

Progress on TIGGE Archive Center in CMA

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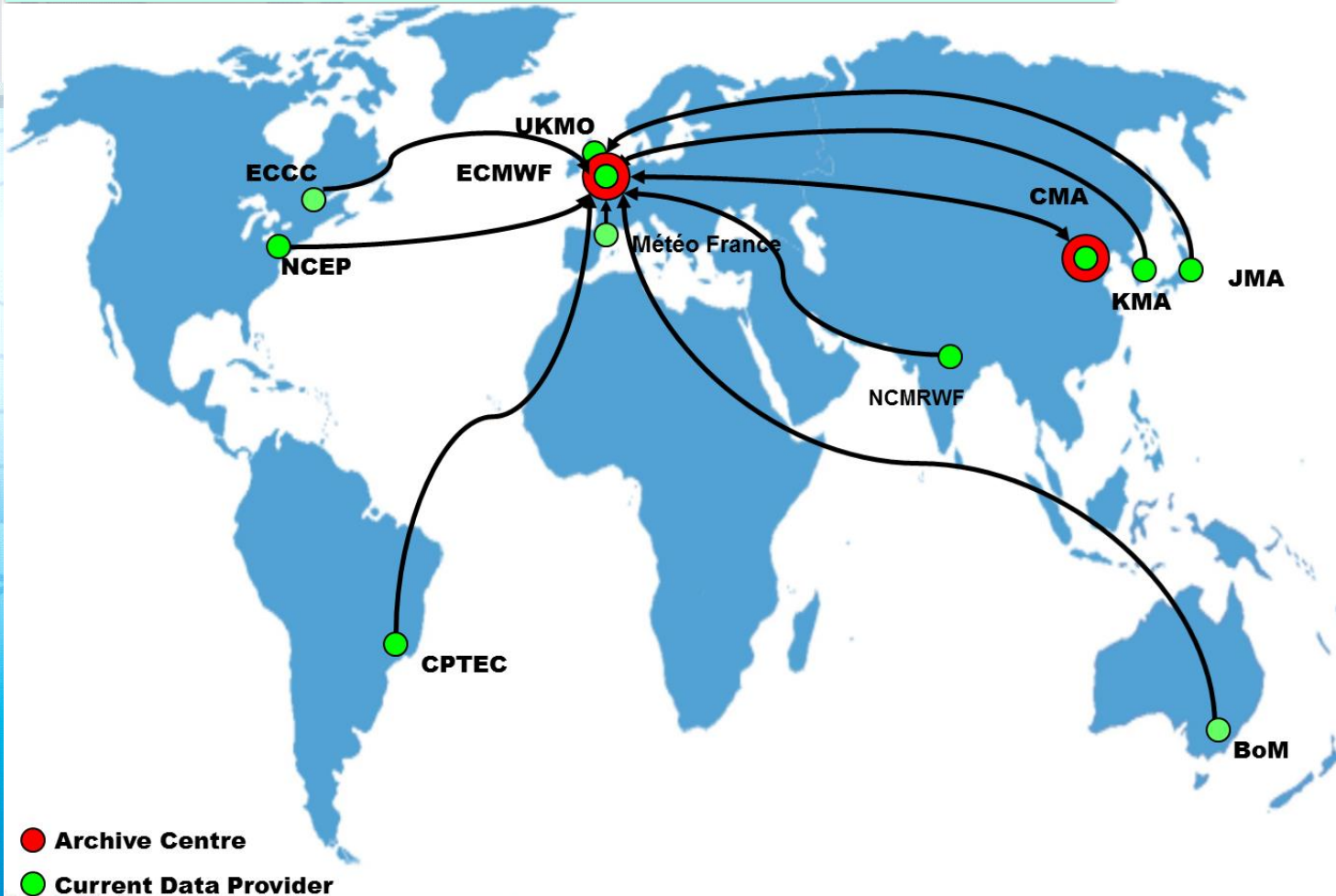
April 3, 2019 Reading

Current Situation

- TIGGE project contains data from 11 centers and which is backed up by two global archiving centers, ECMWF and CMA.

