

NREN and the Internet in ASIA

AI3/SOI-ASIA Fall 2017

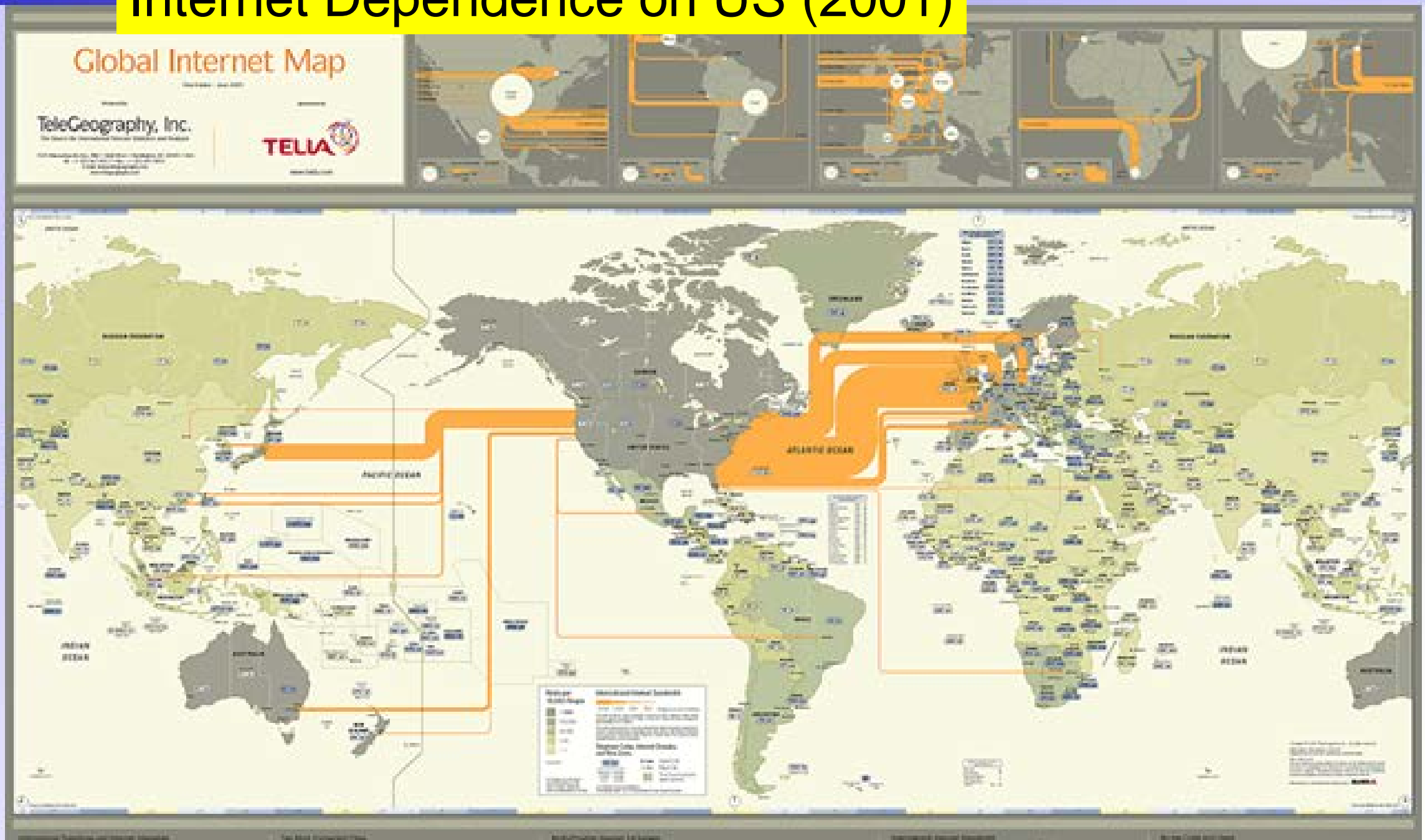
Jun Murai  
WIDE Project  
KEIO University



Asia Pacific Internet



# Internet Dependence on US (2001)







...the ...  
...the ...  
...the ...

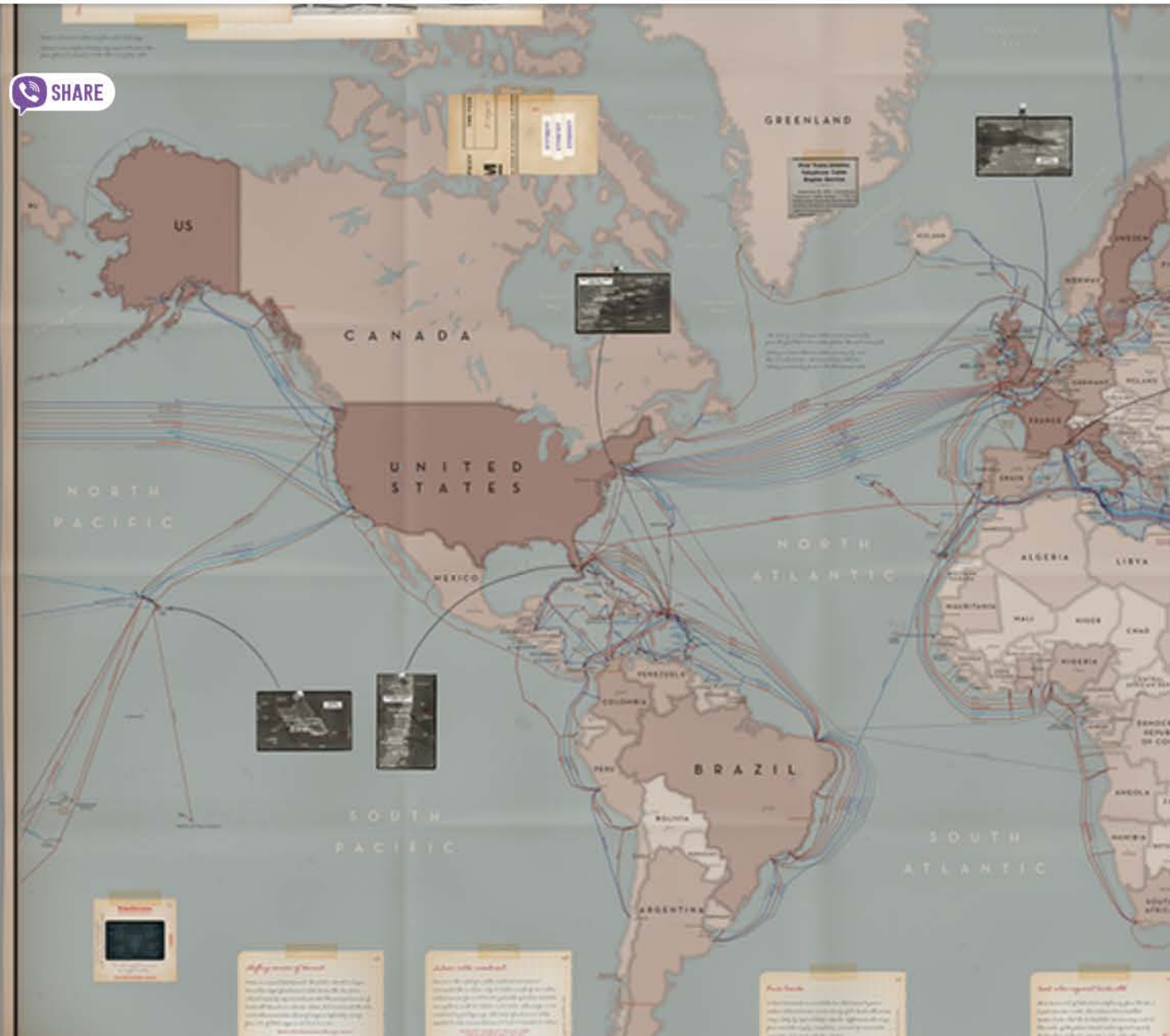








# Submarine Cable Map 2017

[System Components](#) [Costs](#) [Demand](#) [Investment](#) [Prices](#) [Used Bandwidth](#) [C](#)



# Multiple Functions of the SDGs



- **Common language**
  - An enabling condition for multi-stakeholder collaboration
  - Usable across countries
- Represent **legitimacy** and **public** interests
  - Advantage for private companies
- Useful tool to present **linkages** to multiple issues (complexity of the issue)
- Link global/long-term issues with local/short-term issues
- Potential to **scale up actions** by collecting actions for the same goals
  - Mapping with goals, and share experience of best practices and/or problems
  - Creating partnerships
- Evaluate by universal standard using SDG indicators





# Sustainable Development Goals (SDGs)

Global Goals  
For  
2030

17 Goals  
169 Targets  
232  
Indicators

Global in Character  
Apply all countries

Monitoring and  
evaluate progress  
No legal obligations



Transformation

Leave No One Behind



Population?



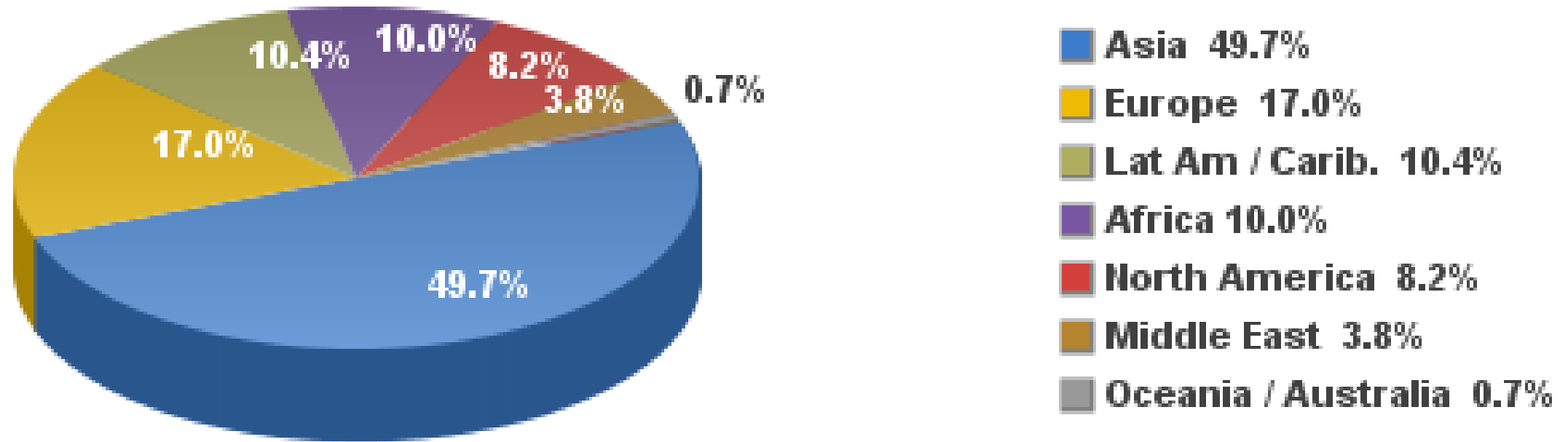
7,519,028,970      vs  
3,885,567,619

June 30, 2017

51.7%



# Internet Users in the World by Regions - June 30, 2017



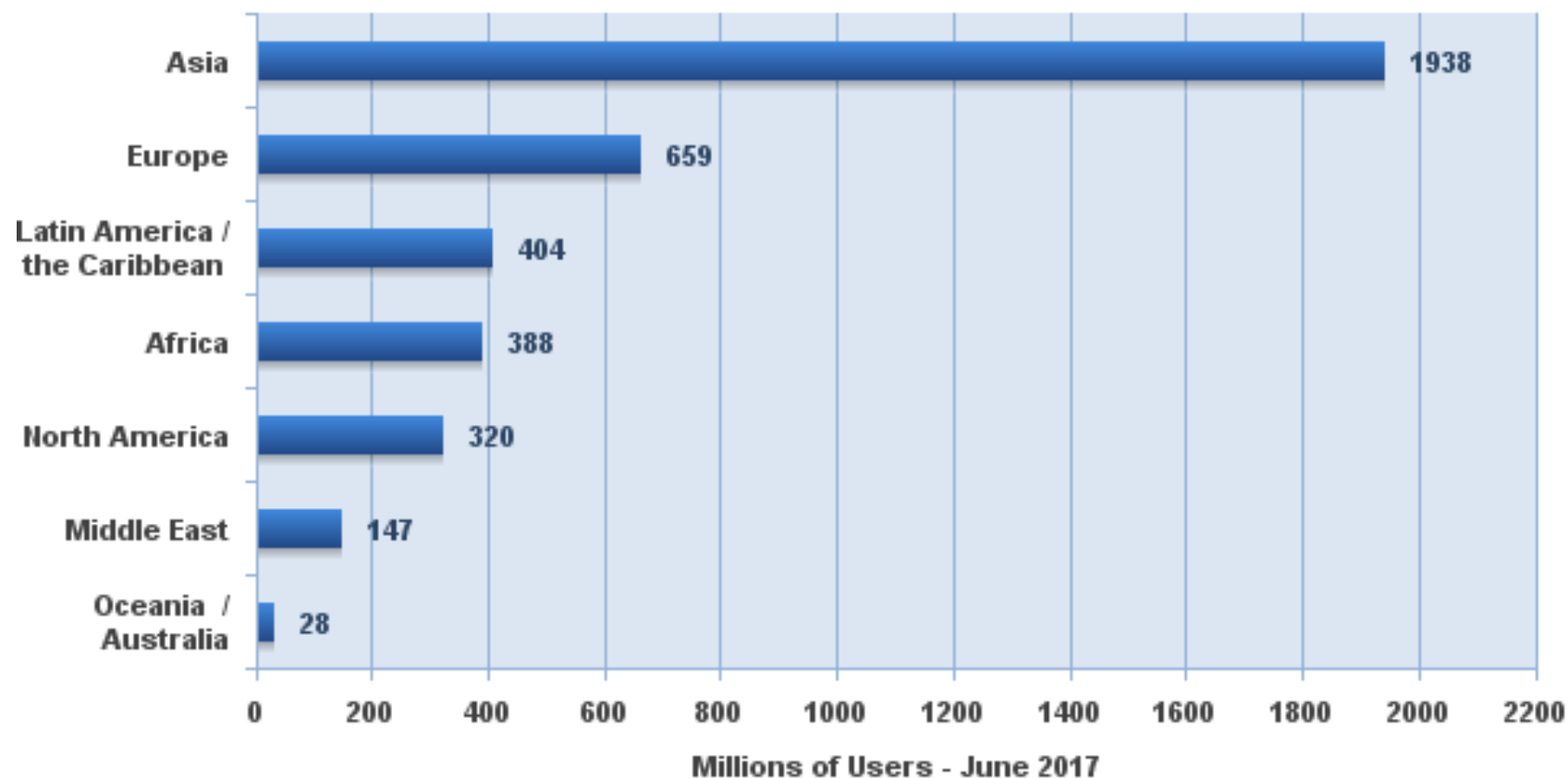
Source: Internet World Stats - [www.internetworldstats.com/stats.htm](http://www.internetworldstats.com/stats.htm)

