

Sentinel[®]LDK

Sentinel LDK v.7.4
Release Notes



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Contents

SCP Free Software Components Acknowledgments	2
About This Document	7
Product Overview	7
Sentinel Vendor Keys	8
Obtaining Support	8
Help Us to Improve Sentinel LDK	8
What's New in Sentinel LDK v.7.4?	9
New Data File Protection Facility	9
Changes to Sentinel Master Key Business Model	9
Enhancements to Sentinel LDK Envelope	11
Support for Sentinel HL Drive microSD	11
Sentinel LDK Hardlock-to-Driverless Upgrade Tool Generator	11
Administrative Rehost of an Existing Protection Key to a Different Key	12
Fallback to V-Clock If RTC Battery is Depleted	12
Windows 10 is Now Supported	12
What's Changed in This Release?	12
Provisional Products Are Now "Unlocked Products"	13
Changes to Sentinel Master key Modules	13
Replacement for Envelope Project Settings_Linux.pdf	13
Replacement of hasp_net_windows.dll in Licensing API Samples	13
Sentinel LDK Language Packs	13
Advanced Protection Parameter Renamed in Sentinel LDK Envelope	13
Supported Platforms for Sentinel LDK – End Users and Vendors	14
Supported Platforms for End Users	14
Supported Platforms for Vendors	16
Supported Versions for Windows CE	17
Supported Platforms for Code Samples	18
Tested Compilers for Code Samples	19
Supported Platforms for Sentinel Cloud Licensing	21
Current Firmware Version	23
Dropped Support	23
Carbon Framework for Mac	23
Platforms for Developers and End Users	23
Chrome Browser for Sentinel EMS	23
Sentinel LDK Documentation	24
Documents	24
Sentinel Cloud Licensing Documents	26
Getting Started Guides	26
Help Systems - Sentinel LDK and Sentinel EMS User Interfaces	27
Online Help Systems – Sentinel LDK APIs	27
Instructional Videos	28

Software and Documentation Updates28

Known Issues and Workarounds29

 Sentinel LDK Installation 29

 Sentinel EMS30

 Sentinel Cloud Licensing30

 End Users, Sentinel LDK Runtime Environment, License Manager, and Customer Tools ...30

 Sentinel LDK Licensing API 31

 Sentinel LDK Envelope for Windows Platforms 31

 Sentinel LDK Envelope and Data Encryption for Mac OS X 33

Sentinel LDK v.7.4 - Release Notes

About This Document

This document contains information about the latest release of the Sentinel LDK product, including new features, changes to the product, documentation, and known issues and workarounds.



These release notes are subject to change. If you are reading the release notes that were installed with the product, SafeNet recommends that you check the release notes available from the Sentinel Community web site to see if any information was added or changed.

You can access the latest release notes from this location:

http://sentinelcustomer.safenet-inc.com/API_Documentation_Information.aspx

Product Overview

Sentinel LDK (*Sentinel License Development Kit*) provides software publishers with strong anti-piracy and intellectual property protection solutions, offering unmatched flexibility in assisting you to protect your revenue and increase sales. The Sentinel system prevents unauthorized use of software, protects software copyrights and intellectual property, and offers multiple licensing models.

The strength, uniqueness, and flexibility of Sentinel LDK are based on two primary principles:

- *Protect Once—Deliver Many—Evolve Often™* — this unique design philosophy enables you to fully separate your business and Protection (engineering) processes in order to maximize business agility while ensuring optimum use of your employee time and core competencies, resulting in faster time to market.
- *Cross-Locking™* — the technology that supports the *Protect Once—Deliver Many—Evolve Often* concept, enabling a protected application to work with a Sentinel hardware key or a Sentinel License Certificate (software key).

All commercial decisions, package creation and license definitions are executed by product or marketing managers after the protection has been implemented.

This workflow model provides you with greater flexibility and freedom when defining new sales and licensing models, including feature-based and component licensing, evaluation, rental, floating, subscription, trialware, pay-per-use, and more, enabling you to focus on revenue growth.

Sentinel Vendor Keys

When you purchase Sentinel LDK, you are provided with two Sentinel Vendor keys—the Sentinel Master key and the Sentinel Developer key.

The Sentinel Developer key is used by your software engineers in conjunction with the Sentinel LDK protection tools to protect your software and data files.

The Sentinel Master key is used in conjunction with Sentinel LDK and is attached to the Sentinel EMS Server. The key is used by your production staff to create licenses and lock them to Sentinel protection keys, to write specific data to the memory of a Sentinel protection key, and to update licenses already deployed in the field.

Every Sentinel EMS Server computer must have a Sentinel Master key connected.

Important: Keep these keys safe and only allow trusted personnel to use them. The Master key is especially valuable because it allows the generation of licenses. Both vendor keys contain secrets and enable the use of tools and API libraries which can access the memory of user keys and use of the cryptographic functionalities.

Obtaining Support

You can contact us using any of the following options:

- **Business Contacts** - To find the nearest office or distributor, use the following URL:
<http://www.safenet-inc.com/contact-us/>
- **Technical Support** - To obtain assistance in using SafeNet products, feel free to contact our Technical Support team:
 - Phone: 800-545-6608 (US toll free), +1-410-931-7520 (International)
 - E-mail: support@safenet-inc.com
 - URL: <http://sentinelcustomer.safenet-inc.com/sentinelsupport/>
- **Downloads** - You can download installers and other updated components using this URL:
www.sentinelcustomer.safenet-inc.com/sentineldownloads/

Help Us to Improve Sentinel LDK

You can make a difference! We invite you to send us your ideas and opinions, and tell us what you like (and don't like) about Sentinel LDK. Your input can help shape future versions of the product.

Feedback on Sentinel LDK can be sent to: ldkfeedback@safenet-inc.com

What's New in Sentinel LDK v.7.4?

This section describes the main features and enhancements that are introduced in this release of Sentinel LDK.

