

# IBM WebSphere Application Server family

*The cornerstone of your cloud strategy*



## Introduction

Today's enterprises need to deliver strategic business initiatives that capitalize on the growth of social, mobile, analytics and cloud technologies. These technologies serve as the foundation of the connected economy, empowering organizations to drive revenue growth and enhance their competitive edge by uncovering innovative ways to engage customers on demand across the digital landscape.

IT plays a vital role in enabling organizations to become connected economy leaders by extending the value of their systems and data. IT leaders are looking toward the cloud to drive their digital transformation while capitalizing on more efficient and cost-effective operations. However, IT leaders recognize the journey to the cloud is not without complications. The requirements of existing enterprise applications must be balanced with those of next-generation systems of engagement.

Recognizing these challenges, IBM introduced the IBM® WebSphere® on cloud platform, a next-generation application infrastructure strategy that provides entry points to capitalize on the benefits of a hybrid cloud strategy. Using WebSphere on cloud, businesses can improve and accelerate their time to market by simplifying the creation of application programming interfaces (APIs) and microservices and reducing costs by moving all or part of their applications to the cloud.

At the heart of this strategy is IBM WebSphere Application Server, which provides advanced infrastructure and tooling for Java applications across a range of workloads. WebSphere Application Server delivers a standards-compliant Java Platform, Enterprise Edition 7 (Java EE 7) server runtime and tools in a single offering that includes both WebSphere Application Server traditional and WebSphere Application Server Liberty.

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## Digital transformation, hybrid cloud and IBM WebSphere Application Server

Hybrid clouds empower businesses to create new solutions; connect to systems of engagement such as the web, mobile devices and the Internet of Things (IoT); and optimize enterprise applications by moving the appropriate applications to the cloud. WebSphere Application Server works in conjunction with the entire hybrid cloud landscape to provide the following features:

- Provisioning and running WebSphere either on or off premises or in a hybrid environment with flexible runtimes and ready-to-run, pattern-based deployments
- Deploying workloads across any cloud or container service in a simplified approach
- Scaling infrastructure to match demand across multisourced and hybrid cloud models with workload scheduling and cloud brokerage services
- Predicting, detecting and automating fixes to IT and application performance issues that impact user experiences through continuous feedback and optimization

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WebSphere Application Server traditional is an industry leader for transactional workloads and hosts some of the world's most demanding Java assignments. WebSphere Application Server Liberty shares the same runtime technology as WebSphere Application Server traditional and, in addition to traditional workloads, it excels in modern workloads that favor a microservices architecture. WebSphere Application Server Liberty provides a modular architecture offering next-generation integration techniques, a cloud and mobile-first




 Create	 Connect	 Optimize
<p><b>Developer-focused to speed delivery pipeline</b></p> <ul style="list-style-type: none"> <li>• Lightweight composable runtime—well-suited for microservices</li> <li>• Full integration with any DevOps toolchain for continuous delivery</li> <li>• Java EE 7 market leadership and support for open source</li> </ul>	<p><b>Easy cloud connections for new and existing apps</b></p> <ul style="list-style-type: none"> <li>• Create, expose and connect APIs</li> <li>• Reuse existing apps and connect to on- or off-premises sources</li> <li>• Deploy anywhere: on premises, in cloud or hybrid</li> </ul>	<p><b>Smart management of mission-critical resources</b></p> <ul style="list-style-type: none"> <li>• Leading-edge cloud and mobile security</li> <li>• Enterprise management of Java and Node.js</li> <li>• High availability: auto-scaling, dynamic routing, health management, diagnostics</li> </ul>

Figure 1. WebSphere Application Server benefits.

mindset, and seamless portability across all topologies. Moreover, WebSphere Application Server Liberty is especially developer-friendly, allowing for integration with DevOps workflows for continuous integration and delivery. WebSphere Application Server Liberty is particularly well suited to lightweight virtualization container environments and supports seamless deployment to hybrid topologies through IBM Containers services and Docker containers.

These qualities allow IT to drive its enterprise digital strategy in the connected economy, enabling the links between people, machines and organizations that will align products and business models around the customer. Building on this foundation, IBM WebSphere on cloud provides a platform that helps you do the following (Figure 1):

- **Create cutting-edge applications, APIs and microservices at the speed of business** to deliver compelling, on-demand customer experiences

- **Connect to valuable cloud services** such as the IBM Watson™ platform, to maximize the value of your existing investments and assets
- **Optimize application infrastructure for flexibility, availability and security** by adopting a lift-and-shift approach to replicate in-house workloads on the cloud, either through a single- or multi-tenant option. This approach allows you to benefit from increased scalability, reduced cost and enhanced agility, while also maintaining the security necessary to satisfy regulatory and legal compliance needs.

