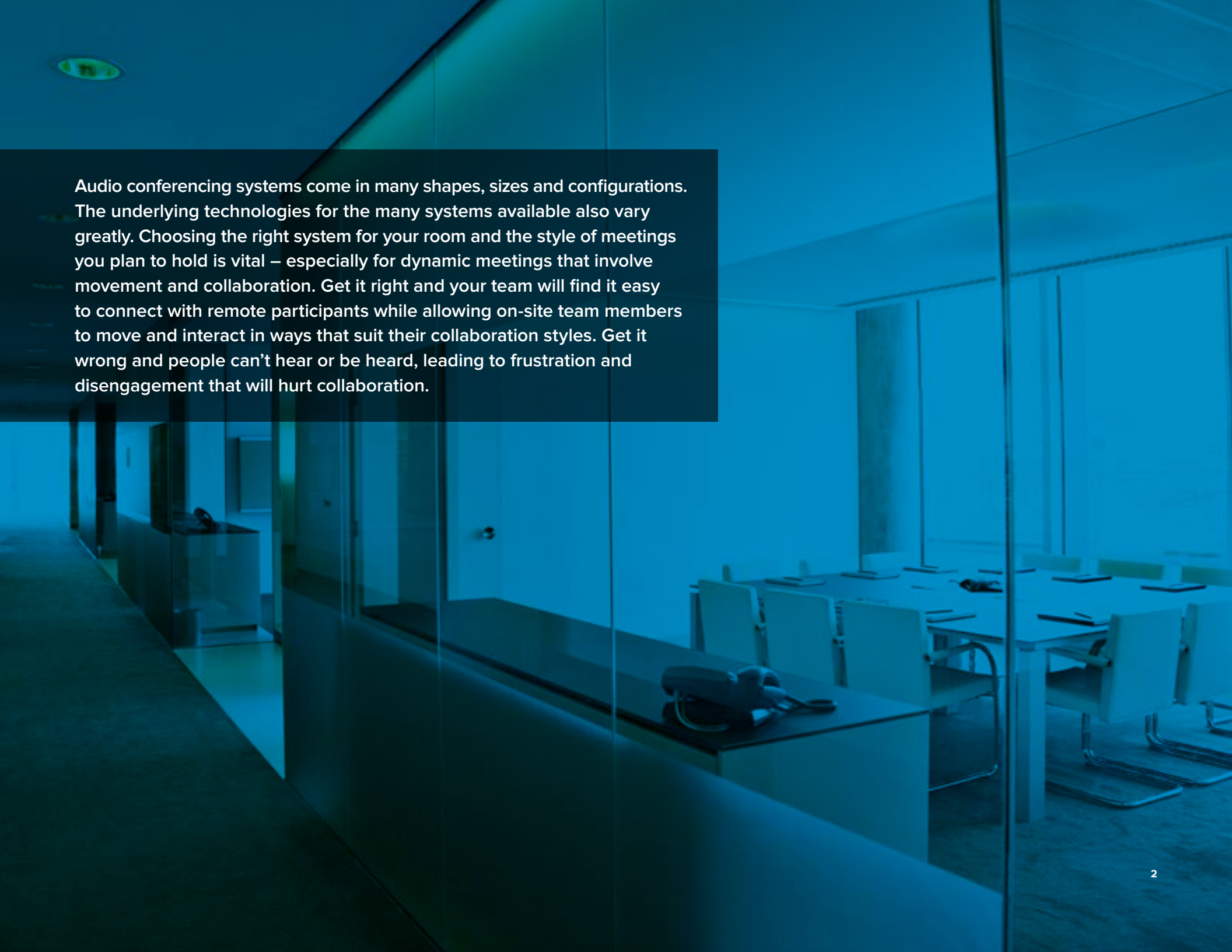# A Brief Guide to Audio Conferencing Systems

How to get the system that enables more dynamic, collaborative meetings

nüreva™

Audio conferencing systems come in many shapes, sizes and configurations. The underlying technologies for the many systems available also vary greatly. Choosing the right system for your room and the style of meetings you plan to hold is vital – especially for dynamic meetings that involve movement and collaboration. Get it right and your team will find it easy to connect with remote participants while allowing on-site team members to move and interact in ways that suit their collaboration styles. Get it wrong and people can't hear or be heard, leading to frustration and disengagement that will hurt collaboration.

