User Guide | PUBLIC
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Segment Service

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Content

1 Overview

Dynamically identifying time series segments

> ℹ Note
>
> **Important**: All apps and APIs related to SAP IoT Segment Service are deprecated as of November 2021 and will be decommissioned by end of May 2022. In case you've used any of the apps and APIs in your SAP IoT system landscape, we recommend getting in touch with SAP support in order to find an alternative solution. For many use cases covered by Segment Service, you may go for a combination of rules, events, and actions, which may help you reach the same goal.

Introduction

When continuously collecting sensor data in an IoT-based business scenario, it's a common experience that sooner or later certain patterns appear that you can relate to corresponding business activities. It's then a natural desire to have these business activities carried out automatically whenever a given pattern occurs, rather than taking action manually. Let's have a look at a couple of examples:

> ✤ Example
>
> - A freight carrier company has equipped their trucks with GPS sensors that help the company to keep track of the current location of each of their trucks. Geofences have been defined that cover the area of numerous major plants acting as delivery destinations. Every time a truck enters a geofence, an event is raised that is used to check automatically whether the agreed delivery time has been met. Also, the difference between entry and exit time can be used for estimating the handling time at a given plant, which is useful for future trip calculation.
> - The same fleet of trucks has also been equipped with speed sensors. It is then possible to check if a truck adheres to the speed limits that are in effect within a given geofence.
> - A temperature sensor attached to a device yields time series data going continuously up and down, with a visualization resembling a sine wave. Experience shows that this is normal system behavior and no reason for concerns, as long as the values remain within certain boundaries. Only if a warning level is detected, certain measures need to be taken to avoid that a maximum allowed temperature is exceeded. Once the temperature has gone below the warning level, the situation can be considered as normal, and the data segment may be discarded.

Segment Definition

While the scenarios outlined in the examples above may sound pretty straightforward, the question arises how the endless stream of incoming sensor data can be handled to find the data values that should actually trigger the business activities described.

The answer to this question is a joint approach where various services cooperate that are part of SAP IoT. The following services are used for that purpose:

- Segment Service
  As a starting point, you define a segment configuration that serves as a formal and abstract description of the subset of time series data in which you are interested. Among other data, each configuration contains references to rules and to a thing type.
- Rule-processing framework
  In the Rule Modeler, you define at least two rules referring to the same thing type. With these rules, you can model the sensor data conditions based on which you consider a data segment as either started or finished (for example, geofence entry or exit of a truck).
- Thing Modeling
  In the Thing Modeler, you define thing types as well as things derived from thing types. The virtual things are mapped to physical devices equipped with sensors, which send the data that are monitored by rules.
- Actions
  In the Action Modeler, you define actions that can be performed in response to a fulfilled rule condition. Examples of such actions are email alerts, in-app notifications, and service integration.
- Events
  Although events are not subject to end-user activities, they still play an important role because they are used to trigger the actions mentioned above. Two different types of events are supported: events raised by rules and events raised by actions (the latter resulting in an action chain, where one action triggers another action). It's during action definition that you specify to which kind of event a given action shall listen.

Looking at all these components of SAP IoT and their contribution to the segmentation of time series data, it turns out that building segments is an abstract, business-agnostic, and purely data-driven process.

1.1 Create a Segment Configuration

Process steps for creating a segment configuration

Context

As an administrator, you want to define a segment configuration that lets you start business activities based on the measured values that are detected by sensors in an IoT scenario.

> **i** Note
>
> When defining a segment configuration, keep the following in mind:
>
> - The most important settings of a segment configuration consist of references to other objects defined in various parts of SAP IoT, such as rules and thing types. Therefore, as a prerequisite, make sure the objects that you want to use for a segment configuration have already been properly prepared.
> - Both rules and thing types have an implicit connection to a package. This connection is established via the property sets or set types assigned to rules and thing types. For a segment configuration to work properly, you have to ensure that start rule, end rule, and thing type do all refer to the same package.

- For a segment configuration, all entries except for tags are mandatory.
- The combination of assigned rules and thing type must be unique. That is, duplicate configurations using the same assigned objects are **not** allowed.

Procedure

1. From the launchpad, start the *Segment Configuration* app.

   The system presents the list of configurations available. Note that the list may contain configurations referring to thing data belonging to different packages.
2. Choose *Create*.

