WAINHOUSE RESEARCH **WHITE PAPER**

What Every IT Manager Needs to Know About Desktop Videoconferencing

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Introduction

After years of being relegated to high priced, custom appointed meeting rooms, videoconferencing is finally moving into the mainstream. Key drivers for this growth include dramatic improvements in video quality, manageability, scalability, and affordability.

Desktop videoconferencing, in particular, has enjoyed strong unit sales growth in recent years. The reasons for this increased demand and deployment scale vary widely and include:

- Cost Effectiveness - desktop video solutions often cost only a few hundred dollars or less per user
- Strong Reach - anyone with a PC and an Internet connection can use desktop video
- Immediacy – desktop video solutions support ad-hoc, impromptu communications
- Convenience – unlike group video systems which require the users to go to the meeting space, desktop video brings the meeting to the user

Thanks to advances in both PC hardware and IP networks, desktop videoconferencing solutions have become increasingly powerful over time. Today's leading solutions support a wide range of power features including high quality video, wide-band audio, data sharing, session recording, centralized management and scalability, and integration with other enterprise systems.

IT managers seeking to deploy desktop videoconferencing solutions (or manage existing desktop video deployments) should clearly understand:

- the importance and benefits of a properly deployed visual collaboration solution, and
- the risks (cost, performance, network, etc.) associated with selecting the wrong solution or a poorly planned implementation.

Desktop video has become a powerful and reliable business tool used every day by countless information workers, and has earned its rightful place as a key part of an enterprise communications strategy.

The IT Manager Perspective

Considering the cost-savings, time-savings, and productivity benefits described above, WR believes that IT managers should view videoconferencing as a key part of their enterprise communications strategy. Once considered an isolated application, videoconferencing has, over time, improved its enterprise-citizenship such that it can now integrate with other organizational systems (e.g. centralized directories, groupware systems, key software applications, etc.). Desktop videoconferencing, in particular, is especially well suited to work in conjunction with unified communications (UC) solutions such as Microsoft OCS and IBM Lotus Sametime.

IT managers responsible for selecting, deploying, and managing desktop videoconferencing solutions need to have a basic awareness and understanding of a variety of concepts including:

Overall Capabilities / Functionality

The current generation of desktop videoconferencing solutions is NOT like those of even five years ago. Available in a variety of form factors and flavors, today's DVC solutions offer a compelling set of features previously available only on dedicated hardware platforms. Common features / capabilities include:

Communication protocols –videoconferencing systems can either be standards-based, meaning that they leverage widely-accepted communication protocols such as H.323 and/or SIP, or proprietary.

Interoperability – once considered only a pipe dream, virtually all of today's videoconferencing solutions – including desktop video systems – provide some degree of interoperability. Depending upon the solution, the interoperability can either be native (meaning that the solution leverages standard signaling and compression protocols such as H.323 and H.264) or may require the use of conversion devices called gateways.

Video quality – today's desktop videoconferencing systems are capable of supporting a wide range of video resolutions and quality ranging from standard definition (e.g. CIF) to high definition. Common video protocols / compression standards in use today include H.264 and H.263.

Audio quality – the audio performance offered by today's DVC solutions exceed that offered by the standard telephone. In some cases, the audio performance rivals that of high-end audio receivers. Key features include wide-band audio, stereo audio, and noise reduction. Common audio protocols / compression standards in use today include G.722, G.722.1, and MPEG.

Data sharing – like their hardware-based cousins, the vast majority of desktop video systems today support high quality data sharing. Common uses include the delivery of PowerPoint

presentations, virtual shared web browsing, playback of rich media video clips, and document collaboration. Common data conferencing protocols in use today include H.239 and T.120.

Multi-point sessions – the vast majority of desktop video solutions support video calls including more than two participants. In some cases, these multi-point / multi-site sessions can include large numbers of attendees (e.g. 50+ participants). Depending upon the solution, multipoint capabilities may be inherent within the desktop software client or may require the use of either a hardware or software-based video bridge.

Session recording – many desktop videoconferencing systems now support integrated session recording of the video, audio, and even shared data conferencing content.

Integration – leading desktop video solutions are designed to integrate with other enterprise systems to enable simplified management and enhanced ease of use. Common scenarios include integrating desktop video with groupware solutions (Outlook, Notes), directory systems (LDAP, AD, Domino), UC systems (Microsoft OCS, IBM Lotus Sametime, etc.), and streaming / content management engines.

Security – once considered unachievable due to the required processing power, today's desktop videoconferencing solutions offer varying levels of security ranging from DES or AES support through to advanced encryption technologies required for government and military applications. Leading solutions encrypt not only the media streams, but all associated control and signaling traffic.

