

TIBCO BusinessEvents®

Release Notes

*Software Release 4.0.2
March 2012*

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Release Notes

Check the TIBCO Product Support web site at <https://support.tibco.com> for product information that was not available at release time. Entry to this site requires a username and password. If you do not have a username, you can request one. You must have a valid maintenance or support contract to use this site.

Topics

- [New Features, page 2](#)
- [Changes in Functionality, page 14](#)
- [Deprecated Features, page 29](#)
- [Migration and Compatibility, page 33](#)
- [Closed Issues, page 36](#)
- [Known Issues, page 77](#)

New Features

This section lists features added since the last major release of this product.

Release 4.0.2

Platform and Third-Party Software

Support for the following software is added in this release:

- JRE usage on different platforms is as follows:
 - JRE 1.6.0.30 on Windows, Linux and Solaris
 - JRE 1.6.0.09 on HP-UX
 - JRE 1.6.0 build pap6460sr9-20101125_01(SR9) on AIX
- Coherence 3.7.1.2 with the latest patch (bundled)
- The following optional software is supported for use with TIBCO BusinessEvents:
 - TIBCO Runtime Agent 5.7.3
 - TIBCO ActiveMatrix Businessworks 5.9.3
 - TIBCO Administrator 5.7.1.



It is advisable to use separate TIBCO HOMES for TIBCO Runtime Agent and TIBCO BusinessEvents. TIBCO HOMES for both can be under a common root folder such as C:\tibco or /opt/tibco.

Content Aware Load Balancer

Content-aware load balancing functionality uses router agents and receiver agents. All related events arriving from queues are routed to the same receiver agent using a unique routing ID, providing "session stickiness." Use of content-aware load balancing simplifies project configuration, and makes runtime behavior more efficient. See [Appendix B, Load Balancer, on page 91](#).

Release 4.0.1

No new features are included in this release. See [Changes in Functionality on page 14](#) for changes in functionality introduced to address various product issues.

Release 4.0

The following new features are included in this release.

TIBCO Software, Platforms, and Third Party Software

Support for the following products and product versions is added in this release:

- Red Hat Enterprise Linux 4.7 and 5.2
- AIX 6.1
- Oracle Real Application Clusters 11g Release 1
- SQL Server 2005 and 2008 (for backing store as well as database concepts)
- JRE 6 (minimum supported version)
- TRA 5.6.2 is the minimum supported version
- IBM DB2 9.5 for use with database concepts only.

Dependencies on other TIBCO Products are Removed

TIBCO BusinessEvents is no longer dependent on any other TIBCO products. Previously TIBCO Runtime Agent and TIBCO ActiveMatrix BusinessWorks also had to be installed before TIBCO BusinessEvents was installed.

New Installer

TIBCO BusinessEvents has adopted use of the TIBCO universal installer. This installer does not use VPD files and provides an easy installation experience.

New Design-Time User Interface

TIBCO BusinessEvents now has a new Eclipse-Based UI, TIBCO BusinessEvents Studio, for designing TIBCO BusinessEvents projects. It is integrated into the standard Eclipse menus where appropriate, and works in harmony with established Eclipse UI methodologies. TIBCO Designer, which was used in earlier releases, is no longer supported for designing TIBCO BusinessEvents projects.

The main artifacts which are included in the Eclipse-Based UI are as follows:

- UML Standard Class Diagrams and State Machine diagram: TIBCO BusinessEvents now provides several kinds of diagrams for use during the development life cycle. They are visualization tools that help you to understand and analyze even very large and complex projects.
- Rule Editor: It now supports text-based and form-based rule editing.

- **Project Analyzer:** Shows a complete runtime message flow through a graphical representation of the project artifacts, to help you find potential problems, and to understand dependencies. Users can now also share this graphical information with others who have no access to TIBCO BusinessEvents using image files.
- **Integrated Debugging (local or remote):** Allows you to test the project. It provides stack trace, rule agenda, variables view, watch views, and so on.
- **Integrated Testing:** Allows you to assert test data to a local or remote engine and view engine results with a causal execution path.
- **Cluster deployment descriptors:** This new engine configuration paradigm separates certain aspects of project configuration from the deployment archive. Settings formerly located in the engine TRA files and also certain settings in the TIBCO Designer project are now in the CDD file. You can now change these configuration settings without having to rebuild the EAR file.

Transports

HTTP Channel

TIBCO BusinessEvents can now act as an HTTP server at runtime. The new HTTP channel can be used to serve requests from clients and can also act as a client to other servers.

TCP Functions

You can now create a local TCP server and TCP client using built-in functions instead of using a channel. This is useful for connecting with systems that are otherwise difficult to connect with.

Web Services

TIBCO BusinessEvents can now act as a web service platform, sending and receiving SOAP requests. It can import a WSDL file and create required artifacts based on it. User can also create the project manually. It also allows the user to export rules and rule functions as WSDL.

Monitoring and Management

The TIBCO BusinessEvents Monitoring and Management (MM) component enables you to monitor and manage the status of all nodes in a cluster and provides various performance metrics. You can stop, start, and pause an agent and you can deploy agents to hosts that were preconfigured in a topology file used by MM.

Deployment Configuration

User can now define the deployment configuration using the Site Topology editor. This graphical user interface enables you to configure agents and processing units (engines at runtime) into deployment units that are assigned to host machines.

TIBCO BusinessEvents Monitoring and Management Console

BusinessEvents MM Console is a web based real time dashboard. It can be used to deploy, manage and monitor the engines which are defined during the design time using site topology. BusinessEvents Monitoring and Management allows you to do life-cycle management on agents such as stop, start, and pause. It supports use of LDAP and JAAS (file based security) for access control.

JDBC Backing Store

JDBC backing store is new in this release. The prior implementation supported only Oracle database and used Oracle Types. The JDBC backing store supports additional DBMS products and uses standard RDBMS tables for easier management.

Concurrent Rete Execution

TIBCO BusinessEvents now supports multi-threaded Rete execution for high performance.

Cache-aside Database Write Strategy

In addition to the write-behind database write strategy used in the Oracle-only (legacy) backing store implementation, you can now use a cache-aside strategy. With cache-aside, the agents write to the backing store and to the cache simultaneously using multiple threads. Threading controls are also available, giving greater control, stability, and better performance.

Rules are Stored Individually, Not as Part of a Ruleset Resource

All TIBCO BusinessEvents artifacts are now stored individually for better version control system support, including rules. In prior releases, individual rules were stored in rule set resources. Now rules are stored individually in project folders like other resources. Rulesets are no longer used (during migration rulesets are converted to folders). At deploytime configuration, you can select individual rules and folders of rules. This change also enables rules to be checked in and out of source control systems for more granular management.

Release 3.0.2

The following new features are included in this release to address issues in the earlier release.

- JDBC backing store. See *TIBCO BusinessEvents Administration* in version 4.0.0 for details.

Related Software

Support for the following platforms is added:

- TIBCO Runtime Agent 5.6.2
- TIBCO ActiveMatrix BusinessWorks 5.8 and higher
- Oracle Database 11g Enterprise Edition
- Oracle Real Application Clusters (RAC) 11g Release 1
- Database driver `ojdbc6.jar` for Sun Java JRE 6
- Database driver `ojdbc5.jar` for Sun Java JRE 5
- IBM Websphere MQ V6 and V7.0.1 and above
- Database concepts now supports Microsoft SQL Server 2008

See the product readme for full platform support details.

Release 3.0.1

The following new features are included in this release to address issues in the earlier release.

Platforms

Support for the following platforms is added:

- Solaris 10 on x86 (64-bit)
- Windows Server 2008 on (x86)
- Windows Server 2008 on (x86_64)
- Windows Vista Business Edition (x86) with latest patches
- HP-UX 11i (v1, v2, v3) (PA-RISC) (64-bit)

Related Software

- Java 6

- TIBCO Runtime Agent 5.6

TIBCO BusinessEvents Decision Manager and RMS

Multiple Implementations per VRF

Multiple decision tables (implementations) can now be created for one virtual rule function (VRF) (see [Multiple Implementations per VRF](#)). A new category of Standard functions, VRF, is introduced to work with this feature. The following new set of functions have been added to enable users to define which table or tables to use in any given case:

```
getVRFImpByNam()
getVRFImpNames()
getVRFImps()
invokeAllVRFImps()
invokeVRFImp()
invokeVRFImpByNam()
invokeVRFImps()
```

Multiple Rules Management Servers and Multiple Projects per RMS

- Users can use multiple Rules Management Servers for various operations.
- Rules Management Server (RMS) now supports multiple projects, each with its own permissions. Users define a directory where RMS projects are stored, and RMS manages all projects in that location.

Project Workflow

A project workflow now enables better management of committed project changes. The workflow (implemented as an XML file) defines the actions that users in the specified roles can take on Worklist items. For example, the workflow may define the "Approve", "Deny", "Rework", and "Discard" actions. A rule administrator could be assigned the ability to take any of the listed actions, while a rule approver might only be granted access to "Approve" and "Deny".

Memory Management

A new preference option is available under Preferences > General, Show memory usage status. The information helps you to understand and manage memory.

TIBCO BusinessEvents Engines

Event Preprocessor Worker Thread Options

New threading options are available in event preprocessors:

Shared Queue and Threads Uses the TIBCO BusinessEvents system-wide shared queue and threads (it is the only feature in this release to use this shared queue).

When you use the Shared Queue and Threads option you can also set these system wide shared queue properties:

```
com.tibco.cep.runtime.scheduler.default.numThreads
com.tibco.cep.runtime.scheduler.queueSize
```

Caller's Thread Uses the thread (and queue size) provided by the channel resource client (the Rendezvous or Enterprise Message Service client, for example).

A Specified Number of Threads You can specify 1-8 threads. TIBCO BusinessEvents creates this number of new worker threads for the input destination. When you choose this option, you must also specify the queue size.

See the Deploytime Configuration chapter in *TIBCO BusinessEvents User's Guide*.

Tutorials and Examples

New Caching and Backing Store Tutorial and Examples

The *TIBCO BusinessEvents Getting Started* guide has been expanded. In addition to the basic project design tutorial, it now includes a caching tutorial and a backing store tutorial, based on the same Fraud Detection scenario. Two new examples are added to the examples folder:

`BE_HOME/examples/FraudDetectionCache`

`BE_HOME/examples/FraudDetectionBackingStore`

New ActiveMatrix BusinessWorks Example

A new examples have been added to demonstrate in-process integration between TIBCO BusinessEvents and ActiveMatrix BusinessWorks. It builds on the `FraudDetection` example. It can be used with a TIBCO BusinessEvents or a ActiveMatrix BusinessWorks container, as documented. The example is added to the examples folder:

`BE_HOME/examples/FraudDetectionBEBW`

Examples Index

An `index.html` file has been added in the `BE_HOME/examples` folder. It lists the examples in logical groupings and enables you to click to open each example's documentation file.

Release 3.0

Note that these release notes were updated in release 3.0.1 to provide additional details.

Continuous Query Language

The query language is an SQL-like language. It enables you to query the current contents of concepts and simple events in the cache (snapshot query) or set up a query that reacts when the cache changes (continuous query). The query languages provides various windowing constraints such as sliding, tumbling, and temporal for continuous queries. It provides a simple deployment model to use an existing TIBCO BusinessEvents engine as a pure query engine (see [Query Agents](#)).

Decision Manager

Decision Manager provides a friendly and rich user interface for business personnel and others with little or no technical background to author, test, and deploy rules to the TIBCO BusinessEvents engine. Decision Manager simplifies complex rules by breaking them into multiple simple rules. Each simple rule is represented by a row in a decision table in the TIBCO BusinessEvents Decision Manager user interface. Decision Manager also provides IT personnel an easy, secure, and scripted deployment life cycle by exposing an extensible Rules Management System.

Rules Management Server (RMS)

The lightweight Rules Management Server (RMS), a component in the TIBCO BusinessEvents family, serves as a rules management repository. RMS is built using TIBCO BusinessEvents itself. Decision Manager communicates with this server to retrieve rules and other artifacts, get updates, commit them, approve or reject those rules, and deploy them to a production system.

Database Concepts

The database concepts feature provide an elegant mechanism to map back-end database tables and views into TIBCO BusinessEvents concepts, including relationships. The feature provides catalog functions for keeping the database synchronized with the current state of the concept. It also provides an ad-hoc querying mechanism.

Export Concepts and Events to XSD Schema

This simple tool enables you to export TIBCO BusinessEvents ontology model elements (concepts and events) to their corresponding XML schema definition. This allows for the interoperability of the TIBCO BusinessEvents model with SOA platforms, and other integration vendors.

Performance Profiler

The profiler utility enables you to collect statistics relating to the run to completion (RTC) rule evaluation cycles in an inference agent. The profiler records time spent during each RTC on various activities such as the number of times each condition or action is evaluated, and the total time spent on each condition and action.

Migration Utility for Migration from Persistence OM to Cache OM

A new migration utility provides an easy and fast way to migrate data from persistence-based object management to cache-based object management with backing store. Files are exported to comma-delimited value files and imported into the backing store configured for the cache.

Features Available with Cache Object Management

Query Agents

A query agent is a non-reasoning agent that has read-only access to the underlying objects in the cache cluster. A query agent has no Rete network.

Query agents are available only in TIBCO BusinessEvents Enterprise Suite. They are used only with Cache object management. Query agents enable you to query the objects in the cache using an SQL-like syntax.

Inference Agents

A BAR that deploys in 2.2 as a rule session, now deploys as an inference agent. Deployed instances of an agent form an agent group.

All agents share same cluster caches. They do not maintain separate caches (except a small local cache for performance reasons).

Rule chaining across different agents running in concurrent engines enables performance improvements. Instances of the same agent provide additional functionality (see [Inference Agent Groups](#)).

Inference Agent Groups

Each instance of an inference agent can be deployed multiple times to form an agent group. Each agent is aware of other agents in the group. Concept instances are shared between agents in a group; events are clustered. Notifications ensure that rule actions are executed appropriately. Inference agent groups provide load balancing and fault tolerance features.

Each agent instance is deployed in a different node (engine). Startup rule functions execute on each agent in a group. If this is not desired, design rule functions accordingly.

Engine Concurrency (Multi-engine Features)

Now a configuration option (`multiEngineOn`) enables you to use TIBCO BusinessEvents in multi-engine mode. This feature has two main applications:

This feature provides a flexible way to load balance rule sets across multiple engines. It simplifies scalability, enabling you to run multiple inference agents on multiple nodes within the same cluster configuration.

Each engine can run multiple agents. Each BAR in an EAR deploys as an agent.

Multi-engine mode is available only with cache object management.

Locking Functions for Event Preprocessors

Event preprocessors are multi-threaded. When multi-engine features are used, locking features ensure multiple preprocessors do not attempt to work on the same concept instance property (updates are at the property level):

```
Coherence.C_Lock(String key, long timeout, boolean LocalOnly)
```

```
Coherence.C_UnLock(String key, boolean LocalOnly)
```

Load Balancing Between Agents in an Inference Agent Group

With point-to-point messaging, the load is automatically distributed among multiple active agents in an agent group.

Fault Tolerance Between Agents in an Inference Agent Group

Fault tolerance is no longer at the engine level. Fault tolerance is provided between agents in an agent group (see [Inference Agent Groups](#)). A new set of configuration options is available for fault tolerance between agents. Two properties define fault tolerance behavior:

`Agent.AgentGroupName.maxActive`

`Agent.AgentGroupName.priority`

In single-engine mode, use only the `priority` property. Because only one agent is active at a time, the `maxActive` property is not required.

With multi-engine mode, agents in excess of the `maxActive` number are deployed in inactive mode. The `priority` setting determines which agents start up first.

The earlier style of fault tolerance is still available for engines using In Memory object management.

Only inference agents require fault tolerance. Cache servers manage cache data, for which backup copies are maintained by the cluster, and for which a backing store is available. Query agents run queries, which does not require fault tolerance).

Functions

Cluster Related Functions

The following new Coherence Cluster functions are now available.

`getClusterName()`

`isEventRecovered()`

They enable programmers to get the cluster name that was set in the TRA file, and also to check whether the current agent seeded the event or has a reference to the event. These functions are intended primarily for use with the "Cache + WM" cache mode (explained in *TIBCO BusinessEvents User's Guide*). Tooltips for the functions are available in TIBCO Designer and are reproduced in the online functions reference, available in the HTML documentation interface.

Instance-Related Functions

Two new functions are now available for creating instances and updating existing instances through an XML stream.

`createInstanceFromXML()`

`updateInstanceFromXML()`

Tooltips for the functions are available in TIBCO Designer and are reproduced in the online functions reference, available in the HTML documentation interface.

Engine Profiler Related Functions

New engine profiler functions are now available.

`startCollectingToFile()`

`stopCollecting()`

They enable programmers to collect profiling metrics on demand and stop them on demand. Tooltips for the functions are available in TIBCO Designer and are reproduced in the online functions reference, available in the HTML documentation interface.

Changes in Functionality

This section lists changes in functionality since the last major (x.0.0) release of this product.

Release 4.0.2

The following changed features are included in this release because they address issues in the earlier release.

Studio Tools Utility buildEAR Available on Solaris SPARC

It is now possible to use the `studio-tools` command line utility `buildEar` operation on Solaris SPARC platforms. To enable this functionality, follow the steps provided in [Enabling Build Ear Tool on Solaris SPARC on page 84](#).

Cache and Backing Store Related Changes

Loading Cache Data (Certain Cases Only) During Recovery

With JDBC backing store, certain data integrity issues caused hard-to-detect problems that prevented TIBCO BusinessEvents from properly loading cache data during restart. The issue was seen when orphan records existed in child tables; for example when a parent table entry was deleted but the child entries and the parent-to-child references were not deleted.

This fix concerns how TIBCO BusinessEvents handles such issues, and does not deal with the causes of the data integrity issues themselves.

Child tables are used for array properties, including contained concept array properties, and history properties.

As an example to illustrate the issue, take 10 parents each with 10 children. Deleting 5 parents (for example, manually purging them from the backing store) was causing the other 5 "good" parents not to recognize their children.

Now in such situations the orphaned children are skipped. In the example above, the 50 orphaned children are skipped and the remaining 5 "good" parents are loaded correctly.

To enable or disable this behavior, use the following new property:

```
be.backingstore.unreferenced.skip
```

By default the value is false. Set the value to true to enable the new behavior.

