

IBM WebSphere Application Server V4.0

WebSphere 4.0 General Introduction



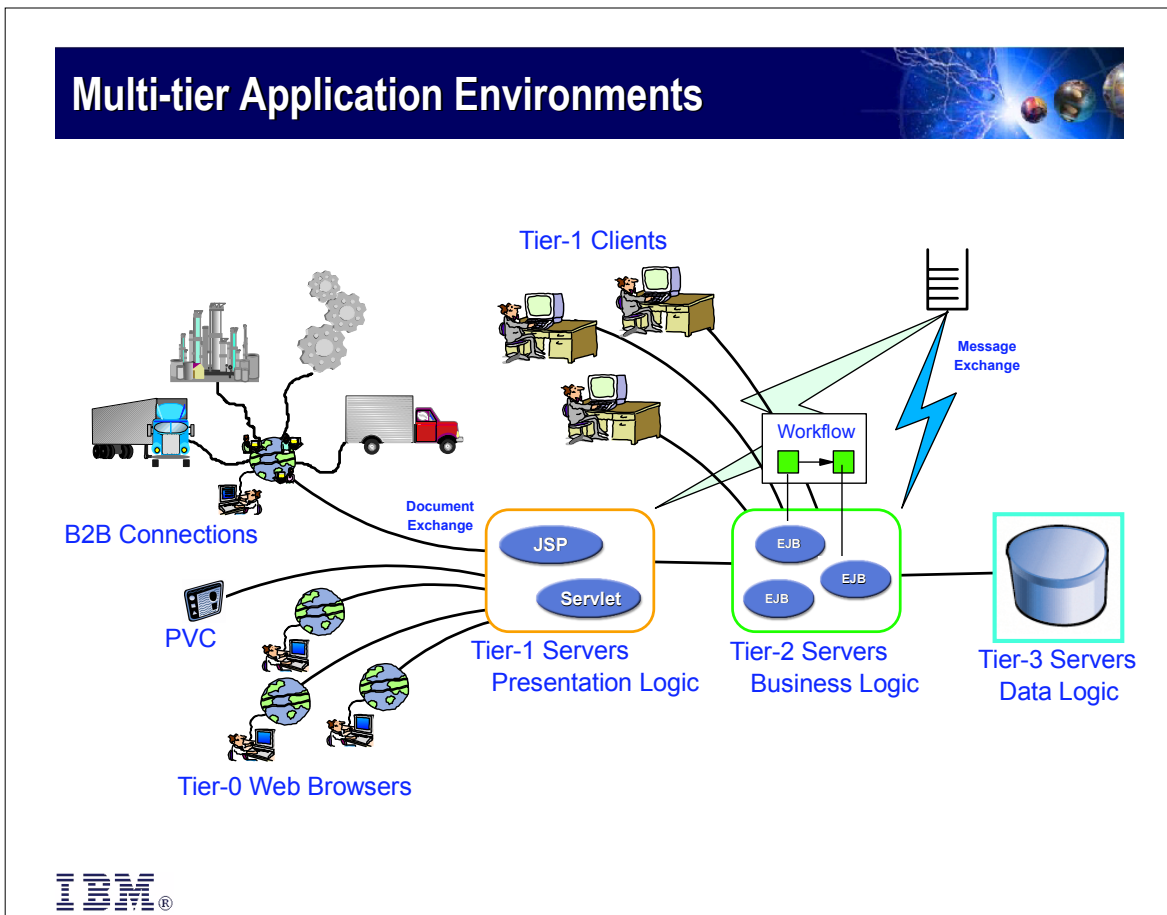
Agenda



- Market Themes
- J2EE and Open Standards
- Evolution of WebSphere Application Server
- WebSphere 4.0 Highlights
 - ▶ J2EE 1.2 Implementation
 - ▶ Web Services Enablement
 - ▶ WebSphere Enterprise Extensions
- Positioning the WebSphere Family

