IoT use cases

Planon Software Suite

Version: L105

About this Document

Intended Audience

This document is intended for *Planon Software Suite* users.

Contacting us

If you have any comments or questions regarding this document, please send them to: support@planonsoftware.com.

Document Conventions

Bold
Names of menus, options, tabs, fields and buttons are displayed in bold type.

Italic text
Application names are displayed in italics.

CAPITALS
Names of keys are displayed in upper case.

Special symbols

	Text preceded by this symbol references additional information or a tip.
	Text preceded by this symbol is intended to alert users about consequences if they carry out a particular action in Planon.

Table of Contents

IoT use cases

This section lists and describes the various use cases that have been developed for Planon IoT.

Use cases provide an easy and out-of-the-box solution for a specific requirement.

They are made available to extend Planon functionality based on apps.

Smart Utility Metering

Smart Utility Metering is an out-of-the-box solution that provides easy monitoring on Gas, Water and Electricity data points.

The Smart Utility Metering solution is part of a larger campaign for ESG (Environmental, Social and Governance), enabling companies/organizations to monitor their performance in these areas.

Smart Utitly Metering

- Works for business objects to which you can link a digital twin.

- Provides an overview of data points with hourly and daily readings and subsequently creates daily meter readings on meters of your choice.

Once enabled, the Smart Utility Metering feature **automatically** creates data points, group templates, rules and other important components on the IoT platform. As such, the solution provides a plug-and-play IoT experience.
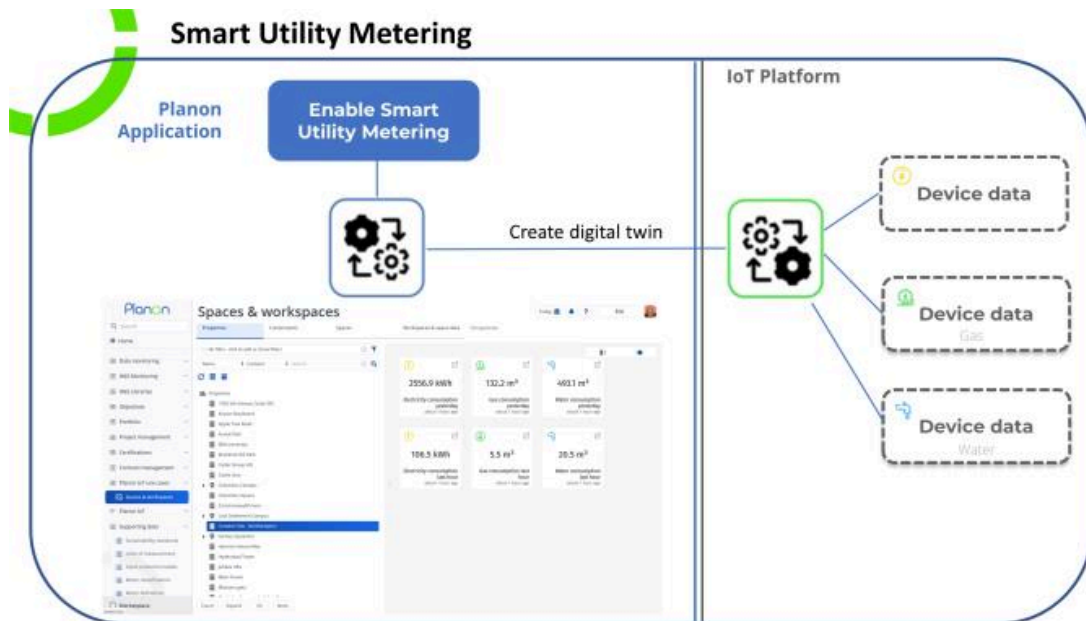
> ℹ️ • The ESG – Smart Utility Metering is available for L89 (and later).
> • The Smart Utility Metering app is not upgraded automatically with each Planon Live version. Future developments will require you to delete and recreate your Digital Twin definitions.
> • The Smart Utility Metering solution only supports properties within a single time zone. There is currently no MTZ support (soon to be supported).

How does it work?

Smart Utility Metering helps companies/organizations gain insight in their utilities consumption.

Use case

It does so in two ways:

- Enables you to measure real-time consumption (hourly/daily) of water, gas, electricity in the IoT platform.

- Automatically creates meter readings on a daily basis in the Planon application.

> ℹ️ By using these meter readings, you can build and populate ESG dashboards allowing you to monitor and steer your performance.
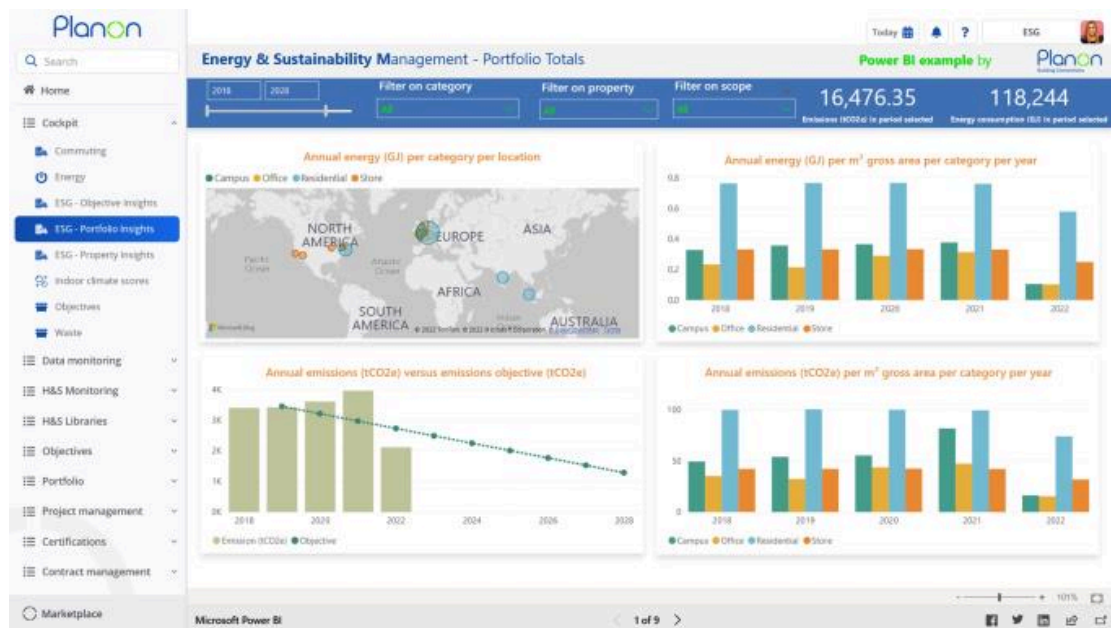
Concepts

The following topics describe the concepts that are key to understanding the functionality.

Data point

A measurement event that is displayed as a tile.

