

# Luna HSM

## Installation Guide



THE  
DATA  
PROTECTION  
COMPANY

## Document Information

<b>Product Version</b>	5.4.1
<b>Document Part Number</b>	007-011329-006
<b>Release Date</b>	04 July 2014

## Revision History

<b>Revision</b>	<b>Date</b>	<b>Reason</b>
A	26 February 2014	Initial release.
B	17 April 2014	Updates to the SFF Backup feature.
C	04 July 2014	Solaris client support.

## Trademarks

All intellectual property is protected by copyright. All trademarks and product names used or referred to are the copyright of their respective owners. No part of this document may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, chemical, photocopy, recording or otherwise without the prior written permission of SafeNet, Inc.

## Disclaimer

SafeNet makes no representations or warranties with respect to the contents of this document and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose. Furthermore, SafeNet reserves the right to revise this publication and to make changes from time to time in the content hereof without the obligation upon SafeNet to notify any person or organization of any such revisions or changes.

We have attempted to make these documents complete, accurate, and useful, but we cannot guarantee them to be perfect. When we discover errors or omissions, or they are brought to our attention, we endeavor to correct them in succeeding releases of the product.

SafeNet invites constructive comments on the contents of this document. Send your comments, together with your personal and/or company details to the address below.

<b>Contact Method</b>	<b>Contact Information</b>
Mail	SafeNet, Inc. 4690 Millennium Drive Belcamp, Maryland 21017 USA
Email	techpubs@safenet-inc.com

# CONTENTS

<b>PREFACE</b>	<b>About the Installation Guide</b>	<b>6</b>
Customer Release Notes		6
Audience		6
Document Conventions		7
Notes		7
Cautions		7
Warnings		7
Command Syntax and Typeface Conventions		7
Support Contacts		8
<b>CHAPTER 1</b>	<b>Luna SA Hardware Installation</b>	<b>10</b>
Luna SA Required Items		11
SafeNet Luna PED?		13
Additional Options?		15
Installing the Luna SA Hardware		17
Installation Notes		17
Installing the Luna SA Hardware		17
<b>CHAPTER 2</b>	<b>Luna PCI-E Hardware Installation</b>	<b>21</b>
Will Luna PCI-E work with host computer/server XYZ ?		21
Luna PCI-E Required Items		22
Password-Authenticated Luna PCI-E		22
PED-Authenticated Luna PCI-E		23
Backup Device		26
Installing the Luna PCI-E Hardware		27
Installing the Luna PCI-E Card Into the Host Computer		27
Connecting a Local PED		29
Connecting a Remote PED		29
<b>CHAPTER 3</b>	<b>Luna G5 Hardware Installation</b>	<b>31</b>
Luna G5 Required Items		32
Password-Authenticated Luna G5		32
PED-Authenticated Luna G5		33
Additional Optional Items		35
Installing the Battery in the Luna G5 or Backup HSM		36
Installing the Luna G5 Hardware		38
<b>CHAPTER 4</b>	<b>Luna Remote PED Installation and Configuration</b>	<b>43</b>
Installing and Configuring a Luna Remote PED		44
Required Items		44
Remote PED Setup		45
<b>CHAPTER 5</b>	<b>Luna Client Software Installation</b>	<b>53</b>

AIX Luna Client Installation .....	54
Prerequisites .....	54
RNG/EGD .....	54
You Need an Entropy Pool .....	54
JAVA .....	57
Remove components .....	58
[Ctrl] [C] - If you interrupt the installation .....	59
After Installation .....	59
HP-UX Luna Client Installation .....	60
Prerequisites .....	60
Installing the Luna Client Software .....	61
Uninstalling the Luna Client Software .....	63
Java Component Installation .....	63
Interrupting the Installation .....	65
After Installation .....	65
Linux Luna Client Installation .....	66
Prerequisites .....	66
Installing the Client Software .....	67
Uninstalling the Luna HSM Client Software .....	70
Java .....	70
Removing components .....	71
[Ctrl] [C] - If you interrupt the installation .....	72
Scripted or Unattended Installation .....	72
SUSE Linux on IBM PPC .....	73
32-bit Client on 64-bit RedHat 6 .....	73
After Installation .....	75
Solaris Luna Client Installation .....	76
Prerequisites .....	76
Installing the Client Software .....	77
Uninstalling the Luna HSM Client Software .....	79
Java .....	79
Removing components .....	80
[Ctrl] [C] - If you interrupt the installation .....	80
After Installation .....	80
Windows Luna Client Installation .....	81
Required Client Software .....	81
Installing the Luna Client Software .....	81
Using msixexec for scripted or unattended installation of the Luna Client .....	85
Java .....	85
CSP and KSP .....	87
Using 32-bit Applications With the Luna Client .....	87
Uninstalling, Modifying, or Repairing the Luna Client Software .....	89
After Installation .....	89
Troubleshooting .....	89
Windows 2012 Luna Client Supplemental Configuration .....	93
Scripted / Unattended Installation on Windows .....	95
Installing the Luna Client For All Luna Products .....	95
Installing the Luna Client For Luna SA .....	95
Installing the Luna Client for Luna PCI-E .....	96

---

Installing the Luna Client For Luna G5 .....	96
Installing the Luna Client for Luna Remote Backup HSM .....	97
Installing the Luna Client for Remote PED .....	97

# PREFACE

## About the Installation Guide

This document describes how to install the Luna HSM hardware and the Luna Client software. Refer to the following chapters to install the hardware and software components applicable to you:

### Luna HSM hardware installation

- "Luna SA Hardware Installation" on page 10
- "Luna PCI-E Hardware Installation" on page 21
- "Luna G5 Hardware Installation" on page 31

### Luna Remote PED installation and configuration

- "Luna Remote PED Installation and Configuration" on page 43

### Luna Client software installation

- "Luna Client Software Installation " on page 53

### Document information

This preface also includes the following information about this document:

- "Customer Release Notes" on page 6
- "Audience" on page 6
- "Document Conventions" on page 7
- "Support Contacts" on page 8

For information regarding the document status and revision history, see "Document Information" on page 2

## Customer Release Notes

---

The customer release notes (CRN) provide important information about this release that is not included in the customer documentation. It is strongly recommended that you read the CRN to fully understand the capabilities, limitations, and known issues for this release. You can view or download the latest version of the CRN for this release at the following location:

- [http://www.securedbysafenet.com/releasenotes/luna/crn\\_luna\\_hsm\\_5-4.pdf](http://www.securedbysafenet.com/releasenotes/luna/crn_luna_hsm_5-4.pdf)

## Audience

---

This document is intended for personnel responsible for maintaining your organization's security infrastructure. This includes Luna HSM users and security officers, key manager administrators, and network administrators.

All products manufactured and distributed by SafeNet, Inc. are designed to be installed, operated, and maintained by personnel who have the knowledge, training, and qualifications required to safely perform the tasks assigned to them.

The information, processes, and procedures contained in this document are intended for use by trained and qualified personnel only.

It is assumed that the users of this document are proficient with security concepts.

