



VIDEOCONFERENCING GUIDE

TANDBERG

A Global Leader in Visual Communication

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I. INTRODUCTION

Videoconferencing and Unified Communication

Videoconferencing is a powerful multimedia tool that improves communication and increases your organization’s productivity. Along with e-mail, instant messaging, Web conferencing, and other collaboration technologies, video is part of a Unified Communication strategy for any organization looking to improve its competitive positioning and the quality of life of its employees.

In an organization **with a Unified Communication approach, all communication tools work seamlessly together**, allowing users to move from one form of communication to the next without a break in the flow of conversation. Imagine an Instant Message between two co-workers escalating to a real-time video meeting over IP, then patching in a supplier on his 3G mobile phone, and later streaming over the Web to those who couldn’t make the live call.

Video offers an essential element of communication that other technologies cannot – the face-to-face experience.

If **55 percent of communication is determined by nonverbal cues**, namely tone of voice and body language¹, how many important details are you missing in an e-mail exchange or teleconference? A TANDBERG/Roper ASW survey found that 56% of business professionals estimate they waste more than 30 minutes a day using inefficient communication methods. Face-to-face communication is more personal, builds higher trust, reduces confusion, and makes people more accountable for their actions.

That’s why the ability to communicate via video is the driving force behind much of the IT convergence we are seeing today.

The Collaboration Universe

Products and services for audio, video and web collaboration as well as enterprise and consumer videoconferencing.

PRODUCTS	COLLABORATION AND NETWORK SERVICES	
Mobile Devices	3G Wireless	
Streaming	Streaming & Webcasting	Network Services
Audio Conferencing	Audio Bridging	
Web Conferencing	Web Conferencing	
Infrastructure	Bridges and Gateways, Gatekeepers & Proxies, Directory/Directory Services, NAT-Firewall Traversal	
Group Video	Managed Video Services	
Personal Video		
Consumer Video	IP Video/Chat Services	

Video-based elements

¹ Mehrabian, A. *Silent messages: Implicit communication of emotions and attitudes*. Belmont, CA: Wadsworth

Benefits of Videoconferencing

Videoconferencing delivers immediate benefits in terms of cost savings and improved productivity. Organizations of all types have found that video creates a competitive advantage by:



Accelerating Decision Making – An estimated \$297 billion is wasted each year in the United States alone from inefficient communication.² The time we spend on traveling, waiting for materials to arrive, or trying unsuccessfully to explain complex issues over e-mail could instead be used to bring new products to market or solve customer service issues. Video allows all parties to share ideas, show detailed images, and take action more quickly.

Scaling Knowledge – Sometimes you need to bring in an expert. Video allows you to leverage the expertise of a few across an entire organization without asking them to travel to different locations. Training, translating, consulting, and troubleshooting can happen in real time. And, with video streaming and archiving, an expert's knowledge can be accessed by anyone at anytime.

Unifying the Organization – Having multiple offices doesn't have to mean isolated teams. Organizations that undergo global expansion, mergers, or outsourcing initiatives often have departments in silos, disconnected from project goals and a communal company culture. Video creates a virtual meeting room for collaboration, keeping everyone on the same page.

Promoting Work/Life Balance – Having to travel all day for a two hour out-of-town meeting means sacrificing family and personal time. Using video to attend that meeting, or even working from home, instead of sitting in rush hour traffic, goes a long way to restoring the work/life balance, saving costs, and protecting the environment.



² TANDBERG/Roper Survey, 2003.

A Starting Point for Videoconferencing Applications: Imagine

The videoconferencing industry is changing rapidly. The options for an organization considering a video purchase have increased significantly in the past several years and continue to diversify. Proliferation of IP, introduction of new video form factors, and simplified user interfaces have made video more accessible than ever. Each system you may consider offers an array of features and functionality that may or may not be what you need to do business.

TANDBERG has developed this Videoconferencing Guide to help you put together the right elements

of a video network, ensure user adoption, and measure your post-implementation success.

