Oracle® Fusion Middleware

Using Oracle Stream Explorer

12*c* Release (12.1.3)

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Describes how to use Oracle Stream Explorer to simplify the complex event processing.

ORACLE

Oracle Fusion Middleware Using Oracle Stream Explorer, 12c Release (12.1.3)

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Preface

This document describes how to use Oracle Stream Explorer. The User Guide describes the various tasks that a user can perform using Oracle Stream Explorer.

Audience

This document is intended for all users of Oracle Stream Explorer and Event Processing.

Related Documents

For more information, see the following documents:

- *Developing Applications for Event Processing with Oracle Stream Explorer*
- *Getting Started with Event Processing for Oracle Stream Explorer*
- *Getting Started with Oracle Event Processing on Oracle Java Embedded Systems*
- *Schema Reference for Oracle Stream Explorer*
- *Customizing Oracle Stream Explorer*
- *Using Visualizer for Oracle Stream Explorer*
- *Customizing Oracle Stream Explorer*
- *Developing Applications with Oracle CQL Data Cartridges*
- *Oracle CQL Language Reference for Oracle Stream Explorer*
- *Java API Reference for Oracle Stream Explorer*
- *Java API Reference for Oracle Event Processing for Oracle Java Embedded for Embedded Linux ARM, Embedded Linux x86, Linux ARM, Linux x86*
- *Administering Oracle Stream Explorer*
- *Getting Started with Oracle Stream Explorer*.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

What's New In This Guide?

There are no changes in the 12*c* 12.2.1 release. This document summarizes the new features and significant product changes for Oracle Stream Explorer in the Oracle Fusion Middleware 12c Release (12.1.3.0) release.

Oracle Stream Explorer is a new tool introduced in the 12c Release (12.1.3.0) of Oracle Fusion Middleware.

This document is new for this release and describes the installation of Oracle Stream Explorer.

1

Introduction to Oracle Stream Explorer

The Oracle Stream Explorer Event Processing platform is very advanced, scalable, reliable, and flexible. However, non-technical users find it difficult to leverage the benefits of Oracle Stream Explorer Event Processing platform.

Oracle Stream Explorer is developed to simplify the complex event processing operations and make them available even to users without any technical background.

This chapter contains the following sections:

- Oracle Stream Explorer User Interface
- Components of Oracle Stream Explorer.

1.1 Oracle Stream Explorer User Interface

The user interface of Oracle Stream Explorer is outlined in the sections that follow.

Oracle Stream Explorer user interface components are listed and explained at a high level in the sections that follow.

1.1.1 Sign In Page

Oracle Stream Explorer uses the same set of users and user roles configured in the Visualizer. Oracle Stream Explorer uses the same role-based authorization and authentication system provided by the Oracle Stream Explorer Server.

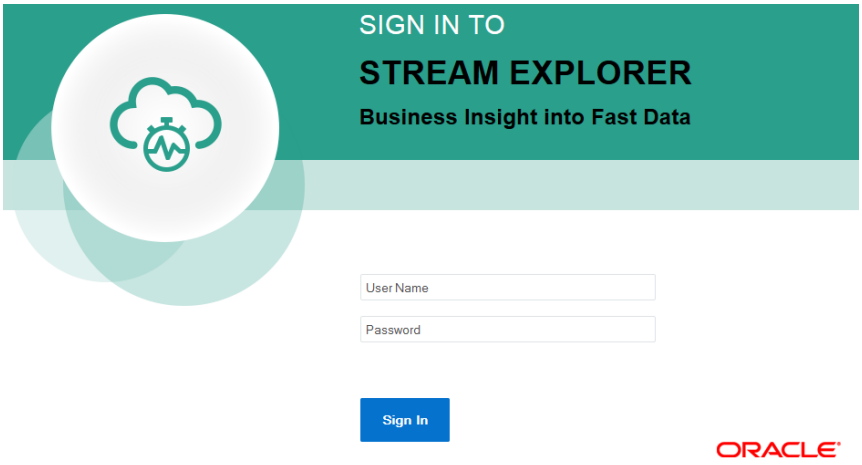
Sign in to the Oracle Stream Explorer application using the following credentials:

- User Name: `<the user name you have provided at the time of installation>` (`oepadmin` is the default user)
- Password: `<the password you have provided at the time of installation>`

You can also sign in using any of the user accounts (with an administrator role) from the Oracle Stream Explorer Event Processing Server users.

The **Sign In** page is as shown below:

Figure 1-1 Oracle Stream Explorer Sign in Page



1.1.2 Home Page

The Home page lists the industry verticals that Oracle Stream Explorer supports.

Each industry vertical has a tag associated with it and the tags are case-sensitive.

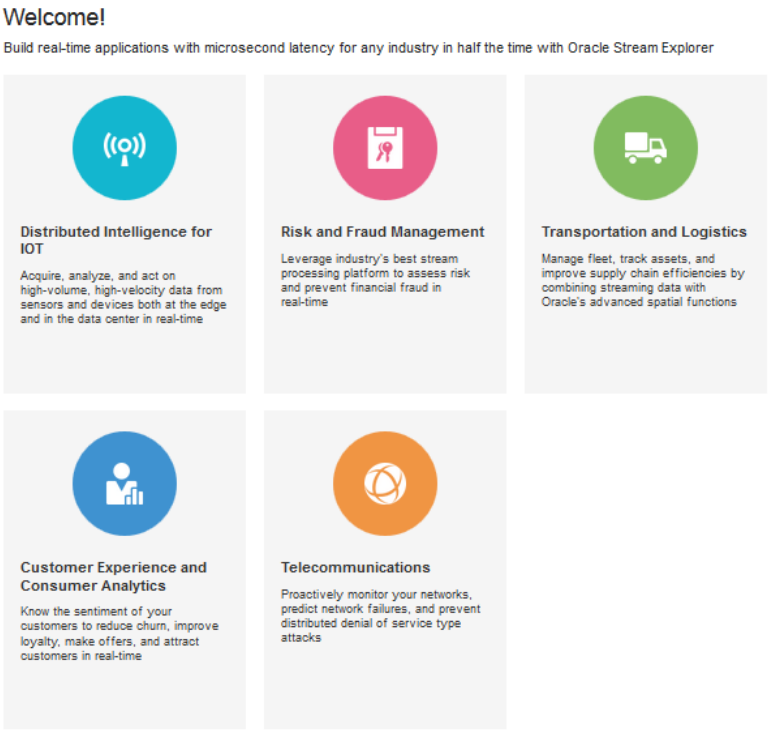
- *Distributed Intelligence for IOT* - Acquire, analyze, and act on high-volume, high-velocity data from sensors and devices both at the edge and in the data center in real-time. Tag for this vertical is *IOT*.
- *Risk and Fraud Management* - Leverage industry's best stream processing platform to assess risk and prevent financial fraud in real-time. Tag for this vertical is *risk*.
- *Transportation and Logistics* - Manage fleet, track assets, and improve supply chain efficiencies by combining streaming data with Oracle's advanced spatial functions. Tag for this vertical is *transportation*.
- *Customer Experience and Consumer Analytics* - Know the sentiment of your customers to reduce churn, improve loyalty, make offers, and attract customers in real-time. Tag for this vertical is *customer*.
- *Telecommunications* - Pro actively monitor your networks, predict network failures, and prevent distributed denial of service type attacks. Tag for this vertical is *telecom*.

Note:

For any application domain not available in this list, use the *Distributed Intelligence for IOT* vertical in the Catalog.

The Home page is as shown below:

Figure 1-2 Oracle Stream Explorer Home Page

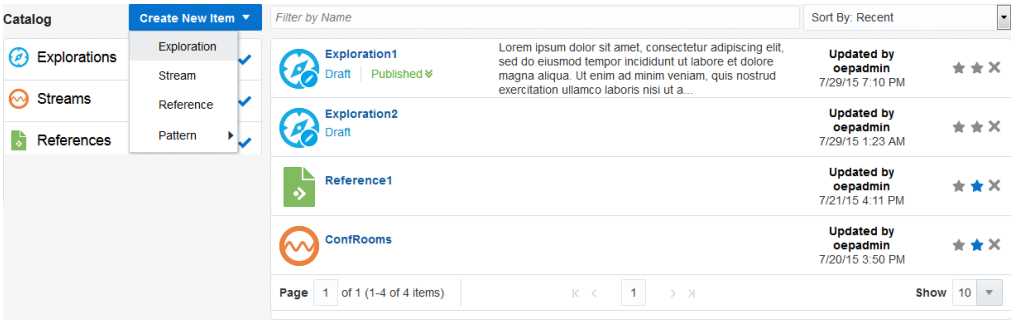


1.1.3 Catalog Page

The Catalog page is the location where all the explorations, streams, and references are listed. This is the go-to place for you to perform any tasks in Oracle Stream Explorer.

You can mark an exploration/stream/reference as a favorite item from the Catalog. The Catalog also allows you to delete an exploration/stream/reference. The Catalog page is as shown below:

Figure 1-3 Catalog Page



You can include or exclude explorations/streams/references/places using the toggle buttons in the left panel. The default view of the Catalog is to display the explorations/streams/references/places.

1.1.4 Exploration Editor

Exploration Editor, also known as the *Explorer*, allows you to create or edit the explorations in Oracle Stream Explorer.

1.1.5 Streams Wizard

Streams Wizard allows you to create or edit the streams in Oracle Stream Explorer.

1.1.6 References Wizard

References Wizard allows you to create or edit the references in Oracle Stream Explorer.

1.2 Components of Oracle Stream Explorer

Oracle Stream Explorer has the following components:

1.2.1 Stream

A *stream* is a source of dynamic data. The data is flowing, it is not static or frozen. For example, stock prices of a particular company can be considered as a stream as the data comes in every second. Stream can be from EDN Server, JMS Server, REST Service, HTTP Pubsub Server, or simulated from a CSV file (data dump).

1.2.2 Reference

A *reference* is a source of static data that provides contextual information about the event data. The metadata and contextual information of event data is stored in a reference. In this release, the only supported reference type is Oracle Database table.

1.2.3 Exploration

An *exploration* allows you to define business criteria for managing data (filters, summaries, group by, or correlations). The exploration is a visual representation of streaming data. It lets you see how the business criteria apply and manage the data. You can also configure a *target*, the location where the data flows downstream from an exploration. Data flows both in and out, to and from an exploration.

1.2.4 Pattern

A *pattern* provides you with a simple way to explore event streams based on common business scenarios.

1.2.5 Shape

A *shape* is a representation of data definition within a stream, i.e., an event type.

2

How to Set Oracle Stream Explorer Preferences

This chapter explains in detail about the Preferences that the user can set on the Oracle Stream Explorer. Based on the preferences the users set in this page, the characteristics of the Oracle Stream Explorer vary.

This chapter contains the following sections:

- General Preferences
- View Mode Preferences
- Notifications Preferences
- Catalog Preferences
- Exploration - Live Output Stream Preferences.

2.1 General Preferences

This section explains the general preferences that the user can set for Oracle Stream Explorer.

Figure 2-1 General Preferences

Start Page

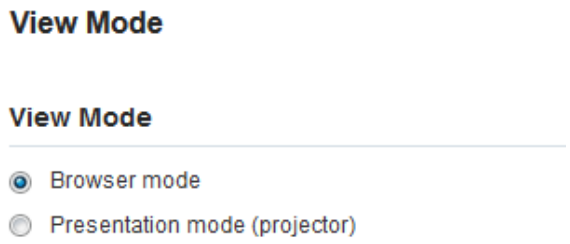
Select if you want the **Welcome** page or the **Catalog** page to appear as the **Start** Page.

Click **Save** to apply the changes you have made or click **Restore To Default** to retain the default settings.

2.2 View Mode Preferences

This section explains the view mode preferences that the user can set for Oracle Stream Explorer.

Figure 2-2 View Mode Preferences



Browser mode

Use this option to view the application in a browser mode, i.e., just like any other web application appears in a browser.

Presentation mode (projector)

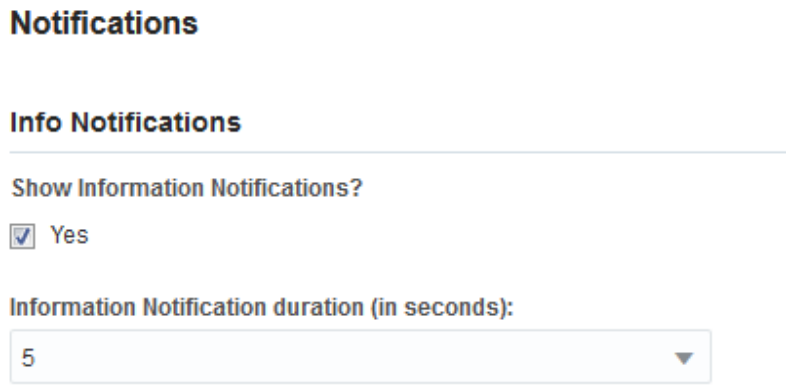
Use this option to view the application in a presentation mode, i.e., as if the application is being viewed on a projector as a presentation. When you select the **Presentation mode**, a different color skin is applied to the application.