## Document Conventions

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

### Notes

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



**Note:** Take note. Contains important or helpful information.

### Cautions

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



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

### Warnings

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



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

## Command Syntax and Typeface Conventions

Format	Convention
<b>bold</b>	<p>The bold attribute is used to indicate the following:</p> <ul style="list-style-type: none"> <li>• Command-line commands and options (Type <code>dir /p</code>.)</li> <li>• Button names (Click Save As.)</li> <li>• Check box and radio button names (Select the Print Duplex check box.)</li> <li>• Dialog box titles (On the Protect Document dialog box, click Yes.)</li> <li>• Field names (User Name: Enter the name of the user.)</li> <li>• Menu names (On the File menu, click Save.) (Click Menu &gt; Go To &gt; Folders.)</li> <li>• User input (In the Date box, type April 1.)</li> </ul>

Format	Convention
<i>italics</i>	In type, the italic attribute is used for emphasis or to indicate a related document. (See the <i>Installation Guide</i> for more information.)
<variable>	In command descriptions, angle brackets represent variables. You must substitute a value for command line arguments that are enclosed in angle brackets.
[ <b>optional</b> ] [<optional>]	Represent optional <b>keywords</b> or <variables> in a command line description. Optionally enter the keyword or <variable> that is enclosed in square brackets, if it is necessary or desirable to complete the task.
{ <b>a b c</b> } {<a> <b> <c>}	Represent required alternate <b>keywords</b> or <variables> in a command line description. You must choose one command line argument enclosed within the braces. Choices are separated by vertical (OR) bars.
[ <b>a b c</b> ] [<a> <b> <c>]	Represent optional alternate keywords or variables in a command line description. Choose one command line argument enclosed within the braces, if desired. Choices are separated by vertical (OR) bars.

## Support Contacts

If you encounter a problem while installing, registering or operating this product, please make sure that you have read the documentation. If you cannot resolve the issue, please contact your supplier or SafeNet support. SafeNet support operates 24 hours a day, 7 days a week. Your level of access to this service is governed by the support plan arrangements made between SafeNet and your organization. Please consult this support plan for further information about your entitlements, including the hours when telephone support is available to you.

**Table 1: Technical support contacts**

Contact method	Contact	
<b>Address</b>	SafeNet, Inc. 4690 Millennium Drive Belcamp, Maryland 21017 USA	
<b>Phone</b>	United States	(800) 545-6608, (410) 931-7520
	Australia and New Zealand	+1 410-931-7520
	China	(86) 10 8851 9191
	France	0825 341000
	Germany	01803 7246269
	India	+1 410-931-7520
	United Kingdom	0870 7529200, +1 410-931-7520
<b>Web</b>	www.safenet-inc.com	
<b>Support and Downloads</b>	www.safenet-inc.com/support	



Contact method	Contact
	Provides access to the SafeNet Knowledge Base and quick downloads for various products.
<b>Technical Support Customer Portal</b>	<a href="https://serviceportal.safenet-inc.com">https://serviceportal.safenet-inc.com</a> Existing customers with a Technical Support Customer Portal account can log in to manage incidents, get the latest software upgrades, and access the SafeNet Knowledge Base.

# CHAPTER 1




## Luna SA Hardware Installation


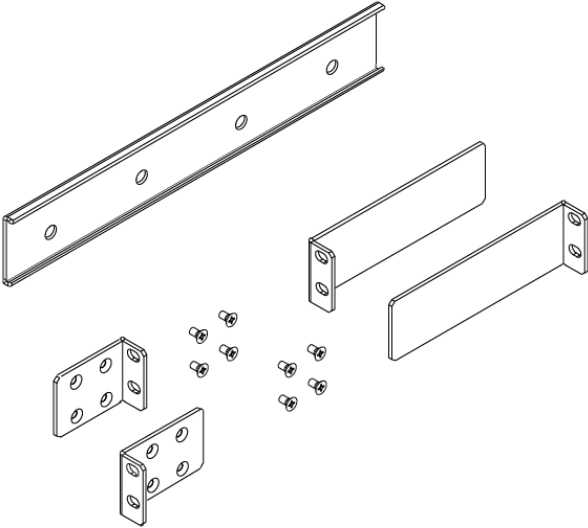
This chapter describes how to install and connect a Luna PCI-E HSM. To ensure a successful installation, perform the following tasks in the order indicated:

1. Ensure that you have all of the required components, as listed in "[Luna SA Required Items](#)" on page 11
2. Install and connect the hardware, as described in "[Installing the Luna SA Hardware](#)" on page 17

## Luna SA Required Items

Follow this checklist to verify that you have all of items required for the installation.

Qty	Item
1	 <p>Luna SA HSM Appliance</p>
2	 <p>Power Supply Cord (one for each power supply; style to suit country for which you ordered)</p>
1	 <p>Null-Modem Serial Cable</p>

Qty	Item
1	<div data-bbox="298 281 542 485"></div> <p data-bbox="248 516 626 548">USB 2.0 to RS232 Serial Adapter</p>
1	<div data-bbox="315 627 899 1152"></div> <p data-bbox="248 1184 324 1215">Set of:</p> <ul data-bbox="248 1218 1187 1318" style="list-style-type: none"><li>- 2 front Mounting Brackets with Screws,</li><li>- 2 Side Bracket Guides, and</li><li>- 2 Sliding Rear Brackets (fit into the guides for rear support adjustable positioning).</li></ul>

Qty	Item
1	 <p>Client / SDK Software</p>

## SafeNet Luna PED?

Additionally, if your Luna SA is the PED-authenticated version, then you might also have ordered the following items (next page).

Note that you can use Luna PEDs and PED Keys that you already own and use with other HSMs, if they have firmware 2.4.0 or later – PEDs of the same type are interchangeable, and PED Keys can be used with multiple HSMs if that is appropriate in your context. You should purchase the number you need for your own convenient operation, and for backup/standby units as your security policies might require.

If you intend to use Remote PED functions, you will need a Luna PED 2 Remote version.

The standard Luna PED 2 is capable of local operation only.

Qty	Item
1	<div></div> <p>SafeNet Luna PED2 (*)</p>
1	<div></div> <p>Cable, Data, 9-pin, Micro-D to Micro-D connectors (for local PED operation)</p>
1	<div></div>

Qty	Item
	Set of iKey PED Keys and peel-and-stick labels

(\* Standard PED 2 is shown. To use Luna SA with Remote PED function requires a Remote Capable PED – the standard PED does not have the Remote capability. They appear identical except for the availability of the “Remote” menu when powered on.)

## Additional Options?

### [Optionally]

You can back up your selected Luna SA HSM partition contents (root keys, certificates, other items) to a Luna Remote Backup HSM.

Qty	Item
1	 <p>Luna Backup HSM(*)</p>

(\* The SafeNet Luna Backup HSM is a backup-storage option, suitable for off-site storage, and for backing up multiple HSM partitions. Its contents are automatically secured at the same level of authentication security (Password versus PED) as the HSM it is backing up. The Luna Backup HSM can be connected directly [locally] to an HSM, or it can be connected to a computer to backup remotely located HSMs, in conjunction with Remote PED.)

