

TIBCO BusinessEvents™

Release Notes

*Software Release 3.0.2
April 2010*

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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 19](#)
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- [Migration and Compatibility, page 27](#)
- [Closed Issues for TIBCO BusinessEvents, page 34](#)
- [Known Issues for TIBCO BusinessEvents, page 72](#)
- [Known Issues for Decision Manager, page 80](#)

New Features

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

Release 3.0.2

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

- JDBC backing store. See [Setting Up a JDBC Backing Store \(CR 1-A02WRF\)](#) on [page 86](#) for details.

Related Software

Support for the following platforms is added:

- TIBCO Runtime Agent 5.6.2
- TIBCO ActiveMatrix BusinessWorks 5.7 and 5.8
- 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 3.0.0 section has been updated in the 3.0.1 version of these release notes. It now provides more details about new features added in the 3.0.0 release.

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 (x86)
- Windows Server 2008 (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

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:

```
getVRFImpByName()
getVRFImpNames()
getVRFImps()
invokeAllVRFImps()
invokeVRFImp()
invokeVRFImpByName()
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.

BusinessEvents Engines

Event Preprocessor Worker Thread Options

New threading options are available in event preprocessors:

Shared Queue and Threads Uses the 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. 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 BusinessEvents and ActiveMatrix BusinessWorks. It builds on the FraudDetection example. It can be used with a 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 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 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 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 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 BusinessEvents ontology model elements (concepts and events) to their corresponding XML schema definition. This allows for the interoperability of the 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 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.

Release 2.2

Synchronous Non-Locking Rule Invocation

A new engine function, `invokeRule()`, enables the synchronous invocation of rules. A tooltip for the function is available in TIBCO Designer and is reproduced in *TIBCO BusinessEvents Language Reference*.

Cache Related Functions

The following new Coherence functions are now available. They enable entities to be loaded from the cache and asserted into working memory. These functions are intended primarily for use with the "Cache Only" cache mode (explained in *TIBCO BusinessEvents User's Guide*). Tooltips for the functions are available in TIBCO Designer and are reproduced in *TIBCO BusinessEvents Language Reference*.

`C_CacheLoadConceptByExtId()`

`C_CacheLoadConceptById()`

`C_CacheLoadEventByExtId()`

`C_CacheLoadEventById()`

XPath Function

The following new XPath function is now available. It evaluates an XPath expression against the input event:

```
executeWithEvent()
```

In-Process Integration with TIBCO ActiveMatrix BusinessWorks

An in-process integration model is available enabling you to integrate BusinessEvents and ActiveMatrix BusinessWorks functionality. The integrated project runs in a single container, that is, a single JVM. Use of this feature requires a production license for ActiveMatrix BusinessWorks. Documentation is provided in *TIBCO BusinessEvents User's Guide*.

Release 2.1.1

No new features were added in this release.

Release 2.1

Functions

The following new functions are now available and are documented in *TIBCO BusinessEvents Language Reference*.

Table 1 New Functions in Release 2.1 (Sheet 1 of 5)

Area	Function Name
Channel	getActiveDestinations()
	getQueueCapacity()
	getQueueDepth()
	resumeDestination()
	suspendDestination()
Coherence	C_CacheName()
	C_ClassName()
	C_Index()

Table 1 New Functions in Release 2.1 (Sheet 2 of 5)

Area	Function Name
Coherence - Constants	C_BooleanConstant
	C_DateTimeConstant()
	C_DoubleConstant()
	C_IntConstant()
	C_LongConstant()
	C_StringConstant()
Coherence - Extractors	C_BooleanAtomGetter()
	C_DateTimeAtomGetter()
	C_DoubleAtomGetter()
	C_EventPropertyGetter()
	C_IntAtomGetter()
	C_LongAtomGetter()
	C_RuleFunctionGetter()
	C_StringAtomGetter()
Coherence - Filters	C_All()
	C_And()
	C_Any()
	C_ContainsDouble()
	C_ContainsInt()
	C_ContainsLong()
	C_ContainsString()
	C_CurrentPage()
	C_Equals()

Table 1 New Functions in Release 2.1 (Sheet 3 of 5)

Area	Function Name
	C_GreaterEquals()
	C_GreaterThan()
	C_LessThan()
	C_LessThanEquals()
	C_Limit()
	C_NextPage()
	C_NotEquals()
	C_PreviousPage()
	C_RuleFunction()
Coherence - Query	C_CacheInvoke()
	C_CurrentContext()
	C_QueryAction()
	C_QueryConcepts()
	C_QueryEvents()
	C_QueryIDs()
Engine	executionContext()
	gc()
	jvmMemoryUsed()
	sessionName()
	sleep()
Engine - Variable	getEngineBooleanArrayVar()
	getEngineBooleanVar()
	getEngineDateTimeArrayVar()

Table 1 New Functions in Release 2.1 (Sheet 4 of 5)

Area	Function Name
	getEngineDateTimeVar()
	getEngineDoubleArrayVar()
	getEngineDoubleVar()
	getEngineIntArrayVar()
	getEngineIntVar()
	getEngineLongArrayVar()
	getEngineLongVar()
	getEngineObjectVar()
	getEngineStringArrayVar()
	getEngineStringVar()
	setEngineBooleanArrayVar()
	setEngineBooleanVar()
	setEngineDateTimeArrayVar()
	setEngineDateTimeVar()
	setEngineDoubleArrayVar()
	setEngineDoubleVar()
	setEngineIntArrayVar()
	setEngineIntVar()
	setEngineLongArrayVar()
	setEngineLongVar()
	setEngineObjectVar()
	setEngineStringArrayVar()
	setEngineStringVar()

Table 1 New Functions in Release 2.1 (Sheet 5 of 5)

Area	Function Name
File	fileClose()
	fileExists()
	fileLength()
	fileReadLine()
	fileRemove()
	fileRename()
	fileSeek()
	fileWrite()
	fileWriteLine()
	listFiles()
	openFile()
Instance	newInstance()
Number	doubleValue()
	intValue()
	longValue()
String	split()
	trim()
System	currentTimeMillis()
	exec()

Object Management Advanced Caching Features

When caching is used for object management, advanced caching features now enable you to tune the performance of your application and reduce its footprint in memory by setting the appropriate object management for selected entities. At the entity level, you can choose between the following object management options:

- Cache plus memory, the default caching behavior
- In memory only, useful for stateless entities
- Cache only, for "on demand" assertion of entities into working memory, which reduces the amount of memory used.

See *TIBCO BusinessEvents User's Guide* for detailed documentation.

Documentation Improvements

Documentation has been developed in the following areas:

- **BusinessEvents™ Tools** Chapters 6 through 9 in *TIBCO BusinessEvents User's Guide* provide concepts, procedures, and reference information for the Rule Debugger and Rule Analyzer utilities.
- **Object Management.** Chapters 10 and 11 in *TIBCO BusinessEvents User's Guide* provide concepts and procedures. In addition, an online reference, *TIBCO BusinessEvents Cache Configuration Guide*, provides detailed operational and cache configuration documentation.
- **Administration Topics** Chapters 12 and 13 in *TIBCO BusinessEvents User's Guide* provide deploy-time configuration and administration documentation.
- **Tutorial** The tutorial, which is in Chapter 14 of *TIBCO BusinessEvents User's Guide*, now provides a more complete step-wise introduction to the product and can be used by people with no prior experience of TIBCO products.
- **TIBCO Designer Documentation** For the convenience of those new to TIBCO products, sections of introductory documentation from the TIBCO Designer documentation set are now included with BusinessEvents documentation. They are included as Appendix A and Appendix B of *TIBCO BusinessEvents User's Guide*.
- **TIBCO Hawk Microagent Methods** The microagent methods documentation is now provided in *TIBCO BusinessEvents User's Guide* Appendix C, TIBCO Hawk Microagent Methods.

Release 2.0

The following are new features in Release 2.0.0.

- **Support for 64-bit systems** This release adds support for 64-bit systems, including HP-UX Itanium, Linux, and Solaris 10.
- **Runtime API** Allows you to run the BusinessEvents server using the Java API.
- **Multiple Rule Sessions** By adding multiple BusinessEvents Archives to a single EAR at design time, you can run multiple rule sessions on a single

BusinessEvents server at runtime. You can configure the BusinessEvents Archives to use different rule sets, different input channels, different startup and shutdown actions — the BusinessEvents Archives can be configured completely differently if that meets your requirements.

- **Local Channels** Allow you to connect multiple rule sessions in runtime.
- **Preprocessor** By assigning a preprocessor to an input destination, you can perform actions on incoming simple events before they reach the working memory.
- **Cache-based Object Manager** BusinessEvents can replicate the current state of the working memory within a cache.
- **Fault Tolerance and High Availability** You can configure a fault tolerant cluster of BusinessEvents servers such that a primary server is running and one or more backup servers are available to take over if the primary server goes down.
- **Advisory Events** A notice generated by BusinessEvents advises you of activity in the engine, for example, an exception.
- **Exception in Language** The BusinessEvents rule Language includes `try/catch/finally` commands to handle exceptions.
- **Hot deployment** Allows for replacement of the EAR file without shutting down and restarting the server.
- **New Standard Functions** New standard functions added.
- **Rule Analyzer** Generates a visual model of the relationships and dependencies between the objects in a project. The rule analyzer allows you to see the project as a graph.
- **Debugger** Replaces the Tester, adding a graphical rule analysis for the BusinessEvents Archive, a tabbed interface to navigate between BusinessEvents Archives, the ability to define and store multiple configuration scenarios, and the ability to debug a BusinessEvents Archive remotely.
- **RVCM Pre-registration** For TIBCO Rendezvous certified message publishers, you can specify pre-registered listener names as a comma separated list.
- **2.0 Feature Examples** The installation includes working examples of the new BusinessEvents 2.0 features.

Release 1.4

This release adds support for AIX 5.3.

Release 1.3

This release bundles TIBCO ActiveMatrix BusinessWorks for design-time use on TIBCO BusinessEvents™ projects. The bundled ActiveMatrix BusinessWorks software is not to be used for runtime purposes.

Release 1.2

The following are new features in this release.

- **Project Tester** Allows you to test a BusinessEvents project in TIBCO Designer.
- **Dynamic State Timeout in State Machine** Timeout of a state can be based on an expression.
- **Support for 0 History Size in Concept Properties** When a history size is set to 0, BusinessEvents does not record a timestamp for the property value.
- **Support for HP-UX** BusinessEvents now supports HP-UX 11i PA RISC Architecture.
- **Improved Function Registry** The function registry now includes categories for DateTime, Instance.PropertyArray, Instance.PropertyAtom, String, and Math.
- **New Persistence Deployment Options** You can now define an upper limit on the number of outstanding database operations before a checkpoint and you can specify that BusinessEvents should not recover on restart.
- **New Language Features** BusinessEvents now supports local variable arrays and the `instanceof` operator.

Release 1.1

The following are new features in this release.

- **Rule Functions** You can define rule functions using the BusinessEvents rules language.
- **Startup and Shutdown Actions** You can use rule functions to define actions at startup and shutdown.
- **Input Destinations** You can enable and disable listeners for individual input destinations.
- **Examples** BusinessEvents includes an examples directory with repositories and documentation.
- **Database Utilities** Command line utilities allow you to import and export between BusinessEvents and a SQL database.

- **XPath Functions** You can evaluate XPath expressions against events, instances, variables, and XML strings.
- **Temporal Functions** You can perform calculations using values stored in a property's history.
- **Improved Function Registry** Includes categories for DateTime, Instance, Engine, and more.
- **Improved Set of Hawk Methods** Includes new methods, including `activateRuleSet()`, `deactivateRuleSet()`, and more.
- **Improved State Machine Functionality** Concepts can inherit main state machines and call state machines virtually.
- **New Language Features** Added support for if/else, while loops, for loops, local variables, and direct access for ScoreCards.
- **More Flexible Event to Destination Relationships** No longer restricted to one-to-one relationship.
- **New Error Checking Feature** You can configure BusinessEvents to always check for errors before building a BusinessEvents Archive.
- **Rule Editor Search** Allows you to search for text within a project.
- **Delete Retracted Objects from Persistence** You can enable BusinessEvents to delete retracted objects from database.
- **Export to SVG Format** You can export state machine graphs in SVG format.
- **Event Expiry Action** You can specify actions to take when events expire.
- **Support for Linux** BusinessEvents added support for Linux kernel 2.4.
- **History Policy for Concept Properties** You can specify how BusinessEvents will store property values in the history — all values or changes only.
- **Unlimited Properties per Concept** Removed the thirty-two property limit.

Changes in Functionality

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

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 per entity. 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

- 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 BusinessEvents project. See *TIBCO BusinessEvents Decision Manager* 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 BusinessEvents Archive resource), the 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.

Release 2.2

Backing Store Configuration Support

The cache configuration file has been preconfigured to support backing store functionality out of the box, reducing the need for customization. SQL scripts and engine property files supporting backing store are also provided. The backing store example and its documentation have been updated accordingly. The *TIBCO BusinessEvents User's Guide* now includes backing store configuration topics.

Convenience Option for Migration from 1.4

A new option has been added to the `be-dbutils` utility, for use in migration from BusinessEvents 1.4 to the current version. The option can be used in the `load` step to specify the location for the persistence files. Any existing files in the specified directory are deleted.

Release 2.1.1

- The name of the log file for the `be-dbutils` utility has changed from `DbUtil.log` to `be-dbutils.log`.
- A new parameter is available in the `be-dbutils` utility. The new `-n` parameter (also available as file property `be.dbutils.berkeley.newdbenv`) is only used in the data migration `load` command. Like the `-b` parameter, the `-n` parameter specifies the directory that is written to. The `-b` parameter requires the specified directory to be empty. The `-n` parameter, however, deletes any persistence files in the directory before loading the latest files.
- In BusinessEvents 2.0 and 2.1, the operation `Event.getDestinationURI` returned the default destination. It now returns the destination URI on which an event was received (as it did in 1.X versions).

Version 2.1

- The persistence data migration utility has been improved. It now handles migration of all persistence data, including state machine data, from the 1.x schema to the schema used in 2.x.
- The object management property called `tangosol.coherence.clustername` in BusinessEvents 2.0 is now called `tangosol.coherence.cluster`. Update your projects accordingly.

Release 2.0

See [Migration and Compatibility on page 27](#) for information on changes in this release.

Release 1.4

No functionality was changed in this release.

Release 1.3

No functionality was changed in this release.

Release 1.2

No functionality was changed in this release.

Release 1.1

No functionality was changed in this release.

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 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.

Release 2.2

No features are deprecated in this release.

Release 2.1.1

No features are deprecated in this release.

Version 2.1

Fault Tolerance Cluster Properties

The following object management properties used to define fault tolerance groups are deprecated (because redundant).

- `be.ft.cluster.name`—Instead use `Engine.FT.GroupName`. Defines the fault tolerance cluster (group) name in the `be-engine.tra` file, for command-line startup.
- `be.ft.enabled`—Instead use `Engine.FT.UseFT`. Enables or disables fault tolerance mode in the `be-engine.tra` file, for command-line startup.
- `be.ft.priority`—Instead use `Engine.FT.Weight`. Sets the priority for a server in a fault tolerance group in the `be-engine.tra` file, for command-line startup.

Release 2.0

No functionality was deprecated in this release.

Release 1.4

No functionality was changed in this release.

Release 1.3

No functionality was deprecated in this release.

Release 1.2

No functionality was deprecated in this release.

Release 1.1

No functionality was deprecated in this release.

Migration and Compatibility



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

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 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 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

See advice for Release 2.2. In addition, note that the be-migration utility enables you to migrate from persistence object management to cache object management with backing store.

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

Release 2.2

You can directly upgrade from BusinessEvents 1.4 and higher to 2.2. If you are upgrading from an earlier release, first upgrade to 1.4, and then to 2.2.

Follow the advice provided in the section for [Release 2.0](#) below. In addition, the 2.2 release enables you to migrate persistence data. For instructions on performing the data migration, see Chapter 5, Persistence Data Migration, in the 2.2 version of the *TIBCO BusinessEvents Installation* guide.

Release 2.0

The following changes occurred between 1.4 and 2.0:

- Session specific methods for TIBCO Hawk contain the Session Name as a parameter in 2.0. These methods are not backward compatible.

- State Machine backward compatibility issues:
 - Execution order changed in 2.0:
 - old order:** State's Entry Action -> State's Exit Action -> Transition's Action
 - new order:** State's Entry Action -> Transition's Action -> State's Exit Action
 - Change of behavior when there is an interrupt from a substate within a composite state: In 2.0, the composite state's exit action is triggered. Previously, it was not.
 - The state's exit action will not be triggered when a timeout occurs for all timeout choices
 - Previously StateMachine functions returned comma separate values. In 2.0, StateMachine functions return a String [].
 - Previously, with persistence turned on, state machine timeout timers restarted when the engine restarted. In 2.0, timeout timers do not restart after recovery; BusinessEvents triggers the timeout at the original scheduled time.
 - Removed State Machine function:


