

Milan: A Networked AV System Architecture

**The philosophy behind the Milan
Networking Protocol**
November 2019



Network System trends

- **Everything will be networked**
 - Growing requirements for multi-functionality and efficiency of products and systems
 - Networking is just the enabling technology that allows us to deliver experiences
 - The network should not be a competitive market on its own or a bottleneck for innovation
- **The fall of the one-size fits all paradigm**
 - No single network is *THE* network for all Pro AV applications
 - Past positioning/marketing of network standards centered on this claim – this is being challenged today

The industry needs to concentrate on true requirements for networking and to refocus on delivering value to customers



Where does Milan sit?

Three fundamental types of AV networks

1. The all-purpose interconnectivity network

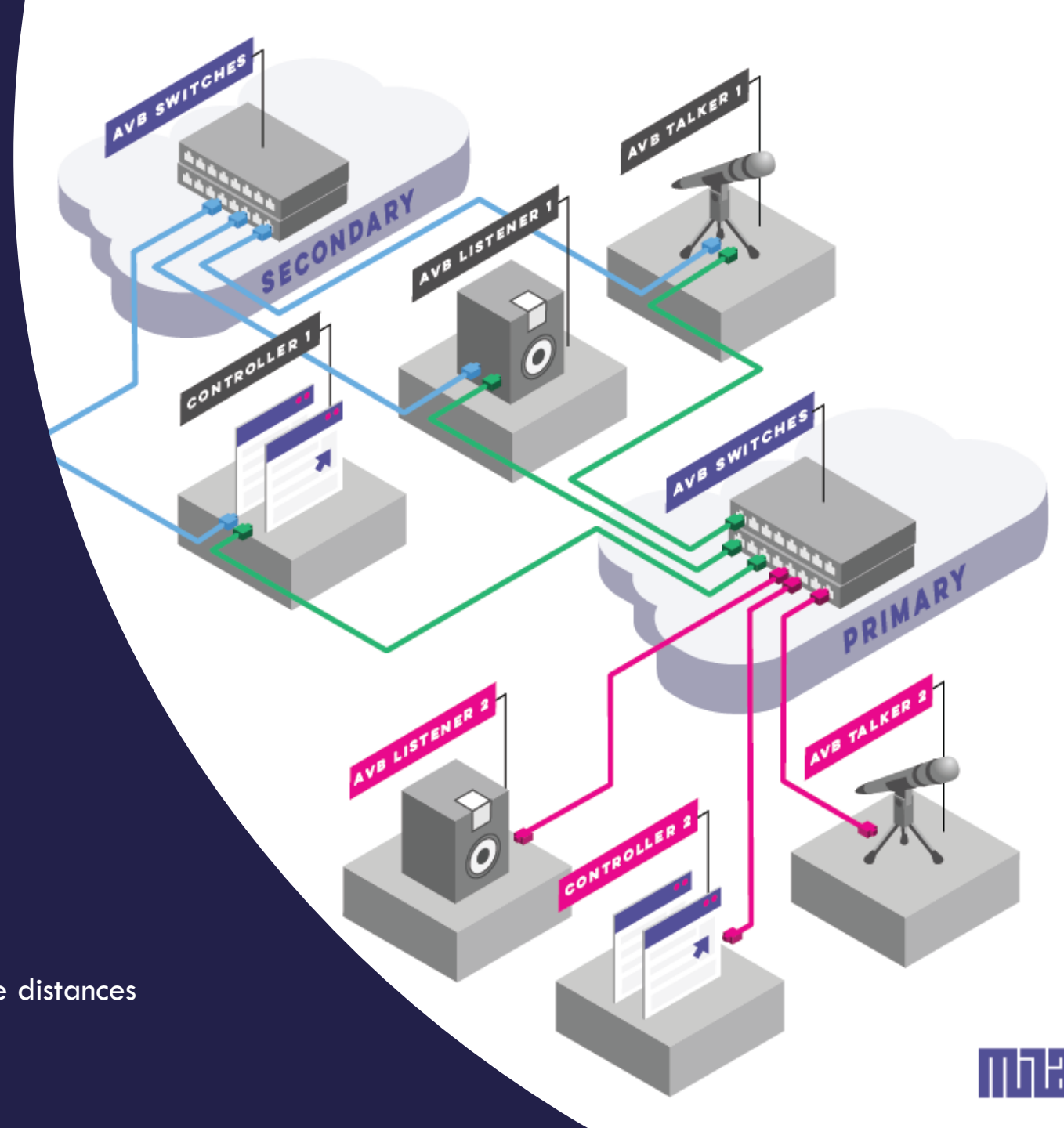
- Connect everything with everything
- Very low dedication to 'System' and 'Workflow'
- Value lies in usualness and commonness