### [Optionally]

You can use your Luna SA appliance to expand the functionality and reach of applications that you might previously have conducted with SafeNet PCMCIA tokens (Luna PCM and Luna PCM CA4), such as Registration Authority for SmartCard issuance, or Key Escrow for managed PKI implementations, or root-key management in the production of encrypted removable storage devices, among other possibilities. This function makes use of the Luna G5 HSM (very similar in appearance to the Backup HSM).

Qty	Item
1	 <p>Luna G5 HSM (for PKI)</p>

The authentication method for external HSMs must match the authentication method for any appliance HSM with which they are used.



## Installing the Luna SA Hardware

This section provides basic Luna SA hardware installation instructions (mounting in a rack, connecting cables, etc.). The Luna SA appliance comes with front brackets and side-rails and sliders for the rear brackets, packed separately in the carton.

### Installation Notes

1. Any computer that is to act as a client to the Luna SA appliance must have the Client software installed. Windows users should log in to your computer as a user with Administrator privileges.
2. A computer that is to be used only for administering the Luna SA does not need the Client software – only an SSH client such as the PuTTY program that we have provided for Windows, or the SSH utilities that come standard with most Linux and UNIX platforms.
3. A computer that is to be used for Remote PED workstation operation against a Luna SA must have the PEDServer software and PED 2 USB driver installed. Applies to select Windows platforms only.
4. All three tasks (Client, administration, and Remote PED) can be performed on a single computer, but in normal practice they are often separate tasks for separate computers.
5. See the Remote PED section if you will be using Remote PED.

### Installing the Luna SA Hardware

You can optionally install the brackets if they suit your equipment rack. The front brackets can be installed with their tabs forward (for flush-mount of the appliance) or reversed, to allow the front of the appliance to stand out from the rack. The rear brackets install in either direction – as appropriate for your rack post spacing – with the brackets simply sliding into the rails on each side of the appliance.

The supplied brackets are designed and intended for 4-point support of the appliance, in racks with rear-post depth up to 22 inches.



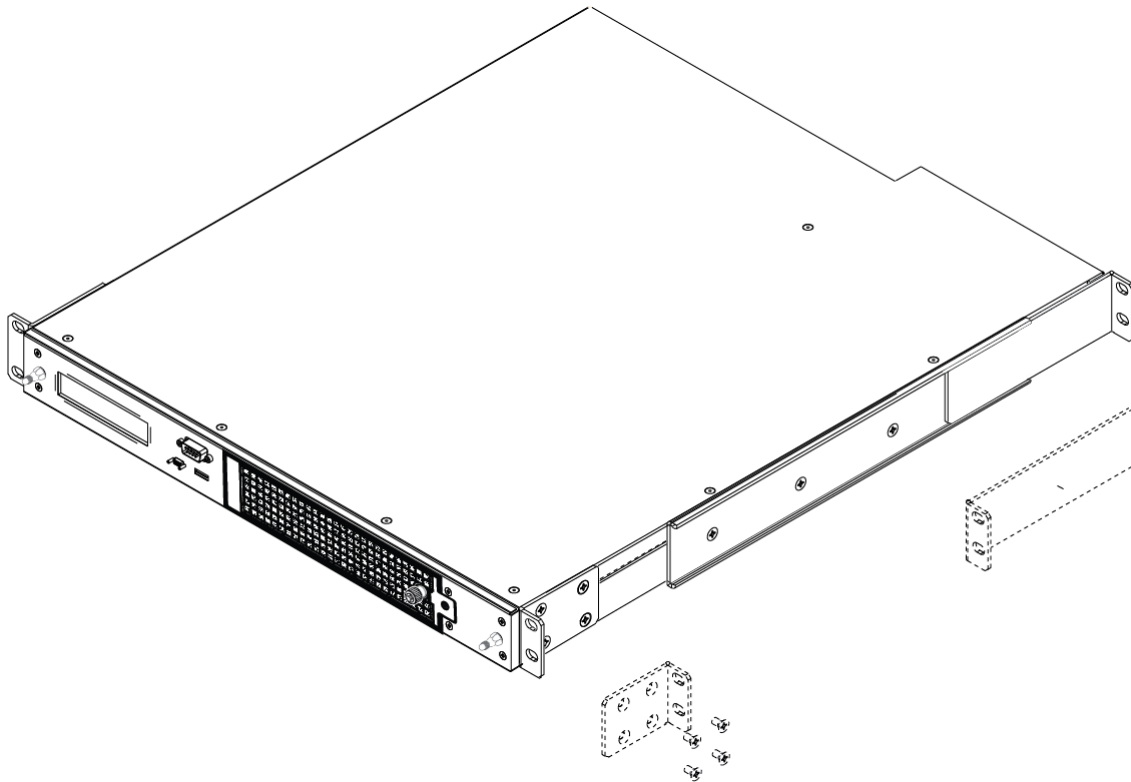
**CAUTION:** Do not attempt to mount the appliance using only the front brackets – damage can occur.



**Note:** The standard Luna PED 2 is capable of local operation only.

### To install the Luna SA hardware

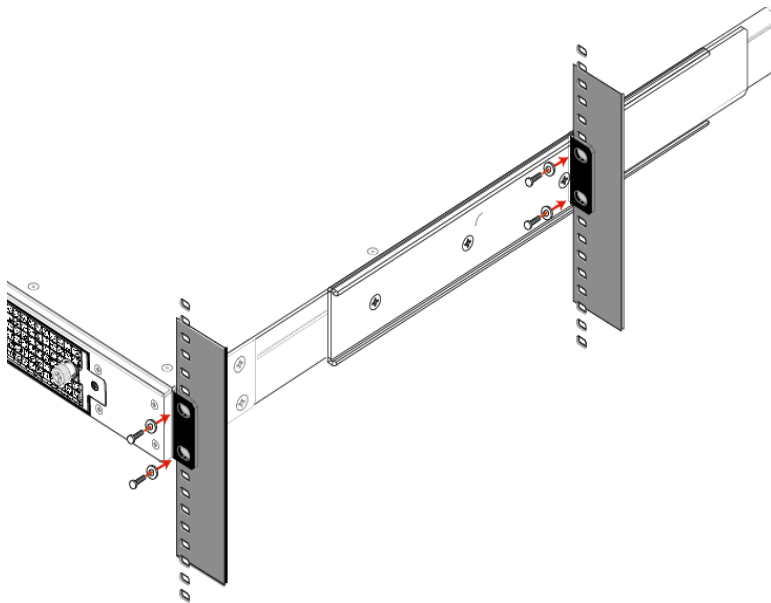
1. Install and adjust rails and brackets to suit your equipment rack.



2. Mount the appliance in your equipment rack. Alternatively, ignore the rails and mounting tabs, and rest the Luna SA appliance on a mounting tray or shelf suitable for your specific style and brand of equipment rack.