```
Instance.StateMachine.getDesignTimeCurrentStatePaths().
```
- Persistence backward compatibility issues: Because BusinessEvents in 2.0 allows multiple BusinessEvents Archive resources in one Enterprise Application Resource, the location of the persistent data store is different.
 - If you specify the database environment directory in Object Management in the BusinessEvents Archive at design time, BusinessEvents uses it as the database directory to store data.
 - Otherwise, specify the root of the database directory for all the BusinessEvents Archives (called *dbenv_root* below) using the BusinessEvents property `be.engine.om.berkeleydb.dbenv`. The default value is `./db/` meaning that the root is a folder called `db`, under the BusinessEvents engine working directory. BusinessEvents puts the database directory for each BusinessEvents Archive under *dbenv_root/BusinessEvents-Archive Name*. For example, if the root of the database directory is `c:/myDbRoot` and the BusinessEvents archive name is `arch1`, then BusinessEvents uses `c:/myDbRoot/arch1` as the database environment directory for this archive.
- Channel backward compatibility issues:
 - Event Serialization: In 2.0, you can select a serializer to use for a destination as part of the destination configuration. If you were not using the default

serializer in a previous BusinessEvents version, configure the destination in BusinessEvents 2.0 to use the desired serializer.

- The `%%DestinationURI%%` variable in the durable subscriber name for JMS channel destinations returns the full path of the destination. Replace `%%DestinationURI%%` with `%%DestinationName%%` to get the destination name. In addition to `%%DestinationName%%`, BusinessEvents 2.0 provides these variables for use in the durable subscriber name for JMS channel destinations: `%%SessionName%%` and `%%EngineName%%`. `%%SessionName%%` is the BusinessEvents Archive name and `%%EngineName%%` is the same as `%%be.engine.name%%`.
- If `clientId` is populated, BusinessEvents now creates two `clientIds`, appending `_Queue` and `_Topic` to the defined `clientId`. Previously, unless the channel was configured to use JNDI, BusinessEvents only created one `clientId`, appending `_Queue` to the defined `clientId`. The other topic connection did not use a `clientId`.
- BusinessEvents 2.0 includes three types of events: simple events, time events, and advisory events. Previous BusinessEvents versions referred to "simple events" as "events."
- By default, BusinessEvents 2.0 uses the `EXPLICIT_CLIENT_DUPS_OK_ACKNOWLEDGE` JMS method for TIBCO JMS implementations in acknowledge mode. Previous versions of BusinessEvents used the `EXPLICIT_CLIENT_ACKNOWLEDGE` JMS method by default for TIBCO JMS implementations in acknowledge mode.
- The Database Concept resource is not available in 2.0.
- BusinessEvents Tester: BusinessEvents 2.0 replaced the Tester in TIBCO Designer with the Debugger, which is stand-alone BusinessEvents tool. You can launch the Debugger by right-clicking an Enterprise Archive Resource in TIBCO Designer.

Release 1.3

- TIBCO recommends that you uninstall BusinessEvents 1.0, 1.1, and 1.2 before installing BusinessEvents 1.3. After uninstalling 1.0 or 1.1, delete `be-tsm.jar` from `TRA_HOME/5.x/lib` both on the machines that run BusinessEvents and the machine that runs Administrator.



BusinessEvents 1.0 and 1.1 required `be-tsm.jar` to be made available to TIBCO Administrator. If you plan to continue using BusinessEvents 1.0 or 1.1 in addition to BusinessEvents 1.3, do not delete `be-tsm.jar`.

- Rebuild Enterprise Archive EAR file for redeployment.

- Migrate old database files to the current format. Send a request to support@tibco.com for the migration tool.

Release 1.2

- TIBCO recommends that you uninstall BusinessEvents 1.0 and 1.1 before installing BusinessEvents1.2. After uninstalling these older versions, delete `be-tsm.jar` from `TRA_HOME/5.x/lib` both on the machines that run BusinessEvents and the machine that runs Administrator.



BusinessEvents 1.0 and 1.1 required `be-tsm.jar` to be made available to TIBCO Administrator. If you plan to continue using BusinessEvents 1.0 or 1.1 in addition to BusinessEvents 1.2, do not delete `be-tsm.jar`.

- Rebuild Enterprise Archive EAR file for redeployment.
- Migrate old database files to the current format. Send a request to support@tibco.com for the migration tool.
- Ontology constructor takes primitive array instead of `propertyArray`. Use `Instance.PropertyArray.toArray<type>` function to convert `propertyArray` to primitive array.
- Changes in function registry:
 - Removed `DateTime.getTimeZoneTime()`
 - Removed `DateTime.setTimeZone()`, use `DateTime.translateTime()` for similar functionality

Release 1.1

- Requires TRA 5.2.1.
- Verify that input destinations are enabled by going to the new Input Destination tab in BusinessEvents Archive.
- Resource name is restricted to non-BE keywords. To open and correct old projects containing keywords, put `java.property.TIBCO.BE.allowKeywordsAsNames=true` in the `designer.tra`.
- Migrate old database files to the current format. Send a request to support@tibco.com for the migration tool.
- Wire format for events on RV and JMS has changed. This will not affect sending or receiving events using BusinessEvents Activities in ActiveMatrix BusinessWorks. For events sent and received by other applications, see the *BusinessEvents User's Guide* for details.
- Removed `suspendChannels()` and `resumeChannels()` hawk methods. User can use `suspendDestinations()` and `resumeDestinations()` with an empty destination name to suspend and resume a channel.
- Renamed `getConcept()` hawk method to `getInstance()`.
- Text coloring may be wrong in the Rule Editor if a line contains a tab character. Replace old tabs with new tabs.

- Changes in function registry:
 - Replaced `Event.SendEventTo()` by `Event.RouteTo()`. See Language reference for `Event.RouteTo()` usage.
 - Renamed `DateTime.time()` function to `DateTime.getTimeInMillis()`
 - Renamed `DateTime.addHours()` to `DateTime.addHour()`
 - Renamed `DateTime.parse()` to `DateTime.parseString()`
 - Renamed `Engine.getTotalNumberRuleFired()` to `Engine.numberOfRulesFired()`
 - Renamed `Engine.resetTotalNumberRulesFired()` to `Engine.resetNumberOfRulesFired()`
 - Renamed `System.writeToFile()` to `System.IO.fileWrite()`
 - Renamed `Engine.Locale.country` to `Engine.Locale.getCountry`
 - Renamed `Engine.Locale.language` to `Engine.Locale.getLanguage`
 - Removed `Instance.deleteByExtId()`, use `Instance.deleteInstance(Instance.deleteByExtId("some_id"))`
 - Removed `Instance.PropertyArray.Length()`, use `instanceX.arr@length`
 - Removed all the get/set functions in `Instance.PropertyArray` category, use `instanceA.arr[index] = value`
 - Removed `isKnown()`, use `(isModified(instanceA) || !isModified(instanceA))`.

Closed Issues for TIBCO BusinessEvents

The table in this section lists issues that were closed in the named releases for TIBCO BusinessEvents, excluding issues for the Decision Manager and Rule Manager Server components. issues. See [Closed Issues for Decision Manager on page 78](#) for closed issues relating to those components.

Closed in Release	Defect #	Summary
3.0.2	1-ARIK47	<p>It was not possible to abort an RTC when an exception or undesirable situation occurred. This could lead to inconsistent state in the cache and backing store.</p> <p>Now you can use the following function in rules and rule functions to abort the RTC and prevent the writes to the cache and backing store.</p> <pre>Engine.Rtc.abortRTC()</pre> <p>Use this call with an advisory event or within the catch block of a try-catch statement.</p> <p>This function aborts a running RTC upon invocation. It clears the RTC agenda. No concept updates (create, update, or delete) are saved to the cache for that RTC.</p> <p>Events, however are immutable. If the application consumes an event in the RTC before or after this call is made, the event is consumed. If <code>Event.replyEvent()</code>, <code>Event.routeTo()</code> or <code>event.sendEvent()</code> are called, those actions are also invoked.</p> <p>Note: This function works only with concepts that are set to be cache only.</p> <p>An additional function is provided.</p> <pre>Engine.RTC.printAgenda()</pre> <p>prints what is currently in the agenda. This information can be useful in rules, depending on how you want to use <code>Engine.Rtc.abortRTC()</code>.</p>
3.0.2	1-AQ8GFH	Under certain circumstances, an infinite loop occurred in an RTC following an RTC in which an event expiry action occurs.
3.0.2	1-AOWYMM	Running the be-migration tool caused a <code>NullPointerException</code> .
3.0.2	1-ALHH41	When a substatemachine was retracted, it triggered multiple info level messages when the debugRole was turned on.

Closed in Release	Defect #	Summary
3.0.2	1-ALFBZP	The tooltip for the <code>Coherence.Query.C_StoreQueryAction()</code> function was not correct.
3.0.2	1-AL7I6J	The function <code>Event.createEvent()</code> was synchronized, causing performance issues. Now multiple threads can use <code>Event.createEvent()</code> concurrently.
3.0.2	1-AL48TT	The number of worker threads was limited to eight. Now you can specify a maximum number of worker threads using a TIBCO Designer property. Add the following property to the <code>designer.tra</code> file and specify the maximum number of worker threads: <code>java.property.tibco.be.preferences.destination.maxWorkers=number</code>
3.0.2	1-AKGJMT	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 existed.
3.0.2	1-AKFLX2	Global variable initialization was not synchronized allowing uninitialized data to be read for a short time after startup.
3.0.2	1-AK3XNO	Tooltips for functions <code>Instance.isNew()</code> and <code>Instance.isModified</code> were incomplete.

Closed in Release	Defect #	Summary
3.0.2	1-AJ2ZVJ	<p>Pool connection properties were not available for Database Concepts. Now these properties are supported for Oracle and for SQL Server as follows:</p> <pre>be.dbconcepts.pool.max=No default - as set in project.</pre> <pre>be.dbconcepts.pool.min=default is 0</pre> <pre>be.dbconcepts.pool.initial=Default is half of max</pre> <pre>be.dbconcepts.connection.check.interval=default is 60 seconds</pre> <pre>be.dbconcepts.connection.retry.count=default is -1, meaning always retry</pre> <pre>be.dbconcepts.pool.inactivityTimeout=default is 0 seconds (meaning no timeout)</pre> <pre>be.dbconcepts.pool.PropertyCheckInterval=default is 900 seconds</pre> <pre>be.dbconcepts.pool.waitTimeout=default is -1 for non-Oracle and 1 for Oracle</pre> <p>Inactivity timeout is the period after which inactive connections will be closed. 0 implies do not set inactivity timeout.</p> <p>Property check interval is the interval at which pool parameters are checked and enforced.</p> <p>Wait timeout is the time for which a thread will wait to acquire a connection. Note: The default for this property is different for Oracle for backward compatibility in customer sites where this property was already in use as a custom property.</p>

Closed in Release	Defect #	Summary
3.0.2	1-AJ00L8	<p>When you set the property <code>bui.gen.class.option</code> in the <code>bui-config.tra</code> file, you now see a Table > Generate Archive menu option in Decision Manager, in addition to the Table > Generate Class menu option.</p> <p>You can also see these options by right-clicking a decision table in the project tree.</p> <p>The new option enables you to generate a JAR file for decision tables, for testing purposes. (In earlier releases you could generate only class files for this purpose.) Class files are saved in the directory <code>project_root/deployment/dt_codegen_temp/classes</code>, and JAR files are saved to <code>project_root/deployment/dt_codegen_temp/project_name.jar</code>.</p> <p>When you select Generate Archive for a table, it adds the table's class files to the <code>classes</code> directory, and then archives them all into the <code>project_name.jar</code> file.</p> <p>Note: This CR partially supersedes the earlier fix provided by 1-9RH8LB and 1-A5N9HA. The property introduced in 1-A5N9HA, <code>bui.codegen.generate_jar</code>, is no longer used in Decision Manager, but it is still used in RMS.</p>
3.0.2	1-AJ00IJ	With Decision Manager, when you clicked "Generate Class" for several tables, the software deleted any existing classes in the Deployment directory, and only the last class generated remained.
3.0.2	1-AHE82N	<p>When reading arrays from the results of a query such as the following:</p> <pre>Concept[] cepts = Query.ResultSet.get(rset, <index>)</pre> <p>a <code>java.lang.ClassCastException</code> was thrown.</p>
3.0.2	1-AE3GXX	In JMS channels, CLIENT_ACKNOWLEDGE acknowledgement mode did not roll back prefetched and unacknowledged JMS messages to the queue when the BusinessEvents engine stopped responding.
3.0.2	1-AAPOAR	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. The format is <code>yyyy-MM-dd HH:mm:ss z</code> .
3.0.2	1-A9NV7E	Bind variables were not supported in the <code>limit</code> clause of a query.

Closed in Release	Defect #	Summary
3.0.2	1-9VVKP5	With Oracle 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.
3.0.2	1-AJ0M8U	<p>When used with Websphere MQ version 7, BusinessEvents did not work with the "Shared Queues and Threads" or "Workers Threads" options for the input destinations Workers field in the BAR resource. Now it works with those settings when object management (OM) type is Cache or In Memory and the input destination resource AckMode field is set to AUTO-ACKNOWLEDGE.</p> <p>Note the following limitations when MQ Version 7 is used:</p> <ul style="list-style-type: none"> When OM type is Cache or In Memory and when AckMode is set to <code>CLIENT_ACKNOWLEDGE</code>, or <code>DUPS_OK_ACKNOWLEDGE</code>, the Workers field must be set to Caller's thread. When OM type is Persistence, the input destination resource AckMode field must be set to AUTO-ACKNOWLEDGE for all Workers field options. This could potentially cause message loss if the BusinessEvents engine fails before a checkpoint occurs.
3.0.2	1-AIWG8E	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.
3.0.2	1-AIBSRH	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.

Closed in Release	Defect #	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	Defect #	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	Defect #	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 extended property called Reverse Ref has been added. It enables you to disable the reverse references. Add the new extended property to relevant ConceptReference properties and set it to false. The default value is true. If you use this property, you must explicitly remove ConceptReference properties for deleted referenced concepts in the referring concept in your code.</p> <p>For example, if <code>employee</code> is a ConceptReference 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> ConceptReference 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 BusinessEvents 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 BusinessEvents TEMP tablespace usage grew rapidly and was not released.
3.0.2	1-AEJTVE	This issue was introduced in BusinessEvents 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, BusinessEvents threw a null pointer exception.