BoM (Australia), CMA (China), ECCC (Canada), ECMWF (European Center), NCEP (USA), UKMO (UK), Météo France (France), JMA (Japan), KMA (Korea), CPTEC (Brazil), NCMRWF (India)

TIGGE Archive Centres and Data Providers



Progress overview

Test platform established

2006.7: Infrastructure(LDM Server, Internet) ready.
Cooperation between CMA, ECMWF & NCAR

1

MARS system localized

2007.07-2008.12: Localized MARS system and data environment

2

LDM server upgraded

2008.10-2009.04: Hardware upgrade & software update for multi-receiving

3

MARS for Data archiving
2009.05

4

- ROADMAP TIGGE-CMA -

5

System Upgraded for better data management

2010.10: LDM hardware upgrade & data management system upgrade

6

Network Performance Upgrade

2010.10-2011.10: Network Performance Upgrade to Ensure the Integrity of Received Data

7

TIGGE-Cloud migration

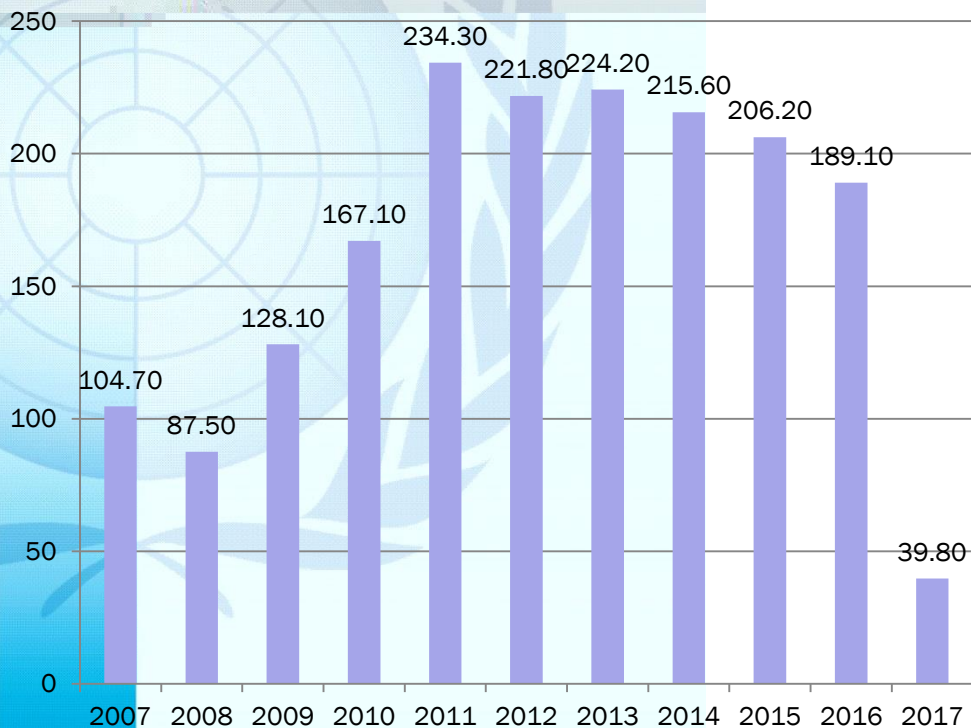
2018.03-2018.12: TIGGE archiving with QC from LDM to FTP, and now to cloud

