WebSphere Application Server for z/OS Version 5

Journée Technologique – 16 septembre 2004
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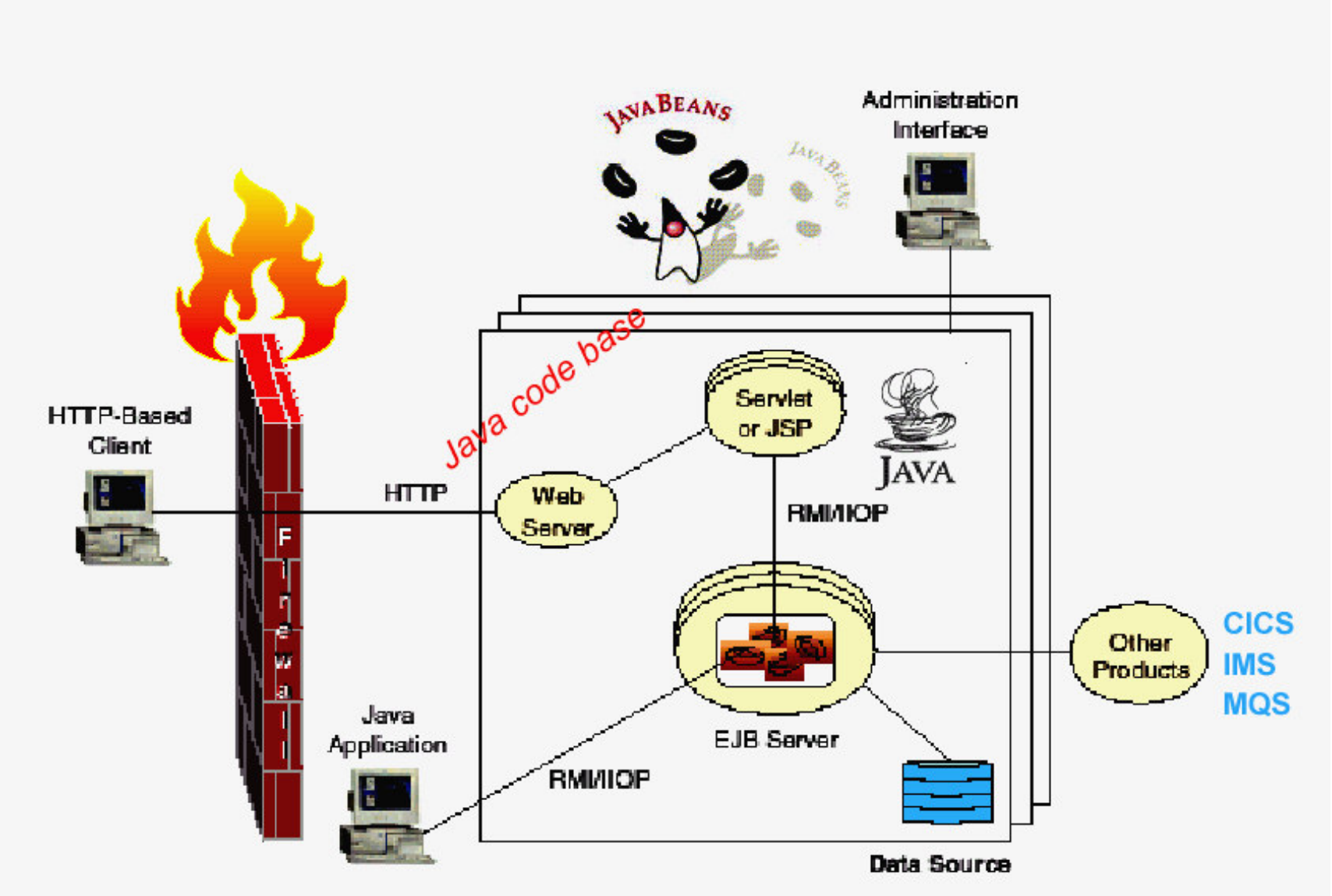
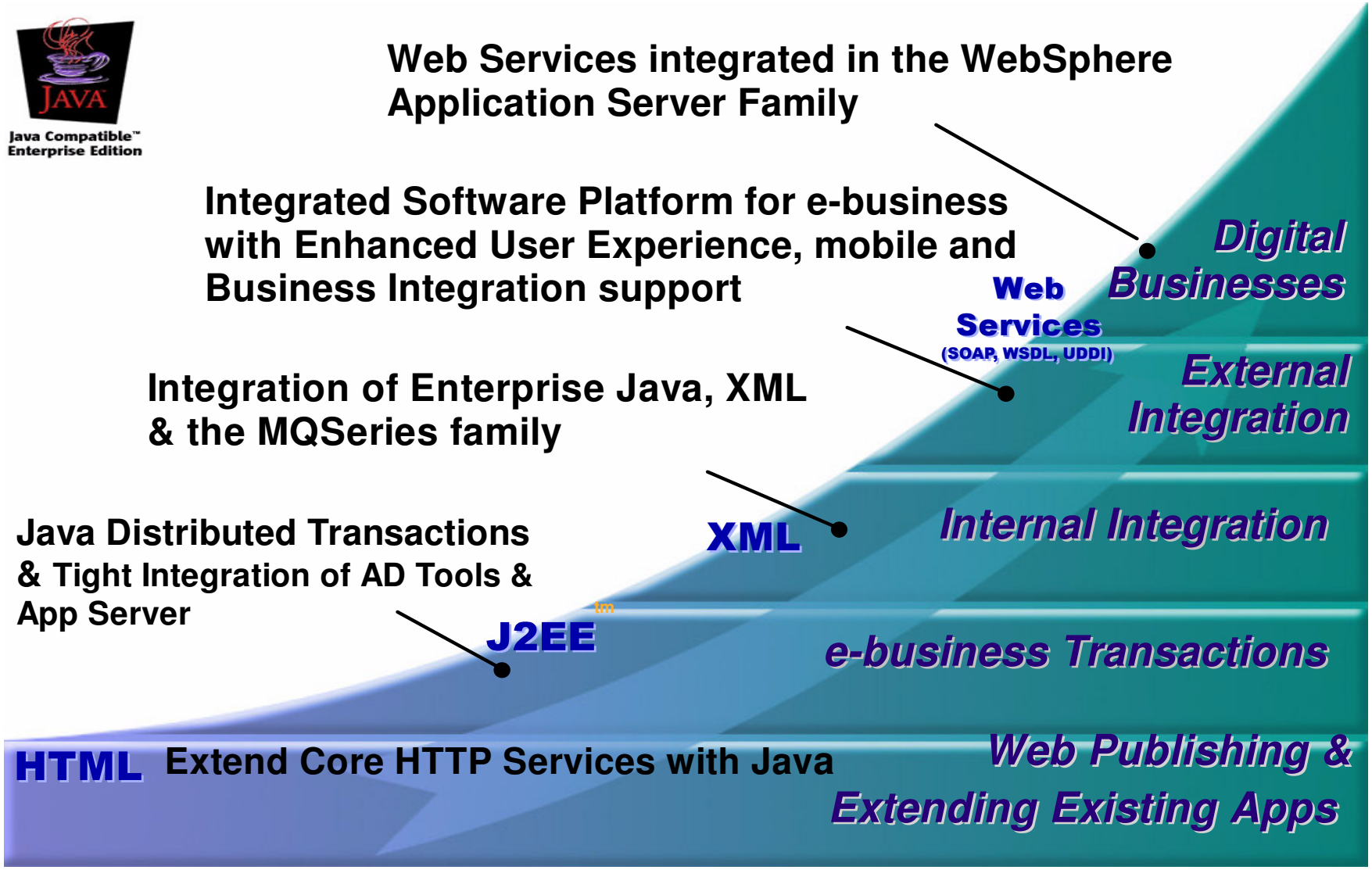
Agenda

- Introducing WebSphere Application Server
- zSeries WebSphere Positioning
- WebSphere on z/OS Optimizations
- zAAP introduction
- WebSphere Business Integration Server Foundation 5.1

