Sentinel Asia System Operation WINDS / Regional Server

3rd Joint Project Team Meeting for Sentinel Asia STEP-3 (JPTM2016), Colombo, Sri Lanka
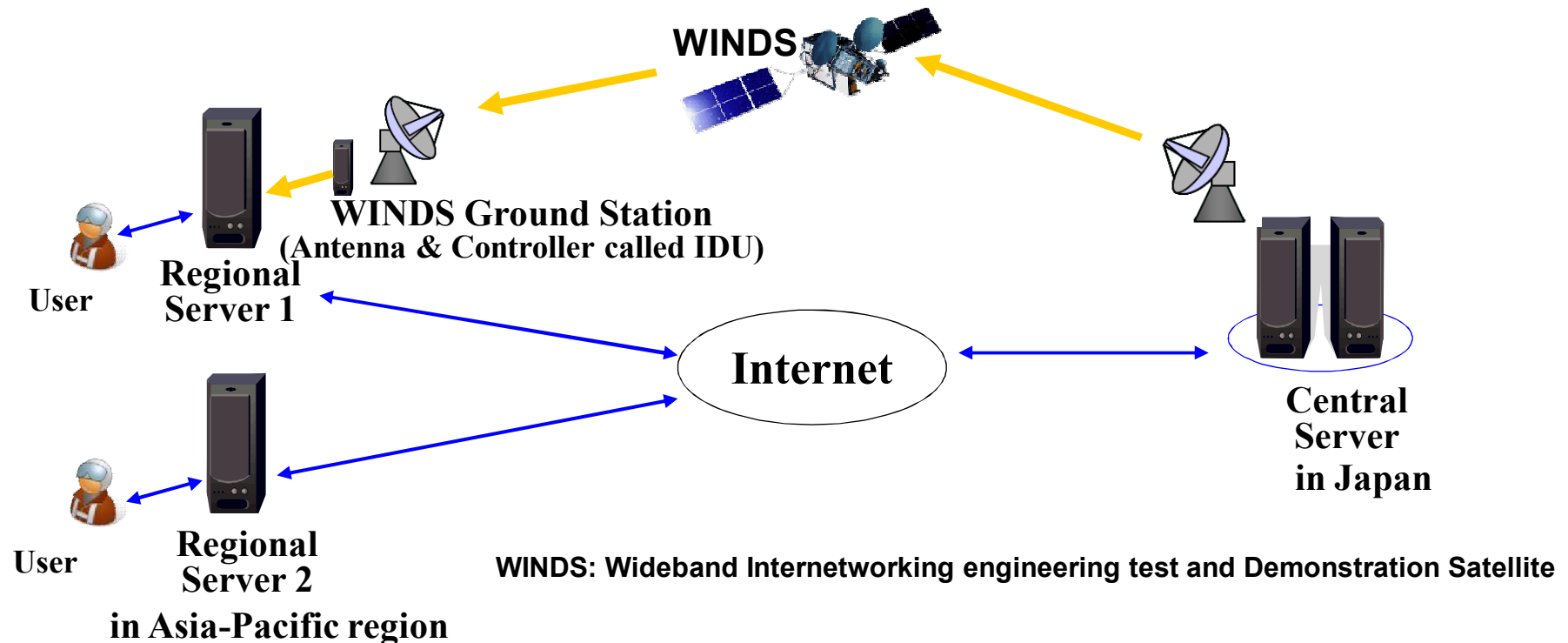
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Overview of Sentinel Asia System

SA System was installed for sharing the information of disaster management in Asia-Pacific region. The controlled data by Central Server are transferred to each Regional Server so that RS can get the same data. It is necessary that data are physically near the user, to increase the data accessibility.

WINDS

WINDS Ground Station
(Antenna & Controller called IDU)