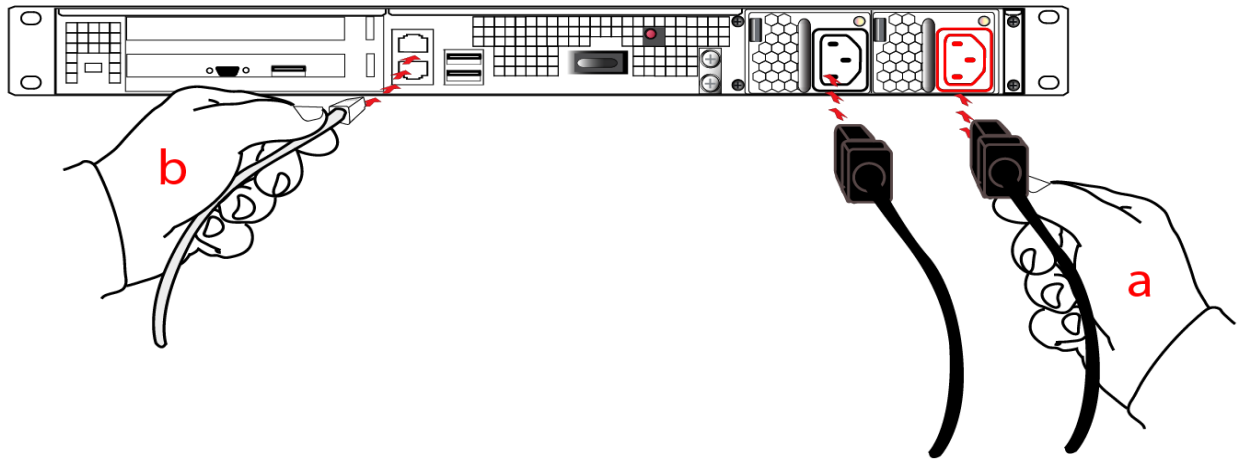


**CAUTION:** Support the weight of the appliance until all four brackets are secured.



3. Insert the power (a) and network (b) cables at the rear panel.

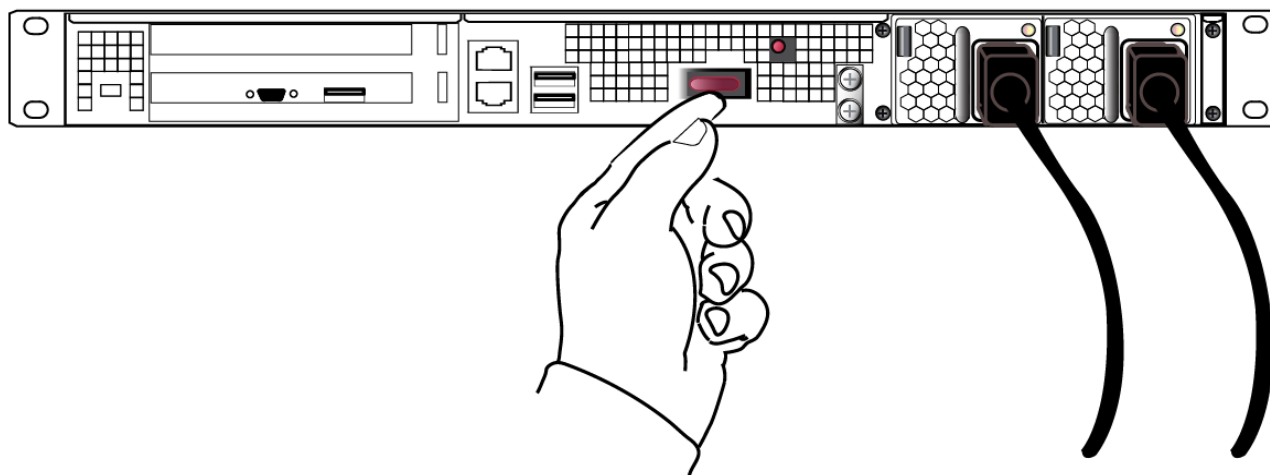
For proper redundancy and best reliability, the power cables should connect to two completely independent power sources.



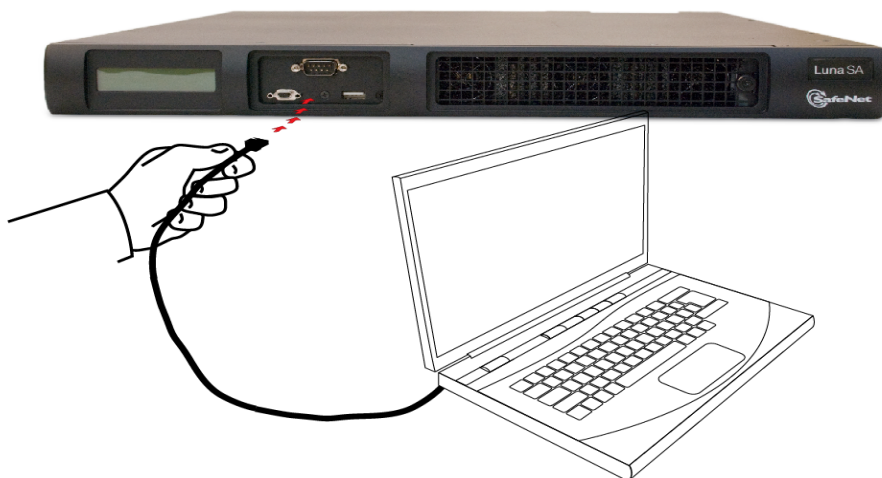
4. Connect the PED at the front panel, using the provided local PED cable – applies only for PED-authenticated HSM, otherwise skip to the next step.



5. Press and release the Start/Stop switch, on the rear panel.



6. Connect a terminal to the serial connector on the front panel.



7. If you have already installed Luna Client software, go to the Configuration Guide, to configure your Luna HSM and peripheral devices, if appropriate.

# Luna PCI-E Hardware Installation

This chapter describes how to install and connect a Luna PCI-E HSM. To ensure a successful installation, perform the following tasks in the order indicated:

1. Ensure that you have all of the required components, as listed in "Luna PCI-E Required Items" on page 22
2. Install and connect the hardware, as described in "Luna PCI-E Hardware Installation" on page 1

### Will Luna PCI-E work with host computer/server XYZ ?

In the majority of modern host computers/servers with compliant PCI express slots, Luna HSM just works.

We test the Luna HSM in a variety of representative computer systems / servers from major manufacturers. However, we cannot possibly test with all computers that are available on the market, or that were sold in recent years, or that come to market after we release the product. When we learn of a compatibility problem with a current, important brand and model computer, we work with the manufacturer to identify and resolve the issue, if possible.

If we test - or if customers report - that the Luna HSM does not work with a particular brand, model, and configuration of host system, we make that information available in Release Notes or via our Technical Support organization, so that you can make the necessary decisions without wasting time and effort.

If we learn that a particular make and model of host computer is partially able to support the Luna HSM, we publicize that information, and we hope that you will tell us if you encounter such a situation that we have not already seen.

When installing the Luna HSM into a new server/host computer, always try more than one PCI express slot if you encounter any issues. It often happens that, due to quirks of motherboard design, or of the associated BIOS, some slots will work properly with Luna HSMs while others do not. Almost always, if a particular PCI express physical slot is intended for use with video cards, or has been specially designated by the host for a particular type of hardware, then you can expect trouble with that slot. It is very possible that simply moving the Luna HSM card to another empty PCI express slot or swapping with another installed adapter card will get your Luna HSM working in the chosen host computer/server.

Contact SafeNet Technical Support if you encounter problems, but expect some of their initial trouble-shooting questions to center around the use of alternate physical slots for installation of your Luna HSM.

