Emerging Technology: Telepresence Solutions

Introduction

Telepresence offers a completely new way to collaborate. This new technology enables connections across companies and locations, so you can meet with customers, suppliers and business partners around the globe as if you were all in the same room, transforming how business gets done. You will be able to redefine business processes, procedures and applications within your enterprises and across industries. This paper is intended to help AT&T customers, and those wanting to become AT&T customers, understand and plan for the implications of running Telepresence Video Conferencing over an AT&T Virtual Private Network. This paper will show how AT&T's MPLS-based, service-oriented network products are best suited as a platform for enabling Telepresence solutions. In addition, we will provide guidelines to help AT&T customers set up their VPNs for optimal Telepresence performance whether the Telepresence deployment is AT&T-managed or customer managed. Lastly, this paper will give an overview of the AT&T Telepresence Solution (ATS) managed services.

at&t

What is Telepresence?

Telepresence is high-definition, IP-based, video telephony that uses Session Initiation Protocol (SIP) signaling for call set up and tear down. Similar to a phone in Voice over IP (VoIP) signaling occurs between the Telepresence endpoints, known as CODECs, and a centralized call control element. Unlike traditional video conferencing, the ease of use for participants in a Telepresence session allows them to experience the meeting and not get frustrated with the technology. The goal is to make using Telepresence as easy as making a phone call.

Telepresence videoconferencing solutions differ from conventional video systems in that they use "life-size" ultra high-definition video images, CD-quality, spatial audio, interactive technologies and a specially-designed environment to give the user the feeling of actually being in the same room as the participants in remote locations. This experience is enabled by:

- 1080p or 720p, high-definition images on large sixty-five inch plasma displays at resolution that allow eye contact and the ability to discern body language
- Optimized acoustics using natural, multi-channel, full-duplex, spatial audio
- Lighting and furniture tuned for the human factor

Thus, Telepresence requires a dedicated, enclosed space with proper dimensions; wall, ceiling, and flooring materials; color, texture, continuity; lighting, heating, ventilation and air conditioning. Most of this can come as an augmentation of existing conference rooms, as most Telepresence systems are designed to be installed in them without requiring additional construction.

Why Telepresence?

The globalization of business has led to increased collaboration between individuals in the same company, their partners, suppliers and customers across countries, continents, and the globe. Because more than sixty percent of communication is non-verbal and existing collaborative technologies don't adequately replace a face-to-face meeting experience, a set of technologies which allow a person to feel as if they were present at a location other than their true location, i.e. Telepresence, is needed.

Assuming the effectiveness of telepresence as a communications medium, companies that incur large travel costs and reduced efficiencies from employee down time during travel can cost justify telepresence services through greatly reduced travel costs and employee down time. Some companies have already reaped these benefits and saved as much as nine percent on company-wide, travel costs, in their first year of using Telepresence technologies.

Telepresence conferencing provides a new level of productivity enhancement opportunity and competitive advantages to the enterprise environment. This is accomplished by enabling greater access to resources needed to perform business functions and to provide more effective ways to interact with those resources. Some of the benefits Telepresence high definition video conferencing brings are:

- Accelerating business transformation by enabling more interactions with less travel, creating sustainable competitive advantage
- Reducing product or services development cycle time
- Improving quality of life through greater staff productivity
- Faster decision making and improved time to market by making the right resource available at the right time

Thus, Telepresence is an empowering business application that can be used to fulfill many current business needs:

- Communicate Globally – The need to be more responsive, to communicate and collaborate more effectively on a global basis without added travel time
- Grow Faster – The need to increase revenue growth with more in-person customer contact, faster product development and reduced sales cycle time. The need to streamline costs through best-practice sharing, better knowledge transfer and providing access to subject matter experts
- Build Sticky Relationships – The need to ensure customer satisfaction and loyalty through frequent, high touch interactions
- Go Green – The need to support green initiatives (reduce fuel usage and emissions) by offering a truly viable alternative to travel for business meetings
- Stay in the Game – The need to address business continuity concerns and enable immediate high-impact communications

Additionally, by leveraging the wide area network and existing applications, Telepresence uniquely integrates into and completes an effective Unified Communications strategy.

Telepresence and Enterprise Applications

Key to providing Telepresence services in an Enterprise and/or Service Provider environment is the ability to integrate with existing systems and infrastructure. The ability to integrate with network and CPE infrastructure, Enterprise/Web applications and Service Provider systems necessitates layered, service-oriented architecture, as illustrated below.

Figure 1: Telepresence Layered Service Architecture

This layered architecture seats network and CPE infrastructure, including the displays and microphones, at the bottom. The middle layer is essentially middleware that can provide call control, provisioning and monitoring capabilities to the layer below. This Communication Services middle-ware must support interfaces into Enterprise applications, such as groupware, LDAP/Active Directory and portals in the layer above it. Additionally, the Communications Services Layer should be able to interact with Web Applications and feed Service Provider OSS also in the layer above it.