User

Regional Server 1

Internet

Central Server in Japan

User

Regional Server 2 in Asia-Pacific region

WINDS: Wideband Internetworking engineering test and Demonstration Satellite
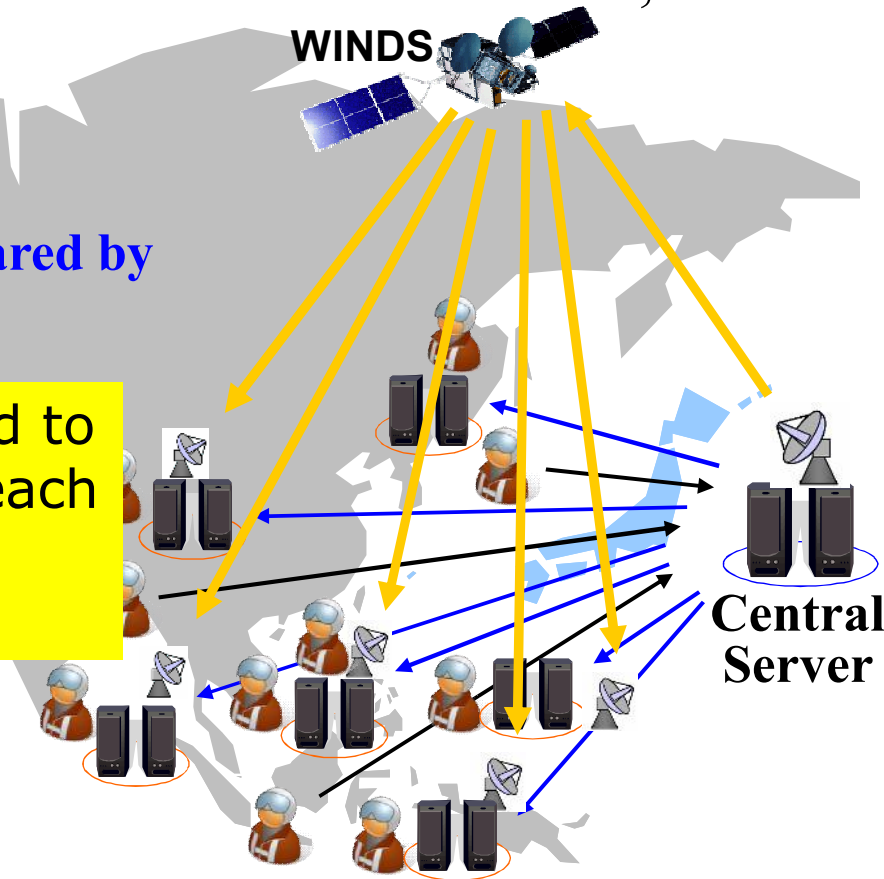
Data Transfer Way in Sentinel Asia System

Utilization of WINDS

In order to solve narrow-band problem in Asia-Pacific region, '**Regional Server**' can equip WINDS ground station and transfer data via WINDS. In case of board-band internet, data can be transferred via the internet.

WINDS high speed communication ~155Mbps[Max] (shared by users)

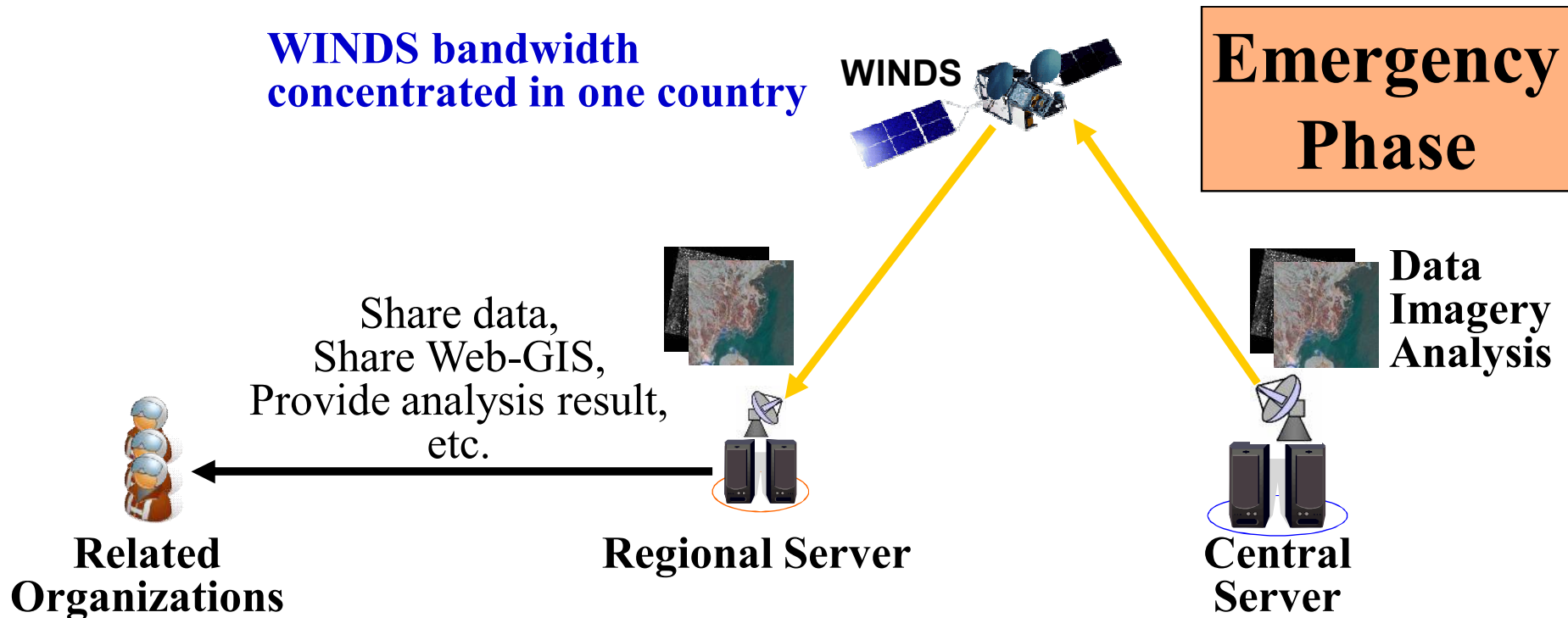Currently restricted to 6.5Mbps max for each RS to share speed among users.

