

## Utilities Online Article

### HAN Capabilities in the AMI Marketplace

By Dale Pennington

At all major technology conferences where AMI is discussed, the subject and product offerings for home area networks (HAN) are presented as an integral part of the AMI product offering. This begs the questions of what the product offerings are in reality, what are the business drivers for these products and what is the cost-benefit relationship to an AMI deployment? While some of these points are straight-forward to evaluate, many benefit issues are not clear, and even more importantly, the associated liability of the HAN products are not clearly defined.

Within the current state of HANs, the largest push to set standards has been with the ZigBee Alliance and the HomePlug Powerline alliance; both of which recently have set goals to work together for a common standard. Over 300 companies, many of whom are significant players in the global energy market, have decided to participate in just these two alliances. What does this mean to the AMI network and more specifically, to the customer? First, does anyone think the thousands of new devices that are being designed to be potentially communicating through my electric meter, *should* be communicated through my electric meter? Secondly, who will decide if the devices are allowed to communicate and at what level will the network become incapacitated by all these new devices?

To this end, the problem arises. It seems that some of the new HAN devices are well suited for the needs of the electric utility such as demand load control devices. They do, of course, come in many designs and capabilities, but with each product comes a significant number of decisions that must be made prior to even the first device joining the network. Let's take a look at a simple load control with a ZigBee-enabled device such as a thermostat. It now is communicating with my electric meter, and the thermostat device tells the air-conditioning unit when to turn on or off. It is adjusted **by the customer for his convenience and comfort**. As a load capacity issue, the on-and-off function of this very simple device significantly affects my utility with regard to energy demand.

Now, let's assume we have an issue of peak load demand, and we want to raise the temperature through our customer's ZigBee thermostat to reduce load. If the utility doesn't provide the thermostat, does it have any right to communicate with it to change its settings? If the utility provides the thermostat, under what guidelines can it change it without notifying a customer, and under what conditions does it have to notify? One can quickly see this becoming very difficult from a business process standpoint of energy management. This discounts the issue of what customers would or would not be targeted for demand response programs. This is the most simplistic application, but let's now consider one that can really hurt a utility.

As mentioned, there are a significant number of companies supplying thousands of devices they wish to enter into the "ZigBee/HomePlug" world. Many are focused on medical devices which broadcast alarms for requesting a system to respond. While using a network to transmit this data may be smart as a "fee-based" service using existing private infrastructure, is it best for the utility? Does a utility want to become a network provider? And if it does, does it understand the associated obligations? Speaking as the electric utility, if hundreds of devices are now looking for my electric meters to be a communication conduit, can I manage it? And, what happens if I can't? When the heart monitoring devices send an alarm, and for whatever reason my network misses it, am I liable? To what level do I measure and promote the reliability of my network? One must consider the revenue benefit, but also the additional liabilities.

It seems then that the utility must review the issue closely. Who can come into my network and why? How do I control my new network? What devices does the utility wish to utilize for its own benefit and how to these compare to devices a customer may use for his benefit? Of course, for every device that

joins the network, software tools must be provided and enabled. This typically requires some level of training and customer support. Based on the fact that there may be multiple devices attached to the network, the knowledge and support required for the network to be managed successfully is significant. New appliances with HAN devices embedded will also be looking to broadcast information into the network when specific events occur. So, does the utility want the refrigerator coming into the network? If it agrees to this, how will they charge for the service and who commission the new service?

The final issue of consideration is the effect on the public utility commissions. Various states already have initiatives with regard to HAN. Do the commissions fully understand the potential of this new network and the associated liabilities? At this point, I do not believe so. Certain states are looking to require HAN capabilities in the electric meters as part of their smart grid requirements and "green" projects. If they require the inclusion of HAN technology, is it the state that takes on the management and design of this network, or do they force it on the utility to manage without clear guidelines as to what devices they have to allow or not allow on the network?

It is clear that HAN products can be of significant value when it comes to energy management for both the consumer and the utility, but the system needs to be clearly thought out as to how it is to be deployed and at what level the various entities involved are required to support it. It will take the various groups involved -- the public utility commission, utility companies and vendors providing HAN devices -- to address all the issues prior to a full scale deployment. For the near term, the system may require all HAN devices be sold and supported by the utility, and restrict the product offerings to a very limited number of devices that can be managed during the early stages of this new network.

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