WebSphere Application Server 5.0

Overview

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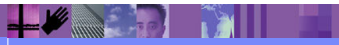
- **WebSphere Application Server 5.0: Themes**
- **WebSphere 5.0 Product Packaging**
- **WebSphere 5.0 Product Contents**
- **Development Tooling**
  - WebSphere Studio Family of Products
- **End-to-End Development and Deployment Scenario**



There are several main motivations at the basis of WebSphere 5.0. A prominent one is represented by J2EE 1.3 compliance. Not only does IBM want to comply with the latest levels of the Java standards -- but we also recognize the intrinsic value of the new functions introduced by this level of the specifications.

EJB 2.0 brings EJBs to a degree of maturity that makes them suitable for the most sophisticated commercial applications

Messaging is also an important area addressed by the specs, with Message Driven Beans and the requirement for an integrated messaging infrastructure

Security and interoperability also present significant enhancements

Another area of focus is WebServices enablemement. WebSphere 5.0 improves SOAP support, and ships the Private UDDI, enabling customers to install and run their own WebServices directory without further requirements. WebSphere 5.0 also includes the WebServices Gateway, which increases the opportunities to interoperate with heterogeneous WebServices infrastructures.

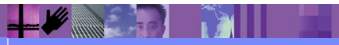
In addition, the administrative model of WebSphere has been significantly redesigned to improve availability, to reduce interdependencies among processes, to increase usability, and to adopt standard resource management interfaces (JMX).

A new version of the Edge Components is now shipped with WebSphere 5.0 providing WebSphere customers with a powerful workload balancing solution right out of the box.

Numerous extensions and value-add features are provided in the base WebSphere Application Server Version 5 - and even more function is available through the WebSphere Enterprise product, which builds on top of the base servers.

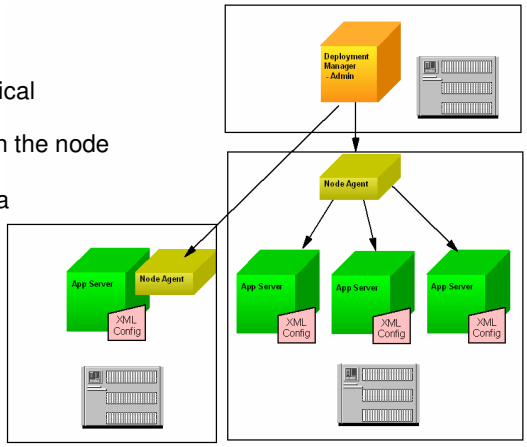
Section

WebSphere Application Server Product Packaging



New Terminology

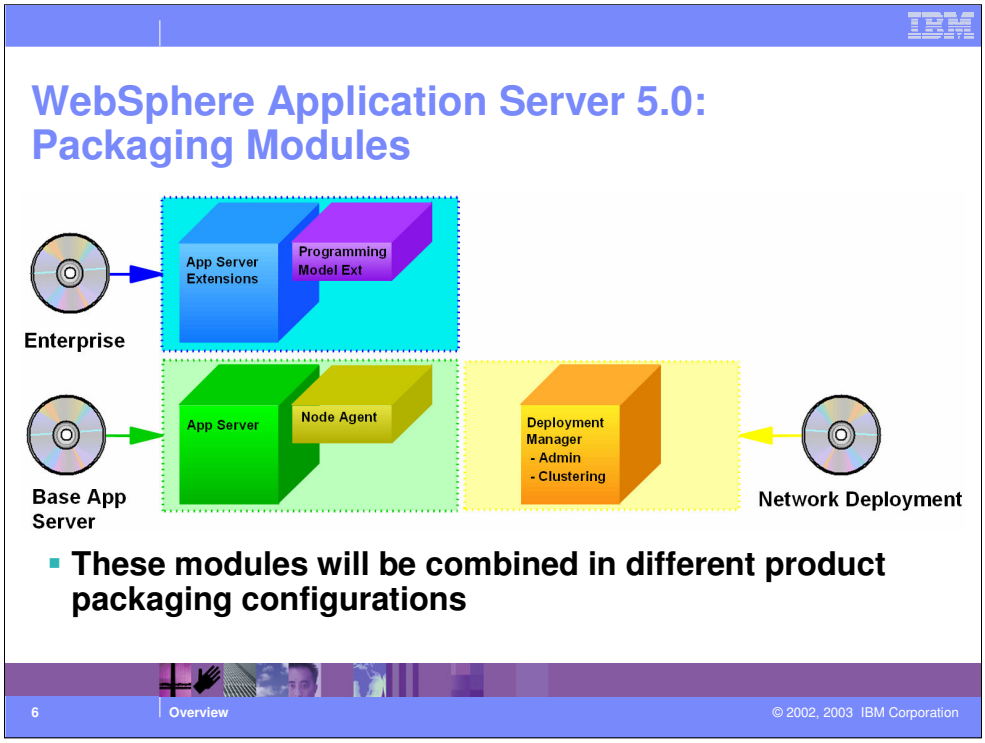
- **Managed Process or Server**
  - Each server running in its own JVM
    - Application Servers
    - JMS Server
- **Node Agent**
  - Resides on a single node (physical machine)
  - Manages the servers running on the node
- **Deployment Manager**
  - Manages the multiple nodes in a distributed topology
- **Cell**
  - Network of multiple nodes in a single logical administration domain



Before we discuss the details of packaging, it's important to understand some fundamental administrative concepts.

By "Managed Process" or "Server" we mean any instance of a JVM that can be managed in a WebSphere V5 environment. Application Servers are managed processes, but also JMS Servers (a special type of server that runs the integrated JMS infrastructure) falls in this category too. Other examples of managed serves are the Node Agent and the Deployment Manager, which are discussed later in this chart.

The Node Agent is responsible for controlling with all the remaining servers running on a certain box. Most likely, you will be running a single node agent on a certain physical system, although it is conceivable that on some very high-end systems multiple node agents may be concurrently up and running.

