



An enterprise solution for enterprise Java

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IBM System/390[®] servers and IBM OS/390[®] operating system have provided the best-of-breed platform for core transaction and data applications required by successful enterprises. Customers have built their key solutions using middleware products such as IBM CICS[®] Transaction Server, IBM DB2[®] Universal Database™, IBM WebSphere[®] MQ and IBM IMS™. With IBM leading the march into e-business, these key products are now augmented with the IBM WebSphere[®] software platform for e-business.

This white paper focuses on the IBM WebSphere Application Server, Version 4 and CICS Transaction Server, Version 2 on IBM z/OS[®], and how, together, these offer an ideal platform for e-business solutions. A broad technical overview of WebSphere Application Server and CICS Transaction Server examines those technology areas that provide a foundation to the WebSphere software platform and CICS. It examines why IBM zSeries™ – the new generation of the System/390 hardware – and the associated z/OS operating system provide the most dynamic base platform upon which to build e-business solutions, and how the WebSphere software platform and CICS take advantage of this. It also looks at the IBM Software Strategy for e-business, which sets out the technologies that are key to successful e-business solutions, and looks into how the WebSphere software platform and CICS deliver these technologies. To conclude, this white paper demonstrates how the WebSphere software platform and CICS provide a flexible solution that allows people to meld the best of enterprise Java™ technology with their existing investment in core business services and skills on z/OS.

Why is z/OS on zSeries the best base platform to build on?

Based on hardware facts alone, the zSeries is an impressive hardware platform. A typical single zSeries server can have up to sixteen 750-MHz 64-bit processors in a symmetric multiprocessing configuration. Added to this raw processing power are huge amounts of memory, broad network bandwidth including high-performance Secure Sockets Layer (SSL) support and support of large volumes of high-performance disk storage.

However, just as important as having raw processing power is how you use that power. A typical e-business solution includes various applications executing differing types of workloads – Web application serving, transaction processing, database management and data mining. If an e-business solution is built on non-zSeries hardware, discreet systems are frequently used for each of the different types of application workloads – typically operating systems and non-zSeries hardware are not optimized for running and managing multiple workload types simultaneously. However, z/OS is designed to run multiple workloads, and run them intelligently.

A single zSeries server can be divided into multiple logical partitions – each running its own operating system. Each logical partition can run multiple workloads. For example, WebSphere Application Server can run alongside CICS Transaction Server, which runs alongside a DB2® system. All of these different workloads and logical partitions share the power of the zSeries server they run on, with the appropriate amount of processor power and resources being intelligently allocated by the smart workload management system built into z/OS and zSeries. When a particular workload requires more resources, its allocation is dynamically changed to ensure that it can meet its defined business and performance goals.

Then, to the power of a single zSeries server, you can add the advantages of IBM Parallel Sysplex®. Up to thirty-two zSeries servers can be coupled together to form a single logical system, using a special zSeries processor called a *Coupling Facility*. This function allows data to be shared with full integrity between the different zSeries servers in the Sysplex, providing high-speed data sharing, messaging, caching and locking. What is significant in a Parallel Sysplex environment comes from how z/OS and its middleware solutions use the Coupling Facility. Each shares appropriate data through the Coupling Facility, enabling multiple copies of a workload running across the Sysplex to act as a single virtual workload. This single workload can then be intelligently and dynamically workload-managed by z/OS across all the processing power and resource of the whole Sysplex. WebSphere Application Server and CICS Transaction Server take full advantage of the Parallel Sysplex environment.

So why is an intelligently workload-managed z/OS Parallel Sysplex supercomputer better for e-business solutions, than, say, a large collection of UNIX® systems? The advantages are clear from a simple systems management standpoint – a single logical system versus multiple discreet systems.

However, another important and less obvious advantage is that of just-in-time e-business computing. Workloads are unpredictable. An enterprise's ability or inability to react to this unpredictability can mean the difference between success and failure. In a typical non-zSeries solution, a particular discreet system running a particular discreet workload must be configured and sized to the expected peak demand for that workload. If the peak turns out to be bigger than expected, a bottleneck occurs and the e-business application might fail. Multiple systems can be clustered to give more resources for a particular workload, but even then, without the benefit of the Parallel Sysplex environment, a common solution involves partitioning data across these multiple systems. This creates a potential for saturation and bottlenecks when a particular subset of data is subject to unusually heavy demand. If you need to add further resources, then you must configure another system and add it to the cluster – a time-consuming and manual process. The rest of the time, when demand for that workload is less than peak, the extra resource and processing power in these dedicated systems is not available to any other workload. The unused processing power across all these systems is potentially more than the entire capacity of any individual system.

