



Vidyo[™]
Personal Telepresence

INTEROPERABILITY SOLUTIONS

Connected Vidyo Conferencing

Guide to connecting with third-party communications equipment

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It's about connecting people

Vidyo has made telepresence both personal and affordable with its revolutionary VidyoRouter™ architecture that leverages Scalable Video Coding (SVC), enabling end users to participate in high quality Vidyo conferences from just about anywhere using standard broadband Internet connections. But what do you do if you have an existing deployment of legacy H.323 and SIP based equipment or want to connect with a third-party with such equipment? Maybe you need to be able to join the conversation from a voice-only endpoint, like a mobile phone. Or perhaps you want to connect face-to-face with a far-flung vendor who doesn't have any video conferencing equipment – just a PC and a webcam. Vidyo has a solution for all of these use cases, extending the life of your existing investments and removing the barriers of anytime, anywhere personal telepresence.

Device Agnostic

- Standards based IP endpoints
- Standards based IP infrastructure
- Windows, Mac, & Linux PCs
- PSTN phones
- IP PBXs
- VoIP phones
- Mobile phones

Connecting with Legacy Video Conferencing Equipment

Adopting revolutionary technologies can be a double-edged sword. On one hand, you have compelling new benefits and economies afforded by the new technology, while on the other hand you have an existing investment in legacy technology that you may not be ready to retire. Vidyo understands that a flash cut from “old” to “new” is typically not practical and that there is need for your new VidyoRouter based personal telepresence solution to interoperate with your existing H.323 and SIP based video conferencing equipment. The VidyoGateway provides the migration path you need. You can retain the use of your legacy room systems and MCUs and enable them to interoperate with your VidyoConferencingSM system. Like VidyoRooms, calls through the VidyoGateway do not consume VidyoLine™ licenses, making integration with legacy endpoints not only easy, but affordable.

H.323 & SIP Endpoints

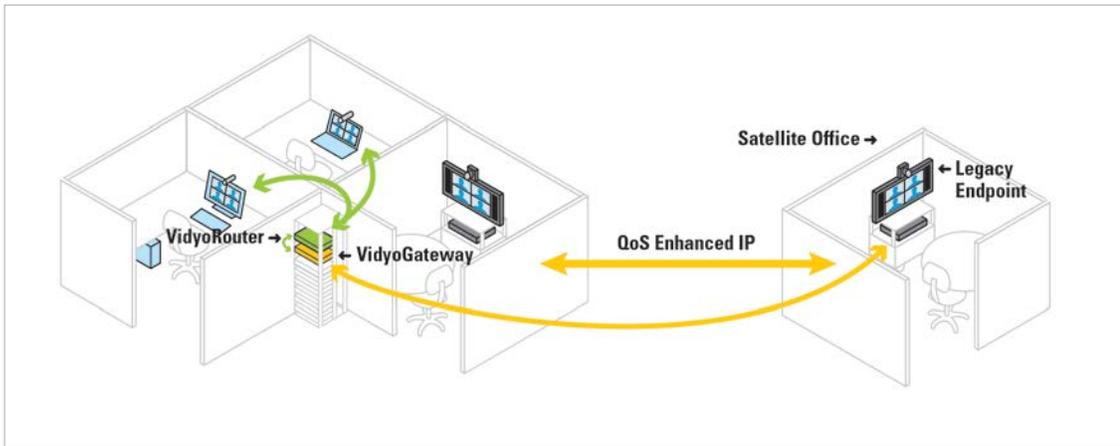
The VidyoGateway supports H.263 and H.264 based video conferencing endpoints that adhere to the H.323 and SIP signaling standards. The VidyoGateway is a 19” 1U rack mountable server that can support up to 3 concurrent transcoded ports in HD or 12 SD. The appliance is stackable for higher density deployments. Features like H.239 data sharing and H.235 media encryption are also supported across the VidyoGateway

Deployment Considerations

Connection to the VidyoGateway is established via general purpose IP networks. There are two different deployment scenarios described below.