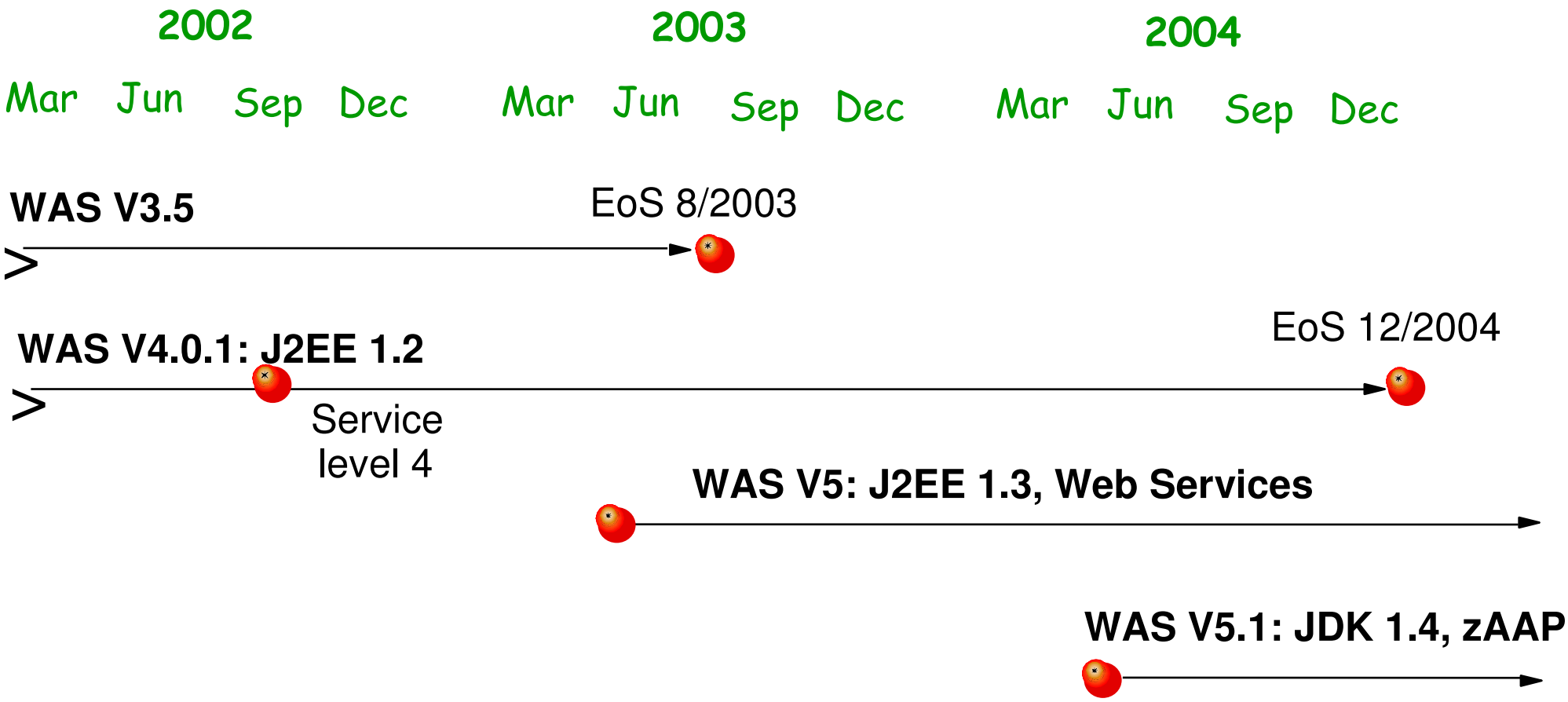
Review: what is an application server



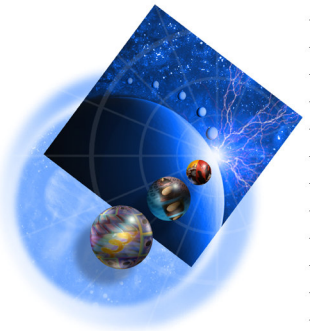
Directions



Versions WebSphere Application Server for z/OS



WebSphere Application Server v5

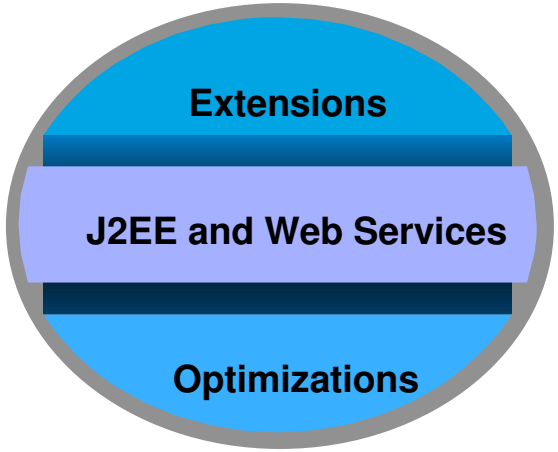


J2EE 1.3 Certified (Servlet 2.3, JSP 1.2, EJB 2.0, JDBC 2.1, JCA 1.0…)

Web Services Support (SOAP 1.2, WSDL 1.1, JAX-RPC 1.0, JSR 109, AXIS)

Java Messaging Support (JMS Client, a subset of WebSphere MQ)

J2EE programming **extensions**.



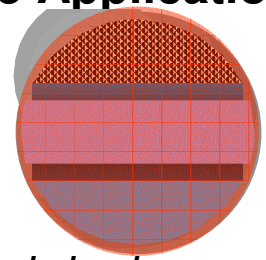
Centralized **administration** with web GUI, scripts or programs.

High Availability options with clustering, load balancing, backup clusters.

WebSphere **family products**: WebSphere Studio Application Developper, WebSphere Portal, WebSphere Commerce, WebSphere Business Integration…)

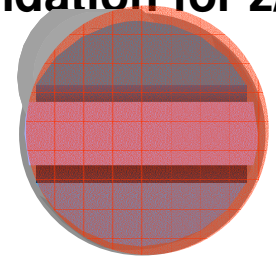
WebSphere Application Server V5 editions

WebSphere Application Server ND



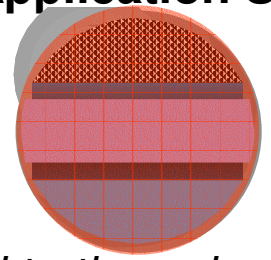
Advanced deployment services including edge services and distributed clustering

WebSphere Business Integration Server Foundation for z/OS



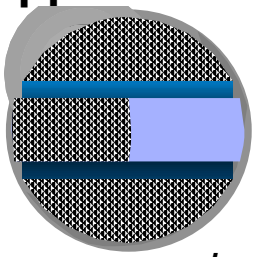
Simplifies build-to-integrate tasks, accelerates development, enables adaptable applications

WebSphere Application Server for z/OS



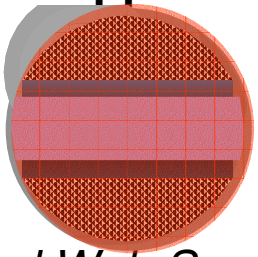
J2EE-certified configuration optimized to the unique qualities of service provided by z/OS

WebSphere Application Server Express



An easy on-ramp to e-business

WebSphere Application Server



The core J2EE and Web Services configuration

zSeries WebSphere Positioning

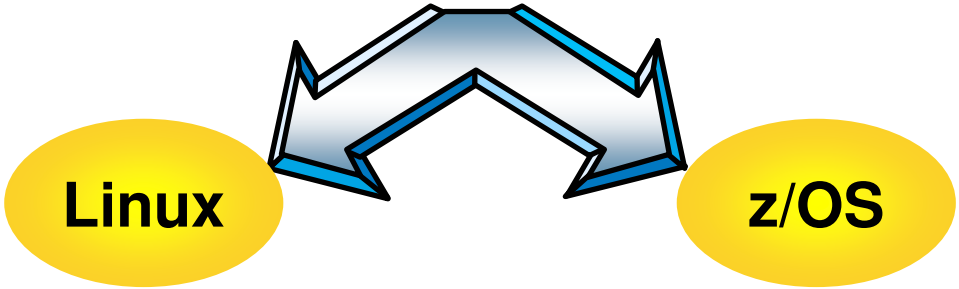
zSeries options for WebSphere Application Server