Basis: 3,885,567,619 Internet users in June 30, 2017

Copyright © 2017, Miniwatts Marketing Group



## Internet Users in the World by Geographic Regions - June 30, 2017



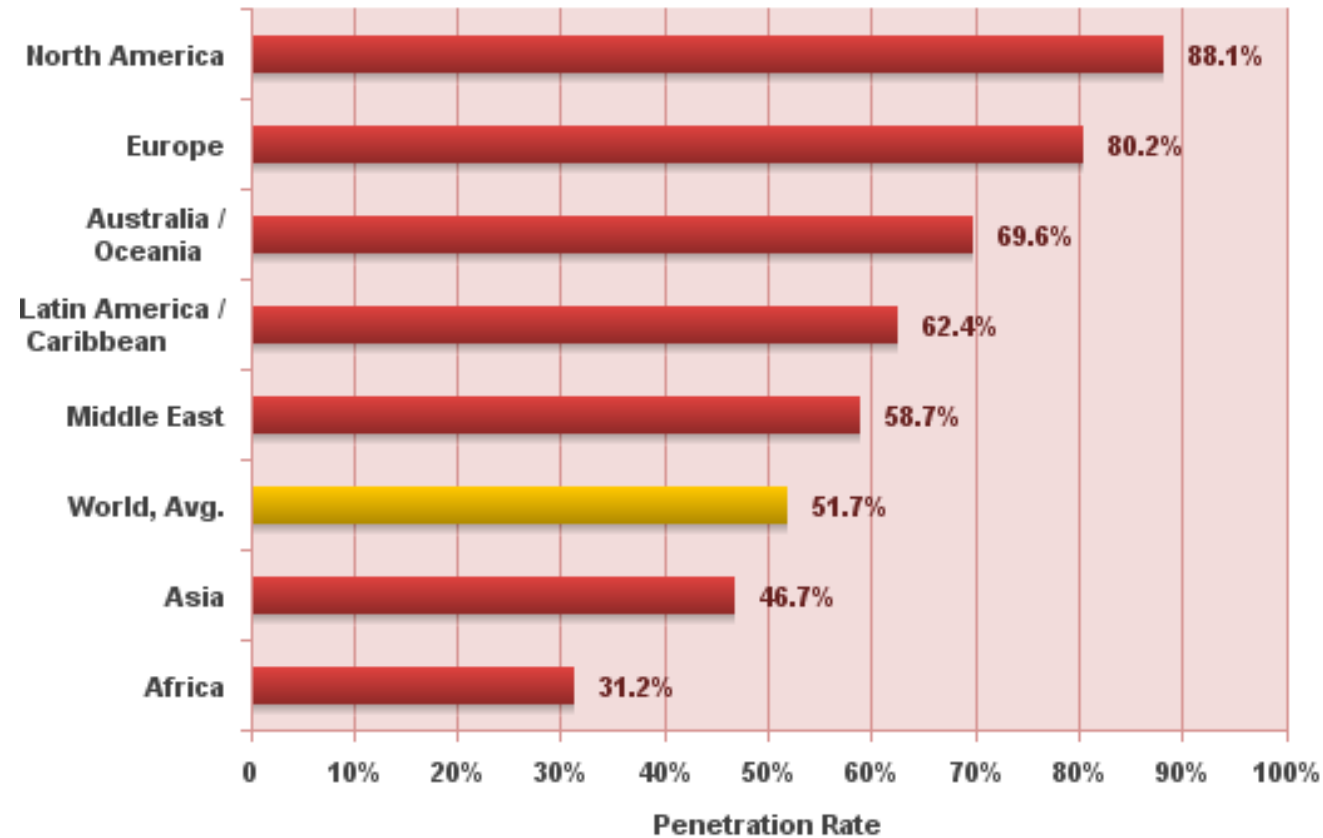
Source: Internet World Stats - [www.internetworldstats.com/stats.htm](http://www.internetworldstats.com/stats.htm)

Basis: 3,885,567,619 Internet users estimated in June 30, 2017

Copyright © 2017, Miniwatts Marketing Group



## Internet World Penetration Rates by Geographic Regions - June 30, 2017



Source: Internet World Stats - [www.internetworldstats.com/stats.htm](http://www.internetworldstats.com/stats.htm)  
Penetration Rates are based on a world population of 7,519,028,970  
and 3,885,567,619 estimated Internet users in June 30, 2017.  
Copyright © 2017, Miniwatts Marketing Group



# Internet Users

Europe  
105M



Asia  
114M



Middle East  
3.3M



Africa  
4.5M



Oceania & Australia

120M



North America  
108M



Latin America &  
Caribbean  
18M

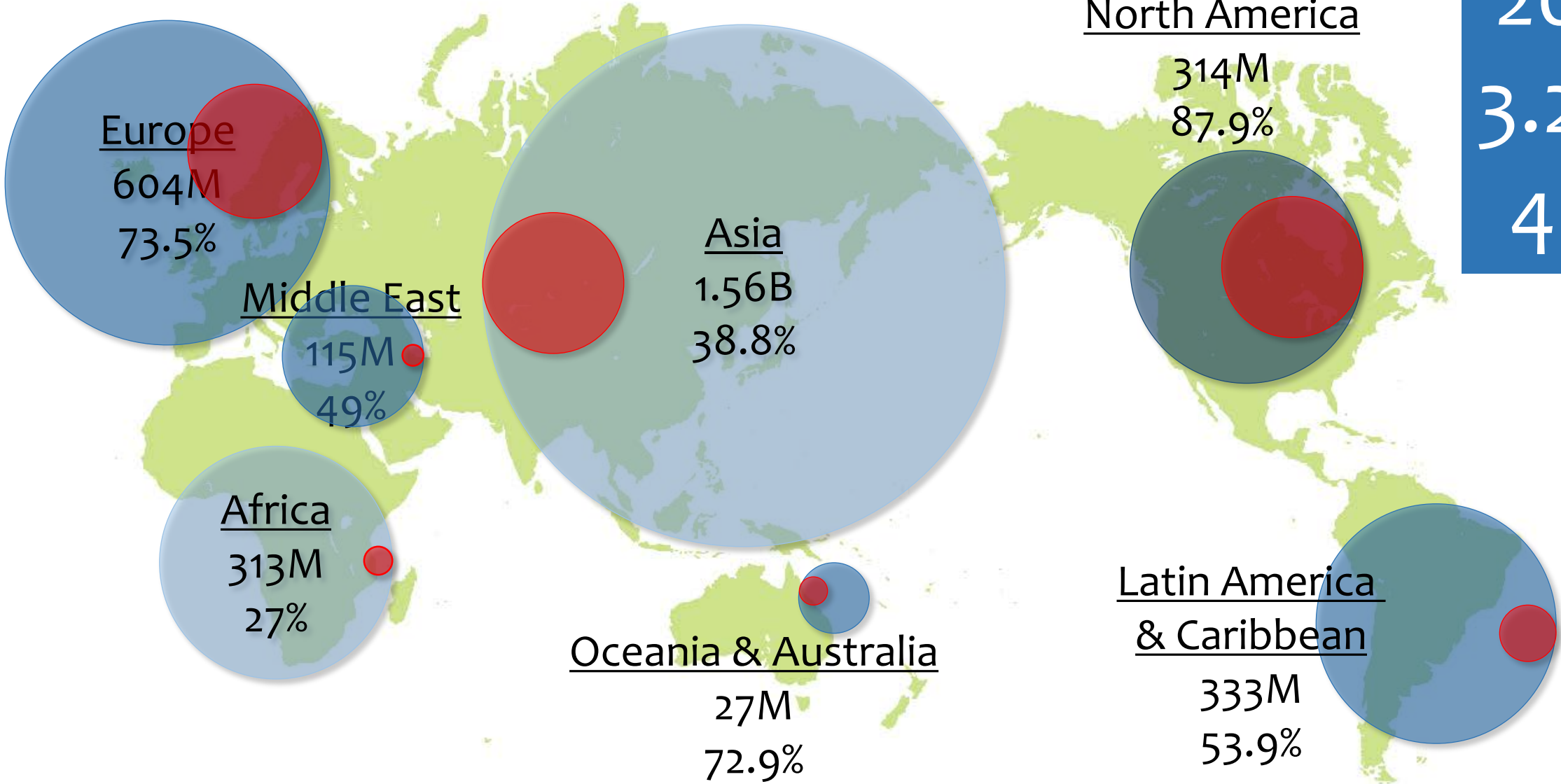


2000  
361M  
6%



# Internet Users

2015  
3.27B  
45%

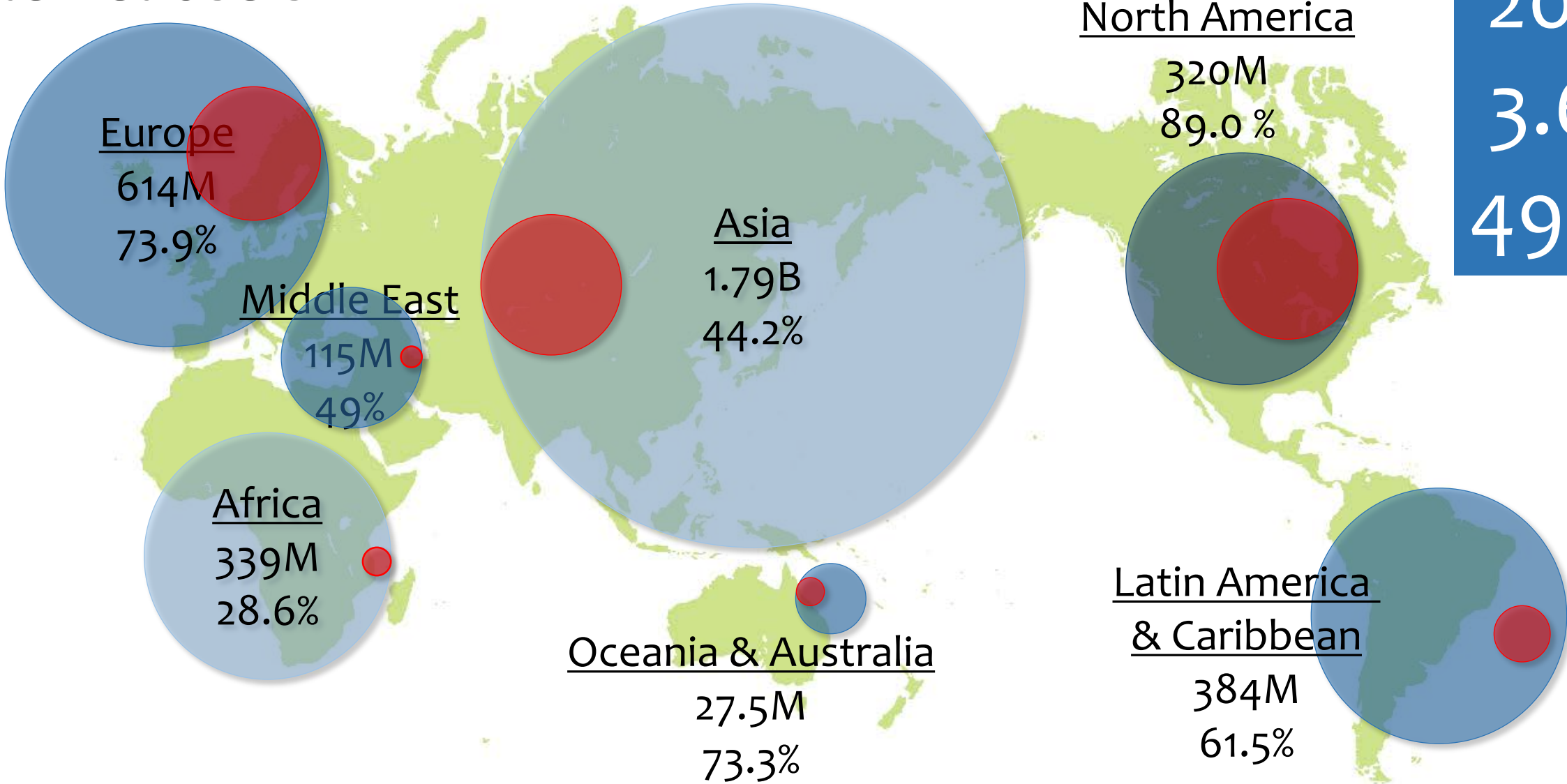


Penetration (% population)



# Internet Users

2016  
3.6B  
49.2%

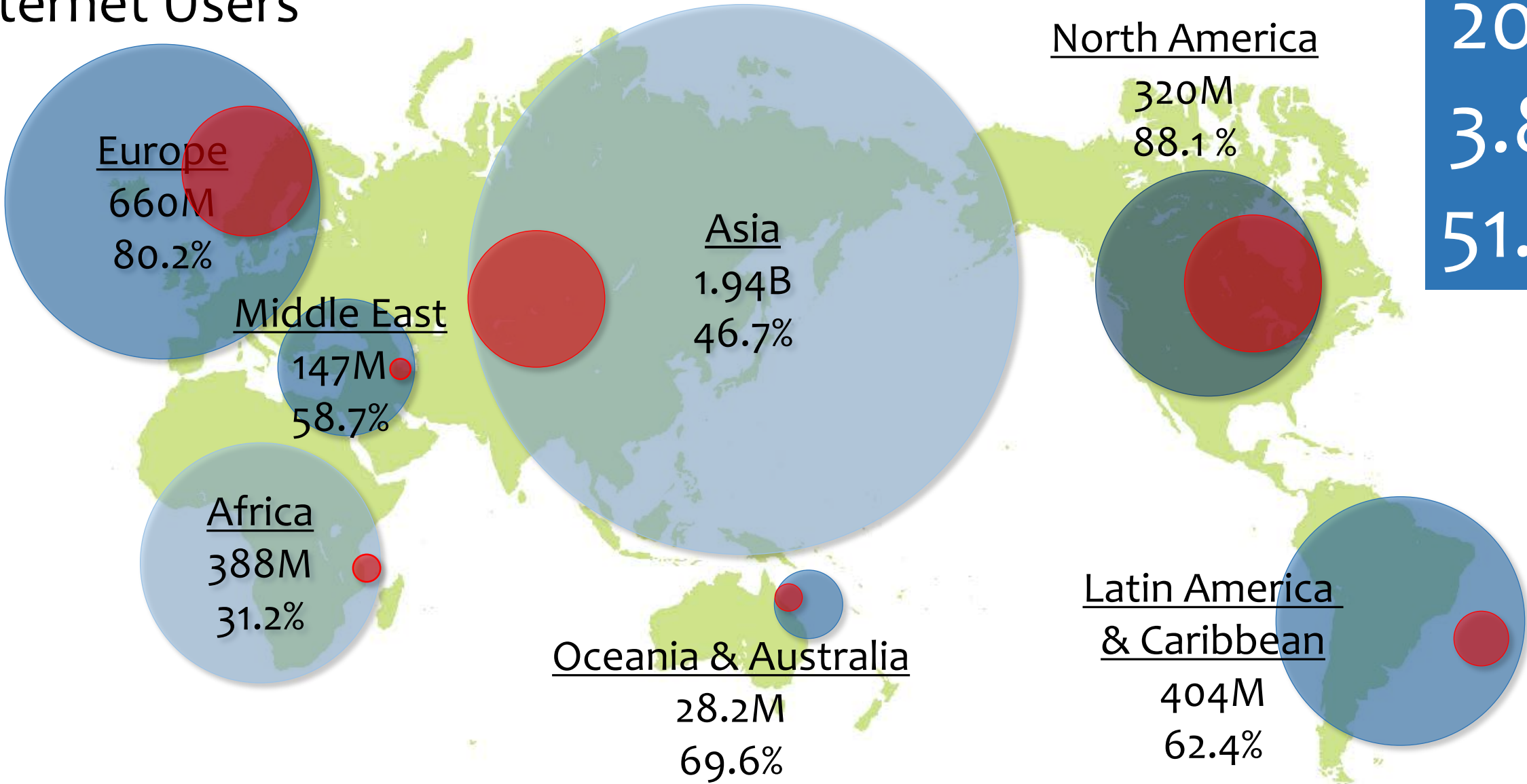


Penetration (% population)



# Internet Users

2017  
3.8B  
51.7%



Penetration (% population)