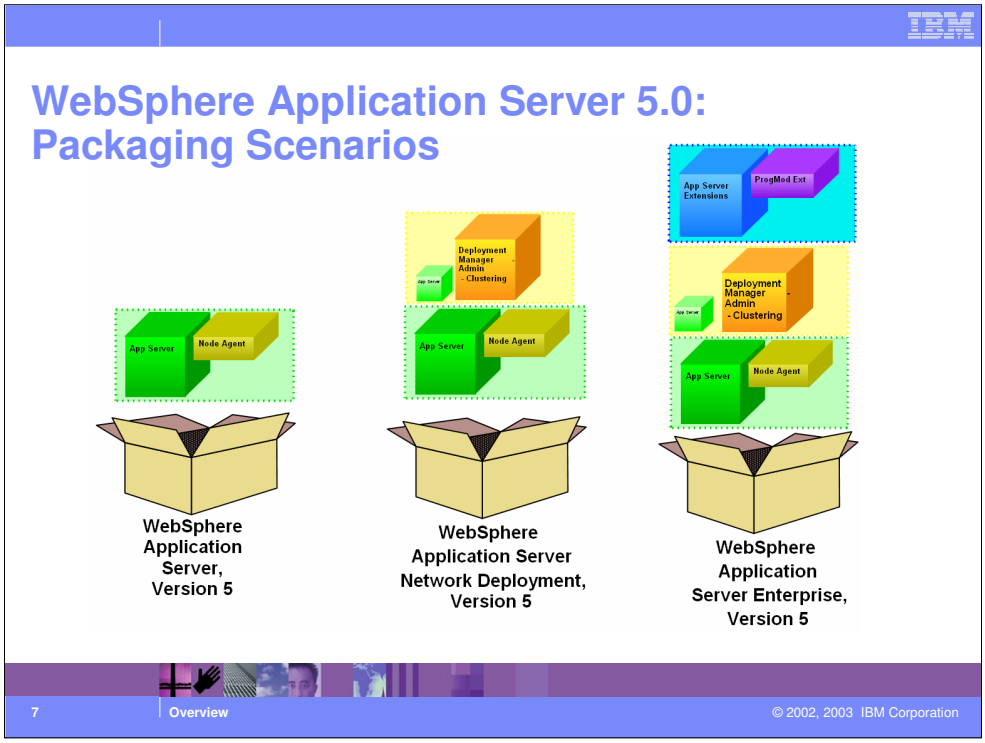


In the Version 5 timeframe, WebSphere development is going to provide four separate deliverables - these deliverables can be combined together to provide a variety of marketable product packages

The base App Server includes the code for the Version 5 Application Server - providing full J2EE 1.3 compliance. It also includes the code for the Node Agent, which will be dormant if used in a single server environment.

The Network Deployment deliverable includes the Deployment Manager. This is the deliverable that enables customers to create a cell and have multiple processes, multiple systems, clusters, etc. in a single cell

The Enterprise deliverable includes a number of functional extensions that are primarily targeted at supporting sophisticated application functions - that go beyond the scope of the standard specifications.

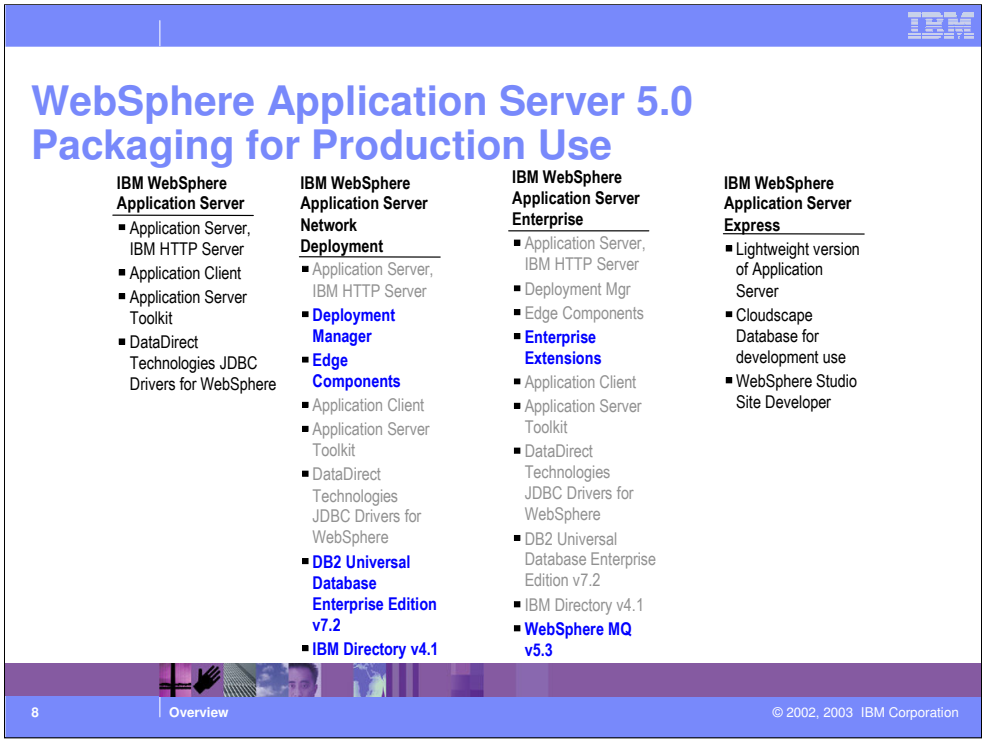


Let's focus on three packaging options that are available to the WebSphere 5.0 customers.

WebSphere Application Server, Version 5 includes the code and the license for a single application server. Conceptually, this packaging configuration is equivalent to the WebSphere Application Server, Single Server Edition we have in Version 4 - the node agent that is shipped in this configuration is not going to be utilized, until the customer upgrades to the next level, the Network Deployment configuration.

WebSphere Application Server, Network Deployment V5 includes the base application server, the Node Agent and the Deployment Manager. This configuration enables customers to run multiple application servers, on a single physical node or on multiple distributed systems, and to centrally administer the Cell.

The WebSphere Application Server Enterprise V5 includes support for some high-end application functions such as workflow, extended transactions, business rules beans, and so on. Technically, it can run on the base server or in an Network Deployment configuration.



This chart summarizes the various options available to WebSphere 5.0 customers and outlines some of the salient features.

