The Intelligent Meeting Environment

The Enterprise Manager's Guide to Creating and Managing an Intelligent Meeting Environment

Wainhouse Research

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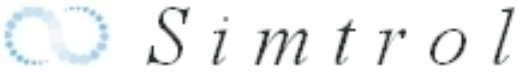

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Executive Summary

It is no revelation to say that success in the workplace depends upon effective teamwork. To work together well, people need to communicate effectively. And to facilitate effective communication, people often must attend a variety of meetings. Given the value and expense of *time*, organizations are highly motivated to make their meetings as focused and high-impact as possible. To that end, many organizations use audio visual (A/V) and conferencing technology. In fact, one recent industry research report estimates the current market for audiovisual technology to be $18.9B – and growing at almost 10% per annum.[1]

Given the significant yearly investments made in audiovisual tools, it is surprising that most organizations do not centrally manage and leverage their A/V investments to maximize their return on investment. Instead, once deployed, these items are either locally managed or worse yet, not managed at all. The unfortunate result is higher than necessary cost, lower efficiency, and mediocre performance for the end-user community.

This paper focuses on the justification for and deployment of an Intelligent Meeting Environment (IME) consisting of Intelligent Meeting Rooms (IMRs). Thanks to the widespread availability of IP networks, the concept of networking meeting facilities and A/V equipment to enable centralized management and increasing returns is now within the reach of virtually any organization.

Wainhouse Research believes that any organization that depends upon its meeting facilities and audiovisual equipment should consider deploying an IME, and that the deployment should be gradual to avoid impacting the user community. This document highlights the key aspects of an IME, the core functionality an IME provides, and also includes an example of the hardware architecture behind a typical IME.

[1] Source: Acclaro Growth Partners / ICIA Press Release – June 10, 2004 (www.icia.org)

The Audiovisual Dilemma

We just have to stop meeting like this! Recent statistics indicate that executives attend more than 60 meetings per month.[2] When asked to identify the factors deemed very important during these meetings, 85% of the survey respondents cited "Having a Presentation" as somewhat or very important. This statistic speaks volumes about the need for audiovisual (A/V) capabilities in meeting rooms. Additional reasons to use audiovisual technologies during a meeting include increased meeting impact, enhanced persuasiveness, faster material absorption, improved camaraderie, and more efficient use of employees' time. In short, it's an accepted fact that when properly used, A/V enhances the effectiveness of meetings.

While the business case behind the use of A/V is clear, those managing these technologies will agree that A/V technology is rarely straightforward. Even a basic A/V requirement, such as making a computer presentation, requires a number of steps including connecting the laptop to the A/V system, activating the laptop's VGA output, connecting the laptop's audio output, switching on the power on the display devices (video projectors, monitors, LCD displays, etc.), selecting the proper input on the A/V switcher, dimming the room lighting, lowering the projection screen, setting the proper audio volume levels throughout the room, activating podium and/or wireless microphones, and more. At first glance, an outsider might consider the above list to be child's play compared to the everyday challenges of the business world. In reality, a number of factors exist that complicate what appears to be a relatively simple initiative.

Meeting Participants

The first problem is that the participants in a meeting are not typically A/V professionals. Instead, they are employees with subject matter expertise in other areas. They do not know how to operate the A/V equipment, how it is connected, or how to resolve potential system problems. In short, they are not A/V experts – nor should we expect them to be.

The typical meeting participants are not audiovisual experts … nor should they have to be in order to benefit from audiovisual services.

Varying Requirements

Another source of complexity is that the steps required to set up an A/V meeting depend upon the user's requirements. For example, if the PC presentation user described above wanted to show a video clip during this meeting or to initiate a videoconference to connect to another location, the A/V setup would be totally different.

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[2] A network MCI Conferencing White Paper. *Meetings in America: A study of trends, costs and attitudes toward business travel, teleconferencing, and their impact on productivity* (Greenwich, CT: INFOCOMM, 1998), 3.

