Industry Trends and the Digital Future of Sound Masking

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SUMMIT 2022

Today's Presenters

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Todays Presentation

THE SCIENCE OF CORE SOUND MASKING CONCEPTS

ARCHITECTURE AND TECHNOLOGY TRENDS EFFECT ON SOUND MASKING SYSTEMS

CURRENT AND FUTURE FUNCTIONAL REQUIREMENTS OF CLIENTS DEPLOYING SOUND MASKING

PREPARE TO TAKE ADVANTAGE OF EMERGING NETWORK SOUND MASKING TECHNOLOGIES

The Science of Sound Masking

Sound Masking is added to spaces where there is a need for:

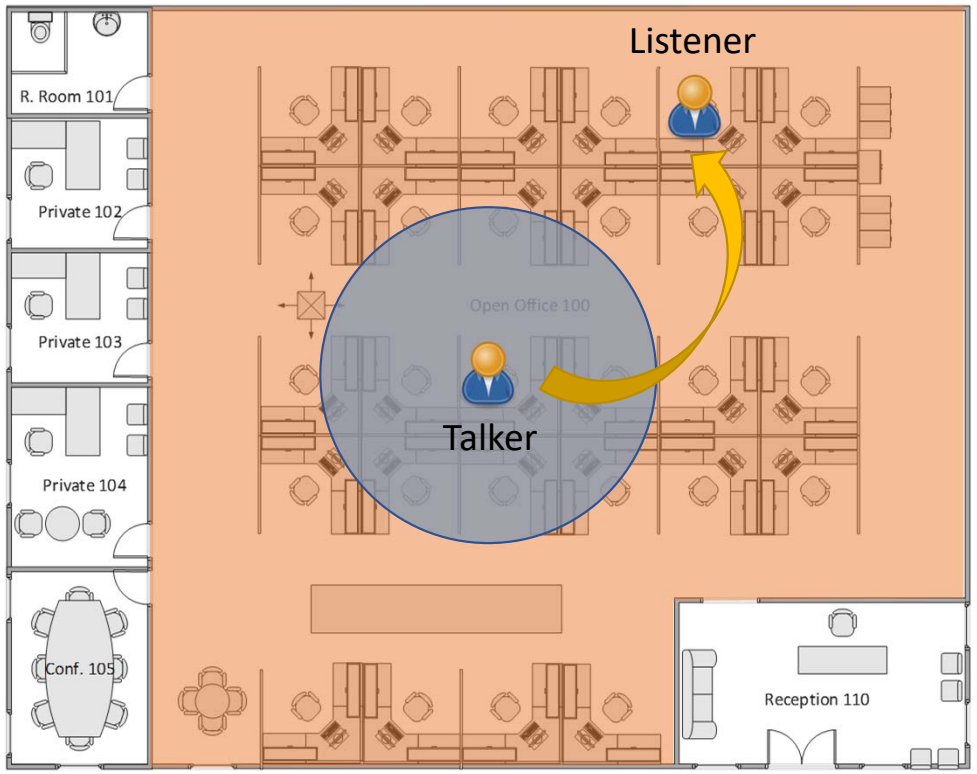
- Freedom from distracting conversations of others (i.e. Open Offices)
- The need for conversations to remain private (example Outside an Exam Room)

The Science of Sound Masking

How it works – In Open Spaces

- A Sound masking signal (spectrum) is added to an environment and “Covers” a distant talker’s speech, thus making the conversation less intelligible.
- A distant conversations may by heard. but when adequate “speech privacy” is present, the conversation cannot be clearly understood alleviating the distraction of the “talker”.

Sound Masking is always placed in the listening environment to be effective.

