

# **The Emergence Of A Software Centric Communications Model: Service Implications and Opportunities**

**A White Paper from**



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## Introduction

As companies seek to gain and maintain competitive advantage in their markets, the use of Information Technology has often been a prime weapon of choice. The creation of the SABRE online reservation system in the 1970s gave American Airlines a major advantage in recruiting travel agents to book flights on its airline. During the late 1990s, with the appearance and rapid growth of the commercial Internet, businesses rushed to stake out positions, first with the creation of web site presence and later with web marketing. As the new century dawned, the bursting of the Tech bubble forced many companies to re-examine their IT investment strategies and even reduce IT investments in order to cope with recession level cost pressures. These cutbacks forced a painful spotlight on expensive IT projects and cost cutting became the dominant element in IT business cases.<sup>1</sup>

As growth has returned to the global economy however, business leaders have again returned to strategic thinking about their IT investment choices and its ability to produce competitive advantage. To achieve competitive advantage in the 21<sup>st</sup> century, companies must think globally about their markets, competitors, suppliers, and their operating models. The current wave of strategic thinking is focused on harnessing and exploiting critical enabling technologies to address cost dislocations, extended supply chains, and global customer segments inherent in the global marketplace. These core technologies are based upon creating new value by providing real time information within global application frameworks that can be deployed across low cost broadband global networks.<sup>2</sup>

The impact of globalization has focused IT thinking on achieving business speed, reach, and agility as companies seek to address new market opportunities, while defending their existing markets from global competitors. The emerging blueprint for achieving global agility and speed is one that is based upon the full utilization of new communications capabilities and the rapid deployment of new business applications that exploit these communications capabilities.

In the past, large applications required large custom software projects that brought high risk factors including costly overruns and delayed implementations. But with the exploitation of the software centric communications model, modular communications components can be integrated with existing business processes and applications to overcome the cost and complexity barriers of traditional large scale applications.

This White Paper will explore how enterprises can realize their objectives for competitive differentiation by undertaking initiatives that exploit the opportunities inherent in a software centric communications model.

## Moving From Converged Networks to Converged Communications Applications

One of the most significant trends in the IT industry has been the increase in the availability of open systems and acceptance of industry standards that have greatly facilitated the interaction and integration of systems, applications and networks to achieve large globally distributed application environments. One only has to point to the rise of enterprise supply chain applications to illustrate the point. Powerful supply chain applications have integrated numerous and disparate applications across a community of vendors, suppliers, and buyers over public networks. Built with powerful and mature software tools and application platforms, these applications can easily connect to a global community of users in which physical distance has been rendered irrelevant. Since these applications sit upon standards-based client/server systems and robust IP networks, they are easier to scale and manage than custom applications built from scratch on proprietary platforms and networks.

Supply chain applications have delivered enormous business value, including increases in global agility and speed as well as cost advantages. New product introductions, for example, can be achieved much faster based upon the time saved in coordinating processes that stretch from design, development, manufacturing and distribution. Increased speed of execution can also contribute to cost reductions. For example, faster decision-making based upon the rapid flow of current information can cut the need for excess inventory with just-in-time delivery.

Yet while enterprise wide applications such as supply chain management have created enormous potential advantage by exploiting global communications networks to increase speed and reach, they have not reached their full economic potential. The opportunity that lies ahead is based upon the process of integrating additional communications applications capabilities that have previously run on separate applications, systems and networks. Voice telephony, various forms of messaging, and email communications have traditionally run in parallel paths to traditional “data” applications. With the emergence of a common converged IP network, all of these applications are now running on the same network backbone. This convergence offers more than just a more efficient use of network bandwidth. It offers the opportunity to integrate parallel communications applications into intelligent real time business communications applications. These new integrated applications enable multi-modal human interactions with enterprise processes and “data” applications that can generate increased business speed and agility that enterprises are seeking.

Strategic planners have begun to seize upon this trend in convergence of network and applications to start mapping out how the process might best be exploited for competitive differentiation. While many businesses have initially

focused on the cost savings inherent in collapsing multiple networks into a common infrastructure, some strategy leaders are suggesting that the capabilities created by implementing Voice over IP communications can “revolutionize” the enterprise operations -- including both internal processes and those dealing with customers. At the heart of the strategic concept is the recognition that the new infrastructure and IP telephony application design can enable entirely new applications and functionality that conventional telephony applications could not deliver.<sup>3</sup>

The integration of business applications and communications into integrated enterprise processes promises to deliver faster and more repeatable business operations and marketplace responsiveness. These new intelligent business communication applications can also form the basis for competitive differentiation for those willing to exploit them first. As business communication applications become embedded in core processes, they must also be proactively managed and maintained to sustain their value as competitive differentiators in the new software centric communication world.

