

Audinate's Dante

the local network that went global

BY JASON ALLEN

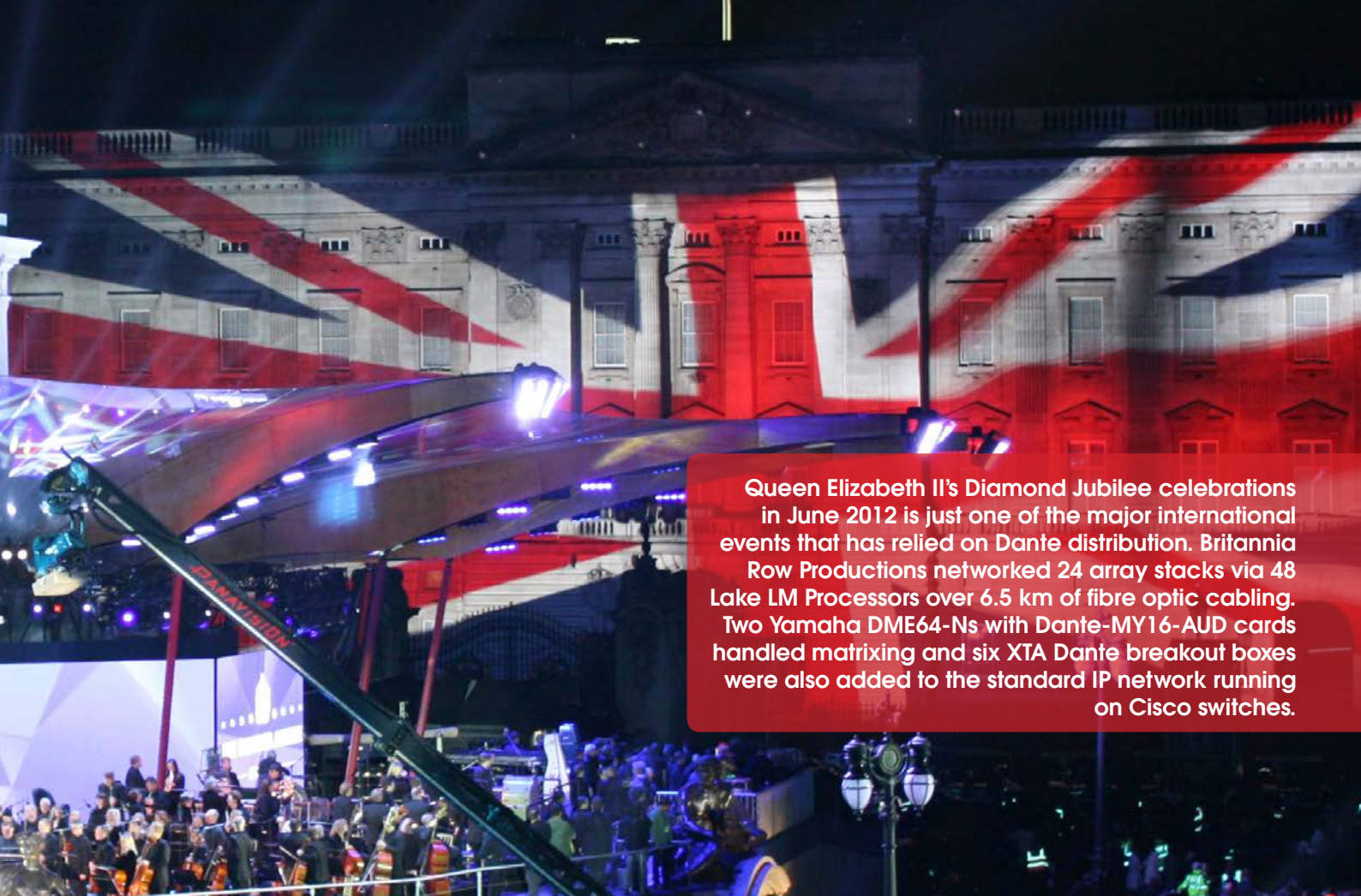
Audinate's Dante protocol is dominating the world of networked audio, yet many people don't realise that the company is proudly Australian. Jason Allen profiles the Aussie tech start-up that's changed the way we plug'n'play....

