



ThaiREN/UniNet/ThaiSarn



Introduction of Education and Research Network in Thailand

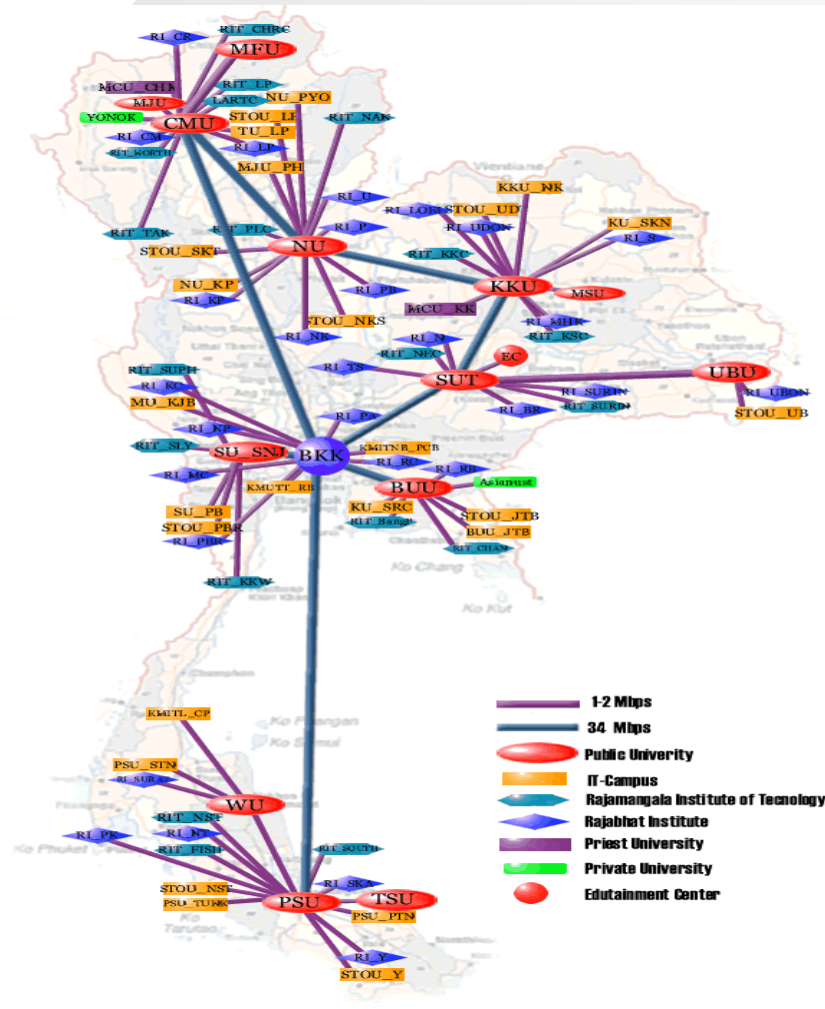
ThaiREN/UniNet NOC

Email: noc@thairen.net.th



University Network (UniNet)

Ministry of University Affairs has launched UniNet in 1996 as Academic and Research Integrated Network providing information and communication technology infrastructure accessible by all Universities across the country.





About UniNet

- ❖ UniNet is the largest internet provider for Thai educational institute.
 - Established in 1996 as a part of Ministry of University Affairs
 - Now is under Ministry of Education
- ❖ UniNet provides hi-speed internet links to universities, educational institutes
 - For advanced research
 - Education and learning

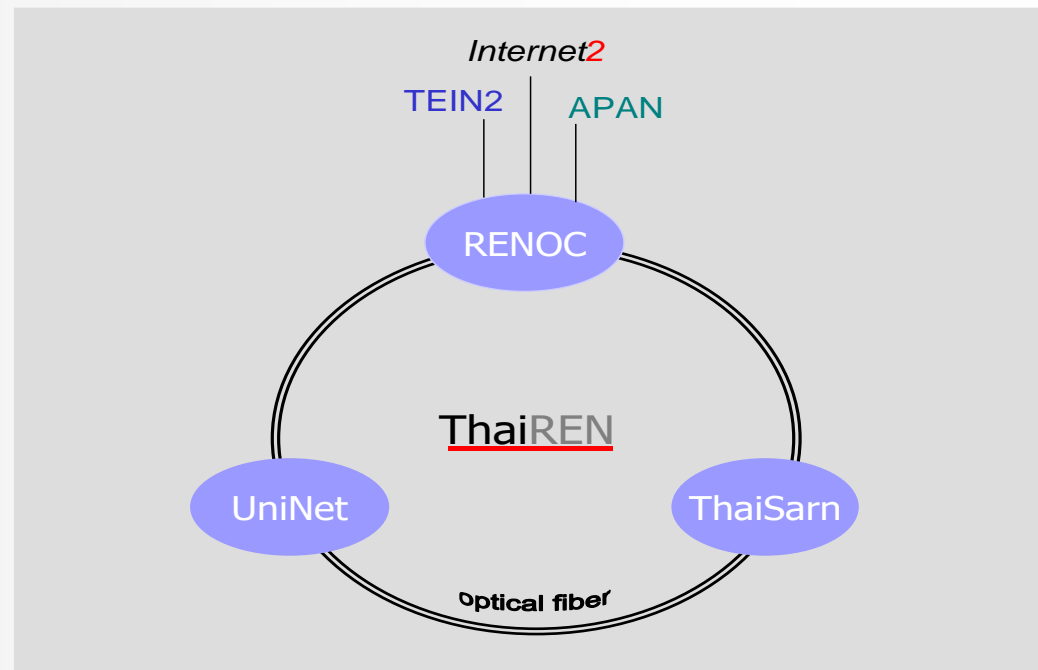




Thailand Research Education Network

ThaiREN

Thai Research and Education Network



- ThaiREN was established in 2005 to coordinate among research and education networks in Thailand as well as collaborate with international R&E networks.



Thailand Research and Education Network

The ThaiSarn and UniNet combined networks as “ThaiREN” for Research and Education purposes.

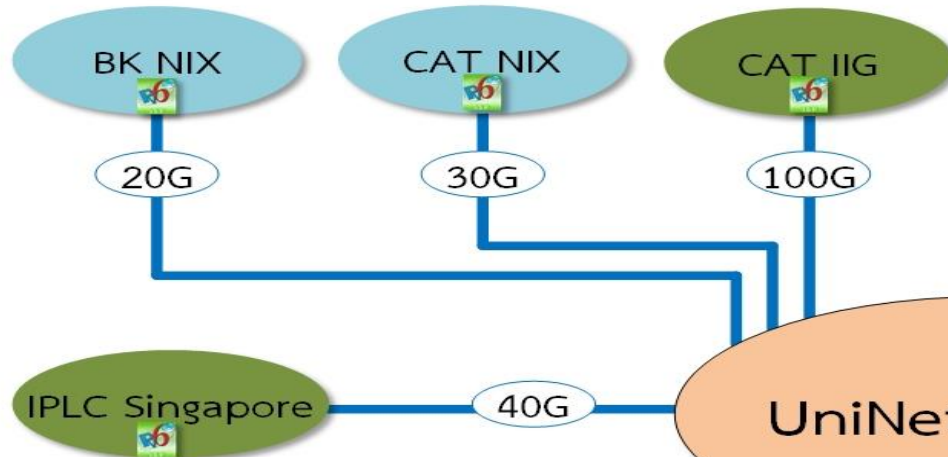
ThaiSarn connects government institutes for research activities and project collaborations.

UniNet currently connects most higher education universities as well as cover more than 7,000 basic education schools and vocational institutions in Thailand. In the near future, the National Education Network (NEdNet) will serve as a sole information networking system to education institutions at all levels under the Ministry of Education. NEdNet will enhance the capacity of the network to cover more than 10,000 school areas.

