



Mainframe Summit Berlin

WebSphere Application Server on z/OS

Selita Faller
Technical Presales Specialist IBM System z
selita_faller@de.ibm.com

WebSphere Application Server

J2EE Application Model



- **Komponenten**

- Fokus der Anwendungsentwickler, EJBs, Servlets, JSPs und Clients
- Verhalten der einzelnen Komponenten kann beim Deployment spezifiziert werden, anstatt im Programmcode

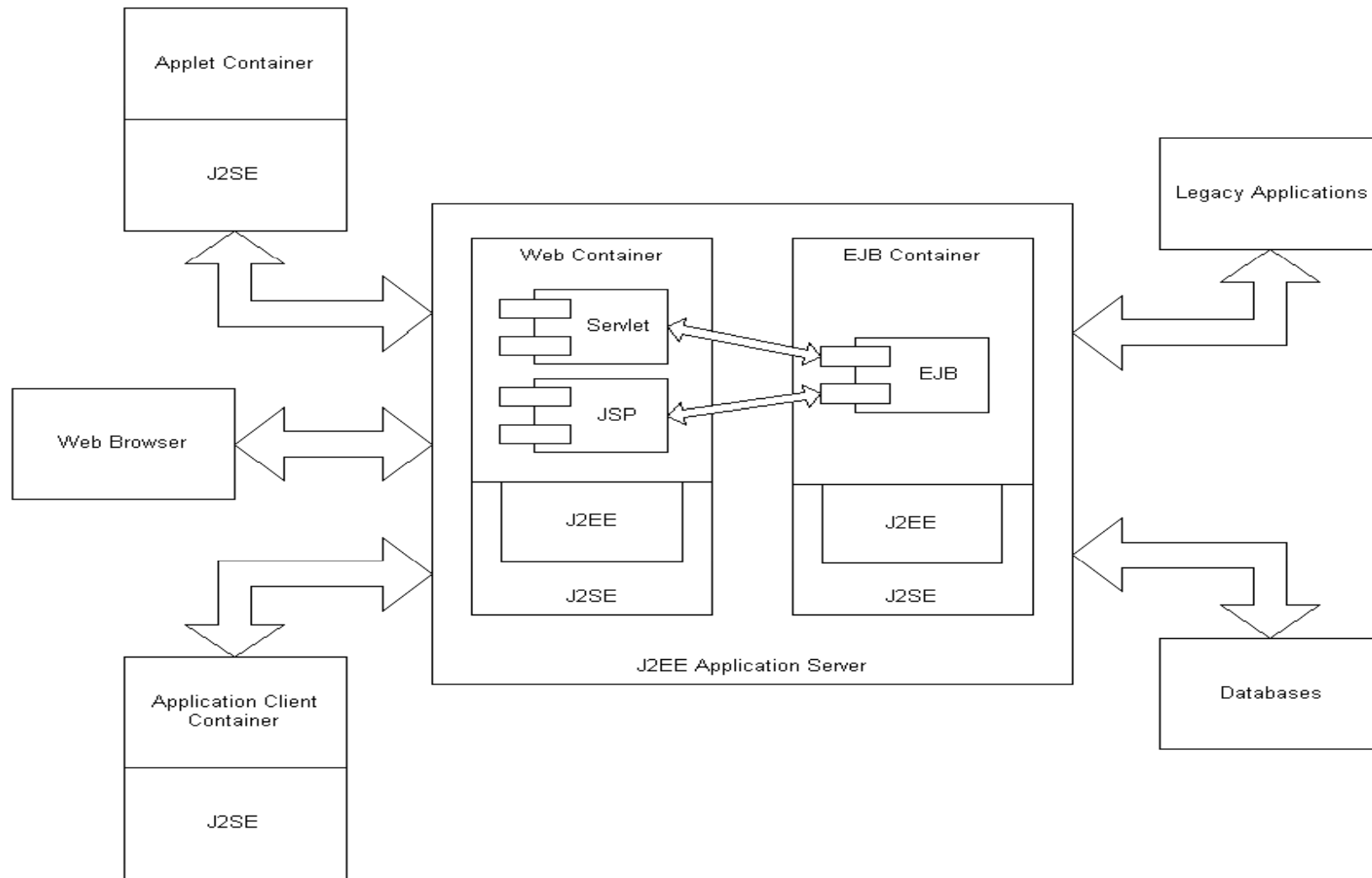
- **Container**

- Stellen den Komponenten transparent Services zur Verfügung, wie z.B. Transaktionalität oder Ressourcenpooling
- Container und Connectoren verbergen Komplexität und begünstigen Portabilität