Click **Save** to apply the changes you have made or click **Restore To Default** to retain the default settings.

2.3 Notifications Preferences

This section explains the notifications preferences that the users can set for Oracle Stream Explorer.

Figure 2-3 Notifications Preferences



Show Information Notifications

Select this option if you want the information notifications to appear in the application. This option is selected by default.

Information Notification duration (in seconds)

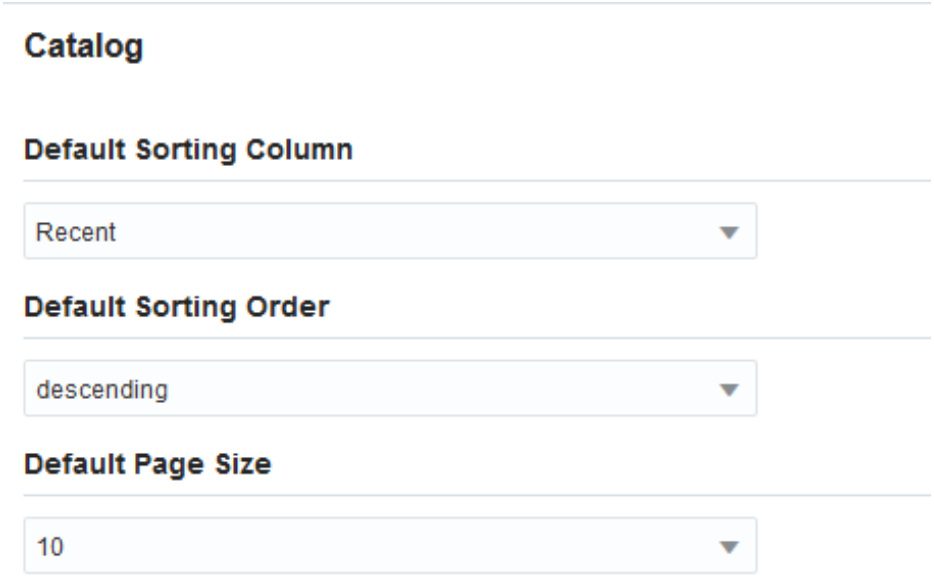
Choose the number of seconds for which the notifications appear. 5 seconds is the default value.

Click **Save** to apply the changes you have made or click **Restore To Default** to retain the default settings.

2.4 Catalog Preferences

This section explains the catalog preferences that the user can set for Oracle Stream Explorer.

Figure 2-4 Catalog Preferences



Default Sorting Column

Select the column by which you want the columns to be sorted. This value will be used as the default for all columns until you change the value again.

Default Sorting Order

Select the sorting order by which you want the columns to be sorted. This value will be used as the default value for all columns until you change the value again.

Default Page Size

Select the value to be used as the default page size. Based on the value selected, the number of records that appear on a page vary. This value will be used as the default for all pages until you change the value again.

Click **Save** to apply the changes you have made or click **Restore To Default** to retain the default settings.

2.5 Exploration - Live Output Stream Preferences

This section explains the exploration preferences that the user can set for Oracle Stream Explorer.

Figure 2-5 Live Output Stream Preferences

Default Table Size

Select a value that you want to be applied as the default table size for the data in Live Output Stream of an exploration.

Click **Save** to apply the changes you have made or click **Restore To Default** to retain the default settings.

3

Working with Streams

This chapter explains the details about streams, creating streams, and editing streams.

This chapter contains the following sections:

- Understanding Streams
- Creating a Stream
- Editing a Stream
- Restoring a Stream
- Marking a Stream as Favorite
- Deleting a Stream.

3.1 Understanding Streams

An event stream is an Oracle Stream Explorer Event Processing adapter node producing events of a single type. Different configurations represent different sources even though they are of the same type.

3.1.1 Metadata

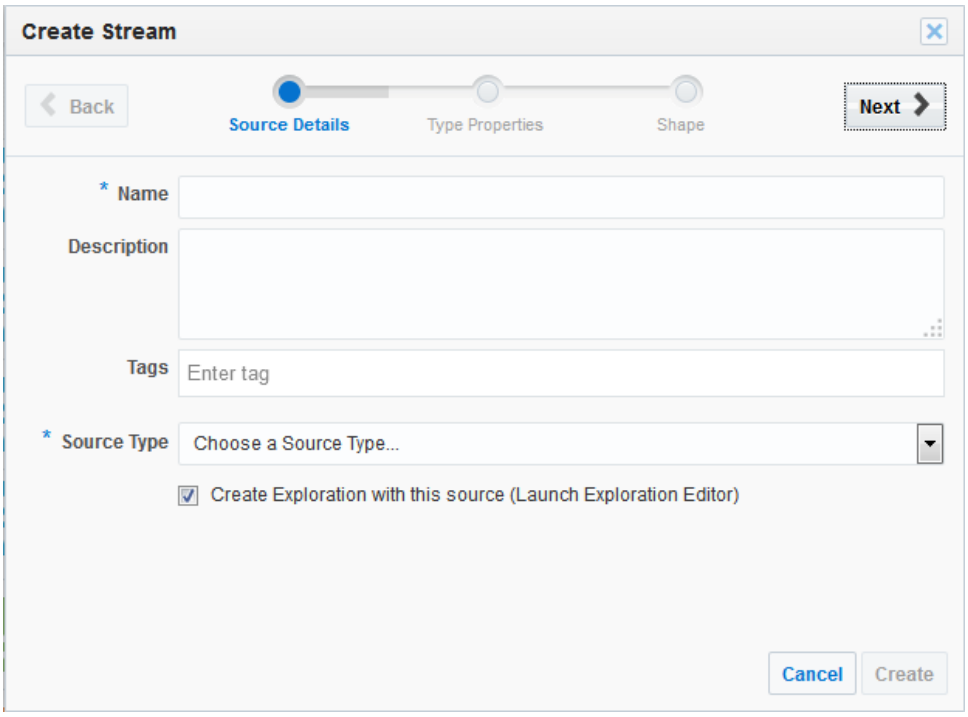
Every stream has the following set of metadata:

- Name
- Tags
- Description
- Created By
- Created At
- Updated By
- Updated At
- Is Favorite.

3.2 Creating a Stream

A stream is required for the users to create an exploration. This section explains how to create a stream. The **Create Stream** screen is shown below.

Figure 3-1 Create Stream - Source Details Dialog



To create a stream:

1. Navigate to Catalog.
2. Select **Stream** in the **Create New Item** menu.
3. Enter a name for the stream in the **Name** field.
4. Provide a description that helps users understand about the stream in the **Description** field. This is an optional field.
5. Enter a tag with which you want to tag the stream in the **Tag** field. You can provide multiple tags. This is an optional field.

Note:

The tags you enter must represent the industry verticals supported by Oracle Stream Explorer. You must use the pre-existing tags. For more information about pre-existing tags, see Home Page.

---

6. Select a stream type that you want to use for the stream from the **Source Type** field.

Note:

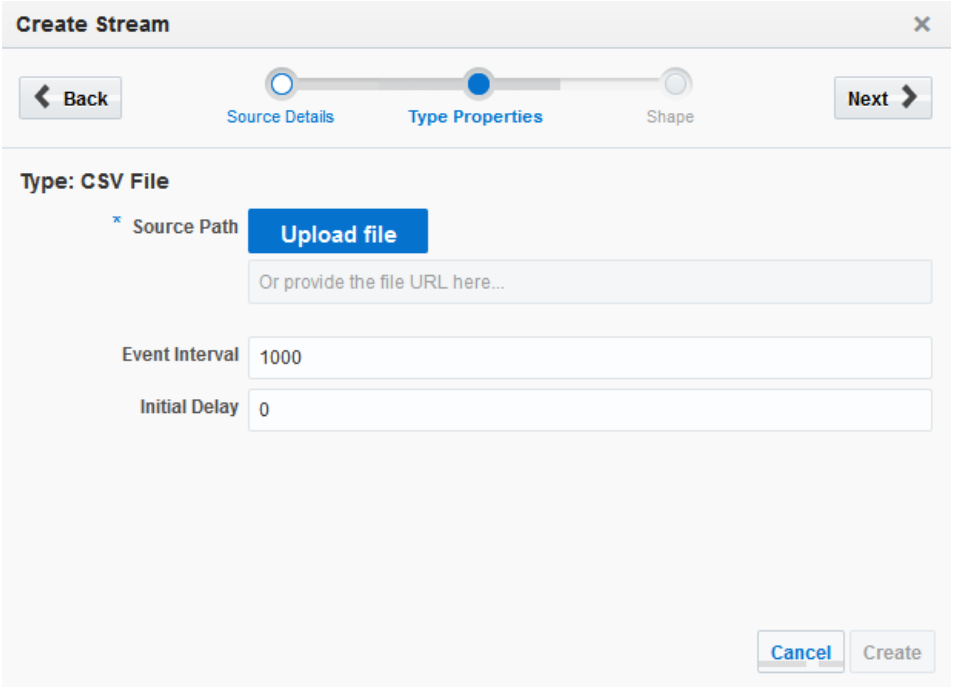
If you select EDN as the source type, you can work only with an XML element that has a flat structure. The XML schema does not support any other schemas. The Stream wizard does not display all other types of EDN.

---

7. Select **Create Exploration with this source (Launch Exploration Editor)** if you want to launch the Exploration Editor utilizing this stream as the primary source.

8. Click **Next**. Based on the source type you have selected, you must enter data in the following fields on the **Type Properties** screen:

Figure 3-2 Create Stream - Type Properties Dialog

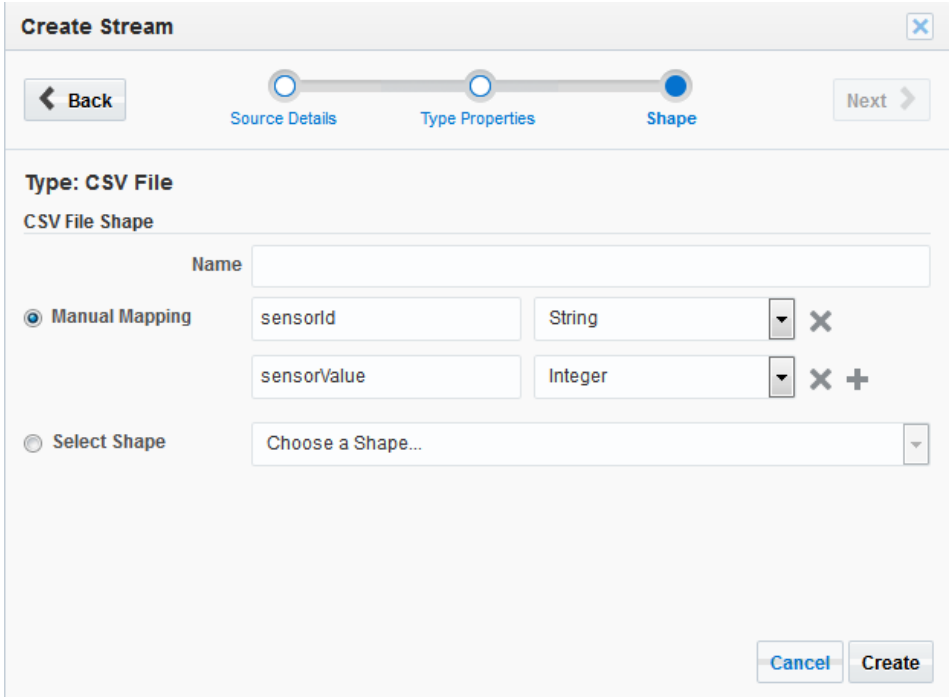


Source Type	Data Fields
CSV File	If the source type is CSV File, you must enter data in the following fields: • **Source Path** - either upload a local CSV file or provide a URL to the location where the file resides. This is a mandatory field. • **Event Interval** - the time interval at which the event refreshes. The time is in milliseconds. Default value is 1000 milliseconds, which is 1 second. • **Initial Delay** - the time interval before which the data streaming starts. The time is in milliseconds. Default value is 0. • **Loop the CSV File** - the option that allows you to keep the CSV source always running by automatically restarting it from the beginning of the file when the end of the file is reached.
HTTP Subscriber	If the source type is HTTP Subscriber, you must enter data in the following fields: • **Server URL** - the server URL for the HTTP Subscriber. This is a mandatory field. • **Channel** - the channel for the HTTP Subscriber. This is a mandatory field. • **Username** - username to access the HTTP Subscriber • **Password** - password to access the HTTP Subscriber

Source Type	Data Fields
EDN	If the source type is EDN, you must enter data in the following fields: • **URL** - URL to access the EDN. This is a mandatory field. • **Username** - username to access the EDN. This is a mandatory field. • **Password** - password to access the EDN. This is a mandatory field.
JMS	If the source type is JMS, you must enter data in the following fields: • **URL** - URL to access the JMS. This is a mandatory field. • **Username** - username to access the JMS. This is a mandatory field. • **Password** - password to access the JMS. This is a mandatory field. • **JNDI name** - JNDI name (queue or topic) to access the JMS. This is a mandatory field.
REST	If the source type is REST, you must enter data in the following fields: • **Context Path** - the context path of the REST Adapter. This is a mandatory field.

