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## **JADE OVERVIEW**

Download JADE for free at:

[www.jadeworld.com/jade](http://www.jadeworld.com/jade)



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**JADE™**



## The JADE Platform

JADE is a high-performance software platform for delivering targeted solutions to complex business problems.

JADE excels in managing complex, highly connected data, relationships and business rules:

- **Wide, interconnected networks of objects**  
Such as the web of connections between facts in an intelligence management system.
- **Deep, hierarchical object structures and decision trees**  
Such as drilling down, traversing and validating a ship's cargo in a container management system.
- **Manipulating large collections of related objects**  
Such as tracking the exported logs of a nation in a supply chain management system, or organising transactions in a financial management system.

From logistics to financial services to case management, **JADE is delivering** proven results to over 1900 organisations worldwide.

## Key Benefits of JADE

JADE allows developers to easily build intricate, real-world business models without being constrained by the mechanics of storing and accessing data. With JADE, developers can store, retrieve and rapidly traverse complex, interconnected object structures as though they are always in memory.

JADE entirely eliminates the development effort required to move objects to and from a database (often referred to as *impedance mismatch*). This makes developers more productive.

Coupled with a flexible distributed processing model, JADE is ideal for solving complex problems. JADE makes it easier to build and run distributed systems that take advantage of modern, high-performance hardware platforms.

Built on more than 25 years of company experience, JADE reduces the complexity of software development by delivering for Windows and Linux a seamless fusion of:

- A proven, high-performance object database that makes the storage, retrieval and traversal of complex object models transparent.
- An object manager and application servers that provide automatic object caching, powerful distributed processing capabilities and interfaces to other languages.
- Web Services to interoperate with other systems and technologies.
- A high-grain, conceptually economic programming model that makes it easier to implement complex business processes.
- A Synchronized Database Service (SDS) that provides hot-standby facilities and the ability to distribute read-only tasks to secondary databases.
- A Relational Population Service (RPS) that makes it easy for JADE systems to populate relational databases for Business Intelligence (BI) and data warehousing purposes.
- An automatic, portable thin client that enables rich user interfaces to be deployed easily over the Internet to both Windows and Linux desktops.
- A clear, concise, easy-to-learn programming language.
- A repository-based development environment that enables collaborative thin client development from anywhere in the world.
- HTML frameworks for delivery of browser-based user interfaces.



- **Increased Productivity**
- **No Impedance Mismatch**
- **Interoperable:**
  - XML
  - Web Services
  - Relational Population Service (RPS)
- **High Performance**
- **Low Administration**
- **Platform Choice:**
  - Windows
  - Linux

## For Developers

JADE is for Developers:

- Who want to easily and efficiently store, retrieve and manipulate complex object models.
- Who want seamless object storage and easy integration with relational data warehouses.
- Who want to easily build distributed systems of complex business rules with automatic object caching for high performance.
- Who are frustrated with fine-grain programming models and want a higher degree of conceptual economy.
- Who want an end-to-end, database-to-presentation, development and runtime platform for Linux.
- Who enjoy extending their skills with a fresh approach.

## For Businesses

JADE is for Businesses:

- Faced with a targeted problem causing business-wide pressure.
- Wanting innovative solutions where other technologies have not delivered.
- Needing to rapidly deliver new back-office services on Windows or Linux that integrate easily with their existing infrastructure.

## For ISVs

JADE is for ISVs:

- Who want a fresh approach to build innovative products that deal with complex, highly connected data.
- Who want a high-performance, low-administration object database and application server to deliver complete solutions to their customers.
- Who want to build products that are portable across Windows and Linux, from the server-side to the desktop.
- Who want a development platform that encourages collaborative, agile, multi-disciplined development teams.

## Reducing Complexity

JADE simplifies programming by giving developers a single data model, seamless persistent data storage and a concise conceptual model for building OO, distributed, systems that manage complex, highly connected data.

