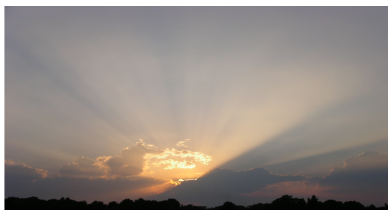


Highly Customizable Process-Oriented Software Framework – Hyla



4. Workshop on the use of GIS/OGC standards in meteorology, Reading, Mar 04, 2013



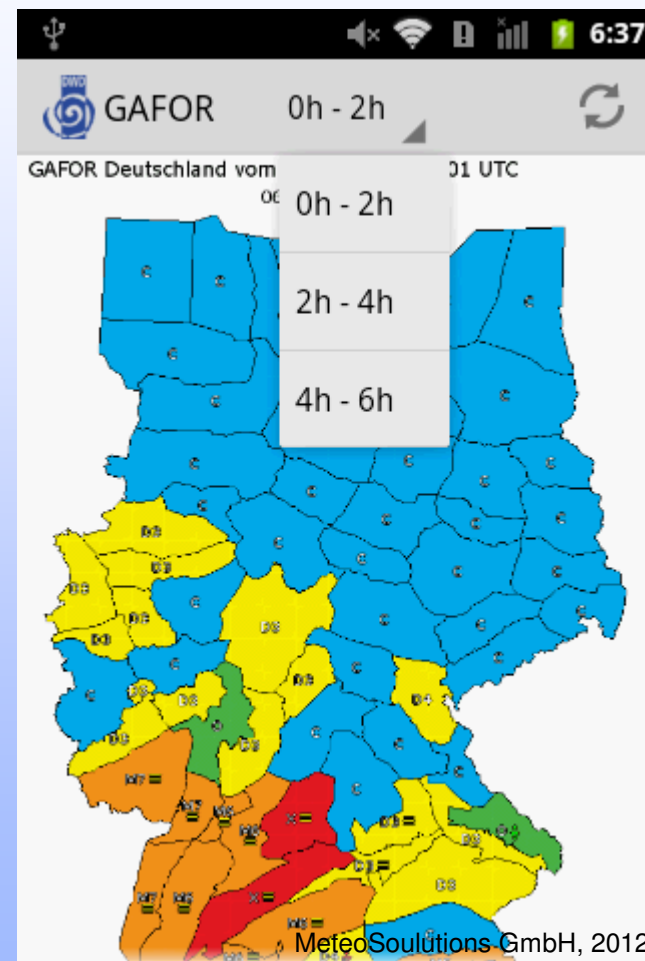
Introduction

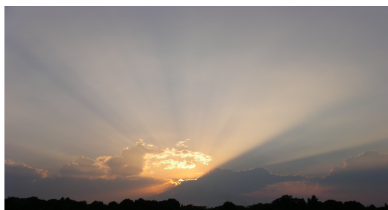
Any Frontend (WMS, Apps, ATC) needs a backend system for

- **pre-processing**
- **combining, merging**
- **provisioning**

of (raw) data

- **BUFR**
- **GRIB**
- **proprietary (local) formats**





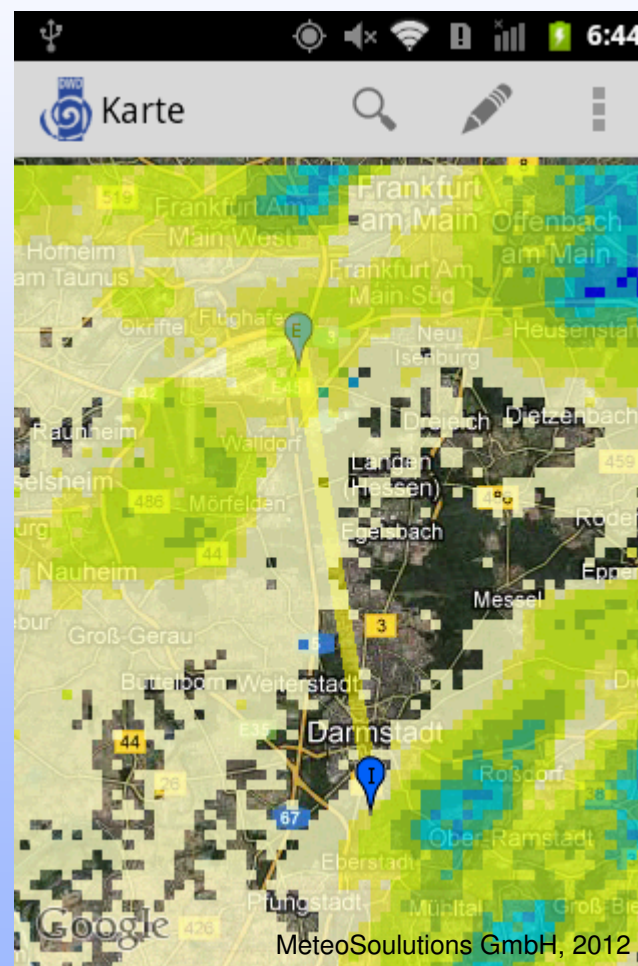
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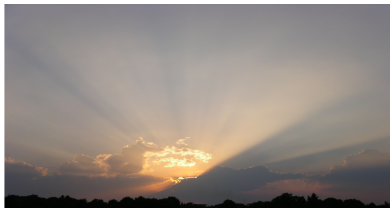