Closed in Release	Defect #	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>
3.0.2	1-AAZBH1	<p>In the query language, bind variables could not be used in an <code>IN</code> clause.</p>
3.0.2	1-AAIKDF	<p>It was not possible to migrate data from an Oracle-only backing store to a JDBC backing store. A utility is now provided. See Migrating Data to a JDBC Backing Store (CR 1-AAIKDF) on page 93.</p>
3.0.2	1-AAIKCW	<p>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 Updating an Existing JDBC Backing Store Schema (CR 1-AAIKCW) on page 97.</p>

Closed in Release	Defect #	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-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-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-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	1-9RH8LB 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> <p>Note See 1-AJ00L8 for related details.</p>

Closed in Release	Defect #	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>
3.0.2	1-AAMKZ4	<p>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 section Profiler Header Changes (CR 1-AAMKZ4) on page 84 for full details.</p>
3.0.2	1-AAB80H	<p>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.</p>
3.0.2	1-A9V156	<p>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.</p>
3.0.2	1-A9837Y	<p>The tooltip for the <code>System.ID.remove()</code> function signature was wrong.</p>
3.0.2	1-A8901H	<p>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.</p>

Closed in Release	Defect #	Summary
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-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.
3.0.2	1-A629WH	The tooltip for the <code>System.ID.reset()</code> function signature was wrong.
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).
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>
3.0.2	1-A71E53	To better analyze issues while interacting with Oracle DBMS, the following new trace roles now can be configured for tracking SQL statements that are executed: <code>orclLv1Role</code> , <code>orclLv2Role</code> Use them along with the existing trace roles in the <code>be.trace.roles</code> parameter in the default TRA file.
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> .

Closed in Release	Defect #	Summary
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-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-A5JJOZ	The file xxx_IOT.sql is no longer generated. it is not used by BusinessEvents.
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-A5EI6N	Entity string properties longer than 65K characters would cause a serialization exception when a cache server exited or joined the cluster.

Closed in Release	Defect #	Summary
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 TIBCO BusinessEvents User Guide Chapter 7 Working with Database Concepts > 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-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>
3.0.2	1-A10RCO	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.
3.0.2	1-9XXSAA	Inference Agents freeze under certain conditions, after hot deployment, while running in multi-engine mode.

Closed in Release	Defect #	Summary
3.0.2	1-A39JW4	<p>On restarting the first cache server in a deployment, preloading was taking too long, because of a multi-site deployment check. For single-site deployments, you can now disable this check. To do so add the following property to all TRA files and set the value to false (the default value is true):</p> <pre>be.engine.cluster.multisite=false</pre>
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 new property:</p> <pre>be.dbconcepts.dburi.query.reuseRefs true</pre>
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.oracle.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>
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>
3.0.2	1-A0JYEW	<p><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)</p>

Closed in Release	Defect #	Summary
3.0.2	1-A06G9K	Deleting an object and then calling <code>getByExtId()</code> with the deleted object's <code>extId</code> would throw a duplicate <code>extId</code> exception.
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 Setting Up a JDBC Backing Store (CR 1-A02WRF) on page 86 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	1-9DLMD9	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.)
3.0.2	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	1-9Y5KN4	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 <code>#time</code> .
3.0.2	1-9XYARG	Under some conditions, a <code>NullPointerException</code> was thrown when starting an inference agent.

Closed in Release	Defect #	Summary
3.0.2	1-9XYAQT	Catalog functions from the Date category were causing errors when used in OQL queries.
3.0.2	1-9XQXWN	Catalog functions <code>Channel.getAllDestinations()</code> and <code>Channel.getSuspendedDestinations()</code> were added to handle certain migration issues.
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	1-9XQXTY	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	1-9NTMQB	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.
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	1-9RZ4BX	It was taking a long time to load cache data into the backing store. Recovery times have been improved.
3.0.2	1-9TWAR6	The Cache <code>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.

Closed in Release	Defect #	Summary
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 <i>RMS_Project/deployment</i> . (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 FROM 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	1-9QEKPU	Fields in nested Rendezvous messages were not accessible using XPath functions.
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.
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	1-9RJ9E	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	1-9RH46E	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	Defect #	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	1-9QAEXL	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	1-9NK26X	With In Memory object management, <code>REGISTRATION.COLLISION</code> RVCN advisory messages were thrown when RVCN transport was used for <code>BusinessEvents</code> channels.

Closed in Release	Defect #	Summary
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	1-9LFW74	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.
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.
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>
3.0.2	1-98Z4YO	BusinessEvents did not set the client identity certificate defined in a JMS Shared Resource.
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>
3.0.2	1-9LC1ZQ	Continuous queries did not process newly modified entities properly.

Closed in Release	Defect #	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	1-9LC1YT	<p>With Cache object management, the scheduler created by one engine was not visible in another engine.</p>
3.0.2	1-9KBBCB	<p>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.</p>
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>

Closed in Release	Defect #	Summary
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>
3.0.2	1-9GHUIM	With Persistence object management, events sent from BusinessEvents did not contain expected properties.
3.0.2	1-9LYIYP	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.
3.0.2	1-9M1IOH	With Cache object management, when the property <code>be.engine.cluster.multiEngineOn</code> was set to false, state machine states did not time out.
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.

Closed in Release	Defect #	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>

Closed in Release	Defect #	Summary
3.0.2	1-9M28SW	<p>REGISTRATION.COLLISION RVCN advisory message es 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> <p>%%EngineName%% %%ChannelName%% %%ChannelURI%%</p> <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>

Closed in Release	Defect #	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.
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	Defect #	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	1-9GEI76	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.
3.0.1	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	Defect #	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>
3.0.1	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>
3.0.1	1-97YTTY	<p>This issue arose in 2.x style fault tolerance (now used for in memory object management only). When running multiple 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>
3.0.1	1-97QJDJ	<p>When running in cache mode, it was possible for multiple objects using the same id to block on calls to acquire a lock.</p>
3.0.1	1-97G8N0	<p>In 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.</p>
3.0.1	1-97AXET	<p>Engines were unable to reconnect to the backing store database when a lost connection was restored.</p>

Closed in Release	Defect #	Summary
3.0.1	1-975GHR	In 2.x style fault tolerance (now used for in memory object management only) 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 BusinessEvents engine.
3.0.1	1-96M3M9	The ActiveMatrix BusinessWorks tester would hang when you loaded two ActiveMatrix BusinessWorks processes each with a 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.
3.0.1	1-96GHE6	The BusinessEvents engine was freezing under moderate loads.
3.0.1	1-950FB2	When shutting down BusinessEvents inference engines, the inference engines threw a null pointer exception.
3.0.1	1-94ZYAT	BusinessEvents Engines showed intermittent memory issues and loss of events.
3.0.1	1-94ZY9P	BusinessEvents inference engines were hanging after processing for some time.

Closed in Release	Defect #	Summary
3.0.0	1-9148Q5	This issue could occur when generating a schema for a backing store. When creating SQL scripts, 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, BusinessEvents gave a namespace error, expected namespace: "null"</p> <p>Now 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.
3.0.0	1-8XV096	<p>ActiveMatrix BusinessWorks processes with process starters, running inside a BusinessEvents container, could use up the number of threads defined by <code>Engine.ThreadCount</code> for the <code>InvokeRuleFunction</code> activity, when 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 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.

Closed in Release	Defect #	Summary
3.0.0	1-8SKE1F	<p>When an event payload data namespace was not confined to the payload schema, BusinessEvents threw an exception but left the message on the JMS queue.</p> <p>BusinessEvents now asserts an AdvisoryEvent for such an event, creates the event without the payload (<code>event@payload=null</code>), and acknowledges the message.</p>
3.0.0	1-8EOPYL	The name of the compilation directory used when building the EAR is now different for each build to avoid collisions on UNIX systems.
3.0.0	1-89JBT1	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	<p>The BusinessEvents engine failed with the following message while trying to confirm the first message it receives if there is no pre-registered listener.</p> <p>Error [Tibrv_Dispatcher] - TibrvException[error=27,message=Not permitted]</p>
3.0.1	1-73T8N1	BusinessEvents could not connect to EMS Using SSL.
2.2.0	1-8MWPJF	SendEvent activities failed when the JMS message body was null.
2.2.0	1-8MTDNA	When the backing store database was down, the cache server continued to function as in-memory cache. However when the database came up again, the cache server did not recover the connection automatically and required restart of the cache server process.
2.2.0	1-8MEYGH	Sometimes, when the engine was stopped using Control-C, a runtime exception was thrown.
2.2.0	1-8K00FN	<p>Requests to remove entities from the backing store were not re-queued if initial delete attempt failed due to database connection-related problems.</p> <p>Fixed by addition of a "redo log" feature. See <i>TIBCO BusinessEvents User's Guide</i> for details.</p>
2.2.0	1-8JL672	The start-up rule function in a BusinessEvents engine configured for fault tolerance was called when an engine became the primary.

Closed in Release	Defect #	Summary
2.2.0	1-8JKW8V	The cache loader did not properly handle some start-up exceptions which could result in cache data inconsistencies.
2.2.0	1-8JKW6V	The BusinessEvents engine began processing before the cache loader had successfully completed the backing store recovery process.
2.2.0	1-8HZH9A	The Oracle-based backing store was not able to restore a database connection after the connection was broken.
2.2.0	1-8HZH8O	<p>Redundant attempts were made to restart JMS listeners if either of the following conditions were true:</p> <ul style="list-style-type: none"> • There was a topic subscriber. Result was the engine received multiple restart messages after a successful reconnect. • There were durable subscribers. Result was the engine failed to re-create the durable subscriber.
2.2.0	1-8HZH81	When running in fault tolerant mode and upon system restart, the JMS listeners for the primary and secondary engines both started (instead of only the primary's listeners).
2.2.0	1-8HM3KQ	Child events were not appropriately inheriting their default destination from parent events.
2.2.0	1-8GBLKJ	BE deployment instance's status is changed to "Running (out-of-synch)" in Admin after hot-deploying.
2.2.0	1-8BJS2C	The BusinessEvents engine was not retracting State Timeout Events when the associated states or state machines exited or ended. This issue was causing a "leakage" of unneeded State Timeout Events.
2.2.0	1-8B993T	When a business events archive is created or copied and object management set to cache, TIBCO Designer did not validate the cache name for uniqueness.
2.2.0	1-85LNK0	JMSDeliveryMode, JMSExpiration, and JMSPriority values were ignored when a JMS message was sent from BusinessEvents. This has been fixed, and use of JMS header properties is now documented in <i>TIBCO BusinessEvents User's Guide</i> .
2.2.0	1-85CL96	BusinessEvents truncated the milliseconds in DateTime properties of events received from JMS destinations.

Closed in Release	Defect #	Summary
2.1.1	1-8ERPZ	A number of inconsistencies and typographic errors existed in the examples documents.
2.1.1	1-8DCFT6	The <code>be-dbutils</code> utility <code>load</code> command would hang if the project had a statemachine.
2.1.1	1-8DCFQH	The name of the log file for the <code>be-dbutils</code> utility has changed from <code>DbUtil.log</code> to <code>be-dbutils.log</code> .
2.1.1	1-8D9U6T	The <code>be-dbutils</code> utility <code>load</code> command recovered the string properties for concepts and events as null from the database.
2.1.1	1-8CKH2J	When starting the ActiveMatrix BusinessWorks engine, an exception was thrown if the ActiveMatrix BusinessWorks configuration enabled BusinessEvents hot deployment.
2.1.1	1-8CK6OL	Fixed an error that prevented the EAR file from building in projects that contained state machine inheritance.
2.1.1	1-8CG3HZ	If a state within a state machine had a timeout value, a <code>ClassCastException</code> was thrown when the timeout occurred.
2.1.1	1-8CD7P6	In BusinessEvents 2.0 and 2.1, the operation <code>Event.getDestinationURI</code> returned the default destination. It now returns the destination URI on which an event was received.
