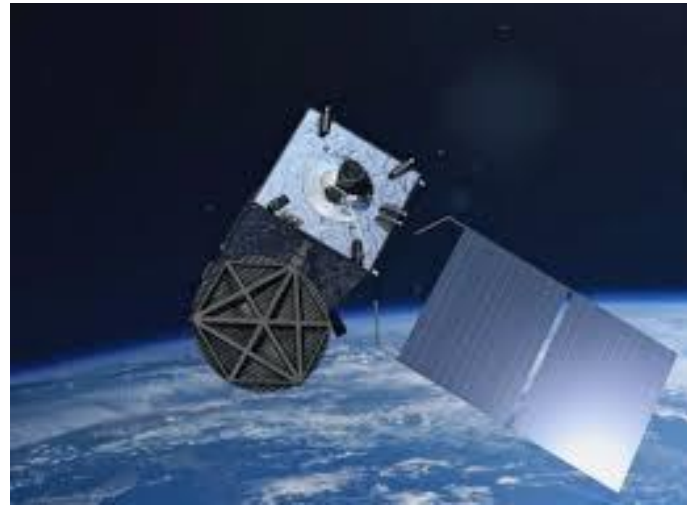


# ASEAN Meteorological Satellite Data Alliance (AMSDA)

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Chalernpol Charnsripinyo<sup>2</sup>, Udom Lewlomphaisarl<sup>2</sup>, Joel S.  
Marciano, Jr.<sup>3</sup>, Andre Jude M. Jose<sup>4</sup>, and Bayani Benjamin Lara<sup>3</sup>

1: NICT, Japan, 2: NECTEC, Thailand, 3: DOST-ASTI, Philippines,  
4: DOST-PAGASA, Philippines

# “Himawari” A meteorological satellite



## Himawari 8/9 (Japanese meteorological satellite)

- Launched in 2014
- Operation since 2015
- World highest equipment



After large-scale typhoon in 2013  
(Philippines)



Floodwaters in 2016 (southern Thailand)

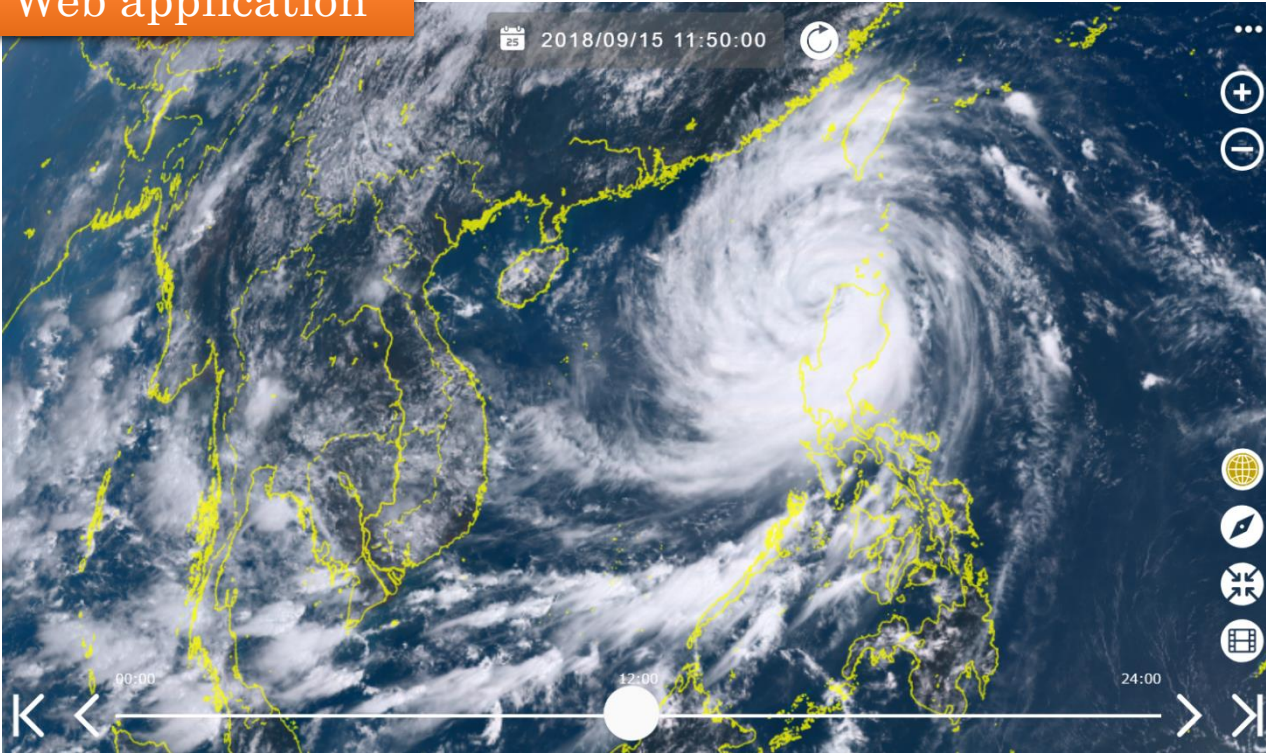


After large-scale typhoon in 2018  
(Philippines)



