GRAPHICAL PRODUCTION AND VISUALISATION IN THE CNMCA LOCAL AREA NETWORK

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During the last two years the National Operative Centre (CNMCA) of the Italian Air Force Meteorological Service (IAFMS) has carried out a distributed architecture for the production and visualisation of graphic files. The production of graphic information is mainly based on MAGICS that has been installed on Unix workstations, while the visualisation rely on software developed for PC with Microsoft Windows (95 or NT) operating system.

1.   INTRODUCTION

In the IAFMS all the production of meteorological graphical files has been based, till 1995, on software running on the IBM mainframe . This configuration had the following weaknesses:

- rigid system;
- poor drawing and editing facilities;
- high demanding in mainframe computer time;

In order to overcome this shortcomings in 1995 we started , at CNMCA,   to install MAGICS on DEC-alpha (Unix) Workstation and to develop a software as interface to MAGICS. We have been printing, operationally, since the 1995's autumn the new postscript files production as A3 or A0 format using laser printer and thermal plotter.   The conversion of this postscript files in bitmapped graphical files and the development of a GUI that provides the forecasters with a simple and intuitive access to this files have been the next steps of this project.

This paper will briefly describe this system and is subdivided in the following subjects :

- the current configuration of the CNMCA data processing centre;
- the configuration of the CNMCA forecast service LAN;
- the new visualisation system in the CNMCA forecast service LAN;
- the future plans.

2. CNMCA DATA PROCESSING CENTER

The current configuration of the CNMCA Data Processing Centre is showed in figure 1. The new Front-End system based on DEC-Alpha machine and UMS (Unified Message Switching) software developed at Global Weather Dynamic Inc. has been working since August 1997; it has replaced IBM S/1 machine. The goal of the SADR system is to centralise and elaborate the radar measurement carried out at remote sites.
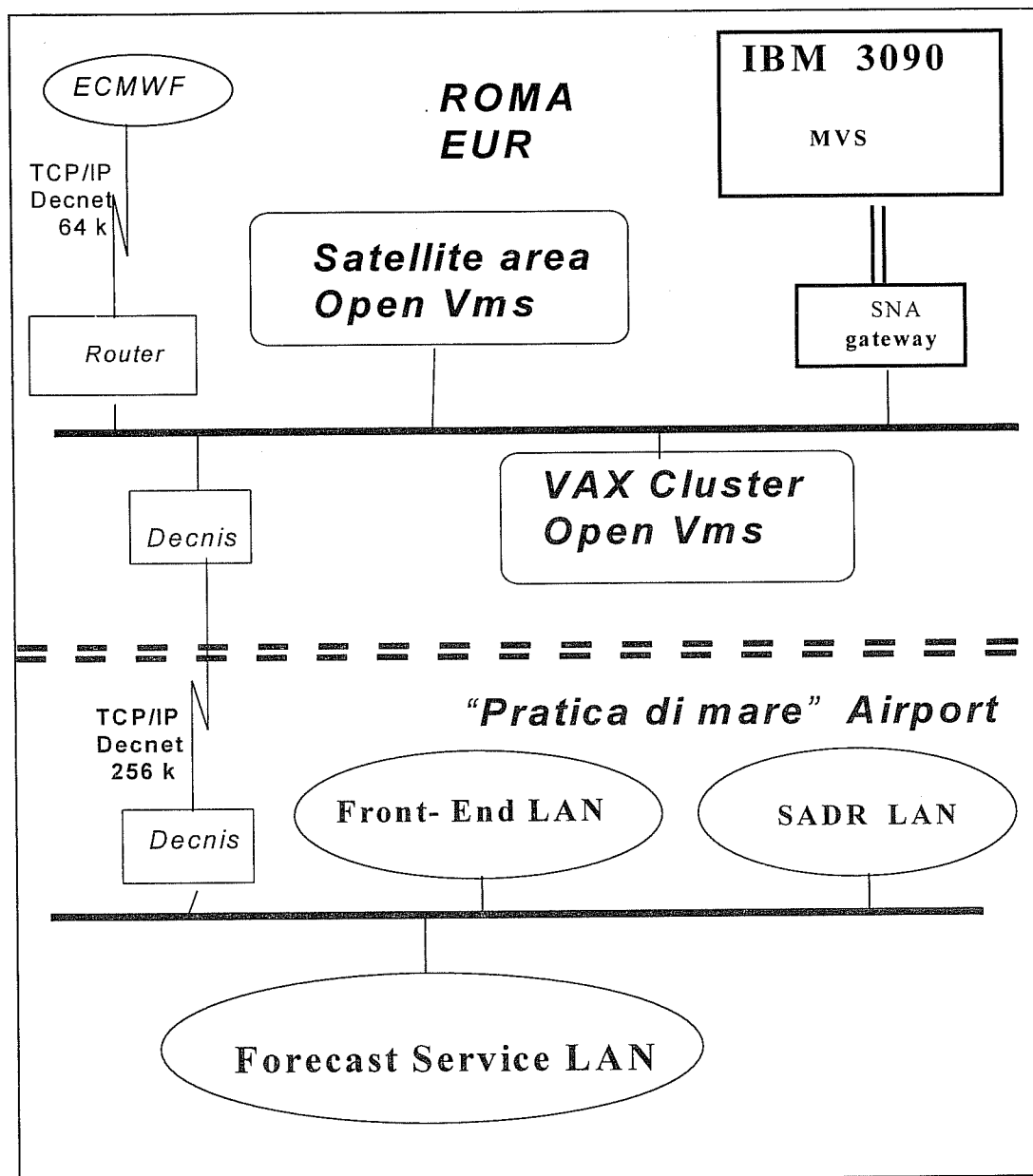
Figure 1: CNMCA DPC Configuration

