Sentinel HASP®

Software Protection and Licensing Tutorial

Developer Kit

SafeNet®

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Sentinel HASP®

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Introduction

Thank you for choosing to evaluate Sentinel HASP as the method to protect and license your software against unauthorized use. In this Tutorial, you use the Sentinel HASP system to protect, license, and distribute software.

The strength, uniqueness, and flexibility of Sentinel HASP is based on two primary principles:

- *Protect Once—Deliver Many*, which is the concept of separating the software engineering and business processes
- *Cross-Locking*, which is the technology that supports the *Protect Once—Deliver Many* concept, enabling a protected application to work with a HASP HL (hardware) or a HASP SL (software) key

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

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

Sentinel HASP Keys

Your Sentinel HASP Developer Kit includes a Sentinel HASP Demo key (DEMOMA Batch Code) that you will use in some of the lessons.

Roles

The Sentinel HASP system is role-based, and the tasks you can perform depend on the user roles assigned to you by the Sentinel HASP Administrator.

In order to enable you to experience the broad functionality of the Sentinel HASP system in this tutorial, you will have access to all roles. The roles you assume in the various lessons include:

- **Product Management** role
  The person, usually a product manager, who determines the product components to be protected (called *Features* in Sentinel HASP), how these components are used to define Products, and the license structure for the Products
- **Development** role
  The person, usually a software engineer, who protects the software using Sentinel HASP Envelope or the Sentinel HASP Run-time API, and performs other development-related tasks, such as generating the Sentinel HASP Run-time Installer
- **Customer Services** role
  The person responsible for performing manual Product activations
- **Order Management** role
  The person responsible for defining and managing customer orders
- **Production** role
  The person responsible for producing customer orders

In addition, you will assume the role of an end user in order to test, use, and update the products licensed using Sentinel HASP.

Conventions

Each of the lessons in this tutorial begins with a focused breakdown of the lesson, such as the following:

Objective	A short description of the lesson objective
Role in this lesson	The role or roles that you assume during the lesson
Applications used	Sentinel HASP applications you use in the lesson

Lessons in This Tutorial

This tutorial is based on a Win32 operating system and includes the following lessons:

- *Lesson 1—Preliminary Preparation*

  In this lesson, you install the Sentinel HASP system and learn how to launch Sentinel HASP Vendor Suite.

- *Lesson 2—Defining Features*

  In this lesson, you use Sentinel HASP Business Studio to define two programs as Features, which you will later license and protect.

- *Lesson 3—Protect Once*

  In this lesson, you use Sentinel HASP Envelope to apply protection to your software.

- *Lesson 4—Defining Products*

  In this lesson, you use Sentinel HASP Business Studio to define your offering by defining Products based on the Features you already defined and protected.

- *Lesson 5—Defining a Provisional Product*

  In this lesson, you use Sentinel HASP Business Studio to define a Provisional Product based on one of the Products you defined, enabling you to distribute a trial version of your software later.

- *Lesson 6—Creating and Distributing a HASP SL-protected Software Order*

  In this lesson, you lock your protected software to a HASP SL key for later distribution. You will create an order, define a customer, code the HASP SL key, and use the software as an end user. You will also learn how to activate a license, in order to convert the trial version of a program to a fully-featured program.

- *Lesson 7—Creating and Distributing a HASP HL-protected Software Order*

  In this lesson, you lock your protected software to a HASP HL key for later distribution. You will create an order, define a customer, code the HASP HL key, and use the software as an end user. You will also learn how to create a license update for a deployed Product that has its license locked to a HASP HL key.

- *Lesson 8—Using Sentinel HASP Run-time API*

  In this lesson, you learn how to program the memory on Sentinel HASP protection keys.

We recommend that you follow the lessons sequentially to familiarize yourself with the Sentinel HASP system and to gain a clear understanding of the strength of the *Protect Once—Deliver Many*™ model, and the flexibility it provides.

Lesson 1

Preliminary Preparation

Objective	Prepare your computer and Sentinel HASP for the tutorial
Applications used	■ Installation DVD ■ Sentinel HASP Vendor Suite

The procedures in this lesson are required in order for you to be able to implement the processes outlined in subsequent lessons of this tutorial. They include:

- Instructions for installing the Sentinel HASP software, including Sentinel HASP Business Studio Server
- Instructions for launching Sentinel HASP Vendor Suite

Note:
SafeNet recommends that you always use the latest software and documentation. To ensure that you have the most recent version of Sentinel HASP software, go to:

http://www3.safenet-inc.com/support/hasp-srm/vendor.aspx

Installing the Sentinel HASP Software

Before proceeding with this tutorial, install the Sentinel HASP software and the Sentinel HASP Business Studio Server on your computer.

Refer to the *Sentinel HASP Installation Guide* for a list of the operating systems that are supported.

WARNING!

Do not connect your Sentinel HASP Demo key before installing the Sentinel HASP software!

To install the Sentinel HASP software:

1. Insert the Sentinel HASP DVD into your machine.
2. Select the **Start the Sentinel HASP Setup** menu option.
3. Follow the **Sentinel HASP Setup** wizard instructions.

Note:

For more detailed installation instructions, refer to the *Sentinel HASP Installation Guide*.

Launching Sentinel HASP Vendor Suite

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

- From the **Start** menu, select **Programs > SafeNet > Sentinel HASP > Vendor Suite**. The Sentinel HASP Vendor Suite program selection window is displayed. You can access the primary Vendor Suite applications from this window.

You are now ready to start the tutorial.

Lesson 2

Defining Features

Objective	Learn how to define Features
Role in this lesson	Product Management
Applications used	Sentinel HASP Business Studio

A Feature is an identifiable functionality of a software application that can be independently protected or licensed. In Sentinel HASP, a Feature may be an entire application, a module, or a specific functionality such as Print, Save, or Draw.

Features are typically defined by the Product Manager based on business decisions, and are then implemented by the company's software engineers.

In this lesson, you assume the Product Management role and use Sentinel HASP Business Studio to define two Features for use in subsequent lessons.

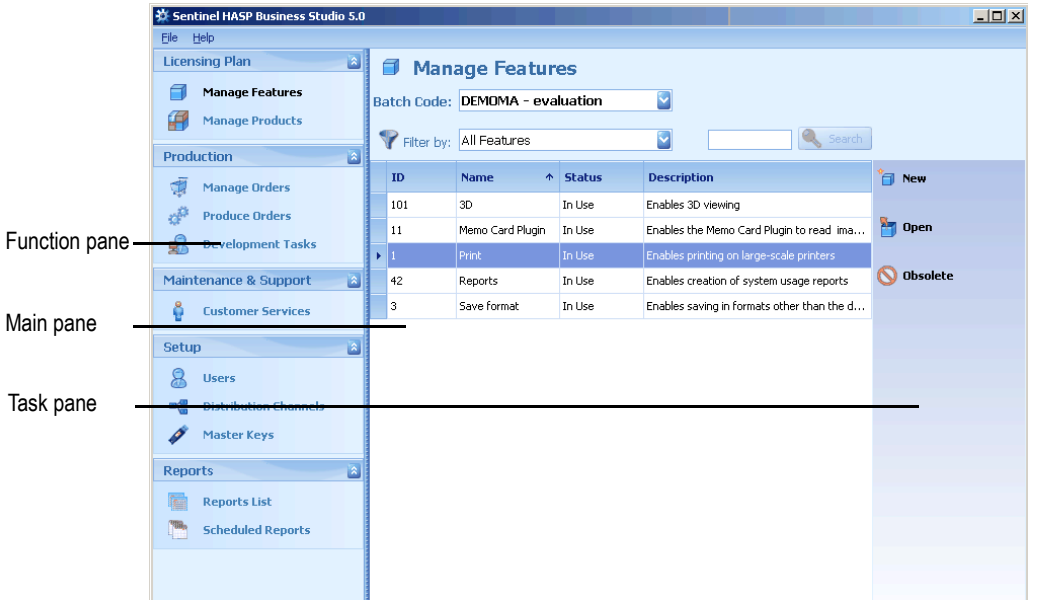
To launch Sentinel HASP Business Studio:

