

APPLICATION BRIEF

USING AMD EMBEDDED PLATFORMS IN COLLABORATION AND EDUCATION

Scalable, Intelligent, and Real-Time AV Processing
From Capture to Collaboration on a Unified Platform



together we advance_AV

OVERVIEW

Hybrid work and education environments are driving rapid innovation in collaboration systems. From small meeting rooms to large lecture halls, organizations demand seamless multi-participant interaction, ultra-low latency audio and video, and AI-enhanced features such as auto-framing, transcription, and content sharing across multiple high-resolution streams.

Many systems still rely on discrete processing architectures, combining separate CPUs, DSPs, FPGAs, networking, and AI accelerators. This fragmented approach increases complexity, latency, power consumption, and development time, making it hard for OEMs to scale across room sizes.

AMD addresses this with a unified, heterogeneous portfolio spanning x86 processors, FPGAs, and adaptive SoCs, letting OEMs consolidate processing, reduce latency, and build scalable, real-time systems across the collaboration pipeline.

AMD TECHNOLOGY END-TO-END

AMD powers every stage of the collaboration and education signal chain, from capture and processing to distribution and display.

AMD Ryzen™ Embedded and AMD EPYC™ Embedded processors serve as the central collaboration engines, handling media processing, AI inference, multi-stream composition, and system orchestration. AMD FPGAs and adaptive SoCs provide deterministic, real-time processing for latency-critical functions such as audio mixing, video switching, beamforming, and AV synchronization. At the edge, power-efficient AMD SoCs enable intelligent endpoints including video bars, microphone arrays, and interactive displays.

AMD and its Embedded Partner Network support industry-standard interfaces including HDMI™, DisplayPort™, USB, PCIe®, and AV-over-IP technologies such as ST 2110, IPMX, Dante AV and NDI.

The AMD heterogeneous portfolio lets OEMs deploy the optimal processing engine at each stage. Long embedded lifecycles (up to 10 years for x86, 15+ years for FPGA/SoC) ensure platform stability and longevity.



SMALL
Huddle Room



MEDIUM
Classroom/Meeting Room



LARGE
Lecture Hall

KEY BENEFITS

REAL-TIME AV PROCESSING

Maintain frame-accurate audio and video synchronization with sub-frame latency for natural, real-time interaction.

FLEXIBLE CONNECTIVITY

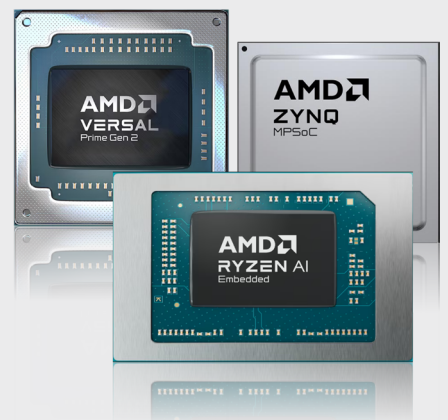
Support multiple concurrent audio and video streams across USB, HDMI, and AV-over-IP networks.

SCALABLE END-TO-END COMPUTE

Deploy one consistent architecture from compact rooms to campus-wide environments using a single AMD roadmap.

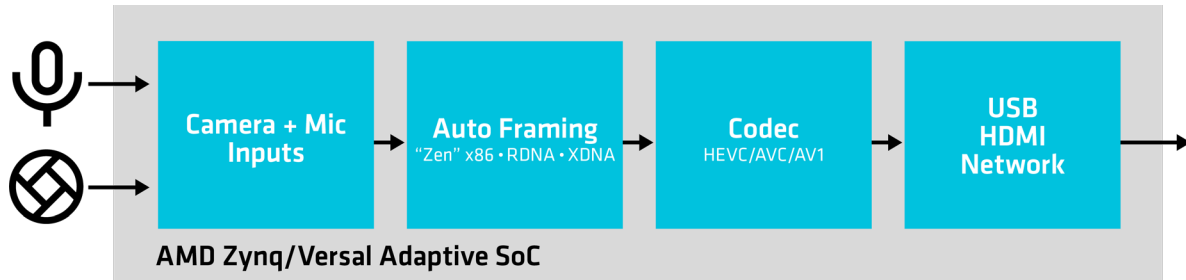
INTEGRATED AI ACCELERATORS

Enable auto-framing, noise suppression, and transcription using on-chip GPU and AI engines.



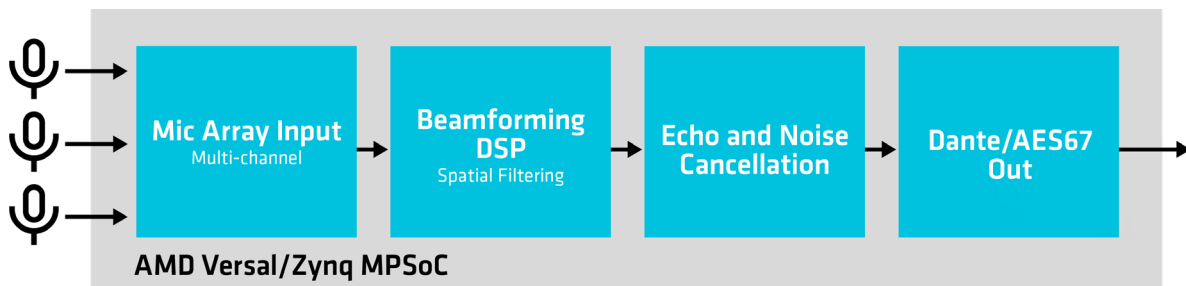
VIDEO BAR / ALL-IN-ONE COLLABORATION DEVICE

An all-in-one video bar combines camera capture, audio, AI, and codecs in a single AMD Ryzen AI Embedded processor. Integrated “Zen” x86 cores, RDNA™ and AMD XDNA™ architectures handle auto-framing, speaker tracking, and noise suppression alongside HEVC/AVC/AV1 encoding, without discrete silicon thereby reducing BOM. This single-chip approach lowers board complexity, cost, and power, simplifying OEM designs and delivering a compact, plug-and-play device that runs standard collaboration software in huddle rooms and small meeting spaces.