The graphical files, used in the new visualisation system, are produced in the satellite area and in the forecast service LAN where they are visualised.

3.   CNMCA FORECAST SERVICE LAN

Three years ago we installed the ethernet local area network in the new building of the CNMCA at "Pratica di mare" airport. The new front-end and the SADR system have been installed in the ground floor of this building, where the new Data Processing Centre, that will replace the IBM mainframe, will be installed in the next future. The forecast service of the CNMCA is situated at the first floor of the building   The devices currently connected at the forecast service LAN are showed in figure 2
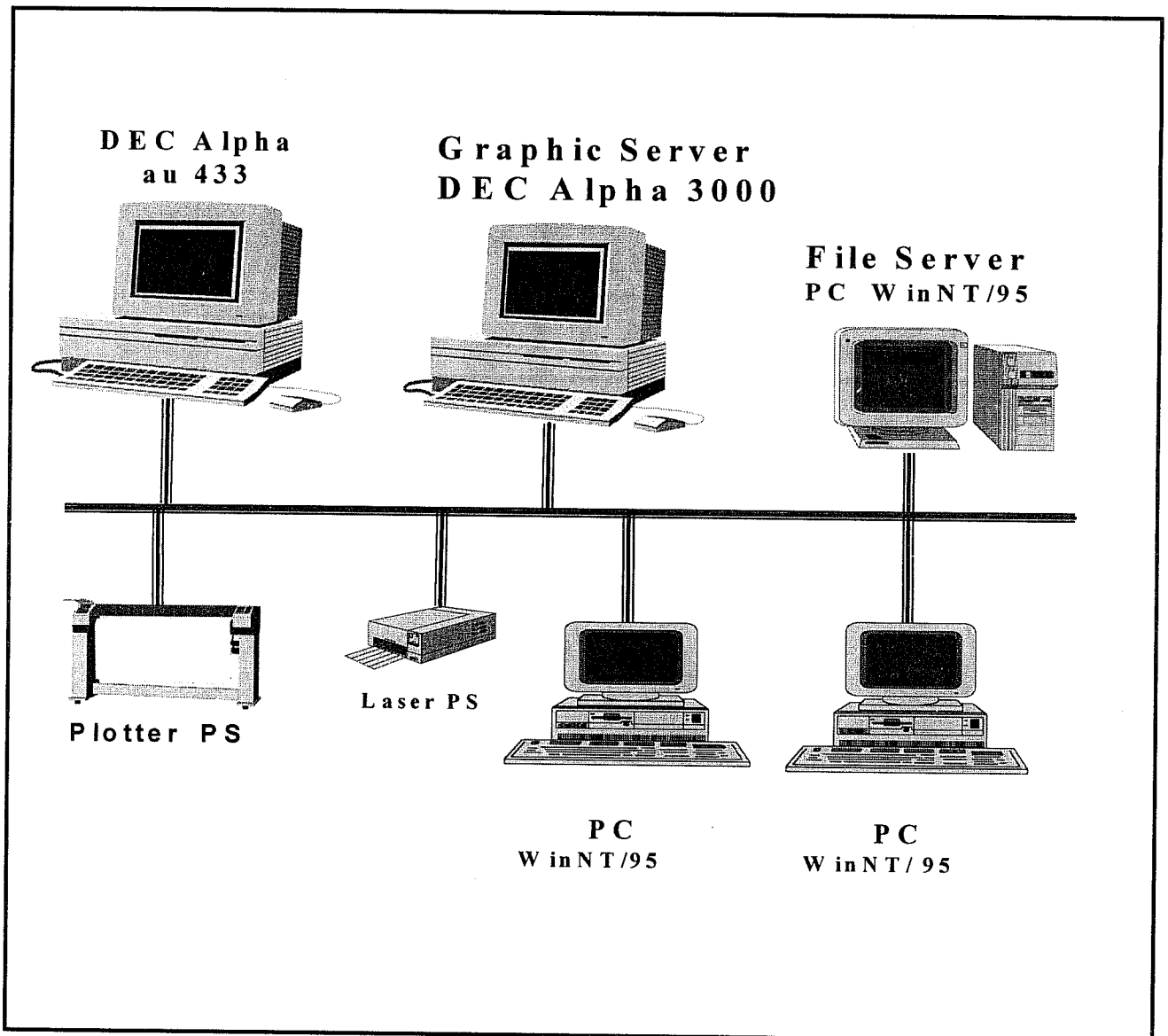
Figure 2 : CNMCA Forecast Service LAN