Evicting Specified Concepts from a Limited Cache

It was not possible to evict concepts from a limited cache, and leave the backing store unchanged. You can now use this catalog function to evict specified concepts from a named cache:

```
Coherence.Query.C_EvictConcepts(String cacheName, long[] ids)
```

where:

- `cacheName` is the name of the targeted cache
- `ids` is an array of concept IDs identifying the concepts to be evicted.

Before you can use the function in your project you must activate it. Open `BE_HOME/studio/eclipse/configuration/studio.tra` for editing. Add the following property and set it to true as shown:

```
TIBCO.BE.function.catalog.cluster.evictConceptsFunction=true
```

Improving Performance in JDBC Backing Stores that use MS SQL Server

With JDBC backing stores implemented using MS SQL Server, you can now use the following hints to improve runtime performance:

`NOLOCK` can be used for `SELECT` statements. Using `NOLOCK` avoids locks on the database or table when `SELECT` statements are issued. As an example:

```
select * from dbo.D_MailerIndex with (nolock) where ...
```

`ROWLOCK` can be used with `UPDATE` or `DELETE` statements to avoid lock-contentions. When you use `ROWLOCK` in the T-SQL statement, SQL Server locks only those rows that are matched in the where condition. (Without `ROWLOCK`, the entire table is locked, which is unnecessary.) As an example:

```
DELETE FROM dbo.D_Mailed WITH (ROWLOCK) where mailernumber =  
'12345678895' and time_created$ = 'somedate'
```

To enable this functionality, add the following properties in the CDD file at the cluster level and set them to true:

```
be.backingstore.optimize.reads  
be.backingstore.optimize.writes
```

Improving JDBC Backing Store Performance in Certain Cases

JDBC backing store updates for certain changes to contained concepts were slow. Now performance is improved for the following kinds of changes:

- Parent concept is modified
- Child concept is modified
- Child concept is added or removed

To enable this functionality, add the following property in the CDD file at the cluster level and set it to true:

```
be.backingstore.containedconceptarray.addremoveonly
```

Default value is false.



You cannot use this property if there are changes to contained concepts where the position of child concepts is modified. If you do, such modifications will not be written to the database.

Backing Store Updates Performance Improvement

In projects with a backing store, updating concepts that have many contained concepts was slow. The process has been optimized, removing unnecessary deletion and re-insertion of data.

To enable this behavior, set the following property in the CDD file:

```
be.backingstore.unmodified.skip=true.
```

And restart engines.

Distributed Preloading

In projects with a backing store, preloading the cache with backing store data was too slow. Now you can enable multiple machines to perform preloading. See [Enabling Distributed Preloading, page 85](#).

Monitoring and Management Related Changes

Remotely Stopping a PU with mm-tools

It was not possible to remotely stop a processing unit (PU) using mm-tools. Now you can use the following operation:

```
-op stop
```

For example:

```
mm-tools --propFile mm-tools.tra -op stop -puc CS -m 100.100.100.101
```

Where -puc refers to a processing unit configuration., and -m refers to the host machine.

Using Public/Private Key Authentication with mm-tools

This functionality requires some configuration. See [Using Public/Private Key Authentication with mm-tools on page 87](#) for details.

Changing Log Levels at Runtime with MM Console

It was not possible to change the log levels at runtime. Now you can Use MM Console to change the log levels using the new method, `SetLogLevel`.

You can set the log level for the entire cluster and also for individual engines. Available levels are: FATAL, ERROR, WARN, INFO, DEBUG, ALL, and OFF.

Controlling Metrics Publishing Interval in MM

When TIBCO BusinessEvents Monitoring and Management (MM) monitored a large deployment, it could become overloaded with metrics-related events and would stop after some time.

Now you can control the metrics publishing interval using properties. Add the following properties to the cluster level of the monitored deployment's CDD (and not in TIBCO BusinessEvents Monitoring and Management (MM) CDD file)

`com.tibco.be.metric.publish.interval` (default value: 10000)

`com.tibco.be.metric.resolution` (default value: 5000)

The value is expressed in milliseconds. The larger the value used, the fewer the metrics events. Tune the value according to your system configuration. For example, set both properties to 30000 or 60000.

JMS Channel Related Changes

Creating a Single Connection to a JMS Server

See [Creating a Single Connection to a JMS Server on page 86](#) for details.

Deserializing Payloads of Certain JMS Messages

With JMS channels, the `BytesMessageSerializer` did not deserialize the payload when a JMS message was sent with `byteMessage.writeUTF()`. To address this issue, a new serializer/deserializer has been added. Choose `UtfBytesMessageSerializer` in the Destinations section of the Channel resource.

Receiving JMS Messages Synchronously

JMS channels were not able to receive messages synchronously. Now you can set the following property at the appropriate level in the CDD:

`com.tibco.cep.driver.jms.receiver = true`

When this property is set to true the channel receives messages synchronously.

The following supporting properties are also provided:

```
com.tibco.cep.driver.jms.receiver.wait
```

Sets the timeout (in milliseconds) for the message to be received. The default is 500.

```
com.tibco.cep.driver.jms.receiver.shutdown.wait
```

Sets the maximum wait time (in seconds) after attempting to stop the receiver, before a forceful stop is attempted. The default is 60.

Setting an Engine's JMX port number

It was not possible to choose an engine's JMX port number in the CDD. You can now add the following property to the CDD at the processing unit level and set the port number as desired:

```
be.engine.jmx.connector.port
```

This property is effective with Cache OM only. (It is ignored and is harmless with In Memory OM.) Depending on your configuration, you may have to create additional PU definitions in the CDD so that you can assign different connector ports for PU instances.

If `be.engine.jmx.connector.port` is set, either do not set `com.sun.management.jmxremote.port` in the TRA file, or set it to a different port number (in this case two JMX connections will be open).

Disabling Connections for Specified JMS Channels

By default, engines connect to all defined channels on startup, including those not mentioned in the CDD file. This is because such channels can be used as output channels. However connecting to all JMS channels on startup is not always desired.

Now you can disable connections for specified JMS channels. To do so use properties that follow this format (to disable topic and queue connections respectively). Use forward slashes to define the project path to the channel:

```
be.channel.tibjms.queue.disabled=/project-path-to-jms-channel
```

```
be.channel.tibjms.topic.disabled=/project-path-to-jms-channel
```

Other Changes

Change in Defaults for Enabling Parallel Operations

In the post-RTC phase, use of parallel operations is generally safe only when locking is used. The parallel operations feature is enabled using this property:

```
Agent.agent name.enableParallelOps=true
```

Before this release, parallel operations was enabled by default when cache aside database write strategy was used. However, many projects that use cache aside do not otherwise require locking.

Now parallel operations is enabled by default only when both cache aside AND concurrent RTC features are used. (Use of concurrent RTC also generally requires locking.)

Parallel operations can also be used with cache aside when concurrent RTC is not used. However, it must be explicitly enabled, and correct locking must also be used as needed.

Exporting to and Importing Global Variables from Project Libraries

In version 3.0 (but not in 4.0) it was possible to export global variables to a project library and then import the project library for use in another project. It was also possible to override such a global variable with another global variable with the same name, by ordering the imported libraries. Also in version 4.0, when imported variables were used in a project, after EAR file generation, the imported variables were not merged and placed in `tibco.xml` within the EAR file.

Now global variables can be exported into project libraries. In the Build Path > Project Libraries tab, up and down arrows allow you to order the libraries. In the Global Variables view, the Project Source column shows the source project and the Override column shows overrides using arrow icons.

Identifying Which Engine Manages a Given Scheduler

It was not easy to identify which engine is managing a given scheduler. Now you can use the cluster MBean to determine where a scheduler is being managed. In the Cluster MBean, the `Cluster/Cluster Name$schedulers` node has an attribute called `Info` that shows information such as the following:

```
{Id=schedulerName,assignedTo=nodeID, ... }.
```

Match the value of `assignedTo` with the value of the `NodeId` attribute of `Cluster/Cluster Name` to determine which engine is managing the scheduler.

Handling Boolean nulls

Certain properties define a special value that indicates null. There was no property for Booleans. Now you can use this property:

```
tibco.be.property.boolean.null.value=value
```

The default value is `Boolean.FALSE`

See *TIBCO BusinessEvents Developer's Guide* for more on handling null properties.

Newly Supported Catalog Functions

Certain catalog functions are enabled by adding properties. To use these functions, add the enabling properties to this file:

```
BE_HOME/studio/eclipse/configuration/studio.tra
```

and set their value to true.

The table below itemizes the properties, their default value, and the functions each one enables.

Property	Notes
TIBCO.BE.function.catalog.Instance.serialize.instance	
Default: false	
	In the Built-in Functions Standard.Instance catalog, this property enables and disables the following function:
	serializeInstance
TIBCO.CEP.modules.function.catalog.database	
Default: true	
	In the Built-in Functions RBDMS.Database catalog, this property enables and disables the following functions:
	assertDBInstance
	beginTransaction
	closeQuery
	commit
	createQuery
	delete
	executePreparedStmt
	executeSQL
	getConnectionStatus
	getNextPage
	getNextPageFromOffset
	getPreviousPage
	getPreviousPageFromOffset
	insert
	queryUsingConceptProps
	queryUsingPreparedStmt
	queryUsingPrimaryKeys
	queryUsingSQL
	rollback
	setCurrentConnection
	unsetConnection
	update

Property	Notes
<code>TIBCO.CEP.modules.function.catalog.database.storedprocs</code>	<p>Default: false</p> <p>In the Built-in Functions <code>RDBMS.Database.sp catalog</code>, this property enables and disables the following functions:</p> <pre>closeStoredProc executeStoredProc getConceptAtIndex getObjectAtIndex intStoredProc setInputParameter setOutputParameterType</pre> <p>Note: If <code>TIBCO.CEP.modules.function.catalog.database</code> is false, then the value of <code>TIBCO.CEP.modules.function.catalog.database.storedprocs</code> is ignored.</p>
<code>TIBCO.CEP.modules.function.catalog.database.templates</code>	<p>Default: false</p> <p>In the Built-in Functions <code>RDBMS.Database.Templates catalog</code>, this property enables and disables the following functions:</p> <pre>templateDml templateQuery</pre> <p>Note: If <code>TIBCO.CEP.modules.function.catalog.database</code> is false, then the value of <code>TIBCO.CEP.modules.function.catalog.database.templates</code> is ignored.</p>

Property	Notes
----------	-------

TIBCO.BE.function.catalog.Oracle.Oracle	
---	--

Default: false

In the Custom Functions `Oracle.Oracle` catalog, this property enables and disables the following functions:

```
closeResultSet
commit
executeQuery
getColumnValueByIndex
getColumnValueByIndex
getColumnValueByName
getConnection
getConnection
getConnectionWithTimeout
next
registerConnection
releaseConnection
rollback
```

Note: Before you can use these functions you must also add `BE_HOME/lib/cep-backingstore.jar` to the build path of the project, as follows. In TIBCO BusinessEvents Studio Explorer, right-click the project and click Properties. In the Properties page left panel, select Build Path. Select the Custom Functions tab, click Add Library, then browse to and select the JAR file.

Externalizing SSL Certificates

It was not possible to externalize SSL certificates. They could only be stored in the project. This meant that if the certificate changed, you had to rebuild the EAR file and redeploy the project.

Now you can store trusted certificates outside of the project and use the following global variable to point to the certificate storage location:

`BE_GLOBAL_TRUSTED_CA_STORE`

You can set the value in the CDD, for example at the PU level as follows:

```
tibco.clientVar.BE_GLOBAL_TRUSTED_CA_STORE=file:///somepath/myGTCAFolder
```

When certificates change or expire, you can replace certificates or add new certificates and then restart the engine to load the changes.

Imported Project Validation Checks and Quick Fix Validation

After importing a TIBCO BusinessEvents project from a different workspace and giving it a different name from the original name of the project, some project resources may not be available, due to the project naming structure.

In earlier releases, you had to open the affected files in a text editor and manually fix the naming.

Now, a resource validation check detects when an entity's name, folder, namespace, or owner project name (`ownerProjectName` attribute) does not match the underlying file in the project.

In addition, a "Quick Fix" feature has been added to help you resolve such problems. To invoke the Quick Fix, right click on the validation problem in the Problems View and select "Quick Fix".

VRF Implementation Class Generation Message

The studio-tools utility now displays a message when VRF implementation classes are successfully generated.

Encoding Parameter Added to `File.readFileAsString`

The catalog function `File.readFileAsString()` can now read text in other languages including Spanish. It now takes an encoding as an optional input parameter.

Change of Agent Time Zone Now Handled Properly

With backing store enabled, datetime properties retrieved were incorrect after the agent time zone was changed and the agent restarted. For example this might happen when failing over and failing back between agents in different time zones. Now you can ensure that datetime stamps are interpreted correctly. To do so set the following property in the CDD at the appropriate level:

```
be.backingstore.timestamp.useDateTimeZone=true
```

Release 4.0.1

Default Encoding Changed

The default encoding of EAR files generated by TIBCO BusinessEvents Studio is now ISO8859-1. This is also the default encoding of TIBCO Administrator, permitting you to upload EAR files for deployment without changing the encoding. You can also use a global variable to change the encoding in the TIBCO BusinessEvents project.

Windows 2000 Support Removed

Windows 2000 is no longer supported. It was deprecated in version 3.0.1.

TIBCO BusinessEvents Monitoring and Management

- Shows deployment status at machine level.
- Includes a command-line tool for deployment.

Testing and Debugging

- Supports asserting subset of test data, persistence of test data, and loading of selected test data.
- Allows selection of row instance test data (default unselected).
- Provides options to select or de-select all rows.
- Allows you to assert selected test data only.
- Provides manual ordering of selected test data files in Test Data Select Table (Tester Input Tab).
- Has up, down and refresh tools for Select Table.
- Shows differences (background/foreground) for the modified property.
- Controls background/foreground change by a preference (Appearance preference page added under Tester Preference category (for color/font change)).
- Dynamic change of appearance occurs now, on applying changed preferences.
- Shows before and after change data modified result data (Remaining ones have only have result data).
- Provides auto scroll adjustment for modified result tables for better usability. and a Preference now exists for auto scroll (default: true).
- Note that since tester leverages the history feature, for you to view previous value and latest value, you must to keep a history value for the property (in the concept or event editor) to at least 2. Also the history policy needs to be set to "All Values".

TIBCO Administrator Deployment

- You can now select which CDD and processing unit name to use for deployment, in the TIBCO Administrator console.
- TIBCO Administrator shows the correct status when the engine has started.
- You can now override global variable values at the application and at the service level.

Release 4.0

Changes in functionality are not itemized for this release, which provides a completely new user interface and major changes in deployment architecture. Runtime functionality, however, is unchanged.

See [New Features on page 2](#) to understand the major new features introduced in this release. See *TIBCO BusinessEvents Getting Started* to gain familiarity with the new user interface and other product improvements.

Release 3.0.2

No functionality was changed in this release.

Release 3.0.1

The following changed features are included in this release because they address issues in the earlier release.

Caching Scheme Selection Performed Implicitly

In 3.0.0, cache type was selected using the property
`be.engine.cluster.cacheType`.

That property is no longer used.

Now the selection is made implicitly based on two properties.

`be.engine.cluster.hasBackingStore`

If the above is set to false, then the distributed scheme with no backing store is used. If it is set to true, then a backing store scheme is used and additional properties are available to refine the choice:

`be.engine.cluster.isCacheLimited`

If the above property is set to true, then a limited cache scheme is used, with a default size of 10,000 entries. If that default is not acceptable, use the following property to define the desired size:

`java.property.be.engine.limited.cache.back.size.limit`

Preloading Options for Backing Store

When limited cache is used, some objects are added to cache from backing store only when needed (this is known as cache only mode). Preloading options now enable you to choose which cache-only objects to load to cache from backing store at startup. You can load all objects, no objects, or you can specify either an inclusion list or an exclusion list. The value of the preload property determines behavior

- To load no objects, use `be.engine.cluster.preload=none`
- To specify an include list, set `be.engine.cluster.preload=include` and add a list of entity classes to preload using properties of this format:
`be.engine.cluster.EntityClassName.preload=true.`
- To specify an exclude list, set `be.engine.cluster.preload=exclude` and add a list of entity classes to exclude using properties of this format:
`be.engine.cluster.EntityClassName.preload=false.`

Events are Mutable Until Asserted

You can modify and enrich events before they are asserted into working memory. Rule evaluation depends on event values at time of assertion, so they can be changed only before assertion.

BusinessWorks.startProcess() Parameter is Now of Type Object

In 3.0.0, when the ActiveMatrix BusinessWorks process completed, the `BusinessWorks.startProcess()` function passed an *event* to the rule function that was specified in another parameter of the function. Now it passes an object.

Backing Store—Oracle connection pool limit properties

The following Oracle connection pool limit properties for backing store database, are set in `be-engine.tra`:

```
be.oracle.dburi.pool.initial.0
be.oracle.dburi.pool.min.0
be.oracle.dburi.pool.max.0
```

To enforce a pool size, you must now also set the following property to true (it is false by default):

```
be.oracle.dburi.pool.enforce.0 true
```

If this property is absent or set to false, the other pool settings are ignored.

Decision Manager

Decision Table Improvements

- TIBCO BusinessEvents Decision Manager has been improved to better handle the large decision tables used by highly complex Business Events solutions.
- Decision Manager now enables users to compare committed decision table changes to the current version of the table maintained by RMS or to other pending decision table commitments.
- Decision tables support merging with approved or other versions.
- Decision tables have a history view.
- Decision Manager tester shows which values of concepts and events have changed or were added.
- Decision Manager tester supports event payloads and array properties, and channels

Greater Flexibility in Decision Table Testing

A new property named `bui.testers.engine.feature.level` has been added. It has three values, `minimal`, `local`, and `full`, to control how fully the tester uses the features of the TIBCO BusinessEvents project. See *TIBCO BusinessEvents Decision Manager User's Guide* for details.

Finer Grained Controls

- RMS shows all checkins along with details and actions for each checkin.
- New permissions have been added to the access configuration files for each project to give rule administrators more control over which user roles have access to these project components: Project, Folder, DecisionTable.
- The Worklist view now displays details for each commitment request and allows rule administrators or approvers to select which specific changes within a request to approve or deny.
- Decision tables support locking and access control.