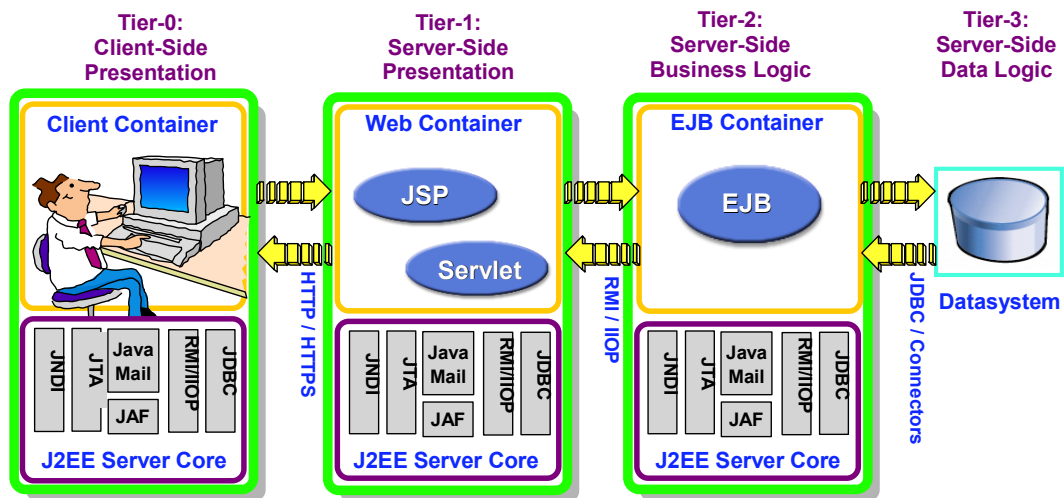


Multi-tier Application Environments



- ▶ Access to enterprise business logic and data from heterogeneous devices and technologies poses a significant technical challenge: the implementation of logic and data needs to be client neutral.
- ▶ Using a multi-tier architectural approach is a natural way to deal with this issue. Enterprise applications can be partitioned in a number of tiers that are logically independent, even though they may physically reside on the same machine or run in the same process.
- ▶ The very back-end tier of an enterprise application is the Data Server, illustrated on the right-hand side of the diagram. The data server may need to handle a combination of legacy databases and of newly created information repositories.
- ▶ The business logic tier can be implemented by using Enterprise Java Beans. EJBs naturally map to business entities and business processes. From a data persistence standpoint, EJBs can be mapped to existing databases or to new databases and tables. The EJB tier incorporates all aspects of the business logic, including the process flow. The core of application functions and data represented by Tier-2 and Tier-3 can be accessed in a variety of ways: by traditional "thick" clients, represented by the Tier-1 Clients in the diagram. These clients require highly a functional and rich GUI and access enterprise applications within the company firewalls. Or, applications can be accessed from the outside world, through the Internet, either via a browser-based interface, represented by the Tier-0 Web Browsers, via handheld devices, or via business-to-business interfaces.
- ▶ Servlets and JSPs, encapsulated in the Tier 1, are responsible for offering a suitable rendition of the business data and methods to Tier-0 customers. This is what is called presentation logic. Tier 1 is the only segment of the whole architecture that needs to be adapted to fit different access methods.

J2EE Server Model



- ▶ The discussion of application architectures leads naturally to introducing Java 2 Enterprise Edition. The J2EE specification defines a packaging structure that maps perfectly to the multiple-tier architecture.
- ▶ Segments of J2EE applications are packaged in separate containers. According to J2EE, not only the Enterprise Java Beans, but also Servlets and JSPs, and the Java "thick" clients have separate containers. This allows for a very clean separation of roles and for a very natural mapping into tiers: the client container implements the GUI, or physical rendition of the information on the screen. The Web Container, where JSPs and Servlets reside, implements the presentation logic. The EJB container is a natural candidate to hold the business logic.
- ▶ The containers and the code that is contained in them take advantage of wide array of standard J2EE functions and APIs provided by the J2EE platform, in our case, WebSphere Application Server 4.0.

WebSphere 4.0 Enhancements Highlights



- Open Standards (J2EE 1.2++ Certified)
- Web Services support
- JMS/XA (MQ) Integration
- Unparalleled Connectivity
- Performance, Scalability, and Security



- ▶ WebSphere's commitment to Open Standards materializes into full J2EE 1.2 compliance - the official certification was achieved in early 2001, when the compliance test suite was successfully executed on an early driver of WebSphere Application Server, Version 4.0. WebSphere 4.0 also provides a number of functions that exceed the J2EE 1.2 specifications and that belong to the 1.3 draft of the specs.
- ▶ WebServices support is provided with this release. WebSphere customers can start right now to create their web services - or to turn existing applications into web services.
- ▶ JMS/XA - which allows distributed transactions to include sending a message onto an MQ Series queue, was recently introduced in WebSphere 3.5.3 and it has been carried over into WebSphere 4.0.
- ▶ Connectivity with a wide array of back end systems is facilitated by WebSphere's support for Java 2 Connectors, or J2C. Java 2 Connectors significantly expand the options for applications running on WebSphere to interoperate with Enterprise Resource Planning applications or legacy systems
- ▶ Enhancements to the workload management facility of WebSphere, improvements to the JDK, the introduction of new performance tuning tools, and of performance monitoring APIs restate the strong commitment of WebSphere's development team towards preserving the best-of-breed performance positioning of WebSphere in the industry. Security is also enhanced, primarily through the adoption of the J2EE security model and by allowing for additional flexibility in the choice of the security registry.

