

Audinate Dante

Dante is the new audio networking name on everybody's lips. But why is Dante so hot?

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SHOCK, HORROR... digital audio is now just like all the other data chugging around computer networks. Audio isn't special anymore (sob).

Yes, that's right (are you sitting down?), any IT shmo can start configuring and managing an audio network in the same way as he or she might manage any other ethernet-based Internet Protocol (IP) network.

Take an RJ45 connector at the end of an ethernet lead and plug it straight into your computer; turn on your audio or control software and you can send and receive audio to your heart's content without any extra hardware. In fact, use the one network to update your Facebook profile and send email, as well as bussing pristine, low-latency, sample-accurate synchronised audio at any sample rate and bit depth of your choosing.

Crumbs. What's changed?

Dante has changed everything. Protocols like Cobranet and Ethersound have always grabbed digital audio and sent it packing down an ethernet network but Dante is built on IP over ethernet – it's the IP bit that makes all the difference.

IN AUDINATE

So is this article about the advantages of digital audio? No. That ship has sailed. Sure, there are still a few pockets of resistance in AV land – cafés and the odd Grateful Dead concert – but the advantages of squirting audio and video info around *digitally* are just far too compelling to ignore. The good stuff is obvious: we can use lightweight (and cheap) Unshielded Twisted Pair (UTP) cable as opposed to deadweight (and pricey) copper multicore snakes; there's no induced noise on long cable runs; and digital is far more versatile – routing and matrixing is 'drag 'n' drop'-easy; as is adding DSP processing. What's more, you can manage a digital audio network from a central point or even remotely.

But no one's saying digital audio transmission has a spotless track record. Traditionally it's had more than its fair share of inherent constraints, compromises and gremlins. Latency is a big one. Convert sound from analogue to digital (or vice versa) and you have a tiny delay. Add a

bunch of tiny delays together and it becomes an annoyance, or even unworkable. Bad sync is another serious problem. Send sound to one device 5m away and another 100m away and timing errors can occur – a real no-no in high-performance systems where sound quality is critical.

But practically, latency and sync aren't nearly as much of a digital deal breaker as all the arcane digital protocols we've had to contend with. These protocols might use UTP but that's where the 'garden variety' off-the-rack comparisons to everyday networking end. Whether it be Cobranet, Ethersound, Aviom, Netcira, IQ...there are some 30-odd different flavours out there, and none of them talk to each other and they each need their own UTP cable to travel down – they don't like to share.

I caught up with Audinate's Chief Operating Officer, David Myers, recently and asked him if there's one easy way of conveying the practical Dante difference to people – i.e. with the right software, will Dante happily plug into any ol' network and play ball?

"Sure. Even in our own labs in Sydney we only have one office network," Myers assures me, "and that's what we use for our mail systems, our PCs and all our audio equipment. So it's entirely possible."

PROTOCOLS FOLLOWED

Once the nascent Audinate research team had figured out how to use IP networks, while keeping latency acceptably low, and sorting out the sync issue – the two principal sticking points up to this point – the IP world was Audinate's oyster. After all, IP networks have been around since the '70s and countless man hours have been spent ensuring that the protocols are robust and full of ways of building in redundancy, while designing your own protocol means starting from scratch. IP over ethernet networks use gear that gets sold by the millions and, as a result, switches and the like are cheap as chips. Plus, ethernet-based networking technology will happily tag along whenever there's a generational leap, such as the recent moves from 100BaseT up to 1000BaseT and (imminently) on to 10Gbps. In other words, a system like Dante

gets to hitch a free ride along with every other IP-based networking technology. Which is absolutely priceless in an AV environment of more channels, more zones, more speakers, more control... more more more.

ZEN & THE ART OF NETWORK CONFIGURING

But it's not just the IP's 'lingua franca' status that makes Dante so easy to work with and configure. There's also Zen, a self-configuring, plug-and-play digital audio network solution.

"The team had a strong background in what's called zero configuration networking, a system designed to take the headache out of home office networks," explains Myers. "The idea is to work around the need for the DNS and DHCP servers that dish out IP addresses and translate a host name such as www.your-site.com to an IP address. With zero configuration networking, devices advertise their presence and get an IP address that's guaranteed not to conflict with anything else on the network – they effectively set themselves up.

"We took those principles and applied it to the AV domain, such that boxes discover each other and they know how many channels of audio they can transmit and receive; they know what sample rates and bit depths they support, and so on. That's what we call Zen and it's a big departure from older systems where it's tricky to set up the network. Traditionally, you need to give every box a unique address and in a large install that's a big job and it can be hard to track down conflicts."

AUDINATION

Since Audinate started trading in earnest in late 2007, it's been on a ballistic trajectory. Dante was almost instantly mentioned in the same breath as Cobranet and Ethersound – the two main incumbents operating under a similar licensing business model. In the subsequent 18 months or so, Audinate worked hand-in-glove with some significant players such as (fellow Sydneysiders) Lake. This turned into a strategic relationship with Lab.gruppen, which recently took over the Lake brand from Dolby. Many other companies in the contracting market are also



The Dante-MY16-AUD card is fully compatible with the Mini-YGDAI card slots in Yamaha's range of digital mixing consoles, processors and power amplifiers. Included with the card is Audinate's Dante Virtual Soundcard (DVS), an application that turns the mixer into a live or studio recording solution. This means any Yamaha digital mixer equipped with up to four Dante-MY16-AUD cards can interface directly with a PC via Cat-5, without the need for an external audio interface. Each Dante-MY16-AUD provides 16 bi-directional channels at 48k (or eight channels at 96k) and full Dante network audio redundancy.

