

and has been weathering the economic downturn well, with [revenues and profits increasing over the past two years](#). More recently it has gotten some traction in the smart grid industry as well, largely as a provider of ZigBee-based network gateways for in-home energy management systems, allowing in-home devices to connect with smart meters or broadband systems that can then connect back to third-party management systems or utility control rooms.

Digi's technology now enables about 140,000 smart meter-to-home gateways in the field, mostly through its long-term contracts to manage the [iThermostat program](#) from Texas energy retailer TXU and demand response provider Comverge. From there, Digi has expanded to supply networking gear and support for [smart thermostat and control platform partner Cooper Industries](#), and is helping major U.S. smart meter vendor [Itron link its older, one-way communicating ERT meters](#) to two-way networks.

Digi also provides the gateway to link up [Schneider Electric's new line of Wiser home energy](#) management gear, and will be linking smart meters from Elster in a [smart meter-smart home pilot in Naperville, Ill.](#), to name some more partnerships.

In an interesting side note, Cisco's home energy management display at the February 2011 DistribuTECH show featured a home dashboard [unit from startup OpenPeak](#) that appeared to be connected with one of [Digi's XBee ZigBee modules](#). A query to Cisco about its relationship with Digi hadn't received a reply by the time this article was posted, however, and it isn't clear which ZigBee networking partners, if any, [new Cisco home energy partner Control4](#) might be using in its projects with the networking giant.

Apps & Services

In building these partnerships, Digi has collected a set of networked devices — as well as networking protocols beyond ZigBee — that as of late 2010 provided more data transactions per minute than Facebook and Twitter combined, Jordan Husney, solutions architect for Digi, told me last month.

That growing market share, in turn, has given Digi the opportunity to move past its traditional role as just a networking “plumbing company,” as Husney put it, and into a position of providing a cross-vendor smart grid network that can deliver the company's own services and applications.

In March 2009, [Digi launched what it calls “iDigi Energy,”](#) a bundled hardware, hosted software and services platform for home energy networking adapted from a similar, cloud-hosted system called ConnectPort that Digi built for companies in the oil and gas monitoring industry. The iDigi Energy system allows network management, Web services, remote firmware upgrades and all the other functions that can become more difficult to manage as the number of devices grows from a handful to the thousands or millions, Husney explained. The product also comes with an application programming interface (API) that can be used by partners to write applications to perform home energy-specific tasks, such as isolating individual appliances and power loads in the home or connecting price data to energy use.

Digi has combined its gateways, modules and iDigi platform into what it calls its [X-Grid](#), or extended grid, solutions platform. Lots of Digi customers are using various pieces of the X-Grid that include writing applications and hosting services on the iDigi cloud platform. Comverge, for example, has used it to upgrade iThermostats to deliver more frequent temperature and run time data on home air conditioners, David Mayne, Digi's director of business development, told me in an interview earlier this month.

Another example is [smart thermostat management startup EcoFactor](#), which has been using Digi's platform to [connect thermostats to EcoFactor's own cloud-based software](#) that helps fine-tune thermostats in homes to save energy for customers including Texas utility Oncor. Using Digi allows EcoFactor to connect to a variety

of smart thermostats and manage them in a secure and reliable network, all while pulling data every 60 seconds or so via broadband connections in homes, Scott Hublou, EcoFactor co-founder and senior vice president of products, told me in a recent interview.

“A lot of people are using that Digi conduit to get access to their data,” he noted. “They’re a pure infrastructure kind of play, but a critical piece of infrastructure.”

The Cloud

Digi's latest cloud-based, hosted product is part of a growing trend of smart grid companies leveraging the benefits of the cloud to manage the scaling-up of a growing array of sensor-enabled, remote-controlled, energy-aware devices.

In the U.K., home energy and security startup and [Google PowerMeter partner AlertMe](#) is using a cloud computing platform to manage devices it's testing with utility British Gas, and startup [Intamac is using the cloud to link in-home devices](#) in Europe and Australia. In the U.S., Palo Alto, Calif.-based startup [People Power is plotting a similar cloud services energy management platform](#), both to control its in-house wireless energy management modules it's hoping to embed in a number of third party appliances, and devices made by others.

[Cisco, IBM and Microsoft are all rolling out cloud computing platforms](#) for managing energy-smart, interconnected urban environments. In Cisco's case, that may include home energy management partners like Control4, which is working with Cisco. Demand response — turning down power loads in factories, office buildings or homes to help utilities manage peak power loads — is also moving toward cloud services, as [Lockheed Martin's launch of a cloud-based smart meter and demand response platform](#) for cooperative utilities earlier this month indicates.

Likewise, smart meter data management software vendor [eMeter's decision to offer cloud-hosted services with Verizon](#) earlier this year indicates how managing the terabytes of data to come from new smart grid systems could require utility IT systems to scale up in a big way.

The Standards Challenge

All of these cloud computing-based services could hit a speed bump given the variety of standards floating around the smart grid. Take the race for home energy networking dominance between ZigBee and other wireless standards like Z-Wave, Wi-Fi and even cellular. [Startups like Tendril and EnergyHub](#) and giants like General Electric are all using ZigBee for home energy networking today, but others are contemplating these other networking technologies.

The complications extend to just how data is carried from in-home networks back up to the utility back-office system — or the cloud computing platform. Millions of smart meters are now being deployed with the ability to connect wirelessly to home energy management systems, but then, homes can also be [linked via broadband connections, cellular communications](#), and other proprietary technologies. Then there's the networks for demand response, variable pricing signals, customer support and billing, and interconnections to utility grid operations and maintenance systems.

It could get even more complicated as other systems, like rooftop solar panels and wind turbines enter the picture, Digi's Husney said. Little surprise, then, that Digi's radios now reside in wind turbines makers [and solar power inverters](#) as well, he said. Digi recently launched a solar photovoltaic monitoring [project with inverter and monitoring company SolarEdge](#), which could one day provide a linkage between home energy management and solar and wind power systems.