The Development of Web-Based Forecaster's Analysis System(WebFAS) at KMA

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1. Introduction

KMA has been developing and using a Forecaster's Analysis System(FAS) based on LINUX with new forecast preparation concepts and interactive display in cooperation with the NOAA Research-Global Systems Laboratory(GSD) since 2000. It is a two-dimensional forecaster workstation designed to query all kinds of weather information interactively on a single display and can easily overlay, combine, and animate different types of data and analysis(Fig. 1). The Operational FAS has been launched at the KMA headquarters in the end of 2002 and at the six Regional Offices in April 2002. Also, the FAS has been deployed at 38 Weather Stations in July 2003.

Nowadays by rapid developing of information technology and infra-structure, KMA is developing the construction of WebFAS which allows the users to easily use and access its system at any places from 2006. The basic mission of the WebFAS is easily dealing with real time numerical model output, remote-sensing observation data, synoptic data and synthetically analyzing relating dataset for forecast. As seen in Fig. 2, the first version of 2006 was aimed to make data processing, user interface and major functions. So as that, some data was possible to be displayed through WebFAS. The
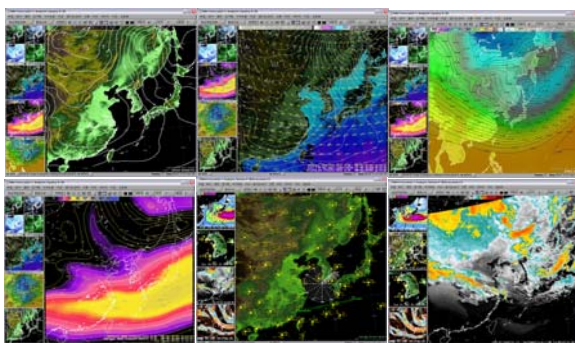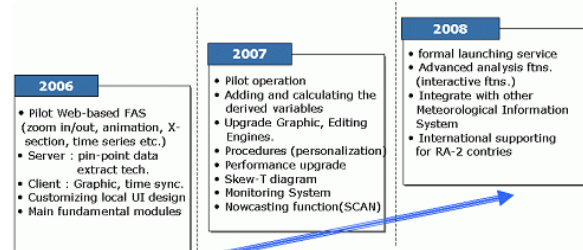

Fig. 2. The 3-year plan of developing WebFAS

second version of 2007 will be adding more data sets, deriving meteorological variables, and advancing functions on WebFAS based on the first version.

2. System Configuration

The functions of WebFAS are divided by the data processing section in server and data displaying section in client(PC). As seen in Fig, 3, the server is in charge of processing data and transferring it back to requested client PC. The extracted data are stored in cash disk of server and it will be served to next requests from client PC. The client PC makes output in graphic through user interface. Most of these data are vector-type data, so that editing of data(zoom in/out, contour, image etc.) will be freed. Also, displayed
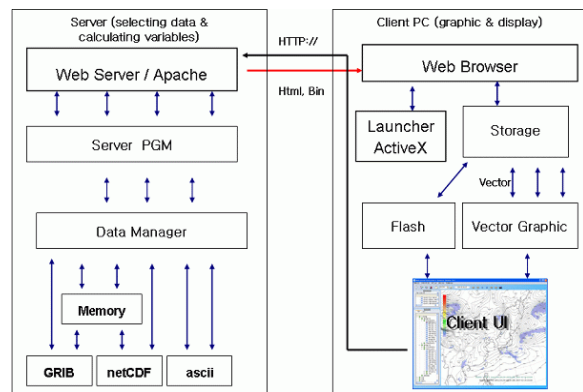

Fig. 1. Some examples of displaying on linux FAS.

Fig. 3. The structure of WebFAS system(Client-Server)

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one time data will be remained in PC, therefore, it helps to saving time to make output again.

