



# MILAN

## FEATURE OVERVIEW

### HISTORY

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Most modern networked systems are based upon 40-year-old Ethernet technology that is defined by IEEE (Institute of Electrical and Electronics Engineers) standards. Ethernet was not designed for real-time traffic of things like audio and video. It is more like a mail delivery service. There is no way to know with certainty when data will arrive, packets can be lost and the network itself can congest and slow down.

Over time some software workarounds have been developed to make Ethernet more suited for media transport. Tools have been created to help with clock synchronization and priority management which forces non-critical data to wait while more critical data is delivered.

But the core transport layer of Ethernet still cannot offer the reliability and synchronicity that is required for real-time media signals. The actual performance of the network remains dependent upon the quantity and nature of the data that is sharing the network bandwidth.

We can think of Ethernet plus the software tools as the network layer or foundation upon which all the existing application layer network technologies (like Dante, Ravenna, etc.) are built. Manufacturers who adopt these application layer network tools offer their customers interoperability with all the other manufacturers who have chosen the same platform. But the limitations of the Ethernet network layer beneath force customers to worry about things like network architecture, media separation and hardware configuration to improve results. And even then, some risks remain.

These challenges associated with network complexity and risk are the reasons that L-Acoustics has chosen AVB as our network layer solution.

### WHAT IS AVB?

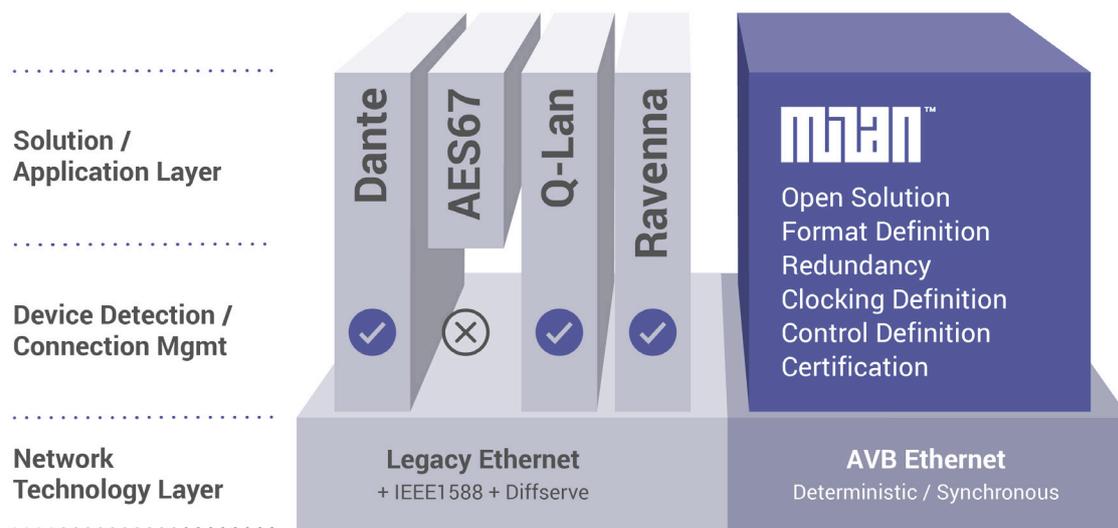
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AVB can be thought of as the evolution of Ethernet developed specifically for media transport. AVB solves the most pressing problems with Ethernet in the hardware itself. AVB networks reserve specific bandwidth for media to eliminate interference with other data. An AVB network also has the timing baked in. It is a self-contained synchronous structure with very precise timing.

But AVB is a network layer technology. It does not in and of itself define a specific implementation strategy at the application layer. To implement AVB, decisions remain about stream formats, media clocking, redundancy and software control. Each manufacturer that has chosen AVB has developed a unique application layer implementation. So AVB networked devices have lacked the application layer interoperability that customers expect from a network. That brings us to MILAN.

## WHAT IS MILAN?

MILAN is the application layer or solution layer that has been built on top of the AVB network layer. Key manufacturers within the Avnu alliance that notably and prominently include L-Acoustics, d&b and Meyer Sound have collaborated behind the scenes since 2016 to develop an agreed upon set of standards for an application layer solution. The group has developed standards for media stream format, media clocking, redundancy, software control and more to create what is now known as MILAN. MILAN offers the benefit of endpoint interoperability combined with the simplicity and reliability of AVB.



## WHAT DOES IT MEAN FOR OUR CUSTOMERS?

MILAN is built upon Ethernet AVB and not legacy Ethernet. This means that users have a guarantee that they will not suffer audio drop outs and/or degradation of audio. It also means that they will not have to worry about clock management and hardware configuration. MILAN specifically ensures interoperability between any MILAN certified devices.

In terms of hardware, Avnu certified AVB products offer interoperability on the network technology layer but not the application layer. Avnu certified MILAN products will offer interoperability with AVB products on the network layer and with other MILAN products on the application layer. This means that customers will build AVB networks with Avnu certified AVB switches and MILAN certified endpoints (things like powered speakers, amplifiers, processors, mixers, microphones, etc.)

## WHEN?

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The MILAN standards and certification tests were completed in 2019. Manufacturers can submit their products for Milan Conformance Testing to [Recognized Test Facilities](#) and get Milan Certification granted by the Avnu alliance.

L-Acoustics has been a leader in the development of MILAN. The latest processors and amplified controllers have all been developed or received firmware updates to make them compliant with MILAN requirements. We fully expect that the list of MILAN certified products will rapidly expand as the industry moves towards a simpler, more reliable and open networking platform.

## WHICH L-ACOUSTICS PRODUCTS ARE MILAN-CERTIFIED?

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The following products are Milan-certified:

- LA2Xi
- LA4X
- LA12X
- P1

\* The Milan certification applies to AVB talkers and listeners. AVB bridges, such as LS10, can be Avnu-certified but are not concerned with the Milan certification.

## KEY BENEFITS

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- Easy and simple usability
- Excellent reliability – no dropouts or degradation of media + enhanced redundancy scheme
- Plug-and-play network setup
- Users can concentrate on the show (instead of IT)
- Control and audio seamlessly on one cable/connector without conflict
- Open platform that is developed by the industry for the industry (not by a 3rd party)

