

Sentinel RMS SDK v9.4.0

Quick Start Guide for Dynamic Entitlements

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About This Guide

This document provides step by step instructions for creating and consuming dynamic entitlements.

Document Conventions

This document uses standard conventions for describing the user interface and for alerting you to important information.

Notes

Notes are used to alert you to important or helpful information. They use the following format:



Note: Take note. Contains important or helpful information.

Cautions

Cautions are used to alert you to important information that may help prevent unexpected results or data loss. They use the following format:



CAUTION: Exercise caution. Contains important information that may help prevent unexpected results or data loss.

Warnings

Warnings are used to alert you to the potential for catastrophic data loss or personal injury. They use the following format:



WARNING! Be extremely careful and obey all safety and security measures. In this situation you might do something that could result in catastrophic data loss or personal injury.

Command Syntax and Typeface Conventions

Convention	Description
Bold lettering	Denotes keystrokes, menu items, window names or fields.
<code>Courier</code>	Denotes syntax, prompts, and code examples.
<i>Italic lettering</i>	Denotes file names and directory names. Else, used for emphasis.

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To find the nearest office or distributor, use the following URL:

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- E-mail (only if having issue submitting the technical issue via portal)
technical.support@gemalto.com

Downloads

You may want to explore updated installers and other components here:

<https://sentinelcustomer.gemalto.com/sentineldownloads/>

Quick Start Guide for Dynamic Entitlements

Introduction

This Quick Start guide provides step-by-step instructions on how to create and work with dynamic entitlements. You use Sentinel EMS to define the dynamic entitlement and Sentinel RMS to generate and install the licenses.

Sentinel EMS

Sentinel EMS is a web-based Entitlement Management System that enables software developers and device manufacturers to define and manage their product portfolio and the associated licensing policies. The Sentinel EMS platform includes out-of-the-box interfaces for license generation, activation, tracking, reporting, and back-office integration and customer self-service portals.

For more details, refer to the [Sentinel EMS User Guide](#).

Sentinel RMS

Sentinel RMS provides a set of APIs and tools to be integrated with the software that needs to be licensed and protected. Licenses are generated by the Sentinel RMS license generator that is integrated with Sentinel EMS. Licenses generated are uniquely encrypted for each software vendor so that only the application licensed by the specific vendor can use the licenses.

For more details, refer to the [Sentinel RMS Developer's Guide](#).

Prerequisites

To use this Quick Start, you must have access to Sentinel EMS.

What Is a Dynamic Entitlement?

An **entitlement** refers to the rights of an end user to use a software package and includes information about who can use it and for what duration.

Dynamic entitlements offer a future-proof mechanism for licensing your products without sacrificing backward compatibility. When new versions of a product are released, you can make the version available to end customers without the need for a new entitlement. Backward compatibility is maintained because the dynamic entitlement not only includes the new product variant but also includes all the previous variants.

How Does It Work?

You create a dynamic entitlement using a version-less product as a line item. A **version-less** product includes all marketable features, acting as a template from which you derive variants.

A **variant** is a customized product definition that includes a subset of the features included in the version-less product. Whenever you modify a variant, the changes are automatically applied to the version-less product. As your product evolves, you can add features to your version-less product.

Although you create entitlements for version-less products, you activate licenses for the variants of these products. With a dynamic entitlement, users can activate any available variants linked with the version-less product within the overall entitlement quantity limit.

Steps for Licensing

A typical process of licensing an application involves the following steps:

1. **Define Product Catalog**
2. **Create a Dynamic Entitlement**
3. **Activate the On-Premise-Standalone Variant in the Dynamic Entitlement**
4. **Install and Consume the License Created for the On-Premise-Standalone Variant**

Define Product Catalog

This includes the following steps:

1. [Log on to the Sentinel EMS Portal](#)
2. [Create Namespace](#)
3. [Create License Models](#)
4. [Create a Feature](#)
5. [Create a Version-less Product](#)
6. [Create Variants of the Version-Less Product](#)

Log on to the Sentinel EMS Portal

To log on to EMS, you need a user ID and password assigned by the administrator. The default user ID and password are shared in the Gemalto Sentinel Order Credential email.