Elements of a Telepresence Solution

In order for Telepresence to be a true business tool the correct elements must attend to the requirements of the desired business outcomes. Whether for quicker access to constrained resources or to reduce travel the idea here is to increase agility around face-to-face communications, while leveraging existing infrastructure as much as possible.

Rooms and Equipment

The goal of Telepresence is to provide an immersive experience. The Telepresence room (or endpoint) is a key to obtaining this experience. Complete rooms include codecs, cameras, screens, lighting, acoustics, furniture and environmental factors such as wall pigment and temperature. Without the room and the attention to environmental details the stand alone system still serves the purpose of providing high-definition access to call participants.

Transport

A service oriented network that can provide proper, real-time transport is needed to support the stringent latency, jitter and loss requirements of Telepresence as a networked application. AT&T's globally deployed, MPLS-enabled IP network is a great example of a platform that can support these requirements globally. Particularly because those services have quality, global reach, performance and differentiated classes of service to enable multi-use.

Multipoint Switching and Control Units

The earliest HD video telephony codecs put any to any requirements on the back burner and initially supported point to point capabilities only. The need to simplify use, e.g. mimic the phone interface, as well as the need for a conference-like, highly collaborative experience requires that multipoint calling be supported by a Telepresence solution.

The distinction should be made between Multi-point Control Unit (MCU) used in traditional video conferencing and multi-point switching used in Telepresence. Unlike MCU's which provide Continuous Presence and Transcoding as standard features, Multi-point Switches are Real-time Transport Protocol (RTP) stream switches, providing video switching and audio mixing for multi-point Telepresence calls.

Investments made in legacy room systems by many companies necessitate integration with that environment. Also the need to extend the reach of conferencing to mobile users will require the ability to integrate, in some manner, with desktop video. This means that the MCU or media switch should include the ability to accommodate desktop video clients and room-based systems.

Audio Conferencing (Audio Add-in)

Until Telepresence technology becomes more ubiquitous and support for mobile clients is available an audio-only participant option has to be part of the Telepresence solution.

Web Conferencing and Document Sharing

A natural extension to a Telepresence solution, as a result of today's collaborative environment, is to provide capabilities for document sharing and web conferencing. Preferably call participants should be able to share this information as an integral part of the solution.

Groupware Integration

While resource management of the Telepresence devices is key, also important is the coordination of meeting attendees and the physical rooms where the devices reside. Thus integration with groupware and reservation systems that attend to these capabilities is needed.

Reservation Portal

In order to facilitate scheduling and reservation of resources across multiple enterprises, some reservation brokerage, middle-ware is needed. Most likely these facilities will reside with the Service Provider. Whether this is an isolated system with a Web-GUI front end or it is some way of federating groupware it is a necessary component of a robust Telepresence solution that has minimal business to business functions.

Business to Business Exchange

Inter-company calling capabilities are realized in the Service Provider's ability to offer a Privately Switched Video Network to Enterprise customers. This capability is quite essential to the Telepresence solution's effectiveness as a business process enabler.

Telepresence and the Network

The network is the interconnection between each end of a Telepresence call. Without the correct medium, the data-intensive, high-definition video imagery can't be transmitted in a timely or efficient manner. Thus when network performance suffers the applications suffers. Without a proper network, the application can't perform adequately and the value of the Telepresence experience won't be gained. Telepresence is a real-time application and the network is the real-time application enabler.

The AT&T Telepresence Solution

Overview

The AT&T Telepresence Solution (ATS) is the latest addition to AT&T's IP-based communications products. It adds an immersive video telephony working environment to the rich AT&T Collaboration portfolio. Other video solutions are what might be called "box-based," with the total solution being a bunch of managed boxes. With AT&T Telepresence Solution, Enterprises purchases the experience and a business tool. This experience is a managed video telephony service bundled and built on top of AT&T VPN transport. Some of the features of this service are:

- Inter-company Calling Capabilities
- Room Management
- Scheduling Tools and Integration
- Network and call monitoring
- Technical support and troubleshooting
- Training

The AT&T Telepresence Solution is global and allows the Enterprise to gain the benefits of cost savings from reduced travel, the agility from instant access to key resources, and AT&T's expertise and global reach.

The AT&T Business Exchange

The any-to-any architecture of MPLS makes placing services in the cloud easier. The service node architecture of the AT&T Business Exchange allows for increased service scalability. The AT&T Telepresence Business Exchange is used for Meet-me services, both intra-company multipoint and inter-company point to point and multipoint calling. Charges for access to the Business Exchange are based on a monthly feed for the customer selected maximum simultaneous capacity into the Exchange. Note that one time charges may also apply. Changes to this capacity are required to be made through a provisioning process.