WAS MultiPlatform V5

J2EE 1.3 & Web Services
Common code base
Passive benefits from zSeries

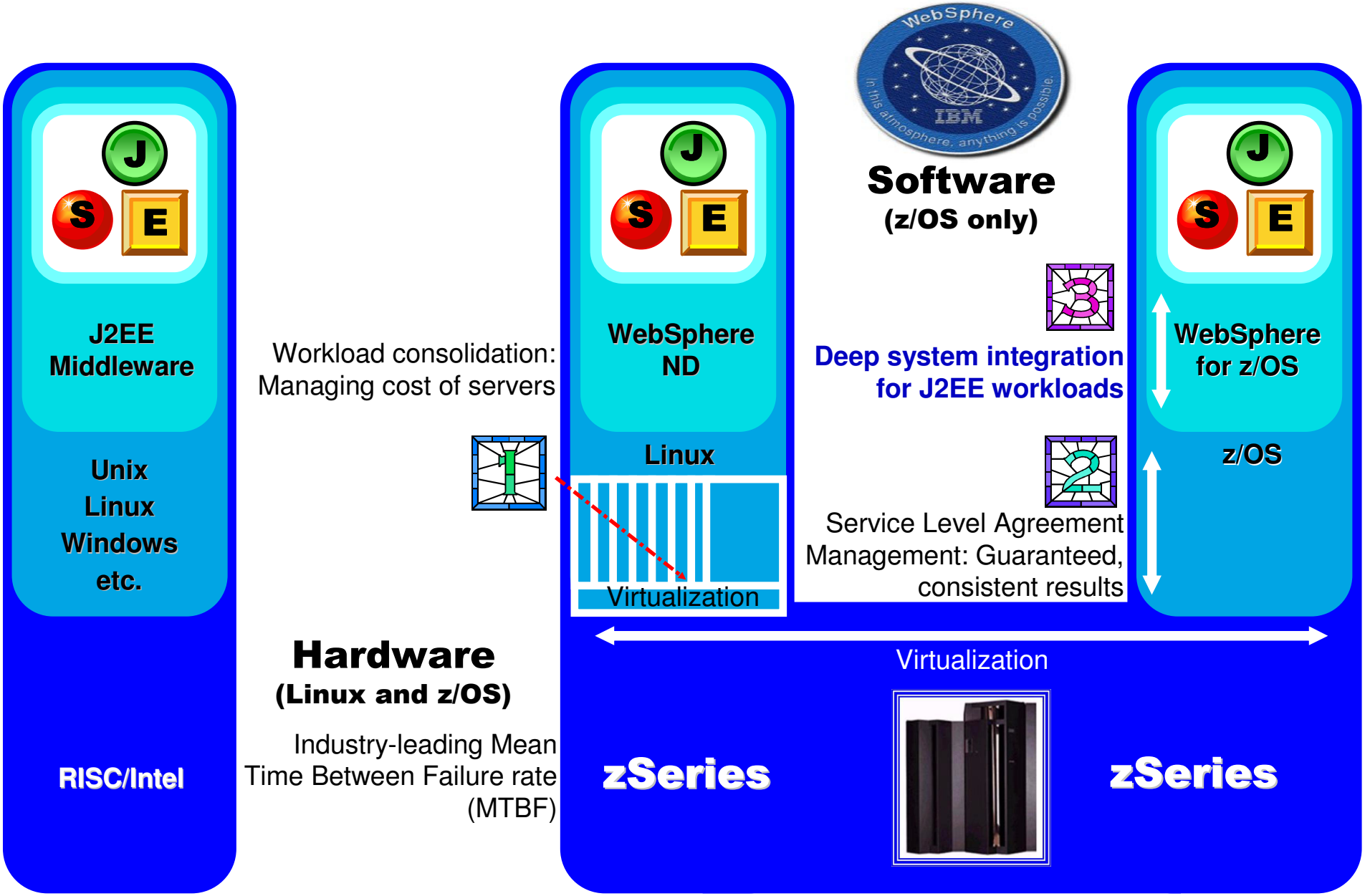
WAS for z/OS V5

J2EE 1.3 & Web Services
Unique infrastructure
Active exploitation of zSeries-z/OS



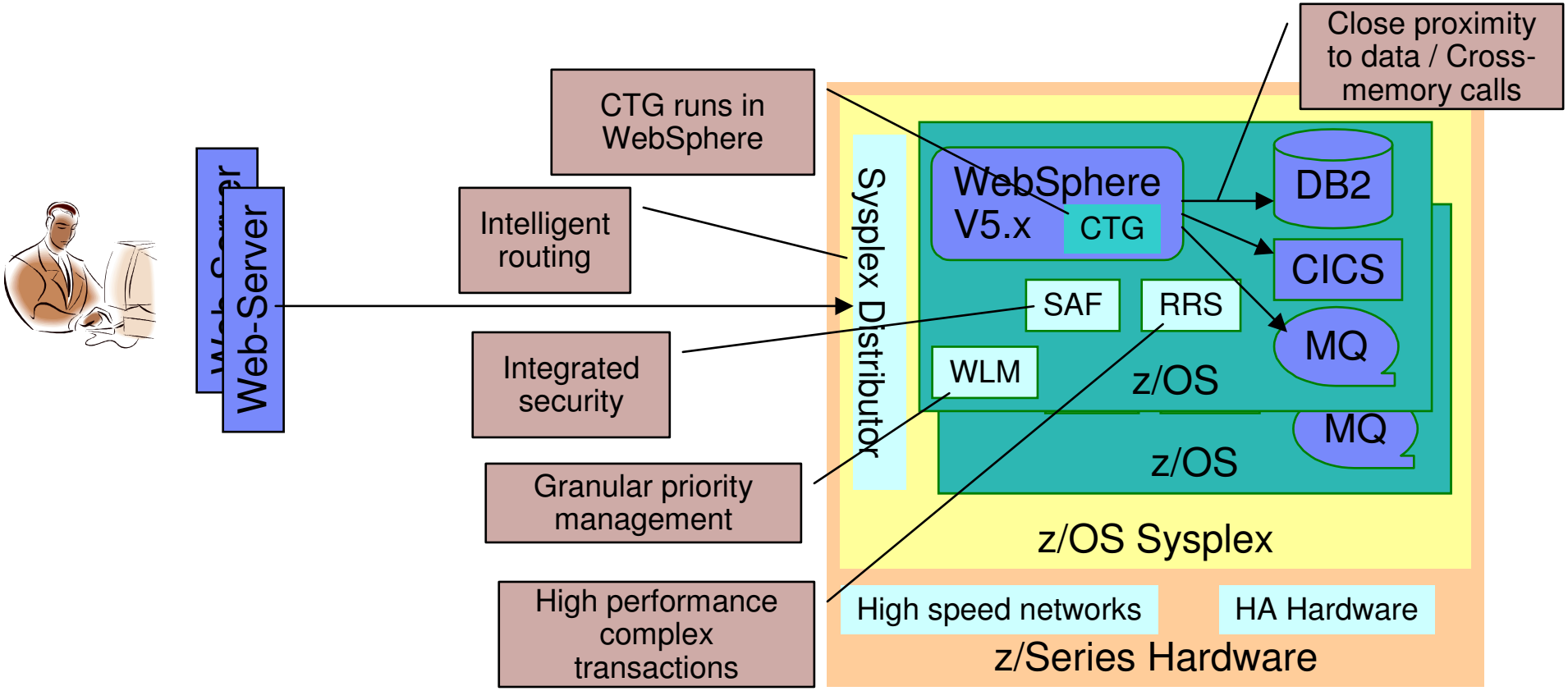
- Both adhere to the WebSphere development model and tools
- Both adhere to the WebSphere systems management/admin model and tools
- Each provides a unique value-add in the deployment of WebSphere applications
  - The Linux value proposition: simplify and optimise existing infrastructure for end-to-end WebSphere applications with the goal of reducing costs and complexities
  - The z/OS value proposition: provide highest possible Qualities of Service (QoS) in an efficient, cost-effective manner
  - Special optimisations are available when Linux and z/OS interact on the same server

zSeries WebSphere differentiation



WebSphere on z/OS Optimizations

WebSphere for z/OS Topology

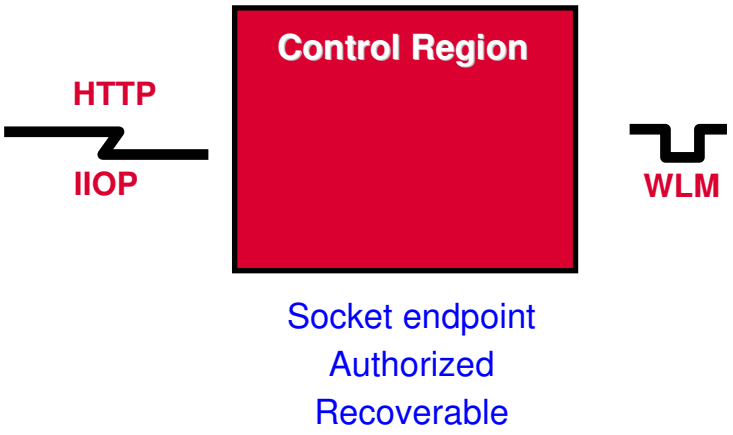


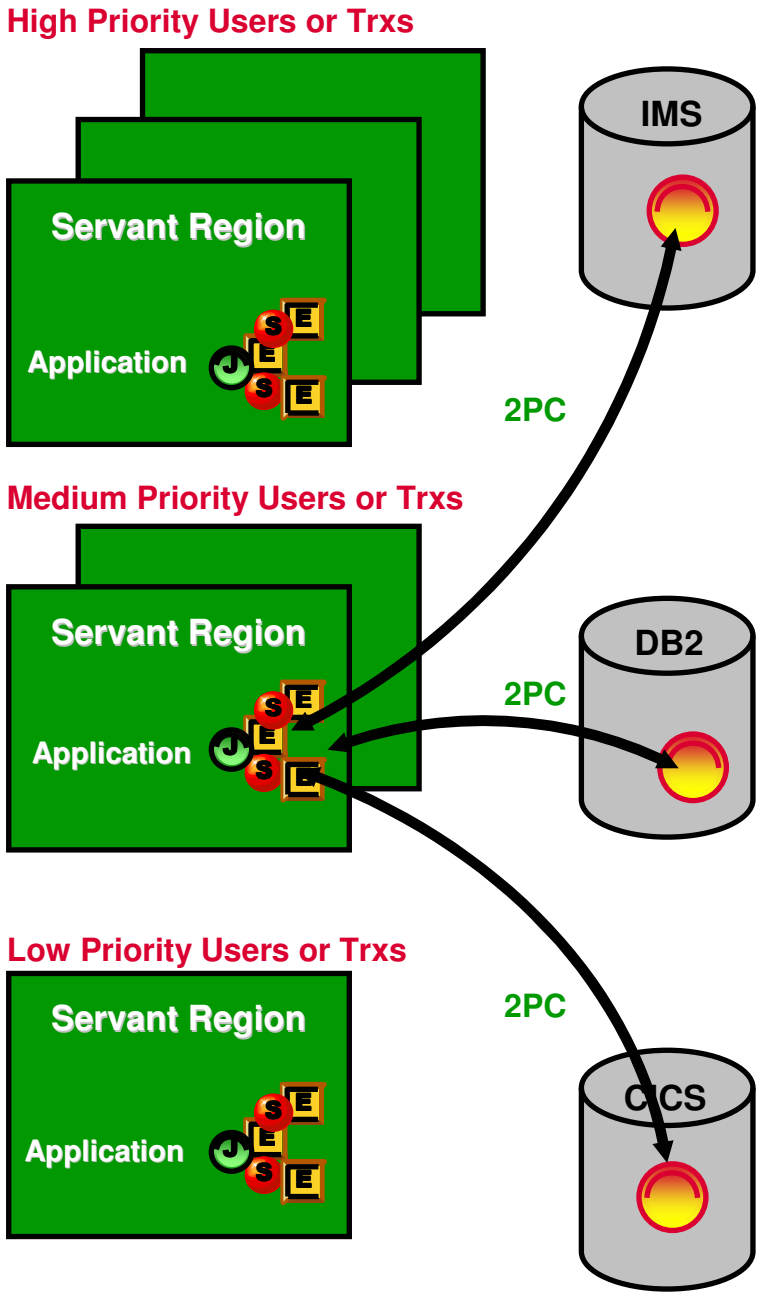
- Integrated environment – single view of total application
- Maximum use of z/Series and z/OS facilities
  - Virtualization of resources and setting priorities of transactions
- Highest performance to “host based” resources

