Samsung

Cisco/Meraki Systems Manager screen



Relief Projects Ebola Emergency



Demo live sites

1. **fing and (maybe fingbox)**
2. **Meraki Device Manager & VNC**
3. **Teamviewer**
4. **smokeping**

What are we measuring/monitoring?

Yes, devices ...

Yes, network performance ...

Yes, sensors ...

But ... human activities also.

Useful Recommended Android apps

!Because we like to be practical and hands-on!

Wifi Analyzer - Farproc

Network Signal Info (Pro) - KAIBITS GmbH

Wifiheatmap - Wifi Solutions

TeamViewer Quick Support - teamviewer.com (USA)

Fing - Fing UK

Smart tool box - Mehanik (Slovenia)

Electronics Calculator - AppDevGenie (South Africa)

RF Calculator - AppDevGenie

ElectroDroid - IODEMA Srl (electrodroid.it)

RealCalc -(HP-like RPN!) quartic-software.co.uk

Freedome (VPN) - f-secure corp (Finland)

AND ALWAYS - ANTI-VIRUS

preferred: avast - avast.com (Czech republic)

Useful Links - References

www.inveneo.org

www.thesecurityblogger.com

<https://meraki.cisco.com/solutions/mobile-device-management>

www.teamviewer.com

[SmokePing - About SmokePing](#)

Most Importantly — <http://wndw.net/>



Grazie molto

Questions please ...