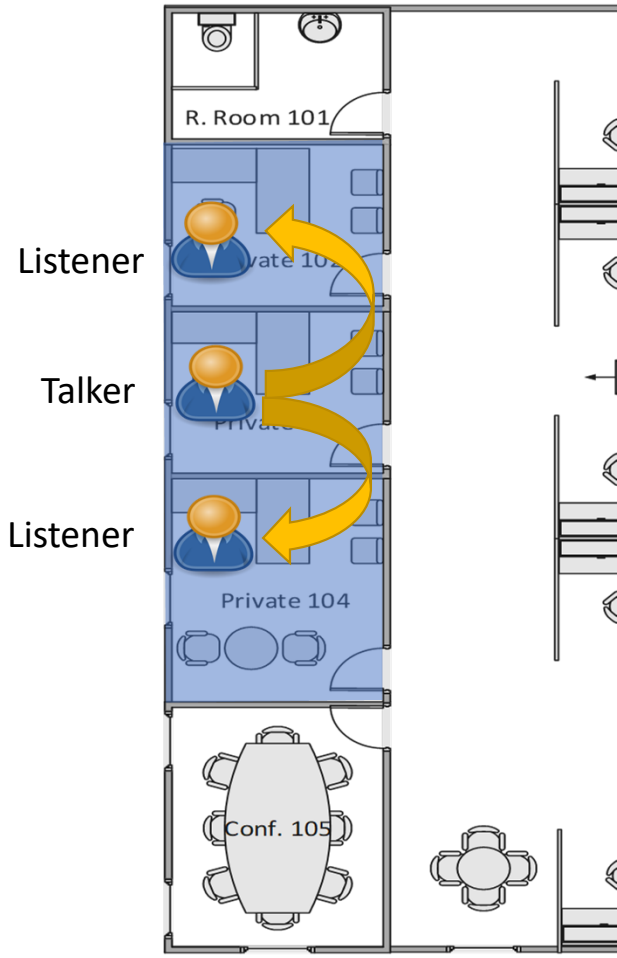


The Science of Sound Masking

How it works – In Enclosed Spaces;

- Sound masking provides speech privacy by lowering the speech intelligibility between adjoining spaces.
- While the "Talker" may be heard, they cannot be understood by the "Listener" in the adjoining space when sound masking is present.

The lack of intelligibility experienced by the listener is referred to as "Speech Privacy"



The Science of Sound Masking

The amount of "speech privacy" present at a given listener location is based on four key variables;

A = Acoustic **A**bsorption present in a space. (finishes absorbing sound)

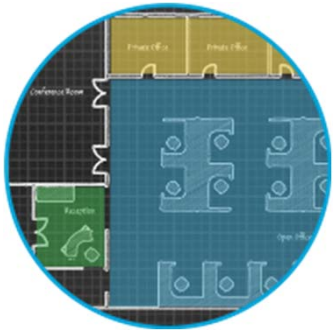
B = The ability for a talker's sound signal to be **B**locked prior to reaching the listener. (walls and partitions)

C = The ability of the talker's signal to be **C**overed by background sounds of the right frequency spectrum. (sound masking)

D = The **D**istance from the talker to the listener

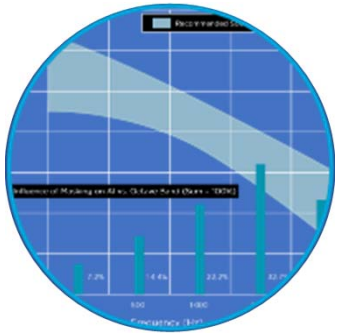
A + B + C + D = The amount of speech privacy obtained in a given environment.

The Science of Sound Masking

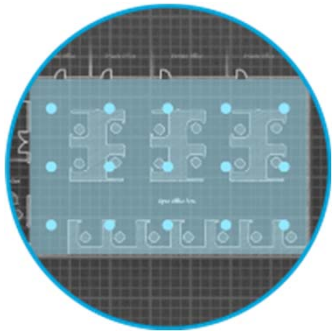


PROPER ZONING

SOUND LEVEL



SOUND SPECTRUM



UNIFORMITY

A Properly designed sound masking system has four key elements in which to "cover" a talker's signal.

- Proper Zoning to accommodate architecture functional use
- Sound Masking volume Level adjusted based on architectural space type
- A Sound Spectrum optimized to promote Speech Privacy
- An extremely Uniform distribution of sound throughout areas of the facility obscure sound masking from the occupant.

The Science of Sound Masking

The Goal: When good sound masking is experienced by listeners throughout a space, it is unobtrusive and extremely consistent. Thus, covering unintentional conversations with adequate levels of speech privacy. The result is **reduced distraction** of unwanted conversations in open areas and **protection of private conversations** in enclosed areas.