2.1.1	1-8C5MMZ	When you selected the "Include all service level global variables" option before building the EAR, global variables (whose Service flag is set) were not included in the archive.
2.1.1	1-8C5BMX	Renaming a folder containing BusinessEvents event and channel resources caused a null pointer exception.
2.1.1	1-8C38OS	BusinessEvents engine state remained at "Starting Up" when running BusinessEvents in the built-in fault tolerance mode.
2.1.1	1-8C2MUH	The TIBCO ActiveMatrix BusinessWorks tester feature in TIBCO Designer was waiting indefinitely. It now stops properly.
2.1.1	1-8BVU8D	When a user tried to start the BusinessEvents engine without specifying a valid EAR file, the engine would start but then stopped responding.

Closed in Release	Defect #	Summary
2.1.1	1-8BMFG9	When using API mode, the engine was locking after a <code>RuleServiceProvider.configure()</code> function call.
2.1.1	1-87OJN5	During migration of data from BusinessEvents 1.4 to BusinessEvents 2.1, be-engine failed to recover state machines.
2.1.1	1-87OJEM	While migrating BusinessEvents 1.4 to 2.1, running be-dbutils load command, produced <code>java.lang.IllegalArgumentException</code> at: <code>com.tibco.xml.data.primitive.values.XsDateTime.compile(XsDateTime.java:180)</code>
2.1.1	1-87DG3G	After repeatedly performing hot deployment within a short time window, a <code>java.lang.ClassCastException</code> was thrown.
2.1.1	1-863JFP	In projects containing state machine inheritance, EAR files failed to build and threw a Java runtime exception.
2.1.0	1-83LJU5	<code>CallStateMachine</code> was not invoked on re-entry.
2.1.0	1-7ZP9FF	Events that were the result of creating or deleting a concept or event instance were not processed for rules triggered via a preprocessor function.
2.1.0	1-7ZP5FY	Simple events that were configured with a time-to-live of -1 (that is, the events did not expire) were not appropriately recovered from the secondary server to the primary server during the primary server recovery process.
2.1.0	1-7Z9VXQ	Only a rule session's first rule was fired when running in the context of the Rule Debugger.
2.1.0	1-7YQP7H	Time events were only triggered a single time (that is, not repetitively) when running within the context of the Rule Debugger.
2.1.0	1-7Y9R2W	A failover problem was encountered when running a cluster of BusinessEvents servers if multiple BusinessEvents archives were hosted by the same BusinessEvents server.
2.1.0	1-7XV0UP	Deployment in TIBCO Administrator with local transport failed.

Closed in Release	Defect #	Summary
2.1.0	1-7XISEB	<p>When using Rendezvous certified message delivery (RVCM) as the message transport, the Send Event activity encountered the following error:</p> <p>[BW-Plugin] BEBW001 Channel Initialized but not started. Queuing message for later delivery</p>
2.1.0	1-7WUMX7	Archives containing long file names would not build due to the Windows 256 character limit.
2.1.0	1-7WSXUI	The backup BusinessEvents server did not execute the start-up function upon becoming the primary server.
2.1.0	1-7WPL9R	<p>BusinessEvents projects saved to TIBCO XML Canon™ threw the following exception:</p> <p>java.io.IOException: The filename, directory name, or volume label syntax is incorrect.</p>
2.1.0	1-7V9QQR	<p>Existing TIBCO Hawk microagent methods did not return engine memory usage as integer values. Therefore calculations on the information were not possible.</p> <p>The microagent method <code>getMemoryUsage()</code> now returns integer variables that provide the following information: maximum memory size of the JVM; estimate of the free memory available to the JVM; estimate of the memory used in the JVM; and estimate of the percentage of max memory used.</p>
2.1.0	1-7V7RD4	If a non-BusinessEvents service archive resource (such as a PAR resource) was placed before a BusinessEvents archive resource (BAR) in the EAR resource in TIBCO Designer, then the Receive Event activity threw exceptions during ActiveMatrix BusinessWorks initialization.
2.1.0	1-7V7RBD	<p>In an EAR resource, the first archive resource was always the shared archive resource. If the service archive resource following the shared archive resource was a non-BusinessEvents archive, for example, a process archive, then the generated EAR file contained no BAR file.</p> <p>The order of service archives of different types now no longer affects correct building of the EAR file.</p>
2.1.0	1-7V7NKT	BusinessEvents was not reporting status of hot deployment.

Closed in Release	Defect #	Summary
2.1.0	1-7V728G	The Send Event activity created new connections after reconnecting to a JMS channel, but did not close the old connections.
2.1.0	1-7V2AOR	Rule Analyzer would not open projects that leverage custom functions if the JAR file for the custom functions was not in the CLASSPATH.
2.1.0	1-7V25JR	An exception was thrown when an event with a null <code>DateTime</code> or <code>String</code> property type to was sent to the Receive Event or Wait for Event activities (available on the BusinessEvents Activities palette).
2.1.0	1-7UUD02	TIBCO Administrator showed an invalid running state (Starting) for members of fault tolerance groups. States such as Running and Stand By now display as appropriate.
2.1.0	1-7UOSM7	<code>Engine.sessionName()</code> returned engine name instead of archive name.
2.1.0	1-7UGVSM	Performing a hot deploy on a primary and secondary server at the same time failed. This is because hot deployment must be performed on secondary servers first. This procedure is documented in <i>TTIBCO BusinessEvents User's Guide</i> .
2.0.0	1-5D617V	The Integer type value in event payload sometimes converted into a double type when the event was sent to another application such as TIBCO ActiveMatrix BusinessWorks JMS Queue Receiver.
2.0.0	1-3K7A8P	The BusinessEvents engine did not recover when the JMS server was restarted. The BusinessEvents engine now recovers.
1.4.0	1-78AHJM	When the <code>Event.routeTo</code> function tried to send an event from a project's startup action, the software dropped the message.
1.4.0	1-787MRP	The utility, <code>be-dbutils</code> , was not working for properties that have a history size of zero.
1.4.0	1-77ZFA0	The dump option of <code>be-dbutils</code> was not working correctly for concepts with state machines. The utility attempted to insert too many values per table row.
1.4.0	1-77TWHI	BusinessEvents engine failed to recover from <code>NullPointerException</code> in condition evaluation. It now catches and logs the exception.

Closed in Release	Defect #	Summary
1.4.0	1-77RICN	The software sometimes updated instances faster than it was able to populate the history buffer for the instances, resulting in lost history values.
1.4.0	1-77RIAU	The minOverTimeDouble function was returning zero even though there were values greater than zero in the history buffer. The minOverTimeDouble function now returns the correct value.
1.4.0	1-77RI9W	There was a problem with the history ring buffer that occurred when the software inserted an older value into a history buffer that was not full. In this case, if the inserted value was older than the oldest stored value, the software filled the empty indexes with zeros. Now BusinessEvents inserts the older value into the history buffer and leaves the empty indexes empty.
1.4.0	1-77RI8T	There was a problem with duplicate history values when setting the value of an instance using the Instance.PropertyAtom.setDouble function. The software created the instance with the proper history size, but populated all history fields with the set value. BusinessEvents now populates only the first history field with the set value and leaves the others empty until the value of the instance is updated.
1.4.0	1-77LYLV	The software was not populating client ID with the value specified in the JMS connection resource.
1.4.0	1-77BAN5	Deleting and then recreating an instance with the same external ID in one rule resulted in a KEYEXIST error from the database.
1.4.0	1-73TEGR	When two destinations on two different JMS servers had the same name, all messages were routed to only one of the destinations. Now, even if the destinations have the same name, BusinessEvents routes the messages properly.
1.4.0	1-734UGV	The software did not allow users to disable trace roles for BusinessEvents activities running on TIBCO ActiveMatrix BusinessWorks. Users can now disable trace roles from the ActiveMatrix BusinessWorks configuration.
1.4.0	1-72STNH	The software was allowing multiple concept instances to be created with the same external ID, resulting in a KEYEXIST error from the database.

Closed in Release	Defect #	Summary
1.4.0	1-72S80D	During runtime, if a concept instance was deleted and recreated with the same external id before the database checkpoint occurred, the database returned a KEYEXIST error.
1.4.0	1-71ZUHL	The BusinessEvents server returned an exception when running a new archive with JRE 1.5.
1.4.0	1-6Y1109	The software always used milliseconds as the unit for statemachine timeouts even if the user selected a different unit, for example, seconds or hours. BusinessEvents now uses the unit selected by the user.
1.3.0	1-70AFSL	The engine sometimes threw a NullPointerException while recovering from the persistence database.
1.3.0	1-707UY7	There is no easy way to get the timestamp in a property's history values based on the history index. This release includes a function for this purpose.
1.3.0	1-707UW1	Even if the send failed, sendEvent and routeTo functions returned the event sent.
1.3.0	1-6Y1109	The software was ignoring the timeout units of the main state machine. (Enterprise Edition only.)
1.3.0	1-6T0JA7	The Server Settings tab was missing in Administrator when deploying a BusinessEvents project.
1.2.1	1-6NPN6K	Instance.StateMachine.getCurrentStatePaths did not return current states path.
1.2.0	1-4TV02R	-p, -property, /p, and /property were not taken.
1.2.0	1-3IJK26	After deploying a BusinessEvents Service Instance and restarting TIBCO Administrator and TIBCO Hawk Service, the BusinessEvents Service Instance state was shown as Unknown. The issue was due to a known bug in TIBCO Hawk 4.5.
1.2.0	1-3DEXE9	With more than one instance of TIBCO Designer with BusinessEvents running simultaneously, further operations created an out-of-memory situation that sometimes resulted in an out-of-resources situation.

Closed in Release	Defect #	Summary
1.1.0	1-3J5X3D	<p>TIBCO BusinessEvents could not coexist on the same machine as TIBCO ActiveMatrix BusinessWorks Workflow.</p> <p>TIBCO BusinessEvents version 1.1.0 will work with TIBCO ActiveMatrix BusinessWorks Collaborator version 5.2.0, which replaced TIBCO ActiveMatrix BusinessWorks Workflow.</p>
1.1.0	1-3F808E	<p>When viewing state machine diagrams in two projects, one after the other, the wrong state machine diagram sometimes appeared.</p>

Known Issues for TIBCO BusinessEvents

The table in this section lists known issues in this release for TIBCO BusinessEvents, excluding issues for the Decision Manager and Rule Manager Server components. See [Known Issues for Decision Manager on page 80](#) for issues relating to those components.

Defect #	Summary/Workaround
1-AQSSJF	<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>
1-A3OFBZ	<p>Summary Microsoft SQL Server 2005 <code>datetime</code> data type does not support years before 1753. Because of this, if your application generates dates prior to 1753, you'll receive errors while running BusinessEvents.</p> <p>Workaround Microsoft SQL Server 2008 has added a new data type, <code>datetime2</code>, which has a date range of 0001/01/01 through 9999/12/31. Therefore, if you are using Microsoft SQL Server 2008, then you can manually change the generated SQL script (DDL) for your backing store, and replace any affected columns' data type from <code>datetime</code> to <code>datetime2</code>.</p>
1-A3OFA9	<p>Summary With an SQL Server backing store, deadlock can occur if multiple rules attempt to update one scorecard at the same time, and at high frequency.</p> <p>Workaround Drop the index on the database table for the scorecard. A scorecard has one index. The index name format is <code>i_d_scorecard</code>. For example, if the scorecard name is <code>foo</code>, the index name is <code>i_d_foo</code>.</p>
1-9CDYRL	<p>Summary Starting with the 3.0 release, the BusinessEvents API works only with In Memory object management. (It does not work with Persistence or Cache object management).</p> <p>Workaround None.</p>

Defect #	Summary/Workaround
1-996AVQ	<p>Summary BusinessEvents adds pretty print (formatting) characters to the XML data which is received from, sent from, or sent by an event.</p> <p>Workaround None. This is a harmless condition.</p>
1-97SSVS	<p>Summary With in-process BusinessEvents-ActiveMatrix BusinessWorks integration, when ActiveMatrix BusinessWorks is running inside a BusinessEvents container that is in fault tolerance mode, Invoke <code>RuleFunction</code> activity may cause an exception when the primary BusinessEvents engine restarts.</p> <p>Workaround Set the <code>Agent.AgentGroupName.priority</code> property to the same value in all nodes where members of the agent group are deployed.</p>
1-97NO7E	<p>Summary In step mode, Rule Debugger should pause after each rule executes but it does not. Rules execute without pause.</p> <p>Workaround None.</p>
1-945NL1	<p>Summary Rule Debugger does not show some rules that the console shows were executed.</p> <p>Workaround None.</p>
1-93CE6B	<p>Summary In TIBCO Designer, When you rename a folder that contains concepts the project fails validation.</p> <p>Workaround Create a new folder and move contents to that folder.</p>
1-93CDZ9	<p>Summary TIBCO Designer UI validation does not prevent you from naming a folder using a reserved word. For example, you can name the folder concept or event. However, when you validate the project an error is returned.</p> <p>Workaround None. Refer to the list of reserved words in <i>TIBCO BusinessEvents Language Reference</i> and avoid using them.</p>
1-934QK1	<p>Summary TIBCO BusinessEvents Rule Debugger does not update the contents of the console window automatically. Check and uncheck Show Console from the View menu to see the changes.</p> <p>Workaround To update the contents of the console window, in the View menu, check and uncheck the Show Console option.</p>

Defect #	Summary/Workaround
1-91OKM5	<p>Summary The profiler utility does not write data when stopped using <code>Engine.Profiler.stopCollecting()</code> or <code>stopFileBasedProfiler()</code> Hawk method or by stopping the engine. It writes data only at the end of the duration period.</p> <p>Workaround Specify a valid duration period in seconds when setting BusinessEvents properties, calling <code>Engine.Profiler.startCollectingToFile()</code> function, or invoking <code>startFileBasedProfiler()</code> Hawk method.</p>
1-919P9B	<p>Summary You cannot assign a <code>DateTime</code> 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>
1-919P89	<p>Summary The <code>@length</code> attribute of arrays does not work in queries.</p> <p>Workaround Write and use a rule function to return the length of the array.</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 <code>DateTime</code>, pass a long instead of a <code>DateTime</code> and use: <code>/#Datetime/parseLong(\$x)</code>
1-8ZU5H1	<p>Summary It is not possible to define service level custom BusinessEvents engine properties in the TIBCO Administrator user interface.</p> <p>Workaround None.</p>
