Integration solutions - A Comparative Analysis

Applies to:
Middleware Technologies.

Summary

A Middleware solution that provides out of the box integration scenarios eliminates the need to hard code point to point connections between applications or businesses. This article explores the integration capabilities of various solutions available in the market.

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Overview

Why there is a need for Integration?
Organizations have found a host of compelling reasons to do this. Some have discovered that they must share order and shipment information in real time between an ERP system such as SAP R/3 and existing production applications located in warehouses or manufacturing facilities. Others have come up with equally compelling diverse scenarios.

What Integration solutions do?
- Integrate systems that were not designed to work together
- Accommodate various elements of information technology that may be dissimilar and incompatible
- Integrate across an increasingly broad organizational scope, perhaps encompassing multiple separate businesses
- Make maximum use of information
- Accommodate and even proactively exploit change
- Support the way the business operates, not the other way around

Why integrate systems and applications?
A successfully integrated enterprise can reward your organization with significant cost, resource, and time savings. Enterprise Applications Integration (EAI) connects existing and new systems to enable collaborative operation within your entire organization.

A successfully integrated system allows information to work harder and smarter, increasing the speed of business reaction time, and facilitating seamless, straight-through transaction processing.

Although a number of Integration solutions-Middleware technologies are available in the market. Some of them are briefly discussed here.

1. SAP Exchange Infrastructure
2. Tibco
3. BizTalk
4. Web methods
5. IBM MQSeries/WebSphere
6. See Beyond
7. Mercator
8. Oracle fusion
9. Vitria

1. Sap XI

XI is well suited for connecting SAP systems with each other and with non-SAP. SAP XI provides an integrated workflow engine that allows defining adapters to non-XML protocols and mappings to convert data content from source to target format.

XI comes handy particularly incase of SAP - Non SAP interfaces where you can import standard integration content. Also XI has got sophisticated
open standard adapter framework which is very easy to implement and custom logic can be implemented using Adapter module programming.

Advantages

- Monitoring is better than any other middleware product. It offers exhaustive monitoring features like message, performance, component monitoring etc, all of which can be used to track and rectify the errors. It follows a hub and spoke model.
- When you need to integrate with an SAP system XI has an advantage in supporting various SAP components and so on.
- Process functionalities inside XI to modify content in the communication channel on own defined rules for business purposes.
- Mappings and adapters are good as comparable with any other middleware product.
- Synchronous & Asynchronous communication is possible.

Dis-Advantages

- Web methods are particularly good if you have B2B kind of communication with their Trading Partners product.
- XI is lacking full-fledged Message Queue compared to other established Middleware products.
- It lacks in ability to process huge messages but SAP is working on that.
- It does not have a messaging layer exposed by APIs like IBM MQ-Series.
- It is not comparable to Tibco in terms of speed.
- SAP relies on other vendors except for a few adapters.

2. Tibco

TIBCO is described as having the most advanced BPM features overall, spanning both integration-centric and human-centric features due to the company's aggressive strategy to sustain competitive advantage by adding leading-edge features, whether via internal development or strategic acquisition.

For the integration of custom applications into the e-business infrastructure, TIBCO makes available a comprehensive Software Development Kit that enables enterprises to build their own adapters.

Advantages

- Tibco has many adapters that are built by their own.
- Tibco simple and productive User Interface is much more matured than XI.
- Tibco does publish/subscribe very well. Available messaging types include request/reply, publish/subscribe and publish/reply interactions.
- Improves overall system performance by eliminating repetitive batch requests to packaged application systems.
- Lowers cost-of-ownership through general n-way rather than point-to-point integration.
- Simplifies administration with data transparency provided by subject-based naming.
- Enhances networked applications based on component or object development models.
- Choice of message delivery service levels for optimal resource utilization.

Dis-Advantages

- Tibco does not have asynchronous SOAP/HTTP.
- Concept of integration in terms of semantics and steps is a little more complex.
- When compared in terms of monitoring, message level trace, message resubmission, pipelining, components monitoring Tibco is far behind to XI.

3. BizTalk

BizTalk is a business process management (BPM) server that enables companies to automate and optimize business processes. This includes powerful, familiar tools to design, develop, deploy, and manage those processes.

While planning for the integration scenario BizTalk takes care about tasks like Gathering information, Defining naming conventions, planning team development, setting up and working with source control.

