

# Oracle® Complex Event Processing

Release Notes

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Oracle Complex Event Processing Release Notes, Release 10gR3 (10.3)

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# Contents

## 1. New and Changed Features in Oracle CEP 10.3

New Features in Oracle CEP 10.3	1-1
Multi-Servers and Clustering	1-2
Caching	1-2
Record and Playback of Events	1-2
Visualizer Administration Console	1-2
HTTP Publish-Subscribe Adapter	1-2
JMS Adapter	1-3
Configuration Wizard for Creating Domains	1-3
Event Processing Language (EPL) New Features	1-3
Security New Features	1-4
Changed and Deprecated Features in Oracle CEP 10.3	1-4
Simpler Helloworld Example	1-4
Programming Model	1-5
Domain Directory Structure Changes	1-5
New and Deprecated Options in the Deployer Tool	1-6
Changes in Management, Monitoring, and JMX	1-6
Changes in Logging	1-6
Upgrading to Oracle CEP 10.3	1-6
Upgrading a WebLogic Event Server 2.0 Application to Run on Oracle CEP 10.3	1-7
Upgrading a WebLogic Event Server 2.0 Domain to Oracle CEP 10.3	1-9
Backward Compatibility Issues	1-10

## 2. Oracle Complex Event Processing Known and Resolved Issues

Known Issues . . . . .	2-1
Resolved Issues . . . . .	2-2

# New and Changed Features in Oracle CEP 10.3

The following sections describe the new and changed features in Oracle CEP 10.3:

- [“New Features in Oracle CEP 10.3”](#) on page 1-1
- [“Changed and Deprecated Features in Oracle CEP 10.3”](#) on page 1-4
- [“Upgrading to Oracle CEP 10.3”](#) on page 1-6

## New Features in Oracle CEP 10.3

Version 10.3 of Oracle CEP includes the following new features:

- [“Multi-Servers and Clustering”](#) on page 1-2
- [“Caching”](#) on page 1-2
- [“Record and Playback of Events”](#) on page 1-2
- [“Visualizer Administration Console”](#) on page 1-2
- [“HTTP Publish-Subscribe Adapter”](#) on page 1-2
- [“JMS Adapter”](#) on page 1-3
- [“Configuration Wizard for Creating Domains”](#) on page 1-3
- [“Event Processing Language \(EPL\) New Features”](#) on page 1-3
- [“Security New Features”](#) on page 1-4

## Multi-Servers and Clustering

You can now configure multiple servers in an Oracle CEP domain, and cluster them together to achieve high availability.

See [Configuring and Using Oracle Complex Event Processing Clusters](#).

## Caching

Oracle CEP applications can optionally publish or consume events to and from a cache to increase the availability of the events and increase the performance of their applications. A cache is a temporary storage area for events, created exclusively to improve the overall performance of your application; it is not necessary for the application to function correctly.

See [Using Oracle CEP Caching](#).

## Record and Playback of Events

The event repository feature of Oracle CEP allows you to record events flowing through an event processing network (EPN) and store them so you can later play back the events. The event repository is configured per stage, such as a processor or stream.

See [Record and Play Back Events Flowing Through an EPN](#) in the Visualizer Online Help document.

## Visualizer Administration Console

Oracle CEP Visualizer, henceforth called Visualizer for simplicity, is a Web 2.0 application that consumes data from Oracle CEP, displays it in a useful and intuitive way to system administrators and operators, and, for specific tasks, accepts data that is then passed back to Oracle CEP so as to change its configuration.

See [Overview of Visualizer](#).

## HTTP Publish-Subscribe Adapter

An HTTP Publish-Subscribe Server is a mechanism whereby Web clients, such as browser-based clients, subscribe to channels, receive messages as they become available, and publish messages to these channels, all using asynchronous messages over HTTP. Every instance of Oracle CEP includes a pub-sub server that programmers can use to implement HTTP publish-subscribe functionality in their applications.

See [Using and Creating HTTP Publish-Subscribe Adapters](#).

## JMS Adapter

Oracle CEP provides both inbound and outbound JMS adapters that you can use in your event applications to send and receive messages to and from a JMS queue, respectively, without writing any Java code.

See [Using JMS Adapters](#).

## Configuration Wizard for Creating Domains

The Configuration Wizard is a new tool for creating Oracle CEP domains.

See [Creating a Domain Using the Configuration Wizard](#).