9. Click **Next**. The **Create Stream - Shape** screen appears.

Figure 3-3 Create Stream - Shape Dialog



10. Perform **Manual Mapping** or **Select a Shape** on the **Shape** screen.

When you perform manual mapping, you need to decide the best data type that is suitable for the value represented by each of the fields in the data source. The data

types can be String, Byte, Integer, Big int, Float, Double, Big decimal, Boolean, Timestamp.

Note:

Providing a shape name is optional. If the shape is not specified, then this shape will not be available for reuse in the drop-down list.

If you **Select Shape**, the pre-existing configuration is used for your stream.

11. Click **Create** to create the stream. The new stream appears in the Catalog.
12. Click **Cancel** at any time to abort the operation.

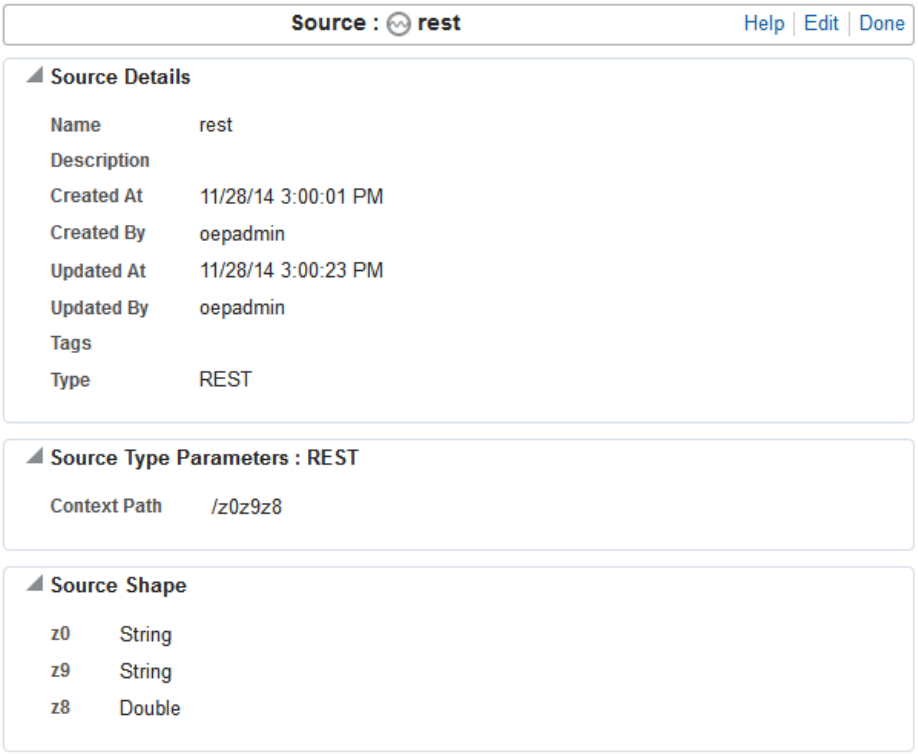
3.3 Editing a Stream

After you create a stream, Oracle Stream Explorer provides you with an opportunity to edit the stream at any point of time.

To edit a stream:

1. Click the stream you want to edit from the **Catalog**.
2. Click **Edit** in the source dialog.

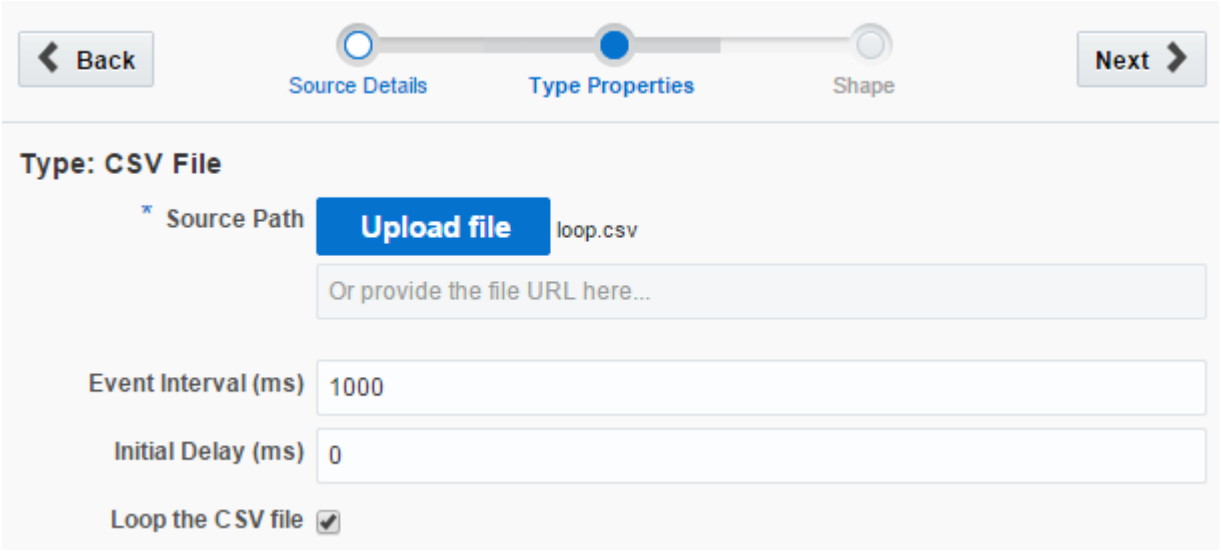
Figure 3-4 Edit Source Dialog



3. Update the data you want to edit in the stream dialog.

4. Select **Loop the CSV** File on the **Edit Stream - Type Properties** dialog. This feature allows you to keep the CSV source always running by automatically restarting it from the beginning of the file when the end of the file is reached.

Figure 3-5 Edit Stream — Loop the CSV File Feature



Note:

This feature is available only for the CSV source and not for any other type of source or target.

5. Click **Save** when you are done with updating or editing the stream.
6. Click **Cancel** at any point of time to abort the operation.
7. Click **Done** in the stream dialog to complete the edit operation.

3.4 Restoring a Stream

A stream goes to an invalid state if the stream or the corresponding Event Processing application is undeployed in the Visualizer. Oracle Stream Explorer allows you to restore a stream that is in an invalid state.

To restore an exploration:

1. Identify the stream that is in invalid state in the **Catalog**. The stream in invalid state is indicated by a red cross icon.
2. Click the *Restore* icon to the right of the stream to fix the deployment problems and restore the stream.

Figure 3-6 Restore Icon

A notification appears about the result of restore operation.

3.5 Marking a Stream as Favorite

You can mark a stream as Favorite. Marking a stream as Favorite allows you to locate and navigate such streams easily even if you have numerous items on the catalog.

To mark a stream as favorite:

1. Identify the stream you want to mark as favorite in the **Catalog**.
2. Click the *Favorite* icon to the right of the table row for that stream to mark it as a favorite. This icon acts as a toggle button.

Figure 3-7 Favorite Icon

3. Click the *Favorite* button again to remove the stream from favorites.

3.6 Deleting a Stream

You can delete a stream if you are sure you do not require the stream anymore. If a stream has dependencies, it cannot be deleted. A stream is said to have dependencies if it is part of a published exploration being used by any user. To delete a stream with dependencies, you must delete the dependencies first.

To delete a stream:

1. Identify the stream you want to delete in the **Catalog**.
2. Click the *Delete* icon to the right of the stream to delete it.

Figure 3-8 Delete Icon

A confirmation dialog appears. If you select **OK**, the stream will be deleted.

4

Working with Explorations

This chapter explains about explorations in Oracle Stream Explorer.

This chapter contains the following sections:

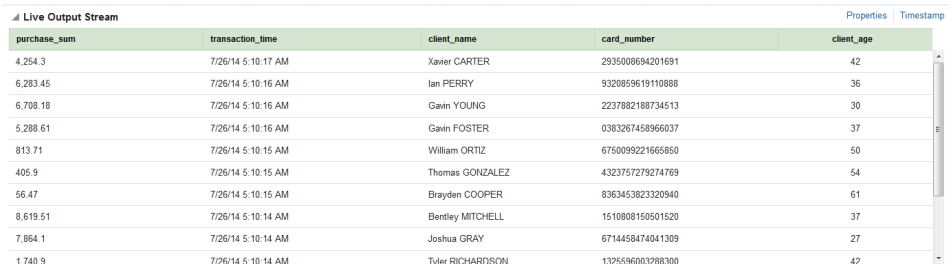
- Understanding Explorations
- Creating an Exploration
- Editing an Exploration
- Configuring a Target
- Understanding a Draft Exploration
- Publishing an Exploration
- Unpublishing an Exploration
- Exporting an Exploration
- Reusing an Exploration
- Marking an Exploration as Favorite
- Deleting an Exploration
- Restoring an Exploration.

4.1 Understanding Explorations

Explorations are Oracle Stream Explorer Event Processing applications that allow you to apply business logic to the event flows. Explorations are the visual representation of the data streamed from a source. The data in the exploration is represented visually in the form of:

- **Live Output Stream** - Live Output Stream shows the streaming data shapes in a tabular form.

Figure 4-1 Sample Live Output Stream

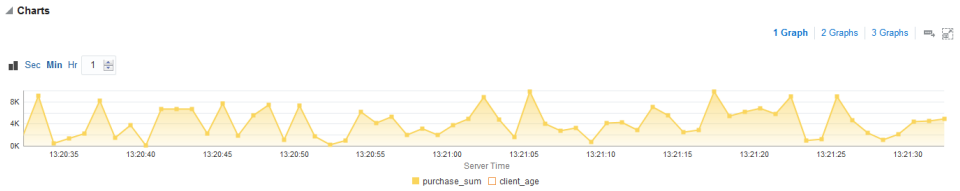


Live Output Stream — Properties | Timestamp

purchase_sum	transaction_time	client_name	card_number	client_age
4,254.3	7/26/14 5:10:17 AM	Xavier CARTER	2935008694201691	42
6,283.45	7/26/14 5:10:16 AM	Ian PERRY	9320859619110888	36
6,708.18	7/26/14 5:10:16 AM	Gavin YOUNG	2237882188734513	30
5,288.61	7/26/14 5:10:16 AM	Gavin FOSTER	0383267458966037	37
813.71	7/26/14 5:10:15 AM	William ORTIZ	6750099221665850	50
405.9	7/26/14 5:10:15 AM	Thomas GONZALEZ	4323757279274769	54
56.47	7/26/14 5:10:15 AM	Brayden COOPER	8363453823320940	61
8,619.51	7/26/14 5:10:14 AM	Bentley MITCHELL	1510808150501520	37
7,864.1	7/26/14 5:10:14 AM	Joshua GRAY	6714458474041309	27
1,740.9	7/26/14 5:10:14 AM	Tyler RICHARDSON	1325596003288300	42

- **Line Charts** - Line charts are the primary way of visualizing time-series data. The X-axis is used to represent the time movement and allows natural scrolling of the data as time moves forward. The Y-axis is used to see the change of the dependent variable, that is, variable of interest, as time moves.

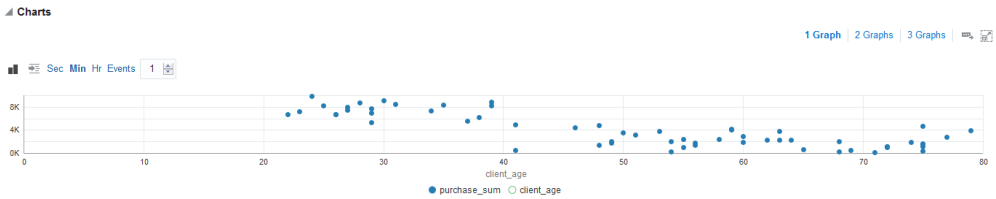
Figure 4-2 Sample Line Chart



- **Scatter Charts** - When the time dimension is not important, then data may be better understood by looking at a scatter plot. In this case, the user can assign distinct event properties to both the X-axis and Y-axis. However, values on both axes need to be numeric variables. Remember that the X-axis represents the explanatory variable and the Y-axis the response variable. Hence, the properties that indicate response or calculated field are better candidates to automatically assign to the Y-axis.

  In the case of time-series, it is obvious that new values enter in the right side of the graph and old values exit in the left side. However, this behavior does not translate to scatter plots, as the new point may show up anywhere.

Figure 4-3 Sample Scatter Chart



Explorations allow you to:

- use one or more streams and references as sources of events and data
- correlate multiple event and data sources
- filter events and data
- group events and data
- specify the time/event -based windows for aggregation functions
- specify aggregation functions to be used in summaries
- add static string fields to resulting events
- review incoming events (before you apply the logic) and resulting events (after you apply the logic) in tabular and graph forms
- configure targets.