However – Sound masking alone ("Covering of the Talkers Signal) is only one of the factor's which contribute to "speech privacy". The others are determined by the architecture and finishes present.

Remember…… A+B+C+D = Speech Privacy.

Architecture and Technology Trends Effect on Speech Privacy

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Architecture & Speech Privacy

When sound masking technologies were first invented back in the 1960's, the spaces which this technology was deployed looked much different than today;

- More Individual office spaces which provided increase "blocking" due to the walls.
- Ceilings were predominately lower in height and used ceiling tile which was the primary source of "absorption" .
- Many open spaces had additional acoustic "Absorption" due to carpeted floors .
- Open offices had full height dividing partitions which often provided both "blocking" and "Absorption".

Traditional sound masking approaches relied on the additional absorption and blocking in this environment to provide adequate speech privacy.

Architecture & Speech Privacy

Today’s spaces are much different with high expansive ceilings, a variety of finishes which are often hard surfaces, and much lower office partition heights. The modern open office has much **less blocking and absorption** which requires a higher level of sound masking technology to provide speech privacy.

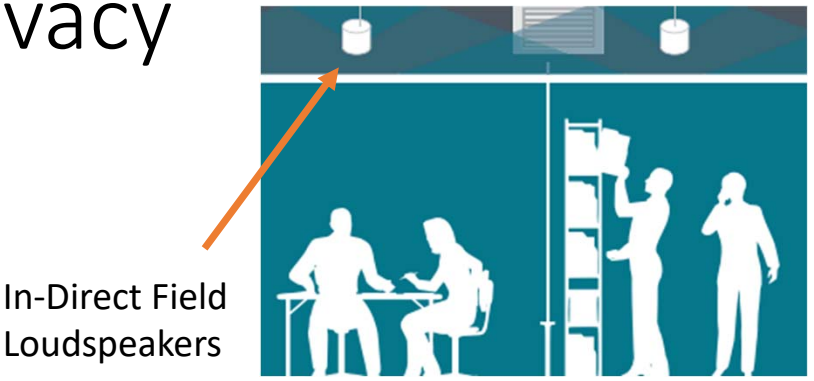
More accurate adjustment of sound masking, more granular zoning, and better sound masking coverage are needed to overcome today's environments.

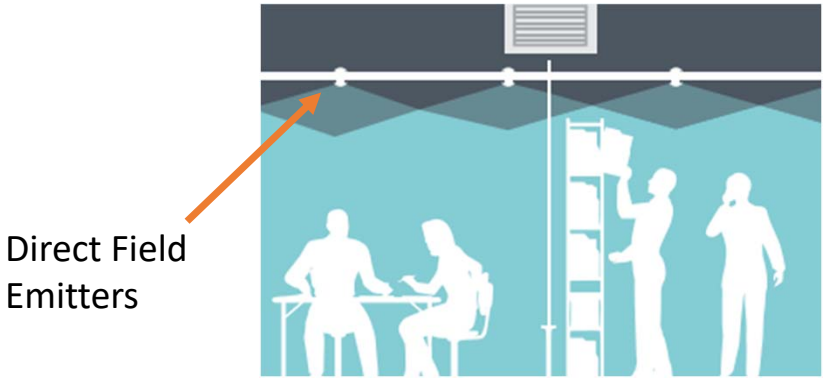
Architecture and Speech Privacy

There are primarily two approaches to Overhead Sound Masking

- "In-Direct" sound masking utilizes upward facing loudspeakers that "bounce" sound off the structural ceiling.
  - Mainly applicable in ceiling tile and open structure ceiling types.

- "Direct Field" sound masking utilizes tiny direct firing emitters which deliver the signal directly to the listener.
  - Applicable in virtually all ceiling types – but requires more emitter devices.





Architecture & Speech Privacy

A new mix of architectural finishes and building approaches requires sound masking systems with better and wider ranging loudspeaker technologies to deliver these higher levels of sound masking consistency in order to achieve adequate speech privacy.

We require a hybrid solution that matches the loudspeaker technology with the architecture present.

