

Collaboration Services in a Services Oriented Architecture

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Executive Overview

Service-oriented architectures (SOA) hold the promise to transform the ways in which enterprises do business. SOAs enable companies to reshape the interaction between IT and business units, providing a high-level framework of technical services that allow IT to swiftly retool applications and services to better meet changing business needs. However, like other technical revolutions that have preceded SOA – pervasive, low-cost and high-performance computing platforms, high-speed networks, and the Internet - broad SOA acceptance will be mediated by the availability of reliable, standards-based and flexible tools that will provide the building blocks of true interoperability between computing platforms, web-based services, applications, and data.

Among the building block technologies and tools that will advance the proliferation of SOA are collaboration services. Collaboration services can be seen in two aspects of a SOA environment:

- At the User Interface level (including portals), where UI components can be pulled into the presentation layer of the SOA environment. The UI level of SOA delivers the fruits of distributed collaboration services to users. As an example, chat rooms, white boards and other plug-and-play web-based components can be integrated in a SOA environment through a simple drag-and-drop action.
- At the system or process level, where real-time interaction occurs within the collaborative environment, including high-level workflow and monitoring tools, mediating the flow of information within the collaborative environment. An example would be a disaster recovery agency responding to a flood, where a request would trigger a real-time action in the collaborative environment to identify participants with the appropriate skill sets to respond.

In this white paper we will evaluate the benefits of service oriented architectures, present analysis from leading research firms, discuss the chief aspects of collaboration in a SOA environment, and explore the importance of collaboration tools to successful SOA implementations.

SOA Market

Born from the evolution of enterprise application integration (EAI), web services and message-oriented middleware (MOM), SOA is still early in the adoption curve for most enterprises. A November 2005 report from industry analyst firm Forrester Research Inc.ⁱ surveyed over 100 technical decision makers and found that 40 percent were not using SOA, 37 percent were pursuing SOA for internal integration, 15 percent were using SOA to achieve external integration, and only nine percent were implementing SOA to achieve business transformation. Nevertheless Forrester estimates that more than 62 percent of large enterprises and 61 percent of medium enterprises will implement SOA by year-end 2006ⁱⁱ, principally for internal integration. Research by IT industry publication InfoWorld tends to support this view, reporting that 75 percent of companies are either planning to pilot or are already deploying an SOA project. Research firm IDC puts dollar figures on the trend, predicting that a \$9 billion market for SOA software will emerge by 2009.

Gartner Researchⁱⁱⁱ, on the other hand, estimates that less than 10 percent of large to midsize companies have made a full commitment to building integrated SOA applications. Barriers to adoption include complexity, lack of tools, fragmentation within web services infrastructures, lack of shared service models, and organizational inability to align business processes with IT approaches to service design.

Benefits of SOA

The most often-cited benefit of SOA is business agility, the tight integration of IT and business that delivers value by increasing an organization's ability to bring new services and offerings to market quickly. SOA simplifies building complex applications by treating enterprise application functionality as a collection of discrete, standards-based services. These components form a 'catalog' of interoperable services that can be re-used, configured, and combined as needed to create new application functionality.

According to Forrester^{iv}, SOA can be defined as:

A style of design, deployment, and management of both applications and software infrastructure in which:

- Applications are organized into business units of work (business services) that are (typically) network accessible.
- Service interface definitions are first-class development artifacts, receiving the same degree of design attention (and more) as databases and applications.
- Quality of service (QoS) characteristics (security, transactions, performance, style of service interaction, etc.) are explicitly identified and specified for each service.
- Software infrastructure takes active responsibility for managing service access, execution and QoS.
- Services and their metadata are cataloged in a repository and discoverable by development tools and management tools.
- Protocols and structures within the architecture are predominantly, but not exclusively, based on industry standards (such as the emerging stack of standards around SOAP).

Clearly, the notion of transforming monolithic, stove-piped business applications into a collection of shared, interoperable, loosely-coupled and process-based services offers forward-looking enterprises the opportunity to change how they bring services and goods to market by facilitating IT-business alignment that builds business flexibility, efficiency and responsiveness to changing market demands. But because SOA is early in its lifecycle, many competing service development models exist, promulgated by vendors seeking to add value to legacy offerings – perhaps message oriented middleware (MOM) products or enterprise application integration (EAI) architectures - and dominate an immature, fragmented market. Many tools are available to companies pursuing SOA.



Tools & Architectures

SOA initiatives can be classed into two categories: big-bang implementations, typically requiring buy-in of one vendor's approach to deploying SOA; and project-based pilots, where internal IT staffs, working with business requirements, pick and choose tools and offerings from a wide range of vendors to bring SOA into their organizations project-by-project.