Dante ports are popping up on almost every digital audio device on the market. As of July 2013, 98 OEMs are including the interfaces in their products, a number so large it quashes any debate as to whether or not Dante can be considered a "standard". The pro audio world has embraced the technology incredibly quickly; the first Dante product was only released five years ago. And all of this has been achieved by a company that started up in Ultimo, Sydney, with a small team spun out of a government funded research project.

The founders of the company were all originally working on networking projects at Motorola Labs in Sydney. After the Tech Wreck of the early 2000s, Motorola closed its Australian research centre and laid off the staff. The team got together and pitched a research project to the then newly-formed National ICT Australia (NICTA), a research body set-up to fund R&D that increases Australia's experience and wealth in ICT. Five staff worked on new and innovative AV network products, inspired by their plug-and-play experience at Motorola and their passion for audio.

Plug and Play

Co-founder and current Chief Technology Officer Aidan Williams describes the genesis of Dante in his home studio; "I'm an amateur musician and I've done a lot of production work on DAWs", he explained. "I was connecting my synth to an analogue mixer and then to a soundcard, and then there was MIDI cables. There were just loads of different wires. To me, it looked like a networking problem. Why plug in four or five different types of cable when you could plug in a network and be done?"



Queen Elizabeth II's Diamond Jubilee celebrations in June 2012 is just one of the major international events that has relied on Dante distribution. Britannia Row Productions networked 24 array stacks via 48 Lake LM Processors over 6.5 km of fibre optic cabling. Two Yamaha DME64-Ns with Dante-MY16-AUD cards handled matrixing and six XTA Dante breakout boxes were also added to the standard IP network running on Cisco switches.

Audinate became the first company spun out of NICTA in 2006. Founding CEO David Myers and Williams created the company, bringing years of experience in management and product delivery for telcos, multimedia and internet services. Three members of the NICTA team, including Aidan, Varuni Witana and Andrew White, joined Audinate in 2007. The founders put in their own money for startup, along with an early investment from Melbourne venture capital firm Starfish Ventures.

Start Me Up

On start-up the team took a trip to the USA to talk to manufacturers to validate their ideas and determine what the market needed. "We were networking people, not audio people," recalled Aidan, "so we wanted to talk to as many companies building audio products as possible to make sure we were doing the right thing." Luckily for Audinate, a world leader in digital audio with an eye for innovation and the



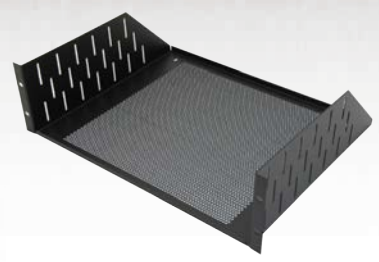
Credenza Wood Racks
From 1U to 12U High
Different depths available
Many accessories available



RP Rack Pack
Easy assembly system
From 6U to 24U High



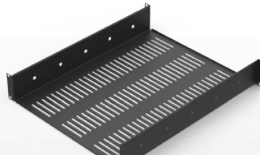
Lockable Rack Drawers
From 1U to 6U High
Different depths available



Rack Shelves
From 1U to 4U High
Different depths available
Clamp bar options available
Sliding options available



Punched Panels with Cable Management
Punched for D-Series or BNC connectors
ID strip option available



Vented Rack Shelves
From 1U to 4U High
Different depths available
Clamp bar options available



Stage Boxes
Punched for D-Series connectors
Suits cable or multipin termination

penn ELCOM
19 Inch Rack Enclosures & Accessories

Penn Elcom Australia Tel: (03)9335-6455
Email: australia@penn-elcom.com
www.penn-elcom.com



vision to take risks was right on their doorstep; the late, great Bruce Jackson. Bruce had moved back to Sydney at the time as Vice President of Dolby's Live Sound Division, and was working on the Dolby Lake Processor.

Bruce liked what he saw in Audinate's work and decided it was the future. "Bruce Jackson decided to change the hardware in the Dolby Lake processor and put in a larger FPGA chip" said Aidan. "That meant it was capable of being firmware upgraded to support what later became Dante. That was a big thing for us. It was pleasure to work with Bruce - he was a visionary. We were the beneficiaries of his vision in how networking would work with his products. He was prepared to take a risk."



Showtime!