# Himawari real time Web

Web application



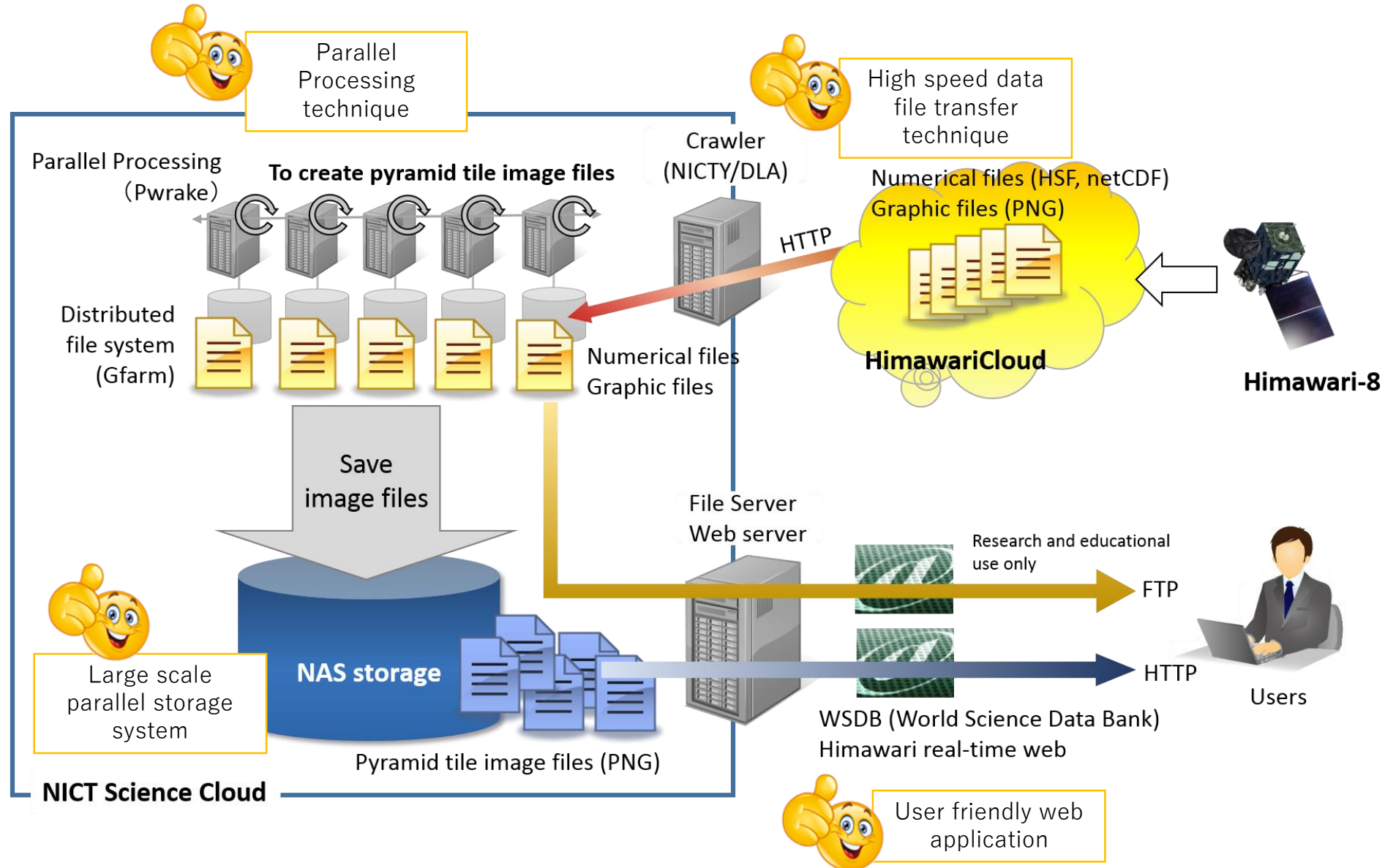
<http://himawari.asia>

Smart Application



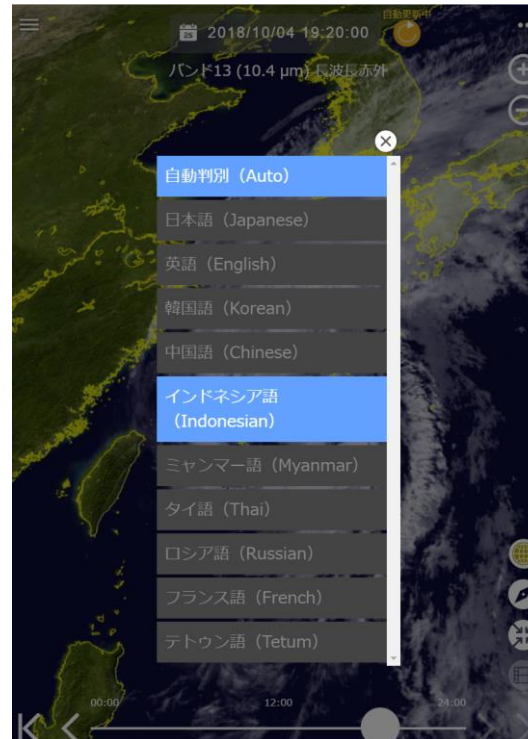
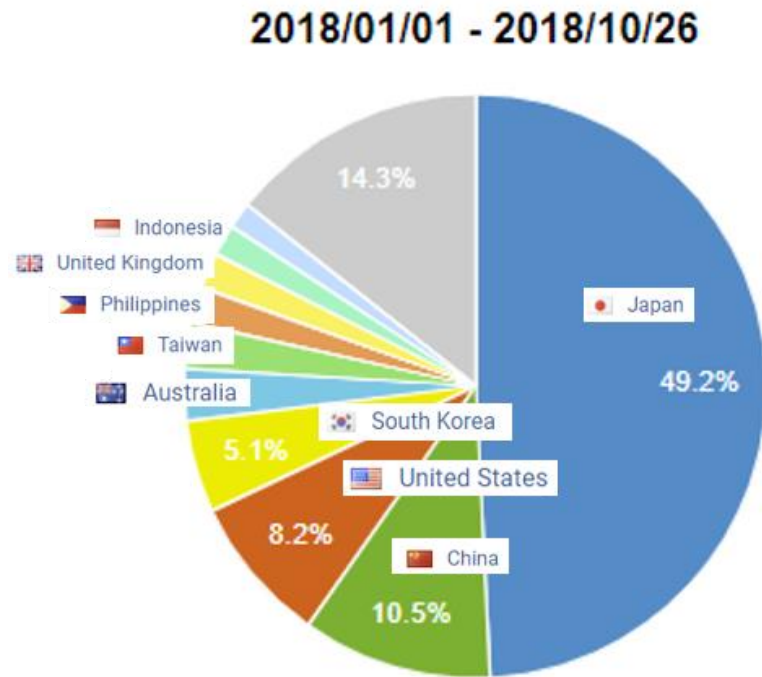
- Highest spatial resolution among Himawari web
- Most real-time visualization among Himawari web
- For PC browser and for smartphone (iOS/Android)

# Himawari Web techniques (for domestic use)



# International use of Himawari real time web

Total Page View (PV): from Jan to Sep in 2017 (1.3 millions) and 2018 (2.1 millions)