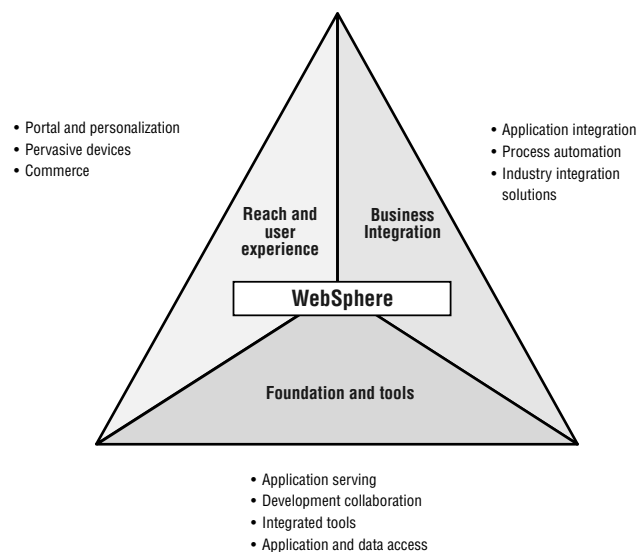
Consider the z/OS solution. Multiple e-business workloads can share the resources of a single zSeries or a larger Parallel Sysplex solution. The peaks and valleys of these different e-business workloads seldom coincide. When a particular workload requires more resources, they can be intelligently and dynamically taken from another workload that requires fewer resources at that time. The just-in-time demands of a particular workload are met by the z/OS

workload manager. You don't have to intervene manually or configure new systems. Sharing the full resource of a zSeries Parallel Sysplex between all the workloads means you don't need large amounts of unused, unshared processing power waiting for peak periods. And if necessary, you can add new processing power to a Sysplex seamlessly and automatically – without stopping, or affecting at all, the operation of the Sysplex.

IBM Software Strategy for e-business

e-business applications are always multi-tier and sometimes complicated. To help with these e-business solutions, IBM has proposed the Software Strategy for e-business. The Software Strategy for e-business gives a sensible blueprint for developing real e-business applications to do real e-business transaction processing. At the core of the Software Strategy for e-business are some important strengths – openness, portability and interchangeability.

The Software Strategy for e-business defines an open, standards-based e-business platform. On top of this platform, it adds a tried and tested application model based on IBM and industry best practices. IBM delivers a comprehensive set of class-leading products that enable customers to build to the Software Strategy for e-business – the WebSphere software platform and other products, including CICS Transaction Server.



Exploring the Software Strategy for e-business

The Software Strategy for e-business recognizes that three broad aspects are involved when engineering a successful e-business solution—typically classified as build, run and manage. You need to be able to build your solution using application development tools supporting open programming models and standards. Then you need to be able to run your solution using application servers and middleware built to support those open programming models and standards. And, finally, you need to be able to manage your e-business solutions using open standards for systems management, security management and more.

However, open standards alone are not enough to build a solution. They provide some of the building blocks and imply some of the technologies. But, ultimately, you need to be able to put those building blocks together. You need programming models built out of those standards. You need topologies for laying out logical tiers joined by those standards. The Software Strategy for e-business includes the guidance, methodologies and topologies needed to tie these standards together—intellectual capital based on IBM and industry experience and best practices.

IBM—implementing the Software Strategy for e-business

IBM has delivered and will continue to deliver the products required by the Software Strategy for e-business. IBM has already incorporated the concepts of the Software Strategy for e-business into its highly successful application-development, application-server and management products. In doing so, IBM enables the rapid development of new e-business solutions, as well as the effective reuse and inclusion of existing and proven core-business investments into your e-business solutions.

IBM makes use of the same building blocks for the e-business solutions that it produces. Starting from the foundation of the Software Strategy for e-business, IBM architects and builds solutions based on its own products to solve wider business problems – e-commerce, industry solutions, business-to-business and more.

Because the Software Strategy for e-business is based on open, widely supported e-business standards, your solution is not tied solely to IBM products in embracing the Software Strategy for e-business. You can build your solution out of the tools and products from the vendors of your choice who support open, industry standards.

Core standards and technologies in the Software Strategy for e-business

The Software Strategy for e-business is built out of the technologies and standards that best enable openness and portability between multiple tiers—Java™ and XML technologies are at the core. In particular, the Software Strategy for e-business is Java 2 Platform, Enterprise Edition (J2EE) compatible.