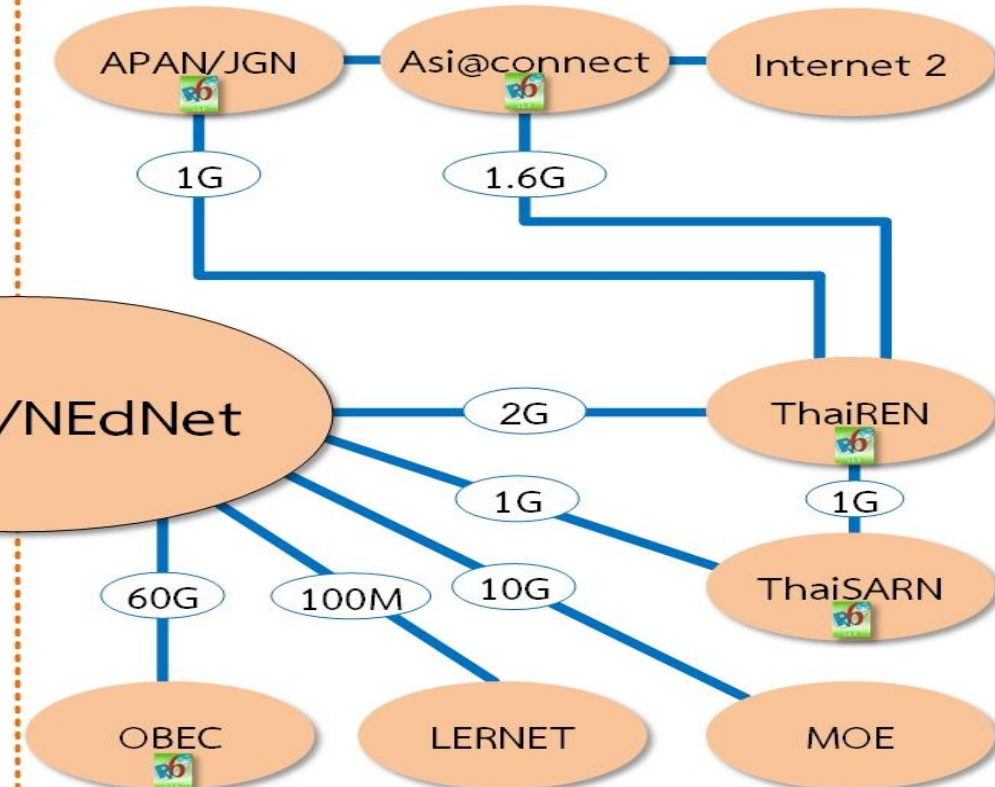


UniNet Peering Diagram

Peering Internet Map

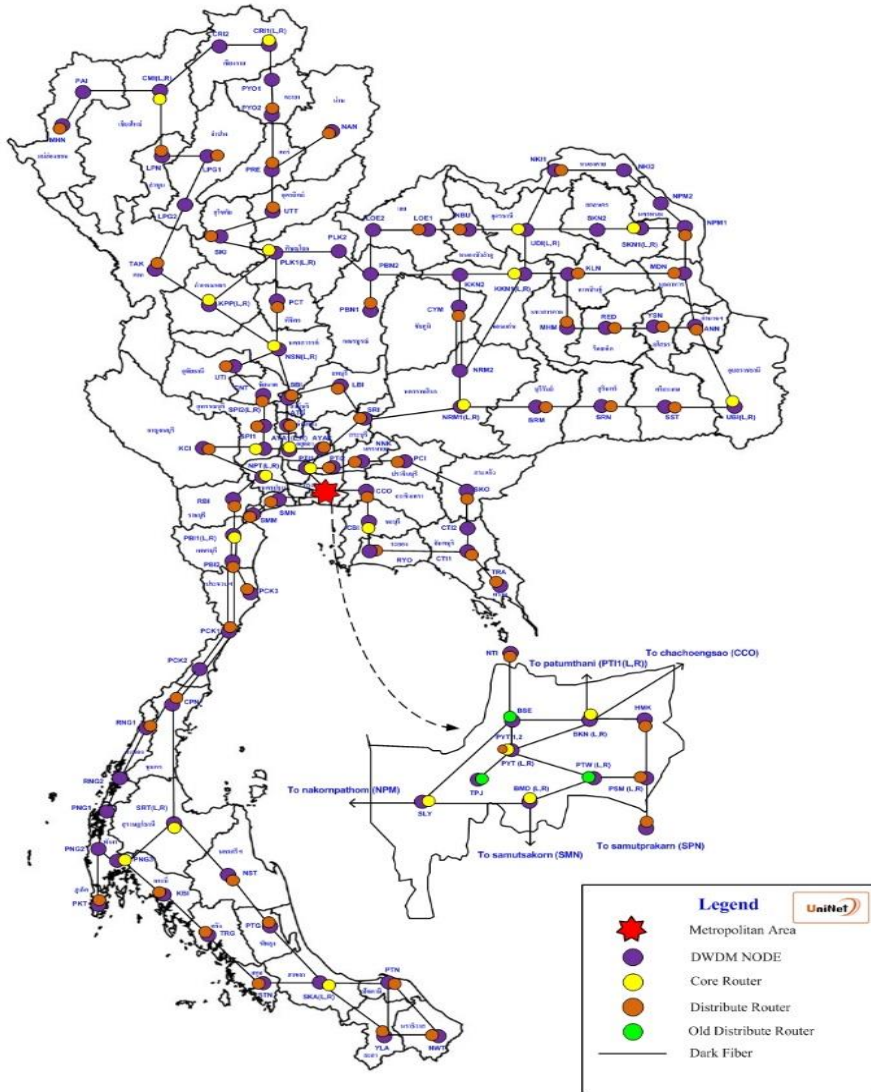


Research and Education Network





UniNet Backbone Network Diagram



NEdNet Backbone (UniNet2)

Node	Size	Bandwidth	Nodes
Super Node	Bangkok	50 Gbps	6 Nodes
	Regionals	(100G in 2019*)	18 Nodes
Province Node	Size XL	N*10 Gbps	90 Nodes
	Size L	10 Gbps	
Distribution Node	Size XL	10 Gbps	1,500 Nodes
	Size L	N*1 Gbps	
Last mile	Size XL	1 Gbps	10,000
	Size L	100 Mbps	Nodes



Bangkok Neutral Internet Exchange

The screenshot shows the BKNIX website with the following content:

- News**
- BKNIX BGP/IXP Workshop**
Bangkok Neutral Internet Exchange(BKNIX) together with Internet Education and Research Laboratory (intERLab) of Asian Institute of Technology(AIT) and Network Startup Resource Center (NSRC) organize a workshop on the topic of BKNIX BGP / IXP Workshop on 20-23 April 2015 at the Sivatel Hotel, Bangkok
[Read more](#)
- BKNIX Launch**
Monday 9 February 2015 BKNIX launch caremony 10.00 A.M.- 01.00 P.M.
The Peninsula Bangkok Hotel,Room:Sakuntala A.
[Read more...](#)
- Logos on the right side:**
 - IIJ Internet Initiative Japan
 - Internet Society
 - NECTEC a member of NSTDA
 - NSRC Network Startup Resource Center

The browser window shows the URL <https://bknix.co.th/en/> and the Windows taskbar at the bottom with the date 9/7/2558 (Buddhist Era) and time 12:04.



About BKNIX

Screenshot of the BKNIX website showing a list of members.

Browser address bar: <https://bknix.co.th/th/index.php?module=service&content=1>

Page Title: Waiting for bknix.co.th

Navigation: File Edit View Favorites Tools Help

Search: Google bknix

Tools: Free Plagiarism Checker O..., Suggested Sites, 1. WildTangent ORB, 2. Norton Security Cen..., Web Slice Gallery

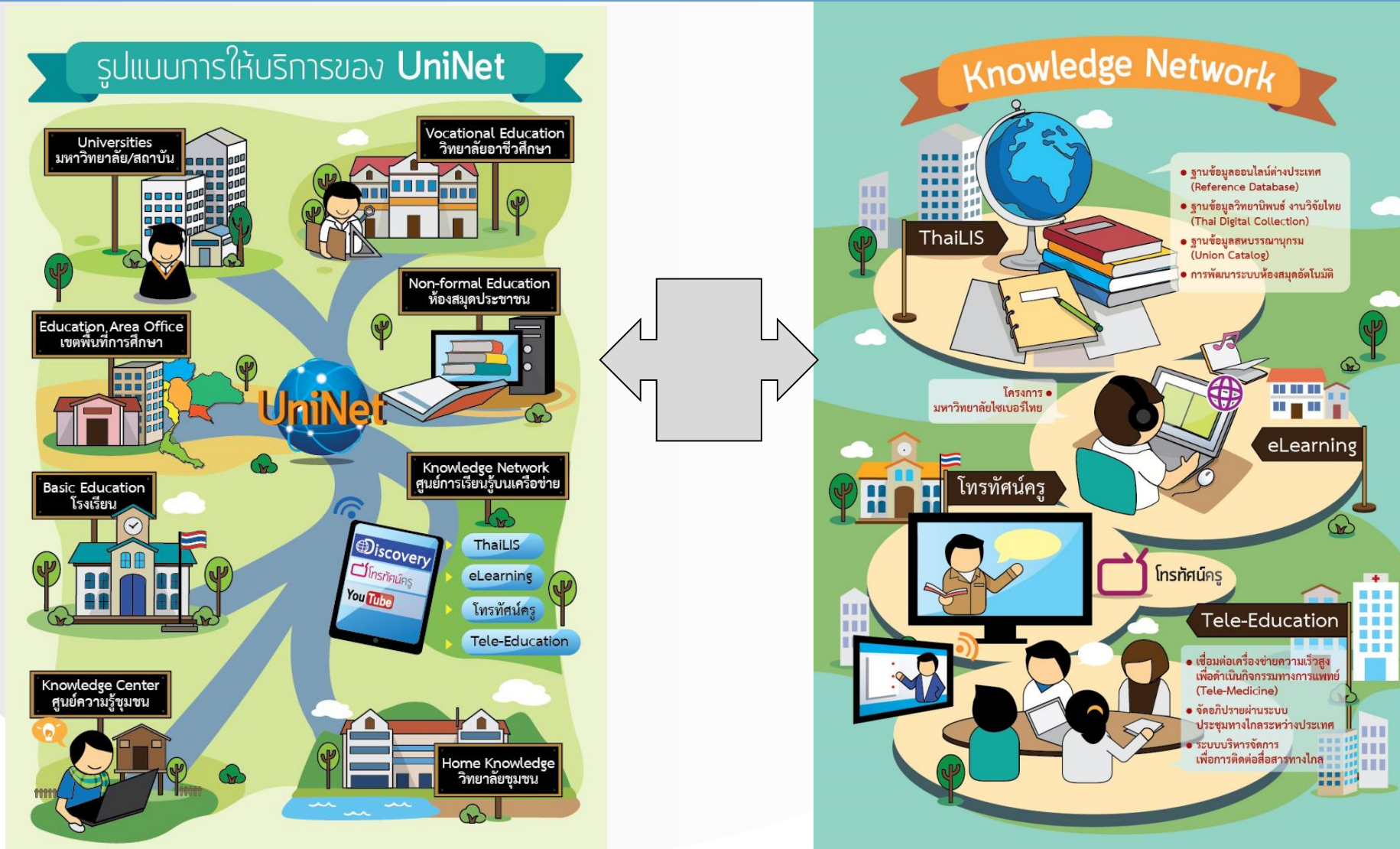
สมาชิก

Member	Website	AS Number	Port Speed	Policy	Peering E-mail
3BB	http://www.3bb.co.th/3bb/	45758	10GE	open	
Bangkok Neutral Internet Exchange Point	http://www.bknix.co.th/	63528	10GE	open	peering@bknix.co.th
BB Connect Co., Ltd.	http://www.bbconnect.co.th	45796	10GE	open	peering@bbconnect.co.th
TCC Technology	https://www.tcc-technology.com/	45667	10GE	open	gateway.ne@tcc-technology.com
TT&T	http://www.ttt.co.th/index.html	55465	1GE	open	ni@ttt.co.th
Uninet	http://www.uni.net.th/UniNet/index.php	4621	10GE	open	noc@uni.net.th
Verisign	https://www.verisigninc.com	26415	10GE	open	peering@verisign.com

