Connecting Remote CNs to an IXP

by

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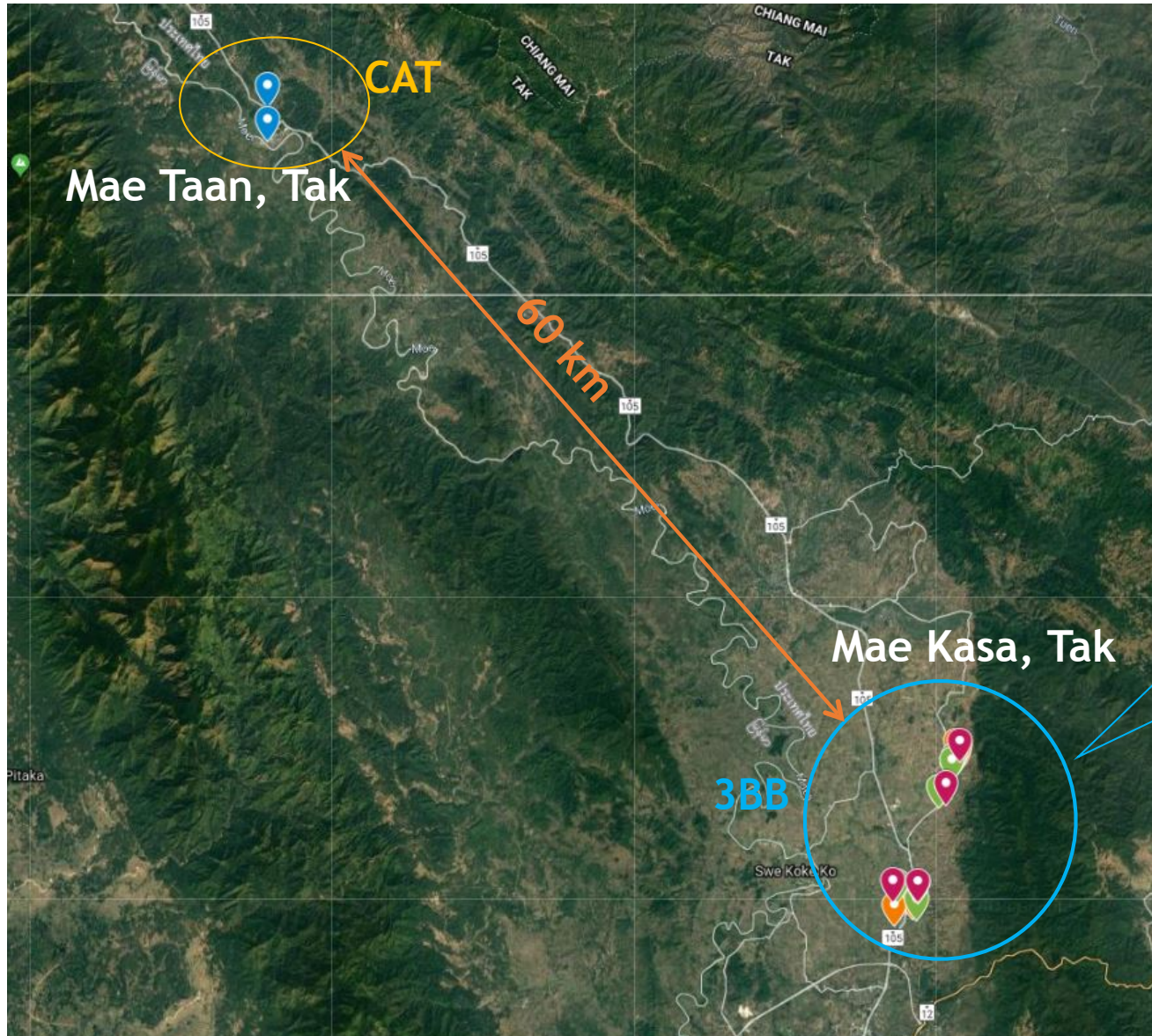Nunthaphat Weshsuwannarugs, *intERLab, AIT*
Viraphan Samadi, *intERLab, AIT*
Sahasachai Kongjue, Tawee Sribuddee, Parkpoom Tripatana, *Net2Home*
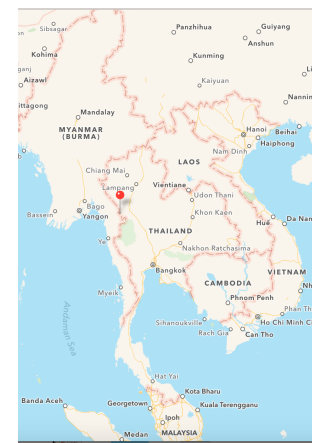Kittinan Sriprasert, *BKNIX*