WebSphere 4.0 Application Server Editions



- **Advanced Edition (AE)**
 - ▶ Core J2EE and Web services programming model - fits most enterprise usage scenarios
 - ▶ Strong integration to databases, message-oriented middleware and legacy systems and applications
 - ▶ Multiple/distributed server and clustering support
- **Advanced Single Server Edition (AEs)**
 - ▶ Same core AE programming model, with simplified administration
 - ▶ Appropriate for departments, medium businesses, pilot applications that require low cost, fast implementation and no multi-server management
 - ▶ AEs trial download available - 6 months free, 60 days online support
- **Advanced Developer Edition (AEd)**
 - ▶ Same as AEs with licensing and pricing terms to meet individual developer needs
 - ▶ Available for order with software maintenance, including subscription and support
- **Enterprise Edition (EE)**
 - ▶ Builds on core AE and includes TXSeries and MQSeries
 - ▶ Meets sophisticated enterprise class customer needs
 - ▶ Employs flexible plug-in configuration that extends AE J2EE programming model
 - ▶ Speeds application development and offers application flexibility (Business Rules, Internationalization support (I18n), Work Areas)
 - ▶ Unparalleled integration capabilities (Message Beans, JMS listener, Microsoft and CORBA interoperability)



WebSphere Advanced Single Server Edition(AEs)

- Single machine and single process administration
- Full J2EE compliance and support
- Full Web Services technology: Integrated XML, XSL, and SOAP support
- HTTP/HTTPS support for Plug-in transport
- Integrated HTTP Server
- Role-based security limited to local OS
- Simplified administration via web browser
 - ▶ XML based repository, no RDB
 - ▶ InstantDB support for samples
- AEd (Developer Edition) has matching functionality. Licensing limits AEd to development use
- Migration Tools



- ▶ This edition is limited to a single application server process and to a single machine. In other words, multiple application servers, multiple nodes, and workload management are not applicable to the Single Server Edition.
- ▶ This limitation was introduced to greatly simplify the management and install effort. This edition consumes a limited amount of computing resources, such as memory and CPU.
- ▶ Functionally, the Single Server Edition is extremely rich, even though it does not include all the features of Advanced Edition.
- ▶ The Single Server Edition is a fully J2EE compliant application server. It includes support for servlets, JSPs, and EJBs. It also provides support for web services and integrates the Xerces xml parser and the Xalan XSL processor.
- ▶ The WebSphere plug-in to the HTTP Server now communicates with the web container via HTTP/HTTPS, rather than via the proprietary OSE protocol. This adds the capability for secure, encrypted communications between HTTP Server and the WebSphere web container. It has the added benefit of providing an HTTP Server embedded in the application server, removing the requirement of an external HTTP Server for development and unit testing. The internal HTTP Server is not recommended for production use because it lacks advanced functions such as caching.
- ▶ The J2EE security model is fully supported. However, the choice of security registries is limited to the local operating system authentication.
- ▶ The Single Server Edition provides a web browser-based console that simplifies administrative access to the XML files that replace the relational database administrative repository found in AE.
- ▶ The application samples that ship with the product can use InstantDB, a lightweight and open source database, to store persistent data. This further reduces the software requirements for installing this edition.
- ▶ It is possible to install multiple instances of the Single Server Edition on the same machine and run those instances concurrently.

WebSphere Advanced Edition (AE)