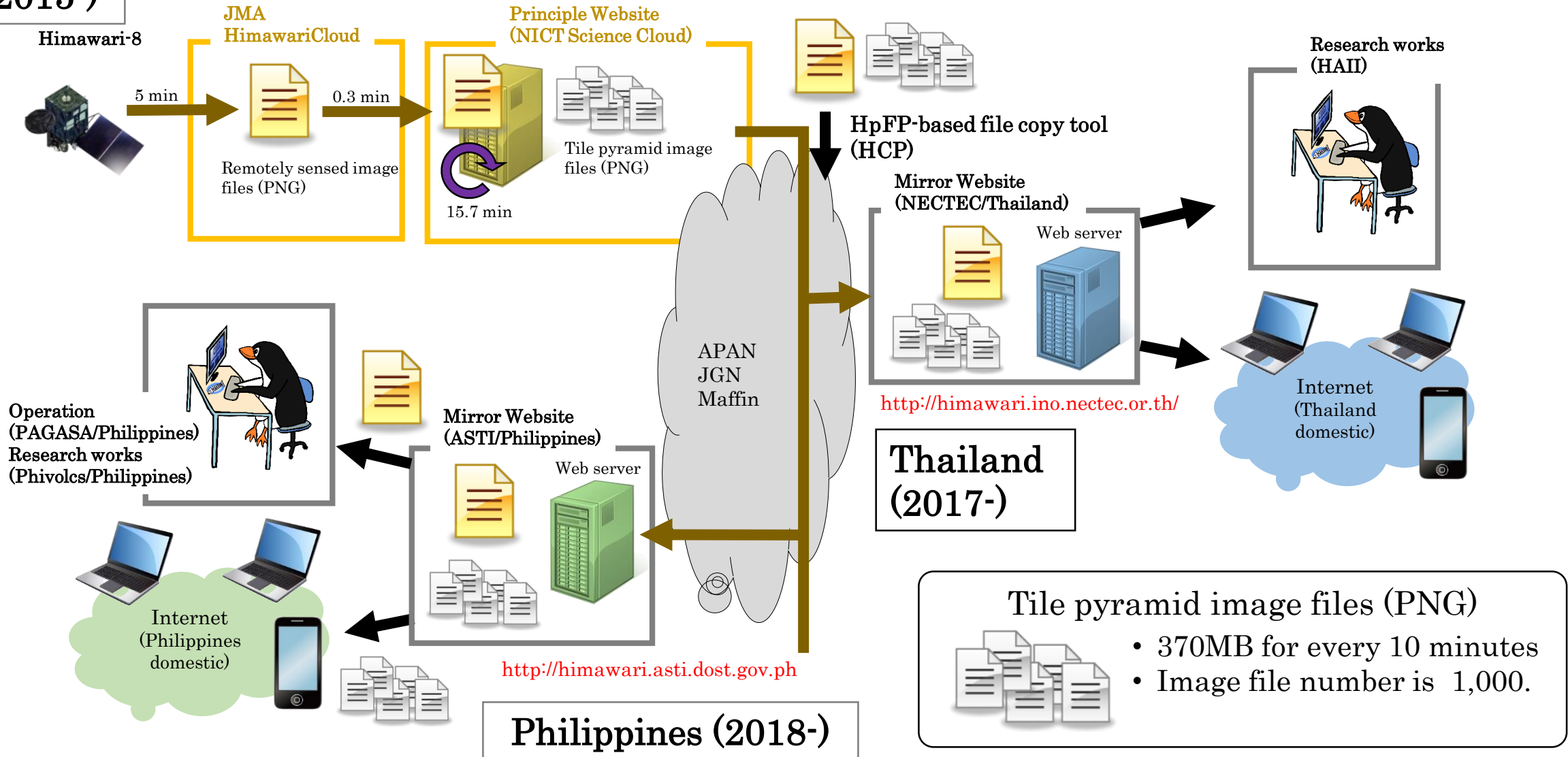
10 languages

- Japanese
- English
- Korean
- Indonesia
- Myanmar
- Thai
- Russian
- French
- Tetum
- Malay



Japan  
(2015-)

# International collaborations (2017-2018)

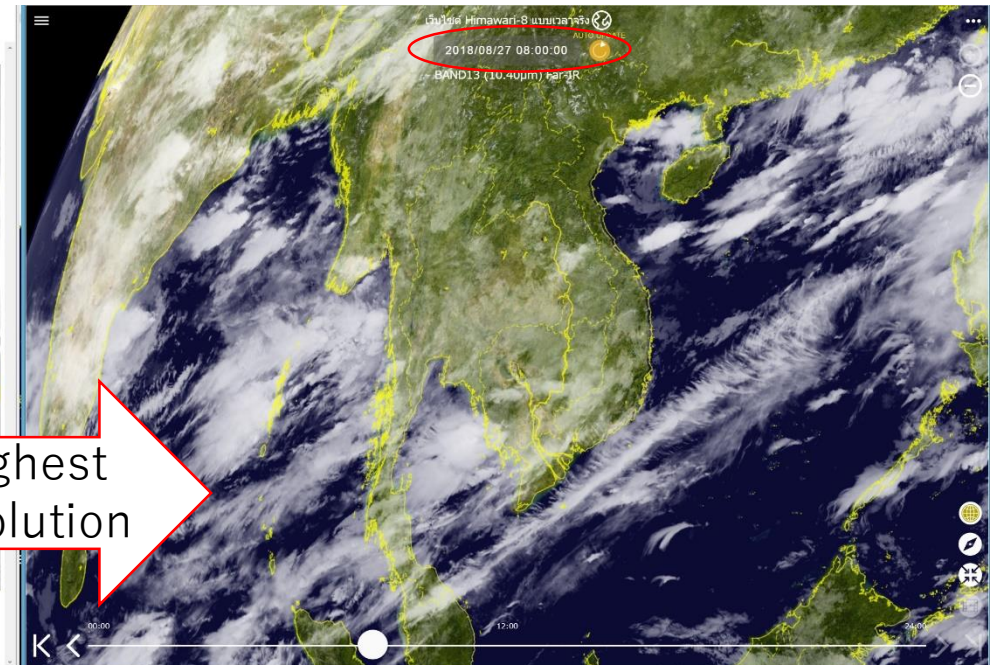
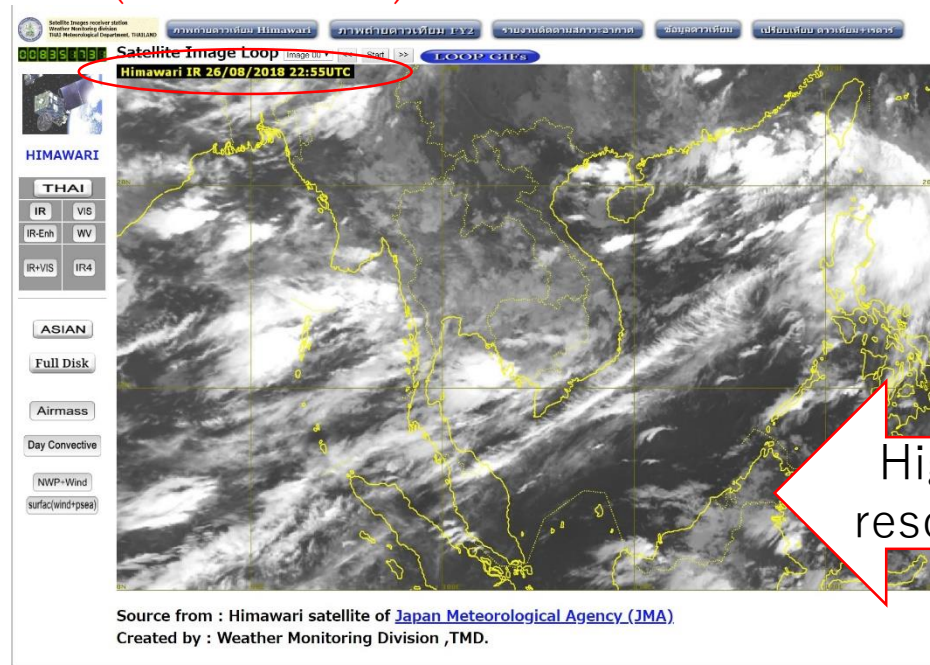


