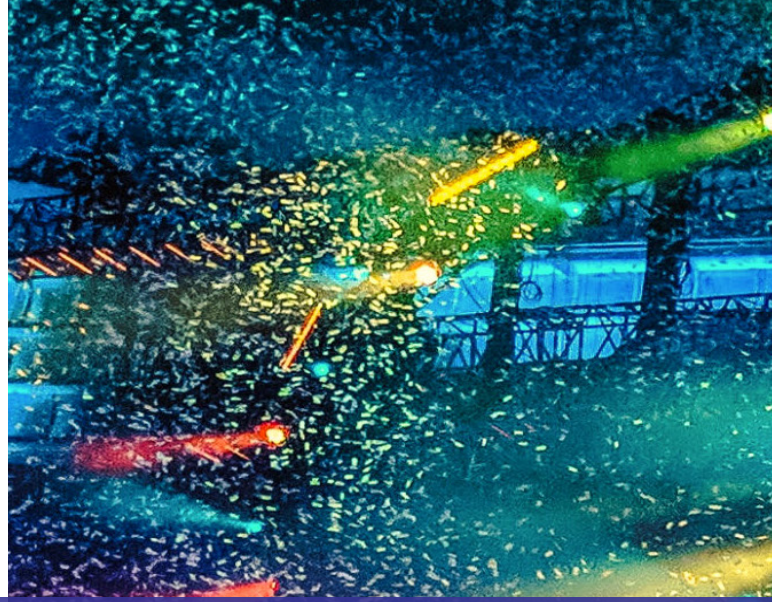


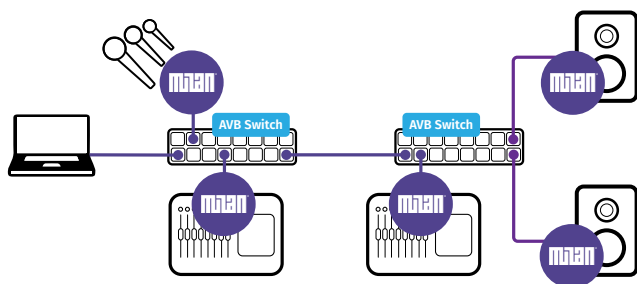
Welcome to the world of Milan, an emerging audio networking protocol. Milan stands for Media Integrated Local Area Networking, is based on the Audio Video Bridging (AVB) standard, and will change the way audio devices interact in professional setups. Let's find out what it is, what its key features are and how it differs from others.



# Welcome to Milan

## What is MILAN?

Milan is an audio networking protocol that's changing the way audio devices communicate and interact within professional audio setups. Based on the AVB standard, Milan aims to redefine the networking landscape by delivering reliable, high-performance, synchronised audio streaming over Ethernet networks.



Milan thrives as an open standard, offering a high level of usability as it allows for interoperability, a smooth integration of different work areas and the significant improvement of digital workflows.







## How it all started

Milan is based on AVB, a robust standard for AV over IP. While Ethernet is omnipresent in our everyday communications, it wasn't designed to handle the real-time signal transport required in AV. AVB has stepped in to meet this need, providing seamless real-time delivery. Milan's key benefits include deterministic behaviour with reserved AV streams, improved reliability, optimal synchronisation and easy network setup. Milan addresses the challenge of interoperability, a key concern in today's AV applications, by providing a solution that does not require special settings, such as Quality of Service (QoS), within the switches to ensure reliable delivery. Manufacturers have been looking for options beyond AVB due to its interoperability limitations,

and Milan is emerging as a solution that combines the benefits of AVB with enhanced features for the needs of AV networking.

Recognising the need for a reliable networking protocol designed for the Pro AV market, a number of AV manufacturers formed a dedicated workgroup within the AVnu Alliance. This non-profit organisation is committed to open standards. Since its introduction at InfoComm 2018, the Milan-based initiative has certified devices and applications for the AV industry. It's important to distinguish the technical reliability of AVB from Milan's overarching goal of providing convenience within a network protocol. The essence of Milan is to create a user-friendly experience while maintaining the solidity inherent in AVB.

### Key Benefits

**Precise synchronisation and low latency:** Milan delivers precise synchronisation, a critical feature in scenarios where timing accuracy is paramount, such as live performance and multi-channel recording. Milan offers nanosecond accuracy, providing optimal jitter performance in Ethernet-based systems. It also offers configurable low latency capabilities, with less than 0.5ms possible, ensuring real-time audio transport with no noticeable delay. This feature ensures seamless communication between devices, a fundamental requirement in professional audio applications.

**Interoperability and a unified ecosystem:** Milan fosters a cohesive environment where devices from multiple manufacturers communicate seamlessly, freeing users from brand-specific limitations and providing flexibility in creating custom audio setups.