Data and Service

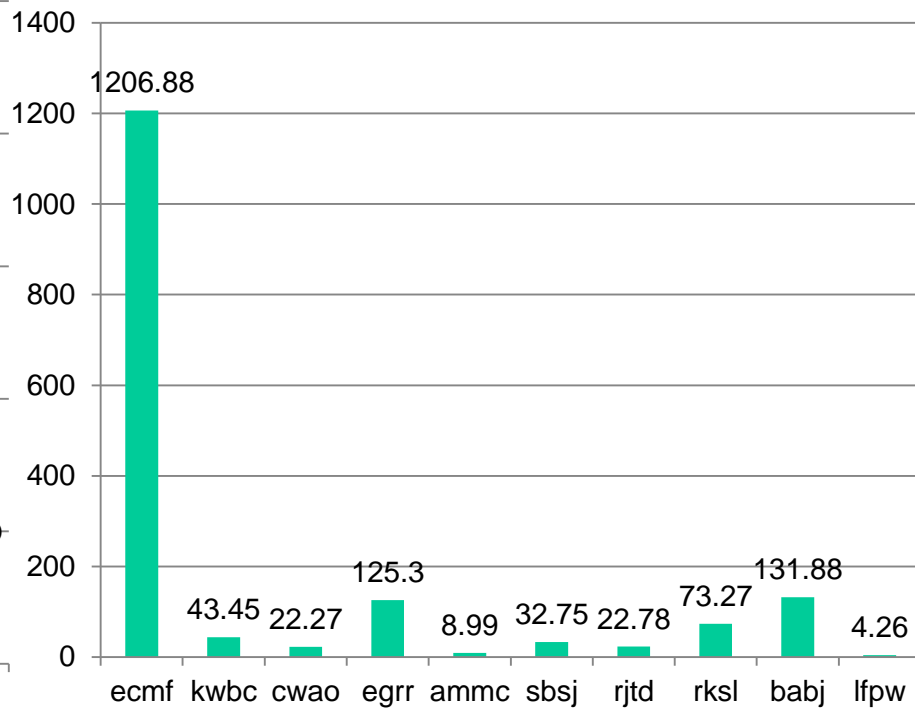
Archived data volume

➤ The total TIGGE data of CMA from 2007 to 2018 is 1671.83 TB.

Archived Data Integrity Diagram (TB)



Total received Data by Centers 2007-2018 (TB)



Data and Service



Weather Forecast Department of National Meteorological Center, CMA



Hong Kong Observatory



Mid-Term Weather Forecast Operational Users



Korea Meteorological Administration

Real-time data service User

Nanjing University

NWP Center of National Meteorological Center

Institute of Atmosphere, Chinese Academy of Sciences

Guangdong Tropical Institute

Typhoon and Marine Meteorological Forecast Center

Sichuan Meteorological Service

Offline data service User



Application

Application of TIGGE

- June 2008, TIGGE was widely used extreme precipitation in South China, medium-term precipitation forecast in Jiangsu Province, Persistent Extreme Precipitation Incentered Eastern China, Rainfall Forecast in Qinghe Basin and Flood Forecasting for Chaihe River Basin.
- The TIGGE application in multi-model integrated forecasting of subtropical westerly jet in East Asia, tropical cyclone in West Pacific and subtropical cyclone is significant.

