Zoom for Broadcast

Redefining Remote Media Contribution

zoom

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Introduction

This document is a comprehensive guide to Zoom for Broadcast, a powerful solution engineered to redefine remote media contribution. It provides a strategic overview, a detailed architectural analysis, and a technical deep dive into the platform's capabilities and operational philosophy. The primary objective is to serve as a resource for television broadcasters, enterprise production teams, and content creators, offering a clear and nuanced understanding of how Zoom for Broadcast enables dynamic, high-quality, and scalable content creation.

The information within this paper is designed to assist professionals in assessing, designing, and implementing remote contribution workflows that are cost-effective and accessible. It delves into the foundational principles that distinguish Zoom's approach, including its unique combination of Raw Data and Multi-Party production techniques, and its role as an open, integrated platform within the broader media ecosystem.

While this document aims for robust coverage, it does not encompass every available feature, as the Zoom for Broadcast team continues to innovate and release new features regularly. Readers with specific inquiries are encouraged to consult with their account or sales teams to ensure a tailored understanding of how this technology can be applied to their unique production needs.

Overview of Zoom for Broadcast

What is Zoom for Broadcast?

Zoom for Broadcast redefines remote media contribution by enabling organizations to seamlessly integrate Zoom's high-quality video and audio streams of remote guests from anywhere in the world into professional live productions with minimal latency and maximum reliability. Zoom has created a globally accessible platform for television broadcasters, enterprise production teams, and content creators to produce dynamic, multi-participant content at scale with lower cost and complexity than traditional remote broadcasting.

Summary of Zoom for Broadcast capabilities

By extracting and injecting media streams within a Zoom environment, producers can feature real-time conversations, panel discussions, and expert insights with broadcast quality. Key capabilities include isolating video and audio streams, conforming to broadcast standards and protocols, and seamlessly distributing video to production endpoints. Beyond remote audio and video contribution, Zoom for Broadcast can also capture audience interactivity data via chat, Q&A, polls, and more to bring engagement into data-driven broadcast graphics pipelines. Unlike traditional point-to-point streaming, Zoom for Broadcast leverages its global cloud infrastructure to significantly reduce latency while enhancing stability and scalability.

Zoom for Broadcast's Multi-Party architecture allows for effortless scaling from a single guest to hundreds using the same core technology, reducing cost and complexity for remote contribution. With robust API and SDK support, Zoom for Broadcast integrates seamlessly into professional production tools across the media landscape, offering a remote contribution solution that is significantly more cost-effective and accessible to broadcast operations of all sizes. Zoom has made the tools for high-quality, scalable, and cost-effective live storytelling broadly available in the broadcast industry for the first time.

Significance to media production

Zoom for Broadcast has revolutionized storytelling by making real-time remote contribution seamless, scalable, and widely accessible. The ability to bring in remote experts, commentators, interpreters, and guests from anywhere in the world has fundamentally changed how live content is produced, particularly in news, sports, and entertainment.

The intuitive interface of a Zoom Meeting provides accessibility for all participants, removing technical barriers and amplifying diverse voices in live storytelling. By eliminating the long-standing barriers of traditional remote broadcasting, such as high infrastructure costs and technical complexity, Zoom's technology has democratized live storytelling, empowering broadcasters, enterprise teams, and independent creators alike.

As the media landscape evolves, Zoom for Broadcast is not just enabling remote contribution—it is reshaping the way stories are told, making live content creation more dynamic, inclusive, and globally connected than ever before.

Benefits of Zoom for Broadcast

Low latency with high quality on consumer hardware

Compared to other broadcast solutions, such as private fiber, bonded cellular, satellite trucks, and WebRTC browser integrations, Zoom for Broadcast offers low latency while maintaining 1080p 30fps quality on consumer computing devices and networks. This combination of optimizations is a unique differentiator for Zoom's design from the competition and a testament to the power of its global cloud server presence. In addition, Zoom for Broadcast's Multi-Party architecture allows for significantly lower conversational latency with optimized streaming between talent through Zoom's cloud instead of requiring broadcast edge endpoints to manually configure the connections in between guests (the "mix-minus").

Time, schedule, and cost savings

The innovations of Zoom for Broadcast have had a tremendous impact on lowering the cost of remote guest contribution and have greatly simplified the setup process, especially when flying in a remote guest to a studio location is impractical to schedule or is cost-prohibitive to implement. Remote contribution via internet calling is substantially more cost-effective than other methods such as satellite contribution, in addition to being substantially less complex to set up, as the guest simply needs a connection to the public internet to be reachable by any studio, any time.