New Data File Protection Facility

Sentinel LDK now includes the capability to license data files as well as applications. This means that valuable intellectual property such as courseware, training videos, and audio files can be protected and licensed using Sentinel LDK Data Protection utility. Video data files that are protected using the new facility are protected against video capture software that runs on the machine where the user is viewing the protected video file.

Each data file or group of data files can be assigned a different Feature ID. This simplifies the process of managing licenses for your customers.

The protected data files can be accessed using one of the following:

- Protected Viewer (Windows or Android): This is your own application that you protect with Sentinel LDK Envelope and provide with your protected data files. As part of the protection process, Envelope adds a module that checks for the presence of a suitable license before allowing access to the protected data files.
- Customized Data File Protection Plugin (Windows): This is a plugin provided by SafeNet for viewing protected FLV or SWF data files in an Internet Explorer Web browser. The end user installs the plugin in their Web Browser. The Browser plugin checks for the presence of a suitable license before enabling access to the protected files.

Data files are protected using the Sentinel LDK Data Protection utility. To use the utility to implement licensing protection for your data files, you must obtain the Advanced Data Protection module for your Sentinel Master key or Developer key.

Changes to Sentinel Master Key Business Model

This release of Sentinel LDK introduces several significant changes to the handling of modules on the Sentinel LDK Master key. This section describes the changes to terminology and then describes the changes that have been introduced for each Module.

Summary of Changes to Master Key License Modules

Module	Change
Product Activation Module	No longer required for HL keys.
Standalone License Pool	Discontinued.
New SL Key Pool	New module.
Unlocked License Module	Expanded flexibility. Renamed to Unlocked Unlimited Module
Trialware Module	Expanded flexibility. Renamed to Unlocked Trialware Module
Network Seats Pool	Split into SL Pool of Seats and HL Pool of Seats .

Module	Change
Advance Data File Protection	New module.

Product Activation Module

Previously, the Product Activation module was required if you wanted to create an entitlement for a Sentinel HL key or SL key using a Product key. Effective with Sentinel LDK v.7.4, the Product Activation module is only required when you generate a Product key for a Sentinel SL key.

Standalone License Pool

The use of the Standalone License Pool is discontinued in this release. If you have a specific number of licenses or an unlimited license for this pool, the licenses are automatically assigned to the New SL Key Pool (described below) when you install Sentinel LDK v.7.4.

New SL Key Pool

The New SL Key Pool is a pool of SL key licenses. This pool is charged once for each new SL key that is created on an end user's machine.

The New SL Key Pool provides a simplified licensing model that replaces the Standalone License Pool. The main differences between the Standalone License Pool and the New SL Key Pool are described in the table that follows.

Standalone License Pool	New SL Key Pool
Charged once for each new Product licensed with an SL key.	Charged once for each new SL key created on a given machine, regardless of the number of Products or concurrency. There are no additional charges when you add or modify Products in an existing SL key.
Not charged for Products with concurrency.	

Expanded Flexibility for Unlocked Products

The available configurations for Unlocked Products and for Unlocked Trialware Products (formerly Provisional Products) in Sentinel EMS and Sentinel LDK have been expanded.

Each Feature in an Unlocked Trialware (Provisional) Product license can now be configured as follows:

- Expire up to 90 days after the date of first use of the protected application.

OR

- Expire up to 90 days after the date of Product generation. (This capability is new.)

The generation of Unlocked Trialware Product licenses requires the **Unlocked Trialware module** in the Master key.

Each Feature in an Unlocked license can now be configured as follows:

- Perpetual (no expiration date).

OR

- Expire any number of days after either the date of first use of the protected application or the date of Product generation. (These capabilities are new.)

The generation of Unlocked licenses requires the **Unlocked Unlimited module** in the Master key.



The Unlocked Unlimited module includes the ability to create and distribute Unlocked Trialware Products.

Network Seats Pool

Starting from Sentinel LDK v.7.3, any Sentinel HL (Driverless configuration) key (with the exception of Basic keys) can serve as a network key. In Sentinel LDK v.7.3, all network seats for both Sentinel SL keys and Sentinel HL keys were drawn from the Network Seats Pool.

Effective with Sentinel LDK 7.4, separate pools are provided for each type of key. The **SL Pool of Seats** is used for SL network keys and the **HL Pool of Seats** is used for HL network keys. When you re-introduce your Master key after you install Sentinel LDK v.7.4, all remaining seats in your Network Seats Pool are assigned to the SL Pool of Seats. (If you want to transfer all or part of the keys from the SL Pool of Seats to the HL Pool of Seats, contact Technical Support.)



Sentinel HL Net keys and NetTime keys contain an internal pool of seats and do not draw seats from the HL Pool of Seats on the Master key.

Enhancements to Sentinel LDK Envelope

Sentinel LDK Envelope now encrypts the entire DEX file for an Android application. This provides an additional layer of security for the protected application.

Support for Sentinel HL Drive microSD

The Run-time environment and APIs provided with this release of Sentinel LDK now provides support for Sentinel HL keys with an integral microSD card reader.

Sentinel HL Drive microSD was tested with microSD cards ranging in size from 2GB to 64GB and manufactured by various brands, including SanDisk, Lexar, Transcend and others. SafeNet expects any cards that comply with the microSD specifications to be compatible.

Sentinel LDK Hardlock-to-Driverless Upgrade Tool Generator

Sentinel LDK now provides an Upgrade Tool Generator that vendors can use to generate a custom Hardlock-to-Driverless Upgrade Tool. This tool can be used at customer sites to upgrade a Sentinel HL (Hardlock configuration) key to a Sentinel HL (Driverless configuration) key.

The Upgrade Tool can be generated for Windows or Linux platforms. On Windows platforms, up to 32 key can be upgraded with each execution of the Tool.

Administrative Rehost of an Existing Protection Key to a Different Key

Sentinel EMS now enables you to copy the contents of an existing protection key to a different key. You can copy all the Products, Features, and memory directly from the C2V file of an actual HL or SL key, or retrieve the state of a specific key from the Sentinel EMS database and copy this information to a different protection key.