Environmental Awareness and Friendliness

In recent years, many A/V devices have become more powerful and remotely manageable. For example, plasma displays that previously supported only remote on/off commands now allow for remote management of brightness, contrast, color, and more. For the most part, however, these devices remain "environmentally unaware" in that they are designed to perform their specific role within the A/V system, without regard for the existence or performance of the devices around them. In addition, these devices are "environmentally unfriendly" in that they do not proactively inform other devices of their status. As a result, a DVD player will continue to play without concern for whether the video projector that should be showing the video image is working (or even installed for that matter). In effect, these components operate in a vacuum, even though the failure of one single item is enough to ruin the end-user experience.

Most A/V devices are environmentally "unaware and unfriendly" in that they perform their specific role without regard for the devices around them. In effect, these components operate in a vacuum.

Control Systems Remain Unaware

In an effort to resolve these issues, many organizations rely upon A/V control systems. These devices provide a simplified user interface while effectively automating the steps necessary to set-up a meeting. By removing much of the "end-user factor," A/V control systems simplify in-room meeting management and improve system reliability. However, either by design or implementation, most A/V control systems are as environmentally unaware as the A/V components they control. Therefore, meetings fail even when the control system is working properly.

While an A/V control system may simplify meeting set-up and improve system reliability, most A/V control systems are as environmentally unaware as the components they control.

For these and other reasons, A/V remains a manual, de-centralized, and "in-person" service in most environments, which reduces the very efficiencies that A/V systems are intended to create. Even when the end users are taught how to set up their own meetings, that emergency call to the A/V support desk remains all too common. As a result, audiovisual services become expensive to provide, time-consuming to manage, and difficult to scale. This is the root of the A/V dilemma; the need for A/V technology is justifiable and strong, yet legacy technology does not lend itself to efficiently and cost-effectively providing those services.

The Intelligent Meeting Environment

As Benjamin Disraeli once said, the most successful person is the one with the best information.[3] In many ways, this holds true in the A/V world; the most successful audiovisual environment is the one with access to the best information. This is the concept behind the Intelligent Meeting Environment (IME).

The IME is a collection of Intelligent Meeting Rooms (IMRs), potentially geographically dispersed, that communicate through a centralized management system and work together to support the end-user community. In an IME, meeting rooms are in constant, two-way communication with a centralized management engine, which allows these rooms to join together to form a single, cost-effective, and manageable entity.

Metcalfe's law states that the usefulness, or utility, of a network equals the square of the number of users or systems on that network.[4] This rule translates well into the Intelligent Meeting Environment in that the utility or effectiveness of an IME increases exponentially as the number of connected rooms increases. In a legacy environment, the meeting rooms act as isolated little islands, while in the IME, these islands join together to form a community.

The goal of the IME is to consistently, reliably, and efficiently support user meeting requirements. These goals are achieved through the acquisition and effective use of system and environmental information. For an IME, important information includes the functional status of the installed equipment, the details of the physical environment, the specific requests of the end users, and other external factors (such as the date, time, workflow issues, corporate policies, etc.). The IME centralized management system not only proactively collects this type of information, but also alters the behavior of each of the Intelligent Meeting Rooms based on the information received. And, the best part is that this activity takes place automatically, 24 hours a day, 365 days a year.

Traditional Environment	Intelligent Meeting Environment (IME)
Rooms are isolated islands of technology	Rooms communicate and are networked together for increased efficiency, effectiveness, and reliability
Support requires local resources	Supported remotely by fewer centralized resources
Problems discovered reactively (typically right before a meeting)	Problems discovered proactively (reported by the equipment or discovered by the management engine)
Difficult to calculate / track actual costs	Actual costs easy to calculate
Limited or no managerial reporting available	Detailed, centralized managerial information provided on-the-fly and automatically

Figure 1: Key Differences between Legacy Environments and an IME

[3] Source: http://www.quotationspage.com/quotes/Benjamin_Disraeli/

[4] Source: Forbes, "Metcalfe's Law and Legacy", September 13, 1993

Typical IME Capabilities

Once activated, the IME becomes an integral part of the daily meeting production schedule and automates many of the tasks previously performed by onsite resources. Specific examples include:

Standard Meetings

The IME can handle most aspects of room management and meeting setup. For example, prior to a scheduled meeting, the management engine can unlock doors, turn on equipment, and perform basic system testing. Before the scheduled meeting start time, the system can connect an audio or videoconference, un-mute system microphones, and adjust cameras in preparation for the conference.