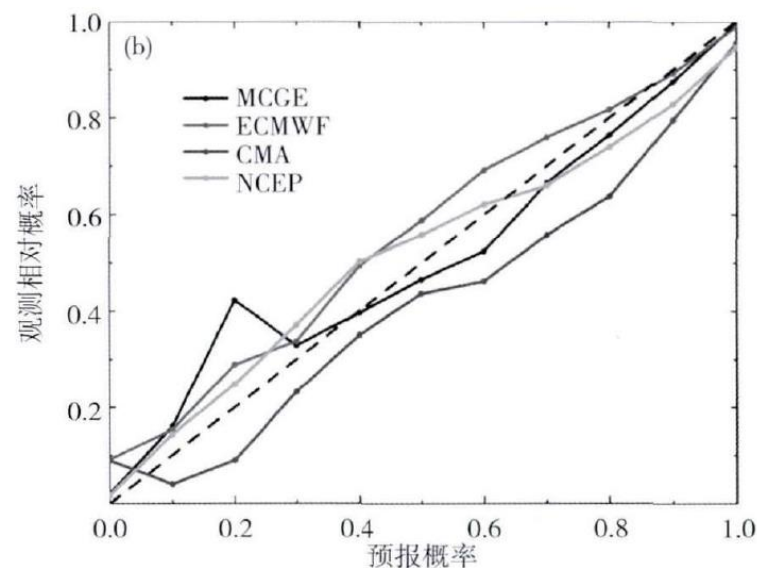
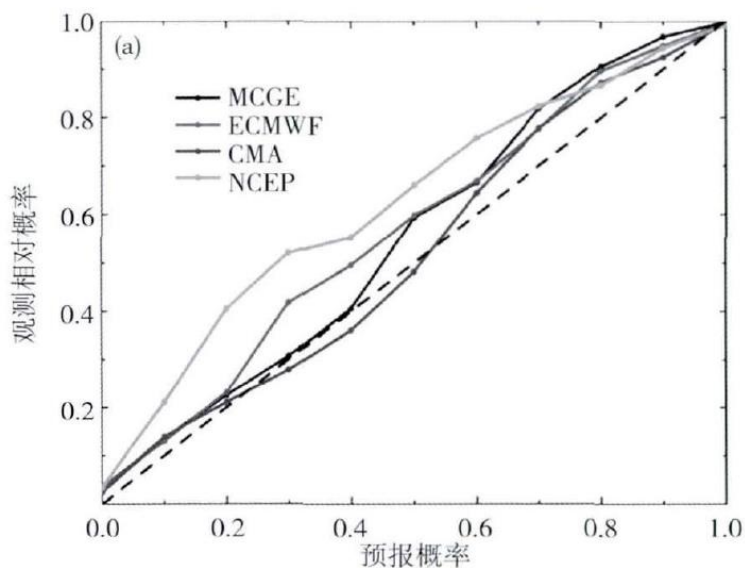


图 6 TIGGE 集合预报可信度检验

Fig. 6 Reliability diagrams of TIGGE ensemble (a) H_{500} ; (b) q_{850}

Data Update

Problem and Background

- TIGGE data was transmitted and interacted to ECMWF by LDM before 2018.
- Due to the limitation of LDM software mechanism on system performance, in January 2018, ECMWF contacted CMA and suggested to adopt FTP to replace LDM in TIGGE system.
- In April, ECMWF and CMA determined the adjustment requirements for TIGGE data.
- In September, the ECCODES tool was introduced to solve the problem of invalid messages in TIGGE-BABJ.



From: Richard Mladek
Date: 2018-01-12 21:16
To: nieyd
CC: ?/??/??; tigde support
Subject: moving from ldm in data exchange for

Dear Nieyd,

We have had a lot of troubles with LDM
<http://apps.ecmwf.int/datasets/history>

At the moment you (CMA) are the only

Because of that we would like to move incoming TIGGE data via ECMWF's eCCodes, which is more feasible for you to think about that solution in both ways - via LDM and via FTP.

Please do not hesitate to ask any question.

Kind regards,
 Richard

Richard Mladek
 analyst, Forecast department

From: Richard Mladek
Date: 2018-03-27 00:50

To: nieyd

CC: tigde support; maqiang

Subject: Re: moving from ldm in data exchange for

Hi Nieyd,

Sorry for our late reply as well!

1) Regarding your test file (babj_20180327_0000.nc)

We do not need to keep that previous for

tigde_babj_YYYYMMDDHH_EXP_LEV_0000.nc

EXP=prod/test

EPS=000/001/002/...../011 (000 means control forecast)

LEV=pl/sl (pressure/surface)

From: Richard Mladek

Sent: 06 September 2018 11:37:32

To: yangff@cma.gov.cn

Cc: nieyd@cma.gov.cn; maqiang; tigde support

Subject: Re: Re: Re: Re: issues with CMA (babj) input data for TIGGE archive (0Z, 2018-08-14; 12Z, 2018-08-17)

Hi Feifei,

Those problematic input files are just corrupted. You can use any tool to read them and see if it works or not. I have demonstrated just one easy way (grib_count tool) trying to count number of fields in the file. It is a part of ECMWF's eCCodes what is our main grib and bufr encoding/decoding package. It is free to use for everybody.