2. The system network

- Provide a network structure for a system context
- Strong relation to product and system value, workflow, specific usability

3. The wide area network

- Defined from bridging signals and workflows over large distances
- Naturally a Broadcast home ground

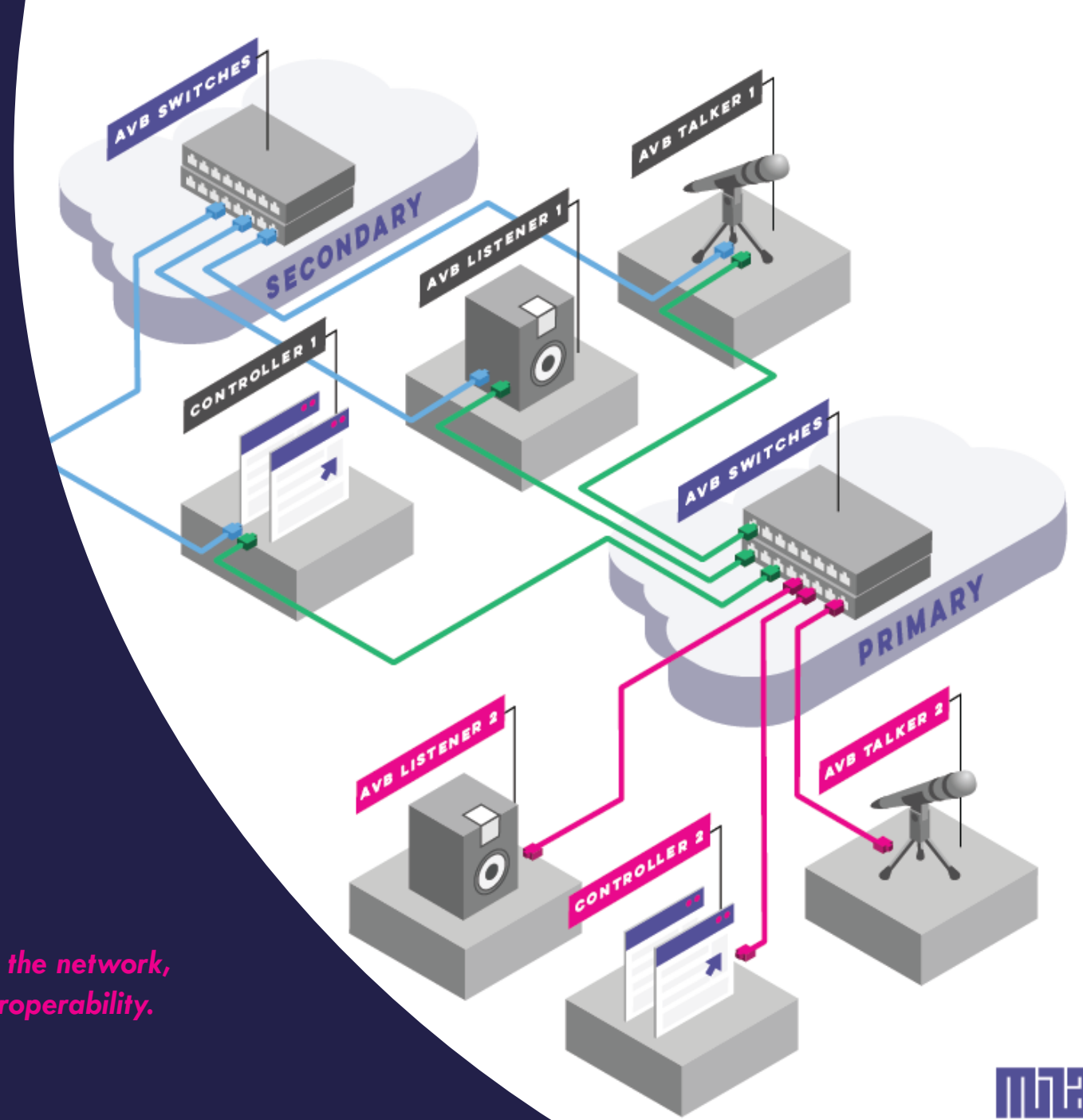


Where does Milan sit?