In his landmark book, “The Mythical Man Month”, Fred Brooks wrote: “I will contend that conceptual integrity is the most important consideration in system design.”

*Conceptual integrity* is about designing and maintaining an accurate and consistent model. This makes it easier to build solutions with fewer resources. JADE’s approach delivers a programming model with a high degree of conceptual integrity, as well as *conceptual economy* by providing integrity with a minimum set of concepts.

One of the most significant aspects in the development of any system is the model used for persistent data storage. In his book, “Patterns of Enterprise Application Architecture”, Martin Fowler writes: “With an OO database you don’t have to worry about mapping (impedance mismatch). The database figures out when to move objects on or off disks. The chief advantage of OO databases is that they improve productivity. Anecdotal observations put the effort of mapping to a relational database at around 33% of programming effort – a cost that continues during maintenance.”

JADE entirely eliminates impedance mismatch enabling well-designed systems addressing complex needs to be built and run more easily.

## Increased Productivity

JADE's single language is compact, consistent and easy to learn. Combined with JADE's conceptually economic programming model, a proficient developer with a good working knowledge of OO and database concepts can be productive in JADE within 3 - 4 weeks.

With JADE, developers can focus their time and attention on system design and critical business details. Investment in key development staff is maximized as they are able to focus more on the higher-level problem space. Developers can generally target more complex problems, so development is invariably faster and easier.

Compared to other environments, JADE typically allows developers to deal with fewer concepts and higher-grain objects with fewer interfaces. These factors reduce complexity and improve productivity.



“Our Greentree Business Management Suite is used by over 500 customers around the world and sales are better than ever. Thanks to JADE we are able to seamlessly deliver continuous increments of new functionality for customers, thereby adding value to their business. We achieve this without doing the typical vendor things like putting up maintenance rates. Our developers are incredibly productive and enjoy the innovative opportunities that JADE provides. Crucially, JADE is developer-friendly for collaborative ventures, making it ideal for customer-oriented teams. With JADE we see no boundaries.”

*Peter Dickinson  
Executive Director  
Greentree International*

## Smaller, Multi-disciplined, Collaborative Development Teams

JADE development teams typically are small in size, with developers being able to easily work across all layers of a system. With JADE's single seamless data model, language and programming model spanning all layers (from the database to the user interface), JADE teams typically have multi-disciplined developers that are able to work productively in any area of a system.

As evidence of this, the following table presents FTE (full time employee) resource details for several large international JADE projects. The total number of classes and lines of code are shown as broad, indicative measurements of size and complexity (in our experience these measurements will be less than those required to implement equivalent functionality across all layers in other technologies). Four of the projects are for systems deployed into multiple customer sites, with the remaining projects representing bespoke developments for individual customers.

*FTE resource details for several large international JADE projects*

Project	FTEs in Role				Initial Build	Live	Total Classes	Lines of Code
	Design	Develop	Test	Manage				
Project A	2	10	2	2	8 months	7 years	6565	1,031,958
Project B	1	3	0.5	0.5	6 months	4 years	1824	227,883
Project C	0.5	3	0.5	0.5	6 months	2 years	1000	87,184
Project D	2	10	2	2	19 months	6 years	7820	1,353,240
Project E	0.5	3	0.5	0.5	9 months	1 year	2076	193,544
Project F	1	6	1	0.5	18 months	7 years	6758	1,048,355
Project G	0.5	3	0.5	0.5	4 months	1 year	1060	73,143
Project H	0.5	4	0.5	0.5	3 months	1 year	1851	174,014
Average	1	5.25	0.9	0.88	9.13	3.63	3619	523,665

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“JADE is great for small, agile, collaborative development teams like ourselves. Teams of customer-oriented, solution-focused developers who get a kick out of getting on and delivering stuff. JADE enables us to achieve a high degree of code reuse and with its seamless database integration we have less code to worry about reusing. Since 1996, JADE has given us a real solid platform that we can rely on. A single platform on which we can build large commercial systems that can scale from small, inexpensive hardware to high-end servers.”

