

# Software AG Digital Event Services Help

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This document applies to Software AG Digital Event Services 10.15 and to all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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# About this Guide

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This document explains how to use Software AG Event Generator and Software AG Event Console. With the Event Generator you can generate streams of Digital Event Services events and with the Event Console you can diagnose and monitor the publishing of digital events.

## Document Conventions

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Convention	Description
<b>Bold</b>	Identifies elements on a screen.
Narrowfont	Identifies service names and locations in the format <i>folder.subfolder.service</i> , APIs, Java classes, methods, properties.
<i>Italic</i>	Identifies:  Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
Monospace font	Identifies:  Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the   symbol.
[ ]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [ ] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

## Online Information and Support

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### Product Documentation

You can find the product documentation on our documentation website at <https://documentation.softwareag.com>.

In addition, you can also access the cloud product documentation via <https://www.softwareag.cloud>. Navigate to the desired product and then, depending on your solution, go to “Developer Center”, “User Center” or “Documentation”.

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## Product Training

You can find helpful product training material on our Learning Portal at <https://knowledge.softwareag.com>.

## Tech Community

You can collaborate with Software AG experts on our Tech Community website at <https://techcommunity.softwareag.com>. From here you can, for example:

- Browse through our vast knowledge base.
- Ask questions and find answers in our discussion forums.
- Get the latest Software AG news and announcements.
- Explore our communities.
- Go to our public GitHub and Docker repositories at <https://github.com/softwareag> and <https://hub.docker.com/publishers/softwareag> and discover additional Software AG resources.

## Product Support

Support for Software AG products is provided to licensed customers via our Empower Portal at <https://empower.softwareag.com>. Many services on this portal require that you have an account. If you do not yet have one, you can request it at <https://empower.softwareag.com/register>. Once you have an account, you can, for example:

- Download products, updates and fixes.
- Search the Knowledge Center for technical information and tips.
- Subscribe to early warnings and critical alerts.
- Open and update support incidents.
- Add product feature requests.

## Data Protection

Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.





# 1 Working with the Event Console


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## About the Event Console

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The Software AG Event Console is a tool that enables you to monitor and diagnose the publishing of Software AG Digital Event Services (DES) events. You use the Event Console to ensure that an application successfully publishes events of a particular digital event type to a Universal Messaging channel. The Event Console acts as an additional subscriber that prints digital events and their contents.

You can access the Event Console from any Designer perspective by clicking .

### Note:

Besides the Event Console, you can use the `events-console.jar` command-line tool to monitor the publishing of digital events. You can find the command-line tool in the *Software AG\_directory* /common/ lib directory.

To access usage information, open a command-line prompt in *Software AG\_directory* /common/lib and execute the following command:


```
java -jar events-console.jar
```

## Configuring the Event Console

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Using the Event Console, you monitor specific digital event types that are published to a Universal Messaging channel. You create a launch configuration in Designer to enable the Event Console to listen for incoming events.

### > To configure the Event Console to monitor digital event types:

1. In Designer, click .
2. In the **Name** field, specify a name for the launch configuration.
3. On the **Configuration** tab, select the Digital Event Services (DES) runtime configuration that the Event Console uses for subscribing to incoming events:

- **Use Universal Messaging Service** - select this option when all events that the Event Console monitors are published to a single Universal Messaging server.

In the **Provider URL** field, specify the host and port of the Universal Messaging server to which the Event Console connects. The default value is `nsp://localhost:9000`.

- **Use External Configuration** - select this option to publish events to a messaging service in the configuration of another product that uses Digital Event Services.

In the **Configuration Location** field, specify the configuration folder of Digital Event Services (DES) in the runtime where DES is embedded. The configuration folder you specify must contain a subfolder called `DigitalEventServices`.

**Note:**

DES configurations for Software AG OSGi runtimes are located in *Software AG\_directory* \profiles\profile\_name\configuration.

