



J A D E™

JADE PRODUCT ROADMAP

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JADE 7.0 – SEPTEMBER 2011

SUPPORTED OPERATING SYSTEMS

JADE 7.0 runs on specified Windows operating systems (see below) and provides a 64-bit database server with both 32-bit and 64-bit clients available. Please note that any node that hosts a JADE 7.0 database must be 64-bit; this includes single user application servers and single user standard clients. The 32-bit clients that are available are multi user clients (application servers, thin clients and standard clients) that connect to the 64-bit database server.

JADE 7.0 supports Windows only, which means that from JADE 7, Linux distributions (for both Red Hat and SUSE) will no longer be available. We will continue to support customers running JADE 6.3 on Linux until April 2014.

- Database Server, available in 64-bit only
 - Windows 2008 Server (R2 recommended) with the latest security updates
 - Windows 7 with the latest security updates
 - Windows Small Business Server 2011 with the latest security updates
 - Windows Vista Business (recommended for Development and Testing only)
- Application Servers and Standard Clients, available in 32-bit and 64-bit but must be 64-bit if hosting a database
 - Windows 2008 Server (R2 recommended) with the latest security updates
 - Windows 7 with the latest security updates
 - Windows Small Business Server 2011 with the latest security updates
 - Windows Vista Business (recommended for Development and Testing only if hosting a database)
- Thin Client Workstation, available in 32-bit and 64-bit
 - Windows 2008 Server (R2 recommended) with the latest security updates
 - Windows 7 with the latest security updates
 - Windows Small Business Server 2011 with the latest security updates
 - Windows Vista Home Premium with the latest security updates
 - Windows XP Professional (recommended) with SP3
- Compact JADE Thin Client only
 - Windows Mobile 5.0 for Pocket PC Phone Edition
 - Windows Mobile 5.0 for Pocket PC
 - Windows Mobile 6.0/6.1 Classic
 - Windows Mobile 6.0/6.1 Professional
 - Windows Mobile 6.5 Professional

Note that Windows Mobile 6 Standard and Windows Phone 7 **are not** supported.

OTHER CHANGES

- Object instance IDs are 64-bit only in JADE 7.0. Note that this does not affect class IDs or the number of classes that are available in an environment.
- The ActiveX exposure feature is not available from JADE 7.0. The ActiveX exposure enables you to expose selected features of your JADE system to other application development tools such as Visual Basic and C++ through ActiveX technologies. JADE implements ActiveX generation through the wizard feature of Microsoft's Visual Studio 6. However, this product is no longer supported by Microsoft. In addition, new users of JADE may be unable to source a copy of Visual Studio 6. In recent years, ActiveX technologies have been replaced by .NET. From JADE 6.3, you can now generate exposures using these .NET technologies. This provides a more modern, flexible, and easier to develop mechanism than that provided by ActiveX. It is recommended that, where required, you re-write ActiveX exposures using the new JADE .NET exposure.
- JADE 7.0 is built using Microsoft Visual Studio 2010, which will require the installation of appropriate C++ runtime binaries. For a level of backward compatibility, system administrators can choose to support 32-bit thin clients using the same (Visual Studio 2005) C++ runtime binaries currently required by JADE 6.3.7 and 6.3.8.
- The JADE Dump and Load utility (jddlutl) is not available in JADE 7.0.
- The JADE interface for the Rational Rose modelling tool is not available in JADE 7.0. If you want to use third-party design tools (e.g. Enterprise Architect), you can use the JADE XMI interface to import the model into your JADE environment.

SUPPORT FOR PREVIOUS RELEASES

As per our [Release Policy](#) and [Release Schedule](#), JADE 6.2 will be supported until October 2012 and JADE 6.3 will be supported until April 2014.

PERFORMANCE AND SCALABILITY ENHANCEMENTS

BENEFITS

JADE 7.0 includes a number of significant enhancements that are designed to improve the performance and scalability of your JADE applications. The key areas are outlined below, but collectively these enhancements deliver the following benefits.

- Increased throughput and higher concurrent access to objects, allowing your applications to take greater advantage of multi-core hardware
- Faster database checkpoints with lower impact on throughput
- Significantly more processes can be run in a single node
- Faster database file operations; including file reorganisations, compacts, certifications and backups

DATABASE ENGINE ENHANCEMENTS

A new block level caching module replaces the file caching and physical I/O functions that were previously performed by the Operating System. The content of a disk block is stored in a buffer; the working set of blocks buffered in memory is called the buffer pool. The buffer pool manager reads or writes blocks using direct I/O. Database objects are read and updated directly in the buffer pool, removing the need for an object caching layer and its data copying overheads.

Each disk block has a header containing meta-data, which includes an 8 byte checksum. The block checksum is updated before a block is written to disk. When a block is read back, the checksum is recomputed and compared with the stored version to determine whether the contents of the block have been damaged or tampered with.

The new caching module provides the following benefits.