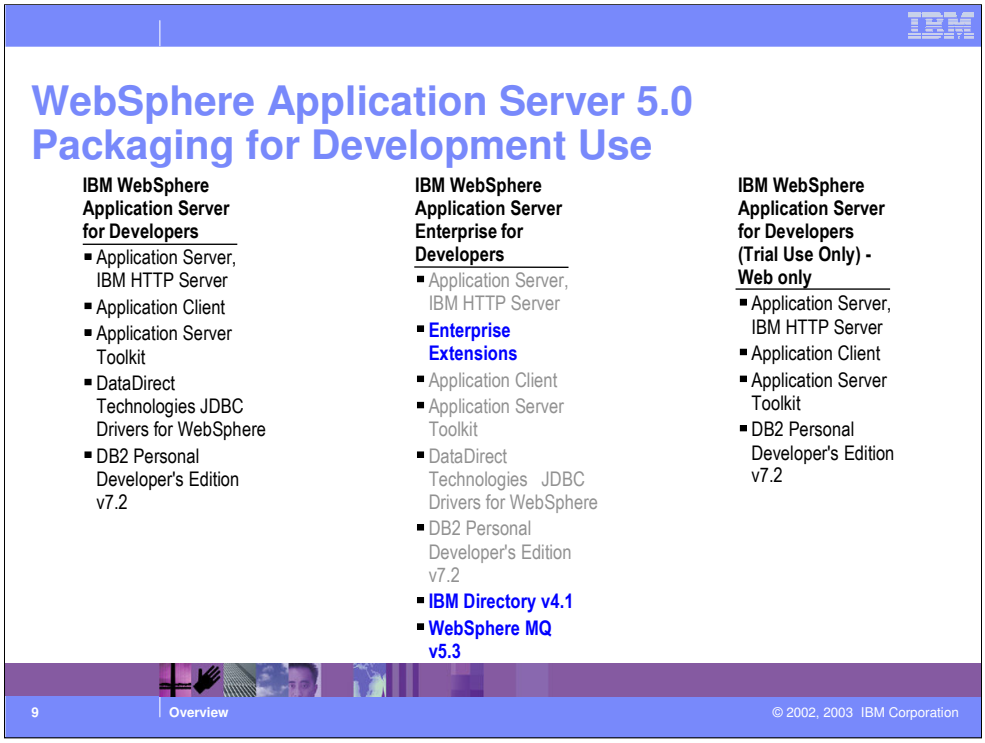
Notice that in addition to the configurations listed in the previous chart, IBM is also going to make available the WebSphere App Server Express product, which targets web and web services developers and customers (no EJB support).

Also notice that we integrated Data Direct Technologies JDBC drivers (like Merant Type 3 and 4 drivers).

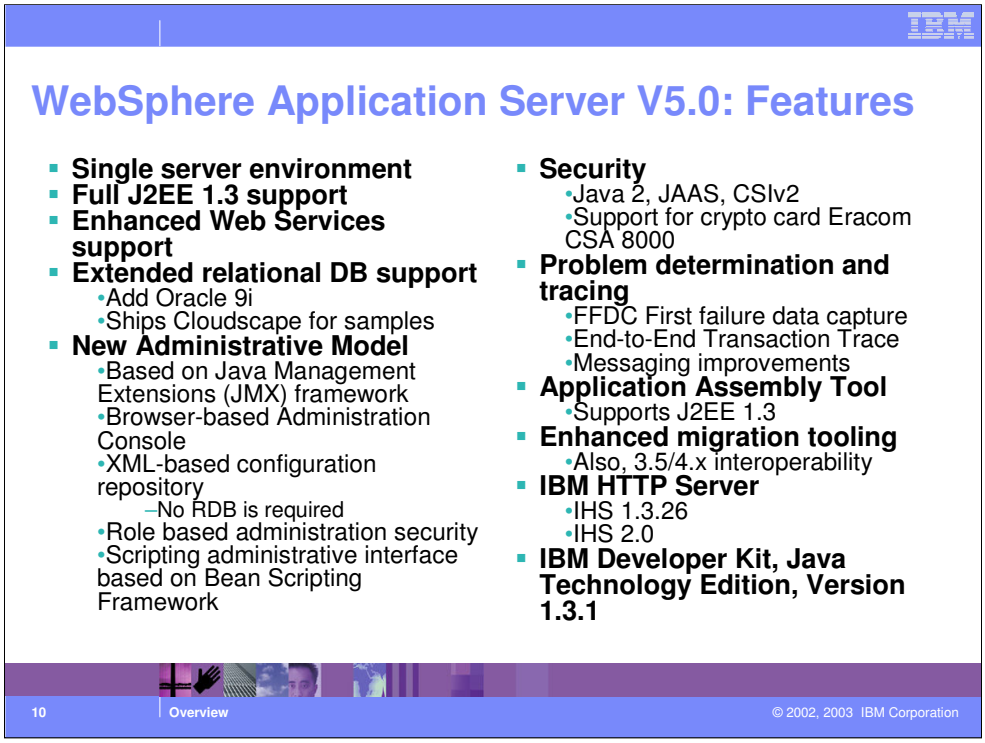
In 3.5, Merant type 3 was used for Sybase.

Merant type 3 can be used for Oracle (Solaris Operating Environment, Windows) and SQL server (Win). Needed this for JTA support. Type 4 is for SQL server only. Now nobody uses the Merant driver for Oracle, since the native Oracle driver support JTA.

In future, we may support driver of database from the vendor. SQL Server will probably have its own driver.



These are the options available to the software providers.



Here is a high level description of the features included in the base application server product.

This product is licensed for a single server type of configuration. All you need is a single JVM, and through that JVM you will be running your applications, performing the administration, running the integrated JMS provider, and so on.

The base app server fully supports J2EE 1.3, including EJB 2.0

It also includes support for Web Services and it includes an enhanced version of SOAP.

There are additional options for EJB persistence - with the addition to Oracle 9i among the supported DBs. Also, Cloudscape (a Java-based RDB) is shipped with the product, with the intent of supporting the samples for persistence.

The administrative model is completely redesign. No relational database is required for the administrative data - all the application and administrative information resides in a set of XML file, stored directly in the file system.

The underlying administrative infrastructure uses the JMX standard - therefore the WebSphere administrative model can be exposed through standard interfaces to the administrative clients.

IBM provides a new browser-based administrative console and a scripting administrative client based on the Bean Scripting Framework - but the standard JMX approach opens the door for more options in the future, and for the integration third-party admin tools.

Also - the administrative tasks are now secured - you can choose among four administrative roles that allow different degrees of access to the system's resources.

More generally, security support is enhanced by the implementation of the Java 2 Security standards, together with Java Authentication and Authorization services, and with the CSIv2 standard - for interoperability. Cryptographic support is also provided by natively supporting the Eracom CSA 8000 card.

Problem determination is made simpler by the addition of the First Failure Data Capture (FFDC) support - which makes it simpler for customers to collect all the data that are relevant to a specific problem occurrence.