Compared to competing solutions in internet-based remote contribution, such as multi-thousand-dollar devices for the legacy Skype TX platform, ZoomISO from the Zoom for Broadcast platform can be licensed for a fraction of the annual cost and operates on unlimited devices, including the Apple Mac Mini (currently starting at $599). Additionally, ZoomISO provides more capacity, with up to four times the contribution channels (16 simultaneous participants from one instance of the app) compared to legacy solutions (such as Skype TX, with a maximum of 4 output channels) at as little as one-fourth of the cost. Zoom for Broadcast is also at least twice as cost-effective as modern WebRTC-based remote contribution platforms.

From a time-efficiency perspective, Zoom for Broadcast's direct integration with third-party apps substantially reduces the deployment time and workflow complexity necessary for production teams when Zoom for Broadcast runs directly from the tools their teams are already using such as vMix, Wirecast, and Ecamm Live.

Intuitive software with widespread application

Zoom has become a household name for remote video calling, and Zoom Workplace presents an easy-to-use meeting interface perfect for talent contributions from their home office, personal setup, hotel travel, and more. Zoom video is highly reliable, even amidst adverse network conditions, and the Zoom application runs on almost any device with minimal user education required.

Competing broadcast contribution solutions are often unfamiliar and difficult for remote guests who don't have advanced technical knowledge, leading to frustrating onboarding experiences for both the talent and the studio engineer. In the worst-case scenario, these challenges negatively impact both the quality and substance of the broadcast interview.

The familiarity of Zoom's platform, along with its integrations for guest onboarding with apps like Spacecommz.io and Remote Settings Control, can improve talent management and broadcast as a whole. The Zoom platform offers many features that benefit talent contribution and remote workflows, including its meeting scheduler, calendar integrations, breakout rooms, automatic transcription, AI Companion meeting summarization, cloud recording, event management platform, and more.

Zoom's Developer Ecosystem

Zoom provides an open platform and has offered its core technology to third party developers via extensive API and SDK support, allowing deep integration of Zoom services into professional production platforms. Zoom offers Raw Data access to obtain decoded audio and video buffers from remote participants and their shared content at scale, and provides workflows that enable secure and transparent data management for remote guests.

Zoom's High Bandwidth Mode technology enables developers to subscribe to multiple HD video streams simultaneously from Zoom's cloud. Zoom's own broadcast solutions like ZoomISO are built off of the same developer technologies that third parties can access. Zoom's technology has been validated by major broadcast technology providers and directly integrated into their products for seamless workflows, underscoring the robustness of the Zoom platform for broadcast-grade productions.

Following years of developing broadcast contribution solutions using WebRTC and other competing platforms, numerous companies including Vizrt, Ecamm, vMix, QuickLink, mimoLive, GnuralNet, and Wirecast developed Zoom integrations. This widespread adoption indicates that the industry recognizes Zoom's approach as uniquely positioned compared to traditional remote contribution methods.

Scalability through Zoom

Zoom for Broadcast can scale from a single participant to dozens in a call, or even hundreds at a time using the same core architecture. The communication between participants is highly efficient, fully featured, and user-friendly; benefitting from the fact that Zoom is an undisputed leader in video meetings.

Many traditional broadcast contribution systems still rely on single channel connections for remote guests, and cannot scale past the expensive studio hardware channel limits. Previous technologies like Skype TX had to work against these point-to-point limitations by mixing the streams in the studio endpoints, raising the compute requirements, technical complexity, and deployment costs.

Zoom can achieve industry-leading performance without compositing all participants into a single buffer in its cloud or creating submixes at the edge, which are powerful architectural advantages that enable Zoom's cloud services to independently handle stream optimizations on a per-participant basis while also managing routing

between participants. As a result, Zoom for Broadcast can provide individual video and audio streams at full quality and lower latency without requiring powerful and complex edge mixing devices.

In addition, Zoom has taken the distinctive approach of building software natively for each platform it supports which has allowed it to democratize remote contribution. Apps like ZoomISO run natively on affordable ARM devices like the Apple Mac Mini, and other solutions like Custom AV for Zoom Rooms deliver unrivaled performance on server-grade PC appliances. These optimizations contribute to better scalability as the remote contribution requirements of an organization's production pipeline increase.

Architecture Deep Dive and Comparisons

Screen-Scraping vs Raw Data

Several videoconferencing products require the use of a remote contribution method known as "Screen-Scraping" in order to be brought into a broadcast video pipeline. Zoom for Broadcast uses an alternative approach based on a "Raw Data" architecture.

