

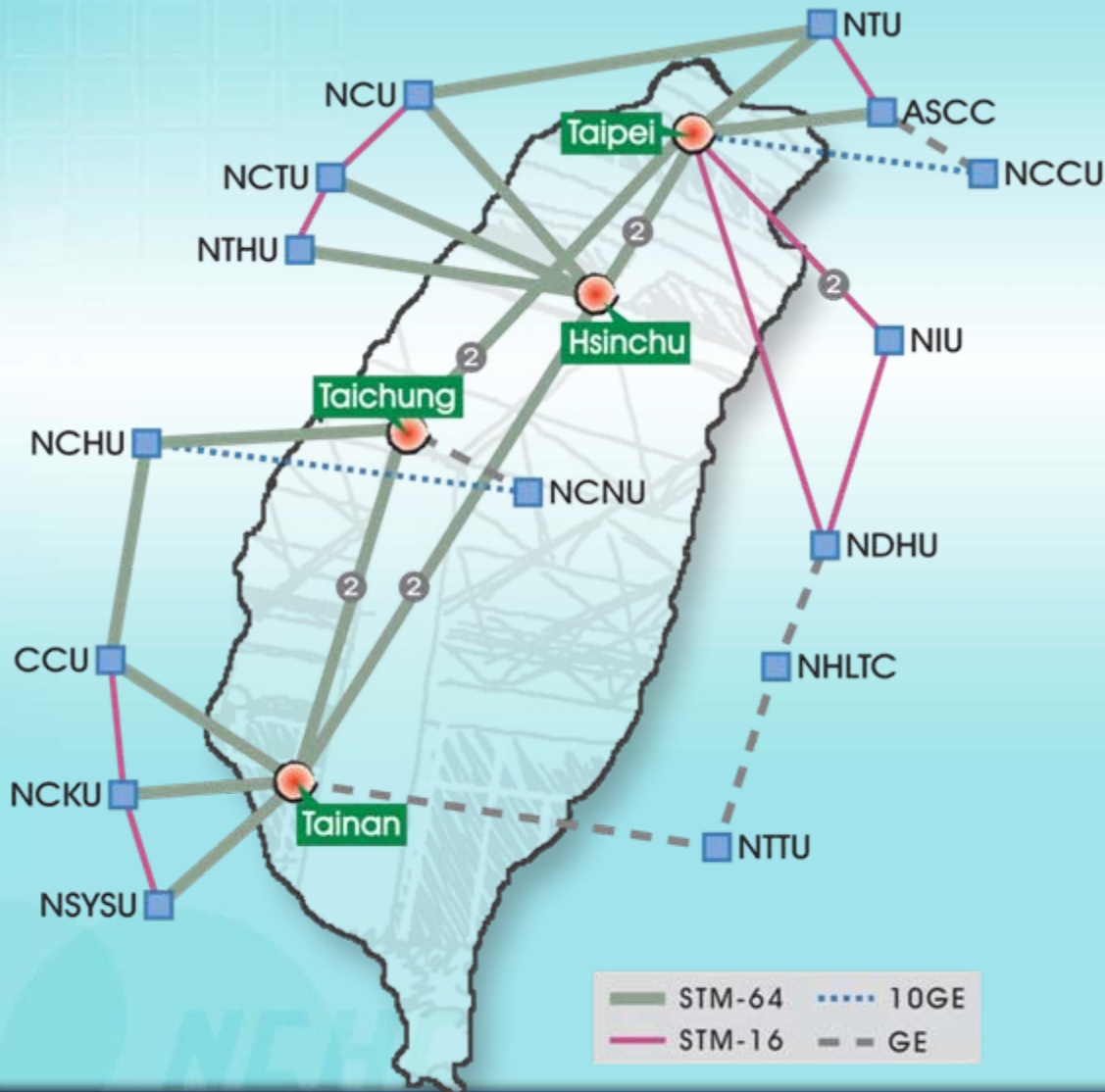
# TAIWANLight Update

Te-Lung Liu,  
NCHC



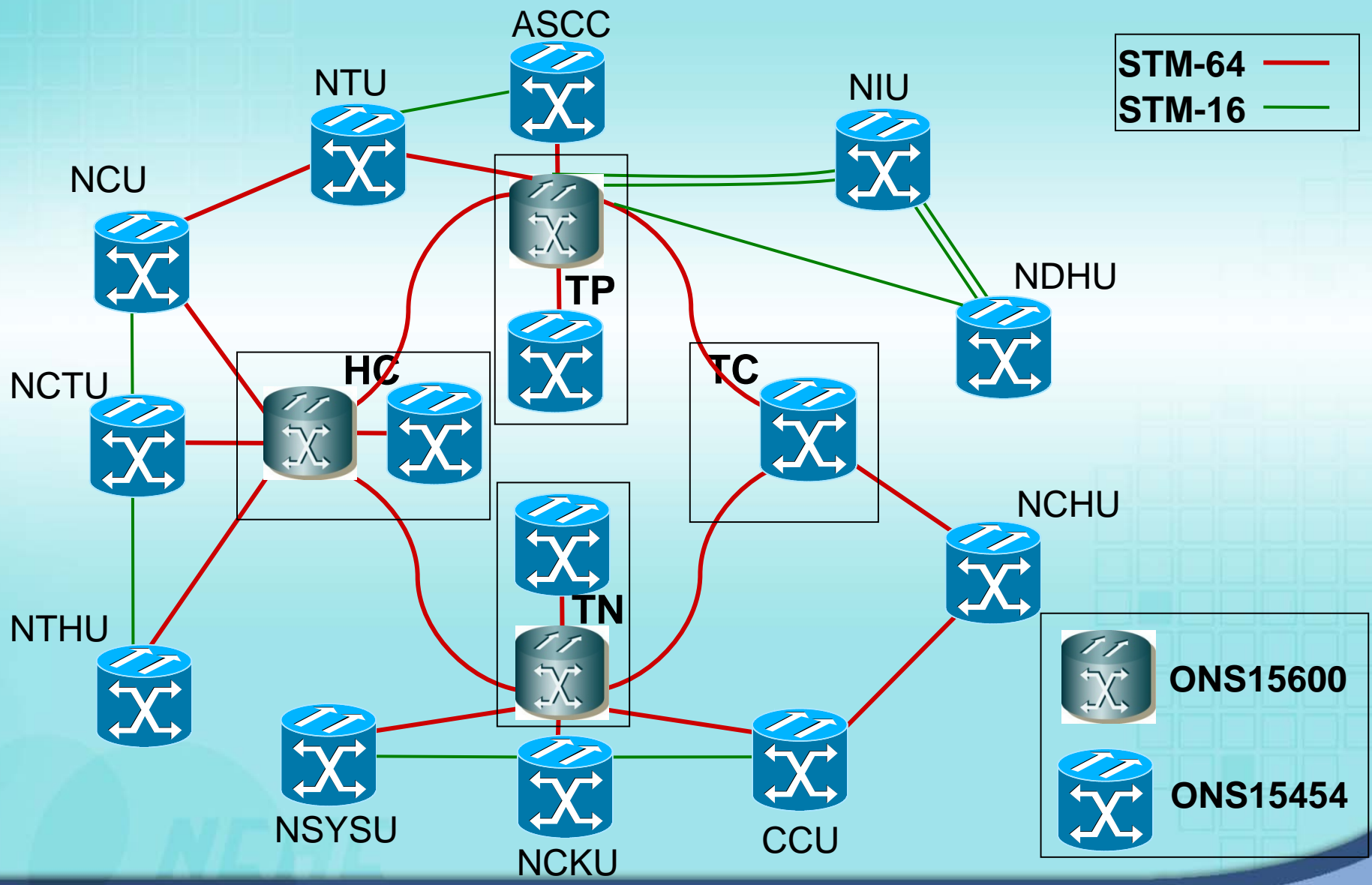