Besides providing runtime standards, the Software Strategy for e-business is strongly focused on application development. Because the Software Strategy for e-business is built on open and, more importantly, portable standards and technologies, it can simplify application development. Common tools can apply across all the different runtime environments conforming to the Software Strategy for e-business. Standard Java application development tools can be used to build presentation logic using Java servlets, which can be deployed in

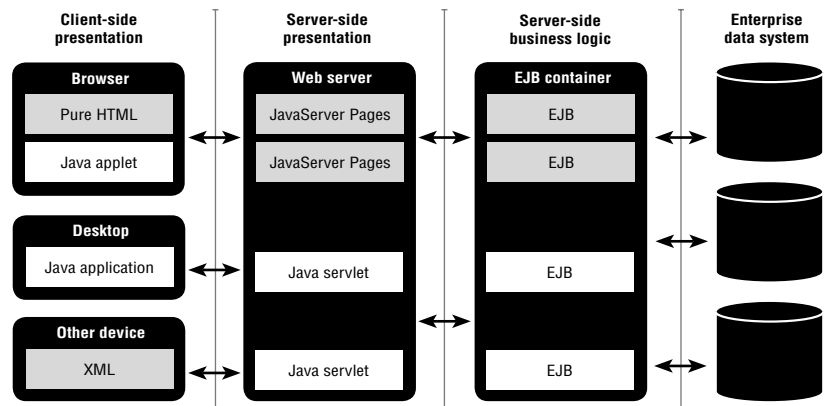
A multitier application topology

The Software Strategy for e-business strongly separates different application roles into different logical tiers. This separation promotes flexibility because, given the use of open and portable standards, a solution can be deployed and redeployed across a number of different physical tiers without the need for massive code change.

A thin-client tier provides client-side presentation using portable standards such as HTML, XML and Java applets, with communication through protocols such as HTTP. A middle tier provides server-side presentation logic to generate presentation data such as HTML. This presentation logic, along with control logic, is written using Java servlets and JavaServer™ Pages (JSP).

A distinct server-side business logic tier contains the core business logic code, written as EJB components. This strong separation between presentation and business logic ensures that new presentation code for a new presentation channel can be added without affecting the business logic. Finally, the business logic tier accesses data in enterprise data systems, including databases and existing non-Java application servers, using a range of connectors.

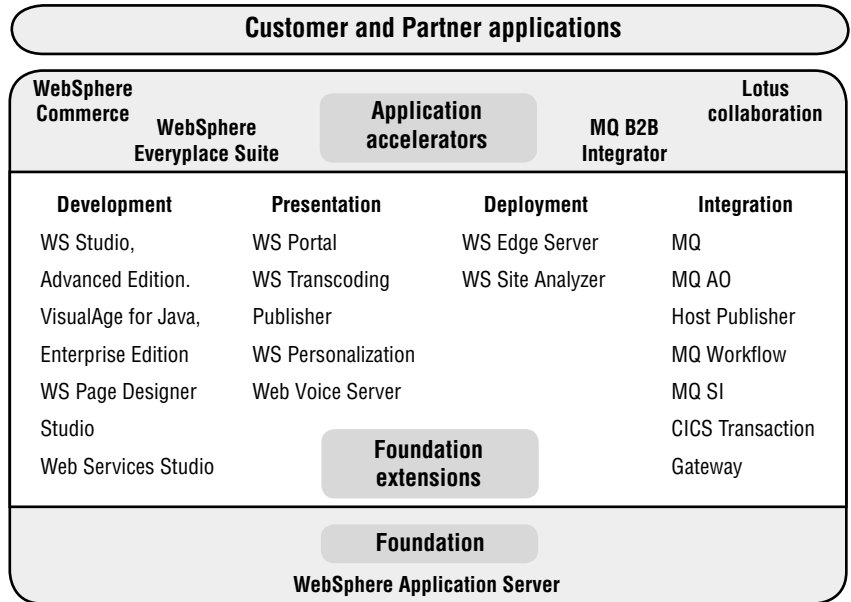
runtime environments on small workstations up to the largest zSeries mainframe. The same standard Java application development tools can be used to build business logic using Enterprise JavaBeans™ (EJB) components; these may be deployed on any appropriate platform that conforms to the Software Strategy for e-business. Other common tools can be used to debug solutions built to conform to the Software Strategy for e-business using open standards, which allow distributed end-to-end debugging. Ultimately, developers can choose to be totally isolated from the final deployment runtime environment or environments; or developers can choose to take advantage of runtime-specific functionality to provide differentiation while losing some portability. In all cases, common application development tooling and skills apply.



The WebSphere software platform for e-business

At the core of the IBM drive to deliver the building blocks required by the Software Strategy for e-business and solutions built to conform to the Software Strategy for e-business, is the WebSphere software platform for e-business. The WebSphere software platform embodies all the key concepts and technologies of the Software Strategy for e-business.

Providing a foundation for the implementation of the Software Strategy for e-business and the WebSphere software platform is the WebSphere Application Server. Available for many physical platforms, WebSphere Application Server provides a complete J2EE runtime environment for deploying new Web-based applications. Other products providing the foundation of the WebSphere software platform include the WebSphere MQ family of integration products.