Taskbar: 114%, 12:00, 9/7/2558

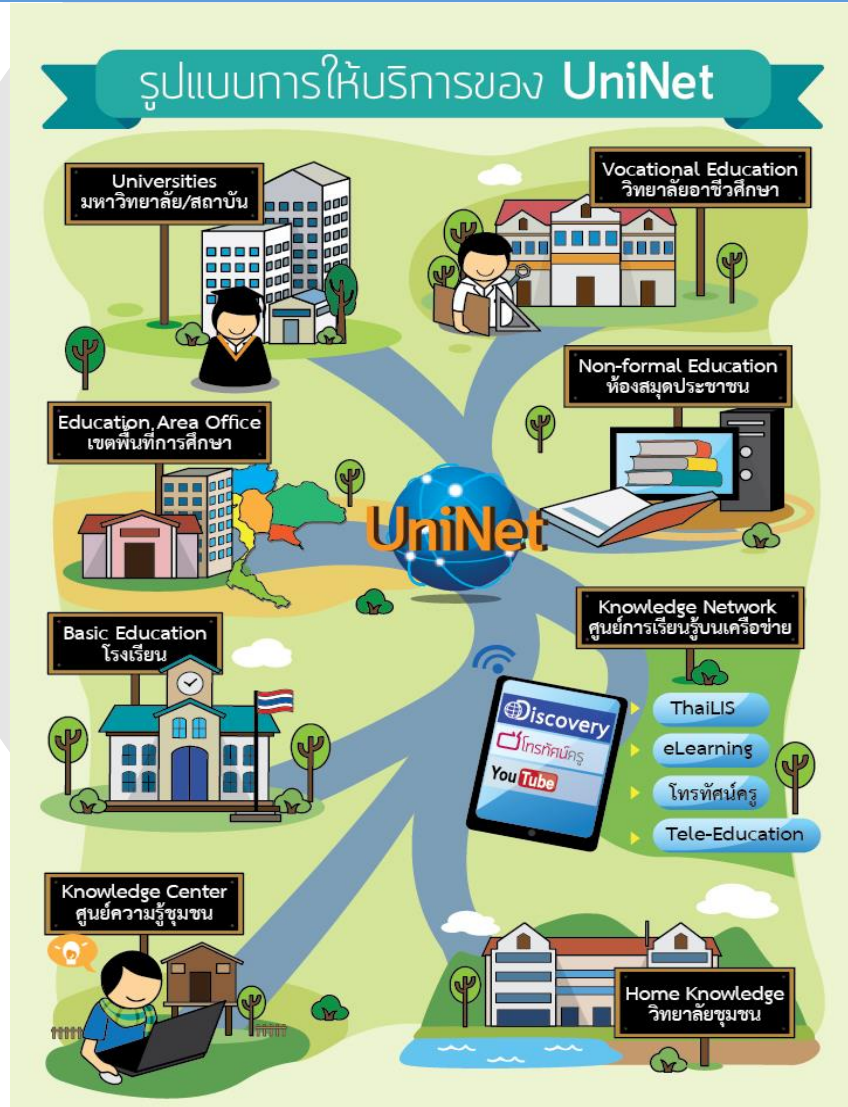


UniNet Service





UniNet Services



■ Internet Services

- International Internet Gateway (IIG)
- National Internet Exchange (NIX)
- National Research and Education Network (NREN)



UniNet Services



■ Knowledge Network

- Union Catalog
- Thai Digital Collection
- Reference Databases
- Thai Cyber University
- Teacher TV
- Video Conferencing Systems
- eduroam
- Thai MOOC
- E - Learning



Member of UniNet/NEdNet (2009-2018)

Members	Number of Member
Universities/Institutes	223
Vocational Education	426
Educational Service Area	227
Basic Education (schools)	9,598
Municipality Public Library	151
Research and other Education	172
Total	10,797

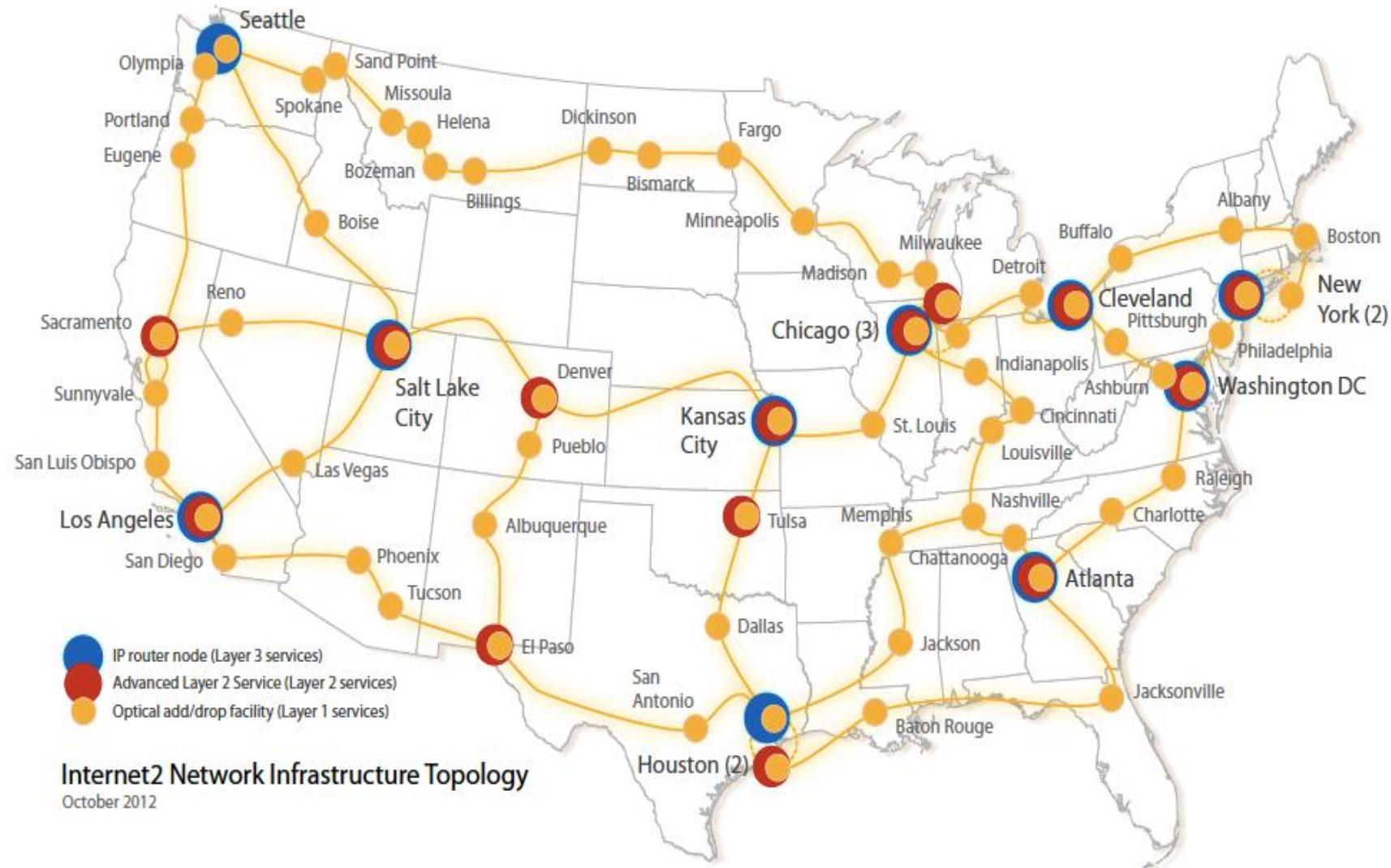
Millions of users!