THAILAND

TakNet Map

CAT

Mae Taan, Tak

60 km

Mae Kasa, Tak

3BB

2

TakNet CWMN

Thai Samakhee (First TakNet village) is a small rural village in the northwest of Thailand

50 households with 300 populations

Before 2013

2 ADSL links provided by one ISP

$33/month for a subscription

less than **10** villagers had Internet at home

TakNet CWMN

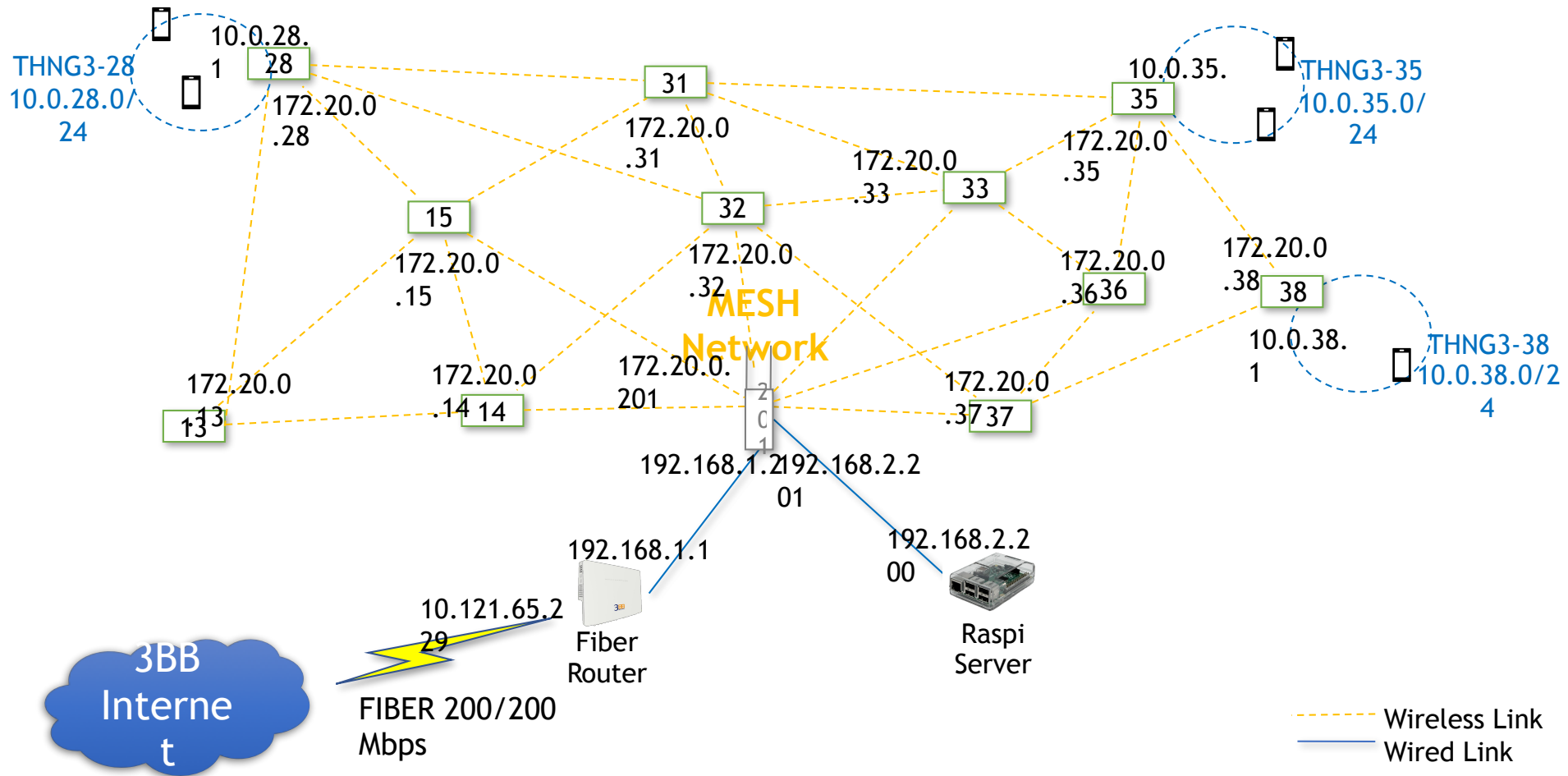**E**xpanded to **21** sites (as of October 2019)