# Comparison: TMD and mirroring@NECTEC

22:55 in UTC  
(-41 minutes)

@23:36 in UTC

23:00 in UTC  
(-36 minutes)



Thai Meteorological Department (Thailand)  
<http://www.sattmet.tmd.go.th/satmet/mergesat.html>

NECTEC mirror site (Thailand)  
<http://himawari.ino.nectec.or.th/th/himawari8-image.htm>

- This area only
- Spatial resolution :  $\frac{1}{4}$  to original

- Expandable to full disk (global)
- Full resolution to original

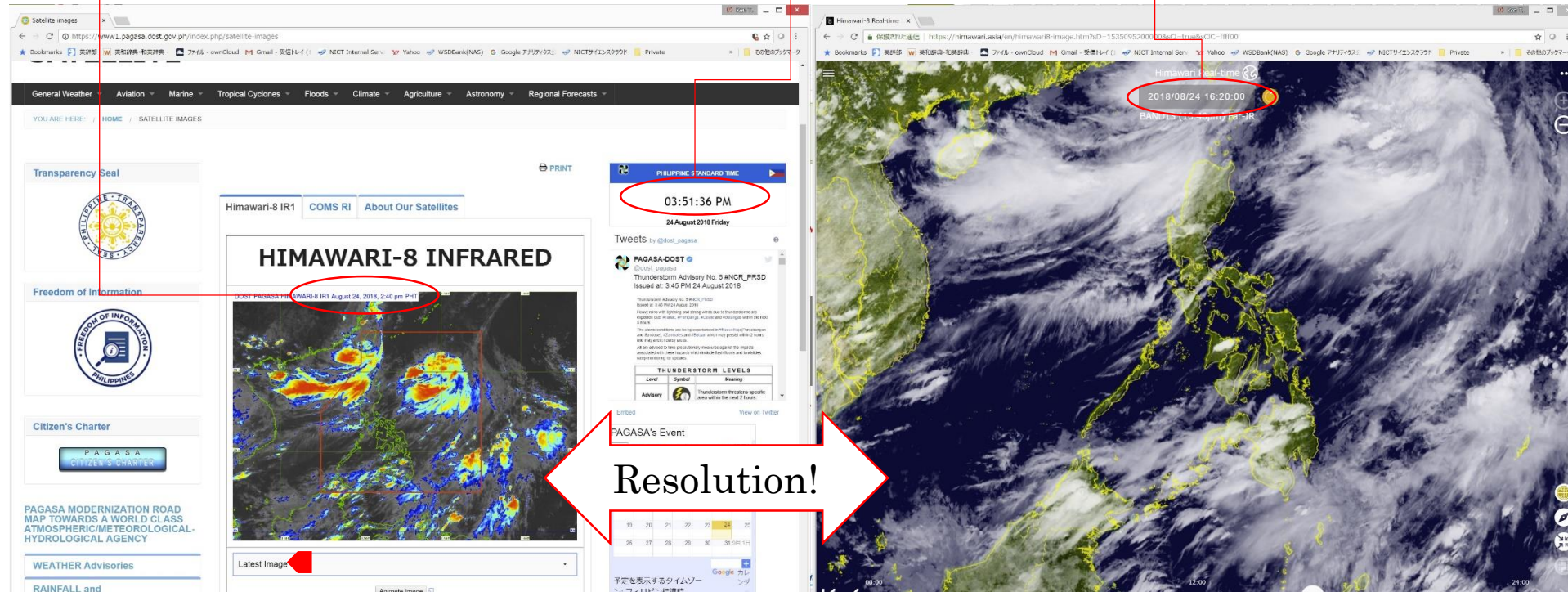


# Comparison: PAGASA and NICT

02:40 PM in PST  
(-71 minutes)

@03:51 PM in PST

03:20 PM in PST  
(-31 minutes)