Please use whenever tool you have to check your input files. Those files were not corrupted during transfer as our acquisition system checks their sizes etc.

Cheers,

Richard

Design, Adjustment of TIGGE Data Format and Establishment of Quality Control Process in Non-LDM Environment

Old data format

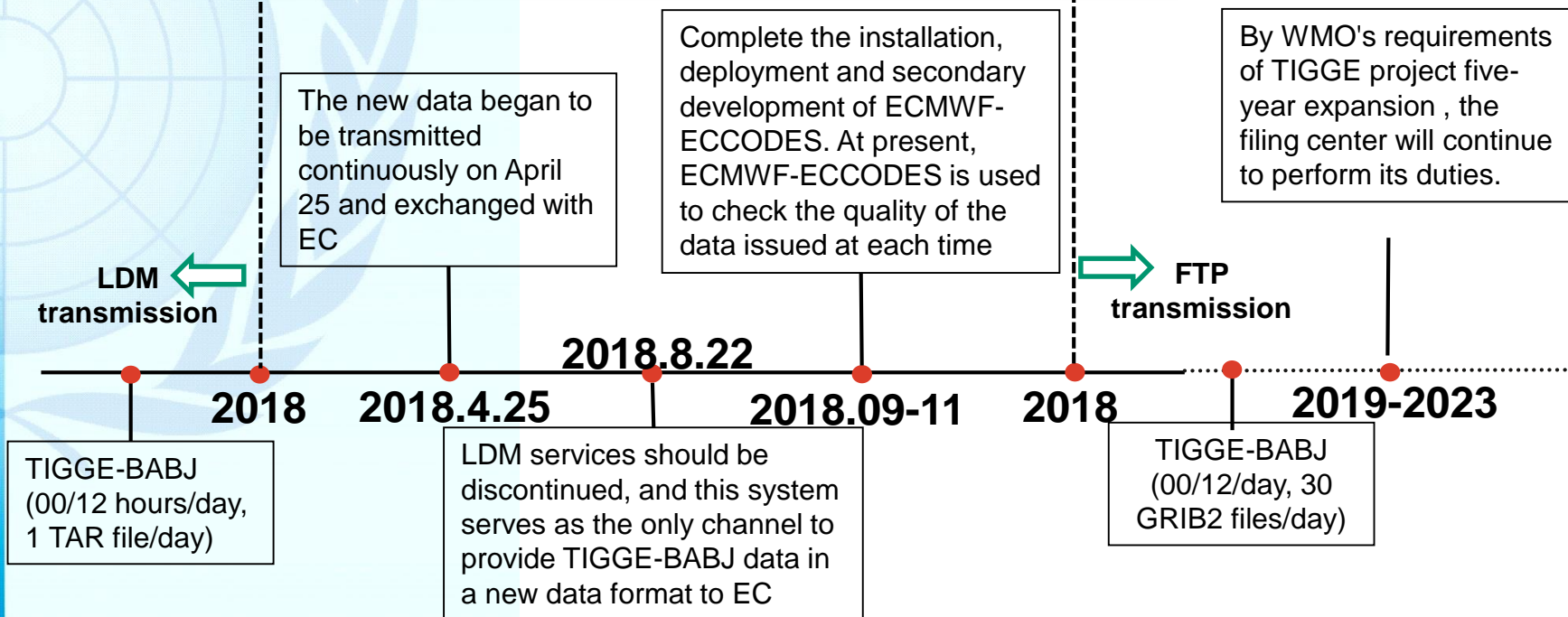
Center	Times	Files Number/Times	Data volume per day	File type
BABJ	00/12	1	54G	tar