**BY 2030, EVERY  
PERSON AROUND THE  
WORLD WILL HAVE  
INTERNET ACCESS**

GOAL 17 **PARTNERSHIPS FOR THE GOALS**

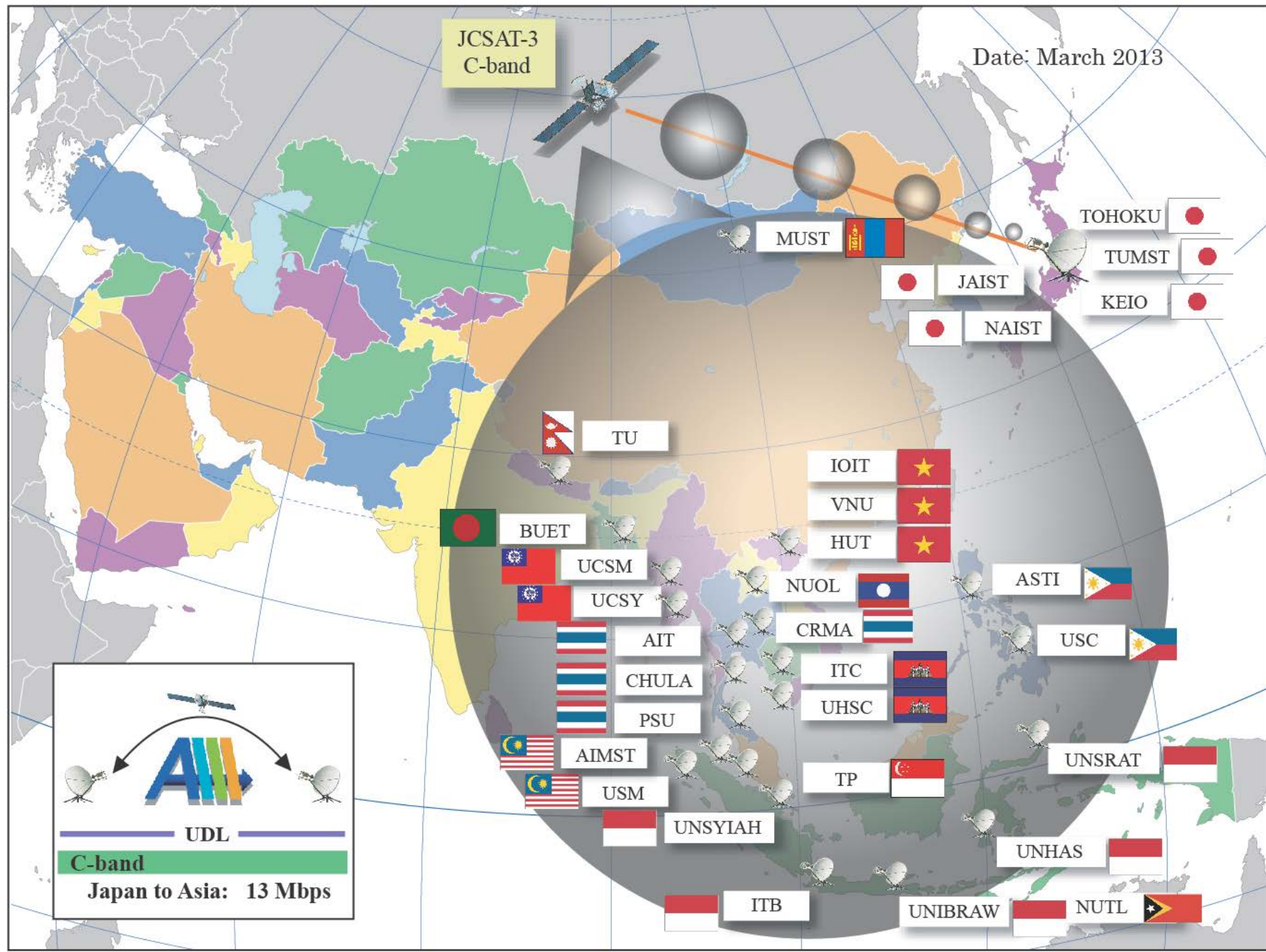


**THE GLOBAL GOALS**  
For Sustainable Development



26 Partners  
11 Countries  
6 time zones

Sharing  
Lectures and  
Workshops  
Among Universities







**\* EDUCATION \***  
Educational Programs for Global Issues



**\* APPLICATION \***  
Lecture Sharing Platform



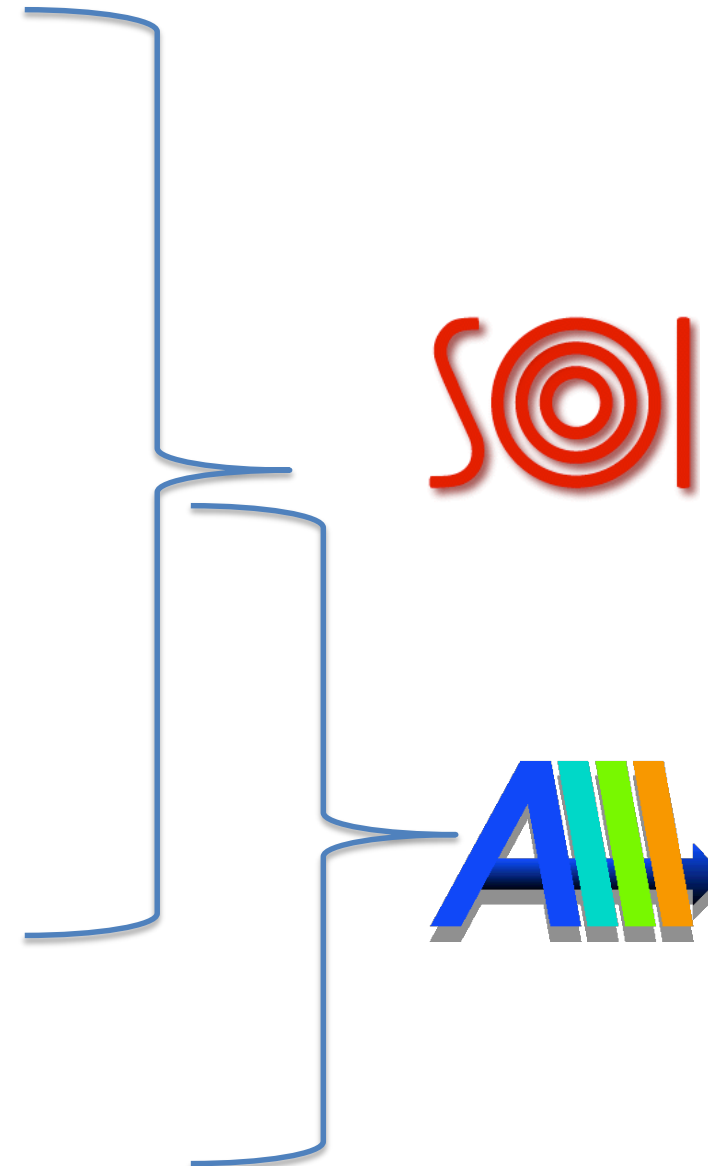
**\* COMMUNITY \***  
Sharing Experience and Ideas



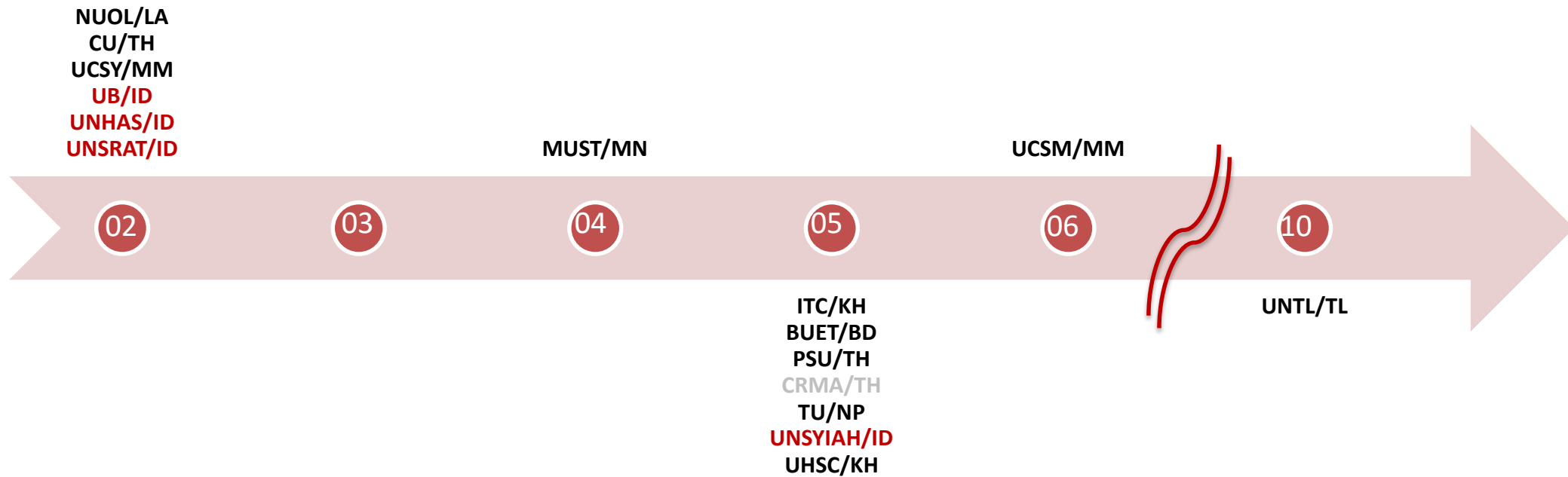
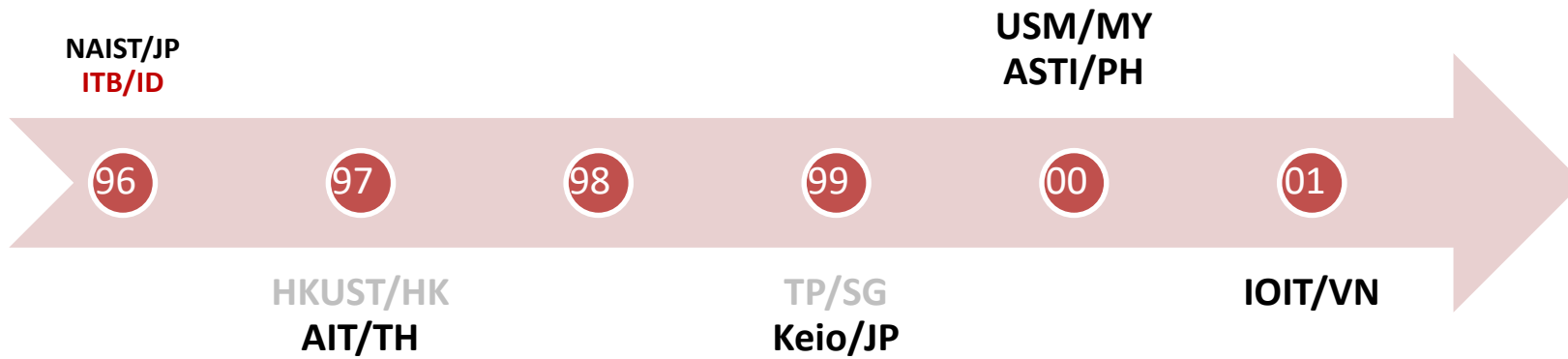
**\* OPERATION \***  
Network Operation and Training



**\* NETWORK \***  
Network Development





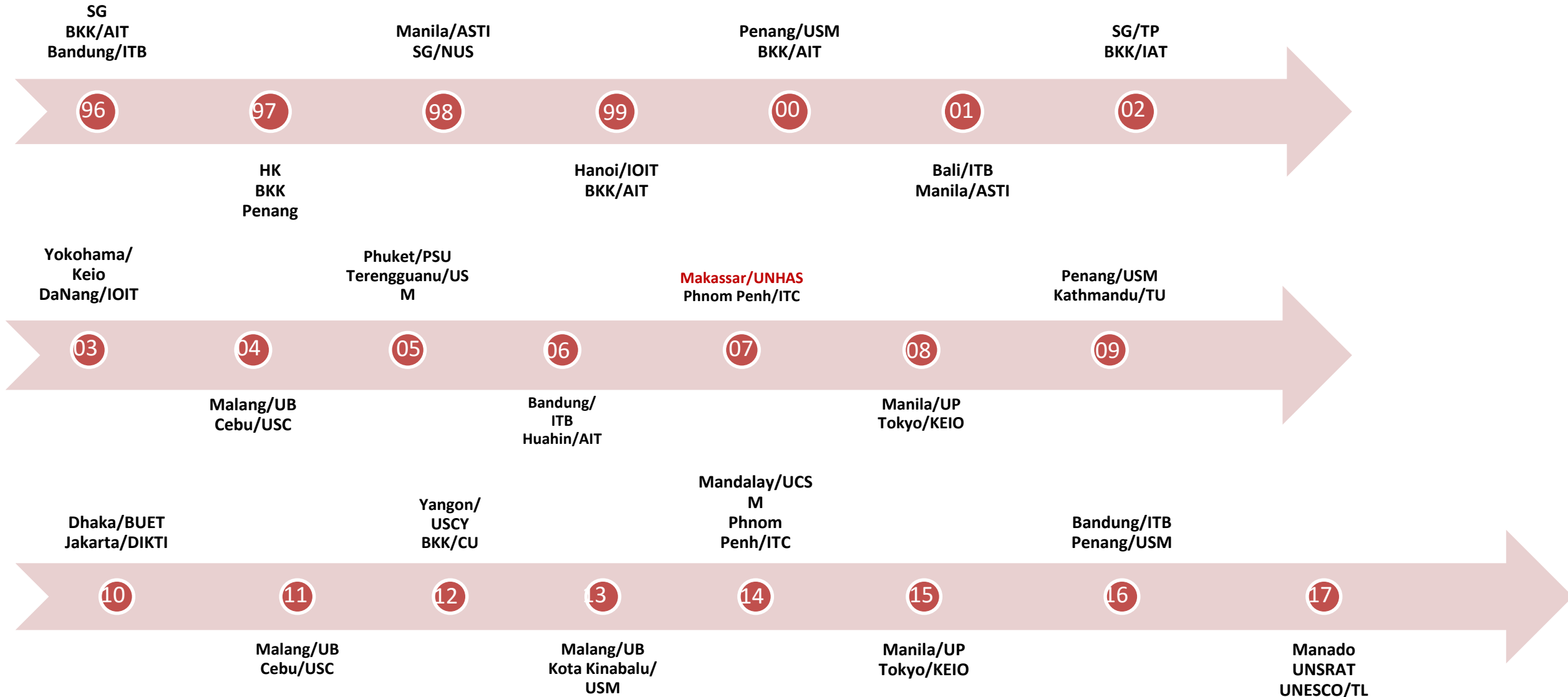


# HISTORY

AI3/SOI-Asia  
NETWORK  
-connected year-



# HISTORY Meetings







\* EDUCATION \*  
Educational Programs for Global Issues



\* APPLICATION \*  
Lecture Sharing Platform



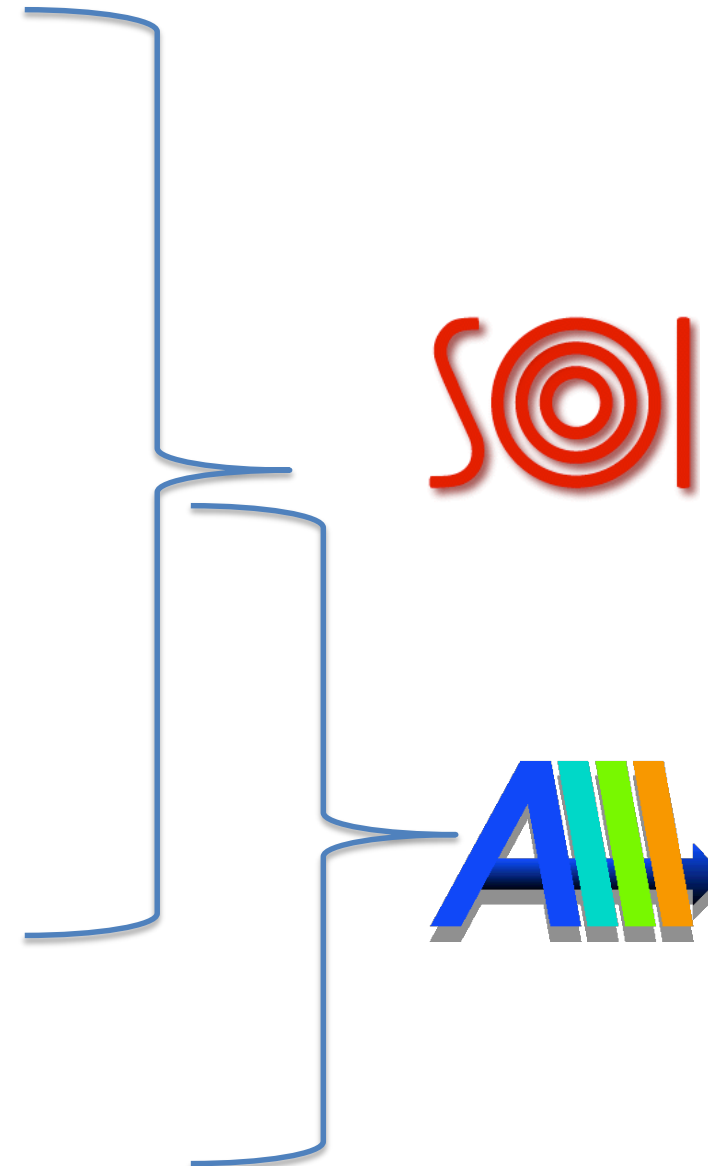
\* COMMUNITY \*  
Sharing Experience and Ideas