Smart Utility Metering focuses on three types of data points:
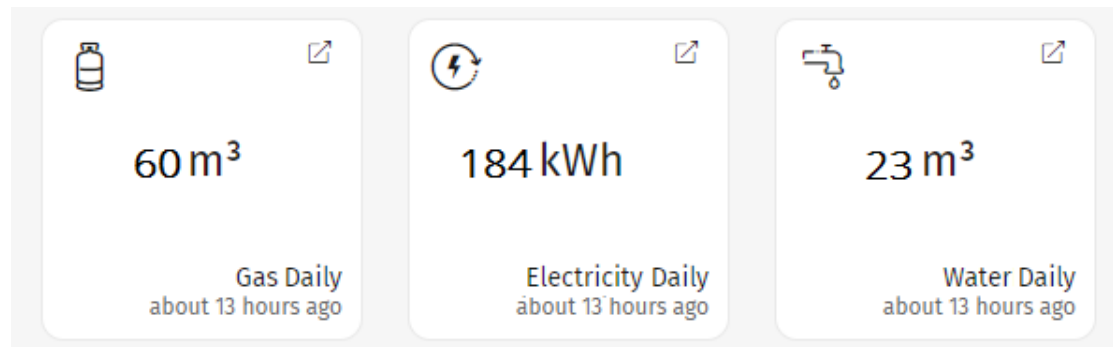
- Gas
- Water
- Electricity

ESG

ESG is an acronym that stands for environmental, social, and corporate governance.

It is a framework designed to be embedded into an organization's strategy that considers the needs and ways in which to generate value for all organizational stakeholders (such as employees, customers and suppliers and financiers).

Configuration

This section describes the steps/configuration required to enable Smart Utility Metering.

Add a digital twin definition

The digital twin definition features a number of fields that can be used by Planon partners or solution developers when creating apps on the Planon platform.

Smart Utility Metering is a system app, which means that it is pre-installed and (as of L89) available in your Planon environment and can be used out of-the-box.

Procedure

1. Go to **Digital twins** and add a new definition.

See **Creating a digital twin definition for more information.**

2. Enter a name to uniquely identify your digital twin.
3. Specify a busines object - typically, this is **Properties** or **Assets**.

> ℹ In this example, we've chosen to create a digital twin definition for **Properties**.

4. In the **Classname** field, select the **Smart Utility Metering** app.

The app is developed to make available the functionality as described in the use case.

5. Click **Save**.

    The new definition is created.

    Automatically, a number of components are now created in the Planon application.

Preconfigured settings

Selecting the app unlocks configuration specified by the app.

Settings tab

On the digital twin definition's **Settings** tab, the app's settings are preconfigured.

For SmartUtilityMetering, there is a single setting: **boTypeGaugemeterReading**. This is where you specify the type of meter reading.

> ℹ • The default value is *Gauge meter reading*, but you can specify your own meter type if necessary.
> • Do NOT alter the preconfigured settings, rules and group templates on the IoT platform as this will break the app's operation.

Technical details tab

The digital twin definition's **Technical details** tab displays the app's context.

Data points

This contains six data points concerning:

- GasHourly
- GasDaily
- ElectricityHourly
- ElectricityDaily
- WaterHourly
- WaterDaily

Action

The app also has a **DailyConsumption** action.

When an inbound message arrives at the Connector, and its body contains the app's classname and action name, the **Smart Utility Metering** app will process the values that are received from the IoT platform.

Only the Smart Utility Metering app will be able to act on this trigger.

When a Daily consumption event is included in the message body, the app will create a meter reading in the Planon application.

Should an hourly consumption event be received, nothing will happen as the app is not programmed to act on it.

Rules

The **Technical details** also includes three rules that will be scheduled to run daily:

- ScheduleGasDaily
- ScheduleElectricityDaily
- ScheduleWaterDaily

These rules are configured to send the **daily** reading values from the IoT platform to the Planon application.

> ℹ The daily readings are based on the hourly readings.

Create a digital twin

You have already created a digital twin definition, now we are going to create a digital twin for it.

Procedure

1. Go to **Assets** > **Properties** step select the property for which you want to receive reading.

2. On the action panel, click **Create digital twin**

    The Digital twin definition dialog appears - a digital twin must be linked to a digital twin definition.

3. Find and select the digital twin definition that you have created.

    In the background, in the IoT platform, it will now create a digital twin, a group template, rules. You can check this by going to the IoT plaform.

> ℹ The digital twin does not yet have readings, because no devices have been linked yet.

IoT platfom settings

When creating a digital twin for **Smart Utility Metering**, a number of settings are automatically created in the IoT platform.

Templates

If you go to **Templates** > **Group templates**, you can see that out-of-the-box, a group template has been created for your digital twin definition.

To identify it, the classname and name of the app are postfixed to the group template name.

Click it to open the side panel. On the **General** tab, you will see that a number of fields have been prefilled.

Events

Go to the **Events** tab. Here you can see the data points that correspond with those specified in the app's context.
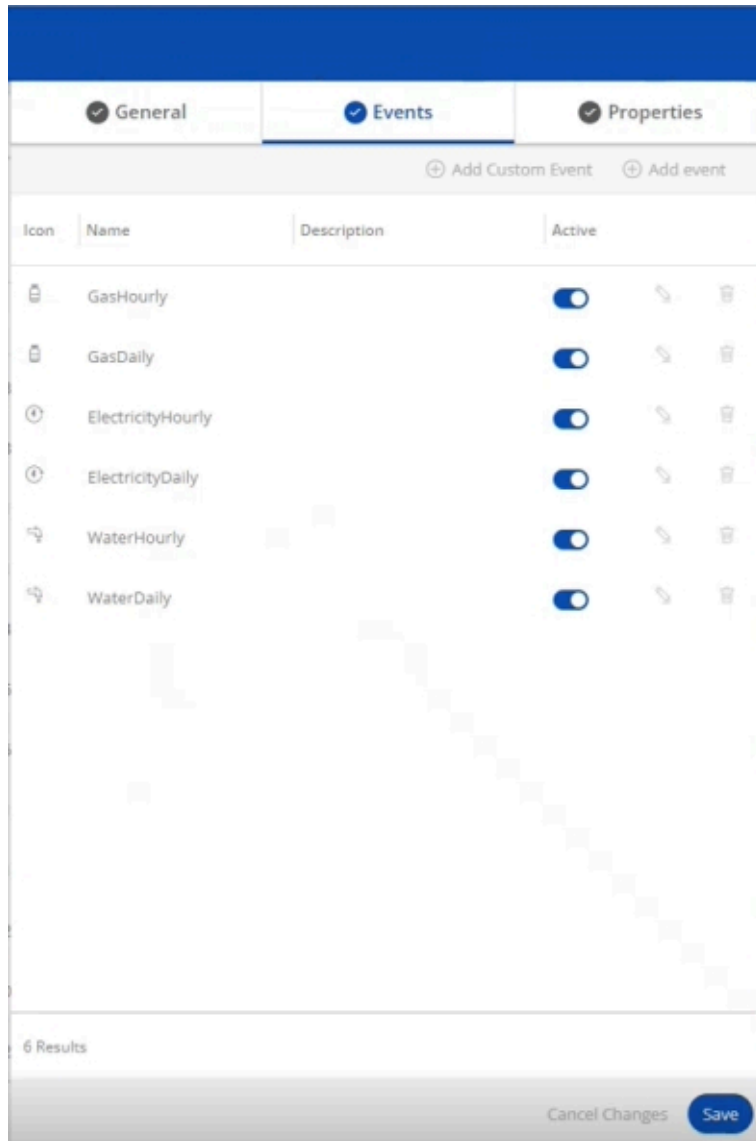
These have been correctly configured and are ready for use immediately!

