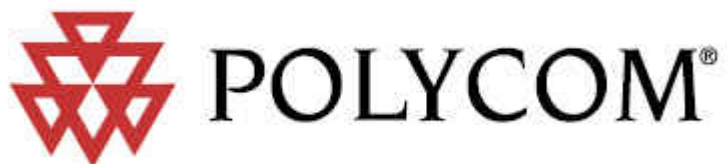


IP Conferencing Application Server Overview and Benefits for Service Providers



Copyright 2008 by Polycom, Inc.
All Rights Reserved

Polycom, the Polycom logo, Voyant, and ReadVoice are registered trademarks of Polycom, Inc. Any other trademarks appearing in this document are the property of their respective owners.

The information in this document is the sole intellectual property of Polycom, Inc., and may not be copied, transcribed, distributed, or used for any other purpose without prior written permission from Polycom, Inc.

The information in this document is subject to change without notice.

Catalog No. 3725-76101-009A

The information contained herein is the sole intellectual property of Polycom, Inc. No distribution, reproduction or unauthorized use of these materials is permitted without the express written consent of Polycom, Inc. Information contained herein is subject to change without notice and does not represent commitment of any type on the part of Polycom, Inc. Polycom and are registered trademarks of Polycom, Inc.

Notice

While reasonable effort was made to ensure that the information in this document was complete and accurate at the time of printing, Polycom, Inc., cannot assume responsibility for any errors. Changes and/or corrections to the information contained in this document may be incorporated into future issues.

Table of Contents

1	The Market.....	5
2	Polycom’s Solution.....	5
2.1	Polycom’s Next Generation Service Provider Vision.....	6
3	Conferencing and Collaboration Application Server – Proxias™.....	7
3.1	The Proxias Runtime Environment.....	8
3.2	The Proxias Service Development Environment.....	9
4	Benefits of Proxias™ Conferencing Application Server.....	9
4.1	Fast Feature and Application Development.....	9
4.2	Differentiate Services from Competition.....	10
4.3	Convergence of Voice, Video, and Data Applications.....	10
4.4	Improved Upgrade, Testing, and Deployment.....	10
4.5	Simplified Scalability.....	12
4.6	Simplified and Improved High Availability.....	12
4.7	Simplified Operational and OSS Support.....	13
4.8	Architected for IMS and Next Generation IP Networks.....	13
4.9	Protect Existing Capital Investment.....	14
4.10	Designed and Developed Specifically for Service Providers.....	14
4.11	A Complete End-to-End Solution.....	14
5	Polycom’s Knowledge and Experience in the Collaboration Market.....	14

1 The Market

Geographically-dispersed project teams and global business partnerships are expanding requirements for real-time group collaboration, whether in traditional audio conferencing scenarios, web-sharing applications, or telepresence sessions. While separate data, voice and video meeting experiences have sufficed in the past, today's dynamic workforces are under increased pressure to produce better and faster results, resulting in the need for tools that integrate these three media within mainstream desktop, mobile, and presence-based applications. Today's users require choice in when, where, and how they collaborate.

Over the previous decade, Conferencing Service Providers (CSPs) have been instrumental in growing the collaboration market. With expanded access to conferencing services, organizations could utilize fast and simple remedies for their on-demand and scheduled meeting requirements. However, today's CSPs are under increased pressure as existing conferencing offerings become commoditized and competition from low- or no-cost alternatives proliferate. Additionally, the threat of enterprises in-sourcing collaboration services as part of their Unified Communication architecture is stronger than ever. CSPs must find new ways to gain advantage over these various competitors.

The market thus requires a new generation of collaboration services – services that seamlessly integrate with existing user applications, devices and tools; services that are highly and easily customizable to the needs of individual users; services that possess robust system management, maintenance, and operational capabilities; and service that deliver fast and ready access to powerful next generation IP networks. CSPs, especially those within large network service providers, are in the optimal position to provide such solutions, with extended resources based on experience, organizational infrastructure, and intellectual capital.