Data Transfer Way in Sentinel Asia System

Utilization of WINDS in Emergency

When disaster occurred and emergency observation was requested by users, Sentinel Asia will coordinate and assign the maximum WINDS resources **(155Mbps).** Then, the satellite data, imagery, the results of analysis, etc are transferred to users via WINDS.

WINDS bandwidth concentrated in one country

WINDS

Emergency Phase

Data Imagery Analysis

Share data,
Share Web-GIS,
Provide analysis result,
etc.

Related Organizations

Regional Server

Central Server

Data Transfer Way in Sentinel Asia System

Current location of Regional Server/WINDS

Mongolia RS (with WINDS)

Kyrgyz RS (with WINDS)

Japan Central Server

Nepal RS (with WINDS)

Vietnam RS (with WINDS)

Bangladesh RS (with WINDS)

Taiwan RS

India CT

Philippines RS (with WINDS)

Sri Lanka RS (with WINDS)

Malaysia RS (with WINDS)

Indonesia RS

Fiji RS (with WINDS)

RS: Regional Server

CT: Client Terminal
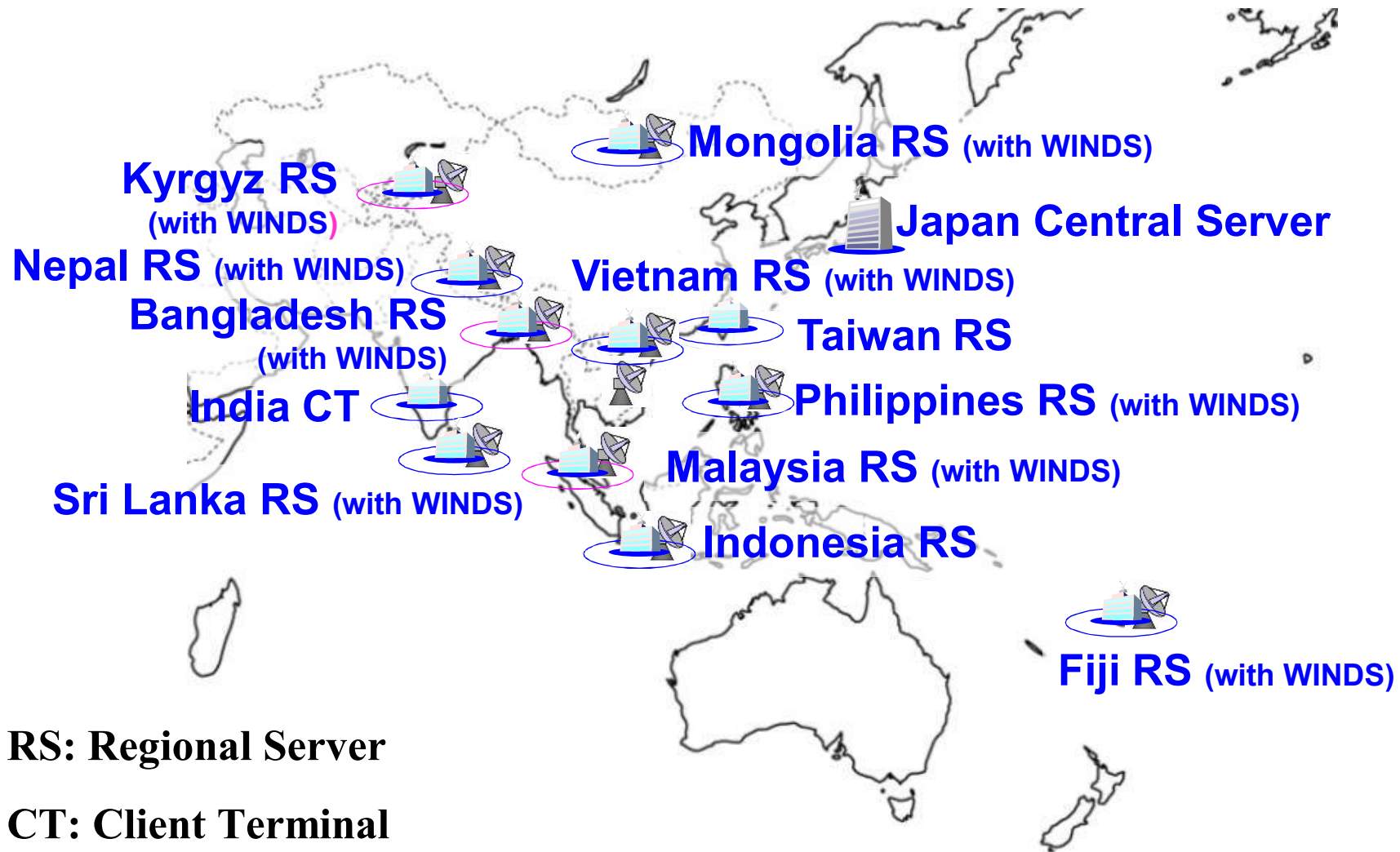
Data Transfer Flow in Sentinel Asia System