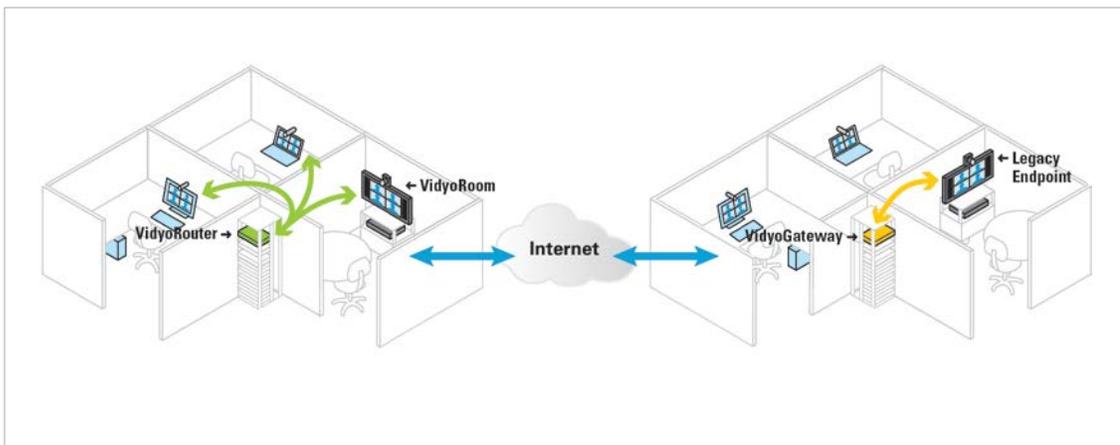
VidyoGateway on LAN with VidyoRouter

Collocating the VidyoGateway on the same network with the VidyoRouter minimizes network induced latency as well as the opportunity for packet loss when legacy endpoints are on the same LAN. For remote legacy endpoints connected via WAN, however, the link back to the VidyoGateway is H.263 or H.264/AVC based, so it will be susceptible to packet loss in the same manor that MCU based video conferencing has always been. For this type of deployment, QoS enhanced bandwidth may be required between the remote location and the location where the VidyoGateway is hosted to ensure performance of the legacy endpoint in conference.

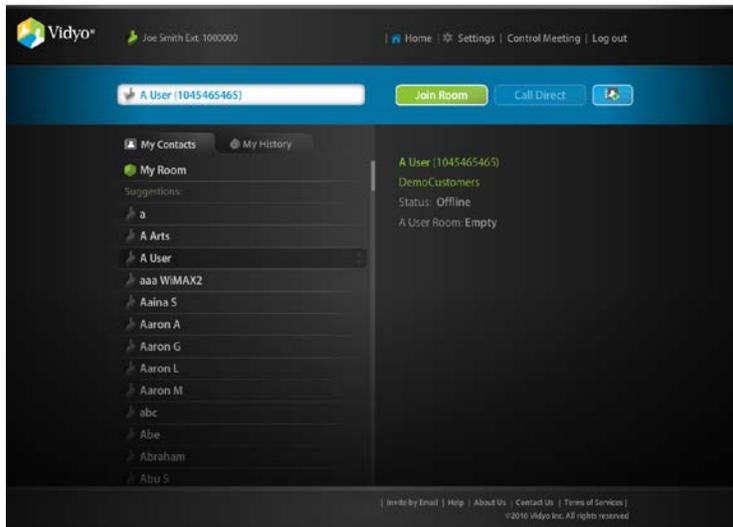


VidyoGateway connected to VidyoRouter via WAN

Since the link between the VidyoGateway and the VidyoRouter is H.264 SVC and the VidyoRouter performs error concealment across this link in the same manner that it does with any Vidyo endpoint, the VidyoGateway can be installed in a remote location to be on the same LAN as remote legacy endpoints, thereby eliminating the need for costly QoS bandwidth across the WAN to the VidyoRouter.



Dialing and User Experience



Vidyo provides mechanisms to simplify the user experience when connecting with known legacy endpoints. The administrator can create entries in the VidyoPortal™ user directory that include all of the information necessary to establish a connection with a specific legacy endpoint so that users can perform intuitive name based look-ups in the directory, and even add these endpoints to their contact lists, enabling connection with the click of a button.

If a legacy endpoint is not in the VidyoPortal directory, the user can still call or invite it into a conference via the Control Meeting tab. The user can add the endpoint to the meeting list by specifying the code for the resolution profile of the endpoint, followed by its IP address and any PIN codes that may be required. The VidyoGateway also supports calling through GDS dial plans.

If the remote legacy endpoint has a NATed IP address, but has access to the VidyoGateway over the WAN, the legacy endpoint can dial into the VidyoGateway to join a conference by specifying the IP address of the VidyoGateway along with the code for the resolution profile and Vidyo room extension to connect to.