\* OPERATION \*  
Network Operation and Training



\* NETWORK \*  
Network Development





# NETWORK





# Bandung Declaration 2006

---

*We have been partners  
in the last ten years, and five years.*

*In this occasion to celebrate  
ten years of AI3 and five years of SOI Asia,*

*We call on each other to continue and strengthen  
our partnerships and friendships for ten years to come.*

Bandung, Indonesia and Tokyo, Japan

11 October, 2006



# AI3 and SOI Asia - Bandung Declaration



Bandung Declaration, October 11 2006



# Statement of Summit by Representatives of AI3/SOI Asia Partners

---

*We are creating a commons for  
research and education  
among partner institutions;*

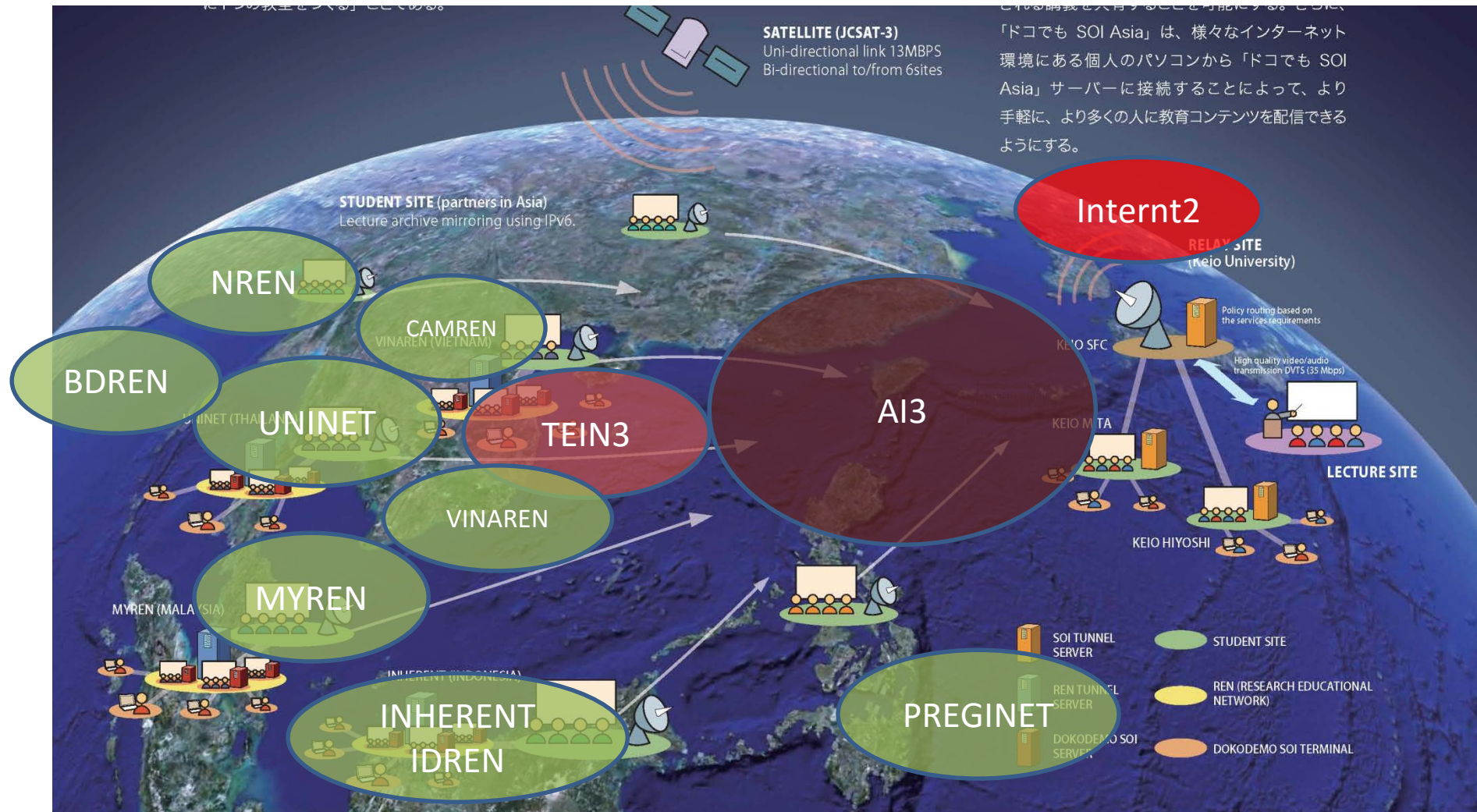
*each of us strives for the future of our own nation  
by utilizing this commons;*

*and we contribute to the world  
by collaborating with similar initiatives.*

Tokyo, 27 June 2008



# Network Collaboration





# NREN's role

- Providing the opportunity to university and Internet community;
  - To understand the Internet Architecture and develop the future Internet.
  - To raise human resource with knowledge and experience for the sustainable Internet operation
  - To contribute to the global technology standard
- Providing the opportunity for researchers and students in all kinds of area;
  - To enhance the education and research environment of the nation.
  - To reach, participate in and lead to the advanced research, development and education in the world.
  - To collaborate with international and global research communities by sharing connecting them and enhancing mobility of faculty, researchers and students.



# NREN in Asia Pacific

## National Research and Educational Network

- Timor Leste: TLREN
- Afghanistan: AfgREN
- Pakistan: PERN
- India: ERNET
- SriLanka: LEARN
- Nepal: NREN
- Bangladesh: BDREN
- Myanmar: mmREN
- Thailand: UniNet
- Laos: LERNET
- Singapore: SingAREN
- Hongkong: HARNET
- Vietnam: VinaREN
- Cambodia: CamREN
- Malaysia: MYREN
- Indonesia: INHERENT/idREN
- Philippines: PREGINET
- China: CERNET
- Taiwan: TWAREN
- Korea: KOREN
- Japan: SINET
- Australia: AARNet
- New Zealand: REANNZ (KAREN)

\* Some are under development



# NREN in Asia Pacific

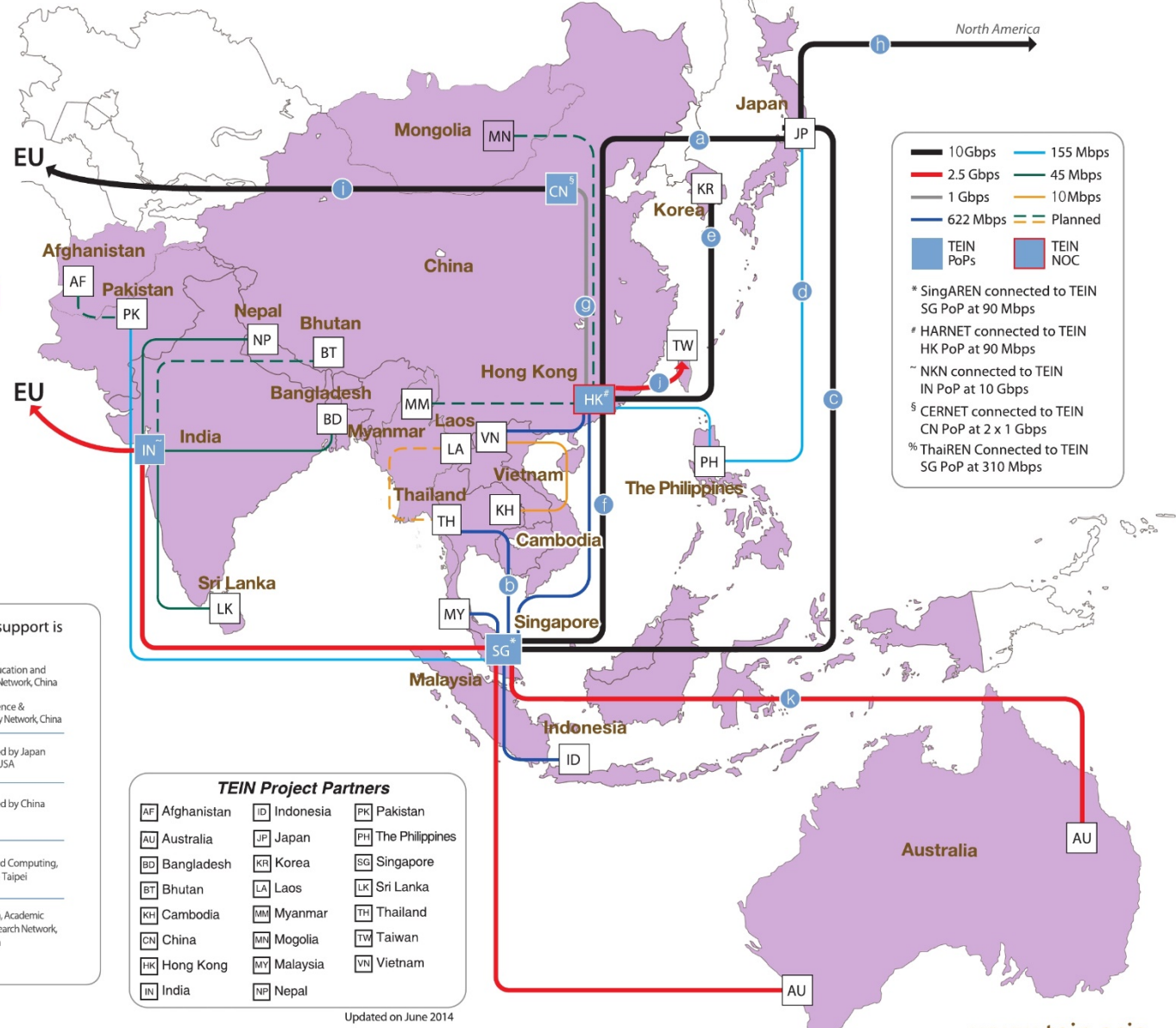
Players to support/promote/operate/fund inter-NREN in Asia

- APAN
- TEIN/EU
- TransPAC/Japan+US
- WIDE
- NII/Japan
- NICT/Japan
- CENIC+Pacific Wave/US
- ThaiREN/Thailand
- Maffin/Japan
- NIA/Korea
- ORIENT/China+EU
- ASGC/Taiwan
- GÉANT/EU
- Internet2/US
- and ... government and industries





# Connecting Asia and Europe's Research and Education Communities



The following links are fully financed by the link owners whose support is gratefully acknowledged.

a **NICT** National Institute of Information and Communications, Japan

b **NICT** National Institute of Information and Communications, Japan

c **NII** National Institute of Informatics, Japan

d **MAFFIN** Ministry of Agriculture, Forestry and Fisheries Research Network, Japan

e **NIA** National Information Society Agency, South Korea

f **NIA** National Information Society Agency, South Korea

g **CERNET** China Education and Research Network, China

h **TransPAC** co-funded by Japan and the USA

i **ORIENT plus** co-funded by China and EU

j **ASGC** Academia Sinica Grid Computing, Republic of Chinese Taipei

k **aarnet** Australia, Academic and Research Network, Australia



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

Updated on June 2014

[www.tein.asia](http://www.tein.asia)

This map has been produced with the financial assistance of the European Union. The contents of this document are the sole responsibility of TEIN<sup>CC</sup> and can under no circumstances be regarded as reflecting the position of the European Union.



# Asia-Pacific Backbone Topology



As of Oct 7th, 2016



Now we celebrate ourselves for 20 years of commitment and  
promise for the future challenge for the Internet in Asia !!



**ANNIVERSARY**  
INTERNET  
@ ITB

*20th Anniversary of AI<sup>3</sup>  
15th Anniversary of SOI Asia  
Institut Teknologi Bandung  
4 - 6 September 2016*



# SEMINAR INTERNET BAGI DUNIA PENDIDIKAN

ALIA BARAT INSTITUT TEKNOLOGI BANDUNG, 5 SEPTEMBER, 1996

Sekretariat : LEMBAGA PENELITIAN INSTITUT TEKNOLOGI BANDUNG

Jl. Ganesa NO. 15, Telp. 250-3602 Fax: 250-3253, 250-1006, E-mail: [lpitbomelsa.net.id](mailto:lpitbomelsa.net.id), Bandung-40132





# Bandung Declaration 2016

---

*We recognize the significance of Research and Education Networks (RENs) as an infrastructure for universities and research institutes in Asia.*

*We urge all stakeholders to join us to foster RENs and their interconnections for knowledge and wisdom for the future.*

Bandung, September 5th, 2016



AI<sup>3</sup> 20<sup>th</sup> & SOI Asia 15<sup>th</sup>  
ANNIVERSARIES





# BANDUNG DECLARATION 2016

*We recognize the significance of Research and Education Networks (RENs) as  
an infrastructure for universities and research institutes in Asia.*

*We urge all stakeholders to join us to foster RENs and their interconnections  
for knowledge and wisdom for the future.*

Bandung, September 5th, 2016

  
  
Keio University

  
  
Nara Institute of Science and  
Technology

  
  
Institut Teknologi Bandung

  
  
Universitas Brawijaya

  
  
Universitas Hasanuddin

  
  
Universitas Syiah Kuala

  
UNESCO

  
  
Universitas Sam Ratulangi

  
Universiti Sains Malaysia

  
  
University of Computer Science,  
Yangon

  
  
University of Computer Science,  
Mandalay

  
  
Asian Institute of Technology

  
  
Institute of Technology  
Cambodia

  
Bangladesh University of Engineering  
and Technology

  
  
University of San Carlos

  
International University  
of Malaya-Wales

  
Tribhuvan University

  
  
National University of Laos

  
  
Advanced Science  
and Technology Institute

  
SOI Asia Project

  
  
Asian Internet Interconnection  
Initiatives

  
  
WIDE Project



# IU Newsroom

All IU News IU Bloomington IUPUI School of Medicine Regional Campuses

IU Newsroom » IU-led collaboration provides first trans-Pacific 100G circuit dedicated to research and education

## IU-led collaboration provides first trans-Pacific 100G circuit dedicated to research and education

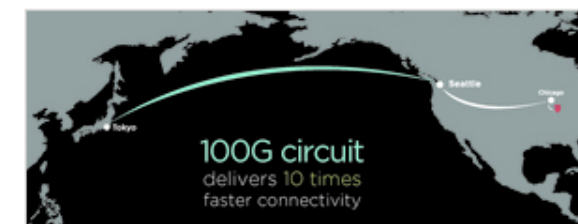
**New TransPAC-Pacific Wave link between Tokyo and Seattle will deliver 10 times faster connectivity**

Oct. 16, 2015  
FOR IMMEDIATE RELEASE

BLOOMINGTON, Ind., SEATTLE, Wash., and WASHINGTON, D.C. -- Indiana University and the Pacific Northwest Gigapop have launched the world's first 100-gigabits-per-second circuit connecting Pacific Rim research and education networks with their counterparts in the United States.

Called the TransPAC-Pacific Wave, the new link connects network research hubs in Tokyo and Seattle. It will deliver data transfer speeds that are 10 times faster than current rates to researchers between Asia and the U.S.

PRINT + SHARE



TransPAC-Pacific Wave | Photo by Indiana University

Print-Quality Photo

### Media Contacts

Ceci Jones

Office of the Vice President for Information Technology



A stylized map of the Pacific Northwest region, including Japan, North America, and parts of South America. A thick, curved teal line represents a 100G circuit connecting Tokyo, Japan, to Seattle, Washington. A thinner, curved white line connects Seattle to Chicago, Illinois. The cities are marked with white dots and labeled. The text '100G circuit' is in teal, 'delivers 10 times' is in yellow-green, and 'faster connectivity' is in white.

