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R. Schulte

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Predicts 2003: Enterprise Service Buses Emerge

The enterprise service bus, a new variation of software infrastructure, has added to the range of technologies that enterprises can use as the enterprise-nervous-system backbone.

Core Topic
Application Integration and Middleware:
Application Integration

Key Issue
How will enterprises meet the challenge of integrating Web-based applications with enterprise systems?

Strategic Planning Assumptions
A majority of large enterprises will have an enterprise service bus running by YE05 (0.6 probability).

Application-server-neutral integration technology, including integration broker suites and enterprise service buses, will triple its penetration of new development projects, from approximately 6 percent in 2002 to 18 percent in 2006 (0.6 probability).

At least four major (more than $100 million in total revenue) software vendors from the integration suite or other related middleware markets will announce new ESB products during 2003 (0.7 probability).

Architects and developers are using service-oriented architectures (SOAs) and event-driven designs in more and more of their projects. These projects will increasingly rely on Web services standards, particularly Web Services Description Language (WSDL) or Simple Object Access Protocol (SOAP), for some or all of their interfaces as these standards mature during 2003 to 2005.

Although every Web server and application server has native Web services support, troublesome technical incompatibilities and the incomplete nature of the official standards make it difficult to make these platforms interoperate. A Web services consumer (client) on one vendor's application server technology will often have problems invoking a Web services provider (server) on another vendor's application server. Moreover, Web services are often not the ideal communication standard for event-driven applications and for certain other computing styles. Other interfaces and protocols must be used alongside Web services. These factors introduce a new set of requirements for architects to consider when specifying the enterprise nervous system (ENS) infrastructure for business applications.

Prediction: Enterprise service buses (ESBs) will become a major market force during 2003.

A new category of software that addresses the above problems came to market in 2002 from several vendors, including:

- Kenamea (Web Messaging Platform)

- Software AG (EntireX Communicator and XML Mediator)

- Sonic Software (SonicXQ)

- SpiritSoft (SpiritWave)

Gartner

These new ESB products combine native Web services support — generally including SOAP, WSDL and Universal Description, Discovery and Integration (UDDI), asynchronous store-and-forward delivery, limited message transformation, publish-and-subscribe, and content-based routing. They can interoperate with a variety of disparate application servers simultaneously, smoothing over the technical differences in the application servers' Web services implementations and also providing services for communication and integration.

A majority of large enterprises will have an ESB running by YE05 (0.6 probability).

As much as 10 percent of new application integration development work in 2006 may use an ESB, although only a small fraction (1 percent to 3 percent) of the installed applications in production will be running on an ESB then. Usage will grow rapidly in succeeding years, although the packaging of these functions, and thus the role of ESB products as currently conceived, could change, depending on vendors' product strategies.

Impact in 2003: Commercial ESB products will be used in a small number of production applications in 2003, but their scalability and reliability are unknown. Although most ESBs incorporate proven communication middleware in their foundation, the new ESB versions of these products have some features that are untried. Furthermore, pioneering ESB vendors are relatively small companies with some business risk or larger vendors with limited marketing and sales channels. ESBs complement application servers in a technical sense, but application server vendors that do not offer an ESB product will discourage the adoption of ESBs. They prefer that developers write the entire application (all clients and servers) on one application server technology — their own — and use their application server's native Web services and message-oriented middleware (MOM) features.

Application platform suites from these vendors have the equivalent of an ESB bundled alongside their application servers and portals. Such competition will not substantially limit the penetration of ESBs, because many enterprises will not be satisfied to use homogeneous application server technology — for example, run everything on one platform, such as .NET, WebLogic or WebSphere.

Reacting in 2003: Leading-edge architects and development teams should consider using an ESB as a middleware backbone if:

- Their new SOA applications will involve two or more different application servers; for example, Microsoft .NET clients on Windows and one or more Java application servers on Linux

- They will use asynchronous communication, such as store-and-forward or publish-and-subscribe

Developers should also consider an ESB if they want to mix Web services with other forms of program-to-program communication in the same application set. ESBs support, but do not require, the use of Web services. An ESB can support COM, .NET, Java, CICS and other programs running on different platforms when some of the interfaces will use native Java Messaging Service (JMS), Java 2 Platform, Enterprise Edition (J2EE), Java Connector Architecture (JCA), other MOM or other non-Web-services communication standards.

Mainstream and conservative projects should avoid commercial ESBs until 2004, by which time the products will be more proven and more, large software vendors will be participating in the market. An enterprise can assemble its own custom ESB-like middleware infrastructure without buying a commercial ESB product. This requires some design work and then integrating a MOM product (for example, from IBM, Sonic, SpiritSoft, Tibco Software or any of the smaller JMS MOM vendors), Web services support (available from most software vendors), a low-end transformation engine (for example, one based on XSLT) and, usually, some custom code. Another alternative is to use a full integration broker suite, a superset of an ESB that is particularly useful for solutions that require a lot of application integration.

Prediction: ESBs will cut into sales growth of comprehensive integration suites during 2003.