Data flow from CS to RS
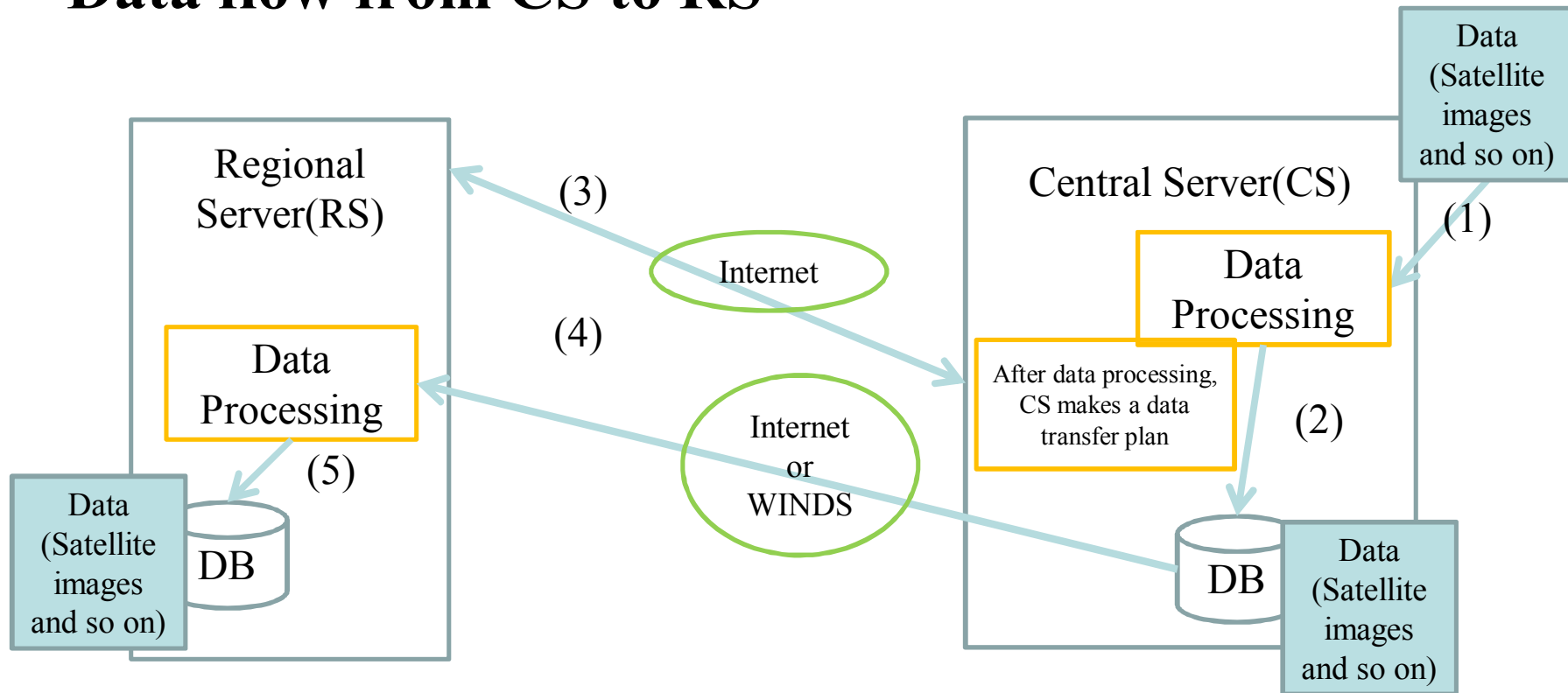
(1) Upload Satellite Image.
(2) Uploaded Satellite image is managed in CS's DB and transfer plan is scheduled.
(3) RS asks CS a data transfer plan every 3 min.
(4) CS transfers the data to RS via Internet or WINDS. (Internet is also used for a data control.)
(5) Transferred data is managed in RS's DB.