Backend (operation)

Operational requirements:

- **24/7 service level**
- **Robustness / fault tolerance**
- **Automatic monitoring**
- **Traceability**
- **Repeatability**

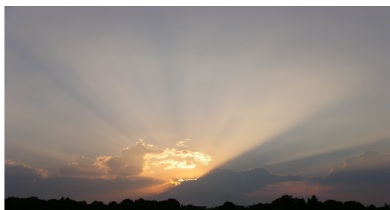




Backend (engineering)

Technical requirements/prerequisites

- **Implementation of various data types**
(raster-, point-, metadata, ...)
- **Communication with data sources**
(files, databases, ...)
- **Input/output in various data formats for easy exchange**
(text, XML, NetCDF, HDF5, GRIB, BUFR, ...)
- **Portability: operating systems**
(LINUX, AIX, Windows, ...)
- **Hardware**
(Intel, Sun, SGI)



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Backend (specific)

Data:

- **Meteorological data**
precipitation, lightning, temperature, ...
- **Physical units:**
dBZ, mm/h, °C, ...
- **Geographic context:**
location, projection, dimension, resolution



Backend (specific)

Operations:

- Aggregation
- Transformation
- Filtering
- Categorizing
- Statistic analyses

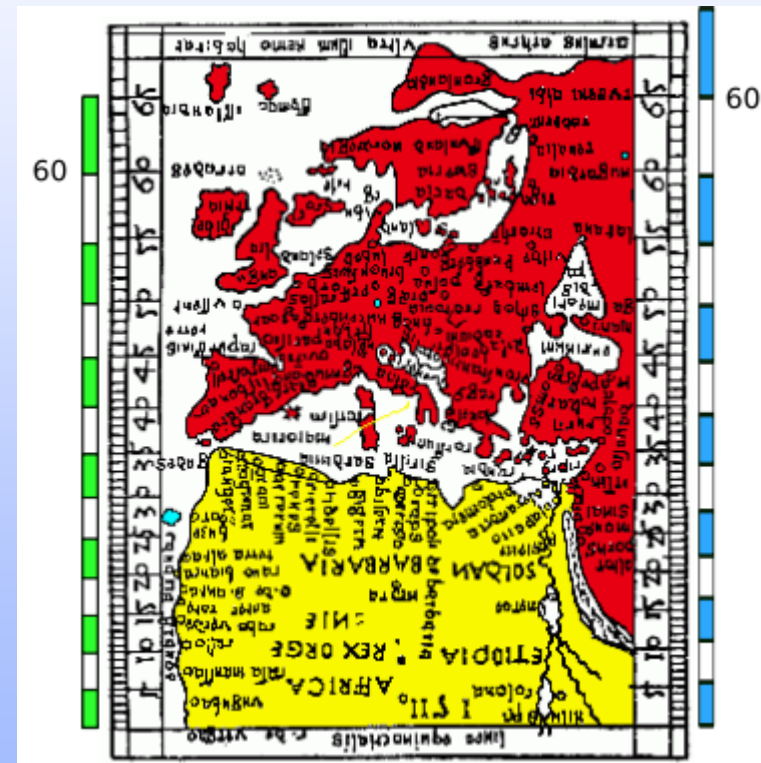
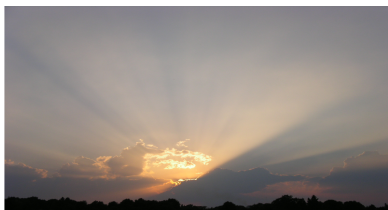


image by Wikimedia Commons



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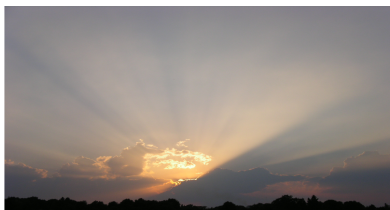
Skills/Experiences

- **Development of mass data processing systems (for more than 10 years)**
- **Monitoring of operational systems (NAGIOS®)**
- **Data visualization applications**

References

- **DWD, DFS**



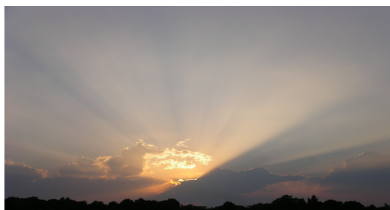


Hyla

Applications built on Hyla software framework:

- **EuRadCustomizer**
(precipitation for ATC)
- **GRIBCon**
(GRIB data conversion)
- **ms-fd**
(file distribution)
- ...