The AT&T Business Exchange maintains the traffic separation capability of AT&T VPN. The AT&T Business Exchange enforces application-level separation using Session Border Control ("SBC"). The AT&T Business Exchange also employs topology hiding and active intrusion detection monitoring. The meet-me function uses randomly generated conference PINs to be used by Users. This means that no traffic transverses from one company's private VPN to another, except when a meet-me call is initiated by a party from each company.

AT&T will connect each Customer's VPN to the AT&T Business Exchange via a logical channel. AT&T will determine the logical channel speed for this VLAN based on the number of simultaneous screens selected by the customer.

Supported Call Types

For all of the supported AT&T Telepresence deployment models, the following Meet-me call types are available via the AT&T Business Exchange:

- Intra-company multipoint meet-me capability (MP Meet-me)
- Inter-company point-to-point and multi-point meet-me capability (P2P, B2B, Meet-me)

Intra-company point to point calls are direct dial and do not transverse the AT&T Business Exchange although signaling information and network management traffic will flow between the end-points and the Exchange.

Subject to limitations in certain countries, audio add in capability is supported for both the Enterprise and Hosted model (discussed below). This provides the ability to conference in a voice line so that people not in a Telepresence room can participate in the meeting. This

can be used to conference in one person or users can dial any audio conferencing bridge that they may use. Certain feature restrictions apply to the Hosted model Audio Add-In capability including, but not limited to, support for only outbound dial functionality, no support for a dial policy, and no support for Emergency Number System (e.g., E911) calling. Toll free outbound dialing (e.g. 1-800, 1-866) is permitted; all other dialed numbers, including 911, are blocked.

Deployment Models

Hosted Model

In the "Hosted" model environment all call signaling and scheduling services are fully managed and provided by the AT&T Business Exchange. Front-ended by application servers there are shared, multi-tenant call control and scheduling elements in the AT&T Business Exchange, which eliminates the need for dedicated, per customer devices to be hosted on the customer's premises. The Hosted deployment scenario does not allow for direct integration with the customer's groupware, e.g. Lotus Notes or Microsoft Outlook. Customers can use the AT&T Exchange Meet-me portal to schedule rooms for both Intra-VPN and B2B Meet-me calls. The portal supports iCalendar (*.ics) file download when a reservation is made. Reservations for Hosted model rooms always use the Meet-me portal to make a reservation. Download of an iCalendar (*.ics) file from the portal helps the Hosted model customer marry the physical room reservation with the reservation of the Telepresence room. Hosted customers can do Intra-company P2P direct or Meet-me calling as well as Inter-company, P2P, Meet-me calling.

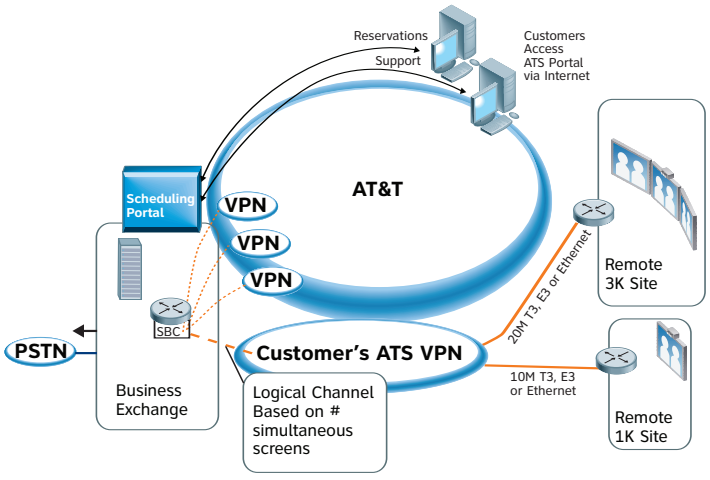

Figure 2: Hosted Model Overview Diagram

Audio add-in is a feature, which allows one of the participant rooms in a call to bridge in an outside PSTN line. This could be a bridge, desk or cellular phone. For Hosted model rooms the second line via the softkey on the IP phone in the room is used to insert the caller. The call control element in the Business Exchange points to PSTN gateways that reside in the Business Exchange. For the Hosted customer the capability is network-based and there is no need for local PSTN access to be provided at the customer sites.

Enterprise Model

In contrast to the Hosted model, the Enterprise Model call control and scheduling elements are local to the enterprise and not network-based. This requires dedicated devices to be hosted on the premises of one of the customer sites and necessitates two site types: at least one Headquarters and Remote sites. The Headquarters (HQ) site is where the dedicated call control and scheduling devices are hosted. HQ sites can be deployed regionally if desired by the customer.