# Domestic Network: TWAREN

TaiWan Advanced Research and Education Network

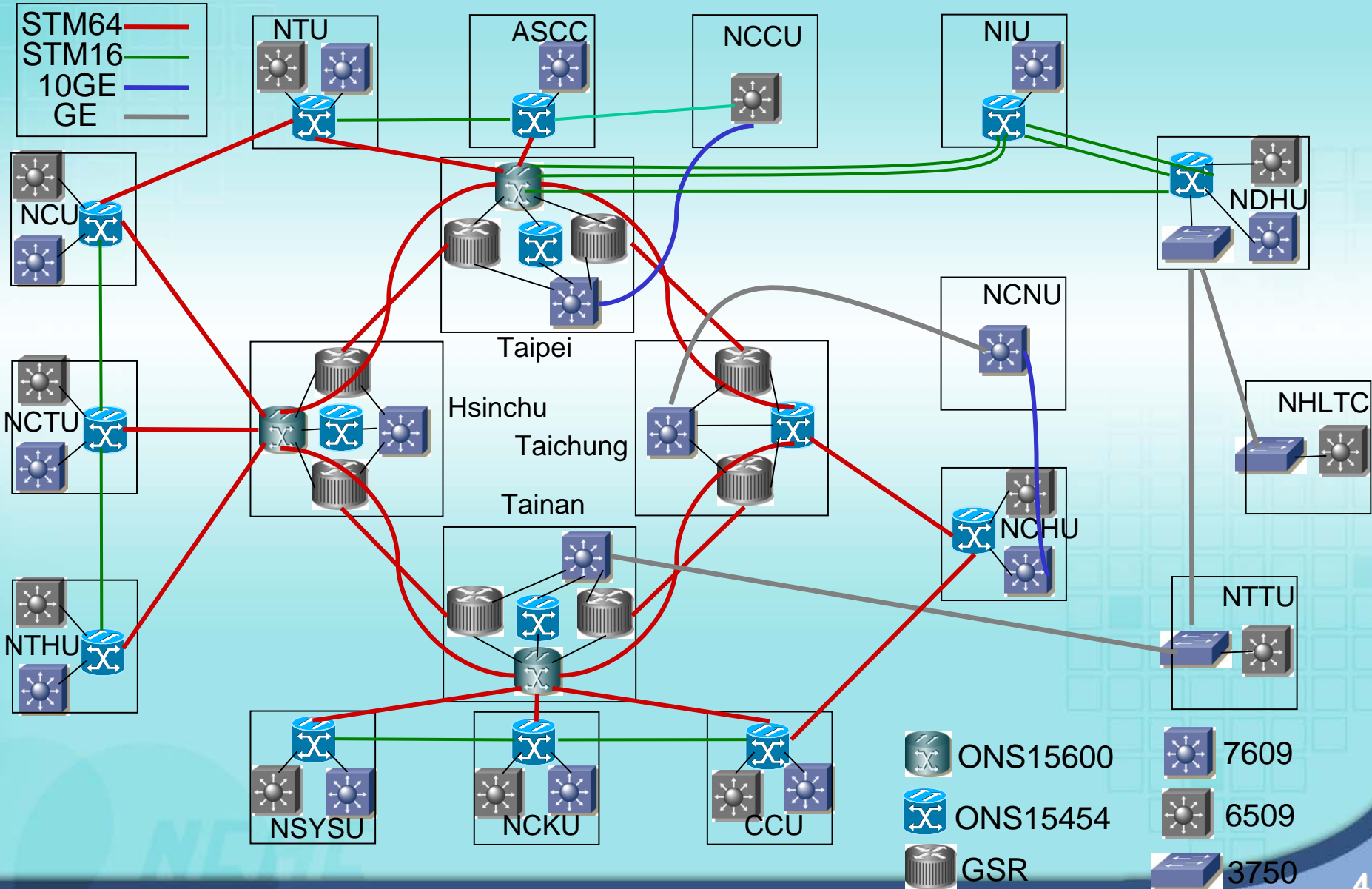


- 4000 schools, 80+ colleges / research organizations
- 5 million users
- ◆ 4 core nodes
- ◆ 20G backbone
- ◆ 12 GigaPops
- ◆ Connects HPC resources in North and South Taiwan
- ◆ Built-in fault-tolerance