The WebFAS Software is programmed by C/C++, Python, TCP/IP, and socket program based on network. To use webFAS, PC installed of Window OS with Internet Explorer(IE) is required. Recommended system requirement is CPU 3.0 GHz, Dual Core, 1GB memory and external graphic card. To activate WebFAS, open Intranet homepage and click WebFAS. Then it will be installed in client PC automatically and working like Fig. 4.
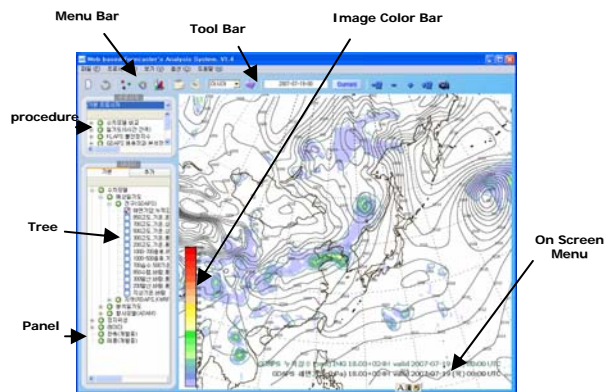

Fig. 4. The main User Interface of WebFAS

3. Main Functions of WebFAS

The main functions of WebFAS are as follows,

- Overlaying all kinds of meteorological data with automatically time synchronization (now, 4 kinds of numerical model data and remote sensing data etc.)
- Zoom in/out, animation
- Cross Section and Time Series
- The flexible searching for history data
- Contour/image editing
- Procedure function

Though this version of WebFAS is not complete yet, we are continuously developing the WebFAS including the functions like Skew-T diagram, advanced analysis tools etc.

4. Examples

Fig. 5 is the examples displayed by WebFAS. Fig. 5a is the overlaying image of radar reflectivity, satellite IR image, and sea level pressure of RDAPS(Regional Data Assimilation and Prediction System). Every variables can be checked in detail with enlargement by activating and inactivating the variables on screen. In WebFAS, all data can be overlayed together, therefore it is expected to find not only known weather factor, but also new weather factor by overlaying of weather variables. Fig. 5b is the PM10 density from ADAM(Asian Dust Aerosol Model), sea level pressure, wind vector from RDAPS. As forecasters are able to combine each model data, the information will be more useful than before. Fig. 5c is the "instability index" calculated by KLAPS(Korea Local Analysis and Prediction System). Fig. 5d shows the time series of the sea level pressure from RDAPS analyzed by WebFAS.
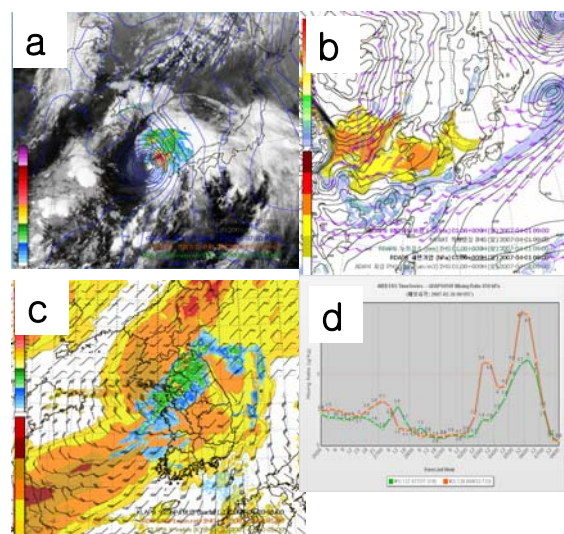

Fig. 5. Some examples of displaying on WebFAS.

5. Summary

The fielding and commissioning of WebFAS has catapulted the KMA into a new era of data integration and graphic capability. WebFAS is an exclusive system for forecasters who can easily analyze all weather information by overlaying, combining, and animating data in a single display, so that forecasters can focus on the weather event itself and reduce the overall preparation time.

After finishing the project of developing WebFAS in 2008, we hope WebFAS will be the forecaster's primary weather analysis and nowcasting tool and will be contributed to improving forecasts in KMA. And also KMA hopes and supports that WebFAS will be available at any developing country from 2008.