Extended Meetings

Thanks to in-room motion detectors, the system can detect when meetings go longer than planned. This allows for on-the-fly schedule updates and room changes to accommodate extended meetings.

In-Room Problems

The system can detect whether the meeting is proceeding according to plan. For example, if the meeting schedule indicates that a laptop presentation will be made, the system can detect the presence of a PC signal and can automatically dispatch support staff if a) motion detectors indicate that clients are in the room, and b) no PC signal is detected within 5 minutes after the scheduled meeting start.

Problem Detection and Resolution

The management engine is always polling the IMRs for status information. Once a problem is reported (or discovered), the system takes proactive steps to resolve the issue. Depending upon the host organization's workflow, the system may check the availability of spare parts, activate local support resources, reserve the room for remediation efforts (and relocate pending meetings in that room), and update operations managers and end users as to the status of the remediation efforts.

Preventative and Quarterly Maintenance

As the central repository for usage and asset information, the system can make asset management recommendations to managers and support staff. For example, the system can email operations managers with suggested equipment maintenance tasks, and once approval has been received can automatically dispatch the appropriate maintenance staff.

The support provided by the IME management engine extends beyond the production schedule. Specifically, the IME can provide managers with a host of real-time reports, either automatically or on an ad-hoc basis, covering variety of areas such as:

Status Reports

Global managers can automatically receive a daily email, perhaps at the start and/or end of the local production day, listing rooms and devices in need of attention or repair, issues resolved that day, new issues discovered, meetings that encountered problems, and end users who were impacted by those meetings. Emails can contain links that provide additional information or allow managers to apologize to users, provide problem resolution status information, and even update the cost-accounting system to adjust client charge-backs as required.

Engineering and Maintenance Schedules

Global engineers can receive a daily email providing a suggested schedule for room maintenance and repairs, including URLs allowing them to reserve those rooms and even order required equipment and parts.

These (and many other) reports are available "on the fly" to authorized staff and can be automatically released (via email) on a recurring basis (hourly, daily, weekly, etc.). In addition, the system can provide monthly summary reports for operations managers, system engineers, and departmental management.

Readers should note that the examples given in this section illustrate only a few of the obvious uses of an IME. In reality, the functionality and reporting is limited only by the imagination of the system designer and operations team. Conceptually, an IME enables environmentally unfriendly devices to act friendly, and helps environmentally unaware devices become aware.

The Benefits and Business Case

In today's excessively plugged-in world, one might shudder at the thought of receiving a help request email from a plasma display installed in a conference room across the world just as you're sitting down to dinner. It's not that knowing the status of that plasma display is not valuable. However, this information needs to get to the right resources in order to be useful. That is the primary justification for the Intelligent Meeting Environment … the distribution of the right information, to the right people, at the right time. So exactly what are the benefits of this type of information collection and distribution system for the intelligent meeting room environment?

Improved Performance and Reliability

The value of a meeting room depends upon its ability to support user requirements on a consistent basis. This is the only way that an A/V meeting room can become a core business tool for the user community. In traditional meeting rooms, the only way to guarantee that a system is fully functional is to test, test, and re-test all functions. Unfortunately, this requires available and locally deployed resources to conduct this testing. In addition, the rooms must be taken out of production during the testing periods. In many organizations each A/V room is tested for 2 or 3 hours each week, making that room unavailable during that time period. Obviously the hands-on testing approach is a high cost, resource intensive way to manage a meeting room environment.

Fortunately, things are quite different in an Intelligent Meeting Environment. The first notable item is that the system itself informs the A/V staff when issues arise. This means that most problems are discovered and remedied without impacting the user community. In addition, this self-monitoring approach means that daily or weekly system testing is no longer required, making the room more accessible to the end users and thereby increasing the return on investment for the meeting room space. Finally, since testing is conducted remotely using the remote management tools, the need for onsite resources is drastically reduced, saving both cost and headcount.

In an Intelligent Meeting Room Environment, system performance is not left to chance.

Improved Resource Management

No matter how many employees an organization has, there never seem to be enough resources to go around. Due to the squeaky wheel principle, only the most urgent tasks get attention in a timely manner. The less urgent, but potentially important items are relegated to the bottom of the list. Unfortunately, these reprioritized tasks tend to include system testing, less critical system repairs, and preventative maintenance. In reality, these neglected items often become significant problems in the future.