1. From the **Start** menu, select **Programs > SafeNet > Sentinel HASP > Vendor Suite**. The Sentinel HASP Vendor Suite program selection window is displayed.
2. Click **Business Studio**. The Log On to Business Studio window is displayed.
3. In the **User Name** and **Password** fields, type **`HASP`**.

4. Click **OK**. The Sentinel HASP Business Studio window is displayed.

   The Business Studio window typically includes the following:

   - Function pane, in which you select the function to perform
   - Main pane, in which you view and select items
   - Task pane, in which you perform actions



Defining a Feature for the Sample Bouncing Ball Program

In this section, you define a Feature for an existing program, the Bouncing Ball sample program supplied with Sentinel HASP.

To define the Bounce Feature:

1. In the Function pane of the Business Studio window, under Licensing Plan, select **Manage Features**. The Manage Features window is displayed in the Main pane. The Task pane on the right of the window lists the tasks that can be performed in this window.
2. In the Manage Features window, in the **Batch Code** field, select **DEMOMA** from the drop-down list.
3. In the Task pane, click **New**. The New Feature window is displayed.
4. In the **Feature Name** field, type `Bounce`.
5. Click **Advanced** to expand the window.
6. Select the **Specify Feature ID** check box and type `50` in the corresponding field.
7. Click **OK**. The New Feature window closes and the Bounce Feature you defined is displayed in the Manage Features window.

Defining a Feature for the MyNotepad Program

In this section, you define a Feature for the MyNotepad program. You will create the MyNotepad program in *Lesson 3—Protect Once*.

To define the MyNotepad Feature:

1. In the Function pane of the Business Studio window, under Licensing Plan, select **Manage Features**. The Manage Features window is displayed in the Main pane.
2. In the Manage Features window, in the **Batch Code** field, select **DEMOMA** from the drop-down list.
3. In the Task pane, click **New**. The New Feature window is displayed.
4. In the **Feature Name** field, type `MyNotepad`.

5. Select the **Specify Feature ID** check box and type `10` in the corresponding field.

Note:

1. If the **Specify Feature ID** field is not visible, click **Advanced** to expand the window.
2. If a message is displayed informing you that this Feature ID is not available, **do not** use a different Feature ID number. Close the New Feature window, and in the Manage Features window, identify Feature 10 and note its name. For the remainder of this tutorial, continue to use Feature ID 10, with the name you noted (instead of "MyNotepad").

6. Click **OK**. The New Feature window closes and the MyNotepad Feature you defined is displayed in the Manage Features window.
7. Close Business Studio.

Lesson 3

Protect Once

Objective	Learn how to apply Sentinel HASP's automatic protection functionality
Role in this lesson	Development
Applications used	Sentinel HASP Envelope

In this lesson, you use Sentinel HASP Envelope to define protection parameters for two programs, using the two Features you defined in *Lesson 2—Defining Features*.

Sentinel HASP Envelope is an innovative, advanced solution for protecting software against illegal or unauthorized use. The solution deters illegal access and execution of protected applications.

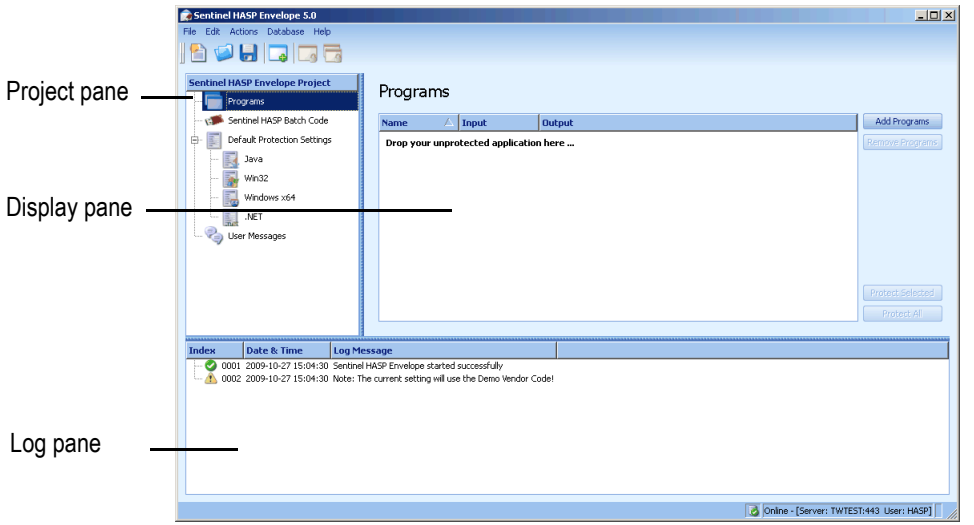
A deployed Sentinel HASP-protected program requires access to a Sentinel HASP protection key in order to run. The protected program queries the Sentinel HASP protection key for predefined information. If the Sentinel HASP protection key is not present, or the information returned is incorrect, the program does not execute, or stops functioning.

Protecting the Sample Bouncing Ball Program

In this section, you launch Sentinel HASP Envelope and identify the Batch Code with which you will protect the software. You then define an end-user error message. Finally, you protect the Bouncing Ball program.

