Web based Weather Prediction Analyssis

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Current Progress with Oklahoma Advanced Regional Prediction System (ARPS) code

- Progress has been made in integrating evolution schemes in ARPS with the Web based terrain modeling.
  - Current work is to support VRML 2.0. We will supply the VRML browser with isosurfaces at each time step from ARPS.
- We are currently working with Oklahoma to evolve winter time scenarios in ARPS.
  - D. Jahn is working on a thesis project to accomplish this project.
  - Currently the code is running on the T3D at the PSC.

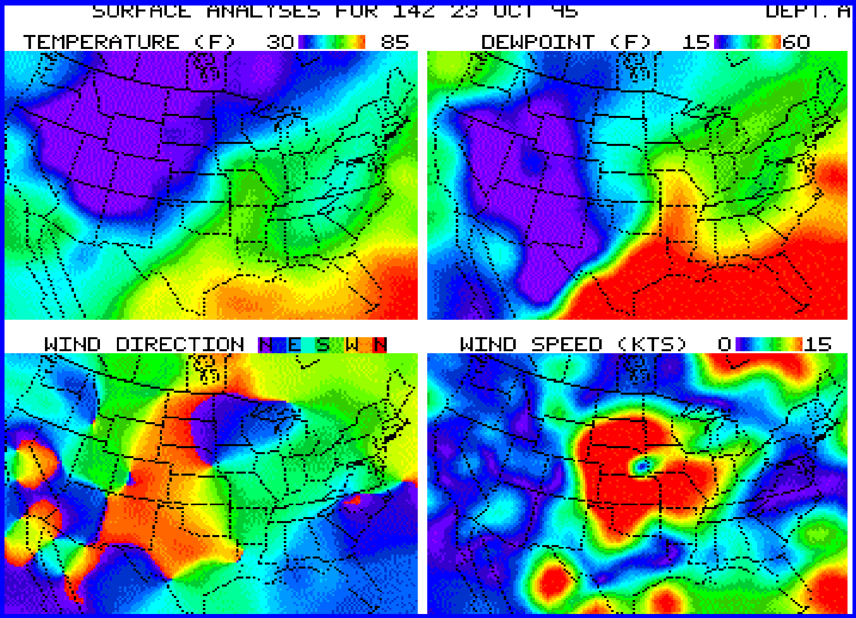
Unidata

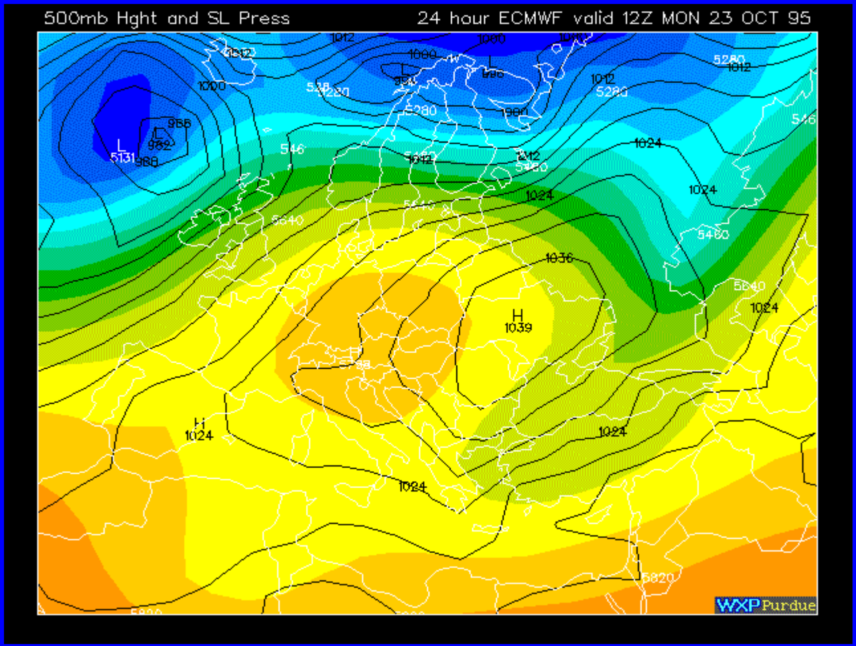
- Weather stations around the world report atmospheric temperature, pressure, winds, cloud cover, visibility, special weather conditions, and other observations.
- These data are collected on a regular basis and made available from the National Weather Service (NWS) via the Domestic Data Service(DDS) and International Data Service (IDS). These are both part of the NWS Family of Services (FOS).
- Through a subcontract with Alden Electronics, the DDS information is disseminated via the Unidata IDD.

Unidata working with Prediction codes

- In addition to the observations of surface and upper air conditions, the NWS Family of Services contains the output of a variety forecast models run on supercomputers at the National Centers for Environmental Prediction (NCEP , formerly known as the National Meteorological Center ,NMC) and the European Center for Medium Range Weather Forecasting (ECMWF).
- These data products are disseminated on the High Resolution Stream (HRS). As part of the FOS, these products are also injected into the IDD by Alden Electronics as part of their contract with Unidata.
- Our goal is to interface ARPS with Unidata, for areas over Oklahoma, Texas, and New York State.