- **Connectoren**

- Definieren portable Service APIs, um sich an existierende Anwendungen anzustecken
- Begünstigen Flexibilität, da sie eine Menge von Implementierungen von spezifischen Services ermöglichen

J2EE Application Server



WebSphere Application Server V6.1

Ease of Use

- Secure configuration out of the box
- Install Factory
- Simplified Administration
- Automation Toolkit
- Console command assistance
- Security enhancements

WebSphere Application Server V6.1

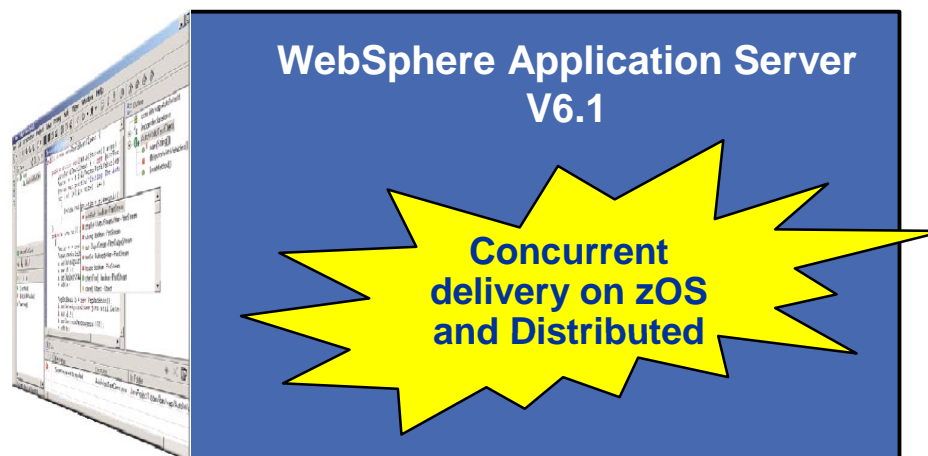
Ease of Use

- Non-root install
- Enhanced port conflict identification and resolution
- Improved migration tooling
- IHS administration enhancements
- IBM Support Assistant