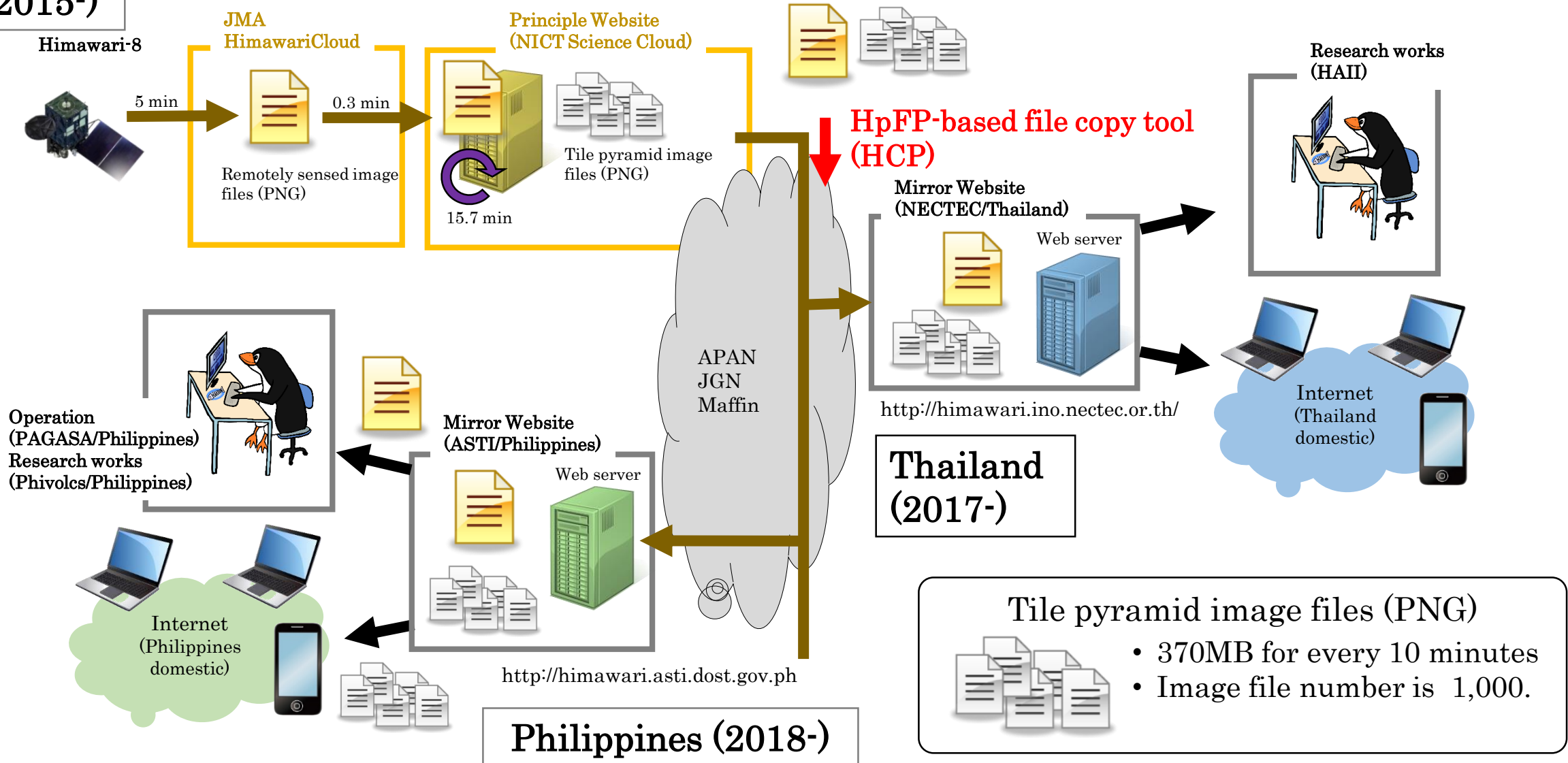
PAGASA (Philippines)  
<https://www1.pagasa.dost.gov.ph/index.php/satellite-images>

NICT (Japan)  
<http://himawari.asia> (<http://himawari8.nict.go.jp>)



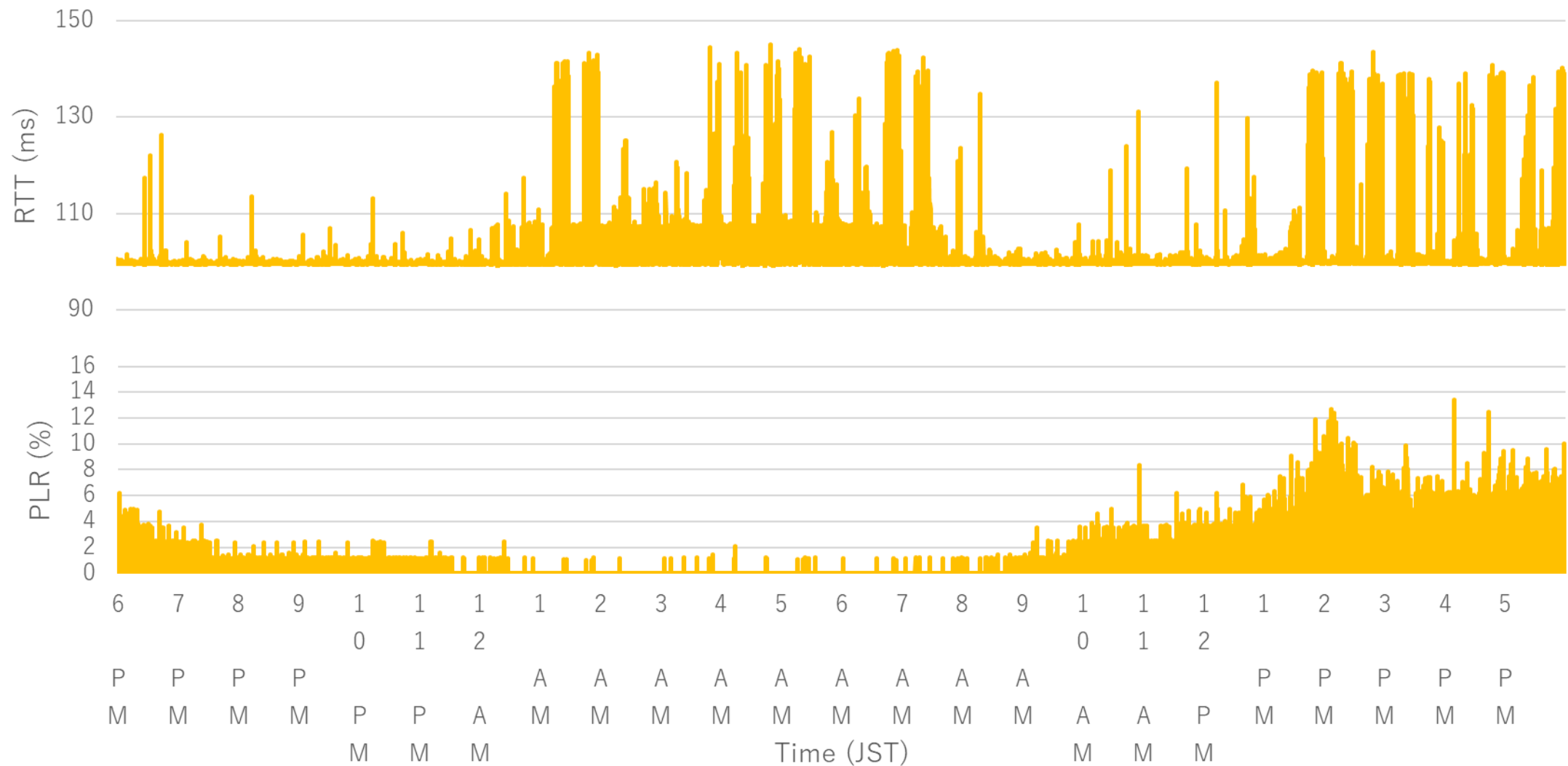
Japan  
(2015-)