> ℹ️ • Hourly events are based on actual device data (daily readings are a summarization of hourly readings)
> • Customers will still have to link physical devices for receiving readings.

Things

Go to **Things** > **All Things** and note that the property that was selected when creating the digital twin in the Planon application, is now in the list of Digital twins (linked to the correct group template)

Rules

Under **Rules** > **All rules**, the rules related to **Smart Utility Metering** are also automatically created and activated (identified by the group template ID).

These rules are triggered on a daily basis and are configured to send messages to the Planon application containing:

- data points
- values (readings)
- date/time stamp

As mentioned ealier, the JSON body also contains the

```
"pnName":"DailyConsumption"
```

> ℹ️ Receiving such message body at the Planon application will trigger the **Smart Utility Metering** app to process the events and create meter readings.

Edit digital twin

Procedure

1. Go to , select your property (for which you created a digital twin definition) and click **Edit digital twin**.

For more information, see Editing a digital twin.

The **Digital twin links - properties** dialog apepars.

This dialog contains settings that are app-specific. The settings here enable you to specify the meters for displaying the reading values received from the IoT platform.

2. Select the meters for electricity, gas and water and click **OK**.

Link physical devices

Before being able to send measurement readings to the Planon application, you need to connect your physical devices in the IoT platform.

Procedure

1. Go to the **IoT platform** and select **All things**

2. On the **Properties** tab, under **Groups**, link the device to the digital twin.

When this is done, everything is operational and you will receive data once the hourly schedule has run.

You have now linked physical devices to your digital twin in the IoT platform. This twin is connected to its counterpart in the Planon application and will start sending readings.

In the IoT platform, the data readings will appear on your digital twin > **Overview** tab.
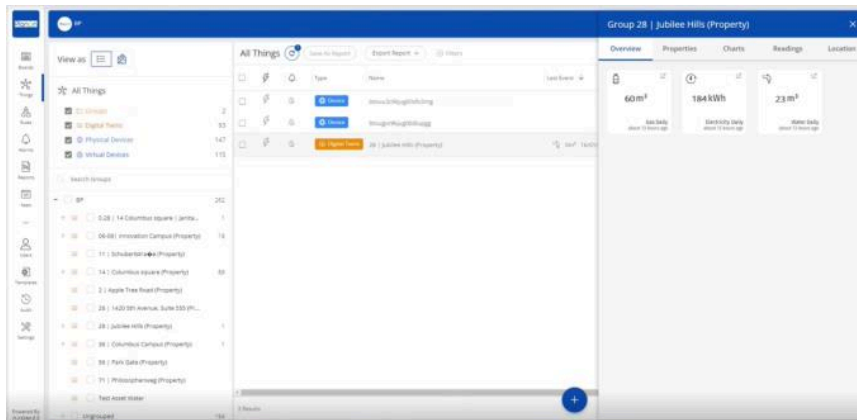
> These readings are sent to the Planon application. On the Planon application side, only the daily readings will result in creating a meter reading.

Updating the solution

Planon supports updating Digital twin definitions to ensure that customers will get the latest system definitions.

On the **Digital twin definitions** level, when you click the update action **Sync with IoT platform**, a check is performed to verify if a newer version of the definition is available.

If this is the case, the action will ensure that on the Planon IoT side, all settings are updated (group template, rule, data points) so that customers can reuse existing definitions.

Adding functionality

However, to be able to provide new functionality, Planon reserves the right to update system setting or add data points during an upgrade.

Retaining settings

Yet, this is not the case for customer settings. In fact, customer configuration is retained. For example: **Data to aggregate** and **Aggregation level** - these are customer configurations that are respected.

Deleting components

On **Group template** level, when a data point becomes obsolete, Planon will not delete it, but will no longer maintain it. It will be considered as if is defined by the customer and it will remain as is.

On **Rules** level, customers can add conditions or change settings. Here, Planon reserves the right to change all settings if necessary. Same goes for **Actions** - this means that actions defined by the user might be deleted during an upgrade so that only system action will remain.

Receiving readings

Once the configuration is done and everything is in place, the meter readings registered at the IoT platform are received and acted on by the Planon application.

Meters

1. Go to **Meters** > **Meters** selection level and select your property from the list.
2. Go to **Meter readings**.
   - After the scheduled synchronization with the IoT platform, the new meter readings will be listed (showing a time stamp of the reading and not that of the inbound message).
   - The readings will always be *gauge readings* (not counter readings) - this is predefined.
   - Ruling ensures that any mandatory fields match the IoT platform requirements.

Assets

Once the readings have been processed, the values reported by the IoT platform will now also be available for your Digital twin definition.

1. Go to **Assets** and select the property to which the Digital twin definition was linked.
2. Click the **Digital twin** view in the data panel - the data points will be displayed.
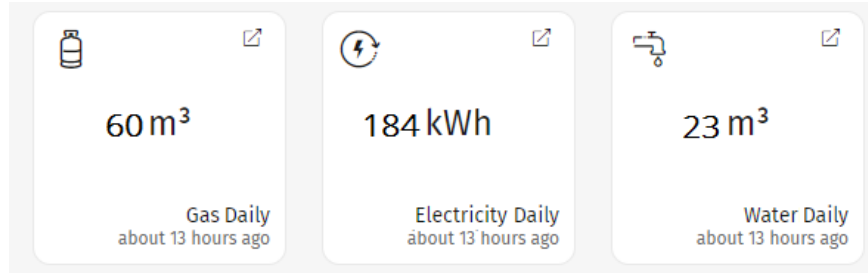
Handling errors

In the Planon application, messages sent by the IoT platform are received by the Connector (**Inbox inbound messages**).

If messages cannot be processed, they are listed in the **Failed inbound messages** step.

The Connector will stop processing messages after nine attempts. The **Comment** field lists the reason for failing to process a message.

The values in the **Attribute** field originate from the corresponding rule in the IoT platform.

Automatically creating work orders

Based on receiving events from Planon IoT, it is possible to automatically have work orders created in the Planon application.

How to configure it

> This feature works for both ESG use cases with a slight deviation for Smart utility metering, as explained later.

1. Go to **Digital twins** and select a digital twin definition.

    Remember, this can either be Smart climatized-asset managment or Smart utility metering.
2. Go to **Digital twin templates** level and select your definition from the list.
3. Go to the **Settings** tab.
4. Here, in **Order reference**, you can link a standard order.

    If an event is received (see, for example receiving notifications), a work order is automatically created.

How it works

Going back to the **Digital twin definitions** level > **Technical details** tab, here you can see the system actions and rules that are available for the solution.

Example

A *Temperature too high rule* sends a *Temperature too high* event to the Planon application.

If this event is received by Planon, a check is performed to verify:

*   The asset for which the action was sent.

*   Whether already a work order was created for this event by Planon IoT.

    If no work order was already created, it will now be created automatically (the description will be used as name). The work order's initial status will be *Reported*.

While this has happened, it is possible that another event for the same asset is received, for example *Humidity too high* or *Temperature within Range*.