On top of the WebSphere software platform foundation, key extensions add support for all facets of the Software Strategy for e-business. Extensions make it easier to build applications with application development tools and prebuilt business components, to target multiple presentation channels and personalize content and to manage and scale solutions. IBM builds its own e-business solutions on the WebSphere software platform.

The Software Strategy for e-business for z/OS

Given its proven history for running a large number of enterprise core transaction and data systems, z/OS is a key operating system for the Software Strategy for e-business. Customers want to continue to build further e-business value beyond their existing investments in core applications on z/OS middleware. They view z/OS as the ideal platform for new e-business applications, developed to follow the Software Strategy for e-business. The z/OS support of the Software Strategy for e-business allows flexibility and choice to meet the needs of all types of z/OS users – from existing users with a large investment in skills and applications on z/OS middleware to brand new users with no existing z/OS investment. WebSphere Application Server and CICS Transaction Server are key to the z/OS support of the Software Strategy for e-business.

**WebSphere Application Server,
Version 4 for z/OS and OS/390—
technical highlights**

WebSphere Application Server, Version 4 for z/OS supports the deployment of applications developed to the J2EE architecture, including:

- **Support for the deployment of EJB components written to the JavaSoft™, Version 1.1 specification level; Java servlets written to the JavaSoft, Version 2.2 specification level; and JSP components written to the JavaSoft, Version 1.1 specification level**
- **Remote method invocation (RMI) using Internet inter-ORB protocol (IIOP)**
- **Java Transaction Application Program Interface (JTA)**
- **New IMS Advanced Program-to-Program Communication (APPC) and CICS EXCI connectors, which support the J2EE Connector Architecture and implement the Common Client Interface (CCI)**

WebSphere Application Server, Version 4

WebSphere Application Server, Version 4 for z/OS and OS/390 provides the foundation of the WebSphere software platform on z/OS. WebSphere Application Server, Version 4 for z/OS meets the needs of customers who demand the highest qualities of service from their J2EE Web application server.

WebSphere Application Server, Version 4 for z/OS provides the full breadth of services required of a Web application server. It delivers J2EE technology—compliant levels of key component technologies—JSP components, servlets and EJB components—within an integrated runtime that is aligned with WebSphere family J2EE specification levels. Optimized attachments to key z/OS resource managers, including CICS, IMS, and DB2, ensure that new J2EE business logic can easily integrate with existing resources. Given the breadth of Web-based application server functionality in WebSphere Application Server, Version 4 for z/OS, it can play several roles in an e-business solution.

WebSphere Application Server, Version 4 for z/OS uses the IBM HTTP Server—shipped as part of the z/OS operating system—for serving Web content. Static HTTP serving can also be performed on a midtier server through HTTP redirection capabilities available with the WebSphere server family. WebSphere Application Server, Version 4 for z/OS provides full support of the Java servlet and JSP standards, used within the Software Strategy for e-business for writing server-side presentation logic. So, WebSphere Application Server, Version 4 for z/OS can take the full role of the server-side presentation tier (second tier) in a typical e-business solution conforming to the Software Strategy for e-business.

WebSphere Application Server, Version 4 for z/OS also has support for all the standards required for the role of a server-side business logic tier (third tier). With complete support of EJB components, WebSphere Application Server, Version 4 for z/OS is an ideal host for brand-new business logic on z/OS. For customers who wish to aggressively adopt all parts of the Software Strategy for e-business and J2EE standards, WebSphere Application Server, Version 4 for z/OS provides a robust runtime environment.

WebSphere Application Server, Version 4 for z/OS is designed as an integrated runtime, providing for the execution of both Web components (servlets and JSP components) and EJB components in a single container. This provides for tighter servlet-EJB interaction and simplifies the deployment and management of applications. z/OS Parallel Sysplex and Workload Manager are fully exploited to provide an extremely high degree of scalability and availability.

WebSphere Application Server, Version 4 for z/OS provides a fully secure Web-deployment environment with the Kerberos security system as the backbone and SSL as the endpoints. Java Reliability, Availability and Serviceability (RAS) services are integrated with existing RAS services and quality of service for z/OS and OS/390.

WebSphere Application Server, Version 4.0.1 for z/OS has passed the J2EE compatibility test (JCS) for J2EE specification, Version 1.2. By supporting J2EE components, WebSphere Application Server, Version 4 for z/OS supports interoperability with IBM WebSphere Application Servers on other platforms as well as non-IBM J2EE servers.

Software Development Kit (SDK) 1.3.0 provides the base support for applications at the Java 2 Application Programming Interface (API) level.

One of the particular strengths of WebSphere Application Server, Version 4 on z/OS is its ability to integrate data from heterogeneous back-end systems to provide new composite business function. It does this through a range of connectors to back-end systems, including CICS, but equally importantly, to the IBM IMS transaction and database server. WebSphere Application Server, Version 4 for z/OS provides full transactional support while working across these heterogeneous back-end systems, allowing robust new business function to be built by integrating otherwise disparate back-end systems.