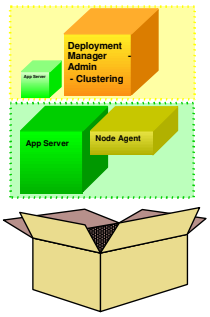
The AAT has been expanded to support J2EE 1.3

Migration tooling is also included to support migration paths from 3.5.x and from 4.0 installations to Version 5. Interoperability with previous releases is also supported.

WebSphere Application Server will include the IBM IHS 1.3.26. The IHS 2.0 is also supported and downloadable from the web.

WebSphere Application Server – Network Deployment

- **Targets multiple servers, multiple nodes environment**
  - Focus is on scalability, availability, and performance
  - Clustering and failover support
  - Web server plug-in supports weighted workload management
- **Distributed Administration**
  - Browser based administration console for the entire topology
  - XML-based repository
    - No RDB requirement
- **Ships with Edge Components**
  - Network Dispatcher
    - Switch Consultants for CISCO and Nortel switches
    - Site Selector for scaling Network Dispatcher
  - Caching Proxy
    - Reverse Proxy, Content Based Routing,...
    - Dynamic content caching: integration with WebSphere servlet caching
- **Enhanced Web Services functions**
  - UDDI Registry - for private UDDI registry
  - Web Services Gateway



WebSphere Application Server Network Deployment (WAS-ND)

The Network Deployment configuration essentially adds the Deployment Manager to the base app server. This allows customers to run their application in a scalable environment, potentially consisting of multiple servers and multiple physical nodes.

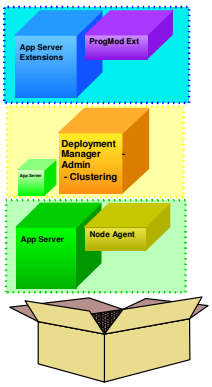
You'll be able to start the deployment manager and add one or more instances of the base app server to the cell. Each "node" will be managed by a single Node Agent and you'll be able to administer the entire cell through the Deployment Manager. However, the deployment manager does not need to be active and running to ensure that all the remaining nodes are running This feature strongly reduces the availability exposure of an administrative process as single point of failure.

The Network Deployment configuration uses the same administrative model, the same repository structure (XML files), and the same administrative clients as the base. There is no need for an RDB for the config information, there is no "Java-based" console - the browser-based console allows you to manage the cell.

The Network Deployment configuration includes the Edge Components (Network Dispatcher and Caching proxy) and it also includes the private UDDI registry and the Web Services gateway.

WebSphere Application Server Enterprise

- **Focus is on extending the J2EE Programming Model**
  - To enable implementation of sophisticated application functions
  - To provide performance advantages
- **Functions provided in WebSphere Enterprise 5.0**
  - Dynamic Access Intent and Application Profiling
    - As opposed to static Access Intent
  - Activity Sessions
    - Extend standard transaction model
  - Dynamic Query Capabilities
    - Extend static and standard EJB QL
  - Extended Messaging Support
  - Process Choreography Support
    - Microflow / Macroflow runtime support
  - Asynchronous Beans
  - Scheduler
  - Startup Beans
  - Business Rules Beans, Work Area, Internationalization, CORBA SDK



WebSphere Application Server Enterprise (WAS Enterprise)

This chart outlines the focus of the WebSphere Enterprise Version 5.

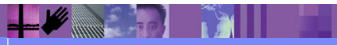
This product is centered around programming model extensions - above and beyond the standards and the support offered in the base.

It includes all the functions provided by the Enterprise Edition 4.x (excluding the Extended messaging support, which is now in the base version 5 app servers, through Message Driven Beans)

In addition, it includes the line items listed in the chart.

"Distributed" Platforms OS Support

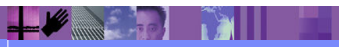
Operating System	Level
Win2000	Advanced Server SP 3 Server SP3
NT	SP 6a
AIX	4.3.3, 5.1, 5.2
HP-UX	HP-UX 11i with Quality Pack of December 2002
Linux/Intel	RedHat Advanced Server 2.1 RedHat Linux 8.0 SuSE Linux for Intel 7.2 SuSE SLES 7 2.4 Kernel SLES 8 with United Linux 1.0 Dist. United Linux 1.0
Linux/390	Red Hat Linux for s/390 7.2 2.4 Kernel SuSE SLES 7 2.4 Kernel United Linux 1.0
Solaris Operating Environment	8 and up
OS400	5.1 & 5.2



"Distributed" Platform Database Support

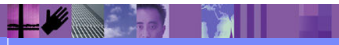
Supported Databases	OS
CloudScape 5.0.9 (for Samples) DB2 7.2 FP 7, DB2 8.1 DB2 for 390 6.1 and 7.1 (through DB2 Connect) Oracle Enterprise Edition 8i Rel. 3 and 9i	Win2000, NT AIX Linux/Intel Linux/390 Solaris
SQL Server Enterprise 7.0 SP 2	NT
SQL Server Enterprise 2000	Win2000
Sybase 12.0	NT AIX Solaris
Informix 7.31 and 9.3	Win2000, NT AIX Solaris
DB2/400	OS/400

Also check: http://www.ibm.com/software/webservers/appserv/doc/latest/prereq.html



