

Sentinel LDK - v.7.9

Installation Guide

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Contents

Introduction	6
About This Guide	6
Obtaining Support	7
Training	7
Chapter 1: Sentinel LDK Software Package	9
Sentinel EMS	9
Sentinel LDK Vendor Tools	9
Sentinel Licensing API Samples	9
Sentinel LDK Run-time Environment	9
Sentinel LDK APIs	10
Sentinel Admin Control Center	11
Sentinel Cloud Licensing	11
Chapter 2: Installing Sentinel LDK for Windows	12
Installing and Configuring SQL Server Manually	13
Installing SQL Server	13
Configuring SQL Server	14
Installing Sentinel EMS	15
Infrastructure	16
Prerequisites	16
Types of Installation Setup	18
Launching the Sentinel LDK Installation Wizard	18
Configuring Sentinel EMS	22
Requirement for Sentinel LDK Run-time Environment	22
Accessing Sentinel EMS	23
Installing the Sentinel LDK Vendor Tools (Standalone)	23
Default Sentinel LDK User Name and Password	24
Working With the Software Manager System	24
Upgrading Sentinel LDK From Earlier Versions	26
Upgrading From Sentinel HASP or From HASP SRM	26
Upgrading From Sentinel LDK v.6.x or v.7.x	26
Modifying the Installed Sentinel LDK Components	28
Chapter 3: Sentinel EMS Network Configuration Options	29
Overview	29

Standard Production Configuration for Sentinel EMS	30
Installing Sentinel EMS	30
Configuring the Firewall	30
Main Points of the Standard Production Configuration	31
Configuration Summary	31
Sentinel EMS Web Portals on Separate Servers	31
Installing Sentinel EMS	32
Configuring the Firewalls	32
Redundant Installation of Sentinel EMS in a Network Environment	34
Understanding Redundant Networks	34
Minimum Network Installation Requirements When Using Redundancy	35
Network Environment Installation	35
Chapter 4: Troubleshooting for Sentinel EMS Installation	38
Problems During Installation	38
Issue: Miscellaneous problems	39
Problems After Installation	40
Sentinel EMS stopped working after Java was upgraded automatically	40
Sentinel EMS applets do not function	40
The Login button on the Login screen does not function	40
Port not available	40
Users are not able to access Sentinel EMS	41
Frequently-asked Questions	41
Can I use a non-system administrator (sa) account?	41
How can I best secure my Sentinel EMS system?	42
Chapter 5: Introducing Your Sentinel Vendor Keys to Sentinel LDK	43
Overview	43
Remote Connection of Vendor Keys	44
Running the Sentinel LDK Master Wizard	44
Chapter 6: Installing Sentinel LDK Run-time Environment for Mac	46
Installing Sentinel LDK Run-time Environment on a Mac Machine	46
Installed Files	47
Modifying the Behavior of the Daemons	47
Chapter 7: Installing Sentinel LDK Run-time Environment for Linux	50
Installing Sentinel LDK Run-time Environment on a Linux Computer	50
Uninstall the Earlier Sentinel LDK Run-time Environment	50
Install Sentinel LDK Run-time Environment	51

Installed Files	52
Uninstalling Sentinel LDK Run-time Environment	53
Upgrading HASP HL Key Firmware	53
Chapter 8: Installing Sentinel LDK Run-time Environment Using an Installation Utility	55
HASPUserSetup.exe Utility	56
haspdinst.exe Utility	56
Multiple Installations on a Single End User's Computer	57
Appendix A: Uninstalling Sentinel LDK	58
Appendix B: Configuring Tomcat for Redundancy	59
Appendix C: Installing Language Packs	61
SAFENET SENTINEL LDK PRODUCT END USER LICENSE AGREEMENT	63
Exhibit A - Third-Party Software	69
Exhibit B - Third-Party Software for Sentinel EMS and Sentinel Cloud Add-on	93
Index	96

Introduction

This guide describes how to install Sentinel License Development Kit—including the Sentinel Vendor Suite software and the Sentinel EMS Service.

About This Guide

The guide contains the chapters and appendixes described below.

- **"Chapter 1: Sentinel LDK Software Package" on page 9**
Describes the Sentinel LDK software package.
- **"Chapter 2: Installing Sentinel LDK for Windows" on page 12**
Describes how to install and configure the Sentinel EMS and Sentinel LDK Vendor Tools software on a machine with a Windows operating system, together with the automatic Sentinel LDK Run-time Environment installation.
- **"Chapter 3: Sentinel EMS Network Configuration Options" on page 29**
Describes advanced network options, including how to install the Sentinel EMS Service components on separate servers and to create a network environment that incorporates redundancy.
- **"Chapter 4: Troubleshooting for Sentinel EMS Installation" on page 38**
Discusses the solutions to some of the frequently asked questions relating to the installation of the Sentinel EMS Service in a network environment.
- **"Chapter 5: Introducing Your Sentinel Vendor Keys to Sentinel LDK" on page 43**
Describes how to introduce your Sentinel Vendor keys to the Sentinel LDK system, to ensure that your applications are protected and licensed with the unique codes that have been assigned to you.
- **"Chapter 6: Installing Sentinel LDK Run-time Environment for Mac" on page 46**
Describes how to install the Sentinel LDK Run-time Environment on a machine with a Mac operating system.
- **"Chapter 7: Installing Sentinel LDK Run-time Environment for Linux" on page 50**
Describes how to install the Sentinel LDK Run-time Environment on a machine with a Linux operating system.
- **"Chapter 8: Installing Sentinel LDK Run-time Environment Using an Installation Utility" on page 55**
Describes additional options for installing Sentinel LDK Run-time Environment.
- **"Appendix A: Uninstalling Sentinel LDK" on page 58**
Describes how to completely uninstall Sentinel LDK and the Sentinel EMS database.

- **"Appendix B: Configuring Tomcat for Redundancy" on page 59**

Describes how to configure Tomcat when Sentinel EMS is installed in a high-availability configuration.

- **"Appendix C: Installing Language Packs" on page 61**

Describes how to download and install Sentinel LDK language packs for languages other than English.

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:

<https://sentinel.gemalto.com/contact-us-sm/>

Technical Support

To obtain assistance in using Gemalto products, feel free to contact our Technical Support team:

- **Customer Support Portal** (preferred):
<https://supportportal.gemalto.com/csm?id=sentinel>
- **Support Essentials** (Contact details, support plans, and policies):
https://supportportal.gemalto.com/csm?id=support_essentials
- **For Issues Related to Using the Portal:** customerportalsupport@gemalto.com
- **Phone:**
 - AMER: 800-545-6608 (US toll free)
 - International: +1-410-931-7520
 - EMEA/APAC: <https://supportportal.gemalto.com/csm?id=sentinel>
- ➔ **Click Contact Us**
- **E-mail** (Use if you cannot submit the technical issue via the portal):
technical.support@gemalto.com

Downloads

You can download installers and other updated components here:

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

Training

For additional information and training about Sentinel LDK implementation issues, contact our team of international consultants at the URL provided above. The consultants can provide you with tailored training sessions on the following:

- Integration of Sentinel LDK into your product
- Analysis of the best protection strategy for your applications

- Assistance in implementation of your protection and licensing models

Sentinel LDK Software Package

The software described in this section is provided on your Sentinel LDK Installation Drive.

Sentinel EMS

Sentinel EMS is a back-office server application that enables you to define, produce and update Sentinel protection keys and to define and process entitlements (customer orders). Sentinel EMS is installed in your organization as a service. A single installation of Sentinel EMS can be accessed throughout your organization using web browsers. The Sentinel EMS Service provides a database that contains all the licensing and entitlement information and can be accessed from customer sites to activate software licenses by entering Product Keys.

Sentinel EMS Web Services enables you to integrate the entitlement and production functionality of Sentinel EMS in your own back-office organizational management software.

Sentinel LDK Vendor Tools

- Sentinel LDK Envelope

Applies security to your software within a protective shield. Available for Windows, Mac, and Linux platforms. (Android applications are protected using Sentinel LDK Envelope on a Windows platform.)

- Sentinel LDK ToolBox

Enables you to familiarize yourself with the Sentinel Licensing API and to generate code to include in your software's source code. Available for Windows platforms.

Sentinel Licensing API Samples

Enables you to integrate protection into your own software using a variety of programming languages.

Sentinel LDK Run-time Environment

Sentinel LDK Run-time Environment is the main link between a Sentinel protection key and a protected application or data file following its deployment at a customer's site. Depending on the

type of protection key used, end users may need to have Sentinel LDK Run-time Environment installed in order to run the protected application or to access a protected data file.

You can integrate the Sentinel LDK Run-time Environment installer into the installation of your protected application.

- Sentinel LDK Run-time Environment for Windows
 - Enables you to customize your Sentinel Licensing API on Windows. Sentinel Admin Control Center is integrated in the Windows run-time.
- Sentinel LDK Run-time Environment for Mac
 - Provides backward compatibility with HASP HL v.1.x and HASP4 for Sentinel LDK Run-time and the Sentinel Licensing API static library.
 - Enables you to customize your Sentinel Licensing API on Mac. Sentinel Admin Control Center is integrated in the Mac Run-time Environment.
- Sentinel LDK Run-time Environment for Linux
 - Includes script, RPM, and DEB installation options.
 - Provides backward compatibility with HASP HL v.1.x, HASP4, and Hardlock for Sentinel LDK Run-time and the Sentinel Licensing API static library.
 - Enables you to customize your Sentinel Licensing API on Linux. Sentinel Admin Control Center is integrated in the Linux Run-time Environment.



Sentinel LDK Run-time Environment is not required for Android applications.

Sentinel LDK APIs

■ Sentinel Licensing API

Enables you to protect your application by inserting calls to a Sentinel protection key throughout your source code.

The root directory on the Sentinel LDK Installation Drive is divided according to operating systems.

Each system folder contains a *Sample* folder that provides samples for various compilers and programming languages. Each sample includes:

- Libraries that must be linked to your application
- A sample application that demonstrates the use of the API

■ Sentinel License Generation API

For sites that already have a licensing infrastructure in place or that prefer to implement an alternative to Sentinel EMS, Sentinel LDK offers a standalone licensing solution.

You can use Sentinel License Generation API together with your existing licensing server software and ERP and CRM back office systems for maximum flexibility and control over your business processes.

Sentinel License Generation API provides the functionality required to generate and maintain Sentinel protection keys, but without any of the back office services that are provided by Sentinel EMS. All the required services are provided by the system that you choose to implement. You would use Sentinel LDK only to handle the protection and Feature-control functions for your applications.

Warning:

Sentinel EMS and Sentinel License Generation API cannot be used in parallel to update licenses for a given customer.

For more information, see the description of Sentinel License Generation API in the *Sentinel LDK Software Protection and Licensing Guide*.

The following component versions are required for Sentinel License Generation API to access the Sentinel Master key:

- Sentinel License Manager (hasplms.exe) - 22.0 or later.
- HASP HL driver (akshhl.sys) - 1.27 or later.
- HASP HL Firmware on Master Key - 3.25 or later
(These requirements are relevant only for vendor who are already using a version of Sentinel HASP earlier than v.6.0.)

■ Sentinel Admin API

Sentinel Admin API provides the functionality available in Admin Control Center and Sentinel License Manager in the form of callable API functions. You can call functions to retrieve information from local or remote License Managers and to perform actions in these License Managers.

■ Activation API

Used in conjunction with various Sentinel Licensing API functions to communicate with Sentinel EMS to integrate the product activation process into your software.

Sentinel Admin Control Center

Sentinel Admin Control Center is a customizable, Web-based, end-user utility that enables centralized administration of Sentinel License Managers and Sentinel protection keys.

Use Sentinel Admin Control Center to monitor licenses and sessions when a protected application or data file is operating, and to manage detachable licenses.

Sentinel Cloud Licensing

Sentinel Cloud Licensing makes it quick and easy for SaaS providers to build versatile service catalogs, provision and authorize user access, measure service usage, and instantly adapt their service offerings to embrace new and evolving market opportunities.