- Greater concurrency
 - Several server threads can read or update different buffers in the pool concurrently
 - Several server threads can read the same buffer concurrently
- Improved replacement policy
 - A new replacement algorithm considers both frequency and recency of access
 - Online backups read through the buffer pool and use low priority buffers to minimise impact on working set
- Dynamic memory allocation
 - The unit of memory allocation is a segment; the size is user configurable with a default size of 64MB
 - Memory allocated to the buffer pool can grow and shrink between configured maximum and minimum sizes
 - Allocated memory can be returned when physical memory is under pressure

- I/O enhancements
 - Asynchronous writes are used to write blocks to disk
 - A database checkpoint reorders writes into file address sequence and initiates multiple writes in parallel
 - Scatter/Gather (vectored I/O) techniques are used to read or write multiple contiguous blocks using a single I/O request

OBJECT MANAGER ENHANCEMENTS

There have been significant performance enhancements in the following areas of the object manager that are designed to improve throughput and concurrency, and to allow more processes to be run in a single node.

- Greater concurrency via mutex elimination and the use of more fine-grain mutexes
- Caching optimisations, including hashing algorithm improvements
- Locking and queuing optimisations
- Collection optimisations
- Inverse maintenance improvements
- Faster transient method execution

RPC IMPROVEMENTS

Several RPC performance improvements have been made.

- JADE 7.0 provides a new Hybrid Pipe/Shared Memory (HPSM) RPC transport. This has lower overhead per request than Shared Memory (JadeLocal) and better performance handling multiple nodes and multiple concurrent requests per node.
- There are now two server thread pools; one for long requests and one for short requests. The long requests pool handles serverExecution method calls and several other long elapsed time operations. The short requests pool handles all other requests, such as getObject, lockObject and putObject operations. Requests are directed to the threads in a pool using an I/O completion port, which significantly reduces thread context switches when the TCP/IP or HPSM transports are used.
- JADE 7.0 uses a larger RPC buffer size than previous releases (256KB vs 48KB). This improves by up to 5 times the speed at which large objects (collection blocks, SLOBs and BLOBs) are retrieved from the database server.

SILVERLIGHT THIN CLIENT

BENEFITS

- Build rich browser-based user interfaces by leveraging Microsoft Silverlight
- Both stateless and traditional thin client programming models are supported

DESCRIPTION

JADE 7.0 provides support for building Silverlight user interfaces, which enables you to create rich web applications that run using the Microsoft Silverlight browser plug-in.

JADE 7.0 provides new RootSchema GUI classes that encapsulate the supported Silverlight and Extensible Application Markup Language (XAML) functionality. Together with a new Silverlight Painter, this provides a straightforward Silverlight GUI programming model similar to the “classic GUI” model that JADE developers are used to, with the GUI being executed in the browser at runtime via Silverlight.

Silverlight-based applications in JADE 7.0 can be defined as one of two styles: thin client (aka “stateful”); or stateless Web Services.

For the thin client style, all JADE logic runs in the application server and communication to the browser hosting the Silverlight content is performed via a dedicated TCP/IP connection from the user’s PC. This architecture is very similar to the “classic” thin client (that is still available and supported in JADE 7.0) and application logic can be written with similar design patterns.

For the stateless style, all presentation layout and logic handling is executed by Silverlight in the browser. These JADE methods are marked with **browserExecution** in their signature, and if they require additional data they can call a method marked as **webServerExecution** which executes in the JADE application server node. JADE automatically generates the Silverlight application that is deployed to the browser. Communication between the Silverlight application and JADE is handled via Web Services with each request and response being stateless. Applications using this style must design a strict decoupling of the client-side and server-side layers, with the server-side architecture being very similar to a JADE Web Services application.

.NET API ENHANCEMENTS

BENEFITS

- Easier and more “.NET natural” integration with .NET systems
- Improved performance

DESCRIPTION

The .NET exposure feature, also known as the .NET Application Programming Interface (API), was introduced in JADE 6.3. This API has been rewritten in JADE 7.0 to conform



to the JOOB API. Based on the JADE database, JOOB is Jade Software's high performance data store for .NET applications: www.joobworld.com

Having a common API brings several advantages in JADE 7.0, including improved performance and a more ".NET natural" programming model. It also means that .NET programs written against the JADE 7.0 .NET API can much more easily be made to run over JOOB as well, if required.

Although the JADE 7.0 .NET API uses the JOOB API, it does not require the JOOB database to be installed. JADE 7.0 uses special JOOB DLLs that are purpose-built for JADE and are installed in the JADE bin directory.

.NET applications and libraries that have been written using the JADE 6.3 .NET API will not work with JADE 7.0 and will need to be converted to use the new API. Previously generated projects will require regeneration (the generation process itself has not changed), and your .NET code will need to be modified to align it with the new API.

DATABASE FILE ENCRYPTION

BENEFITS

- Security of data on disk and on the network between JADE nodes

DESCRIPTION

JADE 7.0 enables objects to be encrypted at rest (on disk) and in flight (RPC).

Objects are encrypted individually when they are sent from the object manager to the database, and decrypted when they arrive in the object manager from the database.

RPC and the database work only with encrypted objects so there is no processor overhead in the database server node to perform encryption or decryption.

A database can be fully or partially encrypted as encryption is specified for each individual database file.