Milan is primarily a System Network

- Manufacturers need a network standard for THEIR system solutions
- Ownership of standard and implementation and independency from proprietary standards is key
 - Fulfill system-specific requirements, integration in dedicated workflow
 - Platform for creativity and differentiation
- Many proprietary incompatible solutions in market
 - Using open standards with maximum interoperability to others is best choice

Milan enables the best system architectures, manufacturers own the network, create the value prop, can plan for the future AND achieve interoperability.



Milan as the Manufacturer's Network

What if the top engineers and strategic thinkers from leading audio manufacturers in the world came together to design a network standard?

- Milan is the manufacturer's network; the technical AND business decision for the top leaders in the market
- Manufacturers deliberately decided to work together and invest their brightest technical knowledge, expertise, and strategic resources to work together to produce something exceptional, which meets their individual and collective requirements for their own products and customer demands
- Milan builds on an open standard networking technology – creating a link between AV, IT and silicon industries to enable a true IT convergence and develop a foundation that professional AV manufacturers can implement for a long term





Image credit: Meyer Sound

Milan essentials

- Live sound audio engineering is one of the most challenging jobs = highest requirements for audio stability + necessity for fast deployment
- Creators of Milan come from this market and are forced to creatively develop attractive solutions that **do that job, and do it in an easy AND reliable way**
- The network must be **future-proof** to support these long product life cycles, the growing requirements and transformations for the evolving Pro AV market
- **Convergence is a reality.**
 - **Audio, video and IT must coexist on one network.**
 - **The AV market must cooperate with IT**



Milan's Long-Term Product Philosophy

- Milan was not created to compete with other network standards; it's a deliberate execution of the solution that live sound leaders have chosen as their network for creating their systems - **It is an evolving, long-term, viable, and durable network standard**
- Milan isn't created by a single entity defining how things are going to be implemented; its many manufacturers coming together, investing their expertise, resources, and experience to ensure that Milan is an interoperable system architecture for the future of many ecosystems

Milan is not just enabling network connectivity; it is our grid to build on for the future



The Milan Journey



What are audio systems like today?

Things used to be pretty simple ...



... yet limited !

What if we could get this simplicity back combined with modern digital functionality?

Isn't that where things should go?



What is required for the future

AV system structures are rapidly changing

- The isolated value of individual products decreases
- 'Network' is the grid on which everything happens
- Without latest technologies network has become a bottleneck for real innovation

PAST

Individual products/components require connectivity

Network = improved connectivity

FUTURE

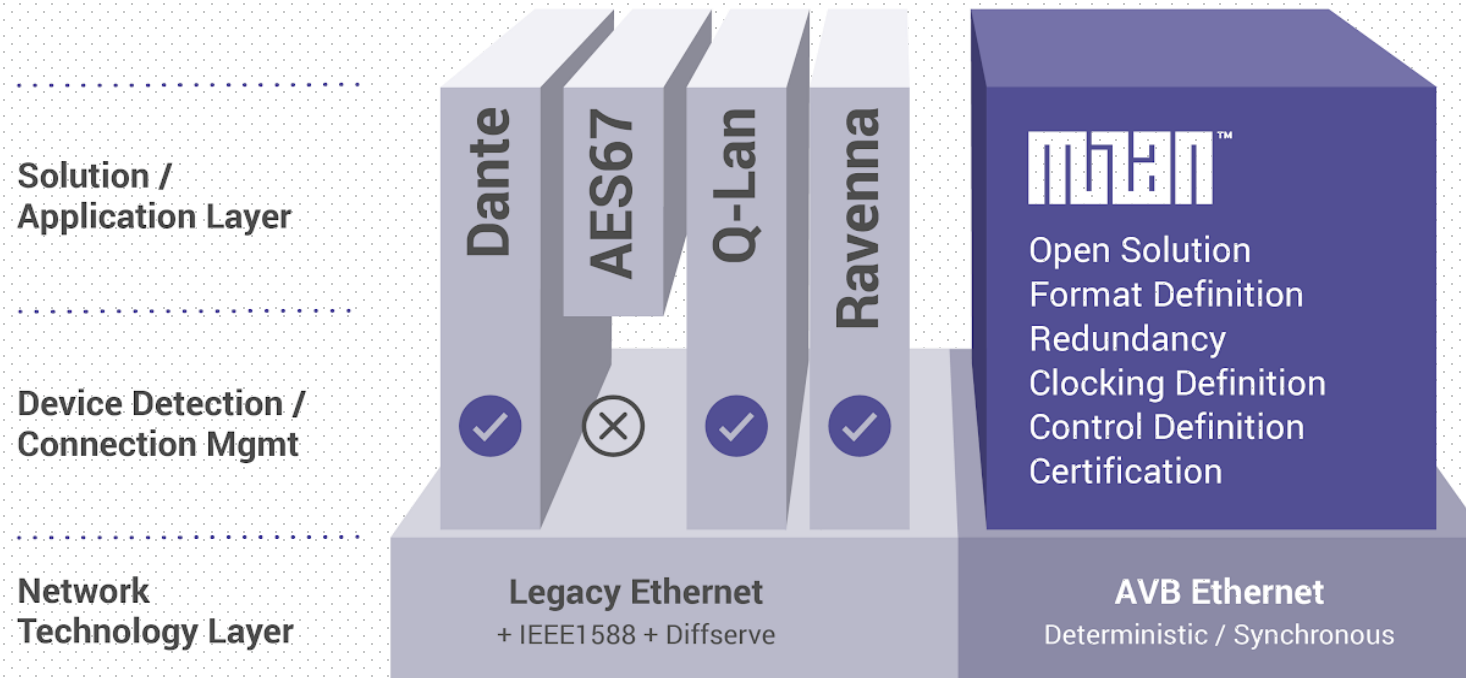
Value and functionality can only be defined within a grid, on the texture of networked integration