WebSphere Application Server V6.1

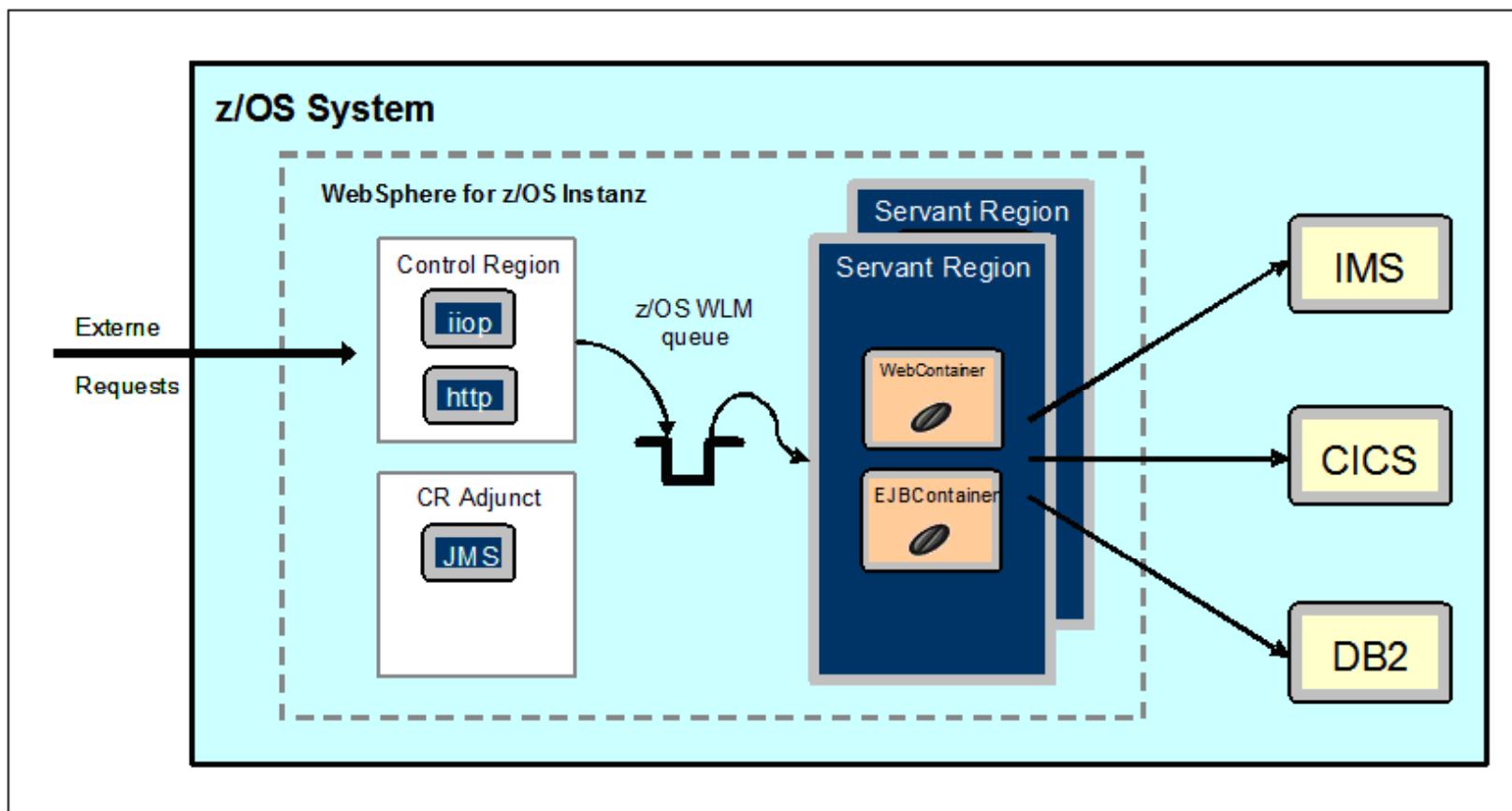
Standards Based Architecture

- J2SE 5.0
- WS Interop-Basic Security Profile
- WS-Notification
- WS-Resource Framework
- WS-Addressing
- WS-Business Activity
- Web services performance improvements
- JSR 168 Portlet support
- JSR 116 SIP servlet support



WebSphere for z/OS Exploitation

Address Spaces in zWAS



WebSphere for z/OS Exploitation

- Mainframe qualities of robustness
 - Hardware
 - CPU, I/O Subsystem, Storage protection
 - MTTF
 - Operating System
 - Isolation, Recovery, Architecture
 - Virtualization
 - LPAR
- Optimizations
 - Hyper-channel, Local TCP Stack Optimization

WebSphere for z/OS Exploitation

- Exploit Parallel Sysplex
 - Scalability and availability
 - Base operational unit
 - Design for clustering
- Exploit z/OS functionality
 - Plug into z/OS operations
 - Optimize to z/OS
- Design server for robustness and scalability
- Capitalize on current z/OS skills, procedures, responsibilities
- Capitalize on the adjacency of 'data' owners
 - Resource managers - IMS, CICS, DB2

WebSphere for z/OS Exploitation

–GDPS or DR

- WebSphere datasets, configuration information, security constructs can be handled by the same processes as all other z/OS subsystems
 - No special considerations
- Recovery is based on capacity not a duplication of boxes

–Capacity planning - utilization

- WLM classification of address spaces - if not the contents
- RMF reporting
- CoD