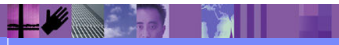
WebSphere 5.0: Standards Checklist

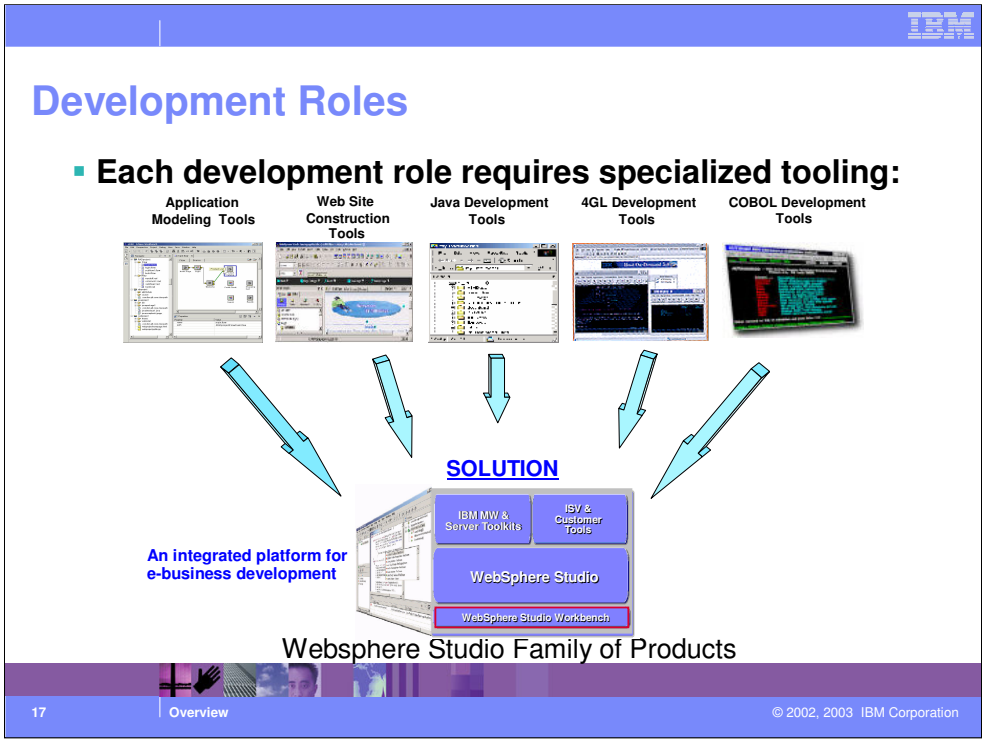
Standards	Level	WebSphere 5.0
J2EE	1.3	✓ Fully certified and part of Sun's JCEE list
EJB	2.0	✓ EJB 2.0 and EJB 1.1 support
JDK	1.3	✓ IBM Developer Kit, Version 1.3.1
Servlet	2.3	✓ Servlet 2.3
JSP	1.2	✓ JSP 1.2
JTS/JTA	1.0	✓ w/distributed transactions
JMS	1.0.2	✓ With Native Provider, and MQ plug-in
JDBC	2.0	✓ 2PC across heterogeneous databases
JNDI	1.2	✓ JNDI 1.2 for EJB lookup and CosNaming
RMI/IIOP	1.0	✓ Fully supported
JavaMail/JAF	1.2	✓ Plus Domino support
SSL Security	2.0	✓ JSSE and JCE
XML JAXP	1.0	✓ XML in EJBs
J-IDL/CORBA		✓ IIOP 1.2
J2C	1.0	✓ Bean and container managed
LDAP		✓ SecureWay, iPlanet, ActiveDirectory
HTTP	1.1	✓ **Yes**, plus across multiple Web servers
SOAP SOAP-SEC	2.2.2 1.0	✓ Soap support for WebServices. ✓ Tech preview
COM/ASP Support		✓ w/Java wrapping & proxy
JMX	1.0	✓ JMX pending
XML4J	4.0	✓ XML support
XSL	2.3	✓ XSL parser



Section

Development Tooling





Each of these development roles demands unique functionality in their Application Development tooling to make them more productive. Things like wizards, connectors, and other Application Development tooling automation can free the programmer from the lower-level, mundane tasks and allow them to focus on the higher-level creativity.

Traditional tools architecture is closed and monolithic, sometimes hard to integrate or even use together. Each tool can implement proprietary tool services.

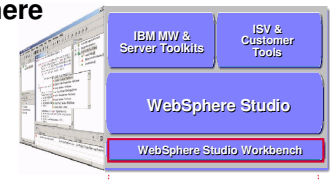
Difference look and feel, specification semantics, UI, resource organization and management, editor,

Different programming tool for each role, multiple tools from different vendors for the same role, and lack of integration between roles, tools or vendors can cause poor productivity.

The solution? One tool interface that unites the tasks at hand.

WebSphere Studio Workbench

- **Open, extensible tool platform for WebSphere**
  - The IBM commercially supported implementation of Eclipse
  - A foundation for the WebSphere Studio family
  - First AD integration platform to fully embrace open technologies
    - Same successful approach as for Apache, J2EE, and Linux
- **Largest contribution to the open-source initiative**
  - Licensed via Common Public License
  - Allows partners, customers to develop, customize, and integrate their tooling using open standards
  - Based on Java
  - Initially supported on Windows and Linux
  - Continued IBM investment in Eclipse



Adopt

eclipse

www.Eclipse.org

The WebSphere Studio Workbench contains a released level of the open Eclipse Workbench.

IBM is contributing the initial Workbench ($40M of development investment) to the Eclipse community and will continue to participate in and contribute to the community

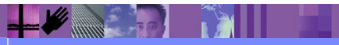
The WebSphere Studio Workbench will adopt new releases of the open Eclipse Workbench as the community makes them available

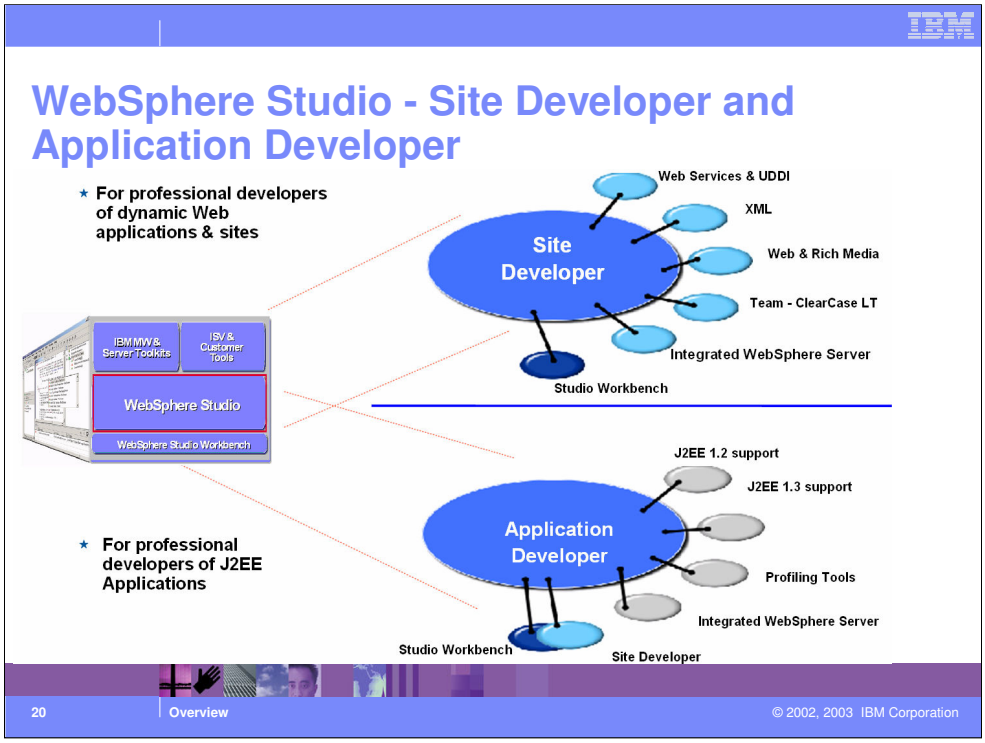
IBM will not sell the Workbench but will make it available for IBM and partner tool developers to provide a consistent integration platform for WebSphere development

and we are providing a partner program for those that develop tools for the WebSphere Studio Workbench.

