

**What stood out this week?** G.hn had two big wins, neither of which was in the traditional home networking market. Korea Telecom, one of the world's most technologically advanced telcos, is using Marvell's G.hn chips in network switches that will connect residences in MDUs to the MDU's fiber broadband, a market that G.fast has been expected to dominate. Star Charge's committed to using Xingtera's G.hn chips in the chain of electric vehicle charging stations it's building in China, with 20,000 already up and running with slower, less reliable cellular networks.

## **Korea Telecom Uses Marvell's G.hn Chip to Develop 1 Gbps Broadband over All Existing Wires in MDUs**

**- Gigabit Speeds over Copper Phone Wires, Coax, Powerline & Old 2-Wire Ethernet Cables**

**- Will Start Exporting G.hn Gear to Telcos in Europe & Asia**

This may be one of the most important stories in the history of G.hn, the technology that was conceived as for "home networks" but has become a building-area-network (BAN) technology that connects homes and offices in an MDU to the MDU's fiber cable. G.hn is unique in that it operates over "anywire" - powerline, coax, copper phone wires, LAN cables - and even older LAN wires that have only two pairs of copperwires, which the older LAN technologies such as 10BASE-T and 100BASE-TX used. Today, all new LAN wiring and connectors use 4 pairs of copperwires.

Remember when G.hn chipmaker **Marvell** landed a deal with **Korea Telecom** (KT) to use adapters with its G.hn chips to connect an MDU's incoming fiber to each residence? KT has gone beyond that and this week said it has developed the world's first technology that's capable of increasing the speed of 2-wire LAN cables up to 1 Gbps. KT was the first to use adapters with Marvell's G.hn chips to connect residences within an MDU to the MDU's fiber cables.

What is remarkable is that the Marvell G.hn chips that KT uses have the capability to be used in adapters and equipment that connect to any wire - coax and/or powerline and/or old and new LAN cables and/or copper phone wires. The adapters that the G.hn chips are in must, of course, have the correct connector for the wire or wires that will be used - and the powerline adapters must have the correct electrical plug for the country where they are used.

KT said the new technology, which it calls 2pairs LAN GiGA, "will accelerate the development of gigabit-class network services without the need for costly and disruptive physical upgrades to network cables." It said the 2pairs LAN GiGA technology doubles network speeds by improving the modulation over the wires between broadband service providers and their subscribers.

KT said it plans to reach 90% of residences with GiGA Internet coverage by 2017. It said that in general Korean MDUs [We assume it meant South Korean MDUs] built prior to 2000 have a 2 pairs LAN network, which could until GiGA only provide broadband speeds between 100 Mbps and 500 Mbps. With 2pairs LAN GiGA network technology, those same wires can provide gigabit

speeds – and all without service providers such as KT having to install new wiring.



*KT researchers show off KT's GiGA gigabit-class  
Internet service over 2 pair LAN*

**“The new technology will strengthen our reputation as an IT powerhouse, following up on the worlds first GiGA Internet and GiGA Wire. We will continue to develop cutting-edge wired and wireless network technologies to take a leading role in the era of 5G.”**

It's unclear how many of the world's MDUs have the older 2-pair LAN cables installed but KT said that in Korea about 39% of the country's broadband subscribers live in MDUs that are wired with LAN cables and many of them have the now outdated 2pairs LAN cables. What is certain is that every MDU

KT's CTO Lee Dong-myun said, “The new technology will strengthen our reputation as an IT powerhouse, following up on the worlds first GiGA Internet and GiGA Wire. We will continue to develop cutting-edge wired and wireless network technologies to take a leading role in the era of 5G.”

KT did not say whose networking chips were in the equipment. KT and Marvell had previously announced that KT had selected Marvell's G.hn chip for use in supplying high-speed broadband within MDUs, the first time that had ever been done with G.hn network technology, which was developed as a home network technology.

And here is the most interesting part of KT's announcement. It said it expects to export the 2pairs LAN GiGA Internet technology and has already sold its GiGA Wire system to service providers in Spain and Turkey in February. The GiGA Wire system provides up to 600 Mbps through existing telephone copper-wire networks. Telephone companies tend to stick together so we wouldn't be surprised to see incumbent telcos in other countries use the G.hn technology – although AT&T is far down the MDU path with G.fast chips.



*Rear view of a GiGA adapter*

KT's video about the GiGA Wire concept and what they offer not only in Korea but also plan to go global with is at: <https://www.youtube.com/watch?v=p1egHrTj0MQ>

### **Q&A Time**

We asked Marvell some questions about KT's technology. Here are the questions and its answers:

**"KT is exporting the technology through local collaborations."**

**Q:** Is GiGA Wire G.Now over powerline? And it's capable of 300-500 Mbps?

**A:** No. G.Now is over UTP (Cat 5/5e) and phoneline. For phoneline deployments, KT uses Marvell software called "Vectorboost" that is used in the cloud or local switch that can get them to 1 Gbps. It is different from G.fast because G.fast is specific to only phone lines so the vectoring is baked into the chipset, where G.hn has to work on multiple mediums such as a LAN Cat 5/5e cable that doesn't need vectoring.

**Q:** Is GiGA over LAN cables with two wires capable of 1 Gbps?

**A:** Yes

**Q:** Are they installing both in Korea?

**A:** Yes

**Q:** Does KT plan to export both?

**A:** Yes, KT is exporting the technology through local collaborations. "KT, having successfully deployed its GiGA Wire solution in Spain and Turkey earlier this year, is now expecting another globally deployable "2pairs LAN GiGA Internet" solution to contribute to improvement of global communication infra

in near future.” See: [http://www.netmanias.com/en/?m=view&id=korea\\_ict\\_news&no=1004](http://www.netmanias.com/en/?m=view&id=korea_ict_news&no=1004)

**Q:** Are both based on G.Now chips?

**A:** They are both based on G.hn compliant ITU-T chips. “G.Now” is the trademark name specifying that G.hn chips are configured in a specific way (for MDUs) based in software.

**Q:** Is G.Now a Marvell proprietary technology? Could other G.hn chip-makers also make G.Now chips?

**A:** G.Now is a trademark, not a chipset. Marvell uses the same G.hn chipset in MDU’s as in Powerline retail adapters [like the ones that Arris is selling at Amazon]. It is the Marvell software that changes the Use Case of the technology. We are migrating away from the term G.Now, which was specific to phoneline at the time, to G.hn over UTP (RJ-45), phoneline (RJ-11), coax and plastic optical fiber (POF) used in MDU switches.

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### **Technologies for BANs (Building Area Networks) For Connecting Residences and Offices in MDUs to Fiber-based Broadband**

G.fast (telcos have begun deploying)  
MoCA Access (recently announced)  
Broadcom’s DOCSIS-over-Coax  
Qualcomm’s HomePlug-over-Coax  
Ethernet LAN  
5G (when it comes to market in a few years)

All but one BAN technology is based on using existing wires so that the cost and disruption of installing new wiring, specifically fiber, is eliminated. The exception of course will be 5G, which could connect an MDU to a nearby 5G tower, in which case wiring from a 5G modem to each residence will still be needed - or it could connect each residence in an MDU directly to a nearby 5G tower, in which case no intra-MDU wiring will be needed. 5G developers and deployers have not yet detailed how they plan to make the connection.

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