Navigate to the URL on which your EMS instance is running, and enter the user ID and password to login to the portal.

Note:

- If you are an EMSaaS customer, use the URL sent by Gemalto in email for login to EMS portal.
- If you host EMS yourself, use the URL on which you are hosting EMS.
- If you are an evaluation/trial customer, the EMS access URL is present in the trial portal. URL and credentials for trial portal are shared in the trial access details email.

To create a product catalog, you need to use the **Catalog** menu from the Sentinel EMS main menu.

Note: First time logging on?



Make sure that version-less products are enabled. In the Sentinel EMS portal, navigate to **Configure > Administration Console > General Configuration** to ensure that **Enable Version-less Product** is set to **Yes**.

Create Namespace

A Namespace acts as a logical partition for your Sentinel EMS workspace. If you have different Product lines, you can maintain a different Namespace for each and define multiple Products in each Namespace. For details, refer to the [Sentinel EMS User Guide](#).

1. Under **Catalog**, click **Namespaces**. The Namespaces page is displayed.
2. Click **New**. The **Create Namespace** page is displayed.
3. In the **Name** field, type **Global**.
4. Click **Save**.

Create License Models

Now, you create one or more license models. In this example, we are creating two license models—**Lease-Standalone** and **On-Premise-Standalone**.

1. Under **Catalog**, click **License Model**. The License Model page is displayed.

2. In the left pane, use the **License Model Name** search criteria to search for the **Flexible License Model**. When selected, the License Model details are displayed in the right pane.
3. Click **Copy**. The Add License Model page is displayed.
4. In the Add License Model pane, do the following:
 - a. In the **License Model Name** field, type **Lease-Standalone**.
 - b. From the **Deployment Type** drop-down, select **Cloud Served - Lease**.
 - c. From the **License Type** drop-down, select **Standalone**.

5. Expand the **Policy** section, and clear the **Enforce Clock Tampered** check box to disable time tampering detection.



Note: If you want to enable time tampering, you will need set up the persistence information on the standalone machine by using the `sntlInitStandaloneSystem` API. For API details, refer to the [Sentinel RMS SDK API Reference Guide](#). For the C interface, you can set up the persistence information by executing the `initdemo` sample. This sample is available in the `Samples` folder of the standard RMS installation.

6. Expand the **Cloud Served** section, and clear the **Fingerprint Registration** check box. This specifies that the machine registration is not required to consume the entitlement.
7. Click **Save**.
8. Repeat steps 2-5 to create a new license with the following:
 - a. In the **License Model Name** box, type *On-Premise-Standalone*
 - b. In the **Deployment Type** box, select **On-Premise Served**.
 - c. In the **License Type** box, select **Standalone**.
9. Click **Save**.

Create a Feature

Now, you create a feature named **Subtract**, which you can deploy later on your on-premise- or cloud-hosted environment.

1. Under **Catalog**, click **Feature**. The Feature page is displayed.
2. Click **New**. The Create Feature page is displayed.
3. From the **Namespace** drop-down, select **Global**.

4. In the **Feature Name** field, type **Subtract**.
5. In the **Feature Version** field, type **1**.
6. From the **License Models Available** list, select both **Lease-Standalone** and **On-Premise-Standalone**, and click the right arrow.

The screenshot shows the 'Create New Feature' interface. At the top, there are tabs for Product, Feature, Product Suites, License Model, Downloads, and Namespaces. The main form has the following fields:

- Namespace:** Global (dropdown)
- Feature Name:** Subtract (text input)
- Feature ID:** 1 (text input)
- Feature Version:** (text input)
- RefID 1:** (text input)
- RefID 2:** (text input)
- External ID:** (text input)
- Description:** (text area)

Below the form are two panels:

- License Models Available:** A list of license models with a search bar. The 'Lease-Standalone' and 'On-Premise-Standalone' models are selected.
- License Models Associated:** A table with columns for License Model Name, Enforcement Name, and Default. The 'Lease-Standalone' and 'On-Premise-Standalone' models are listed with their enforcement names and default status.