## **Planning and Implementing Business Communications Applications**

In order to exploit the competitive capabilities of integrated business communication applications, enterprise IT planners must first ensure that their communications infrastructure and core applications have been architected and designed correctly. The migration to converged IP networks and IP Telephony has generally been engineered on the foundational elements of standards-based open system platforms. Yet competitive jockeying for advantage by network and IP Telephony vendors has introduced new dangers of proprietary lock-in requirements when value added extensions are introduced into either platforms or applications. Enterprise planners should therefore plan their infrastructures with care to ensure that future efforts to integrate communications into their core enterprise applications are not thwarted by proprietary traps.

A second consideration for planners is the need to understand how IP networks and applications can facilitate functionality throughout an enterprise without the requirement to convert all locations and users to the latest IP telephony applications. Many of the application extensions require only that IP telephony exist at the core of the enterprise and can be implemented at edge sites with inexpensive technology conversion mechanisms. Enterprise users with last generation digital telephones can still tap new applications functionality at the telephony server without having to convert to an IP set at their desks. IP softphone applications can also act as bridging devices for mixed environments that have not totally converted to pure IP Telephony environments.

Once the capabilities for IP communications are in place within the communications foundation, planners should shift their attention to expanding communications applications functionality. There are two paths to achieving new levels of communications functionality. The first involves deploying pre-packaged communications applications that can be loosely integrated into business operations. The second involves exploiting new software integration models and methodologies involving Services Oriented Architectures (SOA) and Web Services.

The most promising areas of new functionality in pre-packaged applications that have emerged to date are in messaging, mobility and customer services. New developments in messaging, based upon the integration of multiple messaging methods such as voice messaging, email, and instant messaging, can enable business employees to expand their productivity by connecting with colleagues and customers faster and more effectively. Multi-tasking can use different messaging channels to achieve increased personal and corporate performance.

Mobility applications, which allow information workers to find and communicate with each other regardless of physical location, can also speed the effective pace of business response whether for internal decision making or for satisfying customer inquiries or needs. Follow me/find me rules-based communications forwarding enables workers to define their accessibility to optimize their own productivity and responsiveness. With the introduction of next generation “presence” based technologies and applications, availability and access methods can be detected by different applications, thus enabling multiple methods and levels for communication. One recently introduced application enables the creation of instant video conferencing by utilizing inexpensive cameras and presence based video session software integrated into an IP softphone application that is connected to the network with a broadband connection. Video calls can be automatically initiated by merely clicking on a number in the softphone’s directory, overcoming any kind of complexities of configuration and call set-up associated with the underlying technology or network facilities.

Customer service capabilities can be enhanced with both messaging and mobility application functionality as well as with the expanding suite of customer interaction applications that are expanding call centers into contact centers. Some key applications capabilities include the following:

- Creation of multi-media interaction channels that bring together call center agents with email, fax, web chat access methods to deal with customer inquiries based upon customer access choices
- Expert routing of customer inquires to the right resource within a company regardless of location within the enterprise and beyond tradition hunt group assignment
- Self service customer channels that can handle high volume customer support levels efficiently. Speech recognition capabilities now exist within self service applications to better service mobile customers

- Easier integration of contact center operations with Customer Relationship Management applications to insure better application ROI and improved customer service levels

While messaging, mobility and customer services applications offer attractive benefits to enterprises, the emergence of Web Services and SOA offers enterprises an even greater opportunity for communications-enabling of their businesses. By exposing underlying primitive communications services within communications applications, SOA offers enterprises the opportunity to more tightly couple these communications services into their business follows and applications. Within SOA methodology, these services are now discoverable, provide coarse-grained business-level interfaces, have a network address, as they are now part of an integrated IP-IT convergence solution, can be remotely executable from a network client, and are loosely coupled with their original service context for use.

By utilizing a Web Services interface for access and integration, the services are abstracted from their underlying infrastructure and context used to enable the communication processing. This abstraction through Web Services greatly facilitates the ease of access in building new workflows and integrated applications, and enables the enterprise to map the use of communications to their business process, providing new capabilities for event and exception processing.<sup>4</sup>

Taking advantage of the power of these new IP-enabled applications, requires enterprise IT planners to take a different approach to evaluating functional requirements of their user communities as well as their own organizational ability to deliver them. Planners need to work closely with functional and process leaders in the business to understand key opportunities for achieving process and productivity enhancements that can drive revenue and profit growth.