WebSphere for z/OS was designed for z/OS

- State-of-the-art transactional runtime
  - Unique multi-process architecture leverages Parallel Sysplex scale and availability
  - Dependence on WLM exploits z/OS goal-oriented workload management
  - Use of RRS optimizes Resource Manager integration

and so on …





Merges the best of 30 years of mission critical transaction monitors with the J2EE programming model: Isolation, Availability, Consistency, Resource management, Two phase commit (2PC)

- zSeries hardware
  - Virtualization technology (logical partitioning)
  - Self-configuring, self-healing components (eLiza)
  - Cryptographix Engine
  - zSeries Application Assist Processor
- Integrated Sysplex functionality
  - Ability to provide near-linear scale in a cluster
  - Ability to survive a software sub-system outage w/o loss of availability of the system
  - Shared HFS, Sysplex Distributor, Data sharing
- State of the art resource management
  - Ability to differentiate and prioritize work based on service level requirements
- Advanced resource recovery services
  - Support for application models which require 2PC across IMS, CICS, and DB2
- Things we haven't even discussed today
  - Nondisruptive change to software components (z/OS, WAS and resource managers)
  - Local connection to backend resources
  - Deep end-to-end security integration
    - RACF integration
    - End-to-end security from WebSphere to EIS and databases
    - "Mainframe" security controls for user access to TCP/IP stack, ports, network
    - Integrated intrusion detection services (port scanning, stack attacks, flooding detection)

Some WAS for z/OS reference accounts

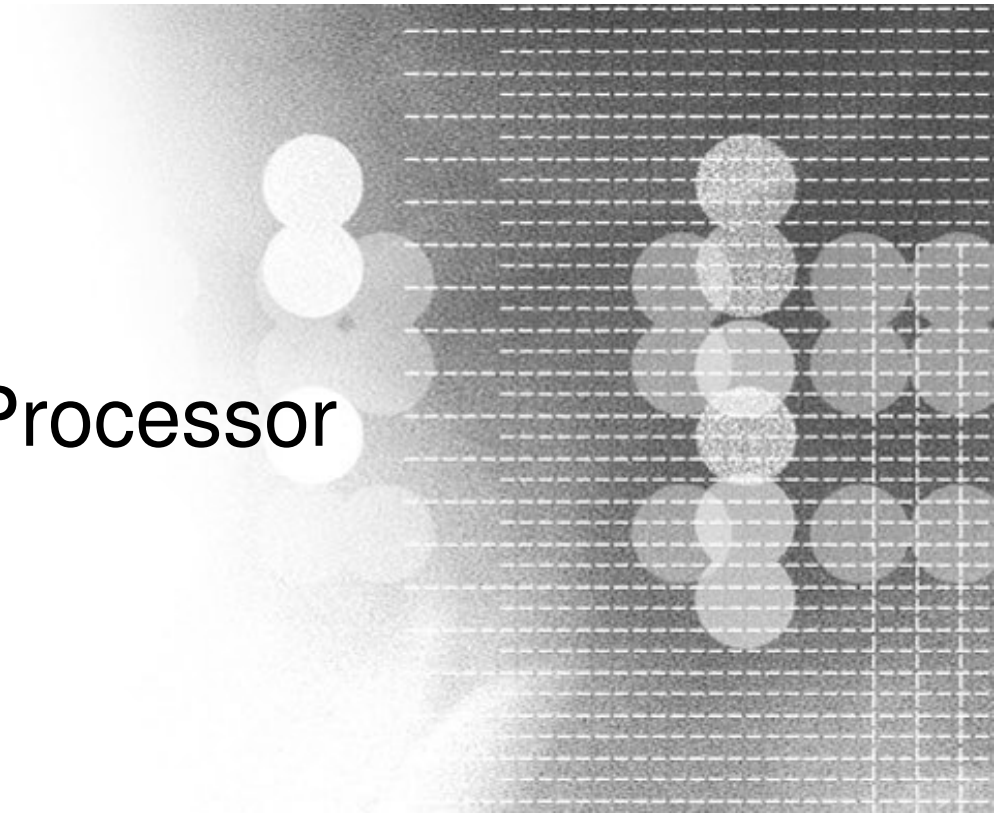
- **Royal Bank of Canada**
  - Internet Banking application to open a new account
  - Modest throughput, but very high profile on security and availability
- **State of Washington**
  - Entirely new web-based court scheduling and document management system
  - Currently 100 Tx/day now, full production will average 12,000 - 15,000 Tx/day
- **Toyota**
  - Parts inventory system; increase access and usability, provide tighter integration with existing systems
  - Global prototype handling over 25,000 Tx/day (9 hour shift)
- **Zurich Insurance**
  - Customer search, claim organization, policy search, claim assignment, two maintenance apps

    Managing 10,000-15,000 Tx/day
  - Advanced Claim Technology, approach 1M Tx/day

WebSphere Conclusion

- WebSphere z/OS offre toutes les fonctionnalités de WebSphere
  - Compatibilité complète pour le développement applicatif
  - Outils communs de déploiement et d'administration
  - Disponibilité des éditions "WAS-ND" et "WBI-SF"
- WebSphere z/OS tire parti de la qualité de service de z/OS
  - Scalabilité, disponibilité : équilibrage de charge par WLM de MVS, support Sysplex
  - Sécurité traitée par le gestionnaire de la plate-forme (RACF - interface SAF)
  - Automatisation : arrêt-relance par ARM, planification des opérations (OPC)
  - Reporting : utilisation de rapports RMF et enregistrement d'informations dans SMF
  - Connexions plus performantes aux applications legacy (CICS, IMS, DB2,...)
- A utiliser si :
  - Nécessité d'une très haute qualité de service
  - Importance des connexions au "backend" z/OS (proximité des données)
  - Volonté de mutualiser les ressources

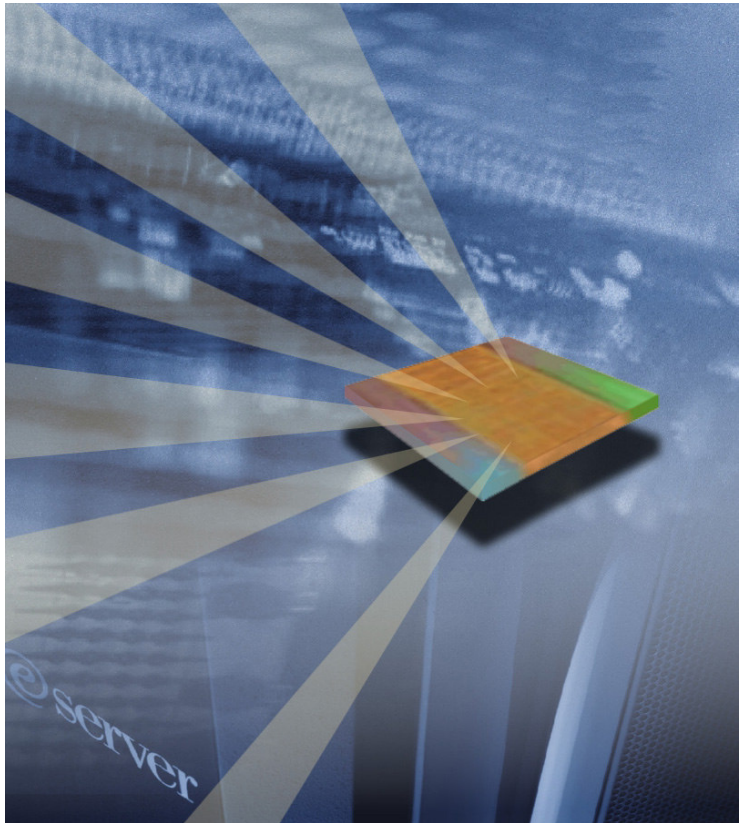
zAAP:
zSeries Application Assist Processor