# Optical Backbone



# Interconnecting with L1/L2/L3 devices



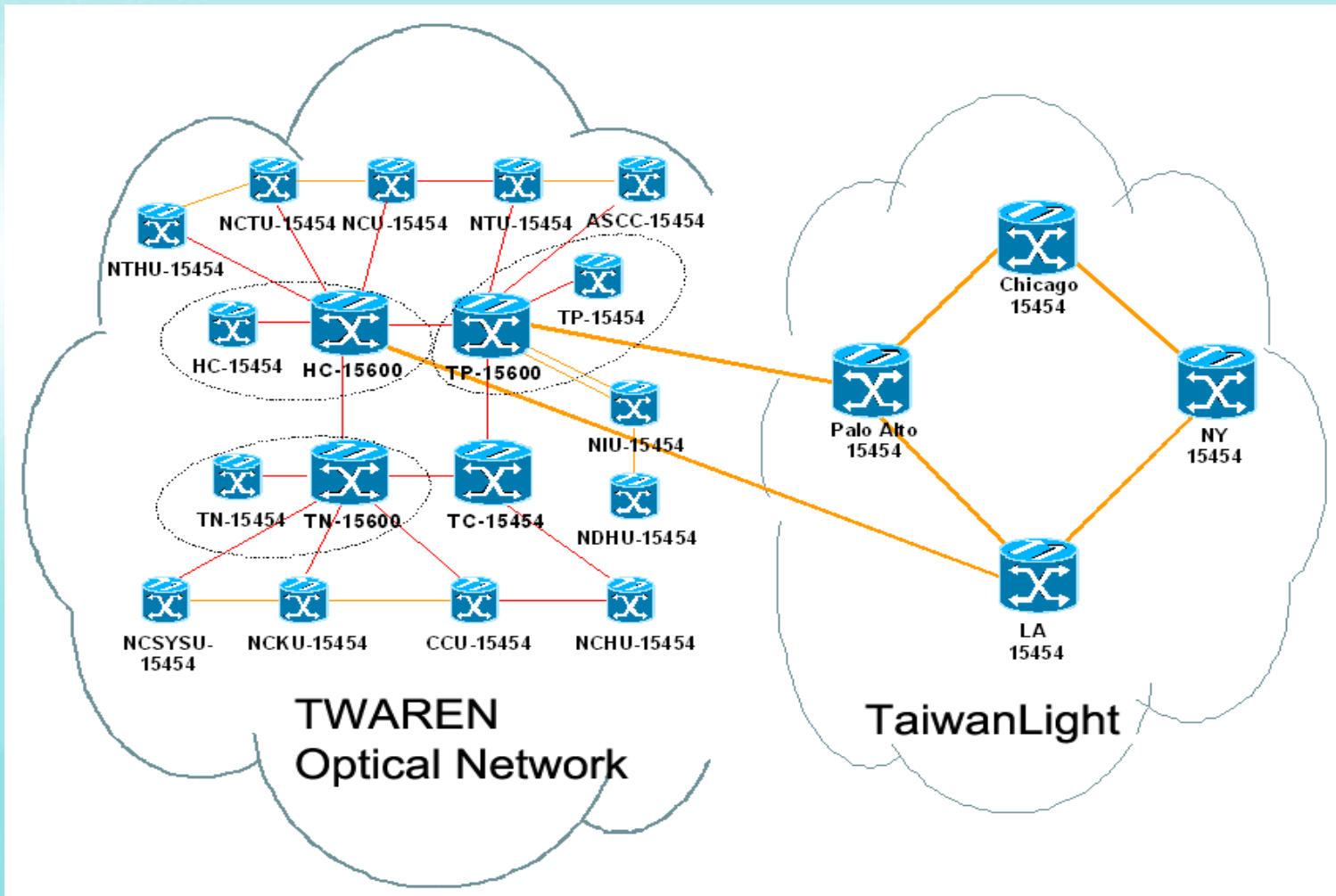
# TWAREN's International Connections

- Pacific Crossing to USA's west coast upgraded to 5 Gb/s
- Connections between LA, Palo Alto, Chicago, and New York are 2.5 Gb/s
- Connects to the rest of the world via the U.S.'s Abilene Network
- Connection expanded to Europe in 2006 (IEEAF donated 622 Mbps of bandwidth/fiber optic cable) ↴



# TaiwanLight Logical Topology

- TaiwanLight is the international part of TWAREN (Taiwan Advanced Research and Education Network) ↗