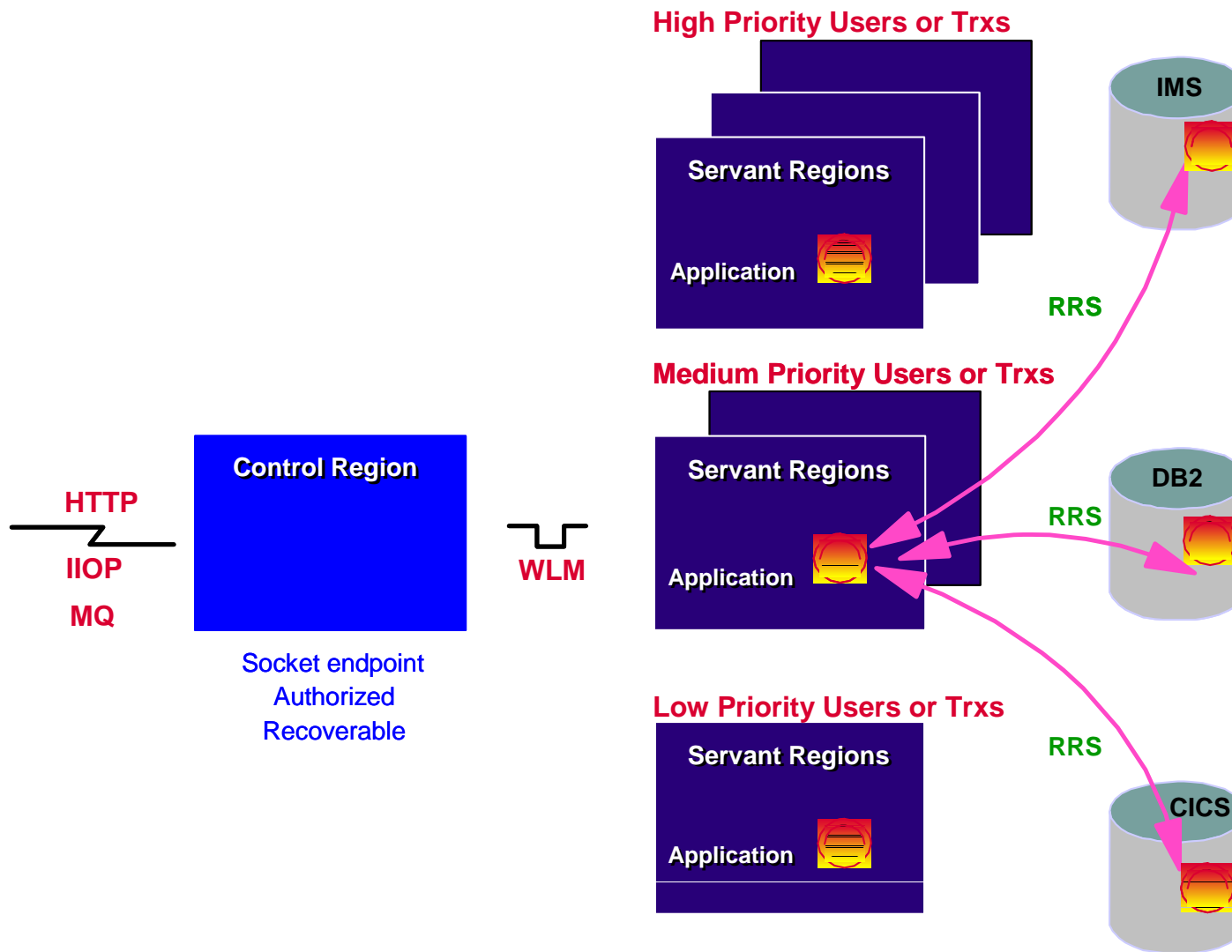
–Storage management

- DFSMS
- Backup
- File sharing environment

WebSphere for z/OS Exploitation

- Sysplex distributor
 - Client access distribution of TCP connections among clustered or cloned servers
- Scalability
 - MQ shared queues, DB2 data sharing, etc.
- Secure environment

z/OS exploitation



WebSphere for z/OS Exploitation

- WLM/RMF integration
 - Transactions
 - Classified,
 - Managed to goal,
 - Reported on
 - Server components
 - Classified,
 - Managed to goal,
 - Reported on

- SMF 120 Records generated by runtime
 - Transaction component information collected
 - Invocations, elapsed and CPU time
 - Interval and Activity records
 - Capacity planning

