

# Business Executive Answer to "Why WAS on z/OS?" Question



## WebSphere Application Server

WebSphere Application Server ("WAS") is IBM's product offering that implements the "Java Enterprise Edition" (Java EE) application server specification model. WebSphere Application Server is available on several IBM and non-IBM operating system platforms, including z/OS.

*The industry standard programming interfaces implemented by WebSphere Application Server are common across all supported platforms.*

The business benefits summary for a industry standard application server model with common APIs across many platforms include:

### Focus on business logic value development

"Application Servers" by their design provide program support functions so application developers may focus on the business logic and not on underlying support function. The concept is not new: CICS is an application server and has been available for decades. The concept is still relevant: smart phones are application servers. WAS is an *enterprise* application server that focuses on Java and accepted industry standards.

### Avoidance of proprietary programming model

Industry standards are developed in a cooperative process among industry experts, often from companies that compete in the market.

*IBM participates in many industry standard committees.*

WebSphere Application Server implements many industry standard specifications, such as Java EE, JDBC, JSP, JDBC, and many more.

Vendor products that implement an industry standard must adhere to the interface as agreed to and documented in the specification.

### Application portability across platforms

WebSphere Application Server implements the same programming interfaces across all supported platform.

*Applications are not programmatically tied to a platform.*

Applications developed on Windows may be carried up to UNIX or z/OS. That enables greater flexibility for decisions of placement for development, test and production.

### Consolidation of application tooling

The industry standard model allows standardization across platforms. That allows development tooling vendors to standardize as well. The tooling environment for WebSphere Application Server is common across all platforms. This allows consolidation around a common set of tooling, saving licensing costs, training costs, as well as skill acquisition and skill retention costs.

### Consolidation of programming skills

Programming skills may be focused around a narrower set of skills, which are more common in the marketplace and thus more cost effective to acquire and retain.

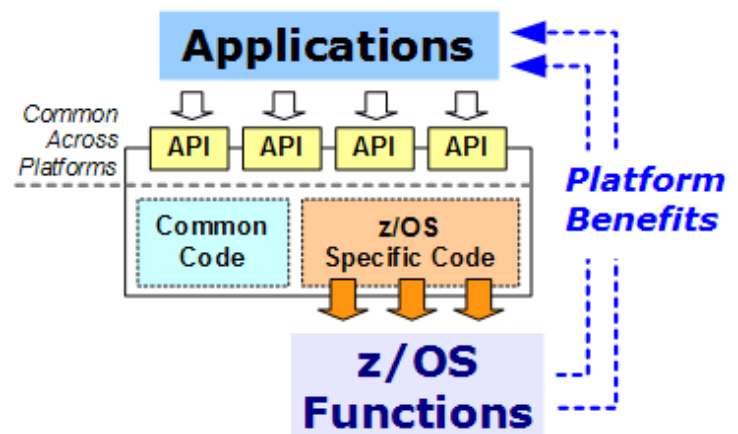
### Enhanced time-to-market for business logic updates

The previous value statements contribute to greater development flexibility, which implies a greater ability to react to changes in your business climate.

*In an open standards environment, vendors compete based on the quality of their implementation and the quality of their support and service. IBM's WebSphere Application Server is the market leader, and IBM is rightfully proud of its historic focus on customer support and service.*

## WebSphere Application Server for z/OS

At the application interface level, "WAS is WAS" across all the supported platforms. Below the API level WAS z/OS is designed to take advantage of specific z/OS functions:



*System z and z/OS offers a set of functions taken advantage of by WAS z/OS. Those functions provide business value. The remainder of this paper will explore the business value of those functions as exercised by WAS z/OS.*

## z/OS Platform Features and WAS z/OS

### Cross-Memory Communications and Co-location with Data

The z/OS operating system permits (and carefully controls) the copying of message buffers from one virtual address space to another. This provides WAS z/OS the ability to co-locate with the critical business data and provide:

- **Efficiency** -- cross-memory avoids networking protocols which means fewer cycles consumed to move data.
- **Low Latency** -- the time to move each message is less, which provides higher throughput and faster completion of business processes. Business processes with limited completion windows require minimal latency.
- **Security** -- cross-memory communications are completely secure with no possibility of "sniffing" the data. The ability to assert the user identity cross memory reduces the need to code less secure alias definitions for identity assertion.

