Austin Energy

Leading the way to the smart grid

Overview

The Need
Seeking to improve service and reliability, Texas utility Austin Energy saw the need—and opportunity—to transform how it delivers electricity.

The Solution
Austin Energy partnered with IBM to create one of the United States' first Intelligent Utility Networks (IUNs) with the ability to centrally manage, monitor and control the grid to an unprecedented degree.

What Makes it Smarter
Austin Energy's leading vision of an improved electrical grid has shown how best practices, combined with technology, can yield real benefits including the savings of over 660 megawatts of electricity.

The Result
Austin Energy has created "smart grid 1.0," which adds integration, intelligence and control to the existing grid. Next is "smart grid 2.0," which aims to go beyond the meter and into the premises, integrating electrical devices into the system.

When it comes to the future of energy and making our infrastructure sustainable, what's needed is a carefully considered, multifaceted approach. That fact was clear to Texas utility Austin Energy in the first few years of this century, when the company conceived a grand vision for the transformation of its entire operating model—a vision that has evolved into an Intelligent Utility Network (IUN) or smart grid. Austin Energy is at the forefront of the drive to create a better way to generate, deliver and manage power and is among the thought leaders in smart grid implementations.

The utility's vision is to make better use of resources, improve service to its customers, become more responsive to outages and encourage conservation. To achieve these goals, Austin Energy devised a mosaic of approaches to transform the grid.

The brilliance of Austin Energy's idea is that it does not focus only on technical solutions. For example, the utility is looking to make use of off-peak generation capacity (power that is less expensive to produce) to make ice, which is then used to cool buildings in downtown Austin the next day. It's a stunningly simple idea; a non-technological answer to the issue of energy storage and peak load reduction.

In the course of its multifaceted efforts, Austin Energy has implemented many of the features that have become the hallmark of Intelligent Utility Networks. These include initiatives such as Web portals that give customers feedback on their energy usage and an energy-trading initiative that encourages conservation. Reliability is improved by infusing the electrical infrastructure with advanced technology ranging from smart electrical meters that give Austin Energy new insight to sense-and-respond capabilities that allow the grid to "heal" itself by automatically rerouting power in the event of a failure.

Business Benefits

- Creates an integrated IT infrastructure that spans the entire enterprise, increasing transparency
- Employs a powerful software platform for development, management and operations, enabling better service levels
- Provides end-to-end monitoring, control and management of generation and distribution to improve responsiveness and utilization of resources
- Monitors over 500,000 devices directly, providing a wealth of data to the utility
- Gives direct feedback to customers on energy usage
- Saves hundreds of megawatts of electricity and helps manage peak loads

Not a project, but an ongoing quest

The realization of Austin Energy's vision is far from complete. It is a journey, one that began several years ago and will continue as new methodologies and technologies are developed. Currently, the utility's intelligent utility network services one million consumers and 43,000 businesses through the management of 500,000 devices (meters, sensors, computers, and network equipment) that generate about 100 terabytes of data annually. This is what Austin Energy refers to as "smart grid 1.0"—the addition of integration, intelligence and control to the existing grid. Next is "smart grid 2.0," which aims to go beyond the meter and into the premises, integrating electrical devices themselves into the system.

It is the *integration* of Austin Energy's many initiatives that yields real benefits and can make a significant difference. However, for the vision to become a reality, Austin Energy first had to build a strong technology foundation with the ability to accommodate not only current goals and initiatives, but also growth and new projects far into the future.

Austin Energy partnered with IBM early on to develop a roadmap and Business Process Management solution enabled by a service-oriented architecture (SOA) that makes IT an integral part of the business and facilitates the addition of new services and capabilities. The openness, flexibility and adaptability of the SOA-based infrastructure are key to the utility's strategy, because these attributes enable the ready integration of information and data communications throughout the grid.

The initial engagement, which laid the architectural groundwork for a series of ongoing projects, involved a team comprised of Austin Energy, IBM and IBM Business Partner Ascendant Technology. It included the development of an SOA reference model and included a Web application server, process integration, and portal and security products. These provide essential capabilities to support the many facets of Austin Energy's new operational model.

Smarter Energy

Unleashing the power of the Intelligent Utility Network

Instrumented

Hundreds of thousands of energy grid assets and devices are deployed throughout the grid, from smart meters to monitoring systems for substations and more.

Interconnected

Devices on the network are monitored and controlled centrally, creating a self-healing capability.

Intelligent

Smart devices on the grid enable new information, never before available, to be gathered. This allows Austin Energy to monitor consumption and respond to outages far more quickly.

Solution Components

Software
- IBM WebSphere®: Application Server, Business Modeler, Enterprise Service Bus, Portal v6, Portal Enable, Portal server, Process server
- IBM Tivoli®: Access Manager for Business Integration, Directory Integrator, Identity Manager
- IBM Rational®: ClearCase®, ClearQuest®, RequisitePro®, Software Architect, Unified Process
- IBM Lotus®: Quickr™, Sametime®, Web Content Management, Web Content Manager

Services
- IBM Global Business Services
- IBM WebSphere Software Services: ISSW – Lab Services
- IBM Rational Software Services: Deployment Services
- IBM Lotus Software Services: ISSL – Lab Services

Austin Energy partnered with IBM to develop a service-oriented architecture that enables the ready integration of information and data communications throughout the grid.

For a transformation as sweeping as that conceived by Austin Energy to succeed, the utility had to put in place a robust software platform that could enable everything from tight systems integration to rapid application development. On the business side, the enterprise needed to be unified through better connections between operational and business units, as well as personnel.

To create a foundation for these capabilities, Austin Energy deployed a suite of software including IBM WebSphere®, IBM Rational® and Tivoli®, along with Lotus®—a platform that provides the requisite tools to handle all future projects as well as run the business more efficiently. Because the entire software stack is built on open standards and designed for seamless integration and interoperability, Austin Energy now has powerful, end-to-end, enterprise-wide capabilities that enable it to bring new applications online faster and respond more quickly to changing business needs.

The engagement with Austin Energy has been notable for the high degree of teamwork. IBM expertise, insight and industry knowledge has been a vital link between Austin Energy's vision and its execution. The utility has always had a good understanding of how to tackle individual challenges using best-of-breed methods; IBM has provided the ability to tie it all together and create true synergy, making the whole more than the sum of its parts. In the course of its longstanding relationship with Austin Energy, there has been a mutually beneficial transfer of knowledge. Austin Energy has tapped the deep understanding and insight of IBM to bring its projects to fruition. IBM, by helping Austin Energy to find practical, real-world ways to meet its goals, has been able to refine and develop the idea of the IUN through hands-on experience—knowledge that could help other utilities achieve similar transformations.

Real results for today and tomorrow
Much of Austin Energy's vision has now, in the space of a few short years, become a reality. The company has led the way in the creation of new energy systems—an optimized grid that is transparent, more efficient, self-healing, adaptive and responsive to customer needs. It's already yielded impressive results. Through demand management initiatives, the utility has been able to save over 660 megawatts of electricity. The Intelligent Utility Network also provides new business capabilities that enable Austin Energy to close many service orders in hours instead of days or weeks. Austin Energy is clearly at the forefront of the drive to build a smarter planet, making a difference not only for today's customers, but for future generations as well.

For more information

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