Soprano, a service oriented production system

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The Soprano project was launched in 2005 to address several difficulties with the central production systems in Meteo-France.

Different production systems were developed over the years to fulfil punctual requirements, without a clear separation between central production and product generation, leading to inconsistencies: the same forecast product could be generated using different data sources, leading to different results. At the same time it was difficult to quickly answer to new request and to increased production needs. Finally, the dissemination system could not cope with the increased amount of data to deliver and new delivering methods such as SMS, fax, e-mail, ftp, telephony...

The project aims to review Meteo-France's supply chain. The result should be a new production system allowing Meteo-France to satisfy its meteorological data production needs, to better serve its customers, and to better manage global production and associated costs, but existing tools should be reused and federated.

Soprano introduces the concept of "producible data services" to split upstream production from products generation.

Upstream production consists in feeding meteorological databases and production of meteorological data via automatic processing or human expertise, while products generation includes presentation of the meteorological data and dissemination of the products to the customers.

The producible data services and producible data components designate a selection of meteorological data as the reference dataset for product generation systems. All the products must be generated only with producible data.

Producible data components are designed to provide a clear separation between upstream production and product generation systems, which enables scalability of product generation systems without interfering with upstream production system. These producible data components are usually a collection of data stored in files.

On a technical point of view, the upstream production system is mainly based on the existing upstream production system, Diapason, which is migrated from hpux servers to linux clusters. The product generation system needed a stronger homogenization since many central production systems using various technologies were operational. Choice was made to concentrate the development around the climatological production system Okapi, which allows the end-user to select and configure his products through a web interface. Nevertheless some product generation needing large amounts of data or computing resources will be hosted by the upstream production system.

The dissemination of products will be achieved by a new system Difmet.

The subsystems Soprano relies on, have been offering services since their initial conception: Diapason offers a remote access service to meteorological databases IAA, Okapi provides several services used by regional production systems to access to various product components, and Difmet provides dissemination services for all the production systems in Meteo-France.

Soprano uses services provided by other systems such as Synergie to produce complex graphics, or an accounting service.

Soprano also defines internal services, like administration services or data access services, to keep the system open for future uses.

SOA makes it possible to treat each component separately, since the interface is defined as a contract between components, and few technical requirements are needed for implementation. This architectural approach is privilegied in the Soprano project to ease the reuse of existing codes and to allow future developments with fewer technical constraints.

The services used by Soprano were built at different times, using sightly different interfaces, not always via web-services, sometimes to fulfil punctual communication needs between heterogeneous systems. The soprano project pointed the need for standardization of the interfaces, with several challenges about which feature to implement, which standards to follow (OGC services?).

Some part of the answer could be the use of an enterprise service bus (ESB).