Product Visualisation & Analysis Tool

14th Workshop on Meteorological Operational Systems
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EUMETSAT was formed in 1986 with the objective to provide, from space, information that can be used in weather forecasting and climate applications.

EUMETSAT is an intergovernmental organisation, formed to service the Member and Cooperating States which fund our activities.

- Geostationary: METEOSAT (7, 8, 9 & 10)
- Low Earth Orbit: METOP (A & B)
Data processing & visualisation

- EUMETSAT operates meteorological satellites for its member states
- In addition to image data, level 2 geophysical products are produced
- Products are derived from image data and forecast data
- Products are validated by comparison with observations from balloons, ships, aircraft
- Graphics workstation is used to display all these data, allowing the analysis of the images and products by meteorologists
- MWS - Original system in MTP ground segment, fixed set of products, fixed layout for each product
- PQM - Part of MSG ground segment, uses a data dictionary, and visualization templates to enable analysis of many products in different ways, without software changes
- PQM can handle data in internal formats and in BUFR
Problems with legacy visualisation tools

- COTS or hardware specific implementations
- Not easy to implement new features or products
- Not able to handle newer formats (GRIB2, netCDF, HDF, etc)
- Flexibility implemented only for certain modes of usability

Result:
- Tools that cannot be easily enhanced
- Users creating their own visualisation tools

Therefore, a need to find a replacement
The hunt for a replacement

- EUMETSAT have a unique set of requirements:
  - Internal formats unknown to third parties
  - Encoded formats specific to a small community
  - Specific display operations required by EUMETSAT users
  - A focus on product content display
Decision to procure a new tool

- Be based on a commodity Intel/Linux platform
- Be based (as much as possible) on existing tools & COTS
- Use no hardware acceleration features
- Be as flexible as possible in design, implementation & usability
- Be a platform that can be easily enhanced for:
  - new products, new encoding formats, new visualisation types, new projections

- Result: Product Visualisation & Analysis Tool (PVA)
- Developed for EUMETSAT by ask - Innovative Visualisierungslösungen GmbH
PVA components

PVA

MM Layer

Man-Machine Interface

Qt4

Configuration

User Vs. Templ.

System Vs. Templ.

Archive Products

Visualisation Engine Layer

Import

Data Processing

Rendering

Export

Image Files

Static Geo Data
PVA components
PVA lattice concept
PVA template

- Lattice structure
  - Node instances
    - All node property settings, defining amongst others:
      - base product, anchor time, explicit/implicit frame sequence (time slots)
  - Routing information
- MMI settings
- Panels
  - All panel property settings, defining amongst others:
    - Visibility, position, size, state (legend, minimised, maximised, ...), docking
Vector products previously
Vector products
Satellite images previously
Satellite images
Newer types of Encoded Products
Input, Colour, Coastline & Reference Controls
Layer, Navigation & Projection Controls
Animation Selection & Controls
Product Tabular Data Displays