

Unit 2 Research Project

Eddie S. Jackson

Kaplan University

IT530: Computer Networks

Dr. Thomas Watts, PhD, CISSP

08/19/2014

Abstract

Application web servers empower businesses to host web services, support dynamic web content, and run web-based applications. These features and functions are integral to application server software. Some common web products used as application servers would include IBM's WebSphere and Oracle's WebLogic. Both software product suites offer a framework of applications that host Java based web applications, and provide a myriad of template pages, code, and data sets. Application servers extend the capabilities of a typical web server by applying business logic to hosted web components. Because application servers sit in-between clients and databases, the term *middleware* is often used to refer to the multi-tiered layout. When considering the server-centric architecture in a business strategy, it is important to factor in application features, cost of deployment, and rate of adoption, among other variables. Thus, the evaluations of WebSphere and WebLogic deserve further research to determine the overall practicality of implementing these products in an enterprise environment.

Keywords: *WebSphere, WebLogic, application server, middleware, SOA*

Unit 2 Research Project

Introduction

Information technology departments are constantly implementing new technology platforms to support company growth. As business server technologies converge with Internet-based technologies, there is even a greater challenge to understand these enterprise platforms and exactly how the business can benefit from them. No better place can this been seen than in application web servers. It was not too long ago when companies managed just web servers. Web servers allowed businesses to serve up web pages (mostly static content), host websites, and to advertise products and services; but then came the need for dynamic content. Application servers extend the capabilities and functionality of a web server. They provide a company with the ability to apply business logic to client applications, to serve up enterprise applications (based on servlets, jsp, and ejbs), and to deliver these cross-platform applications to many types of devices, such as mobile phones, tablets, laptops, and desktops (Diffen, n.d., para. 2).

Application servers change how businesses operate by providing a middle-tier system that acts as a bridge between the client and a database or other application. As a result, application server software suites are commonly referred to as middleware. Middleware can be a valuable asset to a business by linking a database to a web server. This functionality is essential for returning dynamic web content, processing user data via forms, and utilizing standardized application programming interfaces (APIs) (Beal, n.d., para. 1). Two popular middleware application suites include IBM's WebSphere and Oracle's WebLogic. To discuss these products further, research has been completed to evaluate the features and specifications of each product. Ultimately, the goal is to better understand these products and the value they can bring to a company.

Technical Specifications

Before implementing either WebSphere or WebLogic, it is important to have the proper infrastructure in place. This would include a web server where the middleware components will reside. Consequently, the initial research leads to evaluating the minimum system requirements of each application server. When reviewing WebSphere, there is a list of minimum specifications recommended for the application server. WebSphere requires 2.0 gigabytes (GB) of available disk space for installation. The recommended memory is 1 GB. For the central processing unit (CPU), a minimum of 1.2 gigahertz (GHz) has been suggested; this could be either an Intel x86-64 or AMD x86-64 processor (IBM, n.d., para. 4). It is important to note that these are the *minimum* specifications, and may result in performance issues in larger enterprise environments.

When evaluating WebLogic, the recommended disk space is 582 megabytes (MB) for the WebLogic Server installation. The minimum memory requirements is 2 GB. Also, the supported CPU specifications start at 2 GHz (Oracle, 2013, para. 3). Additionally, it is worth mentioning that for WebSphere and WebLogic, these are the minimum hardware provisions for a default installation of the relative suite of software. There are many software modules and extra web components that may be purchased and installed for each of these application servers. These extra products require disk space, memory, and CPU power of their own.

Web Server Application Evaluation

Oracles's WebLogic. Now that basic web server specifications have been discussed, it is time to elaborate further on the details of each of the application servers—this will include covering features, costs, and adoption rates. Oracle's WebLogic is an application server that provides high scalability by utilizing features such as clustering and application grids. WebLogic has a solid foundation built upon service oriented architecture (SOA), which employs the use of

Java's Enterprise platform known as Java EE. Additionally, WebLogic has been developed to work with other Oracle products, such as Oracle Enterprise Pack for Eclipse, Oracle NetBeans, and Maven (Oracle, 2014, p. 4). Similarly, there is a long list of features associated with individual application server components, such as linear scalability in the Oracle Coherence Enterprise Edition, high availability in Active GridLink for Real Application Clusters (RAC), and runtime predictability in the Oracle Java SE Suite.