The Intelligent Meeting Environment allows a company to leverage its existing resources regardless of location, time zone, or even level of expertise. The system automatically routes information to the appropriate people – 24 hours a day, 365 days a year. For example, information about a phone-related

issue can be sent to the phone services team, while notification about a failing projector bulb will be sent to the contracted A/V support company. In "follow-the-sun" environments, the system can route information to on-duty personnel, allowing many issues to be resolved remotely while the local resources sleep. The key is that the IME allows an organization's global resources to work together to achieve a common goal.

Meeting Rooms Become Assets

Ask any facilities manager or space planner and they'll tell you the same thing; meeting rooms are expensive for any organization. Not only must the organization shoulder the cost of the integrated audiovisual equipment, but also it must cover the footprint cost for the meeting room on a monthly basis. For a typical 16 foot x 20 foot meeting room space, the monthly footprint cost might be $3,000 in New York, $3,500 in London, and a whopping $4,800 in Tokyo.

In addition to the monthly cost, many organizations have a significant shortage of space within their buildings. This means that the same 320 square foot meeting room would be enough space to house 10 or more employees, making meeting room real estate a very expensive and valuable asset.

The Intelligent Meeting Environment allows an organization to leverage the investment it has made in their meeting rooms and maximize the benefit of those assets. The availability of real-time management information allows an organization to answer many key questions including:

i) What is the total cost of ownership?

In an IME, managers can easily calculate the total cost of ownership (TCO) for any managed asset. For example, the TCO for a video projector includes the purchase price, the cost of financing (if applicable), shipping and installation fees, and the cost for warranty and maintenance. In fact, in many cases the maintenance costs alone during a device's useful life can exceed the initial purchase price.

ii) What is the cost per use for an asset?

Once the total cost of ownership has been calculated, managers can determine the cost per use for any specific item. For example, perhaps a notebook computer with a yearly TCO of $1,490 has been used only twice in the last 12 months, resulting in a cost per use of $745. Not only does this enable accurate cost recovery and charge-backs, it also highlights potential areas for cost savings. In this case, the organization should consider renting a notebook PC as required instead of keeping this unit in inventory.

iii) Are the resources actually required in these locations?

The same usage and TCO information can help an organization determine the optimal location for specific assets. For example, a standard usage report might highlight that a videoconferencing system on a specific floor has been utilized only three times in a 30-day period. However, in other areas of the same building the users are hard pressed to find an available videoconferencing room. Based on

this information, the manager may be justified in closing down the underutilized room and relocating the equipment to another floor in the building.

iv) How are the assets working?

An important part of resource management is tracking the performance of an item after installation. In an Intelligent Meeting Environment, managers can be notified whenever the maintenance cost of an item exceeds an expected threshold or if a device is not meeting minimal reliability standards. Such information may motivate the manager to activate a flat-fee service contract (or enforce the terms of an existing contract or SLA), complain to the manufacturer or reseller, dispatch preventative maintenance resources, or even swap that item for another brand or model.

The key take-away here is that the information provided by the Intelligent Meeting Environment allows managers to make strategic management decisions about their A/V and meeting room assets. While in the past such decisions were made under duress (typically after an important meeting failed), the IME enables managers to proactively plan and forecast requirements and maximize the return on their meeting room investments. The deployment of an Intelligent Meeting Environment is a time saving, cost saving, and resource saving efficiency initiative for any organization that depends upon their meeting room and A/V assets.

Deploying an Intelligent Meeting Environment

Wainhouse Research believes that the benefits of an Intelligent Meeting Environment warrant the serious consideration of information technology (IT) and A/V managers in virtually any size organization. While larger, more globally distributed organizations will find greater utility in the remote management capabilities, small companies can benefit from the asset management features and other information that an IME provides.

To help organizations implement an IME in a low-stress manner without stepping on the meeting / production environment, Wainhouse Research recommends the following three-phase IME deployment:

Phase 1 – Management and Monitoring

The first phase of an IME deployment involves the connection of the conference rooms and installed equipment to the corporate data network, and the deployment of a centralized management engine. Depending upon whether the meeting rooms include some form of A/V control system, either a single network drop or several network drops may be required for each room.

