THORPEX Interactive Grand Global Ensemble (TIGGE)

Progress on TIGGE Archive Center in CMA

China Meteorological Administration

TIGGE-WG meeting, Boulder, 25-27 June
Provider Summary

- Progress Overview
- Archive Summary
- Equipment Improvements
- Service Improvements
- Future Project
Progress overview

• **2006.07: Establish test platform**
  - Prepare Infrastructure (LDM server, Internet connection)
  - Test TIGGE data receiving, from ECMWF & NCAR via LDM
  - Develop GRIB2 encoding and decoding software

• **2006.09: Upgrade Internet connection**
  - Connect to CSTnet (China Science and Tech network)
  - Internet access rate upgraded to 100Mbps

• **2006.11: Continuous data receiving test**
  - About 8GB and 30,000 files received at CMA per day

• **2007.2: Start routinely data providing and data receiving**
  - Between CMA and ECMWF, NCAR

• **2007.4: Fix the problem of losing data during the transmission between ECMWF**
• **2007.5-8**: development of TIGGE data portal
  
  http://wisportal.cma.gov.cn/tigge/

• **2007.07-2008.12** Using MARS system
  
  – Localize and test MARS system
  – Test MARS local running environment
  – Establish MARS environment

• **2008.08**: Data cutting and interpolation function based on user requirement

• **2008.10-2009.4**: Update LDM performance
  
  – upgrade high performance LDM data receive cache
  – Add one 16TB SAS store disk array
  – Update single LDM receive to multi LDM receive
  – Enlarge LDM server internal memory

• **2009.05**: Using SMS to monitoring TIGGE data exchange
- **2009.05**: Use MARS for data archive
  - All TIGGE data use MARS to archive
  - Link MARS to CMA TIGGE portal
- **2009.07**: Upgrade data Portal start to running based on MARS.
- **2010.10**: System upgrade
  - Optimal network performance, keep the intactness of received data.
  - Established a TIGGE Data Management System to provide data retrieval services directly for users.
- **2011.10**: LDM System upgrade
  - Replace 2 high-performance LDM received server
  - Upgrade high-performance FC RAID (200,000 IOPS)
TIGGE Archive Platform Infrastructure and Data Processing
End in Aug.2010

Add 00Z data since Aug.2011

Transfer the data of upgrade model since Oct.2011

Archive Centres and Data Providers (9)
## Archive Summary at CMA

<table>
<thead>
<tr>
<th>Product Center</th>
<th>Prediction Time (Hour, Day)</th>
<th>Members</th>
<th>Level type</th>
<th>Times</th>
<th>Start Time</th>
<th>the Daily Incremental Data (GB)</th>
<th>Total Data (GB) (to 2012.3.31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>egrr(UKMO)</td>
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<tr>
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<td><strong>合计</strong></td>
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<td>467</td>
<td>581,948</td>
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</table>

We have received data from business centers since 1st Nov, 2006. It is reported that 581.9TB data exchange has been achieved totally by 31st Oct, 2011. Specifically, 52.9TB data of the products of CMA Ensemble Prediction System has been sent. According to the received data volume, ECMWF takes the lead with the total number 373.5TB, followed by UK Met Office with 59.86TB.

Add 00Z data since 3rd Aug, 2011, the data size is 3.8MB/00Z.

End in Aug, 2010 then begin to transfer the data of upgrade model since Oct, 2010, the data size is 60GB/day.

End in Dec, 2010 then begin to transfer the data of upgrade model since Oct, 2010, the data size is 60GB/day.
Archive Summary at CMA

- **Online Data**
  - Period, most recent 1 months
  - 14.48TB

- **Offline Data**
  - Full period of record
  - 582TB, STK 9310 library
Equipment Improvements

- **2011.10: LDM System upgrade**
  - Replace 2 high-performance LDM received server
  - Upgrade high-performance FC RAID (200,000 IOPS)

The Upgrade Physical Architecture Diagram Of CMA TIGGE Archive Center
Comparison Chart of Missing Number between 2011 and 2010

The data integrity has been improved greatly.
Service Improvements

- CMA on-line monitoring and EPS comparing, 2.3TB (May 2012).
- China domestic users off-line data services, 52TB (May 2012).
- TIGGE-LAM project, CMA regional EPS data archive, 3.6G/per day.
- TIGGE Portal: 30 Users Website (http://wisportal.cma.gov.cn/wis), Among them, 6 from ECMWF, JMA and Brazil Area.
Service Improvements

TIGGE data-processing software

- We have developed “TIGGE data processing software” for the user’s convenience.
- The system has confirmed the functions of ftp download, unzip, selecting the data elements, missing data checks, Area cut interpolation and format conversion preliminary.
Future Project

• Data storage process adjustment
  – In order to reduce the storage link, adjusted the Outer net (DMZ Zone) data to intranet.

• Tigge Display platform
  – To display the situation of the daily data reception.

• More funding support from CMA
  – Hardware
  – Software
Support to the lead centre on verification of EPS web site

- Upload CMA monthly statistics of GEPS verification from November 2009 up to the present;
- Will add the reliability table and CRPS table according to the guideline (update: July 2011), before the end of 2011
The Updated of REPS at CMA

- Working on REPS based on the WMO BO8RDP project.
- Working on REPS over China.

Configuration of REPS:
- Model (WRF-ARW dynamical core)
- 15km grid space, 31 vertical levels
- 60h forecast
- 15 members

<table>
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<th>Convective scheme</th>
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谢谢！

Thanks!

- The End -