This presentation is about the new libraries that are available with WebSphere Application Server V7 to support the IBM Thin Client for Enterprise JavaBeans.

Agenda

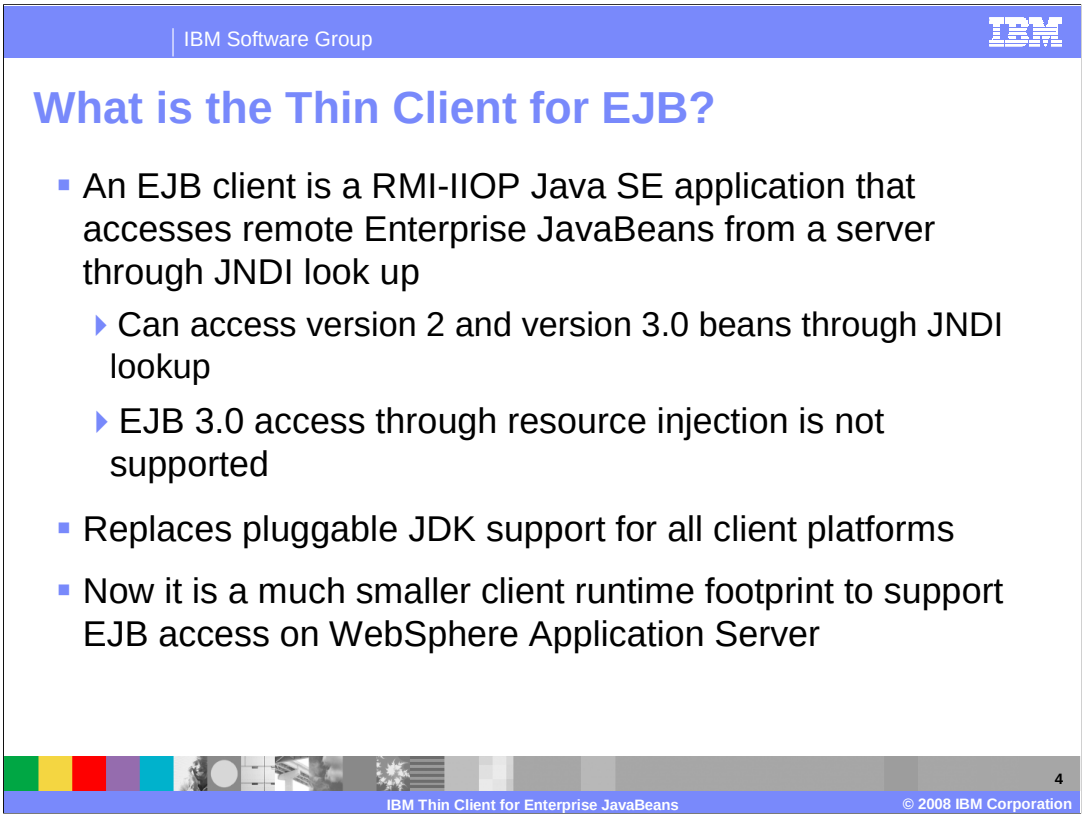
- Overview
- Installation
- Running the Thin Client for EJB

The first section provides an overview of the Thin Client for EJB. The second section describes how to install the client and what platforms are supported. The last section describes how to run your applications with the thin client libraries, including special considerations for running with security on non-IBM platforms.