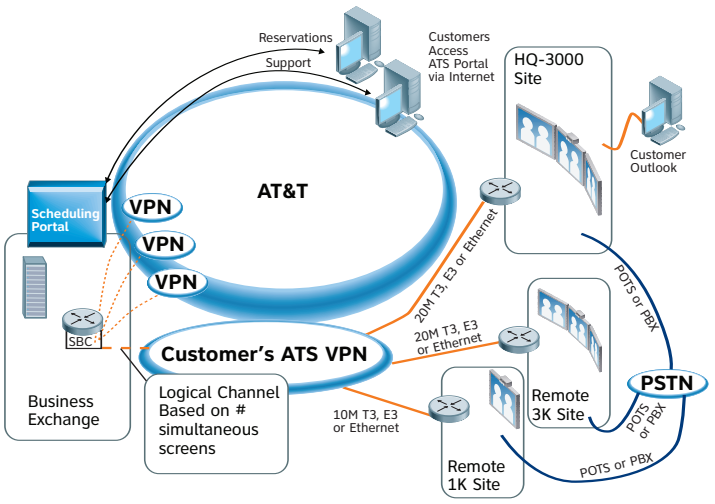

Figure 3: Enterprise Model Overview Diagram

Because call control and scheduling is hosted local for the Enterprise model, integration with internal groupware systems, such as Outlook or Lotus Notes can be accommodated. In order to accomplish this secure access to the customer's LAN and enterprise application environment, via an instance of the Cisco IOS-FW software on the router, is required.

Gateway Connect Model

Gateway Connect is best suited for customers who want to do it themselves. These customers generally have adopted Telepresence as another application on existing MPLS transport in a converged deployment of customer-owned Telepresence endpoints, and also require access to the Business Exchange.

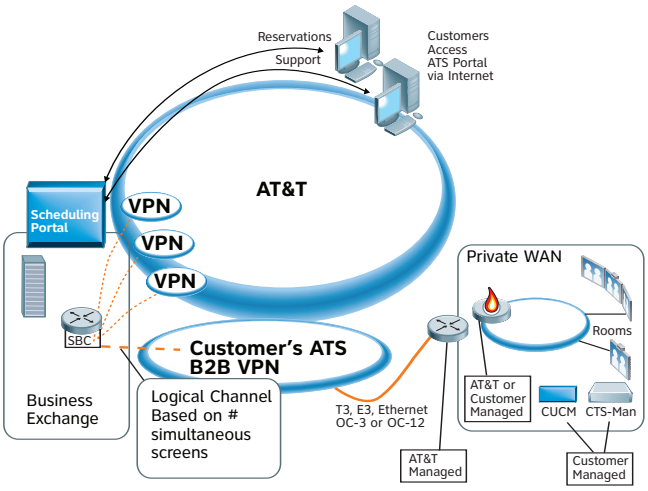

Figure 4: Gateway Connect Overview Diagram

AT&T manages a gateway router and firewall, with the option for the customer to manage the firewall themselves. Gateway Connect comes in small, medium and large flavors: small for speeds up to DS3, medium for speeds greater than DS3 and up to OC-3, large for speeds greater than OC-3. The Gateway Connect customer can do Intra-company P2P, Meet-me calling as well as Inter-company, P2P, Meet-me calling through the gateway router and across the ATS, B2B VPN via the AT&T Business Exchange. On the customer side of the gateway router and beyond the ASA firewall varied permutations of calling Enterprise-type Telepresence calling will occur. The calls that take place on that side of the gateway router are not managed or maintained by the AT&T Telepresence Solution, they are the responsibility of the customer.

Conclusion

In our rapidly changing world, businesses need the ability to change course quickly, collaborate globally, and streamline decision making. The AT&T Telepresence Solution offers an "in-person" meeting experience using the AT&T global MPLS based VPN platform. Telepresence videoconferencing solutions differ from conventional video systems by using "life-size" ultra-high-definition video images (1080p), CD-quality audio, interactive technologies and a specially designed environment. This gives participants the feeling of being in the same room as other participants in remote locations. Through advanced visual technology, participants can easily perceive subtle facial expressions and body language. And, high-definition audio realistically replicates sounds. For instance, if someone on the left side of a table speaks, you hear the sound on your left. You can even set up a special virtual conference table that seats up to three people per location and uses your video monitors to arrange participants from multiple locations around the "same" table.

The AT&T Business Exchange, the unique business to business, meet-me bridging capability allows you to meet with employees, suppliers, partners using the reliability and security of your AT&T VPN network. The AT&T Telepresence Solution is a fully managed, turn-key, scalable service offering a "life-size" in person experience.

For more information contact an AT&T Representative or visit www.att.com/business.

11/25/08 AB-1504

at&t
Your world. Delivered.