Why IBM WebSphere Application Server V8.0?

Providing the right application foundation to meet your business needs

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Introduction

Today, organizations struggle to increase the speed with which they can respond to market demands with new applications and services. At the same time, they must find a way to reduce the costs of providing those applications and services while ensuring their availability and data security and to increase operational efficiency.

IBM WebSphere® Application Server V8.0 addresses these needs by expanding on previous versions by delivering complete Java EE 6 support and certification; increased support for programming models and standards; enhanced performance, administration and security capabilities; faster problem determination; directory-based Java EE application installs; and simplified product installations and maintenance. Built on the industry-leading performance of past versions, WebSphere Application Server V8.0 further enhances performance while driving down costs by increasing data center efficiency through workload consolidation.

New and enhanced feature highlights include:

- Faster delivery of applications and services
- Operational efficiency and reliability
- Security and control

This white paper details the enhancements as well as additional tooling included to support building and testing.

Speed the delivery of new applications and services

WebSphere Application Server V8.0 can help organizations offer richer user experiences by helping to rapidly deliver innovative applications. Developers can jump-start their development efforts and leverage existing skills by selecting from the comprehensive set of open-standards-based programming models WebSphere Application Server V8.0 supports. This allows developers to better align project needs with programming model capabilities and developer skills. WebSphere Application Server V8.0 can also speed application delivery by helping to reuse and extend the life of existing application assets.

New capabilities enable:

- Faster time to application development completion by enabling developers and architects to select the best programming model for the project.
- Ease-of-use and productivity enhancements for improved iterative development cycles for testing applications over a previous version of the specification with the Java EE 6 programming model, which includes compliance with the latest Java EE specification. Key enhancements help to:
  - Improve iterative development cycles with Enterprise JavaBeans (EJB) 3.1 support. The new, embeddable EJB container can unit test EJBs outside of the application server.
  - Free developers from writing logic to maintain objects within a context with Contexts and Dependency Injection for Java (CDI) 1.0.
  - Allow dynamic query construction without in-depth knowledge of SQL via the new dynamic Criteria API in Java Persistence API (JPA) 2.0.
  - Support Web 2.0 programming with Java API for RESTful Web Services (JAX-RS) 1.1.
  - Improve performance and UI composition capabilities with JavaServer Faces (JSF) 2.0, which includes support for Facelets, a much more tightly integrated page description format.
  - Simplify Servlet programming with extensive use of annotations for declaring metadata within Java Servlet 3.0, which adds asynchronous protocol support for SIP and COMET as well as others.
  - Improve developer productivity by eliminating the need to write and maintain validation logic multiple times in multiple places with Bean Validation 1.0.
- Accelerate Java application innovation with support for Java Platform, Standard Edition 6.0, including the latest performance, security and reliability enhancements delivered by the IBM Java SDK 6.0 (J9 2.6).
- Enhance developer productivity during the edit-compile-debug development life cycle through monitored directory-based application installs, uninstalls and updates of Java EE applications. Simply add, delete or update application files in the monitored directory to install, uninstall or update an application.
- Deliver richer user experiences and extend the reach of enterprise applications to desktop web and mobile web applications to improve customer satisfaction with Web 2.0 Mobile and programming model feature pack (FEP)
- Reduce complexity and improve productivity with the Session Initiation Protocol (SIP) programming model, which helps develop, deliver and manage large-scale, mission-critical, converged communications services and applications, as well as the latest SIP Servlet specification (JSR 289) including annotation support.

- Speed development and delivery of situational applications using dynamic scripting languages in the Dynamic Scripting programming model FEP.
- Accelerate developers' time-to-value when using new capabilities with new online samples.
- Many programming models previously available as IBM Feature Packs have been enhanced and integrated into the core of the WebSphere Application Server. Programming models now delivered as part of the core V8.0 application server include:
  - The Open Services Gateway initiative (OSGi) applications programming model, which helps rapidly build, deploy, manage and maintain modular applications using Java EE and OSGi technologies through versioned, isolated, and reusable OSGi bundles. Simplify unit testing with OSGi Enterprise Specification 4.2 Blueprint Container support for declarative components assembly.
  - The XML programming model, which enables application developers to simply and rapidly process XML data and documents using World Wide Web Consortium (W3C) open-standards-based XML technologies.
  - The Service Component Architecture (SCA) programming model, which increases reuse and accelerates innovative application delivery and management in a service-oriented architecture (SOA) implementation.
  - The Communications Enabled Applications (CEA) programming model, which helps simply and rapidly deliver rich and interactive user experiences by adding communications capabilities, such as click-to-call and co-browsing, to web applications. No client-side software or plug-in installations are required.
  - The Java Batch programming model, which helps to reuse existing skills to quickly and cost effectively develop, deploy and manage batch applications. It helps to reduce infrastructure costs through concurrent execution of batch and online transaction processing (OLTP) workloads using shared business logic on a shared WebSphere Application Server infrastructure.