Section

WebSphere Studio Family of Products





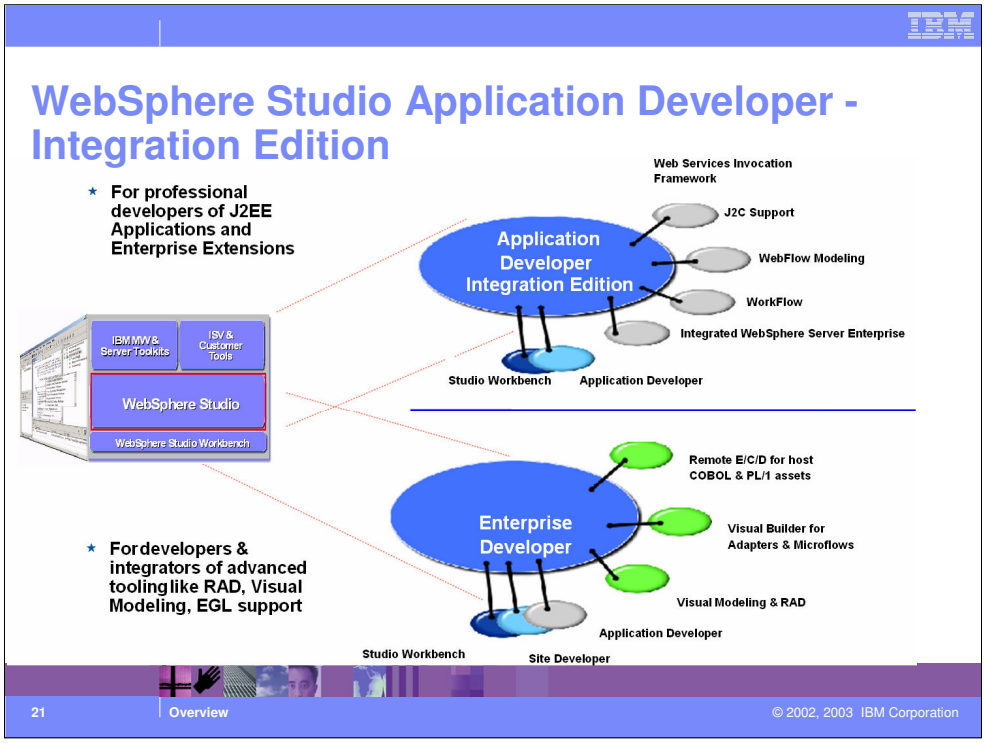
The Site Developer package is a set of tools and perspectives for professional developers of Web sites and Web applications.

It delivers tools supporting open Web standards including XML, JavaServer Pages, and Web services, as well as Java and JavaScript through the tools inherited from the Workbench, and rich media tools required for developing a high quality user experience.

The Web services tools include those for creating services from Java components and publishing their descriptions to a UDDI repository; and for browsing a UDDI repository for available services and linking to them from the Web application via a JavaServer Page.

In addition to the CVS repository interface inherited from the Workbench, Site Developer adds an interface to Rational's ClearCase LT and includes a ClearCase LT repository.

Site developers can test their work as they develop it through an integrated WebSphere Application Server v4.0.



WebSphere Studio Application developer extends the (yet-to-be-released) Site Developer solution - including all the tools and perspectives we discussed earlier - and adds...

A more robust set of Java and J2EE development tools optimized for professional and team development

Data mapping tools for linking the application to the data in the databases - supporting leading databases including DB2

Performance profiling tools to help the application developer optimize the application's performance as it is being developed

Support for Web and rich media, as well as Web Services and XML

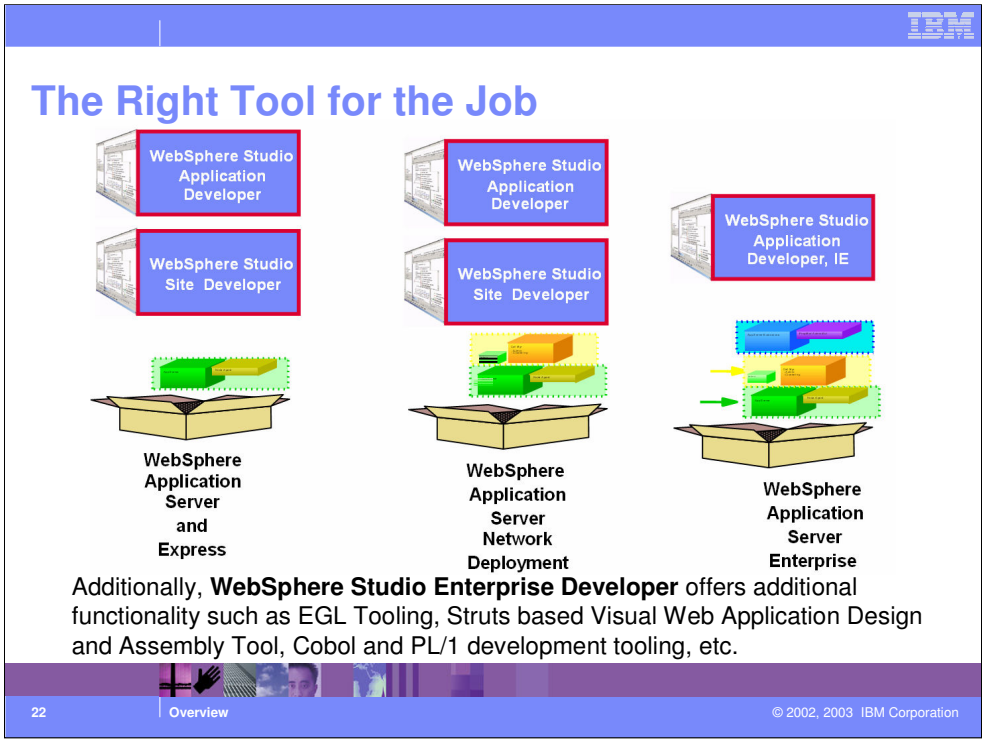
Team support via the included ClearCase LT solution, or the tool of your choice