Internet cost is shared among villagers

$8/month for a subscription

**A**ttract villagers to use the Internet

~1100+ active users

3

Example: Thai Samakkee

THNG3-28
10.0.28.0/24

10.0.28.1

28

172.20.0.28

31

172.20.0.31

15

172.20.0.15

172.20.0.13

13

172.20.0.14

14

32

172.20.0.32

172.20.0.201

172.20.0.33

33

10.0.35.

35

172.20.0.35

THNG3-35
10.0.35.0/24

172.20.0.36

36

172.20.0.37

37

172.20.0.38

38

10.0.38.1

THNG3-38
10.0.38.0/24

MESH Network

201

192.168.1.201

192.168.2.201

192.168.1.1

192.168.2.200

Fiber Router

Raspi Server

10.121.65.229

3BB Internet

FIBER 200/200 Mbps

- - - - Wireless Link
——— Wired Link

Net2Home: a community ISP

- **Type 1** ISP:

  - Infrastructure: No network
  - Service Provided: Internet access
  - Service Areas: entire country
  - Types of Users: general

- Shareholders: open to all community network members

Net2Home: an ISP
w/o Network Infrastructure

TakNet
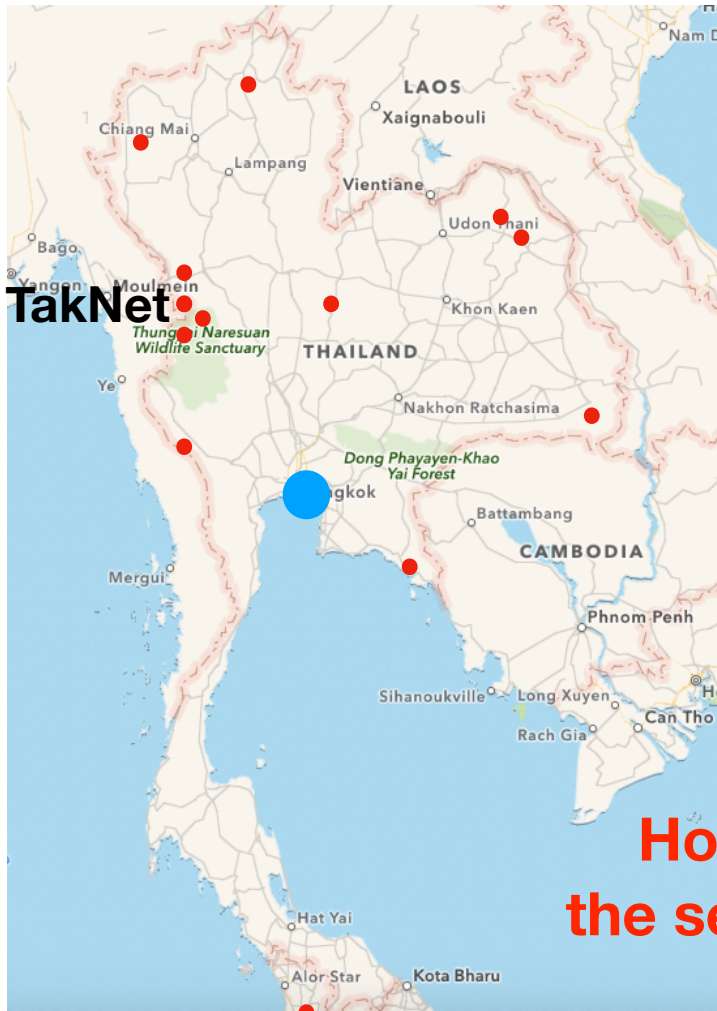
Each CN connects to commercial ISPs with networks

How can CN exchanges content among themselves?