**Reliability and prioritisation:** Milan's traffic shaping capabilities ensure a reliable delivery. By prioritising audio traffic over other traffic, Milan guarantees sustained quality by ensuring that audio data remains uninterrupted, preventing dropouts even in the most challenging network conditions. Its AVB stream reservation method differs from other protocols in that it provides feedback during set-up to confirm the viability of the connection. Once established, the connection remains uninterrupted and immune to network traffic disturbances.

**Streamlined configuration:** By simplifying the setup of network infrastructure, Milan enables audio professionals to efficiently configure and manage their setups, reducing the complexity of deployment and maintenance.



## What about the others?

A key consideration, as mentioned above, is the strategic dependence of manufacturers on a single source such as Audinate/Dante. With Dante, bandwidth management becomes a critical task for IT professionals, requiring vigilant monitoring to ensure reliable performance. Unlike Dante, Milan operates within the AVB standard, where AVB switches inherently understand their capabilities, eliminating the need for over-subscription. This means that Milan delivers exactly the bandwidth required, without surplus, ensuring that the non-reserved bandwidth remains guaranteed for control traffic and other essential functions. This configuration greatly enhances robustness and reliability.

Another difference is the complexity of network configuration. While other protocols require manual configuration of Quality of Service (QoS), VLANs and Internet Group Management Protocol (IGMP) in switches, Milan works seamlessly within the AVB framework. This eliminates the need for manual configuration, streamlining the process and improving usability and efficiency.

Comparing Milan to other protocols such as Dante, it's clear that both aim to deliver high-quality audio streaming over Ethernet networks and to achieve interoperability between different devices. However, Milan stands out for its tight synchronisation and adherence to the AVB standard. This focus not only addresses the stringent requirements for precise timing and low latency in Pro AV applications but also underlines Milan's commitment to reliability. In addition, Milan minimizes configuration headaches, offering a streamlined and user-friendly experience.

These differences show that Milan is an option for all manufacturers seeking autonomy and stability in their networked audio systems. By offering a future-proof protocol, Milan not only meets the stringent requirements of

Pro AV but also places the users at the center as it simplifies both network management and administration.

## How it's going...

The adoption of Milan within the pro audio industry has continued to grow. Various well-known manufacturers have begun to incorporate Milan into their products and solutions, expanding the availability of Milan-enabled devices across various categories, including audio interfaces, mixers, amplifiers and more.

As Milan becomes more widely known and more manufacturers adopt the protocol, the future looks promising. Increased compatibility and widespread adoption could lead to a standardised audio networking solution, simplifying set-up processes and improving interoperability between devices from different manufacturers.

## Conclusion

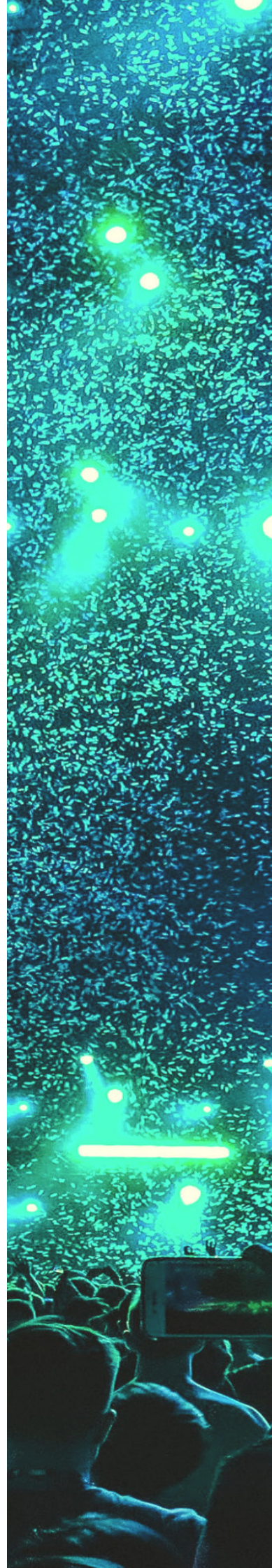
Milan represents a step forward in audio networking, providing an open, reliable, low-latency and synchronised solution for professional audio applications. Its focus on adhering to the AVB standard while addressing the specific needs of the industry positions it as a promising protocol that will shape the future of audio networking.

As the industry continues to evolve, Milan is ready to change the way audio devices communicate, setting new standards for reliability and performance in professional audio setups.

### About the author:



Fabian has been involved in the development of Milan since its inception in 2016. He founded JOYNED in 2022 with the goal to simplify the integration of networking into audio devices. Since then, his mission has been to provide innovative solutions that improve the user experience in the audio industry.





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