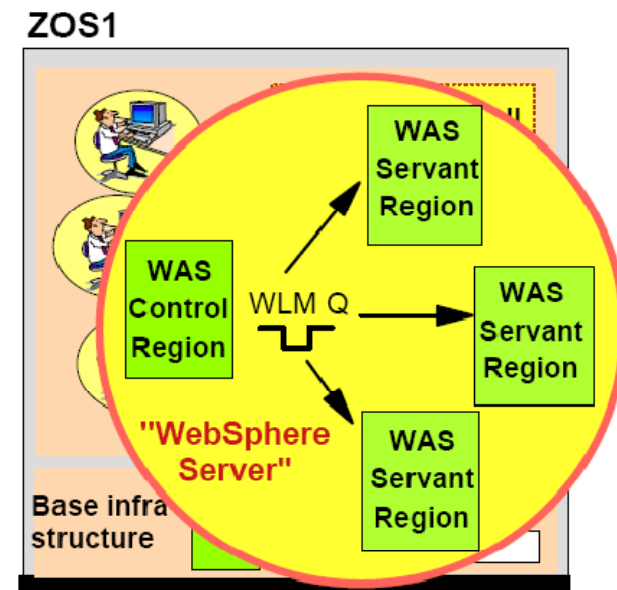
Workload Management

– Control Region

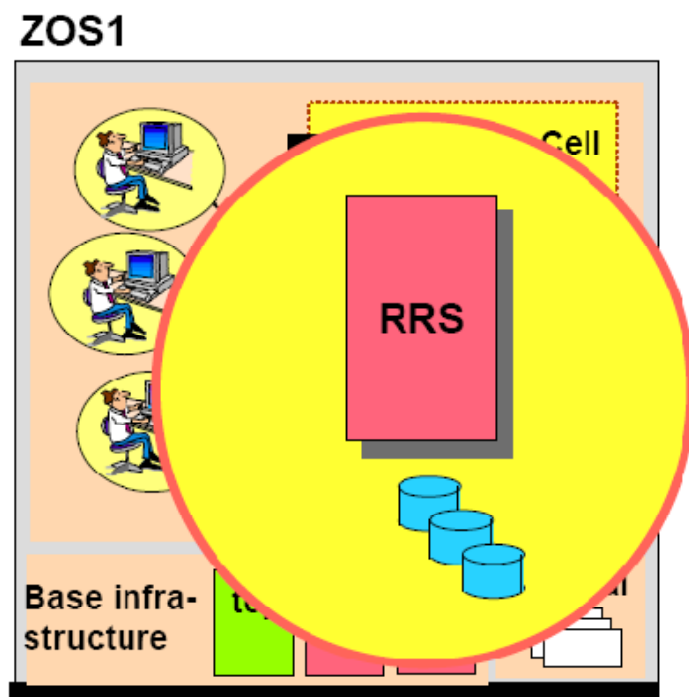
- Receives client requests (HTTP, IIOP), Message detection (JMS)
- Classifies work, places on WLM queues
 - Allows work to be managed at a more granular level, tradeoffs can be made based on importance
- Recoverable unit

– Servant Regions

- Work is selected from WLM queue and managed to goal
 - Work with different goals can be deployed in same server
- Number of regions can be managed by WLM - based on QMPL and attainment
 - Management by policy
- Thread management is much simpler - not tied to 'number of in-flight requests'



z/OS Resource Recovery Services (RRS) Usage



- Required for 2-phase commits
 - Supports various ressourcemanagers: WebSphere, DB2, IMS, CICS, APPC
 - Differentiates zWAS from other Web Application Servers on distributed platforms
- Subsystem usage is independent from product:
 - Usage of RRS is optional when it is active during the initialisation of: APPC, IMS, MQ, DB2
 - CICS needs to be configured to use RRS during startup
 - RRS has to be active during startup of: zWAS

WebSphere V6 Security Mechanisms

- Security in zWAS V6
 - RACF profiles & permissions
 - HFS file / directory permissions and ownerships

- Security for deployment of applications
 - SSL
 - Kerberos
 - EJB roles & ‚Runas‘ support
 - Cryptography support
 - JAAS
 - SAF



Installation and Maintenance

Installation and Service

– SMP/E Installation

- Provides auditability, backout
- Standard z/OS component packaging

▪ Service

- WAS z/OS V6 service is twice as frequent as non-z/OS
 - Critical WAS z/OS specific defects will ship in the WAS z/OS service stream
 - Maintain the current incremental PTF delivery
 - ++APARs can be requested by the customer for Sev1 P1 situations
- All service will be in synch across the family in odd numbered deliverables

