Introduction to Dante Video

Authorisation: This document was approved by the CEO of Audinate Group Limited

April 2023

Dante AV™
Audio and Video over IP
Dante AV Values
Professional-Grade Picture Quality
Up to 4K/60 resolution, visually lossless image quality
No generational loss through production chain
Hassle-free Integration with Dante Ecosystem
Consolidated Management of Audio and Video in Dante Controller
Direct compatibility across Dante audio and AV devices from many manufacturers
Separate essences for audio, video and control links, w/ managed HDCP
Works on existing 1Gbps network infrastructure
Low-Latency Video and Impeccable Timing
From HDMI to HDMI in 8 msec – ideal for live presentation or live studio use
Inherently maintains lip sync
Tight alignment for clean studio transitions, video walls and multi-image projections
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Dante AV
Dante AV™
Delivering audio and video, to the right place at the right time – optimizing network cost, bandwidth, and data requirement efficiencies.

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Dante AV Value Proposition

Dante AV™

Simple, reliable, interoperable audio & video signal transmission across networks, everywhere

Market Opportunity

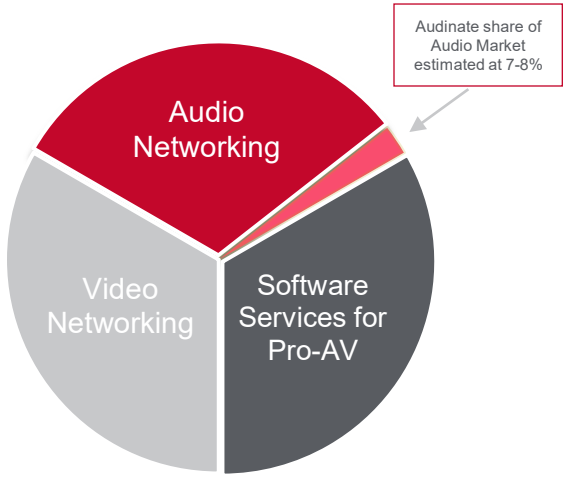
Based on Futuresource research the TAM for video is estimated at A$400m (research underway to refresh TAM)

Video market is fragmented, and the incumbent point to point technology is HDBaseT (potential additional TAM)

“Video Networking” opportunity relates to Pan Tilt Zoom (PTZ) cameras, screens, projectors & IO (Input-Output) boxes

Tailwinds post COVID from increasing prevalence of Zoom & MS Teams

Audinate Total Addressable Market (‘TAM’)*



* *Management estimate total addressable market exceeds A$1bn*

Audinate advantages in video

Audinate entered the video market having established Dante as the pre-eminent audio networking solution:

- Dante is the de-facto standard in audio
- Premium Dante brand, widely recognised
- >3,500 Dante audio products available
- ~200,000 AV professionals know Dante
- Established management & configuration software[1]
- Successful playbook from audio market

Dante AV in a nutshell

AV professionals want:

- *Video networking that works like Dante audio*

Video equipment manufacturers (OEMs) want:

- *Simple ways to offer Dante video (and audio)*

Dante AV offers:

- Familiar Dante setup & troubleshooting tools
- Good, better, best implementation choices
- Software stacks for existing chips & products
- Interoperability between same-codec products
- Path to remote management via the cloud

[1] *Dante Controller and Dante Domain Manager*

Video market is fragmented

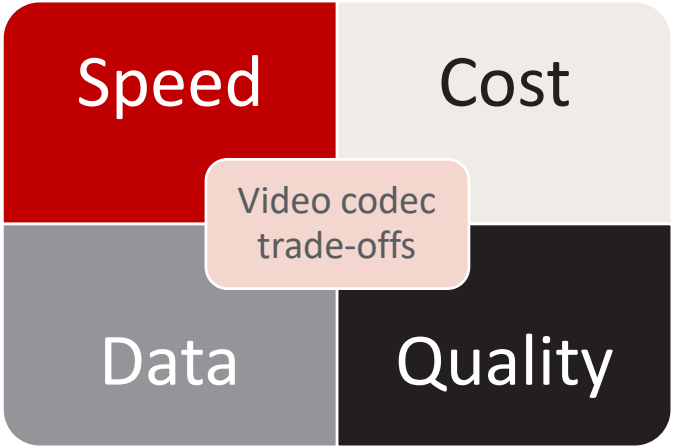
Video signals have a **much larger data rate** than audio signals

Video compression is required - video signals are 3-18Gb/s compared to standard 1Gb/s ethernet cables

Video codecs compress video signals **reducing the data rate**

Market fragmentation relates to three key industry dynamics:

1. **Video codecs** get chosen based on use-case – creating **incompatibility between products**
2. Video products using **the same video codec** mostly **do not interoperate** between manufacturers
3. Vertically integrated manufacturers create **"walled gardens"** using proprietary video codecs