The first step is imagining how you might use video in your organization. Almost any workflow process that you are currently undertaking with telephone, e-mail, or travel can be improved with video. Once video is in place, you may be surprised at the additional opportunities that open up to improve communication. Take these examples from some of the industries TANDBERG serves:



Education

- Collaborate with other educational institutions
- Extend classes to students in rural or remote areas
- Include presentations from experts and virtual field trips in your curriculum
- Offer continuing education and training for instructors and staff
- Hold administrative meetings among multiple campuses



Finance

- Collaborate in real time – set daily strategies, share news and market conditions, and make decisions without confusion
- Extend expert financial services to customers in remote branches
- Interview potential job candidates from afar
- Offer training and consulting opportunities



Healthcare

- Provide remote diagnostics from rural to urban centers
- Link medical professionals for mentoring and consultations
- Offer translation services for patients who speak a different language
- Participate in continuing medical education programs



Public Sector

- Coordinate action with national, state and local agencies
- Conduct briefings with high-level security
- Provide cost-efficient training opportunities
- Promote telecommuting/telework initiatives



Manufacturing

- Make decisions on product development and design
- Hold quality control inspections across different locations
- Provide experts for remote machinery repair
- Coordinate shipments with suppliers
- Create a single company culture with overseas branches
- Prepare for business continuity plans
- Conduct focus groups with customers
- Offer ongoing staff training



Public Safety

- Coordinate disaster recovery efforts
- Establish mobile field command posts
- Disseminate information to a wide audience

Measuring Your Return on Investment

With these potential applications in mind, take some time to calculate the time and resources you are currently spending on the activities you would like to replace with video.

Determine how many people are traveling to meetings and the cost of their travel.

Consider how staff could be using their time more effectively by reaching additional clients.

Measure how long it takes your organization to bring a product to market, complete a consulting engagement, hire a new employee, or repair a problem.

Each time you replace a practice with video communication you will have the opportunity to measure your return on investment.



II. HOW TO SELECT THE VENDOR AND SYSTEM TO MEET YOUR NEEDS

What You Should Look for in a Videoconferencing Vendor

Once you have determined how video could be used within your company, your next step is to develop a short list of vendors. **The ideal vendor acts as a partner in your business.** You should evaluate potential vendors in terms of the following characteristics:

- A sound financial profile and a good business model
- A strong company history, ethical business practices, and professional reputation
- Proven and responsive customer service
- Cost effective maintenance, support, and training programs
- Progressive research and development
- A global presence for one-stop-shop implementation wherever you may use video
- Satisfied customers
- Knowledgeable staff that can provide best practices for video usage in your industry
- An end to end solution (with infrastructure, management and endpoints)
- A commitment to developing standards-based, non-proprietary solutions
- Integration with other multimedia communications tools

How to Identify the Solutions that Satisfy your Business Requirements

There are different categories of videoconferencing systems and **“one size does not fit all.”**

How you answer the following questions will help you decide which elements of an end-to-end videoconferencing solution are best suited to your goals.

- How do you envision your company using videoconferencing?
- What kind of information do you exchange (product details, spreadsheets, multimedia, high security information)?
- Would it be helpful to see and speak to colleagues either at their desk or at their home office?
- Would you be communicating visually with suppliers, customers, partners, or anyone outside of your firewall?
- How many sites do you want to be able to connect in one meeting?
- How many people would participate in each type of meeting, in each location?
- How many calls might be occurring simultaneously?
- What bandwidth will be optimal for your communications?
- Do you want a fully integrated system or a set solution where you can use an existing monitor?
- Will you need to record meetings and/or stream video calls, such as CEO briefings or trainings, for those who were not in attendance?
- How do you want to integrate video with your other communications tools (Instant Messaging, Scheduling applications, IP phones, 3G mobile phones, and existing video systems)?
- How will you measure and report on your success?

How to Evaluate Video Solutions Before Making a Purchase

The vendors you are considering should allow you to test their equipment for a period of time. You should put their solution through a real-life scenario and test all elements in terms of:

Call Reliability and Quality

- How clear is the image at the bandwidth you will be using? Image quality is defined by a codec that supports superior motion handling and can handle a monitor refresh rate of 30 frames per second.
- How well can you hear? Is audio in sync with images? The microphone, echo canceller, speakers, and your bandwidth all define the audio experience.
- How often are calls dropped? There should be a high mean time between failures

State-of-the-art Technology

- Innovative engineering design that provides the latest in video clarity and functionality
- Manufactured under the ISO 9002 certification

Ease of Use

- Clear, concise menu prompts, phone books, and intuitive user interface anyone in your organization can follow
- One-click integration with other communication tools
- Easy to install, maintain and service

Value

- Standards-based for interoperability with 3rd party video units
- Systems that are optimized for both high and low bandwidths, to help you balance cost with functionality
- Software upgradeable solution to allow you to add on features as technology develops and your adoption grows
- Integration with other workplace tools for seamless communication
- Features and functionality that meets your needs at a competitive price

Standards & Compatibility

Choose a solution that is standards-based and can interoperate with video equipment from any manufacturer. If you are adding new infrastructure, management software, or additional systems to expand an existing network, you will only be able to communicate seamlessly if the solution you choose is standards-based.