Customization

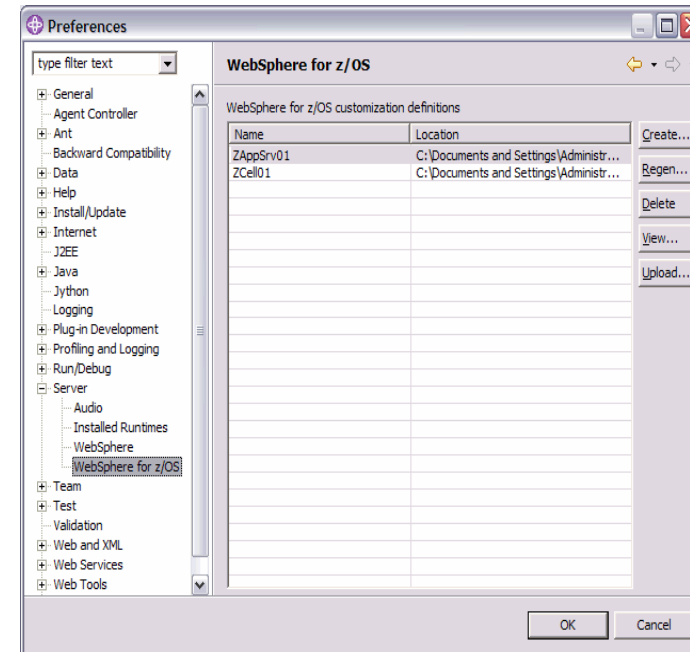
Dual path

– ISPF Dialogue

- Batch job streams generated
 - SAF Definitions
 - Parmlib, proclib updates
 - File system definition
- Targetted for specific roles
- Acknowledged skill and comfort level of of sysprogs at version 4 introduction.

– zPMT Dialogue

- Same Batch jobs generated from workstation GUI
- Provided in Application Server Tool Kit
- Acknowledges increased skills in V6.1 time frame and beyond.



Operational Management

Day-to-day operational tasks

- Server processes are z/OS Started Tasks
- Manageable and recoverable by System Automation
- Messages directed to console, SYSLOG, z/OS logstream and SYSOUT datasets
 - Self pruning, archivable
 - Merged
- Console commands for display, tracing, etc.

Operational Management ...

Recovery

- Control Region is recoverable entity
 - Servants are expendable
- Support Peer mode recovery in case of z/OS image failure
 - Traditional recovery technique used in parallel sysplex environment
 - Works for clustered and non-clustered servers
- Support HA Manager recovery
 - Enhanced by RRS cascaded transaction support
 - Clustered servers only
- Automatic Restart Manager supported for in-place and cross system recovery
- Deployment manager can be moved among systems

Optimizations - z/OS exploitation

- LOCALCOMM
 - Use cross memory services to communicate between WebSphere Servers rather than TCPIP when servers are co-located.
 - SSL avoidance
 - Security and WLM context propagated
- Thread affinity
 - Dispatch stays on same thread if application components are in same server.
 - Reduces communication costs
- Dataspaces and Common DataSpaces used for shared memory
 - Avoids communication costs and allows for light weight serialization
- RRS for transaction support

Optimizations - z/OS exploitation ...