## Event Processing Language (EPL) New Features

The event processing language (EPL) has the following new features:

- **Parameterized Queries**—Parameterized queries allow you to put placeholders inside of an EPL query in the form of a question mark. At runtime you bind these placeholders with values and they are then compiled into regular statements. The process is much like the `PreparedStatement` in JDBC.

See [Parameterized Queries](#).

- **Subqueries**—EPL supports both simple subqueries as well as correlated subqueries. In a simple subquery, the inner query is not correlated to the outer query. Correlated subqueries allow `SELECT` clauses to be embedded within another `SELECT` or `WHERE` clause. Both `IN` and `EXISTS` keywords are available when subqueries are used in the `WHERE` clause. Previously they were available only in the `FROM` clause and without the ability to correlate the inner and outer query.

See [Simple and Correlated Subqueries](#).

- **Dynamic Event Properties**—Dynamic (unchecked) properties are event properties that need not be known at statement compilation time. Such properties are resolved during runtime. The idea behind dynamic properties is that for a given underlying event representation, the properties are not always known in advance. An underlying event may have additional properties that are not known at statement compilation time, but these properties might still be required in an EPL query. The concept is especially useful for

events that represent rich, object-oriented domain models or when generic container events are used.

In conjunction with dynamic event properties, the following functions have also been added to this release: [INSTANCEOF](#), [CAST](#), and [EXISTS](#).

See [Dynamic Event Properties](#).

## Security New Features

Oracle CEP provides a variety of mechanisms to protect server resources such as data and event streams, configuration, username and password data, security policy information, remote credentials, and network traffic.

Oracle CEP supports various security providers for authentication, authorization, role mapping, and credential mapping. As initially installed, Oracle CEP is configured to use the file-based providers for both authentication and authorization. You can also configure the system to use an LDAP or DBMS provider.

For details, see [Configuring Security for Oracle CEP](#).

## Changed and Deprecated Features in Oracle CEP 10.3

Version 10.3 of Oracle CEP includes the following changed and deprecated features:

- [“Simpler Helloworld Example”](#) on page 1-4
- [“Programming Model”](#) on page 1-5
- [“Domain Directory Structure Changes”](#) on page 1-5
- [“New and Deprecated Options in the Deployer Tool”](#) on page 1-6

## Simpler Helloworld Example

The HelloWorld example has been simplified in the following ways:

- The example no longer uses an adapter factory.
- The example no longer extends the default configuration of the components.

See [HelloWorld Example](#).



## Programming Model

The Oracle CEP programming model has changed in the following ways:

- Adapters can now also be outbound; previously they were only inbound.
- There is a new component type called event bean. Event beans are very similar to basic Spring beans, but they can take advantage of the full Oracle CEP framework, such as monitoring and record/playback. Event beans are functionally the same as adapters, but should be used as intermediate nodes in the EPN when adapters are used as beginning or ending nodes.
- You can now also use standard Spring beans as nodes in the EPN, although the beans cannot take advantage of Oracle CEP framework.
- Applications can now be suspended and resumed.
- Programmers are no longer required to create an adapter factory when creating adapters. You only need to create an adapter factory if you want to share adapters among applications.
- Spring tags for adapters and event beans now include attributes for setting lifecycle callback methods via the EPN assembly file.
- For adapters, event beans, and Spring beans that want to run in a thread, their Java class should now implement `com.bea.wlevs.ede.api.RunnableBean`.

See [Overview of the Oracle CEP Programming Model](#).

## Domain Directory Structure Changes

So as to support clustering and a multi-server environment, the directory structure of the out-of-the-box and sample domains has changed.

Previously, all domain files were located directly under the domain directory, such as `ORACLE_CEP_HOME/occep_10.3/samples/domains/helloworld_domain`, where `ORACLE_CEP_HOME` refers to the top-level installation directory of Oracle CEP.

In the 10.3 release, the domain directory contains one or more sub-directories that correspond to a single server; this directory contains all the configuration files for that server. For example, the HelloWorld domain contains a single server whose configuration files are located in the following directory:

`ORACLE_CEP_HOME/occep_10.3/samples/domains/helloworld_domain/defaultserver.`

The new Configuration Wizard for creating domains follows this updated directory structure.

See [Creating an Oracle Complex Event Processing Domain](#).

## New and Deprecated Options in the Deployer Tool

The `-start` and `-stop` commands of the Deployer tool have been deprecated.

