TakNet Community Network

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TakNet: Last meters access solution

Started in late 2013

15 remote communities

190+ deployed nodes

1000+ residents using our network
Our Technologies

DUMBO[1]

TPlink MR3040
- Coverage: 50-60 m
- WiFi 2.4 GHz
- Usage: Portable, Apply to emergency situation

TPlink AC1750
- Coverage: 100 m
- WiFi 2.4/5 GHz
- Usage: Static and Indoor

Unifi Outdoor AP
- Coverage: upto 200 m
- WiFi 2.4/5 GHz
- Usage: Outdoor, Link to GW

Raspberry Pi
- Micro Server
- Running local services (e.g., chat, VoD)

Wok
- DIY p2p antenna
- Extend the connectivity

Our Services

Authentication

Network Monitoring

Haze monitoring (www.canarin.net)

HD Video Streaming

DUMBO chat
Communicate with line accounts (No1 chat application in Thailand)
“What we do to make TakNet sustain?”
TakNetII Model

- **Net2Home** (Micro ISP) + THNICF
- **intERLab** R&D
- **Local Community**

Our first prototype

Deployment by local ppl

Training the local
**TakNetII Model**

- **Net2Home** (Micro ISP) + THNICF
  - Development cost
  - New products and services
  - Monthly fee
  - Equipments & Installation cost

- **Local Community**
  - Local Technician, Users
  - Technical supports & Training

- **intERLab**
  - R&D

**Description:**
- **Net2Home** offers services to **intERLab** for R&D purposes.
- **Local Community** provides technical supports and training.
- **intERLab** develops new products and services, which are then marketed by **Net2Home**.
- **Net2Home** charges a monthly fee for its services, which includes equipment and installation costs.

**Branding:**
- **Net2Home**
- **THNICF**
- **intERLab**

**Logos:**
- **Net2Home**
- **THNICF**
- **intERLab**

**Notes:**
- TakNetII is a model for sustainable community development through technology and infrastructure.
Traffic Locality in TakNet?

Social Communications

81% of Line users have local contacts within the same village

10-20% of messages exchanged among local users[1]

BUT!

Local traffic is not yet optimised

TakNet environment: Hill tribe, Foliage, NLOS

Not applicable with WiFi

TakNet with TVWS

- Research grant funded by Thai regulator
- License: 470 - 790 MHz
- Trial experiments on TV white space
- Carry out TVWS spectrum measurements to build WSDB

TVWS deployment

Spectrum usage in TakNet 1
Extending the network coverage?

Some houses were abandoned

- WiFi signal (Mesh) is not sufficient
- Too much multi hop (3 hops max)
- NLOS
**LTE Small Cell Solution**

- Collaborating with Microsoft research, UK
- Utilises the excellent radio characteristics of TVWS to cover the gap that CWMN could not support.

- LTE small cell on the UHF 700 band
- 75/25 Mbps bandwidth
- maximum 16 active users
- Coverage area 4 km.

- PAWS
- FAB
- SCTP AGENT

- Mobile Core VM (EPC) - Singapore
- Mobile Core VM (EPC) - HK

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TakNetII architecture

Value added services
(Local apps: Barter trading, chat, IoT, etc.)

Content Distribution
(CDN + Local IX)

Middle mile access
(TVWS)

Last meter access
(CWMN + LTE)

Content
Distribution

Internet

Gateway

VPN

Gateway

IXP (BKNIX)

Content Server

ISP

CDNs Provider

Content Providers

CWMN

LTEoTVWS

LTE-BS

L2-Switch

TVWS-CPE

TVWS-BS

Content Server

Local apps:
Barter trading, chat, IoT, etc.
Takeaways

• **Strong collaboration** of three main players
  
  • R&D team (intERLab), Micro ISP (Net2Home) and local community’s participation

• **Simple technology:** Technical maintenance and installation are handled by local technicians with support from the Net2Home and intERLab teams

• **Engage with local community:** Technology transfer, Create revenue for local tech, HW ownership

• **TakNet is growing:** 1 village/year (2013-2016), 11 villages: 2017 & 2018 (new model)
Next ...

Net2Home (Micro ISP)

- Development cost
- New products and services
- Equipments & Installation cost
- Monthly fee ...

Local Community
- Local Technician, Users

intERLab R&D

- Technical supports & Training

New products and services
Our Team

Kanchana
Mongkol
Apinun
Atthaphongse
Nunthaphat
Preechai
Nisarat
Adisorn

Thank you!
Thank you

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