Sentinel Cloud Licensing must be installed on the same computer where you install Sentinel EMS. To install Sentinel Cloud Licensing, contact your Gemalto representative. You will receive an email that contains the instructions to download and install Sentinel Cloud Licensing.

Installing Sentinel LDK for Windows

Sentinel LDK installation package installs two major components:

- Sentinel EMS service
- Sentinel LDK Vendor Tools

These components can be installed on the same machine (for example, to experiment with the Demo Tutorial). However, in production environments, these components are typically installed on separate machines. (The Vendor Tools are often installed on multiple developers' machines.)



For information on supported platforms for Sentinel LDK, see the *Sentinel LDK Release Notes*.

Sentinel LDK provides an easy-to-follow wizard to guide you through the process of installing either or both of the components.

This chapter describes how to install Sentinel LDK. The following procedure are described:

- **"Installing and Configuring SQL Server Manually" on page 13**
This procedure describes how to install SQL Server and configure it for the Sentinel EMS database. (You can skip this procedure if you want to allow the Sentinel EMS installation wizard to install and set up the Sentinel EMS database.)
- **"Installing Sentinel EMS" on page 15**
This procedure describes how to install Sentinel EMS by itself or together with Sentinel LDK Vendor Tools.
- **"Installing the Sentinel LDK Vendor Tools (Standalone)" on page 23**
This procedure describes how to perform a standalone installation of Sentinel LDK Vendor Tools.
- **"Working With the Software Manager System" on page 24**
This section describes how to configure and work with the Software Manager system. This system ensures that you are always working with the latest version of Sentinel LDK.
- **"Upgrading Sentinel LDK From Earlier Versions" on page 26**
This section describes how to upgrade to the latest version of Sentinel LDK from earlier versions of Sentinel LDK, Sentinel HASP or HASP SRM.

- **"Modifying the Installed Sentinel LDK Components" on page 28**

This section describes how to add Sentinel EMS or Sentinel LDK Vendor Tools to an existing installation of Sentinel LDK.

Installing and Configuring SQL Server Manually

This section describes how to install and configure SQL Server as a standalone operation (without using the Sentinel LDK installation wizard). This is typically required:

- When you install the Sentinel EMS database on a different machine from Sentinel EMS Service.
- When you want to use a version of Microsoft SQL Server other than the default version. (By default, the Sentinel LDK installation wizard installs SQL Server 2014 Express.)

Download and install Microsoft SQL Server from:

<https://www.microsoft.com/en-in/download/details.aspx?id=42299>

For information on the installation setup types referred to in this section, see **"Types of Installation Setup" on page 18**.

Installing SQL Server

When using the **Express** setup type to install Sentinel EMS, you have the option to first install SQL Server manually on the machine where you will install Sentinel EMS.

When using the **Advanced** setup type, an SQL Server must already exist and must be active, either on the local machine or on a different machine.

If you install SQL Server manually, you can install any of the supported versions of SQL Server.

To install SQL server, use one of the methods that follow.

- Install the SQL Server instance using a command prompt (silent installation). For example: For SQL Server Express 2014 x64, use:

```
SQLEXPR_x64_ENU.exe /q /IACCEPTSQLSERVERLICENSETERMS /ACTION=Install /FEATURES=SQL  
/INSTANCENAME=EMSDATABASE /SAPWD=DBA!sa@EMSDB123 /SQLSVCSTARTUPTYPE=Automatic  
/SECURITYMODE=SQL /SQLSVCACCOUNT="NT AUTHORITY\Network Service" /TCPENABLED=1 /
```

For SQL Server Express 2014 x86, change the program name in the above command to: SQLEXPR_x86_ENU.exe.

For other versions of SQL Server, the syntax of the installation command may be different.

Installation software for SQL Server Express 2014 can be found on the Sentinel LDK Installation Drive, under: `\Windows\3rdparty\MSSQLExpress2014\`

- Install the SQL Server instance using a normal installation, and specify the following:
 1. (For the **Express** setup type) Specify the instance Name as: **EMSDATABASE**
 2. Select the mix mode installation. (Windows authentication and SQL Authentication)
- Password for the sa User
 - For the **Express** setup type: The password for the **sa** user must be: **DBA!sa@EMSDB123**
 - For the **Advanced** setup type: The password for the **sa** user should not contain any characters from a non-English language. (Numbers and special characters such as **!,@** and **#** are allowed.)

Configuring SQL Server

When you choose to install SQL Server manually for either the **Express** or **Advanced** setup type of Sentinel EMS installation, you must use the specifications described in this section.

Enable TCP/IP

1. Open SQL Server Configuration Manager (**Start > Programs > Microsoft SQL Server 2014 > SQL Server Configuration manager**)
2. In the left pane, expand the node SQL Server 2014 Network Configuration.
3. Select Protocols for EMSDATABASE. The protocol names and their status appear in the right pane. (For the **Advanced** setup type, you can use any instance name.)
4. In the right pane, double-click **TCP/IP**. The TCP/IP Properties dialog box is displayed.
5. Under the **Protocol** tab, select **Yes** from the list against the Enabled context menu.
6. Restart the SQL Server (EMDATABASE) service.

Configure the TCP/IP Port

1. Right-click **TCP/IP**. In the context menu, select **Properties**. The TCP/IP Properties dialog is displayed.
2. Select the **IP Addresses** tab.
3. Expand the **IPAll** node and do the following:
 - a. Set the **TCP Port** field to blank. The SQL Server Express will not automatically choose another port when it restarts.
 - b. Set the desired port number in the TCP Dynamic Port field (for example, 1433).
 - c. Click **OK**.
4. Restart the SQL Server (EMDATABASE) service.

Installing Sentinel EMS

Sentinel EMS is installed under Windows as a service (referred to as *Sentinel EMS Service*). An installation of Sentinel EMS provides the database server and all the required web services for your organization. Any authorized user in the organization can access the Sentinel EMS web interface or can use an application that employs Sentinel EMS Web Services.

To upgrade from an earlier version of Sentinel EMS, see "[Upgrading Sentinel LDK From Earlier Versions](#)" on page 26.

Sentinel EMS can be installed on multiple computers, either to divide the workload among different machine or to ensure high availability, or both. Similarly, Sentinel EMS can be installed separately from the Sentinel EMS database.



For more information, see "[Chapter 3: Sentinel EMS Network Configuration Options](#)" on page 29

If you experience any problems during or after Sentinel EMS installation, see "[Chapter 4: Troubleshooting for Sentinel EMS Installation](#)" on page 38.

This section lists the prerequisites for installation and provides additional information to that provided in the Installation wizard.

In this section:

- "[Infrastructure](#)" on page 16
- "[Prerequisites](#)" on page 16
- "[Types of Installation Setup](#)" on page 18
- "[Launching the Sentinel LDK Installation Wizard](#)" on page 18
- "[Configuring Sentinel EMS](#)" on page 22
- "[Accessing Sentinel EMS](#)" on page 23

Infrastructure

Sentinel EMS uses the following infrastructure software:

- Java Runtime Environment (JRE 8 Update 191)

If your machine contains earlier versions of JRE, and you manually install JRE 8 in addition to the earlier versions, the installation of Sentinel EMS will fail.



- If you have manually installed JRE 8, uninstall the earlier versions of JRE before you install Sentinel EMS.
- If you plan to allow the Sentinel LDK Installation Wizard to install JRE 8, it is not necessary to uninstall the earlier versions of JRE.

- Microsoft .NET Framework 3.5 and 4.0

Microsoft SQL Server 2014 Express Edition requires both Framework 3.5 and Framework 4.0.

If Framework 3.5 is not enabled on your machine:



- The Installer attempts to install Framework 3.5. This requires internet connectivity.
- An alternative method to enable Framework 3.5 on your machine is to follow the instructions provided on the Web pages that follow.

For Windows 7, 8.1,10:

<https://docs.microsoft.com/en-us/dotnet/framework/install/dotnet-35-windows-10>

For Windows Servers:

https://docs.microsoft.com/en-us/windows-server/administration/server-manager/install-or-uninstall-roles-role-services-or-features#BKMK_arfw

- MS SQL Server 2014 Express Edition
- Tomcat 8.5.34

These will be installed by the Sentinel LDK installation procedure.

(If you choose to install MS SQL independently, you can use any of the supported versions of MS SQL.)

Prerequisites

Installation of Sentinel EMS requires the following:

Hardware

- At least 15 GB free disk space
- At least 4 GB RAM
- At least Intel Core™ i5 (latest generation or higher iX generation) processor

The URL on which Sentinel EMS will be hosted should contain only characters that satisfy the RFC 952 standard (that is: A-Z, 0-9, minus sign and period).



Sentinel EMS Service must be installed on a machine whose computer name does not exceed 15 characters.

Software

For the list of supported operating systems, refer to the *Sentinel LDK Release Notes*.

SSL Certificate

Sentinel EMS can be configured to use either the HTTP or HTTPS protocol for communication between the Sentinel EMS web server and the web browsers used to access Sentinel EMS.

The HTTPS protocol encrypts the communication between the server and web browsers. However:

- When Sentinel EMS is configured to use HTTPS, you must use a 32-bit version of Internet Explorer (version 10 or version 11) for any action that accesses a protection key (such as burn, recycle, check in key, check in c2v, or online activation).

With HTTPS, functions such as Check in Key, Check in C2V, and Recycle Keys continue to be accessed with the help of Java-based applets. Each time you access one of these functions, an applet window opens to provide the required functionality.

- The communication with HTTPS is somewhat slower than with HTTP.
- To work with HTTPS, you may want to purchase an SSL (Secure Sockets Layer) certificate from a certificate authority. An SSL certificate is a digital certificate that authenticates the identity of a web site to visiting web browsers and encrypts information for the server using SSL technology. (The Sentinel EMS installation process automatically generates an SSL certificate. However, each user's web browser will generate a security exception with this certificate each time the user logs in.)

To install an SSL certificate that you obtained from a certificate authority, see the *Sentinel EMS Configuration Guide* (described in "[Configuring Sentinel EMS](#)" on page 22).

By default, Sentinel EMS is configured during installation to use HTTP. You can change this setting during installation or afterwards to use HTTPS. To change this setting after Sentinel EMS has been installed, see "[Configuring Sentinel EMS](#)" on page 22.

For more information on HTTPS and SSL certificates, you can access the web sites listed below. (These links were valid at the time this book was released.)

<http://info.ssl.com/article.aspx?id=10694>

<https://www.thawte.com/resources/ssl-information-center/get-started-with-ssl/index.html>

<http://www.verisign.com/ssl/buy-ssl-certificates/index.html>

http://en.wikipedia.org/wiki/Certificate_authority

Types of Installation Setup

The Sentinel EMS installation wizard offers two types of installation setup:

Express

This setup type searches for the Sentinel EMS database and SQL Server on the local machine. If they are present, the installation wizard connects automatically to the database. If they are not present, the installation wizard installs the Sentinel EMS database and SQL Server automatically on the local machine.

No configuration screens are displayed during the installation process. If SQL Server is installed by the wizard, the SQL Server instance has the following user name and password:

- User Name: **sa**
- Password: **DBA!sa@EMSDB123**

Advanced

For this setup type, an SQL Server must already exist and must be active, either on the local machine or on a different machine. The installation wizard can either create a new Sentinel EMS database schema in SQL Server, or it can connect to an existing Sentinel EMS database.

With this setup type, you can also choose where to install Sentinel EMS and whether to use SSL security for Sentinel EMS web access.



To create the Sentinel EMS database yourself, see "[Installing and Configuring SQL Server Manually](#)" on page 13.

Launching the Sentinel LDK Installation Wizard

The Sentinel LDK Installation Wizard is launched from the Sentinel LDK Drive. The Installation wizard enables you to create a default installation with basic configuration.

To run the Sentinel LDK Installation Wizard:

1. Log in to an account that has full administrator rights on the machine.
2. Close all open applications (including web browsers) on the machine where you will install Sentinel EMS.



Before starting the Sentinel LDK Installation Wizard, ensure that no Windows update installation or any other **msi** installation is in progress.