This task can consume considerable IT organizational resources and raises issues about the balance of identifying technology requirements vs. delivering the applications and managing them. Many forward looking IT organizations have been examining their key value contributions to their enterprises in light of cost pressures that inherently limit their resources. Making difficult resource allocation choices means coming to terms with new strategies that define what parts of the process IT needs to build, own, control and leverage. Some IT organizations are deciding that seeking outside technology support resources can free up their key leaders to focus on critical application planning and deployment. Additionally, they are finding that the key to competitive differentiation with business communications applications is clearly defining potential advantages and increasing the speed with which they can execute to achieve these advantages. That speed and agility is ultimately dependent on monitored and maintained network resources and solutions that achieve “always on” levels of performance and reliability.

## Defending Your Business Communications Applications From Attack

Given the strong network and software centric nature of the new business communications applications, it is not surprising that security has become a critical and required component in their architecture and deployment. By combining multiple and diverse applications onto a common enterprise network, and then integrating real time communications into business applications, care must be taken to ensure both the underlying network and the new integrated applications are kept secure. It is important to clarify the critical steps to be addressed to ensure that an expected advantage does not become an Achilles heel leading to disaster.

This has proved to be more challenging than originally thought for a number of reasons:

- While standardization of platforms and operating systems has produced inherent cost efficiencies, it has also focused potential attackers on their weaknesses
- Newer applications like business communications applications are subject to new kinds of vulnerabilities
- Converging voice applications on to a common IP network has opened up voice applications to new types of threats that had not existed in separated and well defined traditional networks. The same is true with protecting critical data applications from potential attacks originating from voice network connections.
- Effective security not only requires securing every link, user, server, and device, it must be designed in from the beginning to be proactive and adaptable.

While the challenges are real to successfully securing converged networks and business communications applications, they are certainly not insurmountable. Converged security requires the adoption of a systematic model designed to achieve secure and continuous communications.

Critical steps that need to be addressed include:

- Implementation, communication, and enforcement of security policies that define the procedures, responsibilities, controls, and measures required to protect assets and applications in a converged environment.
- Focused security planning as part of the convergence initiative that explores the full set of implications and requirements for business communication applications.

- Provisions for enabling secure maintenance on network and applications components by manufacturers' technical support teams. An excellent example of this kind of secure maintenance and management approach is Avaya's Secure Intelligent Gateway (SIG) that provides a secure gateway between an enterprise's network and the external Avaya maintenance systems.
- A plan for ongoing security management that addresses a range of security issues including configuration, system backup and patch management, coordinated security responses to detected attacks, and education of users to the ongoing need for security compliance.

Creating security in depth for business communications applications requires careful planning and ongoing monitoring to insure adequate protection for those enterprises that are building competitive differentiation.

## **Supporting Your Business Communications Applications**

As communications functionality becomes integrated into core process business applications, the need to effectively support business communication application software takes on additional mission critical importance. The shift to a software centric communications model also creates new requirements for operations and support. This shift is appearing in two phases. The first phase is impacting the support requirements for IP Telephony applications (telephony, messaging and contact center) as they are integrated as applications into a converged IP network. Additionally, support needs to span both hybrid TDM and IP environments since many enterprises are likely to migrate their communications infrastructure over a multi-year timeframe. The second phase involves dealing with telephony applications as communication services within a Service Oriented Architecture.

To illustrate the transformational impact of the first phase, we can use the deconstruction of traditional telephony into a new IP communications model with various components. At the core of the deconstruction are two key separations. The first involves removing telephony as an application from the tightly integrated hardware and software systems that make up traditional circuit switched PBXs. By extracting the core telephony feature functionality into a portable application, the transformed application can now operate on open standards-based computing servers. Telephony functionality can then be delivered to connected users in a client/server operational model with a wide range of end user devices requesting and receiving services. The second transformation involves replacing circuit switching protocols with IP networking protocols to manage the transfer of voice traffic across the single converged network.

These two transformations have significant impacts on support processes. As

we have already discussed, the elimination of the separation of voice and data traffic requires a new support process to deal with specific requirements of converged networks including potential security issues and managing the different types of applications on that network. The use of standardized hardware can also significantly change the support process for telephony applications. More enterprise IT organizations are comfortable with using internal resources to support standard server platforms with spare replacement parts and systems. The migration to open standards servers can lead to potentially lower maintenance costs, just as IP Telephony has reduced the cost of moves, adds, and changes (MAC) by allowing internal resources to make the changes. Thus the traditional requirement for on-site system support services based upon specialized systems knowledge is morphing into sophisticated monitoring services that can notify enterprise internal resources on the need for active intervention to resolve issues including software updates and parts replacement.