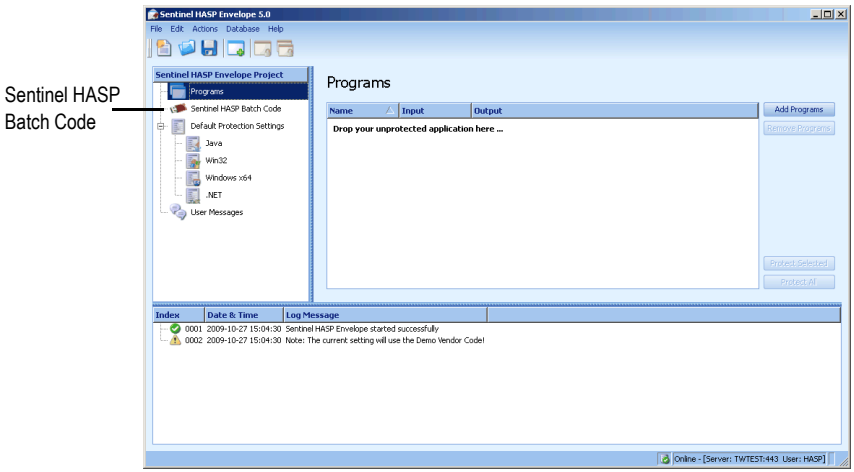
The Sentinel HASP Envelope window includes the following:

- Project pane, in which you select the function to perform
- Display pane, in which you select items and perform actions. The name of the pane changes to reflect the function you selected in the Project pane—for example, **Programs** in the following illustration.
- Log pane, in which Sentinel HASP Envelope messages are displayed



To prepare for protection:

1. Connect your Demo key.
2. From the **Start** menu, select **Programs > SafeNet > Sentinel HASP > Vendor Suite**. The Sentinel HASP Vendor Suite program selection window is displayed.
3. Click **Envelope** to launch Sentinel HASP Envelope. The login window is displayed.
4. Click **Work Offline**. The Sentinel HASP Envelope main window is displayed.



5. Before protecting, Sentinel HASP Envelope must identify the correct Batch Code. In the Sentinel HASP Envelope Project pane, select **Sentinel HASP Batch Code**.
6. In the right pane of the Sentinel HASP Batch Code window, select the **Use Demo Vendor Code** option.

To protect the Bouncing Ball program:

1. In the Sentinel HASP Envelope Project pane, select **Programs**.
2. Click **Add Programs** in the top right of the Programs pane.
   The Add Programs window is displayed, showing the contents of the VendorSuite\samples folder.
3. Select **Win32_Bounce.exe** and click **Open**. Win32_Bounce is now listed in the Programs pane.

4. In the Project pane, under **Programs**, select **Win32_Bounce**. The Display pane lists the Protection Details.
5. In the **Feature ID** field, type `50` (the Feature defined for the Bounce program in *Lesson 2—Defining Features*).
6. In the Project pane, under **Default Protection Settings**, select **Win32**. The Display pane now displays **Win32 - Default Protection Settings**.
7. In the Win32 - Default Protection Settings pane, decrease the number of **Periodic background checks** from the default value to **5** seconds. This means that during run-time, the protected program will check every 5 seconds to ensure that the required HASP HL key is connected.
8. In the Project pane, under **Programs**, select **Win32_Bounce**, then in the Display pane, click **Protect**. A message informs you that the Sentinel HASP system is protecting the program.
9. Click **Close** when Sentinel HASP Envelope notifies you that the protection has competed. The protected Bouncing Ball program is saved in this folder:
   …\Documents and Settings\[*logged_in_user_name*]\My Documents\Aladdin\Sentinel HASP [*version*]\VendorTools\VendorSuite\Protected

Protecting the MyNotepad Program

In this section, you create a copy of the Windows Notepad program, define protection parameters for protecting it using the MyNotepad Feature, and protect the program.

To protect the MyNotepad program:

1. Locate the Windows Notepad utility (usually under …\Windows).
2. Create a copy of the Notepad utility and rename it `MyNotepad.exe`.
3. Verify that your Demo key is connected to your computer.
4. If it is not already open, launch Sentinel HASP Envelope, and in the login window, click **Work Offline**. The Sentinel HASP Envelope main window is displayed.
5. In the Sentinel HASP Envelope Project pane, select **Programs**.
6. Click **Add Programs** in the top right of the Programs pane. The Add Programs window is displayed.

7. Navigate to the folder where `MyNotepad.exe` is located. Select the file and click **Open**. Note that a new **MyNotepad** entry is displayed in the Project pane under **Programs**.
8. In the Project pane, under **Programs**, select **MyNotepad**. The Display pane lists the Protection Details.
9. In the **Feature ID** field, type **`10`** (the Feature defined for the MyNotepad program in *Lesson 2—Defining Features*).
10. In the Project pane, under **Default Protection Settings**, select **Win32**. The Display pane now displays **Win32 - Default Protection Settings**.
11. In the Win32 - Default Protection Settings pane, move the **Encryption level** slider to the far right. Increasing the encryption level raises the level of security of the protected program. Note that the increased security may cause a slight delay in program load time because decryption of the program file may take longer to process.
12. In anticipation of a possible delay in program load time, in the Project pane, under **Programs**, select **MyNotepad**. In the General tab of the Protection Details pane, select the **Show waitbox on start-up** check box to specify that a "wait" message is displayed to users during the program load time.
13. Click **Protect**. A message informs you that the Sentinel HASP system is protecting the program.
14. Click **Close** when Sentinel HASP Envelope notifies you that the protection has completed. The protected MyNotepad program is saved in this folder:
    …\Documents and Settings\[*logged_in_user_name*]\My Documents\Aladdin\Sentinel HASP [*version*]\VendorTools\VendorSuite\Protected
15. Close Sentinel HASP Envelope. You are prompted to save the changes to the current project.
16. Click **Save**. The Save As dialog box is displayed.
17. In the **File Name** field, type **`Tutorial`** and click **Save**.The dialog box closes and the project is saved.

Lesson 4

Defining Products

Objective	Learn how to define the Products you want to license
Role in this lesson	Product Management
Applications used	Sentinel HASP Business Studio

A *Product* is a licensing entity that represents one of the vendor's marketable software products. The Product is coded into the memory of a HASP key and contains one or more Features. License terms are defined for each Feature in a Product.

Like Features, Products are defined using Sentinel HASP Business Studio. Typically, this function is performed by the Product Manager, and implemented by the software engineer. In a real-life environment, a number of Products might be defined and held in readiness for inclusion in customer orders. However, you can define new Products—mixing and matching Features—at any time.

In this lesson, you define a number of Products. The Products will include license terms for the Bounce and MyNotepad Features you defined in *Lesson 2—Defining Features*. The Products that you define now will be included in the orders you define in later lessons.

In this lesson, you define the following Products:

- "Bounce_Lite"—A "rental" Product, in which the license expires after three executions
- "Bounce_Full"—A "fully-featured" Product, in which the license enables unrestricted access to all the Features in the program. This Product will be created by duplicating the "rental" Product and modifying the license terms.
- "MyNotepad_Full"— A "fully-featured" Product that enables unrestricted access to all the Features in the program

Note:
In *Lesson 6—Creating and Distributing a HASP SL-protected Software Order*, and *Lesson 7—Creating and Distributing a HASP HL-protected Software Order* you will assume the role of an end user, and will install licenses and run these Products.

Defining a Product With an Execution-based License

In this lesson, you define a Product based on the Bounce Feature (**ID 50**), with a license that enables the program to be launched three times. Following the third execution, the license must be updated to enable further use of the program.

To define a Product:

1. Launch Sentinel HASP Business Studio.
2. In the Function pane of the Business Studio window, under Licensing Plan, select **Manage Products**. The Manage Products window is displayed in the Main pane.
3. Verify that **DEMOMA** is selected in the **Batch Code** field.
4. In the Task pane, click **New**. The New Product window is displayed.
5. In the **General** area, in the **Base Product** field, type **`Bounce_Lite`**.
6. In the **Attributes** area, in the **Locking Type** drop-down list, select **HASP HL or HASP SL**. This option enables the locking type to be determined at the time when each order is defined.