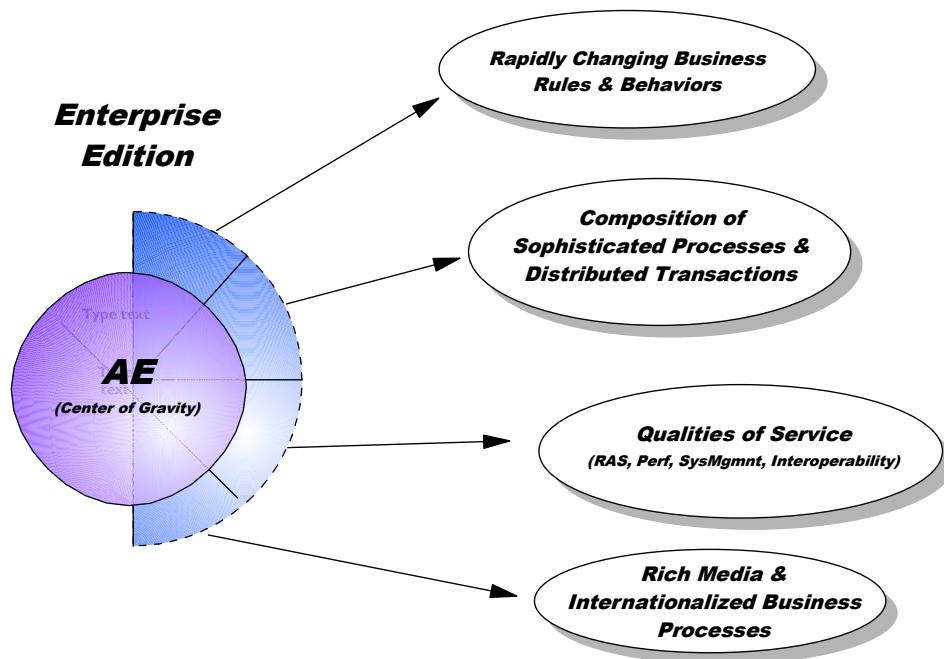


- Multiple application server processes
- Support for multiple nodes (machines)
- Full workload management facilities
- Expanded database and transactional support
 - ▶ Merant drivers for MS SQL server, Informix, and two-phase commit for Oracle
 - ▶ Sybase
- J2EE 1.2 +
 - ▶ Java 2 Connectors
 - ▶ JMS/XA interface to MQ Series
- Expanded options for security registry



- ▶ WebSphere Advanced Edition is the full application server, supporting multiple concurrent application servers, workload management facilities, and allowing your application environment to scale up across multiple separate machines.
- ▶ Additional databases are also supported by the Advanced Edition, thanks to a number of drivers developed by Merant. SQL Server and Informix are now supported, as is two-phase commit for the Oracle database. WebSphere 4.0 provides continued support for Sybase.
- ▶ Advanced Edition also offers significant functionality that exceeds the J2EE 1.2 specifications, such as Java 2 Connectors support for expanded connectivity, and JMS/XA interface to MQ Series--both part of J2EE 1.3.
- ▶ The Advanced Edition also supports Local Third Party Authentication or LTPA (just like in WebSphere 3.5) and there is also additional support that allows developers to implement the APIs necessary to plug custom user registries into a WebSphere configuration

Enterprise Edition: Strategy



- ▶ The Enterprise Edition adds top level functionality to the Advanced Edition. The latter is a prerequisite for the Enterprise Edition. The areas where IBM is focusing with the next release of the Enterprise Edition are:
 - ▶ high level application behavior customization and workflow management
 - ▶ enhanced, leading edge distributed transaction support
 - ▶ top of the line qualities of service for interoperability, system management, and performance
 - ▶ internationalization of business processes.
- ▶ The Enterprise Edition will use the Advanced Edition as its infrastructure. The new release of the Enterprise Edition, will therefore use the same code base as AE.

J2EE Technologies



- **Components**
 - ▶ Software units provided by application developers: Servlets, JSPs, EJBs, client components.
 - ▶ Run inside the container provided by the platform. Container offers services and comm support.

- **Services: Functions available to the J2EE components**
 - ▶ JDBC, JTA/JTS, JNDI, ...
 - ▶ Implemented by the platform provider (WebSphere).

- **Communications: Enables communication between components**
 - ▶ RMI/IIOP, JavaMail, JMS, ...
 - ▶ Provided by the container.



Three areas in J2EE Technologies:

- ▶ **Components:** Provided by the application developers and include servlets, Java Server Pages, and Enterprise Java Beans. These components are contained by J2EE containers that are provided by the middleware vendors, such as IBM with its WebSphere Application Server. A J2EE container provides support for a number of services and communications.
- ▶ **Services:** Functions that are accessible to the components via a standard set of APIs. For example, a component has to be able to access a relational database by using the JDBC APIs, while it can use the JNDI APIs to access the naming services. These APIs need to be supported by the container.
- ▶ **Components need to be able to communicate with each other.** Therefore, the containers need to provide the appropriate communication mechanisms to make this happen. Examples of communications included in the J2EE standards are RMI/IIOP for remote method calls, JavaMail for programmatical access to e-mail, and JMS for accessing messaging technologies.

Summary



- WebSphere 4.0 focus
 - ▶ J2EE, Open Standards
 - ▶ Significant additional function over the specs

- Flexible product packaging
 - ▶ To suit deployment and development needs

- WebSphere family
 - ▶ Partnering momentum
 - ▶ Industry best of breed



- ▶ WebSphere V4 focuses not only on open standards, but also on incremental functional advantage that goes beyond the standard specifications.
- ▶ WebSphere's packaging has been redesigned for release 4.0 to better suit the needs of both the application developers, such as IBM business partners and ISVs, and of the customers primarily interested in deployment.
- ▶ The industry recognizes the leadership of WebSphere in the marketplace. This recognition goes well beyond the consultants' reviews and press articles. In fact, it materializes in partnerships and marketing agreements.