Screen-Scraping

Screen-Scraping refers to a method of remote contribution that involves capturing the system display(s) running videoconferencing software via a dedicated capture card or scan converter and cropping out any content from the operating system or software such that only the remote guest is visible. For example, a production company could use a videoconferencing app's "Pin" feature to have an individual guest occupy as much of a screen as possible, then capture the system display using a tool like NDI Scan Converter and system sound using a virtual audio cable to ingest into a video switcher like vMix. This method became popular during the broadcast industry's pandemic-induced rapid migration to a heavy reliance on remote guests joining from home. Some production companies still leverage Screen-Scraping for remote contribution because it is the "lowest common denominator" solution that can work across a wide variety of videoconferencing providers.

There are several challenges with Screen-Scraping that make it unsuitable for modern, professional broadcast work. First, the conferencing software and operating system may create "screen debris" from GUI elements such as pop-ups, notifications, banners, and tags. These visual artifacts often end up on-air when using Screen-Scraping, leading to issues ranging from a visual clash with other production graphics to blocking the face of the remote guest with a system pop-up or their audio with a notification chime. In addition, the cropping, panning, and zooming required to isolate the remote guest from within the frame degrade the quality of the resulting image. Finally, screen-scraping is also costly to scale. Each remote guest requires their own dedicated computer or system screen in the studio's infrastructure, leading to a "pinning farm" where a table in a broadcast studio is filled with laptops each dedicated to a single remote guest. Between all the computers, screens, and capture devices required to create a pinning farm, Screen Scraping introduces multiple points of failure across a large and expensive hardware footprint that produces subpar video quality and risks on-air disruptions from system pop-ups and notifications.

Raw Data

Raw Data refers to the ability of some videoconferencing tools to provide isolated audio and video buffers of remote guests to broadcast applications and protocols directly, without requiring the capture of their GUIs. The Raw Data method resolves the major challenges of Screen-Scraping by disintermediating the system's displays from the video pipeline. As a result, the output is always a "clean feed" containing only the remote guest.

Raw Data is often the highest quality method of remote contribution because there is no cropping, panning, or zooming required to isolate the remote guest feed. When implemented with sufficient bandwidth, Raw Data can significantly improve the "density" of the remote contribution pipeline by allowing a single computer to export multiple remote guests simultaneously, which improves efficiency and scalability. Another advantage of Raw Data is that the production is not forced to inherit the aesthetic of the videoconferencing app's GUI. For example, many videoconferencing apps have distinctive "Grid View" layouts with logic and UI elements that may clash with the intentions of the production design. Raw Data allows the isolated elements to be composed by the main production systems, resulting in a program output that is consistent with the intended design language.

From a broadcast pipeline perspective, a key advantage of the Raw Data approach is that it allows the videoconferencing client to integrate directly with production protocols without requiring converters or adapters. Most videoconferencing clients must be output via computer display standards like HDMI or DisplayPort when using a Screen-Scraping approach, but clients that can access the Raw Data can instead export the streams to a variety of standard production protocols like SDI, NDI, Dante, SMPTE-2110, SRT, and more. A direct integration with broadcast protocols reduces the deployment cost of a remote contribution system by eliminating unnecessary converters in addition to simplifying the signal chain and removing points of failure.

Zoom for Broadcast's Raw Data solution

Zoom for Broadcast uses Raw Data as the foundation of its remote contribution pipeline. Products in the Zoom for Broadcast portfolio allow the user to select individual participants, their shared content, the active speaker, and more as independent isolated audio and video outputs to production systems.

When the user has selected media to capture using Zoom for Broadcast products, these specialized Zoom clients communicate with Zoom's servers to request the individual feeds directly. Then, the client conforms the incoming video streams to broadcast standard formats such as 1080p 29.97fps. This conformance process allows Zoom for Broadcast to leverage variable resolution and frame rate to minimize conversational latency even amidst adverse network conditions while simultaneously insulating broadcast production equipment from the variability of these streams by scaling the video up or down and repeating or dropping frames as necessary to hit the studio's desired frame size and timings exactly.

Zoom for Broadcast handles stream optimizations independently on a per-participant basis via a “ladder encoding” system on each participant's client, paired with dynamic routing from Zoom's cloud reflectors based on real-time QoS telemetry. This advanced system provides that the best possible quality for each guest is received when it reaches the studio systems. If there are a sufficient number of “rungs” on the encoding ladder, a guest with a high-quality connection is not downgraded because another guest has a low-quality connection, as each will receive a version of that participant's stream that meets their requirements.

In total, the above method is designed to support the receiver in obtaining and standardizing the best quality for each guest before it reaches the studio systems, without being forced to broadcast the “lowest common denominator” to all endpoints in all cases. The dedicated output feeds delivered by Zoom for Broadcast are configurable, reliable, and free of any unwanted overlays.