Upon completion of this phase, the conferencing management team will enjoy the following benefits:

- Remote diagnostic capabilities (as supported by the installed devices)
- Remote device management capabilities (as supported by the installed devices)
- Automated collection of usage data
- Access to a variety of standard and customizable reports (available on-the-fly and if desired created automatically by the system)
- Automatic trouble discovery and problem management (including email notifications, trouble ticket management, etc.)
- Access to centralized equipment inventory and spare parts databases
- Proactive monitoring of device usage vs. estimated lifespan

The centralized management engine should provide most of this functionality "out of the box" with only limited setup and configuration requirements. Note that some organizations may find that completing Phase 1 provides the performance and management enhancements they require for their environment.

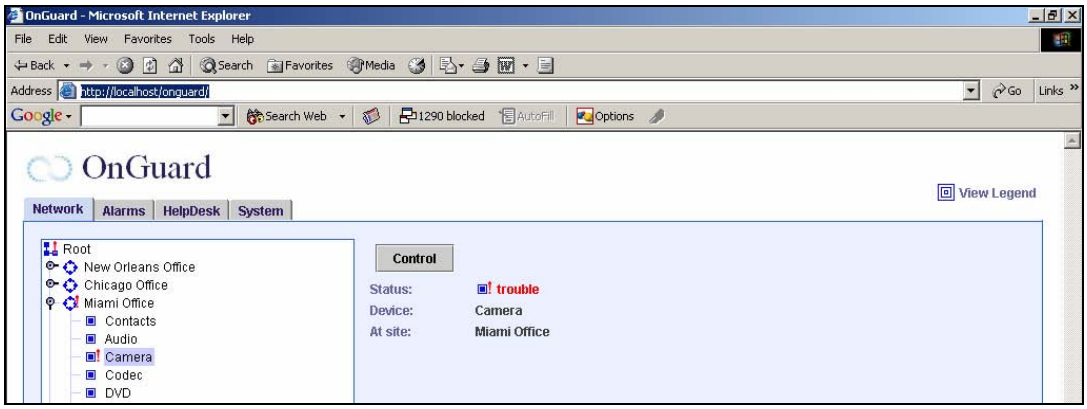

Figure 2: Screenshot of Real-Time Monitoring Engine (Showing Camera Issue)

Phase 2 – Scheduling and Meeting Control

The second phase of an IME deployment marks the injection of meeting management capabilities into the conferencing environment. In order to enjoy these benefits, the host organization must either already be utilizing a centralized scheduling system or must deploy such a system throughout their environment.

For organizations not currently using a centralized scheduling system, Wainhouse Research recommends a gradual, step-by-step approach to rolling out the scheduling solution. For example, the organization could initially allow users to reserve meeting rooms through the system. Soon after, the users could be given the power to include A/V requirements in their meeting reservations. Finally, the users could have the ability to book multi-location video meetings through the scheduling system.

> *Wainhouse Research recommends that organizations deploy a centralized scheduling system in a gradual, step-by-step manner to avoid negatively impacting the user community.*

Once deployed throughout the user community, the scheduling system and management engine must be connected to allow the two systems to seamlessly share meeting schedule data and room status information. In other words, if the scheduling system shows that a video meeting is scheduled to start at 3 PM, the management engine can read that information and manage all aspects of that video meeting (setup A/V devices, connect video systems, etc.). Similarly, if the management engine discovers a problem in a specific room, that room can be set to "unavailable" within the scheduling system.

Phase 3 – Automation and Intelligence

The third phase of implementation involves leveraging the management, monitoring, and scheduling system integration to add automation and intelligence capabilities to the meeting environment. Examples of this type of functionality include:

- Automatic shut-down of conference rooms after 6 PM local time (unless a meeting has been scheduled in advance)
- Automatic notifications to operations staff when a room / system is used without having been scheduled via the scheduling system
- Creation of an information screen for engineering staff to easily view and confirm maintenance requirements and tasks
- Automatic reordering of disposable items and spare parts (videotapes, lamps / bulbs, etc.)
- Automatic relocating of meetings from one room to another upon discovery of a system problem (includes notifying operations staff, engineering resources, and end-user coordinators)

The above list includes only a few examples of the automation that can be activated as a part of phase 3. The figure below provides a suggested timeline for activating an IME.