4. On the **Event Types** tab, select the event types that you want to monitor.
5. On the **Message Format** tab in the **Type Name Details** section, select the format of the information that the Event Console displays.

**Note:**

The message format settings that you choose apply to the digital event types that you select on the **Event Types** tab and to the digital event types that they implicitly require in their event type definition.

- **Show no type information** - this is the default. The Event Console prints events without the name of the digital event type, for example:

```
[{"id":"order #1"}, {"order": [{"item_id":"item #1"}, {"item_count":23}]}]
```

- **Show local name only** - each line that the Event Console prints starts with the name of the digital event type, without package and variant key, for example:

```
{"EventType":"DemoType","EventFields":[{"id":"order #1"}, {"order":{"EventType":"OrderType","EventFields":[{"item_id":"item #1"}, {"item_count":23}]}]}
```

- **Show full type information** - each line that the Event Console prints starts with the name of the digital event type, which includes the name of the package of the event type, for example:

```
{"EventType":"des.sample.DemoType","VariantKey":"158502b503f3afbf","EventFields":[{"id":"order #1"}, {"order":{"EventType":"des.sample.OrderType","VariantKey":"25c7bb036ce347a6","EventFields":[{"item_id":"item #1"}, {"item_count":23}]}]}
```

6. Optional. In the **Additional Message Format Settings** section, select one or more options:
  - **Show every hundredth event on the console only** - the Event Console prints only one in every hundred events.
  - **Show formatted event content** - the Event Console indents the content of the events it prints, for example:

```
[ {
  "id" : "order #1"
}, {
  "order" : [ {
    "item_id" : "item #1"
  }, {
    "item_count" : 23
  } ]
} ]
```

7. Click **Run**.

## 2 Working with the Event Generator

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## About the Event Generator

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The Software AG Event Generator is a tool that enables you to generate streams of digital events to ensure the proper functioning of an event-driven environment. With the Event Generator, you can ensure that the components of the event-driven environment communicate successfully and that an application processes events as expected.

For example, you can create an Integration Server flow service that uses digital events as input and then test the service using the Event Generator. You can also generate a stream of events with a range of values and check if a dashboard you configure in Software AG MashZone NextGen processes events as expected. If your dashboard displays information from events of different event types, you can configure the Event Generator to generate events of multiple event types in parallel.

The Event Generator is available in the Digital Events Development perspective in Designer, which you access by clicking .

To use an Event Generator in a basic scenario, you perform the following operations:

1. Create an Event Generator project where you specify the event types of the events that the tool generates.
2. Determine the rate per event type at which the Event Generator generates events.
3. Create an event rule definition for each event type in the project, by which you specify the information contained in the events.
4. Run the Event Generator project.

In addition, you can choose whether the Event Generator publishes events to a Universal Messaging destination service, or whether the Event Generator writes the events to an event sequence file that you can rerun.

### Note:

Besides the Event Generator, you can use the `events-generator.jar` command-line tool to generate streams of digital events. You can find the command-line tool in the *Software AG\_directory* /common/ lib directory.

To access usage information, open a command-line prompt in *Software AG\_directory* /common/lib and execute the following command:

```
java -jar events-generator.jar
```

## Opening the Digital Events Development Perspective

---

To access the Digital Events Development perspective, click  or navigate to **Window > Perspective > Open Perspective > Digital Events Development**.

The Digital Events Development perspective contains the following views:

- Project Explorer view

- Problems view
- Console view

## Creating an Event Generator Project

The Event Generator project holds event rate definitions, event sequence files, event rules, and the file that represents the Event Generator named *event\_generator\_project\_name.deg*.

### > To create an Event Generator project

1. In the Digital Events Development perspective, right-click inside the Project Explorer view and navigate to **New > Digital Event Generator Project**.
2. In the **Event generator name** field, specify a name for the Event Generator.
3. Under **Event types**, use the dual list box to add the digital event types of the events that you want the Event Generator to emit. The list of event types from which you can choose contains only publishable event types.