WebSphere Application Server V8.0 running on IBM HS22 Blade Server has up to 108 percent higher performance than Oracle WebLogic on SPARC T3-T4.[1]

Improve operational efficiency and reliability

WebSphere Application Server V8.0 can help organizations reduce costs through industry-leading performance, operational efficiency and reliability. Its proven transactional support helps companies maintain transaction integrity and overall reliability to minimize the likelihood of lost business opportunities due to failed transactions or system downtime. New capabilities in WebSphere Application Server V8.0 enable organizations to:

- Achieve end-to-end performance improvements that enable organizations to consolidate workloads and administrative overhead to reduce total cost of ownership. Performance improvement highlights include:
  - DayTrader benchmark performance improved by 20 percent
  - OSGi applications performance improved by 26 percent
  - Application server creation now as much as 69 percent faster
  - Application server cluster creation now as much as 31 percent faster

- Improve transactional integrity with support for shared database locks between transaction branches and integration of new programming models with WebSphere Application Server's proven transaction engine.
- Improve high-availability support when using IBM WebSphere MQ.
- Improve reliability and application performance through support for both client affinity and client reroute for applications that use IBM DB2® databases.
- Improve reliability and performance with Java Connector Architecture (JCA) data source and connection factory failover and subsequent failback to a predefined alternate resource.
- Enhance administrator and developer flexibility to select supported Java Software Development Kit (SDK) releases.
- Deliver developer access to the latest in technology innovations while helping administrators maintain stability in production environments through continued support for optionally installable WebSphere Application Server Feature Packs, including the Web 2.0 and Mobile Feature Pack.
- Enhance deployment efficiency and flexibility by connecting existing and new applications to the latest versions of a wide variety of industry-leading databases and Java Database Connectivity (JDBC) drivers. These include IBM DB2, IBM Informix®, Microsoft SQL Server, Oracle Database, Sybase Database and the DataDirect Connect for JDBC driver.
- Speed time-to-value with simplified install, maintenance and uninstall capabilities, with automated prerequisite and interdependency checking through IBM Installation Manager.
- Reduce disk footprint requirements through enhanced component install granularity to optionally select whether to install WebSphere Application Server components, such as thin clients, Enterprise JavaBean deployment and language packs.

Enhance security and control

WebSphere Application Server V8.0 offers world-class security and administrative control to help organizations confidently reduce costs and increase business agility. It offers rich support for security specifications and granular security controls to help productively secure the application environments businesses depend on. New and improved security highlights help to:

- Increase security, with overall security enhancements that are compliant with Java EE 6 and include updates defined in the Java Servlet 3.0 specification (JSR 315), Java Authentication Service Provider Interface (SPI) for Containers (JSR 196) and additional security features enabled by default.
- Get a more complete view of server security settings with enhanced security configuration reporting.
- Enhance security configuration flexibility and ease-of-use when configuring federated repositories through multiple security domain support for federated repositories.
- Enhance security and auditability for applications requiring distributed and z/OS® system access.
- Securely exchange identities and other information across security domains with enhanced Security Assertion Markup Language (SAML) support.

- Speed time-to-value when delivering single-sign-on web services.
- Reduces cross-site scripting vulnerabilities and enhanced browser attributes for single sign-on applications.
- Maximize administrator productivity and enhance control over the application server environment with standardized and automated administrative tasks and procedures. New and enhanced administrator highlights enable:
  - Improved standardization and repeatability via a new ability to clone a node, along with configuration modifications.
  - Improved administrator productivity through Centralized Installation Manager enhancements to simplify the creation, augmentation and deletion of WebSphere Application Server profiles on remote nodes.
  - Enhanced operational efficiency and business agility through the ability to administratively extend OSGi Applications with new functionality without changing the application.
  - Enhanced operational efficiency and minimized downtime through the ability to update a running OSGi Applications-based application by only impacting those bundles affected by the change, enabling rapid update of deployed OSGi Applications.
  - Enhanced problem determination and application manageability using the new High Performance Extensible Logging (HPEL) log and trace framework.
  - Accelerated problem determination with the separately available IBM Support Assistant (ISA), which provides a workbench to quickly locate key information and automate repetitive steps with a variety of serviceability tools.

