Video Interoperability: A new age is upon us

Introduction

Interoperability has been a concern since the very early days of video conferencing. In the 1990s, the question revolved around whether room systems from different vendors could communicate with each other. By the turn of the century, nearly all suppliers had migrated from proprietary communication and compression techniques to standards promoted by the ITU (H.323 and H.264, for example) and the Internet Engineering Task Force/IEEE (SIP, VP8, VP9, AV1, for example). Unfortunately, standards can sometimes give us too many choices. The result improved interoperability, but video islands still remained.

The situation changed dramatically with the adoption of software-based clients and desktop video conferencing on industry-standard platforms in the early part of the 21st century. Workers and consumers could just download a client (or browser plug-in) for whatever solution was required for the particular conference. This "solved" interoperability by simply installing multiple clients. It also created its own set of challenges, including updates and security concerns.

In the past few years, personal video conferencing has largely moved to the cloud and a services-based model. With the pandemic and widespread adoption of remote working and WFH, the use of cloud-delivered video conferencing, collaboration, and meeting solutions exploded as governments and businesses were forced to lock down. Offices were off-limits.

But now, as enterprises plan for a full or partial return to the office, a new strategy is required — one that provides room systems with the flexibility to connect with more remote and diverse participants. The move to hybrid work also puts office meeting space in a new and more important role. *The Economist* (July 3 issue, page 65) claimed the emerging trend is for firms to "throw out desks" and create spaces for employees to socialize, collaborate,

problem-solve, and innovate. One architectural consulting firm cited in the article expects the pre-pandemic ratio of 33% office real estate reserved for meetings to double post-pandemic.

It does appear that, moving forward, there will be more business meetings in general, and more meetings will involve a mix of meeting room participants and remote individuals. Even more important is that video itself has morphed from being a media used almost exclusively for internal meetings on company-sanctioned devices and services to a key vehicle for both internal and external communications. Hence, meeting room devices need to support users joining via multiple providers, including Cisco Webex, Microsoft Teams, Google Meet, Zoom, and numerous other solutions.

In short, people have grown accustomed to meeting on multiple platforms using apps on their personal devices. At the same time, shared room systems have largely overcome the challenge of connecting to other room systems.

But communicating between the two worlds remains an issue. Often, the connection simply cannot be made. When it can be made, the user interface may be nonintuitive, and the user experience is poor. This issue is of growing concern as workers come back to the office.

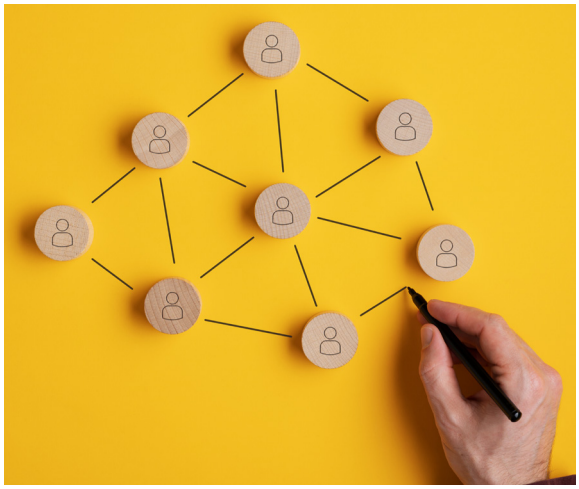
The State of Room Systems' Video Interop

With their ability to support multiple cameras, multiple displays, controls for field-of-view and pan-tilt-zoom, dual video streams, and high-performance audio systems, room video systems have long been the solution of choice for enterprise meeting rooms of all sizes. These are usually dedicated appliances deployed in shared meeting rooms. These systems traditionally made direct connections to other shared systems, multi-point control units, or desktop clients. Interop was practical because vendors supported just a few protocols and standards.

In some cases, connections between different rooms or between rooms and single users

required the use of a gateway device (or hosted service) to act as a translator between these diverse different video conferencing worlds. But gateways generally introduced several weaknesses into the conferencing estate. They:

1. Often supported less than the full complement of features and functions that users expected.
2. Introduced a new user interface.
3. Supported only a limited number of simultaneous sessions.
4. Required devices that added costs to the overall solution.
5. Represented a single point of failure in the collaboration architecture.



One solution adopted for room systems' interoperability was "native support." For example, a system adhering to industry standards could support both H.323 and SIP, and both H.264 and H.265, and answer an incoming call with the appropriate algorithm. This was a big step to having meeting solutions work seamlessly with each other. Information worker productivity could increase because participants need not waste time trying to join meetings from systems that simply did not work together.