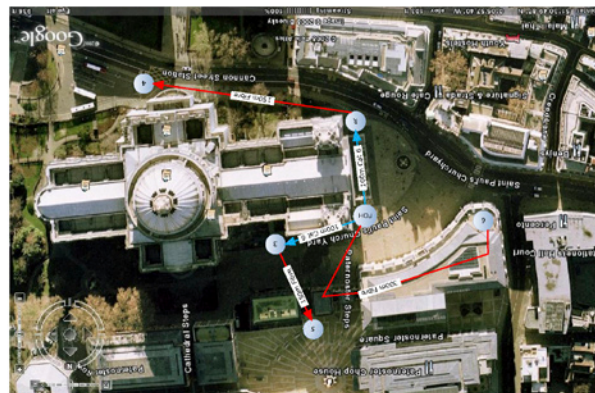
licensing Dante, including Symetrix, Peavey and Whirlwind. More recently, a Dante MY16 card has been developed for Yamaha consoles and Bosch has also signed up for some Dante action. But isn't there a bit of competitive insurance going on here – these companies will license the rights to Shrek 4 if they think there's a chance their customers might want it, surely?

"I think it's more than that," says Myers. "For example, I might not be able to say too much about what Bosch is planning, but I can assure you we're actively working with Bosch – it's a company-wide strategic push, not a cosmetic touch-up. As for Yamaha, I'm told they used Dante almost exclusively for their demonstrations at InfoComm this year in Orlando – so that's quite a show of faith."

SOUNDS GOOD, COBBER

In fact, because of the tight sync and credible latency figures, Dante has a strong reputation for 'sounding good'. British live sound leviathans, Britannia Row, was an early adopter. It has a big inventory of Lake Processors and is using Dante on jobs where it might normally run hundreds of metres of copper – notably on events such as the Olympic handover and The Police concert in Hyde Park.

Kieran Walsh, Head of Digital and RF Systems for Britannia Row is quoted as saying: "Dante's sample-accurate playback synchronisation produced a noticeable improvement on the high end of the loudspeaker arrays and eliminated the noise



The UK's Britannia Row has been using Dante extensively. Dante made its live debut on the City Salute. The City of London saluted British forces with a fund-raising spectacle at St. Paul's Cathedral and Paternoster Square. Britannia Row supplied seven separate PA points around St. Paul's Cathedral, Paternoster Square and on the roof of Juxon House directly across from St. Paul's. All speakers were fed from Dolby Lake Processors using Audinate's Dante networking technology. The production required sending audio down the network using Ethernet Cat-6 cable as well as the use of media converters to fiberoptic for some of the longer cable runs. Britannia Row used Dante networking technology to link multiple production sites and viewing points around St. Paul's Cathedral.

typically heard as a result of long analogue cable runs." High praise, something Audinate isn't short on in the time it's been in business.

AV systems are increasingly complex beasts that are designed, altered, modified, expanded, decommissioned and redeployed, often like there's no tomorrow. And the networking needs to keep up. The fact that AV has potentially lost some of its territory to the IT Borg is, I suggest, trivial compared to the headaches that Dante has done away with. And the fact that it's a home-grown success story? Well, it shouldn't matter – we're all global villagers after all? – but goodonya Audinate... what a bottler. 🐦

A BRIEF HISTORY OF AUDINATE

Audinate was founded by a group of Australian researchers led by the current company Chief Technology Officer, Aidan Williams. Motorola had just closed its Australian research facility so Aidan and his team took their smart networking ideas to the NICTA (National ICT Australia) research institute. NICTA exists to commercialise research and development work. After a couple of years of wearing lab coats and playing Sudoku at the taxpayers' expense (just kidding), Aidan and his team set about establishing Audinate the company and bringing Dante to market.

Audinate looks to be going ballistic, with millions of dollars of investment, a US office in Portland, and a heavy-hitting American CEO in Lee Ellison. It feels like expectations are mightily high.

It's probably the Bosch relationship that best illustrates what's possible. What with its EV, Dynacord, Telex, Midas, Klark Teknik and Bosch brands, it's an initiative that'll see Dante moving in a wide range of audio circles – everything from glamorous concert touring, through to all manner of installations, all the way into the tediously prosaic emergency evacuation systems. Dante may also find itself in the upper end of home theatre/automation. So the horizons are reasonably broad, made all the broader as and when (or, indeed, if) video content is added to the Dante armoury.

THE DANTE DIFFERENCE

Standard IP Network Protocols: Only need one standard network that can handle any sample rate or bit depth. Achieves low latency and tight sync.

Zen: No specialised skills required to set up an audio network. Won't be any IP address conflicts.

Universal Control Capability: Control data and audio distribution on the one network. Dante network happy to 'share' with personal computers.

Flexible Channel Routing: Efficient multicast pruning. Unicast for point to point. Redundant channel connections.

Channel Count: Better than 48 x 48 channels at 48kHz on a 100BaseT network. Better than 512 x 512 at 48kHz on gigabit ethernet.

www.audinate.com



Audinate's Brooklyn provides all the core networking, control and monitoring functions needed for products such as DSP processors, amplifiers, digital snakes and break-in/break-out boxes, allowing manufacturers to more easily develop Dante-enabled products.