If this is the case, the new event will be added to the work order that was already created so that this becomes the single point of information. The information will be appended as a communication log:

Add communication log   ✕

Aalders 3/15/2023 15:30   Communication logs
TemperatureTooHigh
Value 28 at 2022-10-24T11:18:15.883Z

Aalders 3/15/2023 15:31   Communication logs
TemperatureTooHigh
Value 30 at 2022-10-24T11:19:15.883Z

Aalders 3/15/2023 15:32   Communication logs
TemperatureWithinRange
Value 30 at 2022-10-24T11:21:15.883Z

[   ]   Send

500000 characters remaining (500000 maximum)

Close

If this work order is already *Completed* and another event is received, a new work order will be created.

Smart utility metering

For Smart utility metering, creating a work order works slightly different.

This definition only has a single system action: DailyConsumption, which creates a meter reading.

As this cannot be used for a notification, a *user action* is added: ConsumptionExceeded.

This enables the customer to create a rule with a condition

For convenience, you can simply copy the JSON definition from the **Technical details** and paste that in Planon IoT:

When such event is received, a standard order will be created as already described earlier.

> ℹ️ Please note that Smart utility metering does not have a *Restore* action. So, if there is a Consumption Exceeded event, this cannot be canceled by a Restore event. Consequently, the work order always needs to be manually completed.

DTAP support

To test or develop new software versions, it is customary to use a phased approach called DTAP.

Each letter in the acronym stands for a distinct phase:

- Develop
- Testing
- Acceptance
- Production

This setup could also be used if a mistake is found to restore an application in Production and replace it with an earlier version.

> ℹ️
> - For the Planon application and IoT platform, DTAP is supported (only for Cloud).
> - When restoring *Production* > *Production*, IoT remains unaffected.

How it works

In your **Environment management** gadget, you can choose to restore a backup for an instance. Depending on the selected backup, specific actions regarding Planon IoT are carried out. These actions are only triggered when going from:

- Production > non-production

    Example

    Production > Acceptance

- non-production > non-production

    Example

    Testing > Acceptance

IoT Platform

When restoring a backup, in the IoT platform, **all** IoT artifacts are removed (digital twins, rules, configuration).

Planon application

In the Planon application, the **Clean-up IoT links** action ensures that the linked IoT values is purged from the database, because the Planon application still holds references to IoT artifacts. If the database is not purged, these IoT artifacts could result in synchronization issues.

> **i** To be sure, digital twin defintions will not be removed, but their IoT counterparts will be purged. These can subsequently be recreated if necessary (**Create digital twin**).

Example

In the following scenario, the customer restores their *Production* environment to *Acceptance*.

Legend

▬ (pink)	: Will be cleaned up when a backup is restored
▬ (blue)	: Not affected

This will result in an emtpy shell that can again be built up if necessary.

If the IoT platform is in use and a restore backup is triggered, the **Clean-up IoT links** action is required!

The **Clean-up IoT links** action is a technical action that is meant to be triggered by the Planon SDK. For now, however, this action must be triggered *manually* to ensure that the IoT artifacts are removed from the Planon application.

Sync with IoT platform

The **Sync with IoT platform** action synchronizes the settings or configuration between the Planon application and the IoT platform. As such, it is triggered from the Planon application end.

It's purpose is threefold:

- It updates user settings
- It updates the definition when a new app is created containing new fields, rules, etc.
- It can be used to carry out a Restore to factory settings - this will reset to default settings.

> ⓘ • The **Sync with IoT platform** action is available at **Digital twins** > **Digital twin definitions** level.
> • Planon assumes that the settings in the Planon application are leading. Therefore, apply settings here, instead of in the IoT platform.
> • Synchronization is automatically triggered when saving the Ditgital twin definition (via a background action).

Smart Climatized-Asset Management

Smart Climatized-Asset Management is an out-of-the-box solution that provides easy monitoring on asset conditions.

- Temperature - too high / too low

- Power - off

- Humidity - too high / too low

- Door - open

- Electricity consumption - Kwh

Smart Climatized-Asset Management

- Works for **Assets** and **Spaces** to which you can link a digital twin,

- Provides notifications about conditions that have been breeched based on real time readings.

Once enabled, the Smart Climatized-Asset Management feature **automatically** creates data points, group templates, rules and other important components on the IoT platform. As such, the solution provides a plug-and-play IoT experience.
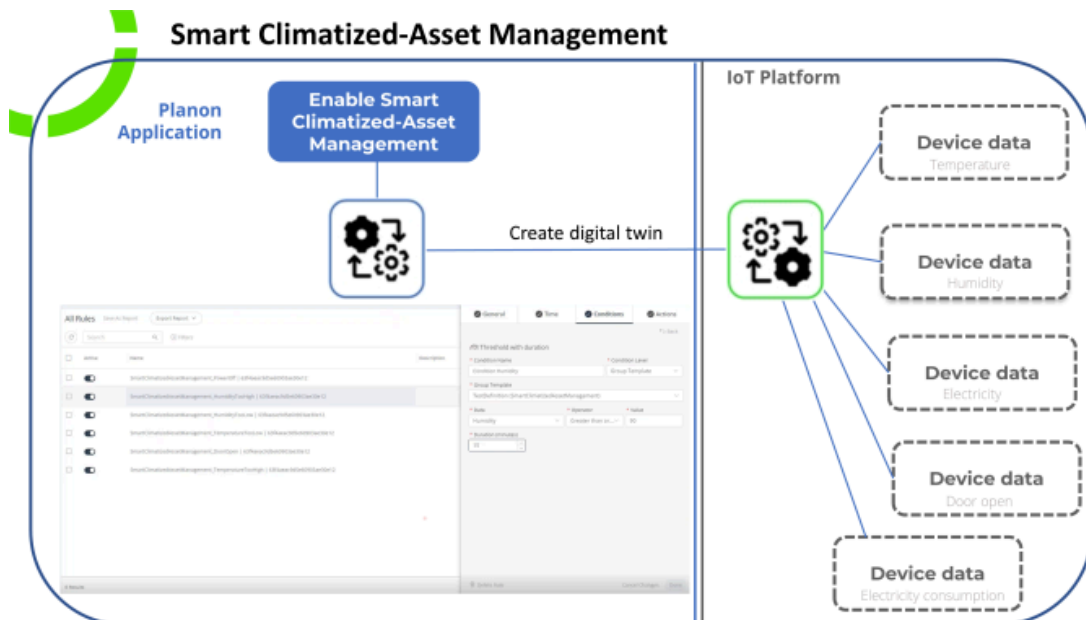
How does it work?

Smart climatized-asset management enables companies/organizations to get a tighter control on monitoring their assets and helps them respond to and resolve issues quickly if they occur.

Use case

IoT-based real-time monitoring and operational insights on (environmental) conditions of climatized assets and spaces, and timely identified need for interventions.