A best in class example of this kind of hardware and systems monitoring is the EXPERT Systems monitoring service that is offered by Avaya. By building in sophisticated algorithms into both its telephony servers and devices, Avaya is able to effectively monitor current performance, predict potential hardware failures and quickly diagnose problems for fast resolution including clearing 98% of alarms through remote intervention. While hardware failure has become a relatively rare occurrence, Avaya has continued to improve its on-site support by streamlining its parts distribution logistics and installing GPS tracking in its technician vehicles to more quickly route parts and live support to hardware and system failures.

The emerging client/server model within IP Telephony enables remote locations and users to receive their telephony applications from centralized servers across whatever network is available. This movement from location-based telephony systems to the new model opens the door to a broader array of IP telephony applications and features. At the same time, this migration requires services support that is truly global in its required reach. It also requires in-depth knowledge and certifications for globally deployed services staffs that support these environments. Avaya, as a leader in telephony support services, has recently totally revamped its global service support structure to address the new cross border and regional reality of its customers and their distributed telephony environments. It has created a large scale “follow the sun” services model which allows effective 24x7 support from 27 service centers with thousands of certified technicians providing in-region language capabilities that literally span the globe. To achieve transparency across its regions, the company has also adopted a common set of processes, knowledge-based support systems, and trouble-ticketing.

Another new option enabled by this decoupling of hardware and software is the ability to outsource a hosted telephony application to a third party that specializes

in hosting hardware and software and provides these services to a business's remote locations over a WAN connection. In the case of telephony applications, the 3<sup>rd</sup> party hosting might best be accomplished by the telecommunications vendor that is also providing the telephony application. Avaya, for example, offers a range of hosted solutions in its Avaya On Demand portfolio. In this model, IP communications applications are hosted in a secure data center operated, monitored and managed 24x7 by either Avaya or an authorized Service Provider. In this model, customers subscribe to the functionality on a per-seat, per-month basis, thereby avoiding the capital expense, integration and management challenges inherent in an on-premise implementation.

A number of other new support issues emerge as telephony becomes an application running on a converged network infrastructure. One of the first tasks that must be addressed is the integration and support for telephony applications across a network of multi-vendor devices. While networking standards certainly help in accomplishing this process, there is a growing need for sophisticated ongoing network monitoring and management that can isolate trouble in the diverse network components that can now be points of failure for converged voice applications. This includes a need for configuration and fault management capability to achieve rapid fault isolation and resolution with a complex network environment. Since telephony remains a business critical application, capability for proactive monitoring of an entire converged IP network for maintenance and performance is required to ensure high quality and reliable VoIP operations. The core support process must provide active management of IP Telephony applications as they are running over the network rather than the closed system focus that have dominated monitoring of traditional telephony systems. Needless to say the success of the support process is based upon the right resources, tools, skills, and specialized knowledge of communications applications that are engaged in the process. Without the specialized IP Telephony diagnostic tools, self-diagnosing telephony applications and proactive monitoring, the required levels of IP Telephony availability and reliability can not be realized.

Since many enterprises do not have the new skill sets, tools and scale to deal with these proactive monitoring and management requirements, telephony providers like Avaya have built comprehensive suites of support services that address this gap. Avaya, for example, has pioneered in the development and deployment of its Enterprise Service Platform (ESP) which was built with leading industry best in class network monitoring and management tools to specifically deal with the issue of providing proactive service support for voice telephony applications as they operate across the multi-vendor IP network. It also built on Avaya's EXPERT Systems<sup>SM</sup> voice diagnostic capabilities. Taking the position that all of its customers are not alike, it has tailored its support capabilities to achieve a shared responsibility model that can address a variety of division of responsibilities options.

An illustration may help to clarify the need for IP network proactivity to achieve

reliable telephony service levels. Some early implementations of IP Telephony experienced troublesome outages that were often difficult to isolate. The root causes of a number of these outages turned out to be either the introduction of new applications on the network that had unanticipated impacts on the performance of latency sensitive applications like voice, or changes in configurations of critical network devices, such as routers, gateways and firewalls, that unexpectedly interfered with voice traffic. Actively managing the overall network environment with a critical eye on voice applications should now be seen as an emerging requirement for preventing these kinds of outages. In addition, as the environment moves from a hardware/systems model to a software/applications model, enterprise will face increasing challenges in managing the software update process for both telephony applications and configuration/version control of the devices of the underlying network.

