

A GUIDE TO VIDEOCONFERENCING INFRASTRUCTURE

VERSION: LARGE IMPLEMENTATION

ACCELERATE DECISION MAKING

Share ideas and materials
Improve multi-channel delivery
Shorten time to market
Ensure business continuity

SCALE KNOWLEDGE

Compress global markets
Deploy troubleshooting, training,
subject matter experts
Develop value-added services

UNIFY THE ORGANIZATION

Solidify corporate culture and goals
Share information in real time
One message, no misinterpretation

IMPROVE WORK/ LIFE BALANCE

Increase job satisfaction with
less time on the road
Compete for scarce human resources
Impact corporate social responsibility

TANDBERG

See: **performance**

EXECUTIVE SUMMARY

Video communications have come of age. Corporate networks are becoming more powerful, with sufficient bandwidth to carry video, audio and data signals simultaneously. There is also recognition of the cost and productivity advantages of face-to-face video communications. An increasing number of private and public sector enterprises are adopting this technology as a strategic, mission-critical necessity at the core of, and throughout their organizations.

As more businesses consider implementing new video communication solutions or enhancing their existing solution, important decisions must be made. Executives and technical decision makers must choose from an increasing number of alternatives. Knowing what questions to ask and what features are important in a video architecture will help you make the best decisions for your company.

This document suggests a set of features and services provided by the infrastructure needed to enable a flexible, scalable, robust and user-friendly solution of a fairly large size and defines such a network and the necessary components. These suggestions are only intended as a starting point for discussion when considering the implementation of videoconferencing infrastructure. We understand the needs of each customer may be different.

TABLE OF CONTENTS

SEE: SIMPLICITY	4
SEE: MANAGEABILITY	5
SEE: COMPATIBILITY	7
SEE: RELIABILITY	8
CONSIDERATIONS	8
SEE: SOLUTION	9

SEE: SIMPLICITY

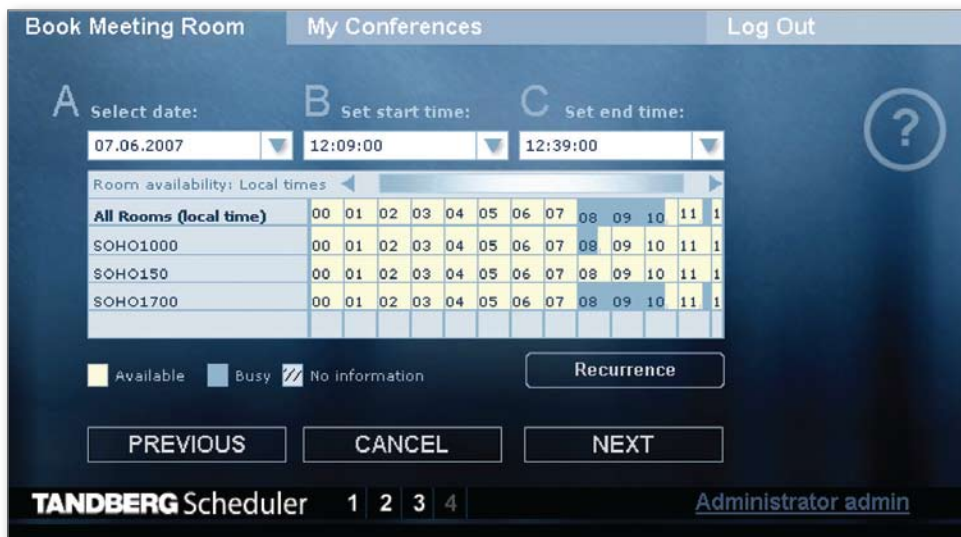
The key requirements for any type of Information and Communications Technology (ICT) investment should be user-friendliness and performance. These requirements ensure that the technologies users are adopting have the most simple and efficient interfaces.

When addressing simplicity from a visual communications perspective, and looking at what kind of services to expect from the infrastructure, the most important aspects are:

- **Booking/Scheduling** — the ability to book and schedule video conferences should be available for the relevant users either from the local intranet as a web-service or integrated in existing calendar tools.