The use case applies to climatized assets (e.g., refrigerators, freezers) and climatized spaces (e.g., server rooms, cold rooms, freezer rooms).
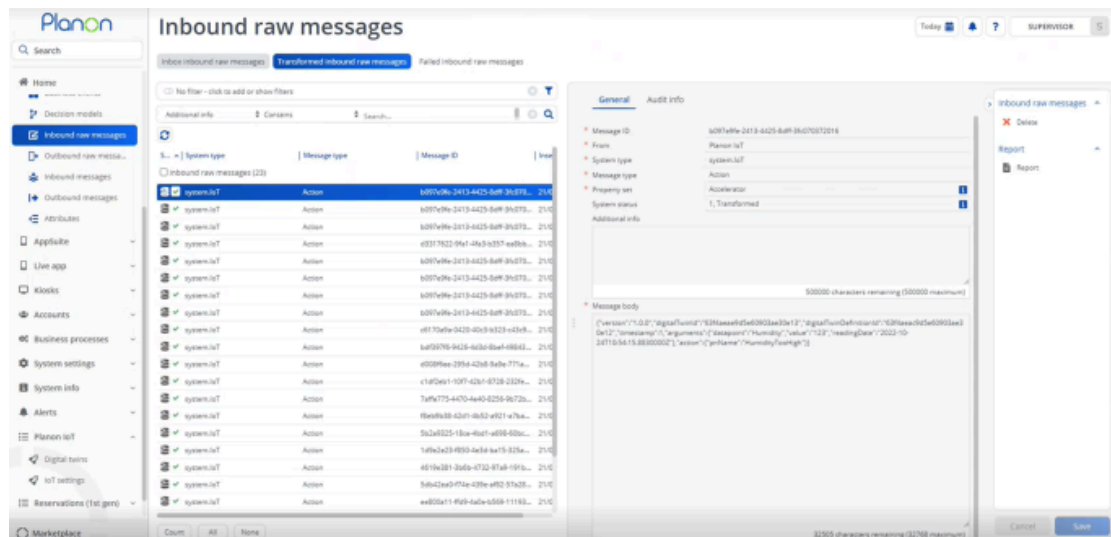
Configuration

This section describes the steps/configuration required to enable **Smart Climatized-Asset Management**.

Add a digital twin definition

The digital twin definition features a number of fields that can be used by Planon partners or solution developers when creating apps on the Planon platform.

Smart Climatized-Asset Management is a system app, which means that it is pre-installed and (as of L91) available in your Planon environment and can be used out-of-the-box.

1. Go to **Digital twins** and add a new definition.

See Creating a digital twin definition for more information.

2. Enter a name to uniquely identify your digital twin.

3. Specify a business object.

> ℹ **Smart Climatized-Asset Management** is only available for **Assets** and **Spaces**. In the dialog box, you can move both business object to **In use**, which enables you to use a single Digital twin definition for both assets and spaces.

4. In the **Classname** field, select the **Smart Climatized-Asset Management** app.

   The app is developed to make available the functionality as described in the use case.

5. Click **Save**.

   The new definition is created. Automatically, a number of components are now created in the Planon application.

Preconfigured settings

Selecting the app and saving the digital twin definition unlocks configuration specified by the app.

When saving the Digital twin definition, automatically the group template will be created in the IoT Platform, reflecting the details of the digital twin definition (data points, rules).

Technical details tab

On the digital twin definition's **Technical details** tab, you will see the following items:

- **Data points**
- **System actions**

  See also: restore actions.

- **Rules**
- **User actions**

These, correspond with entities created in the IoT Platform.

Restore to factory settings

It is possible for application manager to restore digital twin definitions to their original settings. This can be necessary if a digital twin definition no longer functions as required.

> ℹ Performing a reset will only reinstate the original settings - data that is stored is not affected.

1. Go to and select your digital twin definition.

2. On the action panel, click **Sync with IoT platform**.

   A dialog box appears.

3. Set the field **Reset to factory settings?** to **Yes** and click **OK**.

   A message appears - read this message carefully before proceeding.

4. Click **Proceed**.

   The reset will be carried out - refresh your screen to verify your restored settings.

Create a digital twin

You have already created a digital twin definition, now we are going to create a digital twin for it.

> ℹ️ Although **Assets** is used here, Smart Climatized-Asset Management also works for **Spaces**.

Procedure

1. Go to **Assets** and select an asset that you want to monitor.

2. On the action panel, click **Create digital twin**

   The **Digital twin definition** dialog appears - a digital twin must be linked to a digital twin definition.

3. Find and select the digital twin definition that you have created.

   In the background, in the IoT platform, it will now create a digital twin, a group template, rules. You can check this by going to the IoT platform.

IoT platform settings

When creating a digital twin for **Smart Climatized-Asset Management**, a number of settings are automatically created in the IoT platform.

After linking your digital twin to the digital twin definition, automatically the following components are created in the IoT Platform:

- Group template
- Events

- Rules

Link physical devices

Before being able to send measurement readings to the Planon application, you need to connect your physical devices in the IoT platform.

1. Go to the **IoT platform** and select **All things**

2. On the **Properties** tab, under **Groups**, link the device to the digital twin.

When this is done, everything is operational and you will receive data once the hourly schedule has run.

You have now linked physical devices to your digital twin in the IoT platform. This twin is connected to the Planon application and will start sending notifications.

Updating the solution

Planon supports updating Digital twin definitions to ensure that customers will get the latest system definitions.

On the **Digital twin definitions** level, when you click the update action **Sync with IoT platform**, a check is performed to verify if a newer version of the definition is available.

If this is the case, the action will ensure that on the Planon IoT side, all settings are updated (group template, rule, data points) so that customers can reuse existing definitions.

Adding functionality

However, to be able to provide new functionality, Planon reserves the right to update system setting or add data points during an upgrade.

Retaining settings

Yet, this is not the case for customer settings. In fact, customer configuration is retained. For example: **Data to aggregate** and **Aggregation level** - these are customer configurations that are respected.

Deleting components

On **Group template** level, when a data point becomes obsolete, Planon will not delete it, but will no longer maintain it. It will be considered as if is defined by the customer and it will remain as is.

On **Rules** level, customers can add conditions or change settings. Here, Planon reserves the right to change all settings if necessary. Same goes for **Actions** - this means that actions defined by the user might be deleted during an upgrade so that only system action will remain.

Receiving notifications

Once the setup is completed and everything is configured, notifications will be sent to the Planon application if conditions are met.

These notifications are sent to the Planon application as Inbound raw messages.
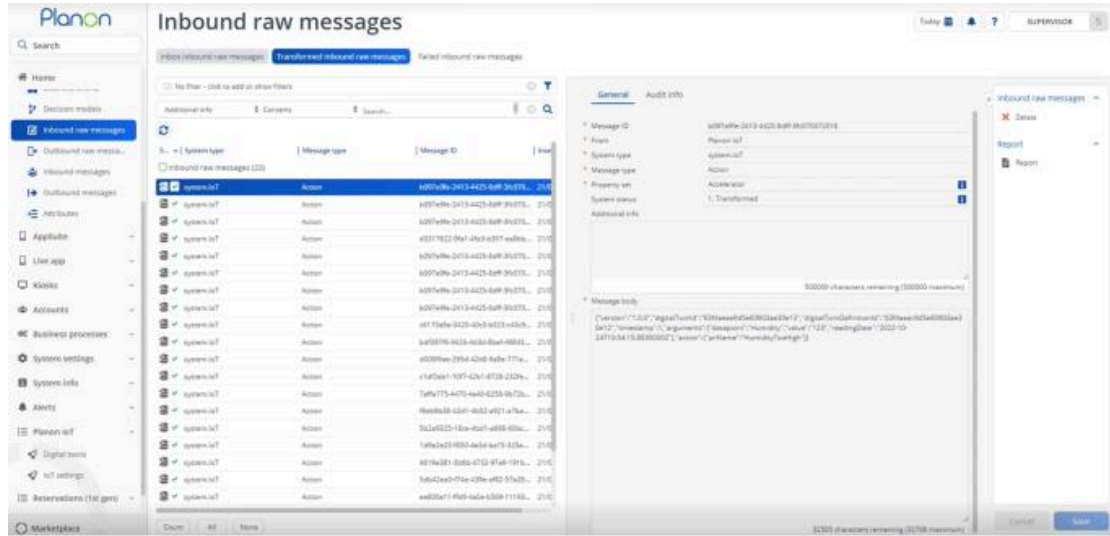
These messages can be monitored and appropriate action can be taken to overcome the situation that is reported.