● Tokyo

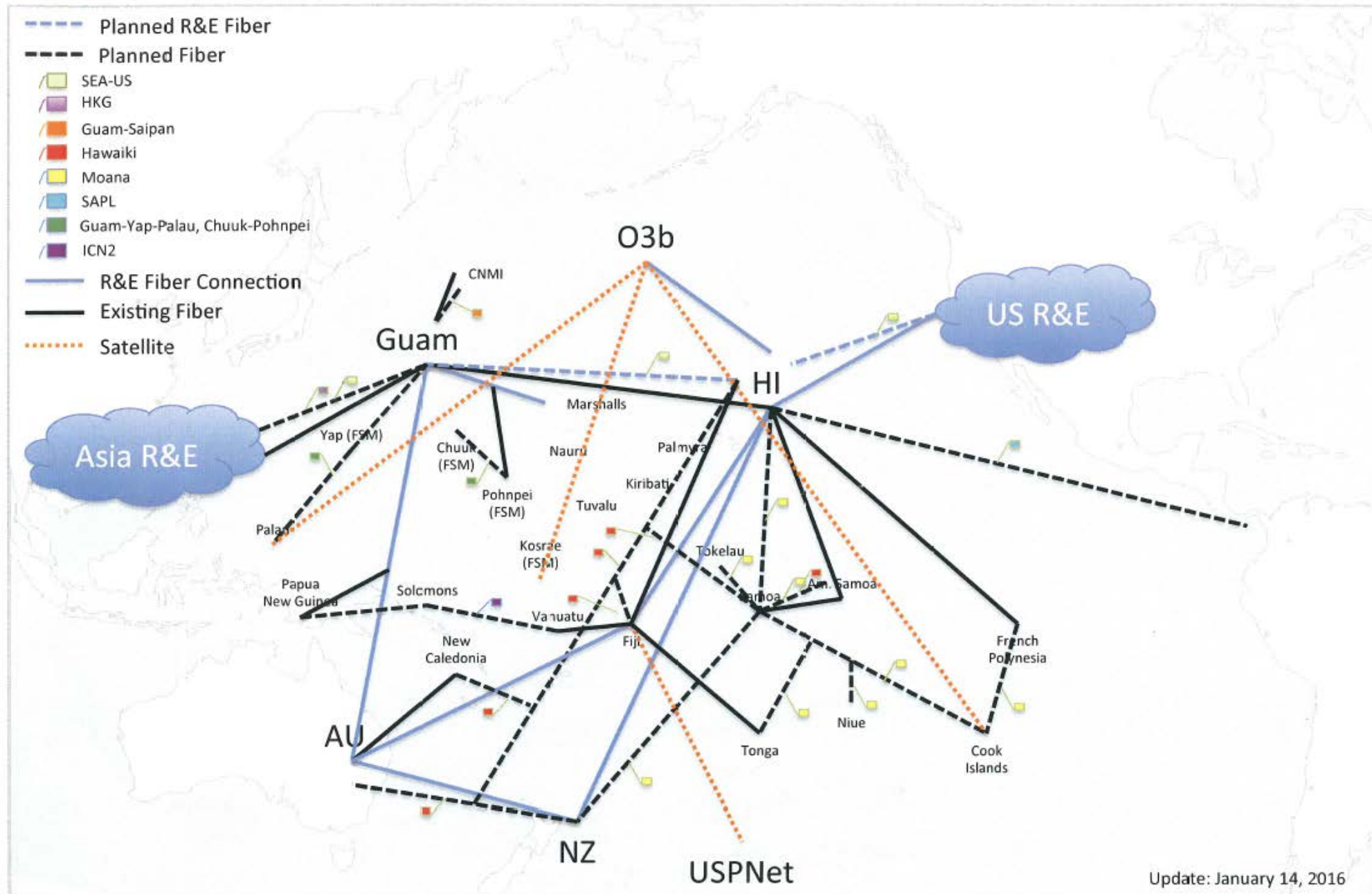
● Seattle

Chicago

100G circuit  
delivers 10 times  
faster connectivity

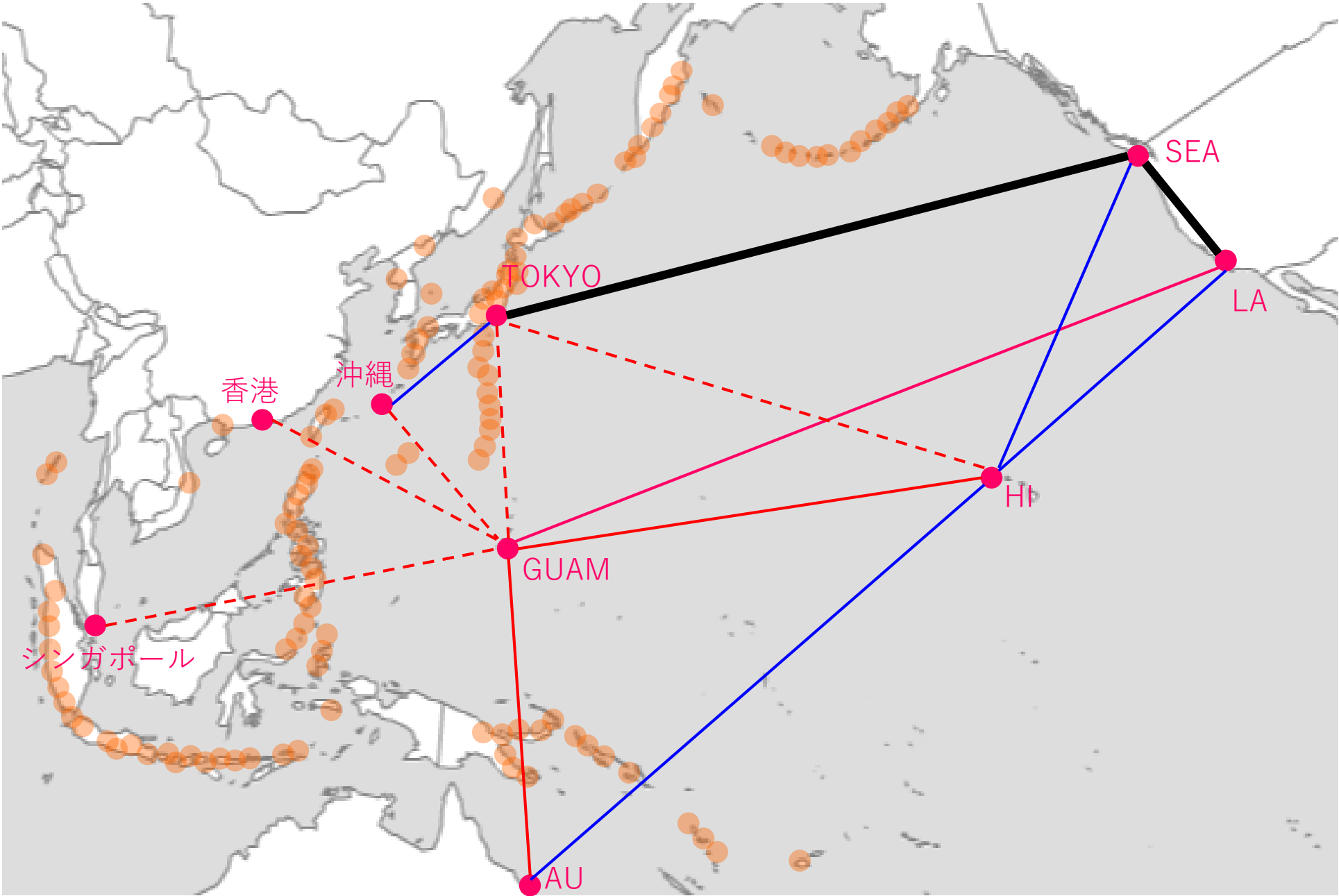


# Notional Pacific Islands Research & Education Network (PIREN)





Authagraph Map



● Vocanos







[Products & Solutions](#)[Support & Downloads](#)[Case Studies](#)[News](#)[About NEC](#)[Home](#) > [Press Releases](#) > SEA-US cable system to connect Indonesia, the Philippines and the U.S.

## SEA-US: Global Consortium to Build Cable System Connecting Indonesia, the Philippines, and the United States

**- NEC awarded contract to build first 100Gb/s submarine cable with a span over 10,000km -**

\*\*\* For immediate use August 28, 2014

A consortium of seven global telecommunications companies agreed today to cooperate in the construction and operation of a new submarine cable system that directly connects Southeast Asia and the United States with NEC Corporation as the system supplier. The Southeast Asia – United States "SEA-US" consortium consists of PT. Telekomunikasi Indonesia International (Telin), Globe Telecom, RAM Telecom International (RTI), Hawaiian Telcom, Teleguam Holdings (GTA), GTI Corporation (a member of the Globe Telecom group of companies) and Telkom USA.

Share:

**Recommend** 209

**Tweet**





**Manado**  
(Indonesia)

**Davao**  
(Philippines)

**Piti**  
(Guam)

**Oahu**  
(Hawaii, USA)

**Hermosa Beach**  
(California, USA)



# Understanding and Solving Real-world Problems at SOI Asia -Tsunami Disaster Recovery Project

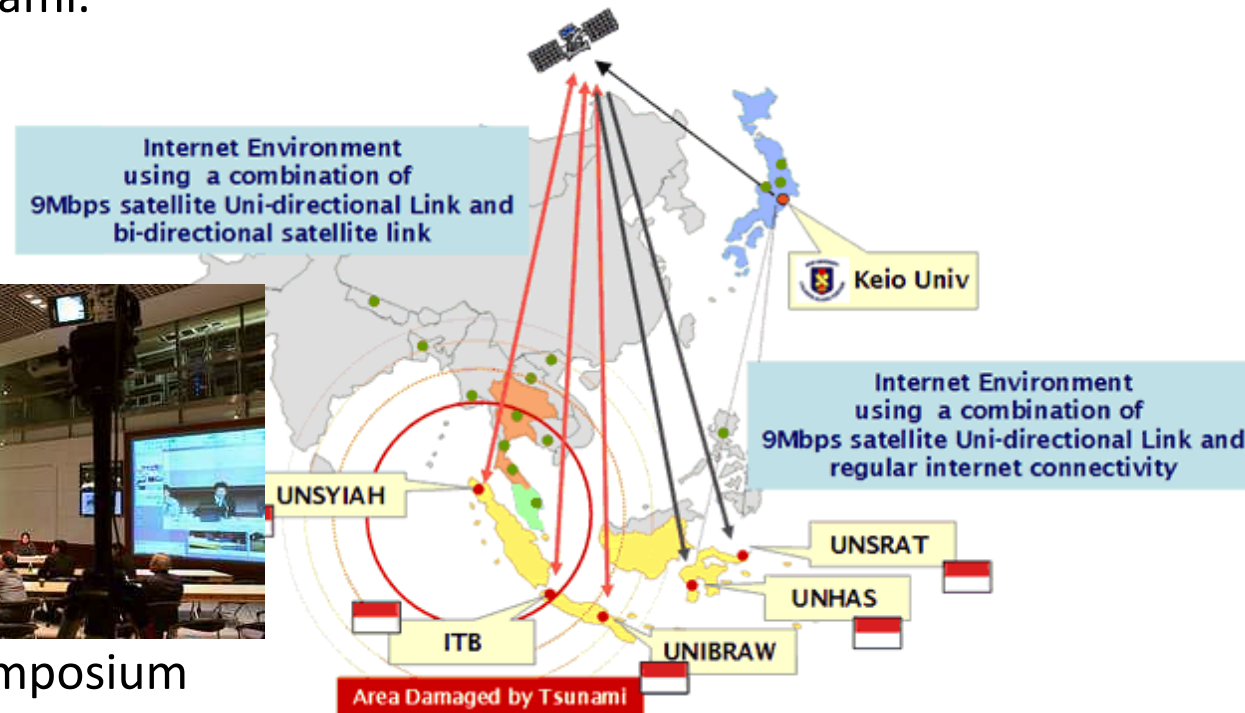
Keio University and SOI Asia assisted Universitas Syiah Kuala, the largest national university in Indonesia, by providing distance learning during its recovery from the tsunami.