#### Tip:

Use the search bar to filter the list of available digital event types. You can also select multiple event types by holding down the CTRL button and clicking specific entries, or by holding down the SHIFT button and clicking the first and last entry of a range.

4. Click **Next** to create an event rate for each of the event types you selected.
5. In the **Event rate name** field, specify a name for the event rate.
6. Select one of the following rates:
  - **Fixed event rate** - emit a constant number of events per second. Specify values for each field in the table as outlined in the Description column:

Field	Description
<b>Rate</b>	The number of events that the Event Generator emits per second. Specify a positive floating point number.

- **Variation** - emit a number of events per second that changes with a deviation. Specify values for each field in the table as outlined in the Description column:

Field	Description
<b>Start</b>	The average number of events that the Event Generator emits per second. Specify a positive floating point number.

Field	Description
<b>Deviation</b>	The deviation in the number of events that the Event Generator emits per second. Specify a positive floating point number.

---

- **Variation with trend** - emit a number of events per second that increases or decreases overtime. Specify values for each field in the table as outlined in the Description column:

Field	Description
<b>Start</b>	The average number of events that the Event Generator emits per second. Specify a positive floating point number.
<b>Deviation</b>	The deviation in the number of events that the Event Generator emits per second. Specify a positive floating point number.
<b>Trend</b>	The positive or negative trend with which the number of events that the Event Generator emits per second increases or decreases. Specify a floating point number.

---

7. Click **Finish**.

## Assigning Event Rules

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If your application displays the information contained in events, or uses the information to sort or analyze events, you can use event rules to specify the information contained in the events to simulate real-world conditions.

If you do not associate an event rule with an event type, the Event Generator still generates events from that event type, but the events do not contain information.

Use the following procedure to create an event rule definition for each event type in an Event Generator project and assign values to the fields of the event types.

### ➤ To create an event rule for an event type

1. In the Project Explorer view of the Digital Events Development perspective, double-click *event\_generator\_project\_name.deg* to open the Event Generator editor.
2. For each entry in the **Event Type Name** column, click inside the cell in the **Event Rule Name** column.
3. Select **Create New Rule** from the drop-down menu.
4. In the **Rule name** field, specify a name for the event rule.



5. In the event rule editor, for each entry in the **Field Name** column that you want to include in the events that the Event Generator emits, click inside the **Value Rule** column.
6. Select **Create New Rule** from the drop-down menu.
7. In the **Rule name** field, specify a name for the event rule.
8. Specify the data that you want the events to contain. For more information about the values to specify per data type, see [“Event Value Rule Types” on page 23](#).
9. Save your changes.


## Running the Event Generator

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By default, when you run the Event Generator project, it emits events that are published to the default Universal Messaging Provider URL `nsp://localhost:9000`.

### ➤ To run the Event Generator

1. In the Project Explorer view of the Digital Events Development perspective, go to the Event Generator project that you want to run.
2. Right-click the `event_generator_project_name.deg` file and select **Run As > Digital Event Generator**.

The Event Generator console shows the time when the Event Generator starts and finishes generating events. If you do not specify a duration for the Event Generator, the Event Generator emits events indefinitely. You can click  to stop the Event Generator.

## Creating Additional Event Rate Definitions

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Use the following procedure to create additional event rate definitions. The additional event rates you create become available in the Event Generator project.

### ➤ To create an additional event rate definition

1. In the Project Explorer view of the Digital Events Development perspective, right-click the Event Generator project and select **New > Digital Event Generator Event Rate**.
2. In the **Event generator** field, specify the Event Generator for which you want to create an event rate definition.
3. In the **Event rate name** field, specify a name for the event rate.
4. Select one of the following rates:

- **Fixed event rate** - emit a constant number of events per second. Specify values for each field in the table as outlined in the Description column:

Field	Description
<b>Rate</b>	The number of events that the Event Generator emits per second. Specify a positive floating point number.