# TWAREN-CESNET Link

Taiwan

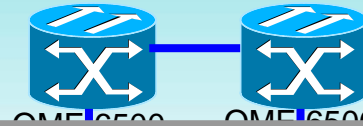
U.S.A

Europe

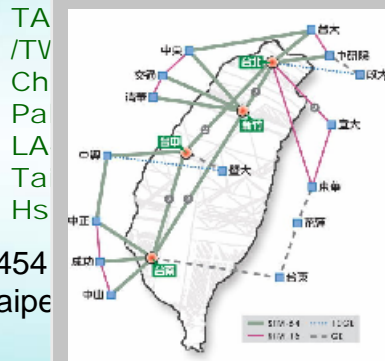
15454

I2 HDXc

Amsterdam



applications  
not connected yet



*TW-CZ Lightpath*  
Single hop  
RTT 310ms  
Bandwidth 576Mbps

TWAREN

CESNET

15454  
@Taipe

15454  
@Hsinchu

7609P  
@Hsinchu



Back to back  
fiber

15454  
@LA

GEANT2  
DANTE

GEANT2: ams-  
pra\_LHC\_CESNET-  
SURFNET\_06005

622M/s

1 GE

OC-192c

E300  
Paha  
0.1.1.2  
ack  
5454  
Paha

# Live Medical Streaming (1/2)

High-quality video streaming of live surgery with CESNet:

- 2007/10: Ophthalmology surgery (NCKU College of Medicine in Taiwan and Central Military Hospital in Czech).

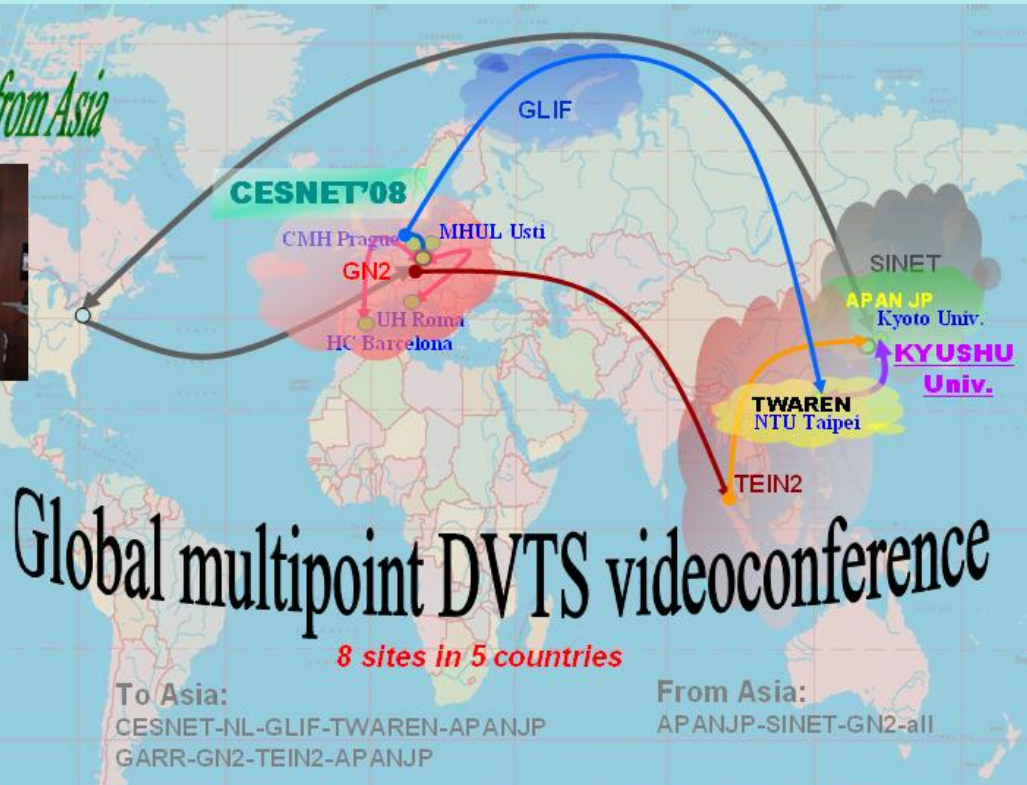




# Live Medical Streaming (2/2)

- 2008/9: Demo of gastrointestinal endoscopy in CESNET08 conference (8 sites in Japan, Taiwan, Italy, Spain and Czech).