All that has been missing, until now, is the technological foundation to make such solutions reality. CSPs have long required a solution that supports integrated voice, video and data, and provides the ability to add new features and services fast. They need systems that integrate together easily, and can fit within their next-generation network architectures as well as their existing PSTN networks. And of course, they need systems that are highly scalable, reliable, and cost effective, as befits a service-provider class offering.

2 Polycom's Solution

2.1 Polycom's Next Generation Service Provider Vision

Recognizing the market need for a new generation of collaboration services, Polycom is developing solutions and strategies to drive the collaboration market to the next level. We want end users to experience the finest collaboration experience technology can provide, and we want to equip CSPs to provide these services to end users.

Our vision is to provide end-to-end, rich-media, unified collaboration solutions that allow CSPs to create unique combinations of services that go beyond what is available today and beyond what enterprises could do on their own. We continue to focus on service providers, delivering products that meet their unique scale, reliability, and network integration requirements. Lastly, we provide products that make it possible for CSPs to create and introduce new and innovative services to the marketplace.

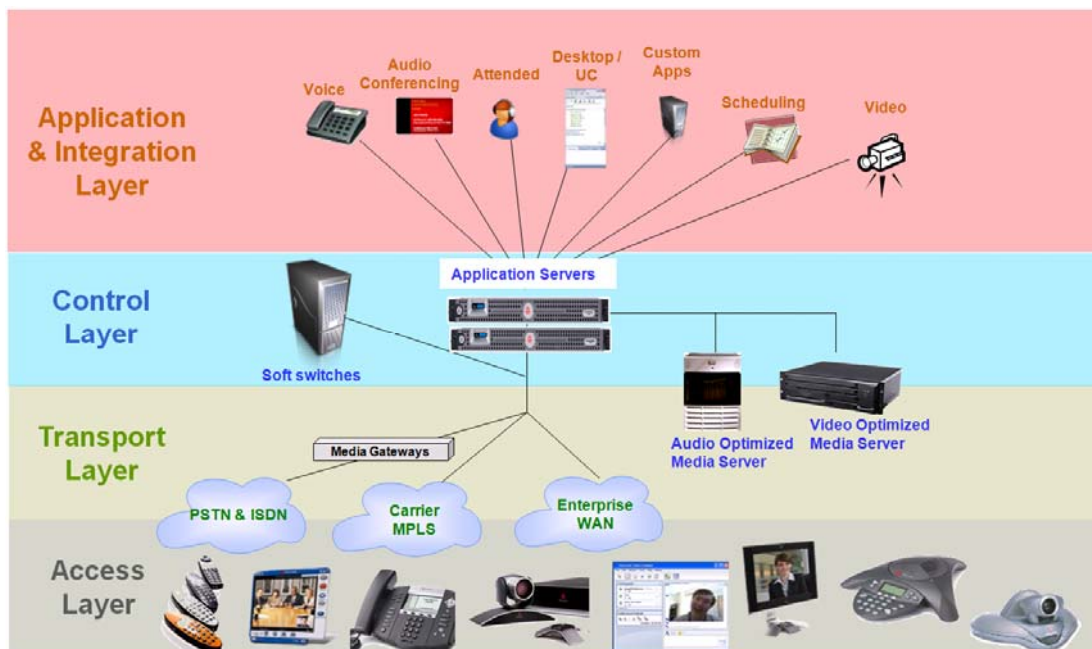
Polycom has all of the pieces that make such collaboration solutions a reality:

- Industry leading audio- and video-collaboration applications
- Integration with leading data collaboration, desktop communication, and enterprise applications
- The industry's most widely deployed media server hardware - InnoVox, RMX, and MGC
- Audio and video endpoints
- A new SIP Conferencing & Collaboration Application Server that brings these pieces together - Proxias™

Polycom has all of these pieces, and further, we have the proven experience and know-how to pull them together into what CSPs really need: hardened, integrated products that stand out by enabling them to agilely offer innovative services to their end-users.

