Oracle® Complex Event Processing

Visualizer Help

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Contents

1. Introduction and Roadmap

2. Overview of Visualizer

3. Typical Application Tasks

4. Typical Server and Domain Tasks

5. Typical Security Tasks

Introduction and Roadmap

This section describes the contents and organization of this guide—*Oracle Complex Event Processing Visualizer Help*.

- "Document Scope and Audience" on page 1-1

- "Oracle CEP Documentation Set" on page 1-2

- "Guide to This Document" on page 1-2

- "Samples for the Oracle CEP Application Developer" on page 1-3

Document Scope and Audience

This document is a resource for software developers who develop event driven real-time applications. It also contains information that is useful for business analysts and system architects who are evaluating Oracle Complex Event Processing (or *Oracle CEP* for short) or considering the use of Oracle CEP for a particular application.

The topics in this document are relevant during the design, development, configuration, deployment, and performance tuning phases of event driven applications. The document also includes topics that are useful in solving application problems that are discovered during test and pre-production phases of a project.

It is assumed that the reader is familiar with the Java programming language and Spring.

Oracle CEP Documentation Set

This document is part of a larger Oracle CEP documentation set that covers a comprehensive list of topics. The full documentation set includes the following documents:

- *Oracle CEP Getting Started*

- *Oracle CEP Application Development Guide*

- *Oracle CEP Administration and Configuration Guide*

- *Oracle CEP EPL Reference Guide*

- *Oracle CEP Reference Guide*

- *Oracle CEP Release Notes*

- *Oracle CEP Visualizer Help*

See the main Oracle CEP documentation page for further details.

Guide to This Document

This document is organized as follows:

- This chapter, Chapter 1, "Introduction and Roadmap," introduces the organization of this guide.

- Chapter 2, "Overview of Visualizer," provides an overview of Visualizer, how to start it, and what you can do with it.

- Chapter 3, "Typical Application Tasks," provides procedures on performing the typical application-related task using Visualizer.

- Chapter 4, "Typical Server and Domain Tasks," provides procedures on performing the typical domain- or server-related tasks using Visualizer.

- Chapter 5, "Typical Security Tasks," provides procedures on performing typical security-related tasks using Visualizer.

Samples for the Oracle CEP Application Developer

In addition to this document, Oracle provides a variety of code samples for Oracle CEP application developers. The examples illustrate Oracle CEP in action, and provide practical instructions on how to perform key development tasks.

Oracle recommends that you run some or all of the examples before programming and configuring your own event driven application.

The examples are distributed in two ways:

- Pre-packaged and compiled in their own domain so you can immediately run them after you install the product.

- Separately in a Java source directory so you can see a typical development environment setup.

The following three examples are provided in both their own domain and as Java source in this release of Oracle CEP:

- HelloWorld—Example that shows the basic elements of an Oracle CEP application. See Hello World Example for additional information.

  The HelloWorld domain is located in
  `WLEVS_HOME`\samples\domains\helloworld_domain, where `WLEVS_HOME` refers to the top-level Oracle CEP directory, such as `c:\beahome\wlevs30`.

  The HelloWorld Java source code is located in
  `WLEVS_HOME`\samples\source\applications\helloworld.

- ForeignExchange (FX)—Example that includes multiple adapters, streams, and complex event processor with a variety of EPL rules, all packaged in the same Oracle CEP application. See Foreign Exchange (FX) Example for additional information.

  The ForeignExchange domain is located in `WLEVS_HOME`\samples\domains\fx_domain, where `WLEVS_HOME` refers to the top-level Oracle CEP directory, such as `c:\beahome\wlevs30`.

  The ForeignExchange Java source code is located in
  `WLEVS_HOME`\samples\source\applications\fx.

- Signal Generation—Example that receives simulated market data and verifies if the price of a security has fluctuated more than two percent, and then detects if there is a *trend* occurring by keeping track of successive stock prices for a particular symbol.See Signal Generation Example for additional information.

The Signal Generation domain is located in
WLEVS_HOME\samples\domains\signalgeneration_domain, where *WLEVS_HOME* refers
to the top-level Oracle CEP directory, such as c:\beahome\wlevs30.

The Signal Generation Java source code is located in
WLEVS_HOME\samples\source\applications\signalgeneration.

Overview of Visualizer

This section contains information on the following subjects:

Description of Visualizer

Oracle Complex Event Processing Visualizer, henceforth called *Visualizer* for simplicity, is a Web 2.0 application that consumes data from Oracle Complex Event Processing (or *Oracle CEP* for short), displays it in a useful and intuitive way to system administrators and operators, and, for specificied tasks, accepts data that is then passed back to Oracle CEP so as to change it configuration.