Research and Education Collaborations



Internet2 (<http://www.internet2.edu>)





TEIN Network collaboration



Connecting
Asia and Europe's
Research and Education
Communities

www.tein.asia

TEIN Project Partners

AF Afghanistan	ID Indonesia	NZ New Zealand
AU Australia	JP Japan	PK Pakistan
BD Bangladesh	KR Korea	PH Philippines
BT Bhutan	LA Laos	SG Singapore
CH Cambodia	MM Myanmar	LK Sri Lanka
CN China	MN Mongolia	TH Thailand
HK Hong Kong	MY Malaysia	TW Taiwan
IN India	NP Nepal	VN Vietnam

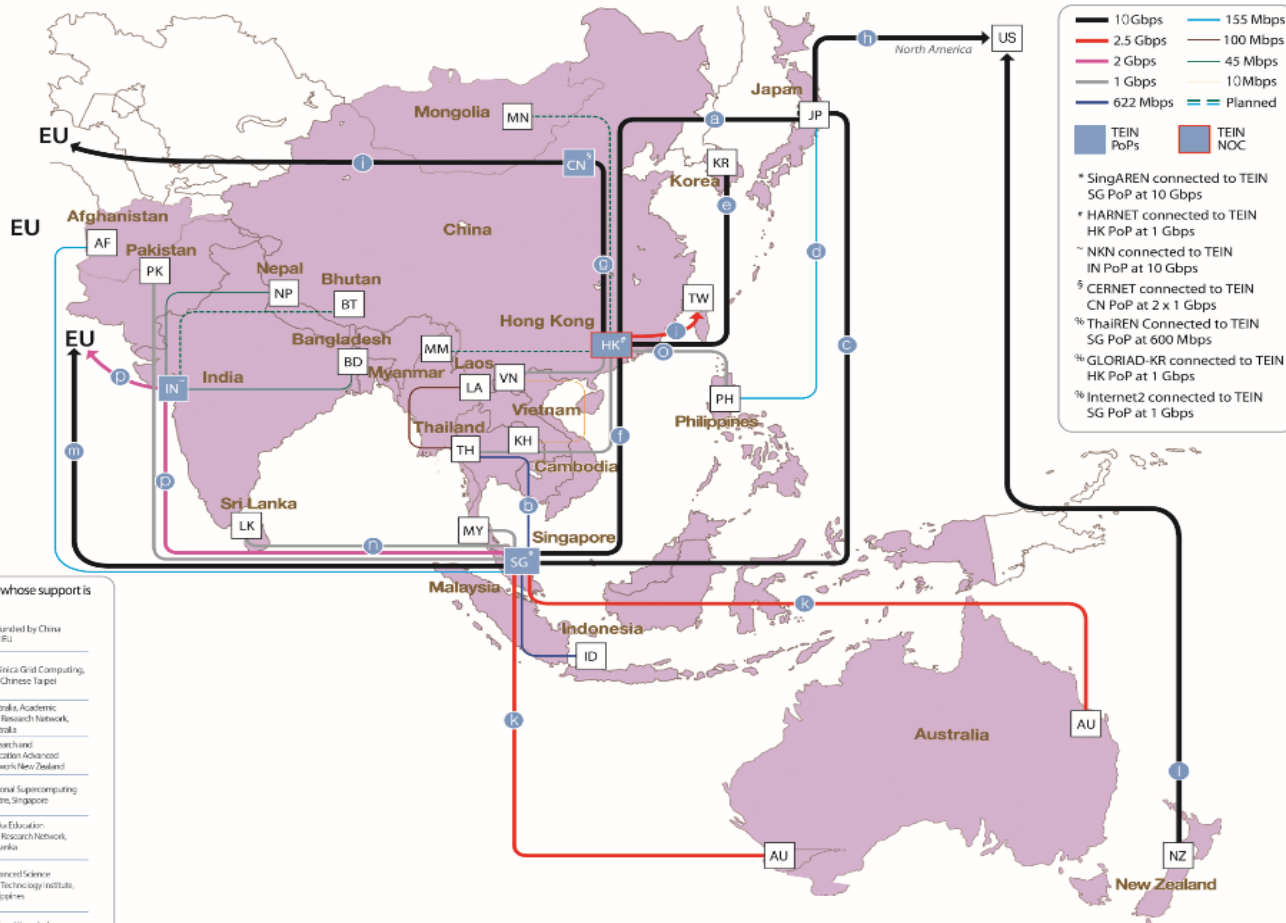
The following links are fully financed/co-financed by the link owners whose support is gratefully acknowledged

a NICT National Institute of Information and Communications, Japan	i ORIENT co-funded by China and EU
b NICT National Institute of Information and Communications, Japan	j ASGC Academia Sinica Grid Computing, Republic of China Taipei
c NICT National Institute of Information and Communications, Japan	k AARNET Australia Academic and Research Network, Australia
d MAREF Ministry of Agriculture, Forestry and Fisheries Research Network, Japan	l REANZ Research and Education Advanced Network New Zealand
e NIA National Information Society Agency, South Korea	m NCS National Supercomputing Centre, Singapore
f NIA National Information Society Agency, South Korea	n LEARN Lanka Education and Research Network, Sri Lanka
g CERNET China Education and Research Network, China	o ASTRON Advanced Science and Technology Institute, Philippines
h CERNET China Education and Research Network, China	p RIN National Knowledge Network, India

As of January 2018



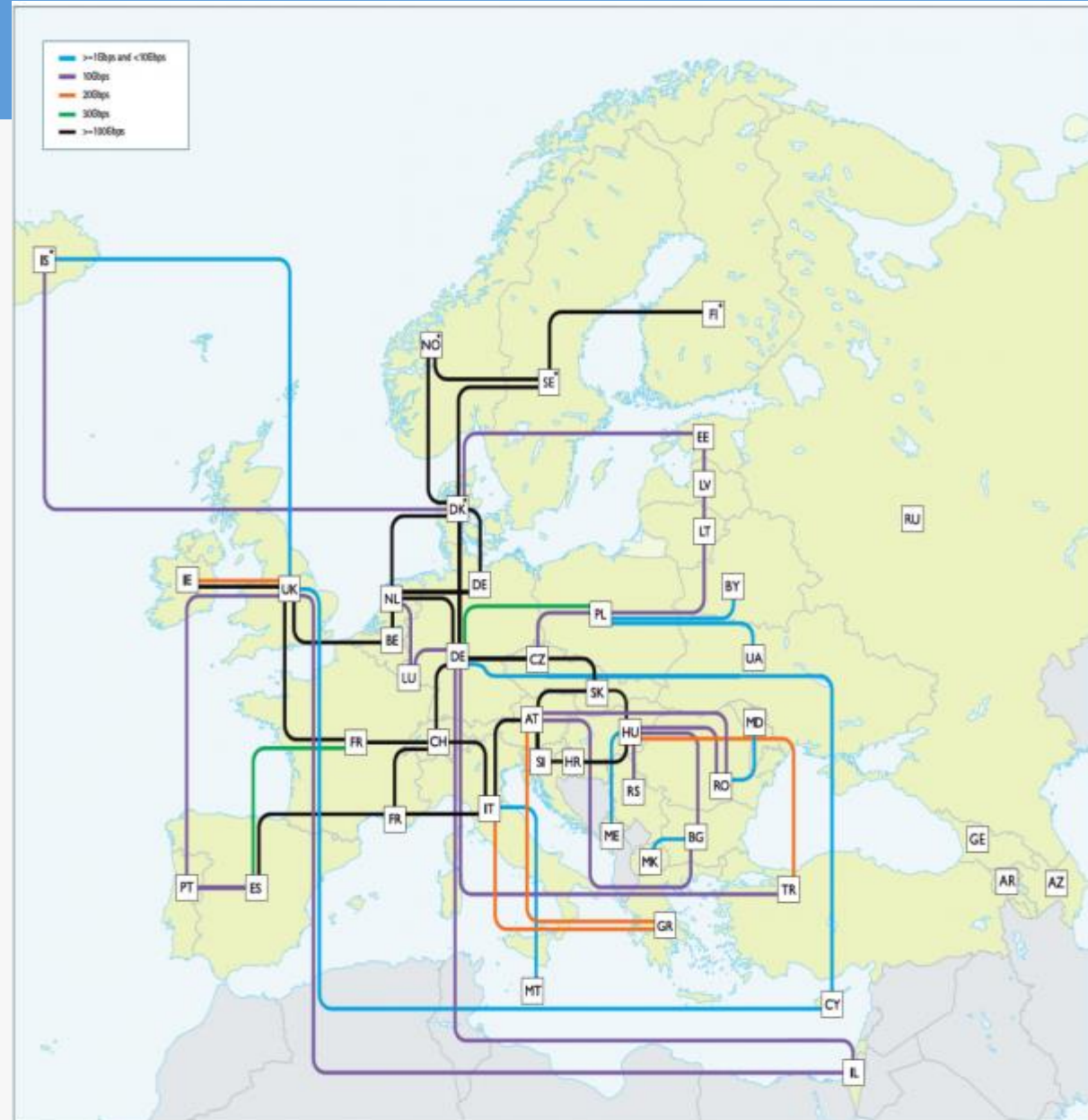
TEIN is co-funded by the European Commission through the Directorate-General for Development and Cooperation-EuropeAid



- * SingAREN connected to TEIN SG PoP at 10 Gbps
- * HARNET connected to TEIN HK PoP at 1 Gbps
- ~ NKN connected to TEIN IN PoP at 10 Gbps
- § CERNET connected to TEIN CN PoP at 2 x 1 Gbps
- 16 ThaREN Connected to TEIN SG PoP at 600 Mbps
- 16 GLORIAD-KR connected to TEIN HK PoP at 1 Gbps
- 16 Internet2 connected to TEIN SG PoP at 1 Gbps