However the endpoint gets connected, once it is in the call, it appears the same as any other participant in the call from all other participant's perspectives, who continue to enjoy full control of the on-screen layout with ability to switch between active speaker to continuous presence modes. From the legacy endpoint participant's perspective, he or she receives the video conference in the same manner as if connected to an MCU, with pre-determined layout.

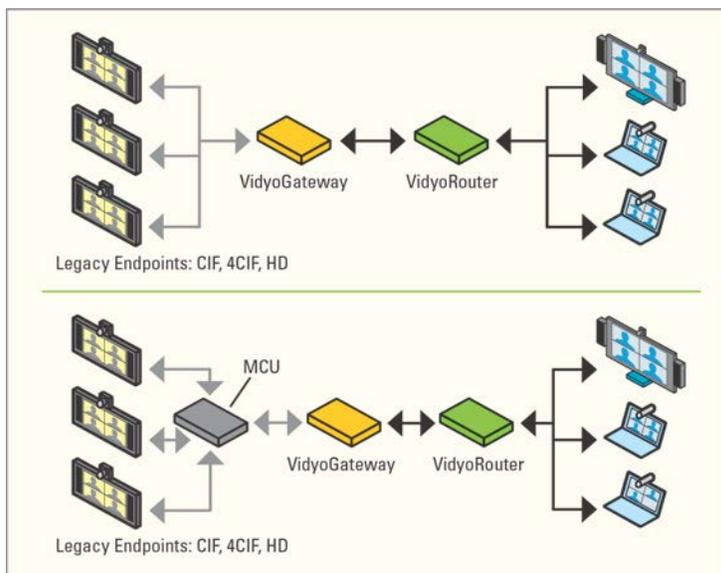
Data sharing can be initiated via the legacy endpoint participant via H.239 and the VidyoGateway converts it to Vidyo's data sharing format so that it appears to be one of the many concurrent shares that can happen in the Vidyo solution. Data sharing initiated by Vidyo users gets converted to H.239 for the legacy endpoint user, but since H.239 is limited to one data share stream at a time, only the data share of the first Vidyo participant to share will be sent to the legacy endpoint.

Tested Legacy Endpoints

While many H.264 or H.263 compliant endpoints that adhere to the H.323 or SIP standard communicate with the VidyoGateway without issue, variants of the standards are at play resulting in inter-vendor nuances that are common in the legacy video conferencing world.

Vidyo's approach to interoperability testing is to identify and test against the most common devices, and versions of those devices, in the market. Additional second tier devices that are specifically requested by our customers and partners are added as resources become available. This is an on-going process of refining the target list as well as regression testing itself with each new release of VidyoGateway. Please reference the Appendix of the release notes for the current version of VidyoConferencing for the most current information regarding the legacy endpoints that have been verified in the Vidyo interoperability lab along with any known issues.

H.323 & SIP MCUs



In addition to legacy endpoints, the VidyoGateway can also connect with H.264 and H.263 based MCUs using H.323 and SIP signaling.

The decision to connect a legacy endpoint directly to a VidyoGateway or to leverage an existing MCU for a given call should be made based upon the other endpoints that will be involved in the call and user tolerance for latency.

Best performance will always be achieved when there are no legacy devices in the call because there is no transcoding required in the network when all endpoints are connected to the VidyoRouter and are SVC based. However, given that a legacy endpoint will be in the call, it is always optimal from a performance perspective to connect directly to the VidyoGateway. Why? Transcoding is only done for the legacy endpoint, same as when it is connected directly to an MCU, but no transcoding is required for any of the SVC enabled endpoints.

If, however, there are a relatively large number of legacy endpoints in the conference as compared to Vidyo endpoints, then it may be desirable to "host" the conference on the existing MCU and have the Vidyo endpoints join via the gateway. The performance penalty in this case is double transcoding for the Vidyo participants. The MCU decodes all of the encoded video streams from the individual endpoints and

then re-encodes them as a single stream and sends back to the endpoints. To get to the Vidyo endpoint, that transcoded stream gets transcoded a second time from H.264/AVC to H.264 SVC, which results in latency that is more characteristic of legacy video conferencing than VidyoConferencing.

