

The Great Gig in the LAN

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As it is now over ten years since the introduction of CobraNet to the audio community it seemed appropriate to review the current state of audio networking protocols and discover how much growing up has gone on in the last ten years. Richard Northwood reports.



As we start 2010 the audio networking fraternity is once more in a state of flux (yes that was the intended word!) with a plethora of new 'standards' either recently appeared or about to appear. These are based on the now commonplace, in the IT world, Gigabit networking standard 1000BaseT. This increase in speed and bandwidth has allowed more companies to join the audio networking stalwarts of CobraNet and EtherSound to provide a wide choice of products for the discerning audio engineer.

Before we examine the capabilities of the new boys let us first review where the old guard have got to.

CobraNet – The original audio networking protocol from Peak Audio/Cirrus Logic with widespread professional support. The Cirrus web site claims, with some justification, that CobraNet is the de-facto standard in audio networking with over 1,000,000 channels of uncompressed, low latency audio installed to date.

CobraNet was originally introduced by Peavey as part of their MediaMatrix line but is now available from fifty different manufacturers covering the majority of the audio market. It utilises 100BaseTx standard Ethernet to carry up to sixty-four channels of 48 kHz 20-bit audio on each 100Mb link.

It opened up a whole new way of looking at the infrastructure of large audio projects and, with a little skill, allowed the network to become a very large routing matrix. Unfortunately the main drawback frequently mentioned in any conversation about CobraNet is the level of skill needed in order to successfully implement it on a large project.

A degree of networking ability is required along with very good record keeping; neither item necessarily available in great abundance in the audio industry ten years ago. Fortunately both manufacturers and end-users have risen to the challenge and product control software and engineers understanding have both come on a lot.

For several years now rumours have been flying around about Gigabit CobraNet but there does not seem to be any silicon in production or any great fanfares from Cirrus Logic. Current CobraNet will quite happily work on Gigabit network backbones, and in fact this is probably the most common installation method, but individual audio hardware connection ports are limited to a 100Mb link or 32 channels in and out. Most of the time this is not that much of a limitation given enough planning time and physical hardware but we are now living in a world that keeps demanding more.

EtherSound - For a long time the only real 'open' competitor to CobraNet was EtherSound from Digigram, originally launched in 2001. This initially won a lot of friends in the live sound market as it did not need any great networking skills, could be plugged up in signal flow (daisy chain) fashion rather than star networked, and was lower latency.

The EtherSound portfolio has now expanded to two main versions; ES-100 bi-directional network with sixty-four channels of 48kHz 24-bit audio, and ES-Giga with 512 channels of 48kHz 24-bit audio. There is also a lower cost uni-directional version of ES-100 called ES-100/spkr designed for manufacturers to implement in powered loudspeakers.

Currently there are thirty-four companies offering products with EtherSound interfaces, again over a wide range of the audio market.

Given the relative maturity, ten years is a fairly long time in audio and a lifetime in IT, of the existing products and the scale of some of the projects they have been applied to it is no great surprise to see advances being offered by other companies. Having had the benefit of hindsight in a few cases and growing requirements in others it is good to see the market finally moving on.

In no particular order the new systems that you need to be aware of are as follows:

Dante – The creation of Audinate in Australia Dante has been around for a little while now and is slowly gathering critical mass with sixteen licensees currently. There are products shipping which have been used successfully in both the live and installation sectors and acceptance seems to be broader than the traditional CobraNet = Installation EtherSound = Live situation.

Dante offers low latency operation with what is described as Zero-hassle Zero Configuration networking. Whilst this is obviously a marketing department phrase operation is pretty simple with the ability to name devices and I/O channels making configuration a breeze.

Capacity wise Dante is able to work with both 100Mb and 1Gb networks with a capacity on a 100Mb link of 96 48kHz 24-bit audio channels and 1024 channels on a 1Gb link.