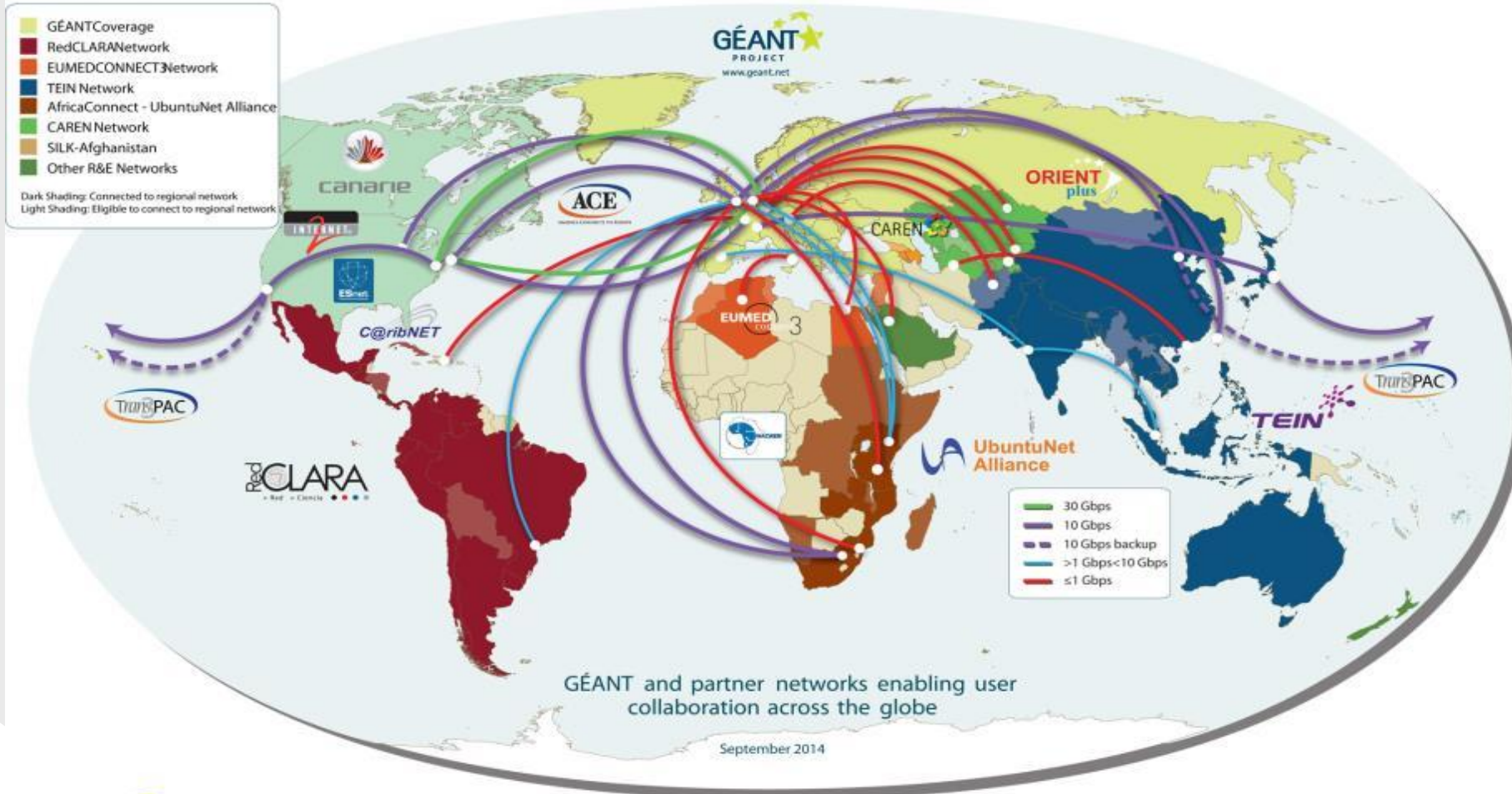


GÉANT





At the Heart of Global Research and Education Networking

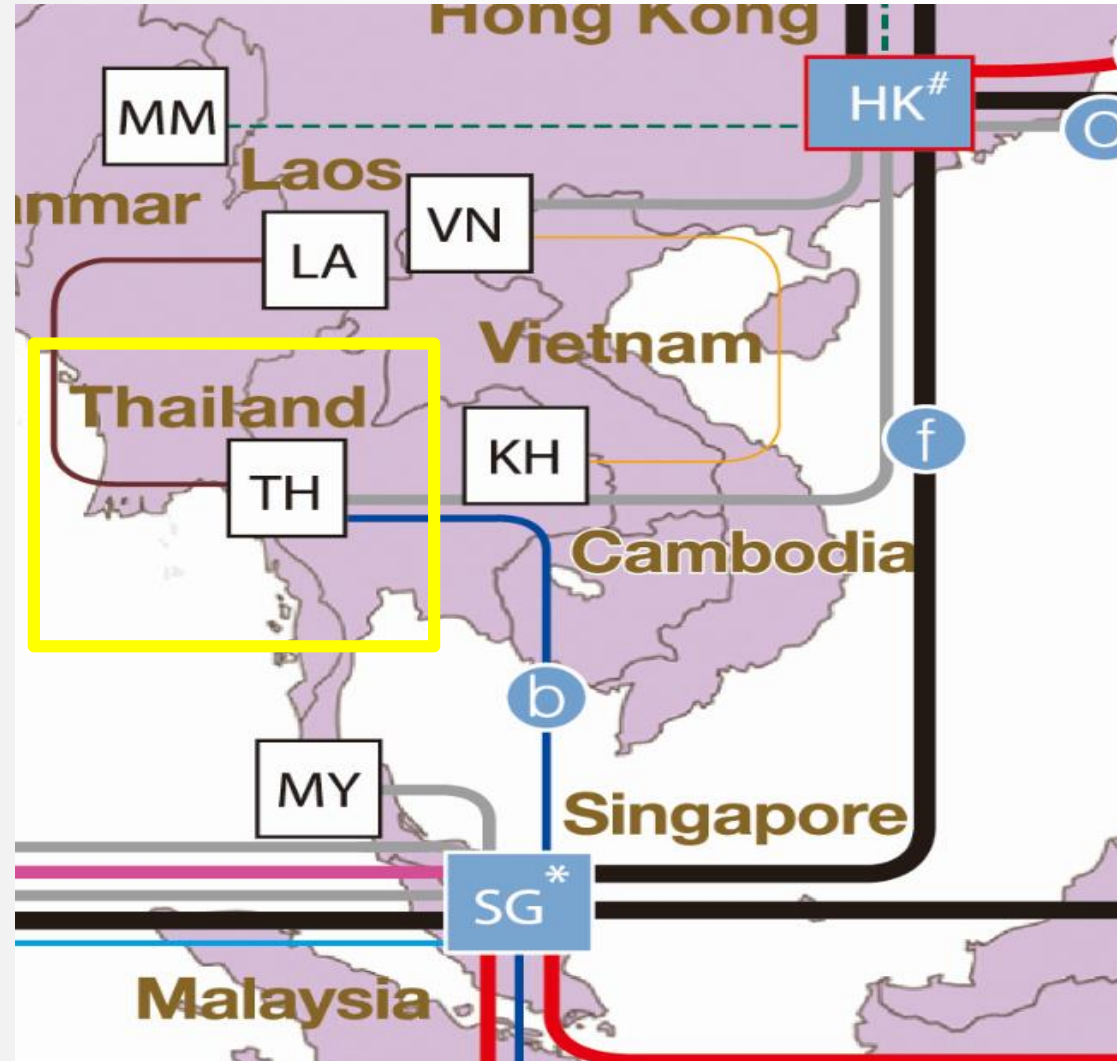


connect • communicate • collaborate
GÉANT is co-funded by the European Union within its 7th R&D Framework Programme.





TEIN Network collaboration



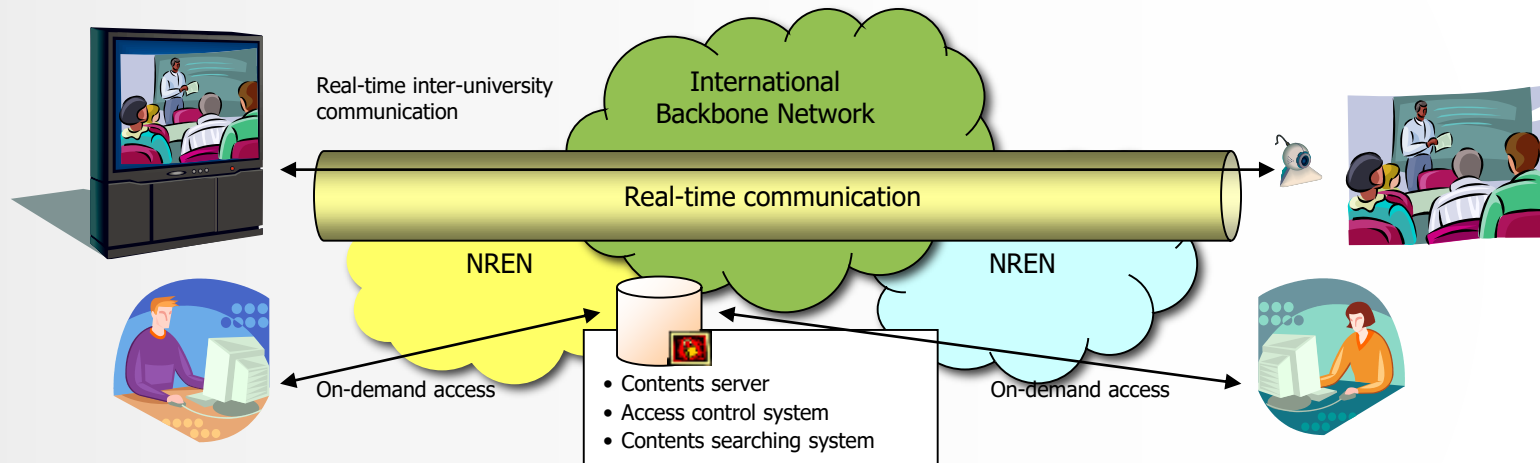


Research and Education Activities



Tele-Education

- ❖ Students can attend virtual classes that look as if they are attending in the same classroom.