3. Connect the Sentinel LDK Installation Drive to your machine.
4. Depending on how your computer is set up, a dialog box may be displayed. If it does, select **Open folder to view files**.
5. Browse to the **Windows** folder on the Sentinel LDK Installation Drive. Double-click **setup.exe**.


6. Click **Start the Sentinel LDK Setup**. The Sentinel LDK Installation Wizard welcome window is displayed.
7. Click **Next**. You are asked to accept the license agreement. Read the license agreement carefully.
8. Accept the agreement and click **Next**. You are asked to choose which basic components to install
9. Ensure that the check box for **Sentinel EMS** is selected. If you are installing Vendor Tools on the same machine, ensure that the check box for **Sentinel Vendor Suite** is also selected. Click **Next**.

The following screen is displayed:



10. Select one of the following, and then click **Next**:
 - **Express**. The installation wizard complete the installation of Sentinel EMS using the defaults described earlier. A minimal amount of additional user input is required.
If you selected the check box for Sentinel Vendor Suite, then Sentinel LDK Vendor Tools are also installed.
 - **Advanced**. The installation wizard will prompt you for information on setting up the Sentinel EMS database and SSL security. (Ensure that Microsoft SQL Server for the database is active when you run the installation wizard.)

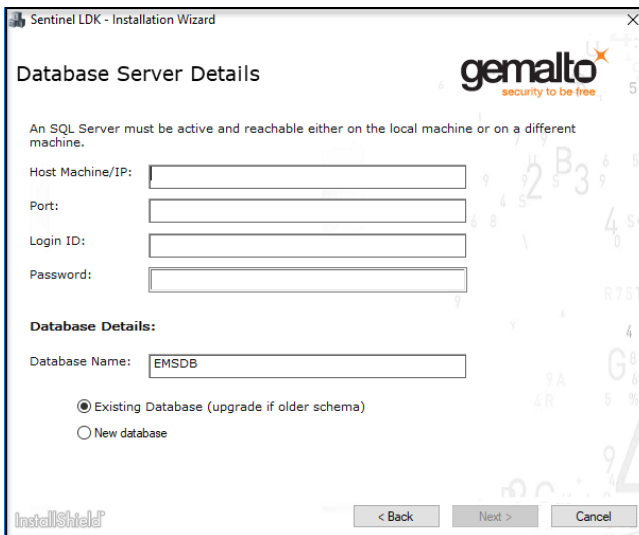
For more information, see [Types of Installation Setup](#).

 During the installation process, you will be notified if Business Studio Server is detected on the machine. If this occurs, then after you complete the installation process, refer to the appropriate Sentinel LDK migration guide for migrating from Business Studio Server.

The Destination Folder screen is displayed.

11. If you want, change the destination folder for Sentinel LDK.
12. Click **Install**. Installation proceeds. This requires several minutes. Accept all defaults during installation.
13. If you selected the **Express** setup type, continue with [Step 15](#).

The following screen is displayed:



14. Use this screen to configure the Sentinel EMS database. Enter the details for the existing SQL Server instance that will be used for the Sentinel EMS database.

Select one of the following options:

- **Existing database.** The installation wizard configures Sentinel EMS to use the existing Sentinel EMS database whose details you specified.
- **New database.** The installation wizard creates a new Sentinel EMS database in the SQL Server instance that you specified above.

When you create a new database, you can select or clear the option **Fill Demo Data**. (The option is selected by default.) If the option is selected, the installation wizard adds demo information for the DEMOMA Batch Code to the Sentinel EMS database. Each Sentinel EMS user that is assigned the DEMOMA Batch Code can view and generate reports based on the demo information.

15. Click **Next**. The following screen is displayed:



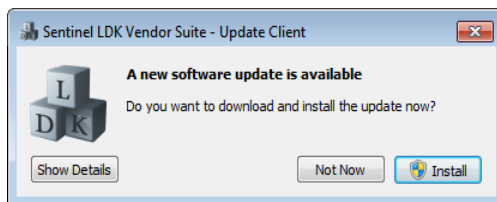
16. Use this screen as follows:

- You can change the HTTP port for accessing Sentinel EMS.
- If you want to use the HTTPS protocol, select the **Use SSL** check box. To use HTTP protocol, leave the check box clear.

17. Click **Next**.

18. Installation of Sentinel EMS continues to completion.

After the Installation Wizard has completed, Sentinel LDK Software Manager checks automatically to determine if a later version of any of the Sentinel LDK software is available. If a later version is found, a message similar to the following is displayed:



You can click **Install** to install the update at this point. For more information regarding this message, see "[Working With the Software Manager System](#)" on page 24.

19. When the installation process has completed, connect the Sentinel Master key to the machine on which the Sentinel EMS Service is installed.



If you need to re-install Sentinel EMS for any reason, you must first remove the existing Sentinel EMS program.

Removing Sentinel EMS *does not* delete the existing database.

Configuring Sentinel EMS

You can perform configuration of Sentinel EMS from the EMS Administration Console. Among the facilities that you may want to configure for Sentinel EMS are:

- SMTP mail server to be used by Sentinel EMS to send various types of email notifications.
- Configuring Sentinel EMS to use the HTTPS protocol (if this was not done during installation of Sentinel EMS).
- Installation of an SSL certificate for HTTPS

These and many other topics are described in the Sentinel EMS Configuration Guide (described below).

To access the EMS Administration Console:

1. From the Start menu, select: **All Programs > Gemalto Sentinel > Sentinel EMS > EMS Administration Console**
2. At the login screen, enter the user name `admin` and the default password `admin` (or enter the new password that you specified below for the EMS Administration account).

To change the password for the EMS Administration account:

1. Modify the password in the file:
`%EMS_HOME%\EMSServer\webapps\emsConfig\WEB-INF\classes\configuration.xml`
2. Restart the EMS Service.

To access the EMS Administration Console documentation (*Sentinel EMS Configuration Guide*):

1. From the Start menu, select: **All Programs > Gemalto Sentinel > Sentinel EMS > Documentation**
2. From the displayed menu, select the Configuration Guide.

Requirement for Sentinel LDK Run-time Environment

In the past, the following activities on a Windows machine were handled in Sentinel EMS by using Java applets in the Web browser:

- Check in HL (HASP configuration) keys
- Burn HL keys
- Recycle HL (HASP configuration) keys
- Perform online activation of SL keys

Most Web browsers no longer support Java applets. When a user's Web browser does not support Java applets, Sentinel LDK Run-time Environment is required on the machine in order to perform any of these activities.

When a user (vendor or customer) attempts to perform any of these activities in a Web browser, Sentinel EMS determines whether the required version of Sentinel LDK Run-time Environment is present and correctly configured on the user's machine. If not, the user is provided with a link to

download a special installer that will install and configure the Run-time Environment. The user simply runs the provided installer. No other action is required by the user.

This Run-time Environment installer is generated automatically when you introduce your Sentinel Master key to Sentinel EMS or when you upgrade to a new version of Sentinel EMS.

For more information, see "[Chapter 5: Introducing Your Sentinel Vendor Keys to Sentinel LDK](#)" on page 43.

Accessing Sentinel EMS

After you have completed installing the Sentinel EMS Service, you will want to access the applications. The default user name and password for the EMS Superuser are **admin**.



- It is highly recommended that you change the default password for the EMS Superuser **admin** account as soon as possible. You can change this password from the main screen of the Sentinel EMS web interface.
- The EMS Administration account (used to access Sentinel EMS Administration Console) is different from the EMS Superuser account, even though both accounts have the user name **admin**. When you change the password for one of these accounts, the password for the other account is not affected.

After completing the installation, launch Sentinel Vendor Suite as follows:

1. If you are not certain that the Tomcat service is active: From the Start menu, select **All Programs > Gemalto Sentinel > Sentinel EMS > Start EMS Service**.
2. From the Start menu, select **Programs > Gemalto Sentinel > Sentinel LDK > Vendor Suite**. The Sentinel Vendor Suite program selection screen is displayed. You can access the primary Vendor Suite applications from this screen.

Installing the Sentinel LDK Vendor Tools (Standalone)

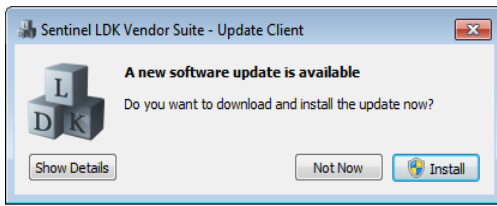
If you did not install Sentinel LDK Vendor Tools together with Sentinel EMS, You can follow the instructions below to install Sentinel LDK Vendor Tools on a machine with a Windows operating system.

To install Sentinel LDK Vendor Tools:

1. Ensure that you do not have any Sentinel Vendor keys or Sentinel HL keys connected to your machine.
2. Connect the Sentinel LDK Installation Drive to your machine.
3. Depending on how your computer is set up, a dialog box may be displayed. If it does, select **Open folder to view files**.
4. Browse to the **Windows** folder on the Sentinel LDK Installation Drive. Double-click **setup.exe**.
5. Click **Start the Sentinel LDK Setup**. The Sentinel LDK Installation Wizard welcome window is displayed.

6. Click **Next**. You are asked to accept the license agreement.
7. Accept the agreement and click **Next**. You are asked to choose which basic components to install
8. Ensure that only **Sentinel Vendor Suite** is selected. Click **Next**.
9. Follow the window instructions to install Sentinel Vendor Suite.

After the Installation Wizard has completed, Sentinel LDK Software Manager checks automatically to determine if a later version of any of the Sentinel LDK software is available. If a later version is found, a message similar to the following is displayed:



10. You can click **Install** to install the update at this point. For more information regarding this message, see "[Working With the Software Manager System](#)" on page 24.
11. When the installation process is completed: If you are using Sentinel HL keys, connect a key.



Sentinel LDK Run-time Environment is installed automatically when you install Sentinel LDK according to the procedure above.

Default Sentinel LDK User Name and Password

The default login user name and password for Sentinel EMS and Sentinel Vendor Tool applications are **admin/admin**.

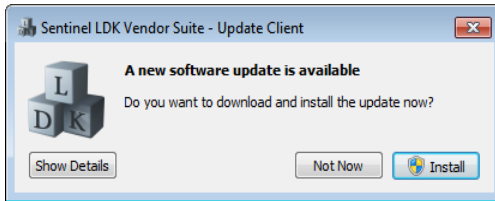
Working With the Software Manager System

On the Windows machine where Sentinel EMS or Sentinel Vendor Suite is installed, Sentinel LDK provides a mechanism that checks to determine whether a later version of the software is available from Gemalto servers. This system helps to ensure that you are aware of important updates and that you are always working with the latest version of Sentinel LDK.

An update may consist of a new version of Sentinel LDK or an update to individual components or documents.

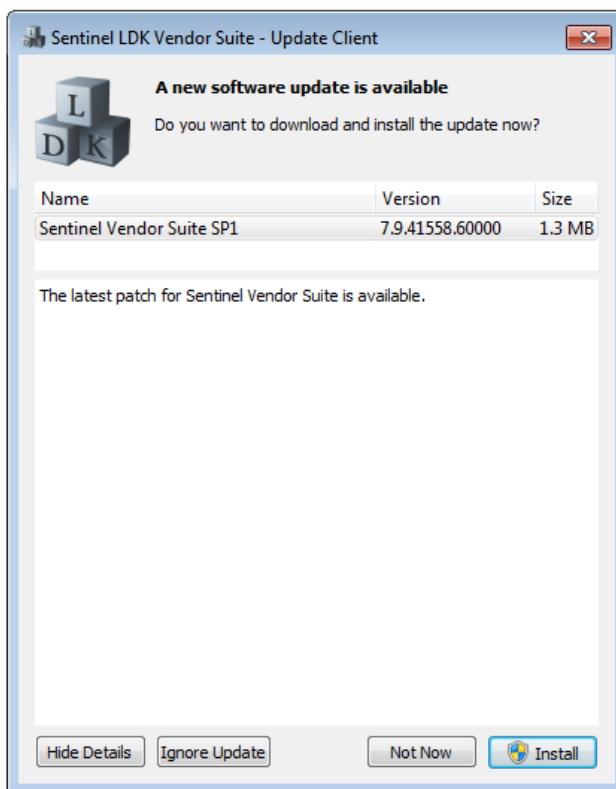
Each day, the Software Manager system checks for the availability of any updates to the installed components of Sentinel LDK. The check takes place at the same time of day that the components were installed. Only one update notification is delivered on any given day.