---

- **Variation** - emit a number of events per second that changes with a deviation. Specify values for each field in the table as outlined in the Description column:

Field	Description
<b>Start</b>	The average number of events that the Event Generator emits per second. Specify a positive floating point number.
<b>Deviation</b>	The deviation in the number of events that the Event Generator emits per second. Specify a positive floating point number.

---

- **Variation with trend** - emit a number of events per second that increases or decreases overtime. Specify values for each field in the table as outlined in the Description column:

Field	Description
<b>Start</b>	The average number of events that the Event Generator emits per second. Specify a positive floating point number.
<b>Deviation</b>	The deviation in the number of events that the Event Generator emits per second. Specify a positive floating point number.
<b>Trend</b>	The positive or negative trend with which the number of events that the Event Generator emits per second increases or decreases. Specify a floating point number.

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5. Click **Finish**.

## Creating Additional Event Rule Definitions

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Use the following procedure to create additional event rule definitions. The additional event rules you create become available in the Event Generator project.

### ➤ To create an additional event rule definition

1. In the Project Explorer view of the Digital Events Development perspective, right-click the Event Generator project and select **New > Digital Event Generator Event Rule**.
2. In the **Event generator** field, specify the Event Generator for which you want to create an event rule definition.

3. In the **Rule name** field, specify a name for the event rule.
4. Select one of the following options to specify the type of data that an event field contains:
  - **Simple data type** - when you want to create an event rule and apply it to event fields that contain data in one of the following formats:
    - String
    - Boolean
    - Bytes
    - Date
    - Integer
    - Long
    - Float
    - Double
  - **Event type** - when you want to create an event rule that you can apply to event types or to event fields that can contain an event type. The list of event types from which you can choose contains both publishable and non-publishable event types.

**Tip:**

Use the search bar to filter the list of available digital event types.

5. Click **Finish**.

## Modifying an Event Generator Project

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Use the following procedure to modify an existing Event Generator project.

### ➤ To modify an Event Generator configuration

1. In the Project Explorer view of the Digital Events Development perspective, go to the Event Generator project that you want to modify.
2. Double-click the *event\_generator\_project\_name.deg*.
3. Perform any following operations as required:
  - Use the **Add** and **Remove** buttons to manage the list of event types associated with the Event Generator project.
  - Modify the event rules associated with the event types in the Event Generator project.
  - Modify the event rates assigned to the event types in the Event Generator project.

4. Optionally, use the **Add** and **Remove** buttons to manage the list of event types associated with an Event Generator.
5. Save your changes.

## Creating a Digital Event Generator Run Configuration


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You can create a run configuration for an Event Generator and specify where the Event Generator publishes events and for how long. You can choose to publish events to destination services or you can publish the events to a sequence file that acts as a recording that you can replay at a later time.

### Publishing Events to Destination Services

You can use the Event Generator to emit events to a destination service where your application listens for the event types you associated with the Event Generator.

#### > To publish events to destination services

1. In the Digital Events Development perspective, navigate to **Run > Run Configurations > Digital Event Generator > event\_generator\_project\_name**.
2. On the **Main** tab of the Run Configurations wizard, select **Publish events on destination services**.
3. Optionally, under **Duration**, specify for how long the Event Generator emits events. Select one of the following options:
  - **Infinite** - Default. The Event Generator emits events until you stop it by clicking  in the Event Generator console.
  - **Duration** - A period of time in seconds during which the Event Generator emits events.
  - **Number of events** - The number of events the Event Generator emits before it stops.
4. On the **Routing** tab, select one of the following options to specify the location of the destination service:
  - **Use Universal Messaging service** - select this option to publish events to a single Universal Messaging server.  
  