In particular, you can use the tool to perform the following tasks:

- Manage servers, clusters, and domains.

- Monitor and tune the configuration of a production system.

- Manage the security policies of Oracle CEP users.

- Install, uninstall, suspend, and resume applications.

- Configure an application and its stages.

Navigational Overview of Visualizer

Visualizer has two main panes, as shown in the following graphic:

Figure 2-1   Sample Visualizer Window
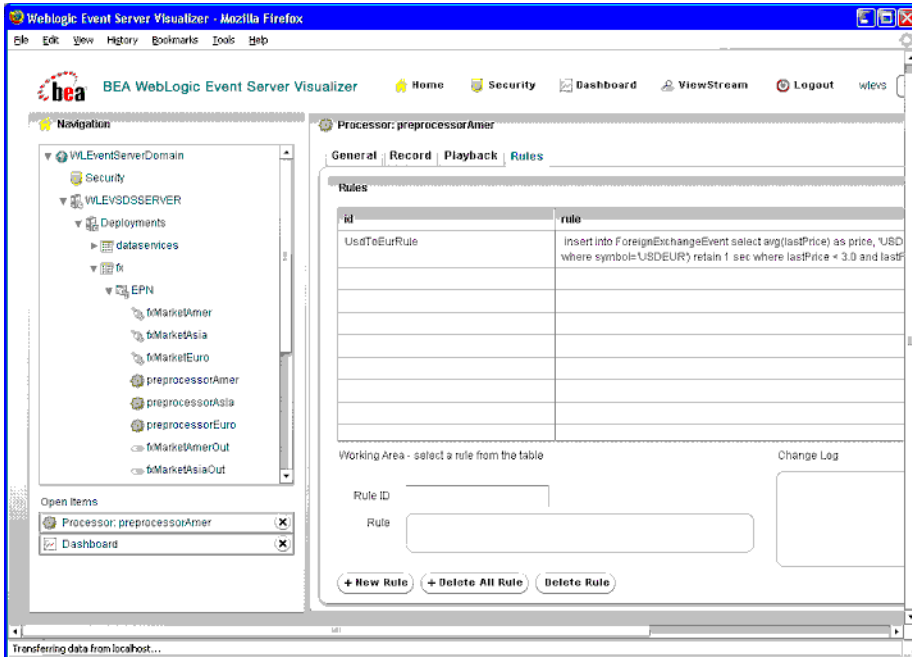
- **Left Pane**: Displays a domain tree for the domain called WLEventServerDomain that includes all the objects contained in the domain, such as the server instances, the deployed applications and services within each server instance, and domain-level security configuration. The lower half of the right pane lists the items that are currently open, making it easy to return to or close the windows after you have navigated away from them.

- **Right Pane**: Displays information about objects that you have clicked on in the left pane. The format of the information depends on the object; for example, if you click on a deployed application, the right pane shows general information about the application (General tab) as well as variuos visual representations of the event processing network of the application (Event Processing Network tab). If you click on a particular stage of the

network, such as a stream or processor, the right pane shows general information about it as well as stage-specific information, such as the rules for a processor.

Figure 2-1 shows a domain that contains a single server instance called WLEventServer. The server contains two deployed applications: dataservices and fx; the fx application is currently opened. The right pane contains the configuration of the rules of the preprocessorAmer stage; in particular, preprocessorAmer has been configured with a single rule called UsdToEurRule.

In addition to the two panes, Visualizer provides the following top menu items:

- The Dashboard link takes you to the performance management screen that you use to monitor the throughput and latency of a running application and its stages.

- The ViewStream link takes you to a screen from which you can actually see the stream of runtime events flowing through a component. This feature uses the HTTP PubSub adapter.

Using Visualizer to Update Configuration Data

Although you can update much of the configuration of an Oracle CEP instance and its deployed applications, not all fields can be updated. The following bullets describe the rules that determine what fields can be updated.

- Information in the EPN assembly file is static and thus read-only. Examples of this type of information include the stages of the EPN and how they are wired together.

- Information in the stage configuration files can be modified, although not typically added to or deleted from; the next bullet lists the two exceptions. Examples of this type of information include the maximum size and threads of a stream.

  When you are allowed to update fields on a Visualizer window, you will see three buttons: Modify, Commit, and Cancel. Click the Modify button to update the fields, then click Commit to commit the changes to the server or Cancel to cancel.

- The EPL rules associated with a processor and the channels associated with an HTTP pub/sub server cannot be modified, but you can add or delete to the existing list of rules or channels.