3 Conferencing and Collaboration Application Server – Proxias™

At the core of the Polycom solution is the Proxias conferencing and collaboration application server. Proxias forms the middleware that manages the multiple collaboration applications available to users, and controls the multimedia processing resources required to service them. Beyond that, Proxias is also a development environment, with service-creation features designed to help CSPs quickly design, develop and deploy new, rich-media collaboration services.



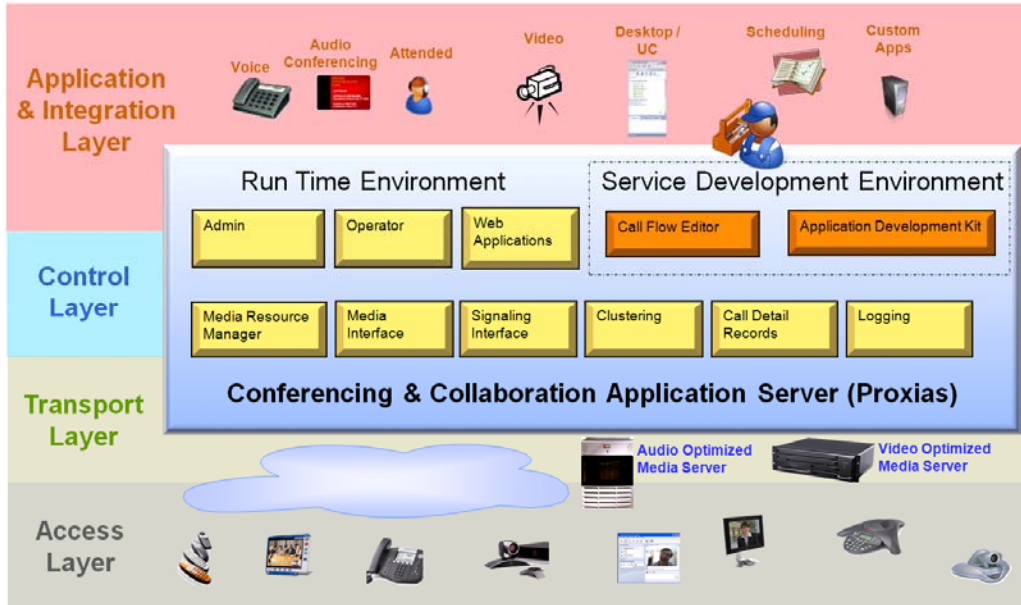
Proxias is based on SIP and on the IMS (IP Multi-Media Subsystem) architecture standards being set by the 3GPP. This architecture takes advantage of IP network capabilities to allow users access to key features wherever they are via their preferred access method. CSPs can provide core sets of integrated services in a standards-based model, using best-in-breed media servers and applications together in the same system, and without end-point limitations.

Proxias disaggregates traditional collaboration products and separates the hardware from the software, allowing greater flexibility in both. At the bottom layer, a heterogeneous pool of media-processing devices manage IVR, mixing, recording, or whatever media processing is required to handle a request from an application.

The Proxias application server routes requests, using patented logic, to target a resource with the right capabilities, as well as to maximize system efficiency. Multiple applications can run simultaneously in this environment, and users can move freely and seamlessly among applications from a variety of endpoints. Adding, removing, or modifying hardware and software is accomplished without affecting other system components and without impact to users. Lastly, Proxias provides an environment in which CSPs can develop and deploy new, customized services quickly and easily.