Single-Party vs Multi-Party Remote Contribution

When multiple guests are brought into a live production at the same time, there are two distinct architectural approaches to the remote contribution design: "Single-Party" calling where each guest is in their own unique videoconferencing session with a unique studio endpoint, and "Multi-Party" calling where all the guests are connected to the same videoconferencing session with a shared studio endpoint.

Single-Party Design

Most remote contribution systems used in broadcast television are built on a Single-Party design, where there is a dedicated calling session for each remote guest. This system applies the point-to-point model used by a wide variety of remote contribution technologies, such as satellite contribution, to videoconferencing connections.

In a Single-Party design for remote contribution via a videoconferencing tool, this system equates to one "meeting" per guest. In the broadcast studio, there will be a dedicated receiver for each remote caller that may also provide a return feed to each guest. Often, these studio endpoints are dedicated computers that each join a single call to extract each guest individually. In some cases, such as legacy Skype TX hardware, a single computer can create multiple point-to-point calls simultaneously. In either case, the studio is responsible for bridging the guests together by creating individual "mix-minus" feeds which return audio (and occasionally, video) from all guests except the receiver back to them. This setup allows for the emulation of a point-to-point workflow using videoconferencing technologies.

Single-Party calling has several attractive features for TV broadcast engineers. First, having individual return feeds dedicated to each guest allows for customizations such as guest-specific notes, cue cards, or content layouts. Critically, individual audio returns create the opportunity for implementing interruptible foldback (IFB), a one-way communication system where producers can override the program return audio to give important notes to remote talent. In addition, individual calls for each guest removes the opportunity for cross-talk between guests at inopportune moments, since remote guests can only see and hear each other if the studio decides to actively bridge them.

Single-Party calling also poses several challenges to remote contribution workflows, especially for enterprise video production teams or content creators with less budget or equipment than television broadcast companies. The requirement to join a unique call for each guest creates steep hardware scaling challenges, requiring the purchase of dedicated computers for each guest or expensive appliances that can join multiple calls simultaneously. In addition, the broadcast engineers operating a Single-Party calling system must have the necessary audio and video equipment to create a customized mix-minus for each guest, which adds significant expense and complexity to the production pipeline. The latency between guests is substantially higher than a traditional videoconferencing session because the stream for each guest must first travel to the studio mixing systems before being returned to the videoconferencing platform sessions for distribution to other guests. This additional delay results in more than double the conversational latency of a normal virtual meeting, which can lead to awkward moments with guests talking over each other or long pauses while they try to wait for each other to finish speaking. Finally, managing all the individual calls can be a scheduling and staffing challenge requiring the studio to keep track of all the guest calls in a given show block, manage concurrent meetings, and monitor guest activities across multiple devices.

Multi-Party Design

Multi-Party calling is the standard method of remote contribution used by enterprise video teams and independent content creators. This approach to remote contribution is a more modern method of bringing in multiple remote guests at the same time using a single videoconferencing session. This design leverages the advantages of videoconferencing technology to create a more seamless guest experience with significantly reduced requirements for hardware and operations.

In a Multi-Party design for remote contribution via a videoconferencing tool, this equates to one "meeting" for the group of guests to join in a given time block. The guests all join the same meeting, and the studio also joins this meeting with their contribution client. Because all the guests are automatically receiving each other via the cloud mix-minus inherit to the videoconferencing platform, the studio only needs to return any supplemental audio (such as in-room talent, sound effects, or content playback) to add to the session as another "participant" in the meeting. If the studio is using a videoconferencing platform that supports Raw Data in addition to a Multi-Party design, and there is sufficient bandwidth to the contribution client, only a single computer is needed to extract multiple guests from the single meeting into the production pipeline.

The Multi-Party remote contribution system is a natural extension of normal videoconferencing experiences, taking the same core architecture as having a remote business meeting and adding a broadcast client to the call to pull the guests into a production pipeline. Multi-Party calling reduces the hardware footprint of the contribution pipeline significantly by eliminating the need for dedicated clients for each guest. Conversational latency is reduced by over 50%, often substantially more, because guests are directly bridged together by the videoconferencing platform and do not need to be transported to and processed by the broadcast studio, leading to more natural and fluid conversations between remote guests. The guest experience is further improved by having the other guests directly available in the same call they themselves are connected to, creating a significantly more familiar, meeting-like environment compared to Single-Party calling. Multi-Party calling is also more efficient for both broadcast software clients and studio operations teams, since the mix-minus for each guest does not need to be processed on-device or offloaded to the studio production pipelines.

There are some challenges that must be addressed by Multi-Party contribution systems. To implement talkback, the videoconferencing platform must support an additional one-way transport extension unique to each guest in order for them to receive independent return feeds from the studio. In some situations, multiple unique video return streams may also be desirable to accommodate the needs of each guest. The videoconferencing platform also needs to support sufficient bandwidth allocation to the studio client so that it can receive all the guests simultaneously, otherwise multiple clients may be required for extracting the guests. Finally, consideration must be given for when guests are permitted to connect to each other to avoid unintended cross-talk.