As the WebLogic product has matured, other components such as enterprise messaging, analysis tools (using Java Mission Control and Java Flight Recorder), and the simplified development tools have been added to the available suite of applications. The WebLogic development tools include JAX-RS 2.0, Java EE 7 APIs, Java API for WebSocket, Java API for JSON Processing, and JPA 2.1 (Oracle, 2014, p. 4). Each of these tools can be used to create dynamic and interactive web applications in a rich client application development environment. WebLogic brings all of these components together into one easily manageable suite of applications. Of course, this does raise the question, if WebLogic contains so many features, "How much is it going to cost?" That is a great question that deserves some insight into the licensing and implementation costs of WebLogic.

The WebLogic price, like other application server suites, is not a flat rate, but is based upon the number of CPU cores, the specific applications to be purchased, extra support costs, as well as implementation, maintenance, and administration costs. The Redwood Consulting Group (2012) suggests that Oracle's price points can be "misleading" (Redwood Consulting Group, 2012, p. 25). Oracle's WebLogic price starts off as simply \$45,000 per processor, but when broken down, other costs popup. For example, when factoring in a Xeon processor with 4 cores, the price points splinter into smaller prices such as Oracle WebLogic Suite price per core is

actually \$22,500 + \$625 for MySQL, which comes to \$23,125. Now, when multiplied by 4 (the number of cores in a XEON processor) the total, and actual price, comes to \$92,500. Additional application modules, such as Active Data Guard at \$11,500 and Advanced Analytics at \$23,000, cost extra (Oracle, 2014, p. 2). Further costs can also be expected for training and administration. So, it is evident that the price of the WebLogic application server may not be clearly defined, but nonetheless the prices and licensing information can be easily found in documentation.

One final topic, as it relates to the evaluation of WebLogic, is the adoption rate, or the rate at which personnel will use the product; the higher the adoption rate, the greater the benefits gained by using the technology (Investopedia, n.d., para. 1). The adoption rate of the WebLogic application server can be considered likely and also quite quickly; this is due to a few variables. One, companies are recognizing the value of Internet-based applications and the importance of collecting and processing client data in real-time; WebLogic offers superior dynamic and interactive content. Two, the WebLogic application server technology is maturing and delivers a set of robust features and functionality, including reporting, analytics, messaging, and security. And finally, the cost of implementing WebLogic is well within the acceptable price ranges of most large companies. For these reasons, the adoption rate of the WebLogic application server is considered to more than adequate to meet company expectations.

IBM's WebSphere. IBM's WebSphere is an application server that offers a family of products supporting high-end enterprise architecture, clustering, and scalability. At its core, WebSphere incorporates a service oriented architecture that powers an agile business model. There are three foundational attributes of this business model—they are simplified development, high performance, and intelligent management. Using these concepts as an enterprise framework, WebSphere has grown into a large suite of *feature packs* that offer a rich set of features. Some of

the WebSphere feature packs include Dynamic Scripting through Web 2.0 technologies, Enterprise Java Beans, Web 2.0 and Mobile, support for XML, and Communications Enabled (IBM, n.d., para. 1). Additionally, WebSphere has integrated Service Component Architecture and Modern Batch feature packs. These extra application features allow for continued development in SOA using Java Enterprise Edition programming models.

In recent years, WebSphere has been adopting and adapting mobile technologies into its application server platform. By including traditional client connections via computers and mobile technologies, the IBM WebSphere application server has increased functionality and offers richer, more robust features to its user base. Some of these mobile features include an online responsive mobile store, mobile call center support, cart optimization, and mobile device location. Additionally, WebSphere has built-in support, wizards, and guides to help non-IT personnel become oriented with the interface and setup their devices. Another great feature of WebSphere is social media integration. Social media has become an explosive platform for communicating and delivering news, information, and product updates to millions of users; WebSphere harnesses social media to allow users to post directly to social networking sites such as Facebook (Gregoire, 2014, para. 8). With WebSphere having so many product features, what exactly does the price structure look like?

The WebSphere pricing structure has several variables. The WebSphere application server prices start off with a set fee for each processor value unit (PVU). A PVU represents the number of units inside an operating system that are a part of the hosting architecture. A typical operating system would have anywhere from thirty to a few hundred units. A single PVU is \$327, and factoring-in a typical seventy units for a Linux-based operating system, that comes to \$22,890. There are also required license and subscription costs. An Express package would cost

\$5,030, bringing the total to \$27,920. Of course, this was for the Express; the Enterprise package cost more at \$1,990 per CVU. The Enterprise packaging licenses start at \$15,700 for a twenty-five store license and subscription. This could easily bring up the application server costs to \$139,300-\$160,730 per year (Gregoire, 2014, para. 7). Obviously, cost is important, but with the various features and functionalities that WebSphere offers, customer satisfaction is sure to be met.

