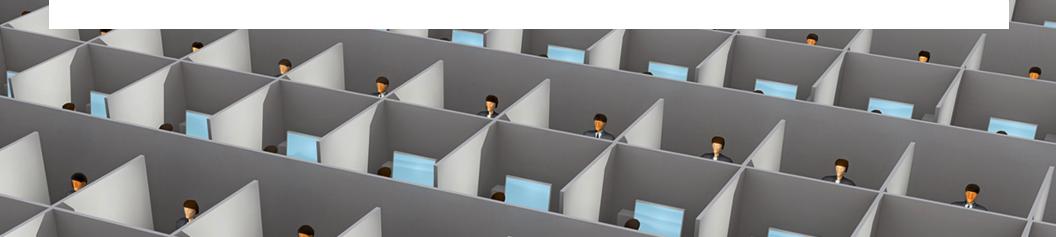# Video Conferencing Tools: Top 10 Considerations

Learn about video conferencing system types, standards & more

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In this e-guide

In this e-guide:

From back-end services to multiple endpoints, enterprises need to consider many variables when shopping for different types of video conferencing systems.

In this guide, learn the basics of video conferencing from experts Irwin Lazar of Nemertes Research and Simon Dudley of Excession Events.

Uncover:

- **6 types of video conferencing endpoints**

- **4 types of video conferencing back-end services**

- **How to determine cost considerations to deliver a measurable ROI**

- **Why standards and protocols are necessary for successful video communications**

🚩 Explore the different types of video conferencing systems

Irwin Lazar, Vice President and Service Director - Nemertes Research

If you're looking to implement video conferencing, you need to understand the basics behind the technology, starting with the types of endpoints and back-end services available to your business. Endpoints provide the user experience, while back-end services enable the connectivity of endpoints and the associated management of video conferencing equipment.

Main types of video conferencing endpoints

- **Desktop endpoints** are software applications or browser-based interfaces that provide access to video conferencing sessions. Typically, these applications take advantage of existing, built-in cameras or rely on external USB-connected cameras. The audio relies on integrated microphones and speakers, or Bluetooth or USB-connected devices. Browser-based clients may use the native WebRTC capabilities of browsers, like Chrome and Firefox, or require plug-ins to support video conferencing.
- **Mobile video apps** enable users to participate in video conferences via phones or tablets, regardless of their location.

- **Executive systems** are optimized for a desktop experience, providing higher-quality video conferencing than desktop applications or browsers. Executive systems typically include hardware that optimizes video encapsulation and decapsulation and supports higher video resolutions than desktop alternatives.
- **Room-based video** offers a variety of configurations -- and price points -- to support small, medium and large meeting rooms. Available features typically include support for multiple screens, the ability to project content from laptops or mobile devices and cameras that focus on active speakers around a room. Audio features vary as well; some vendors offer beamforming microphones to eliminate background noise or other audio enhancements.
- **Immersive telepresence** simulates a live meeting. Large screens mounted on a wall or above conference tables show people at life-size. Similar furniture, directional acoustics and cameras mounted at eye level give the appearance that participants are sitting at the same table and looking at one another. Some sophisticated systems incorporate 3D and holographic images, with virtually invisible screens to create immersive experiences. Because of the complexity involved, many vendors that offer this equipment also offer telepresence support and service, either directly or through partners or resellers. Among the different types of video conferencing endpoints, immersive telepresence is the most expensive option.
- **Hardware multipoint control units (MCUs)** are typically rack-mounted servers that provide interconnectivity between endpoints. MCUs provide transcoding between different signaling and encapsulation protocols.

Different types of video conferencing back-end services

- **Software MCUs**, or video routers, replicate the functionality of hardware MCUs, but do so in virtualized software or special-purpose appliances. Typically, these work best in environments where all endpoints share support for a common set of standards, such as SIP signaling and H.264 video encapsulation.
- **Cloud virtual meeting rooms (VMRs)** provide subscription-based offerings that replace the need for on-premises hardware or virtual software. VMRs typically offer interoperability among vendor systems and open standards, and they may offer meet-me conferencing that allows endpoints to connect into always-on meeting rooms -- similar to people dialing into audio bridges.
- **Management services** are typically offered by cloud VMR providers and managed endpoint services, providing information such as utilization, endpoint inventory, software version control, upgrade management and policy enforcement. If you evaluate different types of video conferencing cloud-based services, be sure to review any security constraints and receive approval from risk-management groups.
- **Additional back-end services** include interoperability between legacy and new platforms, security enforcement for external participants and integration among room systems and desktop and mobile systems.

Before you investigate specific types of video conferencing products and vendors, you'll want to determine cost considerations. Because costs vary greatly, depending on the system you choose and the scope of the installation, you should determine a budget early in the process. Cost can also be affected by your video-quality requirements and any network design changes you may need to accommodate video conferencing systems.

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Top 10 considerations for video conferencing products

Simon Dudley, CEO - Excession Events

Enterprises need to consider several factors when shopping for video conferencing products. Some top considerations include finding the right mix of hardware and software components, interoperability with other video conferencing products, and the financial stability of certain vendors.

Additionally, when assessing video conferencing products, enterprises need to evaluate the technology's scalability, ease of use and, of course, cost. Companies should also determine how some video conferencing products fit into their larger unified communications plans and existing business workflows.