The database master key is a 4096-bit RSA public/private key. This is used to encrypt the AES symmetric keys for the individual map files. The object encryption is done using AES with a 256-bit key. Client node access to an encrypted database is authenticated using Windows Active Directory Kerberos authentication.

When database encryption is enabled, 32-bit application server and standard client nodes cannot be used.

IPV6 SUPPORT

BENEFITS

- Take advantage of the benefits of IPv6 in your JADE systems
- IPv6 provides unconstrained addresses and improved security, and enables easier network management

DESCRIPTION

JADE 7.0 provides support for IPv6 across the following areas of the product:

- RPC, between the database server and client nodes (application servers and standard clients)
- Thin client, between the application server and the thin client
- SDS and RPS, between the primary node and SDS/RPS nodes
- Web, between the application server node and the web server module (jadehttp.dll, mod_jadehttp.so)
- Application code that makes use of the JADE TcpIpConnection class
- ODBC, between the ODBC thin client and the ODBC server

JADE 7.0 uses IPv4 by default, as for previous JADE releases. Use of IPv6 or a combination of IPv4 and IPv6 addressing regimes is configurable via the JADE initialisation file. It is expected that application code changes may be necessary to accommodate the longer addresses presented by IPv6 (e.g. a fully defined IPv6 address including port number can be up to 65 characters in length).

WS-SECURITY

BENEFITS

- Makes it easier to use secure Web Services from your JADE applications

DESCRIPTION

This feature was in the JADE 7.0 program of work but was actually released in Q4 2010 via publication here on our web site:

<http://www.jade.co.nz/jade/whitepapers.htm#websecurity>

The feature takes the form of a white paper, a new .NET assembly (jadwssec.dll) and example schema files. The assembly, which must be imported into the appropriate schema(s) has no dependency on a particular JADE release, and can be used with JADE 6.3 and JADE 7.0. For more information, please refer to the white paper.

JADE 6.3 – APRIL 2009

Based significantly on customer feedback, JADE 6.3 concentrates on three main areas.

- **Scalability – more throughput and easier data management**
The native 64-Bit Edition, plus new Update Lock and Merge Iterator capabilities, give you more ways to increase the scalability of your applications. And for systems with large amounts of historical data, Database File Partitioning will enable easier data management.
- **Interoperability – more ways to connect to other systems**
The .NET Class Library and ODBC Enhancements give you more ways to connect your JADE solutions to other systems. The Replication Framework will make it easier for developers to build disconnected applications. And XMI support enables JADE schemas to be generated from *Enterprise Architect* models.
- **Development Tools**
Unit Testing and Code Coverage will help you to improve the quality of your applications, while several language extensions will enable you to write more flexible application components and diagnostic routines. We have also made it easier for you to work on multiple versions of a method within a patch version.

JADE 6.3 is supported on the following Operating Systems:

- Microsoft Windows
 - Windows 2008
 - Windows 2003
 - Windows 2000
 - Windows XP
 - Windows Vista
- Red Hat Enterprise Linux 5 (RHEL 5)
- SUSE Linux Enterprise Server 10 (SLES 10)
- Microsoft Windows Mobile (Compact JADE only)
 - Windows Mobile 5.0 for Pocket PC Phone Edition (Windows CE 5.0)
 - Windows Mobile 5.0 for Pocket PC (Windows CE 5.0)
 - Windows Mobile 6.0/6.1 Classic (Windows CE 5.02)
 - Windows Mobile 6.0/6.1 Professional (Windows CE 5.02)

Please note that Windows Mobile 6 Standard **is not** supported.

The Relational Population Service (RPS) supports SQL Server 2000, 2005 and 2008.

The Java-based Portable GUI Engine (including the Portable Thin Client) is deprecated in JADE 6.3. Our future portable Thin Client direction is based on the Silverlight technology

As per our [Release Policy](#) and [Release Schedule](#), JADE 6.1.15 (the final 6.1 release) will be supported until October 2010. JADE 6.2 will be supported until October 2012.

SCALABILITY AND PERFORMANCE

64-BIT EDITION

BENEFITS

- Greater performance and scalability
- Configure significantly larger JADE caches to improve system performance

DESCRIPTION

This feature will provide enhanced performance and scalability by taking full advantage of 64-bit hardware and operating system platforms. In particular, each node will have a far greater memory address space, meaning that administrators will be able to configure significantly larger JADE caches if required, to improve system performance. Additionally, internal JADE data structures will be able to grow beyond the current 32-bit limits, providing greater capacity for large JADE systems.

A single Application Server (either 32-bit or 64-bit) will be able to support both 32-bit and 64-bit Thin Clients. A 64-bit Database Server will be able to support both 32-bit and 64-bit Application Servers and Standard Clients.

DATABASE FILE PARTITIONING

BENEFITS

- Easier management of large amounts of historical data
- Achieve cost savings through the use of tiered disk storage
- Improved performance of online and batch operations

DESCRIPTION

This capability will allow customers to more easily manage large amounts of historical data, particularly for bulk data operations such as backups and deletions. It will allow database files to be split into *partitions*, with different partitions then being able to be stored on different media devices and/or tiered disk storage.