Section

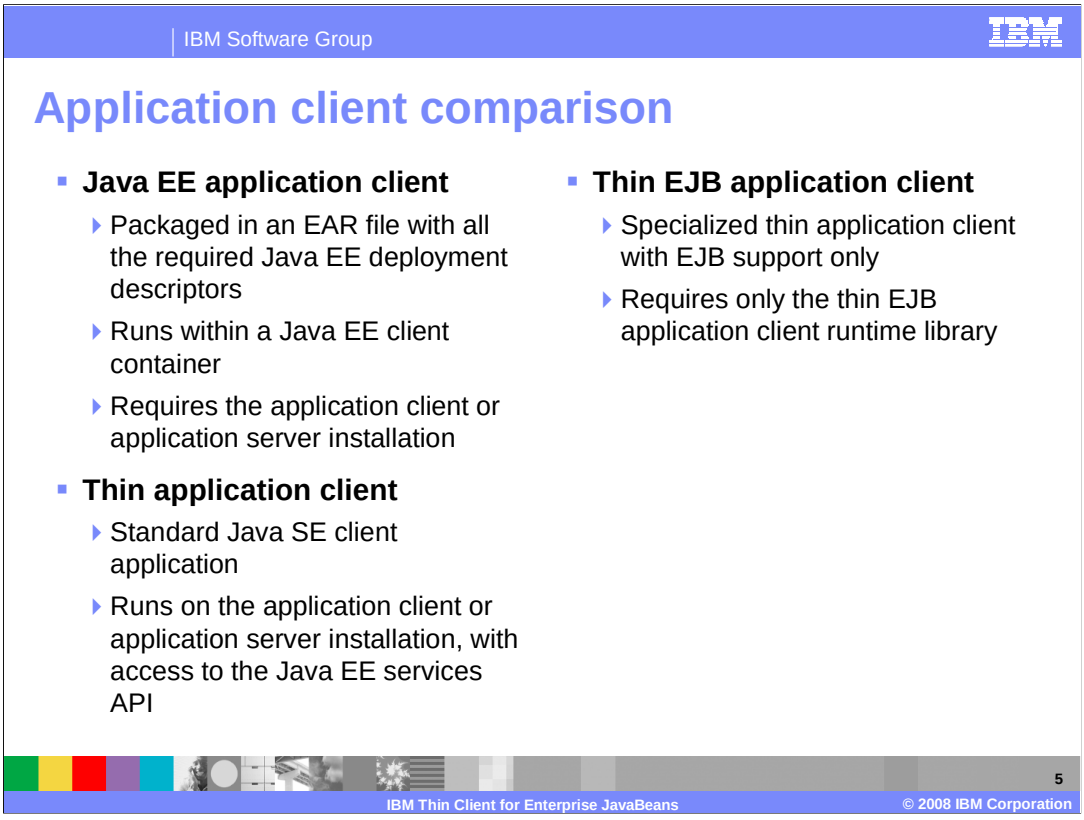
Thin Client for EJB Overview

This section describes the Thin Client for EJB and compares it to other application clients.



An EJB Client is a Remote Method Invocation over Internet Inter-ORB Protocol (RMI-IIOP) Java Platform, Standard Edition (Java SE) application that accesses remote Enterprise Java Beans from a server through Java Naming and Directory Interface (JNDI) look up. IBM Thin Client for EJB offers a smaller footprint and is easy to deploy to a Java SE environment and an Eclipse Rich Client Platform (RCP) environment. You can bundle the IBM Thin Client for EJB library using the WebSphere Application Server installation or the Application Client for WebSphere Application Server installation with your application. The IBM Thin Client for EJB also extends the choice of Java SE runtime. It can be run in the Java Runtime Environment (JRE) that is packaged with the WebSphere Application Server product, the Sun Microsystems JRE that is downloaded from the Sun Microsystems Web site, or the JRE that is downloaded from the HP Web site.

The Thin EJB client is a replacement of what was called *Pluggable JDK Support for all Client platforms. Pluggable JDK Support for all Client platforms* was originally created for the WebSphere Application Server, Version 5.1 to extend the pluggable application client installation feature and support to additional platforms, Linux®, Solaris and HPUX. The Pluggable Application Client feature in the application client installer is deprecated. It is replaced by the IBM Thin Client for EJB.