Beware – Some visual communication systems can be compliant with International Telecommunications Union standards and be proprietary at the same time. These systems may not support all features and speeds, or the same quality image in both modes of transmission. It is important to understand how a system will perform when it is connected to equipment manufactured by another videoconferencing company.

How to Select Your Network

You may choose to run your videoconferencing traffic over ISDN or IP networks. If you already have an IP network in place for voice, your natural next step may be to deploy video over IP.

When selecting your network you should ask yourself:

1. Whom do you plan to call?

For example, are the sites you plan to call all internal? Do you plan to call other sites not owned by your company?

2. How widely available is the desired network?

Not all networks are available worldwide. For example, ISDN is widely available in many countries but is still in the early stages of deployment in some countries and rural areas. The same applies to IP networks; not all countries or areas are connected to the Internet with the same speed and reliability. Ensure that you check which networks are available in the geographic areas where your company operates.

3. What are the costs associated with the network?

Costs will vary based on your choice of network. If considering an ISDN network, remember that you will have local and long distance charges involved. When looking at an IP network, consider the implementation costs and your existing network architecture. Take into account your costs over the long term for each type of network.

4. How reliable is the network?

It is important to note that public Internet is not as reliable as private IP networks.

5. How much bandwidth will you require?

Will you, for example, be using embedded multi-point functionality, High Definition video, or other features that require higher bandwidth? You may wish to restrict the bandwidth for certain users or applications, but allow higher bandwidth for your most critical video meetings. You will want to choose a solution that allows you to adjust the bandwidth or one that automatically balances the bandwidth based on the application.

Unified Communication Over IP

IP promises lower costs, easier management, remote monitoring and control, higher bandwidth calls enabling higher quality audio and video and integration into the corporate information technology mainstream. Video users switching from ISDN to IP can reap as much as 40% to 50% savings as soon as deployed.³ With a converged network over IP, the concept of “Unified Communication” becomes a reality.



³ Frost and Sullivan's July 2005 report, "Guiding Enterprises towards IP Migration – End to End IP Videoconferencing Services"