To summarize the role that WebSphere Application Server, Version 4 plays in the complete z/OS enterprise Java solution, it makes sense to reexamine its goals:

- *Provide a complete implementation of the foundation of the WebSphere software platform on z/OS through support of J2EE standards*
- *Provide a complete runtime for new Web-based applications on z/OS*
- *Provide an integration server for heterogeneous back-end environments*
- *Make full use of z/OS quality of service features, such as Parallel Sysplex and Workload Manager*

CICS Transaction Server, Version 2

The existing value of CICS Transaction Server to a large number of enterprises is clear. Running in excess of 30 billion transactions a day with over 30 million users, CICS is pivotal in making the business world tick. Particularly important is the investment that enterprises have made in CICS – an investment in skills for building, running and managing CICS applications, and a resulting investment in CICS applications estimated to be over \$1 trillion. Many enterprises see the significant advantage in building on top of this core investment in CICS skills and applications, and extending it to provide the basis for their e-business solutions built to follow the Software Strategy for e-business.

CICS Transaction Server, Version 2—technical highlights

Simply put, along with many other major enhancements, CICS Transaction Server, Version 2 can act as an Enterprise Java Server and is able to execute certain EJB components. Support is based on the EJB, Version 1.1 specification. However in keeping with a “fit naturally” strategy, CICS is not providing complete support for EJB, Version 1.1. Most notably, CICS only supports one of the two types of EJB components defined by the specification—the Session Bean.

The Session Bean model maps directly to the typical use of CICS today. CICS does not provide support for the data-centric Entity Bean, though direct database access through Java Database Connectivity (JDBC), Structured Query Language for Java (SQLJ) and Data Access Beans is fully supported.

CICS has been involved in building Java technology-based solutions from the beginning. Starting with Java-client programs that call CICS applications, the CICS use of Java has progressed with the evolution of Java. CICS server applications are now developed in Java. The release of CICS Transaction Server, Version 2 supports EJB components.

In supporting EJB components, CICS enables the seamless inclusion of an enterprise’s investment in CICS into the Software Strategy for e-business. New server-side business logic can be built to take advantage of existing and new CICS applications. Enterprises with a strong investment in CICS skills can evolve them at an appropriate pace into Software Strategy for e-business skills. The same open standards and application models included in the Software Strategy for e-business are now supported in CICS; CICS is a peer application server within your Software Strategy for e-business and WebSphere software platform solutions. The most powerful and flexible way to connect your business logic running in CICS into your e-business solutions is through EJB components.

CICS does not provide the services of a broad Web-based application server; it does not provide support of the full set of J2EE standards; it does not provide Web application server services such as a runtime for Java servlets and JSP components. However, CICS does support the parts of the Software Strategy for e-business and J2EE which accord with its role as a server-side business logic tier (third tier) for core transactional business logic and which are appropriate to a typical CICS skill set.

CICS blends these new enterprise Java services with its existing core services to provide a runtime environment optimized for running business logic written as EJB components, alongside business logic written in traditional languages such as COBOL. CICS allows new enterprise Java logic to run simultaneously in the same managed runtime environment as, for example, traditional 3270-based CICS applications. This enables the same operational personnel to deliver all styles of applications from CICS. It also enables enterprises to continue to take advantage of their investment in traditional application development practices while growing their investment in enterprise Java application development practices, choosing when to use which technology within the single CICS runtime environment.

At the core of CICS EJB components support is the IBM standard EJB container implementation. The container provides the runtime environment for an EJB component, calling upon a supporting server implementation for services such as transaction control and security. Because an EJB component is only aware of its container, the use of IBM common container implementation provides a consistent runtime environment across the different implementations of WebSphere Application Server, and also within CICS.

Of particular interest is the CICS use of the new IBM implementation of the Java Virtual Machine (JVM) on z/OS. This new persistent, reusable JVM shows general advantages over more traditional JVM implementations and is broadly applicable to all Java middleware under z/OS. CICS, in partnership with the JVM, delivers the historical robustness of CICS by enforcing isolation for both Java applications and EJB components running concurrently in CICS. The design of the JVM provides this isolation without incurring unacceptable performance costs.

