# OMNEO **FAQ**

## *What is* OMNEO*?*

OMNEO is a media networking architecture that provides for high-quality multichannel media transmission and powerful, reliable system control via standard Ethernet IP networks. It enables the development of media products capable of interoperating and exchanging media content and control data using industry-standard IP digital network equipment.

## What does "OMNEO" stand for? Is it an acronym?

OMNEO is not an acronym, it is simply the name of the architecture.

## Where will OMNEO be used?

The OMNEO technology will eventually be employed in many Bosch Communications products where media transport and system control is required. This will impact nearly all the markets Bosch Communications currently serves and will be used in products from the Bosch, Electro-Voice, DYNACORD, and RTS brands.

## Who or what is OMNEO for?

OMNEO is targeted at professional AV applications where high quality, reliable and secure communications and control are required for networks of up to 10,000 devices.

## When will OMNEO be available?

OMNEO will be incorporated into Bosch Communications audio products beginning in 2013, and will become a central feature of Bosch Communications product offerings.

## Why is yet another media networking standard needed when there are already so many available?

Currently, several options are available for media networking, including CobraNet, Ethersound, RockNet and many others. However, these solutions all have compromises that range from proprietary and/or non-standards based implementation to difficult operation and maintenance. Additionally, none of these current solutions are truly IP compatible, which creates significant challenges when trying to integrate them into new or existing networks. Finally, while these existing solutions address the transport of content, no current solution addresses the need for system control. OMNEO provides a solution that addresses all of these issues by providing an easy-to-use, standards-compliant solution for both program transport and system control.

## Is OMNEO proprietary?

No. Bosch believes that open public media networking standards will provide the best value options for customers in the long run. OMNEO will be compliant with public standards when appropriate standards, such as AVB, become available.

## Who is developing OMNEO*?*

OMNEO is being developed by a team in Breda.  Members of all business lines, including R&D and Product Management from all Communications Brand business lines are involved in the project.

## What are the main goals of OMNEO?

OMNEO has been specified and designed to provide the following core functions:
- ➔ Studio-quality audio with precision timing and network-wide sync
- ➔ Up to 256 bidirectional channels on gigabit Ethernets
- ➔ Integrated signal transport and system control
- ➔ Easy network setup
- ➔ Public standards compliance when possible
- ➔ Scalability:  2 to 10,000 nodes, local or wide area
- ➔ High-reliability design for critical applications
- ➔ Encryption available for both audio and control

## What are the main components of OMNEO?

The main components of OMNEO are:

*Program transport*
- **Dante** routable audio stream transport network technology from Audinate of Sydney, Australia.

*System control*
- **OCA (Open Control Architecture)**, a robust system control architecture for professional media networks.  OCA is an emerging standard being developed and promoted by the OCA Alliance, a trade association that Bosch helped found in 2011.

## *Dante*

## What is Dante?

Dante is a high performance digital media transport system that runs over standard IP networks.  It has been developed by Audinate, a company based in Sydney, Australia. Dante™ offers a no hassle, self-configuring, plug and play digital audio networking experience. It is a total solution for transporting low latency uncompressed audio over standard IP Ethernet networks with sample-accurate synchronization, automatic device and channel discovery, and easy to use signal routing.

Dante is a powerful technology that allows many channels of audio to be transmitted and received over a single Ethernet cable without the complexities and limitations of earlier solutions. Dante's low latency and tight play-out synchronization meet the most demanding of professional audio and installed sound requirements using off-the-shelf networking equipment. It is easy to set up, configure, and manage because Dante-enabled devices discover one another over the network and learn each other's capabilities (number of input and output channels, sample rates and bit depths supported etc.)

automatically.  As well, Dante devices and channels can be given "friendly" names meaning audio can be routed without having to use or remember magic numbers.

## Can I Connect Dante to a PC or Mac?

Yes to both.  The Dante Virtual Soundcard is software that turns a Windows or Mac OSX computer into a Dante-enabled device, allowing a user to record, play out and process audio to and from a network with other Dante devices.

Dante Virtual Soundcard uses the computer's standard Ethernet port -- no special hardware is required. Dante Virtual Soundcard behaves exactly like a physical soundcard with an ASIO (Windows) or Core Audio (Mac OSX) interface, and so it can be used with virtually any popular Digital Audio Workstation product. Other Dante-enabled devices on the network see the Dante Virtual Soundcard as a normal Dante peer device.