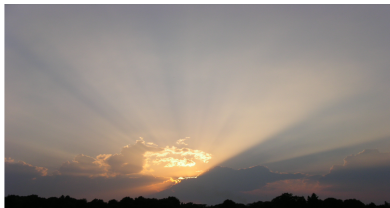




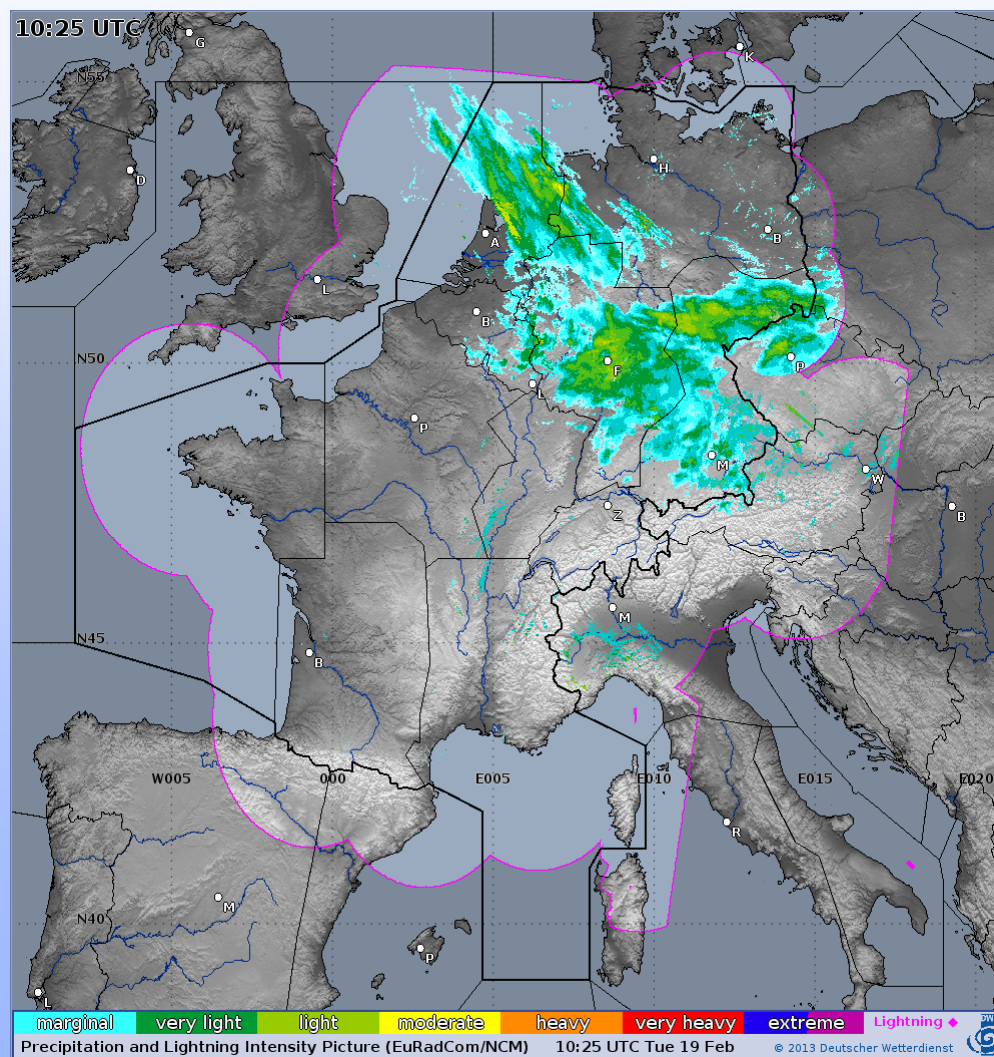
Hyla is designed to be

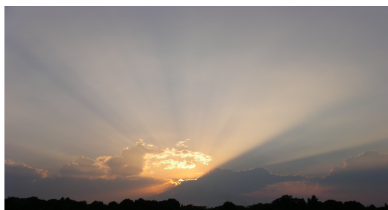
- **modular**
- **open ended (extendible)**
- **process oriented**
- **subject specific**
- **highly customizable**
- **reliable**

The framework's skills are not only limited to operate on meteorological data



EuRadCustomizer (application)