3.1 The Proxias Runtime Environment

The Proxias Runtime Environment encompasses the major elements required to manage and maintain the applications and media resources. It includes the centralized functions that are common across all services including:



- Media Resource Manager – Uses patented technology to determine what type of media resource is required to support different application requests and to route connections to the appropriate resources. It has multiple intelligent routing algorithms to maximize system efficiency and service flexibility.
- Signaling and Call Management Interfaces – Incorporates SIP, SS7, ISDN and other signaling protocols to connect users to services.
- Server Clustering – Manages the physical application server cluster and media resources to ensure optimal system usage and uptime. It has the intelligence needed to route around hardware outages and uses N+1 redundancy to ensure continuous uptime. It allows CSPs to add additional capacity quickly and easily, by adding additional hardware to the cluster, without affecting current users.
- Deployment Environment – Deploys application and system changes on a live system without affecting other system elements or end users. Targeted changes are deployed on a single server and then automatically replicated across the cluster. Changes can be deployed on a live system to a private address for testing and debugging, and then, when testing is complete, rolled instantaneously to a public address making the changes accessible to end users.
- Centralized Administration – Provides a centralized interface for managing, administering, and monitoring all applications and system elements.
- Centralized Logging – Traces user actions and system interactions through the entire system, with information available from a single interface. And unlike existing systems, Proxias pulls information together—from the applications to the media servers—by call or conference, making it easy to

troubleshoot customer problems. Developers can use logging to refine their applications, and they can also create their own customized log messages.

- **Centralized Operator** – Provides a common operator interface, controlled by role-based permissions, from which customer care representatives can assist users across all applications. Developers can customize key operator capabilities to create visibility to new application features.
- **Call Detail Records** – Creates and collects call detail records (CDRs) from all applications running in the system. Developers can customize these records to capture needed information for any newly developed applications.

3.2 The Proxias Service Development Environment

The Proxias Service Development Environment provides the Java application language and basic building blocks required to create meaningful features, applications, and services; or to quickly modify existing features, applications, and services. In this environment, developers combine these building blocks with application and business logic to create new call flow and service logic.

The Proxias Service Development Environment includes:

- **Application Development Kit** – Provides an environment for accessing core service-creation capabilities, and using them to develop JAVA-based Proxias applications. With this unique system design, key features require very little source code. The bulk of required functionality is already written and ready to go—like playing and recording files, collecting and sending DTMF, etc. Developers simply pull functions together in ways that make new features or call flows possible. And because the hardware is abstracted, developers don't have to worry about what hardware is running underneath.
- **Flow Editor** – Creates a way for developers to take applications or call flows that are already created by developers and pull them together in different ways to quickly create new variations of applications. With this tool, they can create a simple call flow, and then reuse it over and over in different applications.

4 Benefits of Proxias™ Conferencing Application Server

4.1 Fast Feature and Application Development

The Proxias Service Development Environment provides a simplified framework for developing applications and features. This technology facilitates building multiple, customized, voice and video user-interfaces running on a set of shared, standardized resources. Developers of various expertise and skill levels can quickly build multipart, multimedia collaboration applications by assembling reusable components into custom call flows and whole new applications. A lightweight container manages the lifecycles of common business and telecom objects, eliminating the need for detailed inter-thread synchronization. Call flows are written in a straightforward, linear fashion and driven through a flexible mapping mechanism.

Applications written, packaged, and sold by Polycom can be easily modified. The call flows of applications like ReadVoice 4.0 will be openly available to developers, who can make changes at any point in the call flow or functionality. Changes can be requested through Polycom, done by the CSP, or outsourced to a third-party developer.

Another key to the fast development cycle is that call flows and applications do not have to account for capabilities handled by the Proxias Runtime Environment. A developer changing a call flow does not have to be concerned with how that call flow will scale or route to an appropriate media resource. All such decisions and capabilities are handled automatically by the Proxias Runtime Environment.

In short, the complexities of a high-volume, fault-tolerant system with intricate and time-sensitive interactions are simplified to provide a highly-accelerated development cycle. This allows CSPs to meet the high-speed demands of their customers for new and customized services, ultimately allowing them to be more competitive.