High Bandwidth Mode - The Zoom for Broadcast approach

Zoom for Broadcast can operate in either Single-Party or Multi-Party calling modes. Especially for TV broadcast companies that need to operate with individual calls for each guest due the design of their existing infrastructure, Zoom for Broadcast can bring the benefits of the Raw Data contribution pipeline to the Single-Party approach. However, for most organizations, there is an additional innovation established by Zoom for Broadcast when using Multi-Party calling that amplifies the benefits of the Raw Data approach even further: High Bandwidth Mode (HBM).

Zoom's HBM technology allows up to a 100Mbps downlink from Zoom's cloud to each studio client. When signed in using a qualified Zoom account on a supported client, HBM equates to 16 simultaneous 1080p 30fps remote guest streams to a single client. Reducing the resolution and frame rate can expand the number of remote feeds even further, up to a theoretical maximum of 250 remote streams simultaneously flowing to a single client. HBM is a substantial technology advantage created by Zoom for Broadcast that dramatically reduces hardware requirements, pipeline complexity, and conversational latency in broadcast workflows.

By combining Raw Data and Multi-Party calling with Zoom's HBM technology, Zoom for Broadcast offers unique and deeply powerful capabilities for remote contribution workflows.

Products leveraging Zoom for Broadcast

Zoom for Broadcast is comprised of a variety of first party production tools created by Zoom, a suite of remote contribution features in Custom AV for Zoom Rooms, and broadcast integrations created by 3rd parties using Zoom's SDKs and APIs or industry-standard production protocols.

Zoom Production Tools

Zoom has created a suite of production tools that enable remote contribution of audio, video, and data at scale into broadcast production pipelines.

ZoomISO

ZoomISO is Zoom's official, high-end offering for remote contribution in the Zoom for Broadcast platform. ZoomISO is a dedicated app for obtaining isolated video and audio streams from the Zoom platform as clean feeds that can be exported to production systems via hardware outputs from SDI and 2110 products from Blackmagic Design and AJA Video Systems, NDI, SRT, Syphon, system displays, or multi-channel audio devices such as Dante Virtual Soundcard, Loopback, and Black Hole Audio. ZoomISO has powerful management controls for routing participants and their shared content to outputs with a variety of selection modes, deep integrations with devices like the Elgato StreamDeck via BitFocus Companion, and fallback controls to adapt to the circumstances of a live event with tools like Video Loss Mode. ZoomISO can also output up to 25 languages of remote interpreters simultaneously joined via Zoom to its audio pipelines.

Tiles for Zoom

Tiles for Zoom scales remote contribution to large audiences by allowing customers to create customized Zoom participant galleries with highly configurable branding and interactive components, optimized hybrid event auditoriums and live streams. This macOS application offers a simple and powerful editor interface to compose Zoom participants onto gallery canvases which can be exported to production protocols. The Tiles editor and its live previsualization capabilities facilitate deep customization of the Zoom gallery with controls for custom borders, rounded corners, aspect ratios, drop shadows, transparency effects, overlays, animations, and more. Because it is critically important to make sure that each member of the Zoom audience is ready to be on-air, Tiles offers a variety of moderation tools to organize the participants within the gallery such as favoriting or blocking participants, sorting them by roles or video status, and setting rules for excluding non-video participants or other user categories. Tiles achieves incredible performance on affordable Mac hardware thanks to deep optimizations for cutting-edge Apple technologies like SwiftUI and Metal and is scalable across multiple devices when a customer needs to create large galleries with hundreds of participants without the risk of duplicates.

Zoom Graphics Toolkit

The Zoom Graphics Toolkit provides remote contribution of audience interactivity data and allows users to render customized, highly interactive graphics for live streams and hybrid events to engage Zoom audiences using chat, Q&A, polls, and more. The Toolkit is a self-hosted web application available for Windows and macOS systems that offers a flexible in-app editor for creating web-based graphics to use with production systems, along with a powerful engine for managing and moderating Zoom participant interactions to use with custom graphics. These Zoom graphics are rendered as web HTML/CSS pages accessible via URLs that can be imported into production systems or digital signage. With the Zoom Graphics Toolkit, customers can display an animated scrolling chat graphic or highlight special chat messages individually, route the audience's active questions from the Zoom Q&A system to production graphics, display captions with speaker attribution and real-time language translation using customized fonts, colors, and branding, create customized emoji fountains from Zoom audience interactions, and

visualize Zoom Polls for live audience feedback during an event. The Zoom Graphics Toolkit also supports custom HTML/CSS code as well as a flexible Zoom data templating system so customers can design their own interactive graphics from scratch instead of being restricted to only modifying the app's stock presets.

