

TECHNOLOGY AUDIT

Oracle SOA Platform

Oracle

BUTLER GROUP VIEW

ABSTRACT

Oracle SOA Suite and Oracle BPA Suite 10g Release 3 are the currently available versions of Oracle's SOA infrastructure. It has become one of the most comprehensive SOA platforms through an aggressive combination of internal development and acquisitions. Much integration of acquired products has already been achieved, with more promised for the forthcoming version 11 to absorb more recent acquisitions.

The suite has a very broad target. It is required to support Oracle's evolving Fusion Applications suite, but also strongly targeted as a logical upgrade for Oracle's database and application-server customers, as well as targeting non-Oracle users. It can address the requirements of mid-sized organisations as well as large enterprises. It should be seen as critically important to Oracle's future growth, and is receiving the development and marketing focus that should be expected of such an important product set.

Oracle is keen on promoting the 'hot-pluggable' nature of the suite and its ability to incorporate third-party point-solution products, where required by individual users. Although Oracle Application Server and Oracle ESB provide the usual underlying infrastructure, users can choose to deploy Oracle SOA Suite on other infrastructure such as WebSphere or JBoss application servers, and WebSphere MQ or TIBCO Rendezvous Message Oriented Middleware (MOM).

The integration of the product components through a shared repository and the shared use of the JDeveloper development tool and its associated application development framework, together with the completeness of scope, should give the Oracle platform a high degree of acceptance across a broad user base.

KEY FINDINGS



Very broad set of SOA platform functionality, built with "hot pluggable" third-party interoperability in mind.



Individual products integrated through a shared repository.



Strong grid support for scalability and fault tolerance.



Simple no-cost download and install for trial and development.



Several important new features planned for Release 11.



Foundation for evolving Oracle Fusion applications.

Key: Product Strength Product Weakness Point of Information

LOOK AHEAD

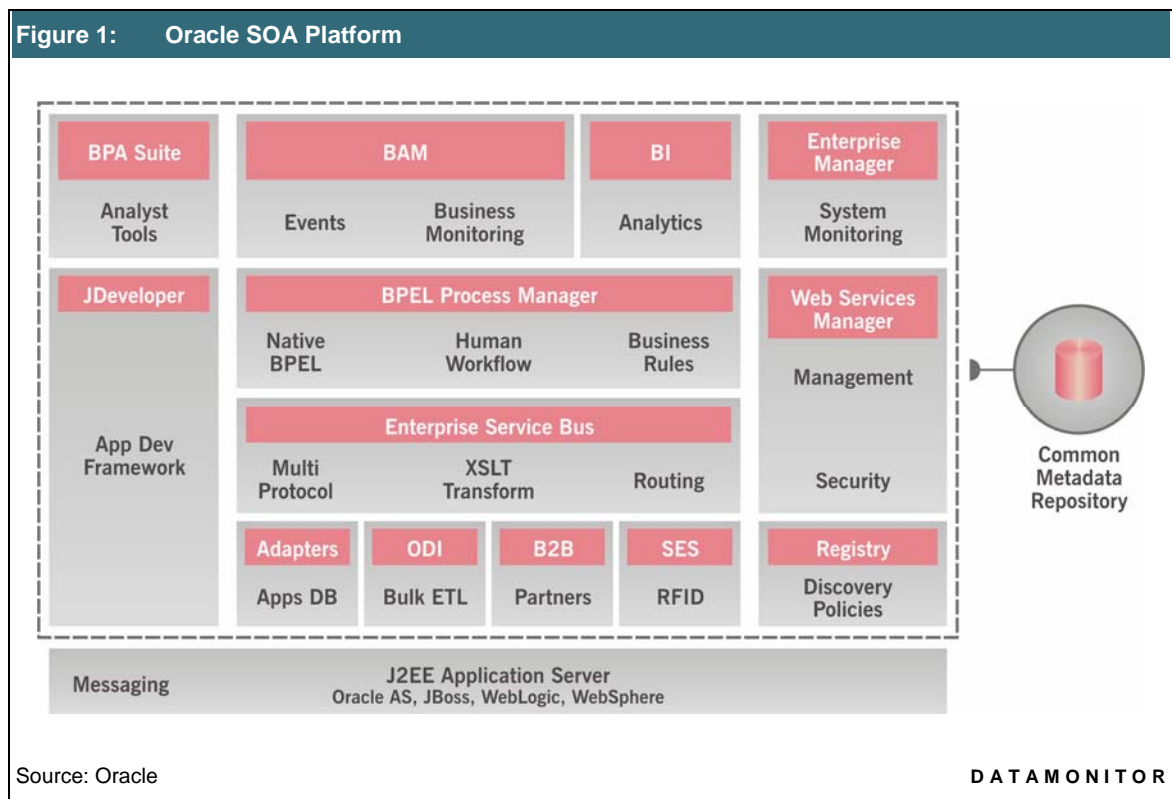
Release 11 will provide integration of Oracle's recent acquisitions including Tangosol and Stellent. This will extend the complex event-processing capability and add shared in-memory cache technology to enhance performance. The runtime architecture will change to provide a single runtime infrastructure for all the SOA platform functionality (without impacting the separate availability of products or interoperability).