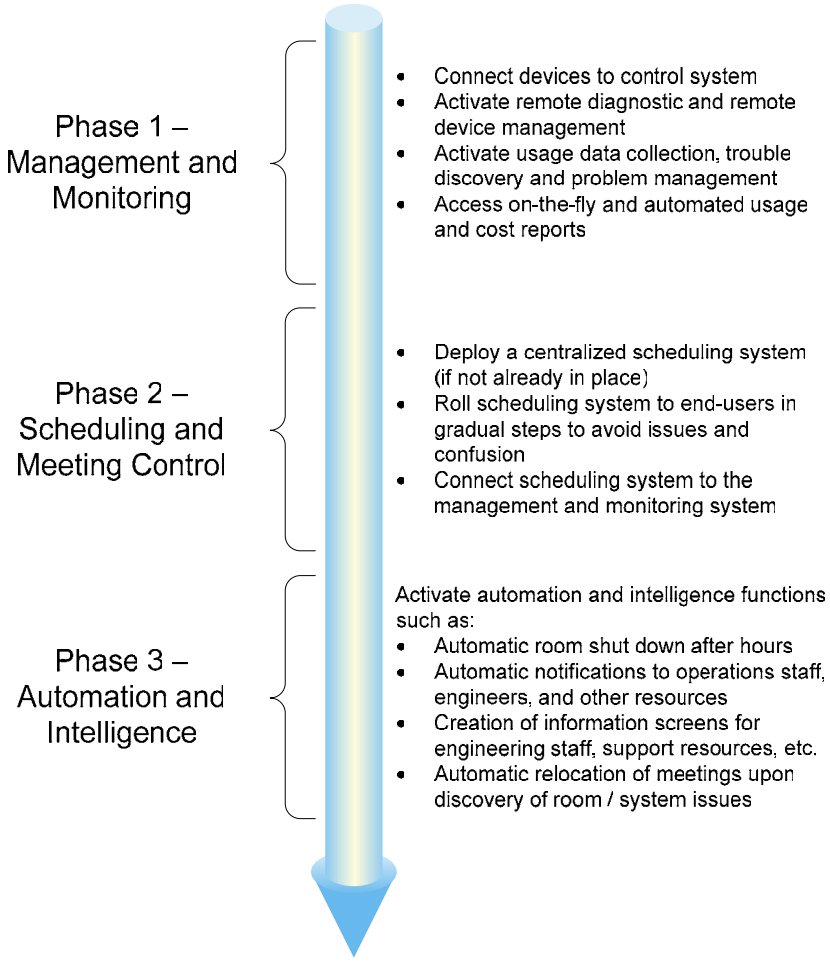

Figure 3: Suggested Timeline for an IME Deployment

A Typical IME Deployment

As described earlier, an Intelligent Meeting Environment (IME) consists of a network of Intelligent Meeting Rooms (IMRs). The IMRs work both independently *and* in conjunction with the other meeting rooms to create a centrally managed conferencing environment.

The diagram below highlights a typical Intelligent Meeting Environment architecture using products from Simtrol.