Tele-Meeting

Meeting between community colleges of nationwide.

The screenshot displays a SCOPIA Desktop tele-meeting window. The title bar reads "SCOPIA Desktop - BCC - 66456". The interface includes a top toolbar with icons for Raise Hand, View, Present, and Moderate. On the left, a "Participants (10)" list shows: UniNet, 9999, Bcca, maehongson, moniter, nancc, PHICHIT, Phrae_CC, Samutsakorn_CC, and TAK_CC. Below this is a "Chat" window with a "Public" chat area. The main display area shows a presentation slide titled "Education for all Community College All for education" with a logo. The slide content includes sections for "ข้อมูลพื้นฐาน" (Basic Information), "ข้อมูลทรัพยากร" (Resource Information), "Report", and "Lookup". On the right side of the main display, there are four video thumbnails labeled "Phrae CC", "Samutsakorn_CC", "maehongson", and "nancc". At the bottom, there are three more video thumbnails labeled "PHICHIT", "Pattanee", and "TAK_CC". The bottom right corner of the window shows "HD" and a system tray icon.



Tele-Consultant



Interhospital Pediatric Oncology Conference in collaboration with

- Phramongkutklao Hospital
- Chiang Mai University
- Khon Kaen University
- Ubon Ratchathani University

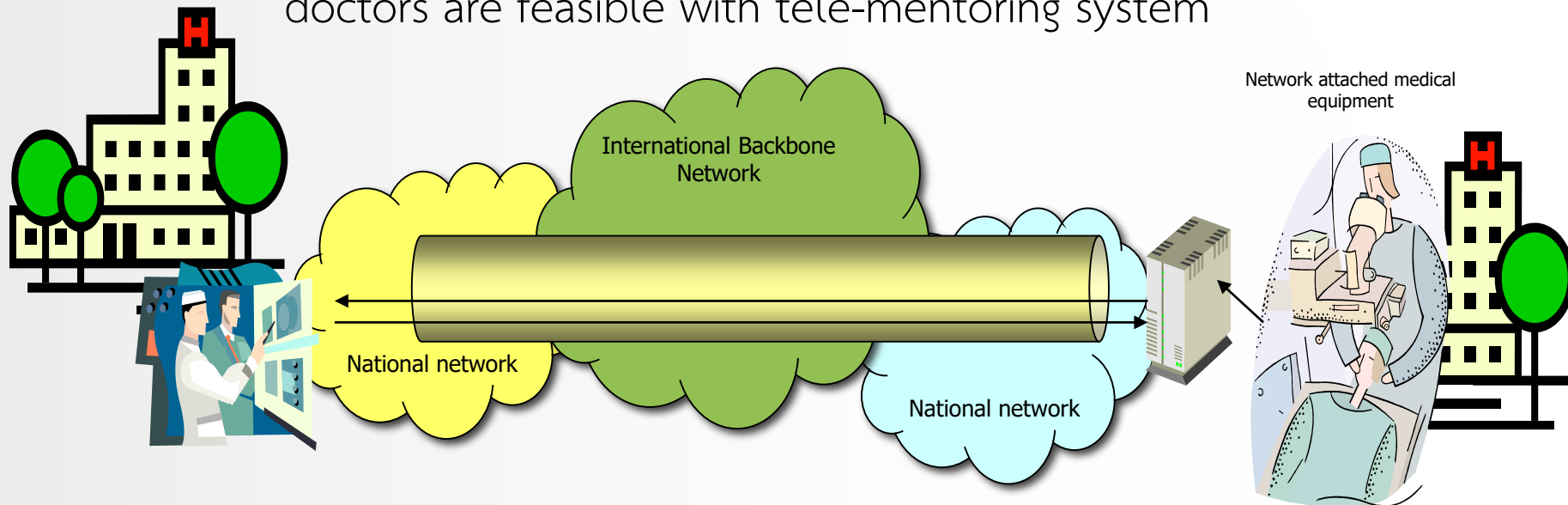




Tele-medicine



- ❖ Advanced medical treatment and diagnostic skills from specialist doctors are feasible with tele-mentoring system





Tele Medicine



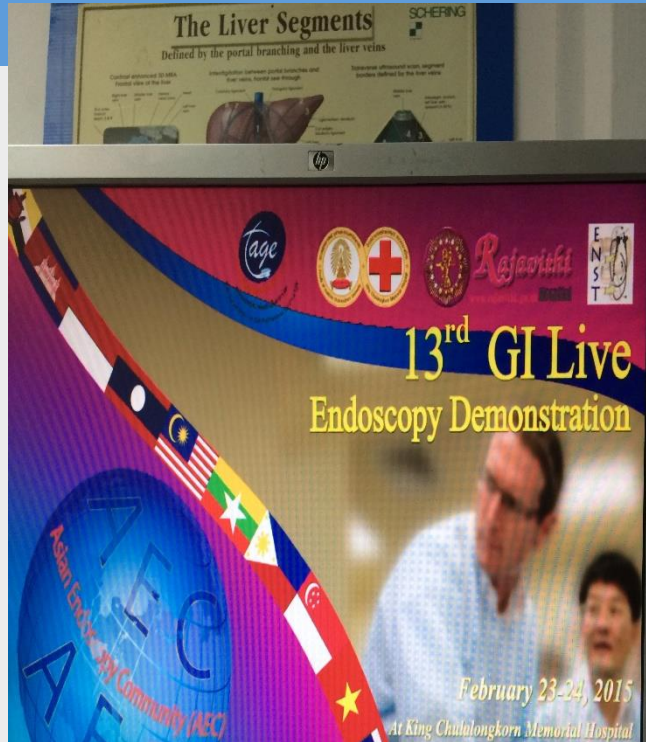
❖ Example:

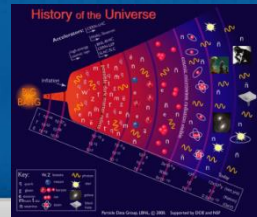
- Siriraj Hospital
- Chulalongkorn Hospital
- Faculty of Medicine Ramathibodi Hospital
- Etc..



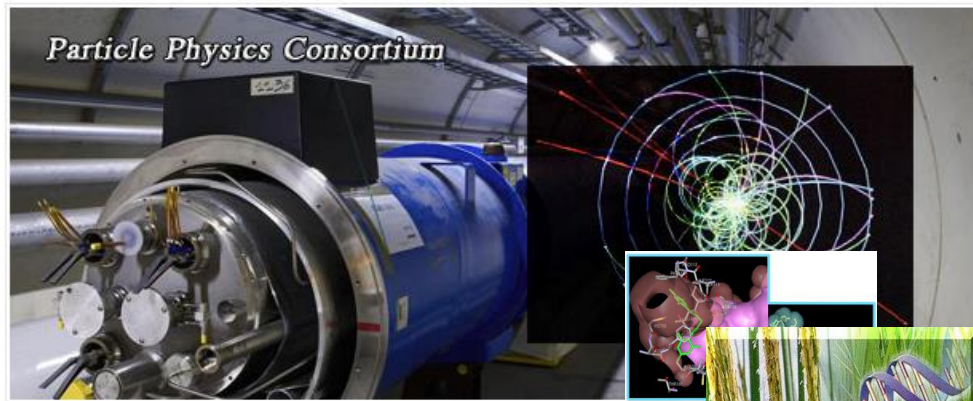


Telemedicine : Endoscopy DEMO

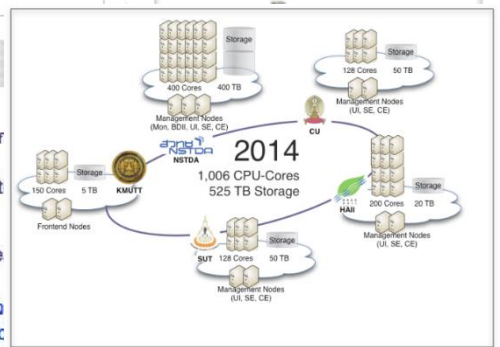




- หน้าแรก
- โครงการ e-Science
- VO และบริการ
- ข่าวสาร
- ภาพกิจกรรม
- ผังเว็บไซต์
- ติดต่อเรา