### Create innovative solutions at the speed of business

Rapid application development and continuous delivery of innovation is paramount to thrive in the swift pace of today's digital landscape. WebSphere empowers you to create, deploy and manage new microservices quickly using WebSphere Application Server Liberty, IBM Bluemix® platform services

and IBM WebSphere Connect capabilities. Together, they facilitate the continuous-delivery capability necessary to respond to new business needs and keep customers coming back.

The Liberty app accelerator is a starting point for developers to create Java-based microservices apps by providing projects for building self-contained applications with a selectable set of Java technologies. Select your technologies, download the resulting project and run the default Maven goal to pull in the correct dependencies and features, build a template application and run tests. The tests are run on the embedded WebSphere Application Server Liberty server—either locally or pushed to Bluemix. By improving developer productivity, the Liberty app accelerator helps speed time to market for WebSphere Application Server Liberty users, broadening your reach to new customers and markets. The Liberty app accelerator is hosted on Bluemix and available at <http://wasdev.net/accelerate>

Additionally, to help organizations transition to a microservices architecture, IBM provides Game On! (<https://game-on.org>), a microservices exemplar app that contains best practices and methodologies for creating a brand new microservices application.

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### WebSphere for a microservices strategy

- **A lightweight, composable runtime architecture that utilizes less than a 64 MB footprint and supports a large developer base using Java Framework (including Spring)**
  - **Enterprise development tools and a platform for microservices**
  - **Easy integration with DevOps workflows and Docker container strategies**
  - **Seamless connectivity to cloud-based data and cognitive services**
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### Connect to valuable cloud services

Your organization made substantial investments in the solutions currently driving your business; however, even if they are successful, they can quickly fall prey to digital disruptions. Rather than becoming a connected economy laggard, WebSphere allows you to invigorate those solutions by exposing them through APIs to an ecosystem of customers, developers and partners. Through its WebSphere Connect capabilities, you can easily make your existing assets part of the API economy, unlocking new opportunities for innovation, revenue streams and expanded channels.

WebSphere Connect is a set of features built into WebSphere that helps turn your WebSphere business assets into APIs. These capabilities enable you to easily produce and consume APIs and connect to and from the hybrid cloud to rapidly extend the value of your application investments. WebSphere Connect helps you accomplish several outcomes:

- Use the WebSphere Application Server Developer Tools to create Swagger API documentation for WebSphere applications.
- Easily publish APIs to IBM API Connect™.
- Leverage the provided IBM API Connect Essentials to create, discover and publish APIs and deliver end-to-end API management. The WebSphere license adds IBM support and additional API call limits beyond the terms of a stand-alone IBM Connect Essentials license.
- Capitalize on existing WebSphere expertise for seamless implementation and management.
- Provide easy access to APIs inside and outside the organization to foster new partner ecosystems.
- Apply end-to-end API lifecycle management and security to your WebSphere application infrastructure while maintaining high levels of service and performance.

Pre-built integrations allow you to quickly connect existing data and applications to IBM Cloud, without the need for customization, added complexity or disruption caused by myriad third-party alternatives. You can capitalize on your current skills and resources for fast and easy implementation, and manage within the WebSphere environment you already have and know.

WebSphere Connect enables you to connect to and from the cloud to enhance existing on-premises applications with many innovative cloud services, such as cognitive computing capabilities from Watson as well as operational services that provide performance insights. Now developers can leverage their existing skills to expose, create and connect applications leveraging the Bluemix cloud platform.

Ultimately, these connection capabilities can help your business minimize costs, reduce time to market and extend the value of critical enterprise data and services by eliminating costly rip-and-replace strategies.

### Optimize infrastructure for availability, flexibility and security

WebSphere is a next-generation application infrastructure for developing and deploying modern Java applications across hybrid cloud landscapes. Whether maintaining an on-premises strategy, moving completely to cloud or adopting a hybrid design, WebSphere provides the flexibility to choose whichever platform works best for you.