The integration of the development and performance optimization tools with the WebSphere Application Server test environment makes Application Developer a very powerful environment

VisualAge for Java customers with current subscriptions will receive upgrades to WebSphere Studio Application Developer free of charge

For our current VisualAge for Java and WebSphere Studio customers, Application Developer includes an online guide with step-by-step tutorials for migrating projects and artifacts

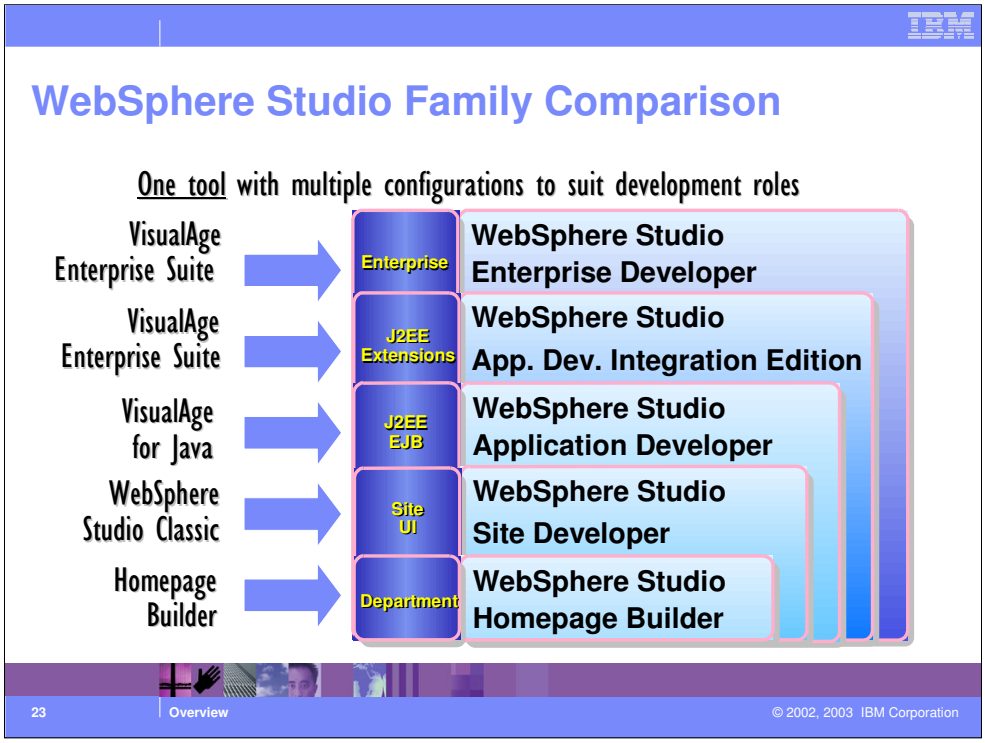
Additionally, a paper is available on WebSphere Developer Domain that covers scenarios for development teams that have coexistence of VAJ and Application Developer as they make the transition.



In the WebSphere Version 5 a special effort was made by IBM development in order to provide a coherent tooling and runtime offer to our customers.

Customers can use the Application Developer to create applications that are going to be deployed on the base appserver or on the Network Deployment configuration. Also - customers that are only interested in the aspects of Web development or web services development can use the Express product for development, testing, and production.

Customers who need top-of-the-line application functions can use the Integration Edition of the Studio product to create and test their applications and then seamlessly deploy them on the Enterprise application server.



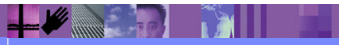
Put this all together and you get WebSphere Studio.

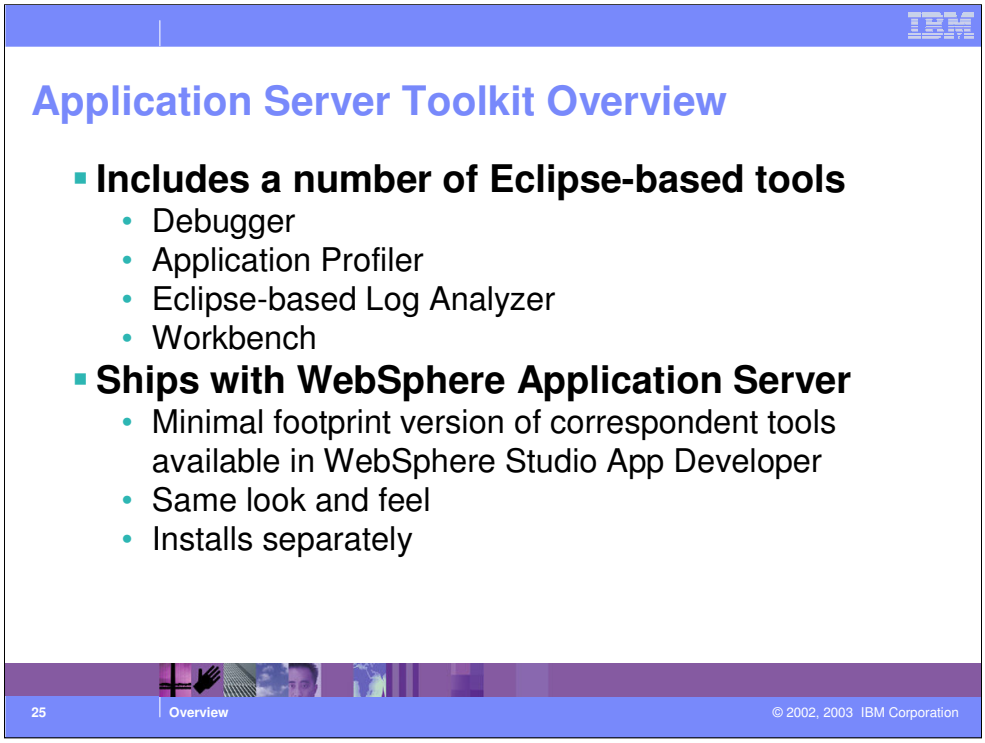
One tool with multiple configurations to suit development needs

An integrated experience unlocks greater productivity by bringing order, collaboration and integration to rapidly expanding e-business development processes.

