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ATTUNITY
SERVICE-ORIENTED INTEGRATION

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Abstract

Service-oriented Integration (SOI) provides an “arms-length” means for systems to simply expose their interfaces while abstracting their internal processes, thus simplifying integration. Attunity has a compelling set of solutions for facilitating the creation of SOI-enabled systems and simplifying integration challenges within organizations. Attunity seeks to expose a wide variety of data sources including custom and legacy systems as services that are used a step in automating business processes both within and external to the organization.

Service-Oriented Integration (SOI)

One of the major problems solved by XML, and Web Services in particular, is the eternal computing challenge: getting systems to communicate and integrate. This integration challenge has been approached from many different fronts including message-oriented middleware, component technology, and even screen-scraping.

The evolution of Web Services has provided a new take on the problem and proposes to solve this challenge once-and-for-all by providing an "arms-length" means for systems to simply expose their interfaces while abstracting their internal processes. One of the unique opportunities that Web Services presents is its ability to be equally applied to internal integration challenges such as those solved by Enterprise Application Integration (EAI) and data integration vendors as well as external integration challenges addressed by B2B Integration (B2Bi) vendors. Thus, the terms EAI, B2Bi, and other expressions are not adequate to describe this new capability. It is in the context of this Service-oriented Architecture that Service-Oriented Integration (SOI) is born.

One of the companies focusing on SOI solutions is Attunity. The company has a compelling set of solutions for facilitating the creation of SOI-enabled systems and simplifying integration challenges within organizations. Since most corporate applications are not shrink-wrap, but custom and legacy in nature, Attunity seeks to expose these custom and legacy systems as Web Services that are used a step in automating business processes both within and external to the organization.

In addition, the company seeks to create applications that are based on service subcomponents through the notion of Service Assembly and workflow. Service assembly allows the creation of an aggregate service such as "Purchase Order" from its components such as "Query Purchase Order".

Attunity's main product, the eBusiness Integration Suite, is composed of two main parts: the Attunity Business Process Integrator piece and Attunity Connect.

Attunity Business Process Integrator

The BPI provides a visual interface for creation, sharing, automation and management of distributed business processes both internally and externally with partners, suppliers, customers and eMarketplaces based on a peer-to-peer architecture. Business processes, application, and data services are described in XML made available as reusable services and can be integrated with other middleware services such as CICS, CORBA, DCOM, JMS, and RMI. Clients are installed at target integration platforms to enable integration without

presenting a central bottleneck.

Attunity's idea of Business Process integration (BPI) is to wrap original functionality such as contained in C, CORBA, or Java code with Web Services specifications and formats. Interaction with specific data sources is defined in metadata by Service Engines. For example, the COM Service Engine is a service factory that at design-time reflects a COM interface and generates an XML-wrapper around this specific COM-object. This use of XML exhibits the capability of the format, and in particular XML Schema, to normalize different data types from different technologies. This means that a user can mix Java and COM strings and deposit them into a non-relational database in a mainframe. Service Engines have a representation of input and output requirements and exception handling features. They reside within an XML repository that is not based on UDDI.

The heart of the BPI is the Process Server. It's an engine that executes business processes as defined by users and controlled by service adaptors that allow one to incorporate any and all Service Engines. The Process Designer allows a developer to build those processes, and Service Gateways provide access to a variety of data communication channels. The server handles the actual transformation between data types and the communications between services.

One important feature to note about services and Service Engines is that Attunity doesn't wrap their basic services in SOAP so that they can be used in different process formats. However, they can represent them in that format for integration. The overhead in using SOAP as a standard would have been too great for their needs. The Web Services standards also lack some basic security and notification features that are required in the Attunity solution.

Once Attunity business processes are created, they can themselves be exposed as web services. The process schema is represented in a graphical user interface and stored in a proprietary, neutral representation that can then be exported as processes compliant with emergent BPMI, WFSL, ebXML, and other process specifications.

Business processes can be exchanged via multiple protocols and standards, such as email, portals, EDI, and XML. The system also provides online and offline monitoring capabilities by logging process information into a knowledgebase so that business managers can check status, track progress, and analyze trends.

Attunity Connect

Attunity Connect provides an infrastructure for integrating applications with data from over 30 data sources on more than 20 different computing platforms including OS/390, OS/400, Tandem, OpenVMS, UNIX and Windows. The system provides a means to integrate these applications with Web Services as well as other interfaces. The Application Adapter Framework allows users to encapsulate 3GL and custom-built application logic within Web Services and other interfaces. The system operates as a data server that resides on each target platform and performs real-time read/write access, distributed transaction management, heterogeneous joins between different data sources, and optimized query execution. The system also provides an Application Adapter Development Kit that allows users to dynamically encapsulate application functionality through a series of native function calls and provide access through Web Services and J2EE Connector Architecture.

Attunity Connect uses J2EE CA and XML in addition to data access interfaces such as JDBC, ODBC, SQL and ADO/OLE DB to target relational, network, indexed, hierarchical, object, flat, and application-based data sources. The system is implemented as a server based, peer-to-peer architecture with engines that run on target platforms. This allows heterogeneous query against multiple data sources in a single step. However, one of the challenges posed to this type of framework is that the distributed environment has to deal with transactional issues.