To summarize the role that CICS Transaction Server, Version 2 plays in the complete z/OS enterprise Java solution, it again makes sense to reexamine its goals:

- *Enable the efficient and optimized reuse and extension of existing CICS applications and business logic*
- *Enable enterprises with a strong investment in CICS skills and infrastructure to easily embrace EJB components and the Software Strategy for e-business by building on those CICS skills*
- *Provide a runtime environment which supports business logic written in mixed languages*
- *Make full use of z/OS quality of service features, such as Parallel Sysplex and Workload Manager*

Some example Enterprise Java scenarios

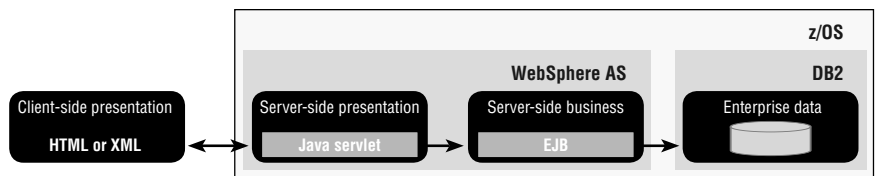
Let's look at some example scenarios for implementing Enterprise Java solutions on z/OS with WebSphere Application Server and CICS Transaction Server. These scenarios are not a definitive set or indeed definitive solutions to those scenarios but do show ways in which WebSphere Application Server and CICS Transaction Server might be most usefully deployed. The z/OS support of Enterprise Java is all about providing flexibility in deployment choice and skills while gaining the benefit of a common set of standards and application development skills under the Software Strategy for e-business. Hence, an enterprise can and will choose different physical and logical topologies based on a large variety of factors. Ultimately, they can be sure that whatever choices they make, z/OS can fit seamlessly into their solution. The scenarios look at both the technical scenario along with, and more importantly, the investment in skills and applications an enterprise has made.

Given a design goal of making it easy for customers with existing CICS operational skills to evolve to exploiting EJB components in CICS, the deployment of an EJB component into CICS is strongly separated into two different roles.

- *The first step of deployment involves the generation of extra Java code required by the EJB component container. Given the use of common container technology in all IBM EJB offerings, the tooling to generate this code is common across the different runtime environments and, being effectively a step in application development, is integrated with IBM application development tools.*
- *The other step of deployment is the definition and installation of the EJB components into a CICS runtime environment. This second step builds on existing customer CICS operational skills. Additional CICS resource definitions must be made for a number of EJB resource types including container instances, and also the deployed JAR files containing the enterprise beans available within those container (and server) instances. The installation of those definitions and the publishing of EJB components is performed using existing CICS commands and tools, and is therefore easily achieved by personnel used to managing non-EJB CICS applications.*

Scenario 1: New Web-based application—broad z/OS skills

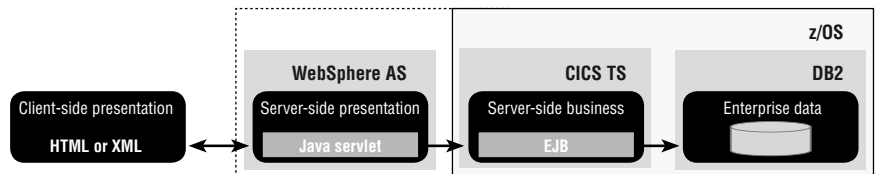
An enterprise wants to write a new Web-based application under z/OS using all of the services offered under the Software Strategy for e-business and J2EE. The enterprise has broad z/OS operational skills and procedures.



This scenario allows the full power of WebSphere Application Server, Version 4 for z/OS to be used. WebSphere Application Server, Version 4 provides a complete runtime solution for new Web-based applications. It can host the server-side presentation logic through its support of Java servlets and JSP components. It can also host the server-side business logic through its support of EJB components. Data access is enabled through Entity Beans built on top of data held in DB2 Universal Database server running also on z/OS.

Scenario 2: New Web-based application—strong CICS skills

An enterprise wants to write a new Web-based application. They want their new business logic to execute on z/OS. The enterprise has a strong investment in CICS operation skills and procedures and an investment in core applications running on CICS.

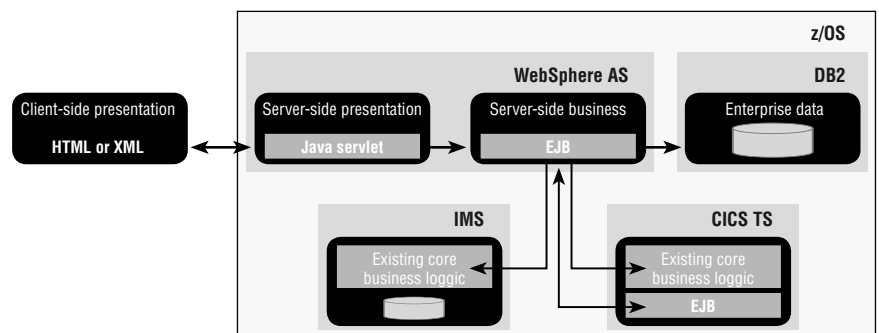


This scenario demonstrates the flexibility of the z/OS support of enterprise Java. Given their strength of CICS skills and existing CICS infrastructure, the enterprise can develop new business logic as EJB components executing under CICS Transaction Server, Version 2. Data access to DB2 is enabled through the JDBC and SQLJ standards. It is also possible to directly access other data resources available to CICS. The skills and tools to develop these EJB components are generic Software Strategy for e-business skills and are not CICS-specific. However, the skills and tools used to install, configure and manage these EJB components build on the enterprise's existing CICS skills.