Introduction

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

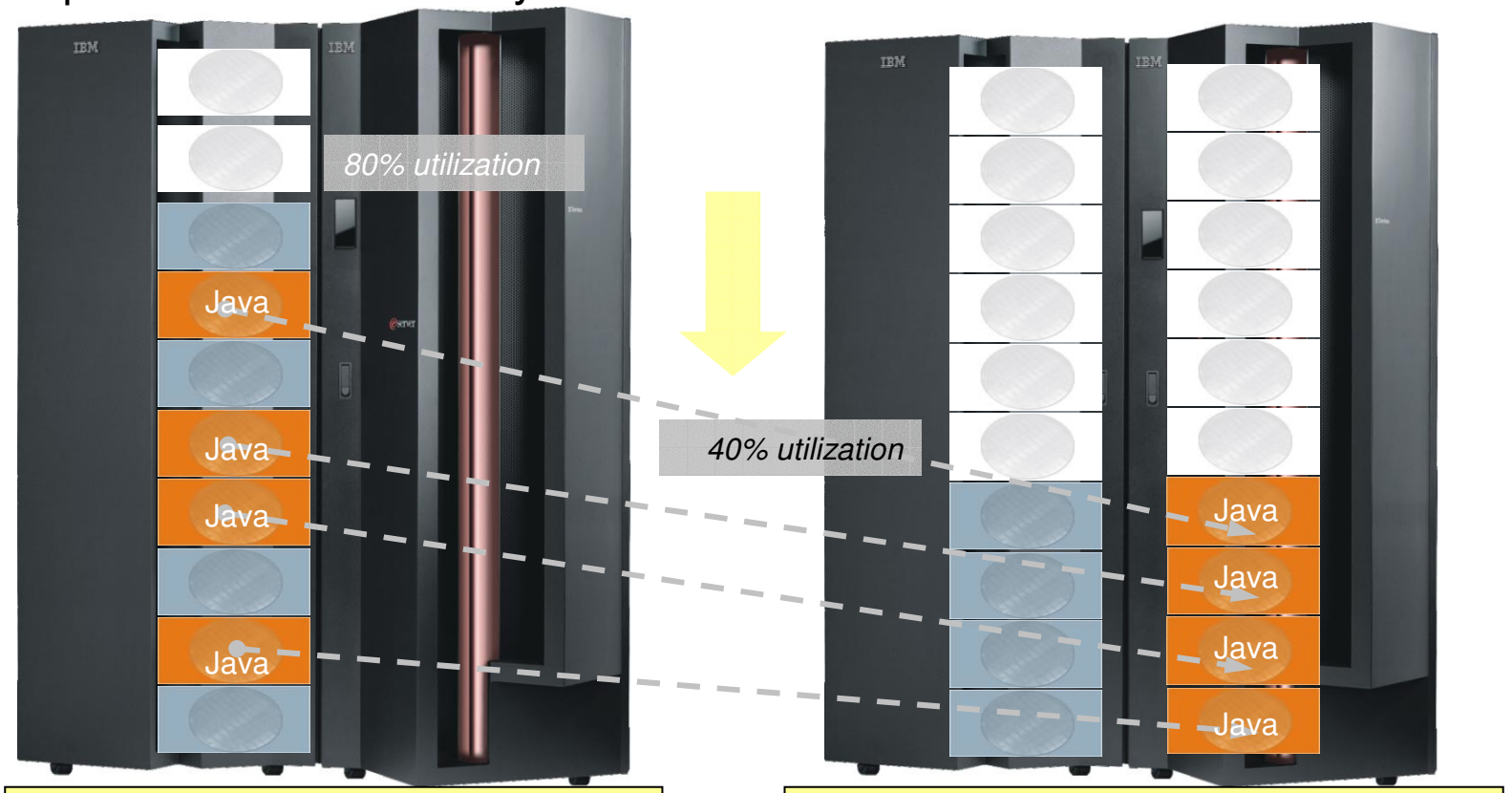
- Available on IBM Server™ zSeries® 990 (z990) and zSeries 890 (z890) and future zSeries servers only
- Leveraged by workloads with Java cycles, e.g. WebSphere, DB2®
- Up to 1 zAAP per general purpose processor in an LPAR
- Executes Java Code with no changes to applications
- Traditional IBM zSeries software charges unaffected
- Sub-capacity eligible IBM software charges can be reduced
- zAAP feature planned availability for June 30th, 2004; software exploitation planned for September 24th, 2004 with z/OS 1.6



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

zAAP Concept Overview: A Simplified Example…

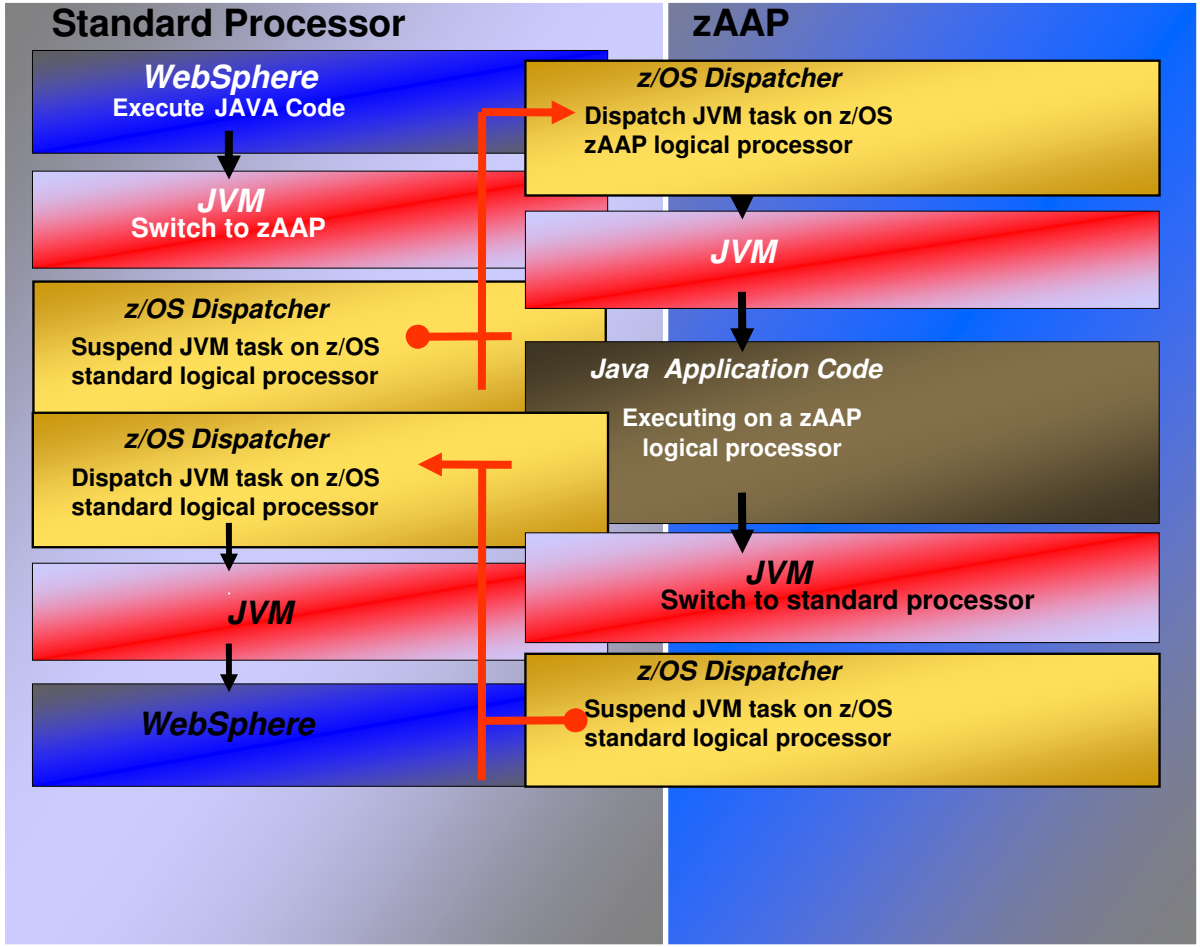
Consider a WebSphere Application that is transactional in nature and requires 1000 MIPS today on zSeries.