*Allan Baird  
Abel Software Limited*



IBM were involved in a very strategic client project in Melbourne Australia that required the use of IBM toolsets as well as a Rapid Application Development environment that had to be competitive with Microsoft technologies and deliver a scaleable, robust approach – JADE was chosen.

“JADE’s strengths were that we were able to take a large development program with programmers that had Visual Basic, C++ and all sorts of other skills, and train them in JADE. Very rapidly, we were able to get them up and running with the technology, turning out prototypes, models, systems and end-to-end applications. They saw JADE as a true integrated environment. Traditionally, they would have to stitch together several things to get an environment to work whereas, in JADE, everything was there in a single environment and toolset.”

*Paul Sweeney,  
Principal, IBM Global Services*

## Reduced Administration Costs

Because JADE systems are robust they deliver lower long-term costs for support and maintenance. JADE's robustness is derived from its single technology approach. One technology across all layers means fewer technology seams. Fewer seams make applications stronger and more robust. As a result, systems built in JADE are resilient, scalable, and generally require less administration than other platforms.

As evidence of this, consider Jade Software Corporation's 24 x 7 managed service:

- 24 x 7 managed service operation
- > 300 JADE environments
- 151 server machines
- > 99.9% average availability (excluding scheduled outages)
- 19 FTEs (performing 24 x 7 first and second level support)

The entire JADE server-side can be encapsulated in a single installation directory. A JADE server-side installation can be relocated easily just by copying this top-level directory.



“As well as our JADE applications, we run a number of other core systems on different database and technology platforms. JADE has proven itself to be the most reliable and robust by far and we are increasing our use of it for mission-critical 24x7 applications. However, unlike some other technologies, JADE requires very little system administration. Although we have two people who are skilled in this aspect of JADE, they spend less than 5% of their time doing such work, enabling them to concentrate instead on more productive work that is of real business benefit to EWS.”

*Dave Fidal*  
*Head of Applications Architecture*  
*English Welsh and Scottish Railway*



“Port Otago Ltd uses JADE for the Container Management System that drives their business. We have been providing IT services to Port Otago since 1998 to administer their JADE system and have been delivering services for other technologies and databases since 1989. Compared to similar database platforms in use at the Port, JADE is by far the easiest platform to look after and requires minimal effort to manage and maintain. This is a critical business application and its stability, up-time and low maintenance is impressive. Compared to database platforms we maintain in other businesses, JADE stands out as the platform that requires the least amount of support.”