By incorporating Bluemix with WebSphere, you can accelerate your digital transformation through new starting points, rules of engagement, decomposition of best practices and best-of-

breed tooling. Migrating or expanding your on-premises Java applications to the cloud can help improve profitability, reduce labor and management hours, and lower both capital and operational expenses through pay-as-you-go pricing. In addition, WebSphere on cloud offers several key benefits:

- **Help control costs:** Without making changes, take what you already have—including code, topologies and applications—and move it to the cloud. IBM WebSphere Application Server for IBM Bluemix requires no download, no installation and no tuning of the application server environment, providing the convenience and experience of the cloud that is highly optimized for developers and operational productivity. This approach creates huge advantages whether driven by current business needs or long-term strategies to control costs.
- **Build scale as business dictates:** Using WebSphere on cloud, you no longer have to add computing capacity or new hardware and software infrastructure when you want to grow. Now, you can easily scale up or down on demand as business dictates.
- **Accelerate application delivery:** When done correctly, application delivery goes beyond deployment and availability and incorporates the security, scalability and management required to properly run and maintain it. With the ease of deployment portability provided by WebSphere on cloud, organizations can support the hybrid topology to accelerate delivery of critical business workloads between their on- and off-premises environments. This approach is imperative as hybrid cloud adoption continues to grow and organizations must stay up to date with the best practices and solutions to optimize application delivery and achieve their business goals.

## Automate application release and deployment

Developing in and for the cloud presents specific challenges. IT organizations are currently automating their builds, tests and infrastructure and application deployments in an attempt to align with a certain level of continuous delivery. DevOps requires that best practices and development tooling address the needs of software delivery teams. It is designed to

facilitate rapid feedback and continuous delivery for agile development while providing the audit trails, versioning and approvals needed in production. For a WebSphere on-premises administrator, IBM UrbanCode™ Deploy ([ibm.com/software/products/en/ucdep](http://ibm.com/software/products/en/ucdep)) offers capabilities for automating configuration and application deployments that can improve an organization’s ability to deliver products and services to market quickly (Figure 2).

### Aligning infrastructure with modern continuous integration and continuous delivery workflows

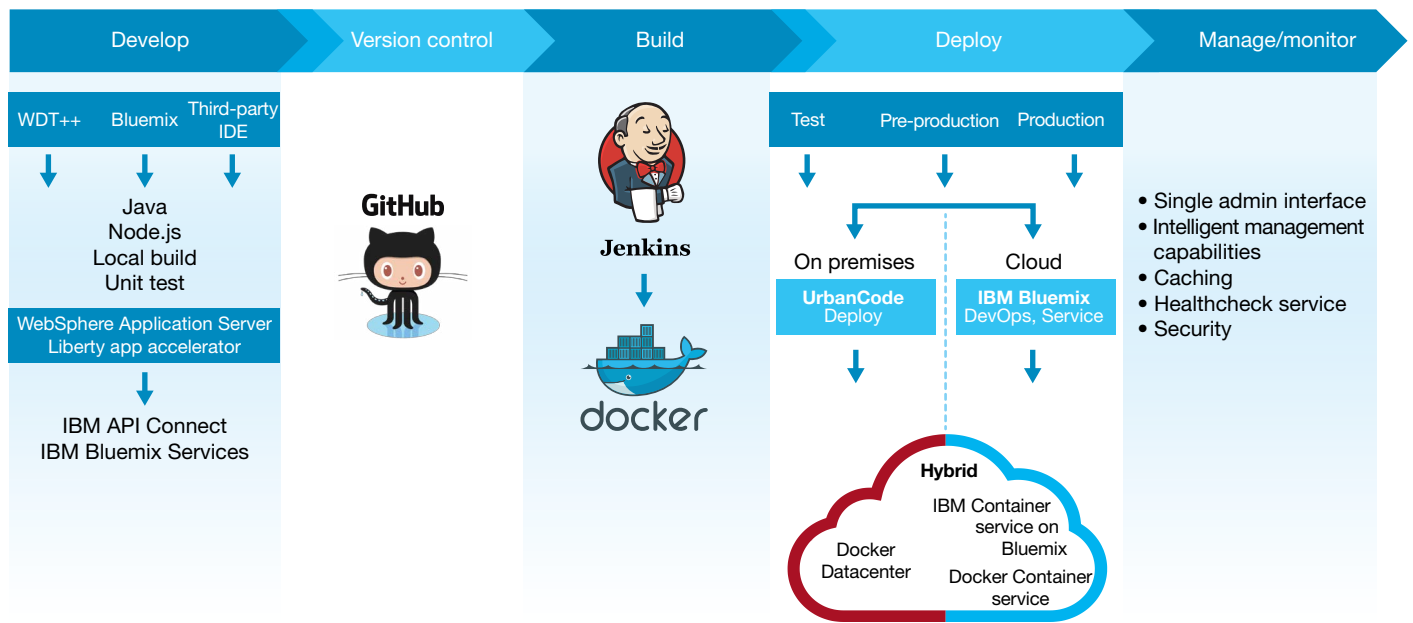


Figure 2. WebSphere Application Server provides continuous integration and workflow delivery.