When using the `-install` command to install an application, Oracle CEP automatically starts it after all internal initialization tasks have completed. Subsequently, if you stop and start the Oracle CEP server instance, the application is automatically stopped and started, respectively.

The Deployer tool has two new options: `-suspend` and `-resume`. Users should use `-suspend` to suspend a currently running application, and `-resume` for it to resume running.

See [Deployer Command-Line Reference](#).

## Changes in Management, Monitoring, and JMX

The management framework of Oracle CEP has been overhauled in this version.

For details, see [Managing Applications, Servers, and Domains Using MBeans](#). See “[Backward Compatibility Issues](#)” on page 1-10 for changes that are not backward compatible to the previous version of Oracle CEP (WebLogic Event Server 2.0.)

## Changes in Logging

You can now specify logging severity for modules of a server, in addition to the logging severity of the server itself. The severity of the modules overrides that of the server.

For details, see [Configuring Logging and Debugging](#).

## Upgrading to Oracle CEP 10.3

Upgrading to Oracle CEP 10.3 is a two-step process: first you must upgrade your applications and then you must upgrade the domain to which the applications are deployed. The following sections describe each step:

- “[Upgrading a WebLogic Event Server 2.0 Application to Run on Oracle CEP 10.3](#)” on page 1-7
- “[Upgrading a WebLogic Event Server 2.0 Domain to Oracle CEP 10.3](#)” on page 1-9
- “[Backward Compatibility Issues](#)” on page 1-10

## Upgrading a WebLogic Event Server 2.0 Application to Run on Oracle CEP 10.3

This section describes the steps you must take to upgrade an application that you developed in Version 2.0 of WebLogic Event Server so that it runs on Oracle CEP 10.3.

1. Update the `MANIFEST.MF` file to import new versions of Spring framework and Oracle CEP packages, as well as new required packages. In particular:

- Update the version of all imported Spring framework packages to 2.5.5. For example:

```
Import-Package:
    org.springframework.aop.framework;version="2.5.5",
    org.springframework.aop;version="2.5.5",
    ...
```

- Update the version of any imported Oracle CEP packages to 3.0.0.0. For example:

```
Import-Package:
    com.bea.wlevs.ede;version="3.0.0.0",
    com.bea.wlevs.ede.api;version="3.0.0.0",
    ...
```

- Add the following packages to the `Import-Package` header if they are not already included:

```
Import-Package:
    com.bea.wlevs.management.configuration.spi;version="3.0.0.0",
    com.bea.wlevs.management.spi;version="3.0.0.0",
    com.bea.wlevs.monitor;version="3.0.0.0",
    com.bea.wlevs.spi;version="3.0.0.0",
    com.bea.wlevs.spring.support;version="3.0.0.0",
    commonj.work;version="1.4.0.0",
    org.springframework.osgi.extensions.annotation;version="1.1.0",
    com.bea.wlevs.ede.spi;version="3.0.0.0",
    com.bea.wlevs.configuration.internal;version="3.0.0.0",
    ...
```

2. If you use Spring or Spring Dynamic Modules for OSGI (Spring DM) features in your application, it is possible that the declaration of the features in the Spring application context file has changed. If this is the case, you must update these declarations in the EPN assembly file of your Oracle CEP application.

**Note:** This change is a result of the upgrade of the Spring framework (from 2.0 to 2.5) that occurred between WebLogic Event Server 2.0 and Oracle CEP 10.3, not as a direct result of the Oracle CEP upgrade.

Refer to the appropriate 2.5 XSD Schemas for any changes:

Spring: <http://www.springframework.org/schema/beans/spring-beans.xsd>

Spring DM: <http://www.springframework.org/schema/osgi/spring-osgi.xsd>

The following bullets list some of the typical changes you might have to make; the following list is not complete.

