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WHAT THE EXPERTS SAY



Is there more to the cloud than hot air?

06/11/2012 - 11.42 am

 **BIG DATA**  **DEMAND RESPONSE**
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Our specialists explain how cloud computing is entering the power industry.



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« It will lead to a wave of new services. »

What is cloud computing?

Marc Jalabert: There are 2 ways to look at it. First, it is a low-cost way to store and access data. Second, it is a programmable Internet – a platform to write applications and run computing processes through a website.

What are the main trends pushing the power industry towards cloud computing?

M.J.: The energy industry needs computing power and skills to deliver new solutions in a smart-grid environment. The cloud makes that connection, without heavy investment in IT. It is more practical, less costly and superfast to run energy applications in the cloud. So the cloud is a vector to accelerate the development of smart-grid applications.

Electricity consumers are becoming more and more active. Does this contribute to the move towards cloud computing?

M.J.: Consumers are already interacting with the cloud without even knowing it. They have been using Hotmail for 15 years. Social media, entertainment, communications all come through the cloud today. But much more will come. Smart homes, for instance, with say, one's diary interfacing with the smart car – which charges up for the number of miles to be travelled next day. This type of application is not too far in the future.

Are there risks associated to the move towards cloud computing?

M.J.: The main risk is privacy. So trust is a priority. Energy providers must be perceived as trustworthy. Also, data privacy mechanisms must be put in place, while consumers need visibility and the ability to change data.

How should the grid data be hosted in the cloud?

M.J.: We have now the ability to store quasi infinite amounts of data. And the cloud can apply massive computing power to process this data and provide better intelligence, faster decision-making or enhanced visualisation, for example. More data means better information and ultimately new knowledge. This is the promise of “big data”. It will lead to a wave of new services and will speed up the deployment of smart grids. Public data will also be shared more openly and will enable new smart energy ecosystems. It is up to the service providers to leverage the potential of big and open data.



« New applications can be rolled out rapidly. »

What are the main trends pushing the power industry towards cloud computing?

Laurent Schmitt: The smart grid requires new applications to be developed to enable consumers to interact with grid infrastructures through Internet connectivity. This implies the development of new architectures to manage massive amounts of data, referred to as “big data”, as well as new analytics to support energy decisions. The idea is to re-use developments from adjacent industries historically offered through the Internet connectivity. This implies the development of new

architectures to manage massive amounts of data, referred to as “big data”, as well as new analytics to support energy decisions. The idea is to re-use developments from adjacent industries historically offered through the Internet.

Electricity consumers are becoming more and more active. Does this contribute to the move towards cloud computing?

L.S.: In effect, the key smart-grid applications are first being implemented in the deregulated domain of the smart grid, as new aggregators enter the sector by deploying energy services in a “public cloud” through the Internet to enable demand response in wholesale markets. Traditional utilities have more recently moved in the same direction by rolling out similar architectures in their own “private cloud”.

Are there risks associated to the move towards cloud computing?

L.S.: Cloud computing presents advantages and risks. The major advantage is that new applications can be rolled out rapidly, while assuring high scalability once the service matures. On the other hand, it requires that applications be hosted in outsourced environments connected through the Internet. This opens up cyber security threats.

How should the grid data be hosted in the cloud?

L.S.: Smart-grid applications and their data can either be located in a “public cloud” – that is, outsourced data centres – for less critical applications such as customer information and demand response, or they can be located in a “private cloud” – typically the intranet infrastructures deployed around mission critical control centre environments.

Can you give any examples of new applications of cloud-based data management for a power grid?

L.S.: So far, new applications have mainly been developed in the area of demand response. In parallel, discussions have been set in motion to investigate the option of benefitting from big data through the next smart grid scale-up.



«More and more data are being generated.»

What are the main trends pushing the power industry (and utilities in particular) towards cloud computing?

Milo Broekmans: There's a technology push as more and more data are being generated. Cloud computing both contributes to this exponential growth and offers solutions for managing it. On the demand side, the cloud helps to cut time to market for services.

In our transmission and distribution sector, consumers are becoming more and more active. Does this contribute to the move towards cloud computing?

M.B.: Yes, since connectivity and reactivity can be improved. But it's important to remember that the cloud doesn't solve everything. SCADA, for instance, is unlikely to move to the cloud in the short term. And operations technology tends to lag IT in using the cloud.

Are there risks associated to the move towards cloud computing?

M.B.: Risks and challenges. Supplying the cloud itself with the electricity it needs is a challenge. Integrating so many different competencies from partners who may not fully understand each other's business can be risky. For example, IT firms may not realise that in an energy grid, a local problem can cascade across the whole network if they react too slowly. The cloud is innovative and future oriented, but managing risk will still depend on traditional business values, especially trust.

What are the expectations of transmission and distribution system operators from companies such as Alstom?

M.B.: That they understand our business and propose solutions, cloud or not, that respect our operating and other constraints.

Can you give any examples of new applications of cloud-based data management for a power grid?

M.B.: Data is the keyword here. The cloud makes large quantities of data available at relatively little cost, and the most useful applications will use these data to improve functions we carry out already, like monitoring and predicting grid conditions, to detect outages or theft for example. But these data and new applications could help us to propose more elaborate services, such as helping consumers craft the most efficient energy-use strategy.

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