The DEC Alpha au 433 is not involved in the production of the graphical files. The main jobs running on it are the new analysis scheme and the CNMCA Local Area Model.

4.   NEW VISUALISATION SYSTEM IN THE CNMCA FORECAST SERVICE LAN

The maps, that are visualised by the new system, are produced by the graphic server that is a DEC-Alpha machine equipped with OSF/1 operating system and DEC GKS library. We installed MAGICS (ECMWF graphics package) and we wrote a FORTRAN software to interface MAGICS. This software, named as "Elabora", calls MAGICS routine according to the instructions it reads from a parameter files, that is a sort of macro, and produces a PostScript file having the same name of the parameter file ("parameter file name".ps).

A few of this postscript files are A0 or A3 format and are printed using a plotter (A0 format) or a laser (A3 format). Most of this files are in A4 format and are not printed in batch mode but are converted in a bitmapped format and then copied in the file server, namely a Win NT PC equipped with two disks of 3.2 Gb each.

Satellite raster files, generated in the satellite section of the CNMCA, are copied in the file server as well.
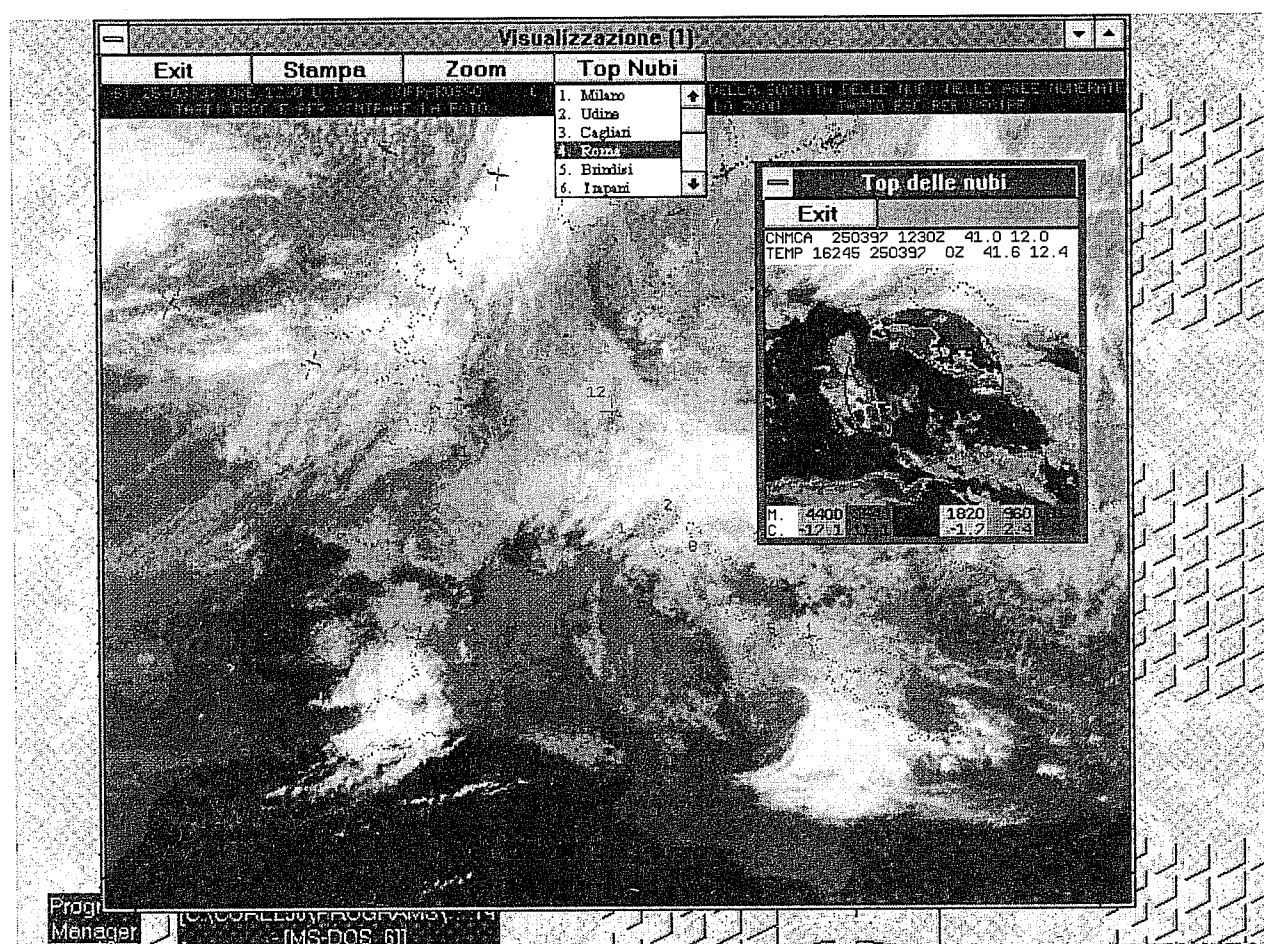

Figure 3 : Satellite image and cloud top window

In order to provide the forecasters with a user friendly interface to select and visualise this files we developed a software for PC Win 95 or Win NT using Visual Basic 4, that has the following main features:

- multiwindow;
- zoom;
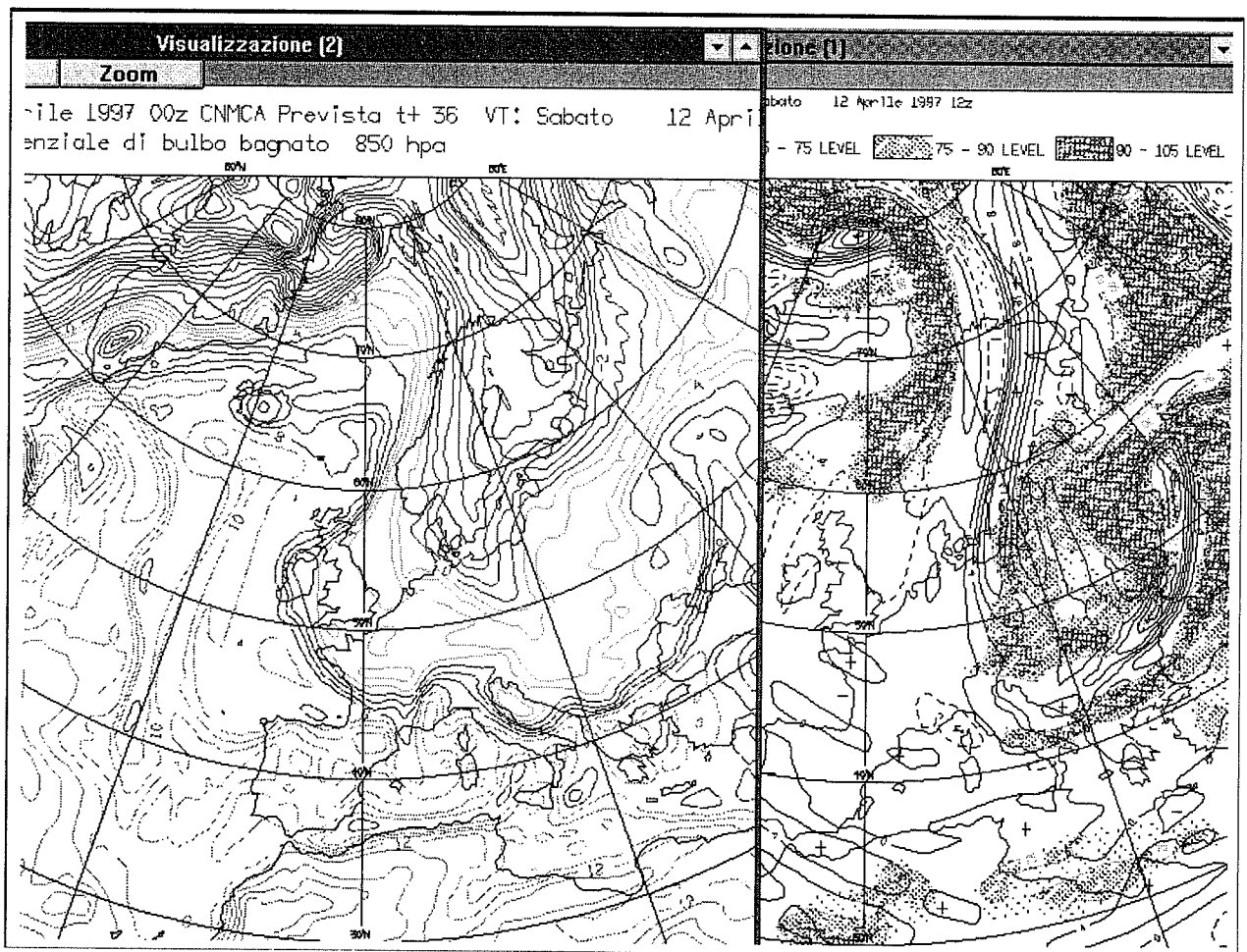- animation;
- plot of thermodinamics diagram.

Figure 4 :   Multiwindow example

This system of production and visualisation has proved to be very reliable and the simple GUI implemented has been well accepted by the forecasters that use it as main tool to enter the basic information they need. Furthermore it is very easy to expand this modular system adding new features.

5.   FUTURE DEVELOPMENTS

The future developments regarding meteorological graphical tools at CNMCA can be subdivided, taking into account the planned achievement term, as follows:

- short term :
    - – use of METVIEW (ECMWF software) in batch mode to generate (using macro language) new operative maps and in interactive mode into not-operational environment;
    - – addiction of radar graphical files to the visualisation system;
- medium term :
    - – graphical interaction capabilities;
- long term :
    - – new meteorological workstation as part of the data processing centre updating/enhancement project

6.   CONCLUSIONS

The new production and visualisation system at CNMCA has been illustrated. This system supply the forecasters with all the basic information they need and is modular allowing further features to be gradually added. At moment it doesn't supply the forecasters with graphical interaction tools that are necessary in an end product generator system. This tools will be included in the new meteorological workstation that are part of the data processing centre updating/enhancement project