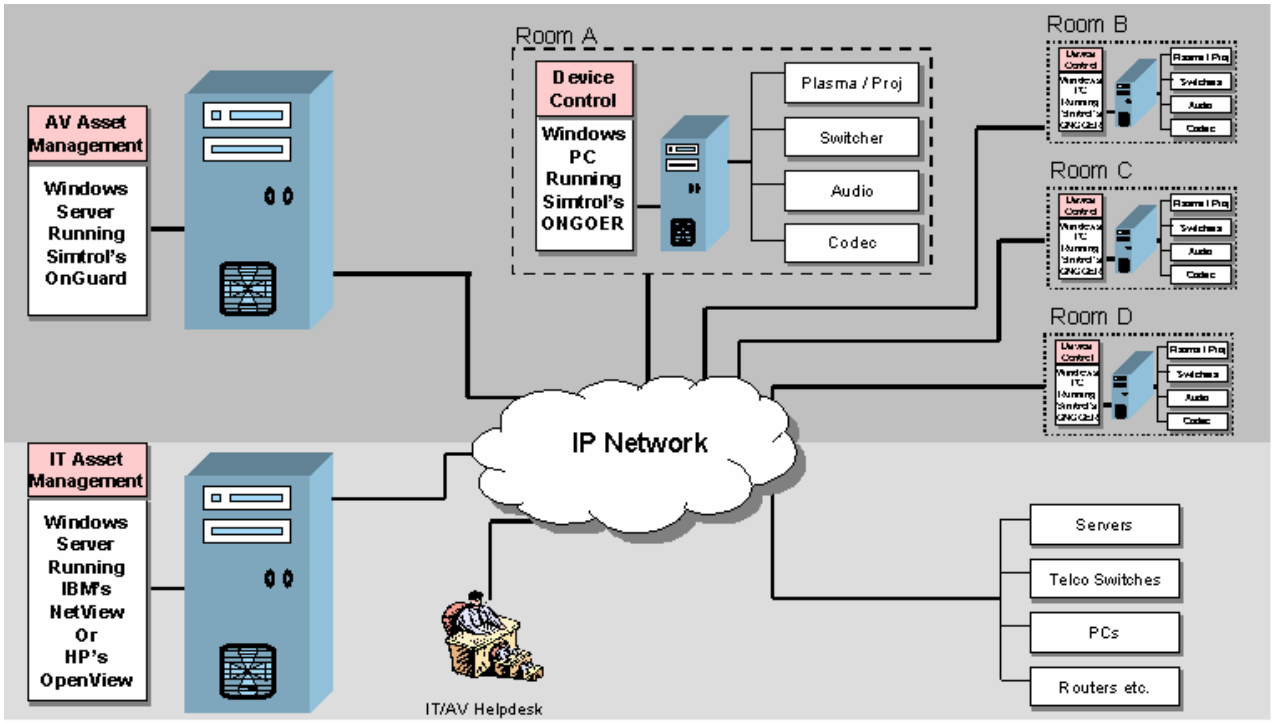

Figure 4: The Simtrol IME Architecture

Readers should first note that device control is provided by a Windows PC located in each meeting room (Room A, Room B, etc.) running Simtrol's ONGOER control software. Although the diagram implies otherwise, in reality a single PC running the ONGOER software can control almost any number of devices, as long as it has a physical connection (IP, USB, RS-232, IR, relay / contact closure, etc) to those units. Therefore, given appropriate interface cabling, all of the equipment in Rooms A through D could be controlled by a single Windows PC running Simtrol's software. Based on our model, each of these meeting rooms would be considered an Intelligent Meeting Room.

The upper left of the diagram shows a Windows Server running OnGuard, Simtrol's management engine and monitoring software. Through the corporate IP network, OnGuard proactively communicates with each of the meeting rooms for system control and information collection. In this diagram it is the OnGuard management and monitoring engine that makes this an Intelligent Meeting Environment.

In Wainhouse Research's opinion, Simtrol's solution is a good example of a distributed meeting room management solution. While not the only solution capable of powering an IME, Simtrol's solution includes a variety of interesting features worth mentioning:

> *Simtrol's OnGuard is a good example of a proactive IME management engine, as it includes device monitoring and management, event scheduling, and a strong managerial reporting system.*

Programming Language

The Simtrol solution is programmed using the standard Basic programming language, which means that hundreds of thousands of programmers around the world can easily configure and update a Simtrol control solution. This translates into faster system deployments and a lower total cost of ownership (TCO) compared to solutions using proprietary programming languages.

Hardware Platform

As shown in the diagram, Simtrol's software runs on standard Windows PCs and servers, which means that the host company's internal IT resources will feel comfortable supporting this solution. In addition, the use of standard PC hardware keeps costs down and allows the organization choose the brand of hardware (such as IBM, Dell) they most prefer.

Control Interfaces

Within the Simtrol environment, devices are connected to the control PCs using standard PC interfaces including USB, RS-232, and IP. Integrators use COTS (commercial off-the-shelf) interface devices and cables to make all the system connections. This keeps costs down and makes it easy to source (and price shop) for all required items.

Furthermore, instead of using propriety touch panels for system control, the Simtrol solution interfaces easily to a variety of commercially available touch screen displays. Once again, the use of commercially available hardware significantly decreases costs and provides additional options for the host organization as highlighted in the table below.