Impacts of fragmentation

- Lack of interoperability
- Adoption of video networking < audio networking
- No equivalent of Dante Controller for video
- Role for Original Design Manufacturers (ODM) to manage complexity

Video Industry Landscape

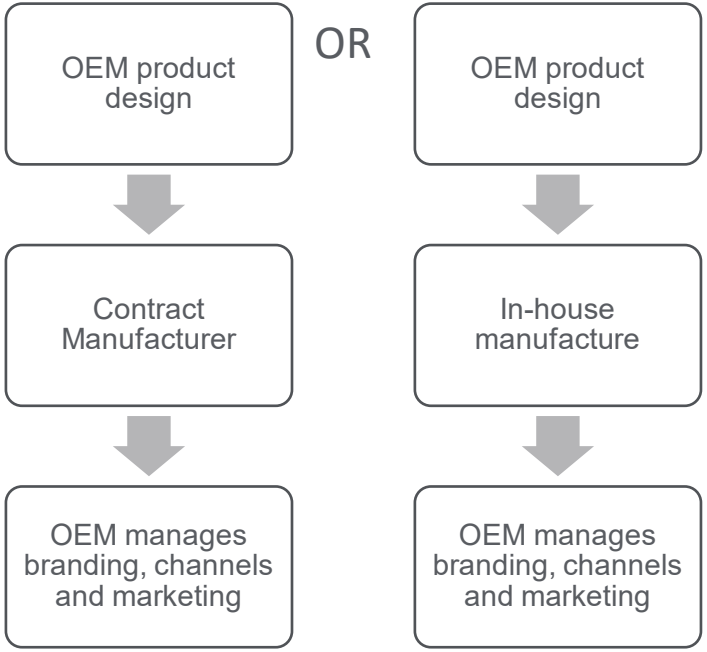
	Example Companies	Comments	Video over IP	Multiple Codecs	Interoperable	Networked Audio	Management & Configuration Software	Mac & PC Software	Price Point
Dante Video	**Audinate**	• de-facto standard in audio networking • multiple price / quality offerings	✓	✓	✓	✓	✓	✓	Low cost to Expensive
Video codec chip vendors	A-Speed Semtech (SDVOE) Ambarella (H264) HiSilicon (H264) Intopix (JPEG2000)	• different codecs for different use cases • not a complete technology solution	Enabling component	X	Limited	X	X OEMs/ODMs write their own per vendor	X	Low cost to Moderate
Vertically Integrated Manufacturers "walled gardens"	Crestron & Extron	• utilise proprietary codec & management & configuration software for solution (audio & video) sales	✓	✓ Within walled-garden	- Within walled-garden	✓ Some Dante	✓ Certified technicians	Limited	Expensive
Alternate video networking technologies	VizRT (NDI)	• moderate performance technology used in small scale broadcast • cost to OEM typically 5% MSRP	✓	X Multiple NDI codecs	✓	✓ Not Dante	✓	✓	Expensive
HDBaseT	Valens	• "point to point" cabling for video • incumbent technology - not networked	X	N/A	✓	X	X OEMs/ODMs write their own per vendor	N/A	Low cost

Dante Video addresses customer pain points

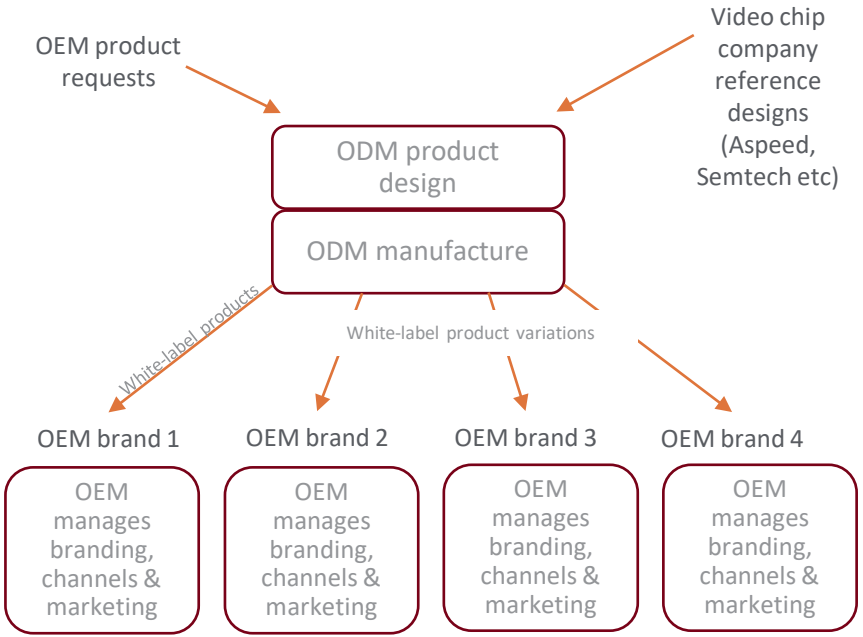
Vs. SDI	Vs. SMPTE-2110	Vs. NDI
• Lack of flexibility, scalability • Expensive matrix routers • Difficulty getting signals across campus, WAN	• Burdensome network requirements • Expensive • Difficult to configure/ manage • Difficulty getting signals across campus, WAN	• Challenging to scale • Need to keep on separate VLAN = more complexity to manage • Audio not robust • Difficult to configure and manage