# International collaborations (2017-2018)



# 24H measurement of round trip time (RTT) and packet loss ratio (PLR)

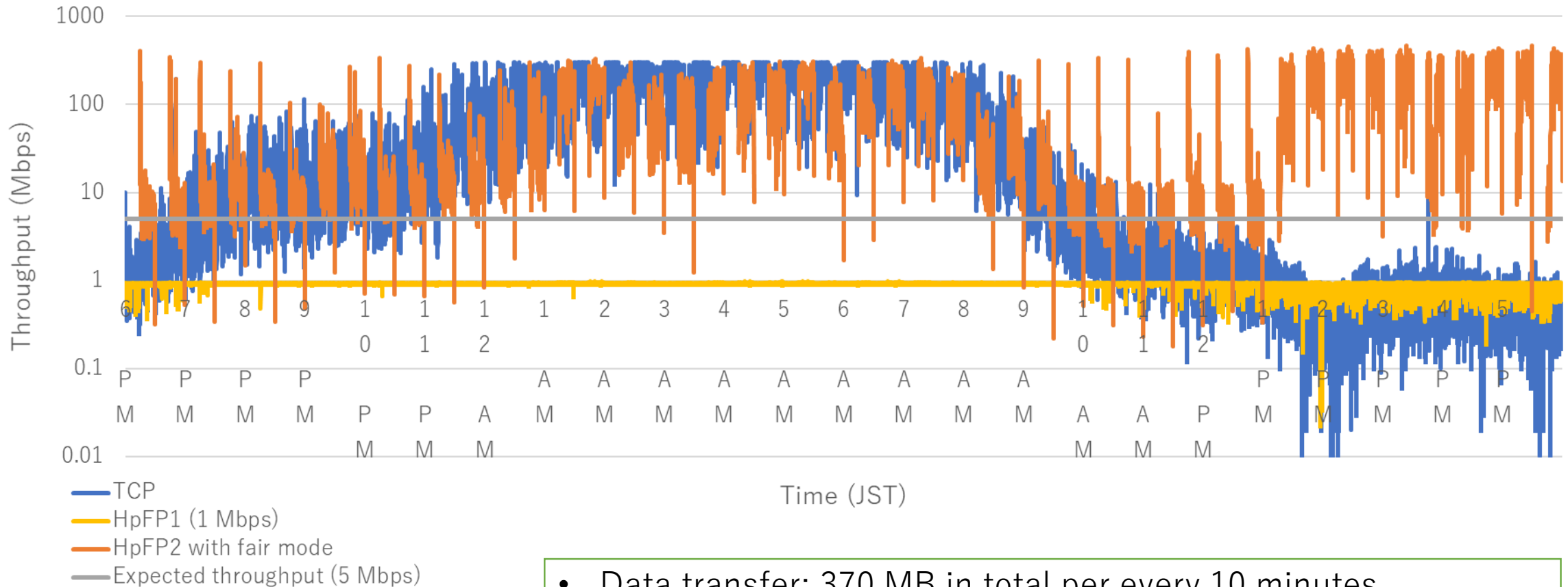
From NICT to Test server of ASTI (300 Mbps bandwidth limitation) - 03/09/2018