## Luna PCI-E Required Items

This section provides a list of the components you should have received with your Luna PCI-E order. The list of items you should have received depends on whether you ordered a password-authenticated Luna PCI-E or a PED-authenticated Luna PCI-E, and whether you order included a backup device, as described in the following sections:

### Password-Authenticated Luna PCI-E

The following are the standard items that you should have received as your basic order for a password-authenticated Luna PCI-E:

#### Luna PCI-E HSM

Your order should include one Luna PCI-E 7000 or Luna PCI-E 1700 HSM. Both HSM models are physically identical.



#### Anti-Static Wrist Strap

Your order should include one anti-static wrist strap.



## Software and Documentation

Your order should include a DVD case containing a Software DVD and a Documentation DVD.

## PED-Authenticated Luna PCI-E

For local-only operation, where you work at the same computer that contains your Luna PCI-E HSM, you require at least a single, local-only Luna PED2. The standard Luna PED 2 is capable of local operation only.

If you intend to use Remote PED functions, you will need a Luna PED 2 (capable of remote or local PED operation).

If you intend to backup your Luna PCI-E HSM to a Backup HSM, then you require a Luna PED2 to connect to that Backup HSM.

If you intend to combine remote operation and backup, then you should have at least one remote-capable Luna PED2 (for remote connection to the Luna PCI-E HSM). For convenience you might prefer to have a second PED (which can be local-only for the Backup HSM). It is possible to use a single Remote-capable Luna PED2 for both connections, and to simply change modes (local or remote mode) as needed.

The following are the items that you receive when you purchase a standard Luna PED2 (local-only capable).

Note that you can use SafeNet PEDs and PED Keys that you already own and use with other HSMs – PEDs of the same type and version (v2.3.0 and later) are interchangeable, and PED Keys can be used with multiple HSMs if that is appropriate in your context (the only exception is the SRK, which is specific to a single Luna PCI-E HSM). You should purchase the number you need for your own convenient operation, and for backup/standby units as your security policies might require.

## Luna PED

Your order should include a PED II device. To use Luna PCI-E with Remote PED function requires a Remote Capable PED – the standard PED does not have the Remote capability. They appear almost identical except for the words “Remote Capable” on the back, and the availability of the “Remote” menu when powered on.



### Luna Local PED cable

Your order should include a 9-pin, Micro-D to Micro-D cable for local PED operation.



### Luna Remote PED cable (Remote PED only)

If you ordered a Luna remote PED, your order should include a Type A to Mini B USB cable for remote PED operation.





### Luna Remote PED Power Supply Kit (Remote PED only)

If you ordered a Luna remote PED, your order should include a Luna remote PED power supply kit. The power supply is auto-sensing and includes replaceable mains plug modules for international use.



### PED Keys and Labels

Your order should include a set of iKey PED Keys and peel-and-stick labels.



## Backup Device

You can back up your selected Luna PCI-E HSM partition contents (root keys, certificates, other items) to a Luna Remote Backup HSM. The SafeNet Luna Remote Backup HSM is a backup-storage option, suitable for off-site storage, and for backing up multiple HSM partitions. The Backup HSM can backup contents of Password authenticated or of PED authenticated HSMs. It must be initialized as one or the other type before the backup operation starts.

The Luna Remote Backup HSM can be connected directly to an HSM, or it can be connected to a separate computer to backup remotely located HSMs, in conjunction with Remote PED.

The authentication method for external HSMs must match the authentication method for any internally installed HSM with which they are used (password or PED).

## Luna Remote Backup HSM

Your order may include a Luna Remote Backup HSM.



## Installing the Luna PCI-E Hardware

This section describes how to perform the following tasks:

- install the Luna PCI-E card into the host computer. See "Installing the Luna PCI-E Card Into the Host Computer" on page 27.
- connect a local PED, if necessary. See "Connecting a Local PED" on page 29
- connect a remote PED, if necessary. See "Connecting a Remote PED" on page 29

### Installing the Luna PCI-E Card Into the Host Computer

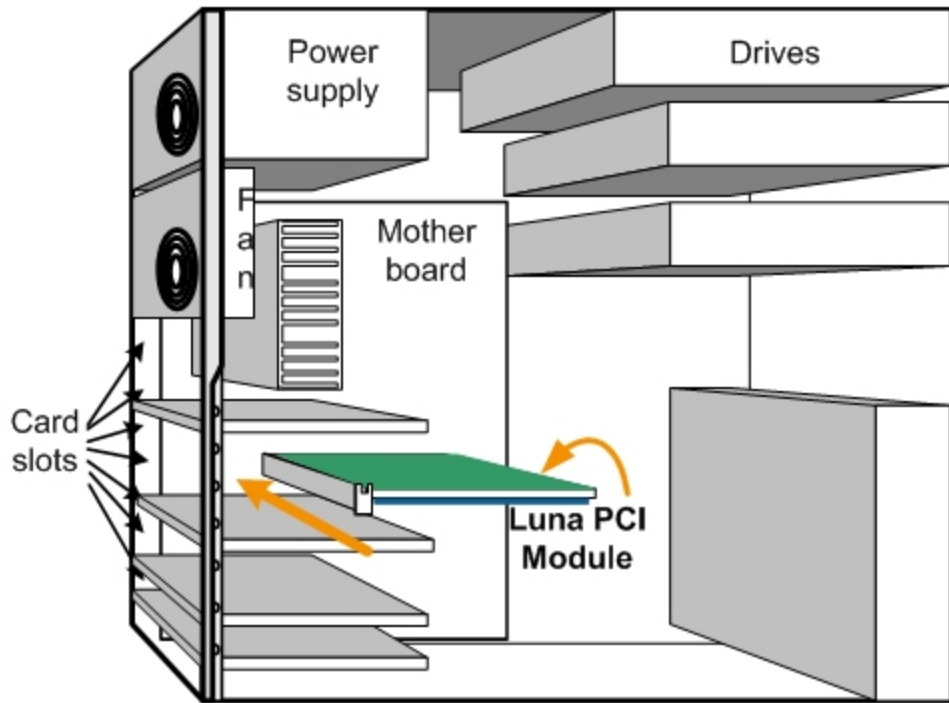
You install the Luna PCI-E card into an open PCIe slot on the host computer.