4.2 Differentiate Services from Competition

Flexibility means being nimble in a competitive market. Unlike today's collaboration solutions, which require vendor intervention to make the simplest of changes; the modularity of Proxias allows CSPs to quickly change their service offerings to meet market demands. New call flow changes can be prototyped and demonstrated to customers in hours. And because the deployment of these new services is simplified and less-risky, testing and certification time can be reduced, with new capabilities deployed for production traffic in days or weeks rather than months. This ability to quickly create customized call flows and applications for individual customers can become a significant competitive advantage.

4.3 Convergence of Voice, Video, and Data Applications

The Proxias Run Time Environment supports and manages multiple applications, and dynamically routes callers to the appropriate resource using powerful capability-matching and efficiency-optimizing algorithms.

The SIP environment ensures that users can move between applications and media resources dynamically and seamlessly. Polycom will ultimately provide multiple voice and video collaboration applications with consistent user interfaces, so that users can move among the applications but feel as if they are using a single application with a wealth of capabilities.

Proxias will eventually integrate with leading data and desktop applications from partners like Microsoft, IBM, Alcatel, Avaya, and more. These third party applications will integrate with the voice and video applications to further extending the features available to end users.

Ultimately, our goal is to allow CSPs to provide experiences in which a user initiates a voice conference from a current Instant Messaging (IM) session, then decides to escalate the session to a video call, where (based on presence information) the system connects all participants' video endpoints. The user then shares desktop application data and controls and monitors all of these session activities through a single, standard web-based interface.

This seamlessly-integrated, highly-flexible collaboration experience provides customers with unlimited control, with CSPs seen as the innovative provider of these higher-value and higher-usage services.

4.4 Improved Upgrade, Testing, and Deployment

The disaggregated, component-based Conferencing Application Server architecture allows CSPs to upgrade existing applications and deploy new applications without taking the platform out of service and, more importantly, without interrupting currently running calls and conferences. Many of the core conferencing

elements can also be upgraded without taking the system down. This means that the most common and frequent software changes can be made with zero downtime and zero impact to end-users.

In addition, call flows and applications are packaged as self-contained units for ease of deployment, testing, and activation. A flexible URI or phone number map allows applications to be privately deployed and tested on live systems prior to general availability. A call flow change can be placed on a live system at a private address and accessed by the admin or test group. Testing issues do not impact public, live traffic, and the call flow can be backed out and de-bugged if necessary. Once testing is complete, the call flow can be remapped to a public address or phone number, and made instantly available to users. The Proxias clustering features mean that a change placed on a single machine can be automatically propagated across the entire system.

Finally, even upgrading or changing network hardware such as media servers can be done in real time, causing only a temporary change in capacity as opposed to a service outage.

In summary, testing, upgrades, and deployments that previously took hours or days can now be done in minutes—all with reduced complexity and risk.

4.5 Simplified Scalability

Standard, load-balanced, application-server hardware means system capacity can be added incrementally as additional capacity is required.

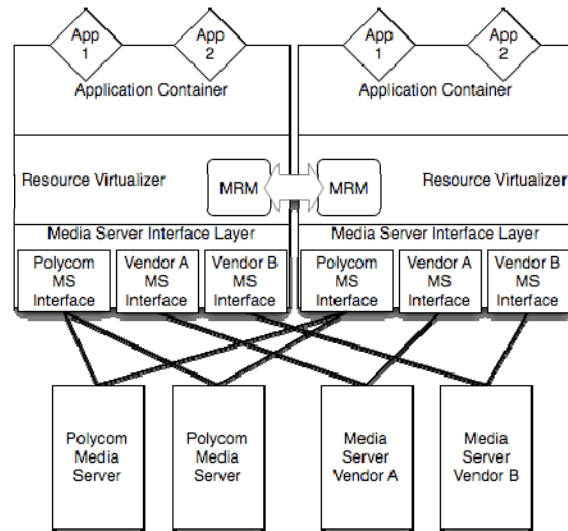
Proxias is built to run on a cluster of non-hierarchical SIP Media Servers, and by using IP multicast technology, communication grows linearly and not exponentially with scale. Adding capacity at the application server level is simple, since automated discovery and data replication mean the system recognizes new hardware, incorporates it into the cluster and automatically loads the appropriate software.

