Geophysical models and data flows in GRID environment

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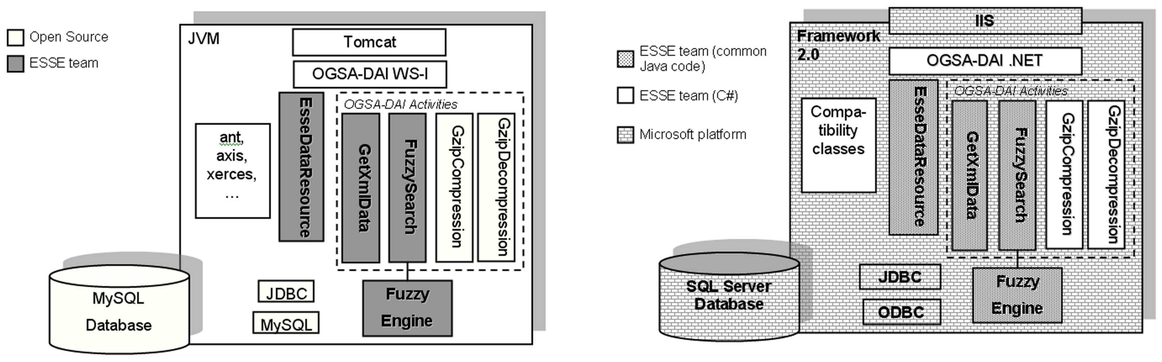
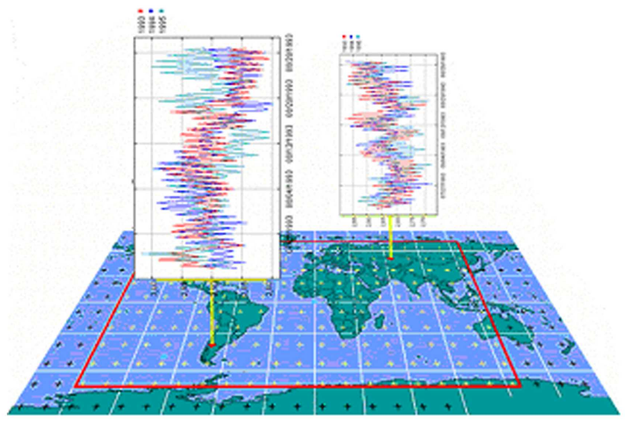
GRID Data Sources - OGSA-DAI

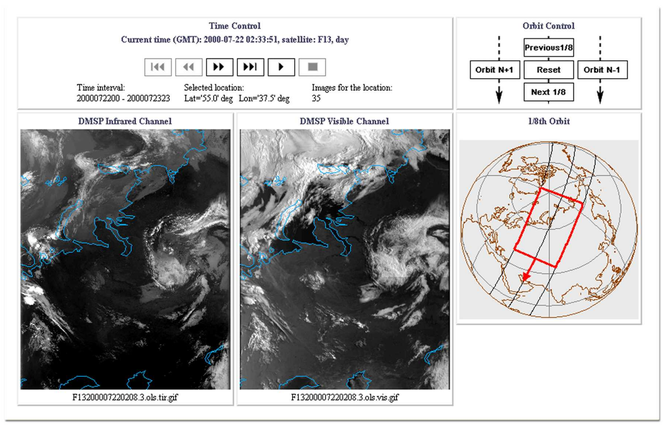


The original OGSA-DAI framework is written in Java and has open sourcecode. There are flavours of the product providing slightly different external interfaces, the WS-I compatible interface when run in Jakarta Tomcat environment and WSRF interface when deployed in Globus 4.0 container. In order to enable true platform independence the team has created OGSA-DAI.NET, a lightweight OGSA-DAI compatible component using Microsoft ASP.NET web services infrastructure.

NCEP/NCAR reanalysis data archive represents gridded output on a regular time step (6 hours) and fixed grid step (2.5 deg). The model uses data ingest procedures to assimilate observational data into model results to produce a consistent picture of the terrestrial weather during the last 50 years.



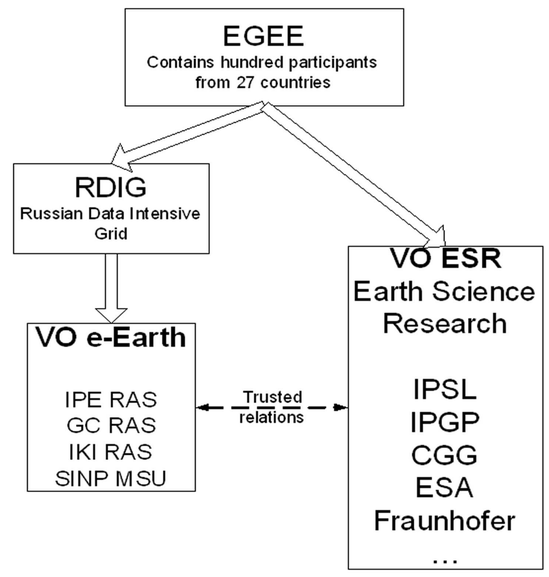
DMSP weather images. Individual DMSP orbits are available whole or subset into latitude range. On average, each satellite records 14 orbits per day. Each orbit contains both visible and thermal infrared data interleaved by line. The latitude and longitude of the nadir pixel is recorded for each line. Each line contains 1465 pixels of data with a ground sample distance of 2.7 km. The visible band records values of 0 - 63. The thermal infrared band records values of 0 - 255, corresponding to temperatures of 190 to 310 K.