Data Transfer Flow in Sentinel Asia System

Data flow from RS to RS via CS

(1) Upload Satellite Image.
(2) Uploaded Satellite image is managed in CS's DB and transfer plan is scheduled.
(3) RS asks CS a data transfer plan every 3 min.
(4) CS transfers the data to RS1 and RS2 via Internet or WINDS. (Internet is also used for a data control.)
(5) Transferred data is managed in RS's DB.
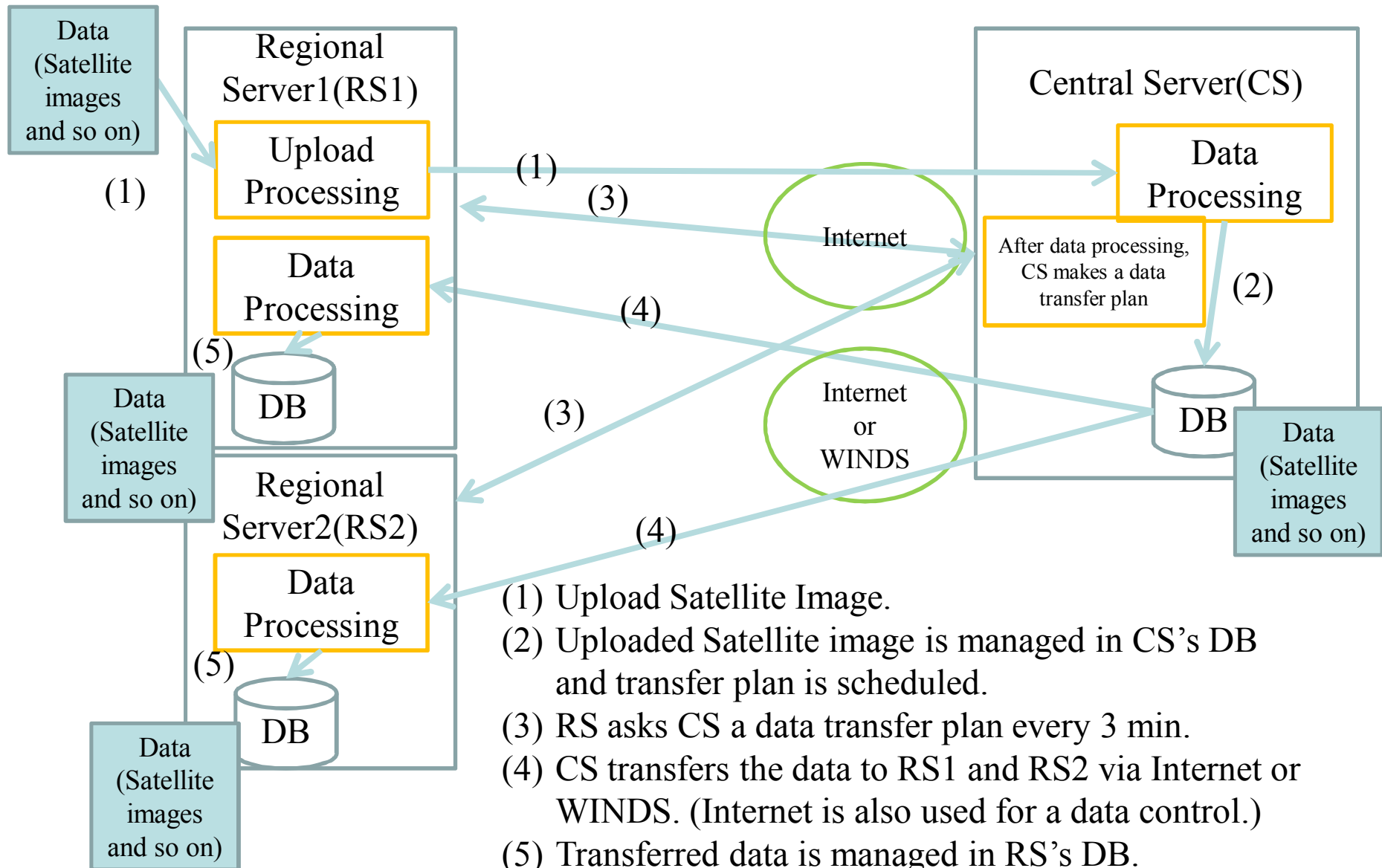
Make the Most of ALOS-2 High Mobility

ALOS-2 has a higher mobility than ALOS.

■ALOS-2 can observe the area near Japan within about 12 hrs.(in case of ALOS, within 3 days), the area of Asia within about 24 hrs. (in case of ALOS, about within 5 days.)

■ALOS-2 data can be prepared within 1 hr.(in case of ALOS, within 3 hrs.)

ALOS-2's data are higher resolution than ALOS's one. (Data size is getting bigger.)