Tabletop microphone systems

1 Budget solution for meetings in small rooms. Performance is challenged when participants move and speak away from the microphone.

Ceiling-mounted and wall-mounted beamforming systems

2 Popular high-cost solution performs well in seated meetings, less so when participants move about the room.

Wall-mounted virtual microphone system

3 Innovative, moderately priced solution provides premium performance, even in problem rooms and when participants move about the room.
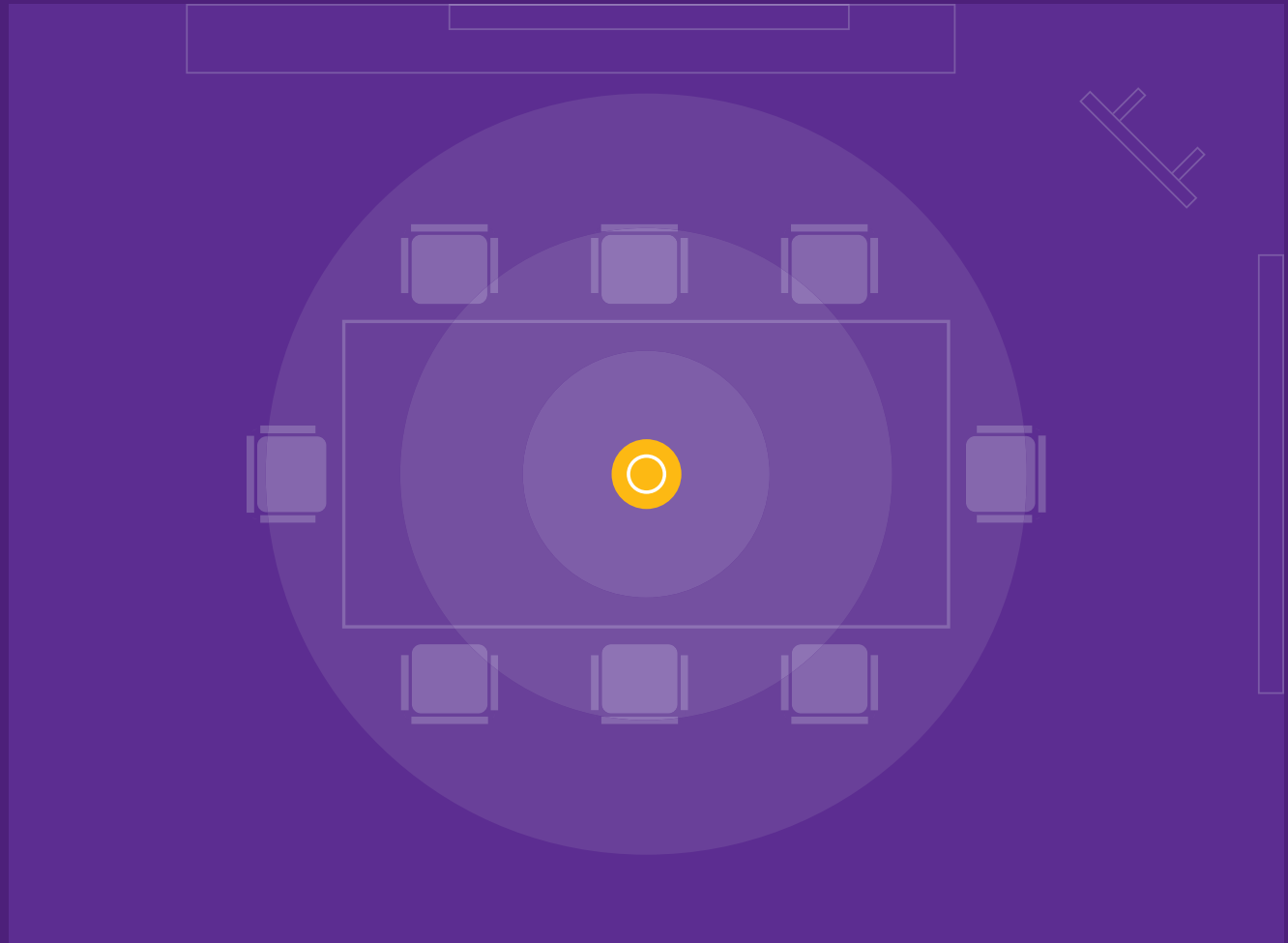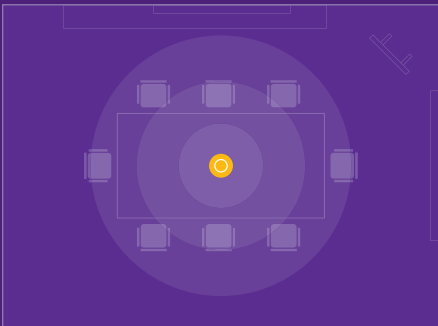
1