WebSphere Application Server traditional and WebSphere Application Server Liberty provide images for Docker. The latter is particularly well suited for Docker containers and lifecycle management within container environments such as Docker Datacenter and IBM Container services on Bluemix.

### Embrace deployment flexibility on all clouds

WebSphere Application Server Liberty can be deployed across a broad spectrum of public and private cloud environments including Amazon Web Services (AWS), IBM Bluemix, Microsoft Azure, Red Hat OpenShift and Pivotal Cloud Foundry running on the IBM SoftLayer® cloud infrastructure. In addition, you can use existing WebSphere on-premises licenses to install and run both WebSphere Application Server traditional and WebSphere Application Server Liberty in virtual machines on any private or dedicated cloud.

### Help eliminate future migration cost with the continuous-delivery model

An important design principle of WebSphere Application Server Liberty continues to be zero migration. For example, Java EE 6 features were retained as Java EE 7 was introduced into WebSphere Application Server Liberty. Existing applications run unchanged on newer iterations of WebSphere Application Server Liberty if they are configured with the same set of Java EE 6 features.

Because you can bring your own Java, WebSphere Application Server Liberty empowers you to run new and old Java applications side by side. In addition, WebSphere Application Server Liberty aligns with the continuous-delivery model, eliminating the requirement for a configuration migration as you move to WebSphere Application Server Version 9.

WebSphere Application Server V9 introduces a new 9.0.0.0 service stream for traditional WebSphere Application Server fix packs, while WebSphere Application Server Liberty follows a continuous-delivery model with a single service stream. As WebSphere Application Server Liberty offers a versionless single-delivery stream, its fix pack numbering is changing to Y.R.M.F. (*year.release.modlevel.fix pack*). Once customers deploy to WebSphere Application Server Liberty, feature or configuration migration is never required as the runtime is updated to newer fix packs.

### Capitalize on a single management interface

With the advent of systems of engagement built for social and mobile, developers are composing applications from multiple languages, such as Java and Node.js, and are using container technologies to gain freedom from a single vendor, platform or enterprise environment. These modern application workloads are typically characterized by unpredictable demand surges and involve sub-second response times—subsequently requiring additional capacity on demand. Often, IT employs cloud vendors to handle these surges, leading to a topology of polyglot applications and servers across a hybrid environment.

WebSphere provides a single, integrated interface to securely and intelligently manage polyglot applications and servers. By combining the WebSphere Liberty-based collective controller and WebSphere Liberty Administration Center, IT administrators can use one interface to easily manage a large-scale topology comprised of WebSphere Java and Node.js applications and servers. These applications and servers are deployed across bare-metal systems, Docker

containers or virtual machines—whether they are on premises or in the cloud (Figure 3). Several key features are available:

- An administration center for visualization and operational control over both Java and Node.js applications
- Scalable clustering for Java applications
- Dynamic routing support—through a WebSphere Application Server plug-in—for Java and Node.js applications
- Scriptable deployment for both Java and Node.js applications

### WebSphere Application Server Version 9: A turning point for cloud and hybrid

WebSphere Application Server Version 9, with entitlement to its traditional and Liberty runtimes, continues to offer an industry-leading, production-ready, standards-based Java EE 7–compliant architecture.

Java EE 7 Web Profile and Java EE Full Platform certification of WebSphere Application Server traditional brings the traditional runtime to the same Java EE level as the WebSphere Application Server Liberty runtime. This extends the set of applications that can be rapidly developed on WebSphere Application Server Liberty for deployment to both WebSphere Application Server traditional and WebSphere Application Server Liberty. It also more generally supports deployment of any Java EE 7–based application that uses the latest industry standards for deployment on premises or in the cloud. Java EE 7 certification provides the following advantages to businesses:

- A scalable infrastructure facilitates building HTML5 applications for improved responsiveness through low-latency, bidirectional communication using the WebSockets