TANDBERG Management Suite (TMS) is a centralized server in the visual communications network facilitating scheduling of video conferences.

TMS optionally integrates with tools like Exchange/Outlook and Lotus Domino/Notes for ultimate ease of use.



- **Phonebooks** — contact information users need is easily accessible from every video system everywhere (meeting rooms, desktops, home offices).

All managed video systems information is stored in TMS; external phonebook entries (Active Directory, LDAP, etc.) can be added.

- **Provisioning Templates** — enables the administrator to set templates for all settings on systems in TMS. Using configuration templates, a specific set of settings can be uploaded to several systems in one operation. This ensures homogenous settings among different systems, makes it easier to enforce a common dial-plan, and TMS makes this operation easy and effective.
- **Simple Dialing** — by using the TANDBERG Video Communication Server (VCS) it's possible to use simple email-like addresses to call video systems inside or outside your organization.
- **Automated Video Receptionist** — easy video access into the organization through intuitive menu systems. One main address or number can be distributed to customers and partners, enabling instant access to specific resources within the enterprise.

SEE: MANAGEABILITY

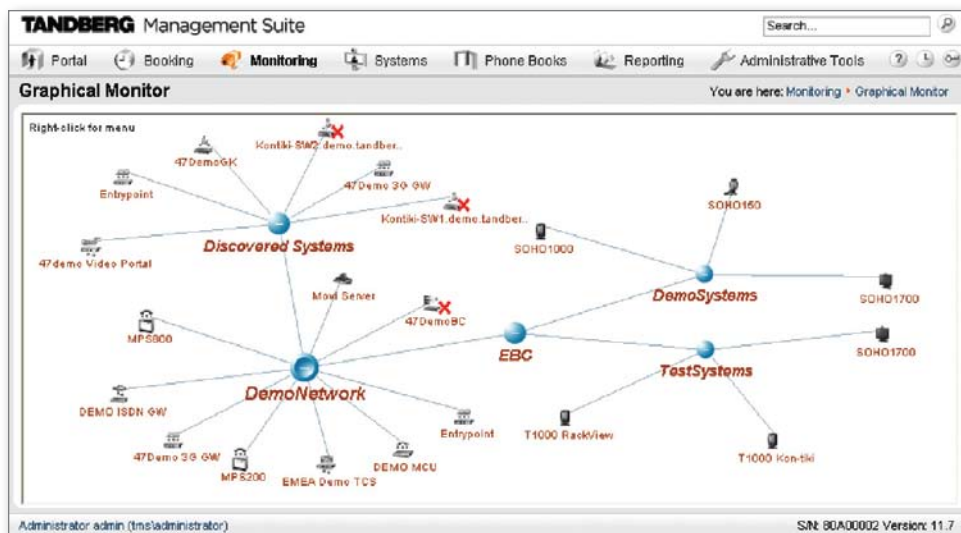
In order to maintain a user-friendly communications network, a robust and comprehensive management system is necessary. To ensure the uniform user experience throughout the organization, a centralized method to distribute software upgrades and configurations is needed. As the network grows in size (number of nodes and/or geographical area) and complexity, a tool to abstract the network administration from taking on proportionally more and more complex maintenance is essential.

The video network is, in this context, no exception. The TANDBERG Management System offers a complete set of services, ensuring the manageability of an optimized video solution:

- **Monitor Video Conferences** — choose between the detailed overview in “Conference Control Center,” the “Graphical Monitor,” (below) providing powerful features for monitoring a network of conferencing systems and infrastructure. The “Map Monitor” is designed to give an overview of the physical locations of the systems in your network.