Architecture & Speech Privacy

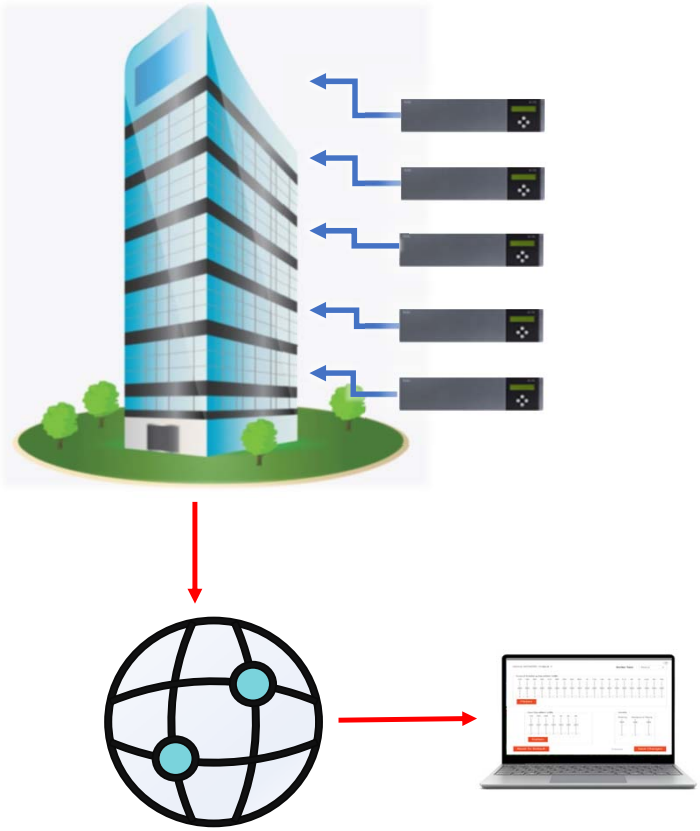
Architecture & Speech Privacy

Approaches supporting differing loudspeaker technologies move sound masking solutions into a more distributed electronics model and away from centralized head ends.

A building block approach must be utilized to support the differing types of loudspeakers serving unique architectures all while providing a unified system approach.

The challenge is to build sound masking technology that can adapt to differing architectural requirements while being seen as a single system for users and building owners.

The answer to this decentralized approach is to leverage the building network for deployment.



Current and Future Functional Requirements of Clients Deploying Sound Masking

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Clients Functional Requirements

There are a host of items informed clients are demanding in their sound masking deployments which impact how sound masking has been traditionally deployed.

- Technology to adapt to changes in architecture and use cases.
- The ability to control, monitoring, and supervise from outside the closet.
- The ability to move to a true ethernet network deployment.
- The ability to leverage a sound masking investment for other purposes.
- The ability to secure systems at an enterprise level.

Clients Functional Requirements

- Sound masking systems must be versatile enough to overcome architectural obstacles yet perform at a high level.
- A building block “system approach” is ideal in allowing differing sound masking devices to be deployed throughout a facility.
- Control platforms for each type of sound masking loudspeaker must be available in a single unified platform.
- The client does not want to choose a single technology approach which can have performance tradeoffs.

Clients Functional Requirements

- Clients have a need to leverage their systems for other purposes. Many are looking at voice announcment delivery which alleviates redundant secondary systems.
- Granular, virtual zones of paging signals, pre-recorded messages, and background music signals can utilize the same infrastructure / and many components found in sound masking systems.
- Standards based networked audio transports such as AVB (Audio Video Bridging) and Dante™ deliver large audio channel counts to provide the zone granularity necessary for today's environments.
- It is possible to leverage sound masking systems for voice announcement and background music purposes for little to no additional client investment.

Dante is a Registered trademark of Audinate

Clients Functional Requirements

- Sound masking systems traditionally have been deployed utilizing proprietary communication protocols which require non-standard (additional) cabling between devices. This limits both interoperability with third parties and low channel counts for other system uses.

- By using standards based ethernet technologies for control, power, and the transport of audio signals throughout a system, a reduction in redundant cabling and the cost of secondary systems will be advantageous to the client.

- Integration with building automation and existing IT network monitoring technologies through Restful API integration can aid in health / status monitoring of critical systems such as sound masking.