This feature can be used in a variety of circumstances. For example:

- Recover an SL key in the event that the original SL key becomes corrupted or the hard drive containing an SL key fails.
- Recover from false positive detection of cloning.
- Correct a mistaken fulfillment without having to create cancellation products. You can create a V2C based on a specific C2V or state, and thus restore a protection key to its previous state.
- Easily fulfill multiple identical protection keys for an existing customer.

You can employ this feature by selecting the new **Add Products From State** option on the Entitlements page in Sentinel EMS. (This option must first be enabled in the Administration Console.)

Fallback to V-Clock If RTC Battery is Depleted

If the battery for the real-time clock on a Sentinel HL (Driverless configuration) Time or NetTime key is depleted, the key is no longer accepted for time-based licenses.

You can now configure a Sentinel HL Time or NetTime key to allow protected applications to switch automatically to the integral V-Clock on the Sentinel HL key. If the real-time clock on the Sentinel HL key stops operating, the protected applications will continue to run. In Sentinel License Generation API, you can implement fallback to V-Clock by including the tag `<fallback_to_vclock>` in a license definition. In Sentinel EMS, you can set a global parameter that implements fallback to V-Clock in all generated licenses.



Once you have enabled fallback to V-Clock for a Sentinel HL Time or NetTime key, this functionality cannot be disabled in the key.

Windows 10 is Now Supported

Sentinel LDK now supports Windows 10 for the Vendor Tools, Run-time Environment, and protected applications.

What's Changed in This Release?

This section describes significant changes to existing functionality that have occurred in this release of Sentinel LDK.

Provisional Products Are Now "Unlocked Products"

Together with increased capabilities and flexibility, the terminology for Provisional Products has been changed in Sentinel EMS and in documentation. A Provisional Product is now referred to as an "Unlocked Product" or as an "Unlocked Trialware Product." For more information, see ["Changes to Sentinel Master Key Business Model" on page 9.](#)

Changes to Sentinel Master key Modules

The licensing modules on the Sentinel Master key have been changed significantly for this release. For more information, see ["Changes to Sentinel Master Key Business Model" on page 9.](#)

Replacement for Envelope Project Settings_Linux.pdf

The *Envelope Project Settings_Linux* PDF file has been replaced by a new document: *Sentinel LDK Envelope for Linux User Guide*. This new document consolidates all the information for working with the Envelope for Linux command line utility in a single place. The new user guide can be found on the LDK installation DVD at: `\Linux\Docs\Manuals & Tutorials\Envelope for Linux User Guide.pdf`

Replacement of hasp_net_windows.dll in Licensing API Samples

The **hasp_net_windows.dll** provided in this release in the C# and Visual Basic .NET samples for Sentinel Licensing API has been compiled with .NET Framework 4.5. Prior to Sentinel LDK v.7.4, this DLL was compiled with .NET Framework 2.0. As a result, vendors who want to work with the provided DLL must upgrade to .NET Framework 4.5 or later.

SafeNet made this change because .NET Framework 2.0 contains known security vulnerabilities. Because of these vulnerabilities, SafeNet highly recommends that you upgrade to .NET Framework 4.5 or later.

If you do not want to upgrade your old .NET Framework, you can obtain and use the **hasp_net_windows.dll** for Windows from a Sentinel LDK release earlier than v.7.4. To obtain an earlier version of Sentinel LDK, contact Customer Support.

Sentinel LDK Language Packs

Translations for user interfaces and end-user documentation are no longer integrated in the Sentinel LDK installation. All user interface and documentation translations are included in language packs that will be made available for download after the release of Sentinel LDK 7.4.

Advanced Protection Parameter Renamed in Sentinel LDK Envelope

The advanced protection parameter `IMPORT_WATCHDOG_CHECK` for Windows applications has been renamed to `INTEGRITY_CHECK`.

Supported Platforms for Sentinel LDK - End Users and Vendors

The operating system versions listed in this section were tested by SafeNet and verified to be fully compatible with Sentinel LDK. Older operating system versions are likely to be fully compatible as well, but are not guaranteed. For reasons of compatibility and security, SafeNet recommends that you always keep your operating system up to date with the latest fixes and service packs.

Supported Platforms for End Users

Sentinel LDK Run-time Environment, Protected Applications

The following Sentinel LDK Run-time Environments are provided with this release of Sentinel LDK:

System	Run-time Environment Version
Windows	Version 7.41 Sentinel LDK Run-time Environment has been certified by Microsoft as "Compatible with Windows 8" (x86 and x64) and "Compatible with Windows 10" (x86 and x64).
Mac	Version 7.40
Linux	Version 7.40



To support all the latest enhancements in Sentinel LDK, end users should be provided with the latest Run-time Environment. However, for all pre-existing functionality in Sentinel LDK, respective earlier versions of Sentinel Run-time Environment are supported.

The Sentinel LDK Run-time Environment, and protected applications (with or without the Run-time Environment), can be installed under the following systems:

System	Supported Versions
Windows	<ul style="list-style-type: none"> ■ Windows (x86) XP SP3 ■ Windows Vista SP2 ■ Windows 7 SP1 ■ Windows 8.1 SP1 ■ Windows Server 2003 SP2 ■ Windows Server 2008 SP2 ■ Windows Server 2008 R2 SP1 ■ Windows Server 2012 R2 ■ Windows 10 <p>The latest service packs and security updates must be installed.</p>
Windows Embedded	<ul style="list-style-type: none"> ■ (x86 only) Windows XP Embedded standard ■ (x86 only) Windows 7 SP1 Embedded standard