A GUIDE TO VIDEOCONFERENCING INFRASTRUCTURE

VERSION: LARGE IMPLEMENTATION



- **Bandwidth Control** — when deploying video on an IP network, it's important to ensure that other IP services will not be adversely affected. By making use of the bandwidth management features of the VCS Control, it is possible to have full control of the video network usage.
- **System Configuration Backup** — enables the administrator to back up all the settings of all/selected systems. Backup for later restoring of the systems settings is done in one operation.
- **System Upgrade** — maintains one software version across the platform and easily publishes new software versions as they are available.
- **Reporting** — generate reports and statistics, i.e. video usage in the company, billing, system and network error reporting, return on investment (in video equipment) and also a carbon calculator. You can use statistics templates to create templates for frequently used reports.
- **Automatic Registration of Systems** — TMS automatically discovers and registers the video systems. These systems may also automatically be given a default system configuration template including phonebooks, call server registrations, etc.
- **Integrations with Active Directory** — TMS integrates with AD in several ways, the most obvious ones being a) user management — ability to import AD-groups in order to assign users to video usage, and b) phonebook import.

A GUIDE TO VIDEOCONFERENCING INFRASTRUCTURE

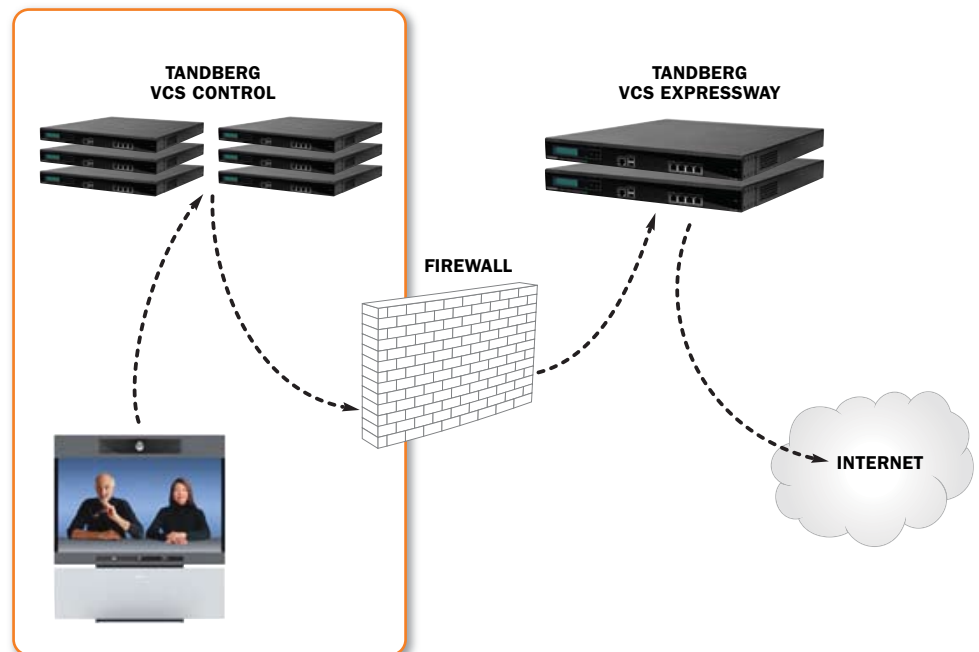
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SEE: COMPATIBILITY

There is very little point in creating a visual communications infrastructure that does not provide compatibility and interoperability with systems from other vendors and with other visual communications users. It is also important for organizations to build a solution that enables seamless communication with internal participants as well as parties outside the organization.

One key aspect of a compatible visual communications installation is the use of video endpoints and infrastructure that complies with multi-vendor industry standards. TANDBERG takes pride in conforming to ITU and IETF standards for visual communications, and is often involved with the creation and improvement of these standards.

- **TMS Compatibility** — the TMS system is the most widely deployed visual communications management and scheduling tool world-wide, not only because it has the most comprehensive feature set, but also because it has the widest built-in support for products from other vendors.
- **Call Control** — the TANDBERG VCS is fully conformant with both the H.323 and the SIP standard and supports endpoint and service registration from H.323 and SIP compliant vendors. Additionally, the Expressway firewall traversal solution uses ITU standard H.460.18/19 for H.323 calls and IETF STUN traversal technology to enable calls from anywhere, to anywhere.