- When specifying a property to the `<osgi:service-property>` tag, use the `<entry>` tag with the `key` and `value` attributes, rather than the old `<prop>` tag. For example, update the following 2.0 tag:

```
<osgi:service-properties>
  <prop key="type">SocketAdapterType</prop>
</osgi:service-properties>
```

to:

```
<osgi:service-properties>
  <entry key="type" value="SocketAdapterType"/>
</osgi:service-properties>
```

- The `value` or `ref` attribute of an instance-property must always be set to an explicit value; it can no longer be an empty string to indicate an implicit use of a default value. For example, update the following 2.0 tag:

```
<wlevs:adapter id="fileAdapter" provider="FileAdapterType">
  <!-- file: empty value uses default
  <wlevs:instance-property name="file" value="" />
  <wlevs:listener ref="algoTradingProcessor"/>
</wlevs:adapter>
```

to something like the following:

```
<wlevs:adapter id="fileAdapter" provider="FileAdapterType">
  <wlevs:instance-property name="file" value="test.file" />
  <wlevs:listener ref="algoTradingProcessor"/>
</wlevs:adapter>
```

3. Recompile the Java code of your 2.0 adapter and business POJOs implementations using your IDE. If you get compile-time errors, check the latest [10.3 Javadoc](#) that describe the new Oracle CEP APIs and make the appropriate source code changes.

After you have made the preceding changes, reassemble the application and deploy it to Oracle CEP 10.3. See [Assembling and Deploying Oracle Complex Event Processing Applications](#).

If, during deployment, you get an exception that indicates that a package is invisible, add this package to the `Import-Package` header of the `MANIFEST.MF` file, then reassemble and redeploy the application. Keep adding packages in this manner until the application deploys successfully.

## Upgrading a WebLogic Event Server 2.0 Domain to Oracle CEP 10.3

This section describes the steps you must take to upgrade a WebLogic Event Server 2.0 domain so that it runs correctly in Oracle CEP 10.3.

For clarity, it is assumed that the existing WebLogic Event Server 2.0 domain is located in the `/bea/user_projects/domains/mydomain20` directory.

1. Using the Configuration Wizard, create a temporary Oracle CEP 10.3 domain. Later steps in this procedure require you to use or refer to files in a new Oracle CEP 10.3 domain, and it is best to use a new domain. You can later delete this domain if you want.

For the purposes of this procedure, it is assumed that the new Oracle CEP 10.3 domain is called `mydomain30`, it contains a single server called `defaultserver`, and the server files are located in the

`/oracle_cep/user_projects/domains/mydomain30/defaultserver` directory.

See [Creating and Updating an Oracle CEP Standalone-Server Domain](#).

2. If the WebLogic Event Server 2.0 server is currently running, stop it.
3. Make a backup copy of your WebLogic Event Server 2.0 domain in case you need to revert back.
4. Replace the following two files in the WebLogic Event Server 2.0 domain with the equivalent files in the Oracle CEP 10.3 domain:

```
- lib/XACMLAuthorizerInit.ldif
- lib/XACMLRoleMapperInit.ldif
```

The WebLogic Event Server 2.0 files are located relative to the domain directory (`/bea/user_projects/domains/mydomain20` in our example) and the Oracle CEP 10.3 files are located relative to the the server directory under the domain directory (`/oracle_cep/user_projects/domains/mydomain30/defaultserver` in our example).

5. Using your favorite text editor, open the `atnstore.txt` file in the WebLogic Event Server 2.0 domain, located in the `config` sub-directory of the main domain directory, and add the new Oracle 10.3 groups:

```
group: wlevsDeployers
description:
```

```
group: wlevsApplicationAdmins
description:

group: wlevsBusinessUsers
description:

group: wlevsOperators
description:
```

6. Remove the following files and directories (if they exist) in the WebLogic Event Server 2.0 domain:

```
- FileBasedDefaultCredentialMappermy-realmInit.initialized
- FileBasedXACMLAuthorizermy-realmInit.initialized
- FileBasedXACMLRoleMappermy-realmInit.initialized
- rm
- cm
- atz
```

7. Update the `startwlevs.cmd` (Windows) or `startwlevs.sh` (Unix) command scripts in the WebLogic Event Server 2.0 domain to point to the new Oracle 10.3 binaries.
8. Update the `stopwlevs.cmd` (Windows) or `stopwlevs.sh` (Unix) command scripts in the WebLogic Event Server 2.0 domain to point to the new Oracle 10.3 binaries.
9. Start the server in the 2.0 domain using the Oracle 10.3 binaries. See [Starting the Server](#).
10. The preceding upgrade procedure might have changed the your security configuration of your 2.0 domain, especially if you created new users and assigned them to groups. In this case, use Visualizer to reconfigure the security. See [Overview of Visualizer](#).

## Backward Compatibility Issues

The following are non-backward compatible changes in the management framework:

- The following classes have been deprecated and removed from all operation signatures:
  - `com.bea.wlevs.management.ManagementException`
  - `com.bea.wlevs.management.ManagementRuntimeException`
  - `com.bea.wlevs.management.MbeanOperationsException`
- The following methods have been removed from all MBeans: `isRegistered()`, `preRegister()`, `postRegister()`, `getMBeanInfo()`.