## How is Dante different from other program transport technologies such as CobraNet?

Dante offers several advantages over alternate media networking technologies, including ease of setup and operation, high channel count, and low latency.  Additionally, since Dante uses IP standards, it provides unique network-friendly features.

## Can an OMNEO device send and receive audio from non-OMNEO Dante devices?

Yes.  Since OMNEO uses Dante as the foundation for its audio transport, OMNEO devices are able to exchange program streams with other Dante devices

## What other manufacturers are using Dante at this time?

Dante is a rapidly growing technology that has already been embraced by some of the industry's largest manufacturers, including Bosch, Yamaha, Whirlwind, Allen & Heath and many others.  A complete list of Dante licensees can be found here.

## *OCA*

## What is OCA?

OCA, or the Open Control Architecture, is a high-function control protocol supporting a rich repertoire of control and monitoring operations.  OCA provides a highly flexible and uniform control structure for control, monitoring and configuration of diverse devices.  OCA provides valuable features such as encryption, multiple controller support and high reliability.

## What is the OCA Alliance?

The Alliance is a group of nine professional audio manufacturers who have come together to help the Open Control Architecture (OCA) become an open public communications standard for control and monitoring of devices in professional media networks.

The mission of the Alliance is to complete the technical definition of OCA, then to transfer that definition to an accredited standards development organization which will render it into an open public standard.

## Who are the founding members of the OCA Alliance?

The founding members are:

- Bosch Communications Systems
- d&b audiotechnik GmbH
- Duran Audio
- LOUD Technologies, Inc.
- Media Technology Systems
- PreSonus
- Salzbrenner Stagetec Mediagroup
- TC Group
- Yamaha Commercial Audio

The OCA Alliance has incorporated as a non-profit trade association as of June 1, 2012 and has begun to accept new members. In 2013 Audinate, Waves, Attero Tech, and RCF have joined The OCA Alliance.

# AVB

## What is AVB?

The acronym AVB (**A**udio **V**ideo **B**ridging) may refer to three related, but separate things.

1. The IEEE[1] 802.1 Audio Video Bridging standards suite for Ethernets. This is a set of four standards for enhanced Ethernet switches that support transmission of time-synchronized, low-latency data through Ethernets. Together, these standards create an Ethernet environment that is friendly to media networking. Ethernets that comply with these standards are often called "AVB Ethernets".

2. The IEEE standards suite that uses AVB Ethernets to transport multiple channels of audio and video. These standards are officially designated **IEEE 1722** and **IEEE 1722.1**.

3. An new specification that will use AVB Ethernets in combination with the IP internet protocol to provide multichannel media transport over large networks and/or long

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1     Institute of Electrical and Electronic Engineers, one of the main standards bodies in the field of networking.

distances.  It's still under development and doesn't have an official designation yet -- its working title is **IP Pro AV.**

In addition to these, the press has sometimes used "AVB" as a general term for any kind of media networking that uses public standards.  This is not a correct use of the term, but you will see it frequently.

## What is the AVnu Alliance?

The AVnu Alliance is a trade association dedicated to the advancement of professional-quality audio video by promoting the adoption of the IEEE 802.1 Audio Video Bridging (AVB definition 1, above), the related IEEE 1722 and IEEE 1722.1 standards (AVB definition 2), and, in the future, IP Pro AV (AVB definition 3).

AVnu aims to offer compliance and interoperability testing services to ensure interoperability of networked AVB devices.  As well, AVnu promotes awareness of the AVB benefits and collaborates with other associations to optimize AVB use.

AVnu's scope includes automotive, professional, and consumer electronics markets.

Bosch is a Promoter Member of the AVnu Alliance and actively works in the Technical Working Group and the Marketing Working group.  Additional information on AVnu Alliance can be found here.

## Is OMNEO **competing with AVB?**

No.  OMNEO will be compatible with all three definitions of AVB listed above. This interoperability has been demonstrated at InfoComm 2012.

## *Standards*

### Why is it important to standardize OMNEO?
➔ Proprietary communication and media transport schemes lock customers out of valuable functionality by imprisoning them in closed technology loops.

➔ As OMNEO becomes standards-compliant, Bosch systems will gain value by integrating important products from other companies -- large format digital mixers, for instance.

Bosch has taken a leadership role in media networking standards because public networking standards provide the best value for customers in the long run.