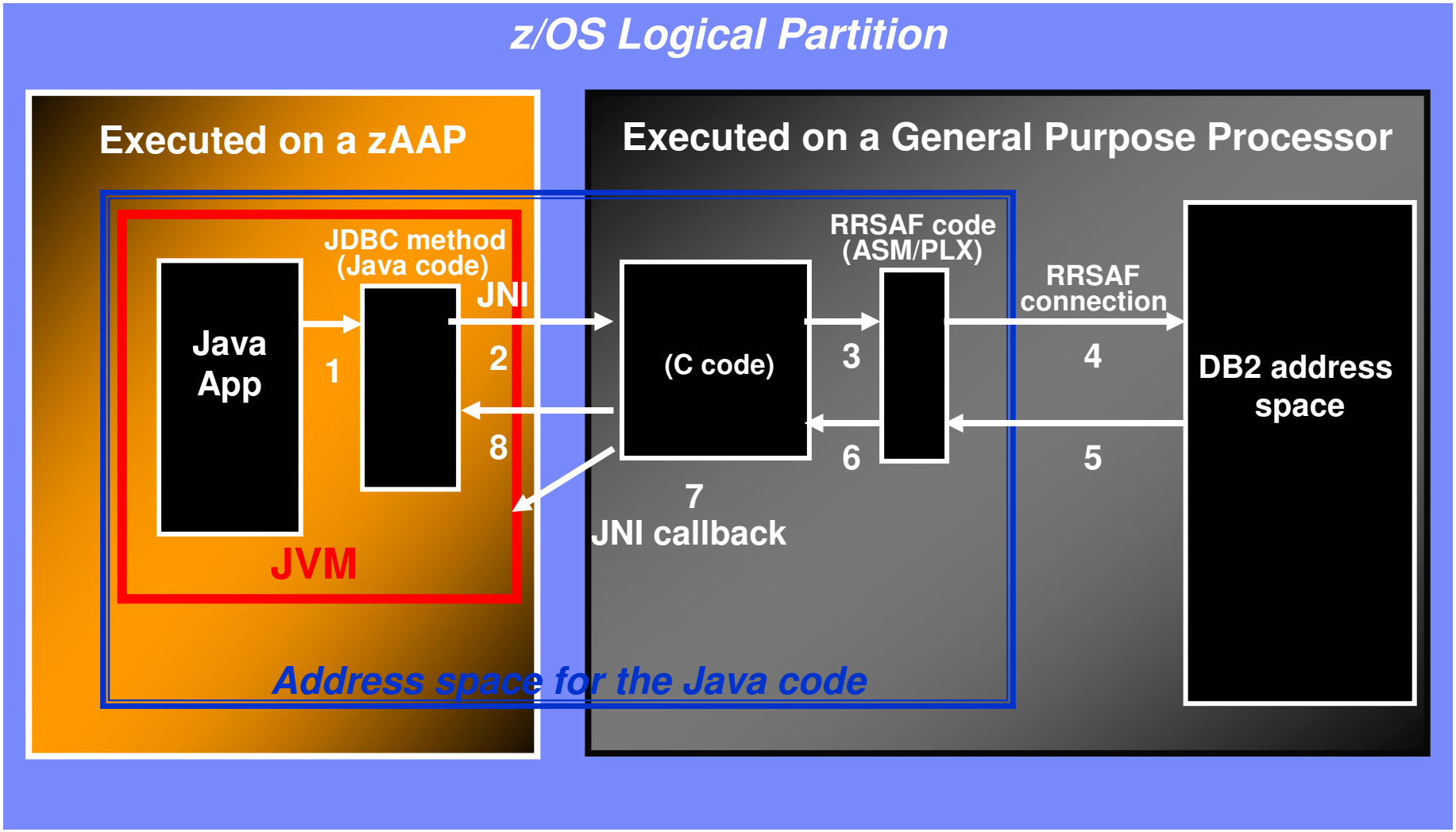
In this example, with zAAP, we can reduce the standard CP capacity requirement for the Application to 500 MIPS or a 50% reduction. ** For illustrative purposes only*

zAAP Architecture and Workflow: Executing Java under IBM JVM control

- **IBM JVM, parts of LE runtime, and z/OS Supervisor needed to support JVM execution can operate on zAAPs**
- **IBM JVM communicates to z/OS dispatcher when Java code is to be executed**
  - When Java is to be executed, the work unit is "eligible" to be dispatched on a zAAP
- z/OS dispatcher attempts to dispatch zAAP eligible work on a zAAP (when present)
  - zAAP ineligible work only dispatched on standard processors
- If there is insufficient zAAP capacity available, or standard processors are idle, the dispatcher may dispatch zAAP eligible work on a standard processor
  - There is an installation control to limit the use of standard processors to execute zAAP eligible work (see Java code execution options)



zAAP Integration at Work: Java App calling DB2



zAAP Configuration Execution Options

- zAAPs are Configured via the Normal PR/SM™ Logical Partition Image Profile
- Java Application code can be executed under any of the following user specified options:
  - *Option 1 - Java by Priority (IFAHONOR_PRIORITY = Yes)*

    Standard processors execute both Java and non-Java work in priority order (as when zAAPs are not configured)
  - *Option 2 - Java Discretionary Crossover (IFAHONOR_PRIORITY = No)*

    Standard processors execute non-Java work in priority order and Java work in priority order only when there is no non-Java work to execute
  - *Option 3 - No Java Crossover (IFACrossover = No)*

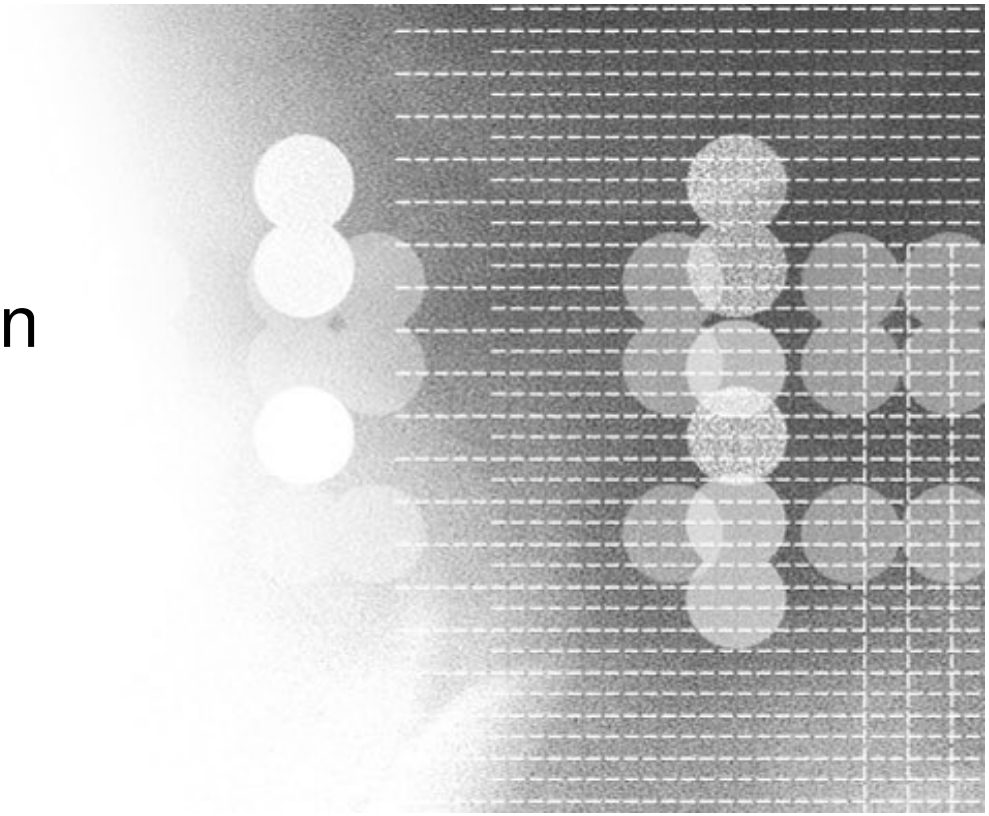
    Standard processors execute only non-Java work in priority order
  - *The selected switching option can be dynamically changed by a SET OPT command*
- Enhanced RMF™ Reports (to include zAAP Usage)
  - Standard Processors: Reporting as today
  - Timing enhancements for zAAPs
- Enhanced SMF Records (to include zAAP Usage)
  - Type 30 & Type 72

    New fields for zAAP time and zAAP eligible on a CP

Requirements for zAAP Exploitation

- **Available on z990, z890 and follow-on models only**
- **Prerequisites:**
  - z/OS 1.6 (or z/OS.e 1.6)
  - IBM SDK for z/OS, Java 2 Technology Edition, V1.4 with PTF for APAR PQ86689
  - Processor Resource/Systems Manager™ (PR/SM) must be enabled.
- **Subsystems and Apps using SDK 1.4 will exploit zAAPs automatically**:
  - WAS 5.1
  - CICS® /TS 2.3
  - DB2 V8
  - IMS™ V8
  - WebSphere WBI for z/OS
- **zAAPs must be jointly configured with general purpose processors within z/OS LPARs**
  - Number of zAAPs may not exceed the number of permanently purchased CPs (including z990 unassigned CPs or z890 Downgrade - Record Only CPs) on a given machine model.

WebSphere Business Integration Server Foundation 5.1



"I want to quickly build and deploy flexible systems that are closely aligned with my business imperatives"

Increase business flexibility by leveraging a service oriented architecture to build modular applications that are designed to adapt quickly to change

"I want to decrease the complexity, risk, and cost of integration"

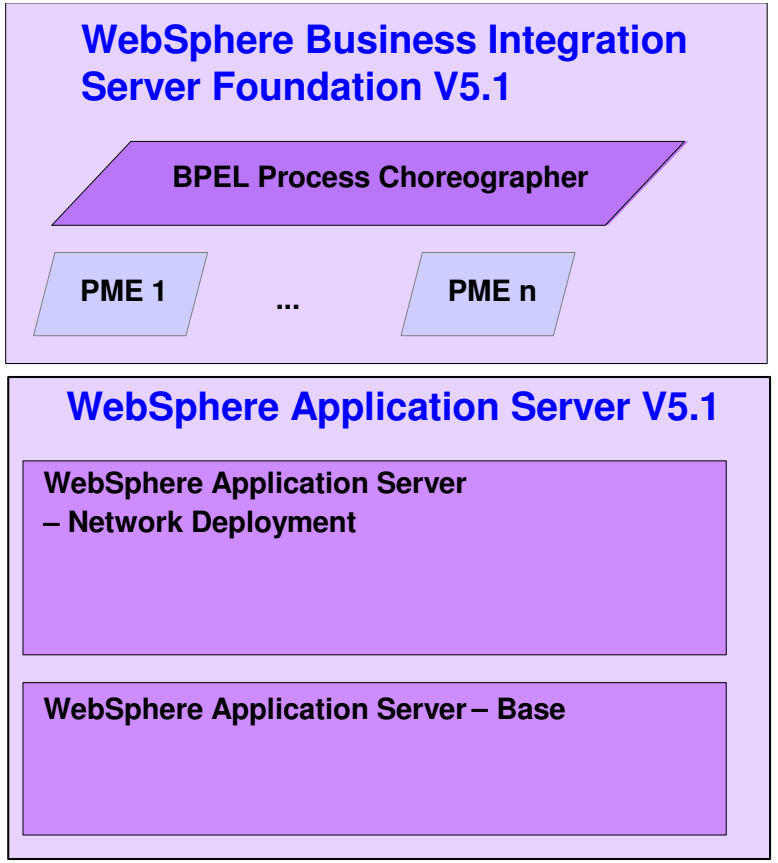
Maximize the return on your infrastructure investments by developing applications using industry supported open standards