Release 3.0

Migration Support

The `be-dbutils` utility is deprecated and replaced by an enhanced, efficient `be-migration` utility. The new utility writes to CSV files, and obsoletes the use of database as temporary transfer medium.

Cache and Backing Store Configuration

The configuration for cache and backing store object management has been simplified and preset default cache schemes are provided out-of-the-box. See [New Features on page 2](#) for additional information.

Cache Loaders No Longer Used

You no longer need to a cache server as a cache loader. Now any engine can act as a cache loader when the system starts up.

Fault Tolerance and Cache Object Management Changes

Fault tolerance implementation is affected by new cache object management features. See [New Features on page 2](#) for details.

Channel and Destination

For every configured active destination (that is, a destination that is enabled in the Input Destination Tab in the TIBCO BusinessEvents Archive resource), the TIBCO BusinessEvents engine (Inference Agent) creates a JMS session for handling the incoming messages. In the previous releases, one session per channel was available.

The most-commonly-used JMS destination properties are now included in the TIBCO Designer user interface for JMS destinations. These are delivery mode, acknowledgement mode, ttl, and priority.

For Rendezvous-based destinations, an internal property `_sendsubject_` is reserved to get the subject on which the message was sent. The programmer can create an event with a string property `_sendsubject_` to access this value.

Deprecated Features

This section describes deprecated features and lists equivalent features that accomplish the same result, if relevant. Any use of a deprecated feature should be discontinued as it may be removed in a future release. You should avoid becoming dependent on deprecated features and become familiar with the equivalent feature.



For a list of all unused and deprecated properties from this or prior releases, see the appendix "Deprecated and Unused Properties in *TIBCO BusinessEvents User's Guide*.

Release 4.0.2

No features are deprecated in this release.

Release 4.0.1

Platforms and Third-Party Software

The following platforms and third-party software versions are deprecated in this release:

- Windows Vista Business Edition
- Redhat 4.x
- Solaris 8 and 9 for SPARC, 32-bit
- HP-UX 11i v1 and v2, for PA-RISC and Itanium
- AIX 5.3, 64-bit
- Microsoft SQL Server 2005
- JDK 1.5 (used in TIBCO BusinessEvents Decision Manager for loading decision table classes, and used for TIBCO BusinessEvents Monitoring and Management functionality)

Metadata (Extended) Properties for Preloading

Metadata properties for preloading, used in events, concepts, and scorecards, are deprecated in this release.

- The Pre Load On Recovery metadata setting is replaced by the CDD Preload Enabled setting.

- The Maximum Records to Load metadata setting is replaced by the CDD Preload Fetch Size setting.

The CDD settings are available in the Object Management (Cache) > Domain Objects area. Settings are available at the Default level, and at the Overrides level (for individual entities).

Buildear Utility

The `buildear.exe` utility is deprecated in this release. The same functionality is available with the `studio-tools.exe` utility's `buildEar` operation.

Release 4.0

Coherence (Tangosol) Cache Manager

In a future release, built-in, in-memory data grid functionality will replace the need for this third-party component.

Single-Engine Mode

Single-engine mode is a legacy function that is now superseded by multi-agent mode (called multi-engine mode in 3.x). This legacy feature will be removed in the next major release. See *TIBCO BusinessEvents Architect's Guide* to understand multi-agent mode functionality, and see *TIBCO BusinessEvents Administration* for implementation details.

Persistence Object Management

The current implementation of the Persistence OM is deprecated in this release. Customers using this OM option are advised to migrate to cache based object management. Migration utilities are documented in *TIBCO BusinessEvents Installation*.

Oracle-Only Backing Store

A new implementation of the backing store (used for cache OM) has replaced the need for the Oracle-only backing store provided in earlier releases. You should migrate from the Oracle-only backing store to the JDBC backing store feature. See migration details in *TIBCO BusinessEvents Installation*.

Oracle Catalog Functions Oracle catalog functions support the oracle-only backing store, and are also deprecated. Improved functions will be made available for the JDBC backing store feature.

Use of TIBCO Administrator

Use of TIBCO Administrator for deployment, management, and monitoring of TIBCO BusinessEvents applications is deprecated in this release. In future releases, the TIBCO BusinessEvents Monitoring and Management component will provide features for these tasks.

Cache Plus Memory Object Management, Except for Use with Constants

The Cache Plus Memory OM type is no longer recommended except for use with constants. It is recommended that you use Cache Only OM.

TIBCO Database Drivers

TIBCO database drivers are no longer supported for use with TIBCO BusinessEvents. (TIBCO database drivers are also no longer supported in TIBCO Runtime Agent.) Instead use drivers provided by DBMS vendors.

Certain Functions in the Coherence Categories

Certain functions in the Coherence function categories are not appropriate for use with TIBCO BusinessEvents and are deprecated. Replacement functionality will be provided in a future release, with a migration path.

The `Coherence.Extractors` category of functions

`C_CacheLoadConceptIndexedByExtId`

`C_CacheLoadParent`

`C_CacheOnlyModeDeleteEntities`

`C_CacheReevaluate`

`C_Classname`

Other Catalog Functions

`Query.Callback.getStatementName()` This function has been removed from the function catalog. It was an inadvertent duplication of a metadata function: `Query.Callback.Metadata.getStatementName()`.

AIX 5.1

Support for AIX 5.1 has been withdrawn by IBM. Therefore it is no longer supported in TIBCO BusinessEvents.

Fault Tolerance Mechanism for In Memory OM

The fault tolerance mechanism for In Memory object management is no longer required and is deprecated. The following properties will not be supported:

```
Engine.FT.UseFT  
Engine.FT.GroupName  
be.ft.nodename  
Engine.FT.Weight
```

Instead use Cache OM and set all entities to Memory Only. Then use the fault tolerance features available for Cache OM. (See *TIBCO BusinessEvents Administration* for details.)

Release 3.0.2

No features are deprecated in this release.

Release 3.0.1

The following platform is deprecated in this release:

- Windows 2000 on x86

Release 3.0

The 5.3 version of TIBCO ActiveMatrix BusinessWorks is deprecated in this release.

The `be-dbutils` data migration utility is deprecated and replaced by the `be-migration` utility.

Migration and Compatibility

This section explains how to migrate from a previous release to this release.



For detailed migration advice and procedures, see the *TIBCO BusinessEvents Installation* guide.

Release 4.0.2

Ensure that all related software used meets required minimum versions. See [New Features on page 2](#) for details.

Back up projects and rebuild project EAR files after upgrading from 4.0.0 or 4.0.1

The product documentation was updated in version 4.0.1. The updated documentation is included in this service pack for the benefit of customers upgrading from 4.0.0.

Release 4.0.1

No new migration or compatibility issues are introduced in this release. However additional documentation has been added to the migration chapters in the *TIBCO BusinessEvents Installation* guide.

Release 4.0.0

Upgrading from Version 3.X

You can import 3.x TIBCO Designer-based projects in TIBCO BusinessEvents Studio. With a few exceptions, the projects are automatically migrated to 4.0.0 Eclipse-based projects. Read the migration chapters in *TIBCO BusinessEvents Installation* to understand what manual actions you may have to take.

Upgrading From an Earlier Version

If your existing installation is a version earlier than 3.0.0 upgrade to 3.0.0 and then to 4.0.0. To upgrade to 3.0, read the migration chapters in *TIBCO BusinessEvents Installation* and follow all instructions carefully. You may also find it helpful to read the section [Release 3.0.1](#) below.

Release 3.0.2

Upgrading From Version 3.0.1

If your existing installation is version 3.0.1, take the following actions:

- Installing this service pack requires regeneration of BusinessEvents archive (.ear) files for your projects.
- If you have modified the TIBCO BusinessEvents 3.0.1 RMS project, you must rebuild its EAR file (as is required for any existing EAR file).
- Back up projects before using TIBCO BusinessEvents 3.0.2. After you open projects and save them using BusinessEvents 3.0.2 you may not be able use those projects in earlier versions of BusinessEvents

There are no additional migration actions or changes in compatibility in this release.

Upgrading From an Earlier Version

If your existing installation is a version earlier than 3.0.0 upgrade to 3.0.0 and then to 3.0.2. To upgrade to 3.0, read the migration chapters in *TIBCO BusinessEvents Installation* and follow all instructions carefully. You may also find it helpful to read the section [Release 3.0.1](#) below.

Release 3.0.1

Read the migration chapters in *TIBCO BusinessEvents Installation* and follow all instructions carefully. Below are a few summary points.

In all cases, you must regenerate all EAR files after you upgrade.

You can directly upgrade from TIBCO BusinessEvents 1.4 and higher to the current version. If you are upgrading from an earlier release, first upgrade to 1.4.

If you use Persistence object management in your 1.x or 2.x version and want to continue to use Persistence object management, upgrade to 2.x and migrate the persistence database. Then upgrade to the current version.

If you plan to migrate from Persistence OM to Cache OM, you can upgrade directly from 1.4 or higher to version 3.0.1 and then migrate from Persistence to Cache OM backing store using a provided utility. Additional configuration is also required.

In Decision Manager, various actions are required, for example, you must clear all worklists before migration, and after migration, you must save decision tables created in the prior release before you export them.

Release 3.0

For detailed migration advice and procedures, see *TIBCO BusinessEvents Installation*.

Closed Issues

The table in this section lists issues that were closed in the named releases.

Closed in Release	Key	Summary
4.0.2	BE-14359	User Name and JNDI User Name on JMS Connection did not support use of global variables.
4.0.2	BE-14523	Foreign key was empty for database concepts when the key was created by a sequence.
4.0.2	BE-12366	Rational Team Concert can now be used with TIBCO BusinessEvents Studio resources.
4.0.2	BE-11074	LDAP authentication now works with Windows ActiveDirectory.
4.0.2	BE-14173	The catalog function <code>Instance.updateInstanceFromXML()</code> threw exceptions when adding a new contained concept to a <code>PropertyAtom</code> .
4.0.2	BE-14108	Building the EAR file was failing for certain projects.
4.0.2	BE-14100	<p>Queries associated with the function <code>Database.Templates.templateQuery()</code> with date/time fields in the where clause did not return results.</p> <p>Note: This function is now supported, when a property is set. See Newly Supported Catalog Functions, page 20.</p>
4.0.2	BE-14083	If you used the Generate Schema utility to export an event whose payload was defined using the "XML Element Reference" option, the generated XSD file contained an invalid schemaLocation. Importing such a file to a TIBCO ActiveMatrix BusinessWorks project resulted in an Invalid Reference error.
4.0.2	BE-13970	In certain cases, when a channel lost the connection to a TIBCO Enterprise Message Service server, the engine did not attempt to reconnect.
4.0.2	BE-13911	Using the unary minus operator with a concept property would cause an error when building the EAR.
4.0.2	BE-13649	The build EAR process was taking several hours for complex projects.

Closed in Release	Key	Summary
4.0.2	BE-13859	If a project library had contained concepts, the project would throw an error at runtime.
4.0.2	BE-13249	Using TIBCO BusinessEvents Studio Tools, it was not possible to build an EAR file for projects with project libraries that contained rules or rule functions that made function calls.
4.0.2	BE-13145	It was not possible to add a custom serializer in TIBCO BusinessEvents Studio. Now the drop-down list allows text entry as well as selection from a list.
4.0.2	BE-13143	An unhandled event loop exception occurred when exporting a project library that itself has dependencies on another project library. Now the export is successful and an informational message displays: Project Library export: Dependency exists on a shared element, need to include project library ' <i>library name and filepath</i> ' when using this project library.
4.0.2	BE-13120	The MBean PendingDBWrites was not displaying the correct information.
4.0.2	BE-12985	The MM server would throw a null pointer exception if a machine's IP address did not match the machine name specified in the site topology file host configuration.
4.0.2	BE-12939	The memory consumption of some XSLT functions has been optimized.
4.0.2	BE-12699	The MM server was not discovering the cluster topology when the host name was specified in the site topology editor using the fully qualified name. Now the host name is always resolved to its fully qualified domain name (even if the simple name is entered) and the host name is also validated against the IP address. If they don't resolve to the same host then an <code>UnknownHostException</code> is thrown.
4.0.2	BE-12657	Rule functions used for the rule ranking feature must have a Validity setting that includes Condition (Action Only is not sufficient). When an Action Only rule function was used, however, no validation error was thrown.

Closed in Release	Key	Summary
4.0.2	BE-12569	<p>An error was thrown when building the EAR file if a rule function in the project returned an array of concepts. The error occurred only when assigning a local variable to the array of concepts returned by that rule function, for example:</p> <pre>Concepts.MyConcept[] arr = myRuleFunction();</pre> <p>This example would cause the build error. However <code>myRuleFunction()</code> itself would build properly.</p>
4.0.2	BE-12537	TIBCO Administrator could not deploy a TIBCO BusinessEvents EAR file that contained Rational Clearcase files. (Such files would be present in a project that had been checked out of Rational Clearcase before the EAR file was built.)
4.0.2	BE-12541	The abs function was missing from the Function Argument Mapper in version 4.0.1.
4.0.2	BE-12520	The LDAP admin password is now encrypted.
4.0.2	BE-12519	A memory leak occurred during bulk deletes of concepts in a single RTC.
4.0.2	BE-12179	In TIBCO BusinessEvents Studio Tester, a <code>ClassCast</code> exception was thrown when a concept instance that has an active statemachine was deleted in a preprocessor.
4.0.2	BE-11977	In the debugger > Rule Input view > Rule Data tab, after you asserted test data, the Assert button became disabled and it was not possible to assert data again (for example after changing the Entity URI value).
4.0.2	BE-11134	In the JMS Connection shared resource dialog, the JNDI Context URL field did not support use of global variables. If a value was specified using a global variable, the Test Connection button displayed a failure message.
4.0.2	BE-11133	In the JMS Connection shared resource dialog, clicking the Test Connection button always caused a success message to display when the Use JNDI for Connection Factory checkbox and Use Shared JNDI Configuration checkbox were checked, even when the JNDI Configuration field was blank or did not specify a valid URL.

Closed in Release	Key	Summary
4.0.2	BE-10403	In TIBCO BusinessEvents Studio, the Test Connection button for JMS Connection shared resources failed if the connection was set up to use JNDI.
4.0.2	BE-12313	Users were not able to create the event view for a project when event descriptions were empty.
4.0.2	BE-12304	When a project library had a file larger than 140KB in size, and the library was imported into a project, the file was not present in TIBCO BusinessEvents Studio. (Typically this issue affected rule functions, which tend to be larger than other files in a project library.)
4.0.2	BE-12239	For projects with a backing store, the backing store data migration utility, <code>be-migration</code> , caused a (harmless) exception for concepts and events whose <code>hasBackingStore</code> metadata property was set to false.
4.0.2	BE-12185	Rule conditions of the form <code>Instance.isModified(<i>concept</i>)</code> were not always re-evaluated when <i>concept</i> was modified.
4.0.2	BE-12083	An exception in <code>RTCTransactionManager.TxnTask_Actions.run()</code> prevented the Post RTC from completing.
4.0.2	BE-12035	The TIBCO BusinessEvents Monitoring and Management component failed to start engines on Linux and Solaris OS if, in the site topology file, they were configured to be started through TIBCO Hawk.
4.0.2	BE-12022	Continued usage of certain form-based editors in TIBCO BusinessEvents Studio, in particular the XML Mapper and the State Model editors, caused memory to grow until an out-of-memory error occurred.
4.0.2	BE-12009	After a request to a web service timed out, the engine would sometimes not recover, and would keep showing errors.
4.0.2	BE-11999	After fetching multiple expired schedules that should be executed immediately, the scheduler would not execute them in the order they were originally scheduled.

Closed in Release	Key	Summary
4.0.2	BE-11972	When the CDD property <code>be.engine.cluster.isCacheLimited</code> was set to <code>false</code> , the cache agent did not override the value of the entity metadata property "Is Cache Limited," which defaults to <code>true</code> . Thus, all entity caches were still limited. Now the CDD property <code>be.engine.cluster.isCacheLimited</code> overrides the entity metadata property, as intended.
4.0.2	BE-11584	Under certain circumstances, <code>C_Lock()</code> could take up to twice the time that had been specified in the timeout parameter.
4.0.2	BE-11565	The engine threw exceptions when a concept property history was set to a very large value.
4.0.2	BE-11461	The scheduler functions did not always work for local channel destinations.
4.0.2	BE-11338	Having many fields in an Event could prevent the EAR to successfully build.
4.0.2	BE-11314	TIBCO Administrator could not deploy EARs that had been built from a TIBCO BusinessEvents project that contained CVS folders.
4.0.2	BE-11088	The buildear utility did not recognize project libraries.
4.0.2	BE-9898	After importing a TIBCO BusinessEvents project from a different workspace and giving it a different name from the original name of the project, some project resources were not available.
4.0.2	BE-9933	Events sent from a start-up function would sometimes not be received by a destination.
4.0.2	BE-3259	Schemas generated from TIBCO BusinessEvents entities using the schema generator were not fully compatible with the XMLInstance resources of TIBCO Designer.
4.0.2	BE-2487	In TIBCO BusinessEvents Studio, searches did not search the description fields of rules or concepts.
4.0.2	BE-10980	Building an EAR file for a project that contained a project library caused an exception.

Closed in Release	Key	Summary
4.0.2	BE-10695	<p>The handling of unsupported time units in timeout attributes has been fixed. The following timeout attributes use time units:</p> <p>The TTL of an event</p> <p>The Time Interval unit of a time event</p> <p>The Timeout Unit of a state model, state, composite state, concurrent state, or region.</p> <p>If one of the above attributes contains an unsupported time unit (WeekDays, Weeks, Months, Years), TIBCO BusinessEvents Studio now marks the usage as a validation error so that you can correct the problem. You must then update the units manually. Open the affected resources in their respective editors and update the interval to a new value.</p>
4.0.2	BE-10498	When JDBC backing store was used, the BusinessEvents engine threw a <code>java.lang.NullPointerException</code> exception error when attempting to store and retrieve a concept that had a contained concept array, with history enabled.
4.0.2	BE-10494	In the MM component, it was not possible to edit global variables when the global variables' total character length exceeded 8192.
4.0.2	BE-10394	Importing an abstract WSDL was throwing a <code>NullPointerException</code> error. Now the import works correctly. The channel is not created, and appropriate warnings are displayed about missing transport information (which is normal in an abstract WSDL).
4.0.2	BE-10332	Returning an concept array in a rule function was causing an error at engine start-up.
4.0.2	BE-10322	When a field name exceeded 30 characters, sometimes the <code>be-jdbcdeploy</code> utility did not generate SQL scripts correctly.
4.0.2	BE-10321	Global variables with an empty value and defined with type Password did not display an encrypted value.
4.0.2	BE-10299	The <code>studio-tools</code> command-line utility for building EAR files was throwing an exception when a project includes any custom function that took a concept array as a parameter.