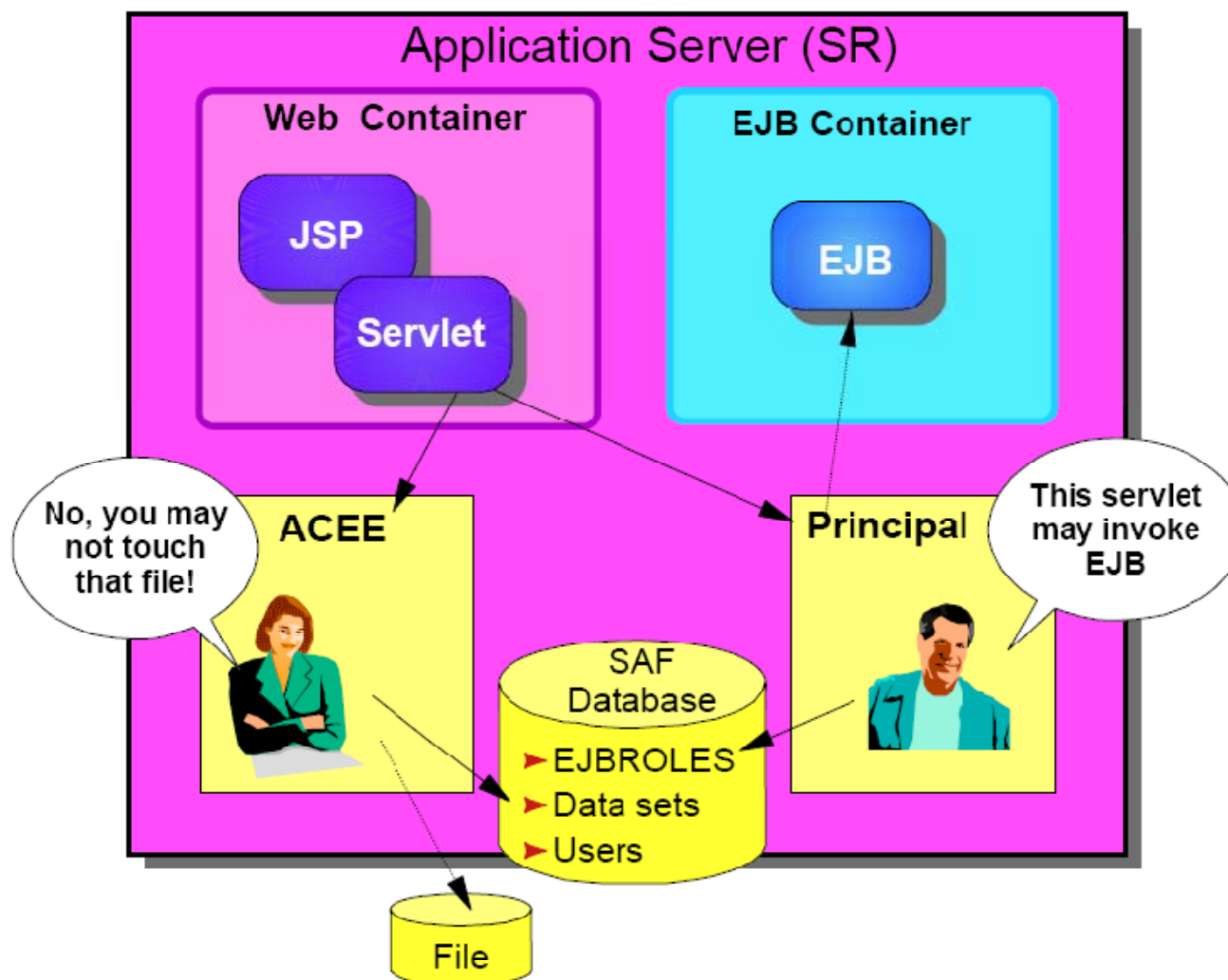
Security

- Type-2 connectors do not require the use of a userid and password
 - No need to store, update passwords in WebSphere configuration
- Client requests can be run with server or client credentials
 - DB2
 - File system access
- Authentication and authorization through SAF
 - Augment with other custom registries
- Certificates can be managed by SAF
 - Consistent security management process
- Clear key and secure key capability