At the bottom right, there are 'Save' and 'Cancel' buttons.

7. Click **Save**. The Subtract feature is now associated with the Standalone Lease and Standalone On-Premise license models.

Create a Version-less Product

In this example, you will create the Calculator version-less product and associate the Subtract feature with it.

1. In the Sentinel EMS portal, select **Catalog > Product**.
2. In the Product tab, click **New**.
3. In the Create New Product pane, do the following:
 - a. From the **Namespace** drop-down, select **Global**.
 - a. For **Product Type**, select **Version-less**.
 - b. In the **Product Name** box, enter **Calculator**.
 - c. In the **Description** box, enter a description. The description is useful for identifying the product.
4. Associate the Subtract feature with the product. In the Available pane:
 - a. Select **Subtract**.
 - b. Click the right arrow  to add the Subtract feature to the **Features Associated** pane.



Note: Do not select the **Fixed** check box.

5. Click **Save**. The **Calculator** product is added to the list of products in the Product tab as a draft with an orange status icon.
6. Click **Complete** to finalize the version-less product. The status icon changes to green.

Create Variants of the Version-Less Product

In this section, you will create standalone and cloud-hosted variants for the Calculator product.

1. In the Sentinel EMS portal, make sure that the Product tab is open (**Catalog > Product**).
2. In the left pane of the Product tab, select the **Calculator** product.
3. Click **Create Variant**.
4. In the Copy pane, do the following:
 - a. In the **Version** box, select **Hosted v1**.
 - b. In the **Activation Method** box, select **Fixed**.
 - c. In the **Fixed Quantity** box, leave the value **1**. This specifies the quantity that is consumed in each activation.
5. In the **Description** box, add a description. This description is useful for identifying the variant during activation.
6. In the Features Associated pane, select **Subtract** and, from the Default License Model box, select **Lease-Standalone**.



Note: The Features Associated pane lists the features included in the variant. You can add or remove associated features using the right and left arrows.

7. Click **Save**.
8. Repeat steps 3-7 with the following differences:
 - a. In the Copy pane, in the **Version** box, select **On-Premise v1**.
 - b. In the Features Associated pane, from the Default License Model box, select **On-Premise-Standalone**.
9. Set the status for each variant to complete by selecting a variant in the list of products in the left pane and clicking **Complete**. The status icons change from orange to green, and you can now add the Calculator product to an entitlement.

Create a Dynamic Entitlement

In this step, you will create an entitlement for the Calculator for a fictitious customer. The entitlement is dynamic because you are creating it for a version-less product.

1. In the Sentinel EMS portal, select **Entitlements > Entitlements**.
2. Click **New**.
3. In the Create New Entitlement pane:
 - a. Place the cursor in the **Customer Name** field and press any key. Click the **Add New** drop-down option that appears. The Create New Customer dialog box is displayed.
 - b. Enter the **Customer Name**, for example, **MyCustomer**. Also enter the **Customer ID**, for example, **MyCustomer**.



Note: Take a note of this Customer ID as you will require this during the SCP configuration (explained in the later part of this document).

- c. Click **Save** to close the Create New Customer dialog box.
- d. In **Contact E-mail**, enter your email address to receive the entitlement certificate.
- e. In the **Start Date** box, accept the current date.
- f. For **End Date**, make sure that the **Never Expires** check box is selected.
- g. Make sure that the **Send Notification** check box is selected.

4. In the Product Details pane, click **Add Product**.
5. In the Search Product pane, search for the Calculator product, and click **Add**.

Product Name	Namespace	RefID 1	External ID
Calculator	Global		

6. In the Configure Product pane, change the **Quantity** value to **2** and click **OK**. The Product Details pane is updated, and you can now activate the dynamic entitlement.
7. Click **Save** and confirm the operation. The new entitlement is added to the list of entitlements in the Entitlements tab as a draft with an orange status icon.
8. Click **Commit** and confirm the operation to finalize the entitlement. The status icon changes to green, and you can now activate the dynamic entitlement.