System	Supported Versions
Mac	<ul style="list-style-type: none"> ■ Mac OS X 10.7.5 ■ Mac OS X 10.8.5 ■ Mac OS X 10.9.5 ■ Mac OS X 10.10 ■ Mac OS X 10.11
Linux	<ul style="list-style-type: none"> ■ OpenSUSE 12.3, 13.2 (x86 and x86_64) ■ Red Hat EL 6.6, 7.1 (x86 and x86_64) ■ Ubuntu Server 12.04.3, 14.04 (x86 and x86_64) ■ Ubuntu Desktop 12.04.3 (x86 and x86_64) ■ Debian 6.0.10, 8.1 (x86 and x86_64) ■ CentOS 7.1 (x86 and x86_64) <p>The latest service packs and security updates must be installed.</p>
Virtual Machines	<p>The VM detection and VM fingerprinting capabilities provided by Sentinel LDK have been validated on the following technologies:</p> <ul style="list-style-type: none"> ■ Virtual Box 4.3.28 ■ Parallel Desktop 9 for Mac ■ VMware Player 6.0.3 ■ Hyper-V Server 2012 R2 (SL only) ■ VMware Workstation 11.1 ■ VMware ESXi 5.5 ■ XEN 4.5 ■ KVM (RHEL 7.0, Ubuntu 14.04 server, Debian 8.x)
Wine	Sentinel LDK Run-time Environment was tested on Linux platforms with Wine 1.7.28.
Linux ARM	<p>Sentinel LDK Embedded supports the Linux ARM platform. Visit the SafeNet website to learn more and to download a free trial:</p> <p>http://www.safenet-inc.com/software-monetization/sentinel-embedded-solutions/</p>
Android ARM	Android 4.1.1, 4.2.2, 4.3, 4.4.2, 5.x

Data File Protection Plugin for Internet Explorer

The Data File Protection plugin (MSI file) is compatible with the following versions of Microsoft Internet Explorer:

- Versions 8 through 11



The Data File Protection plugin cannot be installed on a virtual machine.

Web Browsers for Sentinel Admin Control Center


- Microsoft Internet Explorer (32-bit) versions 8, 9, 10, 11
- Microsoft Edge
- Mozilla Firefox (32-bit) version 22
- Google Chrome (32-bit) version 23 or later
- (Mac) Safari 5.0, 6.0

Supported Platforms for Vendors

Sentinel EMS Service

System	Supported Versions
Windows	See supported Windows platforms for Sentinel LDK Run-time Environment (above).

Sentinel EMS Database

System	Supported Database Server Software
Windows	<ul style="list-style-type: none"> ■ Microsoft SQL Server 2005 x86/x64 ■ Microsoft, SQL Server 2005 Express Edition (must be enabled for remote connections) x86/x64 ■ Microsoft SQL Enterprise 2008 x86/x64 ■ Microsoft SQL Enterprise 2008 R2 x86/x64 ■ Microsoft SQL Server 2012 x86/x64 ■ Microsoft SQL Server 2012 R2 x86/x64 ■ Microsoft SQL Server 2014 x86/x64 <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  Microsoft SQL Server 2008 R2 Express Edition can be installed automatically by the Sentinel EMS Installation wizard. The installer for this version of Microsoft SQL Server is also available on the Sentinel LDK installation DVD. </div>

Web Browsers for Sentinel EMS

- Microsoft Internet Explorer versions 8, 9, 10, 11
- Mozilla Firefox (32-bit) version 40 or later

You must use a 32-bit Web browser for any action in Sentinel EMS that accesses a protection key (such as burn, recycle, check in key, or online activation). You can perform all other actions in Sentinel EMS using a 32-bit or 64-bit Web browser.

Sentinel LDK Vendor Tools

System	Supported Versions
Windows	<ul style="list-style-type: none"> ■ See supported Windows platforms for Sentinel LDK Run-time Environment (above). <p>Requires screen resolution 1280 by 1024 pixels with 24-bit color quality</p> <div> <p>For Sentinel LDK Envelope:</p> <ul style="list-style-type: none"> ■ To protect and execute the provided .NET sample application under Windows 8.1 or Windows Server 2012 R2, you must install Microsoft .NET Framework 3.5. ■ An application that has been protected for performance profiling (with AppOnChip) will not work correctly with Virtual Box versions prior to 4.3.28. </div> <div> <p>For Sentinel LDK Master Wizard: Your customized Data File Protection plugin for Internet Explorer (to display protected FLV or SWF data files) is generated when you introduce the Master Key. If you plan to use this plugin, .NET Framework 3.5 or later must be present on the machine where you run the Master Wizard.</p> </div>
Mac	<ul style="list-style-type: none"> ■ Mac OS X 10.8.5 ■ Mac OS X 10.9.5 ■ Mac OS X 10.10 ■ Mac OS X 10.11 <p>Applications built on the Cocoa framework are supported.</p>
Linux	<ul style="list-style-type: none"> ■ OpenSUSE 12.3 (x86 and x86_64) ■ Red Hat EL 7.1 (x86 and x86_64) ■ Ubuntu Server 12.04.3, 14.04 (x86 and x86_64) ■ Ubuntu Desktop 12.04.3 (x86 and x86_64) ■ Debian 6.0.10, 8.1 (x86 and x86_64) ■ CentOS 7.1 (x86 and x86_64) <p>The latest service packs and security updates must be installed.</p>
Android	<p>Sentinel Envelope supports Android applications designed for the following versions: 4.1.1, 4.2.2, 4.3, 4.4.2, 5.x</p> <p>Only the Android ARM platform is supported. (x86 and MIPS platforms are not supported.)</p>

Supported Versions for Windows CE


The Sentinel LDK Run-time Environment (version 5.95) and Envelope deliverables are supported for Windows CE versions 5.0 and 6.0.