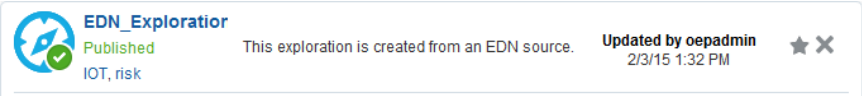
4.1.1 Metadata

Every exploration has the following set of metadata:

- Name
- Tags
- Description
- Created By
- Created At
- Updated By
- Updated At
- Is Favorite.

Tags, Description, and being Favorite are specified explicitly in the Exploration Editor. Creation and update information is persisted automatically.

Figure 4-4 Exploration Metadata



4.1.2 Correlations

When an exploration has more than one data source associated with it, a logical relation must be established between the data sources. This logical relation is known as correlation.

Oracle Stream Explorer allows the data sources to be joined using correlation rules. When all the sources are correlated, they provide a single event stream that can be further sent to a Target. Only fields of compatible types from different non-correlated sources may be used as operands in the correlation.

If your streams and references are not correlated, the exploration is in an invalid state and will remain so until you correlate the sources. The exploration will not be updated on the server until you correlate.

4.1.3 Filters

The conditions with which the output can be filtered are known as *Filters*. When you apply filters to the output, only the events that match ALL or ANY of the filters are displayed. You can filter events by comparing a left operand with a right operand using the following operators:

- equal to
- not equal to
- lower than
- lower than or equal to
- greater than
- greater than or equal to
- contains.

Left operand can be any one of the following:

- a field of any source in the exploration
- a summary that is defined in the *Summaries* area.

Right operand can be any one of the following:

- a constant of a type that is compatible with the type of left operand
- a field or a summary of a field from a source of the left operand.

4.1.4 Summaries

You can aggregate functions (*Summaries*) to fields and apply grouping by any combination of fields. The only exception is that a field cannot have both summary and be included in a Group. When you define summaries and/or grouping, all other non-aggregate and non-grouping fields will be automatically excluded from the results shape.

When you define a summary or grouping, the only fields allowed in the output are fields from *Summaries* and *Group By* area. When you define a summary, it is automatically shown in the results table and filters area is provided with an option to filter by this newly created Summary. When you remove or change the summary, if it is used in the filters and/or in output, you must confirm this action as it will affect the filter and/or output.

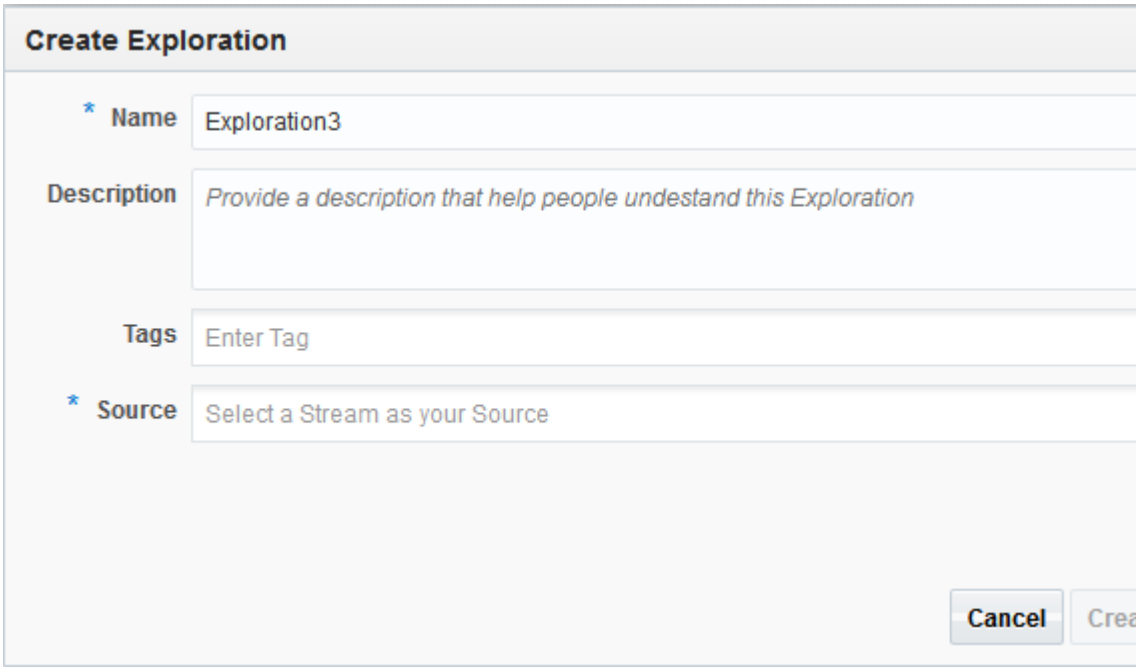
4.2 Creating an Exploration

This section explains how to create an exploration.

To create an exploration:

1. Navigate to Catalog.
2. Select **Exploration** in the **Create New Item** menu.
3. Enter information in the **Create Exploration** dialog. The **Create Exploration** screen is as shown below.

Figure 4-5 Create Exploration Dialog



a. Enter a name for the exploration in the **Name** field.

b. Provide a description that helps users understand about this exploration in the **Description** field.

c. Enter a tag with which you want to tag the exploration in the **Tags** field. You can provide multiple tags.

d. Select a stream as the source for the exploration in the **Source** field. This can be another exploration that is in published state.

Note:

You cannot create an exploration based only on a reference as the source. You must start with a stream and then add reference(s) as source later.

---

4. Click **Create** to complete the creation of an exploration. The new exploration opens in the Exploration Editor. The newly created exploration also appears in the Catalog.

   You can continue to add further to the newly created exploration in this editor:

   - **Correlation** — You must add correlations between sources if the exploration uses more than one source.
   - **Summaries** — You can add summary of the exploration data and then group the data accordingly. This is optional.
   - **Filters** — You can add filters to further filter the data based on the summaries you have added to the exploration. This is optional.
   - **Business Rules** — You can add business rules to the data of your exploration. Business rules build conditional logic into the applications. This is optional.

- **Expressions** — You can add expressions to the streaming exploration data. The expressions help you in populating new data fields in the stream by performing calculations on the existing data.

For more information, see Editing an Exploration.

5. Click **Cancel** at any point of time to abort the operation.

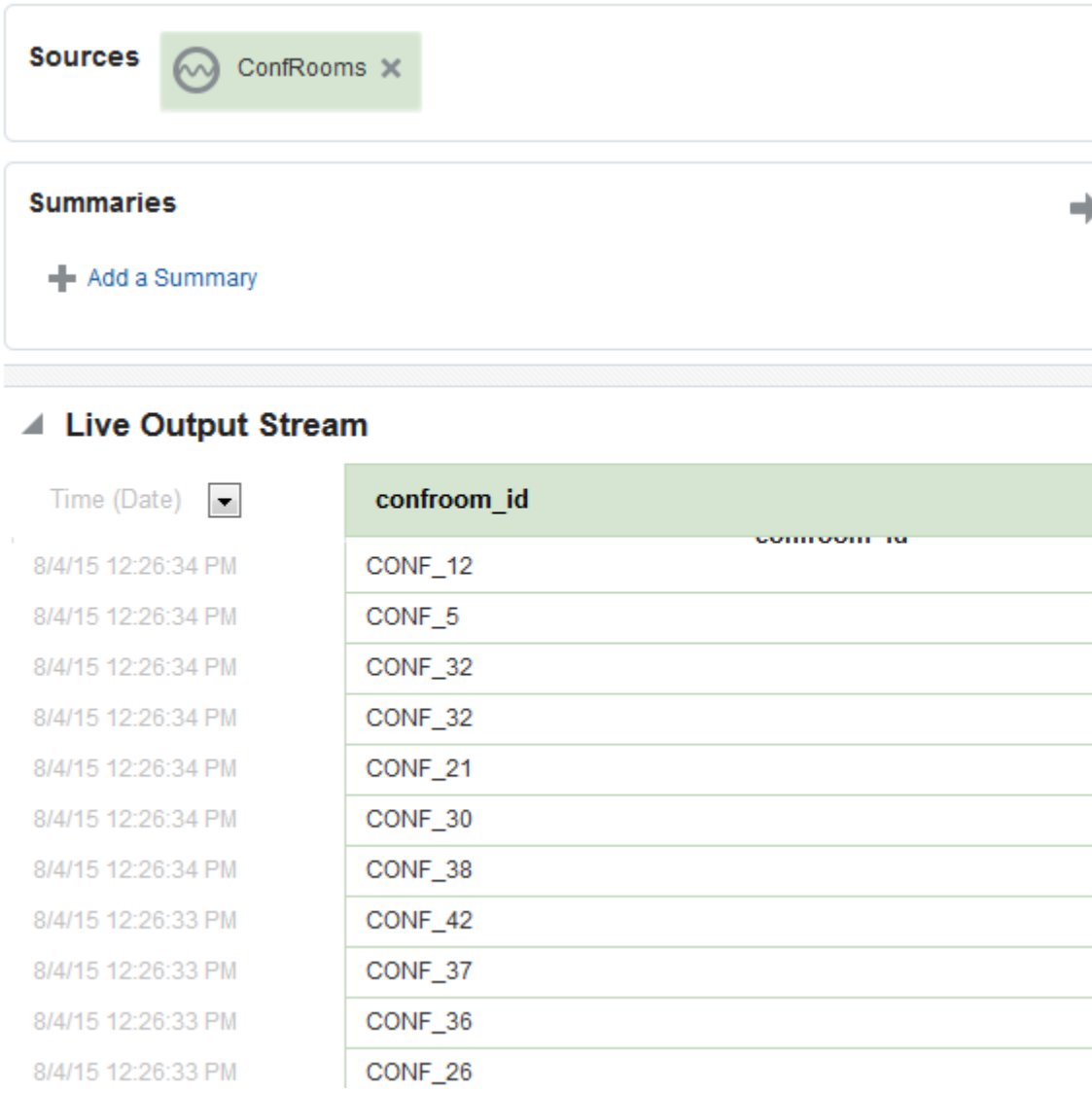
4.3 Editing an Exploration

When you create an exploration, the exploration opens up in the Exploration Editor. You have the option to edit the parameters of the exploration. You can edit or update existing explorations. You can add or modify the data sources for the exploration.

To edit an exploration:

1. Navigate to the Catalog.
2. Identify the exploration that you want to edit or update. Click the name string of the exploration or the exploration icon to open it for editing. The Exploration Editor is as shown below.

Figure 4-6 Exploration Editor



3. Click anywhere in the **Sources** field to add or remove data sources. If you have more than one data source, the sources must be correlated.
4. Define the **Correlations** if the exploration has more than one data source.

> **Note:** Your changes to the exploration are not applied until the sources are correlated. An error message is generated when you try to save the changes without correlating the sources.

5. Click **Add Summary** in the **Summaries** area to add a summary to the exploration.
6. Click **Add a Filter** in the **Filters** area to add filters to the output. The filters further filter the streaming data based on the summaries you have added.
7. Click **Properties** in the **Live Output Stream** area to configure the properties of the output. You can indicate which fields must appear in the output stream.

- You can also add the **Timestamp** to the output stream. The timestamp at which the streaming data was captured appears against each row of live output stream. This is a toggle button and you can use it to switch ON or OFF the timestamp in the live data.

Note:

Only the fields that appear in the live output stream can be sent to the target.

---

8. Configure the number of graphs you want to be displayed for the output stream in the **Charts** area.
9. Click **Window Drawer** icon, available to the right of the screen, to specify time and event based windows used in processing your stream.
   a. Select a value in the **Range** drop-down list and specify a numerical value. This value specifies the range of time period for the stream of data. The range is defined in units like now, nanoseconds, microseconds, milliseconds, seconds, minutes, hours, events, or unbounded.

      Now indicates that the range is as narrow as 1 nanosecond and unbounded indicates a range since the server has started. When the range is anything other than Now, another field, **Evaluation frequency** appears.

   b. Select a value in the **Evaluation frequency** drop-down list and specify a numerical value. This value defines how often the system produces the result events.

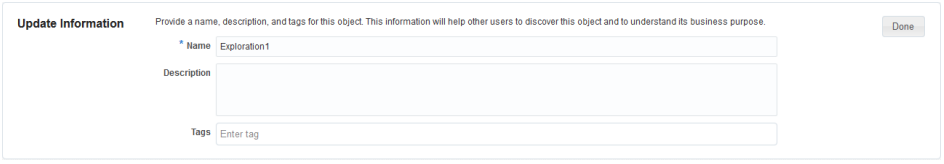
Note:

Evaluation frequency cannot be greater than **Range**.

---

10. Click the pencil icon at the top-right corner to view the information of the exploration.
    a. Click **Edit Info** to update Name, Description, or Tags of the exploration.

    Figure 4-7 Update Information of Exploration

    b. Click **Done** after updating the information.
11. Click **Undo Changes** icon at the top-right corner to undo the changes you have made. The Undo is applicable only on the following changes:
    - add/edit/delete summary
    - group by
    - add/edit/delete filter
    - specifying range.

Note:

Undo operation is not available for publish action. To undo a publish, you must unpublish the exploration.

Figure 4-8 Undo Changes Icon

Note:

Clicking Undo once, reverses only the last made change.