The product is now ready for consumption by using any of the variants available.

Activate the On-Premise-Standalone Variant in the Dynamic Entitlement

In this step, you will activate the On-Premise-Standalone variant of the Calculator product. This will generate a license that the customer can use to run the locally installed version of the Calculator product.

1. In the Sentinel EMS portal, make sure that the Entitlements tab is open (**Entitlements > Entitlements**).
2. In the list of entitlements in the left pane, select the dynamic entitlement you created in the previous step for the Calculator product.

- In the right pane, expand **Associated Products and Features** if the section is collapsed.
- Make sure that the Calculator check box is selected and click **Activate**.
- In the Activate Product(s) dialog box, select the **On-Premise v1** variant.

Activate Product(s) ? ×

EID:d652d025-a7e5-4154-a944-46c8266e3c1b

▼ Enter Quantity

Product	Variant	Remaining Quantity	Quantity	External ID
Calculator	On-Premise v1	2	1	

RMS Client Info values for the selected criteria can be obtained using the [Wechoid tool](#)

Activatee Email Address: Add if not already available.

Send Notification:

Client 1 criteria (in hex): Disk ID

* Client 1 info:

Time Zone: (GMT+00:00) Default [Change](#)

Remarks:

Activate **Cancel**

- Click the **Wechoid** link to download the Wechoid utility. Run the Wechoid utility on the device on which you want to run the sample with the license.



Note: Wechoid is a Windows-based utility for generating locking codes based on the specified locking criteria.

- Under **Locking Criteria**, ensure that none of the fields except **Disk ID** is selected. This is because for the purpose of this guide we are using only Disk ID as the locking criteria.



Note: The locking criteria must be the same as specified in the license model associated with the entitlement; otherwise, the fingerprints in the license will not match the fingerprint on the device.

- The **Code** field automatically displays the Fingerprint based on the selected locking criteria. Select and copy it.



Note: The terms “Locking Criteria”, “Primary criteria”, and “Locking Selector” are used interchangeably throughout this guide and within Sentinel EMS, tools, and documentation. Similarly, the terms “Locking Code”, “Client info”, and “Fingerprint” are used interchangeably. The former are used to define what machine characteristics the latter will be based on.

For details of these terms, refer to the Sentinel RMS Developer's Guide.

9. After obtaining the Fingerprint from the Wechoid tool, return to the Activate Product(s) dialog box.
10. Paste the Fingerprint generated above into the **Client 1 info** field.
11. Click **Activate** to generate the license string.
12. Click **Save To File** to create a *lservrc* file that contains the generated license string.

Install and Consume the License Created for the On-Premise-Standalone Variant

To consume the license, you need to compile the RMS sample, install the license, and run the sample.

Note:



- Microsoft Visual Studio 2015 has been used to explain the steps in this section.
- Change 9.x to the RMS version you are using in all paths referring to the location of the sample or output, in the steps in this section.

Compile Sample (MSVS 2015)

You need to compile the *sntl_demo.c* sample to get the executable application, which can be run to consume the license.

To compile the *sntl_demo.c* sample:

1. Open Microsoft Visual Studio as Administrator.
2. Open the *Samples32.MSVS2008.sln* solution file in Visual Studio. This file is available in the *C:\Program Files (x86)\SafeNet Sentinel\Sentinel RMS Development Kit\9.x\Samples\C* folder.
3. Edit the *sntl_demo.c* file:
 - h. In the **Solution Explorer**, navigate to the **sntl_demo** folder, expand **Source Files** and double-click the *sntl_demo.c* file to open it.
 - i. Change `#define CONTACT_SERVER` to `no-net` from `localhost`.
 - j. By default, the feature name is **Addition** and feature version is **1** in the sample source file. In the source file, change the feature name to **Subtract** and keep the feature version as **1**, similar to the values defined in EMS.
4. Before building the sample, you need to change the properties of the **sntl_demo** project. To do so, right-click the **sntl_demo** folder in the **Solution Explorer**, click **Properties**, and perform the following changes:
 - a. Add the library *ws2_32.lib* (Configuration properties > Linker > Input > Additional Dependencies).
 - b. Change the library path (Configuration properties > Linker > General > Additional Library Directories) to the following:

```
C:\Program Files (x86)\SafeNet Sentinel\Sentinel RMS Development
Kit\9.x\Development\C\Lib\MSVS2015\x86\Static\MT
```