ZoomOSC

ZoomOSC provides a control gateway for remote contribution pipelines by creating an Open Sound Control (OSC) API that can be used to control various capabilities of Zoom Meetings. ZoomOSC provides a robust, real-time control layer that allows for the automation of complex event sequences and abstraction of functionality to customized interfaces. Broadcasters can create custom controls to manage key Zoom features such as pinning, spotlighting, muting, and screen sharing as well as receive events based on key meeting actions such as participant join events, question or chat submissions, and breakout room changes. ZoomOSC simplifies the broadcast integration process, making advanced controls accessible to a wider range of professionals.

Custom AV for Zoom Rooms

Zoom Rooms, a software-based conference room system, has been upgraded with a suite of Custom AV features that significantly enhance connectivity, customization, and control options. Zoom Rooms equipped with Custom AV capabilities are powerful remote contribution clients capable of leveraging the full advantages of Raw Data access, Multi-Party calling, and High Bandwidth Mode. These devices are particularly attractive for customers seeking an appliance form-factor with enterprise-grade management tools for their remote contribution technology.

Advanced I/O and Protocol Support

Custom AV for Zoom Rooms supports 12 configurable video outputs and 4 camera inputs from a single appliance. These outputs support both Network and Hardware AV protocols including robust support for NDI and Blackmagic Desktop Video products (including SDI and IP-2110 connectors). Custom AV for Zoom Rooms also supports up to 8 receiving and 32 transmitting channels of Dante audio.

Similar to ZoomISO, Custom AV for Zoom Rooms can output individual participants, their shared content, or active speakers to isolated output channels. Additionally, this Zoom product can transmit customized Gallery Views for enhanced flexibility. Custom AV for Zoom Rooms can leverage High Bandwidth Mode to transmit multiple remote guests at Full HD quality, and have a built-in conformance layer to scale and clock the incoming Zoom streams to broadcast-standard resolutions and frame rates selected by the studio engineer.

Customization and Control

Zoom has created the Custom AV Zoom Rooms Controller (CAVZRC) to provide direct management of all remote contribution channels across an entire fleet of Zoom Rooms from within one centralized operator dashboard. The CAVZRC can pair to multiple Zoom Rooms simultaneously, even remotely, to expose full control over NDI, Hardware I/O, and Dante channels to technical operators.

In addition to the CAVZRC, Zoom has created a Zoom Rooms Controller SDK (ZRC SDK) to allow developers to integrate Custom AV and room control functionality directly into their products. The ZRC SDK is a native C++ library that allows developers to control a Zoom Room from their own applications, with near feature parity to first-party applications like the CAVZRC as well as the Zoom Rooms Controller on Android, iPadOS, and Web platforms.

Zoom Hardware Certification

Zoom has created a set of hardware certification categories for Custom AV equipment to confirm performance of Zoom Certified equipment with the Custom AV for Zoom Rooms features. This certification process involves rigorous third-party lab testing as well as an evaluation of the performance of Zoom products using the candidate devices in simulated broadcast environments.

Zoom Broadcast Integrations

Companies from across the broadcast industry have integrated Zoom for Broadcast into their products, including many who have pivoted development resources into integrating Zoom's developer offerings after several years of building their own custom broadcast contribution solutions directly with WebRTC or other competing platforms. These extensive integrations leveraging Zoom's developer tools and High Bandwidth Mode capabilities demonstrate a broad recognition of Zoom's superior approach over alternative methods of remote contribution.

Companies implementing Zoom for Broadcast into their products via Zoom APIs and SDKs include:

Vizrt
vMix
Ecamm Live
QuickLink
Wirecast
Epiphan Connect
GnuralNet LiveToAirZ
NewBlue Captivate
mimoLive
Cinamaker
SPX Graphics
SpaceCommz.io
TroikaTronix Isadora
Universe Control

Zoom has also developed integrations with broadcast technology platforms including:

Blackmagic Design
NDI
Audinate Dante
AJA Video Systems

Support for technologies from these companies has created workflow integrations between Zoom and other adopters of these standards, including:

Grass Valley
Ross Video
Vizrt/NewTek
Evertz
and more

Workflows enabled by Zoom for Broadcast

Zoom for Broadcast brings workflow capabilities that can be deployed by each customer with powerful customizations to best suit their unique production requirements.