New data format

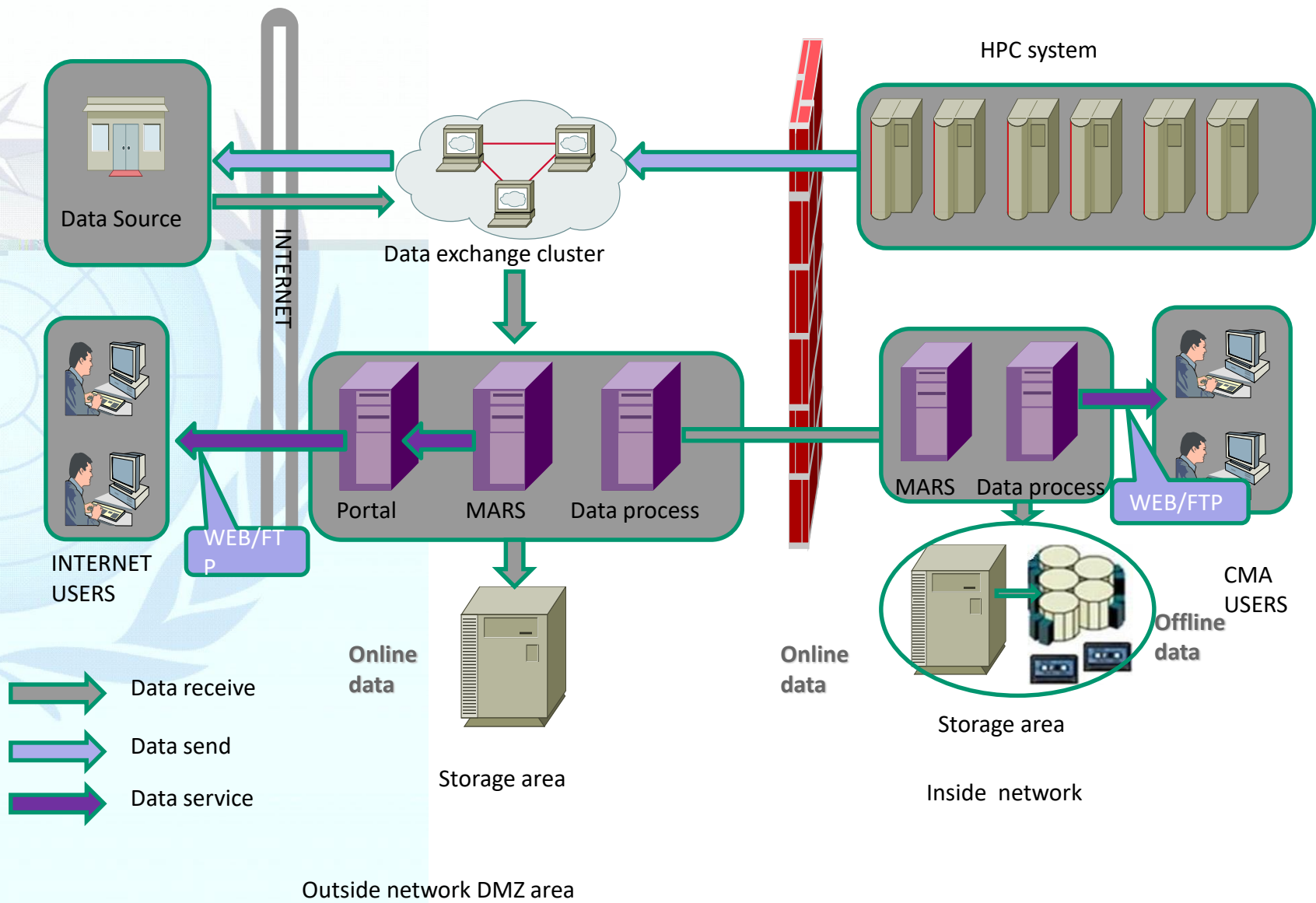
Center	Times	Files Number/Times	Data volume per day	File type
BABJ	00/12	30	54G	Grib2

➤ In 2018, TIGGE-BABJ sent 19.25TB data. After data quality control, the error rate of sending data was 0, and the data integrity reached 99.9%. This effectively guaranteed the operation of ECWMF.

Complete the adjustment and implementation of TIGGE data format and the establishment of quality control process in non-LDM environment.