## Specialty Engines

System z speciality engines (zAAP, zIIP, zAAP-on-zIIP) provide a means of running certain work on processor engines which are: (a) priced lower than general processors, and (b) *not* counted in processor-based software licensing. The offload of work to specialty engines is transparent to applications.

WebSphere Application Server for z/OS execution involves Java, and Java work is offloaded to a zAAP. The percent of total WAS z/OS work eligible for offload to a zAAP varies depending on many factors. Typical results find between 50% and 80% of WAS z/OS work eligible for offload.

- **Lower acquisition Cost** -- specialty engines are priced well below general processor (GP), allowing for capacity with a lower acquisition cost.
- **Less GP usage** -- WAS z/OS Java execution offloaded to a specialty engine is not counted towards GP usage license charges.
- **More GP for other work** -- offload to a specialty engine means general processors are more available for work that requires them, which might allow avoidance or delay of acquiring additional GP.

## z/OS Workload Manager (WLM)

WLM is a z/OS facility that manages access to shared system resources for work operating on z/OS. It provides priority management based on defined business goals. WLM is a function deeply integrated in the z/OS operating system itself.

*For WLM to manage work and resource access, it requires (and has) extensive knowledge of the overall work taking place and what resources (CPU, memory, I/O) each piece of work is using. That information is available to you. Which means you have tremendous insight into system usage and capacity utilization.*

WAS z/OS makes extensive use of WLM for its operations. The business value that accrues to you is:

- **Request Classification** -- WAS z/OS provides a facility for identifying work and having WLM assign classification to that work based on *your* assessment of relative priorities.
- **Request Prioritization** -- classified work may then be managed by WLM to provide prioritization to system resources, relative to all other work on the system and based on your defined business goals.
- **Request Resource Reporting** -- classified work may also be grouped into a separate WLM *reporting class*, which allows you to see *detailed resource usage* for those requests. That insight provides input to capacity planning and usage reporting.

## Security Access Facility (SAF)

SAF is a security interface of z/OS behind which a security product operates. IBM's SAF security product is RACF. Other vendors have SAF products as well.

RACF stands for "*Resource Access* Control Facility." It functions as far more than *just* a userid and password repository. It controls access to a wide array of resources, such as: applications (authentication), application roles (EJB roles), cross-memory access, UNIX file access, and TCP port usage. It serves as a keystore and trust store for SSL certificates. *It is a*

*comprehensive security control system.*

The comprehensive nature of RACF provides the key to the business value to you:

- **Centralized security management** -- when security functions are centralized they are more easily managed. Proper business control processes may be more easily applied. Proper security practices may be more consistently applied.
- **Business protection** -- RACF is an *extremely* secure facility for resource access control and protection. Properly configured it provides the most secure protection available.
- **Auditing** -- RACF provides extensive auditing functions so you may better understand *who* is accessing *what*, *when* the access took place, and *how often* it takes place. Many security breaches are due to *internal* causes. The ability to comprehensively control and monitor security access activity is critical.

## System Management Facility (SMF)

SMF is an efficient recording mechanism that provides detailed information about overall system activity as well as specific subsystem activity. WAS z/OS writes SMF records detailing information about the requests it receives.

The WAS z/OS SMF records contain information about where the request ran, when it ran, how long it took, how much CPU it consumed, as well as a long list of other information. Using analysis tools the data in those SMF records may be used for:

- **Capacity planning** -- information derived from SMF records may be used to analyze usage trends, which permits better capacity planning.
- **Usage recording and chargeback** -- WAS z/OS SMF records provide greater insight into who is using which application, and how much resource was consumed. That information can be used for more accurate chargeback.
- **Business insight analysis** -- the information contained in the WAS z/OS SMF records as well as other subsystem SMF records provides a wealth of data to be mined for insights into system usage and trends.

## Summary

- WebSphere Application Server is IBM's product offering that implements accepted industry standards for a Java Enterprise Edition (EE) application server.
- WebSphere Application Server for z/OS provides all the interfaces and functions of WAS on other platforms, and in addition has z/OS-specific code that takes advantage of z/OS features and functions.
- The z/OS features taken advantage of by WAS z/OS provide business value to you in a variety of ways. This document highlighted those business value statements.

## For More Information

- Contact your local IBM representative
- Jeff Summers, IBM WebSphere Software Product Manager  
summerje@us.ibm.com
- Don Bagwell, IBM Advanced Technical Skills  
dbagwell@us.ibm.com