



July 17-23, 2015

## HOME NETWORKING

### Is the Glass Half Empty or Half Full?

A reader that works for a company that makes home network gear, but which is not married to any home network technology except for what its customers want, emailed this comment on our tests of home network technology:

“In test engineering, the conditions considered are critical to the applicability of the test. Let’s draw an analogy to a water glass. We could consider two different tests to measure the effectiveness of the glass. First, let’s consider size. How much water can the glass contain? Glass A is 100ml [like HomePlug AV2] and Glass B is 50ml [G.hn], this is the analogy of size to which your power line tests compare. If this is the only test considered, Glass A [AV2] must seem like a better glass. But, in reality, that test would be much less relevant if we consider a second condition; the porous nature of the material. If Glass A [AV2] has several holes, it will leak out the contents while Glass B [G.hn] has no holes and will hold the water indefinitely. Now we can see that Glass B [G.hn] is certainly more effective at the function of a glass. My point is this, since power line is inherently a ‘dirty’ medium, any test avoiding this nature is less relevant than one considering the actual conditions, just as the size of a glass means little when there are holes in it. You inadvertently found the holes in HomePlug AV2.”

The comments relate to our finding that the test home had some major interference in its powerline wiring. That prevented AV2 from connecting in one room although G.hn connected at a “slow” speed of 22 Mbps. That is sufficient for streaming/broadcasting one to three HD videos of 6 to 8Mbps but insufficient for 4K streams that require upwards of 15-25 Mbps per stream. In every room where it connected, AV2 provided faster speeds than G.hn (Comtrend’s G.hn adapters), both with the major interference still existing and with the interference removed.

Prototypes of G.hn adapters that the G.hn

chipmaker **Sigma Designs** provided nearly matched the speeds of the AV2 adapters. However, the Sigma Design adapters are not intended for the retail market. They are aimed at broadband/pay TV services for installation in consumer homes. Such services have high standards for products so that they can reduce the number of truck rolls – sending a technician into a home to make an installation or solve a problem.

### HomeGrid Forum: Speed Alone Is Not a Complete Real World Test

The **HomeGrid Forum** (HGF) directly addresses the relative importance of speed (throughput) in powerline network technology as compared to latency and stability, which it says are more important for delivering video streams to devices in the home. In prior conversations with the HGF and its members, they have also emphasized the “whole home” capabilities of G.hn – the ability to connect at more electrical outlets than HomePlug AV2. It said, “Latency, jitter, and packet loss in mixed, managed applications are far more critical” than bi-directional speed.

See: [http://homegridforum.typepad.com/homegrid\\_forum/2015/07/apples-pears-or-the-perils-of-achieving-meaningful-test-results.html](http://homegridforum.typepad.com/homegrid_forum/2015/07/apples-pears-or-the-perils-of-achieving-meaningful-test-results.html)

And: [https://twitter.com/HomeGrid\\_Forum](https://twitter.com/HomeGrid_Forum)

The tests that *The Online Reporter* conducted measured only bi-directional speed and they showed that HomePlug AV2 consistently outperformed G.hn in every instance where they made a connection. G.hn had one edge. It made a connection at every electrical outlet we tested. AV2 did not make a connection at one outlet when two impairments existed. Once the impairments were removed, admittedly something the typical consumer would not do, AV2 connected and showed higher speeds at that outlet.

HGF says the single biggest impairment of powerline networks are noisy electrical devices, such as a phone charger, paper shredder, refrigerator, treadmill and that they are always plugged into electrical outlets and turn on and off at various and

**HomeGrid: continued on page FIFTEEN**

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## HOME NETWORKING

**HomeGrid:** *continued from page FOURTEEN*

sundry times. For that reason HGF says it and its members insists on the presence of such noisy devices in “real tests” because they are creating noise every day on the home’s electrical wires.

*The Online Reporter* found the presence of two such impairments in its tests – a non-working ground fault interrupt (GFI) in a bathroom and, the main culprit, an ancient and forgotten **Radio Shack** powerline-to-phoneline adapter that **DirecTV**’s STBs used to use to download the TV guides.

With the impairments still present, we found that HomePlug AV2 adapters did not connect in one room. The **Comtrend** G.hn adapters not only connected in that room but provided 22 Mbps of speed, a rate that initially seemed paltry in the coming age of 4K TVs but which is more than sufficient for 1 to 3 streams of HD content. When we removed the impairments, which the Forum calls “conditioning” the electrical lines, AV2 connected and in that room and all other rooms AV2 provided faster speeds than the G.hn adapters. Subsequent tests of other G.hn adapters, including a pair of prototypes that are intended only for service providers, showed faster speeds but still did not match AV2’s speed. The G.hn prototypes actually provided almost the same speed as the AV2 adapters but they will not be available at retail.

HGF says a purely throughput-based test provides only a starting point but doesn’t really show the complete picture. HGF said, “Bandwidth in today’s world is irrelevant if it is not allocated properly. Effective testing needs to measure behavior in a mixed-managed services environment; in other words video mixed with voice and data. Tests need to show how well bandwidth is allocated and how latency and error rate affects the service – be it gaming, video on your TV, VoIP, or some other service – and all of this among real world situations.”

HGF says, “Real world use cases are critical to creating test results that are representative of a real user experience.”

*The Online Reporter* agrees but HGF does not say how a consumer with limited technical resources can conduct such a test. The HomePlug Alliance sent us

the procedures we used in our tests. We look forward to HGF sending us procedures that a typical consumer can use to conduct a “real test.”

### MoCA Lands in Israel at the Satco Yes

*G.hn is challenging the incumbent HomePlug in the powerline home network market but in coax, MoCA still has the market to itself. G.hn backers say they have developed coax capable networking into their technology but so far there has not been much public activity – perhaps because MoCA has such a stranglehold on the coax market.*

Israel’s largest satco **Yes** has joined the MoCA Alliance and can be expected to standardize on MoCA-enabled DVRs and adapters that use the home’s coax wiring to connect the home’s TVs to connect to its whole home DVR, Yes’ VoD library, its TV guide and the home’s computers for the purpose of watching videos stored on them.

Yes has an amazing 40% of Israel’s pay TV market.

The move into Israel shows that MoCA is continuing to stretch its success to outside the States and is likely on a path that will make it the global standard for home networking over coax.

Yes uses the latest technologies to offer its subscribers more services.

In 2011, Yes launched its Yes Streamer service, which allows viewers to watch personal content from their computers on their television screens. In 2013, the company launched its multi-room service which enables a recording from the living room to be viewed from any room in the house. In addition, yes launched its MyTV service which provides personalized recommendations based on viewing habits and also enables smart browsing of the program guides and VOD catalogue.

Since May 2014, Yes has provided subscribers access to about 50 channels and thousands of VoD titles via its TV everywhere service.

Yes’ announcement raises two questions:

- When will the G.hn crowd roll out its coax capability worldwide and take on MoCA in the service provider market?

**MoCA:** *continued on page SIXTEEN*

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