It will be possible to *freeze* one or more partitions, thereby making them read-only. This will optimise locks for any objects resident in those partitions, as well as enabling the frozen partitions to be backed up independently of active (i.e. *thawed*) partitions. It will also be possible to mark partitions as *offline*, so that they do not need to be resident in the main online database.

As well as automatically allocating newly created objects to partitions, developers will be able to move objects between partitions programmatically. This feature will also enable developers to avoid accessing historical information if it is not required, making it easier to improve the performance of online and batch operations.

UPDATE LOCK

BENEFITS

- Increased concurrent access to collections, particularly between multiple-reader and single-writer processes
- Improved system performance

DESCRIPTION

This feature will make it easier for developers to improve system performance by providing them with a new *Update Lock*. Use of this lock will allow more concurrent access to collections, particularly in situations where an application requires greater concurrency between frequent read operations and less-frequent update operations. For applications that have such requirements (a common example is “global” collections, where there is often contention between reads and updates), this feature will provide developers with an easy way to deliver immediate performance gains.

MERGE ITERATOR

BENEFITS

- Easier access to a common view of multiple dictionaries
- Improved system performance
- Easier development

DESCRIPTION

The new *MergeIterator* class will enable developers to iterate over a merged view of two or more compatible dictionary objects. When iterating over multiple dictionaries, the merge iterator will return entries in key order, based on the set of high-order keys that are common to all of the dictionaries being merged.

By using a *MergeIterator*, in many cases, developers will be able to avoid the need for global or “catch all” persistent dictionaries that hold objects for inquiry or reporting purposes only. This will reduce update operations and help to avoid lock contention. The *MergeIterator* will also be far more efficient than developers creating their own merged transient copies of persistent dictionaries, thereby providing more opportunities to improve application performance.

DATABASE REORGANISATION ENHANCEMENTS

BENEFITS

- Faster collection population for specific schema changes
- Options to reduce disk space requirements

DESCRIPTION

With the continued growth in the size of customer JADE databases, JADE 6.3 will provide a “fast build” option for collections during database reorganisations. This option will apply to specific schema changes only, but analysis has shown that these are common changes during application upgrades.

New options will also be provided to enable system administrators to reduce the disk space required to perform database reorganisations.

INTEROPERABILITY

.NET CLASS LIBRARY

BENEFITS

- Greater interoperability between JADE and .NET
- Makes it easier for .NET developers to:
 - Use JADE to store and manipulate complex data
 - Take advantage of JADE’s automatic object caching and distributed processing

DESCRIPTION

Building on much of the R&D for the Java Class Library, the .NET Class Library will make it easier for .NET developers to interoperate with JADE. This feature will allow .NET developers to take advantage of JADE’s server-side capabilities by providing a C# framework that encapsulates the JADE Object Manager and the core JADE programming model. This will enable .NET developers to use JADE services from their .NET code (to store and retrieve JADE objects and to invoke JADE business rules, for example).

This feature will make use of the new Language Integrated Query (Linq) facilities in .NET to allow access to JADE objects in a natural and consistent manner for .NET developers.

REPLICATION FRAMEWORK

BENEFITS

- Easier development of disconnected applications
 - Includes both Standard Client and Compact JADE applications
- Easier replication of data between multiple JADE server-side systems

DESCRIPTION

Many applications today need to provide support for disconnected usage, be it on mobile devices or just the ability for users to run a local version of application on their laptop when not connected to the server. A typical scenario is where these disconnected applications operate in a master/slave or satellite arrangement with the main server system. These systems need to be able to replicate and then synchronise objects in their local database with the main server database.

This feature will make it easier for developers to build such applications by providing a framework to support the definition, replication and resynchronisation of data from a server-side system to any number of offline clients (including Compact JADE Single User Node clients). Object-level and property-level replication will be supported, as well as mapping facilities to enable replication between different schema definitions. In addition to disconnected replication, the framework will also be useful for server-side applications that need to replicate data to other server-side JADE systems.

XML METADATA INTERCHANGE (XMI) SUPPORT

BENEFITS

- Enables JADE schemas to be generated from XMI-compliant modelling tools
- Concentrates initially on the Sparx Systems *Enterprise Architect* product

DESCRIPTION

The XML Metadata Interchange (XMI) is an Object Management Group (OMG) and international standard for exchanging metadata information via XML. The most common use of XMI is as an interchange format for UML models, although it can be used to represent the models of other languages as well.

Concentrating initially on UML models built using the Enterprise Architect product from Sparx Systems, this feature will enable JADE schemas to be generated from XMI files created by Enterprise Architect. This provides an easy way for UML models to be imported into JADE.

ODBC ENHANCEMENTS

BENEFITS

- An ODBC “Thin Client”, for faster query execution and easier deployment
- Access to application-defined “soft” entities and attributes

DESCRIPTION

The new ODBC “Thin Client” architecture will split the current ODBC interface into thin client and server components. The client component will remain an ODBC driver, but will have no object manager functionality. Its main purpose will be to provide the ODBC driver interface and pass requests to its server-side counterpart executing in a JADE node. The server component will execute the query and return the result to the client.

This will make query execution faster by eliminating the need to fetch objects across the network to end-user machines and by taking full advantage of server-side processing capacity. The installation footprint of the ODBC thin client will also be significantly smaller, making it easier to deploy to user desktops.