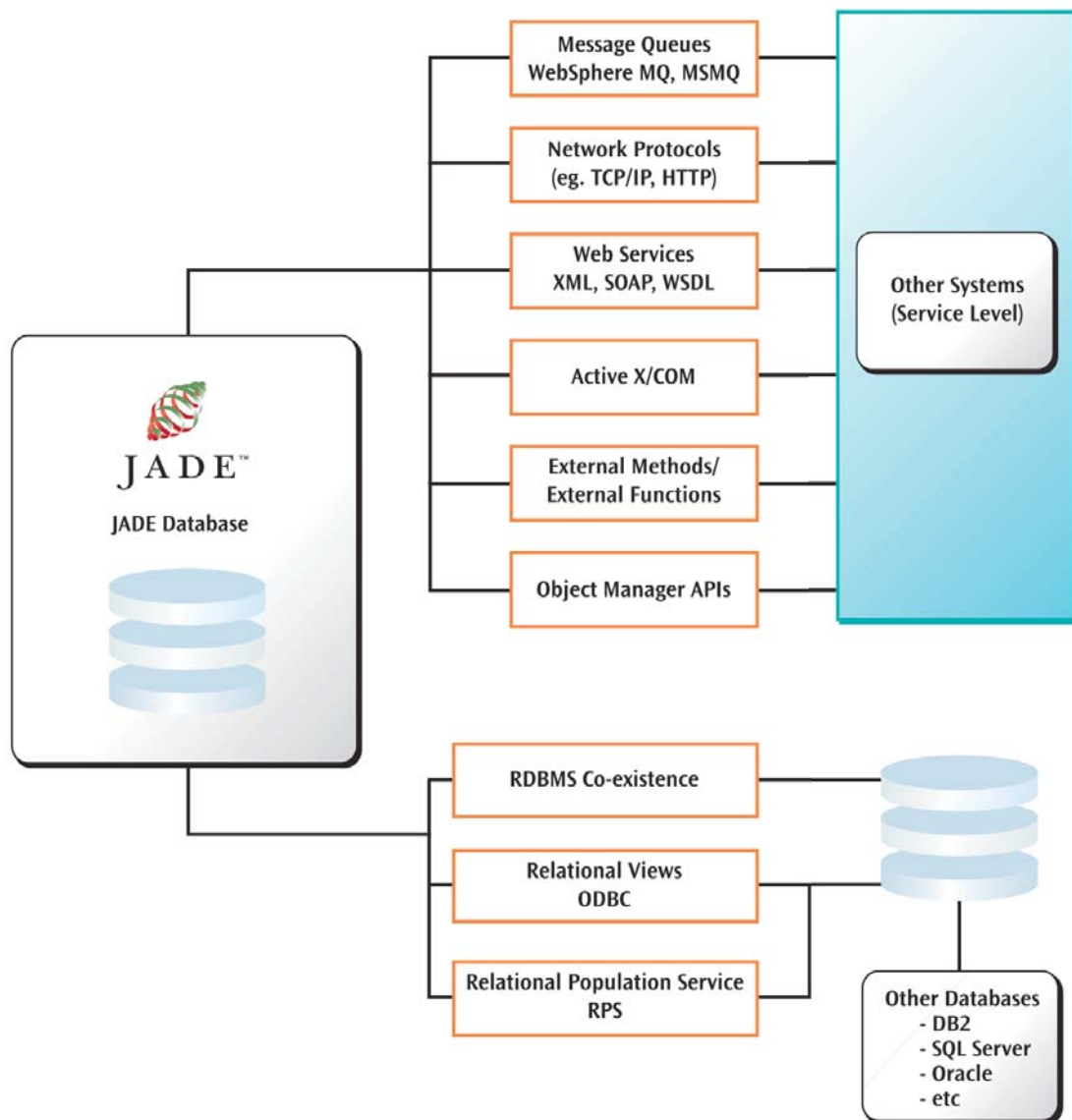
*Ron Jack*  
*Managing Director*  
*SCL Electronic Services Ltd*