Hot News

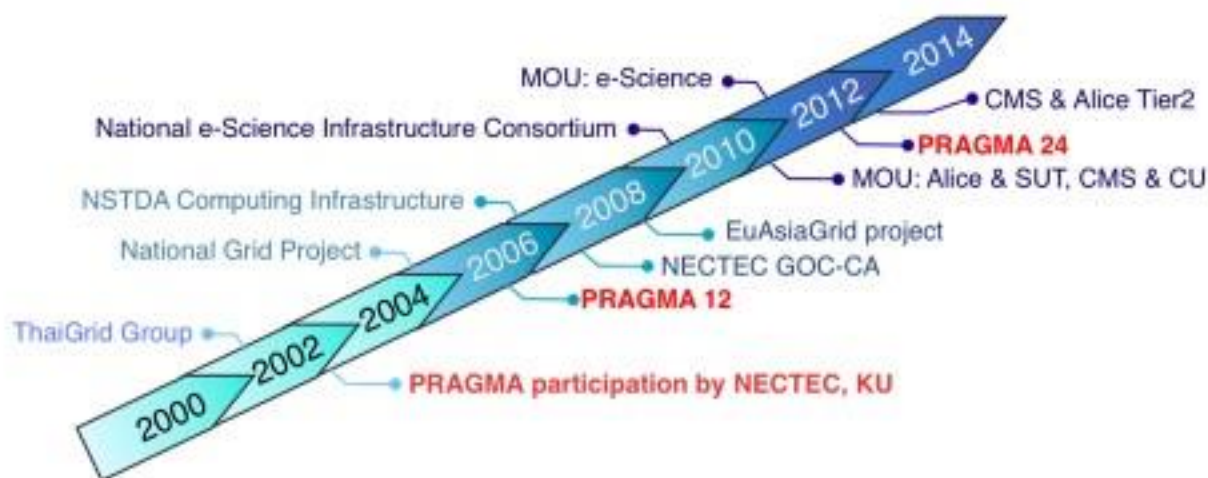




E-Science Projected

LHC Related Projects in Thailand

Thai Computing Development: 2000-Present



LHC Related Projects in Thailand

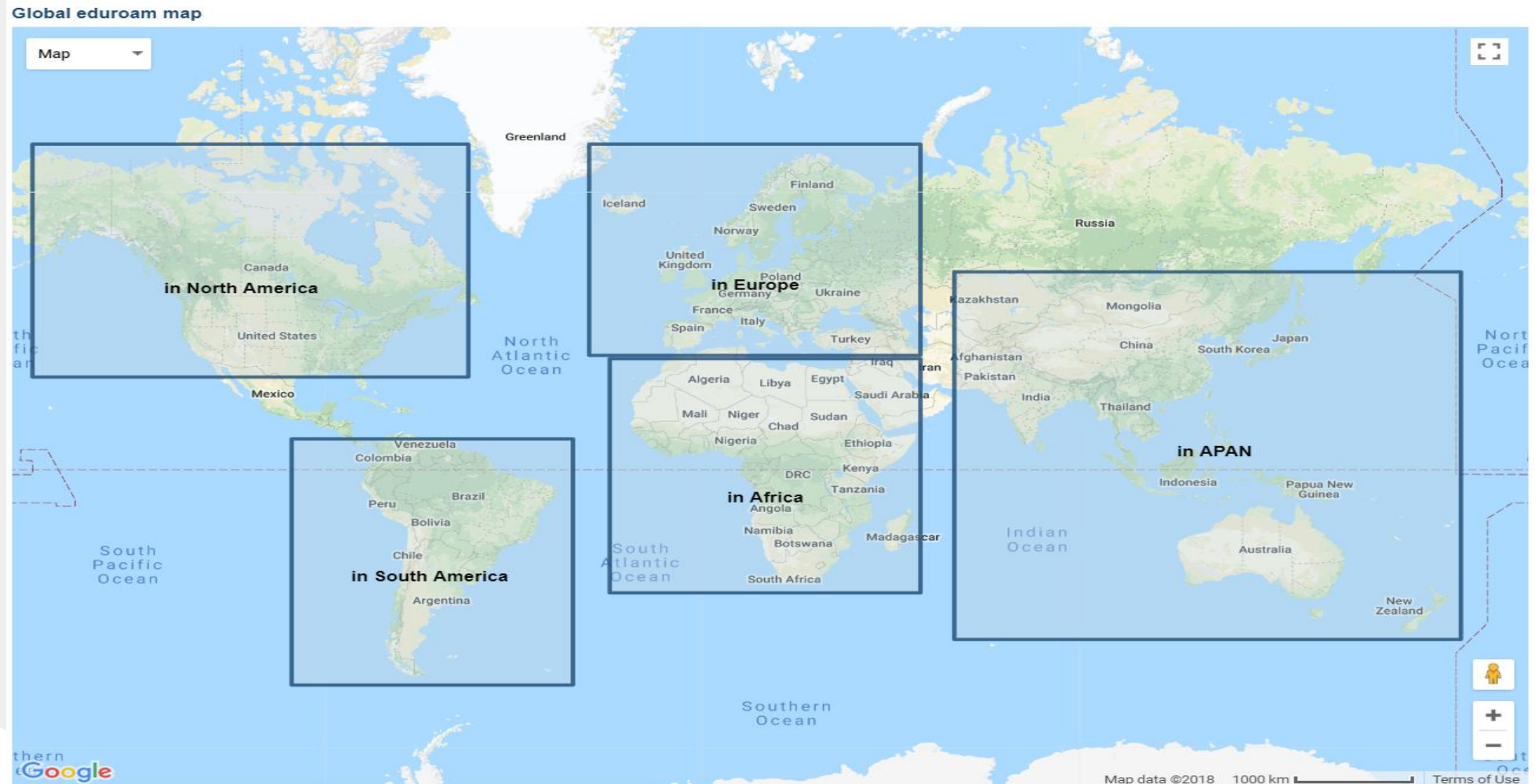
MoU signing ceremony between Chulalongkorn University, Suranaree University of Technology, NSTDA, and CERN (as host of the WLCG: Worldwide LHC Computing Grid) at Sra Patrum Palace on 10 October 2013



NSTDA-CU CMS	CPU 200 cores, storage 200 TB
SUT ALICE	CPU 128 cores, storage 100 TB
NSTDA ALICE	CPU 60 cores, storage 10 TB