7. Ensure that the **Clone Protection** checkbox is selected. This option ensures that when you lock Products to a HASP SL key in a later lesson, the Features in the Products will be protected against cloning. (This means that if the Sentinel HASP Run-time detects cloning at the end-user site, the Product will be disabled.)
8. In the **Features & Memory** area, in the **Available Features** list, select Feature **50** (Bounce) and click the right arrow. The selected Feature is moved to the **Features In Product** list.
9. In the **Features In Product** list, select **Bounce** and click **Define** to specify the license terms for the Feature. The Define License Terms window is displayed.
10. In the **License Type** drop-down list, select **Executions**.
11. In the **Number of Executions** field, type `3`.
12. Click **OK**. The Define License Terms window closes and the license terms are displayed in the **Features in Product** list.
13. Click **OK**. The new Bounce_Lite Product is displayed in the Manage Products window. Note that the status of the Bounce_Lite Product is **Ready**.

Defining Products With Fully-Featured Licenses

In this section, you duplicate existing Products in order to define two additional Products:

- A Product based on the Bounce Feature (ID 50), with a perpetual license that will allow the end user unlimited access to the program. This Product will later be used to update the limited, execution-based Bounce_Lite Product to a fully-featured license.
- A Product based on the MyNotepad Feature (ID 10), with a perpetual license that will allow the end user unlimited access to the program. In *Lesson 5—Defining a Provisional Product*, you will define an evaluation MyNotepad Product. The MyNotepad_Full Product you define in this lesson will later be used to update the evaluation license to a fully-featured license.

To define the Bounce_Full Product:

1. In the Function pane of the Business Studio window, under Licensing Plan, select **Manage Products**. The Manage Products window is displayed in the Main pane.
2. Verify that **DEMOMA** is selected in the **Batch Code** field.
3. In the Task pane, click **New**. The New Product window is displayed.
4. In the **General** area, in the **Base Product** field, type **`Bounce_Full`**.
5. In the **Attributes** area, in the **Locking Type** drop-down list, select **HASP HL or HASP SL**. This option enables the locking type to be determined at the time when each order is defined.
6. Ensure that the **Clone Protection** checkbox is selected. This option ensures that if a Product that is locked to a HASP SL key, the Features in the Products will be protected against cloning. (This means that if the Sentinel HASP Run-time detects cloning at the end-user site, the Product will be disabled.)
7. In the **Features & Memory** area, in the **Available Features** list, select Feature **50** (Bounce) and click the right arrow. The selected Feature is moved to the **Features In Product** list.
8. In the **Features In Product** list, select **Bounce** and click **Define** to specify the license terms for the Feature. The Define License Terms window is displayed.
9. In the **License Type** field, select **Perpetual**.
10. Click **OK**. The Define License Terms window closes and the license terms are displayed in the Features in Product list.
11. Click **OK**. There are now two new items in the Manage Products window: **Bounce_Lite** and **Bounce_Full**. Note that the status of the Bounce_Full Product is **Ready**.

To define the MyNotepad_Full Product:

1. In the Function pane of the Business Studio window, under Licensing Plan, select **Manage Products**. The Manage Products window is displayed in the Main pane.
2. Verify that **DEMOMA** is selected in the **Batch Code** field.
3. In the Task pane, click **New**. The New Product window is displayed.
4. In the **General** area, in the **Base Product** field, type **`MyNotepad_Full`**.

5. In the **Attributes** area, in the **Locking Type** drop-down list, select **HASP HL or HASP SL**. This option enables the locking type to be determined at the time when each order is defined.
6. Ensure that the **Clone Protection** checkbox is selected. This option ensures that if a Product that is locked to a HASP SL key, the Features in the Products will be protected against cloning. (This means that if the Sentinel HASP Run-time detects cloning at the end-user site, the Product will be disabled.)
7. In the **Available Features** list, under the **ID** field, select **10** (MyNotepad) and click the right arrow. The MyNotepad Feature is moved to the **Features In Product** list.
8. To define memory data, in the **Features & Memory** area, click the **Define Memory Data** tab, then do the following:
   a. Click **New**. The New Memory Segment window is displayed.
   b. In the **Offset** field, type `0`. The field content automatically changes to `0x0`.
   c. In the **Length** field, type `50`.
   d. Click **OK**. The window closes and the area at the bottom of the **Define Memory Data** tab is highlighted.
   e. At the first dot on the right of the highlighted area, type `Hello World`.
9. Click **OK**. The Product Properties window closes. There are now three new items in the Manage Products window: **Bounce_Lite**, **Bounce_Full**, and **MyNotepad_Full**. Note that the status of the Bounce_Full Product is **Ready**.

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Lesson 5

Defining a Provisional Product

Objective	Learn how to define a Provisional Product that can be supplied as a trial product
Role in this lesson	Product Management, Development
Applications used	Sentinel HASP Business Studio

In this lesson, still in the Production Management role, you define the "MyNotepad_Evaluation" Product as a trial version of the "MyNotepad_Full" Product you defined in *Lesson 4—Defining Products*. You then assume the Development role to prepare the Product for distribution by creating a customized Sentinel HASP Run-time Environment Installer executable file.

A Provisional Product is typically used for evaluation purposes, to enable the provision of a grace period, or for super-distribution. A Provisional Product can be used on any computer—without a Sentinel HASP protection key—for a limited time period only. After the allotted period expires, the software no longer runs, until it is activated with a Sentinel HASP protection key.

Defining a Provisional Product

In this section, in the Production Management role, you define the "MyNotepad_Evaluation" Product—a Provisional Product that is a trial version of the "MyNotepad_Full" Product, with a license that expires 60 days after the application is first used.

To define a Provisional Product:

1. In the Function pane, under Licensing Plan, select **Manage Products**. The Manage Products window is displayed.
2. Select the **MyNotepad_Full** Product, and in the Task pane, click **New Provisional**. The Provisional Product for MyNotepad_Full window is displayed.
3. In the **General** area, in the **Product Name** field, type **`MyNotepad_Evaluation`**. Note that:
   - The **Base Product** field displays MyNotepad_Full.
   - The **Description** field displays Provisional Product for MyNotepad_Full.
   - The MyNotepad Feature you defined in *Lesson 2—Defining Features* is included in the Product with a license for 30 days. This is the default number of days for a license for a Provisional Product.
4. In the **Features In Product** list, select **MyNotepad** and click **Define**. The Define License Terms window is displayed.
5. In the **Days until expiration** field, type **`60`**.
6. Click **OK**. The Define License Terms window closes and the updated license terms are displayed in the **License Terms** field in the **Features In Product** list.
7. Click **OK**. The status of MyNotepad_Evaluation is displayed in the Manage Products window as **Ready**.