With cloud-based conferencing and collaboration services, however, the number of possible protocols for native support mushroomed. This is because each service provider was free to use whatever proprietary or simplified protocols made sense, given the targeted collaboration environment, software client, feature set, and processing requirements. The focus for cloud service providers was on the individual, desktop, or mobile user, not on room systems and dedicated devices.

Common Approaches for Enabling Room System Interop

Four different technologies play prime roles in enabling room video systems to interop with desktop or personal systems. Each has its own set of strengths and weaknesses.

Enhanced Native Support

Enhanced native support goes a step beyond the traditional approach of supporting multiple industry standards to include non-standards in the software stack. Some vendors have chosen to license proprietary protocols used by popular cloud services and embed them into their room system appliance software. The advantage is that the interoperability is seamless — at least for the cloud service application chosen. The disadvantage is that it may be impossible to upgrade the embedded firmware when the cloud service vendor updates client software features and functions. There is also a practical limit to how many cloud service clients can be added to and supported by a single appliance.

USB Passthrough

A personal device (laptop, smartphone, tablet) provides the user with near-infinite flexibility by downloading and installing apps from multiple cloud service providers and participating in meetings hosted by any of them. A room video system often is connected to large displays, powerful audio systems, and cameras designed to include multiple participants as well as zoom in on individuals.

The USB passthrough approach, which requires the host to connect a personal device to a USB connection on the room system, attempts to combine the best of both — compatibility with a diverse list of services and higher performance audio and video peripherals. This approach works best in smaller conference rooms. Because the personal device serves as the meeting host, USB passthrough does not use many of the room system's advanced capabilities, such as noise blocking, speech, and facial recognition. Furthermore, the host cannot leave the meeting, and content sharing for other participants may be impossible.

WebRTC

WebRTC, a free and open-source project providing web browsers and mobile applications with real-time communication capabilities, is supported by the most common browsers in use today. More recently, the latest room systems products can download and run a web app. Because WebRTC runs entirely in the browser, users need not worry about security issues in any client software provided by the vendor or service provider. (For this reason, Kaspersky has recommended using the Zoom Web client, even though the experience is inferior to that of the dedicated client.)

Disadvantages of this approach include:

1. Many features available with a native client, such as voice assistant, functions (transcription/translation), and performance metrics (HD video and audio), are not supported.
2. The browser may not interface to a conferencing and collaboration scheduling system.
3. Compatibility with and technical support for future software versions may be lacking.

Network Interop

Providing room systems interop via a cloud service is the latest approach, taking advantage of the cloud's scale and flexibility. A prominent example is Cloud Video Interop (CVI), a Microsoft-qualified and Microsoft-proprietary third-party solution that enables third-party meeting room video systems and personal video devices to join Microsoft Teams meetings.

Microsoft has approved only a few CVI providers. Each provider operates the Microsoft Teams add-on using infrastructure from Azure. Microsoft has certified BlueJeans, Cisco, Pexip, and Poly as CVI partners.

Users will require a license from the CVI partner for each host who will schedule meetings, and each user needs a Cloud Video Interop-enabled device to join. So, not every employee may be able to use the service. Another issue is that the service may require organizations to change device configurations, firewall ports, IP ranges, and the Azure consent process. The user interface for launching or joining a CVI call may also be different. And monitoring and managing CVI may require a separate dashboard.

Conclusions

Interop considerations for room video systems have changed. It is no longer about support for industry standards alone. Support for room-to-room as well as room-to-desktop communications must be a key requirement for any enterprise, especially those envisioning a hybrid work environment where meetings are likely to include both room-based and non-room-based participants. Enabling a hybrid workforce means providing secure, seamless access to collaboration from anywhere, anytime, with an easy-to-use and consistent UI.

Most, if not all, leading collaboration product and services vendors have made interop a renewed focus. Cisco has gone further by supporting all the interop approaches detailed above: Enhanced Native Support (for Webex services),

USB passthrough, WebRTC, and CVI. These interop approaches complement the company's long-standing support for video conferencing industry standards such as SIP and H.323 and H.264.

Cisco's interop capability, however, does not come at the expense of ease of use. The company has expanded its One Button to Push (OBTP) calendar service with Webex Hybrid Calendar Service to give end users a big green button to join meetings from the meeting room user interface, independent of the interop approach or cloud service. Users get the same button if they join a Webex meeting natively, a Zoom session via SIP, or a Microsoft Teams meeting via CVI or WebRTC.

With a rich portfolio of hardware systems targeting conference rooms of all sizes, Cisco delivers next-gen features and functions for users and managers such as noise reduction, optimal video framing, background blurring, room utilization metrics, and voice assistant. The result is seamless communications across a broad range of use cases involving room and personal devices and services — and a future-proof strategy for a hybrid return to the office.

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