69 Universities/Institutes implemented



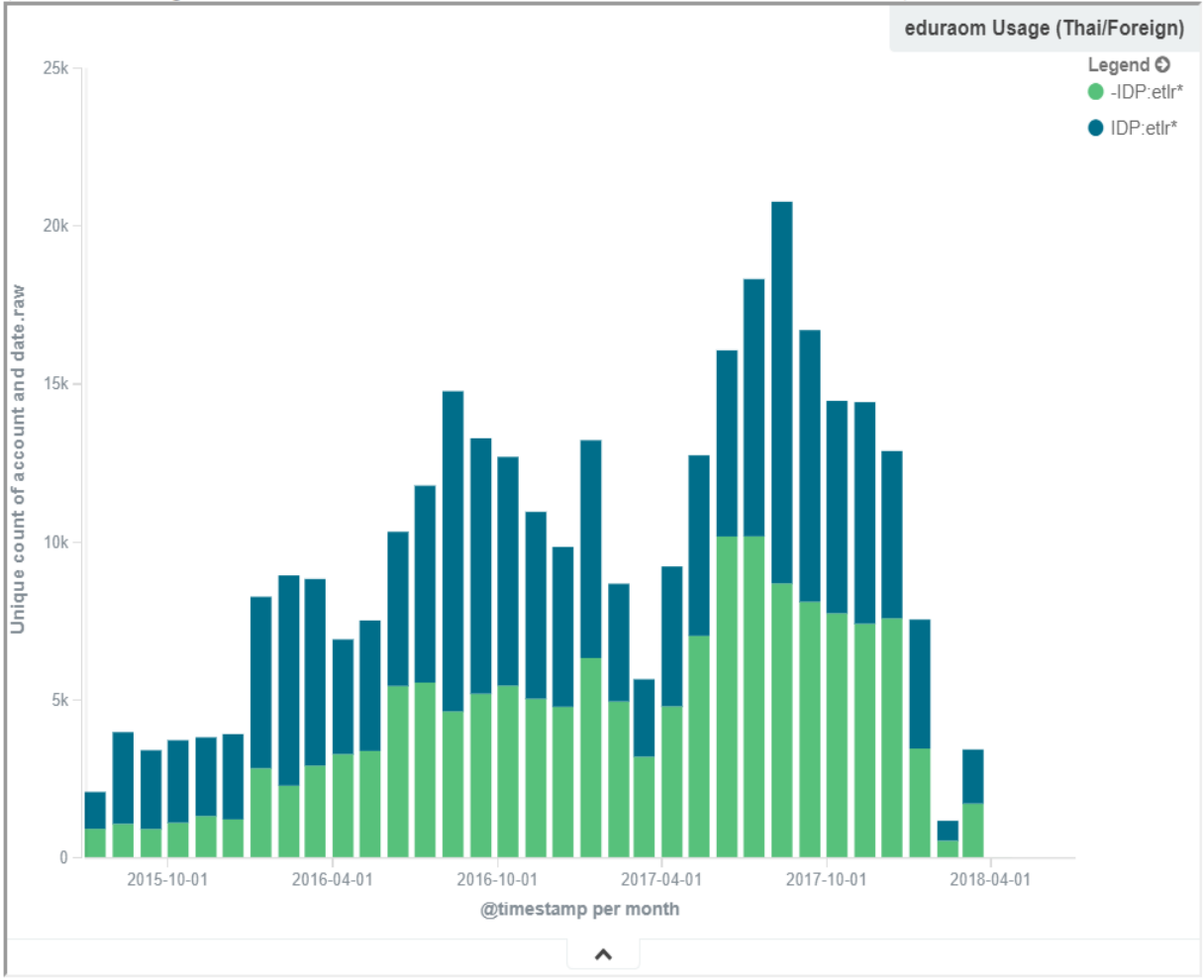


eduroam @Thailand



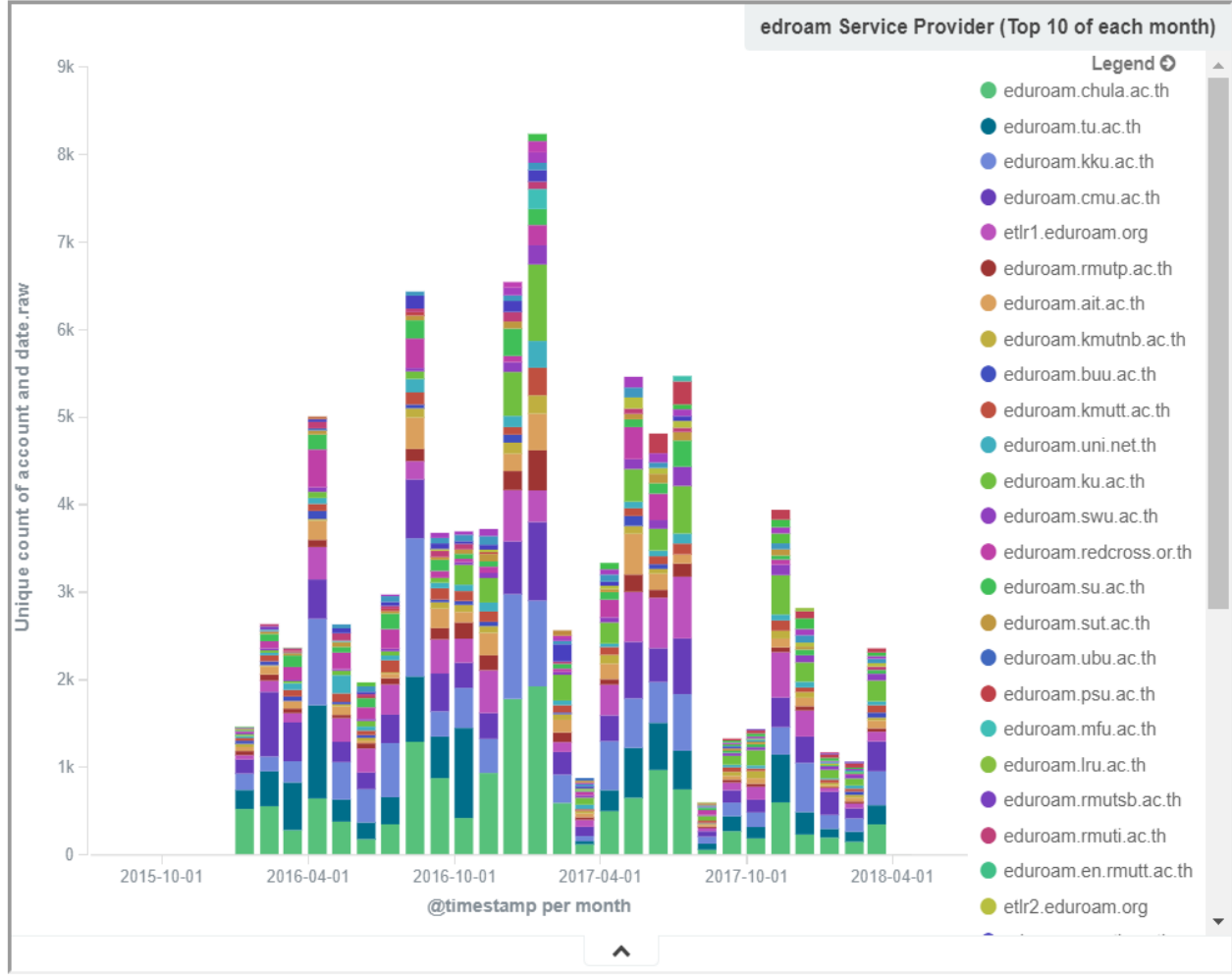
Thailand eduroam Usage

(IDP:etlr* = foreign users in TH, -IDP:etlr* = Thai users in TH + Thai users in other countries)



eduroam Service Provider

(Listed by University Realm)



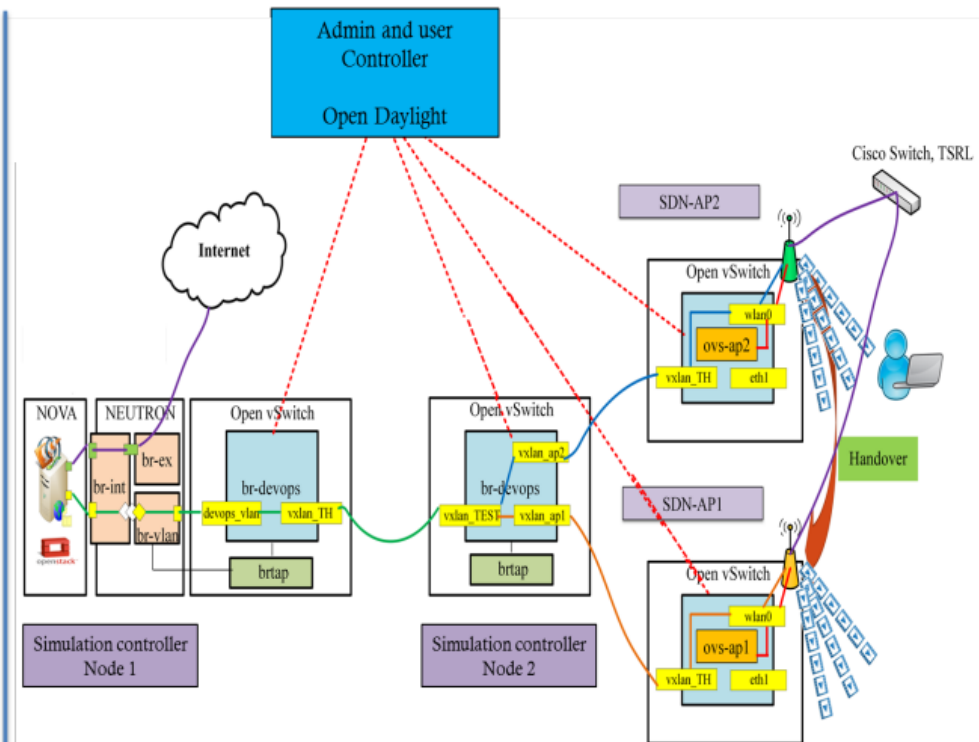
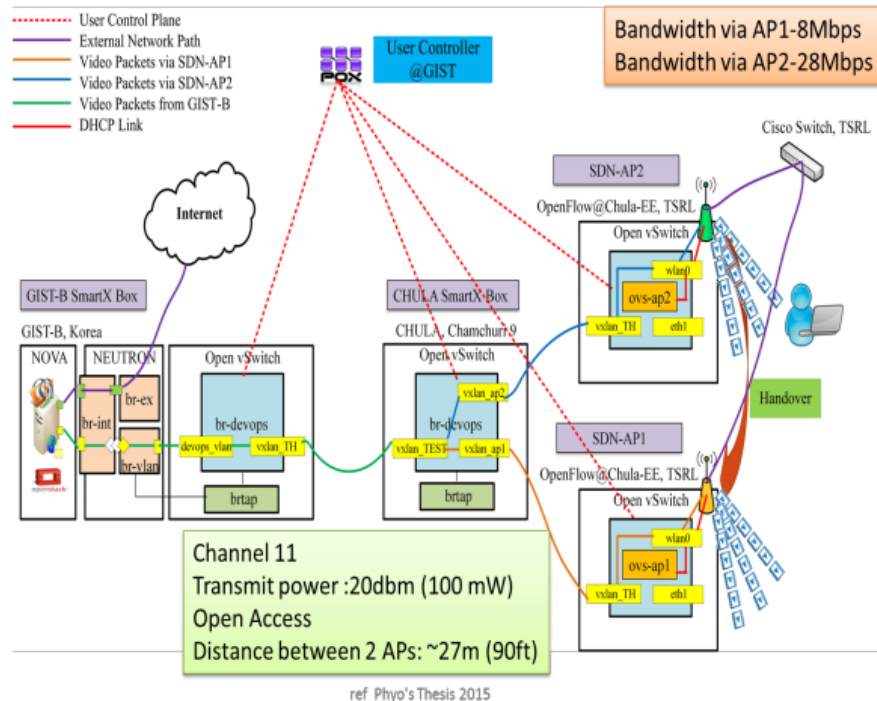


OF@TEIN

Compare the results between wireless experiments over OF@TEIN testbed/
OF@Chula-EE wireless testbed and Lab testbed OF@Chula-EE

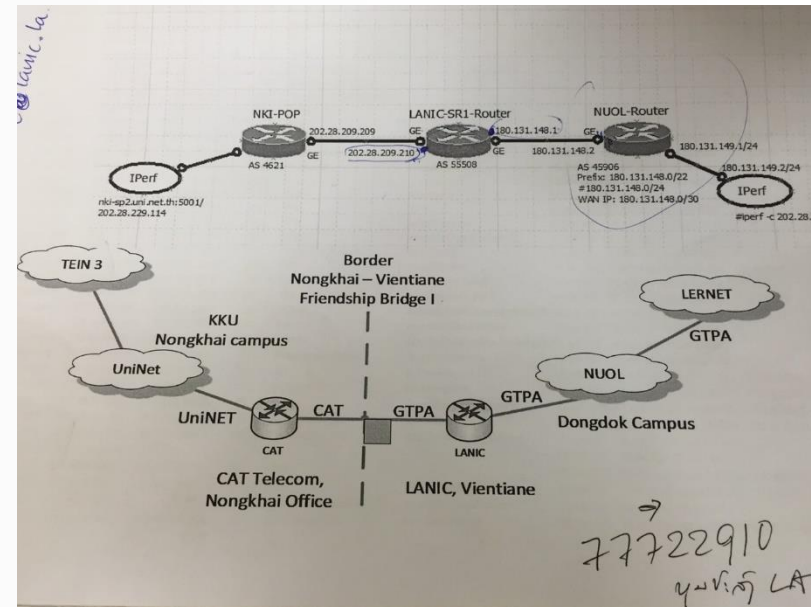


APAN Asia Pacific Advanced Network
Connecting People, Cultures, Research and Education
CHULA ENGINEERING
Foundation toward Innovation





Collaboration Support TEIN (Startup Peering with LERNET : LAOS)



As 2016.



Thank you