If the Software Manager system determines that an update is available, a message window similar to the following is displayed:



The title of the window identifies the component of Sentinel LDK to which the update applies, followed by "Update Client".

For more information regarding the update, click **Show Details**. A window similar to the following is displayed:



This window lists details of the update.

At this point, you can choose to:

- Click **Install** to download and install the updated version.



Before you click this option, be sure to close any active Sentinel LDK applications.

- Click **Not Now** (or just close the window) to postpone the update. The notification will be displayed again the next day.
- Click **Ignore Update**. You will not receive any more notifications regarding this specific update.

Upgrading Sentinel LDK From Earlier Versions

This section describes how to upgrade to Sentinel LDK v.7.9 from an earlier version of Sentinel LDK, Sentinel HASP or HASP SRM.

Note the following issues:

- When upgrading from Sentinel LDK v.7.3 through v.7.8 to Sentinel LDK v.7.9, all non-English locales of Customer contacts and Channel Partner contacts in Sentinel EMS are converted to the English locale. A solution for this issue is provided in the technical note available [here](#).



Note: You can ignore this issue if all of your Customer contacts and Channel Partner Contacts are set up to use the English locale or if you are not upgrading Sentinel EMS.

- The procedure for upgrading to Sentinel LDK v.7.9 has only been tested for Sentinel LDK versions 7.6 through 7.8.

If you plan to upgrade from an earlier version of Sentinel LDK, please contact Technical Support to validate the upgrade scenario. (This applies whether you are upgrading Sentinel LDK Vendor Tools, Sentinel EMS, or both.)

Upgrading From Sentinel HASP or From HASP SRM

Sentinel EMS can be installed on the same machine as Business Studio Server. The two products can coexist since each product uses a different database.

To upgrade from Business Studio Server in Sentinel HASP or HASP SRM to Sentinel EMS, refer to the the appropriate Sentinel LDK migration guide.

Upgrading From Sentinel LDK v.6.x or v.7.x

If Sentinel EMS or Sentinel Vendor Suite from Sentinel LDK v.6.x or v.7.x has been installed on your machine, use the procedures below to upgrade to Sentinel LDK v.7.9.

Upgrading Sentinel EMS

To upgrade from Sentinel EMS v.2.1 or later:

1. Back up the Sentinel EMS database.
2. Install Sentinel EMS as described in this chapter.

The installation wizard automatically detects the existence of an earlier version of Sentinel EMS and offers you the option to upgrade to the latest version.



After completion of the installation procedure, be sure to re-introduce your Master key and Developer key.



The Sentinel EMS user interface has been extensively enhanced in this release. To avoid possible consistency issues, Gemalto recommends that you clear your web browser cache before you start working with the current version of Sentinel EMS.

Upgrading Vendor Suite

To upgrade from any earlier version of the Vendor Suite, no special action is required. The Sentinel LDK installation wizard will automatically uninstall and reinstall the Vendor Suite.

Modifying the Sentinel EMS Database for Advanced Channel Partner Functionality

This topic is relevant if you have recently added or plan to add the Channel Partner module to your Sentinel Master key.



If you have not created any channel partners in Sentinel EMS, no special actions are required before you add the Channel Partner module. You can ignore this topic.

Until you add the Channel Partner module to your Sentinel Master key, Sentinel EMS allows you to associate the entitlements for a given customer with different channel partners. Once the Channel Partner module is added, each customer can only be associated with a single channel partner.

Before you can work effectively with the advanced Channel Partner functionality provided by the module, a script must be run that modifies the Sentinel EMS database to create direct links between existing channel partners and their customers. The script ensures that no customers are associated with multiple channel partners. If a customer is associated with multiple channel partners, the script links the customer to only one of the channel partners. A log file lists the customers for whom multiple channel partners were found.

You must work with your channel partners to resolve these conflicts and ensure that each customer is connected to a single channel partner. If necessary, resolve conflicts by creating new customers in Sentinel EMS.

The script to modify the Sentinel EMS database is executed using the following methods:

- During the Sentinel EMS upgrade procedure, the Installer automatically executes the script. Any conflicts that are found are recorded in the Installer log at `%SystemDrive%\EMS_Log\emsInstaller.log`.
- Click the **Sync Data for Channel Partner Module** button in the Sentinel EMS Administration Portal to run the script. Any conflicts that are found are recorded in the configuration log at `%ProgramFiles(x86)\Gemalto Sentinel\Sentinel EMS\EMSServer\webapps\ems\log\emsConfig.log`.

The script can be executed multiple times.

You can add the Channel Partner module to your Master key before or after the script is executed. However, you should plan to add the module to your Master key as close as possible to the time when the script is executed (using either method).

Resolving Sentinel EMS Upgrade Issues



This topic is applicable when you upgrade from Sentinel EMS v.6.3 or later to v.7.9.

The Sentinel EMS installation procedure automatically merges components that you have customized in Sentinel EMS. In addition, all configuration changes that you performed in the existing Sentinel EMS are backed up under `%EMS_HOME%\Backup`. If you find any differences after you upgrade to Sentinel EMS v.7.9, you can manually merge the conflicting files.

To resolve any differences that you may find after upgrade, you can map the backup and current locations to manually merge the files. The following table provides the details of the components that are placed in the backup location.

Customizable Component	Backup Location %EMS_HOME%\Backup\...	Original Location %EMS_HOME%\EMSServer\ webapps\...
Template Files (TPLs)		
.TPL files	WEB-INF\classes	ems\WEB-INF\classes
Themes and Languages		
Themes	themes	ems\themes
Images	themes\blackGolden\images	ems\themes\ blackGolden\images
Language (messages_[language_code].properties)	WEB-INF\classes	ems\WEB-INF\classes
Samples		
emsWSDemo	emsWSDemo	emsWSDemo
Others		
ems.properties	WEB-INF\classes	ems\WEB-INF\classes
message.properties	WEB-INF\classes	ems\WEB-INF\classes

Modifying the Installed Sentinel LDK Components

After installing one of the two major Sentinel LDK components, you may want to add the second component on the same machine. For example, you may have installed only Sentinel LDK Vendor Tools, and now you want to add Sentinel EMS on the same machine (or vice versa).

To add the second component on the same machine as the first component, run the installation procedure from the Sentinel LDK Installation Drive and select the **Modify** option. *Do not* use the **Change > Modify** option that is available from the Programs and Features window in the Control Panel.

Sentinel EMS Network Configuration Options

This chapter describes different configurations for installing Sentinel EMS on multiple machines in a network environment.

The following configurations are described:

- **"Standard Production Configuration for Sentinel EMS " on page 30**
Installation of Sentinel EMS Service and the Sentinel EMS database on two separate machines
- **"Sentinel EMS Web Portals on Separate Servers" on page 31**
Installation of the Sentinel EMS Vendor web portal and the Customer web portal on two separate machines. The Sentinel EMS database is installed together with the Vendor web portal or on a third machine.
- **"Redundant Installation of Sentinel EMS in a Network Environment" on page 34**
Installation of redundant Sentinel EMS Services on separate machines with load sharing. The Sentinel EMS database is installed on a separate machine or cluster.

Overview

Sentinel EMS is a web-based multi-tier application. It has two primary components: Sentinel EMS Service and the Sentinel EMS database. These components can be installed on a single machine or separate machine (server).

The web application front in Sentinel EMS Service provides two portals, one for software vendor users and another for customers (primarily for activation purposes).

Sentinel EMS Service can be installed and configured for each portal on a separate machine. (Note, however, that this is not a typical configuration for web applications.)

Based on the vendor requirements, a number of security provision are possible for Sentinel EMS installation. Instances of Sentinel EMS are usually installed on a DMZ (demilitarized zone) using an external firewall that controls external access and an internal firewall that allows access to the Sentinel EMS database.

Sentinel EMS listens on a TCP port for incoming requests. If the installation is configured for SSL, the requests are encrypted using the built-in SSL feature. Sentinel EMS then communicates with the Sentinel EMS database (a single database for the entire system) to process the requests.

This chapter describes the considerations and procedures for installing the components of Sentinel EMS. It also describes how to install in a local or wide network environment, creating a redundant system. Creation of redundancy in the system is not necessary; however, it is recommended.

Gemalto recommends that:



- You frequently back up your Sentinel EMS database to protect your data.
- You add adequate security measure including SSL communication link and a firewall to protect your data and application.

Standard Production Configuration for Sentinel EMS

Sentinel EMS Service and the SQL server for the Sentinel EMS database are each installed on a separate machine. Sentinel EMS Service is protected by an external firewall.

Installing Sentinel EMS

1. On one machine, create an SQL database with a user name and password. The user must have SQL sysadmin or dbcreator privileges for this database.
For more information, see "[Installing and Configuring SQL Server Manually](#)" on page 13.
2. On a second machine, run the Sentinel EMS installation procedure. In the procedure, ensure the following:
 - a. Select only **Sentinel EMS** for installation. It is not necessary to install **Sentinel Vendor Suite**.
 - b. Select the **Advanced** setup type.
 - c. In the Sentinel EMS Database Configuration screen, specify the information for the SQL database you created earlier.
Select **Use existing database**.

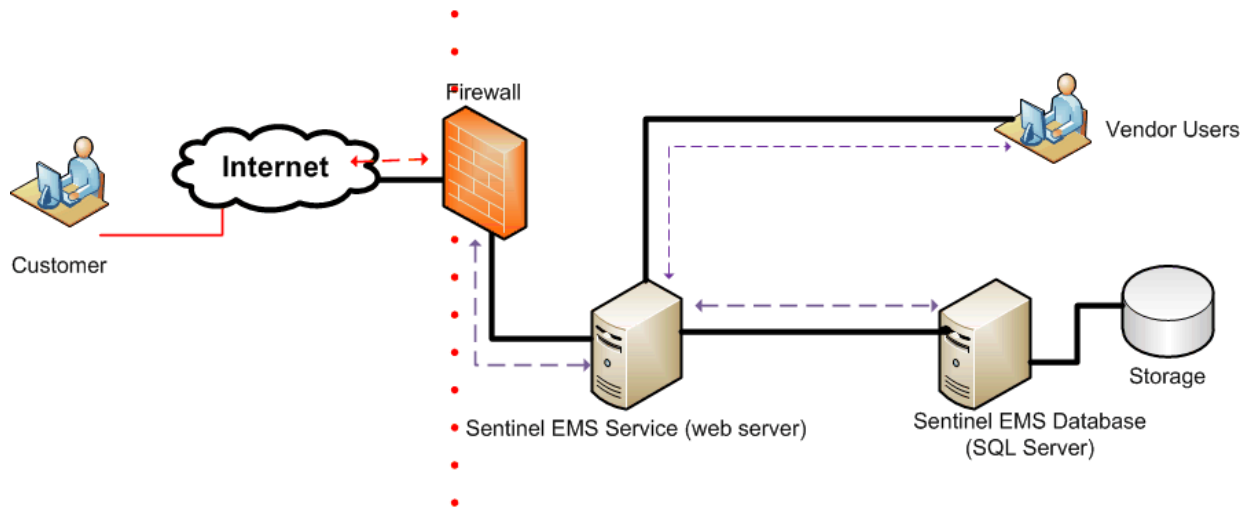
The Sentinel EMS installation procedure is described in "[Installing Sentinel EMS](#)" on page 15.

3. Complete the installation wizard.
Gemalto recommends that you specify to use the SSL communication protocol.

Configuring the Firewall

An external firewall should be configured to accept requests and to forward only the valid request to Sentinel EMS.

You can set firewall rules that enables your customers to access Sentinel EMS, but does not allow them to access the SQL database server, as shown in the diagram that follows.



Main Points of the Standard Production Configuration

- End users (customers) and vendor employees have access to a common Application server.
- Differentiation is by authentication and authorization (access rights).
- External end users can access only a selected URL.
- The Sentinel EMS database can be accessed only by the internal network of the vendor.