- The monitoring-related methods have been removed from `StageMBean` and replaced by `com.bea.wlevs.monitor.management.MonitorRuntimeMBean`.
- The `com.bea.wlevs.management.boot.BootMBean` has been removed.
- The `com.bea.wlevs.management.configuration.ConfigSessionBean` has been removed.
- The `ObjectName` for the `AppDeploymentMBean` has been changed to include the `DomainMBean` as a parent.
- The class `com.bea.wlevs.server.management.mbean.ServerRuntimeMBean` has been changed to `com.bea.wlevs.management.runtime.ServerRuntimeMBean`.
- Two additional modules have been added: `com.bea.wlevs.management.api_*` and `com.bea.wlevs.management.spi_*`, in addition to the existing `com.bea.wlevs.management_*`.
- The service `com.bea.wlevs.spi.ManagementService` has been moved from bundle `com.bea.wlevs.spi_*` to `com.bea.wlevs.management.spi_*`.

## New and Changed Features in Oracle CEP 10.3



# Oracle Complex Event Processing Known and Resolved Issues

The following sections describe release information about Oracle Complex Event Processing (or *Oracle CEP* for short) 10.3.

- “Known Issues” on page 2-1
- “Resolved Issues” on page 2-2

For instructions on installing Oracle CEP 10.3, see *Installing Oracle CEP*.

For additional information about the features and capabilities of Oracle CEP, see the *Oracle CEP Getting Started Guide*.

## Known Issues

The following section describes known problems in Version 10.3 of Oracle CEP, along with workarounds where possible.

Change Request Number	Description and Workaround
CR318170	When you start a server in a domain with no deployed applications, the <code>Server STARTED</code> message may not appear in the command window from which you ran the server start script, even though the server has successfully started.
CR372168	Active VPN software is known to have unpredictable behavior on multicast traffic. Additionally, having both Cisco VPN and Nortel VPN installed breaks multicast traffic.

Change Request Number	Description and Workaround
CR379316	When using Visualizer with the Firefox browser (version 3.0 + SSL + JDK 1.6), the first time you access a Visualizer page it will render slowly, sometimes up to 30 seconds.
Not applicabile.	When using Visualizer, you will get an error if you try to upload a file using the Firefox browser and SSL. This is a <a href="#">known problem</a> with Flex that affects Visualizer use.

## Resolved Issues

The following section describes problems that were found in Oracle CEP 2.0 and are now fixed.

Change Request Number	Description and Workaround
CR323139	JDBC drivers must support the <code>getMetadata</code> feature to work correctly with Oracle CEP; however, Oracle's thin driver 10.2.0.3.0 does not fully support this feature.
CR323199	Packages exported using the MANIFEST.MF's <code>Export-Package</code> entry cannot be redeployed without re-starting server.
CR324013	The <code>&lt;wlevs:instance-property&gt;</code> tag in the EPN assembly file supports only primitive types.
CR327853	Using the <code>wlevs.Admin GET</code> command with the <code>-property</code> option may return unexpected results.
CR328989	In order to execute a Java user-defined function in an EPL statement, you must put the Java class in the server's boot CLASSPATH.
CR330462	In order to use the <code>wlevs.admin GETRULE</code> command, you must have the administrator role, even though this is a read-only command.
CR330602	When invoking the <code>stopwlevs.cmd</code> script to stop a running Oracle CEP in a domain, you must specify a URL because the default value is not valid.
CR330773	Before starting an Oracle CEP instance in the <code>helloworld_domain</code> , you must manually ensure that the <code>wlevs.domain.home</code> variable in the <code>startwlevs.cmd</code> script is set correctly for your particular environment.

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<b>Change Request Number</b>	<b>Description and Workaround</b>
CR331780	If you register an event type with an arbitrary name and then try to look up the event type in the repository based on an instance of the event, the event isn't found and a null value is returned.
CR331932	If you configure a pass through stream by setting <code>max-size=0</code> and <code>max-threads=0</code> in the stream component XML file, then enable monitoring on the stream, and then enable either the average throughput or average latency monitors, both of these monitors will consistently report a metric value of zero even when the stream is under significant load.

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## Oracle Complex Event Processing Known and Resolved Issues