In a traditional client-server environment, the client requests a service and the server fulfills the request. Multiple clients use a single server. Clients can also access several different servers. This model persists for Java clients except that now these requests use a client runtime environment. WebSphere Application Server supports a variety of application clients. The Java EE application client is a Java application program that accesses enterprise beans, JDBC APIs, and Java Message Service message queues. The Java EE application client program runs on client machines. This program follows the same Java programming model as other Java programs; however, the Java EE application client depends on the Application Client run time to configure its execution environment, and uses the Java Naming and Directory Interface (JNDI) namespace to access resources. Thin clients, alternatively, are lightweight and can run in a standard Java SE runtime environment. The full thin client supports multiple Java EE services, such as JMS, enterprise beans, and Web services. The new IBM Thin Client for EJB is a specialized thin client that only contains components for EJB access.

Client types and features

Client	WebSphere Java EE client	Java RMI client	Thin EJB client
Required runtime classes	Complete application client or application server installation	None	com.ibm.ws.ejb.thinclient_7.0.0.jar com.ibm.ws.orb_7.0.0.jar
JDK	IBM Version 5.0 or 6.0	Sun, IBM, or HP Version 5.0 or 6.0	Sun, IBM, or HP Version 5.0 or 6.0
Features	▪ Provides connectivity to WebSphere Application Server ▪ Supports WebSphere-specific features and all Java EE application and client features ▪ Uses IBM ORB ▪ Requires use of IBM-specific factory class*	▪ Provides connectivity to WebSphere enterprise beans ▪ Does not support WebSphere-specific features and many Java EE features ▪ Uses CORBA 2.3 ORB ▪ Requires use of Sun-specific factory class**	▪ Provides connectivity to WebSphere enterprise beans ▪ Supports WebSphere Application Server features like security, transactions, ActivitySession, workload balancing, and failover ▪ Uses IBM ORB ▪ Requires use of IBM-specific factory class*

* com.ibm.websphere.naming.WsnInitialContextFactory
** com.sun.jndi.cosnaming.CNCtxFactory

The table shown here provides some more details on the differences between Java EE clients, standalone Java clients, and the new Thin Client for EJB. The Java EE client has the most significant runtime requirements; it requires that you have installed either the application client package or WebSphere Application Server. Java RMI clients do not have any special runtime requirements because they hook directly into a standard Java Virtual Machine. While they are lightweight, they do not provide support for accessing any WebSphere-specific features or many Java EE features. The Thin Client for EJB is also lightweight – you only need to use the one thin client JAR file to invoke client operations if you are using an IBM Java runtime. The EJB client provides support for connecting to enterprise beans and for accessing WebSphere Application Server components, like security, workload management, and session information.

Thin Client for EJB library

- The Thin Client for EJB is a Java library package which includes:
  - Thin EJB client runtime library – required
  - IBM ORB implementation library – only required if using a non-IBM JDK
- Supports these high level application server components:
  - Basic runtime framework
  - Security, including basic authentication
  - Naming, including initial naming context factory implementation
  - Workload management
  - RAS Lite
  - IBM ORB implementation
  - IIOP over SSL

In WebSphere Application Server V6, the thin EJB client is a new runtime that consists of two Java libraries. The client runtime library is required on all platforms. The IBM ORB implementation library is only required if you are running on a non-IBM JDK, like Sun or HP. The WebSphere Thin EJB Application Client runtime includes additional features like the WebSphere initial naming context factory implementation, the WebSphere workload management support, the WebSphere basic authentication, and IIOP over SSL. These additional features are implemented as extensions or plug-ins to the IBM ORB implementation.