The big-bang implementation is rare, since it involves adding a new layer on top of an organization's existing IT infrastructure rather than transforming that infrastructure by breaking it down into discrete service components. Most analysts and experts advocate the latter approach to give organizations an evolutionary path with the necessary control, experience, and service 'backbone' to secure buy-in at all levels of the organization. A gradual approach, where an organization builds its SOA platform over time by implementing discrete projects, encourages cross-organization cooperation and may deliver the best results.

Tools that support the development of SOA include business modeling tools; process modeling tools, also referred to as Business Process Management (BPM); information integration suites; Enterprise Service Bus (ESB) environments; message brokers; portals; application servers; identity and access management; and communications and collaboration tools.

Leading vendors offering SOA products, services and tools are shown in Table 1, below.

Vendor	SOA Platform	url
BEA	WebLogic, AquaLogic	http://www.bea.com/framework.jsp?CNT=products.htm&FP=/content/solutions/soa/solutions
IBM	IBM SOA Foundation	http://www-306.ibm.com/software/solutions/soa/
Microsoft	.Net Architecture	http://msdn.microsoft.com/architecture/soa/
Oracle	Oracle SOA Suite	http://www.oracle.com/technologies/soa/soa-suite.html
TIBCO		http://www.tibco.com/solutions/soa/
Sun		http://www.sun.com/products/soa/

Table 1: Leading SOA Vendors

Market Direction

SOA market leaders are currently focused on development of document-focused data services, enterprise service bus (ESB) suites, and enterprise security services. Collaboration services in most SOA environments are less well-defined, and are concentrated at the user interface level. Most available SOA suites do not look at collaboration as a real-time service, yet collaboration may be the key to the acceptance of SOA and delivery of its promised efficiencies and business value.

Benefits of Collaboration Within SOA

Messaging tools such as email and instant messaging (IM) may encourage collaboration, but they do not constitute collaboration. Other collaboration tools, such as white boards, text chat, and virtual workspaces, improve workflow and communication but do not provide a consistent base for true collaboration. Many organizations have discovered that attempting to force collaboration by 'synthesizing' these tools into a collaboration environment fails. What is needed is a secure, comprehensive, reliable collaboration platform that supports real-time interaction, presented as SOA services, which can be integrated into existing systems, applications and software.

CollabraSpace and SOA

Although many SOA vendors are focused on BPM and security, few address the delivery of real-time collaboration services in a SOA infrastructure. One developer of SOA-ready collaboration services is CollabraSpace, the leading authority on web-based collaboration solutions. CollabraSpace develops and provides secure web-based collaboration software (CollabraSuite) and platforms that include audio/video conferencing, document sharing and storage, whiteboarding and instant messaging, as well as a J2EE application development platform (CollabraSuite SDK).

CollabraSpace products feature a rich component set of collaborative SOA-ready processes and tools that bring geographically-dispersed people, processes and data together in real-time to increase productivity and improve workflows. CollabraSuite and CollabraSuite SDK include a graphical user interface tuned for collaboration; the ability to monitor collective activity; the ability to create and inject content into the collaborative environment, and integration with a SOA-based dashboard application.

CollabraSuite supports both GUI and infrastructure approaches to delivering collaborative services in SOA via:

- User Interfaces that are included in web applications, such as portals (implemented via WSRP). CollabraSuite's component-based suite of real-time collaboration services enables SOA designers and developers to select services to provide to end users (e.g. chat, whiteboard, etc).
- Collaboration capabilities presented as a service where applications and frameworks, e.g. ESBs and BPM applications, can both retrieve information from the collaboration services and create events within the collaboration service. CollabraSuite provides an API to support the retrieval of information from, or sending events to, the collaboration service.

CollabraSuite's open, standards-based application architecture speeds the development of scalable, web-based enterprise collaboration services. Built on the J2EE platform, CollabraSuite components align with SOA services, enabling the creation of context-sensitive work environments that are integrated at every level with legacy systems and applications. Scalable, secure, and administered through a client portal or application server, CollabraSpace offers an SOA-integrated collaboration development environment that supports:

- Drag and drop collaboration services that integrate into SOA business processes – whiteboards, chat, etc.
- Collaboration services available within an SOA IDE, such as BEA's WebLogic Composer
- J2EE-based authentication and authorization
- Ability to parse messages from ESBs and perform business processes. BPM applications provide evaluation or introspection of messages, and deliver the capability to define actions that should occur based on information within the messages.

In addition, CollabraSuite provides services that enable BPMs to:

- Dynamically create virtual workspaces/rooms where collaboration can occur
- Assign roles and permissions in the rooms, based on real-time analysis of the relevant capabilities and expertise of on-line participants.
- Copy documents/folders to room file cabinets or user briefcases, providing the necessary artifacts to enable real-time interaction
- Locate users currently on line with a particular skill set, for example locate an individual with air traffic expertise to respond to an air control incident.
- Place images on a whiteboard for real-time interaction and interchange.

