POWER PLANT +

Power plant integrated management
by means of distributed architectures

EFACEC

Concept

The POWERPLANT+ concept is behind the origin of EFACEC's new solutions for power plant integrated management, by means of distributed architectures for automation, control and protection.

This concept is based on important Paradigms:

- Object Orientation
- Human Machine Interface according to WEB technologies
- Industrial Standards

EFACEC has new solutions which were developed according to the POWERPLANT+ concept. These solutions offer a set of applications implemented in line with the Object Oriented paradigm, whose structures and dynamic are adequate to:

- Implement the management process for distributed databases
- Easily add new software functions, due to their low entropy

The option to grant this solutions with WEB type applications for the implementation of the respective human machine interface, aims to follow the present trend, very versatile and largely accepted by the industry, granting an effective application of the client/server paradigm.

Any process or system servers have an internal WEB server which offers human machine interface functions for the power plant integrated supervision and control, in its different components, such as generators, remote regulation, substation, dam (when applicable), auxiliary services, etc.

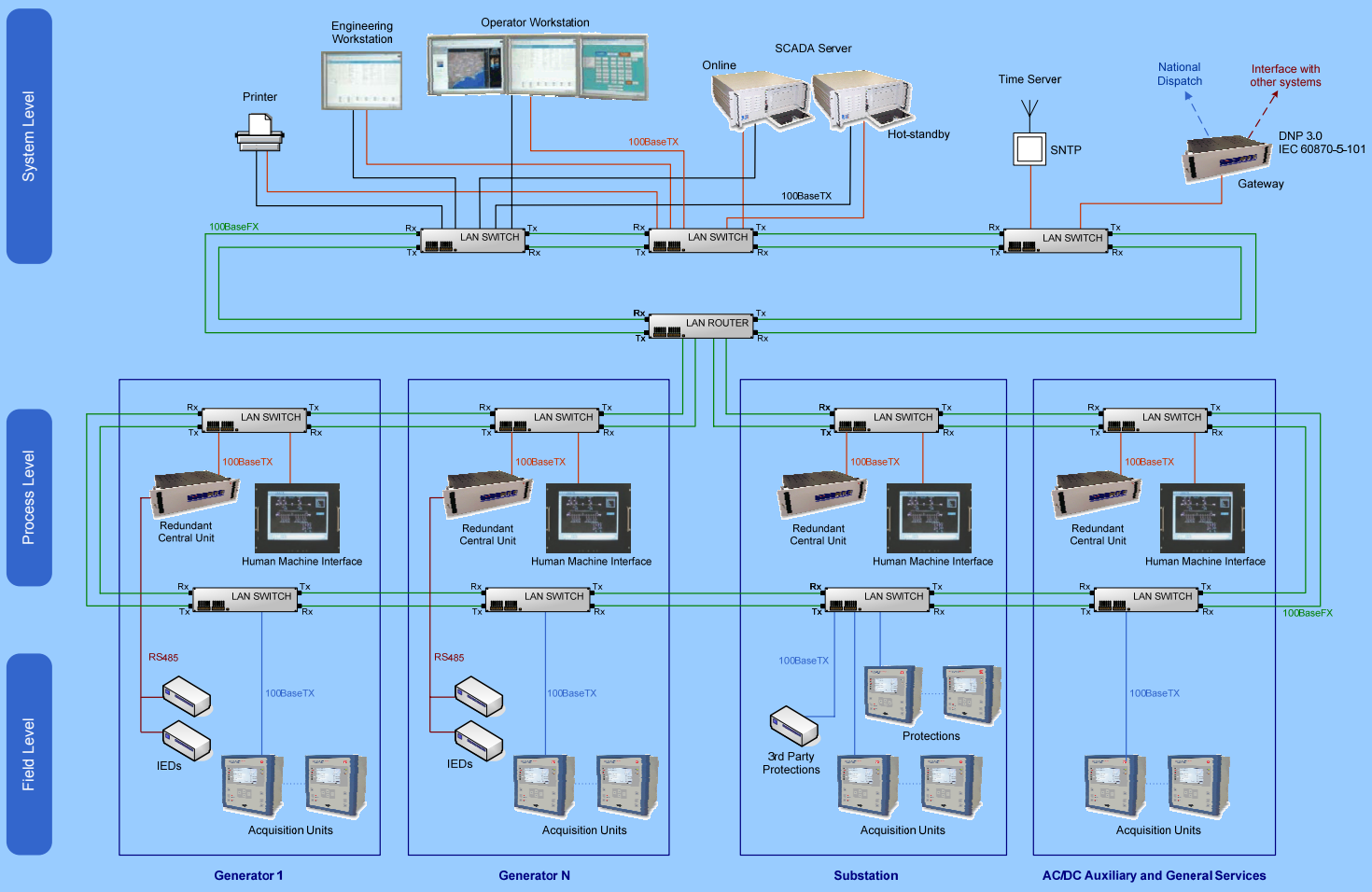
By using any type of computer with a network interface and a commercial browser, all potential of the new solutions is available at a distance of one click, in the systems operation perspective, or in the management perspective, the latter in a distributed real time environment.

The POWERPLANT+ concept evolves according to the state of the art and aims to cope with the most recent industrial sophisticated standards. This way, and without restricting the adoption of other standards, namely emergent ones, the new systems take into consideration the following standards:

IEC 61850	Implementation of the data model, engineering tools and communication protocols between intelligent devices for substation automation, control and protection, the grid interconnection substation being an important component associated to the power plant.
IEC 62344	Implementation of the data model for hydro power plants.
IEC 61400-25	Implementation of the data model for wind farms.
IEC 60870-5	Set of communication protocols between intelligent devices for power plant automation and control, for substation automation, or for top hierarchy systems (profiles 101, 103 and 104).
IEC 61131-3	Distributed automation configuration for the power plant and the substation, from a local single engineering station.

With the POWERPLANT+ concept, the new EFACEC solutions allow the definition of distributed architectures, from the point of view of the hardware and software. Their respective configuration, as well as the automation programming, is easily performed by means of the human machine interface. Those automatisms may be of any type or complexity level, including those of PID type.

Architecture



EFACEC offers an important range of new solutions which were developed according to the POWERPLANT+ concept. These solutions have their own literature.

From the point of view of the hardware, the new solutions keep the characteristics of open systems, adequate to implement distributed architectures, already in use in EFACEC's systems. The solutions' type is *diskless*, based on embedded technology.

The architecture is organised in three levels:

- System — Workstations and engineering stations, central server, external communication, synchronization
- Process — Local workstations, process server and data concentration
- Field — Data acquisition, control and protection

At System level, the new redundant servers implement integrated functions for distributed configuration management of all intelligent devices, also implementing the distributed automation component according to the POWERPLANT+ concept.

At Process level, the new servers offer hot-standby redundant characteristics, in what concerns the processing unit. They also have two internal power supply units working in parallel, granting an elevated MTBF. Since they allow for hot-swap working mode, the new servers present a reduced MTTR.

At the Field level, the new devices have specific hardware for signal processing, besides using high performance components.

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