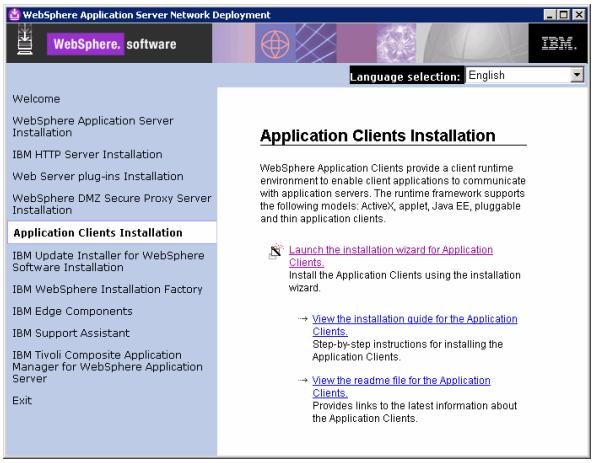
Section

Installation

This section describes how to install application clients, including what platforms are supported and where to find the thin client libraries after the products are installed.

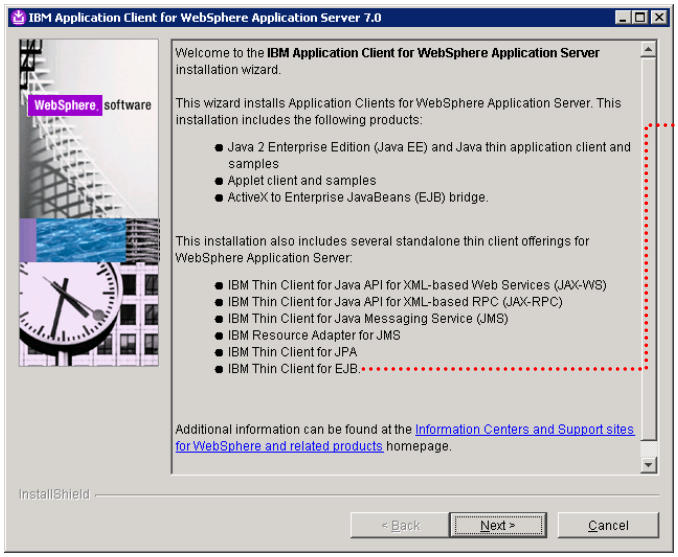
Installation

- Thin EJB client runtime library does not have its own separate installer
  - Use the WebSphere Application Server installer, and the library is included in the runtimes directory
    - <WAS_HOME>/runtimes
  - Use the Application Clients installer
    - Included with the Supplements CD package
    - Start the installer from the product launchpad



The Thin Client for EJB does not have its own separate installer. The runtime libraries can be installed in two ways – with a WebSphere Application Server V7 installation, or with an Application Client installation. Recall that the client consists of two JAR files. When you install the application server, these JAR files will automatically get laid down in the product's runtimes directory. In order to use the client libraries, just copy them from the system where you have installed the application server and include the required JAR files in your client package. You can also use the Application Clients installer to access the Thin Client for EJB libraries. The Application Clients are included with the Supplements CD package that comes with your WebSphere Application Server media. You can access the Application Clients installer from the WebSphere launch pad. The next few slides describe how to use the Application Clients installer to install the thin client libraries.

Application Client installation wizard



This installer can install multiple clients and client samples, including the IBM Thin Client for EJB

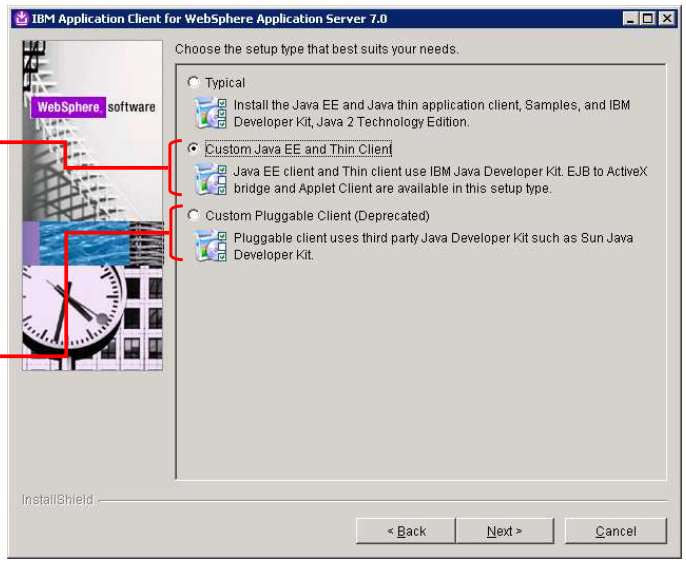
After the Welcome panel, the installer will prompt you to accept the product license, verify your system prerequisites and choose an installation location