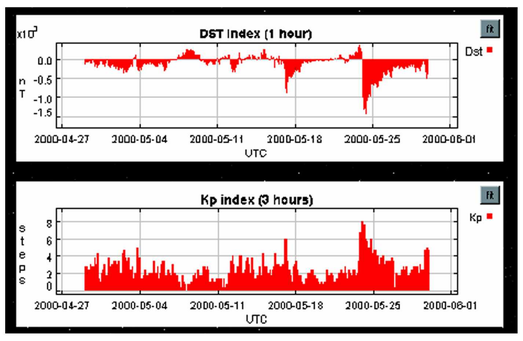
SPIDR (Space Physics Interactive Data Resource) is a datasource on solar terrestrial physics, functioning within the framework of World Data Centers. It is a distributed database and application server network, built to select, visualize and model historical space weather data distributed across the Internet.

VO e-Earth in GRID infrastructure

eEarth goals:
- Provides access to remote data of project participants
- Provides computational resources for remote distributed computation
- Common computational resources load monitoring for optimization

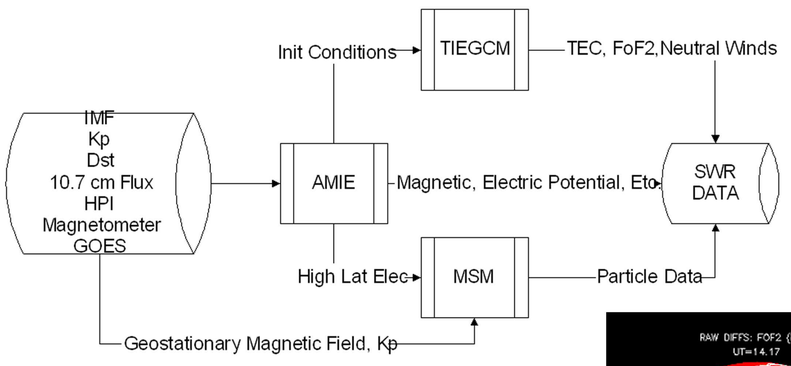


Data modeling and re-analysis

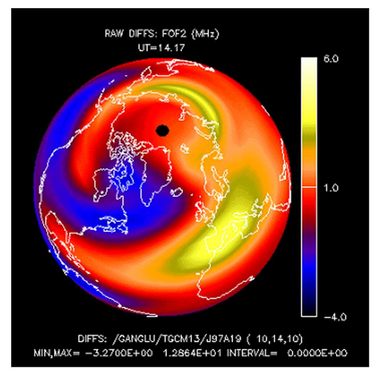


Input:
ground and satellite data from SPIDR GRID data services, ~100 Gb

Space weather **numerical models**

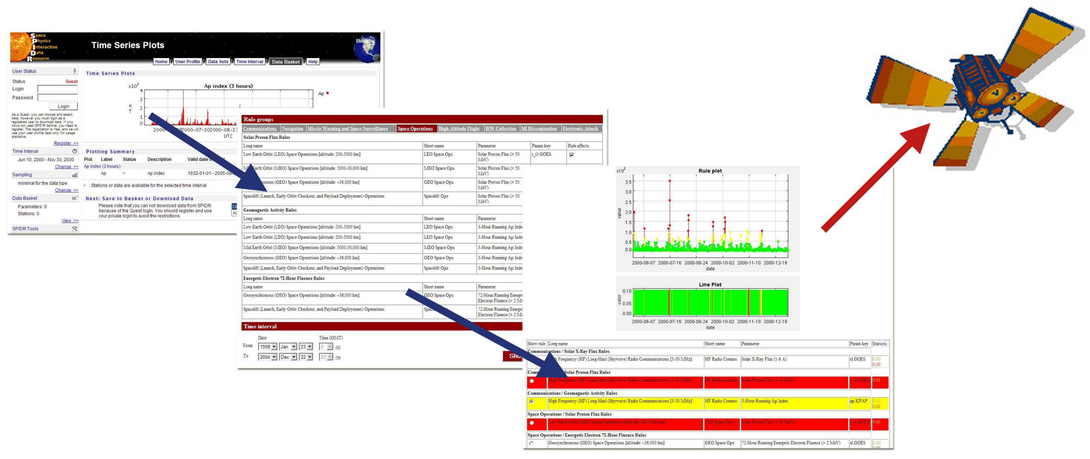


Output:
high-resolution representation of the near-Earth space for 11 years solar cycle, ~1 Tb



Space weather effects (SWXFX) application

SPIDR data — SWXFX rules — SWXFX plot — Satellite alert



The SWXFX project is a proto-type space environment impacts system. It allows users to analyze space weather anomalies affecting equipment using SPIDR data and provides interactive browsing of selected data. "Stop light" charts are generated using the user selected set of rules. The system uses the SPIDR data from OGSA-DAI engine as data source.