Deployment Options

Today's desktop videoconferencing solutions are available in two basic types:

1) Client-Client Offerings – solutions in which all communications flow directly between the clients and no centralized servers are required.

2) Client-Server Offerings – solutions in which one (or more) centralized servers are used to provide centralized management, call routing, or other functionality. Client-server offerings are available in two flavors:

a) Customer Premise Solutions (CPE) – offering in which the required servers are installed on the customer's premise or within the customer's data center / co-lo facility.

b) Hosted / Software as a Service (SaaS) Offering – offering in which the application platform is installed outside the customer premise and managed by a 3rd party, typically a service provider.

In general, client-client offerings are well suited for extremely small deployments, while client-server solutions are designed to support the needs of the typical enterprise – small, medium, or large.

Hardware Requirements

Years ago, desktop videoconferencing solutions required the use of custom processor / daughter boards and cameras. Fortunately, these days are long gone and today's desktop videoconferencing solutions can run quite happily on a well-equipped enterprise PC or notebook and a USB webcam.

Enterprise desktop videoconferencing solutions may require the use of additional hardware or software components including:

- video bridges / MCUs to support multi-point sessions
- gateways to allow connectivity to multiple networks, protocols, and/or other systems
- gatekeepers to provide call admission control and usage tracking
- NAT / firewall traversal servers (e.g. STUN / TURN, etc.)
- Recording / streaming servers

Network Requirements

IT managers expecting to successfully host IP videoconferencing traffic on the corporate data network need to understand the impact of rich media on the data network. Note that the information below applies equally to group and desktop / personal videoconferencing.

1) Bandwidth Required - While newer video compression techniques have lessened the bandwidth needed for videoconferencing, videoconferencing still consumes a significant amount of bandwidth. For example, a good quality desktop video call might require 500 kbps of bandwidth per person, while an HD quality call might require 1+ Mbps per person. Most desktop video solutions adjust their bandwidth utilization in real time to adapt to available network capacity.

2) Traffic Patterns - Unlike the bursty traffic patterns associated with applications like email and web browsing, videoconferencing traffic is relatively constant throughout the video session. Networks must be engineered to handle this type of continuous data traffic.

3) Performance – In order to provide a solid user experience, IP networks must provide a combination of high throughput, low latency, and low packet loss. Due to the real-time nature of videoconferencing, it is not possible to wait for the re-transmission of lost packets. IT managers

seeking to host video calls over loss-prone networks (such as the public Internet) should assess each solution's ability to compensate for or mask the effects of packet loss.

4) Bandwidth Management – A key part of providing a consistently high quality of experience (QoE) for conferencing users is proper bandwidth management. When properly implemented, bandwidth management ensures that time-sensitive, rich-media applications (like videoconferencing) have access to the bandwidth required, while at the same time protecting other applications from the rich media traffic. Proper bandwidth management in the conferencing world includes call admission control, setting and enforcing bandwidth usage limits (per-user, per location, and/or between locations), and adapting automatically to changing network conditions.

5) NAT / FW Issues – Much to the dismay of IT managers and network security folks, H.323 videoconferencing, which is the standard for IP-based videoconferencing in use by most organizations today, uses a variety of network ports across a massive port range. In addition, the ports used vary by call. Fortunately, the majority of desktop video solutions include some form of NAT / firewall traversal capability that allows rich media traffic to traverse the firewall without the need to change firewall rule sets or settings.

Personnel / Support Staff Requirements

Organizations seeking to deploy desktop videoconferencing should anticipate needing the following support resources:

- Centralized IT support teams to manage user accounts and centrally deployed equipment
- Local IT support teams to provide users with onsite support as required (note that the need for this type of support tends to decrease dramatically over time)

In most situations there is no need to dedicate full time resources or sent IT staff for specialized vendor training in order to support a desktop videoconferencing deployment. However, the overall resource requirements will depend upon a number of factors including the type of solution deployed (CPE, ASP, etc.), the level of integration with other enterprise systems, the number of users, and the support expectations of your user community.

Management and Scalability

Today's client-server desktop videoconferencing solutions offer IT managers a wide array of centralized management capabilities including:

- Overall environment management (settings, licensing, etc.)
- User account creation / management
- Remote software provisioning
- Meeting / session management
- Troubleshooting / issue tracking
- Usage tracking / reporting (system usage, network utilization, etc.)

In the last few years, desktop video solution vendors have added support for numerous items to enhance the scalability of their offerings including:

- Support for distributed architectures
- Support for standard load balancing systems / capabilities
- Modular servers / hardware platforms to enable on-the-fly upgrades / expansions

IT managers should note that management and scalability capabilities vary widely by solution.