12. Click **Redo Changes** icon at the top-right corner to re-apply the changes you have made. The Redo is applicable only on the following changes:

    - add/edit/delete summary
    - group by
    - add/edit/delete filter
    - specifying range.

Figure 4-9 Redo Changes Icon

Note:

Clicking Redo once, re-applies only the last made change.

13. Click the **User Assistant** icon at the top-right corner to view explanation about the Exploration Editor. This icon acts as a toggle button.

Figure 4-10 User Assistant Icon

Note:

When you edit an exploration, you must publish it again for the changes to be implemented.

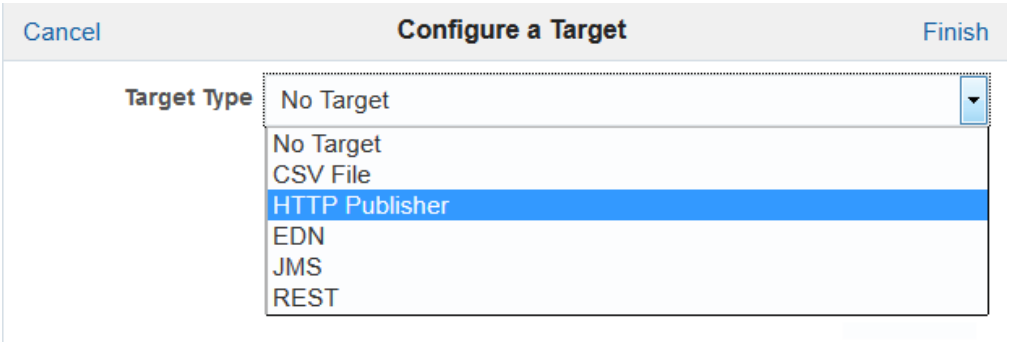
4.4 Configuring a Target

Every exploration must be configured with a target to send the details downstream. Unless the exploration is published, you cannot send the events downstream to the configured target.

To configure a target:

1. Click **Configure a Target** in the Exploration Editor. The **Configure a Target** dialog appears.

Figure 4-11 Configure a Target Dialog



2. Select the **Destination Type** in the **Configure a Target** dialog.

Destination Type	Data Fields
CSV File	If the destination type is CSV File, you must enter data in the following fields: • **File Name** - name of the CSV file. This is a mandatory field. • **Append** - indicates that you do not want to re-create the file and want to add events to the existing file (generally a non-empty file) Under Oracle Stream Explorer event structure, two folders/ directories are created under the server name: • `FileStorage` • `<username>` - the file name you specify for the CSV file goes under this directory.
HTTP Publisher	If the destination type is HTTP Publisher, you must enter data in the following fields: • **Server URL** - the location of the HTTP Publisher. This is a mandatory field. If you use Oracle Stream Explorer's own publisher, the URL is: `http://host:port/pubsub`. • **Channel** - the channel of the HTTP Publisher. This is a mandatory field. • **Username** - username to access the HTTP Publisher • **Password** - password to access the HTTP Publisher
EDN	If the destination type is EDN, you must enter data in the following fields: • **URL** - the location of the EDN. This is a mandatory field. • **Username** - username to access the EDN. This is a mandatory field. • **Password** - password to access the EDN. This is a mandatory field. • **Get Event Definitions** - retrieves the event definitions. • **Select Shape** - select a shape from the drop-down list. • **Target Property** - target shape property. • **Output Stream Property** - select a corresponding shape for the exploration property, or *No mapping* if you do want to map.

Destination Type	Data Fields
JMS	If the destination type is JMS, you must enter data in the following fields: • **URL** - the location of JMS. This is a mandatory field. • **Username** - username to access the JMS • **Password** - password to access the JMS • **JNDI Name** - the JNDI queue name of JMS
REST	If the destination type is REST, you must enter data in the following fields: • **Target URL** - the location of the REST service the exploration will invoke with the resulting messages. This is a mandatory field.

3. Click **Finish** in the **Configure a Target** screen to configure the exploration.
4. Click **Cancel** at any point of time to abort the operation.

4.5 Understanding a Draft Exploration

When you create an exploration, it is in draft state by default. The draft exploration is not available to other users of the application. An exploration moves to a published state when it is published.

When a published exploration is deleted or unpublished, the exploration moves to a draft state.

4.6 Publishing an Exploration

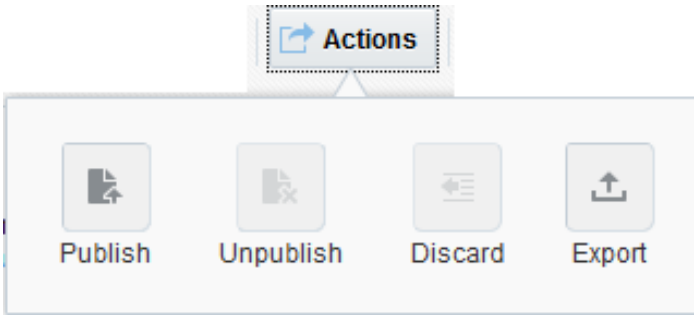
You must publish an exploration to make the exploration available for all the users of Oracle Stream Explorer. A published exploration:

- can be used as a source for another exploration
- will be visible to other users of the application
- is in running state until another user unpublishes or deletes the exploration
- can have targets applied.

To publish an exploration:

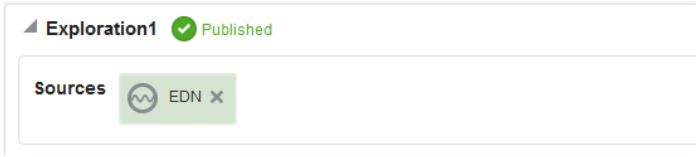
1. Navigate to the Catalog.
2. Identify the exploration you want to publish and click its name or icon.
3. Select **Publish** from the **Actions** menu.

Figure 4-12 Actions Menu



The exploration gets published and you can see a confirmation message. When the exploration is published, it is indicated in the Catalog as shown in the figure below.

Figure 4-13 Published Exploration



You can publish/re-publish an exploration when no consumers are using it, in the following scenarios:

- Re-publish a published exploration with no changes
- Publish a published exploration after modifying its details (a published exploration moves to Draft status when it is modified). After publishing, the draft status changes to published status.
- Re-publish an exploration that has a target configured.

When more than one user tries to publish the exploration after modifications, a conflict arises. The following conflict resolution actions help you in resolving the conflict:

a. Click **Overwrite** to overwrite the published version with the changes you have made.

b. Click **Discard** to discard your changes and go to the latest published version of the exploration.

c. Click **Clone** to publish the exploration under a different name, retaining changes from multiple users.

Note: If there are any users using a published exploration, you cannot re-publish that exploration until you clear the dependencies.

4.7 Unpublishing an Exploration

You can unpublish an exploration that has already been published.

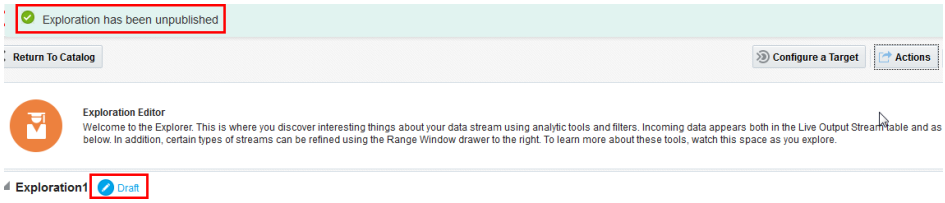
Note: If there are users using a published exploration, you cannot unpublish that exploration until you clear all the dependencies.

To unpublish an exploration:

1. Navigate to the Catalog.
2. Identify the published exploration you want to configure and click it.
3. Select **Unpublish** from the **Actions** menu.

   The exploration gets unpublished and you can see a confirmation message. When the exploration is unpublished, the Published status changes to Draft in the Catalog.

Figure 4-14 Unpublished Exploration



Note:

You cannot unpublish a published exploration when it is being used by any user.

4.8 Exporting an Exploration

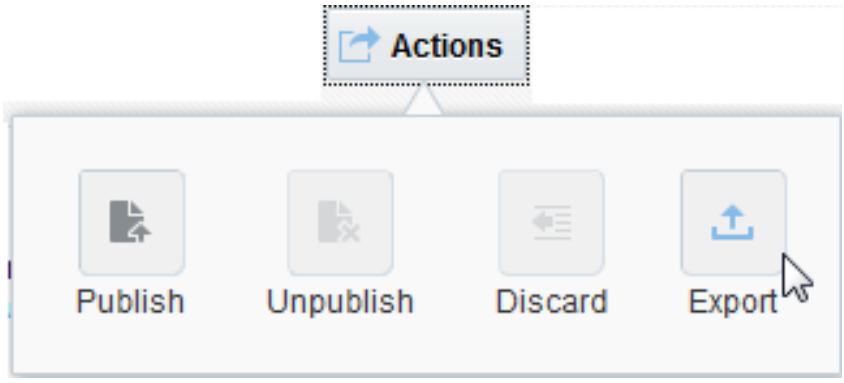
Oracle Stream Explorer allows you to export an exploration as a JAR file and download it for reuse. If you try to export an exploration that is not published, you get an error message.

You can import the exported exploration into JDeveloper and develop the application. However, you cannot import an application or exploration into Oracle Stream Explorer.

To export an exploration:

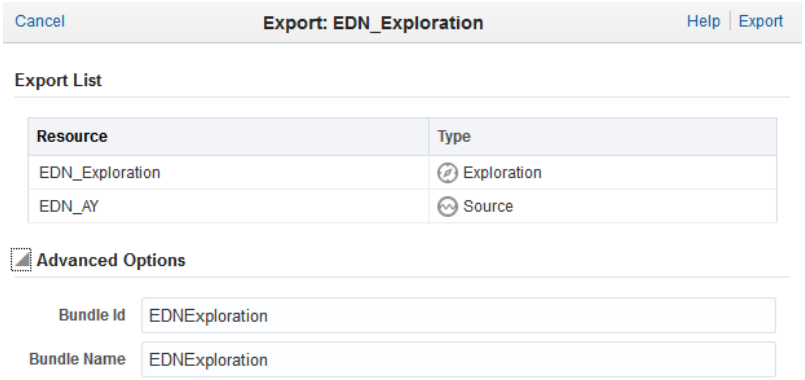
1. Navigate to the Catalog.
2. Identify the published exploration you want to export and click it.
3. Select **Export** from the **Actions** menu.

Figure 4-15 Export Exploration



The Export Exploration dialog is as shown below:

Figure 4-16 Export Exploration Dialog



4. Review the details of the exploration under **Export List**. **Resource** is the name of the exploration and its dependencies to be exported. **Type** is the type of the resource (exploration/source).

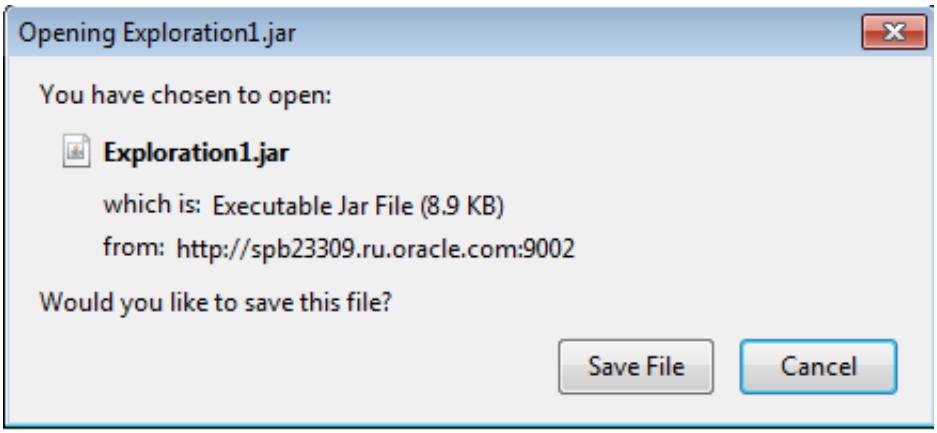
5. Edit/update the exploration bundle details under **Advanced Options** if required.

   a. Enter a value in the **Bundle ID** field. This is an OSGI Bundle-SymbolicName parameter which is unique OSGI Bundle and will be the name of the exported JAR file.

   b. Enter a value in the **Bundle Name** field. This is the name with which the exploration will be exported.

6. Click **Export** to complete exporting the exploration. The exploration is saved as a jar file. You can save the JAR file to any location.

Figure 4-17 Save Exported Exploration



7. Click **Cancel** at any point of time to abort the operation.

If an exploration uses any target or sources with specified user credentials (EDN, JMS, HTTP pubsub), then the exported exploration contains the credentials with encrypted passwords. Passwords are encrypted with the server encryption key. Usually, different servers use different encryption keys. As a result, you must update the encrypted passwords or convert them to plain text passwords before deploying the exploration to a server. If you do not do this, an encryption error appears.

4.9 Reusing an Exploration

You can re-use an existing exploration as a source for another exploration.