You can use the Application Client installer to install a variety of clients that you can use with your server applications. The Welcome panel shown above lists many of the client options that are available, including a Java EE client, standard Java thin application clients, thin clients for Web services and messaging, and the IBM Thin Client for EJB. As you proceed through the installer, you are prompted to accept the product license agreement, verify your system prerequisites, and choose an installation location for the client options that you choose to install.

Installation wizard – installation types

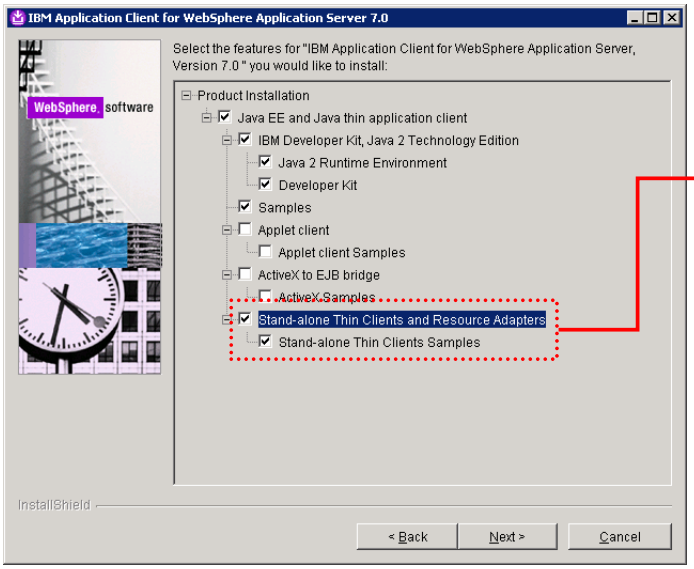
This **Custom Java EE and Thin Client** option will take you through the steps for installing the Thin Client for EJB

Notice that the pluggable client has been deprecated



There are three types of client installation. First is the typical installation, which will install the Java EE and Java thin application client, along with samples and development tools. The second option – Custom Java EE and Thin Client – is the option that you need to choose to install the Thin Client for EJB libraries. Notice that third option is for the pluggable client lists it as being deprecated. The EJB client is a replacement for the pluggable client on all client platforms.

Installation wizard – feature selection



Choose the new option for **Stand-alone Thin Clients and Resource Adapters** to install the Thin Client for EJB

After this panel, complete the installation by providing details for the WebSphere Application Server host that the client will connect to

In the feature selection panel, a new option for Stand-alone Thin Clients and Resource Adapters has been added. Select this option to install the EJB thin client libraries. After choosing which features to install, you are prompted to provide connection details for the WebSphere Application Server host that the client is connecting to. Finally, you will review the installation summary and finish the installation.

What is supported?

- The Thin Client for EJB is available in the Base, Network Deployment and Express® editions of WebSphere Application Server V7
- All WebSphere Application Server supported platforms are supported
- Supported Java runtime environments (JRE) include:
  - IBM JRE 5 and 6 (including the IBM hybrid JRE) on all WebSphere platforms
  - Sun JRE 5 and 6 on Windows®, Linux and Solaris
  - HP JRE 5 and 6 on HP
- Eclipse Rich Client Platform support
  - Eclipse RCP Version 3.2
  - Eclipse RCP Version 3.3

The Thin Client for EJB is available with the Base, Network Deployment, and Express editions of WebSphere Application Server V7. The libraries are included with the application server and with the Application Clients on the Supplements CD. All WebSphere Application Server supported platforms are supported with the thin client. The client also runs on Java SE 5 and Java SE 6 runtime environments, and supported builds vary by platform. You can also use the Thin Client for EJB libraries when building applications with the Eclipse Rich Client Platform. The client libraries work with Eclipse RCP Versions 3.2 and 3.3.