  For these two scenarios you will see buttons for adding and deleting rules or channels; the Modify button will not be provided.

- Information in the server's configuration file (config.xml) can be modified. An example of this type of information includes the configuration of work managers.

  Server configuration updates also use the three buttons: Modify, Commit, and Cancel.

Note: The preceding rules assume that you have logged onto Visualizer with the required authentication credentials for performing the desired update task.

How to Invoke and Start Using Visualizer

Visualizer is itself an Oracle CEP application that is automatically deployed each time you start a server. To start using it, follow these steps:

1. Invoke the following URL in your browser:

    ```
    http://host:port/wlevs
    ```

    where *host* refers to the name of the computer on which Oracle CEP is running and *port* refers to the Jetty NetIO port configured in for the server (default value `9002`).

    The port number is configured in the `DOMAIN_DIR`/config/config.xml file, where `DOMAIN_DIR` refers to the domain directory such as `/beahome/wlevs30/user_projects/domains/wlevs30_domain`. The port number is the value of the `<port>` child element of the `<netio>` object configured for the Jetty server, as shown in the following example (only relevant parts shown):

    ```
    <netio>
        <name>NetIO</name>
        <port>9002</port>
    </netio>

    ...

    <jetty>
        <name>JettyServer</name>
        <network-io-name>NetIO</network-io-name>
        ...
    </jetty>
    ```

    For example, if your browser is running on the same computer as Oracle CEP and you are using the default port, invoke the following URL:

    ```
    http://localhost:9002/wlevs
    ```

2. In the Logon screen, enter the name and password of the administrator user you configured when you created the domain.

You are now ready to begin using Visualizer to manage, configure, and monitor Oracle CEP instances and the applications deployed to the server instances. For information on typical tasks, see:

- "Typical Application Tasks" on page 3-1

- "Typical Server and Domain Tasks" on page 4-1

- "Typical Security Tasks" on page 5-1

Typical Application Tasks

This section contains the typical application tasks you can perform with Oracle CEP Visualizer.

Visualizer is fairly self-explanatory and intuitive, so not all tasks are discussed here, but rather, just those that are most common and typical and from which other similar tasks can be deduced.

This section describes how to:

- Monitor the throughput and latency of a stage or path in the EPN of an application.

- View the event processing network (EPN) of an application

- Record and Play Back Events Flowing Through an EPN

- Add or delete rules from a processor

- View and change the configuration of a stage

- Deploy an application

- Uninstall an application

- Suspend or Resume an application

Monitor the throughput and latency of a stage or path in the EPN of an application.

You can use Visualizer to monitor a stage or a path in the event processing network (EPN) of an application. Oracle CEP defines the following metrics that you can monitor for each stage or path:

- Throughput—The number of events processed by the stage.

- Average Latency—The averge amount of time it takes an event to pass through a stage, or *latency.*

- Maximum Latency—The maximum amount of time it takes an event to pass through a stage.

- Average Latency Threshold—Specifies whether the average latency of events between the start- and end-points of a stage crosses a specified threshold.

The Visualizer monitoring feature is itself implement as an Oracle CEP application; this means that the diagnostic information can be viewed as an event, and the application uses EPL rules to process these diagnostic events. This means that you can update these EPL rules to customize the behavior of the monitoring feature, in particular to detect patterns and trends in the diagnostic events.

To use Visualizer to monitor a stage or path of the EPN, follow these steps:

1. Create a diagnostic profile that describes the stages or path you want to monitor as well as the type of latency and throughput information you want to gather.

   See .

2. Click the Dashboard link at the top of Visualizer to go to the diagnostics dashboard window.

3. Drag the diagnostic profile you created in a preceding step from the domain tree in the left pane to the table at the bottom of the right pane; drop the diagnostic profile into the Profile Name column of the table.

4. Click on the name of the diagnostic profile in the table; you should start seeing latency and throughput information in the graphs in the middle of the dashboard.

5. The Management Events section at the top of the Dashboard displays alerts about the incoming monitoring events. The Visualizer monitoring feature defines a set of default EPL rules that specify when these alerts show up in the Management Events table; you can change

the EPL rules to customize this behavior. See "Customize the Behavior of the Diagnostic Monitoring" on page 3-4 for details.

Create a Diagnostic Profile

1. In the left pane, navigate to and expand the Applications node of the Oracle CEP instance to which the application is deployed.

2. Expand the *appname* > Stages node to see a list of the EPN stages in the domain tree.

3. Click on the stage of the application for which you want to monitor its latency or throughput, or the first stage in the path that you want to monitor.

