

# Sentinel CLOUD SERVICES™

## Cloud Run-time C Reference ReadMe



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Part Number 007-012139-001, Revision F

Software versions 3.4 and later

December 2013

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# Table of Contents

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Introduction .....	1
Files Included in the Sample .....	2
Windows .....	2
Linux .....	2
Prerequisites for Using Sample .....	3
Supported Operating Systems and Compilers .....	3
Required Libraries .....	3
Required Client Configuration File .....	3
Linux Specific Requirements .....	4
Required EMS Entities .....	4
Running the C Sample .....	5
Windows .....	5
Linux .....	6
Using the Run-time C APIs .....	8
Obtaining Support .....	9



# C Reference Application

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## Introduction

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This topic provides information about the Run-time API sample available for C interface. It is useful for application developers who need to integrate the Run-time APIs into the C application source code. The application can be hosted both on-premise and on cloud.



For details about the Run-time APIs, refer to the [Sentinel Cloud Run-time Guide](#).

## Files Included in the Sample

### Windows

The Run-time C sample for Windows is available at: `<InstallDir>\Samples\C SDK`. Here, `<InstallDir>` refers to the installation directory of Sentinel Cloud Services, which by default is `C:\Program Files\Safenet Sentinel\Sentinel Cloud Services`.

The C sample includes the following:

Folder/File	Description
Demo	This folder contains the following: <ul style="list-style-type: none"> <li>▪ <code>src\Demo.c</code> - Main file containing API code</li> <li>▪ <code>Demo.vcproj</code> - A command line based demo application that demonstrates the Run-time API usage.</li> </ul>
<code>SentinelCloudRuntime.sln</code>	Project Solution file
<code>SentinelCloudRuntime.suo</code>	The Solution User Options (. <code>suo</code> ) file
ReadMe	Contains the <i>Sentinel Cloud Run-time C Reference ReadMe</i> (this document).

### Linux

The Run-time C APIs sample for Linux is available at: `<Extract Location>/SafeNet Sentinel/Sentinel Cloud Services/Samples/C SDK`. Here, `<Extract Location>` refers to the extraction directory of Sentinel Cloud Services.

Following are the contents of the *Samples* directory:

Folder/File	Description
Demo	This is the sample application folder. It contains the following: <ul style="list-style-type: none"> <li>▪ <code>src\Demo.c</code> - Main file containing API code.</li> <li>▪ <code>Demo_x32.mak</code> - Project make file for 32-bit machine.</li> <li>▪ <code>Demo_x64.mak</code> - Project make file for 64-bit machine.</li> </ul>
ReadMe	Contains the Sentinel Cloud Run-time C Reference ReadMe (this document).

## Prerequisites for Using Sample

This section contains information on what is required for using Run-time C sample.

### Supported Operating Systems and Compilers

The following table provides a list of supported operating systems and compilers:

Operating System	Compiler
<b>Windows (32-bit and 64-bit)</b> <ul style="list-style-type: none"> <li>▪ XP</li> <li>▪ Server 2008</li> <li>▪ Vista</li> <li>▪ 7</li> </ul>	<ul style="list-style-type: none"> <li>▪ Microsoft Visual Studio 2005</li> <li>▪ Microsoft Visual Studio 2008</li> </ul>
<b>Linux (32-bit and 64-bit)</b> <ul style="list-style-type: none"> <li>▪ <b>Cloud</b> <ul style="list-style-type: none"> <li>○ Ubuntu 10.04</li> <li>○ CentOS 5.4</li> <li>○ Red Hat Enterprise Linux (RHEL) 6.3</li> </ul> </li> <li>▪ <b>On-premise</b> <ul style="list-style-type: none"> <li>○ Red Hat Enterprise Linux (RHEL) 6.3</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ GCC 4.1.2</li> </ul>

### Required Libraries

The libraries required to use Run-time C APIs on different operating systems, are available at the paths specified in the table below:

Operating System	Library Path
<b>Windows</b>	<ul style="list-style-type: none"> <li>▪ <b>For 32-bit:</b> &lt;InstallDir&gt;RunTimes\C SDK\Win32</li> <li>▪ <b>For 64-bit:</b> &lt;InstallDir&gt;\RunTimes\C SDK\Win64</li> </ul>
<b>Linux</b>	<ul style="list-style-type: none"> <li>▪ <b>For 32-bit:</b> &lt;Extract Location&gt;/ SafeNet Sentinel/Sentinel Cloud Services/Runtimes/C SDK/32-bit</li> <li>▪ <b>For 64-bit:</b> &lt;Extract Location&gt;/ SafeNet Sentinel/Sentinel Cloud Services/Runtimes/C SDK/64-bit</li> </ul>

### Required Client Configuration File

The Run-time C sample uses the settings stored in the *SentinelCloudRuntime.properties* configuration file for execution.

You need to update the **DeploymentType** property in the configuration file to work on cloud/on-premise applications. This property can have **OnPremise** or **Cloud** values.

The following table lists the location of the configuration files:

Operating System	Configuration File Path
Windows	<InstallDir>\Configurations
Linux	<ExtractLocation>/SafeNet Sentinel/Sentinel Cloud Services/Configurations/

## Linux Specific Requirements

- make 3.8
- For Ubuntu, the *libuuid* library that can be downloaded by using the following command:

```
sudo apt-get install uuid-dev
```


- For CentOS, e2fsprogs-devel that can be installed by using the following command

```
yum install e2fsprogs-devel
```

## Required EMS Entities

Before you use the sample code, an entitlement must be created in Sentinel Cloud EMS. The typical workflow of creating an entitlement is as follows. For exact steps, refer to the *Sentinel Cloud EMS User's Guide*.



 An entitlement can be for either cloud or on-premise.



## Running the C Sample

### Windows

The steps to run the C sample code on Windows are:

1. Copy [the client configuration file](#) to the directory where the sample code executable resides, which is `<InstallDir>\Samples\C SDK\Demo`.

#### Note

If you want to place configuration file at a custom location, set the environment variable `SFNT_SCR_CONFIG_FILEPATH`.

If the `SFNT_SCR_CONFIG_FILEPATH` environment variable is not set or set to an incorrect path, the Run-time searches the configuration file at the default location.

2. Open *SentinelCloudRuntime.sln* in Microsoft Visual Studio.
3. In the *Demo.c* file, update customer, user, and vendorInfo details.
4. Open the configuration file (copied in Step 1), and update the following elements:

#### DeploymentType

- This parameter specifies the deployment mode to be used for compiling the application. This value can be either **OnPremise** or **Cloud**.
- Example:

```
<add key="DeploymentType" value="Cloud" />
```

#### ClientAlias

- This was sent to you in a previous e-mail from SafeNet.
- This is usually the vendor name specified in the vendor registration request.
- Example:

```
<add key="ClientAlias" value="isv" />
```

#### YPSAddress

- This was sent to you in a previous e-mail from SafeNet.
- This parameter is the address of the Sentinel Directory Services server.
- Example:

```
<add key="YPSAddress" value="https://yps-trial.sentinelcloud.com/YPServer" />
```

#### CABundle

- The path of the CA bundle, which refers to the certificate store that C runtime uses for server certificate verification.
- You can download CA certificate bundle from <http://curl.haxx.se/ca/cacert.pem>.
- Example:

```
<add key="CAbundle" value=".\cacert.pem" />
```



- If you are using proxy server, then you will need to configure the Run-time proxy settings as well. For details of proxy settings, please refer to the [Sentinel Cloud Run-time Guide](#).

- For C interface, Secret Key, Secret Key ID, Vendor ID, and Vendor Code are inserted in Run-time library during the Run-time installation.

6. Build *SentinelCloudRuntime.sln* and start the Sample Application.

## Linux

The steps to run the C sample code on Linux are:

1. Copy *SentinelCloudRuntime.properties* to the directory where the sample code executable resides, which is *<ExtractLocation>/SafeNet Sentinel/Samples/Demo*.
2. For on-premise applications, specify the path in the SFNT\_SCR\_CONFIG\_FILEPATH environment variable. The use of environment variable allows you to define the configuration settings once for the protected applications stored at different locations.