# TCP CUBIC vs HpFP2 fair mode (24H experiment)

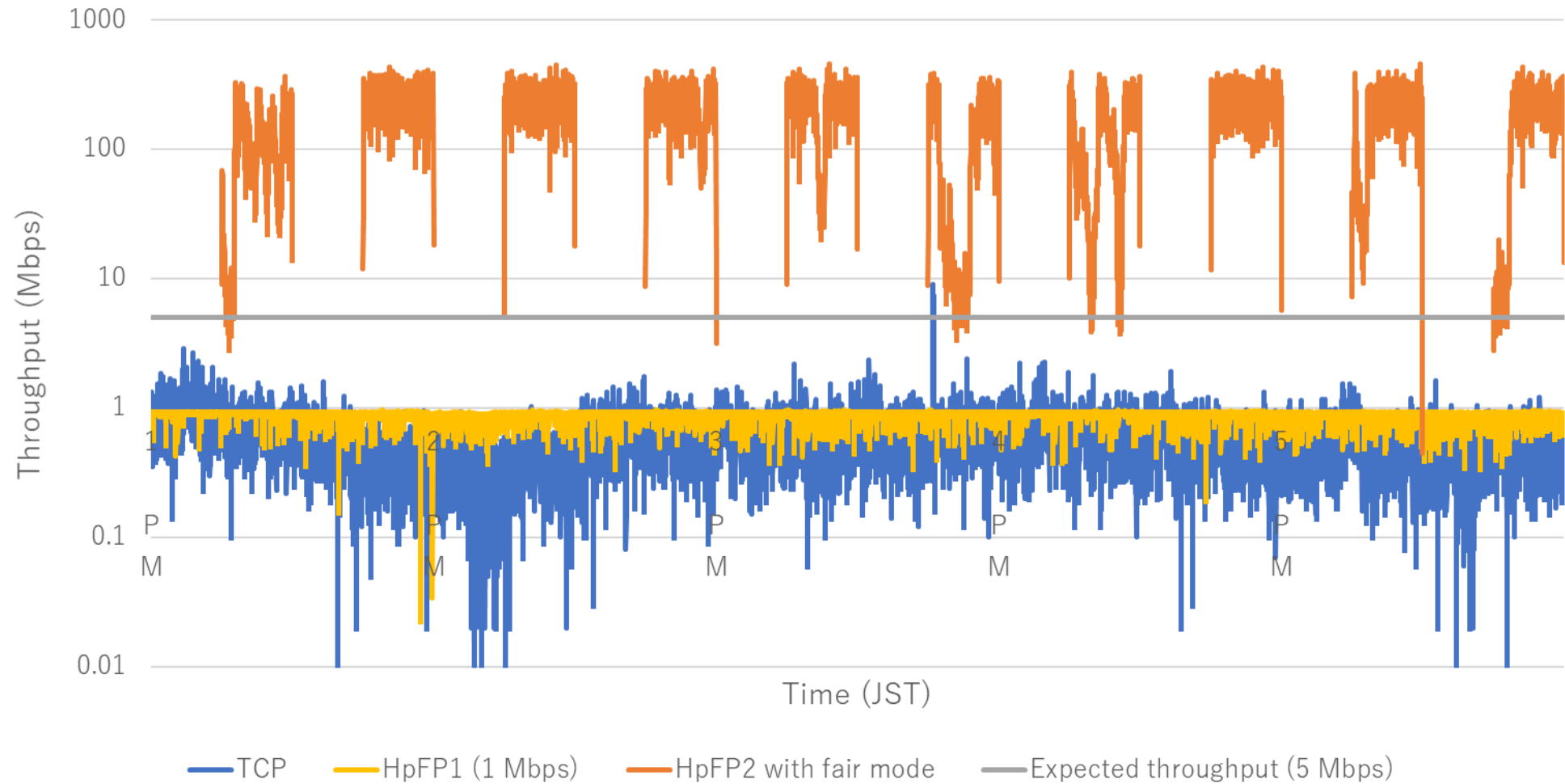
From NICT to Test server of ASTI (300 Mbps bandwidth limitation) - 03/09/2018



- Data transfer: 370 MB in total per every 10 minutes
- Expected throughput for real time: 5 Mbps
- Measured throughput (TCP): < 5 Mbps (1PM–6PM)

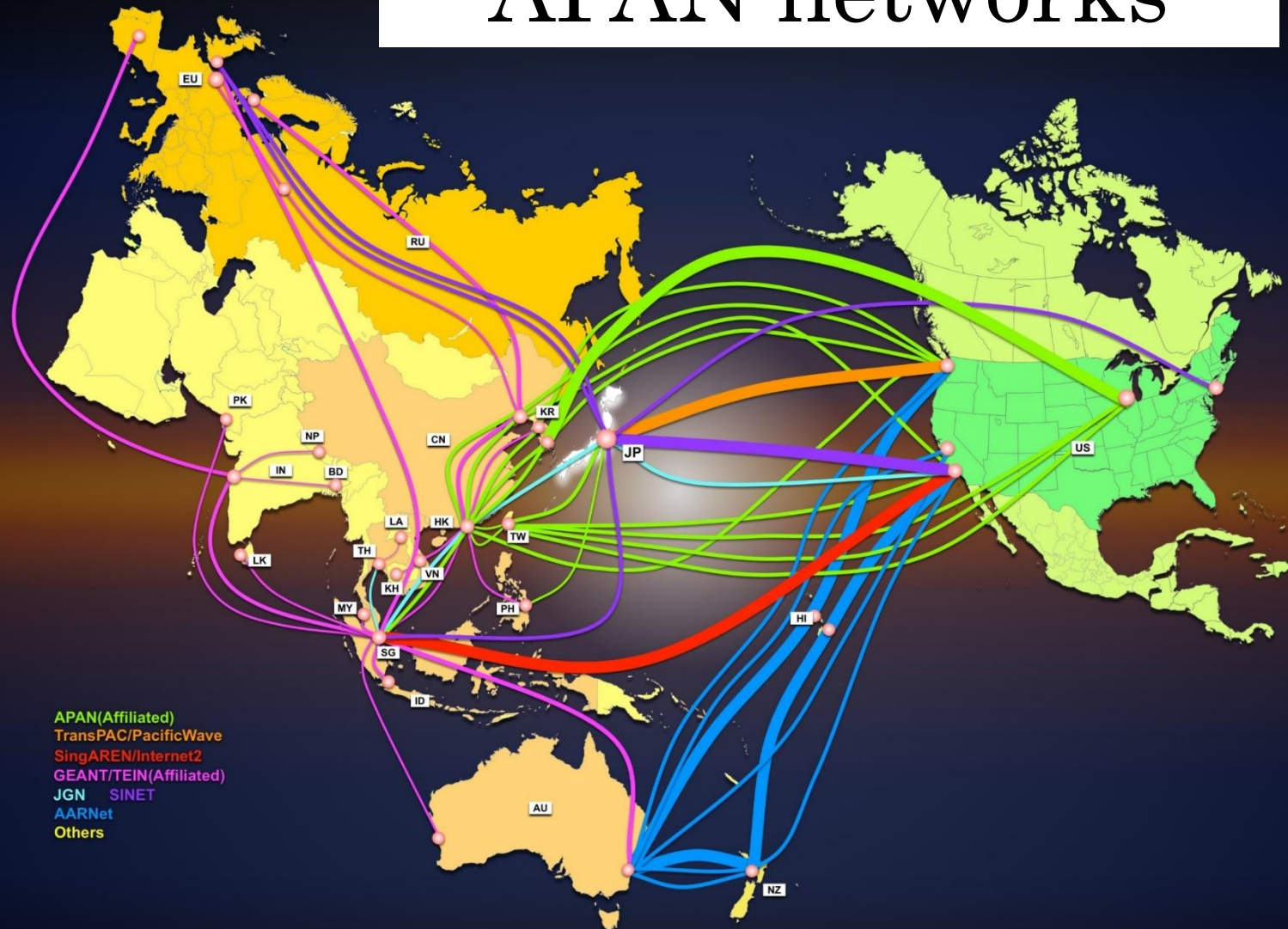
# TCP CUBIC vs HpFP2 fair mode (1PM – 6PM)