The ability to do joins across systems is difficult (if there are a resultant 10 results returned from one system and 10,000 from another, for example). To solve some of these distributed query problems, the company has implemented a P2P architecture that optimizes the queries based on user specifics defined in advance.

The Connect system makes all data appear as relational data source regardless of the original source and structure of data. The result is a logical representation of one data source that might be comprised of multiple physical sources. Attunity Connect has a bus-based architecture in which each device has an instance of Attunity Connect Server. The system then decides based on statistics the best way to process a given query. The results are executed locally on the machine and then parsed out to multiple nodes. This minimizes network traffic and distributes the computing load.

A user interacts with the system using simple SQL '92. While metadata about sources is expressed as XML and XML is used internally to transport and route information, it is all shielded from the user. Their use of straight ANSI-SQL allows them to use different driver interfaces ODBC, JDBC, XML. Do to their support of relational data formats, their use of XPath or XQuery is not relevant. XML document sources are queried in a relational framework.

Customers & Release History

The company recently finished a project with Raytheon, which is a partner in the Commerce One Exostar Marketplace. Their challenge was that all of their purchasing and inventory applications were written in COBOL on a legacy platform. They utilized Attunity's Service-oriented Integration approach to access these systems and expose them as XML that could be integrated with Exostar. According to Attunity, this took five weeks for implementation of a proof-of-concept. Future Electronics also implemented a system to integrate their back-end COBOL systems for production of a web-based interface to their managed inventory and logistics.

Attunity has strong relationships with a few major partners including Oracle (the Oracle Transparent Gateway) and provides a data integration solution for OpenVMS.

Competition & Alternatives

Attunity competes with most integration vendors since customers don't specifically ask for service-oriented integration approaches. These competitors include See Beyond, Vitria, and WebMethods. What makes Attunity unique is the way they are solving the problem. However, other companies such as IONA and Cape Clear are also entering the SOI space. They plan to compete with these vendors through simplicity and greater flexibility. For example, the company has a wizard that defines a service for CORBA objects.

Key Conclusions & Recommendations

- Service-oriented Integration (SOI) is a key use of Web Services that will most likely be the main method by which systems will be integrated in the near term.
- Attunity has a well thought-out and complete system for SOI, but will increasingly face competition from vendors including IONA, BEA, and Cape Clear.
- A smaller issue is that Attunity's Registry for their Service Engines is proprietary and not using UDDI. The company should consider using UDDI once it becomes applicable as it provides a more open means for Service Engine discovery and reuse.

Profile: Attunity (August 2001)

Date Founded: 1987 (as International Software Group)
Funding: Publicly-traded (NASDAQ: ATTU)
CEO / President: Paul MacKay
Employees: 180
Products:

- Attunity Connect
- Attunity Business Process Integrator (BPI)

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Related Research

- *Service-Oriented Integration* Report (ZTR-WS103)
- *Web Services Technologies and Trends* Report (ZT-WEBSERV)
- *Actional* ZapNote (ZTZN-0280)
- *CapeClear* ZapNote (ZTZN-0120)
- *IONA* ZapNote (ZTZN-0140)
- *Infravio* ZapNote (ZTZN-0226)
- *Grand Central Communications* ZapNote (ZTZN-0623)

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About ZapThink, LLC

ZapThink is an IT market intelligence firm that provides trusted advice and critical insight into XML, Web Services, and Service Orientation. We provide our target audience of IT vendors, service providers and end-users a clear roadmap for standards-based, loosely coupled distributed computing – a vision of IT meeting the needs of the agile business.

ZapThink's role is to help companies understand these IT products and services in the context of SOAs and the vision of Service Orientation. ZapThink provides market intelligence to IT vendors who offer XML and Web Services-based products to help them understand their competitive landscape and how to communicate their value proposition to their customers within the context of Service Orientation, and lay out their product roadmaps for the coming wave of Service Orientation. ZapThink also provides implementation intelligence to IT users who are seeking guidance and clarity into how to assemble the available products and services into a coherent roadmap to Service Orientation. Finally, ZapThink provides demand intelligence to IT vendors and service providers who must understand the needs of IT users as they follow the roadmap to Service Orientation.

ZapThink's senior analysts are widely regarded as the "go to analysts" for XML, Web Services, and SOAs by vendors, end-users, and the press. They are in great demand as speakers, and have presented at conferences and industry events around the world. They are among the most quoted industry analysts in the IT industry.

ZapThink was founded in October 2000 and is headquartered in Waltham, Massachusetts. Its customers include Global 1000 firms, public sector organizations around the world, and many emerging businesses. ZapThink Analysts have years of experience in IT as well as research and analysis. Its analysts have previously been with such firms as IDC and ChannelWave, and have sat on the working group committees for standards bodies such as RosettaNet, UDDI, CPExchange, ebXML, EIDX, and CompTIA.

Call, email, or visit the ZapThink Web site to learn more about how ZapThink can help you to better understand how XML and Web Services impact your business or organization.

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