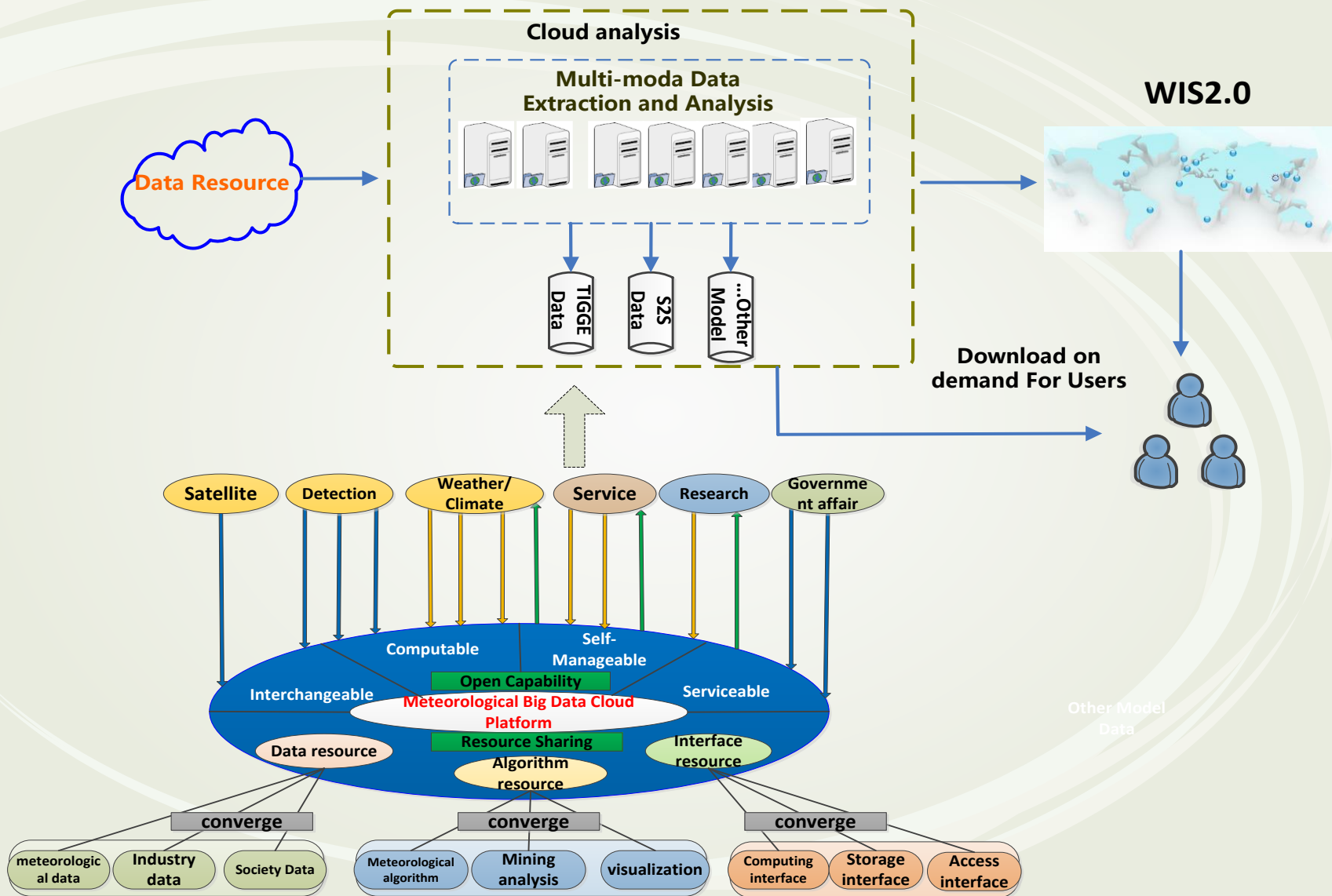


TIGGE data flow in CMA before



Flow chart after data upgrade

Architecture Diagram of Upgraded CMA Data Process Deployment





Thanks