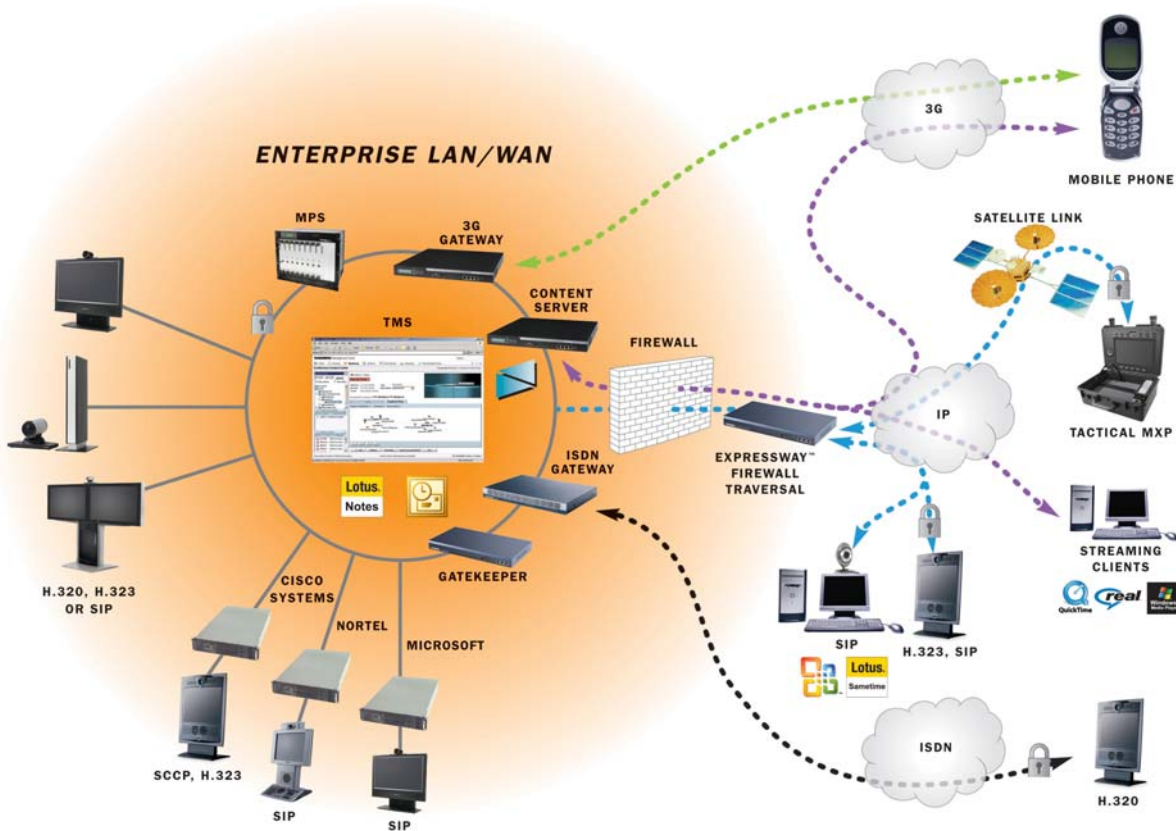
III. ELEMENTS OF AN END-TO-END SOLUTION

There are five essential components that comprise a videoconferencing system: a camera, microphone, monitor, speaker and codec. The camera and microphone capture the image and sound at one location. The codec converts the video and audio into a digital signal and compresses it before sending it out over the network. At the other end, the codec decompresses the signal and feeds the picture to a monitor and the sound to a loud speaker.

A video call can incorporate two units or many, with considerable options for functionality. Depending on your application requirements and budget, you will have numerous options for the video solution you chose. There is a system for every workspace, from boardrooms to desktops, to field locations, and manufacturing floors. All of the systems you implement will be able to work together easily if you choose a vendor with a common platform.

TANDBERG's End-to-End Solution

The TANDBERG End-to-End Solution incorporates a full suite of video systems, infrastructure for multiple environments, and centralized management tools. It can be expanded by integration with external devices and productivity tools.



An End-to-End Solution May Include the Following Products:

Group Videoconferencing Systems

(sometimes called Room): These are high quality systems designed to be used in shared environments such as meeting rooms, boardrooms, and auditoriums.

Desktop or Personal Videoconferencing Systems:

With cameras and microphones designed for personal or single-person use, this product segment includes videophones, executive systems, and PC-based solutions optimized for the office, cubicle or home.

Special Applications: Telehealth, Distance Education, and Defense are industries which have special video systems designed to meet their specific application. Your applications may match up to a specialized solution.

Video Infrastructure: As your video use grows to include multiple sites and advanced functionality, you will require network infrastructure to support your solution. Infrastructure includes multipoint control units (MCUs), also known as bridges, that enable more than two participants to be in a single videoconference; gateways that connect users on different networks (typically IP and ISDN as well as PSTN), gatekeepers that provide sophisticated user and bandwidth management functions as well as directory services; and NAT-firewall traversal solutions that enable audio and video calls to connect across different networks and user domains.

Centralized Management and Scheduling Tools:

Management systems allow you to control an increasingly complex communications environment without decreasing the level of service or significantly increasing associated support costs. With a management system you can perform remote diagnostics and system upgrades, control associated resources and link to 3rd party communication tools, generate usage reports, and calculate your return on investment. Management systems can also simplify the user experience greatly by allowing the use of one-click address books for easy dialing.

Content Server: Adding a content server allows you to record and stream video meetings, such as company-wide announcements or trainings, to be shown to a wide audience at a time most convenient for them.

Peripherals and Accessories: There is a wide range of peripheral equipment that can be used to enhance your visual communication environment. High Definition and wide angle cameras add to your visual experience. Upgraded speakers and microphones can enhance the audio. Document cameras allow you to transmit drawings and other documents via video. You can connect your video systems to DVDs, VCRs, whiteboards, and document and multi-media applications via your PC.

IV. HOW TO CREATE HIGHLY-EFFECTIVE VISUAL COMMUNICATION

Placement of Your Video System

Basic adjustments can ensure that you send and receive the best possible image and audio quality in order to make the meeting feel natural.

Whether your video unit is in a boardroom, manufacturing floor, cubicle or home office, there are important considerations to keep in mind:

Background:

- Remember that the camera shows what is behind you. Provide a calming background with a neutral color, medium contrast and soft texture.
- Avoid moving backgrounds such as curtains in a draft, or people walking behind you, as this may both reduce image quality and distract the attention of those on the far end.
- Do not place the camera facing a doorway.

Lighting:

- Avoid direct light on the subject matter or camera lens as this will create harsh contrasts and shadows.
- If you have poor lighting in the room, you may need to use indirect, artificial light. Indirect light from shaded sources or reflected light from pale walls often produces excellent results.
- “Daylight” type lamps are most effective. Avoid colored lighting that might tint your image.