Many applications also allow users to define their own “soft” entities and attributes that extend the fixed data model defined by the application developers. In JADE 6.3, developers will be able to expose these user-defined entities and attributes via ODBC, as well as implement their own query provider methods that will be used by the ODBC interface to return a result set of objects.

RICH INTERNET APPLICATION (RIA) SUPPORT

BENEFITS

- Easier interoperability with AJAX-style Rich Internet Applications (RIAs)

DESCRIPTION

This feature will provide a mechanism to generate JavaScript to allow for AJAX-style calls to be made to JADE Web Services. The intent of this feature is to provide a framework and a common approach to integrating JADE Web Services with AJAX clients. The framework will make it easier for developers to invoke JADE Web Services from AJAX clients and to process the data that is returned from the Web Services, by removing much of the underlying “plumbing” code that currently needs to be written.

RPS ENHANCEMENTS

BENEFITS

- Enable a single RPS mapping to span multiple separate components
- Easier administration and reduced disk overhead by allowing a single RPS node to replicate data from multiple independent components

DESCRIPTION

In JADE 6.3, customers building modular systems using JADE's *Packages* capability will be able to create a consolidated RPS mapping across all required Packages by including imported classes in an RPS mapping in a single schema. This will make RPS administration easier by consolidating the mapping in one place and it will also reduce the disk requirements for RPS nodes as a single RPS node will now be able to replicate data from multiple Packages.

DEVELOPMENT TOOLS

UNIT TEST SUPPORT

BENEFITS

- Improve quality and reliability by writing unit tests as your system is built
- Perform extensive unit testing with minimal user intervention

DESCRIPTION

Unit Testing is a simple but effective approach to improve the quality and reliability of a system. The key idea is to develop the tests for a unit of code (which may be a fragment, a method or a module) as the code is being written. Development teams can use this approach to ensure that quality is built into a project from the beginning.

JADE 6.3 will provide an integrated framework that will enable developers to define unit test code at the same time that the application code is being written. The framework will enable the automatic execution of these tests, as well as providing the ability to browse tests and extract results. It will be possible to run tests from both the IDE and in batch mode, enabling you to schedule the regular execution of regression tests. An interface will be provided to let developers build their own unit test driver applications if they wish to do so.

CODE COVERAGE

BENEFITS

- Easily quantify how much of your code base is covered by your test suite
- Improve quality by creating tests that increase overall code coverage

DESCRIPTION

Code Coverage is a measure used in software testing to describe the degree to which the methods in a system have been tested. It is a useful measure to assure the quality of a set of tests, as opposed to directly reflecting the quality of the system under test. Code coverage can help testers and developers to:

- Discover methods and blocks of code that are not exercised by a set of tests
- Create tests that increase code coverage
- Quantify the overall code coverage of a system, which is one measure of quality

This feature will provide code coverage analysis of JADE methods; indicating those lines of code that have been executed and those lines of code that have not. It will be possible to save the results as a CSV file for further analysis.

MULTIPLE DELTAS AND PATCH VERSIONING

BENEFITS

- More flexible development by allowing two versions of a method within a single patch version
- Allow two separate versions of a method to be merged back together
- Enable method versions to be deployed and executed independently

DESCRIPTION

This feature will improve development productivity by making it easier for multiple developers to work on independent changes to common methods at the same time. This will be particularly useful in situations where an emergency fix needs to be made to a method, where changes to that method are already underway for a later release.

By enhancing the existing Delta capability, JADE will enable two versions of a method to be created within a single patch version, with developers being able to work on both versions of the method at the same time. In addition to being able to compare the differences between the two versions, JADE will allow them to be merged back together and will provide tools to assist with any conflict resolution. It will be possible to extract method versions together or separately if required. Where two versions of a method exist it will be possible to specify which version is to be executed at runtime.

JADE 6.3 will also enable the batch extract of schema definitions to separate class files, which will make it easier for development teams wanting to save their JADE source code in version control systems such as Subversion.

LANGUAGE EXTENSIONS

BENEFITS

- Easily isolate conditional code with `executeWhen`
- Easy tracking of entry and exit to methods
- Easy access to all objects created, updated or deleted in a transaction

DESCRIPTION

- **executeWhen**
This new language statement will allow developers to bracket a block of code with a Boolean expression, such that if the result of the expression is false, the block of code will not be executed. In fact, the JADE Interpreter will not even load the code into memory. This statement will make it easier for developers to isolate testing and diagnostic code, for example.
- **Method Tracking**
New methods will be provided that will allow developers to register entry and exit callback methods for any other method. The method for which the callbacks are registered is referred to as the *tracked method*. This will make it easy for developers to dynamically “track” calls to any required method in the system. The entry callback will be invoked prior to JADE calling the tracked method. The exit callback will be invoked prior to the tracked method returning. Developers will be able to access the tracked method’s parameters and return value in the callback routines. This feature will be particularly useful when writing testing and diagnostic code.
- **Transaction Trace**
In many applications there is a need to access all of the objects that have been created, updated or deleted in a transaction. Often developers want to be able to access this information from a centralised place in their code (for example, immediately before a `commitTransaction`). This feature will give developers access to all of the objects that have been modified in the current transaction and make it easy to determine what changes have been made to an object. This will make it easier to write diagnostic and auditing routines in particular, as well as code that delegates operations to background task queues.

