

Annual WWW Technical Progress Report on the GDPFS for 2004

CZECH REPUBLIC

Czech Hydrometeorological Institute

1. Summary of highlights

At the Czech Hydrometeorological Institute (CHMI), the ALADIN model has been operated on the computer NEC SX-6 in the increased resolution 9 km and 43 levels and forecast time to 54 hours. A new Sun Fire server was installed to upgrade data management operations of the data processing centre.

2. Equipment in use at the centre and branch offices

The data processing centre is equipped with a vector computer NEC SX-6/4B-32, and with Fujitsu/ICL server DRS Super Server K connected via a local area TCP/IP network Ethernet and FDDI to enterprise network. Sun SPARC 10 model 512, two Sun SPARC 2 and ten Sun SPARC 1+ workstations are also connected.

A Sun Fire 4810 server for central database server (Oracle 9i) is used (six processors Sparc, 6GB RAM, two 36GB internal disks, two 1Gbps ethernet cards, two SAN cards) including Hitachi 9910 disk array (five four-disk cannisters – four 71GB disks each, four SAN connections).

A Sun Ultra Enterprise 450 server, connected to SAN network, is used for Oracle and Ingres database servers.

The MSS at the RTH Prague consists of coupled SUN computers (Sun Enterprise 220R/420R+RAID) using the cluster technology.

Backup activities are performed on a Sun Enterprise 250 server connected to the Qualstar TLS46120 tape library (software Legato).

Archiving activities are performed on the cluster of two Sun Fire V440 servers using disk array Hitachi 9910 and SAN network technology. SamFS archive software is used.

Web and FTP farm was reconfigured and now consists of four Sun Netra T1 and two Sun Netra X1 servers, two Intel based servers, and of two Alteon ACE3 load balancing switches.

NWP model and emergency air pollution dispersion model operations are controlled by two doubleprocessor Pentium Xeon servers Bull Express 5800/120Mf running under Linux Debian operating system. The model development is supported by another Bull Express 5800/120Mf server and HP/Compaq ProLiant ML370 server.

Branch offices use one Sun Enterprise each (one 220R, five 280R) as Oracle database servers (Oracle 8 or 9i with partitioning) and Sun Ultra-1 for data communication purposes.

3. Data and products from GTS in use

Following reports and products received from GTS are used at CHMI: SYNOP - 7000, SHIP - 1600, TEMP - 900, TEMP SHIP - 15, PILOT - 150, BUOY, CLIMAT, CLIMAT TEMP, BUFR, GRIB - 9000, GRID - 2000, T4 -1200. The figures, if included, represent approximate numbers of daily received bulletins for each type of data and products.

4. Data input system

Data input system is fully automated.

5. Quality control system

Surface observations are subjected to automatic quality control at the observations sites with regard to internal consistency, the climatological limits and adherence to the prescribed coding procedures. The upper-air observations are fully automated, quality control included. At the data processing centre, national SYNOP reports are monitored in real-time for completeness and timeliness.

Incoming surface data are checked for incorrect code format and impossible values, data with obvious errors being excluded.

6. Monitoring of the observing system

Surface and upper-air observations from the zone of responsibility of the RTH Prague are monitored in real time. RTH Prague participated in the global annual monitoring in 2004.

7. Forecasting system

The ALADIN model is a primary tool of short-range weather forecasting at the CHMI. It is a spectral limited-area model with horizontal resolution of 9 km (elliptical truncation 159×143, linear collocation grid 309×277, 320×288 including extension zone) and 43 hybrid-type vertical levels. The model is run twice a day from 00 and 12 UTC analysis up to 54 hours on the CHMI's supercomputer NEC SX-6. The lateral boundary condition data are obtained from the latest run of the global model ARPEGE at Météo-France; the initial data are created by the spectral blending method from the ARPEGE analysis and 6-hour ALADIN forecast (based on the 6-hour internal blending cycle using long cut-off ARPEGE analysis).

The raw and postprocessed data outputs are produced every hour of the forecast on both the original Lambert-projection integration area (a 9 km mesh) and the transformed domain regular in the geographic coordinates (12' x 10' mesh).



ALADIN integration domain

Forecasted and diagnostic fields are provided in GRIB (edition 1) format and netCDF format as well as a number of special products for downstream environmental applications and end-users are produced in customized data forms.

For medium-range weather forecasting up to ten days, NWP products from ECMWF, Bracknell, Offenbach and Washington are used, EPS products included.

Regarding specialised forecasts, the MEDIA model of radioactive air pollutant dispersion developed by Météo-France, is operated on an area covering the Czech Republic and surroundings using the meteorological fields forecasted by ALADIN. For information on a possible transport of air pollution from a more remote source, a simple trajectory model using the ECMWF deterministic forecast wind data is operated.

8. Verification of prognostic products

The operational verification of ALADIN products is currently significantly being rewritten and the results will be available in 2005 on the CHMI's web server.

9. Plans for the future

The main effort will be devoted to the participation in the further development of the ALADIN model and its next-generation successors, models ALARO-7km and AROME-2km, with an emphasis on the further development of its non-hydrostatic dynamical core. Two more model runs starting at 6 and 18 UTC are planned to be added in late 2005.