Placement:

- The video system should be placed about 2-3 feet (60-100 cm) away from the person who is speaking, depending on screen size and what feels natural.

Set-up:

- The unit should be set to Automatic Answer, but with the microphone muted.
- The camera should be located in the top center of your unit.

For Desktop Videoconferencing Units:

- As a part of your everyday tools, video should be located close to your PC. This way you can easily share presentations without having to move. You may even be able to use your system as a PC screen.
- In an open office environment, use a headset for privacy.

For Meeting Rooms:

- The microphone should be placed at the front of the table to ensure that all speech will be detected. The best position is at least 6.5 feet (approx. 2 meters) in front of the system, on a flat surface with at least 1 foot (0.3 meters) of table in front.
- The document camera should be close to the leader of the meeting or its designated controller. Remember to arrange all the peripherals so that one participant can reach each of them to point, change the display, record, or perform other functions during the conference.
- To help ensure the most natural meeting environment, position the camera on the top center of the receiving monitor. The camera should point directly at the meeting participants to guarantee eye contact with those at the far end.

Loudspeaker Volume:

- The audio system will use the loudspeakers built into the monitor or TANDBERG’s Digital Natural Audio Module. The default volume level can be set by adjusting the volume on the monitor using its own remote control.

Brightness Control:

- For adjusting brightness, colors or other settings of the monitor, you must use the monitor’s own remote control. Adjust the monitor to suit the conditions of the conference room. The monitors used by TANDBERG have on-screen menus that are very easy to use. For more information on configuring the monitor, refer to the user manual.



Conducting a Powerful Video Meeting

A video meeting is just like a live meeting – almost. If you are already comfortable with the format of a live presentation, you are well on your way to becoming an effective communicator via video. Video meetings and presentations do require that we make some minor changes in our delivery of information.

Adjustments are so subtle that they often remain overlooked by the visual communication newcomer, but they can make a difference in accomplishing your goals.

Six Points for Powerful Video Calls

1. Visual communication gives you the opportunity to share multimedia source materials such as video clips, Web sites, spreadsheets and other presentations. Always test your system and your source materials prior to any meeting. Do not leave this responsibility to someone else, and do not assume that since the systems worked well in one type of connection that they will work for every connection. You may be connecting to a dissimilar and less capable system or into an unstable network, and this may result in small difficulties that need to be worked out ahead of time.
2. Eye contact comes from looking towards the camera, not the display. Make certain that your camera is located as close to top center of your video display as is possible. This will give the impression of strong eye contact and help to build trust and understanding among your participants.
3. Speak up. If you mumble and cannot be heard by the person seated next to you, the people at the far-end will also have a problem hearing you
4. Cameras and video displays tend to make everything “bigger.” Nervous habits or little recurrent gestures will be greatly magnified and distracting. No rocking, swaying or “playing” (fidgeting with pens, pencils, papers, eyeglasses or spare change in your pocket, etc.) is a good rule to follow. RELAX! This is like any other meeting except it includes people who are not physically present in your room.
5. When you are connected in a video call, the electronics of the system will faithfully pick up all your images and words. Smart remarks, quips and asides, or demeaning gestures such as rolling eyes, will be greatly amplified at the far-end. Assume the other meeting participants always see and hear you, even when the camera is not pointed in your direction.
6. This is videoconferencing, not TV. A videoconference is two-way. TV is passive and only one-way. Build in opportunities to verbally engage the participants at the far-end. Vary your source materials and provide visually interesting items that will elicit responses.



V. A FINAL WORD

TANDBERG is changing the way people communicate. By accelerating decision making, scaling knowledge, unifying organizations, and improving work/life balance, video is making our customers more productive.

Our company is at the forefront of the videoconferencing industry, consistently the first to deliver fresh functionality and realize new applications. We introduced the industry's first architecture that embraces open standards, promotes interoperability, and leverages existing network infrastructure. We believe that the success of any visual communication solution depends upon high quality, reliable, and easy-to-use products and services that deliver excellent value.

With customers in all industries in over 90 countries, TANDBERG offers a complete range of videoconferencing solutions built upon feature-rich technology. We are an integral part of the Unified Communication movement. Our alliances with Microsoft, Cisco, IBM, Nortel, and others ensure that our products interoperate with best-in-breed communications technologies, providing you with high value and low total cost of ownership for your video investment.

To learn more about how TANDBERG can help you implement the right video solution for your organization, please visit www.tandberg.net.