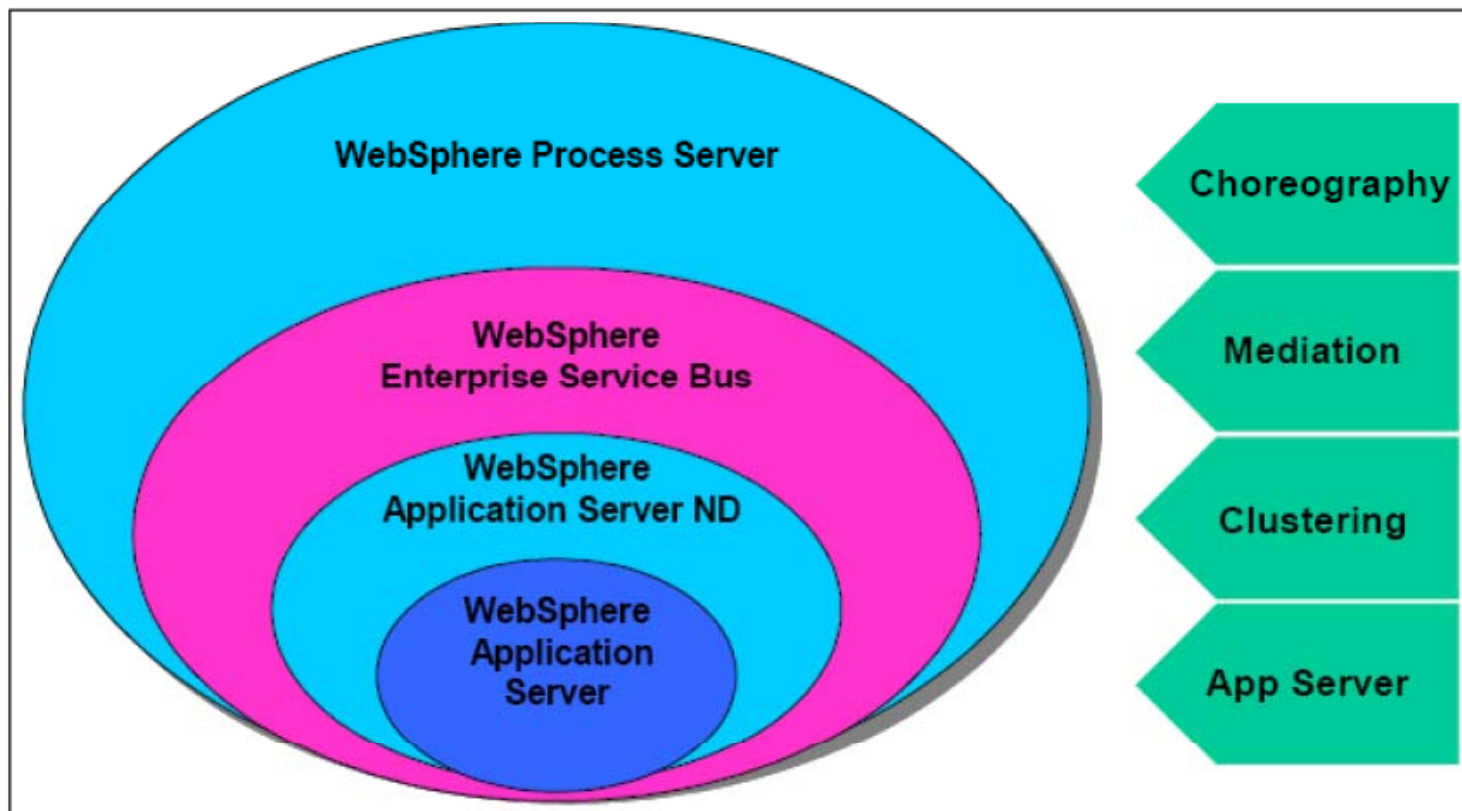
Summary

- **The value of running WebSphere on z/OS is the result of integration of the WebSphere runtime with z/OS services and the scalability and manageability of the underlying environment.**

Two principals: ACEE (z/OS) and Java



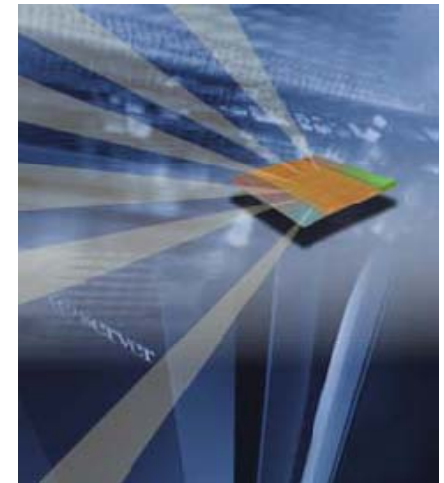
Product Relationship and Services



System z Application Assist Processor (zAAP)

New specialty assist processor dedicated exclusively to execution of Java workloads under z/OS® – e.g. WebSphere®, CICS, IMS, DB2

- Available on IBM Server™ zSeries® 990 (z990), zSeries 890 (z890) and System z9 BC and EC servers
- Used by workloads with Java cycles, e.g. WebSphere, DB2®
 - Executes Java code with no changes to applications
- Attractively priced, much lower than standard CPs
- Significantly lower maintenance costs than standard CPs
- Traditional IBM zSeries software charges unaffected
- Sub-capacity eligible IBM software charges can be reduced
- Up to 1 zAAP per general purpose processor in a CEC



Objective: Enable integration of new Java based Web applications with core z/OS backend database environment for high performance, reliability, availability, security, and lower total cost of ownership

Resources and References

WebSphere for z/OS "home page"

- www.ibm.com/software/webservers/appserv/zos_os390/
- WebSphere InfoCenter
<http://www-306.ibm.com/software/webservers/appserv/was/library/>
Download a copy onto your workstation - See Techdocs FQ102912
- Redbooks: www.redbooks.ibm.com
Monitoring WebSphere Application Performance on z/OS - SG24-6825
Writing Optimized Java Applications for OS/390 - SG24-6541
- Techdocs - White Papers, Hints & Tips
www.ibm.com/support/techdocs
 - Guides on Configuration, Installation, Operations, Tuning, Debugging
- Build a library of WAS & Java for z/OS pubs
 - Developers & Sysprogs need access to z/OS specific information
 - Information is perishable and time sensitive

Remember:

Out of date information is like no information or bad information.

Questions



Thank You!

Selita Faller

selita_faller@de.ibm.com