Produced Panels

Remote contribution into a panel conversation is a common production setup solved by the capabilities of Zoom for Broadcast. Multiple remote guests connect to a single "transport" Zoom Meeting, where a production tool like ZoomISO or Custom AV for Zoom Rooms obtains their individual video and audio streams and exports them to the main production switcher. Alternatively, if the switcher has a direct Zoom integration, then it can join the meeting directly and obtain the streams without intermediate software. In either case, the Zoom contribution client can also receive a return feed from the switcher to send as a confidence monitor back to the remote guests. If talkback audio is needed, integrations like SpaceCommz.io running within the Zoom Apps window can be used to give the producer the ability to speak to specific remote guests inside a Zoom Meeting, even though they are all connected to the same meeting. The final result can be streamed to a third party distribution platform like YouTube or routed into a separate videoconferencing session like a Zoom Webinar with a live audience. Interactivity data can be passed between the transport meeting and the distribution webinar using the Zoom Graphics Toolkit to visualize chats, polls, and questions as HTML5 graphics incorporated into the broadcast program and the return feed. The result of this workflow is a fully-interactive live production with multiple remote panelists in a familiar and conversational Zoom Meeting environment while also seamlessly connected to a professional video switcher to produce a broadcast-quality stream in real-time.

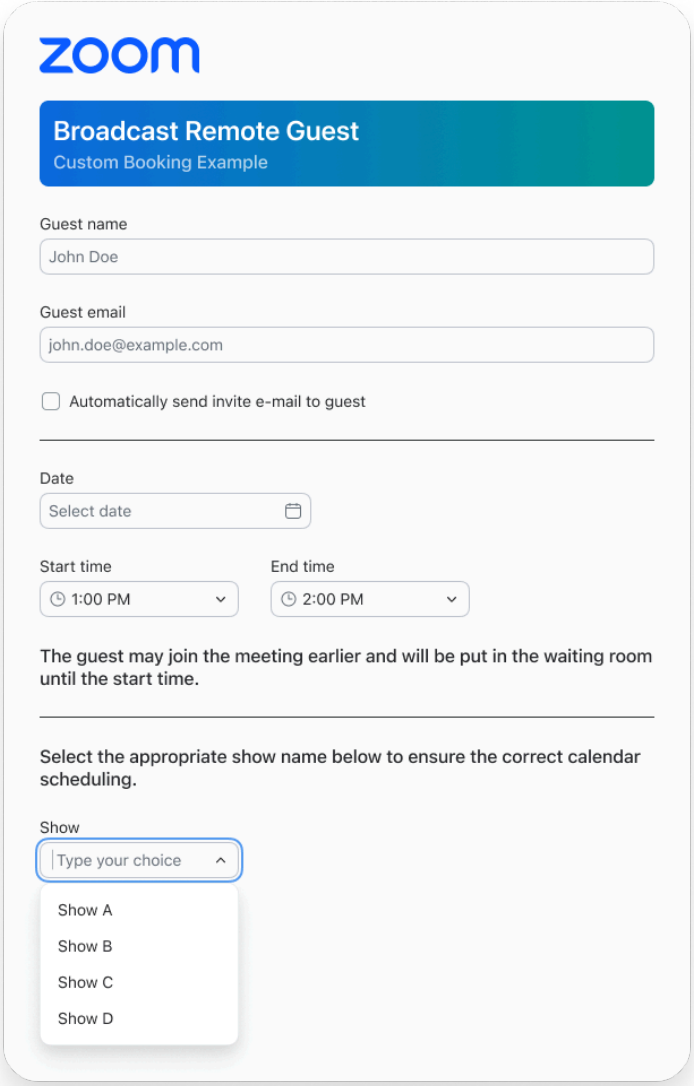
Interactive LED Walls

One of the key challenges of hybrid events is unifying the in-person and remote audiences so they are engaged with the production. As the primary screen real estate in many of these productions, a large on-stage LED wall can play a significant role in solving this problem, especially when leveraging Zoom for Broadcast capabilities. Tiles for Zoom can create a customized Zoom audience gallery on-screen to represent the virtual audience joining remotely. Alternatively, Zoom's integration with Unreal Engine could be used to create an immersive audience experience on screen. When remote audience members see themselves on the LED wall during a broadcast, it creates a positive feedback loop of engagement with the event. Likewise, it can be very helpful for the on-stage talent to see members of the virtual audience so that they instinctively remember to address both the attendees in the room and those joining remotely. To further drive interactivity, the Zoom Graphics Toolkit can create customized displays of emoji fountains, chat highlights, poll results, and approved audience questions, all of which can be driven by both the in-person and remote audiences thanks to the hybrid joining functionality of the Zoom Events mobile companion app. Finally, ZoomISO can create live discussions between on-stage talent and specific virtual audience members or special remote guests by bridging their audio and video streams with the production. As an organization, Zoom has heavily leveraged all of the above production techniques on multiple occasions during its main marketing event of the year, Zoomtopia.