Supported Platforms for Code Samples

Provided code samples are supported on the same platforms as listed above for Sentinel LDK Vendor Tools, with the following exceptions:

Sample	Supported Versions
Sentinel LDK Licensing API – 4D Sample for Mac OS X	Operating Systems supported: <ul style="list-style-type: none">■ Mac OS X 10.6.8 (32-bit and 64-bit)■ Mac OS X 10.7.5■ Mac OS X 10.8.5
Sentinel Activation API	Operating Systems supported: <ul style="list-style-type: none">■ Windows XP■ Windows Server 2003■ Windows Vista■ Windows Server 2008■ Windows 7 (32-bit and 64-bit)
Sentinel Activation API for Mac OS X	Operating Systems supported: <ul style="list-style-type: none">■ Mac OS X 10.6.8 (32-bit and 64-bit)■ Mac OS X 10.7.5■ Mac OS X 10.8.5

Tested Compilers for Code Samples

API	Programming Language	Tested Compilers
Licensing API for Windows	AutoCAD	AutoCAD 2009, 2010, 2014
	C	Microsoft Visual Studio 2005, 2008, 2010, 2013*, 2015 C++ Builder Developer Studio 2006
	Visual Basic .NET	Microsoft Visual Studio 2013*, 2015
	C#	Microsoft Visual Studio 2013*, 2015
	C++	Microsoft Visual Studio 2005, 2008, 2010, 2013*, 2015 <div>  <p>To compile the 64-bit samples using VS 2008, ensure that the 64-bit compiler package is installed when you install VS.</p> </div> C++ Builder Developer Studio 2006 gcc
	Delphi	Delphi 2007 Developer Studio 2006
	Java	Java Developer Kit 1.7, 1.8
	4D	4D v11 SQL
Licensing API for Mac OS X	Java	Java Developer Kit 1.6
	4D	4D v11 SQL
	C	gcc
Licensing API for Linux	Java	Java Developer Kit 1.6
	C	gcc
	C++	gcc
Licensing API for Android	Java	Java Developer Kit 1.8
License Generation API	C, C#, Visual Basic .NET	Microsoft Visual Studio 2013*, 2015
	Java	Java Developer Kit 1.8
Activation API for Windows	C	Microsoft Visual Studio 2003, 2005, 2008, 2010, 2012 Provided workspace may need to be converted for the VS version used.
	Java	Java Developer Kit 1.6
Activation API for Mac OS X	Java	Java Developer Kit 1.6

API	Programming Language	Tested Compilers
Activation API for Linux	Java	Java Developer Kit 1.6
Runtime Environment Installer	C	Microsoft Visual Studio 2005, 2008, 2010, 2012
	MSI	Wise for Windows Installer 7.1 InstallShield 2012 Spring or later Note: The provided solution can only be used with InstallShield 2013 Spring or later.
Admin API	Java	Java Developer Kit 1.8
	C, C#, C++, Visual Basic .NET	Microsoft Visual Studio 2013*, 2015
Envelope Runtime API	C#	Microsoft Visual Studio 2013*, 2015
* Visual Studio 2015 *.sln should be imported to use in Visual Studio 2013.		

Supported Platforms for Sentinel Cloud Licensing

Sentinel Cloud Run-time has been tested on the following platforms:

Run-time	Run-time Interface	Platforms Tested	Run-time Environment	Web Server
Cloud	Java	Windows <ul style="list-style-type: none"> ■ Windows 7 Embedded ■ Windows 7 ■ Windows Server 2008 ■ Windows XP Linux <ul style="list-style-type: none"> ■ Ubuntu 12.04 ■ CentOS 5.4 ■ Red Hat Enterprise Linux (RHEL) 6.3 ■ SLES 11 	JRE 6	Tomcat 7
	.NET	<ul style="list-style-type: none"> ■ Windows 7 Embedded ■ Windows 7 ■ Windows Server 2008 ■ Windows XP 	.NET Framework 2.0 and 3.5	IIS 6.0 and 7.0
	C	Windows (32-bit and 64-bit) <ul style="list-style-type: none"> ■ Windows 7 Embedded ■ Windows 7 ■ Windows Server 2008 ■ Windows XP Linux (32-bit and 64-bit) <ul style="list-style-type: none"> ■ Ubuntu 12.04 ■ CentOS 5.4 ■ Red Hat Enterprise Linux (RHEL) 6.3 ■ SLES 11 	-	-

Run-time	Run-time Interface	Platforms Tested	Run-time Environment	Web Server
On-premise	Java	Windows <ul style="list-style-type: none"> ■ Windows 7 Embedded ■ Windows 7 ■ Windows Server 2008 ■ Windows XP Linux <ul style="list-style-type: none"> ■ Red Hat Enterprise Linux (RHEL) 6.3 ■ SLES 11 	JRE 6	Tomcat 7
	.NET	<ul style="list-style-type: none"> ■ Windows 7 Embedded ■ Windows 7 ■ Windows Server 2008 ■ Windows XP 	.NET Framework 2.0 and 3.5	IIS 6.0 and 7.0
	C (32-bit and 64-bit)	Windows (32-bit and 64-bit) <ul style="list-style-type: none"> ■ Windows 7 Embedded ■ Windows 7 ■ Windows Server 2008 ■ Windows XP Linux (32-bit and 64-bit) <ul style="list-style-type: none"> ■ Red Hat Enterprise Linux (RHEL) 6.3 ■ SLES 11 	-	-

Current Firmware Version

The version of the firmware on Sentinel HL keys that are delivered at the time of the release of Sentinel LDK v.7.4 is 4.27.

To view the version of the firmware for any given Sentinel HL key, connect the key to a computer where Sentinel LDK Run-time Environment is installed and open Admin Control Center.

Dropped Support

This section lists platforms which were supported in the past, but have not been tested with Sentinel LDK v.7.4. SafeNet will continue to accept queries for issues related to these platforms and will attempt to provide information to resolve related issues.

Carbon Framework for Mac

Sentinel LDK Envelop for Mac no longer supports protection of applications built on the Carbon framework. Applications built on this framework may fail to run after protection. The Carbon framework has been deprecated by Apple for several years, and it may be removed from OS X in a future release.

Known issues for the Carbon framework have been resolved in LDK 7.4. However, SafeNet cannot guarantee that applications built on the Carbon framework will continue to work with future releases of Sentinel LDK. SafeNet urges all vendors to rewrite their code using the Cocoa framework instead of the Carbon framework.