Natural Communication — the ability to engage in every business interaction — with a colleague, a supplier, a customer, a shareholder — as though it were an intimate, face-to-face discussion.

- **Multiparty Conferencing** — not only is there a need for being able to connect three or more sites into one video conference, these sites may be connected through different networks on video systems from different vendors, of which some might be standard definition (SD) and others high definition (HD). The TANDBERG Multipoint Control Unit (MCU) portfolio covers H.323, SIP, ISDN, and V.35 protocols and SD as well as HD, ensuring complete compatibility.

SEE: RELIABILITY

To enable true Natural Communications, visual communications technology needs to achieve “utility level” stability. High-quality video systems are very important in this goal, but in addition it’s important to consider how robust and reliable the visual communications infrastructure is.

The first step is ensuring the IP network infrastructure is as strong as possible. After that has been achieved, the core call control components, together with the management system become the most significant points of failure.

- **Redundant Call Control** — TANDBERG VCS supports the clustering of up to six VCS boxes and the capability to provide multiple redundant “alternates” that can use separate power circuits and network switches and provide automatic fail-over and recovery.
- **Redundant Management** — TANDBERG Management Suite supports different levels of redundancy. Depending on the required level of up time, the solution spans from a manual switch over to a fully automated process.

CONSIDERATIONS:

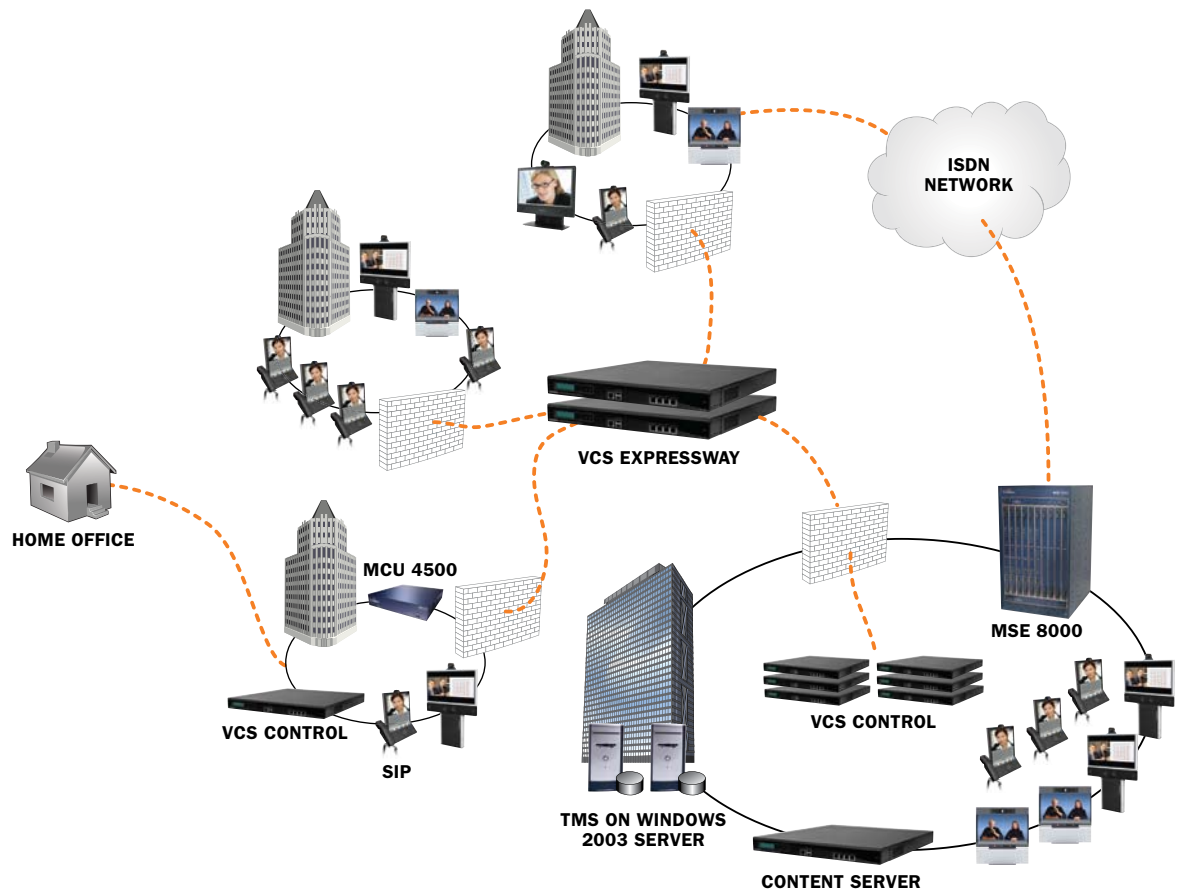
- **Encryption** — to encrypt the media in a video conference and decrypt it at its destination. The feature must be supported by all media handling infrastructure elements (such as bridges, gateways and media recorders).
- **Dial Plans** — unlike audio, which has a coherent global dial plan (with standardized country code, region, exchange and terminator numbers), there are no global video numbers dialing plans. Calling from one number to another, outside your own system, can be very difficult. The use of the Expressway solution in the TANDBERG VCS overcomes this limitation by enabling email-style system addresses.
- **Call Policy** — the ability to define rules for end points, and what network resources are available (gateway, MCU, border controller) is provided by the TANDBERG VCS Control. The ability to define call policy gives the administrator greater control over the video network. Expensive resources, such as access to ISDN or MCU resources, can be explicitly controlled