- c. Change the output file path (Configuration properties > Linker > General > Output File) to the following:

```
C:\Program Files (x86)\SafeNet Sentinel\Sentinel RMS Development
Kit\9.x\Samples\C\Out\MSVS2015\x86\Debug\sntl_demo.exe
```

5. Build the sample. To do so, right-click the **sntl_demo** folder in the **Solution Explorer**, and click **Build**. The output is the sample application executable created in the path that you have set in the step above.

Install License

For standalone applications, the license file (*lservrc*) containing the license strings should be in the same directory as the licensed application.

Copy the *lservrc* file in the folder containing the compiled sample.



Note: You can use a different file name (other than *lservrc*) through the environment variables, licensing library API functions, and command-line switches.

Run Sample

Next, you need to run the sample application executable (.exe) to consume licenses. To run the *sntl_demo.exe* file:

1. Open the command prompt as Administrator.
2. Change the directory to the output folder by running the following command:

```
cd C:\Program Files (x86)\SafeNet Sentinel\Sentinel RMS Development
Kit\9.x\Samples\C\Out\MSVS2015\x86\Debug
```

3. Execute the *sntl_demo.exe* file.

Once the sample compiles and runs, the Console window displays the execution results.

1. First, an application context is created.
2. The login call is executed to consume the license. Errors are thrown, if the license is not present (error 210018) or if the existing license on the machine has expired (error 214109).
3. When a valid license is present, information about the **Subtract** feature is displayed.
4. Press **Enter** to call the login API. This requests the license for the Subtract feature, as shown in the figure below:
5. The session information is displayed, which is the information for the current license session. Note that a successful license request creates a license session. For example, <tokensInUse> is shown as 1 because one license has been used with the call to the login API.
6. Afterward, the logout call is executed to release licenses.
7. Press **Enter** to close the sample.

Install and Consume the License Created for Lease-Standalone Variant

Prerequisite

Download the SCL Add-on for Sentinel RMS package using the links given in the Gemalto Sentinel Order Credential email.

Configure SCP

You need to configure SCP to ensure that the sample application can fetch licenses from the cloud. Before configuring SCP, perform the following steps:

Merge the Sentinel RMS SDK and SCL Add-on for Sentinel RMS Package

You need to merge the contents of standard RMS SDK installation with the SCL Add-on for Sentinel RMS Package to:

- Obtain SCL samples for the Cloud Served - Lease Standalone license deployment mode, and
- Setup the environment required for the execution of the samples

To merge the Sentinel RMS SDK and SCL Add-on for Sentinel RMS package:

1. Unzip the SCL Add-on for Sentinel RMS package (zip archive) by using the password received in the Gemalto Sentinel Order Secret email.
2. Unzip the Windows-specific SCL Add-on for Sentinel RMS package (*Sentinel Cloud Add-On Windows.zip*), and copy all its sub-folders (Development, Manuals, Redistributable, and Samples).
3. Go to the folder where RMS SDK is installed, that is: *C:\Program Files (x86)\SafeNet Sentinel\Sentinel RMS Development Kit\9.x*.

Paste the folders copied in the step above, and confirm to merge the folders.

Modify the SCP Configuration File

To configure SCP, you need to modify the SCP configuration file (*sntlcloudp_configuration_<Vendor_Alias>.xml*), which is available in the *\Samples\C* folder.

To configure SCP:

Navigate to the *Samples/C/* folder containing the SCP configuration file (*sntlcloudp_configuration_<Vendor_Alias>.xml*).