Closed in Release	Key	Summary
4.0.2	BE-10149	Eclipse help for TIBCO BusinessEvents and its add-on products did not display in the BusinessEvents Studio Help contents.
4.0.2	BE-10127	It was not possible to drag and drop properties into the condition area of a decision table if the project contained cyclic referenced concepts.
4.0.2	BE-9933	Events sent from a start-up function would sometimes not be received by a destination.
4.0.2	BE-1324	Using <code>sendEvent()</code> to send an event to an IBM MQ JMS server was failing.
4.0.2	BE-1259	Fault tolerance did not work correctly with RVCM transport.
4.0.2	BE-9983	In the Site Topology editor, deployment unit properties, when you changed the Deployed CDD and Deployed EAR settings, the Save button did not become enabled.
4.0.2	1-ASPLV7	If a TIBCO BusinessEvents 3.x project refers to a project library that has global variables, and the project was imported into TIBCO BusinessEvents Studio, the project did not have the global variables.
4.0.2	1-AP0B0E	If a project refers to a project library, rule functions defined in the project library were not available for selection when defining event preprocessors in the CDD Editor.
4.0.2	BE-9888	In TIBCO BusinessEvents Studio, the UI showed errors if Ontology functions were not called properly in the rule editor.
4.0.2	BE-9645	When you right-click a project name in Studio Explorer, the Refactor > Rename option was not available.
4.0.2	BE-9603	No TIBCO BusinessEvents agents started when the input destinations for any one agent in a CDD created with BusinessEvents 4.0 were configured such that the directly configured destinations and referenced collections of destinations were listed in mixed order.
4.0.2	BE-9429	In TIBCO BusinessEvents Studio, the CDD was correctly updated for refactoring changes. However if the CDD file was open for editing in TIBCO BusinessEvents Studio when the changes were made, the open file did not reflect the changes. Additionally, the Save button becomes enabled. If you then save the CDD file, the old paths were retained and overwrite the correct ones.

Closed in Release	Key	Summary
4.0.2	BE-9425	TIBCO BusinessEvents did not create an EAR file when any event had a high value for the time-to-live (TTL) setting, for example, 35 days.
4.0.2	BE-8487	On the AIX platform, when a backing store was used, a <code>NoClassDefFoundError</code> was thrown when trying to start engines.
4.0.2	BE-5802	Shortcut keys "Shift+Home", "Shift+End", "Home", "End" did not work in the Form editor for Rules and Rule Functions.
4.0.2	1-ABDH3C	Even after successful generation of the EAR file, TIBCO BusinessEvents Studio might not always show the message "Ear File was successfully generated."
4.0.2	1-86QOZR	Using <code>sendEvent()</code> to send an event to an IBM MQ JMS server failed.
4.0.2	1-81AYU0	Fault tolerance did not work correctly with RVCM transport.
4.0.1	BE-9972	When loading a concept from the backing store a null pointer exception occurred in this case: the concept contained one or more properties with both the Multiple checkbox checked and with History enabled.
4.0.1	BE-9399	When using a backing store, there was no indication in the logs when all the objects had been loaded from the backing store into the cache. For example, logs might show: ##### PreLoading process completed. Loaded total types=20 entities=145002
4.0.1	BE-9358	A <code>ClassCastException</code> was thrown when the <code>cacheOpsQueueSize</code> and <code>dbOpsQueueSize</code> properties were set to a small value and Caller's Thread was used.
4.0.1	BE-9330	The type of <code>timeEvent@scheduledTime</code> inadvertently changed from <code>DateTime</code> in 3.x to <code>String</code> in 4.0.
4.0.1	BE-9246	Acknowledgement of memory-only events was handled differently in Cache object management and In Memory object management.

Closed in Release	Key	Summary
4.0.1	BE-9224	<p>The database pool size did not recover to the initial or min connection size, as defined in the following database pool properties:</p> <p>In 3.0.2: the following settings were used in the be-engine.TRA file:</p> <pre>be.oracle.dburi.pool.initial.0 be.oracle.dburi.pool.min.0</pre> <p>In 4.x: the Min Size and Max Size settings are located in the backing store section of the CDD file. In the CDD editor see the Cluster tab, backing store settings section, and cluster tab properties for backing store properties.</p> <p>These settings are used differently for Oracle Types and for JDBC backing stores, and they are further used differently if Oracle database strategy setting is used (see the Strategy setting in the CDD file).</p> <p>See the <i>TIBCO BusinessEvents Administration</i> guide for details on these backing store CDD settings.</p> <p>As part of the fix for this issue, update the CDD file backing store properties, as follows:</p> <p>For Oracle Types backing store: set</p> <pre>be.oracle.recreateOnRecovery=true</pre> <p>For JDBC backing store: Set <code>be.jdbc.recreateOnRecovery=true</code> (only applicable Oracle database strategy is used) if <code>be.jdbc.dburi.strategy.0=oracle</code> is also set)</p>
4.0.1	BE-9076	<p>By default, a TIBCO BusinessEvents engine did not respond well to all TIBCO Administrator requests, because the Hawk library is not available to the engine. <i>TIBCO BusinessEvents Administration</i> guide section "Before Deploying a Project in a TIBCO Administrator Domain" has now been updated to include the changes required to the <code>BE_HOME/bin/be-engine.tra</code> files on all target machines.</p>
4.0.1	BE-9030	<p>The be-migration tool stopped responding when events had large payloads.</p>
4.0.1	BE-8598	<p>This issue occurred with backing store, and using the <code>isCacheAside</code> setting. When two child instances were added to a parent instance that had been loaded using <code>Coherence.C_CacheLoadConceptByExtId()</code>, only one of the child instances was found in the backing store.</p>

Closed in Release	Key	Summary
4.0.1	BE-8597	<p>For the WebSphere MQ <code>CLIENT_ACKNOWLEDGE_MODE</code> to work correctly, the acknowledgement must be sent on the same thread that received the message. To ensure this behavior, use the Caller threading model for the destination, and, if cache aside database write strategy is used, set the following property:</p> <pre>Agent.agentname.enableParallelOps=false</pre> <p>Setting this property to false means that all post-RTC operations are done on a single thread.</p>
4.0.1	BE-8561	When regenerating JDBC backing Store scripts after altering concept schemas, the generated SQL was in an invalid oracle format, for existing <code>SYSTEM</code> generated <code>NestedTableNames</code> .
4.0.1	BE-8539	In TIBCO BusinessEvents Studio, the Test Connection button in a JMS Shared Resource was not working.
4.0.1	BE-8509	<p>When creating an event with <code>Event.createEvent()</code>, if the event element had multiple <code>@extId</code> sub_elements with non-null values, the following <code>javax.xml.transform.TransformerException</code> exception was thrown:</p> <pre>com.tibco.cep.runtime.model.element.ExtIdAlreadyBoundException: Event is already bound to ...</pre>
4.0.1	BE-8490	When starting the BusinessEvents engine, a <code>java.lang.NoClassDefFoundError: javax.jms.Message</code> exception was thrown even if the project did not have a JMS Channel.
4.0.1	BE-8486	<p>The following property:</p> <pre>tangosol.coherence.distributed.backupcount</pre> <p>Did not work when Cache Aside was set to true in the CDD backing store settings.</p>
4.0.1	BE-8482	<code>Instance.Reflection.getAllProperties()</code> specified the return type as <code>Property[]</code> . A local variable can't be created of type <code>Property[]</code> .

Closed in Release	Key	Summary
4.0.1	BE-8481	<p>BusinessEvents did not clear the contained concepts in the secondary tables of a backing store when the contained concept array became empty, resulting in dangling references.</p> <p>You can remove existing dangling references that may have resulted from the earlier behavior, as follows.</p> <p>The below examples use the following terms:</p> <p>d_car is the reference table which has dangling references.</p> <p>d_wheel is the table for the contained concept.</p> <p>Execute a query like the following to determine if you have dangling references:</p> <pre>select count(id\$) from d_car t where not exists (select id\$ from d_wheel where id\$ = t.id\$);</pre> <p>Execute a query like the following to delete dangling references:</p> <pre>delete from d_car t where not exists (select id\$ from d_wheel where id\$ = t.id\$);</pre>
4.0.1	BE-8478	Running the be-migration tool caused a NullPointerException.
4.0.1	BE-8476	The function <code>Event.createEvent()</code> was synchronized, causing performance issues.
4.0.1	BE-8475	The number of worker threads was limited to eight.
4.0.1	BE-8474	Using the XSLT mapper to create multiple concepts related by concept properties resulted in broken references if a <code>DuplicateExtId</code> exception was thrown because one of the new concepts had an <code>extId</code> that already exists.
4.0.1	BE-8473	Global variable initialization was not synchronized, which allowed uninitialized data to be read for a short time after startup.
4.0.1	BE-8472	<p>The property <code>be.dbconcepts.pool.inactivityTimeout</code> now also works for Microsoft SQL Server.</p> <p>(Applies to TIBCO BusinessEvents Data Modeling add-on.)</p>
4.0.1	BE-8459	If the user typed <code>be-engine</code> at the command line, without any parameters, a <code>NullPointerException</code> was thrown instead of a meaningful error message.

Closed in Release	Key	Summary
4.0.1	BE-8456	<p>The command-line <code>buildear</code> tool did not work for new projects created in TIBCO BusinessEvents Studio. It worked only on projects that were imported from previous (TIBCO Designer-based) versions of TIBCO BusinessEvents.</p> <p>Note that this tool is deprecated in 4.0.1 because the <code>studio-tools</code> utility provides this functionality now.</p>
4.0.1	BE-8452	<p>In the Monitoring and Management component's CDD file (<code>MM.cdd</code>), list of properties for the <code>mm-class</code> agent, the following property did not work: <code>global_variable_overwrite > http > tibco.clientVar.HTTPPort</code></p>
4.0.1	BE-8421	<p>While using TIBCO BusinessEvents Studio on Linux, TIBCO BusinessEvents Studio would sometimes stop responding, and the operation could not be completed.</p>
4.0.1	BE-8419	<p>If you declared an event using <code>SimpleEvent</code> in a rule function body, the following error displayed:</p> <p>Type mismatch - cannot be converted to ...</p>
4.0.1	BE-8418	<p>In deployments where all data is available in the cache, and the backup count is set to one or more (using the property <code>tangosol.coherence.distributed.backupcount</code>), and cache servers are evenly distributed over two or more different machines, you can now ensure that cache backups for a given machine's agents reside on a different machine. As a consequence, there is no single point of failure, and all cache data remains available if a machine stops responding.</p> <p>To enable this behavior, set the following property on each node:</p> <p><code>tangosol.coherence.machine=machine-name</code></p> <p>Where <i>machine-name</i> is the name of the physical server, for example, its hostname or name as it appears in a DNS entry.</p>
4.0.1	BE-8390	<p>When using MQ Series Version 7 as the JMS channel provider, the channel function <code>resumeDestination()</code> did not work for topics. On resuming an infinite loop occurred and the following error displayed:</p> <p>Exception while creating consumer.</p>
4.0.1	BE-8380	<p>Under certain conditions the <code>be-jdbcdeploy</code> tool would fail to generate unique table names for entities with the same name.</p>

Closed in Release	Key	Summary
4.0.1	BE-8347	Debugger would throw an <code>org.eclipse.debug.core.DebugException</code> when debugging a project with backing store enabled in the CDD editor.
4.0.1	BE-8333	Migration of data from an Oracle Types based backing store to an Oracle JDBC based backing store was not working.
4.0.1	BE-8306	Project validation was not able to detect a problem if an argument was not provided to a SOAP Fault Catalog function and EAR file building failed.
4.0.1	BE-8243	In an engine with one or more query agents, the engine status displayed "Starting Up" in TIBCO Administrator, although the engine was running.
4.0.1	BE-8140	The <code>be-jdbcdeploy</code> executable did not generate the alter script correctly when complex attributes (such as arrays, history, and so on) were added.
4.0.1	BE-8077	With Rendezvous channels, TIBCO BusinessEvents incorrectly converted the location of the ledger file when it was specified using global variables. Slash characters (/) in global variables were converted to underbar characters (-), and the ledger was created in the TIBCO BusinessEvents home directory.
4.0.1	BE-7994	In TIBCO BusinessEvents Monitoring and Management, if you stopped a processing unit (engine) using the Stop button (the <code>stopEngine()</code> method), and then clicked the Purge button, MM Console showed an <code>UndeclaredThrowableException</code> , which was harmless.
4.0.1	BE-7834	In the TIBCO BusinessEvents Monitoring and Management component, the inference agent method <code>getNumberOfEvents()</code> always showed 0 in the result.
4.0.1	BE-7598	When a TIBCO Designer project that used Cache Object Management and also had a reference to a project library was imported into TIBCO BusinessEvents Studio, an exception was thrown when the user attempted to open the CDD file in the CDD Editor.

Closed in Release	Key	Summary
4.0.1	BE-7550	If the name of a start-up rule function was modified in a TIBCO BusinessEvents Studio project that was created by importing from a TIBCO Designer project (from a previous version of TIBCO BusinessEvents), then at runtime this <code>java.lang.RuntimeException</code> was thrown: <code>RuleFunction newRuleFunctionname does not exist.</code>
4.0.1	BE-7091	In the TIBCO BusinessEvents Studio Debugger, an Unhandled Event Loop Exception and an Asynchronous Viewer Update Error were shown while stepping, that is, while pressing F5 or F7.
4.0.1	BE-7091	In the TIBCO BusinessEvents Studio Debugger, an "Unhandled Event Loop Exception" and an Asynchronous Viewer Update Error were shown while stepping (that is, while pressing F5 and F7).
4.0.1	BE-6969	The tooltip for the <code>Coherence.Query.C_StoreQueryAction()</code> function was not correct.
4.0.1	BE-6757	Rule functions from Project Libraries were not available for adding as startup rule functions in the CDD Editor.
4.0.1	BE-6715	Tooltips for functions <code>Instance.isNew()</code> and <code>Instance.isModified()</code> were incomplete.
4.0.1	BE-66	When using a mapper function, for example, <code>createInstance()</code> , if there was an error in the function argument mapping input, the function did not change to red to indicate an error.
4.0.1	BE-6519	When used with Websphere MQ version 7, BusinessEvents did not work with the Shared Queue or Workers options for the input destinations.
4.0.1	BE-646	The pop-up auto-complete feature did not work in the following cases: Use of <code>@length</code> with a local array variable. Use of dot (<code>.</code>) or at sign (<code>@</code>) after a local variable array or property array index element (<code>[]</code>) when the return type is a concept or event. Use of dot (<code>.</code>) or at sign (<code>@</code>) after a nested function when the return type is a concept or event.
4.0.1	BE-6421	TIBCO BusinessEvents Studio did not allow creation of two shared resources with names that are the same except for differences in case, for example, <code>JMS</code> and <code>Jms</code> .

Closed in Release	Key	Summary
4.0.1	BE-6137	<p>A <code>java.lang.ClassCastException</code> was thrown while reading arrays of contained concept instances from the results of a query such as the following:</p> <pre>Concept[] cepts = Query.ResultSet.get(rset, <index>)</pre>
4.0.1	BE-5292	The <code>suspendDestination()</code> function did not work with Cache OM when called in a startup rule function or in any rule that executed before the destination and its listeners were fully started. (It did work for In Memory OM type.) Now it works in all OM types.
4.0.1	BE-5039	The function <code>Coherence.Constants.C_DateTimeConstant()</code> takes an input parameter with a datetime format. The format was not shown in the function tooltip.
4.0.1	BE-4997	It was not possible to migrate data from an Oracle-only backing store to a JDBC backing store. A utility is now provided. For instructions see <i>Migrating Data to a Current Backing Store Implementation in TIBCO BusinessEvents Installation</i> .
4.0.1	BE-4080	With an SQL Server backing store, deadlock could occur if multiple rules attempted to update one scorecard at the same time, and at high frequency.
4.0.1	BE-3539	With the Oracle-only legacy backing store, when a table became corrupted, the cache server would retry multiple times in quick succession till no more Oracle cursors were available, and a <code>max_cursor</code> exception was thrown.
4.0.1	BE-343	Entity Path in <code>Event.createEvent()</code> mapper function was not updated when the event name was changed, and validation/EAR building did not detect this error.
4.0.1	BE-2405	When using the TIBCO BusinessEvents API, the reset method would throw a harmless NPE when scorecards were used in conditions or actions.
4.0.1	BE-2395	The profiler utility did not write data when stopped using <code>Engine.Profiler.stopCollecting()</code> or <code>stopFileBasedProfiler()</code> Hawk method or by stopping the engine. It wrote data only at the end of the duration period.

Closed in Release	Key	Summary
4.0.1	BE-1537	In BusinessEvents 2.0 and higher, the <code>getScoreCard()</code> TIBCO Hawk method returned only the first row of the table. The first row is the internal Id of the scorecard. (The same method in version 1.4 returned tabular data of all attributes and properties of the specified scorecard.)
4.0.1	BE-1533	When using an RVC channel, a <code>TimeEvent</code> could fire before the RVC channel started. When the rule triggered by the <code>TimeEvent</code> then sent an event through the RVC channel, a <code>NullPointerException</code> resulted.
4.0.1	BE-1318	In TIBCO BusinessEvents 4.0, it was not possible for an event with a payload to be inherited. Similarly, if an event was inherited, it was not possible to add a payload to the event.
4.0.1	BE-9127	With JDBC backing store, the connection pool could become corrupted during SQL exception handling.
4.0.1	BE-8552	Deleting an object with an <code>extId</code> in the preprocessor could delete another object that was created in the preprocessor with the same <code>extId</code> .
4.0.1	BE-8173	<p>With cache-aside mode, inference agents sometimes stopped responding during hot-deployment.</p> <p>Note If you were using the workaround for this issue, providing larger values for <code>Agent.agentname.dbOpsQueueSize</code> and <code>Agent.agentname.cacheOpsQueueSize</code>, you can now revert to the earlier values.</p>
4.0.1	BE-7549	In a JMS Connection Shared Resource, if a global variable was provided in the Provider URL field, an exception was thrown complaining that the URL is invalid, even when it was a valid URL.