*Live endoscopy lesson from Asia*

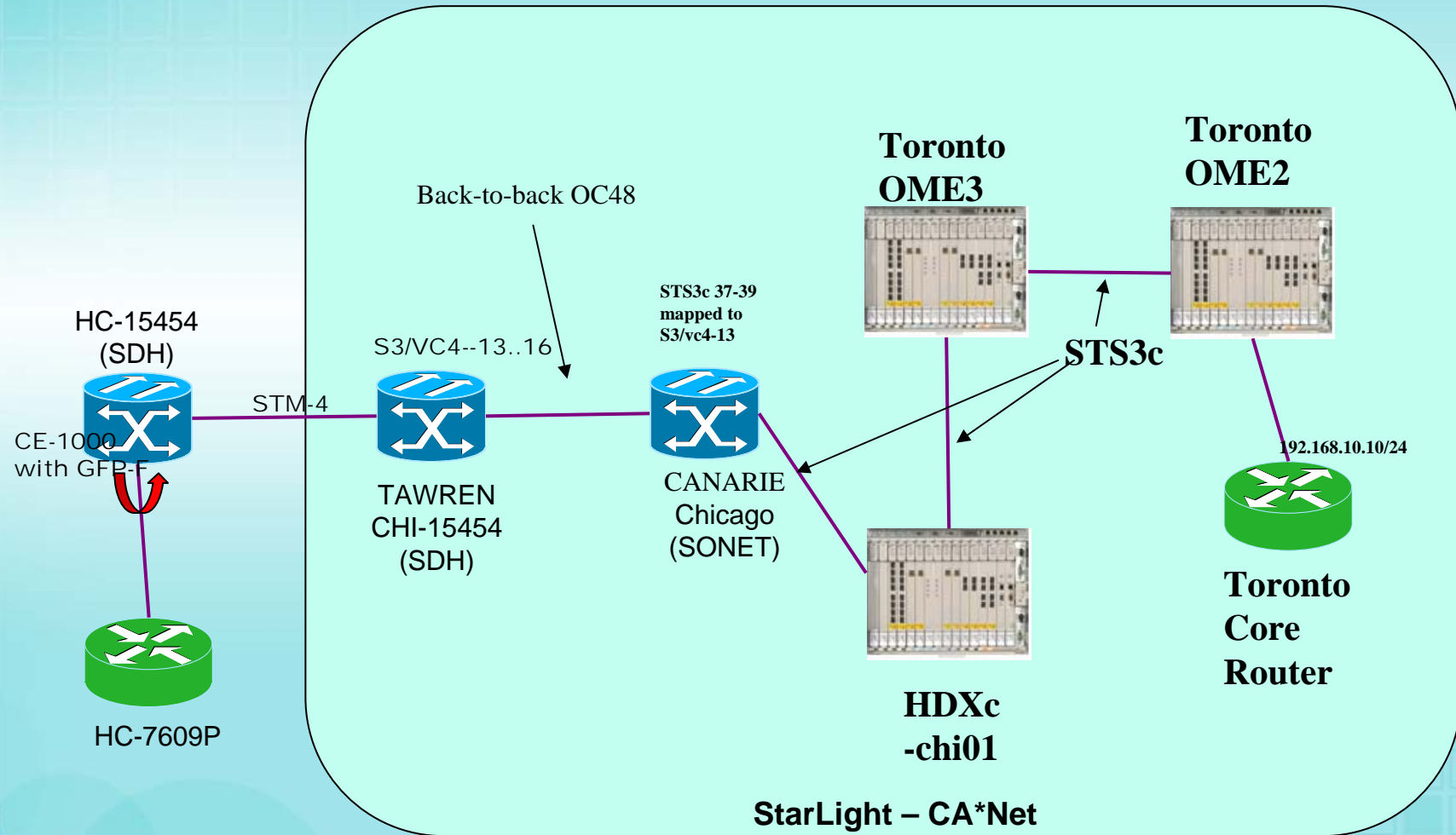


September 25th 2008,  
Prague, Usti o.Elbe., Fukuoka, Kyoto, Rome, Barcelona

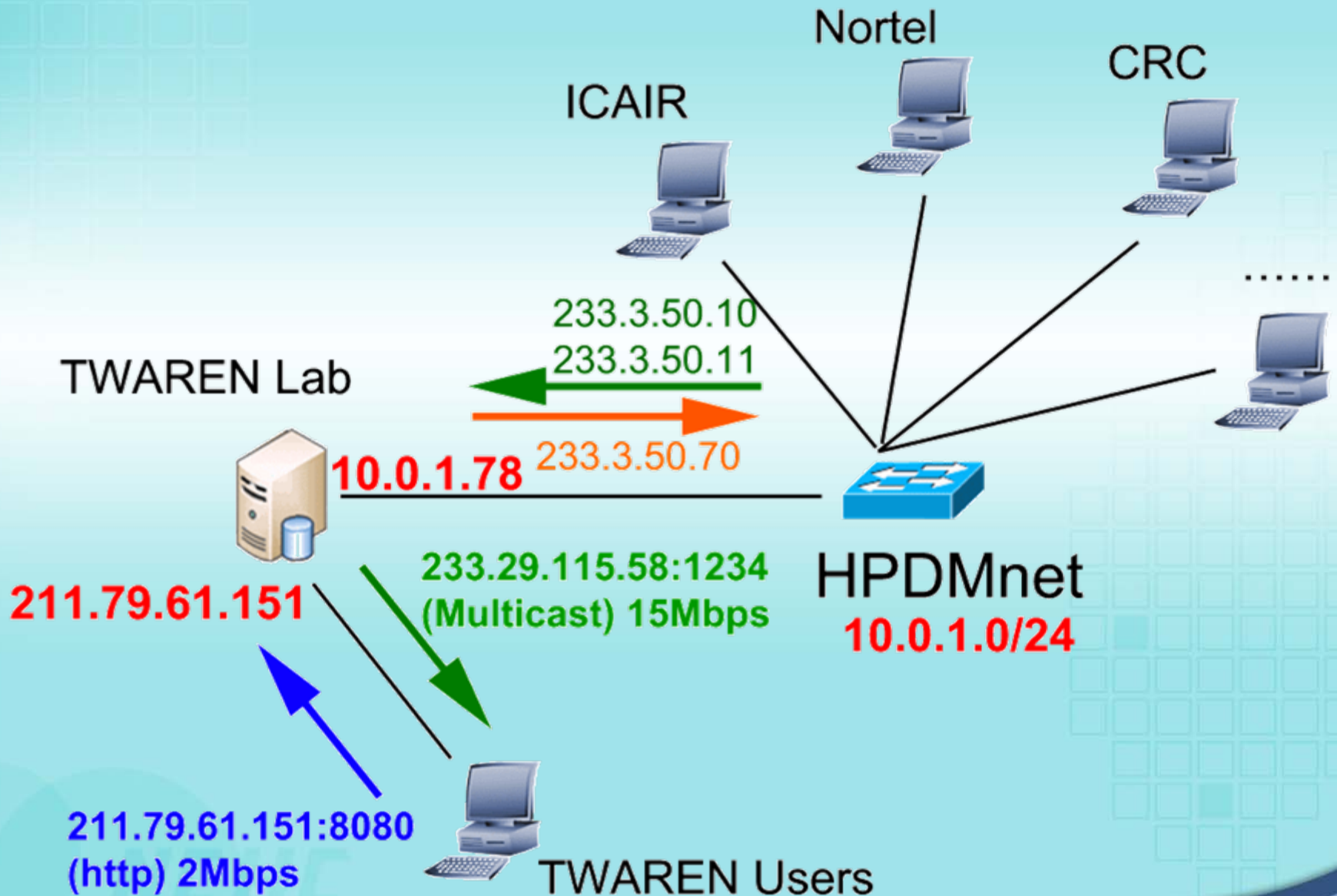


# TWAREN – STARLight-CANARIE

## HPDMnet Circuit



# TWAREN-HPDMnet ICAIR Topology



# Ongoing Work

- Migration of TWAREN core nodes to DWDM/ROADM is scheduled in mid 2010.
- Implementing voice quality measurement and hybrid alarm correlation systems on perfSONAR



Thank You  
Questions?

[www.nchc.org.tw](http://www.nchc.org.tw)