Tabletop microphone systems

1

Tabletop microphone systems

The circles emanating from the (yellow) tabletop mic illustrate its typical pickup pattern and range.

1

Tabletop microphone systems

These products include microphone and speaker systems that sit on tabletops. Some have phone interfaces while others integrate with UC&C platforms when connected to a computer. They most often employ omnidirectional microphones, but may use beamforming or other technologies.

Suitability Smaller rooms where participants sit around a table facing the system.

Installation Easy DIY setup on the tabletop.

Calibration and maintenance While some higher-end units in this category offer a selection of calibration settings, most tabletop systems have a single preset calibration that does not adapt to changes in room configuration or number and movement of participants. Little or no maintenance is required.

Esthetics Tabletop units and the necessary cabling may add clutter to meeting room tables.

Performance The performance of tabletop systems generally exceeds that of speakerphones or a smartphone on the tabletop. Many are relatively inexpensive and easy to set up and can provide adequate performance for small groups that remain seated around the table.

Deficiencies of tabletop products include limited range and restrictive pickup. Meeting participants may not be heard adequately if they move about the room or don't face the unit directly. And with pickup originating from the middle of the room, participants often sound distant. This leads to people speaking in a near shout or leaning in to the unit. Sounds from moving coffee cups and computers on the tabletop can also be jarring to remote callers. Overall, the result is audio that is not natural sounding, which leads to a less than optimal experience for remote participants.
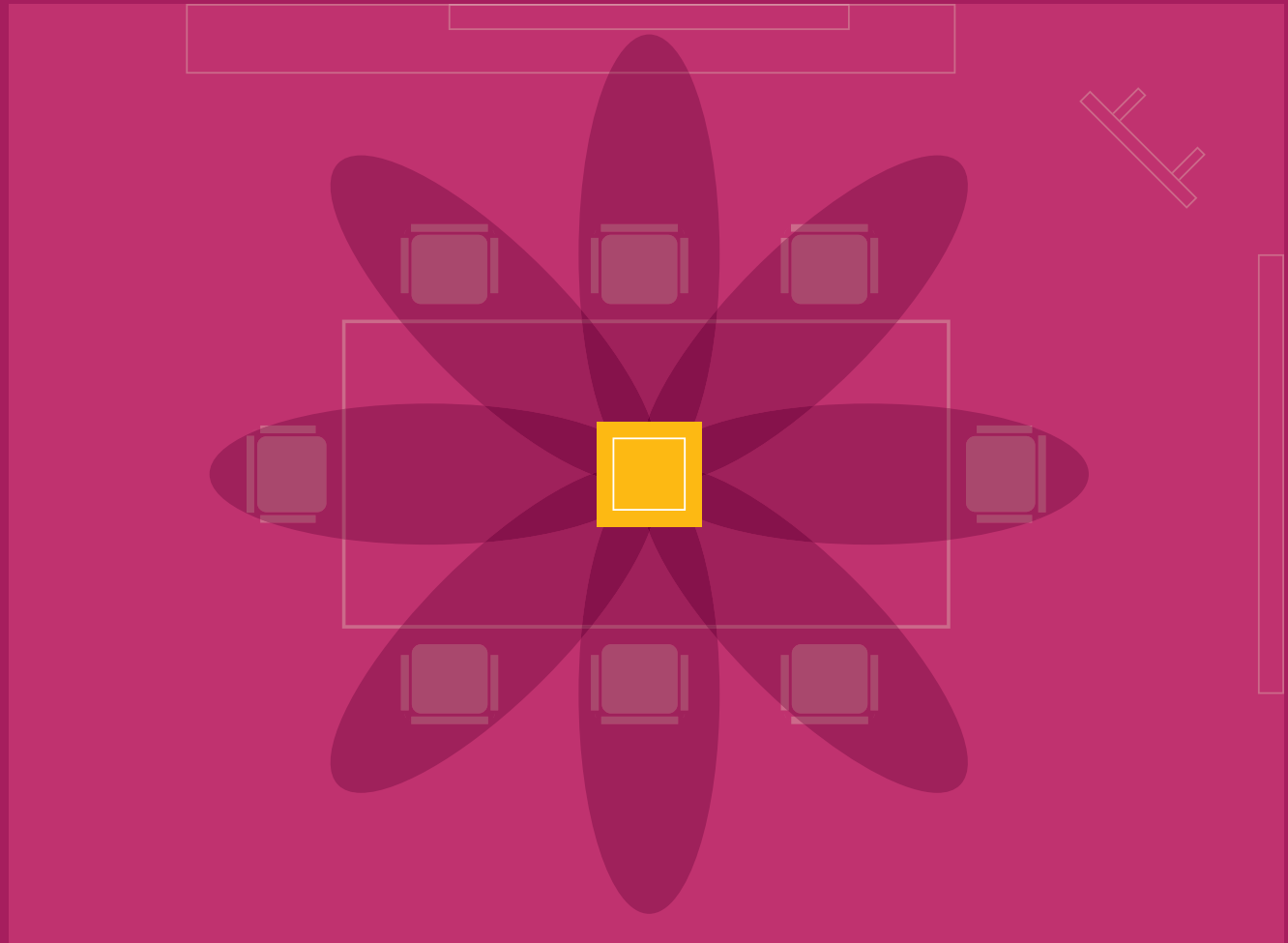
Price range <US$100–>US$2,000

2

Ceiling-mounted
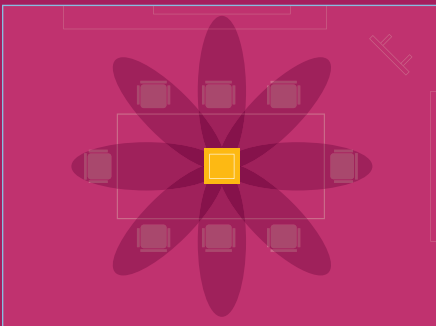and wall-mounted
beamforming systems

2

Ceiling-mounted and wall-mounted beamforming systems

The oblong shapes emanating from the (yellow) mic array illustrate the typical pickup pattern and range of the system's beams.

2

Ceiling-mounted and wall-mounted beamforming systems

Mounted beamforming systems typically entail a range of components, including microphone arrays, external DSPs and speakers. When built into a ceiling, this kind of system may be considered a premium approach (with price tag to match). A small range of wall-mounted beamforming systems are also available.

Beamforming technology, usually considered superior to omnidirectional microphones, requires participants to stay within the prescribed beams (pickup areas).

Suitability Can be customized for a wide range of room sizes. Best performance is for static meetings where participants sit around a table within the directed beams of the overhead or wall-mounted microphone unit.

Installation Most require a professional installer. Can be expensive and time consuming (tying up a room for days). A common concern with ceiling-mounted systems is proximity to ceiling HVAC, which can affect performance.