JADE 6.2 – RELEASED OCTOBER 2007

INTEROPERABILITY

WEB SERVICE EXTENSIONS

BENEFITS

- Improved interoperability with other technologies and systems
- Support for the SOAP 1.2 standard and further compliance with WS-I (Web Services Interoperability) requirements

DESCRIPTION

Web Service standards are continuously evolving and therefore we focus our development on those areas that are of most interest to our customers. JADE 6.2 provides further support for key standards, and makes it easier for developers to expose JADE classes via Web Services. Features include:

- Support for SOAP 1.2, which is the latest version of the standard.
- Further compliance with WS-I (Web Services Interoperability) requirements. WS-I is an open industry organisation chartered to promote Web Services interoperability across different platforms and programming languages.
 - For UTF-8 encodings and styles other than RPC/Literal (which is not supported by JADE), two-way Web Services that do not require UDDI will be 92% compliant with WS-I Basic Profile 1.1 in JADE 6.2.
- More flexibility when exposing JADE classes via Web Services. Finer-grain control over class exposures makes it easier for developers to expose large numbers of classes and properties via Web Services.

JAVA CLASS LIBRARY

BENEFITS

- Greater interoperability between JADE and Java, for both Linux and Windows
- Makes it easier for Java developers to:
 - Use JADE to store and manipulate complex data
 - Take advantage of JADE's automatic object caching and distributed processing

DESCRIPTION

Java remains one of the most significant and popular programming languages, particularly for corporate and enterprise development. In 2005, Evans Data Corporation reported that in the enterprise space, 60% of organisations make use of Java in IT projects.

Java is key to many business IT infrastructures and to the technology stacks of vendors such as IBM, Sun and BEA. Java is also very strong in the Linux community, with Evans Data Corporation reporting that 80% of Java users have more confidence in Linux as a platform for mission-critical applications.

JADE 6.2 provides a Java Class Library that makes it easier for Java developers to interoperate with JADE. This feature allows Java developers to take advantage of JADE server-side capabilities (on both Linux and Windows) by providing a Java framework that encapsulates the JADE Object Manager and the core JADE programming model. This enables Java developers to use JADE services from their Java code (to store and retrieve JADE objects and to invoke JADE business rules, for example).

RPS ENHANCEMENTS

BENEFITS

- Easier interoperability with relational databases for reporting, BI/MIS and data warehousing purposes
- More flexible mapping of JADE classes to relational tables, including the ability to map derived values to table columns
 - Developers have full control of table rows before they are replicated
- Operational flexibility via an RPS Management API (including Web Services)

DESCRIPTION

Released in JADE 6.1, the Relational Population Service (RPS) allows JADE systems to automatically replicate data to relational databases (RDBMS). Microsoft SQL Server is the first RDBMS supported by RPS. Customers have indicated that they want greater control of how JADE objects are mapped to relational tables and they also want to be able to perform more operations on objects before they are replicated to the RDBMS.

JADE 6.2 gives developers more flexibility and makes it easier for them to map JADE objects to relational tables by:

- Allowing methods and virtual properties to be mapped to table columns. This allows derived values to be replicated and enable developers to write methods that aggregate multiple objects into a single table row. These methods must be implemented on a RPS-mapped class and will be invoked when the RPS node processes create, update and delete operations for instances of that class.
- Allowing developers to interrogate, change and process rows prior to them being sent to the relational database, or specify that a row not be sent at all.
- Enabling developers to specify (in the primary environment) those transactions for which deletions are **not** to be replicated to the relational database. This allows selected operations on the primary system (e.g. housekeeping and archiving tasks) to be performed without affecting relational database replicas.

Several operational enhancements are also provided, including an RPS Management API (via both JADE classes and Web Services), the ability for developers to specify customer-specific mappings and support for client-server relational database loads.

GENERIC MESSAGING SERVICES

BENEFITS

- Provides inter-process messaging services within a node
- Provides integration with IBM WebSphereMQ messaging services

DESCRIPTION

JADE has always provided external interfaces that enable JADE systems to interoperate with message-oriented middleware products such as WebSphereMQ, and several reusable schemas have been developed to support inter-system messaging.

In JADE 6.2, messaging services have been added to the core JADE platform. This feature provides a generic framework with a standardised messaging programming model, making it easier for developers to build messaging capabilities into their applications. The first release of this feature supports:

- Messaging between processes running in the same node.
- Transport interoperability. The framework allows different message transport implementations to easily be integrated. JADE 6.2 supports integration with IBM's WebSphereMQ message-oriented middleware.

.NET INTEROPERABILITY

BENEFITS

- Greater interoperability between JADE and .NET applications
- Access .NET class libraries from your JADE applications
- A new XAML control allows JADE applications to display WPF/XAML graphics

DESCRIPTION

JADE 6.2 allows JADE developers to access the growing number of .NET class libraries. This feature is similar to JADE's support for ActiveX Automation libraries. The use of .NET controls on JADE forms is supported via a similar mechanism to that used for ActiveX controls.