When mentioning customer satisfaction, the rate of technology adoption should also be discussed. The adoption rate will be exactly how quickly personnel transition from older technologies to the WebSphere application server platform. Very similar to other application server platforms, installation tends to be quick, and migration is rapid. The IBM WebSphere offers real-time support, guarantees a functional system, and provides many migration and transitioning strategies. Thus, the adoption rate is expected to be swift by meeting, and in most cases exceeding, customer satisfaction.

Contrasted Assessment

After reviewing the WebLogic and WebSphere application servers, it is evident that both products have many similarities that bring a plethora of features and functionality to the middleware platform. Each of the products come from reputable vendors—WebLogic from Oracle, and WebSphere from IBM. A SOA, or service oriented architecture, lies at the center of each of the application servers. This SOA allows for the delivery of robust, agile applications that have a high-level of scalability. WebLogic and WebSphere have leveraged Java's Enterprise platform, known as Java EE, to provide dynamic and interactive content to the user base. And finally, both WebLogic and WebSphere offer three deployment strategies, which are software as

a service, on-premises, and cloud implementation. Of course, there are some key differences between the application server platforms as well.

There are important differences between WebLogic and WebSphere which have to do with licensing policies, support, and available features. For example, WebLogic licenses per processor, whereas WebSphere licenses per PVU, or processor value unit. WebLogic requires a minimum of a 1.2GHz CPU, while WebSphere has a 2 GHz minimum. WebLogic has several optional support options, where WebSphere requires a certain level of paid support. There are unique features to each application platform as well. For example, WebSphere is heavily focused on including mobile and social networking technologies, whereas WebLogic pushes Oracle application integration. WebSphere uses feature packages, while WebLogic sells its applications as components or features. Each of these application modules have their own system requirements, thus it is important to factor-in resource requirements into a setup or upgrade plan.

Conclusion

Application servers are changing the way companies do business; they do this by utilizing middleware systems to provide dynamic and interactive content to large user bases. At the core of middleware systems, lies a SOA, or service oriented architecture. This architecture acts as a framework for applications, scripts, and servlets to deliver cross-platform applications. There are two popular application server platforms that utilize these technologies—they are Oracle's WebLogic and IBM's WebSphere. After the review of each of the enterprise products, it is clear that both application suites offer a large set of robust features and functionality. Companies that have e-commerce divisions within their organizations will benefit greatly by implementing one of these middleware systems.

References

- Beal, Vangie. (n.d.). Middleware. Retrieved from <http://www.webopedia.com/TERM/M/middleware.html>
- Diffen. (n.d.). Application Server vs. Web Server. Retrieved from http://www.diffen.com/difference/Application_Server_vs_Web_Server
- Gregoire, Jon. (2014/1/7). IBM WebSphere Review. Retrieved from <http://www.cpcstrategy.com/blog/2014/01/ibm-websphere-review/>
- IBM. (n.d.). WebSphere Application Server. Retrieved from http://www-969.ibm.com/software/reports/compatibility/clarity-reports/report/html/softwareReqsForProductByComponent?deliverableId=1337870535828&duComponent=Server_11854150A6C511E2A4CA497F0925FE1B
- IBM. (n.d.). WebSphere Application Server Feature Packs Family. Retrieved from <http://www-03.ibm.com/software/products/en/was-featurepacks>
- Investopedia. (n.d.). Rate of Adoption. Retrieved from <http://www.investopedia.com/terms/r/rate-of-adoption.asp>.
- Oracle. (2013/10). Oracle Fusion Middleware. Retrieved from http://docs.oracle.com/html/E38687_01/12c_fusion_requirements.htm
- Oracle. (2014/8/7). Oracle Technology Global Price List. Retrieved from <http://www.oracle.com/us/corporate/pricing/technology-price-list-070617.pdf>
- Oracle. (2014). Oracle WebLogic Server. Retrieved from <http://www.oracle.com/technetwork/middleware/weblogic/overview/weblogic-server-12-1-3-datasheet-2227036.pdf>