Platforms for Developers and End Users

Testing for the following platforms for Vendor Tools, the Sentinel LDK Run-time Environment, and protected applications (with or without the Run-time Environment) has been discontinued:

- Mac 10.6.8
- Mac 10.7.5 (for developers only)
- Red Hat EL 5.x
- Red Hat EL 6.x (for developers only)
- CentOS 6.x
- JDK 1.5

Chrome Browser for Sentinel EMS

Chrome browser support has been dropped from this release as it does not support Java applets anymore. Several important functions in Sentinel EMS (including online activation by the end user) do not work in Chrome version 42 or later due to this change.

Sentinel LDK Documentation

The documents and online help systems described below are provided in this release of Sentinel LDK.

Documents

Sentinel LDK documents (PDF files) can be found:

- on the (physical) Sentinel LDK Installation DVD, under: **\Windows\Installed\Docs**
- where Sentinel LDK is installed, under:
%WINDIR%\Program Files (x86)\SafeNet Sentinel\Sentinel LDK\Docs
- where Sentinel EMS is installed, under:
**%WINDIR%\Program Files (x86)\SafeNet
Sentinel\Sentinel EMS\EMSServer\webapps\ems\Docs**

(For Win32, under: **%WINDIR%\Program Files\...**)

Document	Description
Sentinel LDK Installation Guide	Details the prerequisites and procedures for installing Sentinel LDK Vendor Tools, Sentinel EMS Server, and the Run-time Environment.
Sentinel LDK Software Protection and Licensing Guide	Provides in-depth information about the logic of the applications and best practices for maximizing your software protection and licensing strategies. Describes a wide range of licensing strategies and models that you can implement, and can serve as the basis for elaboration and for creating new, tailor-made licensing models.
Sentinel LDK Software Protection and Licensing Tutorials	<p>Guide you through the basic procedures of Sentinel LDK to familiarize you with the applications and their functionality.</p> <ul style="list-style-type: none"> • The Demo Kit tutorial is for vendors who wish to evaluate Sentinel LDK. • The Starter Kit tutorial is for vendors who have just purchased Sentinel LDK. <p>Two versions of each tutorial are provided – one for working with Sentinel EMS as the back office system, and one for vendors who want to provide their own back office system and only use the Sentinel LDK APIs to handle licensing and protection.</p>
Sentinel LDK Quick Start Guides	Provides a short and simple demonstration of how you can easily protect your software using Sentinel HL keys. Separate Demo Kit and Starter Kit guides are provided.

Document	Description
Sentinel HL Drive Flash Partitioning Utility – User Guide	Describes how to use the Sentinel HL Drive partitioning utility and API to load your Sentinel LDK-protected applications and data onto the CD-ROM partition of a Sentinel HL Drive, and ship it to your customers. Your customers can save files to Sentinel HL Drive or load additional software on it, and thus utilize the convenience of USB flash drive functionality.
Migration Guide: Sentinel HASP to Sentinel LDK	Describes how to migrate from Sentinel HASP to Sentinel LDK. Describes how to migrate your Business Studio Server database to a Sentinel EMS database. This guide also describes the Business Studio Server API for Sentinel EMS.
Additional Guides for Migrating to Sentinel LDK	These guides describe how to migrate to Sentinel LDK from: <ul style="list-style-type: none"> - Hardlock - SmartKey - Sentinel SuperPro - HASP HL - HASP4 - Sentinel Hardware Keys
Integrating Sentinel EMS Server into Your Existing Back-Office Systems	Outlines the many ways that software vendors can maximize the potential of their existing back-office systems, such as ERP, CRM, and business intelligence systems, through seamless integration with Sentinel EMS Server.
Sentinel EMS Configuration Guide	Provides information on setting up and configuring Sentinel EMS to satisfy the requirements of your organization.
Sentinel EMS User Guide	Provides the Sentinel EMS user with detailed directions on how to set up license entities and how to handle entitlements, production, and support for Sentinel HL and SL keys. (This information is also provided in online help for the Sentinel EMS user interface.)
Sentinel EMS Web Services Guide	Provides the developer with an interface for integrating Sentinel EMS functionality into the vendor's existing back-office systems.

Sentinel Cloud Licensing Documents

The documentation in the table that follows describes how to work with Sentinel Cloud Licensing. This documentation is provided with the Sentinel Cloud Licensing installer.

Document	Description
Sentinel Cloud Run-time Guide	Sentinel Cloud Run-time API reference (Java, .NET, and C)
Sentinel Cloud - Quick Start Guide	Document to help you quickly start with Sentinel Cloud
Sentinel Cloud Services Installation Guide	Describes how to install Sentinel Cloud Services
Sentinel Cloud Connect Web Services Guide	Reference for using the Sentinel Cloud Connect Web services
Sentinel Cloud Run-time Java Demo Application ReadMe	Explains how to use the Sentinel Cloud Services Demo Application
Sentinel Cloud Run-time .NET Reference Application ReadMe	Sample for using the Cloud Runtime APIs written in .NET
Sentinel Cloud Run-time C Reference Application ReadMe	Sample for using the Cloud Runtime APIs written in C
Sentinel Cloud Connect Web Services Python Sample ReadMe	Sample for integrating Sentinel Cloud Connect Web services in Python application

Getting Started Guides

Getting Started Guides for other operating systems can be found as follows:

Linux

The *Getting Started Guide for Linux* can be found in the Linux download or on the Sentinel LDK Installation DVD, under: **\Linux**

MacOS

The *Getting Started Guide for MacOS* can be found in the Mac download or on the Sentinel LDK Installation DVD, under: **\MacOS**

Android

The *Getting Started Guide for Android* can be found:

- on the (physical) Sentinel LDK Installation DVD, under: **\Android**
- where Sentinel LDK is installed, under:
%WINDIR%\Program Files (x86)\SafeNet Sentinel\Sentinel LDK\Additional Platforms\Android

(For Win32, under: **%WINDIR%\Program Files\...**)

Help Systems - Sentinel LDK and Sentinel EMS User Interfaces

The documentation described in the table that follows can be accessed from the user interface for the relevant Sentinel LDK component.