A GUIDE TO VIDEOCONFERENCING INFRASTRUCTURE

VERSION: LARGE IMPLEMENTATION

and managed.

- **Recording and Streaming** — is there a need or a requirement in the organization to record certain meetings? For training, corporate briefings, recap of previous meetings, it can be very useful to be able to stream the content to your computer. The TANDBERG Content server offers these and many more capabilities.
- **Quality of Service (QoS)** — QoS refers to the ability of a network to provide consistent and reliable performance that is acceptable for the applications the network carries. For video, jitter and packet loss would ideally be non-existent and delay would be minimized. There are several mechanisms used for QoS that prioritize traffic in the network. These include IP Precedence, DiffServ and RSVP. Separating types of traffic is another way to provide QoS.
- **Unified Communications** — unifying the corporate communications and extending the utilization of these means. i.e. letting audio and video-conferences be initiated from the mail (booked) or IM-client (ad-hoc) through seamless interworking between VoIP, video and IM infrastructure.



SEE: SOLUTION

TANDBERG has worked with many large-scale video communications implementations over a number of years. Our experience suggests that for an implementation of around 150 – 500 videoconferencing systems, the following components are the vital parts of the IP infrastructure for visual communication:

- **Up to six per zone x TANDBERG VCS Control** — base systems (multiple units per zone in order to provide fault-tolerant redundancy and multiple zones for geographically widespread organizations)
- **2(+) x TANDBERG VCS Expressway** — base systems (multiple units per zone in order to provide fault-tolerant redundancy and multiple zones for geographically widespread organizations)
- **2(+) x TANDBERG Management Suite** — base systems with support for appropriate number of video systems and, potentially, integrations — (2+ installations in order to provide fault-tolerant redundancy)
- **Multipoint Control Unit**
 - a) IP and ISDN connected video systems: **TANDBERG Codian MSE 8000**.
Up to 360 ports of multipoint or optional ISDN Gateway blades.
 - b) IP only video systems (SD and HD): **TANDBERG Codian 4520** — 40 ports (IP)
- **TANDBERG Content Server** — videoconferencing recording and streaming

These infrastructure components form the core requirements for a successful and scalable video deployment. With this solid base, any organization can add further services with ease. As the scale of the deployment and the needs of the organization grow, services such as mobile video, integration with calendar tools, instant messaging and VoIP infrastructure can be added as a natural extension. As the number of video systems increases, it is easy to add more VCSs.

To capitalize on TANDBERG's considerable experience, **TANDBERG Professional Services** can assist with design, implementation and deployment of your visual communication needs.