Photos by Chermg Talay  
Subdistrict  
Administration  
Office

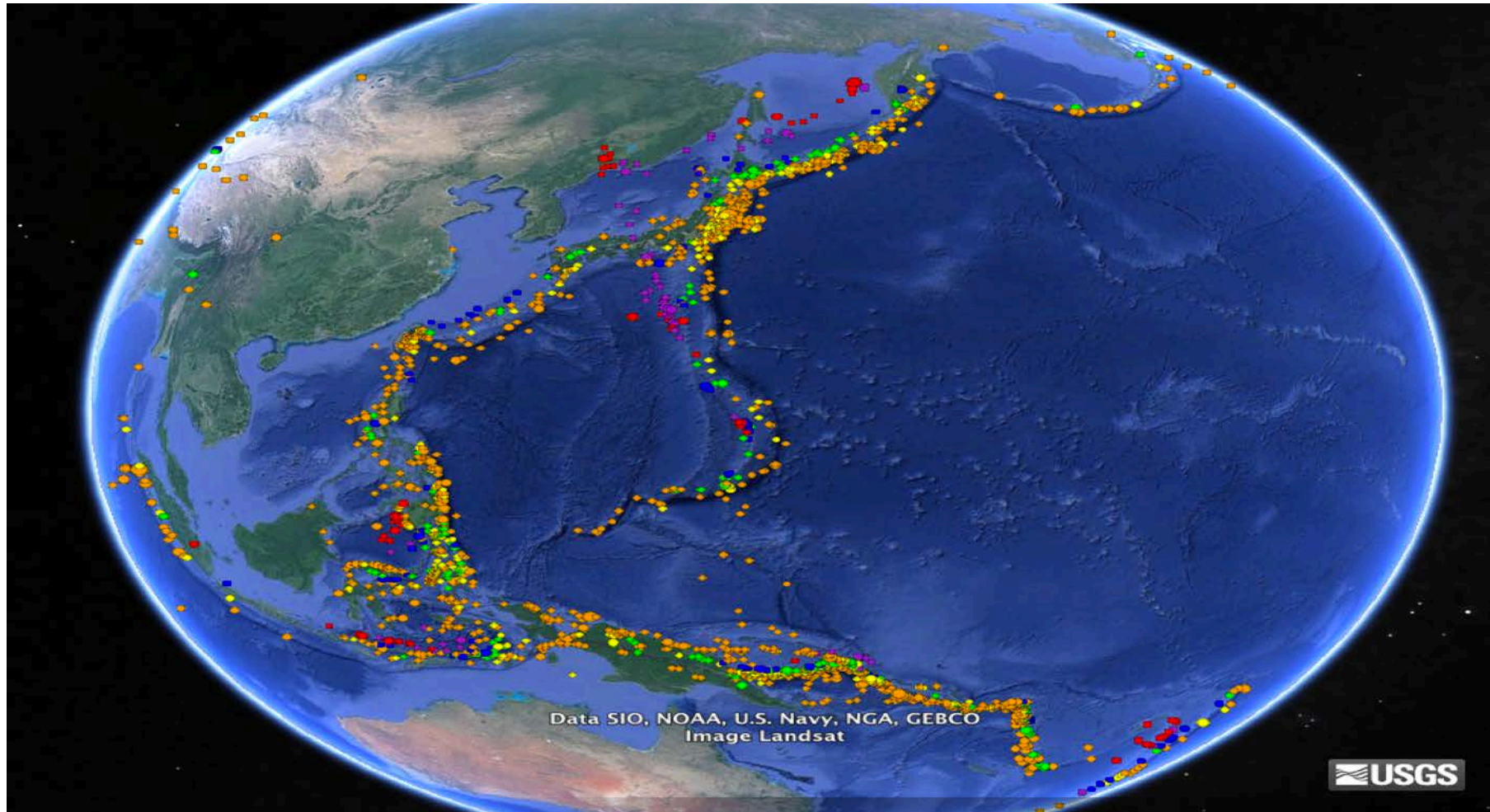


Tsunami Symposium  
on SOI Asia network



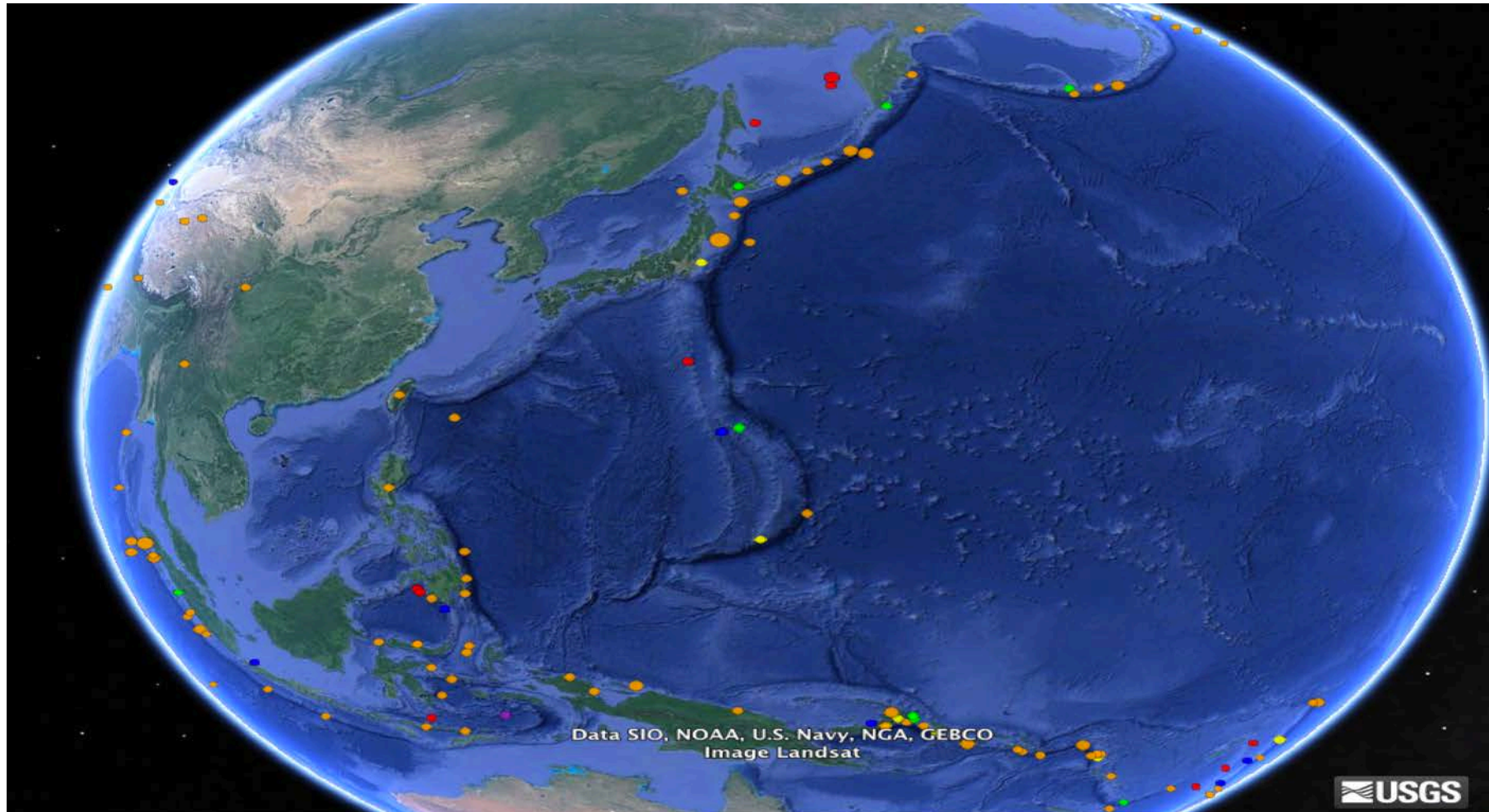


# Beyond M6 (1980~2016)





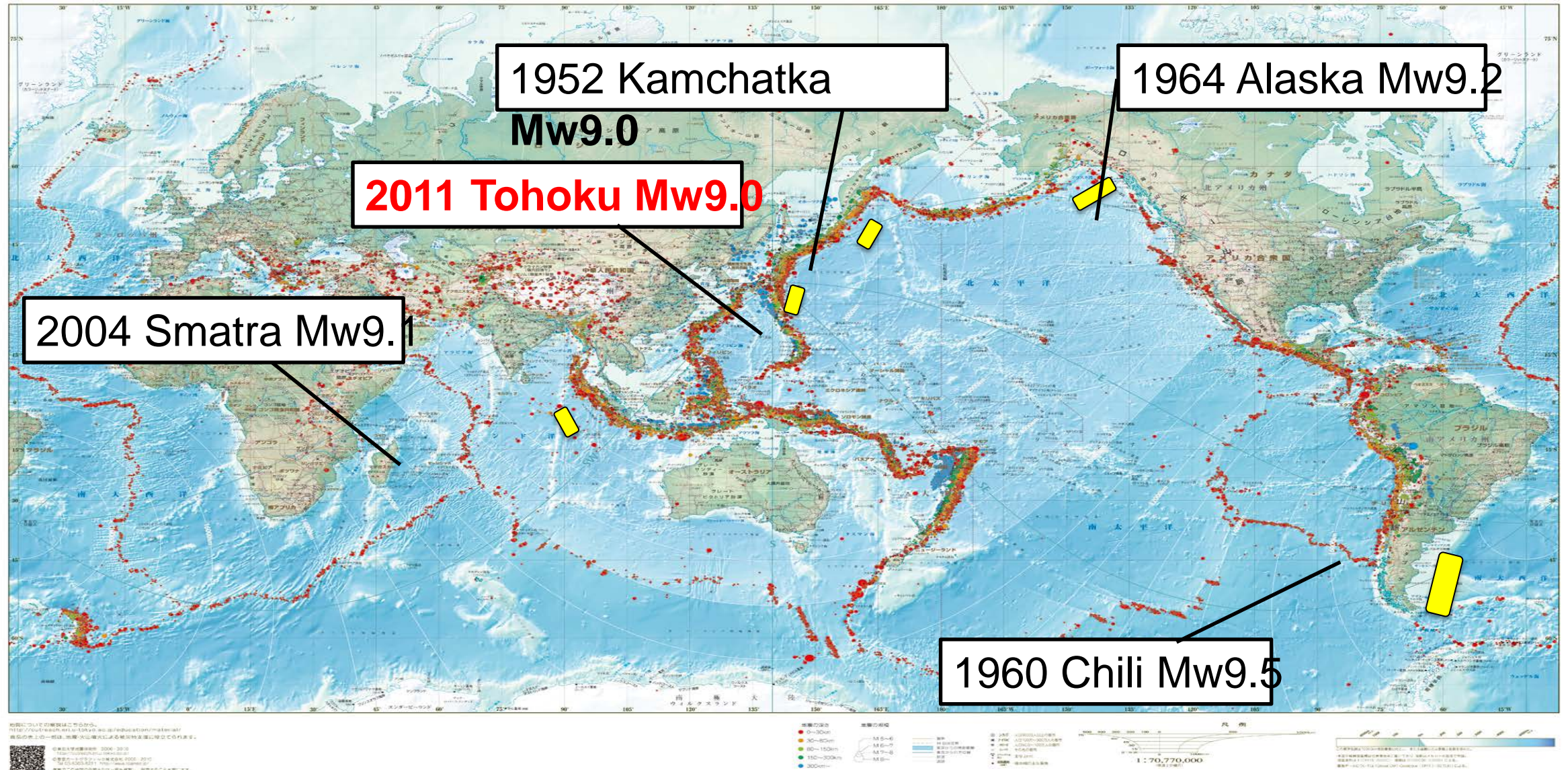
# Beyond M7.5 (1980~2016)





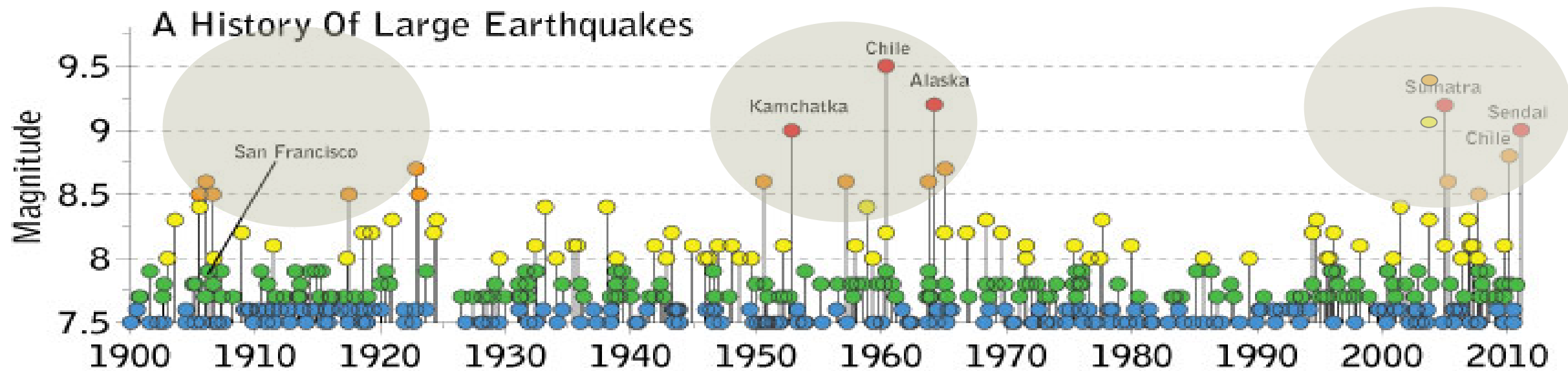
# 世界の震源分布 (2010年版)

東京大学 地震研究所





# Histric View



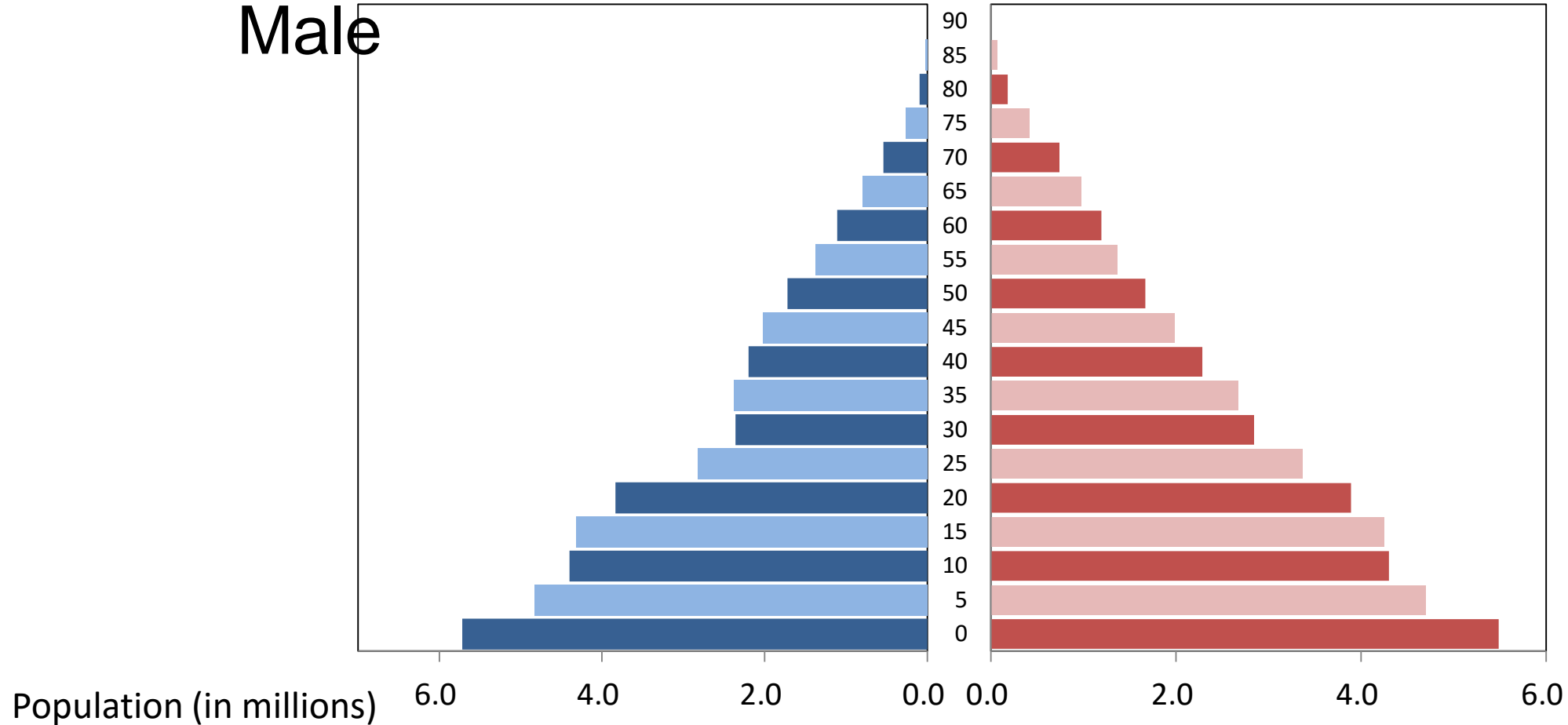


# JP Population (1950)

Ministry of Internal Affairs and Communications  
Statistics Bureau Home Page  
<http://www.stat.go.jp/>

Male

Female



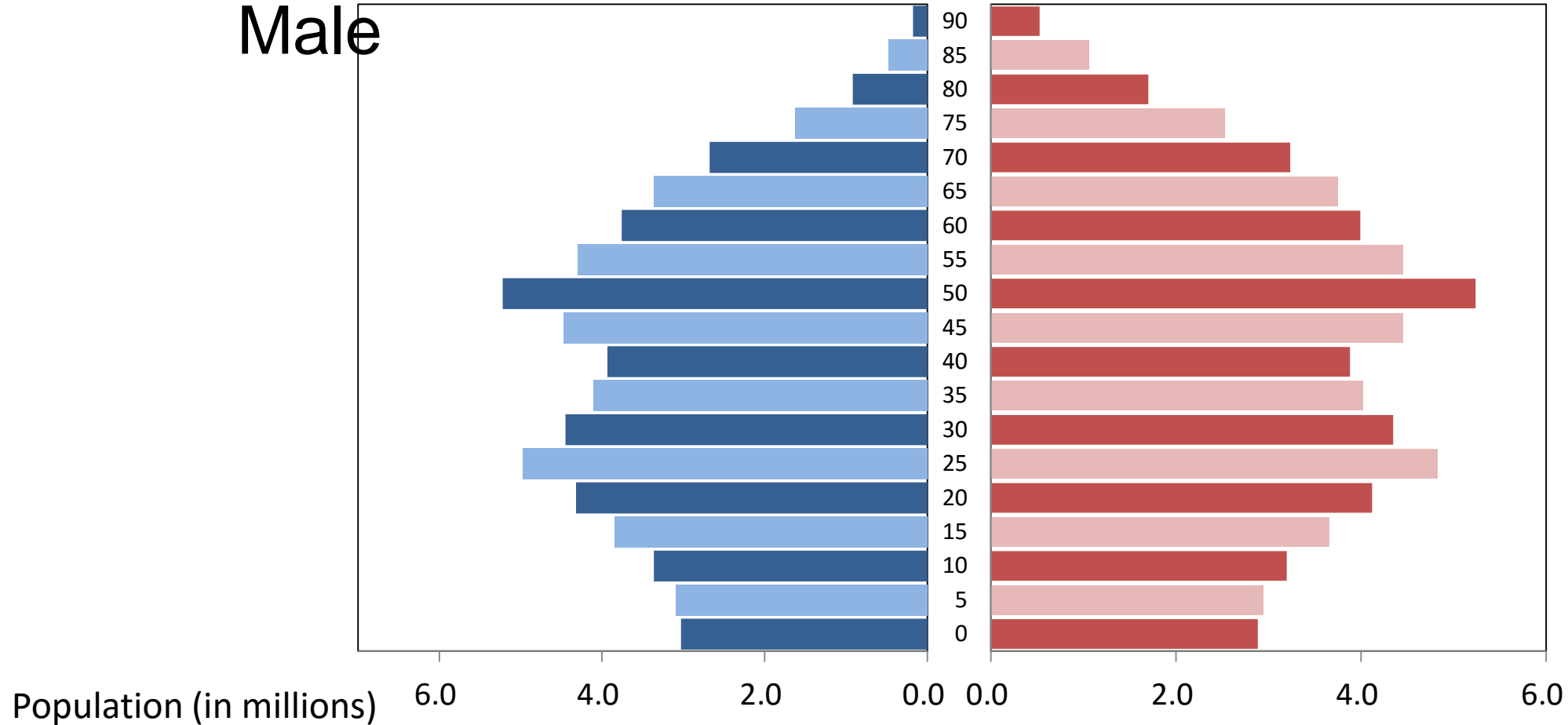


# JP Population(2000)

Ministry of Internal Affairs and Communications  
Statistics Bureau Home Page  
<http://www.stat.go.jp/>