Online Help System	Description
Sentinel LDK Admin Control Center	Documentation for the end user, describing the Admin Control Center and providing instructions for performing the various functions such as updating or attaching licenses.
Sentinel EMS	Provides the Sentinel EMS user with detailed directions on how to set up license entities and how to handle entitlements, production, and support for Sentinel HL and SL keys.
Sentinel LDK Data Encryption Utility (Separate versions for Windows and for Mac)	Provides the developer with a description of the Sentinel LDK Data Encryption utility (formerly DataHASP utility), used for protecting data files that are accessed by Sentinel LDK Envelope.
Sentinel LDK Envelope (Separate versions for Windows and for Mac)	Describes how to employ Sentinel LDK Envelope to automatically wrap your programs with a protective shield. The application provides advanced protection features to enhance the overall level of security of your software.
Sentinel LDK ToolBox	Describes how to work with the ToolBox user interface for the Licensing API, License Generation API, and Admin API. Using Sentinel LDK ToolBox, the developer can experiment with the individual functions that are available in each API and can generate programming code for insertion in the developer's own program. Provides full documentation for each of the included APIs.

Online Help Systems - Sentinel LDK APIs

Documentation for the Sentinel LDK APIs described below can be found:

- on the Sentinel LDK Installation DVD, under: **\Windows\Installed\API**
- where Sentinel LDK is installed, under:
%WINDIR%\Program Files (x86)\SafeNet Sentinel\Sentinel LDK\API

(For Win32, under: **%WINDIR%\Program Files\...**)

Sentinel LDK API	Description
Activation API Reference	Together with various Licensing API functions, this API assists the developer in communicating with the Sentinel EMS Server.

Sentinel LDK API	Description
Licensing API Reference (formerly Run-time API)	Provides the developer with an interface to use the licensing and protection functionality available in the Sentinel LDK Run-time Environment.
Run-time COM API	Provides the developer with access to Sentinel HASP Run-time Environment functionality, through an interface written for the Microsoft Component Object Model (COM).
Run-time Installer API	Provides the developer with an interface for integrating installation of the Run-time Environment into the installation of the vendor's protected application.
Sentinel EMS Web Services	Provides the developer with an interface for integrating Sentinel EMS functionality into the vendor's existing back-office systems. (Documentation is available from the index.html menu under ...\Program Files (x86)\SafeNet Sentinel\Sentinel EMS\EMSServer\webapps\ems\Docs\ (For Win32, under \Program Files\...)
License Generation API Reference	Provides access to the power and flexibility of Sentinel protection keys without the need to employ the full Sentinel EMS system. The developer can call functions in this API to generate and update licenses for Sentinel protection keys.
Admin API Reference	Provides the functionality available in Admin Control Center and Sentinel License Manager in the form of callable API functions.

Instructional Videos

A library of instructional videos for Sentinel LDK is available at:
<http://sentinelvideos.safenet-inc.com/>

Software and Documentation Updates

SafeNet recommends that you frequently visit the [Sentinel downloads page](#) to ensure that you have the most recent versions of Sentinel LDK software and documentation, and for documentation in other languages.


Known Issues and Workarounds

The known issues in Sentinel LDK v.7.4 that are likely to have the most significant impact on users are listed below, according to component.

Additional, less-common issues can be found in the SafeNet Knowledgebase at:

<https://www.safenet-inc.com/ldk-known-issues>

Sentinel LDK Installation

Ref	Issue
EMSLDK-5860	<p>Installation of Sentinel LDK on a virtual machine may hang before completion of the installation process.</p> <p>Workaround: Interrupt and then restart the installation. If the problem occurs again, interrupt the installation. Enable 3D acceleration and increase the video memory of the virtual machine. Rerun the installation.</p>
LDK-12131	<p>When the schedule for checking for updates in Sentinel LDK Software Manager is set to "Manual", the setting is not saved. Instead, Software Manager reverts to the default setting (every 3rd Wednesday at 15:00).</p>
LDK-12429	<p>When you click the Download Only link in Sentinel LDK Software Manager during the process to update Sentinel LDK, the Download window open behind the Software Manager screen.</p>
EMSLDK-7448	<p>Sentinel EMS fails to install correctly on a machine where JRE 8 and earlier versions of JRE coexists.</p> <p>If a machine contains an earlier version of JRE, and you manually install JRE 8, then:</p> <ol style="list-style-type: none"> 1. When installing Sentinel EMS, the Installer generates the error "Kindly Start the Service -SQLServer(EMSDATABASE) and then click OK". 2. When you click OK, the installation fails with multiple errors. <p>The reason for this is as follows: While upgrading to JRE 8 , the Java installer does not replace earlier JRE files from the System32 directory.</p> <p>Workaround: Uninstall the earlier versions of JRE from your machine, and restart the Sentinel EMS installation.</p> <div>  <ul style="list-style-type: none"> ■ When upgrading to JRE 8, the Java installer also recommends that you uninstall earlier the version of JRE from your machine due to security concerns. For more information, see: https://bugs.openjdk.java.net/browse/JDK-8073939 ■ This issue does not occur when your machine contains earlier versions of JRE, and the Sentinel EMS installation installs bundled JRE 8 reference. </div>

Sentinel EMS

Ref	Issue
EMSLDK-5168	<p>When packaging a Run-time Environment installer with a V2C file for one or more Products in Sentinel EMS, you cannot include a Product that only has the locking type SL UserMode. An attempt to install such a package will fail with the message "V2C unknown HASP API 49 Error". Sentinel EMS does not currently prevent you from creating such a package.</p> <p>Workaround: When generating the RTE installer in Sentinel EMS, use the locking type SL-AdminMode for Products.</p>