The following example shows how to set the SFNT\_SCR\_CONFIG\_FILEPATH environment variable in */etc/profile* file on Linux:

```
SFNT_SCR_CONFIG_FILEPATH="/home/work/SaaS"
```



- If the SFNT\_SCR\_CONFIG\_FILEPATH environment variable is not set, the Run-time looks for the configuration file in the directory where the executable exists.
- If the above environment variable is set and the configuration file is not present at the specified location, the error RT\_ERR\_IN\_CONF\_FILE\_LOAD occurs.
- The user account used to execute the licensed application must have access permissions for the file path mentioned in the SFNT\_SCR\_CONFIG\_FILEPATH environment variable.

3. Open the *SentinelCloudRuntime.properties* file, and update the following elements:

### ClientAlias

- This was sent to you in a previous e-mail from SafeNet.
- This is usually the vendor name specified in the vendor registration request.
- Example:

```
<add key="ClientAlias" value="isv" />
```

### YPSAddress

- This was sent to you in a previous e-mail from SafeNet.
- This parameter is the address of the Sentinel Directory Services server.
- Example:

```
<add key="YPSAddress" value="https://yps-trial.sentinelcloud.com/YPServer" />
```

### CABundle

- The path of the CA bundle, which refers to the certificate store that C runtime uses for server certificate verification.
- You can download CA certificate bundle from <http://curl.haxx.se/ca/cacert.pem>.
- Example:

```
<add key="CABundle" value=".\cacert.pem" />
```



If you are using proxy server, then you will need to configure the Run-time proxy settings as well. For details of proxy settings, please refer to the [Sentinel Cloud Run-time Guide](#).

4. In the *Demo.c* file, update customer, user, and feature ID details.
5. Build the Demo file by using the following command:
  - For 32-bit: `make -f Demo_x32.mak.`
  - For 64-bit: `make -f Demo_x64.mak`



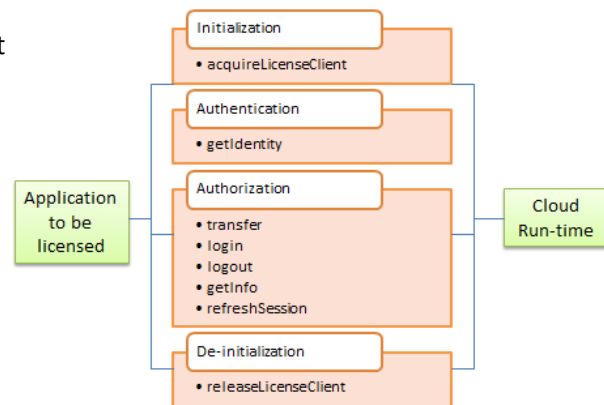
If you are using GCC 4.6 or above as the default compiler, you need to add the "**-Wl,--no-as-needed**" flag to avoid compilation errors.

6. Execute the Demo file.

## Using the Run-time C APIs

Sentinel Cloud Run-time provides a set of APIs that you can use to license your applications. For API details, refer to *Sentinel Cloud Run-time Guide*.

A brief description of the APIs is given below:



Licensing Function	API	Description
Initialization	acquireLicenseClient	Obtains an instance of the Cloud Run-time.
Authentic-ation	getIdentity	Authenticates a user by requesting authentication cookie, identity, and customer reference ID from Cloud Connect. <b>Note:</b> This API is applicable only for on-premise feature level licensing, implemented with authentication. To use this API, an authentication system should be integrated with Sentinel Cloud. Please contact SafeNet for integration-related details.
Authorization	transfer	Detaches licenses, returns licenses, and syncs usage with Cloud Connect. <b>Note:</b> This API is used only for on-premise licensing.
	login	Authorizes a user by requesting a license from the Cloud Connect.
	logout	Releases the license acquired by the user.
	getInfo	Retrieves information about entitlements and features for a given user.
	refreshSession	Refreshes a concurrent session. <b>Note:</b> This API is used only for cloud applications.
De-ini-tialization	releaseLicenseClient	Releases the instance of the Cloud Run-time.

The *Demo.c* file contains the implementation of the Run-time APIs written in C language. Refer to this file to learn about using the Run-time APIs in your C application source code.

## Obtaining Support

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