Clients Functional Requirements

- System control of sound masking has traditionally been through headend adjustment, wall control, or proprietary client-based software.
- Moving the control of sound masking systems to network centric devices puts the power in clients' hands without physical limitations and dedicated resources.
- Building staff leverage existing web-based PCs, tablets, and even smartphones for daily changes including background music management and message delivery.

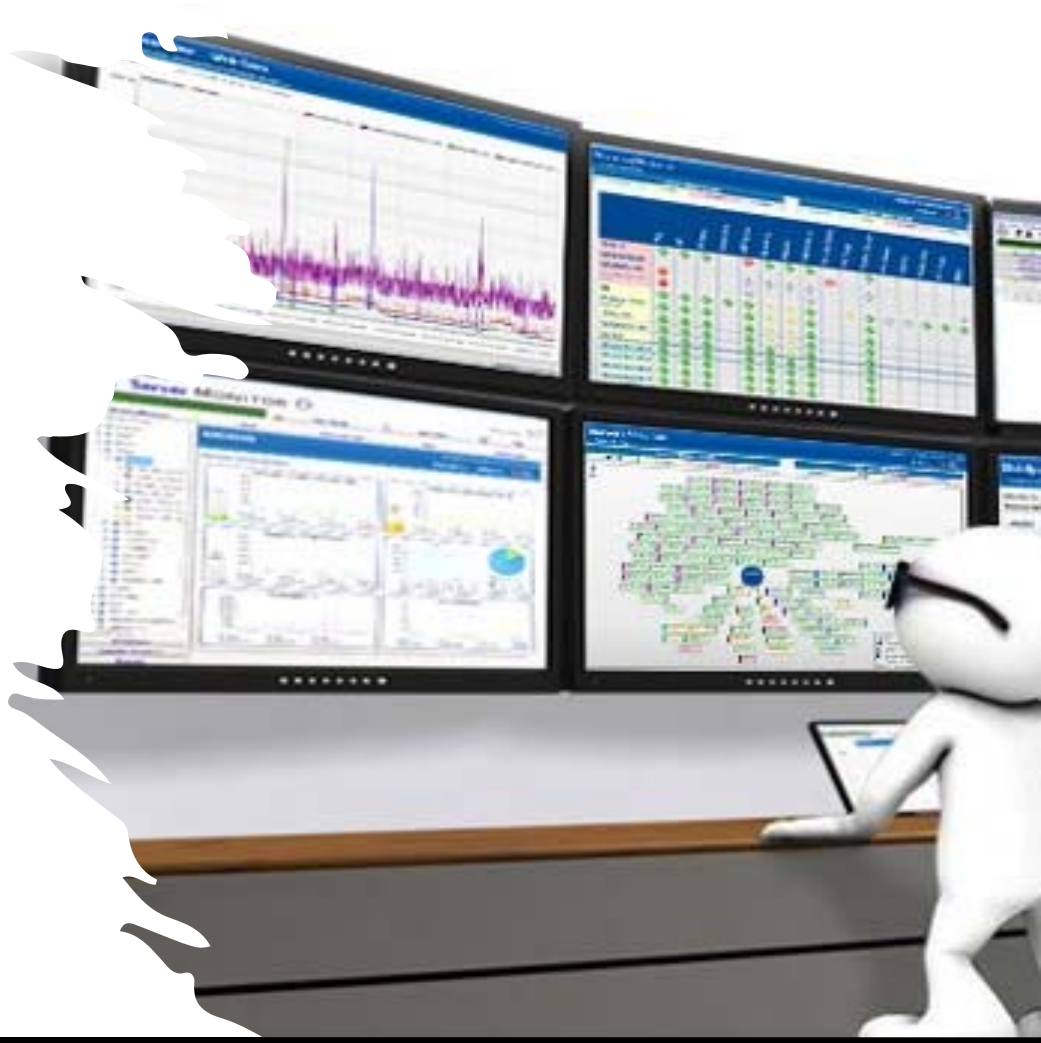
Client's Functional Requirements

- For systems to be network deployed in the enterprise environment, they need to be secured from intrusion.
- Technologies such as multi-role user authentication, encryption of communication, and port monitoring are considered minimum requirements.
- Sound masking traditionally has taken a "silo" or "proprietary" network approach with physical security alone being the primary solution. That is requirement is changing as systems need to be part of the client's network ecosystem.