> **i** In time, these messages will be automatically processed and converted into work orders.

Example

The sensor records in a climate controlled environment records that its has been too high for longer than 15 minutes.

This triggers a condition that subsequently results in a message that is sent to the Planon application.

Appropriate action can be taken to resolve the situation.

Should the situation revert to *normal* again, a restore action is sent to annul the previous alert:

- Humidity within range
- Temperature within range
- Power restored
- Door restored

Automatically creating work orders

Based on receiving events from Planon IoT, it is possible to automatically have work orders created in the Planon application.

How to configure it

> ℹ️ This feature works for both ESG use cases with a slight deviation for Smart utility metering, as explained later.

1. Go to **Digital twins** and select a digital twin definition.

   Remember, this can either be Smart climatized-asset managment or Smart utility metering.

2. Go to **Digital twin templates** level and select your definition from the list.

3. Go to the **Settings** tab.

4. Here, in **Order reference**, you can link a standard order.

   If an event is received (see, for example receiving notifications), a work order is automatically created.

How it works

Going back to the **Digital twin definitions** level > **Technical details** tab, here you can see the system actions and rules that are available for the solution.

Example

A *Temperature too high rule* sends a *Temperature too high* event to the Planon application.

If this event is received by Planon, a check is performed to verify:

- The asset for which the action was sent.

- Whether already a work order was created for this event by Planon IoT.

   If no work order was already created, it will now be created automatically (the description will be used as name). The work order's initial status will be *Reported*.

While this has happened, it is possible that another event for the same asset is received, for example *Humidity too high* or *Temperature within Range*.

If this is the case, the new event will be added to the work order that was already created so that this becomes the single point of information. The information will be appended as a communication log:

Add communication log   ×

> Aalders 3/15/2023 15:30   Communication logs
> TemperatureTooHigh
> Value 28 at 2022-10-24T11:18:15.883Z
>
> Aalders 3/15/2023 15:31   Communication logs
> TemperatureTooHigh
> Value 30 at 2022-10-24T11:19:15.883Z
>
> Aalders 3/15/2023 15:32   Communication logs
> TemperatureWithinRange
> Value 30 at 2022-10-24T11:21:15.883Z

[   ] **Send**

500000 characters remaining (500000 maximum)

Close

If this work order is already *Completed* and another event is received, a new work order will be created.

Smart utility metering

For Smart utility metering, creating a work order works slightly different.

This definition only has a single system action: DailyConsumption, which creates a meter reading.

As this cannot be used for a notification, a *user action* is added: ConsumptionExceeded.

This enables the customer to create a rule with a condition

For convenience, you can simply copy the JSON definition from the **Technical details** and paste that in Planon IoT:

```
User actions:
ConsumptionExceeded
eventconnector/system/v1
{
  "version": "1.0",
  "messageID": "{guid}",
  "from": "Planon IoT",
  "systemType": "system.IoT",
  "messageType": "Action",
  "propertySet": "{planonPropertySetName}",
  "messageBody": {
    "version": "1.0.0",
    "digitalTwinId": "{device.id}",
    "digitalTwinDefinitionId": "{device.productId}",
    "timestamp": "{datetimenowISO8601}",
    "action": {
      "pnName": "ConsumptionExceeded"
    },
    "arguments": {"datapoint":"{triggeringEvent}","value":"{value}","readingDate":"{datetimeISO8601}"}
  }
}
```

When such event is received, a standard order will be created as already described earlier.

> Please note that Smart utility metering does not have a *Restore* action. So, if there is a Consumption Exceeded event, this cannot be canceled by a Restore event. Consequently, the work order always needs to be manually completed.

Synchronizing settings

After adding a digital twin definition, creating a digital twin and linking it to your definition, the Planon application can communicate with the IoT Platform.

Smart Climatized Asset Management comes with a number of predefined settings. Changing these settings was already possible on the IoT platform side, now it is also possible to change these settings from the Planon application.

Procedure

1. Go to and select the digital twin definition that is created for your Smart Climatized Asset.
2. Go to the **Settings** tab, here you will see the available settings and their respective values.

3. Edit the values of these settings as required and click **Save**.

   This will only save the new settings.

4. To apply the new settings to the IoT platform, click **Sync with IoT platform** on the action panel.

   The settings on the IoT platform will be overwritten.

DTAP support

To test or develop new software versions, it is customary to use a phased approach called DTAP.

Each letter in the acronym stands for a distinct phase:

- Develop

- Testing

- Acceptance

- Production

This setup could also be used if a mistake is found to restore an application in Production and replace it with an earlier version.

> - For the Planon application and IoT platform, DTAP is supported (only for Cloud).
> - When restoring *Production* > *Production*, IoT remains unaffected.

How it works

In your **Environment management** gadget, you can choose to restore a backup for an instance. Depending on the selected backup, specific actions regarding Planon IoT are carried out. These actions are only triggered when going from:

- Production > non-production

    Example

    Production > Acceptance

- non-production > non-production

    Example

    Testing > Acceptance

IoT Platform

When restoring a backup, in the IoT platform, **all** IoT artifacts are removed (digital twins, rules, configuration).
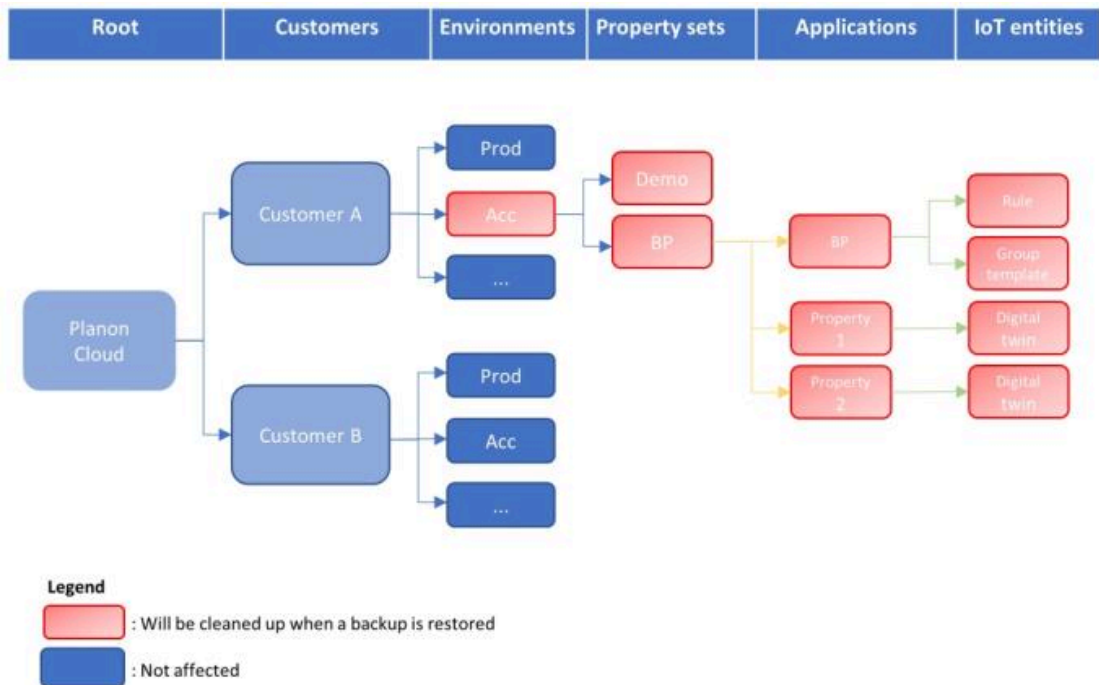
Planon application

In the Planon application, the **Clean-up IoT links** action ensures that the linked IoT values is purged from the database, because the Planon application still holds references to IoT artifacts. If the database is not purged, these IoT artifacts could result in synchronization issues.