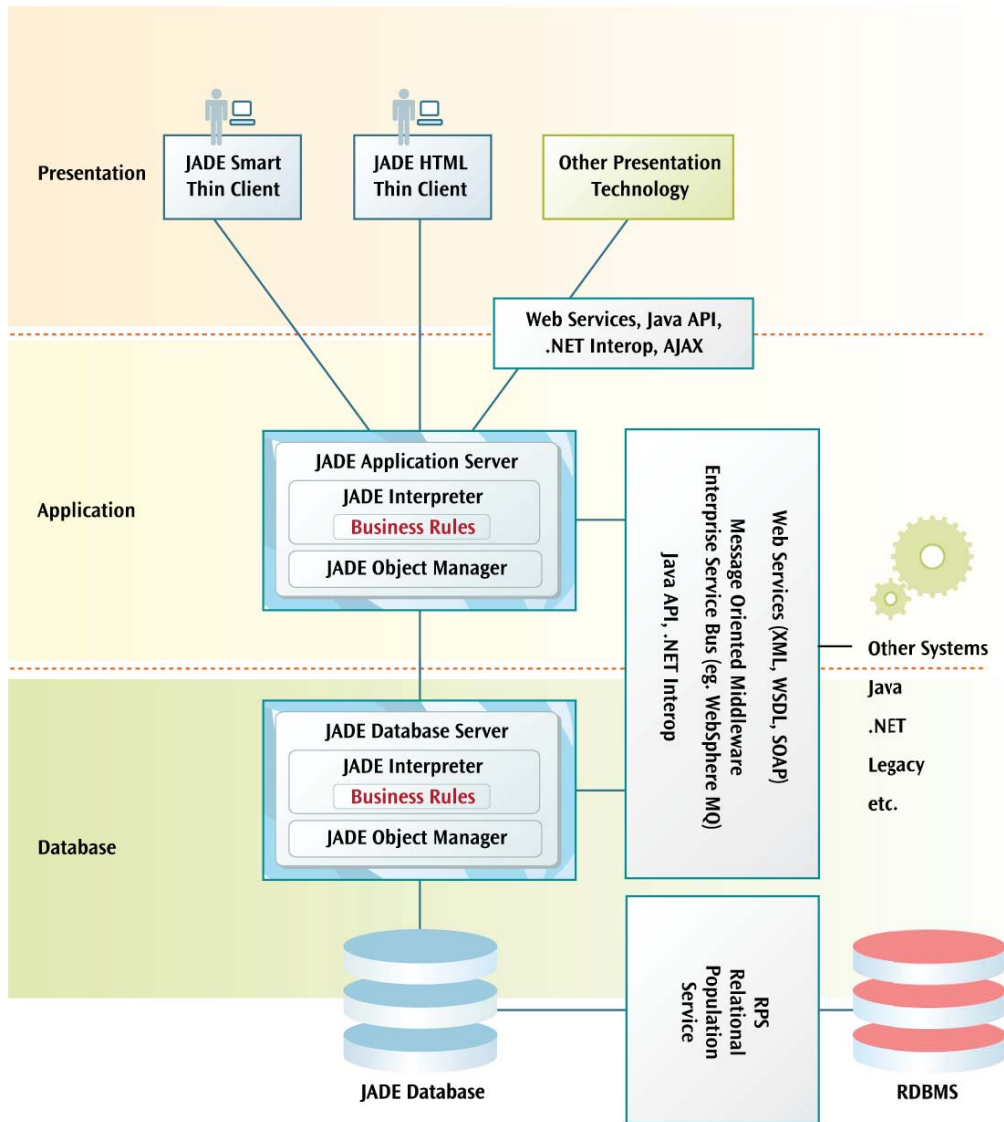


## Interoperability

JADE provides several facilities to interoperate and co-exist with other technologies, the most important of which today is Web Services (XML, WSDL, SOAP). Web Services are a set of technology standards rapidly emerging as the leading model for encapsulating business processes and sharing them with other systems. JADE's Web Services support provides a seamless interface for JADE developers to build distributed JADE applications that interoperate with other platforms (for example, .NET, J2EE and WebSphere).



## Single Interoperable Technology Platform



“We have selected our JADE Student Management System (JSMS) to perform all of our enrolment and administration activities for over 15,000 students each year. As part of our commitment to the needs of students, our own IT staff have integrated our .NET web site with JSMS to make online services and real-time information available to students. This enables us to have flexible control of our web site and take advantage of all of the processes, business rules and data provided by JSMS to deliver new services to students. XML and Web Services have been essential to making this work and JADE’s support for these standards has been integral in this successful integration.”

*Dr. John Vargo  
Project Director  
University of Canterbury*

## High Performance

The JADE platform can scale from single-server systems to large multi-server systems running critical applications with thousands of users.