Where is the EJB client package?

- The Thin Client for EJB client package is available in the application server or application client installation runtimes directory
  - Application server
    - <WAS_HOME>/runtimes/com.ibm.ws.ejb.thinclient_7.0.0.jar
    - <WAS_HOME>/runtimes/com.ibm.ws.orb_7.0.0.jar
  - Application client
    - <APP_CLIENT_HOME>/runtimes/com.ibm.ws.ejb.thinclient_7.0.0.jar
    - <APP_CLIENT_HOME>/runtimes/com.ibm.ws.orb_7.0.0.jar
- The com.ibm.ws.ejb.thinclient_7.0.0.jar is packaged as an Eclipse plug-in and contains both a plugin.xml and an OSGi manifest file

After you have installed the application server or the application client packages, the Thin Client for EJB libraries – both the thin client library and the ORB library – are available in the product's runtimes directory. The paths and file names are shown on this page. The thin client JAR file is packaged as an Eclipse plug-in, which simplifies the process of building Eclipse RCP applications that use the thin client library.

Section

Running the Thin Client for EJB

This section describes how to run your application client that uses the Thin Client for EJB libraries.

Running the Thin EJB client

- When running the EJB client with SSL and security, you must specify these system properties to provide the security properties
  - com.ibm.CORBA.ConfigURL=file:sas.client.props
  - com.ibm.SSL.ConfigURL=file:ssl.client.props
- **Example:** Sample command for running the thin EJB client

```
java -Djava.naming.provider.url=iiop://myappserver.com:2809
-Dcom.ibm.SSL.ConfigURL=file:///c:/userhome/app/ssl.client.props
-Dcom.ibm.CORBA.ConfigURL=file:///c:/userhome/app/sas.client.props
-cp com.ibm.ws.ejb.thinclient_7.0.0.jar;client.jar;ejb.jar
com.user.app.Main
```

- If using a Sun or HP JRE, also add to the classpath com.ibm.ws.orb_7.0.0.jar

To be able to run an application client that uses the thin client library, just include the JAR file in your class path. If you are running with security enabled, you will also need to provide references to the sas.client.props and ssl.client.props files that contain the required security configuration information. When running the Thin EJB Client with SSL and security, users must specify the system properties shown on this page to provide the configuration properties. You can copy these files over from your application server or application client installation. The Thin Client for EJB libraries depend on the IBM ORB implementation, so if you are using a Sun or HP JRE, it is important that you also include the ORB JAR file in your Java system class path so that it will override the non-IBM implementation. The sample command above shows how to launch an application client program that uses the thin client libraries on the Windows platform.

Properties file updates

- The properties files ssl.client.props and sas.client.props can be copied from either the application server or application client directories:
  - <WAS_PROFILE_HOME>/properties
  - <APP_CLIENT_HOME>/properties
- When running the EJB client with a Sun JRE the settings in ssl.client.props shown below in **red** will need to be updated:

```
com.ibm.ssl.protocol=SSL
com.ibm.ssl.trustManager=SunX509
com.ibm.ssl.keyManager=SunX509
com.ibm.ssl.contextProvider=SunJSSE
com.ibm.ssl.keyStore=<existing key file in JKS format>
com.ibm.ssl.keyStorePassword=<password of the key file>
com.ibm.ssl.keyStoreType=JKS
com.ibm.ssl.keyStoreProvider=SUN
com.ibm.ssl.trustStore=<existing key file in JKS format>
com.ibm.ssl.trustStorePassword=<password of the key file>
com.ibm.ssl.trustStoreType=JKS
com.ibm.ssl.trustStoreProvider=SUN
```


The ssl.client.props and sas.client.props files contain security configuration information. You can copy them over from the properties directories for either the application server or the application client and modify them to suit your environment. You will need to update the ssl.client.props file to contain the appropriate key store file properties. If you are using a Sun or an HP JRE, it is especially important that these files exist, because automatic key store generation is only available on the IBM JRE. The example above shows sample contents for the ssl.client.props file. The trustManager, keyManager, contextProvider, and keyStoreProvider values need to be set as above when using a Sun JRE.