Defining a Bundle of Provisional Products

In this section, you assume the Development role. You bundle the "MyNotepad_Evaluation" Provisional Product that was defined by the Product Manager. You then create a Sentinel HASP Run-time Environment Installer executable file that you will embed in your program before you include the program in the Provisional Product bundle.

To define a bundle of Provisional Products:

1. In the Function pane, under **Production**, select **Development Tasks**. The Development Tasks window is displayed.
2. In the Task pane, select **Bundle Provisional Products**. The Bundle Provisional Products window is displayed.
3. Verify that **DEMOMA** is selected in the **Batch Code** field.
4. Click **Add**. The Products window is displayed.
5. Select **MyNotepad_Full [MyNotepad_Evaluation]** and click **Add**. The Products window closes and the MyNotepad_Evaluation Product is displayed in the Bundle Provisional Products window.

   Note:
   In this procedure, you are only adding a single Provisional Product—MyNotepad_Evaluation—to the Provisional-Product bundle.

6. Click **Produce Now**. The Produce Bundle of Provisional Products window is displayed.
7. In **File Type**, select the **V2C** (Vendor to Customer) option.
8. In the **File Location** field, click the browse button. The Browse For Folder window is displayed, pointing to the default folder:
   ...\Documents and Settings\[*logged_in_user_name*]\My Documents\Aladdin\Sentinel HASP [*version*]\VendorTools\VendorSuite\v2c
9. Click **OK**. The path is displayed in the **File Location** field.
10. Click **Generate File**. The V2C file containing the licensing information is generated and a success message is displayed.
11. Click **OK**. The Development Tasks window indicates that the bundle has been created.

Creating a Sentinel HASP Run-time Environment Installer

Remaining in the Development role, you now create a Sentinel HASP Run-time Environment Installer executable that includes the V2C file you created. The Run-time Environment must be installed on the end user's computer in order for your Sentinel HASP protected and licensed program to function correctly.

You need only embed the installer in your software setup to create a ready-to-run Sentinel HASP protected and licensed program. In this scenario, you have already specified that the MyNotepad program will run in Trial mode for a maximum of 60 days.

To generate a Sentinel HASP Run-time Environment Installer executable:

1. In the Function pane, under **Production**, select **Development Tasks**. The Development Tasks window is displayed.
2. In the Task pane, select **RTE Installer**. The Generate Run-time Environment Installer window is displayed.
3. In the **V2C File Location** field, click the browse button.

   The Select V2C File for RTE Installer window is displayed, pointing to the default folder:
   …\Documents and Settings\[*logged_in_user_name*]\My Documents\Aladdin\Sentinel HASP [*version*]\VendorTools\VendorSuite\v2c.
4. Double-click the `v2c` file displayed in this location. The path to the file is displayed in the **V2C File Location** field of the Generate Run-time Environment Installer window.
5. In the **File Type** field, ensure that the **Application (EXE)** option is selected.
6. In the **Output File Location** field, click the browse button and create a folder called **`EvaluationProducts`** on your desktop.
7. Click **OK**. The path is displayed in the **Output File Location** field of the Generate Run-time Environment Installer window.

8. Click **Generate File**. A message informs you that the file was generated.
9. Click **OK**. The Development Tasks window indicates that the RTE (Run-time Environment) Installer has been customized to include the V2C file you created.

WARNING!

Do not execute the generated file at this time! You will install this bundle in *Lesson 6—Creating and Distributing a HASP SL-protected Software Order*.

You are now ready to ship your Product with its license locked to either a HASP SL key as described in *Lesson 6—Creating and Distributing a HASP SL-protected Software Order*, or a HASP HL key as described in *Lesson 7—Creating and Distributing a HASP HL-protected Software Order*.

Lesson 6

Creating and Distributing a HASP SL-protected Software Order

Objective	■ Learn how to define an order locked to a HASP SL key, specify the customer for the order, and produce the order. ■ Simulate a variety of end-user interactions with programs protected by Sentinel HASP protection keys.
Role in this lesson	Order Management, Production, End User
Applications used	■ Sentinel HASP Business Studio ■ Sentinel HASP Remote Update System utility ■ Admin Control Center

In this lesson, you assume the Order Management role and define an order. The order process also entails defining the customer and producing the order so that it is ready for shipment.

The order you define is based on the "MyNotepad_Full" Product that you defined in *Lesson 4—Defining Products*. The license is locked to a HASP SL key that will be activated on the end-user's machine to convert the trial MyNotepad software to a fully-featured product.

When you defined the Products, you specified the license terms for the Features included within those Products at that time. Note that instead of specifying the license terms when you defined the Product, you could have enabled the functionality for specifying the license terms at this stage as part of order processing.

In this lesson, you will also assume the end-user role to install and use the Product. You will then use the HASP SL Product Key received from the vendor to convert a trial version of the software to a fully-featured program.

Note:
When a customer wants to purchase additional Features or to extend the current license for a Product that has its license locked to a HASP SL key, you can update the deployed license, as described in *Creating an Update for a License in the Field* on page 43.

Defining a Perpetual License With a Product Key

In this section, you create an order for the "MyNotepad_Full" Product that you defined in *Lesson 4—Defining Products*, locked to a HASP SL key. This license will then be used to convert the trial MyNotepad_Evaluation Product you defined in *Lesson 5—Defining a Provisional Product* to a fully-featured product.

To define an order with a perpetual license:

1. In the Function pane of the Business Studio window, under Production, select **Manage Orders**. The Manage Orders window is displayed in the Main pane.
2. In the Task pane, click **New**. The New Production Order window is displayed.
3. In the **Customer** area, click **Create New**. The New Customer window is displayed.
4. In the **Name** field, type **`Bob Doe Ltd`**.
5. Click **OK**. The New Customer window closes and Bob Doe Ltd. is displayed in the **Customer Name** field of the New Production Order window.
6. Click **Add**. The Products window is displayed.
7. Select **MyNotepad_Full** and click **Add**. The MyNotepad_Full Product is added to the Order Items list.
8. In the **Order Details** area, select the **Product Key-based** option.
9. Click **Produce Now**. The Produce Product Keys window is displayed.

10. In the **File Location** field, click the browse button and create a folder named **`ProductKeys`** on your desktop. This folder will store your generated Product Key.
11. A default name is provided in the **File Name** field.
12. Click **Generate File**. The file is produced and a success message is displayed.
13. Click **No** to close the dialog box. The order is displayed in the Manage Orders window.

Installing a Trial Product

In this section, you simulate the experience of the end user when installing and running your MyNotepad "trial" software program.

Although in a real-life environment your software engineer would typically embed the Run-time Environment installation which includes the provisional license (for trial use) into your software installation so that it executes as part of the installation process, in this tutorial you perform several installation and simulation steps.

To install the Sentinel HASP Run-time Environment on an end-user machine:

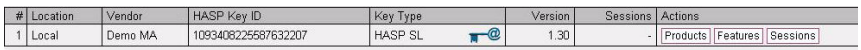
1. From the **Start** menu, select **Run**.
2. Click **Browse** and navigate to the **EvaluationProducts** folder you created on your desktop.
3. Select the `haspdinst.exe` file and click **Open**. The browse window closes and the file path is displayed in the **Open** field.
4. In the **Open** field, type a space followed by **`-i`** at the end of the file path.