The following benchmarks results were obtained using a real-world complex, mission-critical, JADE financial services system on production hardware. In all cases, the transactions-per-second (TPS) rate was held at the reported level in order to measure transaction response time at that rate:

- 1500 users, 36GB database, 16 TPS, 94% of responses < 1 second
- 200 users, 36GB database, 44 TPS, all responses < 0.5 seconds
- 2000 users, 25GB database, 20 TPS, average response 0.2 seconds
- 358 users, 25GB database, 86 TPS, average response 0.24 seconds

The following benchmark results were obtained using a JADE OO implementation of a TPC-A-like benchmark, running on standard commodity hardware (Quad 700MHz CPUs, 1GB RAM):

- 320 TPS, 25 users, 15GB database, TCP/IP communication
- 470 TPS, 25 users, 15GB database, shared memory communication
- 4100 read TPS (3 collections, 3 objects), 80 users, 15GB database

## Synchronized Database Service (SDS)

SDS allows any number of secondary databases to automatically be mirrored and synchronized with the primary database. This provides customers with an out-of-the-box hot-standby capability for improved disaster recovery. Read-only processes can also be run against secondary databases. This provides developers with the ability to offload read-only tasks (such as inquiries and reports) from the primary database, to improve system performance.

## Relational Population Service (RPS)

RPS enables JADE systems to automatically replicate data into external relational databases in near real-time. RPS makes it easy for JADE systems to interoperate with relational databases for reporting, BI (Business Intelligence), ETL (Extract, Transform, Load) and data warehousing purposes. Developers can specify the classes, objects and properties that are to be replicated to the required relational database(s). This allows an entire JADE database to be replicated, or just the data that is required for external purposes. Configurable options for replication frequency are available, similar to those provided by SDS. RPS can populate an entirely independent relational database, or tables within an existing relational database where that database may be updated from multiple sources (that is, via JADE's RPS and also non-JADE systems).



“In addition to our own core JADE systems, Skipton Building Society manages a number of large, critical, online JADE systems for other organisations. Several of these systems must feed data into a large SQL Server data warehouse that is used to provide BI information to customers. RPS will make it easy for us to automatically replicate data from the online JADE systems to SQL Server, in near real-time. With the high performance of RPS we are expecting significant reductions in CPU utilisation and batch processing time.”

*David Slack*  
*Technical Project Manager*  
*Skipton Building Society*

## Windows and Linux Thin Client

JADE's native thin client capability (the JADE Smart Thin Client) allows rich user interfaces to be deployed automatically over low-speed networks such as the Internet. The Smart Thin Client can run natively under Windows, or in a portable mode on any compatible Java-capable Windows or Linux platform. This provides customers with more choice of client platforms when deploying their applications (particularly with respect to Linux desktops) and also delivers a complete development and runtime platform for Linux. In addition to making development easier, system administrators have the advantage of maintaining the application in a central secure location, while providing remote staff or branches with LAN-like access to the application across the Internet or WAN. Should the application be upgraded at the central location, JADE automatically upgrades all thin clients when they next connect.



“With the ability to run a Smart Thin Client on Linux, we can offer a complete Linux solution to our customers. One major US-based customer is extremely interested in Linux, so JADE is fantastic for us. We have designed our system from the ground up with portability in mind and JADE makes it easy for us to do that. As a proof-of-concept, we migrated our system from JADE on Windows to JADE running end-to-end on Linux. It took less than a day and it just came up and ran.”

*Allan Baird  
Abel Software Limited*

## Platform Choice

JADE runs on the following operating systems on Intel compatible hardware:

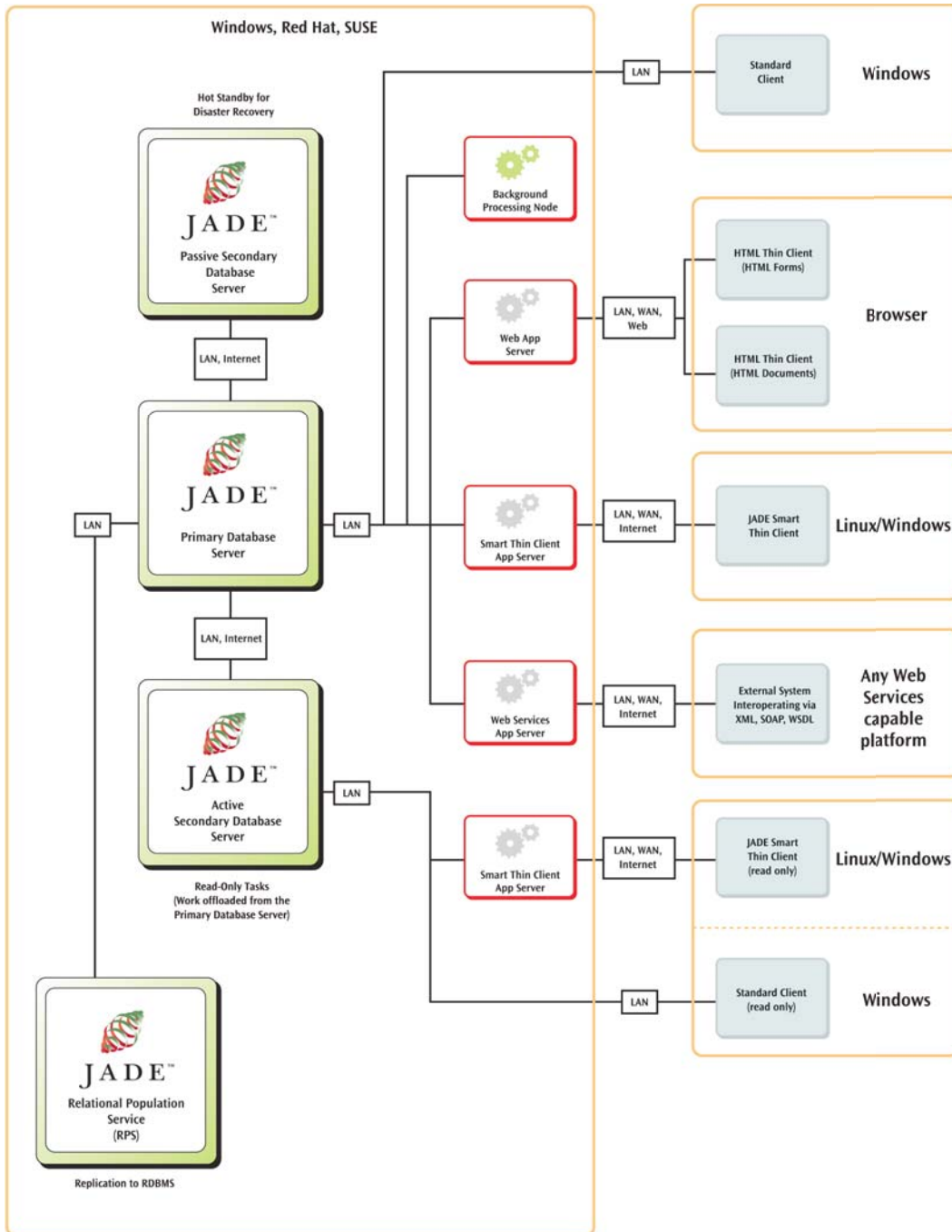
- Windows
- Red Hat Linux
- SUSE Linux

In preferred relationships, support for other IBM hardware platforms is available on request.





## JADE Deployment Options



## Operational Requirements

### Operating Systems

Minimum operating system requirements for machines hosting a JADE node (database server, application servers, background nodes or standard clients) are:

- Windows Server 2000 Standard Edition Service Pack 2
- Windows Server 2003 Standard Edition
- Windows Vista, from JADE 6.2
- Windows XP Professional
- Red Hat Enterprise Linux 3 (RHEL 3) Update 5, up to JADE 6.1 only
- Red Hat Enterprise Linux 5 (RHEL 5), from JADE 6.2
- SUSE Linux Enterprise Server 9 (SLES 9) Service Pack 2, up to JADE 6.1 only
- SUSE Linux Enterprise Server 10 (SLES 10), from JADE 6.2

Up to and including JADE 6.1, the JADE Smart Thin Client runs on Windows 98, Windows NT, Windows 2000, Windows 2003 and Windows XP.