4. In the right pane, click the General tab.

5. Click the Create Diagnostics button. An accordion menu with three tabs appears.

6. Click the top Diagnostic Profile Information tab and enter the information as follows:

    – Enter the name of the diagnostic profile you are about to create in the Profile Name field.

    – Select whether you want to enable the profile for immediate use.

7. Click the Latency tab in the accordion menu. Enter the information about the type of monitoring information you want to gather about latency in the Diagnostic Information section as follows:

    – `Max Latency Metric`—Specifies that you want to monitor the maximum amount of time it takes for events to flow through a stage or a subset of the event processing network (path).

    – `Average Latency Metric`—Specifies that you want to monitor the average amount of time it takes for events to flow through a stage or a subset of the event processing network (path).

    – `Threshold`—Specifies threshold for the average latency monitoring. This value is enabled only if you specify Average Latency Metric.

    – `Time Unit`—Specifies the time units for the threshhold and average interval fields.

    – `Average Interval`—Specifies the time interval for which you want to gather diagnostic data.

    Update the Path Information section as follows:

– If you want to monitor just the current stage, rather than a path in the EPN, set the Start and End Stage Name to the name of the current stage. Select Entry for the Start Stage Name and Exit for the End Stage Name.

– If you want to monitor a path in the EPN, Visualizer assumes that the current stage is the start of the path, and thus automatically selects it for the Start Stage Name field. Specify whether the start of the path should be the entry or exit of the current stage. Then select the End Stage name, or the end of the path you want to monitor, and specify whether the end of the path should be the entry or exit of the stage.

8. Click the Throughput tab in the accordion menu. Enter the information about the type of monitoring information you want to gather about throughput as follows:

– `Average Throughput Metric`—Specifies that you want to monitor the average throughput of events flowing through the stage.

– Stage Name—Specify whether you want to monitor the throughput at the entry or exit of the stage.

– `Time Unit`—Specifies the time units for the average interval fields.

– `Throughput Interval`—Specifies the time interval for which you want to gather metrics.

– `Average Interval`—Specifies the interval for gathering the average throughput.

9. Click Save. The saved diagnostic profile appears in the left domain tree, under the stage from which you created it.

Customize the Behavior of the Diagnostic Monitoring

No documentation available for Beta.

View the event processing network (EPN) of an application

1. In the left pane, navigate to and expand the Applications node of the Oracle CEP instance to which the application is deployed.

2. Click the name of the application shown below the Applications node.

3. In the right pane, click the Event Processing Network tab.

4. In the Layout drop-down choice box, chose your favorite layout, such as hierarchic or organic.

5. Alternately, expand the *appname* > EPN node in the left pane to see a list of the EPN stages in the domain tree. Click on an individual stage to see its configuration.

Record and Play Back Events Flowing Through an EPN

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.

You cannot dynamically create the record and playback configuration in Visualizer. Instead, you must manually add the initial parameters to the configuration file of the stage you want to record using an IDE or your favorite XML editor. After that you can use Visualizer to modify the record and playback operations.

You can add only one entry per stage for the record and playback operations.

1. Using your favorite XML editor or IDE, edit the configuration file of the stage for which you want to configure record and playback. Add a `<record-parameters>` child element of the stage (`<processor>`, `<stream>`, or `<adapter>`) to configure a record operation and a `<playback-parameters>` child element to configure a playback operation. The following example shows how to add record and playback to the `helloworldProcessor` of the HelloWorld sample application; relevant sections shown in bold:

```
<processor>
    <name>helloworldProcessor</name>

    <record-parameters>
        <dataset-name>test1data</dataset-name>
        <event-type-list>
            <event-type>HelloWorldEvent</event-type>
        </event-type-list>
        <provider-name>test-rdbms-provider</provider-name>
        <time-range>
            <start>2008-03-03T17:32:02.000-05:00</start>
            <end>2008-03-03T17:33:02.000-05:00</end>
        </time-range>
        <batch-size>1</batch-size>
        <batch-time-out>10</batch-time-out>
    </record-parameters>

    <playback-parameters>
        <dataset-name>test1data</dataset-name>
        <event-type-list>
```

```
                        <event-type>HelloWorldEvent</event-type>
                    </event-type-list>
                    <provider-name>test-rdbms-provider</provider-name>
                    <time-range>
                        <start>2008-03-03T17:32:02.000-05:00</start>
                        <end>2008-03-03T17:33:02.000-05:00</end>
                    </time-range>
                    <playback-speed>1.0</playback-speed>
                    <loopback>false</loopback>
                </playback-parameters>

                <rules>
                    <rule id="helloworldRule"> select * from HelloWorldEvent
            retain 1 event </rule>
                </rules>
                <bindings/>
            </processor>
```

2. Redeploy the application so the new configuration takes effect.

3. Invoke Visualizer.

4. In the left pane, navigate to and expand the Applications node of the Oracle CEP instance to which the application is deployed.