### But won't open standards hurt Bosch?

Not at all. While Bosch is standardizing OMNEO to support multi-vendor interoperability, this does not mean that Bosch will be opening up all of its underlying

technology.  Bosch's unique technology solutions and methods will remain the province of Bosch.

Products that are based on standards will be easier to sell into existing systems that are expanding, will be easier to integrate with complex designs, and will be able to meet the requirements of projects that require standards-based solutions.

## What is the current status of standardizing OMNEO?

There are three sets of standards, as follows:

➔ **IEEE 802.1 AVB**

Table 1 summarizes the versions and status of the various IEEE AVB specifications as of April, 2013.

| Standard | Title | Status | Date |
|---|---|---|---|
| IEEE 802.1BA-2011 | Audio Video Bridging Systems | Ratified and published | 30 September 2011 |
| IEEE 802.1Qav | Forwarding and Queuing Enhancements for Time-Sensitive Streams | Ratified and published | 5 January 2010 |
| IEEE 802.1Qat | Stream Reservation Protocol | Ratified and published | 30 September 2010 |
| IEEE 802.1Q-2011 | Incorporates IEEE 802.1Qav and IEEE 802.1Qat | Ratified and published | 31 August 2011 |
| IEEE 802.1AS | Timing and Synchronization for Time-Sensitive Applications in Bridged Local Area Networks | Ratified and published | 30 March 2011 |
| IEEE 1722 | Layer 2 Transport Protocol for Time Sensitive Applications in a Bridged Local Area Network | Ratified and published | 6 May 2011 |
| IEEE 1733 | Layer 3 Transport Protocol for Time Sensitive Applications in Local Area Networks | Ratified and published | 25 April 2011 |
| IEEE 1722.1 | Device Discovery, Enumeration, Connection Management and Control Protocol for 1722-Based Devices | Draft 20 | June 2012 |

*Table 1:* The current status of AVB Standards

➔ **Dante**
Audinate has announced its intent to:
- Make Dante compatible with Ethernet AVB network equipment (AVB definition 1);
- Make Dante able to exchange audio signals with AVB-compliant devices (AVB definition 2).
- Make Dante compatible with IP media transport standards (IP definition 3) when they become available.

➔ **OCA Standardization Status**
- The OCA Alliance completed OCA 1.0 in May, 2012.  The AES has been chosen to ratify this release as an open public standard.
- OCA has been openly published as a proposed standard and is on track to be standardized by the AES under the project designation X-210.

## *Dante Benefits*

Dante delivers something every audio professional needs: a no hassle, self configuring, true plug-and-play digital audio network that uses standard Internet Protocols over both 100Mbps and 1 Gigabit Ethernet. Patent pending Dante technology distributes digital audio plus integrated control data with imperceptible latency, sample accurate playback synchronization, extreme reliability and high channel counts.

## Easy to Setup and Use

Our innovative configuration protocol makes networking a true plug and play process with automatic device discovery and system configuration. Dante enabled devices will automatically configure their network interfaces and find one another.

## Sample Accurate Timing with Inaudibly Low Latency

Dante uses audio independent, high accuracy network synchronization standards to ensure all Dante devices are synchronized at all times. Sample-accurate playback with extremely low latency and jitter is achieved without limiting your audio sample rates and network layout options.

## True Ethernet and IP Network Compatibility

Dante runs on inexpensive off the shelf computer networking hardware, and does not require dedicated network infrastructure. Ethernet switches transmit Dante digital media streams along-side ordinary data traffic, so you can integrate professional media operations into properly designed pre-existing networks.

Dante is a high performance digital audio networking solution that offers many benefits to users and manufactures of equipment for Live Sound, Install, Recording or other Pro Audio markets.

## Benefits of Using Dante

- Plug-and-play technology – automatic discovery and simple signal routing
- Reduced Cost & Complexity- No special skills required to set up audio networking
- Sample accurate playback synchronization
- Lowest latency available from any networking technology
- Add/remove/rearrange components at will
- Deterministic latency throughout the network
- Support mixed bit depths and mixed sample rates over one network
- Scalable, flexible network topology  supporting a large number of senders and receivers
- Supports mix of 100 Mbps, 1Gbps, through 10Gbps networks
- Supports a single integrated network for  audio, video, control, monitoring
- Uses inexpensive, off-the-shelf computer networking equipment
- Direct connection to PCs for multi-channel recording, processing and playback using a Dante Virtual Soundcard for both PCs and Macs
- AVB Ready