From JADE 6.2, the JADE Smart Thin Client will not support Windows 98 and Windows NT. The JADE 6.2 Smart Thin Client will support Windows Vista.

### Web Servers

For JADE systems that deploy HTML clients, the minimum Web Server requirements are:

- IIS Version 6.0 for Windows
- Apache 2.0.43 for Windows, up to JADE 6.1 only
- Apache 2.2.3 for Windows, from JADE 6.2
- Apache HTTP Server version 2.0.46 for Red Hat Linux (RHEL 3), up to JADE 6.1 only
- Apache HTTP Server version 2.0.40 for SUSE Linux (SLES 9), up to JADE 6.1 only
- Apache HTTP Server version 2.2.3 for Red Hat Linux (RHEL 5), from JADE 6.2
- Apache HTTP Server version 2.2.3 for SUSE Linux (SLES 10), from JADE 6.2

### Portable Thin Client

To run the Smart Thin Client in portable mode on any compatible Java-capable Windows or Linux desktop requires the following:

- Sun or IBM Virtual Machine for the Java 2 Runtime Environment (JRE) Standard Edition (J2SE) Version 1.4.2, up to JADE 6.1 only
- Sun or IBM Virtual Machine for the Java 2 Runtime Environment (JRE) Standard Edition (J2SE) Version 5, from JADE 6.2
- Sun Java Media Framework (JMF) 2.1.1e

## Hardware

This section describes minimum configurations only. More powerful configurations may be required depending on the scale of your JADE applications and the performance requirements of your system.

For machines hosting one or more JADE nodes (database server, application servers, background nodes or standard clients):

- 500MHz Pentium class CPU or better
- Server class hardware components
- 512MB Error Checking and Correcting (ECC) RAM
- Network Interface Card (NIC)
- TCP/IP network environment
- 2GB free disk space for the minimum JADE environment

For machines hosting only JADE Smart Thin Clients running in native Windows mode:

- Any 200MHz or better Intel-compatible PC
- Minimum 64MB RAM for Windows 98 (not supported from JADE 6.2)
- Minimum 256MB RAM for Windows XP, Windows 2003 and Windows 2000
- Network Interface Card (NIC) or a dial-up adaptor and modem

For machines hosting only JADE Smart Thin Clients running in portable mode:

- Any 500MHz or better Intel-compatible PC
- Minimum 256MB RAM
- Network Interface Card (NIC) or a dial-up adaptor and modem

## Relational Population Service (RPS)

RPS supports the following relational databases:

- Microsoft SQL Server 2000
- Microsoft SQL Server 2005



## Jade Direct USA

Established in 2002, Jade Direct USA is located in Atlanta, Georgia. The LINC technology platform was very successful in the USA. Armed with the JET LINC to JADE conversion technology, and offering the JADE Original Solutions service, Jade Direct USA is providing organizations operating on the LINC technology platform an alternate way forward to open, lower cost commodity hardware platforms.

## Jade Direct United Kingdom

The Jade operation in the United Kingdom is focused on the finance, banking, education, health and social care market sectors. In addition, it offers original solution development, consultancy and expertise to large organizations such as English, Welsh & Scottish Railway Ltd and Skipton Building Society. Situated in York, Jade Direct UK accesses additional development expertise from New Zealand and Australia to operate a 24-hour work day.

## Jade Direct Australia and New Zealand

With offices in Melbourne, Sydney, Auckland, Christchurch, Wellington and Dunedin, Jade Direct ANZ services a range of organizations providing original solution development, JADE Co-ordinated Care and JADE Student Management System, implementations for the respective healthcare and education industries in both Australia and New Zealand.

Organizations such as Fonterra, Royal District Nursing Service and Swinburne University use Jade Direct to provide them with the unique JADE solutions they need to meet the demands of their modern business.

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