Calibration and maintenance Programming and adjusting the beamforming mics requires a professional installer (to avoid compromises in microphone pickup performance). And beams need to be adjusted whenever the configuration of the space changes, such as when the conference table is moved, more seats are added, people sit in different areas or new presentation hardware (such as displays and whiteboards) is added.

Esthetics Professionally installed in-ceiling systems are unobtrusive – integrating esthetically with meeting room design. Hanging or wall-mounted systems are also unobtrusive.

Performance These systems provide good-quality, natural-sounding audio when participants stay within the unit's prescribed beams. However, meeting participants can't be heard clearly if they move about the room (outside of the beams) or face away from the unit. This limits the ability of participants to engage with each other and use a variety of collaboration tools. Additional microphones (hanging from the ceiling or on tabletops) may mitigate this; however, this solution can generate a feedback loop with in-room speakers. Reconfiguring a room (adding seating, moving tables) will also require re-aiming and recalibrating the system by a professional technician.

Price range Wall-mounted US$1,499–US$3,999. Ceiling-mounted US$4,500–>US$15,995 (hardware only; renovations, installation, initial programming and calibration are extra).
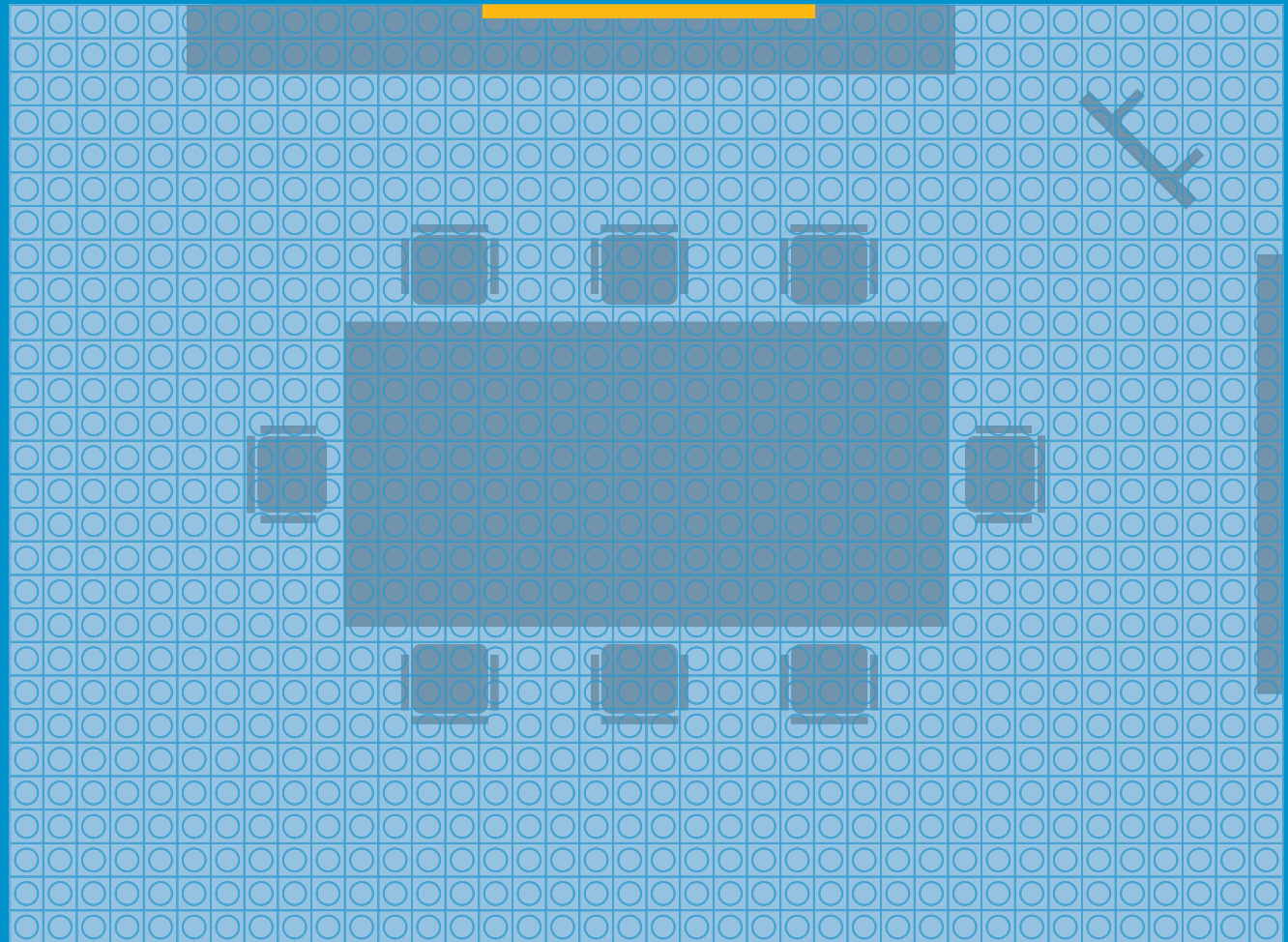
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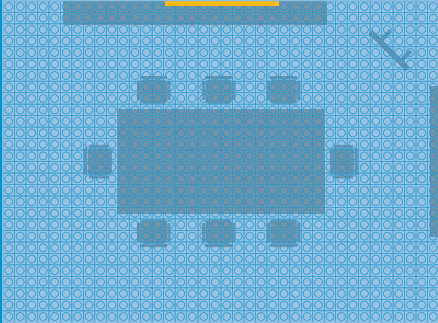Wall-mounted virtual microphone system