Double click the SCP configuration file to open it, and update the following:

- a. Copy the YPS URL Dev from the Gemalto Sentinel Order emails or from the trial portal for an evaluation customer and specify it in the SCP configuration file.

```
<YPSaddress value="https://sin01_heppq.prod.sentinelcloud.com/YPserver" />
```

- b. Update **Customer ID** to *MyCustomer*.

```
<Customer id="MyCustomer" />
```

- c. In the **FingerprintFriendlyName** element, set the value to the host name of the standalone machine on which you want to request license.

Example:

```
<FingerprintFriendlyName value="host_name"/>
```

- d. Specify the product key in the `pkid` element and variant in the `productvariant` element, to configure the specific product and variant from which licenses are to be fetched by SCP. The product key is mentioned in the License Certificate email.

Example:

```
<ProductKeys>
  <ProductKey pkid="0ca278a5-b504-4be3-a969-99d0fc1b9376" productvariant="Hosted v1" />
</ProductKeys>
```

Compile and Run the Sample (MSVS 2015)

You need to compile the *sntl_lease_demo* sample to get the executable application, which can be run to consume the license.

To compile the *sntl_lease_demo.c* sample:

1. Open Microsoft Visual Studio as Administrator.
2. Open the *sntl_lease_sample.MSVS2008.sln* solution file in Visual Studio. This file is available in the `\Samples\C\` folder.
3. By default, the feature name is **Addition** and feature version is **1** in the sample source file. In the source file, change the feature name to **Subtract** and keep the feature version as **1**, similar to the values defined in EMS.
4. Build the sample. To do so, right-click the **sntl_lease_demo** folder in the Solution Explorer, and click **Build**. The output is the sample application executable (.exe) in one of the following directories depending on the configuration setting (Release or Debug):

```
\Samples\C\Out\MSVS2008\x86\Release
```

```
\Samples\C\Out\MSVS2008\x86\Debug
```

Next, you need to run the sample application executable (.exe) to consume licenses. To run the *sntl_lease_demo.exe* file:

1. Place the SCP configuration file in the same directory as the sample.
2. Open the command prompt as **Administrator**.
3. Change the directory to the output folder by running the following command:

```
cd C:\Program Files (x86)\SafeNet Sentinel\Sentinel RMS Development
Kit\9.x\Samples\C\Out\MSVS2008\x86\Release
```

4. Execute the *sntl_lease_demo.exe* file.

Note for Microsoft Visual Studio 2015

Use the *sntl_lease_sample.MSVS2015.mak* file to build the sample for Microsoft Visual Studio 2015. The command to use the *.mak* file is:

```
nmake /f sntl_lease_sample.MSVS2015.mak all
```

The output executable will be available in the corresponding folder (`MSVS2015\x86`).

Output of the Sample

Once the sample compiles and runs, the Console window displays the execution results.

1. An application context is created, and SCP initiates the retrieval of licenses from the cloud. The login call is also executed to consume the license.
2. If the license is not fetched (error 210018) or the existing license on the machine has expired (error 214109), the *sntl_licensing_transfer* API with the *sync* action is executed to fetch the license again. In the figure below, the login API call has returned the error 210018 to indicate that the license has not been fetched. So, press **Enter** to sync licenses from SCC to the machine. The "Successful" message indicates that SCP has initiated the retrieval of licenses from the cloud again.
3. Press **Enter** to get sync lease job information.
4. Press **Enter** to call the login API. This requests licenses for the Subtract feature.
5. Press **Enter**. The information for the Subtract feature is displayed.
6. Press **Enter**. The session information is displayed, which is the information for the current license session. Note

that a successful license request creates a license session. For example, <tokensInUse> is shown as 1 because one license has been used with the call to the login API.

Next, the refresh API is called to periodically refresh the license and keep the license session alive for a longer period.

Afterward, the logout call is executed to release licenses.

7. Press **Enter** to close the sample.

Error Code

Refer to the [Sentinel RMS SDK API Reference Guide](#) for information about errors and status codes.