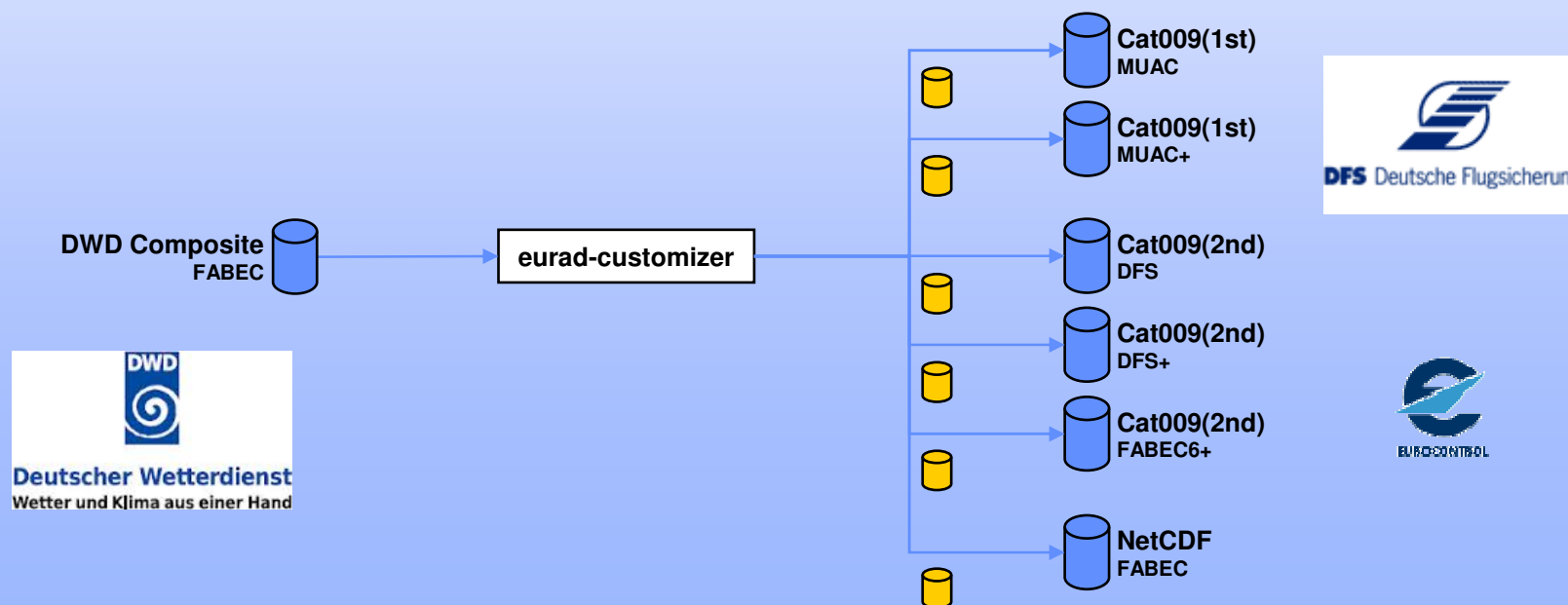


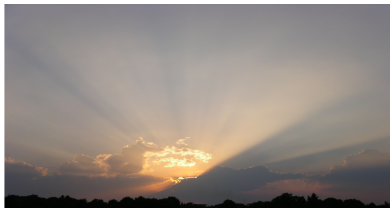


EuRadCustomizer (use case)

Example of successful operation:

- **Target data: Overview on the current precipitation distribution in various flight levels for DFS/EUROCONTROL. Areas: MUAC, FABEC**
- **Source data: European RADAR composites with different precipitation classes, produced by DWD**



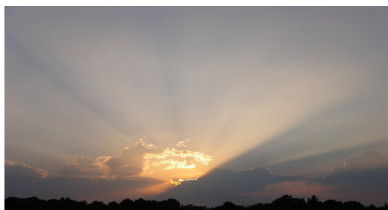


EuRadCustomizer (application)

Results vary in

- geographic location
- dimension
- spatial resolution (1km, 2NM)
- projection
- thresholds and number of classes
- data format (ASTERIX CAT009, NetCDF)

Configuration by plain text files.



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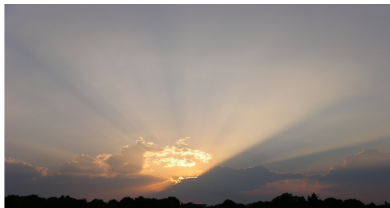


EuRadCustomizer (NetCDF)

Experiences using NetCDF:

- **Consideration of Climate and Forecast Metadata Convention (CF Version 1.5)**
- **Projection metadata was not automatically recognized by visualization tools**

-> HDF5 OPERA Convention



The modular architecture of Hyla supports:

- module focused development
- extensive failure assessment by unit tests
- exchangeability of modules to cope with change requests
- control by text files



image by Wikimedia Commons

Hyla – Swiss Army Knife in geospatial backend systems

„Thank you!“

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