"I want to accelerate my entire application development process, so that applications get delivered on time, within budget, and with the functionality my business requires"

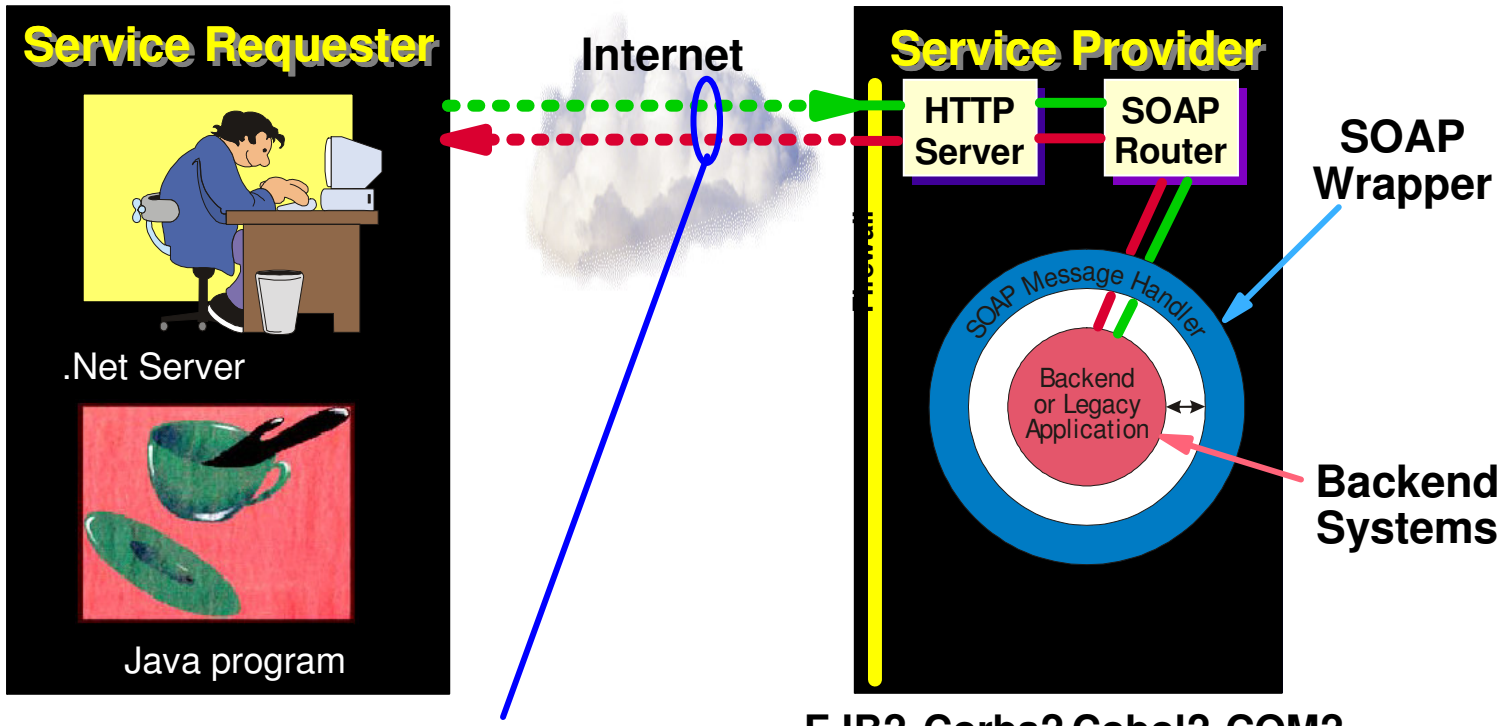
Increase developer productivity by building composite applications using a highly integrated development environment with specialized integration functionality

Composants

- WebSphere Enterprise -> WBI Server Foundation
- Toutes plates-formes - dont z/OS : Juin 2004
- Développement : WSAD Integration Edition
- WBI-SF = WAS-ND, plus extensions :
  - **BPEL process choreographer**
  - Programming model extensions
- WebSphere Application Server V5.1 z/OS
  - JDK 1.4.1 -> "ready for zAAP"
  - Serveur J2EE 1.3
  - Connectivité au backend
  - Exploitation de la QoS z/OS



Process Choreographer: relier les Web Services

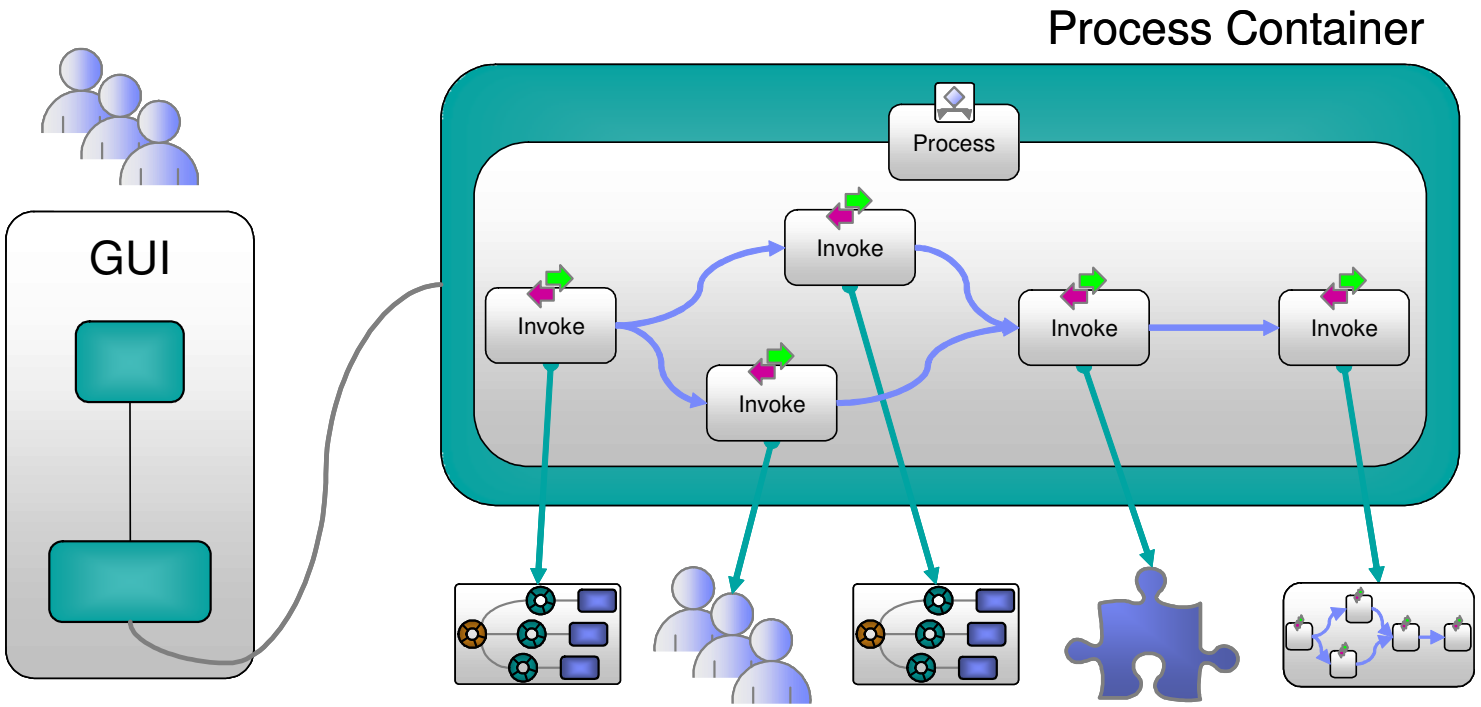


Simple, standard XML messages

- seul compte le format et le contenu du message
- l'implementation du service est totalement transparente
- SOAP défini l'enveloppe, le transport peut être HTTP, MQ/JMS, SMTP...
- WSDL défini la description des Web Services
- UDDI défini l'interrogation/publication des Web Services dans un annuaire