OEM and ODM manufacturing approaches

Original Equipment Manufacturer (OEM)



Original Design Manufacturer (ODM)



ODMs manage the complexity of making video products – getting them to design Dante into their video products can act as a force-multiplier to get into multiple brands' video products through a single relationship

Dante Video and Audio Platform

Audio Visual Integrators, Professionals & Consumers

AV Configuration & Management

- Dante Controller
- Dante Domain Manager
- Dante Cloud

AVIO Network Adaptors

- Analogue
- USB / Bluetooth

Audio & Video Software Tools

- Dante Studio (AV)
- Dante Virtual Soundcard
- Dante Via
- 3rd party apps

Manufacturers (OEMs)
Original Equipment Manufacturers

Audio Products

Chips, Cards & Modules

- Brooklyn III
- Ultimo
- Broadway

Software

- Dante Embedded Platform
- Dante Application Library
- Dante Ready
- IP Core

Video Products

Chips, Cards & Modules

- Dante AV Ultra
- Viper Board

Software

- Dante AV-H

Summary of Dante AV functionality

Dante® AV -ULTRA

Dante® AV-H

H.264 MPEG-4/AVC

H.265 MPEG-4/AVC

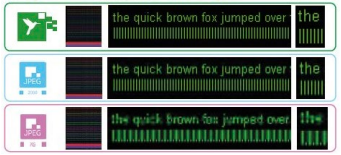
- Discovery
- Control & Routing API
- Dante Controller Support
- Dante Domain Manager Support
- Dante Audio
- Interoperability of products based on same technology
- Dante Studio Compatible
- Common AV Clock
- Dante Video Transport
- Integrated Codec

Dante AV technical specifications

Dante AV -ULTRA

A complete AVoIP offering where 4K60 (4:4:4), visually lossless content, tightly synchronized audio and sub-frame latency are required.

- Hardware/FPGA Deployment
- Colibri Codec
- HDCP 2.x
- 8 x Dante Audio Channels
- Supports Dante Studio & PoE



Dante AV-H

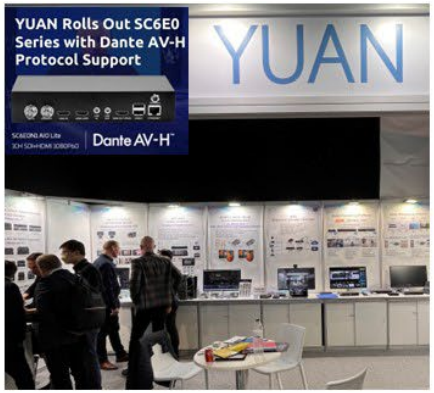
A lighter weight, software-based deployment which enables any H.26x product into the Dante ecosystem. Add major value and features with zero additional hardware.

- Software/SoC Deployment (coexists)
- H.26x Codec*
- No HDCP
- Up to 8 x Dante Audio Channels (DEP)
- Supports Dante Studio

H.264 MPEG-4/AVC H.265 MPEG-4/AVC arm

(*) Based on Main profile for H.264/H.265

Integrated Systems Europe tradeshow – Feb 23



AJA launch at NAB tradeshow – April 23

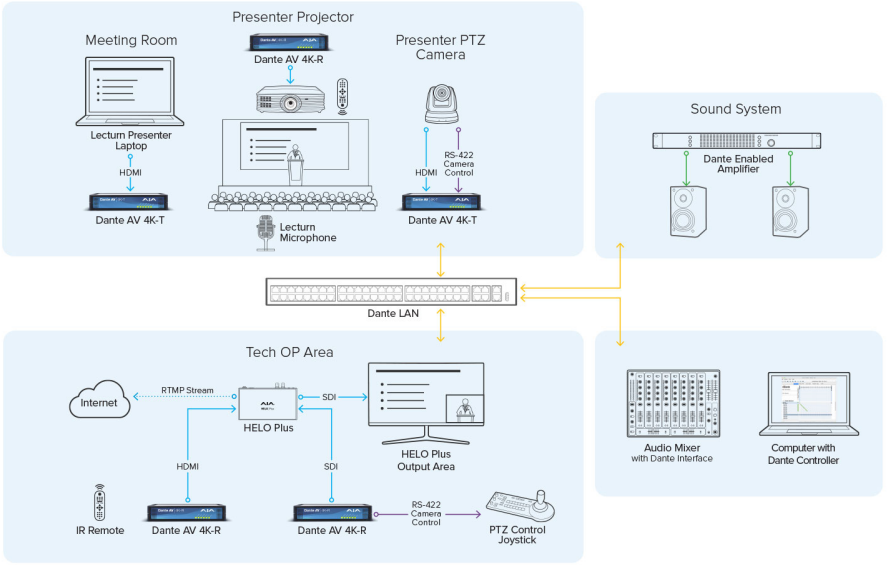
www.aja.com/products/dante-av-ultra
AJA introductory video - use cases and benefits of Dante video