#### To install the Luna PCI-E hardware

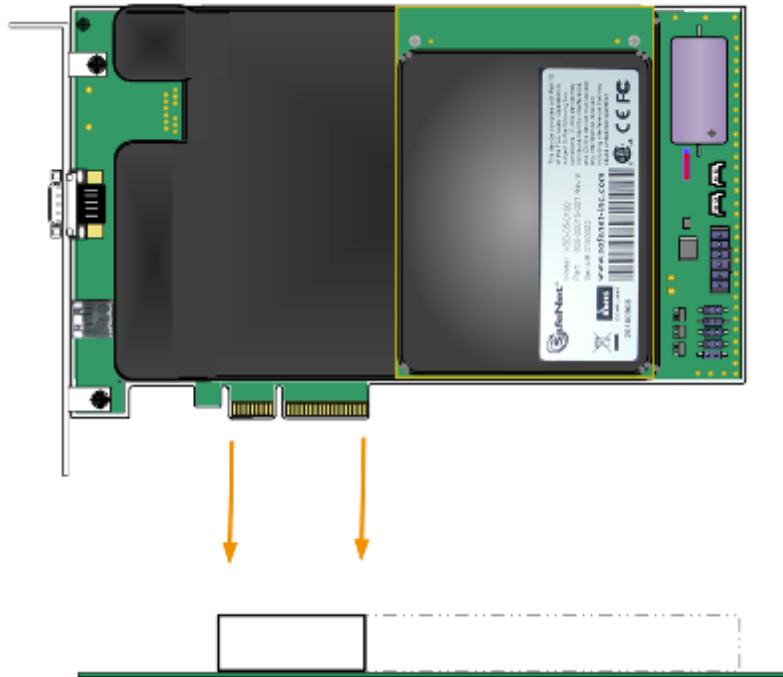
1. Open your computer, and remove the slot-cover bracket from an available PCIe slot. If the bracket is secured by a screw, retain that screw.
2. Use the provided anti-static wrist-strap to ground yourself to an exposed metal part of the computer chassis.



3. Remove the Luna PCI-E 7000 or Luna PCI-E 1700 from its anti-static packaging and prepare to insert the card into your computer.

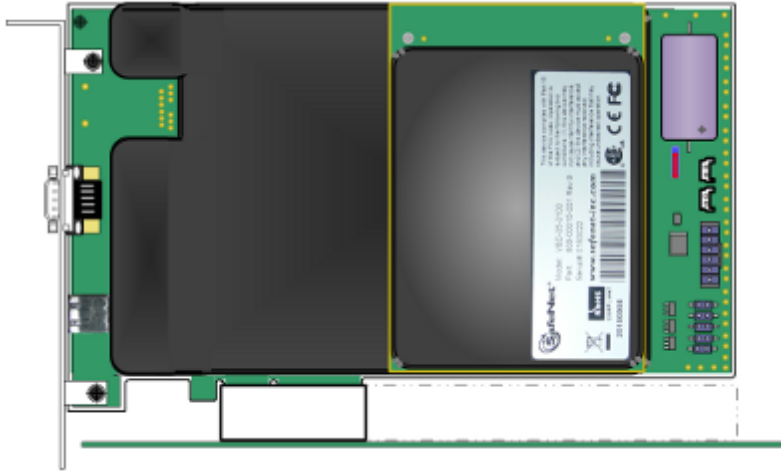


4. Align the Luna PCI-E card with the vacant slot. You might need to introduce the tip of the card-hold-down bracket first (the silver-metal part along the back edge of the card), in order to properly align the card with the connector. You can use a PCIe X4 or larger slot, as long as it is wired for at least four PCI express channels, and not reserved for a dedicated function. For example, we do not recommend that you use your Luna PCI-E card in a designated PCI-express video slot - different models of computer and their BIOS firmware can differ in how faithfully they support the PCIe standard.



5. Insert the Luna PCI-E card, gently but firmly, into the connector. It should go straight in – angling the card might

cause it to bind. The card is properly seated when no portion of the gold-colored contacts of the card protrudes above the connector socket.



6. Secure the card-hold-down bracket with a screw.
7. Close the computer.

## Connecting a Local PED

The local Luna PED (or a Luna PED Remote used locally) connects directly to the 9-pin Micro-D connector on the Luna PCI-E card.

### To connect a local PED to the Luna PCI-E HSM

1. Use the Luna PED local cable (mini-D-shell 9-pin connectors at both ends) to connect the Luna PED to the Luna PCI-E card.



## Connecting a Remote PED

The Remote-Capable PED can be used either locally, connected directly to a SafeNet HSM (exactly as for the standard PED), or remotely when connected to a suitable workstation and to the electrical main power supply. The normal local use of a PED with Remote PED capability is to use it in local mode to prepare an HSM (imprint an RPK – the orange key with a Remote PED Vector) before shipping it to its remote location. Then you would switch to Remote PED mode.

To prepare an HSM for Remote PED operation you need to connect it locally and imprint the HSM with a Remote PED Key (orange). Once the HSM can be reached via remote desktop connection, and the HSM is associated with an orange PED Key, all further configuration and administration can be performed remotely.

### To connect a remote PED to the Luna PCI-E HSM

1. Use the Luna PED local cable to connect the Luna PED to the Luna PCI-E card. This step is required to imprint the HSM with a Remote PED Vector (RPV) using the orange PED key (RPK). This should be the only time you need to connect a PED locally to the HSM. Once the orange PED Key is imprinted with the same RPV as the HSM, all future PED operations can be performed remotely.



2. Follow the instructions in the *Administration Guide* to configure the remote PED. Note that you must install at least the Remote PED optional component of the Luna Client software before you can configure the remote PED. See "Luna Client Software Installation " on page 53.

## CHAPTER 3

# Luna G5 Hardware Installation

This chapter describes how to install and connect a Luna G5 HSM. To ensure a successful installation, perform the following tasks in the order indicated:

1. Ensure that you have all of the required components, as listed in "Luna G5 Required Items" on page 32
2. Install the included removable battery, as described in "Installing the Battery in the Luna G5 or Backup HSM" on page 36. The Luna G5 requires the battery to operate.
3. Install and connect the hardware, as described in "Installing the Luna G5 Hardware" on page 38

## Luna G5 Required Items

This section provides a list of the components you should have received with your Luna G5 order. The list of items you should have received depends on whether you ordered a password-authenticated Luna G5 or a PED-authenticated Luna G5, as described in the following sections:

### Password-Authenticated Luna G5

The following are the standard items that you should have received as your basic order for a password-authenticated Luna G5:

#### Luna G5 HSM

Your order should include one Luna G5 HSM.



#### Power Cord

Your order should include one power supply cord for the Luna G5 HSM. The actual cord received depends on the country for which you ordered the Luna G5 HSM.



#### USB cable (USB A to USB mini B)

Your order should include one USB A to 5-pin (Mini-B) cable.





## Software and Documentation

Your order should include a DVD case containing a Software DVD and a Documentation DVD.

## PED-Authenticated Luna G5

Depending on your ordering options, the Luna G5 ships either in secure transport mode or with secure transport mode enabled, but turned off:

- If your Luna G5 was shipped in secure transport mode, you require the SRK PED Key (purple label) that was shipped separately from your Luna G5 to unlock your Luna G5. Note that each SRK PED key is specific to a certain Luna G5.
- If your Luna G5 was shipped with secure transport mode enabled, but turned off, no purple key is required initially.

Note that you can use SafeNet PEDs and PED Keys that you already own and use with other HSMs – PEDs of the same type and version (v2.3.0 and later) are interchangeable, and PED Keys can be used with multiple HSMs if that is appropriate in your context (the only exception is the SRK, which is specific to a single Luna G5). You should purchase the number you need for your own convenient operation, and for backup/standby units as your security policies might require.

If your Luna G5 is the PED-authenticated version, then you might also have ordered the items listed below.

## Luna PED

Your order should include a PED II device.



### Luna PED local cable

Your order should include a 9-pin, Micro-D to Micro-D cable for local PED operation.



### PED Keys and Labels

Your order should include a set of iKey PED Keys and peel-and-stick labels.