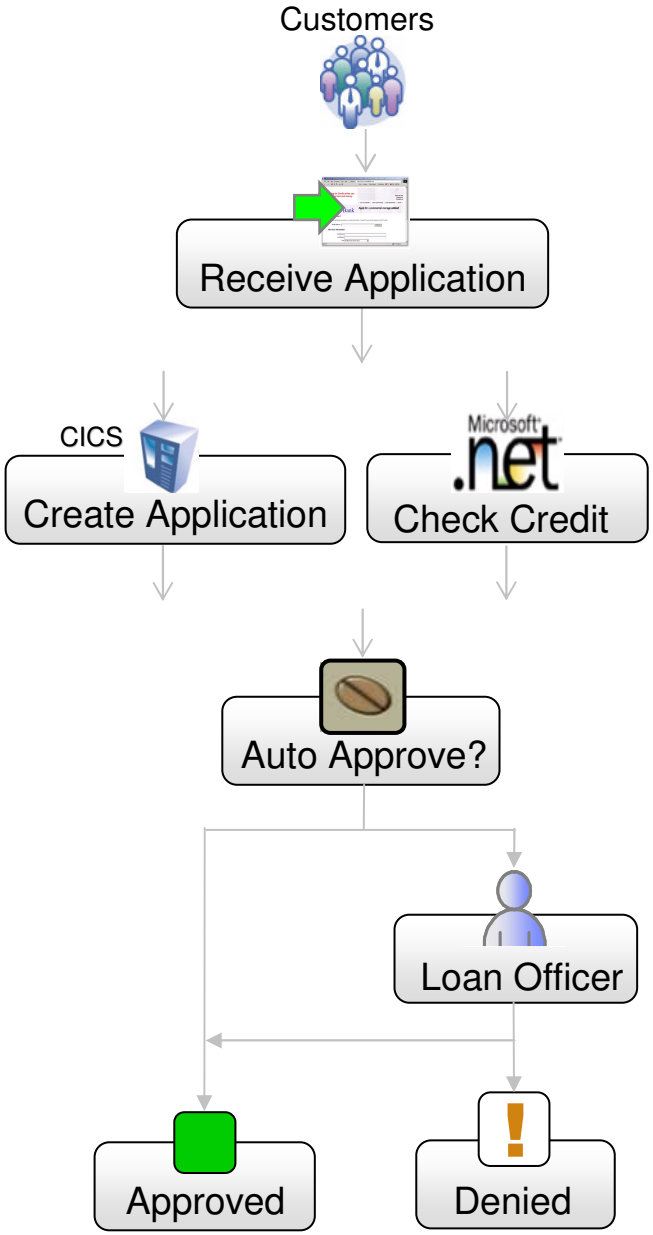
Process Choreographer

- Process Engine basé sur le standard BPEL (Business Process Execution Language for Web Services) proposé par l'industrie pour la "chorégraphie" de services Web
- Exécution d'applications de type "Workflow"
- Extensions pour le support de compensation (Rollback)
- Extensions "Human Workflow"

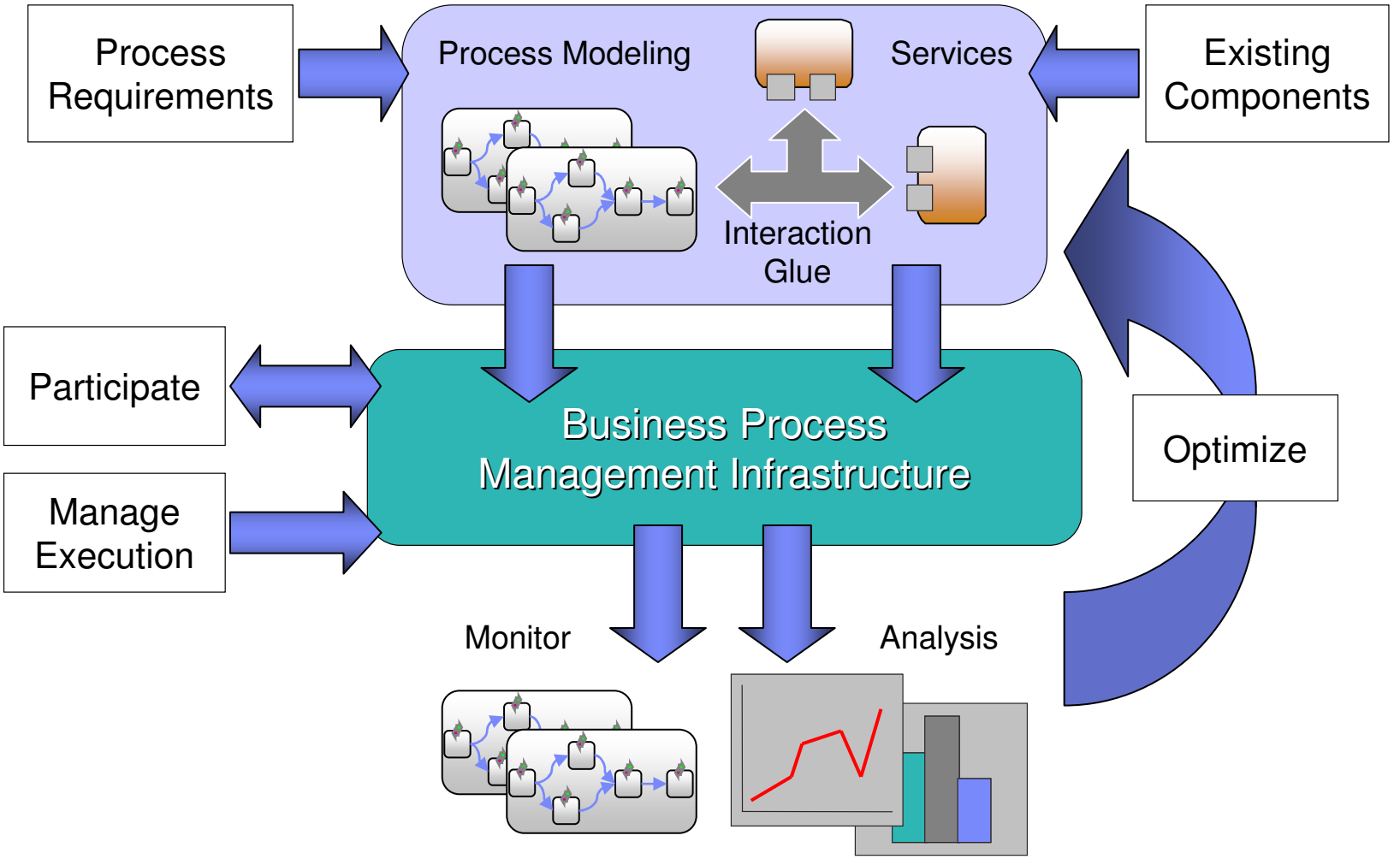


Business Process Execution Language for Web Services (BPEL)

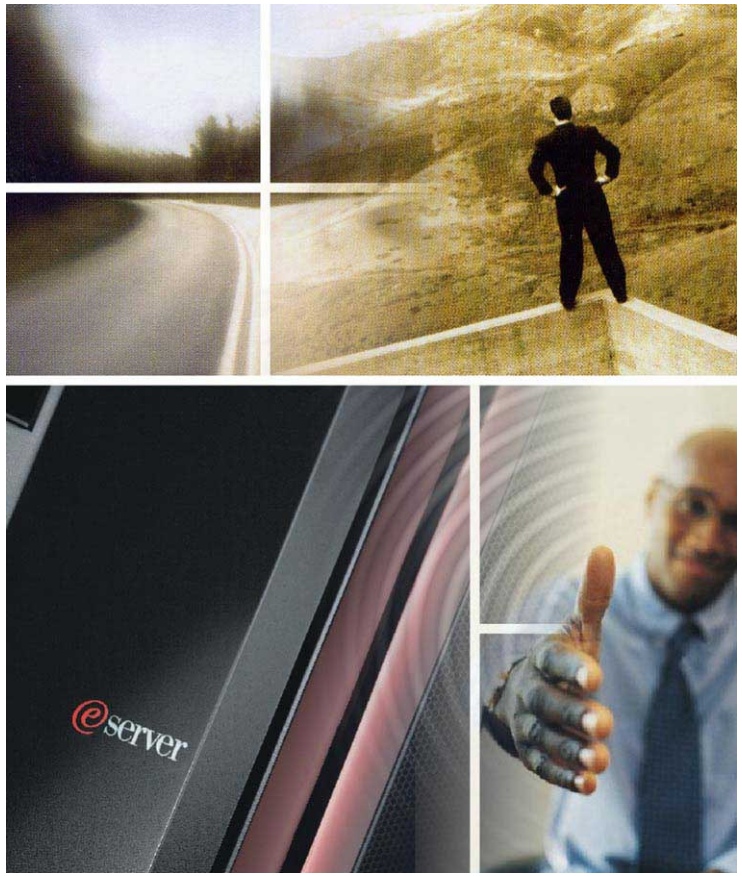
- A language to specify behavior of business processes as Web services and between Web services
- Codified universal description language for processes
- Based on WSDL and other XML standards
- Proposed industry standard
  - 7/2002: Original 1.0 BPEL proposal from IBM, Microsoft and BEA.
  - 4/2003: OASIS Technical Committee formed. Standards-based follow-on to earlier BPEL work.
  - 5/2003: Revised 1.1 proposal with contributions from SAP and Siebel.



Cycle de vie



For more information…



- Visit the zSeries Web site:
  - **ibm.com**/zSeries
- Visit the zAAP Web site:
  - **ibm.com**/zseries/zaap
- Visit the WebSphere Application Server for z/OS Web site:
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