From NICT to Test server of ASTI (300 Mbps bandwidth limitation) - 03/09/2018





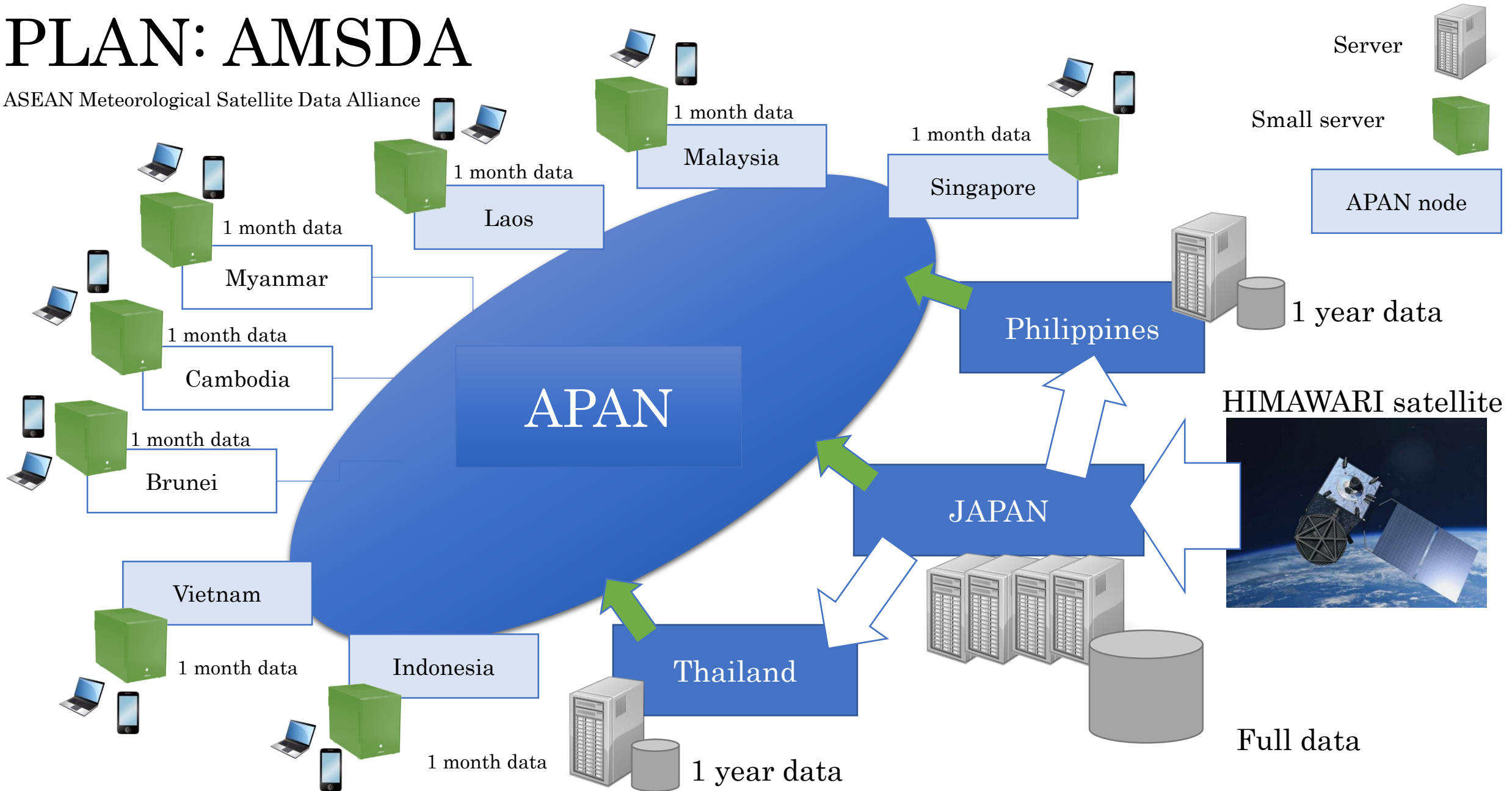
# APAN networks



As of Oct 7th, 2016

# PLAN: AMSDA

ASEAN Meteorological Satellite Data Alliance



ASEAN IVO forum 2018 @Istana Ballroom, Sari Pacific Jakarta, Jakarta, Indonesia



# Proposal

- Start-up AMSDA (ASEAN Meteorological Satellite Data Alliance)
  - NICT will be in charge of AMSDA office
- Invite institutions to AMSDA from ASEAN countries as mirror site operators
- Operation
  - Use «HpFP tool» for real time data transfer from NICT/NECTEC/ASTI
  - Set-up Web site and smart application in each country
- Meeting
  - Annual meeting to be reported by each country
  - Good results are reported at an annual meeting of “Asia/Oceania Meteorological Satellite Users' Conference (AOMSUC)”
- Domestic collaboration
  - Each institute shall make contact with domestic meteorological organization

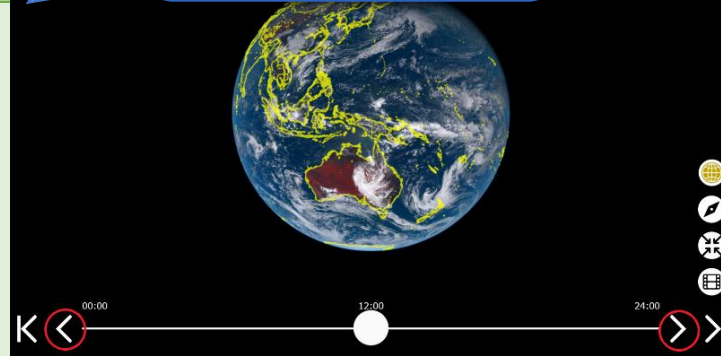
# HIMAWARI satellite



# DISASTER MITIGATION



# HIMAWARI real-time



# EARTH SCIENCE



# EDUCATION