Configuration Summary

- Deploy Sentinel EMS Service and MS SQL Server for the Sentinel EMS database on two separate machines.
- Use an external firewall. Configure the firewall to allow only for the customer URL (set of URL expose only for Customer access).
- Place the web server (Sentinel EMS Service with Tomcat) and the SQL Server inside the firewall.
- The Sentinel Master key must be attached to the machine where Sentinel EMS Service is installed.

Sentinel EMS Web Portals on Separate Servers

The Sentinel EMS web front consists of two portals:

- For vendor users
- For customers (primarily used for activation)

These Sentinel EMS portals are usually installed on a single machine (as described in the previous section). However, you can choose to configure Sentinel EMS so that each portal and the Sentinel EMS database are all installed on separate machines.

Each server listens on a TCP port for incoming requests. The requests are encrypted using the SSL feature if configured accordingly. Each server then communicates with the Sentinel EMS database (a single database for the entire system) to process the requests.

Installing Sentinel EMS

1. On one machine, create an SQL database with a user name and password. The user must have SQL sysadmin or dbcreator privileges for this database.
For more information, see "[Installing and Configuring SQL Server Manually](#)" on page 13.
2. For the Vendor portal: On a second machine (or the same machine), run the Sentinel EMS installation procedure. In the procedure, ensure the following:
 - a. Select only **Sentinel EMS** for installation. It is not necessary to install **Sentinel Vendor Suite**.
 - b. Select the **Advanced** setup type.
 - c. In the Sentinel EMS Database Configuration screen, specify the information for the SQL database you created earlier.
Select **Use existing database**.

The Sentinel EMS installation procedure is described in "[Installing Sentinel EMS](#)" on page 15.

3. Complete the installation wizard.
Gemalto recommends that you specify to use the SSL communication protocol.
4. For the Customer portal: On a separate machine, run the Sentinel EMS installation procedure again. In the procedure, ensure the following:
 - a. Select only **Sentinel EMS** for installation. It is not necessary to install **Sentinel Vendor Suite**.
 - b. Select the **Advanced** setup type.
 - c. In the Sentinel EMS Database Configuration screen, specify the information for the SQL database you created earlier.
Select **Use existing database**.
5. Complete the installation wizard.
Gemalto recommends that you specify to use the SSL communication protocol.
No additional configuration is required.
6. On the Customer portal machine: configure Sentinel EMS so that the installation can only be accessed using a customer-related URL (requests which are only applicable to the Customer portal). This configuration is a manual process. Contact Gemalto Professional Services for assistance to perform the required configuration.

Configuring the Firewalls

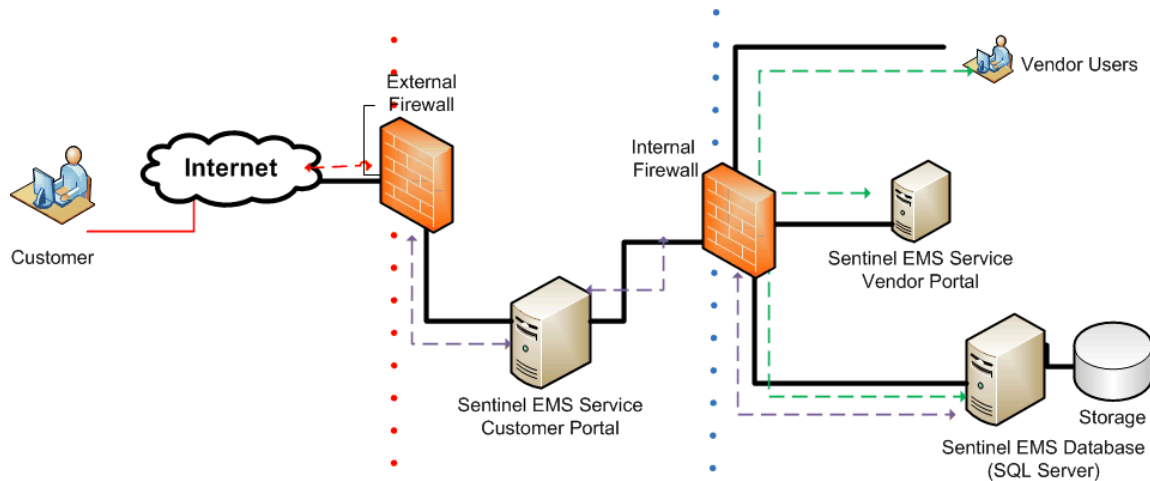
The external firewall should be configured to accept only requests that are related to the Customer portal. The requests should be forwarded to the instance of Sentinel EMS Service that acts as the Customer portal. Sentinel EMS Service then accesses the remote Sentinel EMS database through the internal firewall.

The Sentinel EMS Vendor portal and the Sentinel EMS database could be installed on a single machine or on two separate machine inside the internal fire wall.

External access to the Vendor portal should be blocked by the external firewall.

All access to the Sentinel EMS database and the Vendor portal should be only through the internal firewall.

The diagram that follows shows the configuration described in this section.



Main Points of the Separate Portals Configuration

- End users (customers) and vendor employees access Sentinel EMS on different application servers.
- Differentiation is by authentication and authorization (access rights).
- External end users can access only the Customer portal of Sentinel EMS using a selected URL.
- Internal vendor users can access the Vendor portal of Sentinel EMS.
- The Sentinel EMS database can be accessed only by the internal network of the vendor.

Configuration Summary

- Deploy Sentinel EMS Service as a Vendor portal and as a Customer portal on two separate machine
- Deploy MS SQL Server for the Sentinel EMS database inside the internal firewall, on a separate machine or on the same machine as the Vendor portal.
- Use two proxies (internal and external).
- Configure the external proxy to allow only for the customer URL (set of URLs exposed only for Customer access), to allow access to the Customer portal.
- Set up Sentinel EMS Service for the Customer portal to access only the Sentinel EMS database and only through the internal firewall.
- Place the instance of Sentinel EMS Service for the Vendor portal inside the internal firewall

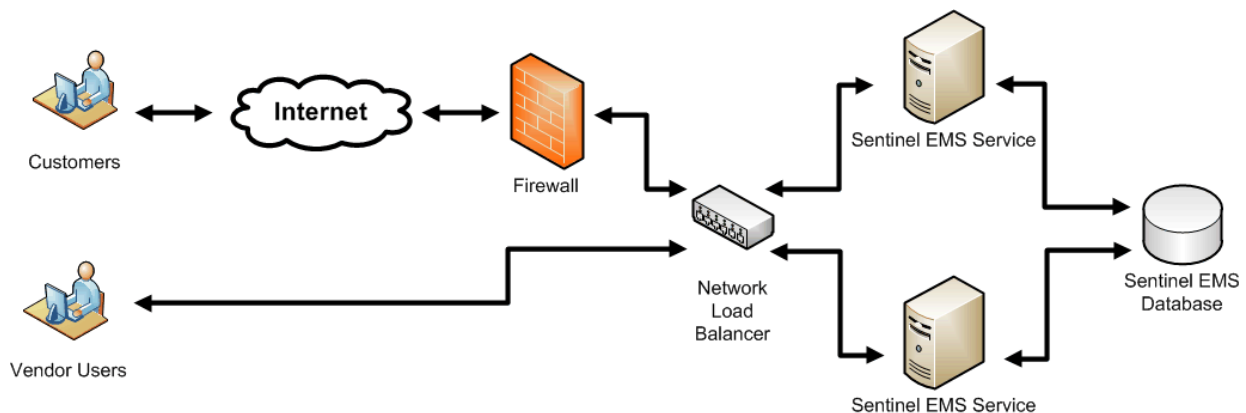
- Place the SQL server behind the internal proxy.
- A Sentinel Master key must be attached to each machine where Sentinel EMS Service is installed.

Redundant Installation of Sentinel EMS in a Network Environment

This section describes the procedure for installing Sentinel EMS in a network environment, including redundancy to enable the server to remain online in the event that a machine becomes unavailable. It is recommended that you provide redundancy for Sentinel EMS Service to ensure uninterrupted availability for end users who must activate their software.

Understanding Redundant Networks

Redundancy eliminates a single point of failure in a network. The following graphic illustrates a simple redundancy setup installation for Sentinel EMS Service when a single Sentinel EMS database exists.



1. When two or more server machines are utilized in order to provide redundancy, each machine runs an identical instance of Sentinel EMS Service, and each server machine accesses the same database. Each machine has its own IP address.
2. A load balancer is installed between the servers and the Sentinel EMS applications and end-user applications. (An external customer-facing firewall can be used to protect server resources.) The load balancer is configured with the IP address of the actual servers. The load balancer has an additional—virtual—IP address, which is exposed to the network users. A DNS entry must point to the virtual IP address for the load balancer.
3. When Sentinel EMS applications or end-user applications need to access Sentinel EMS Service, they send a request to the DNS name. The load balancer directs the requests to the appropriate instance of Sentinel EMS Service and channels the responses back to the user.



It is highly recommended that you always use a DNS name. This ensures that, in the event a server IP address changes, your software will still be able to access Sentinel EMS Service, without the need to redistribute updates to your software.

Minimum Network Installation Requirements When Using Redundancy

In addition to the prerequisites listed in the previous chapter, the following components and information are required in order to install Sentinel EMS Service in a network environment that includes redundancy:

- Two or more servers to run Sentinel EMS components
- Sentinel Master keys for each Batch Code for every server



Ensure that you have a Sentinel Master key with your Sentinel LDK licenses for each Activation component server in the network.

- Network load balancer with TCP functionality. It is recommended that you install load balancers in a cluster configuration.
- Firewall with at least 3 IP subnets. The subnets are required for:
 - the Internet
 - the SQL database
 - the load balancers

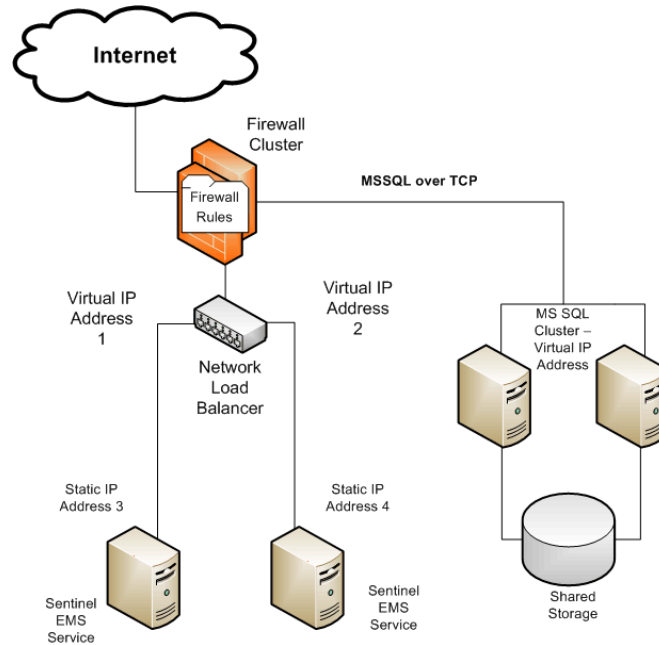
It is recommended that you install the firewall in a cluster configuration.

- MS SQL cluster. Only a single database is required. If you have an existing SQL server, that database can be used. The sysadmin (sa) account of the existing database is required.
- IP addresses for use as the virtual IP address on the load balancer
- Static/NAT IP addresses of each of the servers

Network Environment Installation

This section discusses the procedure for installing Sentinel EMS Service on multiple machines in a network.

The following diagram illustrates a network topology consisting of separate servers for the Sentinel EMS Service component and for redundancy.



Server security is provided by setting firewall rules that control who can access the various servers on which Sentinel EMS Service is installed. In order to provide security in the illustrated scenario, you must specify that:

1. Both external (customers) and internal (vendor) users can access Virtual IP addresses 1 and 2, which provide access to the instances of Sentinel EMS Service.
2. Both instances of Sentinel EMS Service can access the SQL server and Sentinel EMS database.