## Additional Optional Items

Your order may also include the following optional item.

### Luna G5 Rack-Mount Shelf

The SafeNet Luna G5 rack-mount shelf (available by separate order) fits a standard 19-inch equipment rack, allowing you to install up to two Luna G5 units side-by-side in server-room racks. For office use, without rack mounting, Luna G5 units can be placed on a desktop and are stackable.



## Installing the Battery in the Luna G5 or Backup HSM

The battery is shipped with the Luna G5 device, but is not installed. You must install the battery before beginning to configure and use the Luna G5 device.

### To install the battery in the Luna G5 or Luna Backup HSM

1. Remove the front faceplate. The faceplate is held in place by two spring clips. Grasp the faceplate firmly and pull to disengage the clips. Set the faceplate aside.



2. The battery compartment is to the right as you face the unit. The compartment cover is circular and has both raised dots and a recessed slot. Use finger-pressure against the dots, or use the edge of a coin in the slot, to twist the battery compartment cover  $\frac{1}{4}$  turn in a counter-clockwise direction. The cover should fall out easily.



3. Remove the battery from its packaging and align it at the opening of the Luna G5 battery compartment. The battery should have a "+" sign near the end with the raised nub/bump. The flat end of the battery is the negative pole (-).
4. Insert the battery into the battery compartment, negative end first. The positive end (+) should protrude. The compartment is spring-loaded.



5. Use the battery compartment cover to push the battery into the compartment, against the spring tension. Maintaining the pressure, align the two tabs on the inside of the cover with the two recessed indentations at the top and bottom of the compartment opening. With a little jiggling and a few trial pushes, the tabs should settle into those recesses, allowing the cover to seat flush with the front of the Luna G5. Maintain the inward pressure and twist the cover  $\frac{1}{4}$  turn clockwise to lock it in place. The battery is installed.
6. Replace the Luna G5 front-panel by aligning the clips with their respective posts and pushing until the clips grab the posts and the cover snaps in place.



7. The Luna G5 HSM or Luna Backup HSM is ready to connect to your host system.

## Installing the Luna G5 Hardware

This section describes how to mount the Luna G5 and connect the cables and peripheral devices.

### To install the Luna G5 hardware

1. If you are using the SafeNet Luna G5 rack-mount shelf, mount the shelf in a suitable equipment rack. Use fasteners appropriate to your brand of equipment rack. The shelf and the Luna G5 units are light-weight and therefore are adequately secured at the front only. Do not mount more than two Luna G5 devices, or any non-Luna G5 equipment, on the shelf.

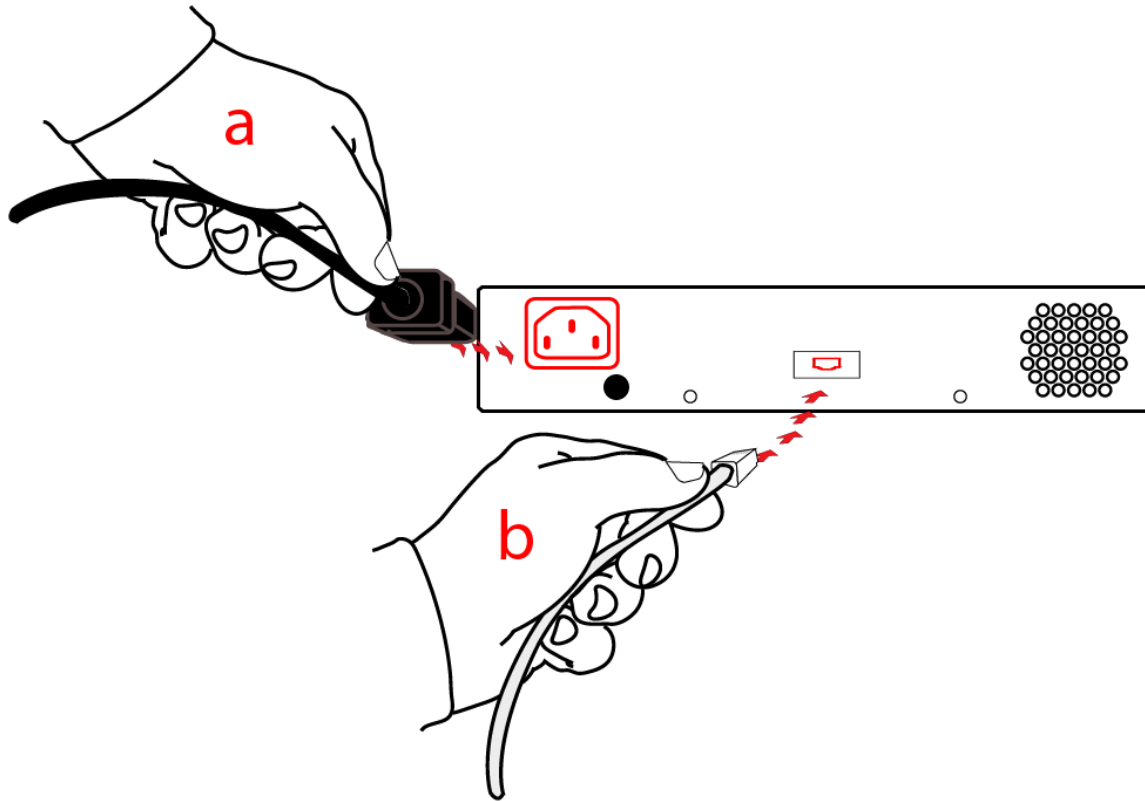


2. Place your Luna G5 unit(s) on the shelf and push back until one of the index posts at the back edge of the shelf engages the index hole on the back panel of each Luna G5.





3. Insert the power (a) and USB (b) cables at the rear panel.



4. If you are installing a PED-authenticated Luna G5, connect the PED at the front panel, using the provided local PED cable.





5. Using the USB cable, connect the Luna G5 to a USB port on the Luna client computer.



## CHAPTER 4

# Luna Remote PED Installation and Configuration

This chapter describes how to install, connect, and configure a Luna Remote PED. It contains the following sections:

- "Installing and Configuring a Luna Remote PED" on page 44

## Installing and Configuring a Luna Remote PED



The standard Luna PED is intended to connect directly to the HSM appliance, and receives its power, as well as instructions and data via that connection. The Remote PED can act as a local PED, when needed, and connects as described previously. When used in Remote PED mode, the Luna PED 2 connects to a computer via USB, and therefore requires some additional hardware.




Remote PED can be distinguished from local PED by:

- the words **Remote PED Capable** on the back label
- availability of menu item **[7] Remote PED** from the PED's main menu.

### Required Items

The following items are included with your Remote PED. All are required for a successful installation.

Quantity	Item
1	<p>Luna PED 2 (Remote PED Capable and with firmware 2.5.0-3 or greater)</p> 
1	<p>Luna PED Power Supply kit with replaceable mains plug modules for international use (for Remote PED operation)</p> 

Quantity	Item
1	Cable, USB 2.0, Type A to Mini B connectors (for Remote PED operation). 
1	Cable, Data, 9-pin, Micro-D to Micro-D connectors (for local PED operation). 
1	Ten-pack of ikey 1000 PED Keys, and sheets of peel-and-stick labels 



## Remote PED Setup

The Remote-Capable PED can be used either locally, connected directly to a SafeNet HSM (exactly as for the standard PED), or remotely when connected to a suitable workstation and to the electrical main power supply.