Section

Application Server Toolkit



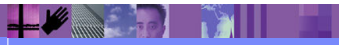


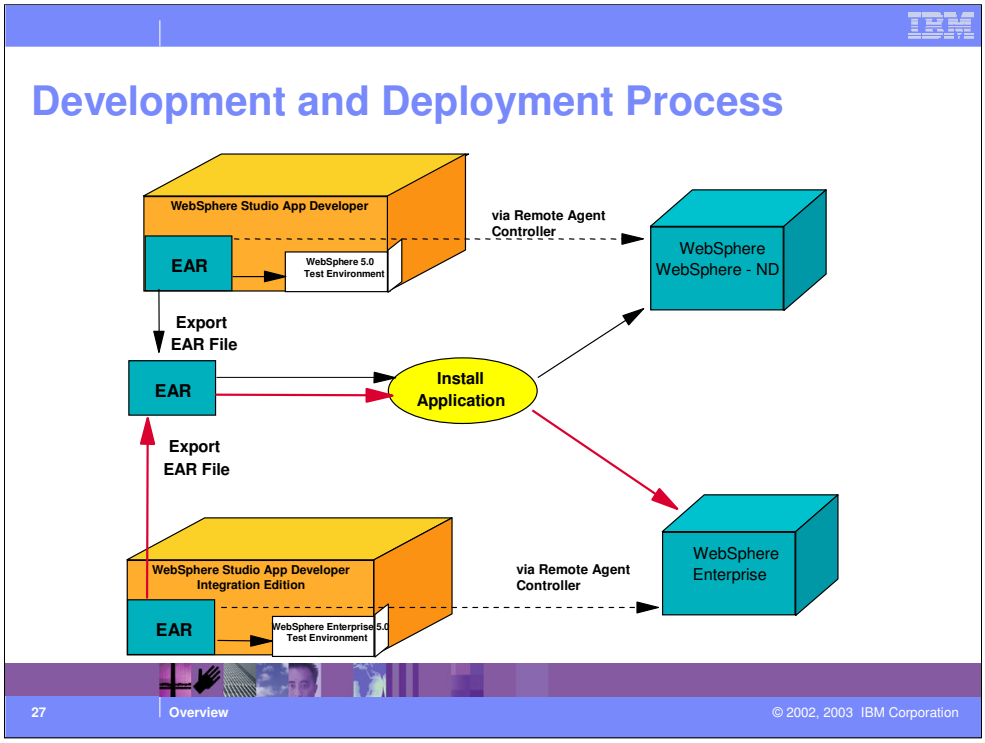
The Application Server Toolkit includes several Eclipse-based tools - including the Debugger, profiler, log analyzer, and the workbench itself.

This toolkit ships with the WebSphere Application Server, as a separately installable package. It has the same look and feel as WebSphere Studio, but has the reduced footprint for the non-Developer to use in a runtime environment.

Section

Development and Deployment Process

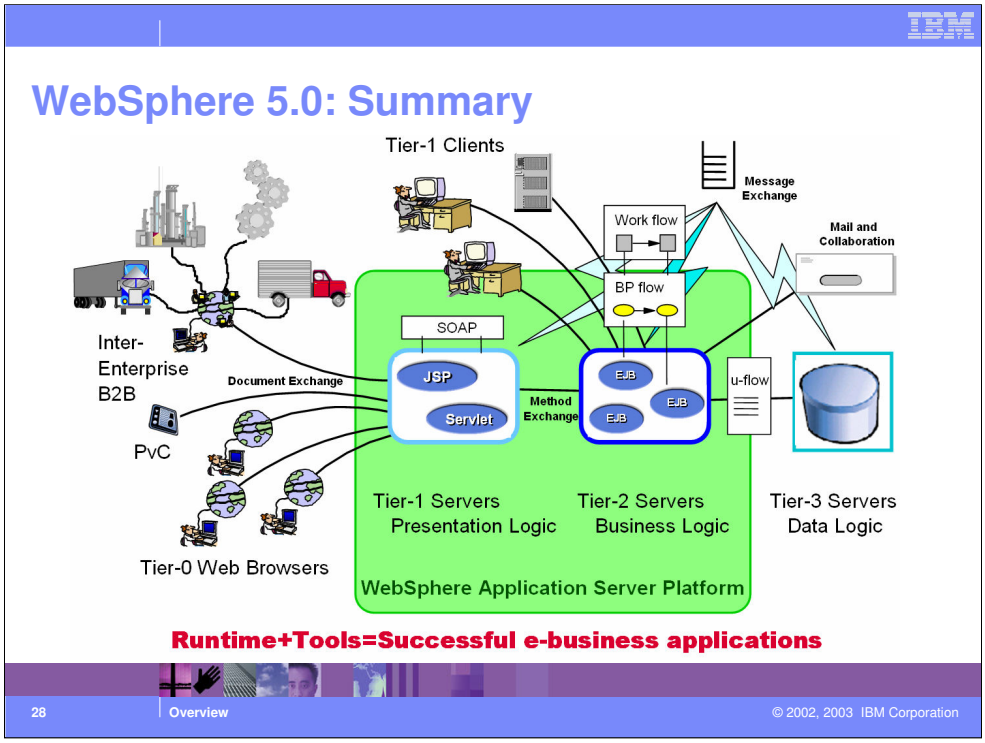




The Studio products and the WebSphere App Server runtime are specifically designed for a seamless integration.

On the top of the chart you can see that you can develop a J2EE Enterprise App and test it right inside of the Studio product, where you'll find an integrated test environment which is identical to the externally available product - once testing is complete, the application (EAR file) can be installed directly on the runtime - or it can be exported and distributed to be installed at a later time.

The same processes are available to the enterprise developer and customers. WebSphere Studio App Developer Integration Edition is the product that integrates a WebSphere Enterprise test environment.



In summary - in the Version 5 timeframe, WebSphere Application Server addresses all of the highly in demand industry requirements:

- It provides a standard, scalable transaction engine through the base app server, where the core business processes are executed
- It provides a variety of options for integrating diverse client technologies and B2B interactions
- It provides a variety of leading edge functions that allows customers to enhance and complement the core transactional processes with micro- and macro-workflow functionality, job scheduling, messaging patterns, and other advanced features
- It is part of an overall portfolio of products that include the WebSphere Studio family, where tooling and runtime are specifically designed to work seamlessly together and to support all the aspects of the complex lifecycle of modern applications.

Trademarks and Disclaimers