To install Sentinel EMS in a network environment:

1. Create an SQL database with a user name and password. The user must have SQL sysadmin or dbcreator privileges for this database.
For more information, see ["Installing and Configuring SQL Server Manually"](#) on page 13.
2. On each of the Sentinel EMS machines, run the Sentinel EMS installation procedure. In the procedure, ensure the following:
 - a. Select only **Sentinel EMS** for installation. Do not select **Sentinel Vendor Suite**.
 - b. Select the **Advanced** setup type.
 - c. In the Sentinel EMS Database Configuration screen, specify the information for the SQL database you created earlier:
 - On the first machine, select **Create new database**.
 - On the second machine, select **Use existing database**.
3. On each of the Sentinel EMS machines, configure Tomcat XML files as described in ["Appendix B: Configuring Tomcat for Redundancy"](#) on page 59.

4. Configure the load balancer to balance SSL (TCP 443) traffic between the servers, and define a DNS entry for the virtual IP address.
5. Using a PC on the Internet, test that the installation is correct using one of the following methods:
 - a. In your browser, enter the following URL:
https://<SERVER>:<PORT>/HASPLgin?test.

*The test will return a **Database connection: PASSED** message.*
 - b. Launch Sentinel EMS and attempt to log in. The default login user name and password is **admin**.



To ensure your data is secure, change the default password as soon as possible.

Troubleshooting for Sentinel EMS Installation

This chapter describes issues that might occur during or after installation of Sentinel EMS and provides possible solutions.

In this chapter:

- "Problems During Installation" on page 38
- "Problems After Installation" on page 40
- "Frequently-asked Questions" on page 41

Problems During Installation

This section describes problems that may occur during the installation process for Sentinel EMS.

Issue: During Sentinel EMS installation, the following message is displayed:

Kindly Start the Service -SQLServer(EMSDATABASE) and then click OK

When you click **OK**, the installation fails with multiple errors.

Solution:

Your machine contains earlier versions of JRE, and you manually installed JRE 8 in addition to the earlier versions.

Uninstall the earlier versions of JRE, and then rerun the Sentinel LDK Installation Wizard to install Sentinel EMS.

Issue: During Sentinel EMS installation, the following message is displayed:



Solution:

Check which version of Windows Installer (from Microsoft) is present on your machine. (From the Start menu, Click **Run**. In the Open Box, type `msiexec.exe` and click **OK**. The Windows Installer screen is displayed. The version appears on the first line of the screen.)

If the version on your machine is earlier than 4.5, download and install version 4.5 from the Microsoft web site.

Issue: The Sentinel EMS installer detects an earlier version and attempts to remove it, but fails.

Do one of the following:

- If Sentinel EMS is visible in the **Programs and Features** screen (which you can access from the Control Panel), remove it from there. Restart the installation.
- If Sentinel EMS is not visible in the **Programs and Features** screen or if it is not successfully uninstalled by removing it:
 1. From the Windows Start menu, select **Run** and enter `regedit`. The Registry Editor is displayed.
 2. Locate and delete the following entry:
 - 32-bit machine:
HKEY_LOCAL_MACHINE\SOFTWARE\SafeNet\Sentinel EMS
 - 64-bit machine:
HKEY_LOCAL_MACHINE\Software\Wow6432Node\Safenet\Sentinel EMS
 3. Restart the installation.

Issue: Installation of Sentinel EMS failed.**Solution:**

Do one or more of the following:

- Check if the operating system on the machine is supported for Sentinel EMS installation.
- Check log files at `%Systemdrive%\EMS_log\` to see if any issues are listed.
- Make a note of the step at which the installation failed. Report the issue to Technical Support.

Issue: Miscellaneous problems**Previous uncompleted installation of Sentinel EMS**

The machine on which Sentinel EMS is being installed may have some previous incomplete installation / removal of software in an incomplete state.

This could be due to any software, including Sentinel EMS.

Solution: Boot your system before trying to install Sentinel EMS.

Problems After Installation

This section describes problems that may occur after Sentinel EMS has been successfully installed.

Sentinel EMS stopped working after Java was upgraded automatically

With the auto-upgrade utility of Java, Java could be upgraded to the latest version. This sometimes impacts the JRE path that is used by Sentinel EMS.

Check if the system variable JRE_HOME is pointing correctly to the JRE installation.

For Apache Tomcat x64 or for an x64 machine, JRE_HOME must point to an x64 JRE installation. For Apache Tomcat x32, JRE_HOME must point to an x32 JRE installation.

To check system variables, go to **Control Panel > System > Advanced > Environment Variables**.

Sentinel EMS applets do not function

The following applets in Sentinel EMS will not work with a 64-bit Web browser:

- Check In Key
- Recycle Key
- Burn Key
- Online Activation

Use a 32-bit Web browser.

The Login button on the Login screen does not function

Due to high security settings in the web browser, the Login button on the login screen of Sentinel EMS does not work.

Solution:

In your web browser, do the following:

1. From the menu bar, go to **Tools > Internet Options**. A dialog is displayed.
2. Click the **Security** tab.
3. Click **Sites** and add the URL of Sentinel EMS to the list of trusted sites.
4. Apply the changes and restart your browser.

This problem has been seen under Windows Server 2003 and Windows Server 2008.

Port not available

Given the following situation:

- A user is not able to access the Sentinel EMS site (localhost/ems)
- In the Services screen, Sentinel EMS Service has the status **Started**.

This can be caused by a port conflict. The HTTP/HTTPS port for Sentinel EMS may be in use by another application.

Check the Sentinel EMS log file. This can be found at:

```
%ProgramFiles(x86)%\Gemalto Sentinel\Sentinel EMS\EMSServer\webapps\ems\log\
```

(For 32-bit machines: %ProgramFiles%\....)

If the log file shows a “JVM binding” issue, this indicates that the port used by the Sentinel EMS web application run is in use by another application.

To resolve a port conflict:

Use the Netstat command to identify which application has occupied the required port. Do *one* of the following:

- Stop the conflicting application as follows:
 1. Enter: `netstat -aon | findstr "8080"`
The relevant process ID is displayed.
 2. Use the Task Manager to cancel the process with this process ID.
 3. Restart Tomcat.
- Configure Sentinel EMS to use a different port.
Modify the port used by Sentinel EMS in the `web_service.xml` file and the database.
- Remove and then reinstall Sentinel EMS (removal does not remove the Sentinel EMS database).

Users are not able to access Sentinel EMS

Sentinel EMS Service may be installed behind a firewall, and it was not added in the exception list for the firewall.

Frequently-asked Questions

This section describes and answers some of the frequently asked questions relating to the installation of the Sentinel EMS in a network environment.

Can I use a non-system administrator (sa) account?

Yes, you can use a non-system administrator account as follows:

1. Open the Microsoft SQL Server Management utility and create a new login. Ensure that:
 - The login uses SQL server authentication
 - The defined database is the Sentinel EMS database (by default, *EMSDB*)
 - User mapping maps the login to the Sentinel EMS database, enabling all roles except `db_denydatawriter` and `db_denydatareader`

2. Edit all the configuration files and change the `CONNECT_STRING` parameters as follows:
 - Change `uid` to the login name that you defined
 - Change `pwd` to the password that you defined

Note that this string is displayed many times in the configuration files and must be changed in every instance.

The configuration files are:

context.xml

ems-quartz.xml

ems.properties

emsconfig.properties

3. Restart the server.
4. Check the connection by entering the following URL in your browser:
https://<server>:<port>/ems/ (OR http://<server>:<port>/ems/)

The test will return a **Database connection: PASSED** message.

How can I best secure my Sentinel EMS system?

- Implement the standard IT information security protocols that are applicable to your organization.
- Ensure that only the TCP port number, as defined for HTTP/HTTPS ports configured in Tomcat, are accessible.
- Ensure that only Sentinel EMS can access the SQL database.
- Change the default `admin` password. For information about how to change passwords, see the Sentinel EMS Help documentation.
- Ensure that personnel in your organization are designated appropriate roles in Sentinel EMS, and that their accounts are inaccessible when they are no longer part of the organization. For more information about assigning roles, see the Sentinel EMS Help documentation.

Introducing Your Sentinel Vendor Keys to Sentinel LDK

When you order Sentinel protection keys from Gemalto, you are assigned a unique Batch Code. Your Batch Code represents your unique confidential Vendor Code.

The Sentinel Vendor keys contain your unique Vendor Code, vendor-specific APIs, and the vendor library, which are required when using Sentinel LDK to protect and license software. For more information about Batch Codes, see the description of personalized Vendor and Batch Codes in the *Sentinel LDK Software Protection and Licensing Guide*.

Before you begin to use Sentinel Vendor Suite, you must introduce your Sentinel Vendor keys to the system to ensure that your applications are protected and licensed with the unique codes that have been assigned to you. The Sentinel Vendor keys are introduced using Sentinel LDK Master Wizard.



If you have purchased Managed Services, you do not need to introduce the Master key (provided in your Sentinel LDK Starter Kit) to Sentinel EMS. The hosted installation of Sentinel EMS already includes a Master key. However, you must introduce your Developer key as described in this chapter.

Overview

When you introduce your Sentinel Vendor keys, the Master Wizard does the following:

- (Optional) Associates Sentinel EMS with your confidential codes.
- Extracts your Vendor Code from the Master key or Developer key and saves it to a file.
- Downloads your vendor-specific ToolBox library, Licensing API libs and the vendor-specific **vlib** from the Gemalto servers.
- Generates your customized Data File Protection plugin. This plugin enables your customers to view certain types of protected data files in the Internet Explorer Web browser.
- Generates a special installer that installs and configures the Sentinel LDK Run-time Environment. This installer can be downloaded by Sentinel EMS users who require the Run-time Environment. For more information, see "[Requirement for Sentinel LDK Run-time Environment](#)" on page 22.

Sentinel LDK Master Wizard operates in either of two modes:

- **Online**

If the Sentinel EMS (Tomcat) service is active, Sentinel LDK Master Wizard connects to Sentinel EMS at startup. The Master Wizard displays a login screen, prompting the user to provide credentials to log in to Sentinel EMS. In this case, the Master Wizard associates Sentinel EMS with the vendor's confidential codes, and the vendor's Batch Code will be available in Sentinel EMS screens. The Master Wizard also performs all other functions described earlier.

- **Offline**

If Sentinel LDK Master Wizard cannot connect to Sentinel EMS, the Master Wizard does not display the login screen. In this case, the Master Wizard skips Sentinel EMS-related functions but performs all other functions described earlier.

Remote Connection of Vendor Keys

Sentinel Master keys and Developer keys can be connected remotely using available third-party solutions. These solutions can be used in cases where a physical key cannot be connected due to the lack of a USB port or inability to physically access the machine. You can connect your Master or Developer keys to an over-the-network USB solution and access them from any physical or virtual machine as if they were connected locally.

There are several such solutions, both software-based (that can be installed on any PC with a USB port) and dedicated devices. Among the dedicated devices, Gemalto recommends myUTN-80 by SEH Technology. This device was tested for Gemalto Sentinel HL keys, and is backed by partnership between SEH Technology and Gemalto.

Running the Sentinel LDK Master Wizard

Perform the procedure that follows to run the Sentinel LDK Master Wizard and introduce your Sentinel Vendor keys.

To introduce your Sentinel Vendor keys:

1. (Optional) Ensure that the Sentinel EMS (Tomcat) service is active.
2. Connect your Sentinel Master key or your Sentinel Developer key to the machine where Sentinel EMS or Sentinel Vendor Tools are installed.

Do one of the following:

- Connect the key to the machine locally.
- Connect the key to the machine using a remote USB solution as described earlier in this section.

3. Start Sentinel LDK Master Wizard as follows:

- From the Start menu, select: **All Programs > Gemalto Sentinel > Sentinel LDK > Tools > Sentinel Master Wizard**



If you open either Sentinel LDK Envelope or Sentinel LDK ToolBox, and the application detects a new Sentinel Vendor key, the Master Wizard will launch automatically.

For Online mode, the Log In to Sentinel EMS window is displayed. For Offline mode, continue with [Step 5](#).

4. In the **User Name** and **Password** fields, type `admin`; then click **OK**.
5. In the Specify API Settings screen, select the libraries for which you want to generate APIs.