The Dolby Lake Processor became the first Dante enabled device to hit the market "The first big event we did was in Washington DC in 2008 on an early version of the Dante firmware." Aidan said. "Bruce was mixing on a Barbara Streisand tour. We had some reverbs running through the Lakes - they had AES inputs and were connected with Dante". Bruce continued to support Audinate; as audio director of the 2010 Winter Olympics in Vancouver, he used Dante to distribute to 160 Lab.gruppen amps on the opening and closing ceremonies.

After the first product came to market, the task was now to add more devices to the network. Dante needed to be "productised", and the business needed to grow. Lee Ellison was bought on as CEO, with David Myers becoming COO. Based in Portland, Oregon, Lee brought years of experience in telecoms, including with David Myers at Australian multimedia communication company Dilithium Networks. Lee started in November 2008; "Bosch was developing Omneo" recalls Lee, "and Yamaha wanted an MY16 card." At the same time, Peavey added Dante to MediaMatrix and Dolby sold Lake to Lab.gruppen, bringing Dante to their amplifiers. A signal chain had formed, and the company gained momentum.

Most of the big pro audio brands followed suit through 2009 to 2011, as companies like Allen & Heath, Shure, Symetrix, Midas, and DiGiCo, came on board.

"Probably the biggest validation for us was when Yamaha launched the CL Series with Dante built in at ProLight+Sound 2012" Aidan continued. "Four months later at InfoComm we had loads of people coming to us saying 'Yamaha has built it in. It's solid, we're committed. Where do we sign?'". It's been a snowball effect since, explained Lee; "Last year we grew from 50 OEMs to 98 OEMs aboard. Last quarter, there were 12 companies that announced products, some of them multiple products. Today alone we had two companies from China and two from Korea reach out and say 'we have to have it'."





Tennessee Titans Stadium
in Nashville, Tennessee.
The new audio system
installed in 2012 features
Peavey Nion DSP, a Yamaha
M7CL-32 mixer and a
huge EAW rig
networked
via Dante.

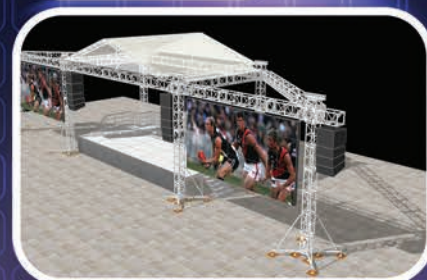
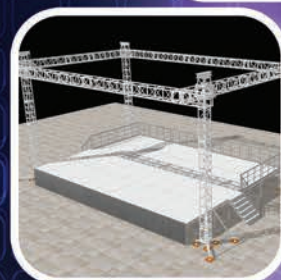
Pictured:
Dante MY16 card
for Yamaha digital devices

So what is Dante exactly?

Dante carries a theoretically unlimited amount of uncompressed audio channels on standard Ethernet hardware. A network's size is only limited by available bandwidth. A gigabit switch, for example, will carry 512 channels at 48kHz. Dante has been built to be upgradable and interoperable, using standard Ethernet tools such as TCP/IP and DiffServ QoS that make it capable of "playing nice" with a huge range of equipment and protocols. It has incredible low latency – most Dante networks can run at 100 microseconds. It can also do some unique things like carry multiple sample rates and with ASIO

HIRE & SALES

TRUSS GROUND SUPPORT
& STAGE DECK



WE SELL:

TAPES
LAMPS
HOOK CLAMPS
ALLOY COUPLERS
RIGGING ACCESSORIES
ALLOY TRI & BOX TRUSS
GROUND SUPPORT
STAGE DECK
DRAPE SUPPORT
LED FIXTURES
LIGHTING CONSOLES
DIMMERS
LIGHTING FILTERS
POWER CABLES
SMOKE & HAZE FLUIDS



CONCERT LIGHTING SYSTEMS AUSTRALIA

Melbourne
Head Office
63 - 65 Kingsway
Southbank, VIC, 3006
Phone: 03 9682 6111
Fax: 03 9682 6777
www.clsa.com.au
info@clsa.com.au

Sydney
Depot
60 Epsom Rd
Rosebery, NSW, 2018



Audinate's Scott Willsallen with Aidan Williams at Randwick for Sydney's World Youth Day in 2008.

driver Dante Virtual Soundcard, turn your computer's LAN port into a 64x64 Dante device. Most importantly for the end user, its device discovery, patching and administration are simple and intuitive through the Dante Controller software.

And what isn't it?