> ℹ️ To be sure, digital twin defintions will not be removed, but their IoT counterparts will be purged. These can subsequently be recreated if necessary (**Create digital twin**).

Example

In the following scenario, the customer restores their *Production* environment to *Acceptance*.

This will result in an emtpy shell that can again be built up if necessary.

If the IoT platform is in use and a restore backup is triggered, the **Clean-up IoT links** action is required!

The **Clean-up IoT links** action is a technical action that is meant to be triggered by the Planon SDK. For now, however, this action must be triggered *manually* to ensure that the IoT artifacts are removed from the Planon application.

Sync with IoT platform

The **Sync with IoT platform** action synchronizes the settings or configuration between the Planon application and the IoT platform. As such, it is triggered from the Planon application end.

It's purpose is threefold:

- It updates user settings

- It updates the definition when a new app is created containing new fields, rules, etc.

- It can be used to carry out a Restore to factory settings - this will reset to default settings.

> • The **Sync with IoT platform** action is available at **Digital twins** > **Digital twin definitions** level.
> • Planon assumes that the settings in the Planon application are leading. Therefore, apply settings here, instead of in the IoT platform.
> • Synchronization is automatically triggered when saving the Ditgital twin definition (via a background action).
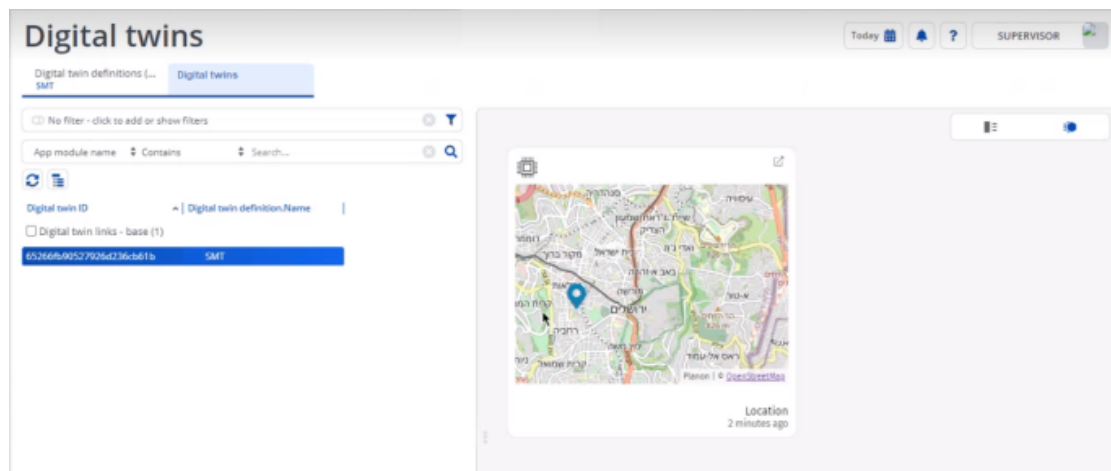
Smart Asset Tracking

Smart Asset Tracking is an out-of-the-box solution that enables easy monitoring of (mobile) assets based on GPS location data.

Smart Asset Tracking

- Works on the **Assets** business object only.

- Provides a street map data point with a near-exact location of an asset and various history views (Day, Week, Month).

Once enabled, Smart Asset Tracking **automatically** creates a data point, group template, rules and other important components on the IoT platform. As such, the solution provides a plug-and-play IoT experience.

How does it work?

Smart Asset Tracking helps companies/organizations to geographically monitor and track mobile assets based on near actual GPS location data.

Use case

When installed, the smartassettracking app:

- Enables GPS asset tracking of - including Live and History views.

- Creates a digital twin definition and provides a new data point type - a street map.

The smart asset tracking use case is only available on **Assets** and allows you to track a valuable asset (pool car, shipment, ...).

- It provides a near live view of the location

- The location data is refreshed every 5 minutes (defined by the app)

- Interaction: the street map data point allows you to grab and move the map. Also, you can zoom in/ zoom out.

- It has a history view that becomes available if you click the expand

   icon (   ). This opens a details window and shows a Day view (you can select a different date or select a Week or Month view).

   It shows a map with all measured locations plotted on it and a line that connects the locations. It does not show the route that was taken to get from one point to another because this is not measured.
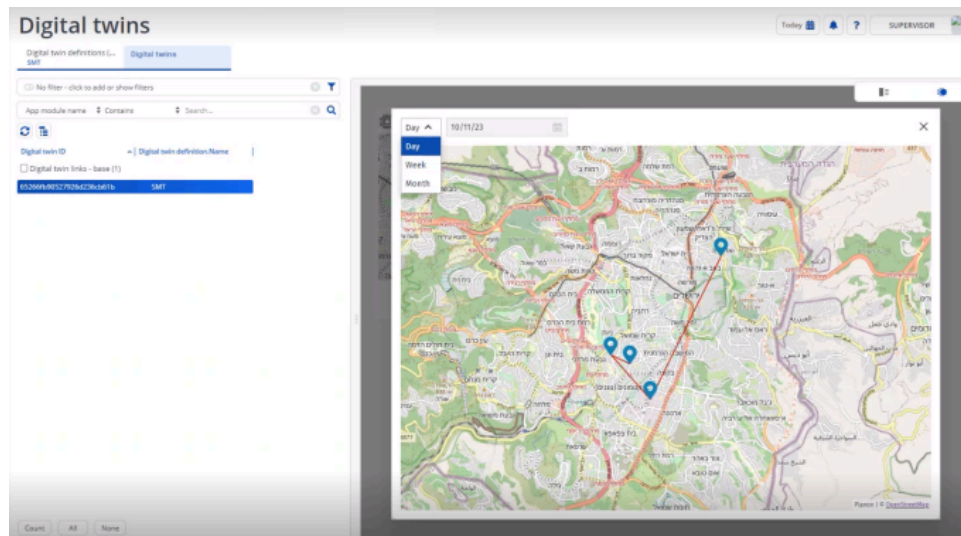
You can also disable/enable the lines connecting the locations.

If your device has GPS and provides location data and it is connected to the digital twin in the IoT Platform, its location data is shared with the Digital twin counterpart in Planon and the street map data point is populated.

Configuration

This section describes the steps/configuration required to enable **Smart Asset Tracking**.