An ESB is a low-end alternative to a comprehensive integration broker suite, offering less functionality, but with less complexity and cost. Comprehensive suites from vendors such as IBM (WebSphere MQ Integrator), Microsoft (BizTalk), SeeBeyond (e*Gate), Tibco (ActiveEnterprise), Vitria (Businessware) and webMethods (Integration Platform) have features such as off-the-shelf adapters, packaged integrating processes (PIPs), business process management (BPM) and business activity monitoring (BAM) that are usually not included in an ESB. These value-added features particularly benefit projects that center on packaged and legacy applications, with only a small amount of new code. However, many managers and development teams are not ready to exploit all these features, so a comprehensive suite is "overkill" in those cases.

ESBs are particularly relevant for projects that are building a lot of new SOA application code from scratch, with only a moderate amount of integration with packaged and legacy applications. An ESB can be a sensible first step toward a systematic ENS because it provides the basic connectivity backbone. An enterprise can then add more features — such as adapters, PIPs, BPM and BAM tools — to their ESB over time, eventually approximating a comprehensive integration suite using best-of-breed pieces from disparate sources. The drawback is that significant expertise and custom integration and testing are required unless the ESB is a subset of a comprehensive integration suite offered by the same vendor.

ESBs and some of the comprehensive integration suites — for example those from integration specialists such as SeeBeyond, Tibco, Vitria and webMethods — are application-server technology neutral. They support a variety of interface technologies that enable them to connect COM, .NET, WebLogic, WebSphere, CICS, SAP and other platforms without favoring any one (see "Integration Brokers, Application Servers and APSs"). In a world that will continue to be heterogeneous, ESBs and these specialists' comprehensive broker suites will, therefore, be attractive in many situations.

Application-server-neutral integration technology, including specialists' comprehensive integration suites and ESBs, will triple its penetration of new development projects, from approximately 6 percent in 2002 to 18 percent in 2006 (0.6 probability).

Most of the growth will be from ESBs, which may account for 10 percent of all new development projects by 2006. The remaining 8 percent of the neutral integration technology will be split among the comprehensive integration suites and various types of low-end integration brokers (see "'Low End' Integration Middleware No Longer So Low End").

Impact in 2003: Numerous vendors whose middleware products already have many ESB attributes will modify and reposition their products during 2003 and 2004 to be ESBs. Vendors that are likely to execute this strategy include Actional, Cape Clear, DataPower Technology, KnowNow, Metapa, Sarvega, Talking Blocks and XML Global Solutions. These vendors offer MOM, Web services broker or XML router products that overlap the coalescing identity of the ESB.

Comprehensive integration suite vendors must also respond to the arrival of ESBs. Many of these vendors will seek to maintain their product positioning and premium prices by emphasizing value-added features. They will point out that the comprehensive suites are a pure superset of ESB capabilities. Some even deny

that the ESBs are anything new, since the purpose of an ESB is so similar to that of a traditional integration broker suite. However, an ESB is a bit different from a traditional broker because of its lower cost and its greater emphasis on the basic transport function.

ESBs are a thinner layer of function over the industry standards, such as JMS and Web services, and, therefore, they could be swapped out for another product more easily than a comprehensive broker could be. ESBs are aimed more directly at supporting new application logic, whereas traditional comprehensive brokers aim a bit more at supporting purchased and legacy applications. ESBs will be used for composite applications more than they are used for data consistency and multistep applications, whereas comprehensive integration suites do more data consistency and multistep processes than composite applications.

We expect that some comprehensive integration suite vendors will offer low-cost, stripped-down versions of their suites as ESBs. If these are packaged and priced properly, they could be effective competitors in the ESB market. IBM and Iona are the most-likely candidates to pursue this strategy in 2003.

At least four major (more than $100 million in total revenue) software vendors from the integration suite or other related middleware markets will announce new ESB products during 2003 (0.7 probability).

The arrival of these large vendors will further accelerate the use of ESBs.

Reacting in 2003: Large enterprises need to develop a systematic strategy that will support Web services and application integration in several different ways. Enterprises that do not already have an integration competency center to oversee their ENS should implement one now (see "The Role of the Integration Competency Center"). In situations where application servers will be heterogeneous, integration technology should be application-server-neutral, that is, it should use an ESB or a comprehensive integration suite from a specialist integration vendor that does not bundle the suite with a general-purpose application server. Enterprises that will build most of their business solutions on one dominant packaged application suite or one application server technology do not need an ESB or neutral integration suite because they can get everything from their application platform suite (APS) or other one-stop-shopping software stacks that include Web services, integration tools and MOM.

Acronym Key

APS	Application platform suite
BAM	Business activity monitoring
BPM	Business process management
ENS	Enterprise nervous system
ESB	Enterprise service bus
J2EE	Java 2 Platform, Enterprise Edition
JCA	Java Connector Architecture
JMS	Java Messaging Service
MOM	Message-oriented middleware
PIP	Packaged integrating process
SOA	Service-oriented architecture
SOAP	Simple Object Access Protocol
UDDI	Universal Description, Discovery and Integration
WSDL	Web Services Description Language

Middleware vendors must revise their product road maps and their positioning, pricing and marketing strategies to compete in the ESB space or to coexist with ESBs. Two types of external service providers should prepare for growing customer interest in ESBs: large system integrators, such as Accenture and IBM Global Services, and small, specialist external service providers with expertise in SOA, Web services, MOM, events and application integration, such as Candle, CommerceQuest, International Systems Group and MQSoftware.

Bottom Line: Enterprise service buses are a new category of infrastructure software that will enable certain types of enterprise nervous systems. They will be widely used in mainstream enterprises and will have a major impact on several segments of the software market.