Client's Functional Requirements

- The next generation of sound masking systems allow clients to deploy along side other building wide systems and leverage existing supervision technologies already deployed by IT departments worldwide.

- Monitor, Control, Supervise, and Maintain from both web-enabled secure browser connections and IT based monitoring platforms to ensure operation and monitor system health.



Prepare to Take Advantage of Emerging Network Sound Masking Technologies

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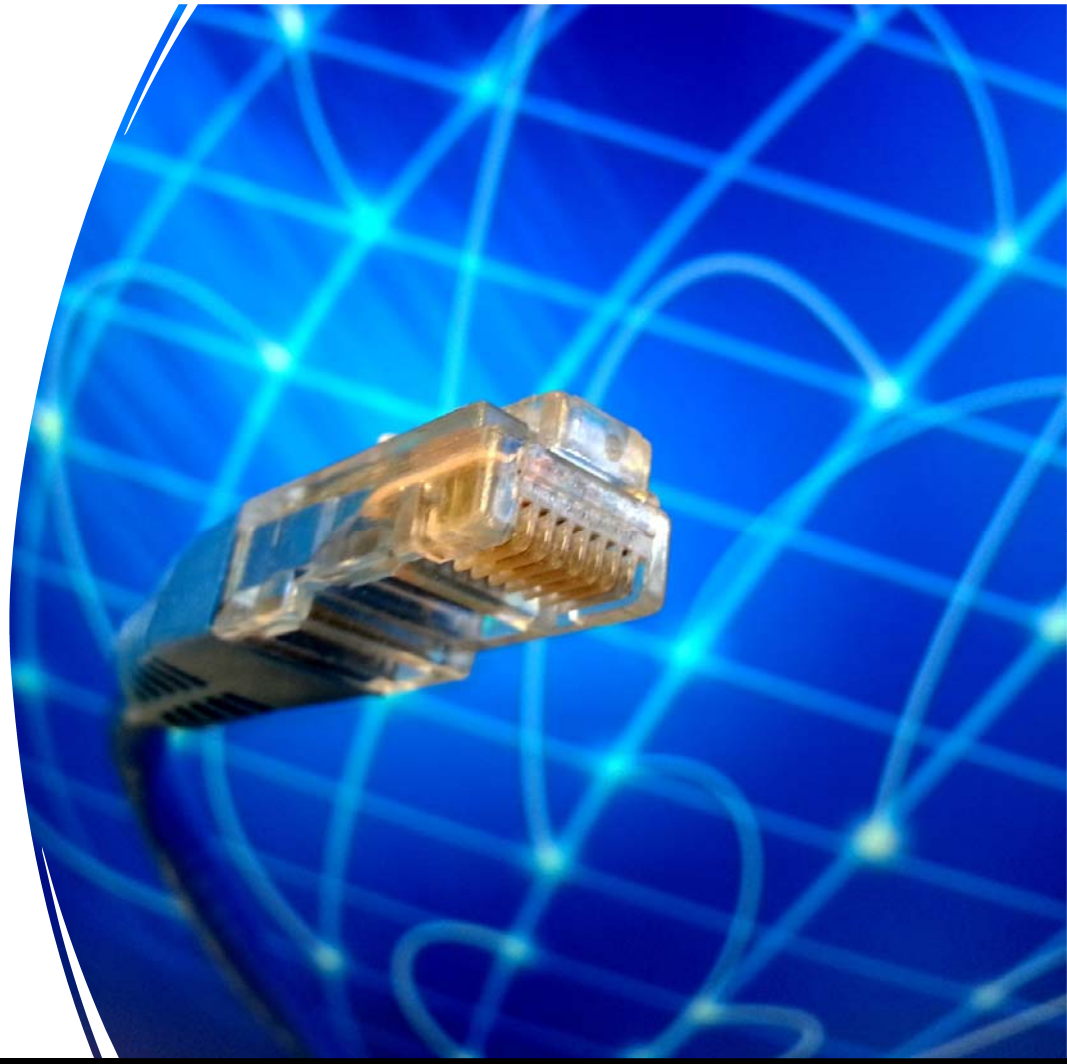
Prep for Networked Masking

- The ICT / Electrical integration community continues to build additional project revenue through the offering of sound masking solutions.
- Up until now, these systems have been predominately analog with limited network connectivity which has been limited to control.
- Deploying the loudspeakers and analog infrastructure remains constant using the technologies you are already familiar with and perform every day.
- However, to remain leaders in the space, you should consider to be prepared to discuss several network-centric principals.