The generated APIs are located in the following directory, under the appropriate sub-directory:

```
%UserProfile%\Documents\Gemalto\Sentinel LDK 7.9\API\Runtime\
```

6. Click **Finish** to close the wizard.

For additional information on Vendor Codes, see "Understanding Sentinel LDK Software Protection and Licensing" in the *Sentinel LDK Software Protection and Licensing Guide*.

Sentinel EMS provides a notification facility for your Master key. This facility can send automatic e-mail reminders when:



- any of the license modules on the key are about to expire.
- the pool of standalone licenses or network seats on the key falls below a certain threshold.

Gemalto highly recommends that you configure the notification facility to send reminders as necessary. In the Sentinel EMS screen, on the main menu, click **Administration > Master**. Follow the instructions to configure e-mail reminders.

Installing Sentinel LDK Run-time Environment for Mac

This chapter describes how to install the Sentinel LDK Run-time Environment on a machine with a Mac operating system, and explains how to modify the behavior of the daemons.



For information on supported platforms for Sentinel LDK Run-time Environment, see the *Sentinel LDK Release Notes*.

In this chapter:

- "Installing Sentinel LDK Run-time Environment on a Mac Machine" on page 46
- "Installed Files" on page 47
- "Modifying the Behavior of the Daemons" on page 47

Installing Sentinel LDK Run-time Environment on a Mac Machine

Follow the instructions below to install the Sentinel LDK Run-time Environment on a machine with a Mac operating system.

To install the Sentinel LDK Run-time Environment:

1. Connect the Sentinel LDK Installation Drive to your machine. The image is mounted.
2. Open `/MacOS/Redistribute`, and double-click `Sentinel_Runtime.dmg`.
3. Double-click the *Install Sentinel Runtime Environment* disk image icon. The installer wizard is launched.
4. Follow the instructions of the installer wizard until the installation is complete.

Following successful installation, the Sentinel LDK Run-time Environment is automatically launched. The first time that you run Admin Control Center and submit configuration changes, `hasplmd` creates configuration files in `/private/etc/hasplm/`.

Installed Files

After you run the installation, verify that the following files have been installed on your hard drive:

- `/usr/local/sentinel/aksusbd` (support for Sentinel HL (HASP configuration) keys and HASP HL keys)
- `/usr/local/sentinel/hasplmd` (Sentinel License Manager daemon)
- `/Library/LaunchDaemons/com.aladdin.aksusbd.plist`
- `/Library/LaunchDaemons/com.aladdin.hasplmd.plist`

Modifying the Behavior of the Daemons

Behavior of the daemons can be modified by changing the switches used to start the daemons. Modification requires the following steps:

- Terminating the daemons
- Determining the switches to use
- Saving the modifications
- Restarting the daemons

To terminate the daemons:

1. Ensure that you have Administrator privileges.
2. Launch `/Applications/Utilities/Terminal`.
3. Change the directory to: `/Library/LaunchDaemons/`
4. At the command prompt, enter the following commands:

```
sudo launchctl unload com.aladdin.hasplmd.plist
sudo launchctl unload com.aladdin.aksusbd.plist
```

(When prompted, enter your administrator password.)

The daemons stop running.

To determine which switches to use:

Use the table that follows to determine which command line switches to use to set the behavior of the **aksusbd** and **hasplmd** daemons.

Daemon	Command	Description
Both	-f	Forces the daemon to work in the foreground. Required for <code>launchd</code> startup.
Both	-h, --help	Displays a list of available commands

Daemon	Command	Description
Both	-l <level>	Specifies the level of log messages. The values are: 0 - Errors only 1 - Normal 2 - Verbose 3 - Ultra verbose
Both	v	Displays aksusbd and API versions OR Displays hasplmd version
aksusbd	-d <milliseconds>	Specifies the delay after connecting a Sentinel HL (HASP configuration) key or HASP HL key, before it can be accessed the first time (range 0–2000)
aksusbd	-q <entries>	Specifies the length of the work queue (default 64)
aksusbd	-u <mask>	Specifies the permission bits for the special socket file. Default is 666 (access for all users)
aksusbd	-s <file>	Specifies the communication socket name
hasplmd	-s, -start	Starts the Sentinel License Manager daemon
hasplmd	-u <user>	Launches daemon with owner as user to enhance security

To save the selected switches:

After determining which switches you want to employ, do the following to save the switches in the `.plist` files so that they will be used each time the daemons are launched when the system is restarted:

- Either edit the relevant `.plist` files using a text editor or use the */Developer-/Applications/Utilities/Property List Editor* (part of the Xcode Developer Tools) to do the following:
 1. Add the modifications for `aksusbd` to */Library/LaunchDaemons/com.aladdin.aksusbd.plist*
 2. Add the modifications for `hasplmd` to */Library/LaunchDaemons/com.aladdin.hasplmd.plist*

Ensure that the `-f` switch is included in both daemons.

To restart the daemons:

After saving the selected switches, do the following to restart the daemons:

1. Ensure that you have Administrator privileges.
2. Launch */Applications/Utilities/Terminal*.
3. Change the directory to: */Library/LaunchDaemons/*

4. At the command prompt, enter the following commands

```
sudo launchctl load com.aladdin.aksusbd.plist
```

```
sudo launchctl load com.aladdin.hasplmd.plist
```

(Enter your Administrator password when prompted.)

The daemons are restarted.



The Run-time Environment daemons are launched automatically when the system is restarted.

Installing Sentinel LDK Run-time Environment for Linux

This chapter describes how to install Sentinel LDK Run-time Environment v.7.90.1 on a computer with a Linux Intel operating system.



For information on supported platforms for Sentinel LDK Run-time Environment, see the *Sentinel LDK Release Notes*.

In this chapter:

- "Installing Sentinel LDK Run-time Environment on a Linux Computer" on page 50
- "Installed Files" on page 52
- "Uninstalling Sentinel LDK Run-time Environment" on page 53

Installing Sentinel LDK Run-time Environment on a Linux Computer

Follow the instructions below to install Sentinel LDK Run-time Environment v.7.90.1 under the Linux operating system.

Uninstall the Earlier Sentinel LDK Run-time Environment

An existing installation of the Run-time Environment v.1.14 or earlier cannot be upgraded and must therefore be uninstalled. (Run-time Environment v.1.15 or later *can* be upgraded.)

Before installing the new Run-time Environment, enter the following command to uninstall an existing Run-time Environment v.1.14 or earlier (if present):

- For RedHat: `rpm -e aksusbd-redhat`
- For SUSE: `rpm -e aksusbd-suse`

If the existing Run-time Environment was installed using the Run-time Environment installation script (dinst), remove this installation by entering following command as **root** from within the script package: `./dunst`

Install Sentinel LDK Run-time Environment



When installing Sentinel LDK Run-time Environment on an end user's machine: To support your application on both 32-bit and 64-bit architectures, ensure that you provide both 32-bit and 64-bit customized Vendor libraries with the Run-time Environment installer. These libraries are contained in the following files:

- `haspvlib_<vendorID>.so`
- `haspvlib_x86_64_<vendorID>.so`

To install the Sentinel LDK Run-time Environment using RPM or DEB:

1. Disconnect your Sentinel HL key (if any) from the computer.
2. Connect the Sentinel LDK Installation Drive to the computer.
3. Open a terminal window and navigate to *Linux/Redistribute/Runtime/* on the Sentinel LDK Installation Drive.
4. As root, enter the following command:

- For 32-bit RedHat, SUSE, or CentOS:

```
rpm -i aksusbd-7.90-1.i386.rpm
```

- For 64-bit RedHat, SUSE, or CentOS:

```
rpm -i aksusbd-7.90-1.x86_64.rpm
```

- For 32-bit Ubuntu or Debian:

```
dpkg -i aksusbd_7.90-1_i386.deb
```

- For 64-bit Ubuntu or Debian:

```
dpkg -i aksusbd_7.90-1_amd64.deb
```



All install/uninstall commands must be executed with **root** rights. In Ubuntu, prefix the commands with the **sudo** command; in other distributions, use the **su** utility to become root in the terminal window.

The Sentinel LDK Run-time Environment is launched.

5. Reconnect the Sentinel HL key.



At this point, for older HASP HL keys, the firmware on the HL key may be automatically upgraded. During the upgrade process, the key will blink continuously. *Do not remove the key while it is blinking.* If you remove the key too soon, the key may no longer be visible in Admin Control Center. If the key is not visible, or if the upgrade does not occur, see "[Upgrading HASP HL Key Firmware](#)" on page 53.

To install the Sentinel LDK Run-time Environment from a script:

(Use this procedure if the distribution does not support RPM or DEB.)

1. Disconnect your Sentinel HL key (if any) from the computer.
2. Copy the package *Linux/Redistribute/Runtime/aksusbd-7.90.1.tar.gz* from the Sentinel LDK Installation Drive to a local directory.
3. Open a terminal window in the local directory.
4. Enter the following command to uncompress the package containing the Run-time Environment installer:


```
tar zxvf aksusbd-7.90.1.tar.gz
```
5. Enter the following command to change to the directory containing the installer:


```
cd aksusbd-7.90.1
```
6. As **root**, enter the command: `./dinst`
The Sentinel LDK Run-time Environment is launched.
7. Reconnect the Sentinel HL key.



At this point, for older HASP HL keys, the firmware on the HL key may be automatically upgraded. During the upgrade process, the key will blink continuously. *Do not remove the key while it is blinking.* If you remove the key too soon, the key may no longer be visible in Admin Control Center. If the key is not visible, or if the upgrade does not occur, see ["Upgrading HASP HL Key Firmware" on page 53.](#)

Installed Files

After you run the installation, verify that the following files are installed:

- */usr/sbin/aksusbd* and */usr/sbin/aksusbd_x86_64* – 32-bit and 64-bit support for Sentinel HL (HASP configuration) keys and HASP HL keys, and support for low-level access to the Sentinel License Manager daemon.
- */etc/init.d/aksusbd* or */etc/init.d/aksusbd_x86_64* – 32-bit or 64-bit startup script for Sentinel License Manager daemon. This file is not installed for Linux systems that use **systemd**. The file is installed only for old systems that use **sysv**.
- */usr/sbin/hasplmd* and */usr/sbin/hasplmd_x86_64* – 32-bit and 64-bit Sentinel License Manager daemons
- */etc/udev/rules.d/80-hasp.rules* – Rules for */udev*

Following successful installation, the Sentinel LDK Run-time Environment is automatically launched. The first time that you run Admin Control Center and submit configuration changes, *hasplmd* creates a *hasplm.ini* configuration file in */etc/hasplm*. In addition, log files are created in */var/hasplm/*.

Uninstalling Sentinel LDK Run-time Environment

To uninstall Sentinel LDK Run-time Environment v.1.15 or later, when installed using RPM or DEB:

- For RedHat, SUSE, or CentOS: As root, enter the command:

```
rpm -e aksusbd
```

- For Debian or Ubuntu: Enter the command:

```
dpkg -r aksusbd
```

For some earlier Ubuntu systems, it may be necessary to specify that this is an i386 package. Enter the command:

```
dpkg -r aksusbd:i386
```

To uninstall Sentinel LDK Run-time Environment when installed using “dinst”:

- As root, open a terminal window and enter the command:

```
./dunst
```

The `dunst` script can be found in the directory containing the `dinst` script, described in ["Install Sentinel LDK Run-time Environment" on page 51](#).

Upgrading HASP HL Key Firmware

The Firmware for older HASP HL keys has been modified to support future planned security enhancements in Sentinel LDK. Sentinel LDK automatically upgrades the Firmware on HASP HL keys from v.3.21 to the latest version (v.3.25). This occurs:

- when a HASP HL key with v.3.21 Firmware is connected to a computer where the Run-time Environment is being updated to v.1.15.
- when a customer connects a HASP HL key with v.3.21 Firmware to a computer where the Run-time Environment v.1.15 has been previously installed.

(You can determine the Firmware version of your HL key by viewing the key on the Sentinel Keys page of the Admin Control Center.)