4.10 Marking an Exploration as Favorite

You can mark an exploration as Favorite. Marking an exploration as Favorite allows you to locate and navigate such explorations easily even if you have numerous items on the catalog.

To mark an exploration as favorite:

1. Identify the exploration you want to mark as favorite in the **Catalog**.
2. Click the *Favorite* icon to the right of the exploration to mark it as a favorite. This icon acts as a toggle button.

Figure 4-18 Favorite Icon

3. Click the *Favorite* icon to remove the exploration from favorites.

4.11 Deleting an Exploration

You can delete an exploration if you are sure you do not require the exploration anymore. When you delete a published exploration, it moves into a draft state. When an exploration is available in both draft and published state, the delete operation first deletes the draft exploration. When you invoke delete operation for the second time on the same exploration, the exploration gets deleted.

To delete an exploration:

1. Identify the exploration you want to delete in the **Catalog**.
2. Click the *Delete* icon to the right of the exploration to delete it.

Figure 4-19 Delete Icon

A confirmation dialog appears. If you select **OK**, the exploration will be deleted.

4.12 Restoring an Exploration

An exploration goes to an invalid state if the deployment was removed from the Visualizer, the EDN source could not start because of a network issue, a CSV source could not start because of the file absence, or the corresponding Event Processing application was undeployed or paused on the OEP Server. Invalid state indicates that there is no deployment for the object, either a source or a published exploration.

You can restore an exploration. The restore operation tries to deploy an object in invalid state with the information available in Oracle Stream Explorer. For example, there is an exploration E1 that uses the source S1, and both of them are in invalid state. When you invoke a restore operation on the exploration, the Oracle Stream Explorer tries to deploy both the stream and exploration in sequence.

To restore an exploration:

1. Identify the exploration that is in invalid state in the **Catalog**. The exploration in invalid state is indicated by a red cross icon.

Figure 4-20 Exploration in Invalid State

2. Click the *Restore* icon to the right of the exploration to fix the deployment problems and restore the exploration.

Figure 4-21 Restore Icon

A notification appears about the result of restore operation.

5

Working with References

This chapter explains about references in Oracle Stream Explorer.

This chapter contains the following sections:

- Understanding References
- Creating a Reference
- Editing a Reference
- Marking a Reference as Favorite
- Deleting a Reference

5.1 Understanding References

Oracle Stream Explorer allows you to create references to static data to enrich the event streams.

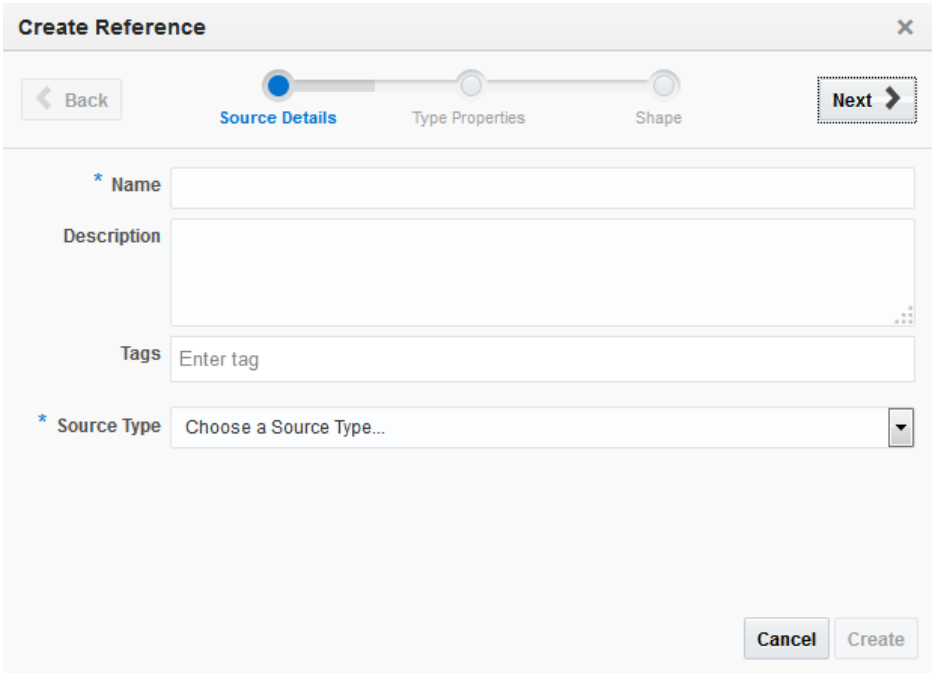
5.2 Creating a Reference

This section explains how to create a reference.

To create a reference:

1. Navigate to Catalog.
2. Select **Reference** in the **Create New Item** menu.
3. Enter information in the **Create Reference** dialog. The **Create Reference - Source Details** screen is as shown below.

Figure 5-1 Create Reference - Source Details Dialog



a. Enter a name for the reference in the **Name** field.

b. Provide a description that helps users understand about this reference in the **Description** field.

c. Enter a tag with which you want to tag the reference in the **Tags** field. You can provide multiple tags.

d. Select a source type from the **Source Type** drop down list. The source must be defined in Oracle Stream Explorer Visualizer.

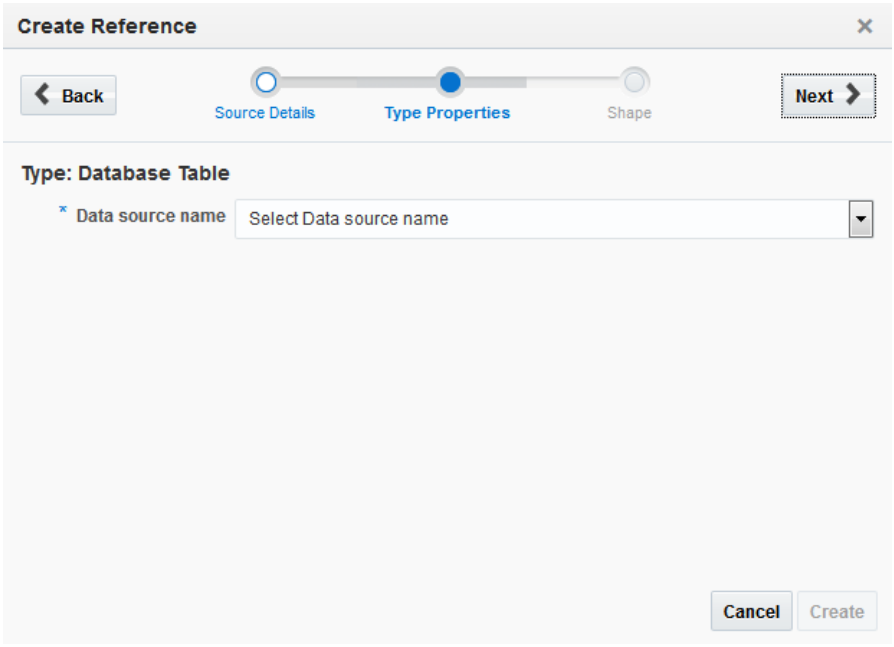
Note:

In this release, only Database Table (Oracle Database) is supported. The driver `oracle.jdbc.driver.OracleDriver` is deprecated and not supported. Use `oracle.jdbc.OracleDriver` instead in the `config.xml` file.

---

4. Click **Next** to go to the **Type Properties** screen. The **Create Reference - Type Properties** screen is as shown below.

Figure 5-2 Create Reference - Type Properties Dialog

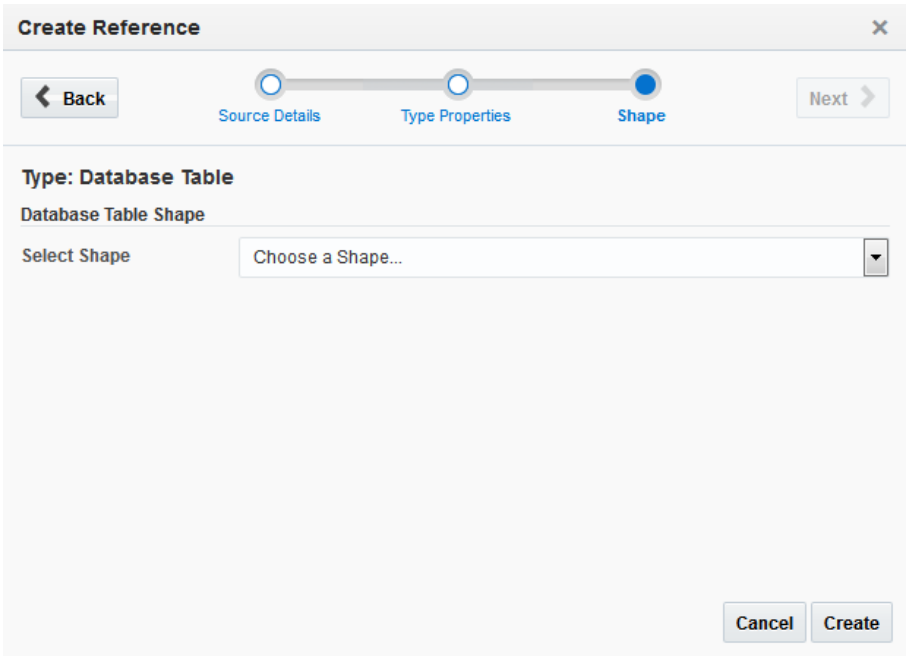


a. Select a **Data source name**.

b. Click **Back** at any point if you want to change any of the details.

5. Click **Next** to go to the **Shape** screen. The **Create Reference - Shape** screen is as shown below.

Figure 5-3 Create Reference - Shape Dialog



a. Select a **Shape** for the reference.

The shape is applied on based on the pre-existing shape you choose.

6. Click **Create** to complete the creation of a reference. The new reference appears in the catalog.
7. Click **Cancel** at any point of time to abort the operation.

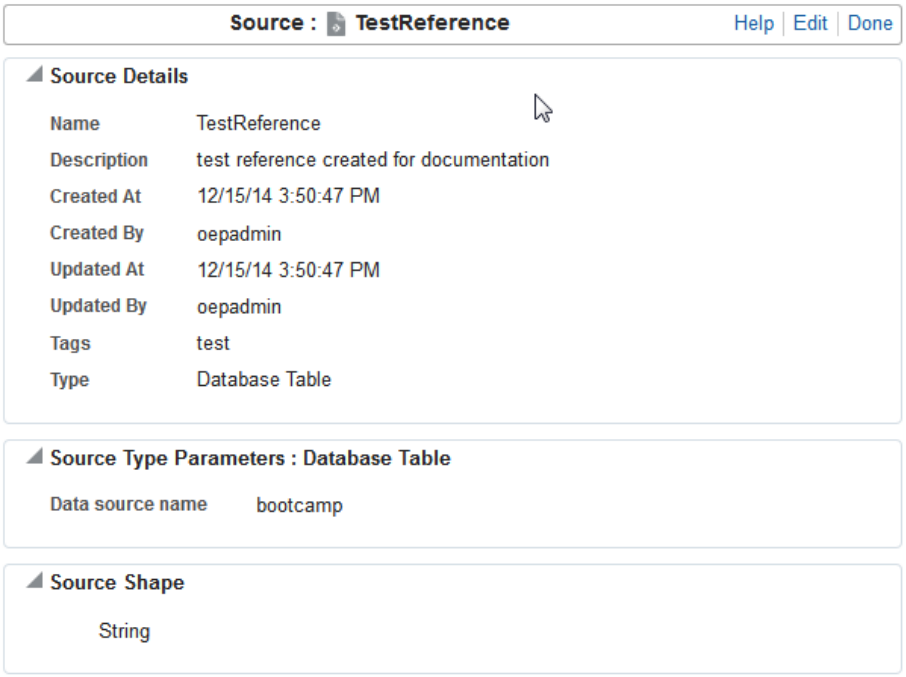
5.3 Editing a Reference

Oracle Stream Explorer allows you edit or update an existing reference. This section explains how to edit a reference.

To edit a reference:

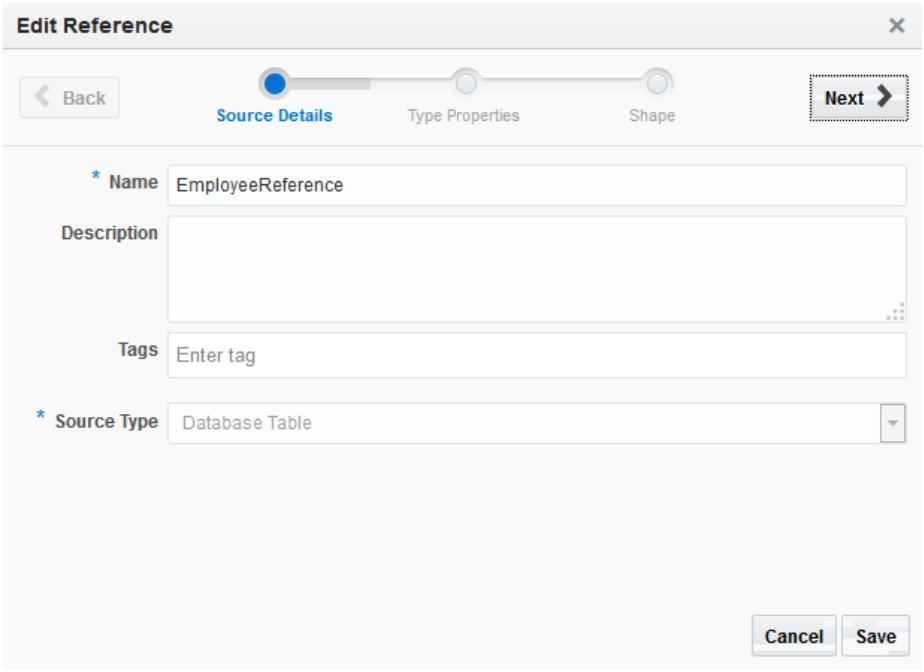
1. Navigate to Catalog.
2. Identify the reference you that want to edit. Click the name string of the reference or the reference icon to open it for editing. The reference details screen appears and it is as shown below.