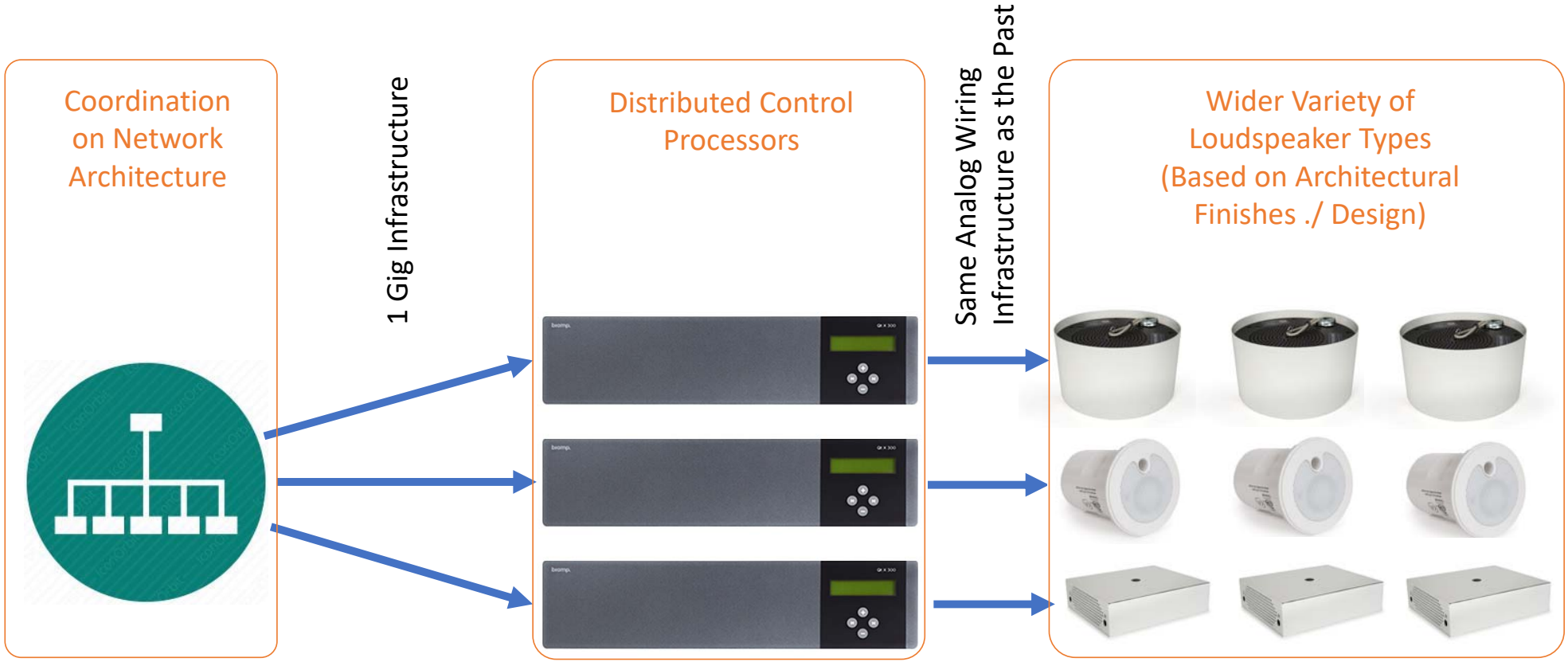
Prep for Networked Sound Masking

What Can We Expect in the Future?

- Expect clients to ask more from the technology you deploy.
- Expect differing loudspeaker types on a project due to wide variability in the architectural environment.
- Expect electronic components to become even more decentralized leveraging PoE+ for power in some instances.
- Expect the core deployment to continue to use the analog wiring methods and types found in past systems.
- Expect “The Network” to play an instrumental role in meeting client needs and delivering features.