■ALOS-2 data (L1.5 GeoTIFF) is about 3 GB. ALOS data(L1.5 GeoTIFF) is about 107 MB.

JAXA as DPN should make the most of ALOS-2's high mobility for disaster management using Sentinel Asia System. But...

Results of transferred data in Sentinel Asia System

Amount of Provided all Data in 2015
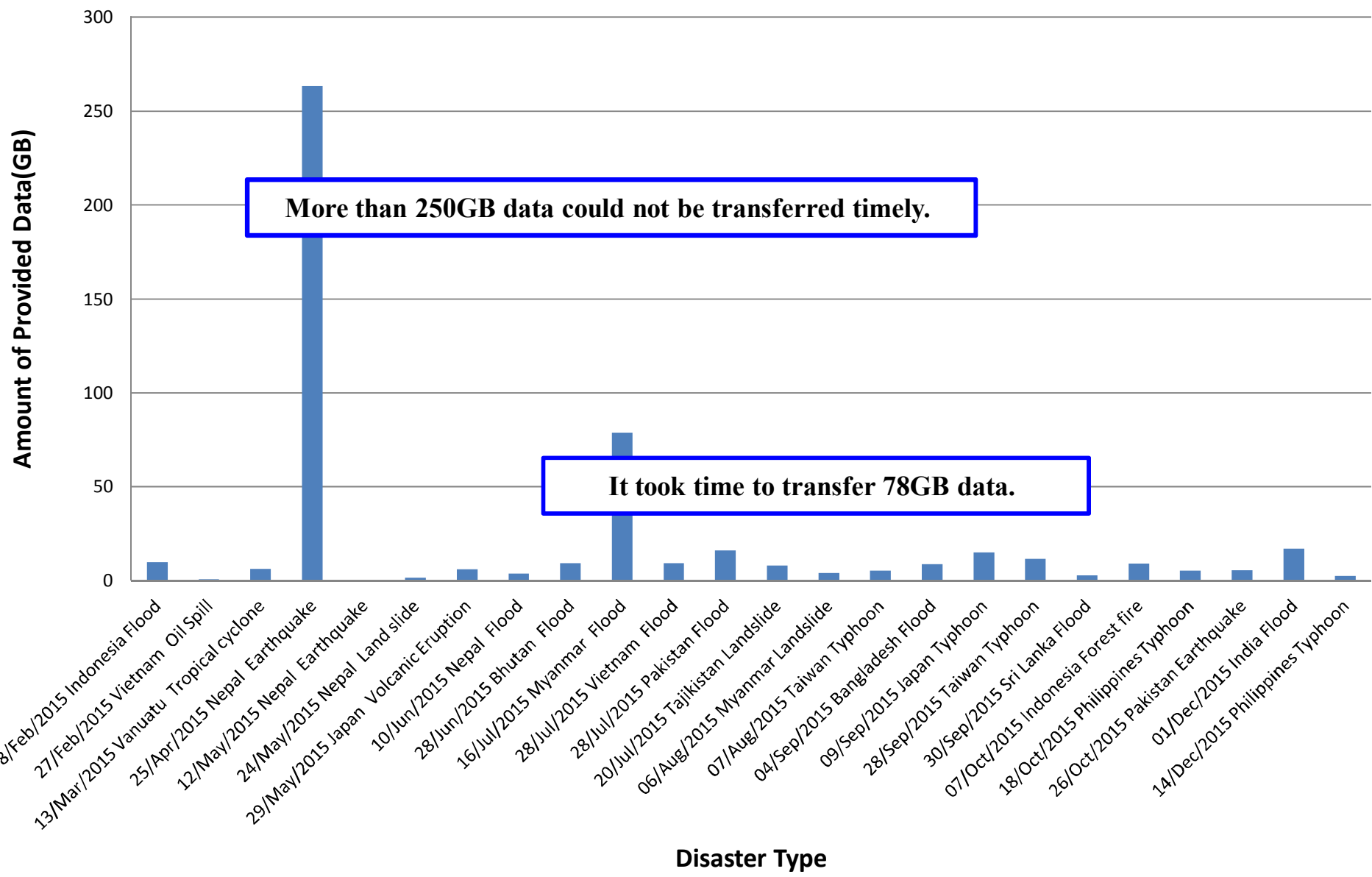
Speedup of Data Transfer

Current Problem(by our investigation)
It takes time at Data Processing in Central Server.

・Data Processing time : 12min for 1GB GeoTIFF data
(Less than 2GB data can be transferred in SA system.)