Another strength of the Dante system is the Virtual Soundcard. This allows a computer that supports either ASIO or Core Audio to playback or record up to sixty-four channels using only the network hardware on the computer without an expensive sound card. Whilst it would still be best not to scrimp on the specification of the PC this is less and less of a problem as hardware prices continue to fall relative to performance. It also means that it is simple to connect your laptop to the network for commissioning or test purposes and be able to playback or record tracks very simply.



QSC's QLAN system is a true Gigabit networking technology

to simplify home theatre and other domestic installations which are rapidly approaching many professional projects in complexity. Because of this you may well find AVB support built in to products such as switches and routers along with televisions etc without you having to do anything; AVB will just be another one of the hundreds of markings on the outside of the box.

AVB – (Audio/Video Bridging) This is the latest development by the IEEE 802 committee (responsible for Ethernet generally) which seeks to extend the Ethernet standard in order to better support audio and video transport. It is not yet ratified but is being pushed forward by a veritable alphabet of well known names such as Apple, Broadcom, Cisco and Harman.

The standard will guarantee bandwidth and latency on a system with accurate synchronisation between different endpoint hardware. A large part of the drive behind AVB comes from companies working at the consumer level in order

There are several attractions for the AV installer with AVB, especially if it becomes as prevalent as predicted. If everything has a compatible audio and video networking standard built-in from the off integration should become far easier to achieve. The system designer should then be able to concentrate on how the customer wants to use his or her system rather than piling up a bunch of boxes with a lot of functionality and then trying to make it all work together.

It is hard to pin down many details at the moment on AVB but there are various promises of allowing different audio and video streams on a network to co-exist with different bandwidths and different latencies with the possibility of an output device negotiating with an input device the best stream the two pieces of hardware can mutually support.

This is heady stuff and hopefully it can be delivered without the cry of the lone wolf being heard. In the meantime some hardware is available with AVB interfaces from companies such as Meyer and the various Harman companies. Note that Dante is AVB ready and in its next release is promised to be fully compliant.

If you really want to play on the bleeding edge however it would be best to ask some very long hard questions before purchasing hardware from more than one company. It should also be noted that AVB will only work properly with AVB compliant network switches to ensure that your audio streams are looked after in the way they expect.

Q-LAN – is the network system for the new QSC Q-Sys system. It is a 1Gb only system with support for up to 512 48kHz 32-bit audio channels. System latency is quoted as being 2.5ms. As many of the Q-LAN team worked at Peak Audio on development of the CobraNet system there are high hopes that they are best placed to have learnt the lessons from CobraNet and have moved on to where they believe audio networking should be.

The main drawback of the Q-LAN system is that it is essentially proprietary and only available on Q-Sys systems. Even if bridges are built to other networking systems this does limit the applications it can be used in.

Mention should also be made of other audio networking standards currently out there such as Calrec Hydra, RockNet and OptoCore. The Calrec Hydra system is based on 1Gb Ethernet but is probably only really of interest if you use Calrec mixing consoles but does illustrate another approach. Given that Calrec are part of D&M Holdings this may pop up in a few other places as well.

RockNet from Media Numerics is not Gigabit based but is still an interesting niche product for live sound use if you don't fancy delving into the complexities of networking too deeply.

Optocore have been providing 'networked' audio systems without reliance on Ethernet for many years now based on their own fibre-optic network. It is a robust and easy to use system that has recently been extended with their SANE products which helps to increase the flexibility of the system.

"May you live in interesting times" has been used both as a curse and a blessing but hopefully the few words above have hinted towards what an interesting time we are currently living in, from an audio networking point of view anyway. Whether you see this as a curse or a blessing will depend on your personal point of view but I definitely believe the next few years are going to be very interesting.

Within the space allowed it is only possible to scratch the surface of any one system but remember, Google is your friend. Dig for information, and carry a large bag of salt with you. With one of the largest thrusts from manufacturers being ease of use there is a tendency not to publish too much information in the fear that things will look more complicated. This is not a good trend from an engineer's point of view and is one that can only be countered by more people asking more questions.

With networks and processing systems that are becoming more transparent and easy to use hopefully we can concentrate more on the traditional basics of getting the right microphone and the right speaker in the right place (both still analogue devices!).