Closed in Release	Key	Summary
4.0.1	BE-1658	<p>JMS channels were making Topic and Queue connections to the JMS server though the JMS connection resource was configured to use only Queues or only Topics.</p> <p>Now you can use the following new properties as appropriate. You can use comma or space delimiters:</p> <pre>be.channel.tibjms.queue.disabled=channelURI1, channelURI2, channelURI3...</pre> <pre>be.channel.tibjms.topic.disabled=channelURI4, channelURI5, channelURI6...</pre> <p>Use <code>be.channel.tibjms.queue.disabled</code> to prevent queue connections.</p> <p>Use <code>be.channel.tibjms.topic.disabled</code> to prevent topic connections.</p>
3.0.2	1-AIWG8E	<p>When serializing events to JMS messages and deserializing JMS messages to events, BusinessEvents filtered out all event or message properties whose names began with "JMS" (case insensitive), except for actual JMS message header properties, which are handled appropriately. Now BusinessEvents sets event or message properties whose name begins "JMS_" (case insensitive). This allows provider-specific properties to be used.</p>
3.0.2	1-AIBSRH	<p>With JDBC backing store, the engine did not recover correctly after a database disconnect. This sometimes caused acknowledgment of incoming messages that the engine had failed to process, due to the disconnection.</p>

Closed in Release	Key	Summary
3.0.2	1-AH0AVN	<p>Snapshot queries with pre-filters that spanned multiple concept boundaries and with the following property enabled were causing Java runtime exceptions to be thrown:</p> <pre>com.tibco.cep.query.executionplan.factory=composite</pre> <p>The following is an example of such a query:</p> <pre>select * from /Model/Cpts/A as a where a.B.Cs[0]@extId = "C-0"</pre> <p>The problem arose because cache servers do not have rule sessions. Therefore they could not perform object dereferencing.</p> <p>The fix provides a dedicated thread pool (and other supporting code) to handle such calls. These calls are blocking. Therefore you must configure more than one distributed thread to avoid deadlocks.</p> <p>On all cache servers, set the following properties to avoid deadlock situations. You may need to use more threads, depending on your needs, and avoidance of deadlocks is not guaranteed under heavy loads.</p> <pre>java.property.tangosol.coherence.distributed.threads n1 be.agent.cache.specialom true be.agent.cache.specialom.maxthreads n2</pre> <p>where <i>n1</i> is a number greater than 1, and is usual set to between 8 and 16 and <i>n2</i> is a number greater than 1, and must be equal to or less than distributed threads. Defaults to 16.</p> <p>When enabled you see this in the Info log:</p> <pre>Special OM initialized with [N] threads</pre>
3.0.2	1-AG938T	<p>In a query, within the optional limit clauses, it was not possible to specify the value for first or for offset as a bind variable. Now you can use bind variables, for example (all one query):</p> <pre>select {limit: first \$f1 offset \$o1} * from /MyConcept order by prop1 {limit: first \$f2 offset \$o2}, prop2</pre>
3.0.2	1-AG8V0V	<p>Removed misleading (though harmless) messages, such as "batchFileResponse has entity type : 6." These were seen when BusinessEvents was configured with JDBC backing store.</p>

Closed in Release	Key	Summary
3.0.2	1-AFQ58C	<p>Note CR 1-AS354H supersedes this CR. Text below provided for historical purposes only.</p> <p>BusinessEvents configured with backing store was not able to continue running when the database was disconnected. To avoid this issue, a new property is added:</p> <pre>be.engine.cluster.isObjectCacheFullyLoaded</pre> <p>Setting this property to true ensures that the ObjectTableCache is fully-loaded at all times (at startup as well as when any new objects are added). This means that lookup for an object won't require going to database.</p> <p>To correct the problem, set the following properties:</p> <pre>be.engine.cluster.recover all be.engine.cluster.preload all be.engine.cluster.isCacheLimited false be.engine.cluster.isObjectCacheFullyLoaded true</pre>
3.0.2	1-AFETYM	<p>When BusinessEvents was configured with a JDBC backing store, the backing store tables used unique indexes to guarantee the integrity of ID columns. Now, primary keys are used for the same purpose, to improve performance.</p> <p>To use this change in an existing backing store, regenerate the backing store scripts and apply the differences as needed. This change is optional.</p>
3.0.2	1-AFE8PB	<p>When used with Websphere MQ server, BusinessEvents created new sessions for each new message sent, causing an increase in the number of sessions over time. Now BusinessEvents creates a session per sending thread for sending messages and reuses that session.</p>

Closed in Release	Key	Summary
3.0.2	1-AFA67N	<p>With a backing store, database updates related to a referring concept in a referenced concept can take a long time, causing decreased performance. This happens when there are very many reverse references in a shared instance (referenced by many other instances).</p> <p>To address this issue, a new metadata property called Reverse Ref has been made available. It enables you to disable the reverse references. Add the new extended property to relevant <code>ConceptReference</code> properties and set it to false. The default value is true. If you use this property, you must explicitly remove <code>ConceptReference</code> properties for deleted referenced concepts in the referring concept in your code.</p> <p>For example, if <code>employee</code> is a <code>ConceptReference</code> type property in a concept <code>acme</code>, and <code>smith</code> is an instance of concept type <code>employee</code>, then you would set the extended property to true for the <code>employee</code> <code>ConceptReference</code> property, and you would add something like this to rules:</p> <pre>acme.employee = null; Instance.deleteInstance(smith);</pre> <p>Or, for array properties:</p> <pre>Instance.PropertyArray.removeConceptReference(acme.employee, smith); Instance.deleteInstance(smith);</pre>
3.0.2	1-AF6QMD	In rare circumstances, default worker threads could be prematurely killed by uncaught exceptions.
3.0.2	1-AF2UGJ	When <code>BusinessEvents</code> was configured with JDBC backing store, it threw out of memory errors when attempting to schedule multiple jobs that had conflicting (or duplicate) IDs. Now it throws an appropriate exception.
3.0.2	1-AERHP3	When the <code>be.engine.isCacheAside</code> property was set to true, the <code>BusinessEvents</code> TEMP tablespace usage grew rapidly and was not released.
3.0.2	1-AEJTVE	This issue was introduced in <code>BusinessEvents</code> 3.0.1 hotfix 3. When a state machine transition rule was in the rule agenda, and another rule deleted the concept that owned the state machine, <code>BusinessEvents</code> threw a null pointer exception.

Closed in Release	Key	Summary
3.0.2	1-AE3BSC	<p>With BusinessEvents-ActiveMatrix BusinessWorks integration, When the callback rule function (specified in a <code>startProcess()</code> argument) threw an exception, default worker threads were killed and the following error was thrown:</p> <pre>Job Error on thread:\$default.be.mt\$.Worker.x</pre>
3.0.2	1-ACZVM7	<p>It was not possible to get the count of records in a result set when using Query Functions. A new function addresses this issue for certain types of queries:</p> <pre>ResultSet.getRowCountIfPossible()</pre> <p>This function can be used only with snapshot queries that use joins and aggregations (order by and group by clauses). Only in such cases is the result set known. In other cases the query begins filtering and feeding results to the result set without knowing when the query will end.</p>
3.0.2	1-ACAQWV	<p>The <code>suspendDestination()</code> function did not work in "Cache" OM type when called in a startup rule function or in any rule that executed before the destination (and its listeners) were fully started. It did work for "In Memory" OM type, however. Now it works in all OM types.</p>
3.0.2	1-ABRCAA	<p>In the query language, bind variables could not be used in a <code>BETWEEN</code> clause.</p>
3.0.2	1-ABESRO	<p>The tooltip for the <code>Instance.getByExtId()</code> function was incorrect. It said that the function would return null if the instance did not exist in the Rete network. However, the function also looks into the cache if the instance is not found in the Rete network.</p>

Closed in Release	Key	Summary
3.0.2	1-ABEKVJ	<p>Profiler output would not import correctly as a comma-delimited file when rule conditions contained commas. The profiler is now tab-delimited by default. The delimiter character can be changed using the following new TRA file property:</p> <pre>be.engine.profile.delimiter</pre> <p>Specify the delimiter using a String value. Enclose the value in double quotes (the quotes are not used as part of the delimiter). For example to use an open curly brace as the delimiter, you would specify "{" as the value. Do not choose a character used in rule conditions.</p> <p>Use a single character if the application into which you will import the output uses a one-character delimiter. When importing the file into Excel, do not check the "Treat consecutive delimiters as one" option. Consecutive delimiters indicate a column that is empty.</p> <p>Also, when importing the file into Excel, set the timestamp field to Text (and not General, which is the default).</p> <p>This information is also added to <i>TIBCO BusinessEvents Developer's Guide</i>.</p>
3.0.2	1-AAZBH1	In the query language, bind variables could not be used in an IN clause.
3.0.2	1-AAMKZ4	BusinessEvents Profiler was not reporting accurate NumEvaluated and NumSuccess values for some join conditions. As part of this fix, some of the condition data headers in the Profiler output have changed. See <i>TIBCO BusinessEvents Developer's Guide</i> for this documentation.
3.0.2	1-AAIKCW	With JDBC backing store, it was not possible to update the schema for a JDBC backing store to account for changes in ontology (while preserving existing data). A utility is now provided. See <i>TIBCO BusinessEvents Administration</i> .
3.0.2	1-AAB80H	Creating large number of connections (in the shared database pool) took a long time. The connection pool wrapper has now been optimized to improve performance.
3.0.2	1-A9V156	The <code>Oracle.getConnection()</code> function blocks indefinitely. You can now use the function <code>Oracle.getConnectionWithTimeout()</code> function instead. This function has a timeout parameter and returns null if the timeout expires.

Closed in Release	Key	Summary
3.0.2	1-A9LW55	Scheduled rule-based time events would not fire if the agent on which they were scheduled left the cluster before firing the time event.
3.0.2	1-A9837Y	The tooltip for the <code>System.ID.remove()</code> function signature was wrong.
3.0.2	1-A95XMP	Queries on concepts that use inheritance were failing with a Java runtime exception.
3.0.2	1-A94L1F	When using <code>be-jdbcdeploy</code> with SQL Server, an exception was thrown as the <code>be-jdbcdeploy</code> utility was looking for an Oracle class.
3.0.2	1-A8901H	In Decision Manager, if the same concept is referenced using different aliases in the virtual rule function, a validation exception was thrown when importing the Excel spreadsheet for the decision table.
3.0.2	1-A7VGYM	With snapshot queries, errors were thrown when a large number of items was downloaded to the query agent local cache causing it to rapidly reach its maximum size (as defined by the property <code>be.agent.query.localcache.maxelements</code>). Such items were getting evicted immediately by newer items.
3.0.2	1-A7OC3T	BusinessEvents threw a <code>NullPointerException</code> when a JMS connection was configured with JNDI Lookup but without providing the TIBCO Enterprise Message Service property: <code>com.tibco.tibjms.naming.security_protocol</code> .
3.0.2	1-A72PKA	The <code>Temporal.History.howMany()</code> function returned an incorrect value (the actual number + 1) when the start and end times were between the timestamps of property values.
3.0.2	1-A6J720	Object deletion behavior was incorrect with In Memory OM: deletion was not reflected in the same RTC. Now it is.

Closed in Release	Key	Summary
3.0.2	1-A6E5HQ	<p>With any backing store, database types and tables were created for concepts and events whose cache mode was set to In Memory Only. They were also created for events (with any cache mode) whose time to live field was set to zero (TTL=0). Now such entities are not persisted in the backing store, with the following limitations:</p> <ul style="list-style-type: none"> • All child entities of an entity with cache mode set to In Memory Only must also use In Memory Only cache mode. • All child entities of an event with TTL=0 must also use TTL setting TTL=0 (regardless of cache mode).
3.0.2	1-A629WH	The tooltip for the System.ID.reset() function signature was wrong.
3.0.2	1-A5T27S	Under certain conditions, the value of the "Main State Machine" checkbox in the State Machine resource Configuration tab was incorrectly changed to a "checked" state when loading a Designer project. A consequence of the fix is a UI change: The "Main State Machine" checkbox (in the Configuration tab of the State Machine Resource) is no longer checked automatically when a user adds the first state machine to a concept.
3.0.2	1-A5SI2Z	Subscription events were being sent when reverse references changed. These references do not affect conditions. Now subscription events are not sent when only reverse references change.
3.0.2	1-A5JIT3	Spurious "Database Inconsistent" exceptions were seen under certain conditions. Also, the warning message was misleading. It has been changed to "Possible race condition. Please ensure proper locking."
3.0.2	1-A5JJRV	As a safety measure, BusinessEvents now rolls back any pending transactions on database connections before they are released to the connection pool.
3.0.2	1-A5JJQ0	Deadlocks were happening when two or more threads tried to acquire the same resources, but in a different order. Deadlocks were also happening when multiple transactions tried to update more than one row in the same table. Now the database writes and updates are ordered by entity id, which is the primary key for the rows.
3.0.2	1-A5JJOZ	The file xxx_IOT.sql is no longer generated. it is not used by BusinessEvents.

Closed in Release	Key	Summary
3.0.2	1-A5EI6N	Entity string properties longer than 65K characters would cause a serialization exception when a cache server exited or joined the cluster.
3.0.2	1-A5CZVP	<p>When the Database Concepts feature was used with SQL Server, inference agents threw an exception when inserting a record to the database. As part of this fix, the format of the <code>.sequences.xml</code> file is changed. An additional attribute for the <code>unique_identifier</code> element enables you to specify the name of a stored procedure. The attribute is <code>stored_proc = "StoredProcName"</code>:</p> <pre><?xml version = "1.0" encoding = "UTF-8"?> <unique_identifiers> <unique_identifier entity = "ConceptURI" property = "PropertyName" unique_identifier = "SequenceName" stored_proc = "StoredProcName"/> </unique_identifiers></pre> <p>The value must be a callable JDBC statement. The called stored procedure must take only one OUT type parameter. See the <i>TIBCO BusinessEvents Data Modeling Developer's Guide</i> > Performing Insert Operations for more details.</p>
3.0.2	1-A3XS57	It was not possible to edit event properties in Decision Manager, even though events are mutable in preprocessors.
3.0.2	1-A39JW4	On restarting the first cache server in a deployment, preloading was taking too long, because of a multi-site deployment check. The check is now disabled by default using the property <code>be.engine.cluster.multisite</code> . The Default value is now <code>false</code> .
3.0.2	1-A2X78L	<p>With JDBC backing store, when running the generated file <code>yournameremove.sql</code>, the following message sometimes appeared, though the table or tables mentioned did exist (sometimes caused by duplicate ontology names):</p> <pre>Cannot drop the table 'tablename', because it does not exist or you do not have permission.</pre>

Closed in Release	Key	Summary
3.0.2	1-A2N2U7	<p>With the database concepts feature, when a database query was made, a new concept was created even if an existing concept was in cache. To correct this behavior add the following property:</p> <pre>be.dbconcepts.query.reuseRefs true</pre> <p>Default value is <code>false</code>. (Note that the above property name was corrected in the 4.0.1 version of the release notes)</p>
3.0.2	1-A2BHIK	<p>A cluster mismatch exception was thrown when different paths were given for <code>be.engine.cluster.externalClasses.path</code> property different TRA files, although the java classes in both locations were the same. In each TRA file, the path can point to different locations as needed. You must ensure, however, that the files themselves are identical in all locations.</p>
3.0.2	1-A1SVEH	<p>When an inference agent had suspended destinations using JMS connection the engine did not always gracefully shut down, either using TIBCO Administrator or using Ctrl+C from the command line.</p>
3.0.2	1-A1LY4W	<p>Engines running inference agents would hang when the JDBC connection to the backing store slowed down or was intermittent. To correct this issue, set the following new timeout property (using milliseconds):</p> <pre>be.backingstore.jdbc.readtimeout</pre> <p>If no response is received from the database within this period, a call is aborted. A value of 0 (zero) means that no timeout is set.</p> <p>Note that the property name in 4.0.1 is now as shown above and not <code>be.oracle.jdbc.readtimeout</code> as it was in 3.0.2. Its use is documented in <i>TIBCO BusinessEvents Administration</i>.</p>
3.0.2	1-A10RCO	<p>Under certain conditions, with BusinessEvents-ActiveMatrix Businessworks in-process integration, when Invoke RuleFunction activities were used in a process, unlocking was not being done correctly after the initial request and BusinessEvents was not processing subsequent requests.</p>
3.0.2	1-A0VXYN	<p>Design-time ontology loading failed to bind some standalone state machines to their owner concept. This could cause these standalone state machines to be ignored at runtime.</p>

Closed in Release	Key	Summary
3.0.2	1-A0JYEW	<code>Temporary.Statistic.avgOverTimeInt()</code> did not return the expected value. (This is the final fix for an incomplete fix in HF5 CR 1-9MX2LH)
3.0.2	1-A02WRF	Backing Store didn't work with Microsoft SQL Server. A JDBC backing store is introduced to address this issue. See <i>TIBCO BusinessEvents Administration</i> for details on setting up the backing store.
3.0.2	1-9ZYKX5	In rare cases, a <code>NullPointerException</code> was thrown by <code>ClusterMemberListener</code> during startup.
3.0.2	1-9ZUQ33	Composite state to-boundary and from-boundary self-transitions did not re-enter the composite state when the self-transition rule fired.
3.0.2	1-9ZIOQS	With database concepts, the database connection failed to reconnect after a database disconnect.
3.0.2	1-9ZIOKW	With database concepts, maximum open cursors were exceeded for insert operations.
3.0.2	1-9Y5L3Q	With backing store, "database inconsistent" errors were thrown in some situations. To resolve this issue, add the following property to all engine TRA files: <code>be.engine.cluster.isCacheAside true</code>
3.0.2	1-9Y5KN4	The keyword "time" can now be used in OQL queries, for example when it is the name of a property you want to use. To use a keyword, you must escape it with the pound sign (#), for example #time.
3.0.2	1-9Y1WWZ	It was not possible to reply to a JMS message using a synchronous JMS reply using the <code>Event.replyTo(reqevent, replyevent)</code> function.
3.0.2	1-9XYARG	Under some conditions, a <code>NullPointerException</code> was thrown when starting an inference agent.
3.0.2	1-9XYAQT	Catalog functions from the Date category were causing errors when used in OQL queries.
3.0.2	1-9XXSAA	Inference Agents freeze under certain conditions, after hot deployment, while running in multi-engine mode.