Adding new media processing hardware is just as easy. Proxias recognizes new hardware additions and analyze their capacity and capabilities prior to adding them into its managed pool of available resources. Polycom understands CSPs needs for scalability and architected Proxias to ultimately support systems consisting of tens of thousands of statistically managed media resource ports.

4.6 Simplified and Improved High Availability

Fully active clustering of non-hierarchical Media Servers produces a system that continues to accept calls even under circumstances of catastrophic failure. The clustering environment shares application logic across a large number of physical hardware servers. All nodes of the cluster run the core software and applications, assuring that loss of any one node does not cause a loss of capability, but only a temporary loss in capacity. Dynamic routing of users to multiple media servers also ensures that loss of any media server hardware does not bring down an entire service.

The Proxias Run Time Environment uses a load balanced, fully redundant, N+1 architecture that is far simpler and more efficient than existing hot-standby High-Availability systems. There is no unused hardware sitting at the ready in case of an outage, and there is no failover lag time when a failure occurs. The system remains up and manages around the lost resource until it can be returned to the cluster. Also, the use of commodity hardware for computational nodes provides cost-effective redundancy as compared to today's costly HA systems, and geographical redundancy for disaster recovery scenarios may be achieved through well-known database-replication techniques. This design means greater system uptime, fewer end-user impacting failures, and continuous availability of critical revenue-generating services.



4.7 Simplified Operational and OSS Support

The applications running on Proxias share resources and are managed through unified portals. This allows the creation of centralized tools that cut across multiple applications.

A centralized operator console provides a single point of access to all collaboration applications, whether high- or low-touch, audio or video. Operators can view calls and conferences, as well as manage customer issues, from a single user interface. This role-based GUI is built for flexibility; new applications, with the same look and feel, can be integrated quickly across all applications. This improves customer satisfaction, improves operator efficiency, and reduces training costs.

Administrators also access the same system, but (based on permissions) have access to additional capabilities. They can manage all system components—applications, servers, and media processing hardware—from a single place. This reduction in complexity allows system administrators to be more efficient, managing larger systems in less time.

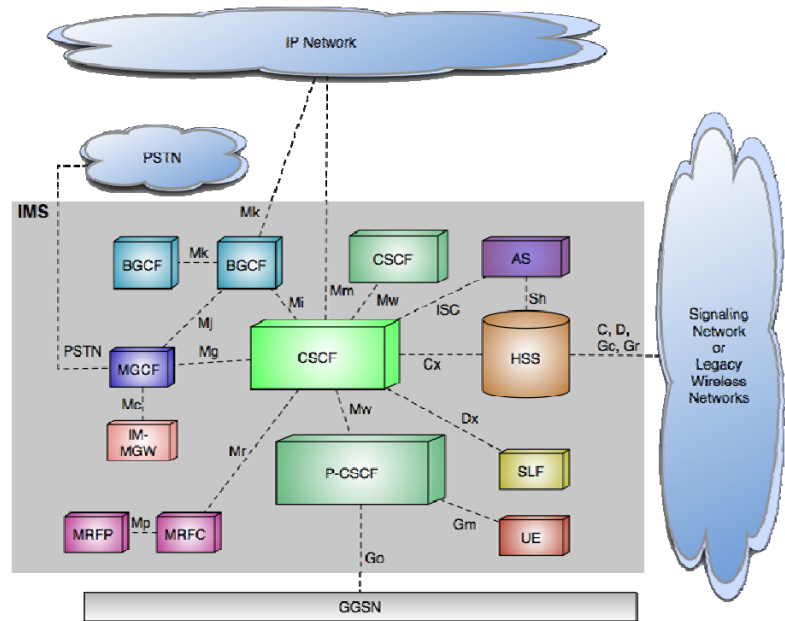
In addition to the main operator, Proxias offers a simple web-based audit system for rapid fault diagnosis across the entire system, including all applications, integration points, and media processors. Centralized logging capabilities keep track of all system and application interactions, with synthesized information available from the operations console for quick user-assistance and fault remediation. This means that problems can be tracked and traced through and across the whole system, reducing the time and effort required to resolve issues. In most cases operators can view and discuss information real-time.