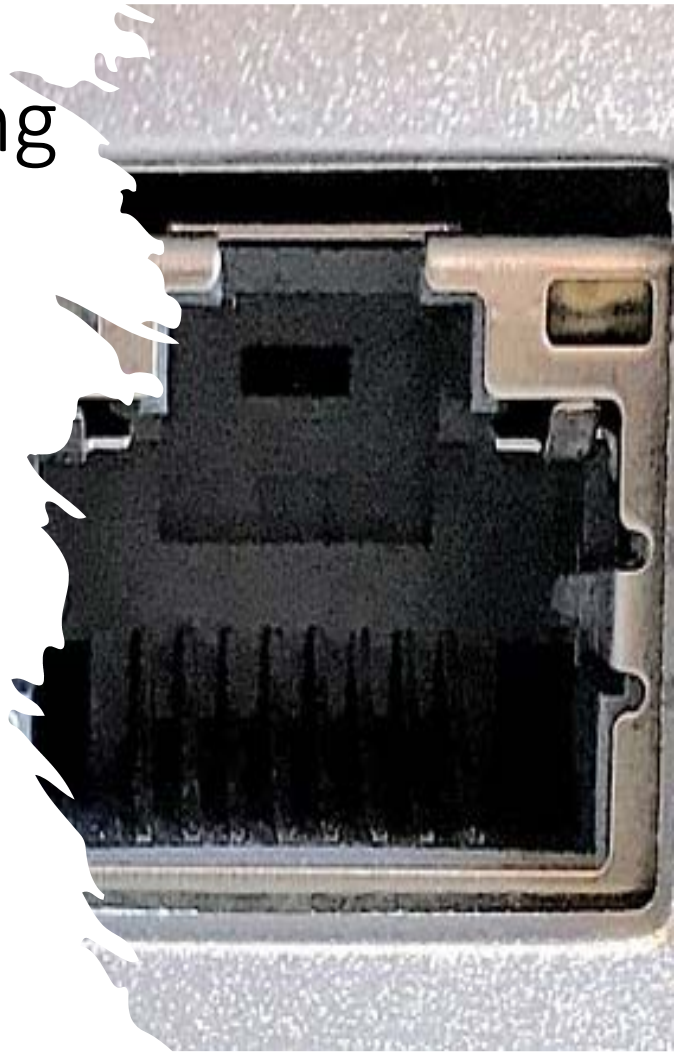
Prep for Networked Sound Masking



Prep for Networked Sound Masking

Putting Audio Sources on the Network

- Virtually all audio transports today rely on time deterministic networks meaning they deploy on “flat” networks. (OSI Layer 2 technologies)
- This network topology along with limited switch hops enables the audio packets to arrive with precise latency.
- A viable strategy for deployment is to advocate Virtual LAN (VLANs) for deployment of sound masking & audio signals.
- Some standard Audio / Video transports rely on software licenses by network switch manufacturers.



Deploying a Solid Security Plan

Prep for Networked Sound Masking

- Limiting access through role base security policies is a good first line of defense to securing systems. (Unique Usernames and Passwords per person)
- Technologies such as 802.1x (port authentication) can identify trusted devices on the network from those which are unauthorized.
- Encryption through updatable security certificates is a method IT uses to ensure only trusted devices can communicate with one another.

Prep for Networked Sound Masking

Be Prepared to Train Staff

- As the deployment of sound masking systems becomes more encapsulated in IT technologies, the importance of staff training on specific platforms / technologies is more important than ever.
- Take advantage of both Sound Masking specific and IT Network trainings available. Many are free and can greatly reduce time spent to deploy systems.
- Work with your sound masking manufacturer partners to understand what system limitations might exist and better prepare your people to discuss them with clients early in the negotiation stage.

Wrap Up

- More sophisticated approaches to sound masking which rely on the building network and bring greater capabilities to clients.
- Decentralized and network-based technologies provide the power to overcome many of today's architectural environment and finish challenges.
- Clients continue to expect more capabilities from the technology they purchase and have need to unify control and monitoring regardless of loudspeaker delivery method.
- While the concepts of how we deliver sound masking have not changed, the tools that we will utilize to achieve speech privacy certainly are evolving.

Thank You for Attending Today!

We are happy to take any questions you may have at this time.

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