Public Lighting Management Today

Public lighting management is an important subject of concern to municipalities and to the utility in terms of personal welfare, security and cost efficiency. Public lighting costs have a great impact on municipality budgets once they are translated directly into the electrical bill that needs to be paid; on the other hand, public lighting is considered a factor that contributes to the safety of persons, property and the society in general. For this reason, effective monitoring and management can contribute to avoid over-spending and to contribute to people's safety.

In this context, the role of EDP Distribuição is to manage the public lighting system in line with the municipalities' requirements (see Figure 1).

Nowadays, the public lighting control is divided by two geographical groups: urban area (Porto and Lisbon), and remaining country. Porto's and Lisbon's public lighting is centrally controlled by two dispatch centres located in these two cities through a Centralized Remote System (CRS), which is able to control public lighting by sending signals through the electrical grid. [1]

On the other hand, the remaining country has a completely differ-

Figure 1: Public Lighting

ent way to control public lighting, based on local equipment, such as astronomic clocks, light sensors or defined thresholds, and manually operated.

Smart Lighting System

Smart Lighting is a public lighting management system for a Smart Grid. It was designed to address the cloud computing paradigm and, as such, it is quite different when compared with a traditional architecture. It consists of a web application hosted in a computing cloud that lets authorized users interact with the underlying Smart Grid infrastructure in order to operate and extract information from the public lighting sub-system, thus enabling a more efficient management over the public lighting service (see Figure 2).

It provides functionalities such as on/off commands, real-time status, energy consumption and

schedules update to client municipalities and to the operator utility. These functionalities rely on integrity and availability of the collected information; therefore, Smart Lighting takes advantage of a set of TClouds security components for ensuring information security and resiliency.

Smart Lighting Benefits

The functionalities presented above allow grid operators to act upon public lighting with more information, ensuring the most efficient control. Also, municipalities are able to directly monitor the system, which allows them to make more specific and strategic decisions.

In this application, data availability is considered and represents an added value since Smart Lighting allows users to generate reports about many operational aspects, both to the client and to
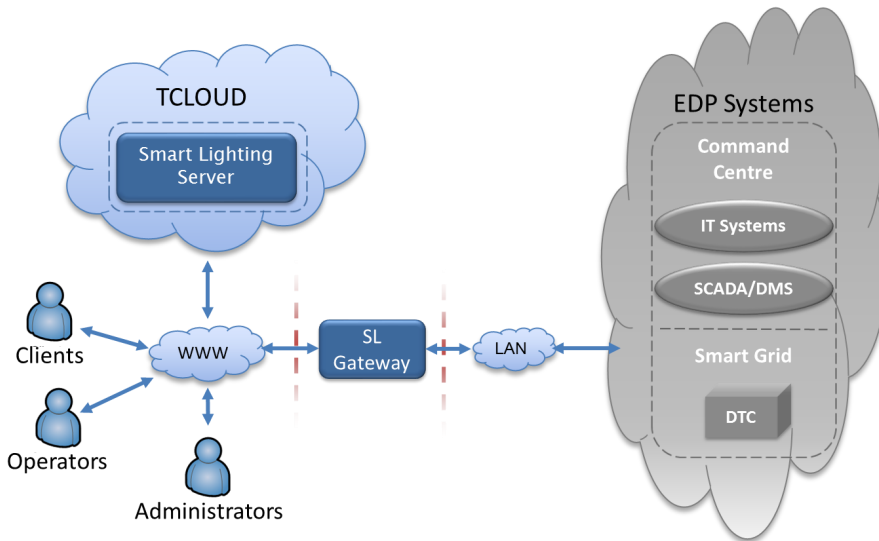
Figure 2: Smart Lighting System

the operator. It is possible to segregate access to information by defining what kind of data each user can access.

The Smart Lighting system is based on a cloud environment, which brings to the utility the scalability and computational power needed to manage a system with this level of geographic expansion and constant integration of new assets. Smart Grid components in general and public lighting in particular involve many different kinds of technical devices which, in many cases, are vulnerable to failures or damage. With a cloud based solution using TClouds' security components this impact is reduced, bringing a higher reliability to the system.

From the utility point of view, cloud computing adds flexibility to hardware investment plans. It allows lower starting investments and also the possibility to evolve the solution to follow changing requirements.

Future Work

Cloud computing may be exploited beyond public lighting management, covering all areas of Smart Grids. A new Smart Grid architecture can emerge, focused on scalability and able to process, in a real-time fashion, large amounts of data. The feasibility of this approach it is also being evaluated under TClouds, however migrating such a critical and complex system it is not a simple and straightforward process. In fact, requires specific solutions for specific components that are not able to be migrated to the cloud.

References

[1] Medida e Comando nos Processos Industriais Sistema de Telecomando Centralizado (STCC), EDP Distribuição – Energia, S.A

Further Information

Further information about the Smart Lighting System can be found in Deliverables „D3.2.2—Smart Lighting System Design" and „D3.2.1—Smart Lighting System Specification".

Disclaimer

TClouds at a glance

Project number:
257243

TClouds mission:
- Develop an advanced cloud infrastructure that delivers computing and storage with a new level of security, privacy, and resilience.
- Change the perceptions of cloud computing by demonstrating the prototype infrastructure in socially significant application areas.

Project start:
01.10.2010

Project duration:
3 years

Total costs:
EUR 10.536.129

EC contribution:
EUR 7.500.000

Consortium:
14 partners from 7 different countries.

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