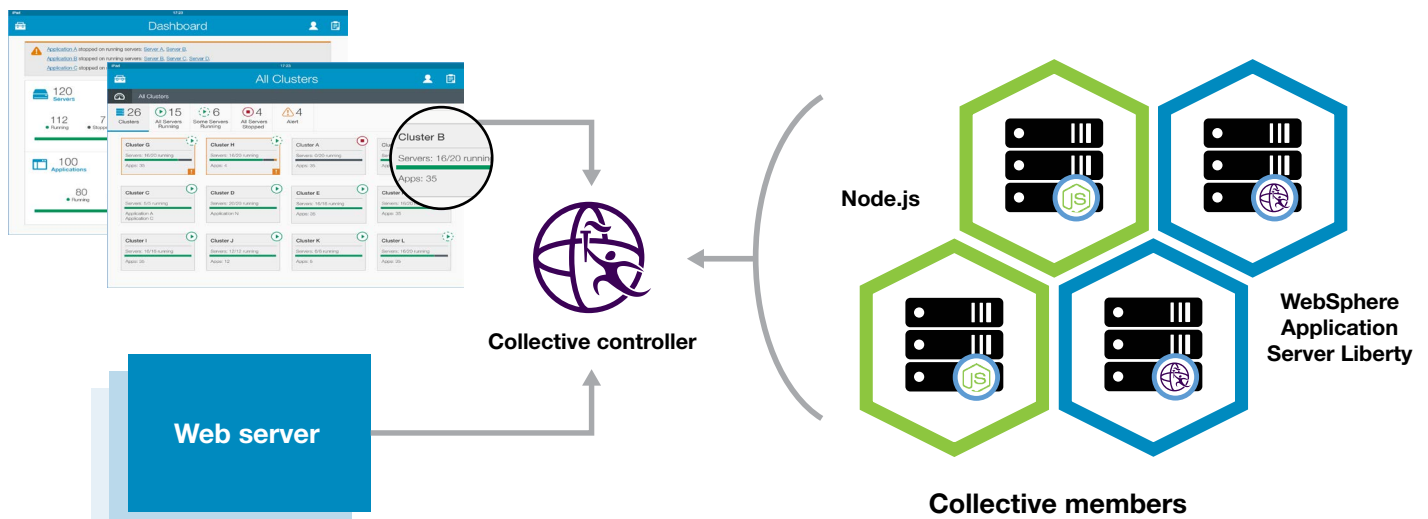


Figure 3. The WebSphere Application Server single management interface.



protocol. It simplifies data parsing and exchange by using industry-standard JavaScript Object Notation (JSON) processing and supports many more concurrent users through asynchronous RESTful Web Services with Java API for RESTful Services (JAX-RS) 2.0 client support.

- An increase in developer productivity through a simplified application architecture, reduced boilerplate code using dependency injection and default resources, and broadened use of annotations boost efficiency and enhance application portability with standard RESTful web services client support.
  - It meets highly demanding enterprise requirements, such as:
    - Breaking down batch jobs into manageable chunks for uninterrupted online transaction processing (OLTP) performance
    - Defining multithreaded concurrent tasks easily for improved scalability
    - Improving Managed Beans alignment, including transactional interceptors
    - Delivering transactional applications with choice and flexibility
    - Improving usability through annotations and Contexts and Dependency Injection (CDI) Beans support, and significantly reducing the code required to send and receive messages
  - Java Platform Standard Edition 8 (Java SE 8) support for WebSphere Application Server traditional and WebSphere Application Server Liberty delivers enhanced developer productivity and significant application performance improvements.
- Other features in Version 9 provide the following advantages:
- Docker container and Docker Datacenter support accelerates delivery of modern applications with easier integration of WebSphere into your DevOps tools chain. Use of WebSphere with Docker Datacenter enables management of WebSphere Docker containers as part of a broader, on-premises Docker-centric ecosystem.
  - Updated Docker images with the latest WebSphere binaries accelerate software deployment in hosts containing Docker engines.
  - A new WebSphere on Bluemix single-tenant offering provides deployment flexibility. You can deploy applications on isolated single-tenant hardware, with an optional dedicated back-end database connection to the client's data center. This option is also available for WebSphere Application Server Version 8.5.5.
  - A single management interface for managing and administering WebSphere Application Server Liberty Java and Node.js applications is deployed across bare-metal machines, virtual machines and Docker environments in on-premises, cloud or hybrid topologies.
  - Enhanced WebSphere eXtreme Scale provides an easy-to-configure, easy-to-deploy distributed caching solution in which speed and performance are the main drivers of business success.
  - Easy-to-deploy WebSphere Application Server Liberty applications to OpenShift and Pivotal Cloud Foundry run on AWS, IBM Bluemix, Microsoft Azure and IBM SoftLayer platforms. In addition, these applications can be in on-premises environments and apply sub-capacity pricing for suitable configurations.