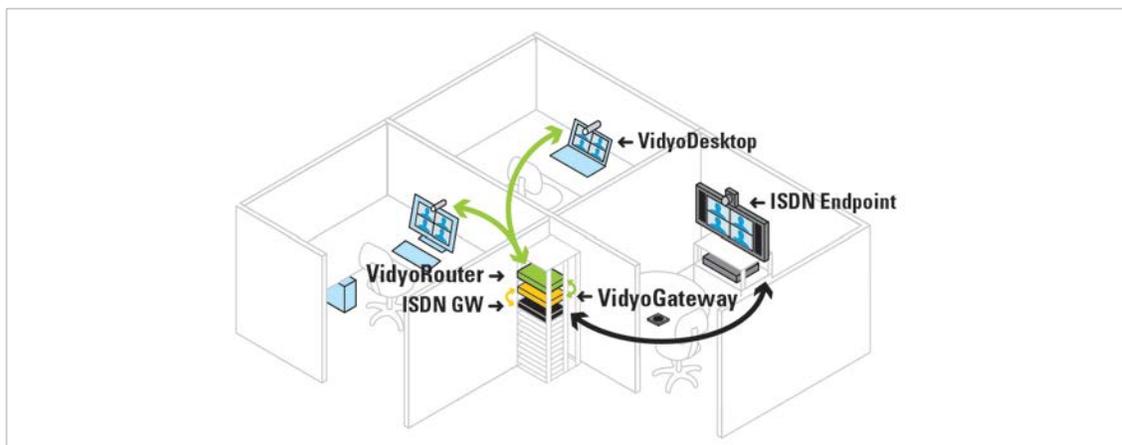
Tested MCUs & Gatekeepers

While many H.264 or H.263 compliant MCUs that adhere to the H.323 or SIP standard communicate with the VidyoGateway without issue, variants of the standards are at play resulting in inter-vendor nuances that are common in the legacy video conferencing world.

Vidyo's approach to interoperability testing is to identify and test against the most common devices, and versions of those devices, in the market. Additional second tier devices that are specifically requested by our customers and partners are added as resources become available. This is an on-going process of refining the target list as well as regression testing itself with each new release of VidyoGateway. Please reference the Appendix of the release notes for the current version of VidyoConferencing for the most current information regarding the MCUs and Gatekeepers that have been verified in the Vidyo interoperability lab along with any known issues.

ISDN Endpoints

VidyoGateway does not support ISDN endpoints. However, commercially available ISDN to H.264 gateways exist which can be connected to the VidyoGateway. While we do not recommend continued use of ISDN endpoints due the high operating costs associated with them, please reference the Appendix of the release notes for the current version of VidyoConferencing for the most current information regarding the ISDN to H.264 gateways that have been verified in the Vidyo interoperability lab along with any known issues.



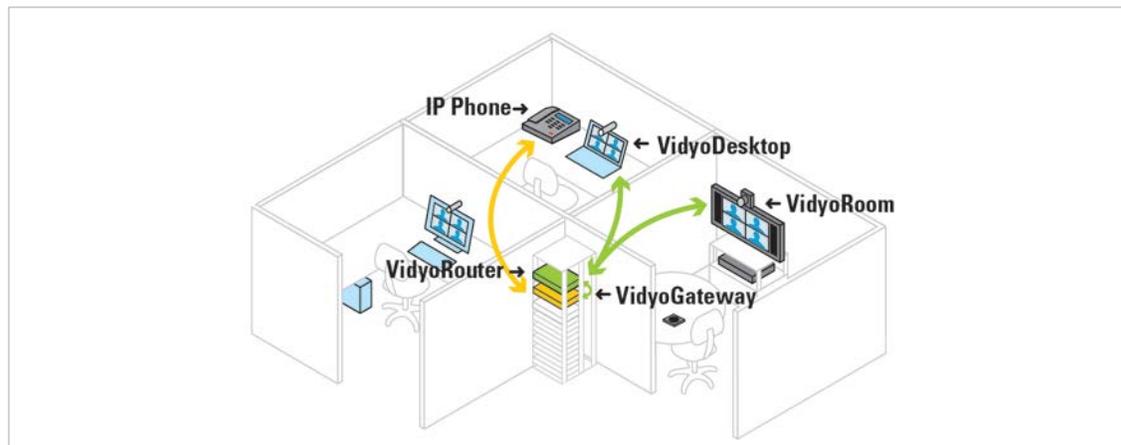
Connecting Voice-only Participants

Vidyo has reinvented video conferencing with its patented VidyoRouter architecture, making it more accessible than ever before with reliable performance over the error-prone Internet and wireless networks, and without the need for dedicated hardware – just PCs you already own. But even with these significant improvements in accessibility, we know there are still times when your laptop is not close at hand, you are in transit between locations, or you simply don't have broadband access at a scheduled meeting time. To ensure that no one is left out of the discussion, the VidyoGateway supports audio only participation via SIP trunking to an IP-PBX or VoIP service provider, enabling users with PSTN, mobile or VoIP phones to connect to Vidyo conferences.