How can CNs share common resources/services?

How can Net2Home manage the services fairly and effectively?

Why connecting to an IXP?

- Net2Home has many gateways connecting to different ISPs; some are on neutral IXPs while others may not

- More local content providers likely to share content via IXPs

- Provide a direct connection means an ability to control routing

- Enabling domestic exchanges among Net2Home members and BKNIX members

Effective Bandwidth Utilization

- Users share common interests: "in trend" movies, TV programs, music as well as educational materials

- Proxy and cache servers

- Common services for ALL CNs include

  - Exchanges of local content among CNs

  - Cloud service

  - Peering with other IXP members

HOW?
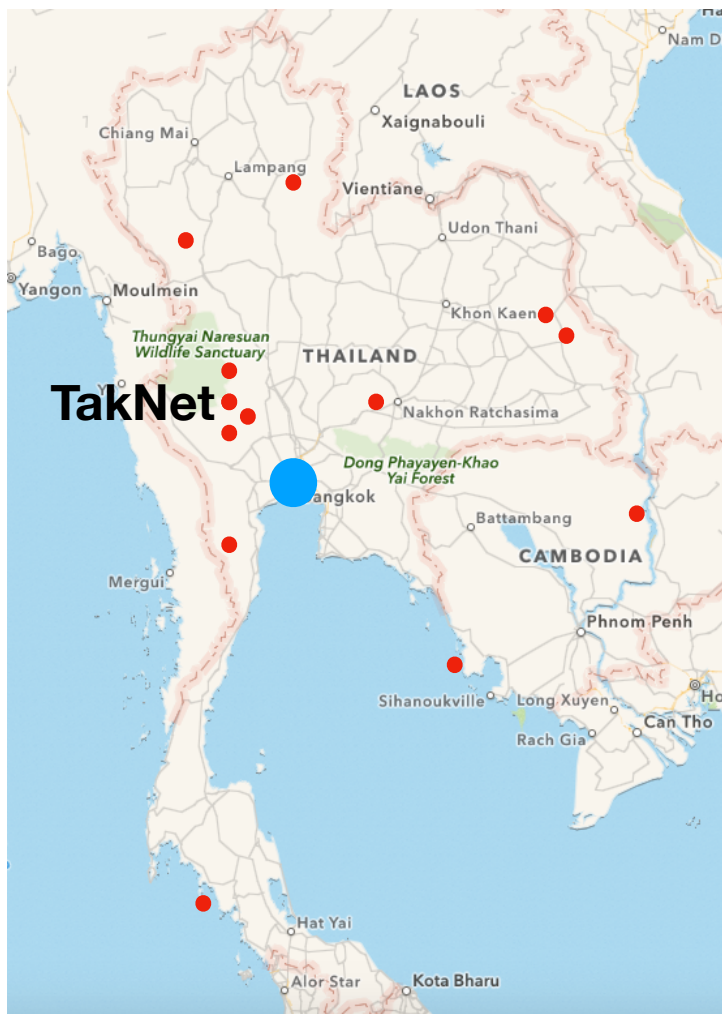
Use IP tunnelling to direct traffic between gateway of CN and Net2Home border router