Book to Broadcast

Zoom's "Book to Broadcast" workflow simplifies and automates the process of booking a remote guest for a broadcast interview. The workflow begins when a booker fills out a form, which uses Zoom's APIs to automatically create a unique Zoom Meeting. Using the organization's email system, the workflow automatically sends a custom-branded confirmation to the booker, and optionally sends an invitation to the guest as well with the joining instructions and call time. Behind the scenes, the system searches for and assigns an available Zoom Room to host the guest's meeting. When the guest joins the meeting, their video feed is automatically output via SDI using the Custom AV for Zoom Rooms features to transmit to the studio's equipment for broadcast. This streamlined process minimizes the manual steps required to connect remote guests, requiring zero manual steps for the studio operations team between booking the guest and completing the on-air interview.

Despite the high level of automation, the studio operations team retains full visibility and control, allowing them to manually view and adjust any booking details or change room assignments as needed without affecting the guest's meeting ID. The Book to Broadcast workflow is especially helpful for organizations producing many remote interviews per day in a Single-Party calling workflow.



Corporate Broadcast Studios

For organizations looking to produce professional internal live streams, such as a town hall or all hands, a production studio can leverage Zoom for Broadcast capabilities via Custom AV for Zoom Rooms. For example, a studio could install a rack-mounted, high-performance compute device running the Zoom Rooms software. Using its Custom AV features, Zoom Rooms could integrate with the studio's professional broadcast switchers, signal processors, and control equipment. This single Zoom Rooms-enabled device can handle up to 12 remote guests in full HD quality, feeding them directly into the video switcher while also returning multiple views of the in-studio talent back to the Zoom Meeting. Zoom Rooms could also support isolated participant audio export over Dante to an audio mixing station, while accepting a mix-minus return feed. The produced show from the video switcher could be sent as a confidence monitor back to the Zoom Meeting via a professional capture card, such as a Blackmagic Design DeckLink Duo 2, connected to the computer running the Zoom Rooms software. The entire system would be remotely manageable through a Custom AV Zoom Rooms Controller dashboard, giving operators granular control over AV configurations across their fleet, whether on-site or off-site. As a result of these features, this example studio would be ready to produce high quality corporate communications at a moment's notice.

Putting it together: the impact of Zoom for Broadcast

Zoom for Broadcast has revolutionized the storytelling process by making real-time remote contribution seamless, scalable, and widely accessible. Traditionally, high-quality remote broadcasting required extensive infrastructure and technical expertise. Zoom for Broadcast eliminates these barriers, reducing infrastructure, compute costs, and network requirements while maintaining professional-grade quality.

This innovation can enable democratized live storytelling, extending beyond major broadcast studios to producers from all market segments, from enterprise video teams to the creator economy at-large. By making remote participation more accessible, Zoom for Broadcast amplifies voices from underrepresented communities, supporting the inclusion of more perspectives in conversations that matter. Zoom for Broadcast products have also become standard tools in the industry, as news programs and broadcasters continue to rely on them for expert interviews, remote panel discussions, and hybrid events where in-person access is not feasible. Analysts note that the trend of using consumer video-call technology on air allows faster, cost-effective access to diverse voices.

Zoom has also changed the way audiences participate in events and broadcasts. The ability to construct a remote studio audience at scale was made possible by Zoom through innovations like its Tiles app. Not only can remote global audience members be visually integrated into the broadcast, such as on an LED wall, but their chats and engagements can be incorporated into data-driven interactive graphics directly within the production pipeline. The Zoom platform can also unify in-person and remote audiences via mechanisms such as the Zoom Events mobile companion app, allowing in-person members of a hybrid event to participate in the same chats, polls, emoji reactions, and Q&A systems as virtual attendees. Zoom Meetings are designed with accessibility in mind, bringing more voices from communities not traditionally served by broadcast to the table. The ability to engage with audiences almost anywhere in the world has fundamentally changed the way that presenters and producers tell their stories at scale. World-renowned producers and talent have chosen Zoom for Broadcast in their televised shows and events over the past several years.

As the media landscape evolves, the integration of consumer video-call technology into professional broadcasting is proving to be more than just a temporary trend—it's a fundamental shift in how stories are told. Remote interviews and Zoom guest segments are now accepted parts of TV production, used when in-person visits are impractical or impossible. News programs in particular have continued leveraging Zoom for Broadcast to quickly bring in experts or commentators from around the world. By enabling real-time, cost-effective, and highly interactive storytelling at scale, Zoom for Broadcast has not only enhanced production workflows but also expanded the boundaries of live content creation for a global audience.