Softphones and VoIP Device Connectivity

A user can easily connect as an audio-only participant from a softphone or IP phone directly to a Vidyo conference through the VidyoGateway, provided that the softphone or IP phone is capable of dialing a SIP URL directly and supports G.711 or G.722 audio compression.

The SIP URL dialed would consist of the VidyoGateway's voice-only service code, the extension of the Vidyo room to be accessed and the IP address of the VidyoGateway.



IP-PBX Connectivity

Administrators can connect their IP-PBXs which support SIP signaling and G.711 or G.722 audio compression standards to the VidyoGateway in one of two ways.

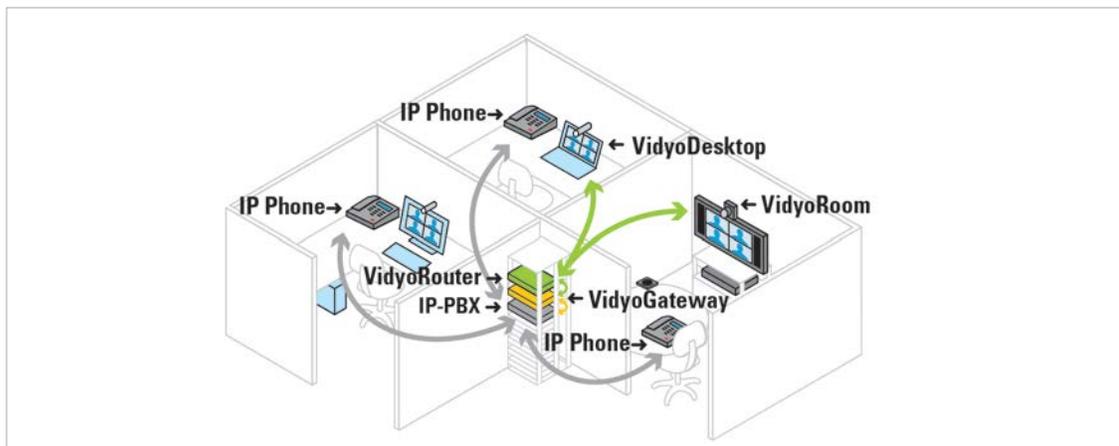
Preferred Extensions

The preferred extensions method is simple to achieve. Through this option, several office extensions of the PBX are mapped to several selected private or public Vidyo rooms.

For example, we can do the following mapping:

- ext #101 -> Boardroom
- ext #102 -> CEO Vidyo meeting room
- ext #103 -> CFO Vidyo meeting room
- ext #103 -> COO Vidyo meeting room

The IP-PBX forwards these extensions to the corresponding Vidyo meeting room numbers, on the IP-PBX using the VidyoGateway dialing instructions. The IP-PBX provides dialing number manipulation and converts a specific extension to a VidyoGateway dialing stream.



Map All Extensions

Mapping all Vidyo meeting rooms in a Vidyo conference deployment to the organization's IP-PBX provides better service coverage, enabling any user to call any Vidyo room. SIP trunking is established between the IP-PBX and the VidyoGateway with a "service" prefix that maps the Vidyo rooms. The IP-PBX is set to forward all calls designated to that service to the VidyoGateway.

Tested IP-PBXs

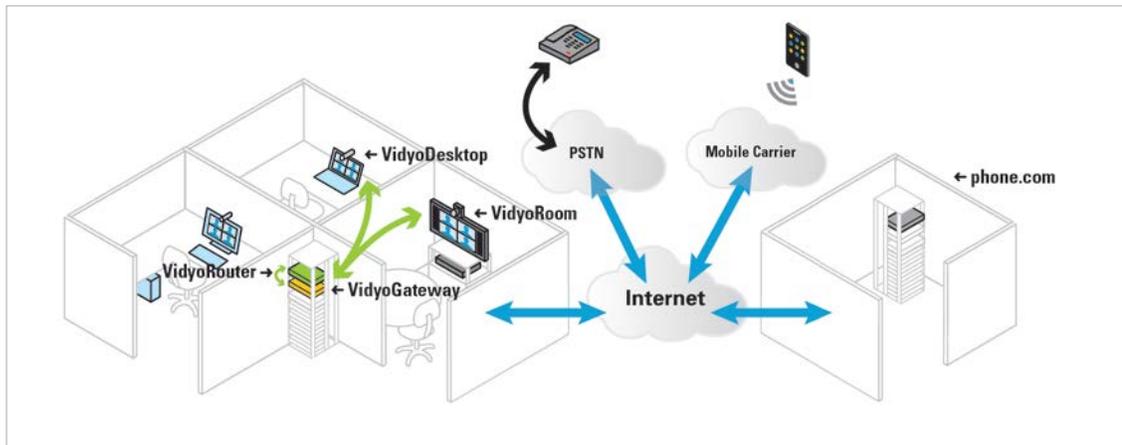
While any IP-PBX supporting SIP signaling and trunking and G.711 or G.722 audio compression should provide voice connectivity to the VidyoGateway, please reference the Appendix of the release notes for the current version of VidyoConferencing for the most current information regarding the IP-PBXs that have been verified in the Vidyo interoperability lab along with any known issues.