Add a digital twin definition

The digital twin definition features a number of fields that can be used by Planon partners or solution developers when creating apps on the Planon platform.

P r o c e d u r e

1. Go to **Digital twins** and add a new definition.

   See [Creating a digital twin definition](#) for more information.

2. Enter a name to uniquely identify your digital twin.

3. Specify a business object.

> **Smart Asset Tracking** is only available for **Assets**.

4. In the **Classname** field, select the **Smart Asset Tracking** app.The app is developed to make available the functionality as described in the use case.

5. Click **Save**.

   The new definition is created. Automatically, a number of components are now created in the Planon application.

Preconfigured settings

Selecting the app and saving the digital twin definition unlocks configuration specified by the app.

When saving the Digital twin definition, automatically the group template will be created in the IoT Platform, reflecting the details of the digital twin definition (data point, rules).

Technical details tab

The digital twin definition's **Technical details** tab will reflect the components that are implemented by the app. These correspond with the entities created in the IoT Platform.

Restore to factory settings

It is possible for application manager to restore digital twin definitions to their original settings. This can be necessary if a digital twin definition no longer functions as required.

> Performing a reset will only reinstate the original settings - data that is stored is not affected.

Procedure

1. Go to and select your digital twin definition.

2. On the action panel, click **Sync with IoT platform**.

   A dialog box appears.

3. Set the field **Reset to factory settings?** to **Yes** and click **OK**.

   A message appears - read this message carefully before proceeding.

4. Click **Proceed**.

The reset will be carried out - refresh your screen to verify your restored settings.

Create a digital twin

After creating a digital twin definition, you can now create a digital twin for it.

Procedure

1. Go to **Assets** and select an asset that you want to track.
2. On the action panel, click **Create digital twin**.

   The **Digital twin definition** dialog appears - a digital twin must be linked to a digital twin definition.

3. Find and select the digital twin definition that you have created.

   In the background, in the IoT platform, it will now create a digital twin and its components.

IoT platform settings

When creating a digital twin for **Smart Asset Tracking**, a number of settings are automatically created in the IoT platform.

After linking your digital twin to the digital twin definition, automatically the required components are created in the IoT Platform.

Go to **All things**, and select your digital twin to review the settings.
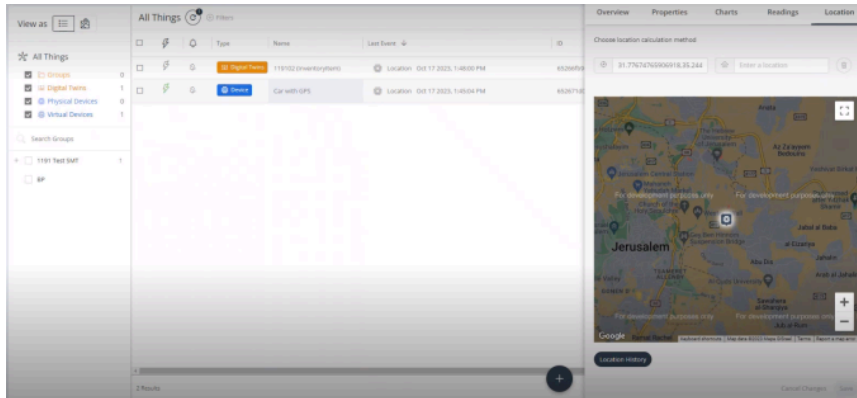
Link physical devices

Before being able to send location data to the Planon application, you need to connect your physical devices in the IoT platform.

Procedure

1. Go to the **IoT platform** and select **All things**.
2. On the **Properties** tab, under **Groups**, link the device to the digital twin.

   When this is done, everything is operational and you will receive data once the hourly schedule has run.

You have now linked physical devices to your digital twin in the IoT platform. This twin is connected to the Planon application and will start sending location data.

Updating the solution

Planon supports updating Digital twin definitions to ensure that customers will get the latest system definitions.

On the **Digital twin definitions** level, when you click the update action **Sync with IoT platform**, a check is performed to verify if a newer version of the definition is available.

If this is the case, the action will ensure that on the Planon IoT side, all settings are updated (group template, rule, data points) so that customers can reuse existing definitions.

Adding functionality

However, to be able to provide new functionality, Planon reserves the right to update system setting or add data points during an upgrade.

Retaining settings

Yet, this is not the case for customer settings. In fact, customer configuration is retained. For example: **Data to aggregate** and **Aggregation level** - these are customer configurations that are respected.

Deleting components

On **Group template** level, when a data point becomes obsolete, Planon will not delete it, but will no longer maintain it. It will be considered as if is defined by the customer and it will remain as is.

On **Rules** level, customers can add conditions or change settings. Here, Planon reserves the right to change all settings if necessary. Same goes for **Actions** - this means that actions defined by the user might be deleted during an upgrade so that only system action will remain.

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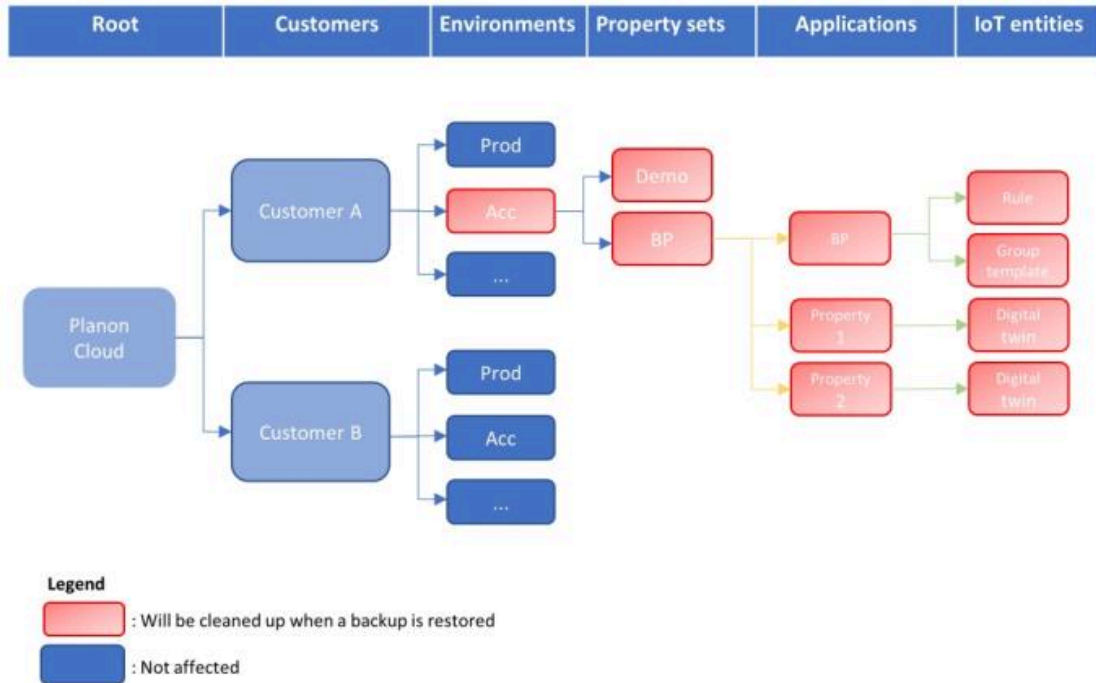
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