CollabraSuite's rich component set includes:

- Presence awareness
- Document storage and retrieval
- Instant messaging/paging
- Audio/video & web-conferencing
- Navigation
- Shared whiteboard
- Associates list
- Desktop sharing
- Access controls
- Auditing and metrics
- Support for lightweight handheld devices.

CollabraSuite's sophisticated set of graphical modules can be easily and quickly assembled to create a custom-configured collaborative workspace. The plug-and-play components can function within a web-based application, or as a stand-alone application, ensuring seamless integration with existing SOA environments.

CollabraSuite's UI:

- Contains real-time end user collaborative components, such as whiteboards
- Provides seamless integration into portal applications via WSRP
- Enables single sign-on through SOA security mechanisms (authentication is required from both a UI and service perspective)



Organizations are able to monitor collaborative activity in the environment:

- Post messages to ESB whenever thresholds are met or exceeded
- Monitor who's online, how many are online, the amount of activity, etc. and respond appropriately by activating business processes within the SOA via the ESB. CollabraSpace enables participants to see things in real-time in the environment and publish actions into the collaborative environment
- Via a dashboard display, participants can view and report on and the amount of collaborative activity.

The flexible, dynamic and secure platform supports injecting events into a collaborative environment. Some examples of this are:

- Create virtual workspaces (buildings/floors/room), documents, sending pages, etc. by posting an activity to the ESB
- Coordinates the facilitation of a virtual meeting
- Etc.

SOA Scenario

Consider the following application of CollabraSuite, used by the Department of Homeland Security (DHS) to monitor restricted air space in several regions throughout the country. With CollabraSuite, DHS uses a portal as the display mechanism through which users monitor restricted air space. The DHS collaboration portal contains displays of several different applications, such as:

- Radar
- Real-time text chat, a/v conferencing, whiteboarding and document sharing
- Video surveillance of key targets within the restricted air space
- FAA's tracking application which tracks all planes and specific details of each plane to include coordinates, airline, departure and arrival information
- A custom application called a 'decision matrix' used during a crisis, e.g. when an airplane is in restricted airspace, to make decisions on how to respond to the current crisis.

Working in a SOA environment, CollabraSuite enables DHS to manage airspace incursions in real time:

- The radar application can be configured to post messages to the ESB whenever planes enter a predefined restricted air space. Alerts intensify as planes get closer to the restricted airspace. Notifications contain information about the location of the plane and other specifics, e.g. speed and aircraft identifiers.
- The BPM process reads the message from the ESB and parses the information. Based on the geographic location of the plane, the process can determine the level of threat. As the plane gets closer to the restricted airspace more messages are sent to the ESB. For each event the BPM increases the threat level. Information posted to or retrieved from the CollabraSuite environment includes:
 - Initial threat level: watch officers are sent real-time page notifications
 - Mid-threat level: the system finds users from particular group and sends them a notification (e.g., FAA personnel monitoring the restricted space)
 - Threat level: the BPM creates a virtual crisis room, places detailed information about the plane into the room, and loads the customized decision matrix application. Text chat, A/V, etc. are engaged to handle the threat.

In this scenario, all actions are driven by the BPM based upon messages received through the ESB by various services within the enterprise environment.

Conclusion

CollabraSuite meets the requirements of users and developers of SOA environments for real-time collaboration services. Users in a geographically-dispersed organization are able to work as a team to resolve problems; SOA developers are able to speed time-to-market and significantly reduce the cost and time required to create and maintain the collaborative environment. Providers of SOA suites will find in CollabraSpace a partner capable of providing real-time, SOA based collaboration tools that can be integrated out-of-the-box into existing SOA deployments. CollabraSpace, and its products CollabraSuite and CollabraSuite SDK, are an effective solution for integrating legacy applications into a collaborative, SOA services-based work environment.

ⁱ *The Forrester Wave: Enterprise Service Bus, Q4 2005*. Mike Gilpin and Ken Volmer, c 2005 Forrester Research Inc.

ⁱⁱ *Survey Data Says: The Time For SOA Is Now*. Randy Heffner, c 2006 Forrester Research

ⁱⁱⁱ *Software Architectures Will Evolve From SOA and Events to*

Service Virtualization. Gartner RASCore Research Note G00126246, D. Plummer, 9 March 2005.

^{iv} *Your Strategic SOA Platform Vision*. Randy Heffner, Bobby Cameron and Kimberly Q. Dowling, c 2005, Forrester Research Inc.