Advantages

- BizTalk 2004 is completely built on .Net.
- Recoverable Interchange. In BizTalk, an Interchange can contain two or more messages, such as a batch. With the introduction of Recoverable Interchange in BizTalk Server 2006, only messages that fail validation are suspended, and the messages can be resumed after the error is corrected.
- Failed message routing. New functionality is available to allow orchestration and send ports to subscribe to failed messages. When used appropriately, failed message routing can be used for notifying users of failed messages or building rich error handling and message repair capabilities.
- Lowest total cost of ownership (TCO). BizTalk Server reduces the cost and complexity of automating and managing business processes with a single, unified solution for Enterprise Application Integration (EAI), Business-to-Business integration (B2Bi), and Business Process Management (BPM).
- Enhanced productivity through integrated management and development tools.
- Supports Computer Telephony Interface (CTI) through TAPI.

Dis-Advantages
• Recovery is manual.
• Backups are not automated.
• Fault Tolerance capabilities are supported through other Microsoft products.
• Repository only works with MS SQL.
• Requires additional software to use certain features in BizTalk 2002, Microsoft Operations Manager & Application Center.
• To use a server with 8-32 processors it requires Microsoft Windows 2000 Datacenter, which must be purchased through an OEM.
• Only runs on Microsoft/Intel platform and only supports XML Data Reduced (XDR) not XML Schema Definition (XSD).

4. Web Methods

Web Methods was one of the first vendors to realize the significance of XML interactions, bringing its first generation of XML-based B2B integration software to market in 1999. Since that time, the vendor has expanded its scope to include enterprise application integration (EAI), electronic data interchange (EDI), and, most recently, business process management (BPM), giving it the most comprehensive and easy-to-use integration suite on the market.

Advantages

• Connectivity from legacy applications to Web delivery channels is core strength.
• Web Methods provides strong monitoring features, as well as comprehensive support for vertical-industry accelerators.
• Web Methods has been a strong proponent of the concepts underlying SOA since its inception.
• Web Methods Fabric is priced in the midrange compared with other products in this category.
• Web Methods Extended Enterprise Solution Suite software focuses on supply chain management to facilitate order processing and inventory management.
• Web Methods will extend its current universe of ERP adapters to address the needs of financial services by offering full FIX adapters and SWIFT libraries.
• Web Methods Fabric provides a well-integrated, comprehensive collection of capabilities for supporting many foundational requirements for advanced integration and BPM in the SOA world.

Dis-Advantages

• Overhead: Transmitting all your data in XML is obviously not as efficient as using a proprietary binary code. What you win in portability, you lose in efficiency.
• Lack of versatility: Currently, Web Services are not very versatile, since they only allow for some very basic forms of service invocation.

5. IBM MQSeries/WebSphere

The WebSphere MQSeries allows you to integrate back-end and external systems with WebSphere Commerce using WebSphere MQ as middleware. The supported software is MQSeries Version 5.2 or higher, with the MA88 product extension.

Advantages

• WebSphere MQ enables you to reliably and consistently integrate your applications, allowing you to fully leverage your existing software and hardware assets.
• WebSphere MQ eliminates the need to write complex communications code and offers a choice of simple APIs (Message Queue Interface (MQI) and JMS) that are consistent across the range of more than 80 supported operating environments, provided both by IBM and business partners.
• WebSphere MQ can reduce the risk of data being lost when applications, Web services, or networks fail. It also helps ensure that data is not duplicated and completes as a single unit of work or transaction.
• WebSphere MQ has powerful development facilities that simplify integration tasks by providing a functionally rich and consistent application programming interface (MQI) across all its supported platforms. It helps make integrated programs portable.
• WebSphere MQ supports Secure Sockets Layer (SSL) for authentication, message integrity checking, and encryption for data sent across the Internet.
• WebSphere MQ reduces the time and skills required to be productive with a new File Transfer application that provides a simple GUI tool to move files across the MQ network with reliability.
• WebSphere MQ supports clustering for dynamically distributing messaging workload across available MQ resources.

Dis-Advantages

• The disadvantage of WebSphere/MQ is its awkward way to program and customize. MQ was originally designed as an application-programming interface (API) that was meant to be used as a program library for another programming environment, e.g., C++. Now MQ is mainly marketed together with IBM's WebSphere Application Server (WAS) for one main programming environment.
6. See Beyond

From a technology, functionality, and architecture standpoint, See Beyond should be considered one of the top performers in the EAI market. See Beyond has entered the low end integration market with their new release of eInsight Enterprise Service Bus 5.0. This is fully J2EE compliant, allowing business processes and logic to run natively within an application server. This capability is unique as compared to the other pure-play EAI vendors (which provide connectivity to applications services, not pure integration).