In the **Provider URL** field, specify the host and port of the Universal Messaging server. The default value is `nsp://localhost:9000`.
  - **Use external configuration** - select this option to publish events to a messaging service in the configuration of another product that uses Digital Event Services (DES).

In the **Configuration location** field, specify the configuration folder of DES in the runtime where DES is embedded. The configuration folder you specify must contain a subfolder named DigitalEventServices.

**Note:**

DES configurations for Software AG OSGi runtimes are located in *Software AG\_directory \profiles\profile\_name\configuration*.

5. Click **Run**.

## Writing Events to an Event Sequence File

You can write events to an event sequence file that you can replay at a later time. An event sequence file displays events with timestamps, as if they were published to an actual destination service.

### > To write events to an event sequence file

1. In the Digital Events Development perspective, navigate to **Run > Run Configurations > Digital Event Generator > event\_generator\_project\_name**.
2. On the **Main** tab of the Run Configurations wizard, select **Write events into an event sequence file**.
3. In the **File name** field, specify a name for the event sequence file.

**Note:**

If you do not specify the .seq file extension, it is added automatically.

4. Under **Duration**, specify for how long the Event Generator emits events. Select one of the following options:
  - **Duration** - A period of time in seconds during which the Event Generator emits events.
  - **Number of events** - The number of events the Event Generator emits before it stops.
5. Click **Run**.

The sequence file you create becomes available in the **Event Sequence Files** folder of the Event Generator project you selected.

Double-click *event\_sequence\_name.seq* to open the event sequence file.

## Running an Event Sequence File

You can repeatedly test your event-driven environment with the same conditions by rerunning an event sequence file.

➤ **To run an event sequence file**


1. In the Project Explorer view of the Digital Events Development perspective, navigate to ***event\_generator\_project\_name* > Event Sequence Files**.
2. Right-click *event\_sequence\_name*.seq and select **Run As > Digital Event Sequence**.

## **Creating an Event Sequence Run Configuration**

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Use the following procedure to create a digital event sequence run configuration.

➤ **To create a digital event sequence run configuration**

1. In the Digital Events Development perspective, navigate to **Run > Run Configurations**.
2. Double-click **Digital Event Sequence**.
3. In the **Name** field, specify a name for the event sequence run configuration.
4. On the **Main** tab, in the **Event Generator** field, select the Event Generator project for which you want to create an event sequence run configuration.
5. In the **Event Sequence** field, select the event sequence file which you want to use for the run configuration.
6. Under **Duration**, specify for how long the Event Generator emits events. Select one of the following options:
  - **Infinite** - Default. The Event Generator emits events until you stop it by clicking  in the Event Generator console.
  - **Duration** - A period of time in seconds during which the Event Generator emits events.
  - **Number of events** - The number of events the Event Generator emits before it stops.
  - **Number of iterations** - The number of times the event sequence file is replayed before it stops.
7. Click **Run**.

## **Exporting an Event Generator Project**

---

You can export an Event Generator project as a single model file. With the file you export, you can run the Event Generator in batch mode and set up automated tests.



➤ **To export an Event Generator project**

1. In the Project Explorer view of the Digital Events Development perspective, go to the Event Generator project that you want to export.
2. Right-click *event\_generator\_project\_name.deg* and select **Export > Export As Digital Event Generator Model**.
3. In the **Event Generator** field, select the Event Generator project that you want to export.
4. In the **To file** field, specify the .json file that will hold the Event Generator project model.
5. Click **Finish**.

## Event Value Rule Types



### String Event Rules

You can configure an event rule that has a string data type. Specify how the Event Generator fills the event field value as outlined in the description column of the following table.

Field	Description
<b>Fixed</b>	One fixed value.
<b>List</b>	<p>A list of values. Use the   buttons to manage the list of values.</p> <p><b>Note:</b> The Event Generator assigns the values in the list in a round-robin way.</p>



### Boolean Event Rules

You can configure an event rule that has a boolean data type. Specify how the Event Generator fills the event field value as outlined in the description column of the following table.