In case of total 10GB(1GBx10) data transfer, it takes about 120 min. using WINDS max. 155Mbps speed.
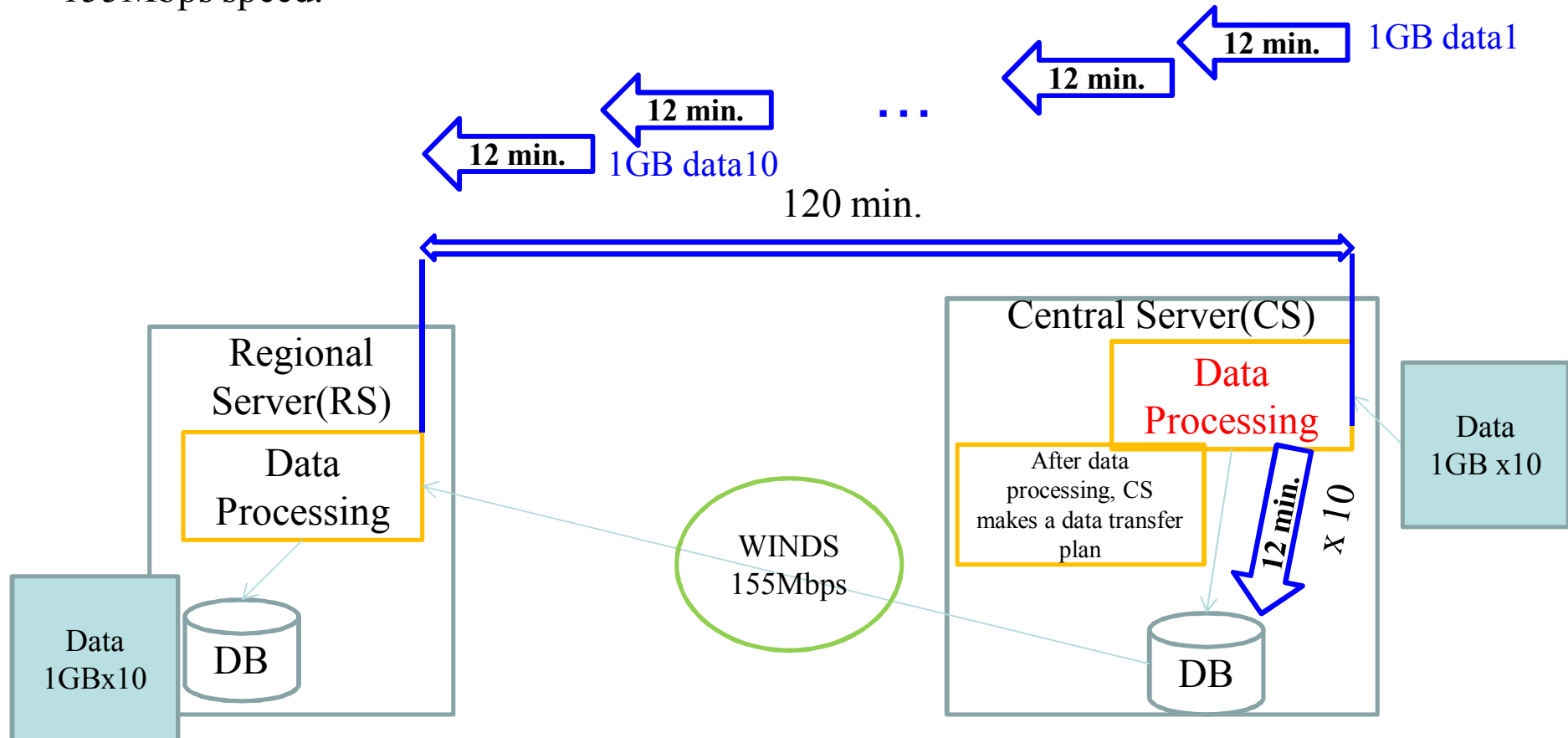
Speedup of Data Transfer

Improvement of Data Processing to shorten time

From the investigation, we are going to improve this Data Processing time to be less than 4 min by end of March, 2016.

In case of total 10GB(1GBx10) data transfer, it takes about less than 40 min. using WINDS 155Mbps speed.

Current time 120 min.

After improvement,
time less than 40 min.

This improvement makes us analyze data quickly and provide the disaster management agency with analyzed product timely.
This improvement will be more effective for bigger data transfer.