Advantages

- Support for technical standards, including J2EE, .Net, and Web services.
- See Beyond also provides portal builder, Business Activity Monitor (BAM), Online Analytical Processing (OLAP) facility, Extract Transform and Load (ETL) product, and other tools to provide a full-service EAI offering.
- Another positive aspect of its architecture is that it has developed its integration components as an integrated suite rather than retrofitting components acquired from third parties.
- See Beyond has made support for ISO 15022 messaging and connectivity to market infrastructures such as DTCC a top priority.
- See Beyond faces many of the same challenges inherent to EAI vendors that target multiple vertical with their integration solution.
- Despite a strategy built around vertical solutions and depth of domain expertise and “key person dependency” is still a problem for See Beyond because it targets so many verticals.

Dis-Advantages

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- Depth of domain expertise will always be an issue for See Beyond.

7. Mercator

Mercator is a leader in offering SWIFT messaging and enabling tools in the marketplace. Beginning with TSI and Braid, Mercator built much of its franchise in financial services by offering an extensive library in support of SWIFT. It is likely that more SWIFT messages are generated by Mercator software than by any other financial messaging vendor, and half of its relationships, particularly with the custodian bank community, started as a result of a SWIFT messaging initiative.

Advantages

- A broad universe of adaptors remains a key strength of Mercator today and spans a wide variety of market infrastructures, including central securities depositories such as CREST and DTC, and payment clearing systems such as CLS and CHIPS.
- Transformation - Mercator was designed as an EDI tool, but its core design allows for further flexibility into any data format with the concept of a ‘tree’ which is a graphical representation of a data object.
- Transport independent - non intrusive integration, if you already have WebSphere MQ, JMS or a Tibco Bus, Mercator readily plugs into the existing transport infrastructure with standard adapters. There is no additional programming required.
- Embed-ability - You can plug Mercator interfaces into any application server and allow your existing EJB’s to leverage Mercator transformation and connectivity.
- Mercator provides a rich set of APIs to hook existing code - these include the ability to develop fully functional custom adapters in either Java or C/C++, and execute Java Classes, JCA, cobra, and com objects within a map.

Dis-Advantages

- Mercator placed substantial bets on the success of the GSTPA. Although it was successful in marketing adapter solutions to pilot users, the failure of the initiative was a blow to its growth ambitions within the financial services segments.
- The risk of building out so many adapters is the time and materials lost when the service, infrastructure, or standard fails to garnish support by the industry.

8. Oracle fusion

Oracle is using Oracle Fusion Middleware as the foundation for Oracle's next-generation applications, codenamed “Project Fusion.” The use of standard technologies such as BPEL and Java will provide this next generation of applications with critical flexibility and management advantages.

Oracle Fusion Middleware ensures that information gets handed off to the right people and the correct business applications—accurately and efficiently—even when data resides at many different places.

Advantages

- Access management and security, BPEL Process Manager, Identity Management, Business Intelligence, Web services.
- Using the Business Process Execution Language (BPEL) standard, this component of the Oracle Fusion Middleware family ensures that you can develop, monitor, and improve processes over time with optimal portability and reuse potential.
- Oracle Fusion Middleware is modular (allows you to install, configure, and use only those services that you need) open, and extensible to
work in a heterogeneous environment.

Dis-Advantages

• An automated upgrade from one product to another is devilishly hard to provide by considering the customization of PeopleSoft that will have gone on out there.
• Unless Fusion has the same data model as PeopleSoft there may be a need for manual analysis, mapping and data integration work to get it right.

9. Vitria

Vitria offers off-the-shelf connectors/adaptors for most of the popular databases. Vitria performs data level integration using JDBC/ODBC drivers. You can either run SQL queries against the database or you can retrieve data based on add/delete/update triggers.

Advantages

• The data transformations are quite robust in Vitria.
• Vitria’s graphical interface to define custom transformers makes defining transformations pretty easy.
• In addition, you can also create simple java classes to build your custom transformers.
• Vitria has been a leader in the EAI segment in terms of its BPM.
• To help expedite its penetration of the back-office it is constructing adapters to the most common third-party applications found in this environment.

Dis-Advantages

• Vitria has not yet been able to leverage its capabilities in terms of financial success.
• Vitria came down to one vertical or another, financial services will likely take a back seat to healthcare in terms of its priorities.