OPERATIONAL GRAPHICAL PRESENTATION FOR LOCAL AND REMOTE USERS AT THE ITALIAN AIR FORCE METEOROLOGICAL SERVICE

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The support to IAFMS forecasters by graphical tools is briefly described. This tools are made of two components: one is handled by IBM mainframe and the other is based on PC's. Data receveid from ECMWF, observations, satellite images and post-processed data are displayed interactively according to local needs. The project aimed at updating and enhancing the CNMCA data processing center is mentioned too.

1.   INTRODUCTION

The representation of the meteorological data in a graphical format have in the last years acquired an icreasing importance in a operational enviroment. The applications managing graphical presentation depend on the available hardware and development software and, furthermore, on the users the application will be devoted to. Some aspects as reliability and user friendly interface should be carefully considered when developing an operational graphical application.

In this paper the current operational graphical applications in Italian Air Force Meteorological Service (IAFMS) will be described. The subjects covered by this brief description will be the following :

- the current configuration of data processing equipment at the national operative centre (CNMCA);
- the CNMCA local area network and the IAFMS wide area network;
- the CNMCA graphical data bank composition;
- the available tools local and remote users have in order to access and visualize graphical data;
- the advantages and the weaknesses of the current configuration;
- the future plans.

2.   **CNMCA** DATA PROCESSING CENTER CONFIGURATION

The basic component of the current data processing center at CNMCA is an IBM 3090 120E mainframe equipped with :

- MVS/XA supervisor system ;
- CICS operating system that is an interactive enviroment allowing , in real time, the alphanumerical data bank access;
- TSO operating system where the operational suite runs daily according scheduled time.
- VTAM, Virtual Telecommunication Access Method.

The backup machine is an IBM 4381.

The Mainframe receives observation data, circulating on GTS, by two IBM S/1 machine. The mainframe is accessible trough two IBM 3174/L unit by local users and trough an IBM 3725 unit by remote users.

DEC   computers (VMS and DEC/OSF1 operating system)   linked by an ethernet line constitute the remaining part of the data processing center and their functions are, basicallly, subdivided in two areas:

- DEC area, which functions are : front-end to ECMWF and decode of binary messages (GRIB, BUFR, etc.);

- satellite area, that manages reception and processing of satellite digital data.

The connection between IBM and DEC systems is established through a SNA gateway machine.

3.   LOCAL AND WIDE AREA NETWORK

The network configuration is of star type, i.e. each user is linked directly to mainframe.

The local users access the mainframe using a direct link (nomodem) allowing a very high speed.

The remote users ,using a leased telephone line, can access the mainframe through two kinds of connection:

- monouser , (modem; IBM 3270 emulation card with PCSA adapter);

- multiuser, (modem; 3174/r unit; IBM emulation card with coaxial cable output)

The local and remote user workstation have the following configuration:

- CPU i386 or i486;

- SVGA video card;

- laser or dot matrix printer;

- 3270 emulation card.

4.   GRAPHICAL DATA BANK

The graphical applications running on the user workstation display the following graphic files archived in TSO datasets:

- pif files, that are made by " SIGAMO" software (written in APL language and using GDDM graphic routines) and memorized as members of a partitioned data set;

- bgl files, that are made by graphic BGL routines and memorized in sequential data sets;

- bmp files, that are made by built in software for satellite data processing and memorized as members of a partitioned data set.

5.   GRAPHICAL TOOLS FOR LOCAL AND REMOTE USERS

5.1.   Sigamo image presentation

This is the main graphical application currently running at IAFMS. As said before the mainframe software called SIGAMO is the main component of this application and it has two separate functions:

- visualize on an IBM 3192 graphical terminal the images that are interactively required by the users (interactive procedure).
- create the pif graphics files that is visualized on PC's screen after the trasfer files operation, started by user input,   will be successfully completed. (trasfer file procedure)

Both procedure use a menù driven interface. The latter procedure uses a suitable software, installed on user's PC, for trasferring , displaying an memorizing images.   This functions are carried out in a easy and transparent way so as to avoid any repetitive intervention by the users

The image identification is based on a six to eight character key. For istance METEUhh means metar observations of the hh hour relating to European area while S216245S means sounding diagram of the 12/z hour relating to 16245 (Pratica di Mare - Italy) station.

The most interesting images IAFMS users can display using SIGAMO are:

- pictorial presentation of IAF post-processing software, ARGO;
- ARGO meteograms for fixed station;
- sounding diagrams and stability indices;
- numerical model output (ECMWF, IAFMS) contours and meteograms.

5.2.   Satellite and bgl image presentation

The sofware PRESAGIO, installed on user's PC, manages trasfer, interpretation and visualisation of bmp and bgl files memorized in the mainframe. PRESAGIO, like the SIGAMO's PC component, carries out its functions in a easy and transparent way.

The most interesting images displayed by PRESAGIO are:

- superimposition of meteosat IR image and surface or upper analysis;
- TIROS images of north and central-southern Italy;
- cloud top height maps, that are obtained by converting cloud top temperatures into heights by means of an actual vertical temperature profile measured by a radiosonde.

5.3.   Unix graphical application

A new graphical application has recently been developed by CNMCA satellite section and it will be shortly operative. This application runs on DEC/OSF1 alpha workstation and has the following features when an IR Meteosat image is displayed:

- displays latitudine, longitude and temperature of the point, by pushing left mouse button;
- carries out zoom of the image by pushing middle mouse button;
- displays cloud top heights window by pushing right mouse button.

6.   ADVANTAGES AND WEAKNESSES OF CURRENT CONFIGURATION

The current graphical application have been developed some years ago using that age philosophy, i. e. centralized generation of the images and their remote visualisation without any local facilities. The current approach to graphical applications is radically different and is based on a distributed architecture philosophy that means remote images generation. However we can locate some advantages of the current configuration:

- cost effectiveness, taking into account the high number of remote users;
- reliability: the simple configuration makes it easy to change   faulty workstations. Furthermore the mainframe has a backup machine;
- standardization, that means all the system users exploit the same information.

We can summarize the weaknesses of the configuration in the following items:

- rigid system;
- poor drawing and editing facilities;
- high demanding in mainframe computer time;
- different operating systems.

7.   FUTURE PLANS

IAFMS is moving toward an updated hardware and software configuration for both data processing center and remote workstations network. The main goals of this project are :

- data processing center :
    - ⇒ distributed architecture;
    - ⇒ unique operating system;
    - ⇒ unique on-line data bank;

- remote workstation:

  ⇒ client/server architecture;

  ⇒ local data bank

  ⇒ standard operating system;

  ⇒ modular, flexible and expandible application software;

  ⇒ standard GUI

8. CONCLUSIONS

The operational graphical applications in use at IAFMS have been illustrated. The SIGAMO application has been supporting remote forecasters since 1987. Reliability and easy to use are SIGAMO main characteristics. PRESAGIO is a more recent application and it has the same basic features of SIGAMO.

Saturation of mainframe computing time recources and increasing needs of the forecasters makes it necessary to update and enhance the data processing center at CNMCA and the remote workstations configuration. The new CNMCA data processing center will be based on a distributed architecture where the main component will be the on-line data bank. This configuration implies a client/server architecture for the wide area network and the remote generation of the graphical informations.