Sentinel Cloud Licensing

Ref	Issue
EMSLDK-5934	<p>Entitlement-level Caching: Sentinel Cloud Licensing is unable to consume a license if the end user machine contains multiple hard disk drives. Error 1021 is generated.</p>

End Users, Sentinel LDK Runtime Environment, License Manager, and Customer Tools

Ref	Issue
LDK-8480	<p>With some new USB chipsets, it is possible that the API <code>hasp_update()</code> call, used to update the firmware of Sentinel HL keys to version 3.25, will generate the <code>HASP_BROKEN_SESSION</code> return code, even if the firmware is correctly updated. (This issue does not occur with Sentinel HL Driverless keys with firmware version 4.x.)</p> <p>Workaround: Install the latest Run-time Environment. The automatic firmware update feature of the License Manager will automatically update the firmware of the key the first time that the key is connected, without the need to call <code>hasp_update()</code>.</p>
LDK-9044	<p>Given the following circumstances:</p> <ul style="list-style-type: none"> ■ A Sentinel HL (Driverless configuration) key is connected to a USB host controller in default mode on QEMU emulator version 2.0.0 and Virtual Machine Manager version 0.9.5. <p>When the key is disconnected, the key continues to be displayed in Admin Control Center as a connected key. (However, a protected application whose license is located in the key does not execute after the key is disconnected.)</p> <p>Workaround: Switch the USB controller to USB 2.0 mode.</p>
LDK-10670	<p>After a user connects a Razer Abyssus mouse and installs Razer drivers on a computer, the device manager on the computer does not recognize a Sentinel HL key if the key is connected to the same USB port where the mouse was previously connected.</p> <p>This issue has been reported to Razer.</p>

Ref	Issue
LDK-12172	The Data File Protection plugin is installed in both 32-bit and 64-bit Internet Explorer. However, the plugin is not functional in 64-bit Internet Explorer. Workaround: Use the 32-bit Internet Explorer to view protected data files.
LDK-12145	When a data file is protected with Version 2 data protection mode for Android platforms: If, for any reason (for example, no license was found), the protected application is not able to decrypt the protected data file, no error message is generated to explain why the file cannot be opened.
LDK-12547	Under Linux, if the user is running a Windows 64-bit protected application using Wine with default options, Linux may return a "debugger detected" error. Workaround: When you protect the application using Envelope, disable User debugger detection for the application.

Sentinel LDK Licensing API

Ref	Issue
LDK-12617	When you link with the Licensing API static lib using Visual Studio 2015, "unresolved external symbol" errors are generated Workaround: Do the following: <ol style="list-style-type: none"> 1. Under Solution Explorer, right-click the project, and select Properties. 2. Under Configuration Properties > Linker > Input, go to Additional Dependencies. 3. Add "legacy_stdio_definitions.lib" to Additional Dependencies.

Sentinel LDK Envelope for Windows Platforms

General

Ref	Issue
LDK-6235	If a protected DLL is launched by an unprotected console application, and the DLL code is in sleep() mode, the DLL does not detect if a debugger is attached to the console application. Workaround: Ensure that the console application is also protected.
LDK-11727	Debugger detection is not provided for .NET applications. Workaround: Implement debugger detection mechanism in the application code, and use Envelope to protect the methods that call these functions.
LDK-3424	Although a Win32 DLL file can be protected with debug detection enabled, the C# application that calls the DLL can run successfully in debug mode. However, the C# application uses a CLI debugger. This debugger cannot debug x86 DLL code. Therefore, this debugger is not detected for the protected Win32 DLL file.

Ref	Issue
LDK-11191	When a protected application is run under Novell ZENworks Agent, the application may generate "Debugger Detected" errors and may fail to run. This is because ZENworks Agent attaches to the started application as a debugger in order to monitor different events.
LDK-6695	When a "Debugger Detected" error is generated, it is not possible for the protected application to determine which process is regarded as a debugger.
LDK-8850	When a protected application detects that a debugger is attached, the application may generate multiple "Debugger Detected" message windows.
LDK-12377	<p>Given the following circumstances:</p> <ul style="list-style-type: none"> ■ The message output mode for a protected application is set to 2 (eventlog). ■ hasp_rt.exe is included with the protected application. ■ The application does not find the required HL key when it performs the periodic background check (for example, the HL key was temporarily disconnected). <p>The application does not continue when the HL key is reconnected.</p> <p>Workaround: Do not set the message output mode to 2 or do not include hasp_rt.exe with the protected application.</p>

Java

Ref	Issue
LDK-11195	<p>When protecting a Java application, Envelope fails with the message "Serious Internal Error (12)".</p> <p>Workaround: If this error occurs, protect the Java application using either of the following techniques:</p> <ul style="list-style-type: none"> ■ If the application contains JARs within a JAR/WAR executable, remove those JARs when protecting the executable with Envelope. You can add the JARs to the JAR/WAR executable after protection is complete. ■ Create a JAR/WAR executable using only those classes that you want to protect. After applying protection, you can add other classes or JARs, or any other dependencies in the protected JAR/WAR executable.
LDK-11418	<p>For a Java 7 or Java 8 application that is protected with Envelope, the end user must use the following flag when launching the protected application:</p> <ul style="list-style-type: none"> ■ For Java 7: Specify <code>-usesplitverifier</code> ■ For Java 8: Specify <code>-noverify</code> <p>If the appropriate flag is not specified, the application may throw java.verifyerror when launched.</p>

Sentinel LDK Envelope and Data Encryption for Mac OS X

Ref	Issue
LDK-11655	<ul style="list-style-type: none">■ When running Envelope in a VMware Fusion 7.1.1 virtual machine on a Mac machine, if you save the protected application to a HGFS (Host Guest File System) volume, the application file is corrupted.■ When you run a protected application on a VMware Fusion virtual machine from an HGFS share, if the application requires write access, the error "unable to write to file" is generated.