Male

Female



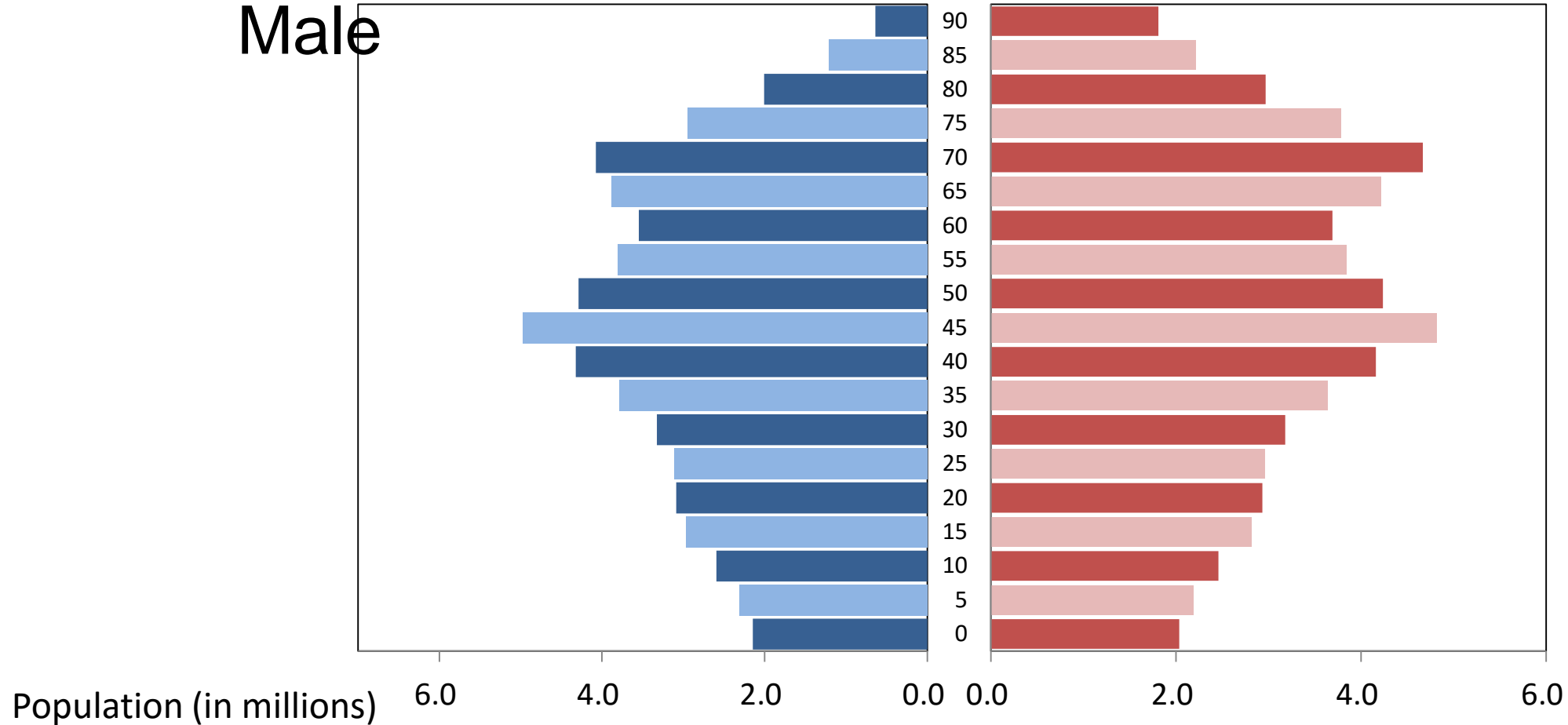


# JP Population(2020)

Ministry of Internal Affairs and Communications  
Statistics Bureau Home Page  
<http://www.stat.go.jp/>

Male

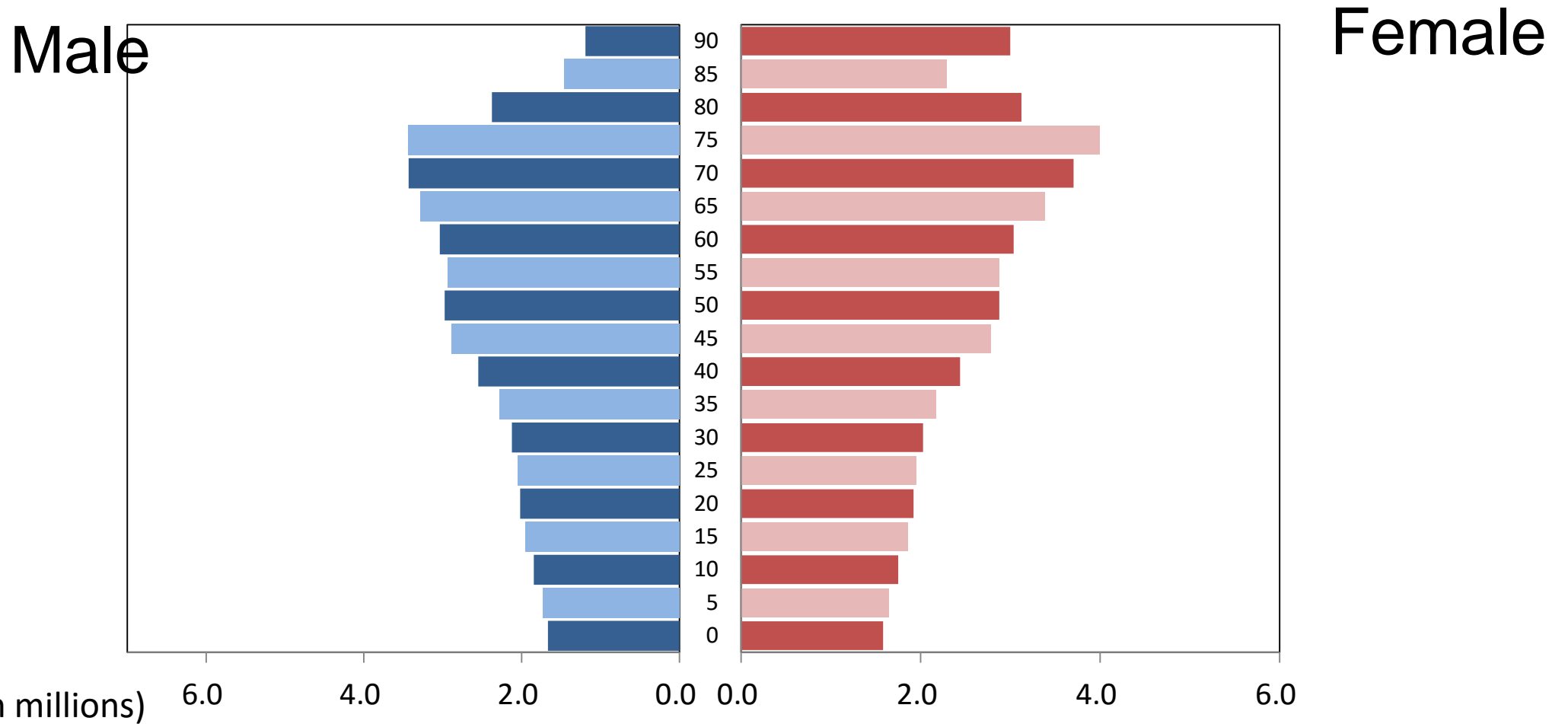
Female





# JP Population (2050)

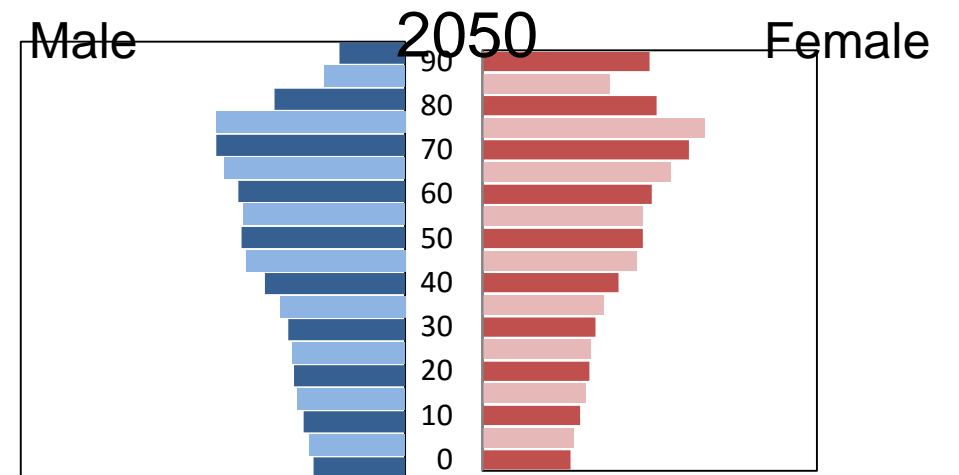
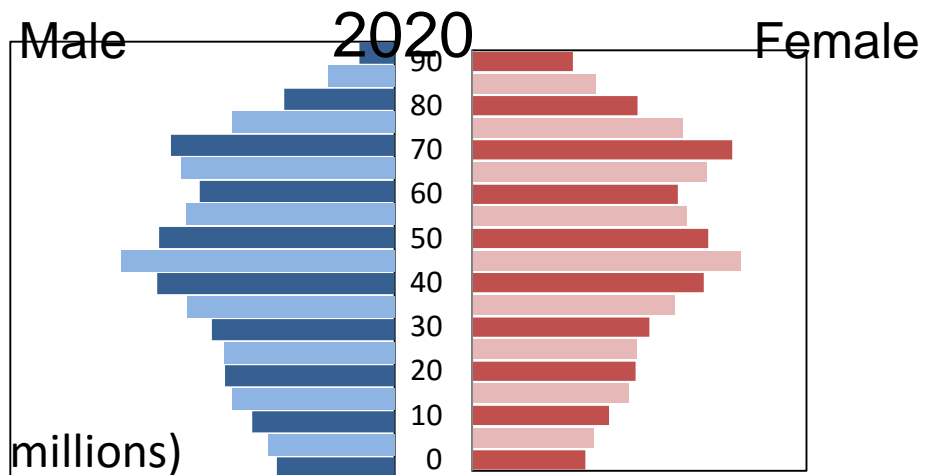
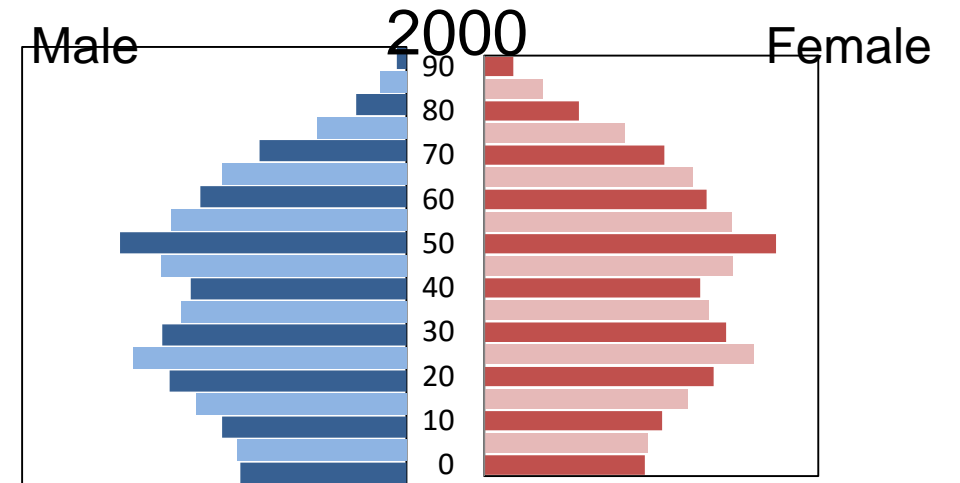
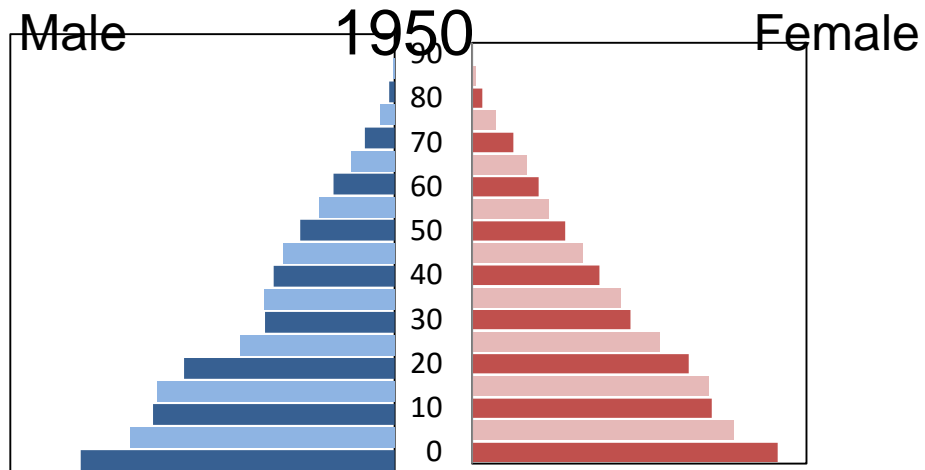
Ministry of Internal Affairs and Communications  
Statistics Bureau Home Page  
<http://www.stat.go.jp/>





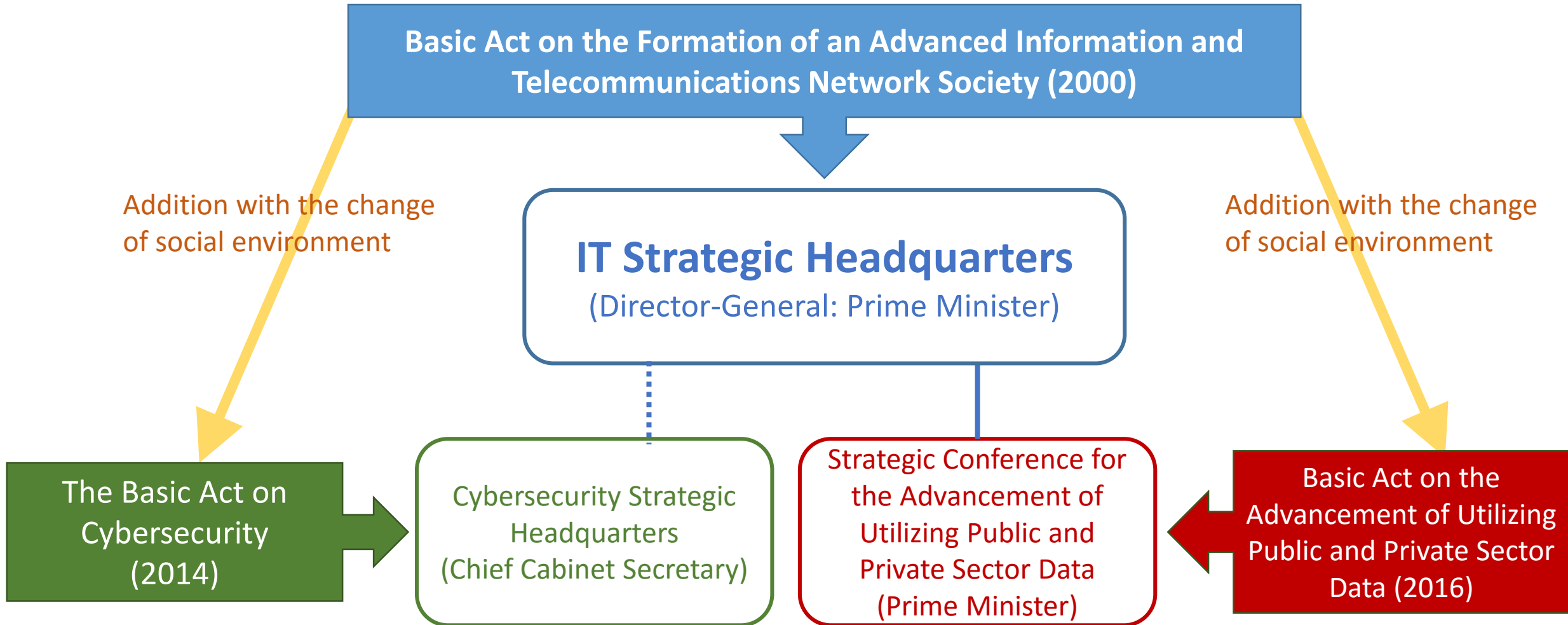
# JP Population

Ministry of Internal Affairs and Communications  
Statistics Bureau Home Page  
<http://www.stat.go.jp/>