As the use and experience of the Software Strategy for e-business grow within the enterprise, they might find that they require broader enterprise Java support under z/OS. At this point, they can choose to augment their CICS systems with WebSphere Application Server, Version 4 and consolidate their server-side presentation logic onto z/OS. Because of the standards inherent in the Software Strategy for e-business and embodied in both CICS and WebSphere Application Server, Version 4, logic in both CICS and WebSphere Application Server, Version 4 can seamlessly interoperate.

Scenario 3: Web-based application reusing existing logic from multiple application servers—broad z/OS skills.

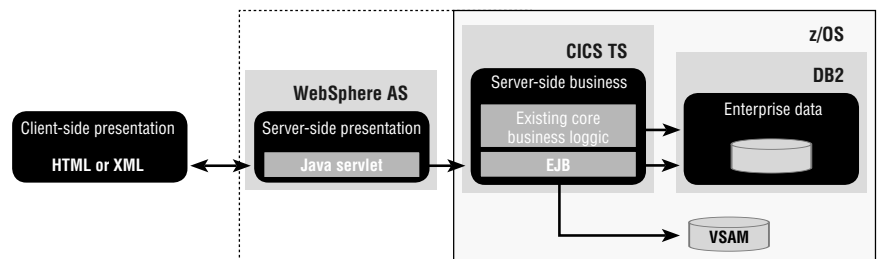
An enterprise wants to write a new Web-based application running on z/OS. This application must contain not only new logic, but also needs to use existing logic and data in a number of different back-end application and data servers.



Given the WebSphere Application Server, Version 4 for z/OS focus on integrating data from heterogeneous back-end environments, it is well suited to this scenario. WebSphere Application Server, Version 4 supports a standard connector model for back-end environments such as CICS and IMS, enabling integration with full transactional integrity. However, the CICS Transaction Server, Version 2 support of EJB components enables transparent access between WebSphere Application Server, Version 4 and CICS Transaction Server, Version 2 without the use of the CICS Connector – explained further in Scenarios 4 and 5.

Scenario 4: Extension of an existing CICS application and “publication” of that business logic into a broader Software Strategy for e-business solution—strong CICS skills

An enterprise wants to build on their existing core logic running in CICS. They want to augment the function and make it available for use in their broader Software Strategy for e-business and WebSphere software platform solutions. They want the new extended EJB components to be hosted and managed alongside their existing core CICS applications.



The CICS Transaction Server, Version 2 support of EJB components allows the easy reuse and extension of existing CICS applications.

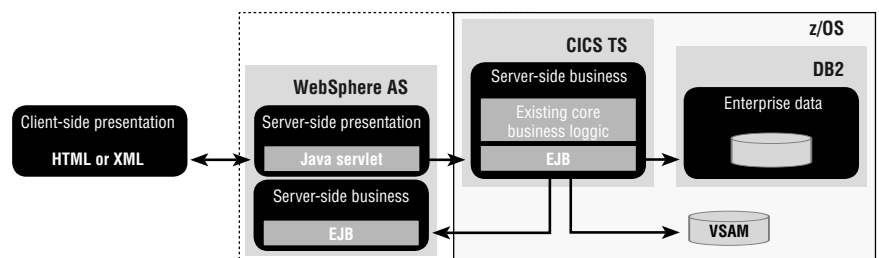
CICS supports the following two key interfaces to allow this efficient reuse of CICS applications:

1. *The CICS Connector interface provided in all the WebSphere Application Servers for calling existing CICS logic. The advantage of using the connector interface is that application development tooling is provided to create the interface between Java and an existing COBOL business program in CICS.*
2. *A CICS-specific set of interfaces called JCICS. JCICS allows tight integration with existing CICS applications by providing a full set of CICS services to EJB components, including calling existing business logic and accessing data held in VSAM. Using JCICS limits the EJB component to executing in CICS. However, it provides optimized integration with existing logic when compared with the more generic CICS Connector interface.*

EJB architecture provides the best technology for calling business logic in CICS. For a programmer building server-side presentation logic, the task of calling business logic written as an enterprise bean in CICS is identical to calling an EJB component in any other enterprise Java server. EJB provide distributed transactional control, end-to-end security and the future possibility of other end-to-end functions such as end-to-end debugging.