3

Wall-mounted virtual microphone system

The dark blue grid with circles illustrates the pickup pattern and range of the (yellow) wall-mounted system's virtual microphones.

3

Wall-mounted virtual microphone system

This option is only available with the Nureva™ HDL300 system, which includes a microphone array and speakers in a unit that can be hung on the wall anywhere in a meeting room. The HDL300 system features patent pending Microphone Mist™ technology, which is a new approach to meeting room microphones. It fills a meeting room with 8,192 virtual microphones so there is always a virtual microphone close to the person who is speaking. This means participants can be heard no matter where they move in the room or which direction they face.

The HDL300's advanced system processing capability, which can handle 15,000 MIPS (millions of instructions per second), allows the system to process sound from all of its virtual mics in real time. It focuses on the cleanest sound sources, without gating or clipping, and optimizes them for distortion-free, natural-sounding conversations.

Suitability The HDL300 is designed for small to mid-sized rooms up to 30' x 30' (9.14 x 9.14 m). The new Dual HDL300 can accommodate large rooms up to 30' x 50' (9.14 x 15.24 m). Both are designed to facilitate active collaboration where meeting participants move freely about the room to engage with other team members and interact with displays.

Installation Involves a simple DIY process that typically takes less than 30 minutes.

Calibration and maintenance Calibration for changes in room configuration or number and movement of participants is automatic. Firmware updates are also automatic through the included Nureva audio manager. Little or no maintenance is required.

Esthetics These wall-mounted units are unobtrusive and professional looking.

Performance Provides natural-sounding audio from meeting participants no matter where they move or which direction they face. This mitigates the problems of dead zones (that affect beamforming technology) and limited range (a deficiency of desktop omnidirectional mics). The result is an excellent experience for remote participants.

Virtual microphone technology also solves "problem rooms." Reflective surfaces, HVAC, movable furniture and dead zones are problem room ingredients that can confound conventional systems. Virtual microphone technology allows the HDL300 system to focus on the highest processing gain value (typically a person talking) and intelligently presents background sounds proportionately to the desired audio. Add in the system's high-quality stereo speakers, and the result is a premium audio experience.