1-8YQ76V	<p>Summary When multiple BusinessEvents projects are opened in TIBCO Designer and you switch between the open projects, you will notice the ontology functions are all from the same project.</p> <p>Workaround Run multiple instances of TIBCO Designer, instead of one instance.</p>

Defect #	Summary/Workaround
1-8YHHBD	<p>Summary When ActiveMatrix BusinessWorks is contained within 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>
1-8XV0AL	<p>Summary When using the BusinessEvents API, the reset method throws an NPE when scorecards are used in conditions or actions.</p> <p>Workaround This is harmless. Ignore the exception.</p>
1-8PV58A	<p>Summary Multiple BusinessEvents instances on one machine cannot use the same db store directory.</p> <p>Workaround Use different directories or use the migration feature provided in version 3.0 to eliminate this problem</p>
1-8KONZI	<p>Summary In BusinessEvents 2.0 and higher, the <code>getScoreCard()</code> TIBCO Hawk method returns only the first row of the table. The first row is the internal Id of the scorecard. (The same method in version 1.4 returns tabular data of all attributes and properties of the specified scorecard.)</p> <p>Workaround Use the <code>getInstance()</code> method instead.</p>
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>
1-8K7EKA	<p>Summary When using an RVC channel, a TimeEvent may fire before the RVC channel starts. When the rule triggered by the TimeEvent then sends an event through the RVC channel, a <code>NullPointerException</code> results.</p> <p>Workaround None.</p>
1-8JHMZF	<p>Summary It is not possible to copy a folder containing events or channels or both.</p> <p>Workaround Before copying the folder, select one of the events or channels at least one time. Then you can copy successfully.</p>

Defect #	Summary/Workaround
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>
1-86T1B5	<p>Summary When you copy a destination it loses the default event and queue name that was set in the original destination.</p> <p>Workaround Set the values manually.</p>
1-86QOZR	<p>Summary Using <code>sendEvent()</code> to send an event to an IBM MQ JMS server fails.</p> <p>Workaround Create two JMS Connection resources and create separate JMS channels for sending and receiving.</p>
1-86D6X7	<p>Summary An error occurs when configuring events as follows: Create an event, <code>event1</code>, with a payload. Then delete the payload. Create a new event, <code>event2</code>, that inherits from <code>event1</code>. Set a payload on <code>event2</code>. Then delete <code>event2</code>. After this, you cannot add a payload to <code>event1</code>.</p> <p>Workaround None.</p>
1-81AYU0	<p>Summary Fault tolerance does not work correctly with RVCM transport</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-BusinessEvents resources, specifically JMS or Rendezvous connection resources.</p> <p>Workaround If you need to change these resources, you must restart the 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>

Defect #	Summary/Workaround
1-6GC7KP	<p>Summary The pop-up auto-complete feature does not work in the following cases:</p> <ul style="list-style-type: none"> Use of @length with a local array variable Use of dot (.) or at sign(@) after a local variable array or property array index element ([]) when the return type is a concept or event Use of dot (.) or at sign(@) after a nested function when the return type is a concept or event <p>Workaround Type it manually or assign the returned concept instance or even instance to a local variable before using the dot(.) or at sign (@).</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>
1-4HUI9A	<p>Summary Entity Path in <code>Event.createEvent</code> mapper is not updated when Event's named is changed, and validation/EAR building do not detect this error.</p> <p>Workaround Update the path in the mapper manually.</p>
1-2XLKHJ	<p>Summary When using a mapper function, for example, <code>createInstance</code>, if there is an error in the function argument mapping input, the function does not change to red to indicate an error.</p> <p>Workaround None.</p>

Closed Issues for Decision Manager

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

The table in this section lists issues that were closed in the named releases for the Decision Manager component of TIBCO BusinessEvents, including Rule Manager Server (RMS) issues. For BusinessEvents closed issues, see [Closed Issues for TIBCO BusinessEvents on page 34](#).

Closed in Release	Defect #	Summary
3.0.1	1-9F0HTL	If File->Export failed, a NullPointerException was shown on the Console.
3.0.1	1-91LG2E	In the Decision Manager application, the custom functions view was sometimes blank even if you had defined your own custom functions.
3.0.1	1-91LG0J	If you used drag-and-drop to move custom functions from the view to your decision table, the text automatically added to your cell was incorrect.
3.0.1	1-91KKUL	When you were logged out from Rules Management Server, you could not deploy decision tables for local testing.
3.0.1	1-91G13V	Activating focus in a cell of a saved decision table caused the editor to show that it needed to be saved.
3.0.1	1-91EK1Z	In some cases, security validation error messages were shown on the Console view instead of the Problems view.
3.0.1	1-91C72P	By default, the Rules Management Server keeps its repository in the C:/bdb directory. There was no configuration property for changing this location. Now you can specify a different location using the following property: <code>tibco.clientVar.RMS/StorageLocation</code> .
3.0.1	1-917PVA	If you deleted a decision table and committed the project, and then the Rule Administrator approved the project, the deleted decision table class files still existed on the Rules Management Server.

Closed in Release	Defect #	Summary
3.0.1	1-9148GN	With LDAP authentication, you could not log in to Rules Management Server if you had no password in the LDAP directory used as the authentication system by the server. Now you can login if the username is correct and you either omit the password or provide a correct password. (However if password is not correct authentication fails.)
3.0.1	1-8ZH7X9	In the Decision Manager Test Data, if you switched from one resource (such as a concept or event) to another without testing any test data changes you may have made, those changes were lost.
3.0.1	1-8ZH4Y1	When you checked out a decision project from the Rules Management Server, you saw a harmless exception on the Rules Management Server console: <code>java.lang.RuntimeException: encoded string too long: 162342</code> . (The actual number depended on the size of the data being sent).
3.0.1	1-8ZBW0P	There was no option available to rename a decision table. Now you can right click on a table to rename it.
3.0.1	1-8YSMDG	Effective and expiration dates in decision tables were not validated to ensure they are in the correct format.
3.0.1	1-8SAB39	For the Test Data component of Decision Manager, you could not specify a file that contains the XML payload of event instances.

Known Issues for Decision Manager

The table in this section lists known issues for the Decision Manager component of TIBCO BusinessEvents, including Rule Manager Server (RMS) issues. For BusinessEvents issues, see [Known Issues for TIBCO BusinessEvents on page 72](#).

Defect #	Summary/Workaround
1-9EZWN6	<p>Summary If a VRF consists only of primitive data types, you cannot drag and drop them onto the decision table or exception table.</p> <p>Workaround None.</p>
1-9EO0HU	<p>Summary Non-contiguous multiple-row deletion is not supported in decision tables.</p> <p>Workaround Delete the rows individually.</p>
1-9DWNBX	<p>Summary After checking out a decision table created in BusinessEvents version 3.0 or earlier, you cannot immediately export the decision table.</p> <p>Workaround First open the decision table in the Decision Manager editor. This action convert the decision table to the current format. This step is also documented in the migration chapter in <i>TIBCO BusinessEvents Installation</i>.</p>
1-97WE6X	<p>Summary If users commit two decision tables with the same name but for different virtual rule functions, only one implementing is shown for both decision tables after checkout.</p> <p>Workaround Don't use the same name for different tables that are in the same folder, even if they implement different VRFs.</p>
1-93M4OG	<p>Summary Projects that fail validation can be checked in.</p> <p>Workaround None. Such projects are allowed to be checked in so others can check them out and continue to work on them.</p>
1-91ERE8	<p>Summary The Test Data view does not have an "extID" column for you to specify the external ID of the concept or event.</p> <p>Workaround Use a custom property or ID if you need to reference your test data instances.</p>
1-91EJZI	<p>Summary When a project is approved by the Rule Administrator, options to Reject or Rework are still available even though these actions no longer have any effect. Once you approve a project, it cannot be retracted.</p> <p>Workaround After approving a decision project, do not reject or rework the project.</p>

Defect #	Summary/Workaround
1-916LZS	<p>Summary When a new row is added to a decision table, the table automatically sorts by the first column.</p> <p>Workaround None.</p>
1-90RST4	<p>Summary Vertical scrolling options are not available in decision table cells.</p> <p>Workaround None.</p>
1-90P6G6	<p>Summary In a decision table, you cannot specify actions only, without specifying at least one condition.</p> <p>Workaround Specify one custom condition and leave it blank if you want to have only actions in your decision table.</p>
1-90DB4I	<p>Summary If you add a certain number of condition columns to the decision table without adding any actions such that the width of all columns exceeds the maximum width of the application window, you cannot add any more action columns to the table.</p> <p>Workaround Add a minimum of one action column before adding several condition columns.</p>
1-904TOG	<p>Summary When a decision project is open in Decision Manager, and you open another project, Decision Manager does not give notification that it will close the prior project. (If the project requires saving, however, Decision Manager prompts you to save the project.)</p> <p>Workaround Close the old project first.</p> <p style="text-align: right;">Adobe FrameMaker 9.Ink</p>
1-8ZMN3Z	<p>Summary SSL-based HTTP communication between the Decision Manager application and the Rules Management Server is not supported.</p> <p>Workaround Use the communication in a firewall environment.</p>

Appendix A **Documentation for Fixed Issues**

Some fixed issues in this release require additional documentation, provided in this appendix.

Topics

- [Profiler Header Changes \(CR 1-AAMKZ4\), page 84](#)
- [Setting Up a JDBC Backing Store \(CR 1-A02WRF\), page 86](#)
- [Migrating Data to a JDBC Backing Store \(CR 1-AAIKDF\), page 93](#)
- [Updating an Existing JDBC Backing Store Schema \(CR 1-AAIKCW\), page 97](#)

Profiler Header Changes (CR 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. The following table provides the old and new names, followed by a brief description.

Table 2 BusinessEvents Profiler Header Name Changes

Old Name	Current Name
NumSuccess	NumEvalTrue
Total number of times the join condition evaluates to true. This value is the sum of NumEvalTruePropagatedLeft and NumEvalTruePropagatedRight.	
NumLeftSearch	NumEvalPropagatedLeft
Number of times the join condition evaluation is triggered by object assertion propagated from the left side of the condition.	
NumSuccessLeftSearch	NumEvalTruePropagatedLeft
Number of times the join condition evaluates to true and evaluation is triggered by object assertion propagated from the left side of the condition.	
AvgSuccessLeftSearchRate	AvgRateEvalTruePropagatedLeft
Average rate that the condition evaluates to true and evaluation is triggered by object assertion propagated from the left side of the condition.	
MaxNumLeftSuccessSearch	MaxNumEvalTruePropagatedLeft
Maximum number of times the join condition evaluates to true and evaluation is triggered by object assertion propagated from the left side of the condition.	
MinNumLeftSuccessSearch	MinNumEvalTruePropagatedLeft
Minimum number of times the join condition evaluate to true and evaluation is triggered by object assertion propagated from the left side of the condition.	

Table 2 BusinessEvents Profiler Header Name Changes (Cont'd)

Old Name	Current Name
NumRightSearch	NumEvalPropagatedRight
Number of times the join condition evaluation is triggered by object assertion propagated from the right side of the condition.	
NumSuccessRightSearch	NumEvalTruePropagatedRight
Number of times the join condition evaluates to true and evaluation is triggered by object assertion propagated from the right side of the condition.	
AvgSuccessRightSearchRate	AvgRateEvalTruePropagatedRight
Average rate that the condition evaluates to true and evaluation is triggered by object assertion propagated from the right side of the condition.	
MaxNumRightSuccessSearch	MaxNumEvalTruePropagatedRight
Maximum number of times the join condition evaluates to true and evaluation is triggered by object assertion propagated from the right side of the condition.	
MinNumRightSuccessSearch	MinNumEvalTruePropagatedRight
Minimum number of times the join condition evaluate to true and evaluation is triggered by object assertion propagated from the right side of the condition.	

Setting Up a JDBC Backing Store (CR 1-A02WRF)

Introduction

This section explains how to configure the JDBC Backing Store.

JDBC Backing Store is introduced in this release to address the issue that backing stores could not be used with SQL Server databases. JDBC Backing Store also works with Oracle in this release.

See [New Features, page 2](#) for supported DBMS products.



Notes

- When you install Microsoft SQL Server, select SQL Server authentication. (Do not select Windows Authentication.)
- A file is provided to handle key word errors. It is configured to handle an issue with BusinessEvents terms ("start" and "end") that are also reserved words in database products. Additional configuration should not be required. The filename is `dbkeywordmap.xml`.
- SQL Server Driver Version:
 - For JDK 5 you can use `sqljdbc.jar`.
 - For JDK 6, `sqljdbc4.jar` is required.
- The `datetime` datatype in SQL Server 2005 has the following range: 1/1/1753 to 12/31/9999 (see 1-A3OFBZ in [Known Issues for TIBCO BusinessEvents on page 72](#))

Task A Set up the JDBC Connection Resource. Build the EAR

In this task, you configure a JDBC Connection resource with details of the database you will create in [Task C](#), and build the EAR file.

After you have created the database, it's a good idea to open your project again and test the connection. If you need to make corrections to the connection, do so and rebuild the EAR before deploying the project.

(The EAR file you use when creating the database does not require the JDBC Connection resource to be present. Only ontology details are used by the script. You can create the JDBC connection resource after you create the database, if you prefer.)

1. Open your `designer.tra` file and add this property:

```
java.property.TIBCO_SECURITY_VENDOR=j2se
```

This property is required in order to test the connection to the SQL Server database server. Testing the connection is a feature of the JDBC Connection resource you will add in this task.

2. Open your TIBCO Designer project and add a JDBC Connection resource.
3. Set Connection Type to JDBC.
4. In the JDBC Driver field manually enter the SQL Server driver class name:

```
com.microsoft.sqlserver.jdbc.SQLServerDriver
```

 (For Oracle, select a format from the drop-down list and configure accordingly.)
5. In the Database URL field, enter the SQL Server URL following this format:

```
jdbc:sqlserver://hostname:port;databasename=database name
```

 For example:

```
jdbc:sqlserver://localhost:1433;databasename=be_user
```



For SQL Server 2008, make sure the TCP-IP Network Protocol is enabled

6. Add the JDBC Shared Resource as a resource in the Shared Archive (SAR) of the Enterprise Archive (EAR).
7. As needed, build an EAR file, for use in [Task C](#). You must have a valid EAR for your project, with up-to-date ontology definitions. Model information in the EAR will be used to build tables in the database.

Task B Prepare the TRA and Database Driver Files

1. Copy the JDBC driver files for your database to `BE_HOME/lib/ext`.
2. Open the `be-jdbcdeploy.tra` file for editing and specify which type of database you are using. The default value is `oracle`. Do not change the other configuration properties shown:

```
# BE base type schema file
java.property.jdbcdeploy.bootstrap.basetype.file %BE_HOME%/bin/base_types.xml
java.property.jdbcdeploy.bootstrap.keyword.file %BE_HOME%/bin/dbkeywordmap.xml
java.property.jdbcdeploy.database.type [oracle | sqlserver]
```

Also set the `be-jdbcdeploy.tra` environment variables to appropriate values, as needed.

Task C Run the Initialize Database Script as the System User

This script creates the BusinessEvents user and initializes the database.



Running the `initialize_databaseYourDBMS.sql` script deletes the user before creating it again. Running the `create_tables_YourDBMS.sql` drops all database tables before creating them again. This means you can run these scripts again during test phases of your project development, without having to take extra cleanup steps.

The first time you run the scripts, you see harmless error or warning messages because there is nothing to delete.

If you are updating the schema for an existing backing store, see [Updating an Existing JDBC Backing Store Schema \(CR 1-AAIKCW\)](#) on page 97.

1. As desired, change the default BusinessEvents user credentials: Open the `initialize_databaseYourDBMS.sql` script for editing and change the default username and password. The documentation uses the default username and password.
2. Navigate to the location of the scripts (by default in the `BE_HOME/bin` directory) and open an SQLPlus or OSQL prompt. (For example, open a command window, type SQLPlus then provide the system user credentials.)
3. For SQL Server, type a command like the following at the prompt:

```
osql -S Your-Server-Name -U system_user -P sys_user_password -n -i
initialize_database_sqlserver.sql
```

For Oracle you would use a command like this:

```
sqlplus system_user/sys_user_password@SID @ initialize_database_oracle.sql
```

This script creates the BusinessEvents database user. This user must be used to run the other scripts. You see messages like the following:

```
DROP USER be_user CASCADE
          *
ERROR at line 1:
ORA-01918: user 'BE_USER' does not exist

User created.
Grant succeeded.
SQL>
```



Using your database product, you can configure additional users to access the database, in addition to this user.

Task D Run the Create Tables Scripts as the BusinessEvents User

Next you log on as the BusinessEvents user, `be_user` by default and run a script to create non-project specific tables.

1. Navigate to the location of the scripts (by default in the `BE_HOME/bin` directory) and open an SQLPlus or OSQL prompt. (For example, open a command window, type SQLPlus then provide the system user credentials.)
2. For SQL Server, type a command like the following at the prompt:

```
osql -S Your-Server-Name -d Your-DB-Name -U be_user -P be_user123 -n -i
@create_tables_sqlserver.sql
```

For Oracle you would use a command like this:

```
sqlplus be_user/be_user@SID @ create_tables_oracle.sql
```

Use the credentials defined in the `initialize_database_oracle.sql` or `initialize_database_sqlserver.sql` files. By default those are: username `be_user`, with password `be_user` (Oracle) or `be_user123` (SQL Server).

Task E Generate the Project-Specific SQL Scripts

Open a command window and navigate to `BE_HOME/bin`. Run `be-jdbcdeploy.exe` using a command with the following format:

```
be-jdbcdeploy [-p property file] [-o schema output file] [EAR Path] [-h]
```

For example:

```
be-jdbcdeploy -o acme c:/BEProjects/MyEar.ear
```



In this release the `be-jdbcdeploy.tra` must be in the working directory. It is easiest therefore to run the executable in the `BE_HOME/bin` directory. If you need to execute `be-jdbcdeploy.exe` from a different directory, copy the `be-jdbcdeploy.tra` file to your working directory.

The generated scripts appear in the directory where you run the executable. For example, if you provide the schema output filename `acme`, you would see files called `acme.sql`, `acme.aliases`, and `acme_remove.sql`.

The user-defined part of the database schema is in the schema output file (`yourname.sql`) as schema definition commands. In [Task G](#) you run this script (together with provided scripts) to build the schema in the database.

The options are explained in the following table:

Option	Description
-p, /p, -property, or /property	Specifies a supplementary property file as needed. If not specified, the default property file is used, that is, <code>be-jdbcdeploy.tra</code> in the current directory.
-o	Specifies the schema output filename for deployment.
-h, /h, or /help	Displays help.

Task F Check the Aliases File and Modify Aliases as Desired

The aliases file contains any table names that are longer than the database maximum length for table names, and auto-generated short aliases for them. (For example, the Oracle limit is 30 characters, and the SQL Server limit is 128 characters.)

It’s a good idea to check the aliases file for entries, even if the BusinessEvents names are not very long. The length of the generated database table names is not easy to predict.

Optionally, you can edit the file to provide more meaningful names.



It is recommended that you keep the aliases file for future reference. If the project ontology changes after the backing store has data in it, you must also update the database schema to match (as explained in [Updating an Existing JDBC Backing Store Schema \(CR 1-AAIKCW\) on page 97](#)). If you modified the generated aliases, you must use the same aliases again when you update the schema, to preserve those columns and their data.

Key word
mapping file

Entries in the key word mapping file are also added to the aliases file so you can replace the key word aliases with project-specific ones, as desired (generally in a second pass). For details see [Task H, If Needed—Map Key \(Reserved\) Words to Aliases, on page 91](#).

1. Open the `yourname.aliases` file for editing.
2. Replace any aliases as desired with more meaningful short names. Make sure that each name is unique. It’s a good idea to leave any system generated prefixes or suffixes in place for consistency of names across the database.
3. Perform [Task E, Generate the Project-Specific SQL Scripts, on page 89](#), again. This time, the aliases you created are used.

Task G Run the Project Schema Script (as BE_User)

In this step, you log on as the user you created and run a script to create the project related part of the database schema.

The schema combines the definitions in `base-types.sql`, `create-tables.sql`, and the generated schema file, `schemaOutputFile.sql` (acme.sql as an example).

1. Navigate to the location of the scripts and open an SQLPlus prompt (Oracle) or OSQL prompt (SQL Server).
2. At the SQL prompt, type the following to run the script:

```
osql -S Your-Server-Name -d Your-DB-Name -U be_user -P be_user123 -n -i
@schemaOutputFile.sql
```

For Oracle you would use a command like this:

```
sqlplus be_user/be_user@SID @ schemaOutputFile.sql
```

(As before, use the credentials defined in the `initialize_database_your_dbms.sql` file.)

If there are no errors, your database tables are now configured for use. If there are errors you may need to add some mappings to the key word mapping file.

If you see errors, go to [Task H](#),

After the scripts are loaded, check the database to see that the tables are there.

Task H If Needed—Map Key (Reserved) Words to Aliases

Complete this task only if you saw errors after completing [Task G, Run the Project Schema Script \(as BE_User\)](#). Such errors are caused when your project ontology uses terms that are key words (reserved terms) in the DBMS you are using. You must map these terms to an alias in the keyword mapping file.

1. Edit the `BE_HOME/dbkeywordmap.xml` file to add entries. Below is the format followed by an example:

```
<keyword name="dbKeyword" mapname="nonDbKeyword" />
<keyword name="start" mapname="start_" />
```

2. Repeat [Task E, Generate the Project-Specific SQL Scripts, on page 89](#), and tasks following as needed.



Providing Project-Specific Key Word Aliases When you repeat [Task E](#), the new key words are added to the `yourname.aliases` file. You can create project-specific aliases for the key word mappings as desired. Then repeat [Task E](#) again and continue.

Note that you must generate the SQL scripts a total of three times if you add keyword mappings to the aliases file—a summary of the whole procedure is as follows:

1. *Generate the SQL scripts and run them (as explained in the procedures).*
2. *Errors occur due to key word clashes, so you add the appropriate key word mapping entries to the key word mapping file.*
3. *Generate the SQL scripts again.*
4. *To use project-specific aliases for the keyword mappings (Optional):*
 - a. *Edit the aliases file entries for the key word mappings.*
 - b. *Generate the SQL scripts again.*
5. *Run the SQL scripts to create the backing store.*

Task I Set Up the BusinessEvents TRA File

Add the following properties to ALL TRA files, with appropriate values for the `be.jdbc.data base.type`, JDBC Connection Resource project path, and pool properties:

```
be.engine.cluster.hasBackingStore true
be.jdbc.database.type [sqlserver | oracle]
be.engine.cluster.isCacheAside true
java.property.tangosol.coherence.cacheconfig
c:/tibco/be/3.0/bin/coherence-cache-config-jdbc.xml
be.jdbc.cacheLoaderClass com.tibco.be.jdbcstore.BECoherenceJdbcStore
be.jdbc.dburi.0 /shared/myJDBC.sharedjdbc
be.jdbc.dburi.strategy.0 jdbc
be.jdbc.dburi.pool.initial.0 2
be.jdbc.dburi.pool.min.0 2
be.jdbc.dburi.pool.max.0 5
```

Your backing store is now ready for use.

Migrating Data to a JDBC Backing Store (CR 1-AAIKDF)

This section explains how to migrate data from an Oracle backing store to a newly created JDBC backing store. As a result, the BusinessEvents engine can continue running under the new backing store, using historical data.



Note the following terms used In this section:

- "Oracle backing store" refers to the Oracle Types backing store implementation provided in BusinessEvents 3.0.1 (and earlier).
- "JDBC backing store" refers to the implementation introduced in 3.0.1-hotfix 6 to address the need for a backing store that can be used with SQL Server. It can also be used with Oracle database.

The migration script creates a copy of an existing Oracle backing store and migrates the data to a newly created JDBC backing store.



The product ontology used to create the Oracle backing store and to create the JDBC backing store must be identical.

Task A Set up the JDBC Backing Store

See [Setting Up a JDBC Backing Store \(CR 1-A02WRF\)](#) on page 86 for details on creating the new JDBC backing store.

Tasks that follow assume that you have set up the JDBC backing store and as needed, built the EAR file. The `be-engine.tra` file, however, is not used in the migration procedure.

You will next migrate data from the Oracle backing store that has been in use with the same project.



You must keep the JDBC Connection resource for the existing Oracle backing store, and you must be able to connect to it.

Task B Configure the Migration TRA File

Open the `be-migration.tra` file and specify appropriate values for the properties shown below with example values. The table following explains the properties

# Oracle/JDBC Migration Properties	
<code>be.migration.batchsize</code>	1000
<code>be.migration.workersize</code>	16

```
be.migration.objecttable      true
be.migration.target.type      jdbc

# Database URLs
# Source database:
be.oracle.dburi.count 1
be.oracle.dburi.0 /Resources/myORCL.sharedjdbc
be.oracle.dburi.pool.initial.0 5
be.oracle.dburi.pool.min.0 5
be.oracle.dburi.pool.max.0 10

# Target database:
be.jdbc.dburi.count 1
be.jdbc.dburi.0 /Resources/myJDBC.sharedjdbc
be.jdbc.dburi.pool.initial.0 5
be.jdbc.dburi.pool.min.0 5
be.jdbc.dburi.pool.max.0 10
```

Property	Description
be.migration.batchsize	Defines the database batch size to be used during the migration process. The best size depends on the database configuration. Default is: 200
be.migration.workersize	Defines how many concurrent threads to use during the migration process. Set to the number of processors available. Default is: 10
be.migration.objecttable	<p>If the existing Oracle backing store contains a large amount of data, the migration process can take many hours to complete. If this is the case, you can shorten the process using this property.</p> <p>When this property is set to false, the migration process ignores the data contained in OBJECTTABLE table. Skipping this table can shorten the migration time considerably.</p> <p>Note: If you skip migration of the OBJECTTABLE table, you must then copy this table from the Oracle to the JDBC backing store database using other tools (or simple SQL scripts).</p> <p>Default is true.</p>

Property	Description
<code>be.migration.target.type</code>	<p data-bbox="561 196 1329 262">Defines which type of schema to use for the new backing store. Values are:</p> <p data-bbox="561 270 1329 371">jdbc: The JDBC backing store schema. Use this value for migrating from an Oracle backing store to a JDBC backing store (the procedure documented in this section).</p> <p data-bbox="561 387 1329 546">oracle: The Oracle backing store schema. The migration utility can also be used to copy data from an Oracle backing store to another Oracle backing store. This is generally done to migrate data from an older to a newer implementation of the Oracle backing store.</p> <p data-bbox="561 562 743 593">Default is jdbc.</p> <p data-bbox="561 609 1329 710">Note To migrate an older Oracle backing store to newer implementation, follow the general migration procedure, with these differences.</p> <ul data-bbox="561 725 1329 1149" style="list-style-type: none"> <li data-bbox="561 725 1100 756">• Set <code>be.migration.target.type=oracle</code>. <li data-bbox="561 772 1329 838">• Define a second Oracle database connection to be used for the target database connection. <li data-bbox="561 854 1200 920">• Set up the database, following directions in TIBCO BusinessEvents User's Guide. <li data-bbox="561 935 1329 1036">• Define the migration TRA file properties as appropriate. you would set <code>be.oracle.dburi.count=2</code> and <code>be.oracle.dburi.1=new connection URI</code>. <li data-bbox="561 1052 1329 1149">• In your <code>be-engine.tra</code> file ensure that all properties with a numeric extension should end in <code>.0</code> (and not in <code>.1</code>). Use of two backing stores is limited to migration procedures.

Task C Prepare to Migrate

To prepare for the update, do the following:

- Gracefully shut down the deployed application (all agents and cache servers).
- Back up your existing database.

Task D Run the Data Migration Process

1. Open a command prompt and navigate to `BE_HOME/bin`. Make sure that the updated `be-migration.tra` file is located in the same directory.
2. Execute the following command:

```
be-migration -copy -ear EAR File
```
3. Wait until the process is complete.
4. If you set the property `be.migration.objecttable=false` in [Task B](#), then you must manually migrate OBJECTTABLE table contents.
5. If you did not do so already, configure the `be-engine.tra` for the JDBC backing store. See [Task B, Prepare the TRA and Database Driver Files, on page 87](#).
6. Start BusinessEvents engine using the new target repository.

Updating an Existing JDBC Backing Store Schema (CR 1-AAIKCW)

If you change the project ontology, that is, if you create, alter or delete a concept or an event, you must update the backing store schema so it matches the updated ontology. You must do this before you deploy the updated project.

What the Schema Update Utility Can and Can't Handle Automatically

You must examine the alter script before you run it. Entries that could result in data loss are commented. Decide what changes to make manually and what changes to make using the script, taking into account the kind of data in the tables. Remove or comment entries for changes you will make manually.

Adds

The schema migration utility handles addition of entity types and attributes. New entity types and attributes are added to the database schema.

Changes (Drop and Add)—Assess individually

The utility handles changes to attributes (entity properties) as DROP and ADD operations. However, DROP operations are commented in the script to avoid data loss.

If a column is empty, or you don't want to keep the data they contain, you can enable the DROP operation and let the utility handle the change.

If the column contains data that you want to keep, then make the change manually using an appropriate database tool. For example, you can change the data type of a column from string to double without loss of data, as long as all the column values are numeric values.

Entity Deletions

If an entity is deleted from the Studio project, the corresponding tables are not dropped from the database schema. Existing data is not lost. Deleted entities are not mentioned in the alter script. Manually delete such tables as needed.

Attribute Deletions

The schema update utility does handle deletion of entity attributes. SQL statements for deleted attributes are generated but they are commented. Examine the alter script and enable these commands if you want to run them. Note that existing data is lost when you drop an attribute.

Example Alter Script

Below is an example *yourname_alter.sql* script.

Property type change	<pre>-- ##### WARNING : Non-alterable Ontology changes found. Please see following errors. Manual schema-migration is required. --* For Concept Concept1 field PROPERTY_1 type changed from VARCHAR2 to LONG -- ALTER TABLE D_Concept1 DROP (Property_1); ALTER TABLE D_Concept1 ADD (Property_1 numeric(19));</pre>
New table	<pre>DROP TABLE D_Book_rrf; CREATE TABLE D_Book_rrf (pid numeric(19), propName char varying(255), id\$ numeric(19) not null);</pre>
New property	<pre>-- ALTER TABLE D_MyConcept DROP (FOLDER_1); ALTER TABLE D_MyConcept ADD (Folder_0 char varying(255));</pre>

The Procedure

To Update an Existing Backing Store Database Schema

1. To prepare for the update, do the following:
 - Gracefully shut down the deployed application (all agents and cache servers).
 - Back up your existing database.
 - Generate the updated EAR file for the modified project.
 - If you modified aliases when you created the schema, locate the *yourname.aliases* file you used. It will help you to modify those aliases in the newly generated file, so they match.
2. Open the *be-jdbcdeploy.tra* file for editing and set the following properties:

```
be.jdbc.schemamigration.url=SourceDbURL
be.jdbc.schemamigration.user=username
be.jdbc.schemamigration.pswd=password
```

- Use the database URL that points to the existing backing store. See [Set up the JDBC Connection Resource. Build the EAR on page 86](#) for example URLs.
- Use the same username and password you used when setting up the backing store. See [Task C](#).

These properties enable the program to compare the schema of the existing database with the ontology in the project EAR file, and generate the alter script.

3. Log on as the user name you specified in [Task C, Run the Initialize Database Script as the System User, on page 88](#).
4. Run the `be-jdbcdeploy.exe` utility as explained in [Task E, Generate the Project-Specific SQL Scripts, on page 89](#), using the *updated* EAR file.
5. If any of the new or changed definitions result in entries in the `yourname_aliases` file, and you want to change the provided aliases, follow instructions in [Task F, Check the Aliases File and Modify Aliases as Desired, on page 90](#). If you modify aliases, remember to generate the scripts again so the modified aliases are used.



You must use the same aliases that you used before. If any were modified when the schema was created, you must modify them the same way when updating the schema. It can be useful to refer to the original aliases file.

6. Examine the generated `yourname_alter.sql` script and modify as needed so you only run statements for changes you want to make. See [What the Schema Update Utility Can and Can't Handle Automatically on page 97](#) for details.
7. Run the `yourname_alter.sql` script.

Your database tables are now configured for use.

