One of the CONCERT’s Smart Grid solutions (Smart Electrical Networks) is the Interoperability and Services Platform (SOA - CIM/GDM), which meets the growing needs of interaction between engineering and business systems at the Control Centres of electricity or gas agents. Among those systems, it stands out those of supervision and control (SCADA), geographic information (GIS), simulation and design (CAD) and enterprise planning (ERP). The interactions between these and other systems take place through the exchange of data of various types, usually passed directly from one to the other, without any optimization in relation to the scenario in which they operate.

CONCERT’s solution represents a state-of-the-art technological option to the traditional creation of interfaces between several systems in use in the Control Center of a concessionaire. The traditional approach of implementation of interfaces of 1 for all, and all for 1, besides ineffective, is also infeasible, mainly because of the high costs involved in the implementation and maintenance of these interfaces, as well as extended deadlines.

The approach adopted by CONCERT, was creating an infrastructure that enables communication between these systems, with the maximum efficiency and the lowest possible cost, in addition to other advantages such as flexibility, agility and scalability. This solution also enables the independence of the utility from its suppliers for the integration of new systems or changing the existing ones.

Concert’s Interoperability and Services Platform is supported by a Service Oriented Architecture (SOA), which is accomplished through the application of a set of guidelines in various stages of development and/or systems integration. As a result of this approach, various "services" to be provided by software modules are brought to existence, featuring various functionalities, including the capacity to interact with each other or with other applications. This set of services, implemented on commercial message management systems, creates an "integration bus" (ESB - Enterprise Service Bus), which supports the transportation of the various data to be exchanged between systems. These data are transported through the ESB in the form of messages to be published or received (Publisher/Subscriber policy) by different systems of the Operation Center. Among the benefits of these interactions is possible to highlight the efficiency improvement of management processes and streamlined decision-making processes.

Messages are published or read by services called "connectors," that are specific to each system, obtaining data to be published or inserting data read in messages of interest. Each connector is built for the publication or insertion of data specifically exchanged between the system to which it serves and the integration bus, always in accordance with a predefined standard formatting.
Given the importance of meeting international standards, an essential part of the implementation of the Interoperability and Services Platform is to model business information in accordance with adopted standards of each corporate department. This modeling ensures a comprehensive understanding of all data and their relationships, and establish a common knowledge base and nomenclature for treatment of data involved. This modeling, or formating pattern, is what makes an integration bus a universal "path" for the data traffic between all systems involved.

For the electric energy industry, this default template is provided by IEC 61970 and IEC 61968 standards, collectively known as CIM - Common Information Model, which is a standardized model of power system data objects for development and integration of applications used for engineering, planning, administration, operation and marketing of electric power systems.

CIM enables the description of all assets of the electrical networks and their connections, as well as standardizing the exchange of information between systems and electric sector entities, in tabular or spatial form, comprehending all the segments of the electricity sector, namely generation, transmission and distribution of electricity.

For organizations of the oil and gas industries, this model is provided by PODS and GDM (USA) standards. The PODS - Pipeline Open Data Standard provides the data modeling templates required to the storage of critical information and analytical data about the pipelines network, as well as for its geospatial treatment. This model focuses on the production and transportation of oil and gas. Later, this model incorporated the GDM - Gas Distribution Model, which provides the modeling of gas distribution pipelines, used by all large corporations of this industry.

Data persistence

Eventually, a relational database (RDBMS) can be used to ensure the availability of the data carried by the Interoperability and Services Platform, in a historical context (previously transported data). Later, this data can be retrieved and used in various management applications. When available, this database will be modeled in strict accordance with CIM standards (for the electricity industry) or PODS/GDM (for the oil&gas industries), easing the data processing for all systems involved.