Use Proxy and Cache at each CN

Towards Micro DC at CN level and reverse proxy at Net2Home gateway to IXP

=> CNs on IXP

InteERLab
Internet Education and Research Laboratory

CDN1

Local
Content

CDN2

ISP_ix_1
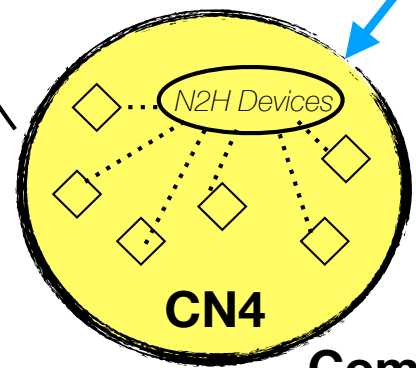
ISP_ix_n

Community
IX
BKNIX

ISP_ex_1

ISP_ix_2

ISP_ex_2

*N2H Border
Router*

N2H Devices

CN1

N2H Devices

CN3

AS137856

N2H Devices
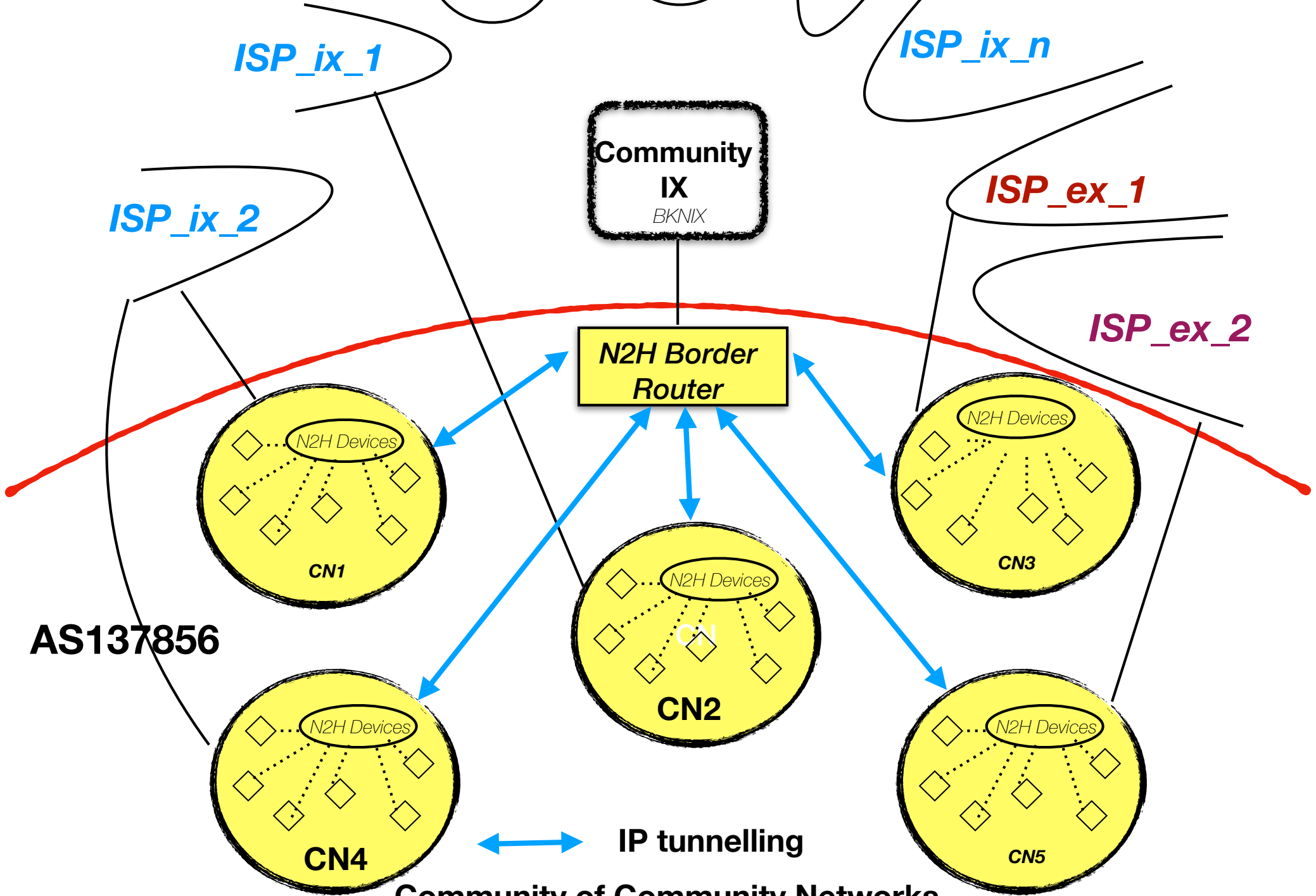
CN2

IP tunnelling

N2H Devices

CN4

N2H Devices

CN5
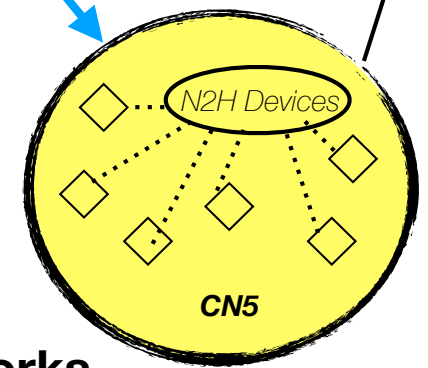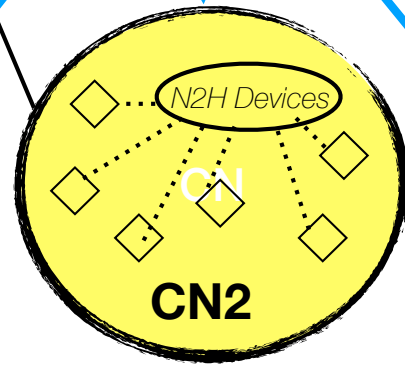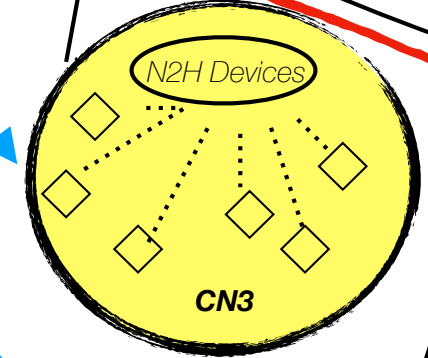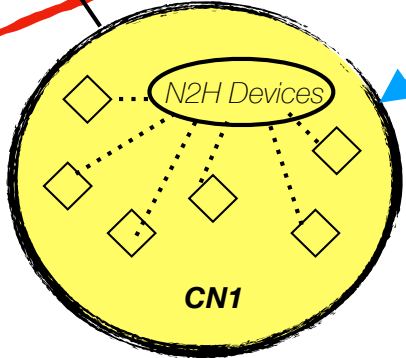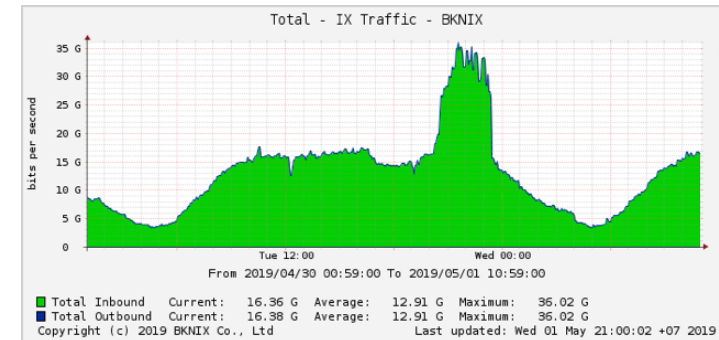
Community of Community Networks

BKNIX: a community IXP

- Established : 21 Feb 2015

- Number of members : 29 ASNs

- Traffic : 36.02 Gbps (Peak) / 12.47 Gbps (avg.)

- Website : bknix.co.th

Total - IX Traffic - BKNIX

From 2019/04/30 00:59:00 To 2019/05/01 10:59:00

	Current:	Average:	Maximum:
Total Inbound	16.36 G	12.91 G	36.02 G
Total Outbound	16.38 G	12.91 G	36.02 G

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Ongoing developments...

- Content delivery on N2H

    - Cache for popular content

    - Reverse proxy to promote local content

- Local services

    - แบ่งปั๋น platform for resource sharing

Acknowledgements

- THNIC Foundation
- Team members at
    - intERLab AIT
    - Net2Home
    - BKNIX
- TakNet members

Thank You
ขอบคุณค่ะ