Figure 5-4 Edit Reference Screen



3. Click **Edit** in the top-right corner of the screen. The **Edit Reference - Source Details** screen is as shown below.

Figure 5-5 Edit Reference - Source Details Dialog



a. Update the name of the reference, if required.

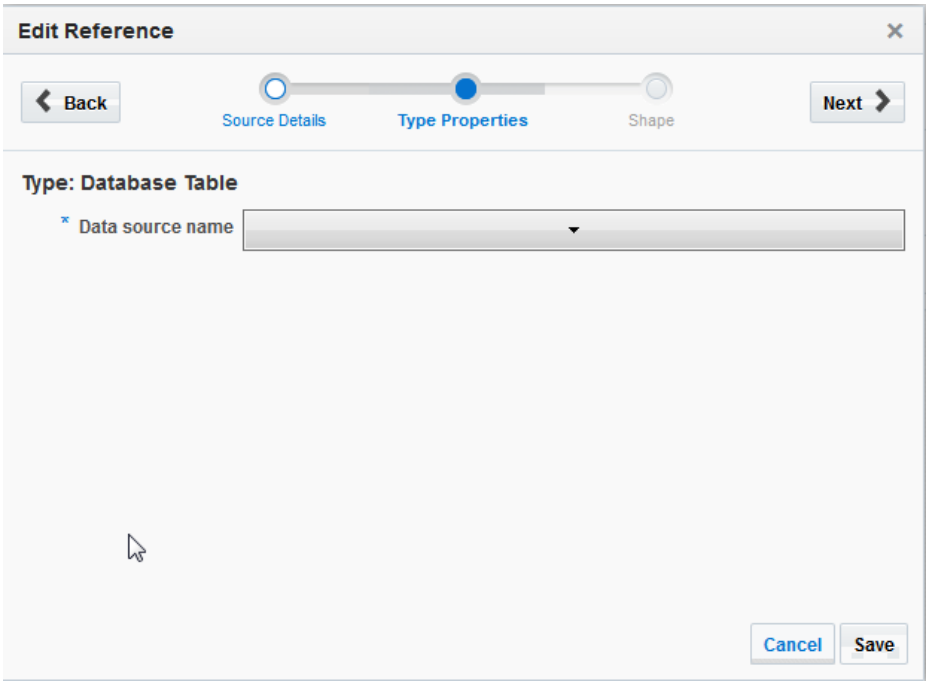
b. Update the description of the reference, if required.

c. Add or update the tags with which you want to tag the reference. You can provide multiple tags.

d. The **Source Type** cannot be modified in this release. Hence, it is disabled.

4. Click **Next** to go to the **Type Properties** screen. The **Edit Reference - Type Properties** screen is as shown below.

Figure 5-6 Edit Reference - Type Properties Dialog

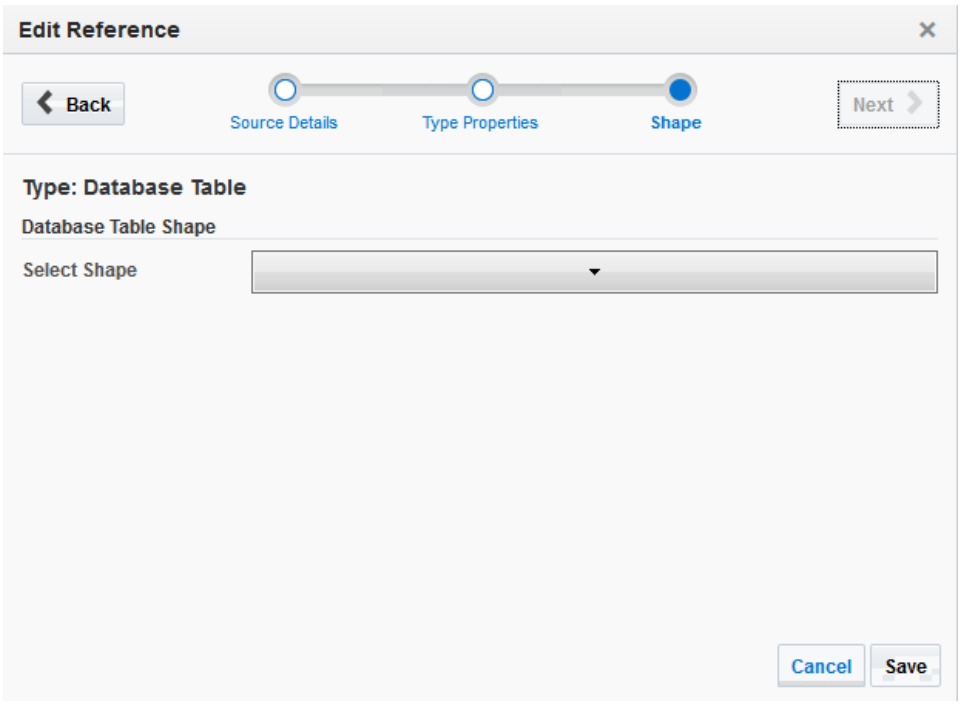


a. Select a different **Data source name** if you want to update the source.

b. Click **Back** at any point if you want to change any of the details.

5. Click **Next** to go to the **Shape** screen. The **Edit Reference - Shape** screen is as shown below.

Figure 5-7 Edit Reference - Shape Dialog



a. Select a different **Shape** if you want to update the shape of the reference.

6. Click **Save** to complete the editing of a reference.
7. Click **Cancel** at any point of time to abort the operation.
8. Click **Done** on the reference details page to complete the operation. The update reference appears in the catalog.

5.4 Marking a Reference as Favorite

You can mark a reference as Favorite. Marking a reference as Favorite allows you to locate and navigate such reference easily even if you have numerous items on the catalog.

To mark a reference as favorite:

1. Identify the reference you want to mark as favorite in the **Catalog**.
2. Click the *Favorite* icon to the right of the reference to mark it as a favorite. This icon acts as a toggle button. Click this button again to remove the reference from favorites.

Figure 5-8 Favorite Icon

5.5 Deleting a Reference

You can delete a reference if you are sure yo do not require the reference anymore. If a reference has dependencies, it cannot be deleted. A reference is said to have dependencies if it is part of a published exploration being used by any user. To delete a reference with dependencies, you must delete the dependencies first.

To delete a reference:

1. Identify the reference you want to delete in the **Catalog**.
2. Click the *Delete* icon to the right of the reference to delete it.

Figure 5-9 Delete Icon

A confirmation dialog appears. If you select **OK**, the reference will be deleted.

6

Working with Patterns

This chapter explains the details about Patterns.

This chapter contains the following sections:

- Understanding Patterns
- Creating Top N Pattern
- Creating Bottom N Pattern
- Creating Up Trend Pattern
- Creating Down Trend Pattern
- Creating Fluctuation Pattern
- Creating Eliminate Duplicates Pattern
- Creating Detect Duplicates Pattern
- Creating Detect Missing Event Pattern
- Creating W Pattern
- Creating Inverse W Pattern.

6.1 Understanding Patterns

Oracle Stream Explorer provides a feature known as patterns. A *pattern* provides you with the results displayed in a live output stream based on common business scenarios. A *pattern* is a template of an Oracle Stream Explorer application that already has the business logic built into it. The visual representation of the event stream varies from one pattern type to another based on the key fields you choose.

6.1.1 Top N

A *Top N* pattern is used to create a pattern of the *first N* events in the specified window of an event stream.

6.1.2 Bottom N

A *Bottom N* pattern is used to create a pattern of the *last N* events of an event stream. Logically, this type of pattern is the reverse of Top N pattern.

6.1.3 Up Trend

An *Up Trend* pattern detects when the up trend starts and continues to grow. For example, use this pattern to identify when the temperature value from a sensor device starts increasing continuously.

6.1.4 Down Trend

A *Down Trend* pattern detects when a numeric event field shows a change in a specified trend, lower in value. For example, use this pattern to identify when the temperature value from a sensor device starts continuously decreasing.

6.1.5 Fluctuation

A *Fluctuation* pattern detects when an event data field value changes in a specific upward or downward fashion within a specific time p. For example, use this pattern to identify the variable changes in Oil Pressure values within acceptable ranges.

6.1.6 Eliminate Duplicates

The *Eliminate Duplicates* pattern is used to build an exploration that eliminates duplicate events in a specific event stream.

6.1.7 Detect Duplicates

The *Detect Duplicates* pattern detects when an event data field has duplicate values within a specified period of time. For example, use this pattern when the same order is placed twice within a day.

6.1.8 Detect Missing Event

The *Detect Missing Event* pattern detects when an expected event does not occur within a specified time window. For example, use this pattern in circumstances when the next heartbeat event is missing.

6.1.9 W

The *W* pattern detects when an event data field value rises and falls in a *W* fashion over a specified time period. For example, use this pattern when monitoring a market data feed stock price movement to determine a buy/sell/hold evaluation.

6.1.10 Inverse W

The *Inverse W* pattern detects the inverses of *W*. Logically, this pattern is the reverse of the *W* pattern.

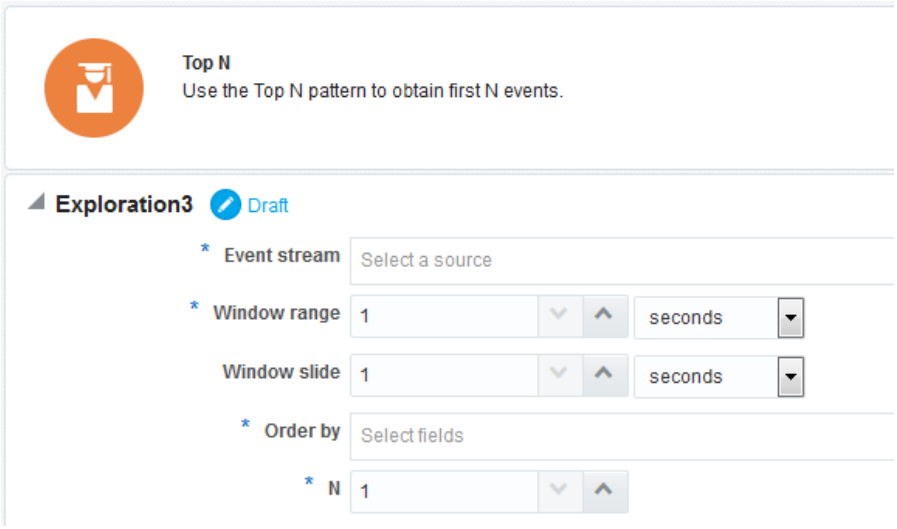
6.2 Creating Top N Pattern

This section explains how to create a Top N pattern.

To create a Top N pattern:

1. Navigate to the Catalog.
2. Select **Pattern** -> **Top N** under the **Create New Item** menu. The create pattern screen appears as shown below:

Figure 6-1 Creating Top N Pattern



3. Select an **Event stream**.
4. Enter a value for **Window range** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This number must be greater than or equal to 1.

   A Window range is the range from which the output is generated.
5. Enter a value for **Window slide** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This is the frequency at which you want to refresh the data.
6. Select a value in the **Order by** field. You can select multiple fields.
7. Enter a value in the **N** field. This number must be greater than or equal to 1. This is the number that indicates the number of events to be considered for the pattern.

The pattern is visually represented based on the data you have entered/selected.

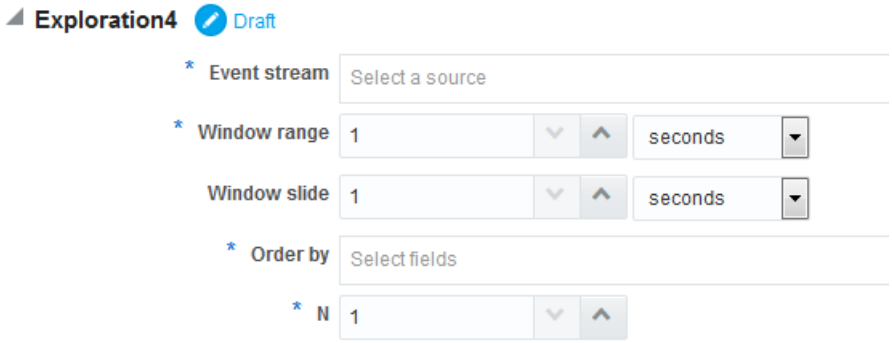
6.3 Creating Bottom N Pattern

This section explains how to create a Bottom N pattern.