Closed in Release	Key	Summary
3.0.2	1-9XQXXT	After restarting an inference engine, the Rete network would sometimes build only partially for concepts that had a property of type <code>ConceptReference</code> .
3.0.2	1-9XQXWN	Catalog functions <code>Channel.getAllDestinations()</code> and <code>Channel.getSuspendDestinations()</code> were added to handle certain migration issues.
3.0.2	1-9XQXTY	When using a backing store, there was sometimes an incomplete recovery of "Cache + Memory" concept instances from the backing store. This would happen for concepts with a property of type <code>ConceptReference</code> , where the type of the actual referenced concept instance was a subtype of the declared referenced concept type (due to inheritance).
3.0.2	1-9WP4CO	When using <code>Coherence.Query.C_QueryAndLoadConcepts()</code> function to load and modify an object inside a rule, the modified object was not reloaded from cache after the query.
3.0.2	1-9TWAR6	The <code>Cache Coherence.C_CacheLoad*</code> functions were asserting objects and triggering rules. Now the behavior is as it was in the 2.2 release. Although the objects are loaded into working memory, the objects are not asserted and their presence does not trigger rules. The internal Rete join structures are updated, however.
3.0.2	1-9TLINB	When a decision table was approved, class files for the compiled table did not generate in the configured deployment directory. By default, the deployment directory is <code>RMS_Project/deployment</code> . (This issue was introduced in BusinessEvents 3.0.1 hotfix3.)
3.0.2	1-9TKTDG	OQL queries that contained joins (more than one source in the <code>FROM</code> clause) were not clearing the memory they had allocated, even after the <code>close()</code> operation on the <code>QueryStatement</code> .
3.0.2	1-9T9W XK	When a new concept type was added to a TIBCO Designer project stored in XML Canon, the save operation failed with a null pointer exception. Note: This fix requires the TIBCO Runtime Agent 5.6.1 Hotfix1 release.
3.0.2	1-9T6MH0	BusinessEvents threw an exception during validation when an event payload schema was defined internally (that is, not by reference to an XSD).

Closed in Release	Key	Summary
3.0.2	1-9S2KJN	When a preprocessor for an event failed due to an exception, BusinessEvents attempted to reprocess the event. This was not desirable for some situations. A checkbox labelled “Retry on Exception” has been added to the Simple Event resource (in TIBCO Designer). When the checkbox is unchecked for an event type, BusinessEvents does not attempt to reprocess events of that type when the event’s preprocessor fails due to an exception. This has also been documented in <i>TIBCO BusinessEvents Developer’s Guide</i> .
3.0.2	1-9RZ4BX	It was taking a long time to load cache data into the backing store. Recovery times have been improved.
3.0.2	1-9RYREM	It was not possible to control the start of a state machine independently from the creation of the concept.
3.0.2	1-9RXULL	RMS server would not start and threw a <code>NullPointerException</code> .
3.0.2	1-9RULIW	For state machine states with a long timeout period, the state machine timeout action did not always update the concept property.
3.0.2	1-9RULI1	For state machine states with a short timeout period, the state machine timeout sometimes fired two times.
3.0.2	1-9RJR9E	In state machines with a self transition rule, an infinite loop occurred: the rule continued to fire even if there were no changes to the concept.
3.0.2	1-9RH8LB 1-A5N9HA	<p>When deploying decision table implementation files using RMS, there was no option to use JAR files. Now BusinessEvents recognizes the path to a JAR file (1-9RH8LB) and can generate a JAR file (1-A5N9HA). (In 3.0.1 only class files could be generated). You specify the path to the JAR file in this property (used in 3.0.1 only to specify the directory for deployable class files):</p> <pre>be.engine.cluster.externalClasses.path</pre> <p>To enable JAR file generation, you set the following property in <code>be-rms.tra</code>:</p> <pre>bui.codegen.generate_jar=true</pre>
3.0.2	1-9RH46E	Sometimes a scheduler was erroneously acquired by more than one engine, resulting in incorrect behavior of the scheduler, including state machine timeout issues.

Closed in Release	Key	Summary
3.0.2	1-9RDDQK	When a state machine state timed out and the current state was reached after using the option "Timeout State Choice: Specified state", the transition did not fire on receiving an event.
3.0.2	1-9RCQJF	With Cache object management, the catalog function <code>Instance.PropertyArray.appendConceptReference()</code> threw a <code>ClassCastException</code> .
3.0.2	1-9QZFDD	When the <code>Instance.Deleteinstance()</code> catalog function was used in an event preprocessor, it did not delete the concept.
3.0.2	1-9QLJSG	When generating an XML payload with substituted abstract elements, <code>BusinessEvents</code> did not include the namespace definition needed to resolve the <code>xsi:type</code> attribute of the abstract elements. This caused the XML payload to be invalid.
3.0.2	1-9QEKPU	Fields in nested Rendezvous messages were not accessible using XPath functions.
3.0.2	1-9QAEXL	When it lost connection with the Oracle backing store, <code>BusinessEvents</code> threw exceptions for read operations but did not retry. Now <code>BusinessEvents</code> retries the operations until the connection is restored.
3.0.2	1-9PDW2Q	To address difficulties with source control systems, you can now define standalone state machines and standalone rules at design time, which enables more granular checkin and checkout options.
3.0.2	1-9OBI1X	<p>To address minor difficulties in using the user interface, the following enhancements have been added:</p> <ul style="list-style-type: none"> • Rule function navigation: It can be hard to locate a rule function in large projects. Now you can Ctrl + Right-click on the rule function hyperlink in the rule editor. The rule function opens in the editor and the project ontology tree also expands to show the rule function. • In the <code>BusinessEvents</code> Archive Object Management and Input Destinations tabs, the default column width now displays the contents better.
3.0.2	1-9NTMQB	TIBCO Designer would hang when double byte characters were used in a mapper function, or in the same rule language block as a mapper function.

Closed in Release	Key	Summary
3.0.2	1-9NK26X	With In Memory object management, <code>REGISTRATION.COLLISION</code> RVCN advisory messages were thrown when RVCN transport was used for BusinessEvents channels.
3.0.2	1-9N8LSR	As explained in 1-9LQQJ1 below, if you did not use database concepts, you had to add the <code>be.dbconcepts.dburi</code> property to the <code>be-engine.tra</code> file, with no value. Doing so prevented BusinessEvents from making unnecessary JDBC connections. Now BusinessEvents makes connections for database concepts only when they are specified as the value of the <code>be.dbconcepts.dburi</code> property.
3.0.2	1-9MX2MV	<code>Temporal.History.alwaysIncreasingInt()</code> had incomplete and incorrect documentation. Tooltip and documentation was changed to properly explain sampling and how the function works.
3.0.2	1-9MX2LH	The function <code>Temporary.Statistic.avgOverTimeInt()</code> did not return the expected value.
3.0.2	1-9M5FLJ	With Cache object management, when the property <code>be.engine.cluster.hasBackingStore</code> was set to true, state machine states did not time out.
3.0.2	1-9M28XD	<p>Cache servers always connected to channels, creating unnecessary connections. Now you can disable channel connections for cache servers by setting the following new property to true:</p> <pre>be.engine.cacheServer.channel.disable=true</pre> <p>The default value is false, so that all channels are enabled (for backward compatibility).</p> <p>This has been documented in <i>TIBCO BusinessEvents Administration</i>.</p>

Closed in Release	Key	Summary
3.0.2	1-9M28SW	<p>REGISTRATION.COLLISION RVCN advisory messages were thrown when RVCN transport was used for BusinessEvents channels in a multi-engine deployment (of cache servers or inference agents or both). These name collisions could result in thrashing.</p> <p>To prevent this issue, you must add global variables to the CM Name or CMQ Name, and to the ledger file name if a ledger file is used for RVCN, to ensure the uniqueness of these names.</p> <p>Add one or more of the following variables, depending on need (as explained below):</p> <pre>%%EngineName%% %%ChannelName%% %%ChannelURI%%</pre> <p>The %%EngineName%% variable is generally required for all names. Note that you must start engines using unique names so that the value of each engine's %%EngineName%% variable be different at runtime.</p> <p>In addition, if different channels use the same RVCN shared resource, you also need to add %%ChannelName% or %%ChannelURI%%. (Use %%ChannelURI%% in cases where channels using the same RVCN shared resource have the same name but are in different folders.)</p> <p>You must define any of the above String type global variables you use. They are not predefined in TIBCO Designer. However, BusinessEvents provides the value at runtime, so you can use any string value or use an empty string as the value when you define the variables.</p> <p>Do not add any of the above global variables for RVCN shared resources used by non-BusinessEvents activities such as the Publish Rendezvous Message activity.</p>
3.0.2	1-9M1IOH	<p>With Cache object management, when the property <code>be.engine.cluster.multiEngineOn</code> was set to false, state machine states did not time out.</p>
3.0.2	1-9LYIYP	<p>With Cache object management, when you used hot deployment, the BusinessEvents engine did not add new rule sets and did not drop deleted rule sets.</p>

Closed in Release	Key	Summary
3.0.2	1-9LQQJ1	<p>Note: The behavior explained in this CR is modified in a later CR: 1-9N8LSR (see above).</p> <p>By default, database connections were created for all JDBC shared resources in a project's Shared Archive (SAR), including those used for a backing store. This could result in too many inactive connections.</p> <p>You can now limit the number of connections using the property <code>be.dbconcepts.dburi</code>. For backward compatibility, if the property is not specified, BusinessEvents will still create these connections for database concepts, even if you do not use database concepts.</p> <p>To specify the JDBC connections for which you want to create connections used by database concepts, add the <code>be.dbconcepts.dburi</code> property to the engine TRA file and provide a comma delimited list of the connections, using their project path. For example:</p> <pre>be.dbconcepts.dburi=/SharedResources/Con/JDBC/DataSource_1.sharedjdbc,/SharedResources/Con/JDBC/DataSource_2.sharedjdbc</pre> <p>To prevent any connections being made for database concepts, add the property but do not specify a value:</p> <pre>be.dbconcepts.dburi=</pre>
3.0.2	1-9LQI27	<p>BusinessEvents checked that external IDs (@extId) of entities were unique within the agent, and did not check across the cluster. You can now check for uniqueness of external IDs across the cluster. To do so, set the following property to true:</p> <pre>Agent.AgentGroupName.checkDuplicates=true</pre> <p>Performing this check affects performance so use it with care. If you do not set this property, uniqueness of external IDs is checked within the agent, as before.</p> <p>This has been documented in <i>TIBCO BusinessEvents Administration</i>.</p>
3.0.2	1-9LFW74	<p>In BusinessEvents-ActiveMatrix BusinessWorks in-process integration projects that use Persistence OM, BusinessEvents did not correctly return concepts with contained concept arrays when called using Invoke RuleFunction activities.</p>

Closed in Release	Key	Summary
3.0.2	1-9LC21B	<p>State machine timeouts did not work correctly in certain cases. Now the default value of the following properties is 10000 ms:</p> <pre>be.engine.cluster.smtimeout.refreshAhead be.engine.cluster.smtimeout.pollInterval</pre> <p>If you do not use default values, provide the same value for both properties. If they are set to different values, BusinessEvents uses the higher value.</p>
3.0.2	1-9LC20T	<p>With Cache object management, entities were not retrieved correctly using any of the following BusinessEvents catalog functions, unless a lock was first acquired using <code>Coherence.C_Lock()</code>:</p> <pre>Coherence.C_CacheLoadConceptByExtId(); Coherence.C_CacheLoadConceptById(); Coherence.C_CacheLoadConceptIndexedByExtId(); Coherence.C_CacheLoadConceptsByExtId(); Coherence.C_CacheLoadEntity(); Coherence.C_CacheLoadEventByExtId(); Coherence.C_CacheLoadEventById(); Coherence.C_CacheLoadParent()</pre>
3.0.2	1-9LC1ZQ	Continuous queries did not process newly modified entities properly.
3.0.2	1-9LC1YT	With Cache object management, the scheduler created by one engine was not visible in another engine.
3.0.2	1-9KBBCB	With Cache object management, channels using RVCN transports did not connect unless the channel contained an enabled input destination. Messages could not be sent from the BusinessEvents engine through channels that used RVCN transports and had no enabled input destination.
3.0.2	1-9K7XVH	Query Engine hot deployment failed with a <code>NullPointerException</code> when the hot-deployed EAR contained a modified rule function.

Closed in Release	Key	Summary
3.0.2	1-9K4542	<p>If you created a JMS queue or topic destination without specifying a value in the queue or topic Name field, BusinessEvents sent messages to such destinations. However this sometimes caused the TIBCO Enterprise Message Service server to fail, due to a defect in the Tibco Enterprise Message Service 4.4.2 64-bit version.</p> <p>Now when the BusinessEvents engine initializes and connects the JMS channels and their destinations, BusinessEvents ignores JMS destinations with null or empty-string queue or topic names. It logs an error message for the ignored destinations.</p> <p>If a JMS message is sent out through an ignored destination, BusinessEvents throws an exception and the message is not sent out. BusinessEvents also does not receive JMS messages (events) through these ignored destinations.</p>
3.0.2	1-9JMCSU	<p>Because of a defect introduced in the 3.0.1 release, BusinessEvents was unable to start in API mode.</p>
3.0.2	1-9JFGF2	<p>When a cache server was restarted, it performed automatic cleanup of the entries in the DeletedEntities table. This activity could sometimes affect performance.</p> <p>Cleanup of deleted entities at cache server startup is now optional. You can do the following instead, to help reduce startup time:</p> <ul style="list-style-type: none"> Set the following property to false: <code>be.engine.cluster.cleanup=false</code> (It is true by default.) When set to false, cleanup of deleted entities is skipped. The OracleDeployment utility now generates the following script: <code>xxx_delete.sql</code> Run this script to delete the entities in the DeletedEntities table from the backing store. You can run the script even when the system is running. <p>This has been documented in <i>TIBCO BusinessEvents Administration</i>.</p>
3.0.2	1-9IYQH7	<p>The BusinessEvents engine threw an exception when using JMS connection with JNDI unless you specified both Queue Connection Factory and Topic Connection Factory.</p>

Closed in Release	Key	Summary
3.0.2	1-9HX30J	<p>With Cache object management, <code>extIds</code> must be unique across all concept and event instances. You cannot retrieve an event instance if its <code>extId</code> is also used by a concept instance. Similarly, you cannot retrieve a concept instance if its <code>extId</code> is also used by an event. The BusinessEvents engine did not throw an exception in the above case.</p> <p>Now the engine throws a <code>ClassCastException</code> when creating a concept with an <code>extId</code> that is already in use by an event, and when creating an event whose <code>extId</code> is already in use by a concept.</p>
3.0.2	1-9GHUIM	With Persistence object management, events sent from BusinessEvents did not contain expected properties.
3.0.2	1-9GEI76	The BusinessEvents backing store feature did not release the Oracle temporary space that deals with CLOBs.
3.0.2	1-9G6VVA	The BusinessEvents backing store feature did not allow any username except the owner of backing store schema to access the database. Now if you want to allow another username to access the database, you can configure the database accordingly.
3.0.2	1-9DLMD9	The utility <code>be-oradeploy</code> did not split SQL statements into multiple lines when a line exceeded the maximum number of characters per line (2499) This was causing the create view statement to fail. (Such long lines are possible with concepts that have a huge number of properties.)
3.0.1	1-9D1IFZ	<p>Some of the JVM settings given in the engine properties file, <code>be-engine.tra</code>, did not work for all platforms, and some platforms use additional, platform-specific parameters.</p> <p>For the AIX platform the property <code>-d64</code> (passed as an argument to the <code>be-engine</code> command in the <code>be-engine.tra</code> file) has been removed.</p> <p>Note that no single file can provide all the appropriate settings. Consult the appropriate JVM reference manual and ensure the correct settings are used for your platform.</p>
3.0.1	1-9BYXIN	JNDI and JMS shared resources successfully connected to EMS via SSL without certificates in TIBCO Designer. However after validating, building and running project the connection failed. Internally TCP was substituted for SSL in the connection URL.

Closed in Release	Key	Summary
3.0.1	1-9ACGHV	<p>The following Oracle connection pool limit properties for backing store database, set in <code>be-engine.tra</code>, were ignored by the cache server and engine:</p> <pre>be.oracle.dburi.pool.initial.0 be.oracle.dburi.pool.min.0 be.oracle.dburi.pool.max.0</pre> <p>To enforce a pool size, you must also set the following property to true (it is false by default):</p> <pre>be.oracle.dburi.pool.enforce.0 true</pre>
3.0.2	1-992R4P	<p>BusinessEvents did not set the JMS <code>JMSReplyTo</code> header property in outgoing JMS messages. Now, if an event has a string type property named <code>JMSReplyTo</code> (case sensitive), BusinessEvents reads this event property value as a JMS queue or topic name (according to the event's default destination type). BusinessEvents looks up the <code>javax.jms.Destination</code> on the connected JMS server using this queue or topic name. If BusinessEvents cannot find one, it creates a new <code>javax.jms.Destination</code> using the given queue or topic name, it then sets the outgoing JMS message's <code>JMSReplyTo</code> header property.</p> <p>However, BusinessEvents does not create a listener for the destination specified in the event's <code>JMSReplyTo</code> property.</p>
3.0.1	1-98ZMWP	<p>In the 3.0.0 release, the <code>MultipleDataSources</code> example and <i>TIBCO BusinessEvents User's Guide</i> provided information about using two backing store databases for limited fault tolerance with manual switching. This functionality has not been tested and was included by mistake. The example and the documentation have been removed.</p>
3.0.2	1-98Z4YO	<p>BusinessEvents did not set the client identity certificate defined in a JMS Shared Resource.</p>
3.0.1	1-97YTYT	<p>This issue arose in 2.x style fault tolerance (now used for in memory object management only). When running multiple TIBCO BusinessEvents engines from the same TRA file, which specified <code>be.ft.nodename</code> (thus using same the value for different engine nodes), the second engine came up and then shut down correctly giving an exception that an engine with the specified node name already exists. However, when the second engine was restarted again it incorrectly started as primary when a primary engine was already running.</p>

Closed in Release	Key	Summary
3.0.1	1-97QJDJ	When running in cache mode, it was possible for multiple objects using the same id to block on calls to acquire a lock.
3.0.1	1-97G8N0	In TIBCO BusinessEvents-ActiveMatrix BusinessWorks in-process integration projects, setting a selector in a JMS reply destination caused an invalid selector syntax exception to be thrown when the ActiveMatrix BusinessWorks tester started.
3.0.1	1-97AXET	Engines were unable to reconnect to the backing store database when a lost connection was restored.
3.0.1	1-975GHR	In 2.x style fault tolerance (now used for in memory object management only) TIBCO BusinessEvents engine names generated during Administrator based deployment were greater than 30 characters in size and failover/failback was not successful. Now for deployment in a TIBCO Administrator domain, the last 30 characters of the generated engine name are used as the node name, when a new engine property <code>be.ft.nodename</code> is not used in the administrator generated TRA file. For deployment outside an administration domain (command line deployment), a new engine property has been added: <code>be.ft.nodename</code> . Provide a unique node name for each node that is 30 characters or less using this property.
3.0.1	1-96ZE1W	In query agent mode, the JMS listeners were being enabled before the engines were initialized, resulting in a <code>java.lang.IllegalArgumentException</code> .
3.0.1	1-96ZDXZ	When running in query agent mode with a destination whose <code>ackmode</code> property was set to <code>EXPLICIT_CLIENT_ACKNOWLEDGE</code> (TIBCO Proprietary), the system was not automatically acknowledging messages.
3.0.1	1-96NBNH	Autogenerated <code>ClientId</code> of JMS connection was not working as expected for TIBCO BusinessEvents engine.
3.0.1	1-96M3M9	The ActiveMatrix BusinessWorks tester would hang when you loaded two ActiveMatrix BusinessWorks processes each with a TIBCO BusinessEvents "Wait For Event" resource that used the same destination (an EMS durable subscriber topic).
3.0.1	1-96JU2S	Applications with multiple rule functions could not be compiled.