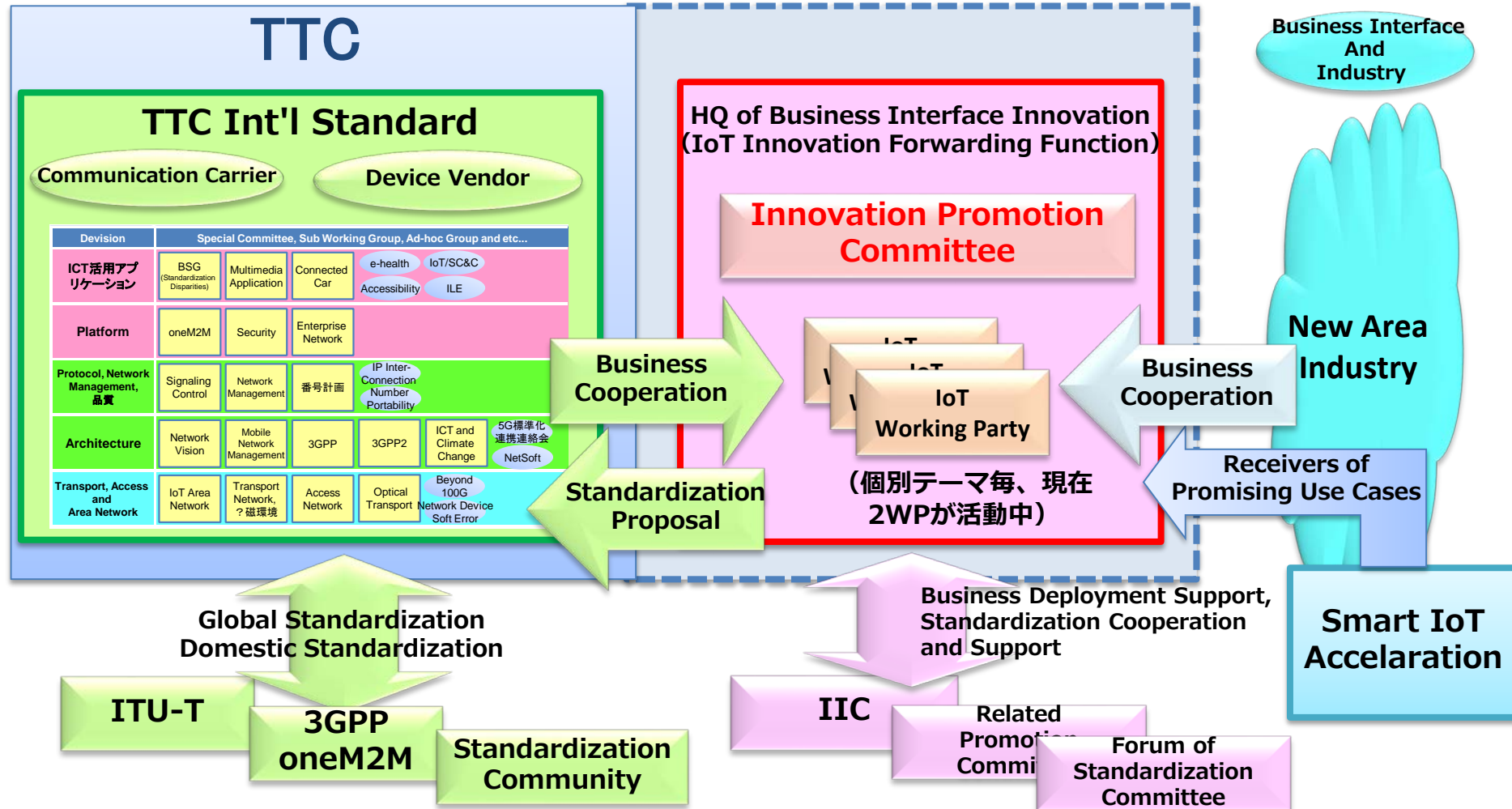
# New Law-based IoT in 2017, and W3C/IETF recognized



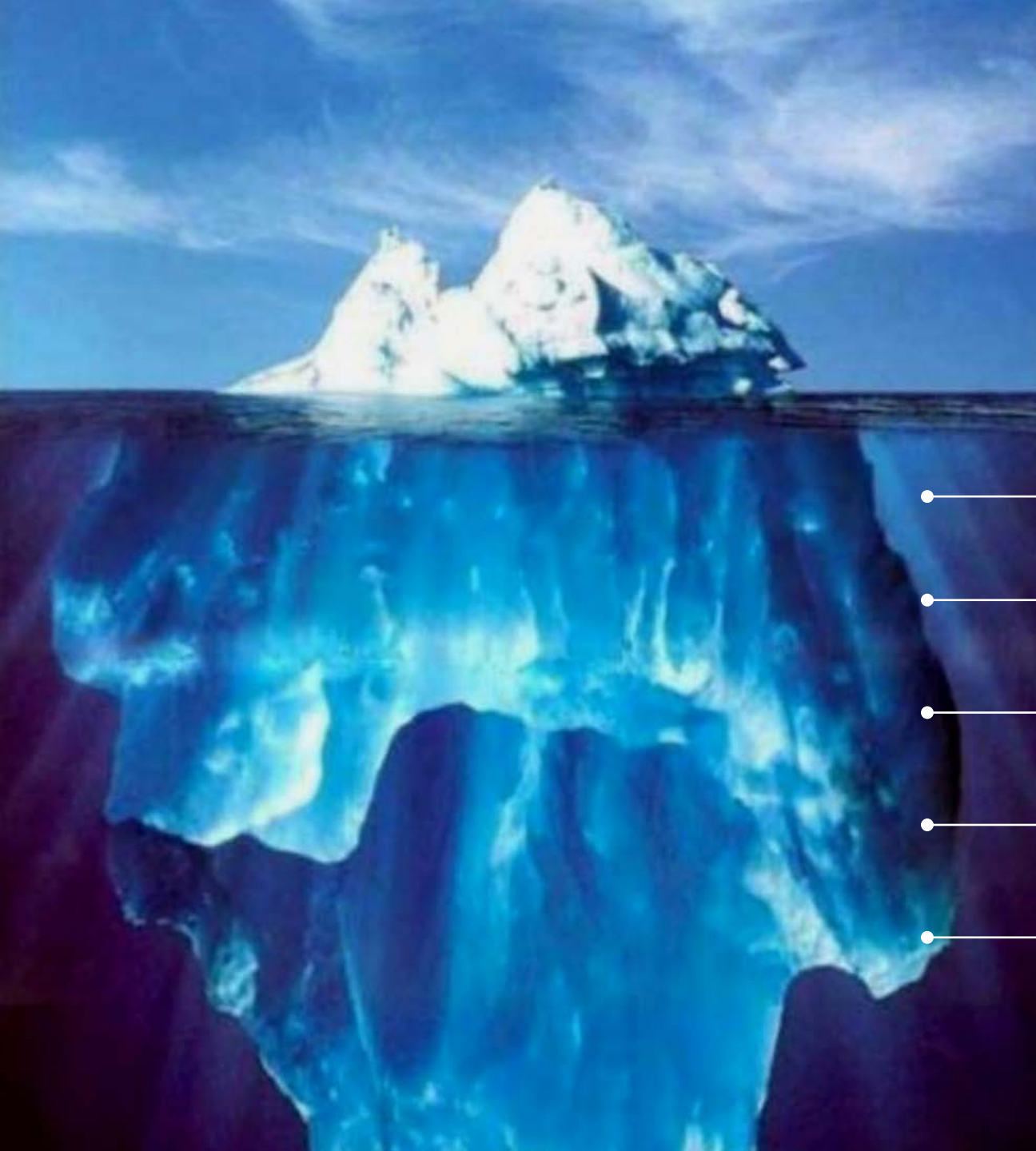


# New Step toward non De Joule Standards in 2017

Japan's Standard Organization, TTC (Telecommunication Technology Committee) now ready covers non-De Joule standards: IEEE, IETF, W3C, MPEG, and so on.







• **API (Application Interface)**

• **WEB**

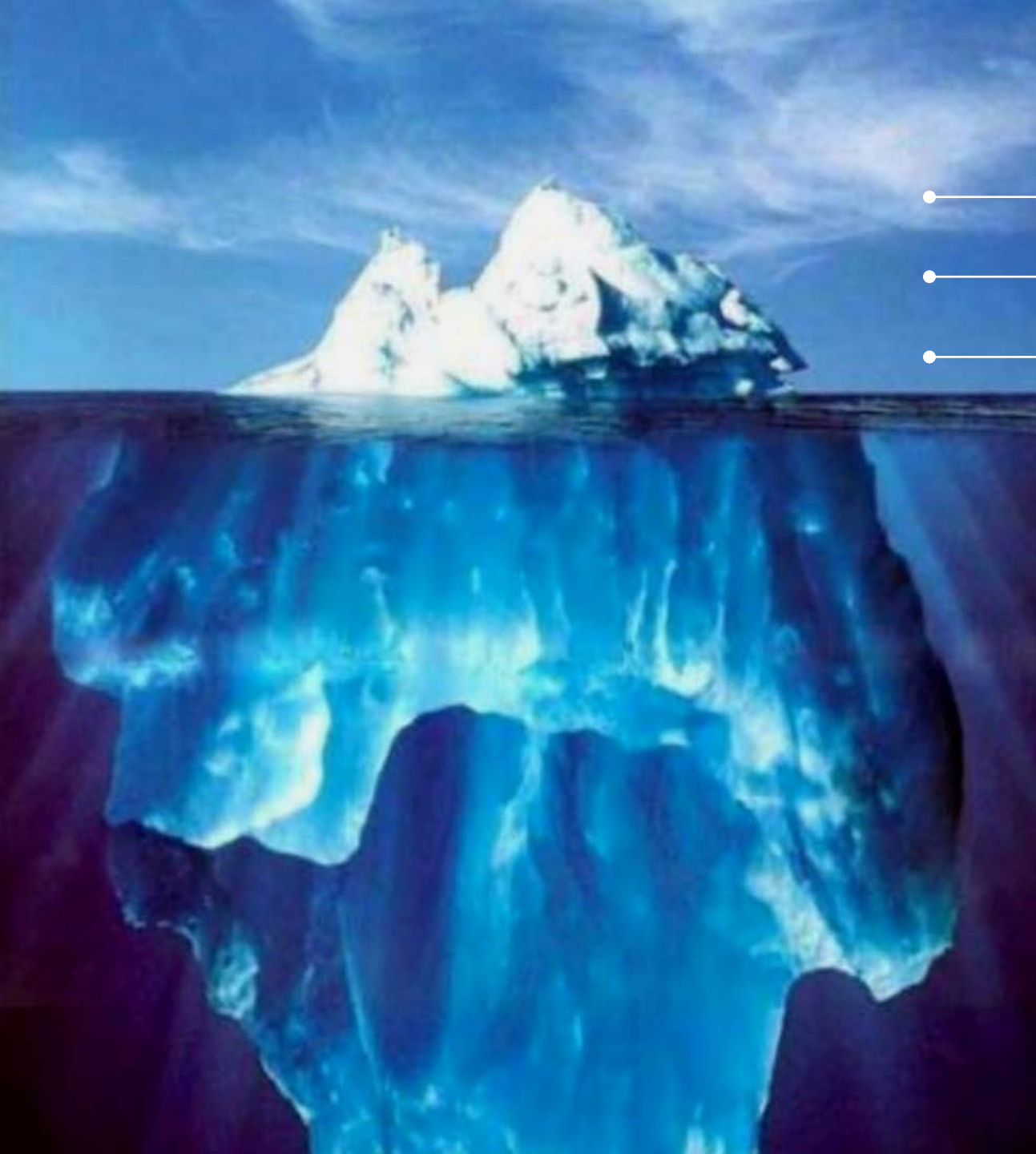
**SDN and NFV**

• **TCP/IP**

• **Ether, WiFi, Bluetooth**

• **Fiber, Mobile Wireless, Satellite**



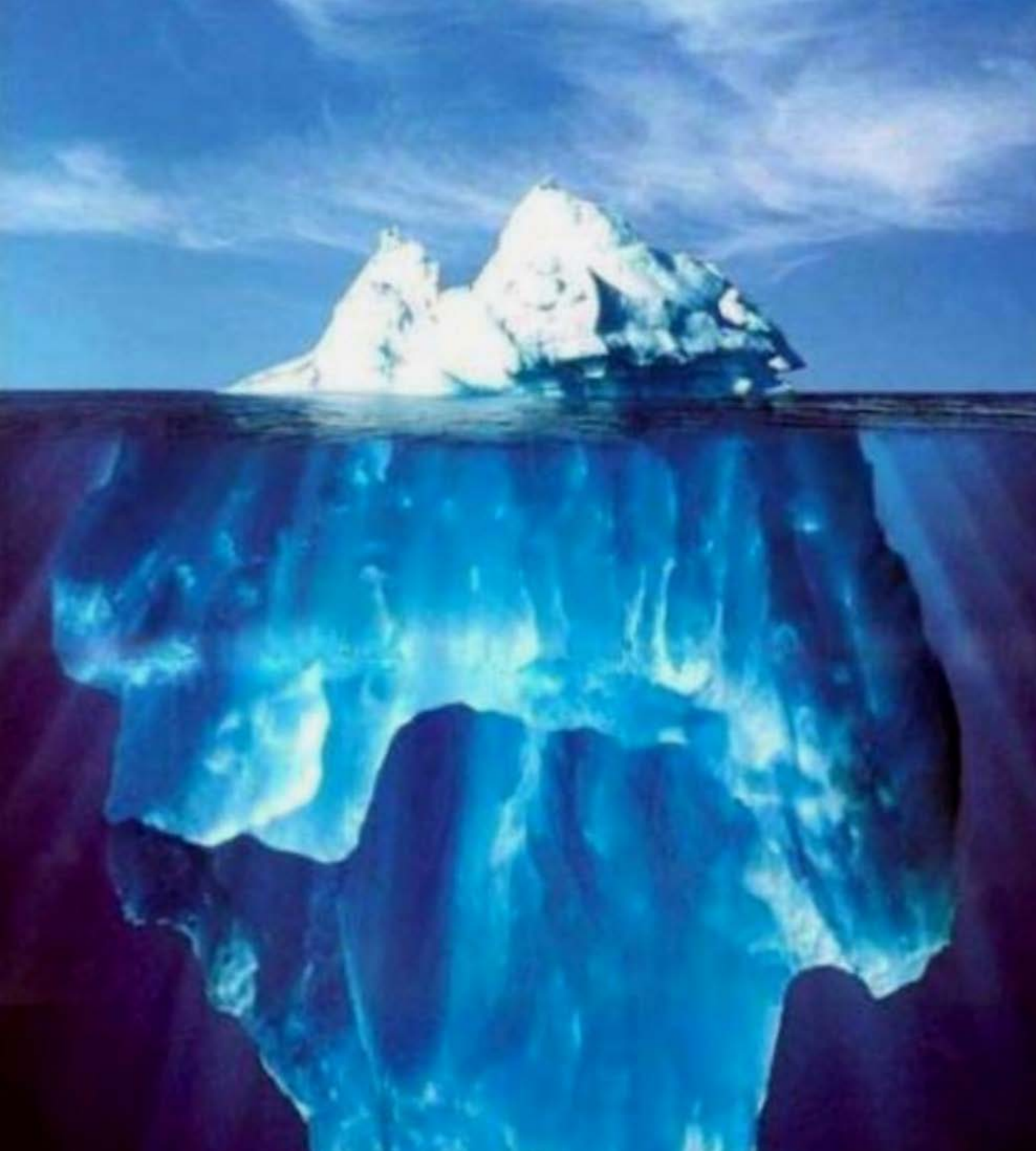


• **Service**

• **IoT, Bigdata**

• **AI**





**The Internet**