5. Expand the *appname* > Stages node to see a list of the EPN stages in the domain tree.

6. Click on the stage for which you added record and playback configuration to its configuration file.

7. In the right pane, click the Record tab.

8. If you want to change the time to start and end recording, click on the entry in the table, update the dates in the Change Schedule area, then click Update Schedule.

9. Click Start Recording to start recording, End Recording to end.

10. To playback, click the Playback tab. The buttons below work similarly to those of the Record tab.

Add or delete rules from a processor

1. In the left pane, navigate to and expand the Applications node of the Oracle CEP instance to which the application is deployed.

2. Expand the *appname* > Stages node to see a list of the EPN stages in the domain tree.

3. Click on the processor to which you want to add or delete rules.

4. In the right pane, click the Rules tab.

5. To delete a rule, select a rule in the table and click Delete Rule.

6. To add a rule, enter the rule ID and rule text in the boxes at the bottom of the page, then click New Rule.

Note: You cannot change an existing rule using Visualizer.

View and change the configuration of a stage

1. In the left pane, navigate to and expand the Applications node of the Oracle CEP instance to which the application is deployed.

2. Expand the *appname* > Stages node to see a list of the EPN stages in the domain tree.

3. Click on the stage whose configuration you want to update.

4. In the right pane, click the General tab.

   Note: Not all stage's configuration can be updated by Visualizer. A Modify button will appear if the configuration can be updated.

5. If a stage's configuration can be updated, click Modify.

6. Enter the new values.

7. Click Commit.

Deploy an application

Deploying an application refers to uploading to the server the JAR file that contains the application and then installing it, which makes it available to clients.

1. In the left pane, navigate to and expand the Applications node of the Oracle CEP instance to which you want to deploy the application.

2. In the right pane, click the Deployment tab.

3. Click the Install button.

4. Click the Upload tab.

5. Click on the "..." button to invoke a file browsing window, browse to the directory that contains the JAR file of application, and click Open.

6. Click Upload. The JAR file appears in the table of applications.

7. Click the Install button and select your application in the table.

8. Click Deploy.

9. Click OK.

Your application is deployed and ready for clients to use.

Uninstall an application

When you uninstall an application, you completely remove it from the server so that clients can no longer access it.

1. In the left pane, navigate to and expand the Applications node of the Oracle CEP instance to which you want to uninstall the application.

2. In the right pane, click the Deployment tab.

3. In the Deployments table, select the application you want to uninstall by checking the box to the left of its name.

4. Click Uninstall.

5. Click OK.

Suspend or Resume an application

1. In the left pane, navigate to and expand the Applications node of the Oracle CEP instance to which you want to suspend or resume an application.

2. In the right pane, click the Deployment tab.

3. In the Deployments table, select the application you want to suspend or resume by checking the box to the left of its name.

4. Click Suspend to suspend the application or Resume to resume the application.

5. Click OK.

Typical Server and Domain Tasks

This section contains the typical server and domain tasks you can perform with Oracle CEP Visualizer.

Visualizer is fairly self-explanatory and intuitive, so not all tasks are discussed here, but rather, just those that are most common and typical and from which other similar tasks can be deduced.

This section describes how to:

- Update the JMX configuration of the server.

- Configure data sources.

- Configure Jetty servers.

- Configure work managers.

- Configure logging.

- Configure the event repository.

- Configure HTTP Publish-Subscribe Server.

Update the JMX configuration of the server.

No documentation available for Beta.

Configure data sources.

No documentation available for Beta.

Configure Jetty servers.

No documentation available for Beta.

Configure work managers.

No documentation available for Beta.

Configure logging.

No documentation available for Beta.

Configure the event repository.

No documentation available for Beta.

Configure HTTP Publish-Subscribe Server.

No documentation available for Beta.

Typical Security Tasks

This section contains the typical security tasks you can perform with Oracle CEP Visualizer.

Visualizer is fairly self-explanatory, so not all tasks are discussed here, but rather, just those that are most common and typical and from which other similar tasks can be deduced.

This section describes how to:

- Create new users.

- Assign users to groups.

- Map groups to roles.

- Configure the security policies for roles.

Create new users.

No documentation available for Beta.

Assign users to groups.

No documentation available for Beta.

Map groups to roles.

No documentation available for Beta.

Configure the security policies for roles.

No documentation available for Beta.