- An enhanced portability option for VMware clients takes advantage of the speed of the cloud and economics by enabling them to easily extend their existing workloads, as they are, from their on-premises, software-defined data center (SDDC) to the cloud. The solution uses jointly designed architecture by VMware and IBM to automatically provision pre-configured VMware SDDC environments, which consist of VMware vSphere, VMware NSX and VMware Virtual SAN on the IBM Cloud. With VMware, SDDC environment clients can deploy workloads into this hybrid cloud environment without modification because of common security and networking models that are based on VMware.

### Configuration options for WebSphere Application Server editions

The WebSphere Application Server family offers multiple configuration options and support for a variety of business models and deployment platforms. It also supports a wide range of deployment scenarios, from projects with no up-front budget to simple administration of a single server environment, all the way up to a clustered, highly available, high-volume environment with Intelligent Management services. These editions offer unparalleled flexibility so organizations can incrementally add higher quality of service to applications as business needs change—all without worrying about the cost of rearchitecting, reprogramming or migrating to different technology bases.

#### No-charge and no-support option

All editions of WebSphere Application Server traditional and WebSphere Application Server Liberty have a no-charge entitlement for development. WebSphere Application Server Liberty also provides a no-charge and no-support option

for web-centric applications used in test and production environments. Usage in test and production environments is restricted to a maximum of 2 GB of Java virtual machine (JVM) heap size across all instances of application servers for the licensee. IBM offers an in-place option to upgrade from a no-charge, no-support option to other WebSphere editions.

### WebSphere Application Server Liberty Core Version 9

WebSphere Application Server Liberty Core Version 9 is a lightweight and dynamic offering that is Java EE 7 Web Profile-compliant. It enables rapid development and deployment of web and mobile-centric applications, allowing businesses to quickly respond to enterprise and market needs. WebSphere Application Server Liberty Core profile servers can be members of collectives that can be managed by a collective controller from a WebSphere Application Server Network Deployment installation. WebSphere Application Server Liberty Core capabilities are a subset of those capabilities provided in WebSphere Application Server and WebSphere Application Server Network Deployment. They include several highlights:

- **Fast time to value** through an extremely lightweight offering that is composed of a subset of the Java EE 7 Web Profile, making it an excellent production and development runtime for web applications.
- **A turnkey solution for entering the API economy** through its support for IBM API Connect, helping to easily create, discover and publish APIs while also integrating with API Management.
- **Composable, small-download, small-footprint, fast-startup and easily packaged applications**—including configuration—for deployment that are extensible through the WebSphere Application Server Liberty Core System Programming Interface (SPI).

### WebSphere Application Server Version 9

WebSphere Application Server, which includes WebSphere Application Server traditional and WebSphere Application Server Liberty, is a flexible solution for configurations supporting departmental or large-scale, dynamic web applications that require web-tier clustering and failover across application server instances. The WebSphere Application Server Liberty runtime includes a superset of capabilities found in WebSphere Application Server Liberty Core Version 9, providing additional programming models such as web services, full Java EE and Java Message Service (JMS). It enables web request load balancing across servers, and includes WebSphere eXtreme Scale with support for session distribution and DynaCache.

### WebSphere Application Server Network Deployment Version 9

WebSphere Application Server Network Deployment, which includes WebSphere Application Server traditional and WebSphere Application Server Liberty, offers enterprises near-continuous availability, advanced management and automated performance optimization for their mission-critical applications. Its capabilities include a superset of those found in WebSphere Application Server:

- World-class clustering and high-availability management to help minimize the cost of system downtime
- Autoscaling, autorouting and internet-scale clustering for intelligent and efficient management of compute resources
- Enterprise-level, Java batch capabilities such as parallel job processing, job checkpoints and restart, workload management, and shared OLTP and batch processing to support batch modernization and modern batch projects
- Advanced centralized management and administration to make management of more complex environments less time-consuming and resource-consuming
- High performance that maximizes business competitiveness while minimizing total cost of ownership (TCO)
- WebSphere Application Server Liberty collective cluster administration that improves server resiliency and provides high availability for mission-critical applications
- Distributed caching through WebSphere eXtreme Scale that provides responsiveness to enterprise, cloud and mobile applications

### WebSphere Application Server Family Edition Version 9

The WebSphere Application Server Family Edition brings together the following key WebSphere Application Server products that are bundled under a common license entitlement:

- WebSphere Application Server Network Deployment, which includes the Network Deployment editions of both WebSphere Application Server traditional and WebSphere Application Server Liberty application servers
- WebSphere Application Server, which includes the single-server editions of both the WebSphere Application Server traditional and WebSphere Application Server Liberty application servers
- WebSphere Application Server Liberty Core

WebSphere Application Server Family Edition gives you the flexibility to deploy the application server edition that is specific to your business needs. It also allows you to easily adjust the mix of products deployed from the bundle without additional charges as the needs of your business change.

