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Power line: Does market success require resets?

I remain intrigued with power-line-network technology's promise, but the three key technology suppliers for the 200-Mbps PHY (physical) rate—HomePlug AV, UPA (Universal Powerline Association), and HD-PLC (High Definition Power Line Communications)—are unwilling to bury the hatchet and come up with a standard approach. The disagreements among the competitors, which have the backing of Intellon, DS2, and Panasonic, respectively, mean that an added

UPA adapter, for example, will not communicate with HomePlug AV adapters. Even worse, its presence on the power grid will adversely degrade if not squelch the HomePlug AV network. The same undesirable end result will occur in all possible currently available-plus-added power-line-technology scenarios.

The lingering absence of interoperability leads to consumer confusion, and recently claimed compatibility breakthroughs by all three camps turn out to be mostly mirages under close inspection. For example, the IEEE

1901 working group recently wrapped up a draft standard that supposedly merges HomePlug AV and HD-PLC. Read the fine print, though, and you'll find that adapters employing IEEE 1901 can—but are not required to—support dual MAC (media-access-control)/PHY combos to implement both HomePlug AV's OFDM (orthogonal-frequency-division multiplexing) and HD-PLC's Wavelet technologies. Cost-sensitive applications can instead employ a single MAC/PHY—that is, HomePlug AV- or HD-PLC-only—approach, therefore negating any interoperability potential. Admittedly, IEEE 1901 also adds a mecha-

nism that will allow single MAC/PHY adapters—when they come to market—to coexist without degrading each other, although they won't necessarily interoperate with each other.

UPA instead threw its fortunes with the ITU's (International Telecommunication Union's) G.hn effort. Despite its advantages, however, G.hn is a clean-slate approach, thereby adding cost to dual-mode G.hn-plus-UPA de-



velopments. I wonder whether DS2's G.hn-inclusive ICs will ever work as advertised and whether, in this fiscally challenged environment of slashed R&D budgets, any phone-line or coaxial-networking suppliers will join the ITU parade. And will anyone care if they do, given that today's dominant networking technologies, Category 5 and Wi-Fi, aren't in the G.hn camp?

There is a potential silver lining to this otherwise-gray cloud: The IEEE 1901 group added a third MAC/PHY option to its draft standard to support G.hn. This option adds even more cost and further increases product-de-

velopment risk. If everyone ends up supporting G.hn, however, it may be the bridge to interoperability and may even ultimately encourage its adopters to discard their proprietary protocol predecessors.

At times such as these, I wonder whether the power-line-silicon providers need to take one step back to make several steps' forward progress. To use a baseball analogy, they've conceptually built on an X10 power-line-control-protocol foundation by "swinging for the fences" in search of low-probability home runs with local-area and BPL (broadband-over-power-line) networking. However, plenty of opportunities also exist for high-probability singles that cumulatively can also rack up lots of revenue and profit scores.

At January's Consumer Electronics Show, HomePlug, UPA, and HD-PLC all had show-floor presences demonstrating power-line technology's adaptability to an expanded suite of applications. For example, HD-PLC showcased how silicon intelligence at both ends of an electric-vehicle-charging setup, with the help of PLC-data connectivity, can lead to faster charging and longer battery life. Another application is in home- and office-power-usage monitoring for utility companies, along with premises power and temperature control for their customers.

These types of applications have appeal to power-line-IC suppliers beyond their high volume potential. They're protocol-limited, simplifying the implementation and support efforts. They're also data-bandwidth-limited, leading to additional simplification opportunities and easing operating-frequency-spectrum requirements. **EDN**

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