FUNCTIONALITY

Product Analysis

Oracle's SOA Platform is a logical continuation of the development of Oracle Fusion Middleware. Oracle has slightly unusual product bundling for its SOA Platform in that the ESB capabilities and rules engine are provided with the application server, so that organisations that are already licensed to use the application server need only purchase the additional functional components required. Oracle SOA Suite is therefore available either as an option on top of the Oracle Application Server, or as a separate license when used in conjunction with competitive application servers. If the SOA Suite is licensed for deployment on a non-Oracle application server, the ESB and rules capability are included in the suite. The individual components of the suite are also available standalone, providing customers with maximum flexibility to buy the solution that best fits their needs.

Figure 1 shows the components of Oracle's SOA Platform.



Oracle has arrived at the current set of functionality through a combination of internal development and acquisitions. This has presented Oracle with an ongoing integration effort to include the acquired products as seamless components within the Oracle environment. To-date, Oracle has managed this process well, minimising the impression that the suite stems from a variety of different sources.

Product Operation

Oracle's SOA platform is comprised of two main product suites: Oracle SOA Suite and Oracle BPA Suite. As already described, Oracle's SOA Suite is available as an option to the Oracle Application Server (which itself delivers ESB and business rules capabilities), or as a suite of functionality to be deployed on a variety of alternative Java EE application servers.

Enterprise Service Bus

Oracle ESB, whether delivered as a component within the Oracle Application Server, or bundled with SOA Suite for deployment on a non-Oracle application server, provides the expected message management. It can make use of a number of different message transports including JMS, IBM MQ, or TIBCO Rendezvous as well as Oracle's own OEMS (Oracle Enterprise Messaging System, which refers to Oracle JMS or Oracle Advanced Queuing).

The ESB includes content-based routing functionality, so providing most of the essential SOA infrastructure. Extended functionality is provided by other components – predominantly from Oracle SOA Suite, but if required, from other third-party products that can be exposed as Web services.

ESB includes a monitoring console that provides a full set of instruments for monitoring and managing the health of the service bus. Oracle ESB utilises drag-and-drop data mapper design elements within JDeveloper to create XSLT standards-based transformation and routing templates for reuse across the enterprise.

BPEL Process Manager

Oracle BPEL Process Manager, part of the Oracle SOA Suite, inherits many of its properties from Oracle's acquisition of Collaxa. It provides a composite runtime engine that executes not just BPEL models, but also provides the execution environment for human workflow and business rules. There is a separate designer GUI for defining rules, which are managed in a rules repository and deployed by the Rules Engine within BPEL Process Manager. This permits the abstraction of business policies from services and process scripts, allowing each of these to be changed independently of the others. Rules are currently defined as sets of statements, but it is planned that the next version will add the capability to define rules using decision tables. In addition to Oracle's own rules capability, Oracle has certified ILOG and Fair Isaac products for execution within the SOA Platform. Human workflow activities appear just as any other asynchronous task. Sophisticated workflow features including pattern-based routing, escalation, delegation, etc. are supported, benefiting from experience with Oracle's earlier Workflow product.