Closed in Release	Key	Summary
3.0.1	1-96GHE6	The TIBCO BusinessEvents engine was freezing under moderate loads.
3.0.1	1-950FB2	When shutting down TIBCO BusinessEvents inference engines, the inference engines threw a null pointer exception.
3.0.1	1-94ZYAT	TIBCO BusinessEvents engines showed intermittent memory issues and loss of events.
3.0.1	1-94ZY9P	TIBCO BusinessEvents inference engines were hanging after processing for some time.
3.0.2	1-92LB29	Bad XML event payloads were not validated. Now validation is done when this property is set to true in the TRA file: <code>com.tibco.cep.runtime.channel.payload.validation</code>
3.0.0	1-9148Q5	This issue could occur when generating a schema for a backing store. When creating SQL scripts, TIBCO BusinessEvents sometimes created duplicate CacheID columns in Views.
3.0.1	1-90ULBP	The Event-Payload column was being generated with a name longer than 30 characters, but no entry was made in the aliases file (used to set up the backing store database).
3.0.0	1-8ZDXWJ	<p>When an event payload did not have a <code>targetnamespace</code> attribute, TIBCO BusinessEvents gave a namespace error, expected namespace: "null"</p> <p>Now TIBCO BusinessEvents only validates the top-level namespace and does not do validation in the following cases:</p> <ul style="list-style-type: none"> Event payload top node content is Any Element (regardless of validation level configuration). Event payload schema does not have a <code>targetnamespace</code> attribute.
3.0.1	1-8Z5RW9	When using cache object management with a backing store, and a concept or event string property exceeded 4000, characters, an Oracle error, ORA-01461 would sometimes occur.

Closed in Release	Key	Summary
3.0.0	1-8XV096	<p>ActiveMatrix BusinessWorks processes with process starters, running inside a TIBCO BusinessEvents container, could use up the number of threads defined by <code>Engine.ThreadCount</code> for the <code>InvokeRuleFunction</code> activity, when TIBCO BusinessEvents <code>BusinessWorks.invokeProcess()</code> was again called in the invoked rule function. Also, a deadlock situation could occur when the timeout input argument specified for <code>BusinessWorks.invokeProcess()</code> was too long.</p> <p>Now TIBCO BusinessEvents allocates its own thread and releases all ActiveMatrix BusinessWorks threads for the <code>InvokeRuleFunction</code> activity.</p> <p>Note that TIBCO recommends that you use the asynchronous <code>BusinessWorks.startProcess()</code> instead of <code>BusinessWorks.invokeProcess()</code> when the invoked ActiveMatrix BusinessWorks process may take an unknown time to finish.</p>
3.0.0	1-8UH6AF	Entity definitions used by <code>InvokeRuleFunction()</code> are now automatically added to Shared Resources in the EAR.
3.0.2	1-8TA5SI	<p>BusinessEvents did not extract the JMS <code>JMSReplyTo</code> header property from incoming JMS messages. Now, if an event has a string type property named <code>JMSReplyTo</code> (case sensitive), BusinessEvents gets the destination (queue or topic) name from an incoming JMS message's <code>JMSReplyTo</code> header property, and sets the event's <code>JMSReplyTo</code> property value.</p> <p>However, BusinessEvents does not create a destination for this queue or topic name, and does not automatically send a reply event through this <code>JMSReplyTo</code> destination.</p>
3.0.0	1-8SKE1F	<p>When an event payload data namespace was not confined to the payload schema, TIBCO BusinessEvents threw an exception but left the message on the JMS queue.</p> <p>TIBCO BusinessEvents now asserts an <code>AdvisoryEvent</code> for such an event, creates the event without the payload (<code>event@payload=null</code>), and acknowledges the message.</p>
3.0.0	1-8EEPYL	The name of the compilation directory used when building the EAR is now different for each build to avoid collisions on UNIX systems.

Closed in Release	Key	Summary
3.0.0	1-89JBT1	TIBCO BusinessEvents did not throw any exception (Advisory event) when receiving a message with a different namespace from that defined in the event. The received event payload elements were all null.
3.0.1	1-7Z7E7O	The TIBCO BusinessEvents engine failed with the following message while trying to confirm the first message it receives if there is no pre-registered listener. Error [Tibrv_Dispatcher] - TibrvException[error=27,message=Not permitted]
3.0.1	1-73T8N1	TIBCO BusinessEvents could not connect to EMS Using SSL.

Known Issues

The table in this section lists known issues in this release

Key	Summary/Workaround
BW-10164	<p>Summary Using TIBCO ActiveMatrix BusinessWorks 5.8 can result in a <code>StackOverflowError</code> exception when starting a TIBCO BusinessEvents application that initializes a BusinessWorks process.</p> <p>Workaround Comment the below lines from the <code>log4j.xml</code> file shipped with ActiveMatrix BusinessWorks 5.8.</p> <pre><logger name="tibco.bw.infoRole"> <level value="INFO"/> <appender-ref ref="tibco_bw_log"/> <!-- Add the following appender for Common Logging --> <!-- <appender-ref ref="tibco_bw_BEf2CBEFileAppender"/> --> </logger></pre>
BE-9870	<p>Summary With Cache object management, and when cache-aside is not used, you may get "Storage Not Configured" errors while starting up inference engines, even when the cluster is configured properly and the cache server or servers are up and running. This is due to a feature called "Service Guardian" introduced in Coherence 3.5.2. The issue is seen when the Coherence nodes give delayed responses due to external reasons such as slow network speed and database latency.</p> <p>Workaround You can safely disable the feature. To do so set the following property in the CDD at the cluster level (so that it applies to all nodes):</p> <pre>tangosol.coherence.guard.timeout=0</pre>
BE-9838	<p>Summary This issue occurs when using the XSLT mapper, if "Surround with Choice" is used on an attribute, and you click "OK" without populating the final [When] condition. When the mapper is later reopened, the final when statement no longer surrounds the attribute and the mapper shows an empty 'when' attribute.</p> <p>Workaround Complete all [When] conditions when "Surround with Choice" is used.</p>
BE-9837	<p>Summary This issue occurs when using the XSLT mapper, if "Surround with Choice" is used on an attribute and you click "OK" without populating the [When] conditions. When the mapper is later reopened, the when statement no longer surrounds the attribute and the mapper shows an empty 'Choose/When' attribute.</p> <p>Workaround Complete the condition before clicking "OK."</p>

Key	Summary/Workaround
BE-9836	<p>Summary This issue occurs when using the XSLT mapper, if "Surround with If" is used on an attribute and you click "OK" without populating the condition. When the mapper is later reopened, the <code>if</code> no longer surrounds the attribute and the mapper shows an empty 'If' attribute.</p> <p>Workaround Complete the condition before clicking "OK."</p>
BE-9646	<p>Summary The WSDL export utility generates a non-working WSDL when the input destination is defined using a collection in the CDD file.</p> <p>Workaround Define the input destination directly in the Agent Classes tab.</p>
BE-8445	<p>Summary If the TIBCO Designer™ Add-in for TIBCO Business Studio™ product required by TIBCO ActiveMatrix BusinessWorks is installed in the same Eclipse environment as TIBCO BusinessEvents Studio, enterprise archive generation fails for TIBCO BusinessEvents Studio projects.</p> <p>Workaround None.</p>
1-ATETI4	<p>Summary When using the command-line <code>buildear</code> tool to generate an enterprise archive for TIBCO BusinessEvents Studio project that was imported from a 3.x TIBCO Designer project, sometimes this harmless exception may be thrown even when the EAR file generates successfully:</p> <pre>org.eclipse.core.internal.resources.ResourceException</pre>
1-APZLY5	<p>Summary The TIBCO BusinessEvents Monitoring and Management server occasionally throws a <code>NullPointerException</code> when the server is shutting down</p> <p>Workaround None.</p>
1-ANUYMG	<p>Summary Refactoring does not work well in the Domain Objects section of the Cluster tab in the CDD Editor. Changes made to TIBCO BusinessEvents entities such as events, concepts and so on are not reflected in this section of the editor.</p> <p>Workaround None.</p>
1-AMQMGB	<p>Summary Project Validation does not throw any errors if a non-existent global variable name is used in some TIBCO BusinessEvents entities such as Shared Resources and channels.</p> <p>Workaround None.</p>
1-ALY1P5	<p>Summary In the XPath formula builder, under the Logical functions category, if the <code>xor</code> function is used, a false warning "Always true" is shown.</p> <p>Workaround None.</p>

Key	Summary/Workaround
1-AK55ZF	<p>Summary If the Identity Resource inside an HTTP Shared Resource SSL Configuration is renamed, the new name is not reflected in the shared resource.</p> <p>Workaround None.</p>
1-AJ7M0T	<p>Summary If you are using payloads in events that refer to an element inside an XSD and there are multiple XSDs present in the project with the same element, the TIBCO BusinessEvents engine throws a NullPointerException when deserializing an event with payload.</p> <p>Workaround Keep only the XSD that you need in your TIBCO BusinessEvents Studio project and remove the ones that are not needed.</p>
1-AGWRLS	<p>Summary In a JMS Connection Shared Resource, if the JNDI Configuration resource is renamed, the new name of the JNDI Configuration resource is not reflected in the JMS Connection Shared Resource.</p> <p>Workaround Manually update to the new name.</p>
1-AGP9MQ	<p>Summary In an HTTP channel, if the method of configuration is Properties instead of Shared Resource, then SSL related fields are not present on the channel configuration dialog.</p> <p>Workaround Use Shared Resource as the method of configuration, if you need to use SSL.</p>
1-AF5OHI	<p>Summary Unlike in TIBCO Designer, when a new project is created in Business Events Studio, some global variables such as Domain and Deployment are not created by default.</p> <p>Workaround Create these global variables manually.</p>
1-AEQ6AE	<p>Summary In the XSLT Mapper opened up by <code>Event.createEvent</code> or <code>Instance.createInstance</code> functions, no validation error is thrown if a non scalar value such as a node is dragged and dropped onto the input of a field that can only accept a scalar value.</p> <p>Workaround None.</p>
1-AE3GXX	<p>Summary In JMS channels, <code>CLIENT_ACKNOWLEDGE</code> acknowledgement mode does not roll back prefetched and unacknowledged JMS messages to the queue when the TIBCO BusinessEvents engine stops responding.</p> <p>Workaround None.</p>

Key	Summary/Workaround
1-ABW7KZ	<p>Summary If the payload of a SOAPEvent is invalid or has been deleted, and another event inherits from this event, project validation does not show that the payload of the inheriting event is invalid or had been deleted.</p> <p>Workaround None.</p>
1-ABTGG7	<p>Summary TIBCO BusinessEvents Studio cannot Reset to the original schema after having made changes to the schema in a mapper.</p> <p>Workaround Undo the changes manually.</p>
1-A3EPZ9	<p>Summary The silent uninstaller does not uninstall anything in TIBCO BusinessEvents 4.0.0</p> <p>Workaround Use the GUI Uninstaller instead.</p>
1-9CDYRL	<p>Summary Starting with the 3.0 release, the TIBCO BusinessEvents API works only with In Memory object management. (It does not work with Persistence or Cache object management).</p> <p>Workaround None.</p>
1-919P9B	<p>Summary You cannot assign a DateTime to a bind variable in queries.</p> <p>Workaround In the query, use <code>/#Datetime/parseLong(\$milliseconds)</code> and pass a long integer in <code>\$milliseconds</code>.</p>
1-9146V5	<p>Summary In queries, the type of a bind variable is enforced by its surrounding expression.</p> <p>Workaround In the query, use the following expressions to assign the desired type to the bind variable <code>\$x</code>:</p> <ul style="list-style-type: none"> • For int and long use: <code>(\$x + 0)</code> • For double use: <code>(\$x + .0)</code> • For String use: <code>(\$x "")</code> • For Boolean use: <code>(\$x or false)</code> • For DateTime, pass a long instead of a DateTime and use: <code>/#Datetime/parseLong(\$x)</code>
1-8YHHBD	<p>Summary When ActiveMatrix BusinessWorks is contained within TIBCO BusinessEvents, JAR files that are part of an alias library should be extracted from the EAR during the deployment process, but are not.</p> <p>Workaround Manually place the JAR files in the classpath.</p>

Key	Summary/Workaround
1-8KLNE4	<p>Summary If the location of the persistence database directory is specified using the Database Environment Directory field in the Object Management tab, persistence files are created in the root directory.</p> <p>Workaround Specify the location using the property <code>be.engine.om.berkeleydb.dbenv</code>. The files are then placed in a directory whose name matches the BAR name.</p>
1-8A9FA9	<p>Summary When you use the XPath mapper to assign a concept to a field of type any in the payload of an event, and that concept has a contained concept property with an <code>extId</code> that is not null, the following exception occurs:</p> <p><code>ExtIdAlreadyBoundException: Event is already bound to extId</code></p> <p>Where <code>extID</code> is the instance <code>extId</code> of the concept or its contained concept.</p> <p>Workaround None.</p>
1-7UGVMG	<p>Summary Async checkpoint is not working.</p> <p>Workaround Use sync checkpoint. It is enabled by default.</p>
1-7M7QOT	<p>Summary The hot deployment feature does not handle changes made to non-TIBCO BusinessEvents resources, specifically JMS or Rendezvous connection resources.</p> <p>Workaround If you need to change these resources, you must restart the TIBCO BusinessEvents engine.</p>
1-6MMNZW	<p>Summary When a primary statemachine's concept is moved to a folder, then secondary statemachine's path to the called primary statemachine does not get updated.</p> <p>Workaround Update it manually.</p>
1-630PGL	<p>Summary Assigning an empty string ("") to a field in a mapper function will result in a null string.</p> <p>Workaround Set <code>TIBCO.BE.xsltVersion</code> to 2.0 in the <code>designer.tra</code> file and regenerate the mapper XSLT template by opening the mapper function and clicking OK. (This is a non-supported feature because it is part of the XSLT 2.0 specification, which the W3C has not yet released.)</p>

Key	Summary/Workaround
BE-9174	<p>Summary In projects that involve integration with TIBCO ActiveMatrix BusinessWorks, changes made to the TIBCO BusinessEvents EAR file while TIBCO Designer is open are not reflected in the ActiveMatrix BusinessWorks plug-in activities, such as SendEvent. (The EAR file is referenced in the RuleServiceProvider Configuration Resource in TIBCO Designer.)</p> <p>Workaround Restart TIBCO Designer to load the changes in the EAR file.</p>

Appendix A **Documentation for Changed Functionality**

Some changes in functionality provided in this release require some documentation, provided in this appendix.

Topics

- [Enabling Build Ear Tool on Solaris SPARC, page 84](#)
- [Enabling Distributed Preloading, page 85](#)
- [Creating a Single Connection to a JMS Server, page 86](#)
- [Using Public/Private Key Authentication with mm-tools, page 87](#)
- [Guidelines for Using Coherence Cache Provider, page 89](#)

Enabling Build Ear Tool on Solaris SPARC

To enable Solaris SPARC installations to execute the `studio-tools` command line utility buildEar operation, follow the steps below.

1. Install TIBCO BusinessEvents 32 bit 4.0.2 on a Solaris SPARC 64 bit machine.
2. Install TIBCO BusinessEvents 32 bit 4.0.2 on a Linux machine.
3. Download and install Eclipse 3.4.2 for Solaris SPARC. You can download the software from this location:

<http://archive.eclipse.org/eclipse/downloads/drops/R-3.4.2-200902111700/index.php>

Select the following option: Solaris 10 (SPARC/GTK 2). The filename is `eclipse-SDK-3.4.2-solaris-gtk.zip`.

4. Copy the following files from a Linux installation to the corresponding file location in the Solaris installation:

```
BE_HOME/studio/eclipse/plugins
BE_HOMEBE_HOME/studio/bin/studio-tools.tra
BE_HOME/eclipse-platform/eclipse/links/TIBCOBusinessEvents-Studio-plugins.link
BE_HOME/eclipse-platform/eclipse/plugins/*emf*
BE_HOME/eclipse-platform/eclipse/plugins/*uml*
BE_HOME/eclipse-platform/eclipse/plugins/javax.xml_1.3.4.*.jar
BE_HOME/eclipse-platform/eclipse/plugins/org.apache.commons.codec_1.3.0.*.jar
BE_HOME/eclipse-platform/eclipse/plugins/org.apache.commons.httpclient_3.1.0.*.jar
BE_HOME/eclipse-platform/eclipse/plugins/org.apache.commons.lang_2.3.0.*.jar
BE_HOME/eclipse-platform/eclipse/plugins/org.apache.xerces_2.9.0.*.jar
BE_HOME/eclipse-platform/eclipse/plugins/org.apache.xml.resolver_1.2.0.*.jar
BE_HOME/eclipse-platform/eclipse/plugins/org.apache.xml.serializer_2.7.1.*.jar
```

5. On the Solaris machine, edit the `BE_HOME/studio/bin/studio-tools.tra` file. Specify the appropriate environment paths for all path variables such as `TIB_HOME`, `BE_HOME`, `TIB_JAVA_HOME`, `JVM_LIB_PATH` and so on.
6. On the Solaris machine, edit the following file:

```
BE_HOME/eclipse-platform/eclipse/links/TIBCOBusinessEvents-Studio-plugins.link
```

Specify the path to the TIBCO BusinessEvents Studio plugins, as appropriate for the Solaris installation.