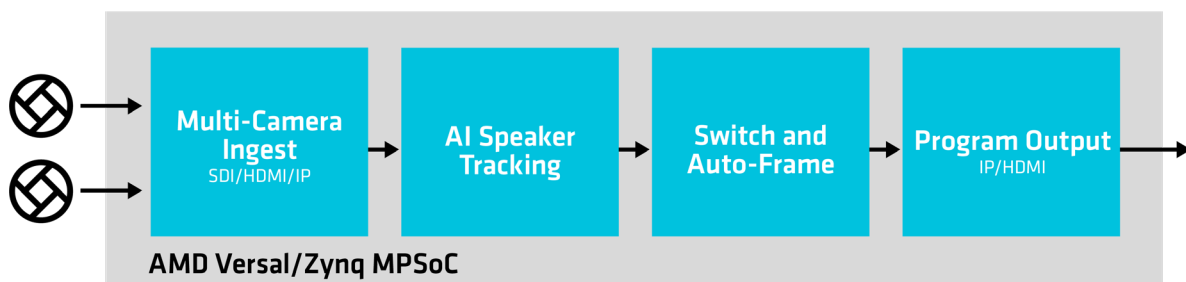
CEILING MIC + SMART AUDIO SYSTEM

A ceiling microphone and smart audio system uses AMD Zynq™ UltraScale+™ or Versal adaptive SoCs to process many microphone channels in parallel. Programmable logic performs real-time beamforming, spatial filtering, echo cancellation, and noise suppression with deterministic, microsecond-level latency that software-only platforms cannot guarantee. Audio is delivered over Dante, AES67, or AV-over-IP for clean, intelligible voice across large rooms, while the integrated Arm® processor manages configuration and control in a flexible single-chip platform.



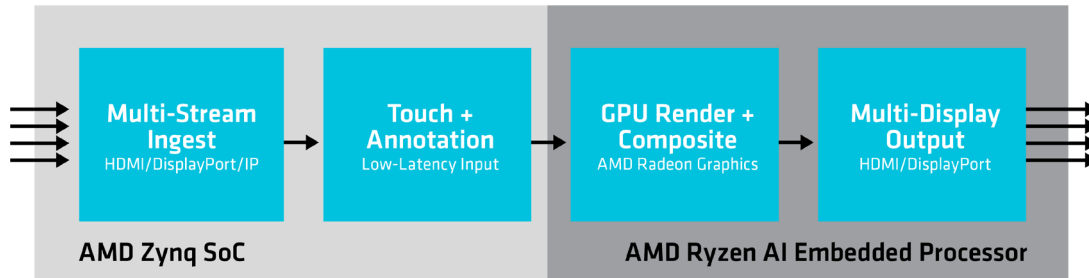
AUTO CAMERA SWITCHING SYSTEM

An automatic camera switching system tracks the active speaker and selects the best view in real time. AMD Versal and Zynq UltraScale+ devices ingest multiple camera streams and run on-chip AI inference for speaker detection, framing, and tracking. Hardware video pipelines handle switching, scaling, and composition with low, predictable latency, while integrated Arm® processors coordinate logic and system control. One adaptive platform replaces separate AI and video boxes, delivering responsive, broadcast-quality switching for hybrid rooms.



INTERACTIVE DISPLAY / DIGITAL WHITEBOARD

Interactive displays and digital whiteboards combine touch input, high-resolution rendering, and live collaboration. AMD Ryzen AI Embedded processors with Radeon™ graphics drive smooth GPU rendering, annotation, and compositing, while an AMD Zynq SoC manages low-latency touch and multi-stream video ingest over HDMI, DisplayPort, and IP. Multiple sources can be displayed, annotated, and shared simultaneously with local and remote participants, supporting responsive writing, flexible multi-window layouts, and seamless content sharing for modern classrooms and collaborative workspaces.



AMD TECHNOLOGY	OEM BENEFIT
AMD RYZEN & EPYC EMBEDDED	• Execute complete collaboration workload from video processing and audio handling to AI inference and system orchestration on a single device. • Scale performance from entry-level room systems to high-density backend infrastructure. • Enable AI-driven collaboration features using integrated Radeon graphics and AMD XDNA architecture. • Support standard operating systems and collaboration software stacks for rapid integration. • Deliver long lifecycle support with up to 10-year availability.
AMD FPGAS (ULTRASCALE+)	• Deliver deterministic, sub-frame latency processing for real-time audio and video pipelines. • Enable high-performance video switching, scaling, and protocol conversion. • Support diverse I/O including HDMI, DisplayPort, SDI, USB, and 1-400GE. • Adapt to evolving standards such as ST 2110, IPMX, Dante AV and NDI via firmware updates. • Accelerate development using a broad ecosystem of AMD and partner IP.
AMD ZYNQ / VERSAL SoCS	• Combine programmable logic and Arm® processing for integrated control and real-time processing. • Enable compact, power-efficient edge devices with built-in intelligence. • Support deterministic, synchronized audio/video processing at the endpoint. • Integrate AI engines for local inference: tracking, enhancement, and analytics. • Simplify system design by consolidating multiple functions into a single chip.

NEXT STEPS

For more information on Broadcast AV solutions, visit www.amd.com/broadcastav

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