Field	Description
<b>Fixed</b>	One fixed value.
<b>List</b>	<p>A list of values. Use the   buttons to manage the list of values.</p> <p><b>Note:</b> The Event Generator assigns the values in the list in a round-robin way.</p>
<b>Random</b>	The Event Generator fills the event field value with <code>True</code> or <code>False</code> values randomly.

## Bytes Event Rules

You can configure an event rule that has a bytes data type. Specify how the Event Generator fills the event field value as outlined in the description column of the following table.



Field	Description
<b>Fixed</b>	Specify one fixed value in a two-digit hexadecimal format. Spaces are allowed between each block of two digits, for example AF01 D9FF.
<b>List</b>	Specify a list of two-digit hexadecimal values. Spaces are allowed between each block of two digits.  Use the   buttons to manage the list of values.  <b>Note:</b> The Event Generator assigns the values in the list in a round-robin way.
<b>Random</b>	The Event Generator fills the event field value with a random bytes array limited by the maximum <b>Length</b> you specify.

## Number Event Rules

You can configure an event rule that has the following number data types:

- int64
- int32
- float
- double

Specify how the Event Generator fills the event field value as outlined in the description column of the following table.



Field	Description
<b>Fixed</b>	One fixed value.
<b>List</b>	A list of values. Use the   buttons to manage the list of values.  <b>Note:</b> The Event Generator assigns the values in the list in a round-robin way.
<b>Random</b>	An <b>Upper</b> and a <b>Lower</b> value between which the Event Generator generates bytes values.



Field	Description
<b>Variation</b>	A <b>Mean value</b> and a <b>Deviation</b> .
<b>Increment</b>	A <b>Lower</b> value, an <b>Upper</b> value, and a <b>Delta</b> value.

## Time Event Rules

You can configure an event rule that has a time data type. Specify how the Event Generator fills the event field value as outlined in the description column of the following table.

Field	Description
<b>Event creation time</b>	The time when the event is created.
<b>Fixed</b>	One fixed value. Use the following format: <code>YYYY-MM-DDTHH:mm:ss.sssZ+00:00</code> , where <code>+00:00</code> specifies the time zone.
<b>List</b>	<p>A list of values. Use the   buttons to manage the list of values.</p> <p><b>Note:</b> The Event Generator assigns the values in the list in a round-robin way.</p>
<b>Random</b>	An <b>Upper</b> value and a <b>Lower</b> value between which the Event Generator generates timestamps.
<b>Increment</b>	<p>A <b>Lower</b>, an <b>Upper</b>, and a <b>Delta</b> value. Specify a <b>Delta</b> value in the following duration format: <code>P[dD][T[hH][nM][s[.s]S]]</code>.</p> <p><b>Note:</b> <b>Delta</b> allows negative values.</p>

## Array Rule Types

You can configure an event rule that has an array data type. Specify values for the available fields as outlined in the description column of the following table.

Field	Description
<b>Rule</b>	Specify an event rule for the element data type.
<b>Array element count</b>	Specify the number of elements in the array.

## Map Event Rules

You can configure an event rule that has a map data type. Specify values for the available fields as outlined in the description column of the following table.

Field	Description
<b>Generate the specified number of map entries using the rule</b>	The Event Generator creates a map with the <b>Number of entries</b> you set from one event rule you specify as <b>Key</b> and one event rule you specify as <b>Value</b> .
<b>For each specified rule generate one map entry</b>	The Event Generator creates a map from the event rule you specify as <b>Key</b> and the event rule that you specify as <b>Value</b> for each map entry.

## Any Event Rules

You can configure an event rule that has an any data type. Specify values for the available fields as outlined in the description column of the following table.

Field	Description
<b>Data Type</b>	The data type of the event field value. Choose between a <b>Simple data type</b> and <b>Event type</b> .
<b>Rule</b>	The event rule that applies to the data type.