So where are the users in this?



Milan Networking Protocol

Application interoperability standard on top of AVB network technology layers

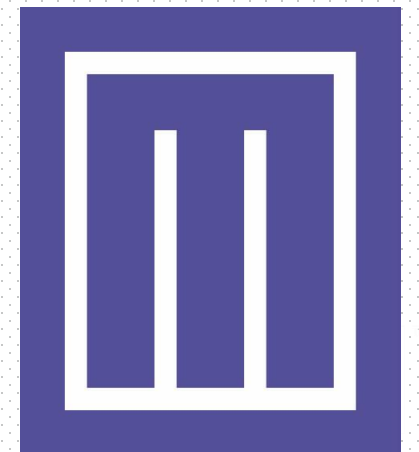


Interoperability through Certification



- An open standard alone doesn't guarantee **interoperability**
- Independent certification is key to a **no-compromise A/V network**
- Certified products build **end user confidence** and eliminate guess work for integrators and manufacturers.

- Milan works with Avnu-certified AVB Switches
- Milan provides certification for the solution level/application layer on top of network foundation



How Did Milan Evolve

- Leading AV and IT manufacturers **making Milan together**
- Manufacturers gain ownership, get in the driver seat
- Collaboration beyond competition since 10/2016
- Defining the requirements together



Milan In the Field



Arcade Fire: Infinite Content Tour 2017

Méduse and Solotech

- **Traveling 451,851 miles**
- **Across over 50 locations**
- **The AV system, comprising devices from various manufacturers, needed to be easily and consistently installed.**
- **Control and Audio on the same network**
- **92 Networked Amplifiers (audio+control)**
- **11 Avnu Certified AVB switches**
- **2 High Channel Count AVB Processors**

mban™

MAKING MILAN TOGETHER

Hollywood Bowl

Named one of the 10 best live music venues in America by Rolling Stone Magazine in 2018

- **17,000-seat venue**
- **Host venue for hundreds of musical events each year**
- **0 incidents with AVB since installation in April 2018**
- **System is never switched off during season!**
- **Audio and control on the same network**
- **42 Networked Amplifiers (audio+control)**
- **4 Avnu certified AVB switches**
- **3 AVB Processors**

Mark Knopfler Tour

SSE Audio Group

- **72 Shows in 2019**
- **68 Locations**
- **Hyperreal Sound System (Multichannel)**
- **Audio and control on the same network**
- **45 Networked Amplifiers (audio+control)**
- **4 Networks AVB switches w. 26 ports**
- **3 AVB Processors**



Rammstein

SSE Audio Group

- **Stadium Tour**
- **Audio and control on the same network**
- **186 Networked Amplifiers (audio+control)**
- **17 Networks AVB switches, 26 ports**
- **3 AVB Processors**

New 2019 Installs with AVB & Milan

- **Orange Velodrome Marseille – 300 loudspeakers & 51 amplifiers**
- **Princess Cruise L-ISA Theaters are all AVB**
- **Chimelong Circus, Zhuhai**
- **Scottrade Center in St. Louis, Missouri, venue of the NHL St. Louis Blues – AVB system designed by IDIBri**

New 2019 Shows AVB & Milan

- **London Symphony Orchestra L-ISA Show in Vietnam**
- **Alice Cooper Tour 2019**
- **Bon Iver Tour 2019**
- **The National Tour 2019**
- **Plenty of others, users just using it**





MAKING MILAN TOGETHER