Recognizing the growing complexity and change velocity of its own software telephony applications, Avaya has recently introduced a Software Release Management (SRM) service that helps customers with the process by off-loading the management of software patches to meet customer defined deployment criteria. This prevents inadvertent software version conflicts in the network that can cause performance and out of service problems. At the same time, it provides a way for customers to remain current on the latest version of software, while minimizing the risks associated with software update management and implementation.

As communications becomes more software centric and it moves from a separate application into an integrated business communication framework under a Service Oriented Architecture, support take on an entirely new dimension. That dimension is the ability to support not only the communications services that are invoked by the integrated applications but to support the integration process itself from its design all the way through operations and management.

Key to achieving the value proposition of intelligent business communications is the ability to design and orchestrate, and support new solutions that link communications and business processes for faster customer response and improved operations. Enterprises will face the choice of either needing to develop the expertise, experience, and consistent methodologies to exploit the development of intelligent business communications from planning through full implementation and Life-cycle support or seeking external expertise to supplement internal resources.

As companies move toward Web services for more flexible access to communications applications, professional services and support will play an increasingly important role in creating applications functionality that can support new capabilities in an open, standards-based SOA model. These services assist enterprises in developing technology and IT architecture roadmaps to support this transformation to business-driven communication solutions while mitigating

risks, leveraging existing investments, and maximizing potential benefits.

Professional services also can support enterprises on the design, development, and integration of custom software applications that enable the migration of traditional enterprise communications and contact center solutions into powerful, SOA-based applications. By working with enterprises in the early stages of a new SOA-based communications solution planning process, consultants can help deliver seamless integration between business processes and applications within the solution. Enterprise communication solution examples include Web Services adaptors to contact center reports, IP agent greeting administration, and voice portal adaptors, as well as IP Telephony phone applications such as Webcam, hospitality, and news feeds. Contact Center solution examples include web based reporting systems, complex CTI applications such as business-driven intelligent routing, and self-serve speech enabled applications.

Product support and managed service capabilities can play an important support role for the entire communications architectural model. For example software based remote monitoring and management capabilities can provide enterprises with highly reliable and available applications and network infrastructure that is critical not only for existing telephony, contact center and collaboration applications but also for new “communication-enabled” applications. Leading communications vendors are creating common software services and tools that deliver on communications infrastructure support. These services formulate the composite serviceability solutions that are accessible across all the layers of the Service Oriented Architecture.

As enterprises take advantage of the advanced capabilities of IP based telephony applications to link with and communications-enable core enterprise applications and business processes, the need to effectively support these integration efforts will grow. Having knowledgeable service support for communications applications and their extensions will become increasingly important as enterprises differentiate themselves based upon their abilities to deal with their customers and supply chains in rapid and flexible ways. This support structure will also increasingly rely upon communication industry ecosystems where groups of applications developers cooperate with communications platform vendors to not only increase application functionality but also insure supportability for application implementation and maintenance.

## Conclusions

The migration to a software centric communication world holds out the promise of significant advantages for enterprises that are willing to invest in new technologies and applications. The nature of investment criteria has shifted from a recession dominated cost reduction focus into a broader set of competitive objectives that factor in the forces of globalization. Yet to achieve competitive

differentiation as well as sustainable global advantage enterprise communications planners must carefully plan, architect, implement, and support the introduction of new business communications applications. Those enterprises slated to succeed will understand how to utilize the inherent opportunities available in a software world and build or acquire the required application support to insure its continuous operation.

#### Footnotes

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4. For more on SOA and Web Services see Nick Lippis, "The Lippis Report Issue 51: Web Services & SOA Redefine IP Telephony Landscape" February 2006 and "Avaya Communication Architecture White Paper " March 2006 or click here <http://www.avaya.com/gcm/master-usa/en-us/resource/assets/whitepapers/lb1842.pdf>

#### About GreenSpringPartners and the authors:

GreenSpring Partners is an industry analyst and consulting firm focused on driving profitable growth for its clients. The principals at GreenSpring Partners, Richard Kent and Harold Tepper, are engaged in an ongoing effort to help shape the landscape of infrastructure possibilities – hardware, software, applications and services -- for both enterprises and service providers as they migrate to next generation networks.

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