   For example:

   `"...\Desktop\EvaluationProducts\haspdinst.exe" -i`
5. Click **OK**. The Sentinel HASP Run-time Environment is installed and a success message is displayed.

To check the license status of the trial Product:

1. Navigate to the following folder:
   …\Documents and Settings\[*logged_in_user_name*]\My Documents\Aladdin\Sentinel HASP [*version*]\VendorTools\VendorSuite\Protected).
2. Double-click `MyNotepad.exe`. A message is displayed warning that the program is only protected with a demo HASP key.
3. Click **OK**.
4. While the application is running, from the **Start** menu, select **Programs > SafeNet > Sentinel HASP > Tools > Admin Control Center**.
5. In the Administration Options pane, select **HASP Keys**. All the Sentinel HASP protection keys that are accessible on the HASP License Manager are displayed.



#	Location	Vendor	HASP Key ID	Key Type	Version	Sessions	Actions
1	Local	Demo MA	1093408225587632207	HASP SL	1.30	-	Products Features Sessions

6. Locate the entry for your Demo key and click the **Features** button in the **Actions** column. The Features that are licensed in your key are displayed.

   Note that the **Logins** field shows that there is currently one login to MyNotepad_Evaluation and that the **Restrictions** field for Feature ID 10 indicates that the 60-day trial has begun.
7. Close the MyNotepad program.

Activating a License With a Product Key

In this section, still in the role of the end user, you assume that you have purchased the MyNotepad_Full program and received a HASP SL Product Key from the vendor. You use the Product Key to convert the trial version of the software to a fully-featured program that is locked to your machine.

To simulate activation of the program:

1. From the **Start** menu, select **Programs > SafeNet > Sentinel HASP > Tools > Online-Activation Demo**. The Sentinel HASP Activation Sample dialog box is displayed. This dialog box simulates the end-user experience when activating a license. In real life, use the Activation API to integrate the activation process into your software.
2. In the **ProductKey** folder on your desktop, open the `.txt` file that contains the Product Key you generated earlier in this lesson in *Defining a Perpetual License With a Product Key* on page 34.
3. Copy the Product Key and paste it into the **Product Key** field.
4. Click **Activate**. A message box is displayed indicating that the activation simulation has been successful.
5. Click **OK**. The message box closes.
6. Open Sentinel HASP Admin Control Center to see that you now have a **Perpetual** license for Feature ID 10.

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Lesson 7

Creating and Distributing a HASP HL-protected Software Order

Objective	■ Learn how to define orders locked to HASP HL keys, specify the customer for each order, and produce the orders ■ Simulate a variety of end-user interactions with programs protected by Sentinel HASP protection keys ■ Learn how to update a license in the field
Role in this lesson	Order Management, Production, End User
Applications used	■ Sentinel HASP Business Studio ■ Sentinel HASP Remote Update System utility ■ Admin Control Center

In this lesson, you assume the Order Management role and define two different orders. The order process entails you defining the order, defining a new customer, and producing the order so that it is ready for shipment. You also assume the end-user role to test different types of Sentinel HASP protection keys and licenses.

When a customer wants to purchase additional Features, or to extend the current license for your protected program, you can update the deployed license without having to recall or redeploy keys.

In this lesson, you will also assume the Order Management role and learn how to update the deployed license.

The orders you define are based on the Products that you defined in *Lesson 4—Defining Products*, and include:

- An order for the "Bounce_Lite" Product.
- An order for the "Bounce_Full" Product. This order will be used to update the license on the HASP HL key provided to the end user with the "Bounce_Lite" Product. You will learn how to convert its functionality from Bounce_Lite to Bounce_Full in the field.

When you defined the Products, you specified the license terms for the Features included within those Products at that time. Note that instead of specifying the license terms when you defined the Product, you could have enabled the functionality for specifying the license terms at this stage as part of order processing.

Defining a "Rental" Product Order With HASP HL Locking

In this section, you define an order for the "Bounce_Lite" Product, with its license locked to a HASP HL key.

To produce a HASP HL key-based order for a customer:

1. In the Function pane of the Business Studio window, under Production, select **Manage Orders**. The Manage Orders window is displayed in the Main pane.
2. In the **Batch Code** field, ensure that DEMOMA is selected.
3. In the Task pane, click **New**. The New Production Order window is displayed.
4. In the **Customer** area, click **Create New**. The New Customer window is displayed.
5. In the **Name** field, type `John Smith Ltd`.
6. Click **OK**. The New Customer window closes and John Smith Ltd. is displayed in the **Customer Name** field of the New Production Order window.
7. Click **Add**. The Products window is displayed.
8. Select **Bounce_Lite** and click **Add**. The Bounce_Lite Product is added to the Order Items list.

To lock the license to a HASP HL key:

1. In the **Order Details** area, select the **HASP HL Keys** option.
2. In the **Number of keys** field, type `1`.
3. Click **Produce Now**. The Produce HASP HL Keys window is displayed.
4. Connect the Demo HASP HL key, to which you want to burn the order, to your computer.
5. Click **Burn Now**. A bar is displayed showing the progress of the burn process. When the burn process is complete, the progress bar closes and the **Burned** field in the Produce HASP HL Keys window indicates that one key has been burned.
6. Click **Done** to close the Produce HASP HL Keys window.

Note:
This procedure could also be performed by a person in the Production role, who is authorized to use Sentinel HASP Business Studio only for this purpose and does not have access to other functions.

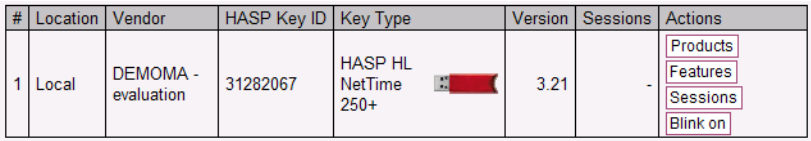
Using an Application With a HASP HL Key

When a customer receives an application you protected with a HASP HL key, the actual key must be accessible by the application in order to run the program. In the following procedure, you assume the end-user role to test Bounce, with a Bounce_Lite license locked to a HASP HL key.

In this part of the lesson, you use Sentinel HASP Admin Control Center to manage the use of your licensed software. In a real-time environment, a system administrator in your customer's organization uses this Web-based application to manage network licenses for your software.

To activate a Product protected with a HASP HL key:

1. Connect the Demo key on which you burned the order to your computer. The required licensing information for Bounce_Lite is contained, in encrypted format, in the key. As long as the license is valid, the protected application can run.
2. From the **Start** menu, select **Programs > SafeNet > Sentinel HASP > Tools > Admin Control Center**. Sentinel HASP Admin Control Center is displayed. This interface enables customers to track the status and usage of their Sentinel HASP licenses.
3. In the Administration Options pane, select **HASP Keys**.
   All the Sentinel HASP protection keys that are accessible on the HASP License Manager are displayed.