Thin client as an Eclipse RCP application

- When running the thin client as an Eclipse RCP application:
  - Include the com.ibm.ws.ejb.thinclient_7.0.0.jar plug-in
  - If using a non-IBM JRE, include the com.ibm.ws.orb_7.0.0.jar fragment plug-in to override the JRE's default ORB implementation

The class path configuration requirements for running as an Eclipse Rich Client Platform application are similar to those for standard clients. The thin client library needs to be included as a plug-in. If using a non-IBM JRE, the ORB library also needs to be included as a plug-in.

Section

Summary and references

This section contains a summary and references.

Summary

- The Thin Client for EJB is a Java library package that provides support for client EJB access
  - Offers a smaller disk footprint than other application clients
  - Easy to deploy to a Java SE environment or an Eclipse RCP environment

The Thin Client for EJB is a new set of lightweight thin client libraries, available with WebSphere Application Server V7, that replaces pluggable JDK support for all platforms. The client libraries have a much smaller footprint than standard Java EE application clients and are easy to deploy to a Java SE environment or an Eclipse RCP environment.

References

- RCP project
  http://www.eclipse.org/home/categories/rcp.php
- RCP tutorial
  http://www.eclipse.org/articles/Article-RCP-1/tutorial1.html
- IBM JRE
  http://www.ibm.com/developerworks/java/jdk/

These references provide additional documentation on topics related to the Thin Client for EJB.

Feedback

Your feedback is valuable

You can help improve the quality of IBM Education Assistant content to better meet your needs by providing feedback.

- Did you find this module useful?
- Did it help you solve a problem or answer a question?
- Do you have suggestions for improvements?

Click to send e-mail feedback:

mailto:iea@us.ibm.com?subject=Feedback_about_WASv7_ThinEJBClient.ppt

This module is also available in PDF format at: ../WASv7_ThinEJBClient.pdf

You can help improve the quality of IBM Education Assistant content by providing feedback.

Trademarks, copyrights, and disclaimers

The following terms are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both:

Express IBM WebSphere

A current list of other IBM trademarks is available on the Web at http://www.ibm.com/legal/copytrade.shtml

Windows and the Windows logo are registered trademarks of Microsoft Corporation in the United States, other countries, or both.

EJB, Enterprise JavaBeans, Java, Java runtime environment, JDK, JRE, and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Product data has been reviewed for accuracy as of the date of initial publication. Product data is subject to change without notice. This document could include technical inaccuracies or typographical errors. IBM may make improvements or changes in the products or programs described herein at any time without notice. Any statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business. Any reference to an IBM Program Product in this document is not intended to state or imply that only that program product may be used. Any functionally equivalent program, that does not infringe IBM's intellectual property rights, may be used instead.

Information is provided "AS IS" without warranty of any kind. THE INFORMATION PROVIDED IN THIS DOCUMENT IS DISTRIBUTED "AS IS" WITHOUT ANY WARRANTY, EITHER EXPRESS OR IMPLIED. IBM EXPRESSLY DISCLAIMS ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT. IBM shall have no responsibility to update this information. IBM products are warranted, if at all, according to the terms and conditions of the agreements (for example, IBM Customer Agreement, Statement of Limited Warranty, International Program License Agreement, etc.) under which they are provided. Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products.

IBM makes no representations or warranties, express or implied, regarding non-IBM products and services.

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents or copyrights. Inquiries regarding patent or copyright licenses should be made, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.