- Weather stations around the world report atmospheric temperature, pressure, winds, cloud cover, visibility, special weather conditions,and other observations
- We can easily produce hourly maps which can show the temperature, wind speed and other parameters throughout the country in the form of color contours on a map background
- This map uses output over Europe from a supercomputer model run at ECMWF to show the 24-hour forecast for surface and upper air conditions





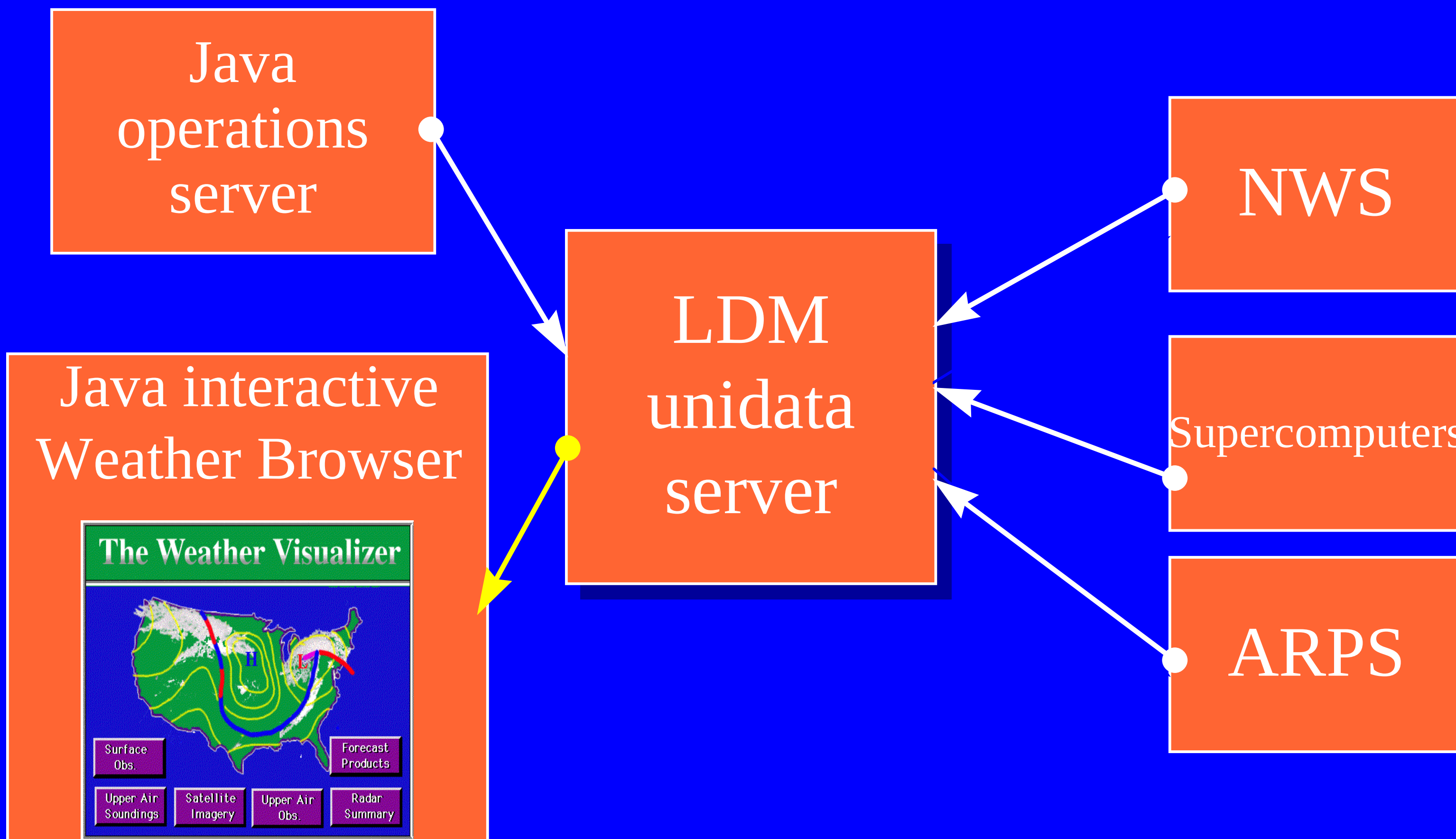
What does the Unidata LDM do?

- The Unidata Local Data Manager (LDM) is a collection of cooperating programs that select, capture, manage, and distribute meteorological data products.
- The system is designed for event-driven data distribution, and is currently used in the Unidata Internet Data Distribution (IDD) project.
- The LDM system includes network client and server programs and their shared protocols.
- An important characteristic of the LDM is its support for flexible and site-specific configuration.

NPAC's model

- One of the most important parts of weather data analysis is to obtain up-to-date weather reports from all over the world.
  - Weather is a highly non-linear global problem. This means that in order to make accurate reports on the weather we need to look at the weather all over the globe.
- We are starting to use Unidata's LDM to capture the weather data from the NWS. We are also in the progress of enabling this system to capture weather information from ARPS.
  - The weather data will be stored on local disks, and will be put into an Oracle database, which NPAC has expertise in.

NPAC’s Java model



NPAC's Java weather browser

- We are currently working on a design which will allow us to visualize the weather data obtained from our LDM server, via Java.
- We are providing such features as
  - Movies. We will store the data in particular regions, (defined in the Java server section), which we will be able to interactively play back.
  - 3D visualization. We have written a 3D marching cubes (isosurface) Java applet.
    - We will be able to concatenate various elevations of upper atmosphere weather soundings, into a 3D data set.
    - We will then filter this data set with our matching cubes algorithm, which will then generate a 3D surface in the VRML browser