   New Segment Configuration dialog box.
3. Enter a *Name* for the new configuration.

   We recommend using a name that clearly indicates the business purpose of the configuration because the number of configurations tends to increase rapidly, which can make it difficult to find the right configuration easily.
4. Specify the *Start Rule* that shall be used to determine the start of a time series data segment.

   > **i Note**
   >
   > For both *Start Rule* and *End Rule*, you first have to specify the *Rule Project* to which the respective rule belongs.
   >
   > Rules can exist in draft as well as in active version. Only the active version of a rule is executed at runtime. Therefore, you must make sure that the rules assigned to a segment configuration are active. Obviously, this applies both to start rules as well as to end rules.
5. Specify the *End Rule* that shall be used to determine the end of a time series data segment.
6. Specify the *Thing Type* that contains the properties you want to use for defining a time series data segment.

   The system displays a dialog box where you can first choose the *Package* and then the *Thing Type*.
7. To specify whether the system shall send a notification whenever a segment is created or a change occurs to the segments derived from the new segment configuration, tick the *Send Notifications* checkbox accordingly.

   > **i Note**
   >
   > Activating this setting requires that you're subscribed to the SAP Event Mesh service (formerly known as Enterprise Messaging Service). For more information, see Segment Service Messaging.
8. As an optional step, you may find it useful to assign any number of tags to the configuration.

   Tags contain arbitrary alphanumeric strings that can be helpful for filtering and grouping a set of configurations that have something in common (for example, a set of similar configurations that are all dealing with geofence entries, but for geofences with a continuously decreasing radius).
9. Choose *Save*.

Results

The newly created segment configuration is stored in the database in inactive state. To start using the configuration for identifying data segments, choose *Activate*.

1.2 Update a Segment Configuration

Process steps for updating a segment configuration.

Context

As an administrator, you want to modify the settings of an existing segment configuration.

> **i** Note
>
> When updating a segment configuration, keep the following in mind:
>
> - Except for the configuration *Name*, you can only modify configuration attributes if the segment configuration is inactive. That is, prior to applying the intended changes you may need to deactivate the configuration.
> - If you need to deactivate the configuration, keep in mind that during the inactive period, no new segments can be created by the associated rules. This could lead to unrecoverable gaps in your time series data as well as to missing events caused by these gaps. It's up to you to judge whether this is an acceptable risk for your business scenario or not. If you consider this risk too high, a possible mitigation could be to copy the current configuration to a clone that takes over until the original configuration has been updated.
> - Some configuration attributes depend on the settings that are in effect for the objects referenced by the configuration. Therefore, these attributes are always shown in read-only mode and cannot be changed (for example, *Sensitivity Level*).

Procedure

1. From the launchpad, start the *Segment Configuration* app.
   The system presents the list of configurations available.
2. In the list of configurations, search for the one you want to update.

   > → Tip
   >
   > To narrow down the number of configurations displayed, you may use the filter criteria that are offered above the list.

3. Click the table row containing the configuration to be updated.
   The system presents the configuration details in the *Update Segment Configuration* dialog box.
4. Depending on which fields you want to change, choose from these options:

Field	Action
Name	Update the name as required. Once done, choose *Save*.
Other fields	1. Check the activation status of the configuration. 2. If the configuration is active, choose *Deactivate*. 3. Update the fields as required. 4. Choose *Activate*.

   The system saves your changes into the database and navigates you back to the list of segment configurations.

1.3 Delete a Segment Configuration

Process steps for deleting a segment configuration

Context

As an administrator, you want to delete a segment configuration that is no longer needed or that has been wrongly set up.

Procedure

1. From the launchpad, start the *Segment Configuration* app.

   The system presents the list of configurations available. Note that the list may contain configurations referring to thing data belonging to different packages.
2. In the list of configurations, search for the one you want to delete.

   > → Tip
   >
   > To narrow down the number of configurations displayed, you may use the filter criteria that are offered above the list.

3. At the end of the row displaying the configuration to be deleted, choose ⊗ *Delete*.

   The system presents a confirmation dialog where you have to confirm your decision to delete the selected segment configuration.
4. Confirm your decision.

Results

The segment configuration is deleted from the database.

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