Use more Sentinel Asia System

Access Procedure to Reginal Server

①**Digest Authentication**

②**Login Web Site**

Two access accounts are different.
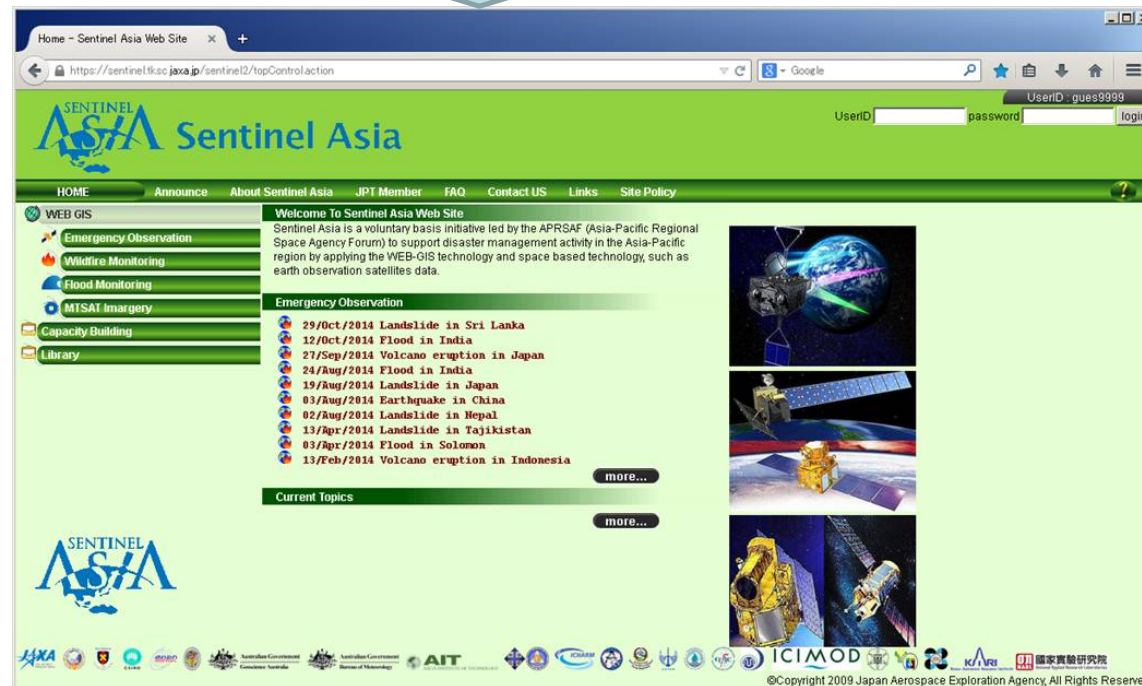
Use more Sentinel Asia System (Data Download)

1. Login

Enter Your ID & Pass
and Click 'login' button

Use more Sentinel Asia System (Data Download)

D2. Click 'Emergency Observation' tab.

Use more Sentinel Asia System (Data Download)

D3. Find your requested Emergency Observation in list.

Use more Sentinel Asia System (Data Download)

D4. Go to Data List page

D5. Data List page.

Click Disk Icon to Download Data

Click Thumbnail for Quick Look

Click File Icon to Check Meta Info.

Use more Sentinel Asia System (Data Upload)

U2. Click 'Disaster Information Manage' tab.

Use more Sentinel Asia System (Data Upload)

U3. Disaster information management screen appears

① Set Emergency Obs. ID and Click Search

② Searched Results are shown.

Use more Sentinel Asia System (Data Upload)

U3. Enter Information for Data

Enter Information for Data and set the Upload File

Use more Sentinel Asia System (Data Upload)

U4. Data Upload

②Upload status is shown

①Click Register

Conclusion

1) Sentinel Asia System is improved to meet ALOS-2 high mobility and the quick response required for disaster management, and provides the disaster management agency with data quickly.

2) Use more Sentinel Asia System for sharing the information of disaster management.

Regional Server

- Philippines: http://sentiph1.asti.dost.gov.ph/
- Taiwan: http://sentiasia.nspo.org.tw/
- Mongolia: http://drisa.disasterinfo.mn
- Nepal: http://118.91.160.244/
- Vietnam: http://113.190.248.6/
- Fiji: http://124.108.31.199
- Indonesia: http://103.16.223.200/
- Kyrgyz: http://winds.caiag.kg/
- Bangladesh: http://123.49.36.42/
- Sri Lanka: http://220.247.200.164/
- Malaysia: http://175.28.12.70/

Back up Power Point

Data Download and Upload Procedure

3.B. Web GIS Site.

Use more Sentinel Asia System

- ALOS-2 Emergency Observation can be performed twice a day (around 12pm and 0am JST)
- observation request until one and half hour before command uplink
- Products will be submitted in a few hours (Quick disaster map in 2 hrs)

ALOS-2 Emergency Observation

6:00 9:00 12:00 18:00 0:00 6:00 (JST)

observation around 12：00+-1.5 hrs

observation around 0：00+-1.5hrs

Observation with same condition as base map can be performed once in up to 72 hours

disaster

Products

immediately after a disaster
・ALOS pre-disaster map

around 1 hour after observation request
・Archived data (standard products)

around 2 hours after observation
・quick disaster map

around 1 hour after observation
・standard products

around 5 hours after observation
・multitemporal polarization composition map etc.

around 1 hour after observation
・standard products

around 2 hours after observation
・quick disaster map

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