BPEL Process Manager requires a Java EE application server platform, but is supported on BEA WebLogic, IBM WebSphere, and JBoss as well as Oracle Application Server. The process runtime environment provides native BPEL execution without the need to compile or generate any intermediate code. It provides support for secure message exchanges through the implementation of WS-Security. Oracle uses a technique it calls "dehydration" to manage large numbers of long-running processes with low overhead. All instances of BPEL Server (in a distributed environment) use a stateless architecture that permits a load balancer to use any one

of them to take on the work of any process instance. The actual state information pertaining to each process instance is written away to a database, while also being cached in memory in the BPEL Server. A process that becomes inactive will have its state details removed from in-memory cache (this is the dehydration part). Upon reactivation these details will be refreshed (rehydrated) from the database to the appropriate server instance. This seems an effective and efficient means of handling the common problem of state management and reliable execution of long-running processes.

BPEL Process Manager includes a design studio that uses a shared metadata model between business analysts and developers. The analyst is responsible for designing the logical flow of services and data within a process, while the developer is concerned with the physical design issues, including the connectivity and any message transformations that are needed. Physical design information added to the shared model is not lost if the logical design is later changed, reducing the impact and cost of change, as well as removing much of the risk.

High-level business modelling is not included within BPEL Process Manager, but instead a variety of modelling tools can be used to derive the initial process model (including Oracle BPA Suite).

Oracle BPA Suite

Oracle BPA Suite is based around Oracle Business Process Architect. This is a high-level business modelling tool produced by collaboration between Oracle and IDS Scheer. Using IDS Scheer's popular ARIS modelling tool as a starting point, this has been customised to interface neatly with Oracle SOA Suite, using the shared metadata repository to store and manage the models. The suite also includes Oracle Business Process Simulator, which provides graphical simulation of process instances to ensure that conditional decisions have been defined correctly according to business policy.

Use of the shared metadata repository allows concurrent development of related models, and the Oracle Business Process Publisher provides viewing of processes through a portal, enabling feedback from business users.

Business Activity Monitoring (BAM)

Oracle's BAM Active Studio, included within Oracle SOA Suite, uses a browser-based AJAX interface to deliver comprehensive alerting and reporting capabilities. Users can define alert rules that could be based on simple threshold violations (such as Service Level Agreements), or could be based on complex combinations of conditions and events. Active caching is used to mitigate the performance impact of complex event detection, eliminating the need for request 'polling'. Individual processes can be tracked, or results can be aggregated to identify bottlenecks. Correlations between apparently unrelated process instances can be made to support fraud-detection and other critical-information requirements.

Information regarding work progressing through the SOA environment can be presented to users in real-time through a variety of graphical formats, or as reports produced to a schedule or on demand. Templates are provided to accelerate the creation of personalised studios.

JDeveloper

Oracle JDeveloper is best known as Oracle's platform for Java developers, which is available for free download. As such it has a role in the SOA Suite by providing a productive development environment for the creation of Web services (including taking the pain out of the creation of WSDL definitions). JDeveloper also

provides the framework to support the design and development tools found in the SOA Suite. It supports drag-and-drop development of BPEL process scripts, manages the use of adapters, generates test cases, defines intelligent routing rules, and creates message transformations.

Providing a single platform for all development tasks aids continuity and communication between those responsible for different phases of SOA deployment (helped further by the use of a common repository).

Web Services Manager

Based on the earlier Oblix acquisition, Oracle Web Services Manager (WSM), part of the Oracle SOA Suite, provides the runtime governance component through security and management policies. WSM creates the abstraction of policies from services and from process rules, so providing consistency of policy implementation and the ability to accommodate separate lifecycles for services, processes, and business policies. This decouples the individual components from the impact of changes made to others. The policies themselves may be implemented as gateway processes at the edge of the SOA environment, or as embedded agents.

WSM implements SAML to support role-based security assertions, and can act as a proxy to hide the true address of a service from unauthorised parties. WS-Policy is also supported, providing a means for messages and services to specify the levels of security they require and that they themselves can support.

Currently, WSM uses its own console to manage SOA governance. It is expected that at some point Oracle will deliver a single-governance console across its entire product line.

Service Registry

The Oracle Service Registry provides a UDDI v3-compliant platform for publishing, categorising and discovering Web services and related resources. It is integrated with all of the relevant components of the SOA Platform, including BPEL Process Manager, ESB, Web Services Manager, and JDeveloper. The registry provides its own workflow capability to ensure that all changes go through the appropriate governance change-control cycle.