### WebSphere Application Server for z/OS, Version 9

WebSphere Application Server for z/OS offers all the capabilities that are available in WebSphere Application Server Network Deployment. Most notably, it takes advantage of the unique qualities of service of IBM z Systems® hardware and the IBM z/OS® operating system, such as policy-driven workload management, advanced transactional integrity, unsurpassed scalability and availability,<sup>1</sup> built-in enterprise security capabilities and more. It also includes z/OS-specific features that large-enterprise customers value, such as z/OS Connect and WebSphere-optimized local adapters. Version 9 offers several highlights:

- Installation improvements, including a reduction in the installation package size
- Product customization simplification and improvements
- A total transition to 64-bit for WebSphere Application Server for z/OS
- A number of WebSphere Application Server Liberty on WebSphere z/OS Optimized Local Adapters (WOLA) enhancements, including IBM IMS™ support for global, two-phase commit transactions

Different WebSphere Application Server editions and their corresponding features are available to meet your business needs (Figure 4 and Table 1).




 <b>WebSphere Application Server Liberty Core</b>	 <b>WebSphere Application Server</b>	 <b>WebSphere Application Server Network Deployment and WebSphere Application Server for z/OS</b>
<p><b>A lightweight production runtime for rapid web- and cloud-based application development and deployment</b></p> <ul style="list-style-type: none"> <li>• Fast and easy download (&lt;100 MB footprint)</li> <li>• Install and deploy within two minutes<sup>2</sup></li> <li>• Full integration with IBM Open Platform</li> <li>• Java EE Web Profile for web, mobile and Open Source Gateway Initiative (OSGi) applications</li> <li>• A well-suited runtime for microservices</li> </ul>	<p><b>A flexible, secure Java server runtime environment for enterprise applications that provides advanced performance, redundancy and programming models</b></p> <ul style="list-style-type: none"> <li>• Java EE Full Platform</li> <li>• Security and support for single, midsized and large-scale server deployments</li> <li>• Web tier clustering over multiple application server instances</li> <li>• IHS load balancing up to 25 servers</li> <li>• Includes Java Message Service, JDBC, Java Batch, Full EJB and more</li> </ul>	<p><b>An advanced runtime environment for large-scale and mission-critical application deployments that offers near-continuous availability and Intelligent Management capabilities</b></p> <ul style="list-style-type: none"> <li>• Unlimited server allowance for IHS load balancing</li> <li>• Centralized management for massive scalability (thousands of servers)</li> <li>• Intelligent Management for optimal workload performance</li> <li>• Full integration with z/OS platform capabilities for highest quality of service</li> </ul>

Figure 4. WebSphere Application Server Family editions and capabilities.

**Table 1: WebSphere Application Server editions**

Capability	WebSphere Application Server Liberty Core	WebSphere Application Server (base)		WebSphere Application Server Network Deployment		WebSphere Application Server for z/OS	
		Liberty	Traditional	Liberty	Traditional	Liberty	Traditional
Java EE 7 Web profile + JDBC + OSGI	✓	✓	✓	✓	✓	✓	✓
Java EE 6 Web profile + JAX-RS + JDBC + OSGI	✓	✓	✓	✓	✓	✓	✓
Full platform Java EE 7		✓	✓	✓	✓	✓	✓
Full platform Java EE 6			✓		✓		✓
IBM API Connect Essential entitlement*	✓	✓	✓	✓	✓	✓	✓
Java Platform, Standard Edition 8	✓	✓	✓	✓	✓	✓	✓
Fidelity between WebSphere Application Server Liberty and traditional	✓	✓	✓	✓	✓	✓	✓
IHS routing and load balancing (# of servers allowed)	✓	✓	✓	✓	✓	✓	✓
SPI (allows third-party extensions to Liberty features)	✓	✓		✓		✓	
Zip or archive install	✓	✓		✓		✓	
Collective controller membership and management	✓	✓		✓		✓	
WebSphere Application Server Developer Tools (Java EE, OSGi)**	✓	✓	✓	✓	✓	✓	✓
IBM Rational Application Developer (for WebSphere Application Server V9)**	✓	✓	✓	✓	✓	✓	✓
Supported in Docker containers	✓	✓	✓	✓	✓	✓	✓
Supported in WebSphere Application Server for Bluemix	✓		✓	✓	✓		
Supported in Bluemix Instant Runtime	✓	✓					
Programming model support for SIP, WebRTC		✓	SIP only	✓	SIP only	✓	SIP only

\* Use of the API Connect Essentials server is unrestricted, and entitlement provides for up to 500 monthly API calls per WebSphere Application Server Processor Value Unit (PVU) purchased on distributed platforms.