#	Location	Vendor	HASP Key ID	Key Type	Version	Sessions	Actions
1	Local	DEMOMA - evaluation	31282067	HASP HL NetTime 250+	3.21	-	Products Features Sessions Blink on

4. Locate the entry for your Demo key and click the **Features** button in the **Actions** column. The Features that are licensed in your key are displayed.

   Note that the **Restrictions** field for Feature ID 50 displays **Executions 3 left**, indicating that the remaining number of logins permitted by the license is **3**.
5. Navigate to the following folder:
   …\Documents and Settings\[*logged_in_user_name*]\My Documents\Aladdin\Sentinel HASP [*version*]\VendorTools\VendorSuite\Protected.
6. Double-click `Win32_Bounce.exe`. A message is displayed, warning that the program is only protected with a demo HASP key.
7. Click **OK**. The Bouncing Ball program launches.
8. Close the Bounce software.
9. Repeat step 6, step 7, and step 8 twice, to consume all the permitted executions.
10. Repeat step 6. Bounce fails to open and a message is displayed indicating that the Feature has expired.
11. In Sentinel HASP Admin Control Center, in the Administration Options pane, select **HASP Keys**. All the Sentinel HASP protection keys that are accessible on the HASP License Manager are displayed.

12. Locate the entry for your Demo key and click the **Features** button in the **Actions** column.

    Note:
    If you are not sure which entry relates to your specific key, click the **Blink on** button and identify the key on which the LED is blinking.

    Note that the **Restrictions** field for Feature ID 50 displays **Expired**, meaning that the number of allowed logins defined in the license has been exhausted.

Creating an Update for a License in the Field

John Smith requested a license upgrade—from Bounce_Lite to Bounce_Full. In this part of the lesson, you will assume the Order Management role to create an update for the deployed license, and the Production role to produce the order for the updated license. You will then assume the role of the end user (John Smith) to activate the license update.

Note:
There are many ways to use the Sentinel HASP Remote Update System (RUS) when you send license updates to your customers. For more information, see Chapter 12, *Sentinel HASP Remote Update System* in the *Sentinel HASP Software Protection and Licensing Guide*.

To produce an order for a license update:

1. In the Function pane of the Business Studio window, under Production, select **Manage Orders**. The Manage Orders window is displayed in the Main pane.
2. In the Task pane, click **New**. The New Production Order window is displayed.
3. In the **Customer** area, click **Search**. The Locate Customer window is displayed.
4. In the **Name** drop-down list, select **`John Smith Ltd`**.
5. Click **OK**. The Locate Customer window closes and John Smith Ltd. is displayed in the **Customer Name** field of the Production Order window.

6. Click **Add**. The Products window is displayed.
7. Select **Bounce_Full** and click **Add**. The Bounce_Full Product is added to the Order Items list.
8. In the **Order Details** area, select the **HASP Update** option.
9. Click **Locate**... The Locate HASP Keys window is displayed.
10. Click **Locate**. The key information is displayed in the upper table.
11. In the **HASP ID** field, note the HASP ID number for John Smith's HASP HL key.
12. Click **Add to List**. The information is added to the **HASP Keys to Update** table.
13. Click **OK**. The Locate HASP Keys window closes.
14. Click **Produce Now**. The Produce HASP Update window is displayed.
15. In **File Type**, select the **V2C** option.
16. In the **File Location** field, click the browse button. The Browse For Folder window is displayed, pointing to the default folder:
    …\Documents and Settings\[*logged_in_user_name*]\My Documents\Aladdin\Sentinel HASP [*version*]\VendorTools\VendorSuite\v2c
17. Click **OK**. The path is displayed in the File Location field.
18. Click **Generate File**. The file is generated and a success message is displayed.
19. Click **OK**. The Produce HASP Update window closes.
    The license update is stored as a V2C file in this format:
    `HASPUpdate_[OrderID]_[HASP KeyID].v2c`
    where `[OrderID]` is the ID number assigned to the new order, and `[HASP KeyID]` is the HASP ID number that you noted in step 11.

Updating a License at the Customer's Site

In this section, you retain the role of "John Smith Ltd." Having purchased a fully-featured Bounce_Full version of the program to replace the execution-based Bounce_Lite version, you update your license using the Sentinel HASP Remote Update System (RUS) and the `HaspUpdate.v2c` file you receive from the vendor.

To activate a license update:

1. Ensure that the Demo key is connected to your computer.
2. Launch Sentinel HASP Admin Control Center, as follows.

   From the **Start** menu, select **Programs > SafeNet > Sentinel HASP > Tools > Admin Control Center**. Sentinel HASP Admin Control Center is displayed.
3. In the Administrative Options pane, select **Update/Attach**. The Update/Attach License to HASP License Manager window is displayed.
4. Click **Browse** and navigate to the following folder:
   …\Documents and Settings\[*logged_in_user_name*]\My Documents\Aladdin\Sentinel HASP [*version*]\VendorTools\VendorSuite\v2c.
5. Select the `HASPUpdate_[OrderID]_[HASP KeyID].v2c` file that you created when producing the order for the license update in your Order Management role earlier, in *Creating an Update for a License in the Field* on page 43.
6. Click **Open.** The file path is displayed in the **Select a V2C, H2R or ID file** field.
7. Click **Apply File**. A message is displayed confirming that your update was applied successfully.
8. In the Administrative Options pane, select **HASP Keys**.
9. Locate the entry for your Demo key and click the **Features** button. The Features that are licensed in your key are displayed.

   Note that an additional row is created for Feature ID 50. The **Restrictions** field in this row is **Perpetual**, indicating that the remaining number of logins permitted by the license is unlimited.

10. Navigate to the following folder:
    …\Documents and Settings\[*logged_in_user_name*]\My Documents\Aladdin\Sentinel HASP [*version*]\VendorTools\VendorSuite\Protected.
11. Double-click `Win32_Bounce.exe`. A message is displayed warning that the program is only protected with a demo HASP key.
12. Click **OK**. The Bouncing Ball program launches.
13. Close the Bouncing Ball program and disconnect the Demo key.

Lesson 8

Using Sentinel HASP Run-time API

Objective	Learn how to implement Sentinel HASP Run-time API functions using Sentinel HASP ToolBox
Role in this lesson	Development
Applications used	Sentinel HASP ToolBox