To create a Bottom N pattern:

1. Navigate to the Catalog.
2. Select **Pattern** -> **Bottom N** under the **Create New Item** menu. The create pattern screen appears as shown below:

Figure 6-2 Creating Bottom N Pattern



3. Select an **Event stream**.
4. Enter a value for **Window range** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This number must be greater than or equal to 1.

   A Window range is the range from which the output is generated.
5. Enter a value for **Window slide** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This is the frequency at which you want to refresh the data.
6. Select a value in the **Order by** field. You can select multiple fields.
7. Enter a value in the **N** field. This number must be greater than or equal to 1. This is the number that indicates the number of events to be considered for the pattern.

The pattern is visually represented based on the data you have entered/selected.

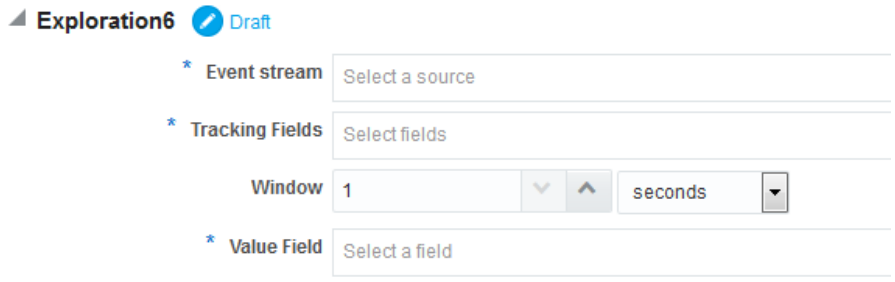
6.4 Creating Up Trend Pattern

This section explains how to create an Up Trend pattern.

To create an Up Trend pattern:

1. Navigate to the Catalog.
2. Select **Pattern** -> **Up Trend** under the **Create New Item** menu. The create pattern screen appears as shown below:

Figure 6-3 Creating Up Trend Pattern



3. Select an **Event stream**.

4. Enter a value for **Tracking Fields**. You can select multiple fields.

   These are the fields in which you want to track the trend.

5. Enter a value for **Window** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This is the interval within which the application looks for a pattern match.

6. Select a value in the **Value Field** drop-down. You can select only 1 item.

   This is a source field whose behavior follows the trend for the pattern to emit the event.

The pattern is visually represented based on the data you have entered/selected.

6.5 Creating Down Trend Pattern

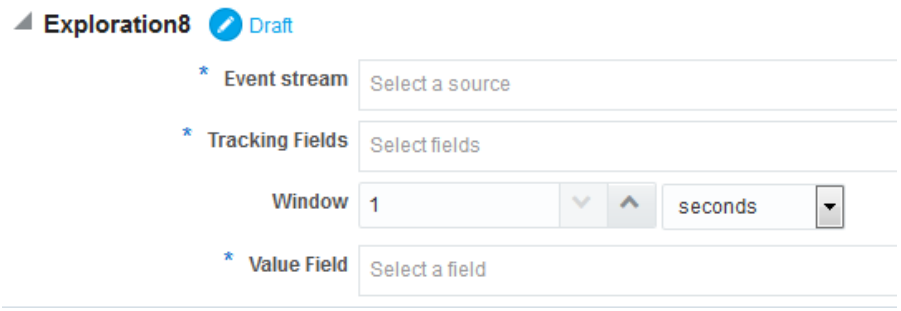
This section explains how to create an Down Trend pattern.

To create a Down Trend pattern:

1. Navigate to the Catalog.

2. Select **Pattern** -> **Down Trend** under the **Create New Item** menu. The create pattern screen appears as shown below:

   Figure 6-4 Creating Down Trend Pattern



3. Select an **Event stream**.

4. Enter a value for **Tracking Fields**. You can select multiple fields.

   These are the fields in which you want to track the trend.

5. Enter a value for **Window** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This is the interval within which the application looks for a pattern match.

6. Select a value in the **Value Field** field. You can select only 1 item.

   This is a source field whose behavior follows the trend for the pattern to emit the event.

The pattern is visually represented based on the data you have entered/selected.

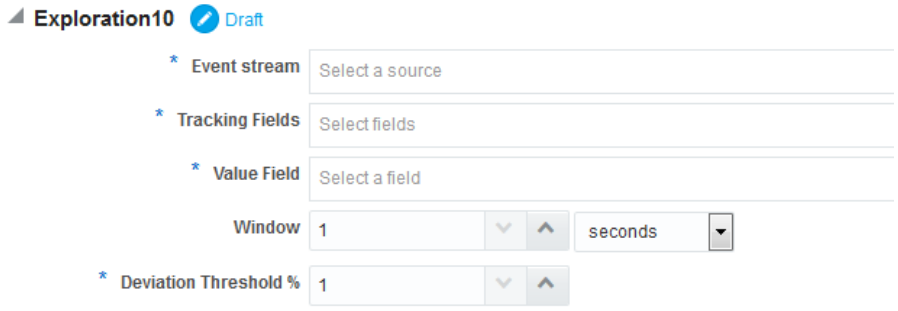
6.6 Creating Fluctuation Pattern

This section explains how to create a Fluctuation pattern.

To create a Fluctuation pattern:

1. Navigate to the Catalog.
2. Select **Pattern** -> **Fluctuation** under the **Create New Item** menu. The create pattern screen appears as shown below:

Figure 6-5 Creating Fluctuation Pattern



3. Select an **Event stream**.
4. Enter a value for **Tracking Fields**. You can select multiple fields.

   These are the fields in which you want to track the trend.
5. Enter a value for **Window** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This is the frequency at which you want to refresh the data.
6. Select a value in the **Value Field** field. You can select only 1 item.

   This field provides a for which you want to identify a change in the trend.
7. Enter a numeric value in the **Window** field.

   This is the interval in which the application looks for a matching pattern.
8. Enter a value for **Deviation Threshold %**. This value indicates the percentage of deviation you want to be included in the pattern.

The pattern is visually represented based on the data you have entered/selected.

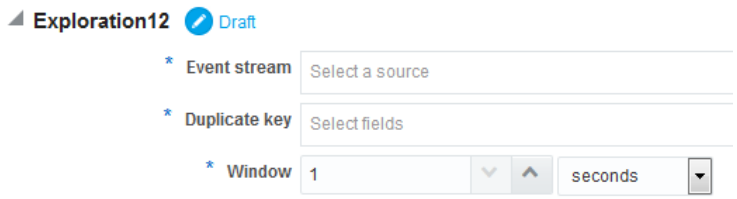
6.7 Creating Eliminate Duplicates Pattern

This section explains how to create an Eliminate Duplicates pattern.

To create an Eliminate Duplicates pattern:

1. Navigate to the Catalog.
2. Select **Pattern** -> **Eliminate Duplicates** under the **Create New Item** menu. The create pattern screen appears as shown below:

Figure 6-6 Creating Eliminate Duplicates Pattern



3. Select an **Event stream**.
4. Enter a value for **Duplicate key**. You can select multiple fields.

   These are the fields that you want to eliminate for duplicate keys.
5. Enter a value for **Window** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This is the range within which the application searches for duplicates.

The pattern is visually represented based on the data you have entered/selected.

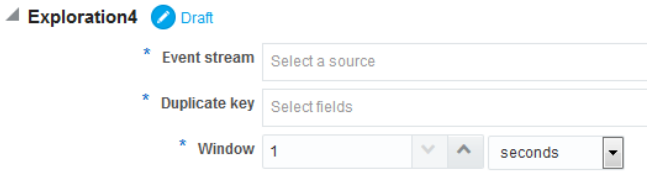
6.8 Creating Detect Duplicates Pattern

This section explains how to create a Detect Duplicates pattern.

To create a Detect Duplicates pattern:

1. Navigate to the Catalog.
2. Select **Pattern** -> **Detect Duplicates** under the **Create New Item** menu. The create pattern screen appears as shown below:

Figure 6-7 Creating Detect Duplicates Pattern



3. Select an **Event stream**.
4. Enter a value for **Duplicate key**. You can select multiple fields.

   These are the fields that you want to look for duplicate keys.
5. Enter a value for **Window** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This is the interval in which the application looks for duplicates.

The pattern is visually represented based on the data you have entered/selected.

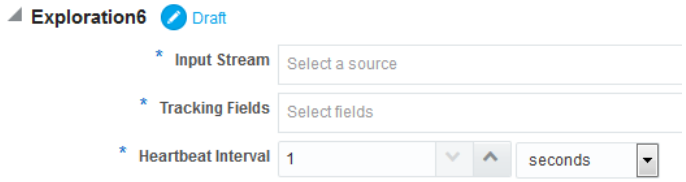
6.9 Creating Detect Missing Event Pattern

This section explains how to create a Detect Missing Event pattern.

To create a Detect Missing Event pattern:

1. Navigate to the Catalog.
2. Select **Pattern** -> **Detect Missing Event** under the **Create New Item** menu. The create pattern screen appears as shown below:

Figure 6-8 Creating Detect Missing Event Pattern



3. Select an **Input stream**.
4. Enter a value for **Tracking Fields**. You can select multiple fields.

   These are the fields with which you track and identify the missing events.
5. Enter a value for **Heartbeat Interval** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This is the interval in which the application looks for an event. If the event does not appear in the specified interval, the application generates an event indicating that there is something missing, i.e., an event should have appeared here, but not.

The pattern is visually represented based on the data you have entered/selected.

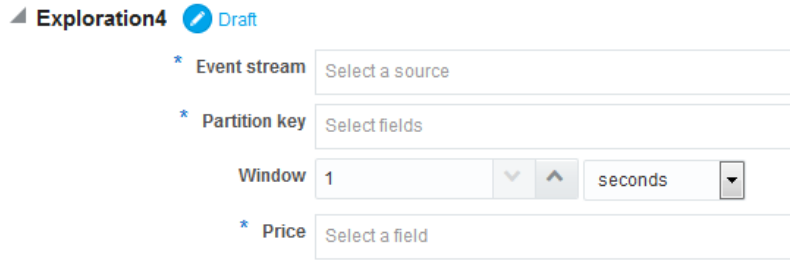
6.10 Creating W Pattern

This section explains how to create a W pattern.

To create a W pattern:

1. Navigate to the Catalog.
2. Select **Pattern** -> **W** under the **Create New Item** menu. The create pattern screen appears as shown below:

Figure 6-9 Creating W Pattern



3. Select an **Event stream**.
4. Enter a value for **Partition key**. You can select multiple fields.

   These are the fields by which the data is partitioned to form a W.
5. Enter a value for **Window** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This is the interval in which the application looks for a matching pattern.

6. Select a numeric value for **Price** based on which variation constitutes a W-shape for the pattern-based exploration to produce event.

The pattern is visually represented based on the data you have entered/selected.

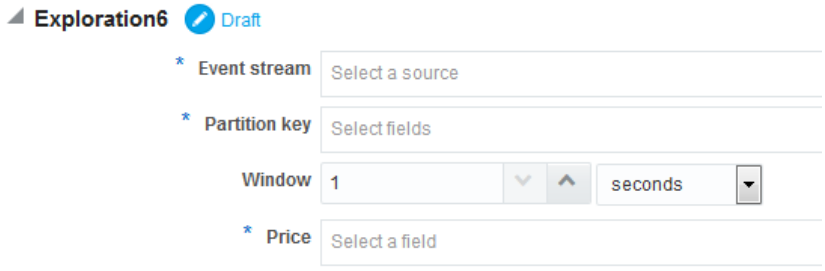
6.11 Creating Inverse W Pattern

This section explains how to create an Inverse W pattern.

To create an Inverse W pattern:

1. Navigate to the Catalog.
2. Select **Pattern** -> **Inverse W** under the **Create New Item** menu. The create pattern screen appears as shown below:

Figure 6-10 Creating Inverse W Pattern



3. Select an **Event stream**.
4. Enter a value for **Partition key**. You can select multiple fields.

   These are the fields by which the data is partitioned to form an inverse W.
5. Enter a value for **Window** and select its unit (one of nanoseconds, milliseconds, seconds, minutes, and hours). This is the interval in which the application looks for a matching pattern.
6. Select a numeric value for **Price** based on which variation constitutes an inverse W-shape for the pattern-based exploration to produce event.

The pattern is visually represented based on the data you have entered/selected.

7

Sign Out of Oracle Stream Explorer

This chapter explains the details about signing out of the Oracle Stream Explorer application.

7.1 Signing Out

After you are done with using the Oracle Stream Explorer application, you must sign out of the application.

To sign out:

1. Click the username at the top-right corner of the screen.
2. Select Sign Out in the drop-down list.

Figure 7-1 Signout

You are signed out of the application and taken back to the Sign In page. Sign In again to use the Oracle Stream Explorer application. For more information about signing in, see Sign In Page.