Common Metadata Repository

Oracle's Metadata Repository is essential to the integration of the tools described here, as well as other development tools that are not directly SOA-related. All of the objects created and maintained by the SOA tools are stored and managed in the repository. Version management is provided, and deployment is controlled through the repository.

Full round-tripping (the ability to take a deployed business process back to the beginning of the high-level design process for modification, without the loss of physical design work) is currently in Beta testing, with general availability planned for summer 2007.

Adapters

Oracle bundles a small set of adapters with SOA suite providing connectivity to major databases and some technology products such as MOM products, e-mail, and SOAP. Further adapters are available from Oracle as cost options (major application suites, legacy platforms, and some legacy databases). Together with certified adapters from third-party partners, these will satisfy most connectivity requirements.

Oracle's adapters, and 3rd-party adapters that have been certified by Oracle, are managed on a Java EE application server. They provide a native interface to the source functionality on one side, while providing JCA connectivity or Web services (through a WSDL-defined service interface) at the other.

Other components

Oracle's early 2006 acquisition of Sunopsis has added bulk Extract, Load, and Transfer (ELT) capabilities, extending Oracle's connectivity options to include significant batch processing. Oracle provides further technology components relevant to SOA, such as RFID processors, which can create events into the SOA environment to initiate processes.

Oracle BI Enterprise Edition is a former Siebel Business Intelligence (BI) product that provides sophisticated analytics. It is not specific to SOA processing, but provides enterprise-wide reporting and analytics with access to heterogeneous sources. BI allows SOA information and traditional information sources to be analysed and presented through a single tool. The alerting capability can create new events in the SOA environment to initiate processes.

Product Emphasis

Oracle is extremely ambitious in its positioning of the SOA Platform. It is intended to address mid-sized organisations as well as large enterprises, and to appeal to those that are not currently Oracle users as well as its mainstream database users and application customers. There is no particular industry bias. The only general qualification for a prospective customer is that the SOA Suite is better suited to sites that have an in-house development capability (or use a systems integrator to provide bespoke development services). Because of the Java bias of Oracle's middleware, Java expertise should be seen as a prerequisite.

Oracle's SOA capability should not be viewed in isolation. Oracle has a wide portfolio of products that are relevant to SOA deployments, and in particular it has a well defined strategy, and strong product set, around Master Data Management (MDM). MDM provides the ability to present a single, consistent data model that hides the fact that it may be composed from many heterogeneous data sources. It is likely that organisations embarking on SOA will also need to address MDM. Oracle enables a rapid start by providing metadata models based around common business objects (such as customer and product), together with mapping and transformation to popular data sources.

DEPLOYMENT

The SOA Platform is a Java-centric set of products, requiring the availability of a Java EE application server as an underlying platform. The properties of the application server will determine the scalability and fault tolerance capabilities of the SOA environment. In most cases the underlying application server will be Oracle Application Server, which delivers considerable deployment flexibility including the use of a grid of heterogeneous servers with strong administration functions. Grid support provides for scale-out of the SOA platform through the use of distributed commodity servers, with the added benefit of failover support for high availability at an acceptable cost. Oracle delivers a nice compromise between retaining portability and choice of deployment environments while ensuring that there is considerable synergy with other Oracle products.

Previously, Oracle software has not been renowned for its ease-of-deployment and administration. Thankfully, this has been addressed over the last several releases of the Fusion Middleware products, and the task of managing the environment has become less demanding of time and skills. If the “Oracle everywhere” approach to deployment is taken, this should now be viewed as one of the simpler SOA environments to manage.

Oracle uses a SOA maturity model to guide users through five stages of SOA exploitation, ranging from opportunistic through to the direct support of business initiatives. Each phase is associated with tactical IT activities in support of the goals appropriate to the particular level. Oracle provides education and consultancy based around this model. Additionally, Oracle has many implementation partners with skills suitable for most industries, geographies, and sizes of organisation.

PRODUCT STRATEGY

SOA Suite is designed to have broad appeal, and Oracle provides a free downloadable development version to encourage adoption. This is not a limited or timed version, but sites will naturally wish to purchase a supported version before any live deployment.