For HASP HL keys with Firmware earlier than v.3.21, the upgrade does not occur automatically. Customers can upgrade the Firmware to v.3.25 by applying the Firmware Update V2C provided on the Sentinel LDK Installation Drive.

During the Firmware upgrade, the relevant key will start to blink. Do not remove the key while it is blinking. If you remove the key too soon, the key may no longer be visible in Admin Control Center.

In the event the key is no longer visible using the Linux Run-time Environment, do the following on a Windows computer:



1. Install Sentinel LDK Run-time Environment from the Sentinel LDK Installation Drive.
2. Connect the HL key.
3. Run the application `FirmwareUpdate.exe`, located on the Installation Drive in `\Windows\Installed\Redistribute\Firmware Update\HASP HL\`.

The HL key is upgraded to v.3.25 Firmware and will now be visible in the Linux Admin Control Center.

Installing Sentinel LDK Run-time Environment Using an Installation Utility

Sentinel LDK Run-time Environment may be required:

- at the vendor's site, to perform many activities using Sentinel EMS. In this case, the Run-time Environment is installed and configured automatically.

For more information, see "[Requirement for Sentinel LDK Run-time Environment](#)" on page 22.

- at the customer's site, to perform online activation of SL AdminMode keys using the Sentinel EMS Customer Portal. In this case, the Run-time Environment is installed automatically, although manual configuration of the Run-time Environment may be required.

For more information, see "[Requirement for Sentinel LDK Run-time Environment](#)" on page 22.

- at the customer's site, for your protected application to run.

Depending on the type of protection key provided, the Run-time Environment may be required at the site.

For more information, see the *Sentinel LDK Software Protection and Licensing Guide*.

This chapter describes how you can install the Run-time Environment when it is required for your protected application (and it has not been installed automatically from the Customer Portal).



For information on supported platforms for Sentinel LDK Run-time Environment, see the *Sentinel LDK Release Notes*.

The following utilities are available for installing the Sentinel LDK Run-time Environment at the end user's site:

- A stand-alone GUI installer (`HASPUserSetup.exe`)
- A command line installer that you can integrate into your software installer (`hasp-dinst.exe`)

These utilities recognize the operating system in use and install the correct Run-time environment.



Administrator privileges are required to install the Sentinel LDK Run-time Environment.

In this chapter:

- "HASPUserSetup.exe Utility" on page 56
- "haspdinst.exe Utility" on page 56
- "Multiple Installations on a Single End User's Computer" on page 57

HASPUserSetup.exe Utility

HASPUserSetup.exe is a GUI-based installation program to independently install the Sentinel LDK Run-time Environment. Following installation, the file is located in:

`%ProgramFiles(x86)%\Gemalto Sentinel\Sentinel LDK\Redistribute\Runtime Environment\Setup`

To launch the utility, double-click HASPUserSetup.exe and follow the wizard instructions.

haspdinst.exe Utility

haspdinst.exe is a command-line utility that installs the Sentinel LDK Run-time Environment. Following installation, the file is located in:

`%ProgramFiles(x86)%\Gemalto Sentinel\Sentinel LDK\Redistribute\Runtime Environment\cmd Install`

To install the Sentinel LDK Run-time Environment:

- Type `haspdinst -i` in the command line. A message is displayed informing you that the Sentinel LDK Run-time Environment was successfully installed.

To remove the Sentinel LDK Run-time Environment:

- Type `haspdinst -r` in the command line. A message is displayed informing you that the Sentinel LDK Run-time Environment was successfully removed.

To upgrade the Sentinel LDK Run-time Environment:

- Type `haspdinst -i` in the command line. The `haspdinst.exe` utility automatically manages the upgrade process. A message is displayed informing you that the Sentinel LDK Run-time Environment was successfully installed.

Additional haspdinst.exe Utility Switches

The following table lists additional switches that can be used with the `haspdinst.exe` utility.

Switch	Description
-info	Displays the installation status
-h or -?	Displays a list of the available commands
-kp	Enables the installation program to 'kill' all processes accessing the Run-time Environment
-cm	Sets the installation program to display only critical messages (for example, instructions to reboot)

Switch	Description
-fr	Sets the installation program to remove Sentinel LDK Run-time Environment by force, leaving the run-time in a non-functioning state
-fi	Sets the installation program to ignore other running Windows processes
-nomsg	Sets program to display no messages
-chkllm	If used in conjunction with the -i or -r switch, checks for active License Manager sessions and prompts the user to continue or to abort the operation.
-fss	Silently stops "HASP Loader" and "Server" services (if they are active), performs the requested operation, and then restarts the services.

Multiple Installations on a Single End User's Computer

The Sentinel LDK Run-time Environment installer utilities contain an automatic mechanism that prevents more than one copy of the Run-time Environment from being installed on a single computer, even if multiple protected applications are installed on the computer.

The Run-time Environment installer utilities employ a counter that keeps track of the number of protected applications installed on a given computer.

For each installation after the first, the installer simply increments the counter instead of actually installing an additional copy of the Run-time Environment. Similarly, the counter is decremented each time the Run-time Environment is uninstalled.

The Run-time Environment is not actually uninstalled until the last protected application is uninstalled.

Uninstalling Sentinel LDK

This appendix describes how to completely uninstall Sentinel LDK from your computer.



This procedure does not remove the Sentinel EMS database.

This procedure is applicable for uninstalling the current version of Sentinel LDK. To uninstall earlier versions of Sentinel LDK or Sentinel HASP, see the appropriate version of the Installation Guide.

To completely uninstall Sentinel LDK from your computer:

1. Ensure that all Sentinel LDK components and Tomcat are not active.
2. On the computer where you want to uninstall Sentinel LDK, open the **Programs and Features** window from the Control Panel.
3. Remove the following:
 - Sentinel EMS
 - Sentinel LDK
 - Sentinel Runtime
 - Sentinel Vendor Suite
4. If you installed Sentinel Cloud Services: To uninstall Sentinel Cloud Runtime, select from the Start menu:

**All Programs > Gemalto Sentinel> Sentinel Cloud Services >
Uninstall SentinelCloudRuntime**

Configuring Tomcat for Redundancy

This appendix describes how to configure the Tomcat web service when you install redundant instances of Sentinel EMS Service to ensure high availability.

For more information on redundancy, see ["Redundant Installation of Sentinel EMS in a Network Environment" on page 34](#).

Each installation of Tomcat contains a file called **server.xml**. Add the following to either <Engine> or <Host> in this file:

```
<Cluster className="org.apache.catalina.ha.tcp.SimpleTcpCluster">

<Manager className="org.apache.catalina.ha.session.DeltaManager"
expireSessionsOnShutdown="false"
notifyListenersOnReplication="true"/>

  <Channel className="org.apache.catalina.tribes.group.GroupChannel">

    <Membership className="org.apache.catalina.tribes.membership.McastService"
address="228.0.0.4"
port="45564"
frequency="300"
dropTime="1000"/>

    <Receiver className="org.apache.catalina.tribes.transport.nio.NioReceiver"
address="auto"
port="4000"
autoBind="100"
selectorTimeout="3000"
maxThreads="6"/>

    <Sender className="org.apache.catalina.tribes.transport.ReplicationTransmitter">

      <Transport className="org.apache.catalina.tribes.transport.nio.PooledParallelSender"/>

    </Sender>

    <Interceptor className="org.apache.catalina.tribes.group.interceptors.TcpFailureDetector"/>

    <Interceptor className="org.apache.catalina.tribes.group.interceptors.StaticMembershipInterceptor">

      <Member className="org.apache.catalina.tribes.membership.StaticMember"
port="4000"
securePort="-1"
host="172.25.14.109"
domain="ems">
```

```

    uniqueId="{10,3,1,33}"/>

</Interceptor>

<Interceptor className=
e="org.apache.catalina.tribes.group.interceptors.MessageDispatch15Interceptor"/>

</Channel>

<Valve className="org.apache.catalina.ha.tcp.ReplicationValve"
filter=""/>

<Valve className="org.apache.catalina.ha.session.JvmRouteBinderValve" enabled="false"/>

<ClusterListener className="org.apache.catalina.ha.session.ClusterSessionListener"/>
</Cluster>

```

1. On each machine where Sentinel EMS and Tomcat are installed, open the **Server.xml** file in a text editor and update the IP address in the host parameter so that it contains the IP address of the alternate server. (See the underlined text above.) Save the file.

For example:

The two machines where Sentinel EMS and Tomcat are installed have the following URLs:

Machine #1: <http://172.25.14.108:8080/ems>

Machine #2: <http://172.25.14.109:8080/ems>

On machine #1, modify the host parameter so that it contains the IP address for machine #2, as follows:

```

<Member className="org.apache.catalina.tribes.membership.StaticMember"
port="4000"
securePort="-1"
host="172.25.14.109"
domain="ems"
uniqueId="{10,3,1,33}"/>

```

On machine #2, modify the host parameter so that it contains the IP address for machine #1.

2. On each of the two machines, open the **web.xml** file in a text editor. Add `<distributable/>` just before `</web-app>`. Save the file.



This was verified with Tomcat 6 and JRE 6.

Installing Language Packs

You can use Sentinel EMS and the Sentinel LDK Vendor Tools and utilities in languages other than English. You download the required language pack from the Gemalto Web site and install it on your system. Each user in your organization can use their preferred language.

Language packs must be installed as follows:

- On the computer where Sentinel EMS Service is installed.
- On each computer where Sentinel LDK Vendor Suite is installed.

After language packs are installed, the language used to display the user interface is determined as follows:

- In Sentinel EMS, each user can select one of the available languages from links displayed at the bottom of each screen.
- In the Sentinel EMS Customer Portal, the language is selected automatically for each customer, based on the local that you specify when defining the Contact for the customer. The customer can choose a different language from links displayed at the bottom of each screen.
- In the Sentinel LDK Vendor Suite, each user can select one of the available languages by going to **Start > All Programs > Gemalto Sentinel > Sentinel LDK > Tools > Language Selection Tool**.

To download and install a language pack for one of the available languages:

1. Go to <https://sentinelcustomer.gemalto.com/Sentinel/LanguagePacks/> and download the appropriate language pack ZIP file for Sentinel LDK v.7.9. (If the language pack is not yet available, check with your Gemalto representative to determine when the language pack will be released.)
2. Extract the files from the ZIP file.
3. Follow the instructions in the Readme file to install the language pack.

Repeat the installation procedure to install additional languages.

Use the **Add/Remove Programs** functionality to remove a language pack from the system.



The display language for the Admin Control Center is handled separately. Language packs for the Admin Control Center can be downloaded and installed directly from the **More Languages** link in the Admin Control Center. For additional information, see the description of the Admin Control Center in the *Sentinel LDK Software Protection and Licensing Guide*.

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smali/baksmali

Version 2.2.4

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LibJpeg8

Version: 8.4.0

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Index

A	
Add a second component to a Sentinel LDK installation	28
Administration Console	
See EMS Administration Console	22
Advanced setup type	18
Android applications	9-10
C	
Channel partners, resolving inconsistencies	27
Clean reinstall of Sentinel LDK	58
Customers, resolving channel partner conflicts	27
D	
Daemons (Mac)	
available switches	47
modifying behavior of	47
starting manually	48
terminating	47
Demo data	20
Developer key	
remote connection	44
E	
EMS Administration account	
change the password for	22
EMS Administration Console	
to access	22
to access documentation for	22, 45
EMS Superuser account	
password	23
Express setup type	18

F	
Firmware (HASP HL key), upgrading	53
H	
HASP HL key Firmware, upgrading	53
haspdinst.exe utility	56
HASPUserSetup.exe utility	56
HL key Firmware, upgrading	53
HTTPS protocol	17
I	
Installation	
Linux Run-time Environment	50
Mac Run-time Environment	46
network environment	35
Run-time Environment	55
Installation prerequisites	
Run-time Environment	46, 50, 55
Sentinel LDK	12
Installation setup types	18
Installation wizard for Sentinel	
EMS	18
Installer utility for Run-time Environment	55
L	
Language Packs, installing	61
Linux	
installing Run-time Environment	50
uninstalling Run-time Environment	53
M	
Mac	
installing Run-time Environment	46