Item	Simtrol PC-Based Control System	Proprietary Control System
15" Color Touch Panel	$900	$12,000 (Est.)
Control Processor	$460 - Dell PC	$2,000+ (Est.) - Proprietary Controller
Control Software	$3,150 - Simtrol ONGOER SW	Included in Proprietary Controller
IR / IO Box	$600 - 12 IR, 6 Relay	Included in Proprietary Controller
Serial Expansion	$200 – 8 ports	Included in Proprietary Controller
Total Cost	$5,310	$14,000 (Est.)

Figure 5: Cost Comparison - Open vs. Proprietary Platform

Conclusion

Every year organizations become more dependent upon their daily meetings and their audiovisual and meeting support technology. Whether those meetings are local presentations or global videoconferences, efficient meeting management is a key part of enhancing communications and optimizing the use of employee time.

Organizations seeking to provide a high-performance and reliable internal audiovisual / conferencing service should consider the activation of an Intelligent Meeting Environment (or IME). Thanks to advances in IP networking and control system technologies, deploying an IME is now relatively straightforward and within the reach of any end-user organization. Best of all, even a basic IME deployment provides significant performance and asset management benefits for the host organization.

End-user organizations considering an IME deployment should carefully review their options for control systems and hardware / software platforms. In addition, Wainhouse Research recommends a staged, gradual approach to ensure a seamless transition from a legacy to an Intelligent Meeting Environment.

Indications are that the number of meetings an average employee attends will not decrease in the near future. Therefore, optimizing the performance and efficiency of enterprise meetings and meeting support assets is an important initiative for both today and tomorrow.

About Wainhouse Research

Wainhouse Research (http://www.wainhouse.com) is an independent market research firm that focuses on critical issues in rich media communications, videoconferencing, teleconferencing, and streaming media. 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 as well as speaker presentations at industry group meetings. Wainhouse Research publishes *Conferencing Markets & Strategies*, a three-volume study that details the current market trends and major vendor strategies in the multimedia networking infrastructure, endpoints, and services markets, as well as the segment report *Video Communications Management Systems*, the free newsletter, *The Wainhouse Research Bulletin*, and Free end user content website, PLATINUM. To learn more about conferencing, collaboration, and networking, please review other white papers and documents available from Wainhouse Research at http://www.wainhouse.com and http://www.wrplatinum.com.

About the Author

Ira M. Weinstein is a Senior Analyst and Consultant at Wainhouse Research, and a 14-year veteran of the conferencing, collaboration and audiovisual industries. Prior to joining Wainhouse Research, Ira was the VP of Marketing and Business Development at IVCi, managed a technology consulting company, and ran the global conferencing department for a Fortune 50 investment bank. Ira's current focus includes IP video conferencing, network service providers, global management systems, scheduling and automation platforms, ROI and technology justification programs, and audiovisual integration. Mr. Weinstein holds a B.S. in Engineering from Lehigh University and is currently pursuing an MBA in Management and Marketing. He can be reached at iweinstein@wainhouse.com.

About Simtrol

Simtrol, Inc. designs and develops software that enables the control, monitoring, and management of audio and video devices. The Company's solutions run on Windows-based PCs or servers and are designed to simplify the automation and integration of audiovisual and information technology ("IT") equipment into an organization's meeting and conferencing environment.

Historically, control and monitoring systems have utilized closed-architecture hardware-based solutions. In contrast, Simtrol leverages the power and flexibility of the Windows operating system and an open hardware platform to deliver highly scaleable, feature-rich, and cost-effective solutions.

Simtrol's two primary solutions for device control and monitoring are ONGOER and OnGuard. ONGOER can control virtually any device using a variety of interfaces (serial, IR, IP, contact closure, etc.), is programmed easily in Visual Basic using Simtrol's OnLooker and Builder development tools, and runs on an off-the-shelf PC.

OnGuard is Simtrol's server-based software solution that provides remote, proactive monitoring, management and diagnostic capabilities for all devices within the meeting room environment. OnGuard communicates in real-time via standard IP connections with all ONGOER-equipped meeting rooms to provide instant device and room status, control, alert notification and customizable reporting functions.

Simtrol's solutions are sold through a growing network of system integrators and distributors to Fortune 1,000 corporations, Government entities, educational institutions, and other entities.

Additional information about Simtrol can be found on the company's Web site: www.simtrol.com