"One of the misconceptions people have is that Dante is a protocol or a format" explained Aidan. "Dante is actually a toolbox of all the pieces people need when they're building a product. We use standard TCP/IP, we use IEEE1588 (PTP) for clock synchronisation. We happen to have a transport that runs on top of UDP/IP that people latch onto, but the transport is just one piece. We use standardised multicast DNS and DNS service discovery as part of our discovery system. When I talk about Dante as a solution, I think it means to not just the end point implementation, but also things like Dante Controller and DVS. When you buy a Dante solution you get all of those things, not just a transport."

Dante is also compatible with the other big buzz in networking, Audio Video Bridging. As Dante has been written to use the same Ethernet standards as AVB, a firmware upgrade will be all that is needed once the IEEE Audio Video Bridging Task Group finish ratifying. "We have firmware that implements AVB as part of our Brooklyn II chipset Dante implementation" Aidan points out. "Our intent is to keep the same user interface and have our modules speak more than one networking protocol. We want Dante to interoperate with as much of the equipment



The Dante Brooklyn II module

on the market as possible. Standards come and go. If you think about a Cisco router, it doesn't get replaced by some new standard. You just implement a new standard in the router. It speaks several different protocols, it accepts new standards as they come out. I see Dante like that."

Conference Call

Both AVB and Dante are expanding into the huge commercial installation market, which is usually estimated to be around 10 times the size of the live production and production installation market. "We see the growth in the commercial installation and communications space", said Lee Ellison. "Where you traditionally have had a lot of compressed audio moving around, you're going to see more higher quality systems in the enterprise space – public address, evacuation systems and rail transport systems, for example". This has seen companies like Extron bringing Dante into their products.

Audinate is expanding into this market with their new Ultimo chip. "Most of the solutions for AV networking out

to date have involved a hardware FPGA or chip solution with high packet rates and large channel count.” Aidan elaborated. “Because the hardware cost has been quite high, they’ve been best suited to stageboxes and mixing desks. The goal of Ultimo is to have a cost-optimised solution with a couple of channels to go into the vast bulk of devices on the market, which only have a few channels.”

This opens up enormous possibilities for the company.

Every Class D power amplifier could be fitted with Dante networking if the price is right. There’s also strong interest from microphone companies. Even the domestic market and MI stand to benefit from the trickle-down effect of the technology. Audinate are teasingly reticent to talk about any developments in the MI space; “There’s some interesting musical equipment that implements our technology”, hinted Lee. ““There’s a lot of really big brands that we haven’t announced yet that are implementing Dante”.

Still Call Australia Home

Until recently, all Audinate’s manufacturing was done in Sydney’s St Peters by a company called Dayang. Despite expansion into China to cope with demand and Dayang’s merger with another company, Audinate continue to use some local manufacturing. The head office is still in Ultimo, with CEO Lee Ellison residing in Portland, Oregon. Audinate employ 30 full-time staff overall, mostly in Sydney, and are looking to grow out of their original office.

Audinate is also looking to grow into new product areas. Lee has a tantalising vision of the future of audio; “More systems will be connected via a common audio and video network”, he foresees, “and at some stage, more of that will happen in



Dante Virtual Soundcard

the home. Wireless will be the next frontier - we’re looking at a lot of things that will enable that right now.” Needless to say, the company that first cracks reliable wireless distribution of multichannel audio stands to revolutionise the industry, as well as make an unimaginable amount of money.

Das ist Cool...

Being at the cutting edge of audio distribution technology at the moment, we asked Aidan Williams what’s the coolest application of Dante that he’s seen. “German company Four Audio make a module for Wave Field Synthesis that has around 30 channels of Dante input to each array” he answered. “They go into these systems that have hundreds of loudspeakers for reproducing three-dimensional audio wavefronts.” Wave Field Synthesis is way of creating artificial audio spaces and sounds by generating custom wavefronts from hundreds of arrayed diaphragms. It’s based on the mathematical principle that any wavefront can be synthesised by superimposing the right spherical waves. Are these systems used in the architectural acoustics departments of Universities? **CX** asked. “No, they seem to be going into German nightclubs” said Aidan.



australia

THE PERFECT TRILOGY

SUPER LIGHT | ULTRA BRIGHT | VERSATILE

NEW GENERATION OF MOVING HEADS

www.dts-australia.com.au



MAX



JACKSPOT



RAPTOR