Streamline Web 2.0 and mobile application development

With the new Web 2.0 and Mobile Feature Pack available for WebSphere Application Server, organizations are able to communicate with customers, partners and employees wherever they are through their mobile devices. This FEP introduces new components, services and tooling to create mobile-ready versions of existing web applications. It offers a valuable alternative to native mobile application development and addresses most challenges faced by project teams that need to extend desktop web applications to mobile devices. An extensive list of visual components that can be used either for desktop or mobile web applications help dramatically improve the user experience. It also provides a standards-based programming model for application developers to build RESTful web services using their existing Java platform investment.

Based on open web standards, including HTML 5, the package comes with an IBM-supported version of the Dojo Toolkit, additional graphical components enabling rich user experience and ready-to-use REST services to help improve developer productivity. Mobile device operating system support includes iOS 3 and 4; Android 2.1, 2.2, and 3.0; and BlackBerry 6.

Migrate applications quickly and easily

IBM has made significant investments in upward compatibility, configuration and management process upgrades, as well as API preservation and consistency between WebSphere releases. But, with changing industry standard specifications, application changes are sometimes needed to support or exploit new levels of the required industry standard. IBM provides extensive tooling support to make migrating to WebSphere Application Server as quick and easy as possible.

The Configuration Migration Tool can copy the configuration from existing WebSphere Application Servers and merge it into the new WebSphere Application Server V8.0 servers being deployed, thus programmatically preserving the investment in application server customization.

Application migration speed and ease-of-use is further enhanced through the separately available WebSphere Application Server Migration Toolkit. Available via web download, the Application Migration Tool supports upgrades from WebSphere Application Server V5.1, V6.0, V6.1, or V7.0 to WebSphere Application Server V8.0. The Application Migration Toolkit can programmatically scan existing applications to identify changes required to run that application on V8.0, and in most cases make that application change itself; in other cases, it identifies the change that needs to be made to the application code.

The Application Migration Tool can also migrate applications from Oracle or JBoss application servers to WebSphere Application Server V8.0, enabling the latest industry standards for those applications. Using the Application Migration Tool can reduce the time required to migrate an application to V8.0 by more than 50 percent.

See the IBM Webserver Application Migration Server Toolkit for more information.

WebSphere Application Server V8.0 provides extensive investment protection support for migration scenarios. For example:

- Different versions of the application server can run concurrently within the same cell to enable staged migrations over time.
- WebSphere Application Server V8.0 provides support for a wide range of application standards to protect client investments in existing applications. Standard support includes J2EE 1.2, 1.3, 1.4 and Java EE 5 and Java EE 6 applications.

In addition, IBM Services and IBM Business Partners have extensive experience in migrating applications from older WebSphere releases, and from Oracle and JBoss application servers, to the latest WebSphere Application Server versions.

Leverage included tooling for building and testing

On a trial basis, clients can leverage IBM Rational Application Developer for WebSphere Software with integrated programming model support for building and testing WebSphere Application Server V8.0 applications. A full developer license to IBM Rational Application Developer for WebSphere Software is easily available for purchase by using a downloadable license key.

The WebSphere Application Server for Developers option delivers an optimal development environment for building and testing applications on a developer's desktop, which will eventually run on WebSphere Application Server in production. Licensed for development use, WebSphere Application Server for Developers offers functional equivalence to the core WebSphere Application Server configuration to help developers reduce testing efforts, develop with confidence and deliver innovative applications faster. This configuration is also available at no charge, with optional paid support, to lower the entry barrier for developers.

Summary

WebSphere Application Server V8.0 builds on more than a decade of industry leadership to deliver the first enterprise, production-ready implementation of Java EE 6, with the performance to minimize total cost of ownership and the broad programming model support to maximize developer productivity. All of these capabilities are enhanced by leading administration and management capabilities that deliver enterprise-class reliability and availability designed for today's business applications.

For more information

To learn more about IBM WebSphere Application Server V8.0, contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/software/webservers/appserv

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[1] Results based on SPECjEnterprise 2010 benchmark from www.spec.org as of 06/17/2011 were used in this comparison. Comparing WebSphere Application Server V8.0 on IBM HS Blade Server HS22 X5690 result of 307.86EjOPS/core (3,694.35 EjOPS, 12 cores, 2 chips) against Oracle WebLogic Server 10.3.3 on Oracle SPARC T3-4 score of – 147.8 EjOPS/core (9,456.28 EjOPS, 64 cores, 4 chips)

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