Scenario 5: A new Web-based application built on WebSphere Application Server not running under z/OS, which wants to reuse business logic running under CICS—strong CICS skills

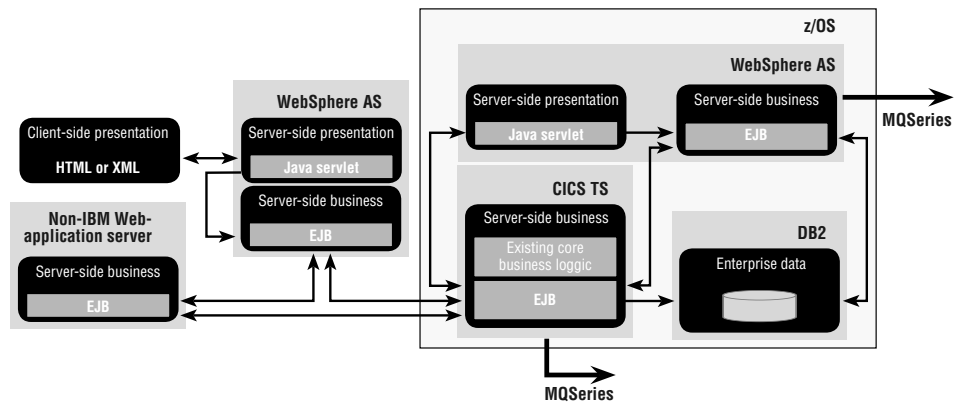
An enterprise is building a new Web-based application. They choose to create the solution using WebSphere Application Server running on a platform other than z/OS, perhaps Linux® for zSeries. They want to reuse core business logic running under CICS.



This scenario is in fact the same as the previous “extension of CICS logic” scenario. It reinforces the use of CICS EJB component support as the best way to integrate existing and new CICS logic into a broader Software Strategy for e-business solution. The task of calling an EJB component is identical wherever that business logic is hosted, providing a standard method of calling business logic across all application servers. The easiest way of accomplishing distributed transaction control between business logic running in WebSphere Application Server off z/OS and business logic in CICS is to use the EJB component support in CICS.

Scenario 6: A complex application involving many tiers built to the Software Strategy for e-business-broad skills on multiple platforms

A large enterprise is building a complex e-business application. Due to a number of acquisitions, they have diverse application server platforms on multiple platforms. They want to simplify the whole solution by using common standards to ensure interoperability and portability.



This scenario illustrates the ultimate benefit of the Software Strategy for e-business. By embodying the standards of the Software Strategy for e-business in the WebSphere platform and other key products such as CICS Transaction Server, complex e-business solutions are simplified. Both WebSphere Application Server, Version 4 and CICS Transaction Server, Version 2 under z/OS can seamlessly interoperate with WebSphere software platform solutions on other

physical platforms as well as between themselves on z/OS. Also, both WebSphere Application Server, Version 4 and CICS Transaction Server, Version 2 can seamlessly interoperate with other vendors' solutions that support the open standards of the Software Strategy for e-business. Finally, by use of the WebSphere MQ products, other non-Java application servers can be integrated into the solution. The Software Strategy for e-business does not necessarily simplify the operational complexity of operating multiple application server environments. Over time, a convergence of skills might be expected. However, the Software Strategy for e-business does simplify the development of the solution. The same application development tools and skills can be used to develop logic to be hosted across the WebSphere platform and CICS. IBM use of a common-container technology for EJB components is key in providing this level of portability.

WebSphere and CICS on z/OS—an enterprise solution for enterprise Java

Real e-business is all about transforming your business to make it more dynamic and reactive to your customers' needs. To succeed, your e-business must be built on a software platform that can stand up to demands of your real business.

With the Software Strategy for e-business, IBM delivers the blueprint for succeeding with e-business. With WebSphere Application Server, Version 4 and CICS Transaction Server, Version 2 for z/OS, IBM delivers the enterprise-class building blocks on which to build your successful e-business.

A key open technology in the Software Strategy for e-business is enterprise Java. WebSphere Application Server, Version 4 and CICS Transaction Server, Version 2 for z/OS together provide a flexible solution for enterprise Java on z/OS. Whatever the investment in skills and applications within an enterprise, z/OS has the right solution for their enterprise Java needs and allows them to take full advantage of these investments. Whatever the pace of adoption of enterprise Java within an enterprise, z/OS has the right solution for their needs. By providing the WebSphere software foundation on z/OS with WebSphere Application Server, Version 4, and by embodying the core of the Software Strategy for e-business in CICS Transaction Server, Version 2, enterprises can be certain that they will reap the multiple benefits of the Software Strategy for e-business however they blend WebSphere Application Server and CICS Transaction Server in their solutions.

For more information

To learn more about how the WebSphere Application Server and CICS Transaction Server can help your e-business, visit:

ibm.com/software/CICS



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