front

rear

Conference/Education Dante AV IP Workflow

Dante AV | 4K-T and 4K-R



Source: www.aja.com/assets/m/workflows/dante-av/DANTE_AV_Conference_Workflow_FIN.pdf

Accelerating Momentum with Dante AV

ODM

CYP

YUAN

Lumens®

ProITAV

AVer™

Telycam

VHD

iSmart Video

Minrray®

GoMax Electronics, Inc.

OEM

BOLIN

PATON let's Connect!™

SOUND HOUSE

ADTECHNO®

YAMAHA

sy

AJA® VIDEO SYSTEMS

Marshall CAMERAS

BZB GEAR

PTZOPTICS

Tenveo

AVONIC

televic

Dante Studio software

Enables Dante Video into and out of PC applications

- Use PC software with Dante AV hardware; integrate with video production solutions such as OBS & vMix as well as Teams, Zoom and other video conference platforms
- Dante Studio is a suite of 3 software components:

Dante Studio RX

Receives Dante AV hardware streams into PC software.

Dante Studio TX

Transmit your PC screen to Dante AV hardware at high quality and low latency.

Dante Video Viewer

Display Dante AV hardware streams in a standalone PC player.

Dante Video Product Inventory

Dante AV Chips & Modules

- Dante AV Ultra and Viper are premium products targeting live venues, broadcasters, corporate board rooms and university lecture spaces.

Dante Software

- Dante AV-H enables existing mainstream products targeting corporate meeting rooms, lobbies, education classrooms, hospitality etc.
- Provides a lower cost Dante AV endpoint for price sensitive applications

- Dante Studio enables both PC to/from devices and PC to PC use cases (Mac compatibility will follow in future releases)
- Enables future cloud Dante AV offerings

Dante AV Ultra

- Premium Dante AV offering:
  - high resolution
  - visually lossless quality
  - audio/video synchronization
  - subframe latency

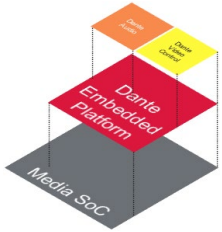
Repeat revenue model

Viper

- Fully integrated AV over IP board:
  - Provides a foundation for ODM designs
  - From Silex acquisition
  - Foundation of Dante AV Ultra v2

Repeat revenue model

Dante AV-H



- Simple Dante AV offering:
  - Enables Dante audio and video routing & configuration
  - Targets existing ODM hardware designs
  - H264 is the dominant codec used in PTZ IP cameras
  - Support **new** & **existing** product designs

Repeat revenue model

Dante Studio

Dante™ Studio

- Software product that enables PCs to support Dante AV video streams
- Used by AV Professionals and consumers

Subscription revenue model

Audinate video team

- Development team of 20+ people across 2 sites UK (Cambridge) & Belgium (Louvain la Neuve)
- Capability covers video compression, FPGA, hardware design and video software capabilities
- Critical mass in the European time zone – access to video engineering talent pools
- Audinate is now able to offer fully integrated video solutions
- Video product roadmap has been accelerated through the acquisition of Belgium team
- Established relationships with Original Design Manufacturer (ODM) and Original Equipment Manufacturer (OEM) customers

Customer perspective…

Dante AV was the perfect solution for us to send audio and video all over the facility with the lowest latency. Dante AV is cutting-edge technology that will allow us to be more productive and expand to meet the challenges of a changing industry.

Dennis Cham, HIT Productions

As we researched potential network solutions, we learned about Dante AV. This looked like the direction we needed to go. The flexible scalability that a Dante AV system offers is light-years beyond analog cabling.

Ryan Schaub, City Church Wisconsin

Conclusion: Why Dante?

Largest audio product ecosystem	Interoperability between brands/OEMs	Universal setup & mgmt. tools and APIs
Large, educated community of AV professionals	Proven reliability and performance	Designed to deploy into *typical* IT networks
Software, hardware and cloud options	Scalable solutions for the LAN, campus & WAN	Support for different codec & quality options