VidyoVoice

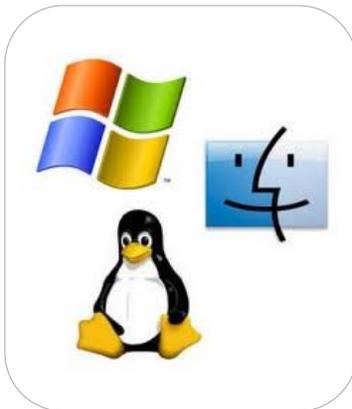
VidyoVoice is a voice bridging service offered by Vidyo that eliminates the need for VidyoGateway hardware or an IP-PBX in order to bring voice-only participants into your Vidyo conferences. Through a partnership with Phone.com, Vidyo is able to make connecting via voice as easy as dialing a local access

number in any of 39 countries or toll free number in the US, and keying in the extension of the Vidyo room the conference is taking place in. That's it!

Vidyo has a bank of VidyoGateways hosted in the cloud which have an IP trunk per user access number from Phone.com. The VidyoGateway associated with a customer's account is provisioned on the customer's VidyoPortal. When a user dials the access number, an auto-attendant greets the user and requests the extension of the conference. The user enters the extension and Phone.com sends the information to the VidyoGateway to establish the connection.



Connecting Participants with Computers



Interoperability is far more than simply connecting one technology with another. It's about connecting people whenever the need arises, from wherever they may be, using whatever device happens to be most readily available. That's why every Vidyo user has a unique hyperlink to his or her personal meeting space, which can be sent via email, instant message, or calendar invite to anyone with a computing device and a webcam – whether they are Vidyo users or not. With a simple click of the hyperlink, the default web browser is launched and the invited guest is brought to the VidyoPortal Login page where he or she enters a name and clicks "Join" to connect to the Vidyo user's meeting room.

Windows, Mac, Linux – it doesn't matter. VidyoDesktop supports all major operating systems and soon VidyoMobile will enable Android and iOS tablet and smart phone users to connect just as easily.

With the millions of general purpose computing devices deployed today, Vidyo is the most accessible telepresence quality video communications system on the planet.

Is Your Video Conferencing Infrastructure Future Proofed?

With the exception of Cisco, all major video conferencing forces in the industry have announced new SVC based solutions, or plan to move to SVC based solutions, making SVC the clear standard for video conferencing moving forward. Competitors have acknowledged that in order to achieve affordable scalability for personal video deployments a new “intelligent” client-server architecture that leverages SVC is required. One competitor has issued a white paper denouncing the MCU architecture and exalting the client-server approach using SVC to deliver better and more accessible video conferencing experiences.

Further investment in legacy infrastructure no longer makes sense. So now the question becomes, “How will your video deployment interoperate with the new generation of SVC based video conferencing solutions?” With the majority of all deployed SVC based solutions being based upon the VidyoRouter architecture, a worldwide network of Vidyo based service providers and their Chief Scientist elected as the Chief Editor of the SVC Profiles Task Group of the UCIF, along with the legacy device and computer based connectivity discussed above, Vidyo based deployments will be the most interoperable solutions available in the market – now and in the future.

Conclusion

Whether your organization is looking to extend the life of legacy video conferencing systems while implementing better performing, next generation technology, or you simply want to leverage the productivity gains of a video conferencing system that works anytime, anywhere, on any device, Vidyo has the solution that brings the cost to performance ratio in line with user expectations and keeps everyone connected.

For more information: 1.866.99.VIDYO