JADE interrogates .NET assemblies to generate JADE classes that will act as proxies for .NET objects. JADE developers can use these proxy classes as they would any other JADE class.

A new XAML control is provided that allows JADE applications running Windows-based clients to display WPF/XAML graphics.

PERFORMANCE AND SCALABILITY

FASTER WEB SERVICE (SOAP) MESSAGE HANDLING

BENEFITS

- Faster SOAP message handling for greater Web Service performance

DESCRIPTION

With the importance of Web Services as an interoperability standard, a key feature of JADE 6.2 is increased Web Service (SOAP) message handling performance. Direct support for SOAP processing will be added to the JADE Object Manager to greatly improve the performance of Web Service request messages.

PERFORMANCE AND SCALABILITY OPTIMISATIONS

BENEFITS

- Improved performance and scalability of JADE applications
- Enable developers to deliver greater performance when building applications that work with large objects (BLOBs and SLOBs)

DESCRIPTION

Performance and scalability enhancements are an ongoing activity in all JADE releases. However, in JADE 6.2, specific focus has been placed on:

- Object Manager caching algorithms
- Improved memory efficiency
- Performance enhancements in the management of large objects (BLOBs and SLOBs)

The enhanced management of large objects:

- Allows developers to store and extract large objects from the database without impacting object cache.
- Provides more efficient management of large objects for better cache utilisation to deliver higher performance. This also makes development easier by reducing the occurrence of “no memory for buffers” (1018) exceptions.
- Allows developers to share large picture binaries (BLOBs) across multiple forms in the same node, including forms hosted by different Thin Clients connected to the same Application Server node.

SYSTEM ANALYSIS AND DIAGNOSTIC TOOLS

BENEFITS

- An enhanced JADE Monitor provides more comprehensive and centralised performance information, making analysis and diagnostics easier
- Web-based access to JADE Monitor information
- Web Services enable external systems to access performance information

DESCRIPTION

This feature delivers enhanced analysis and diagnostic tools, enabling customers to more easily monitor, analyse and tune their JADE systems.

A new JADE Monitor (with both Thin Client and web-based access) enables JADE systems to be analysed more easily. It centralises information from a number of sources, including the current Monitor statistics and reports, plus thin client traffic, high-level node sampling statistics, inter-node communication statistics and low-level multi-threading performance statistics. The new JADE Monitor also allows methods to be profiled dynamically, without the need for code changes or system downtime.

Web Services are provided, enabling developers to use the monitoring capabilities from other systems (JADE or non-JADE) if required.

PLATFORM CHOICE

COMPACT JADE

BENEFITS

- The ability to run a JADE Thin Client on small devices including PDAs
- The ability to run a single-user JADE node (including the Object Manager and Database) on small devices

DESCRIPTION

There is a recognised need for customers to be able to access their JADE systems from non-traditional client devices such as PDAs. This feature delivers increased client-side platform choice by enabling Thin Clients to run on Windows Mobile devices.

This feature also delivers a specialised JADE node and specialised RootSchema class library that runs on Windows Mobile devices. In addition to GUI and Web Service consumer capabilities, this Compact JADE Node provides Object Manager and Database services and can host multiple JADE processes. Customers can build JADE applications for deployment in Windows Mobile devices, with those applications being able to store persistent data and interoperate with other systems via Web Services.

The minimum Compact JADE device requirements are shown below.

OPERATING SYSTEMS

- Pocket PC 2003 SE
- Windows Mobile 5.0 for SmartPhone (recommended for Thin Clients only)
- Windows Mobile 5.0 for Pocket PC Phone Edition
- Windows Mobile 5.0 for Pocket PC

Windows Mobile Version	Underlying Windows CE Version	Compact JADE Features
Pocket PC 2003 SE	Windows CE 4.2	<ul style="list-style-type: none"> ✓ Thin Client ✓ Single-User Node ✓ GUI Controls ✓ Web Service Consumer ✓ Serial Port Access ✓ TCP/IP Connectivity ✓ Database Recovery
Windows Mobile 5.0 for SmartPhone	Windows CE 5.0	<ul style="list-style-type: none"> ✓ Thin Client ✓ GUI Controls ✓ Serial Port Access ✓ TCP/IP Connectivity
Windows Mobile 5.0 for Pocket PC Phone Edition and Windows Mobile 5.0 for Pocket PC	Windows CE 5.0	<ul style="list-style-type: none"> ✓ Thin Client ✓ Single-User Node ✓ GUI Controls ✓ Web Service Consumer ✓ Serial Port Access ✓ TCP/IP Connectivity ✓ Database Recovery

PROCESSORS (CPU)

- For devices hosting a Compact JADE Thin Client:
 - ARM V4 400 MHz (minimum), 600 MHz (recommended), or better
- For devices hosting a Compact JADE Single-User Node:
 - ARM V4 600 MHz (minimum), or better

MEMORY

- 32 MB (minimum) of memory available to applications (this most likely means a minimum 64 MB capable device)

STORAGE

- This is additional storage space to the Memory requirements (above). Typically, this will be a separate SD or Flash card of 256 MB minimum size.
- For Thin Client applications that have been designed to suit small devices and limit the use of highly complex forms and large graphics, we expect 256 MB to be sufficient. Additional storage requirements will depend on the size of the Thin Client form cache and this is dependent largely on the size and complexity of application forms.
- For Single-User Node applications, the additional storage space must allow for the database size, software installation size, transient object storage, and any external file requirements that the application may have.
- For the best performance, selecting a fast memory card is important (e.g. the SanDisk 1 GB Extreme III CF Card), especially for Compact JADE Single-User Node applications.