Call Detail Records, or CDRs, are also maintained centrally for all applications. This reduces the need for complex billing integrations, which are currently needed to offer multiple audio and video collaboration services. These records can also be dynamically updated with the addition of each new application.

4.8 Architected for IMS and Next Generation IP Networks

Proxias is based on the IP Multimedia Subsystem or IMS design as proposed by the 3GPP. Architecturally, it employs similar components and interactions. As the IMS standards are solidified and evolve, they will be incorporated into Proxias as applicable. In fact, Polycom is working to help develop and evolve the standard through our involvement in IMS committees.

If deployed as a stand-alone system, Proxias acts as its own “mini-IMS” system. It includes the functionality of various elements including the CSCF, AS, HSS, MRFC, and MRFP (for further clarification of IMS terminology and design, see www.3gpp.org). It provides the advantages of the IMS architecture in a self-contained system.



But Proxias can also be incorporated within larger scale, full IMS deployments. In these deployments, Proxias plays a more specialized role and interfaces with centralized resources like the CSCF and the HSS.

Compliance and integration with standards like IMS allows CSPs to integrate collaboration services with multiple and diverse media and data services. For CSPs that are part of a larger network operation, a standards-based solution can fit within greater corporate network architectures both today and tomorrow. As these networks and standards continue to evolve, and as new capabilities are developed, Proxias will evolve, exploiting the capabilities of these next generation networks.

4.9 Protect Existing Capital Investment

Proxias is a great solution for CSPs who have already invested in Polycom products such as the InnoVox, RMX, and MGC platforms. The InnoVox 4000IP Media Server seamlessly plugs into the Proxias framework today. Support for the MGC and RMX Media Servers will be added in the future. Additionally, other third-party, general-purpose media servers can be added to Proxias through IMS standard interfaces.

4.10 Designed and Developed Specifically for Service Providers

From the very beginning, Proxias was a service-provider product and only a service-provider product--no compromises. Every design decision made centered on the scalability, reliability, manageability, flexibility, and efficiency required by the world's largest CSPs. The design and development effort was led by our Colorado team (formerly Voyant Technologies), whose sole focus has always been, and continues to be, the CSP market. The Proxias engineers have decades of experience in the design, development, and testing of the most reliable, scalable collaboration systems available.

4.11 A Complete End-to-End Solution

Proxias contains all of the elements needed to create complete unified collaboration services--from the endpoints, to the applications, to the media processors. Polycom provides all of these elements, and we can integrate solutions from third parties through standards compliance. This means that you can choose the best-of-breed products to meet your needs.

Also, because we offer an end-to-end solution with our own products, you can be assured that we understand interoperability issues and the complexities of bringing all of these pieces together. In our interoperability labs, we ensure that the entire solution works together and provides the highest reliability possible.

5 Polycom's Knowledge and Experience in the Collaboration Market

Polycom's experience and leadership in the collaboration market is underpinned by an unmatched breadth of products and services, and intellectual capital acquired from supporting a wide variety of CSPs. Our strength and advantages are typified by our leadership in network video with the MGC and RMX Conference Platformss and our proven ability to support the world's largest service providers with ReadVoice.

Exemplifying our commitment to our platforms, we are developing solutions using the Proxias Collaboration Application Server- application features that formerly took months to develop are now being delivered and fully tested in weeks. For our CSP customers and end users , Proxias provides powerful, integrated features and services quickly, in a fast-paced, complex, standards-based, high-reliability world.