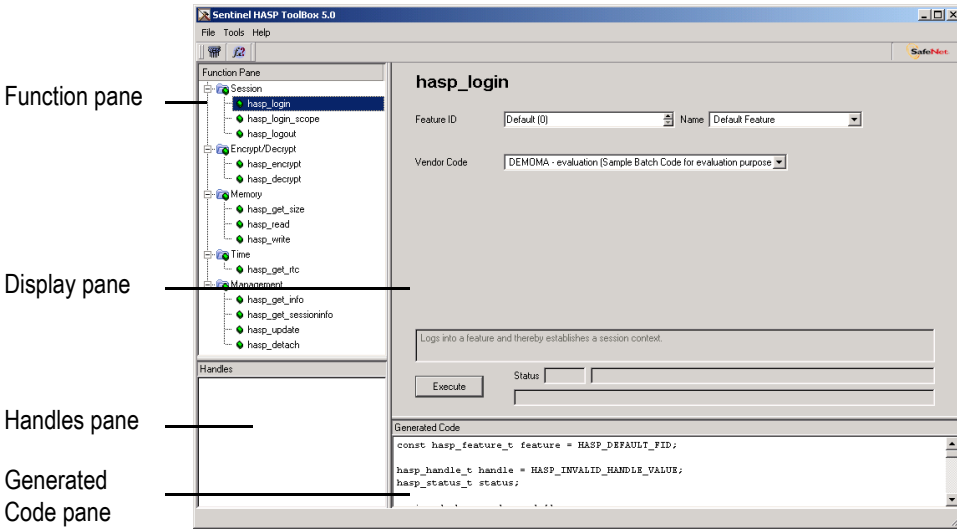
Now that you have completed the other lessons in this tutorial, you should have a good understanding of how Sentinel HASP works. This lesson builds on your accumulated knowledge and introduces you to the Sentinel HASP Run-time API through Sentinel HASP ToolBox, which is an interactive GUI application that helps you familiarize yourself with the Sentinel HASP Run-time API.

The Sentinel HASP system offers a rich variety of API calls to support customized protection of your program, as well as other operations on Sentinel HASP protection keys.

You can also use Sentinel HASP ToolBox to generate source code that you can immediately copy and paste into your own application source code.

The Sentinel HASP ToolBox window includes the following:

- Function pane, in which you select the function to perform
- Display pane, in which you can view and edit the details of the API call you selected
- Generated Code pane, in which code is displayed. You can copy this code and paste it into your own files.
- Handles pane, in which the session handle is displayed



To launch Sentinel HASP ToolBox:

1. From the **Start** menu, select **Programs > SafeNet > Sentinel HASP > Vendor Suite**. The Vendor Suite program selection window is displayed.
2. Click **ToolBox** to launch the Sentinel HASP ToolBox application. The login window is displayed.
3. Click **Work Offline**. The Sentinel HASP ToolBox main window is displayed.
4. The Function pane on the left of the ToolBox window lists all the available Sentinel HASP Run-time API calls.
5. Browse the list. You can select any API call as you browse. When making a selection, the Display pane on the right of the ToolBox window displays the parameters you must specify in order to activate the selected API call.

Selecting Your Programming Language

Sentinel HASP ToolBox can generate code in several programming languages.

To select a programming language:

1. From the **File** menu, select **Settings**. The Sentinel HASP ToolBox Settings window is displayed.
2. Select the **ToolBox** tab.
3. From the **Programming language** drop-down list, select your preferred language.

   For the purpose of completing this tutorial, it is recommended that you select **C-API**. If C-API is not selected, select it and click **OK**. If C-API is already selected, click **Cancel**.

   The Sentinel HASP ToolBox Settings window closes with the programming language selected.

Login

Each Sentinel HASP Run-time API session must begin with the `hasp_login` API call, which establishes a connection with the connected Demo key and enables access to its resources.

To log in to the Demo key:

1. Connect the Demo key.
2. In the Function pane, select **hasp_login**. The Display pane displays all the parameters with the default values that are appropriate for the login operation.
3. Specify the location of your stored Vendor Code file.
   To locate your Vendor Code file, click the browse button.

   By default, the DEMOMA Vendor Code is stored in:
   …\Documents and Settings\[*logged_in_user_name*]\My Documents\Aladdin\Sentinel HASP [*version*]\VendorCodes
4. Select **DEMOMA.hvc** and click **Open**. The code is displayed in the **Vendor Code** field.
5. In the **Feature ID** field, type `50`.

6. At the bottom left of the `hasp_login` pane, click **Execute**. The result of the executed login is summarized to the right of the **Execute** button in three **Status** fields—number, code and message.

Encrypting Data and Writing to Memory

Now that you have established a session with the connected Sentinel HASP protection key, you can access its resources through other API calls.

One of the most important and powerful resources available in a Sentinel HASP protection key is its internal encryption engine. You can optimize protection by using this engine and the encryption facilities in the Sentinel HASP application as an additional method for verifying that the correct key is accessible when the protected program is running. To do this, proceed as follows:

- Encrypt a string using the Sentinel HASP protection key
- Incorporate the encrypted string into the application source code
- Define your source code to send the encrypted string to the key for decryption and then to verify the result

In its encrypted form, the string prevents the program from running correctly. The protected program will run only if it can decrypt the string, and this can only be achieved if the Sentinel HASP protection key is accessible. This section demonstrates how the key encrypts and decrypts a string.

To encrypt a string:

1. In the Function pane, select **hasp_encrypt**. The Display pane displays parameters for the `hasp_encrypt` API call.
2. Specify the **Size** as **100**.
3. Click the first dot to the right of the memory editor, on the far right of the window, and type: **`SafeNet, Inc`**.

4. Click **Execute**. Note that the string has been encrypted by the Sentinel HASP protection key and is now illegible.

   Note:
   Because Sentinel HASP uses a unique encryption key for each encryption process, based on your unique Sentinel HASP Vendor keys, the string you type is encrypted differently from any other software vendor.

5. In the Function pane, select **hasp_decrypt**. The editor still displays the encrypted string.
6. Click **Execute**. The Sentinel HASP protection key decrypts the string. **`SafeNet, Inc`**. is now displayed in the editor.

Retrieving Sentinel HASP Key Information

Sentinel HASP ToolBox enables you to retrieve key-related information. In this section, you use the `hasp_get_sessioninfo` function to retrieve information relating to the identity and memory size of the Sentinel HASP key.

To retrieve Sentinel HASP key information:

1. In the Function pane, under **Management**, select **`hasp_get_sessioninfo`**. The Display pane displays parameters for the `hasp_getsessioninfo` API call.
2. In the Display pane, from the **Format Template** drop-down list, select **HASP_KEYINFO**. Note that a description of the Format definition is displayed in the gray box below the **Information** field.
3. Click **Execute**. The Information pane displays XML tags with information on the key, including:
   - The unique ID number of the connected key
   - The key Read/Write memory size
   - The key Read-only memory size

Reading and Programming Sentinel HASP Key Memory

In this section, you log in to Feature ID 10 on the HASP SL key that you defined in *Lesson 4—Defining Products*, and read the memory of the key.

To log in to the Sentinel HASP protection key:

- Follow the Demo key login procedure on page 49, but this time, in step 5, type `10`.

To read the Sentinel HASP key memory:

1. In the Function pane, under **Memory**, select **hasp_read**. The Display pane displays parameters for the `hasp_read` API call and an editor for the Sentinel HASP key memory.
2. In the memory editor, set the **Offset** field to **0** and the **Length** field to **50**.
3. Click **Execute**. The string `Hello World`, which you stored in the key in *Lesson 4—Defining Products*, is now displayed in the memory editor.

What's Next?

This concludes the Sentinel HASP tutorial. You are now ready to use the Sentinel HASP applications to license your software and protect it against unauthorized use.

For additional information about the Sentinel HASP system, refer to the *Sentinel HASP Software Protection and Licensing Guide* and the Help documentation available in the Sentinel HASP applications.