OTHER REQUIREMENTS

- 320 x 240 minimum display resolution
- TCP/IP network environment is required (802.11 b/g protocols are recommended)
- Depending on the performance of the cradle that is supplied with your device (some provide only slow transfer speeds), the use of an external Flash or SD card reader/writer may be desirable to enable fast file transfers

LICENSING

- Compact JADE Thin Clients consume a server-side process license, in the same manner as any other Thin Client.
- Compact JADE single-user node licenses are available at no cost and it is permitted to deploy such a license on any number of devices for a given application. Compact JADE single-user node licenses limit the Compact JADE environment to a 2 GB database and 25 concurrent processes.

LANGUAGE EXTENSIONS

ASYNCHRONOUS METHOD CALL FRAMEWORK

BENEFITS

- Easier development of parallel operations

DESCRIPTION

This feature makes use of JADE 6.2's Generic Messaging Services to provide a framework that makes it easier to synchronise the execution of multiple methods running in parallel. While all of the parallel methods must initially be invoked in the same node, once invoked they can call `serverExecution` and `clientExecution` methods if required.

This capability provides an efficient and flexible alternative to code that currently must be written manually. It will be very productive for applications that need to execute several concurrent tasks, especially Web Service consumers.

NEW DATA TYPES

BENEFITS

- Easier timestamp arithmetic, string handling and integration with external code

DESCRIPTION

TimeStampInterval represents the interval between two timestamps and makes it easier to perform date and time arithmetic.

Byte represents an 8-bit integer value and is the unit of Binary attribute values. The separate Byte type makes it easier for developers to manipulate Binary values in Unicode systems and to integrate JADE code with external code.

Integer64 represents a 64-bit integer value and makes it easier for developers to interoperate with external code and 64-bit platforms.

MemoryAddress represents either a 32-bit or 64-bit memory address and makes it easier for developers to interoperate with external code and 64-bit platforms.

StringUtf8 represents one or more UTF-8 characters. UTF-8 (8-bit Unicode Transformation Format) is a variable-length character encoding for Unicode. It is able to represent any universal character in the Unicode standard, with the initial encoding of byte codes and character assignments being consistent with ASCII. UTF-8 is becoming the preferred encoding for e-mail, web pages and other situations where characters are stored or streamed. The `StringUtf8` type makes it easier for developers to build JADE systems that interoperate with Unicode applications.

GENERAL PRODUCTIVITY ENHANCEMENTS

Based on developer feedback, a number of popular enhancements have been delivered in JADE 6.2, including:

- **Load multiple schema files in one operation via the IDE**
The Load Options form has been extended to allow the selection of multiple files. If multiple files are selected, a new sheet allows the load order to be specified, as well as allowing files to be added and removed from the selection.
- **Insert a schema into the schema hierarchy**
JADE 6.2 provides a command-line utility that enables one schema to be inserted into the schema hierarchy above another schema. The utility inserts (or moves) an existing schema (that has no subschemas) to a new position in the schema hierarchy. Ideally, the schema being inserted should be an “empty” schema (that is, one containing only the Application, Global and WebSession subclasses, with no properties, constants or methods on any of these classes). The utility can insert a non-empty schema, but any entities that conflict with the schema branch into which it is being inserted will cause the operation to be cancelled.
- **More easily open a Class Browser for the top-most definition of a class**
Pressing <Shift>+<F11> over a class name opens a new Class Browser window for the class in the schema that contains the top-most definition of the class. Pressing <F11> twice over a class name continues to open a Class Browser window for the class in the current schema.
- **Be able to see a history of the most recently visited methods**
A new “History” menu item and tool bar icons in the IDE allows direct navigation to any of the last (up to) 30 methods visited.
- **Default text templates for classes, properties and constants**
In addition to method text templates, JADE 6.2 allows developers to define text templates for classes, properties and constants. This makes it easier for teams to adhere to development standards.
- **Easier drag selection of child controls in the Painter**
In JADE 6.2, <Ctrl>+<Shift>+<drag> allows developers to select controls, even if the drag operation is started over a control. Additionally, if the Painter’s “Control Move Lock” option is set (meaning that controls cannot be repositioned), then normal drag selection is allowed to start over a control.
- **Find a user more easily in the JADE Monitor**
The ability to search for a user has been provided as part of the new JADE 6.2 Monitor.
- **Programmatically invoke the Find/Replace dialog of the RTF control**
A new JadeRichText::findReplaceDialog method has been provided to allow developers to invoke the Find/Replace dialog of the JadeRichText control.
- **Analyse interpreter method cache usage more easily**
Additional logging has been provided to show the interpreter method cache swap rate and usage.