Price (in the USA – prices will vary in other regions) HDL300 US$2,999, Dual HDL300 US$5,499

You've learned about the features and pros and cons of the three leading audio conferencing technologies for small to medium-sized rooms. The next vital factor in making your purchase decision is hearing any system you are considering in real world conditions.
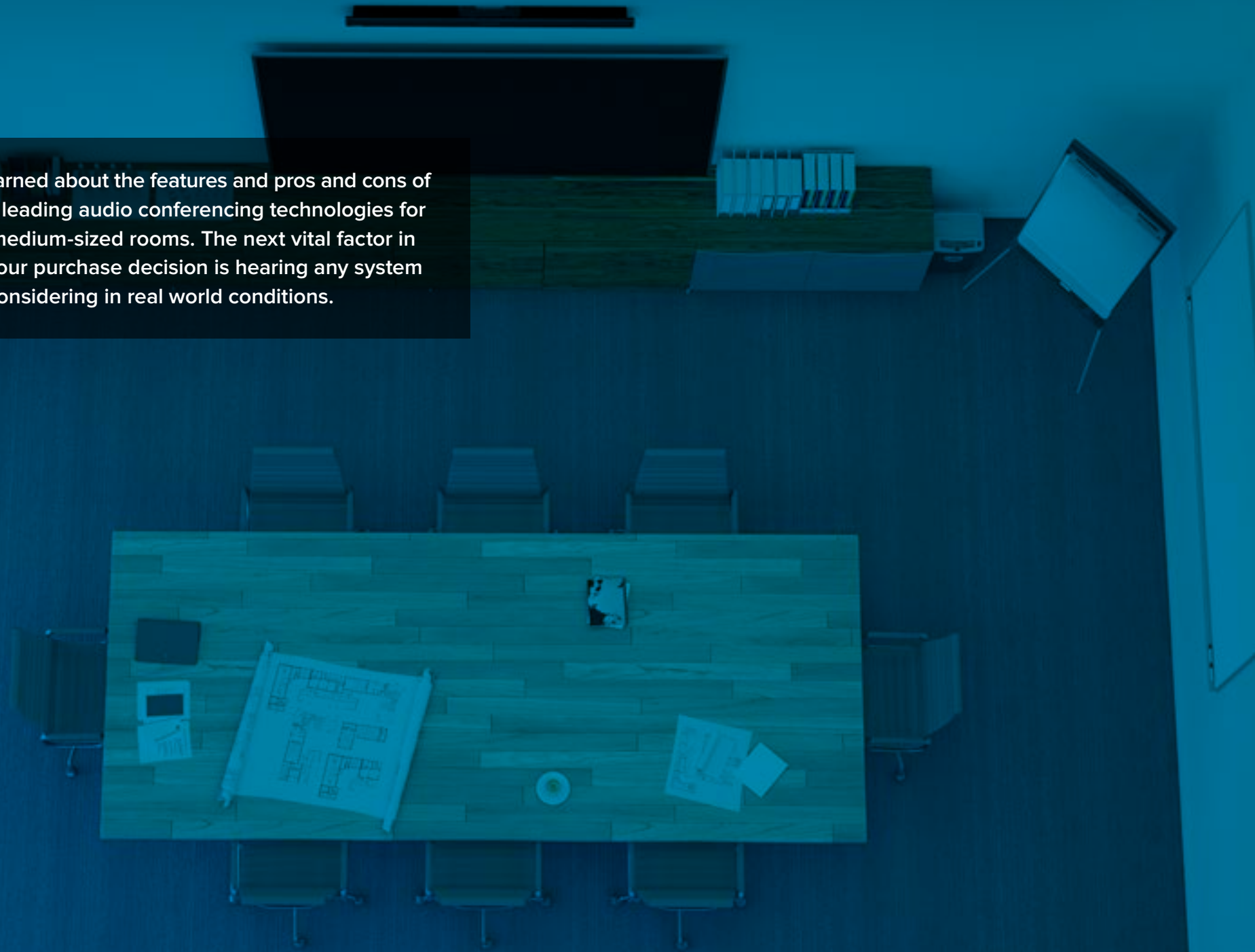
Hearing is believing

In this guide, we've looked at three types of audio conferencing systems. Two (tabletop and beamforming) are legacy technologies. The third, the wall-mounted HDL300 system, is a completely new approach to meeting room microphones. You install it yourself in less than 30 minutes, calibration is automatic and with 8,192 virtual microphones, it is the only system that provides true full-room pickup. You'll hear the difference with just one listen.

Book a demo

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