\*\* WebSphere Application Server Developer Tools available from the Eclipse Marketplace or WASdev (<https://developer.ibm.com/wasdev/>). Rational Application Developer requires separate purchase.

(continued on page 14)

**Table 1: WebSphere Application Server editions (continued)**

Capability	WebSphere Application Server Liberty Core	WebSphere Application Server (base)		WebSphere Application Server Network Deployment		WebSphere Application Server for z/OS	
		Liberty	Traditional	Liberty	Traditional	Liberty	Traditional
WebSphere eXtreme Scale entitlement (PVUs dependent on joint or separate installs)* – <b>Joint:</b> WebSphere eXtreme Scale and WebSphere Application Server can share up to the entitled WebSphere Application Server PVUs – <b>Separate:</b> WebSphere Application Server PVUs plus WebSphere eXtreme Scale PVUs cannot exceed entitled WebSphere Application Server PVUs		✓ <sup>+</sup>	✓ <sup>+</sup>	✓	✓	✓	✓
Edge-of-network services				✓	✓	✓	✓
Intelligent Management (Dynamic cluster, Edition Management, Health Policy)				✓ <sup>++</sup>	✓	✓ <sup>++</sup>	✓
Liberty z/OS extensions (WebSphere Optimized Local Adapters, z/OS Connect)						✓	✓

\* WebSphere eXtreme Scale capabilities are limited to HTTP session management and DynaCache and can only be used in support of entitled WebSphere Application Server. WebSphere eXtreme Scale capabilities are not limited, and can be used in support of entitled WebSphere Application Server or for other purposes

\*\* Intelligent Management Assisted Lifecycle Management in WebSphere Application Server Network Deployment or WebSphere Application Server for z/OS.

### Notes for Table 1

- WebSphere Application Server Express, WebSphere Application Server Hypervisor Edition and WebSphere Application Server for Developers are not available with WebSphere Application Server Version 9.
- Lifecycle for WebSphere Application Server Express, WebSphere Application Server Hypervisor Edition and WebSphere Application Server for Developers prior to WAS Version 9 is not impacted.
- WebSphere Application Server Express 7 and 8.x customers are eligible for trade-up to WebSphere Application Server Version 9 (base).
- WebSphere Application Server Express 8.5.5 limited to 480 PVUs per machine (physical or virtual).
- Service Component Architecture, Web 2.0 and Mobile toolkit are removed from WebSphere Application Server Version 9.
- Support for CEA and CG programming models is limited to WebSphere Application Server traditional.

## Conclusion

Hybrid clouds empower businesses to create new solutions; to connect to systems of engagement such as the web, mobile devices and IoT; and to optimize enterprise applications by moving the appropriate applications to the cloud. WebSphere Application Server Version 9, working in conjunction with the entire hybrid cloud landscape, extends your infrastructure to take advantage of cloud-based resources and services. You can deploy WebSphere Application Server Version 9 on an on-premises cloud, on a remote cloud or on a hybrid cloud comprising on-premises deployments and remote cloud deployments. WebSphere Application Server Version 9 also helps ease access and connections to cloud services, such as IBM Watson and IBM Cloudant®, and includes IBM API Connect to facilitate use of APIs. With all of these features in one release, isn't it time you explored the possibility of new architectures for your infrastructure?

## For more information

To learn more about the WebSphere Application Server family, contact your IBM representative or IBM Business Partner, or visit: [ibm.com/software/products/en/appserv-was](https://ibm.com/software/products/en/appserv-was)



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<sup>1</sup> "Discover the new possible with Oracle and IBM z Systems," [ibm.com/solutions/oracle/us/en/infographic/systemz.html](http://ibm.com/solutions/oracle/us/en/infographic/systemz.html)

<sup>2</sup> "Liberty profile: Zero to Hero in under two minutes!" video, posted July 18, 2014, <https://developer.ibm.com/wasdev/docs/liberty-profile-zero-to-hero-in-three-and-a-half-minutes>



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