As video conferencing products have seen a recent upswing, with the advent of cloud technologies, improved availability and lower costs, enterprises may be evaluating different services to fit their needs. Here are the top 10 items enterprises need to consider when shopping for video conferencing products:

• **Flexible hardware.** Can meeting room products be used with a different provider? If so, enterprises should investigate how the experience will differ with each service. The cost and loss of momentum in retraining users should be considered.

• **Software as a service (SaaS) workflow.** Does changing SaaS providers change the use case of the service? And will users need to be retrained? Although similar conceptually, the user experience of different SaaS products can be very different. Some enable direct dialing of users, while others work as a virtual meeting room in which two or more users can interact. Each use case has its own merits, but enterprises need to consider which approach works best in their workflow.

• **Financial viability.** What is the financial viability of the manufacturer and reseller? For customers looking for an inexpensive, month-to-month SaaS product, they can take on a higher-risk vendor; however, most customers should consider the supplier's viability.

• **Scaling up and down.** How quickly can a supplier scale up and down? If the technology is installed and grows quickly within the business, can the supplier scale technically and with a financial model that's not prohibitive? Suppliers have a sweet spot at which their technology represents the best value. Some suppliers will start costs low, but as the service grows, the costs escalate dramatically. Other suppliers have a higher starting price, but the cost of additional users remains constant. Customers should ask potential suppliers to detail the cost per user as a range from 50% of expected use to 500%.

• **Unified communications strategy.** If an enterprise is considering a UC product, the video conferencing capabilities of that service should also be considered. Many UC vendors today have early stage visual communication services, and customers might install more powerful video conferencing in

parallel to it. Many services will work together, and users need to consider how well differing products interact.

• **Tool integration.** Products such as Slack, Spark, Salesforce, Office 365 and many others are where users spend most of their time. In these environments, consider how well a visual communications service would fit into users' workflows. Moving between disparate systems might inhibit adoption.

• **No one service.** Because of the fragmented nature of the industry, users might employ various services. An organization might have its own standard service, but it should also plan for employees who need to use a different application when speaking with a supplier or customer. Installing new software is relatively easy for most users in nonlocked-down environments, but the meeting room technology should be flexible enough to cope with such a workflow.

• **Streaming and recording.** Video conferences can be streamed and recorded. Users can record to a PC, in the cloud or on a dedicated server.

• **One to one or one to many?** Some video services are better suited for the dissemination of data, rather than interactive communications. Enterprises need to consider how users will use the technology.

• **Suppliers.** Video conferencing is a specialized product, so customers should evaluate suppliers carefully. Many suppliers sell through resellers, and these resellers should be vetted carefully. Video conferencing is not UC,

IT or AV, but it needs skills from all three disciplines. Lastly, special suppliers
should be consulted as part of the buying process.

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⚐ Video conferencing standards, protocols and interoperability

Irwin Lazar, Vice President and Service Director - Nemertes Research

Video conferencing standards and protocols are necessary to define common means for video encapsulation and session management. Encapsulation standards define how video and audio are captured, converted to digital format, transmitted between endpoints and decoded.

Signaling standards control session establishment, teardown and management. Session Initiation Protocol (SIP) is widely supported for video session management, though many older systems rely on H.323. Gateways and multipoint control unit (MCUs) can make SIP and H.323 work together.

Encapsulation protocols vary in terms of vendor support and performance. Popular encapsulation standards include the International Telecommunication Union's (ITU) H.264, as well as VP8 for video, ITU G.711/G.722/G.729 for voice, and ITU H.239/T.120 for data, such as screen sharing or web conferencing. H.264 is widely supported by video conferencing vendors, while VP8 is widely used in WebRTC-capable browsers, like Google Chrome and Mozilla Firefox.

Some of these video conferencing standards and codecs often form the lowest common denominator for interoperability. Vendors such as Microsoft, Polycom and Vidyo have their own enhanced and proprietary versions of

H.264 that incorporate scalable video coding (SVC) to improve video performance over lossy networks, like public Wi-Fi or cellular-based services. Microsoft Skype for Business also provides support for Microsoft's own Real-Time Video codec. Microsoft also relies on a variant of WebRTC known as ORTC, or Object Real-Time Communications, to support video conferencing natively within its Edge browser.

What's new in video conferencing standards?

Newer video encapsulation standards include H.265 and VP9. These codecs use less bandwidth for high-definition video and offer better video quality and better support for video over lossy networks by natively incorporating SVC.

Licensing and competitive considerations drive variances in video codec support. H.264 and H.265 require royalty payments for use. VP8 and VP9 are royalty-free, but competitors are reluctant to embrace these codecs, since they're controlled by Google, not natively supported in most video conferencing room systems and do not support hardware optimization in Apple mobile devices.

More recently, a new organization called the Alliance for Open Media was formed by leading video conferencing vendors -- including AMD, Cisco, Intel, Microsoft, NVIDIA and Vidyo -- to develop a royalty-free alternative to H.265 and VP9.

Varying encapsulation approaches are an obstacle for buyers wishing to integrate different products from different vendors or take advantage of WebRTC to enable video conferencing within browsers and browser-based apps. Vendors continue to perceive competitive advantage toward offering a "better-than-standard" service while supporting baseline interoperability for well-defined video conferencing standards.

Integrating systems that use different video codecs requires deploying an on-premises MCU or a bridging software platform like Acano or Pexip, a cloud-bridging service like StarLeaf, or a cloud video conferencing service like Blue Jeans, Cisco, Fuze, Videxio, Vidyo or Zoom. Any of these services will typically provide transcoding between codecs, but with additional cost and complexity.

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