7. Copy the wrapper executable from `TIBCO_HOME/tools/wrapper/wrap` (or `wrap64`) to `BE_HOME/studio/bin/studio-tools`.
8. Change directory to `BE_HOME/eclipse-platform/eclipse` and run the command:

```
eclipse -clean -initialize
```

You can now execute the `studio-tools buildEar` operation.

Enabling Distributed Preloading

In projects with a backing store, preloading the cache with backing store data was too slow. Now you can enable multiple machines to perform preloading.



- This behavior is disabled by default.
- This behavior is distributed in nature and requires use of at least two nodes to do the preloading.
- With this implementation, at least four recovery threads are required. If `be.engine.cluster.recovery.threads` is set to a value less than 4, then the number of threads is silently reset to 4, with a warning in logs.

To Enable Distributed Preloading

1. Add and set the following properties at the cluster level of the CDD:

```
be.engine.cluster.recovery.distributed=true
```

```
be.engine.cluster.recovery.distributed.strategy=batch
```

```
be.engine.cluster.recovery.distributed.batchsize=500000000
```

Set the batch size as needed. When higher percentages of object per batch are configured for preloading, use a smaller batch size.

2. Add and set the following property at the cluster level of the CDD, to avoid Coherence service timeouts:

```
tangosol.coherence.invocation.threads=2
```

Creating a Single Connection to a JMS Server

By default, TIBCO BusinessEvents creates two connections to a JMS server, with the following client IDs:

user client id_queue

user client id_topic

To create a single connection using the clientID specified in the Channel resource properties, or in the JMS Connection shared resource if used, add the following property in the CDD and set as shown for all agents:

```
be.channel.jms.unified=true
```



When the connection is configured using a JMS Connection shared resource you must also do the following. Ensure that the topic and queue connection factories on the JMS Connection shared resource Advanced tab match each other. Also, when using TIBCO Enterprise Message Service, use `GenericConnectionFactory` for both.

Using Public/Private Key Authentication with mm-tools

With the TIBCO BusinessEvents Monitoring and Management mm-tools component, it was not possible to authenticate a user using certificates when performing `deploy` and `remote start` and `stop` operations. (See [Changes in Functionality on page 14](#) for details about the `stop` operation.)

Now you can use this functionality as follows.

1. On the computer hosting the MM server, use a utility to create a public/private key pair. The `ssh-keygen` utility is widely available. Two files are generated. They are referred to as follows:

PK_FILE_NAME: The file containing the private key

PK_FILE_NAME.pub: The file containing the public key

Optionally, you can specify a passphrase.

Place both generated files in the same directory on the computer hosting the MM server. For example, put them in *BE_HOME*/mm/certificates.

2. On computers hosting the to-be-monitored cluster PUs that you want to remotely deploy, start, or stop, copy the contents of the *PK_FILE_NAME*.pub file to the file containing the list of authorized keys for the user who will be logging in remotely.

For example, for SSH using certificates for authentication, the authorized keys file is called 'authorized_keys' and it is stored in the `.ssh` directory of the user who will be logging in remotely, that is, in `~/ .ssh/authorized_keys`.

3. When executing a command with mm-tools, use these new options:

-pkf The fully qualified path to the *PK_FILE_NAME* file, that is, the file with the private key.

-pph The passphrase, if you specified one when creating the public/private key pair. (One example below shows the `-pph` option.)

Example Commands

Remote Deploy:

```
mm-tools --propFile mm-tools.tra -op deploy -m 100.100.100.101 -pkf
BE_HOME/mm/certificates/PK_FILE_NAME
```

Remote Deploy, with passphrase:

```
mm-tools --propFile mm-tools.tra -op deploy -m 100.100.100.101 -pkf
BE_HOME/mm/certificates/PK_FILE_NAME -pph passphrase
```

Remote Start:

```
mm-tools --propFile mm-tools.tra -op start -puc CS -m  
100.100.100.101 -pkf BE_HOME/mm/certificates/PK_FILE_NAME
```

Remote Stop:

```
mm-tools --propFile mm-tools.tra -op stop -puc CS -m  
100.100.100.101 -pkf BE_HOME/mm/certificates/PK_FILE_NAME
```

Guidelines for Using Coherence Cache Provider

Documentation did not point to guidelines customers needed for using Coherence as the cache provider. The following links provide these guidelines:

Checklist and guidelines before architecting a new project:

http://download.oracle.com/docs/cd/E15357_01/coh.360/e15723/deploy_checklist.htm
http://download.oracle.com/docs/cd/E15357_01/coh.360/e15723/deploy_plat_consider.htm
http://download.oracle.com/docs/cd/E15357_01/coh.360/e15723/tune_perftune.htm

Coherence Network Protocol

http://download.oracle.com/docs/cd/E15357_01/coh.360/e15723/cluster_tcp.htm
http://download.oracle.com/docs/cd/E15357_01/coh.360/e15723/tune_datagramtest.htm

Coherence Metrics

http://download.oracle.com/docs/cd/E15357_01/coh.360/e15723/appendix_mbean.htm
http://download.oracle.com/docs/cd/E15357_01/coh.360/e15723/appendix_operational.htm

Appendix B **Load Balancer**

This Appendix describes the load balancing functionality.

Topics

- [Content Aware Load Balancing, page 92](#)
- [Working with the Functions, page 94](#)
- [Router Function Reference, page 98](#)
- [Receiver Function Reference, page 101](#)

Content Aware Load Balancing

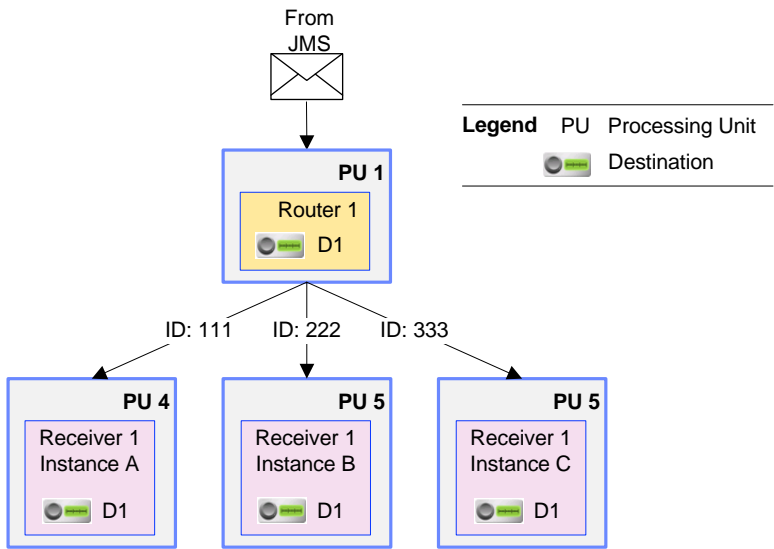
With content-aware load balancing, all related events arriving from queues are routed to the same agent using a unique routing ID. The ID uses the value of a selected event property. For example, if the event property is ZipCode then a routing ID is a specific zip code. All messages relating to one zip code are routed to the same agent, providing "session stickiness." (The ID is set using the *uniqueMessageID* function parameter, as explained in [Router Function Reference on page 98](#) and [Receiver Function Reference on page 101](#).)

In this release, TIBCO Enterprise Message Service servers are supported as the queue source, using JMS channels and destinations.

Content-aware load balancing uses *routers* and *receivers*. You can use functions to create ad-hoc receivers at runtime. One receiver can handle more than one set of related events. For example if the routing ID is a zip code, one receiver might handle events for multiple zip codes.

Use of content-aware load balancing simplifies project configuration, and makes runtime behavior more efficient. For example, only local locking is generally required (whereas the type of load balancing already provided in earlier releases requires cluster-wide locking). Also the L1 cache does not have to be checked for version consistency.

The following diagram shows the an example router and receiver configuration.



- Routers** A router PU receives messages from the JMS server and routes them to appropriate receivers. Routers do no other work. For example, they should not execute rules.
- A router PU contains one inference agent with one or more sets of JMS channels and destinations. Each destination has a default event. Values of one property of that event are used at runtime as routing IDs.
- Event preprocessors can be used as needed to populate the routing key property, for example using some calculation or combination of other event properties.
- The router redirects events to a receiver, based on the destination and the routing key values. The router transparently distributes the load across the available receivers. If a receiver agent fails, its messages (that is, messages with the key that the router was sending to that agent) are routed to another receiver and continue to be handled by that other receiver.
- Receivers** Receivers are the inference or query agents that do the actual work. A receiver PU contains one inference or query agent. A set of receivers belongs to the same agent class. Receivers can also do other work, in addition to the work they receive from the router.
- A receiver agent class is configured with one of the channel and destination configurations specified in the functions.

Working with the Functions

Creating a Load Balancer and Receiver

Create the load balancer in a startup function on the router.

Example:

```
String chnl = "/Receiver/Channels/LocalChnl";
String dest = chnl + "/LocalDest";
Object loadBalancer =
LoadBalancer.Router.createLoadBalancerTo(chnl, dest);
    Util.HashMap.createMap("AllLoadBalancers");
    Util.HashMap.putObject("AllLoadBalancers", "demoLB",
loadBalancer);
```

Create the RPC receiver in a startup function on the receiver.

Example:

```
String chnl = "/Receiver/Channels/LocalChnl";
String dest = chnl + "/LocalDest";
Object receiver = LoadBalancer.Receiver.createRpcReceiverFor(chnl, dest);
Util.HashMap.createMap("AllReceivers");
Util.HashMap.putObject("AllReceivers", "demoReceiver", receiver);
```

Sending and Receiving Events Using Built-in Acknowledgement



- When you use the `sendWithAck()` function, you must also use the `ackEvent()` function, on the receiver
- When you use the `sendWithAck()` function in a rule, the rule must not consume the event after the call. The event consumption is handled internally.

Router Agent

The `sendWithAck()` call must be made in the router agent rule for the event that is referenced in its event parameter.

Example:

```
Events.TestEventA test;
LoadBalancer.Router.sendNoAck(loadBalancer, test, test@extId,
test.name, "/Router/RuleFunctions/EventCleanup");
```

In the above example, the `sendWithAck()` call must be made in the router rule for `TestEventA`.

The `sendWithAck()` function takes a rule function URI as a parameter. This rule function is invoked when the receiver calls (again using the example event) `ackEvent(test)`.

If this rule function is specified, it must accept an event as a parameter. The function must then return an array of events (`Event[]`) including the original `TestEventA`. All the events in this array will be acknowledged back to the JMS server internally.

If no rule function is specified, then the `test` event would be acknowledged to the JMS server internally.

Reliable message
delivery

The `sendWithAck()` function also provides reliable message delivery in case a receiver goes down.

For example, suppose a cluster has one router and two receivers, A and B. And suppose that 10 events are sent to receiver A and 10 to receiver B. If receiver B goes down before calling `ackEvent()` on its events, the router will reroute these 10 events to receiver A.

Receiver Agent

The `ackEvent()` call must be made in the receiver rule that receives `TestEventA`.

Example:

```
LoadBalancer.Receiver.ackEvent(test);
Event.consumeEvent(test);
```

Sending and Receiving Events Without Built-in Acknowledgement



The `sendNoAck` function can be used with the `ackCaller` function on the receiver, or you can use it alone, without the `ackCaller` function.

Router Agent

The `sendNoAck()` function offers no reliability. The developer must add code for acknowledging the event. It is recommended that the event is consumed in the same rule that calls `sendNoAck()`.

Example:

```
Events.TestEventA test;
LoadBalancer.Router.sendNoAck(loadBalancer, test, test@extId,
test.name, "/Router/RuleFunctions/EventCleanup");
Event.consumeEvent(test);
```

The `sendNoAck()` function takes a rule function URI as a parameter. This rule function is invoked when the receiver calls `ackCaller(test, customString)`. (See the [Receiver Agent](#) example.)

If this rule function is specified, it should be of void return type and must accept a string as parameter.

Receiver Agent

The `ackCaller()` function is used only to invoke a rule function on the router side with a custom string parameter.

Example:

```
String result = "Process event"+test@extId;
LoadBalancer.Receiver.ackCaller(test, result);
Event.consumeEvent(test);
```

Discarding Load Balancer and Receiver Objects

The discard functions can be called in clean-up rule functions. They can be used as shutdown rule functions.

Router Example

```
Object lb = Util.HashMap.getObject("AllLoadBalancers", "demoLB");  
discardLoadBalancer(lb);
```

Receiver Example

```
Object rc = Util.HashMap.getObject("AllReceivers",  
"demoReceiver");  
discardReceiver(rc);
```

Router Function Reference

`LoadBalancer.Router.*` functions are used for the router side.

Create the Load Balancer

Signature

Object createLoadBalancerTo(String channelUri, String destinationUri)

Description

Creates and returns a load balancer that can be used to send messages to load balanced destinations.

You generally create load balancers in a startup rule function.

Parameters

Name	Type	Description
channelUri	String	<p>The URI of the channel where receivers expect messages (sent using this load balancer) to arrive.</p> <p>For example:</p> <p>"/Channels/LocalChannelA"</p>
destinationUri	String	<p>The URI of the destination where receivers expect messages (sent using this load balancer) to arrive.</p> <p>For example:</p> <p>"/Channels/LocalChannelA/LocalDestinationA"</p>

Returns

Type	Description
Object	An opaque handle to the loadbalancer object that can be used to send messages

Send Event to Receiver with Acknowledgement

Signature	<code>Object sendWithAck(Object loadBalancer, SimpleEvent event, String uniqueMessageId, String routingKey, String ruleFunctionURI)</code>
-----------	--

Description Sends an event to a remote receiver. The routing decision is made using the routing ID (*uniqueMessageId*). This function waits for the receiver to acknowledge the event. After this acknowledgement is received, the router acknowledges the event back to the JMS server.

The `sendWithAck` function is used with the `ackEvent` function on the receiver.



When you use the `sendWithAck` function in a rule, the rule must not consume the event after the call. The event consumption is handled internally.

Parameters

Name	Type	Description
loadBalancer	Object	The loadbalancer object from a previous <code>createLoadBalancerTo</code> call.
event	SimpleEvent	The event to be routed
uniqueMessageId	String	The unique message ID, used for routing.
routingKey	String	Not used in this release. Set to null.
ruleFunctionURI	String	Optional. Callback on the router. Call to a rule function that takes an event and returns an array of events that must be acknowledged to the JMS server (including the event in the original call). If not specified, the router acknowledges the JMS event directly.

Returns

Type	Description
Object	An opaque receiver object.

Send Event to Receiver Without Acknowledgement

Signature `void sendNoAck(Object loadBalancer, SimpleEvent event, String uniqueMessageId, String routingKey, String ruleFunctionURI)`

Description Sends an event to a remote receiver. The routing decision is made using the routing ID (*uniqueMessageId*). This function waits for the receiver to acknowledge the event. Once the acknowledgement is received, the router calls a rule function, if available.

The `sendNoAck` function is used with the `ackCaller` function on the receiver.

Parameters	Name	Type	Description
	<code>loadBalancer</code>	Object	The <code>loadbalancer</code> object from a previous create call.
	<code>event</code>	SimpleEvent	The event to be routed
	<code>uniqueMessageId</code>	String	The unique message Id, used for routing.
	<code>routingKey</code>	String	Not used in this release. Set to null.
	<code>ruleFunctionURI</code>	String	Optional. Call to a void rule function which takes a String parameter (for the ID from the <code>ackCaller</code>).
Returns	Void.		

Discard Load Balancer

Signature	<code>void discardLoadBalancer(Object loadbalancer)</code>		
Description	Discards the load balancer. Generally used in a shutdown rule function.		
Parameters	Name	Type	Description
	<code>loadBalancer</code>	Object	The <code>loadbalancer</code> object from a previous create call.
Returns	Void.		

Receiver Function Reference

`LoadBalancer.Receiver.*` functions are used for the receiver side.

Create an RPC Receiver

Signature `Object createRcpReceiverFor(String localChannelUri, String localDestinationUri)`

Description Creates and returns an RPC (Coherence remote procedure call) receiver that receives messages from a remote load balancer. Messages are received on the specified local channel and destination.

You generally create the RPC receiver in a startup rule function.

Parameters	Name	Type	Description
	localChannelUri	String	The URI of the channel where receivers expect messages (sent using this load balancer) to arrive For example: "/Channels/LocalChannelA"
	localDestinationUri	String	The URI of the destination where receivers expect messages (sent using this load balancer) to arrive. For example: "/Channels/LocalChannelA/LocalDestinationA"

Returns	Type	Description
	Object	An opaque destination object.

Acknowledge Event

Signature `void ackEvent(SimpleEvent event)`

Description Used with the `sendWithAck()` routing function. This function acknowledges an event back to the router. The router then does an internal lookup and acknowledges the original event back to the JMS server.

Parameters	Name	Type	Description
	event	SimpleEvent	The event to be acknowledged back to the receiver.
Returns	Void.		

Acknowledge Caller

Signature	void ackCaller(SimpleEvent <i>event</i> , String <i>id</i>)		
Description	Used with the sendNoAck function on the router. Acknowledges an event back to the router. The router does not acknowledge the original event back to TIBCO Enterprise Message Service. The router can, however, call a rule function (using any custom string id) for any cleanup or logging that may be required on the router side.		
Parameters	Name	Type	Description
	event	SimpleEvent	The event to be acknowledged back to the receiver.
	id	String	A custom string that will be sent back to the router's callback function
Returns	Void.		

Discard Receiver

Signature	void discardReceiver(Object <i>receiver</i>)		
Description	Discards the Discards the receiver object created from a previous create call. Generally used in a shutdown rule function.		
Parameters	Name	Type	Description
	receiver	Object	The receiver object from a previous create call.
Returns	Void.		