Solution Spotlight – Avistar

This section provides information about the Avistar C3 Desktop Videoconferencing Solution available from Avistar, the sponsor of this white paper. The Avistar C3 platform is comprised of the following components:

Avistar C3 Desktop – a SIP-based desktop videoconferencing solution that includes centralized user and system management, data conferencing, 1-click video calling, integrated network / bandwidth management capabilities, and click-to-call with IBM Sametime and Microsoft Office Smart Tags. The Avistar C3 Desktop solution includes the Avistar C3 Desktop Software (installed on user's PCs / notebooks) and the Avistar C3 Server Software (to be installed on a client-provided standard Windows server).

Avistar C3 Conference – a software-based video bridge / MCU designed to operate with the Avistar C3 Desktop solution. Key features include support for up to 12 simultaneous video calls per server (each with up to 4 sites), interoperability with H.323 videoconferencing systems, integrated bandwidth management, and web-based monitoring and management.

Avistar C3 Tunnel Server – a software-based firewall traversal solution that supports a wide variety of standards including STUN, TURN, ICE, and HTTPS tunneling. Additional features include support for both H.323 and SIP environments and up to 20 traversal calls per server (at speeds up to 1 Mbps per call).

Avistar C3 Command – a dynamic bandwidth management solution that provides three key features: i) control over the amount of bandwidth used for audio and video calls on a per-user basis, ii) control over the amount of bandwidth used by UC solutions, and iii) protection of bandwidth allocated to UC to ensure an appropriate user quality of experience (QoE).

Avistar C3 Connect – a software-based SIP to H.323 gateway that allows Avistar users to communicate with H.323 video systems and MCUs. Avistar C3 Connect supports up to 100 concurrent video calls, translates address books between SIP and H.323 environments, and supports H.239 and SIP dual video.

Avistar C3 Media Engine – a software applet designed to be embedded within other applications that video- and audio-enables any software application. Key features include support for up HD720p video, integrated NAT / firewall traversal capabilities, and full AES encryption.

Avistar C3 Unified Microsoft OCS Edition – a software plug-in that integrates Avistar's conferencing capabilities with the Microsoft OCS platform.

Avistar C3 Integrator Citrix Edition – an add-on to the Unified Microsoft OCS Edition that enables the Avistar platform to operate in a Citrix ICA protocol and thin client environment.

In addition, Avistar offers an IBM Lotus Sametime module that adds dynamic bandwidth management capabilities, including bandwidth limiting / call admission control, to IBM Lotus Sametime environments.

Note that WR did not perform any system testing as a part of this project. However, WR has participated in a number of Avistar-hosted video sessions over the years and has first-hand knowledge of the solutions key benefits including:

- Strong ease of use / a simple user experience
- Interoperability with SIP and H.323 video systems
- An all-software architecture that allows users to host the application on their preferred hardware platform
- A modular architecture that allows users to deploy only the pieces of the solution they require while enabling Avistar to license pieces of its offering to strategic partners.
- Field proven reliability and consistent performance (Avistar desktop video solutions are in use within many of the world's largest investment banks)

Summary / Conclusion

Organizations can enjoy a wide array of soft and hard benefits via the use of desktop videoconferencing solutions. Once considered a tool for techies only, today's desktop video systems provide a compelling combination of cost-effectiveness, ease of use, and reliable performance.

Today's desktop videoconferencing systems include a wide array of features and capabilities to assist IT managers in the successful deployment, provisioning, and ongoing management of large scale deployments. In addition, leading-edge solutions, such as the Avistar C3 software solutions offered from Avistar (the sponsor of this white paper), even integrate with and leverage existing enterprise directory and groupware systems.

The key takeaway of this document is that the current generation of desktop video solutions are not only deployable … they can be deployed in an efficient, responsible, cost-effective, and secure manner with limited ongoing support requirements.

About Wainhouse Research

Wainhouse Research (www.wainhouse.com) is an independent market research firm that focuses on critical issues in rich media communications and conferencing. The company conducts multi-client and custom research studies, consults with end users on key implementation issues, publishes white papers and market statistics, and delivers public and private seminars. WR hosts the PLATINUM (www.wrplatinum.com) content website and publishes numerous market studies as well as a free newsletter, The Wainhouse Research Bulletin.

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About Avistar

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Avistar is recognized as a pre-eminent leader and innovator in solving the significant challenges of scale, quality and performance required to deliver desktop visual communications and collaboration solutions that are a measurable asset in organizational performance. Avistar provides the technology and solutions that supply the missing critical element in unified visual communications. Avistar brings people in organizations face-to-face through enhanced communications, for true collaboration anytime, anyplace. Avistar C3 solutions draw on over a decade of market experience to deliver a single-click desktop or room-based videoconferencing and collaboration experience, that moves business communications into a new era. For additional information about Avistar and Avistar C3 solutions, visit www.avistar.com.