Oracle’s SOA platform will be a logical choice for those that have made a commitment to Oracle’s applications, but in fact this only accounts for around 40% of Oracle’s SOA platform revenue. Most of the remaining 60% comes from existing users of Oracle database or Fusion middleware products, but Oracle is also targeting sites that are not traditional Oracle users. There is a good balance of revenue generation between Oracle’s dedicated Fusion Middleware sales force and partner-led sales, indirect sales representing approximately 44% of the total.

Each product is available separately or packaged (at a significant discount) as suites. The relevant suites are Oracle Application Server Enterprise Edition, Oracle SOA Suite, and Oracle BPA Suite.

Oracle has demonstrated that it is capable of implementing a dual strategy of acquisition and internal development, and plainly has the resources to manage both of these within a framework of ongoing product integration. We should expect to see further acquisitions targeted at extending the general capabilities of the SOA Platform to address the niche requirements of specific market segments.

Because of the very broad target market, Oracle will need to compete with the whole spectrum of SOA infrastructure vendors, from the largest platform vendors to the most specific point-solution providers, including open source, regional, and smaller platform vendors along the way. This will be as much a struggle for the hearts and minds of the user base as it will be a technology war, and this will be interesting to follow.

COMPANY PROFILE

Oracle Corporation (NASDAQ:ORCL), with its corporate headquarters in Redwood Shores, California, and 300 offices worldwide in 145 countries, is the world’s second largest independent-software company, and has its roots in information management. The company’s product lines cover database, middleware, tools, and enterprise application products. It also offers consulting, education, and support services. Of the around 58,000 full-time employees (at May 2006), roughly half work in the US and half internationally. Oracle employs over 15,000 people in research and development, more than 14,000 in sales and marketing, almost 6,000 in license updates and product support, over 17,000 in services, and around 6,000 in general and

administrative positions. Oracle technology can be found in nearly every industry worldwide and in 98% of Fortune 100 company offices.

The company was originally founded as Software Development Laboratories Inc. (SDLI), by Larry Ellison, Robert Miner, Edward Oates, and Bruce Scott in 1977. In the early days, the company built a commercial database management system for IBM, in a project commissioned by the Central Intelligence Agency (CIA) with the code-name ORACLE. In 1982, this became the new name for SDLI, and the company pursued the development and distribution of database software, with Miner, Oates, and Scott concentrating on the database development side, while Ellison was, and still is, responsible for the vision of the organisation and for bringing clients on board. Oracle went public in 1986. Oracle was early in committing to the SQL relational database standard, delivering the first commercial SQL DBMS.

The company has made a number of acquisitions, the most significant of the recent ones being PeopleSoft and Siebel, pitching Oracle firmly into the heart of the Enterprise Applications market. Several smaller, but significant acquisitions of middleware, BI, and SOA vendors, have given Oracle a very broad product set with potential appeal to a very large market.

Revenues and Net Income for the last three full financial years were as follows:

Table 1: Financial Details			
Year ending 31 May	2006	2005	2004
Revenue (US\$ Million)	14,380	11,799	10,156
Change on Previous Year (%)	21.9%	16.2%	7.2%
Total Net Income/(Loss) (US\$ Million)	3,381	2,886	2,681

Source: Oracle DATAMONITOR

SUMMARY

Despite Oracle’s obvious focus on the enterprise-applications market, it is quite plain that the company does not regard its middleware products as just supporting technology for its applications. Rather, it is aggressively building its middleware capabilities into an extremely effective platform for supporting Java-based applications of all types and for supporting SOA initiatives with a comprehensive set of capabilities. The integration of the various tools through a common repository and common development platform certainly lead to the situation where there is much to be gained by adopting Oracle products throughout – but the adherence to relevant standards throughout means that point-solution best-of-breed products can be used alongside Oracle products wherever needed.

The grid capabilities delivered by the Oracle Application Server provide cost-effective scalability and fault tolerance that make the SOA Platform a sound choice for deployment in mid-sized organisations as well as scaling up to the very demanding performance capabilities of large enterprises. The additional features that Oracle plans to make available during 2007 will enhance the experience, both at the high-level business modelling end of the lifecycle, through to the needs of high-volume, performance-critical deployment.

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