The normal local use of a PED with Remote PED capability is to use it in local mode to prepare an HSM (imprint an RPK vector – the orange key) before shipping it to its remote location. Then you can switch to Remote PED mode.

### To configure the remote PED



Step	Action
1	Local OPERATION [Ongoing] To use your HSM appliance and PED for local operation only, refer to the instructions accompanying your HSM, on the Luna SA documentation CD (begin by browsing the START_HERE.html page and selecting Help).
2	Local OPERATION [Preparing for Remote Use] To prepare an HSM for Remote PED operation, it needs a minimum of preparation as described in this section, below.
3	[Preliminary] Copy the PED USB driver from /USBDriver folder on the Luna PED software CD (or in the archive [tar] if you received via download) to the workstation computer that will act as the PED server to your remotely located SafeNet HSM appliances and let the Windows “Found New Hardware” dialog install it). Install PEDserver.exe software to any convenient directory on that same computer by copying it from the /Windows folder of the CD (or the archive [tar]).
4	[Preliminary] Configure your HSM appliance for your network. Refer to the other product documentation that you have received separately – in the form of WebHelp on the Luna SA documentation CD. Imprint the HSM with a Remote PED Key (orange); see below. Once the appliance can be reached via SSH and the HSM is associated with an orange PED Key, all further configuration and administration can be performed remotely.
5	To use the PED locally (for first orange PED Key imprint), connect the PED directly to the PED port of the HSM that you will later be using remotely.

Step	Action
	
6	<p>On power-up, the PED defaults to local mode. Follow the instructions in the SafeNet HSM documentation to:</p>  <ul style="list-style-type: none"> <li>• log in as “admin” to the appliance (SSH session or local serial connection)</li> <li>• issue the Luna shell command “hsm ped vector init”, inserting a blank (orange-labeled) PED Key into the PED, when prompted OR inserting an already-imprinted orange PED Key and select “re-use” at the PED prompt</li> <li>• bring the imprinted (orange) Remote PED Key to your workstation, along with a Remote-capable PED</li> <li>• the HSM appliance can now be shipped to its remote locale</li> </ul> <p>You can perform other maintenance at this time, if convenient, but only the foregoing steps were required to be done locally - all future configuration and administration can be performed remotely.</p>



### To use the Remote PED

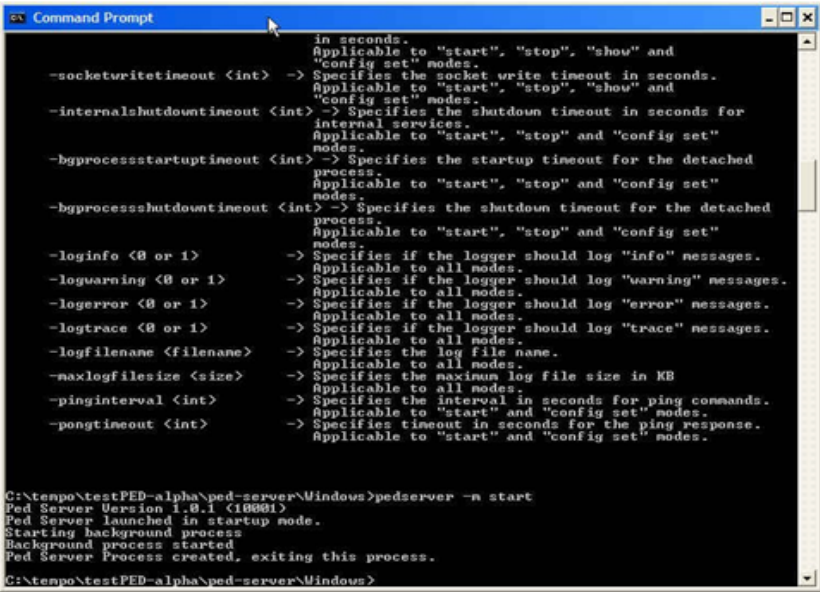
Once an HSM has been imprinted with a Remote PED Key (RPK) vector, you can begin administering remotely, while also authenticating remotely from any workstation that has PEDServer software and driver, a remote-capable PED,

and an orange PED Key with the correct RPK (that you just imprinted in the previous steps).

Step	Action
1	REMOTE OPERATION Perform the following steps to begin using your computer as a PED Server Workstation, connecting remotely to the distant HSM appliance.
2	<p>[Prepare the PED Power Supply]</p> <p>On the PED power supply, slide the release catch as shown by the heavy arrow, and lift the pin protector (thinner arrow) from the power supply.</p>  <p>The pin protector was used during shipment only.</p>
3	<p>Choose a plug style that is appropriate for your country and place it in the power supply, top end first, then snap the bottom end in the direction indicated by the arrow.</p> 
4	<p>For Remote PED operation:</p> <ul style="list-style-type: none"> <li>• connect the power supply to the AC mains,</li> <li>• connect the DC power plug of the power supply to the DC power receptacle on the top of the PED,</li> </ul>



Step	Action
	 <ul style="list-style-type: none"> <li>connect the USB cable between the USB micro connector on the PED and a USB socket on your computer.</li> </ul>
5	<p>At the workstation-connected PED:</p> <ul style="list-style-type: none"> <li>press [ &lt; ] on the PED keypad to exit Local mode,</li> </ul>  <ul style="list-style-type: none"> <li>press [ 7 ] to enter Remote PED mode.</li> </ul>
6	<p>In a command-prompt window on the workstation start the PEDserver program in its listening mode</p> <pre>c:\&lt;yourRemotePED-dir&gt;\pedserver -m start</pre>

Step	Action
	 <pre> in seconds. Applicable to "start", "stop", "show" and "config set" modes. -socketwritetimeout &lt;int&gt; -&gt; Specifies the socket write timeout in seconds. Applicable to "start", "stop", "show" and "config set" modes. -internalshutdowntimeout &lt;int&gt; -&gt; Specifies the shutdown timeout in seconds for internal services. Applicable to "start", "stop" and "config set" modes. -bgprocessstartuptimeout &lt;int&gt; -&gt; Specifies the startup timeout for the detached process. Applicable to "start", "stop" and "config set" modes. -bgprocessshutdowntimeout &lt;int&gt; -&gt; Specifies the shutdown timeout for the detached process. Applicable to "start", "stop" and "config set" modes. -loginfo &lt;0 or 1&gt; -&gt; Specifies if the logger should log "info" messages. Applicable to all nodes. -logwarning &lt;0 or 1&gt; -&gt; Specifies if the logger should log "warning" messages. Applicable to all nodes. -logerror &lt;0 or 1&gt; -&gt; Specifies if the logger should log "error" messages. Applicable to all nodes. -logtrace &lt;0 or 1&gt; -&gt; Specifies if the logger should log "trace" messages. Applicable to all nodes. -logfile &lt;filename&gt; -&gt; Specifies the log file name. Applicable to all nodes. -maxlogfilesize &lt;size&gt; -&gt; Specifies the maximum log file size in KB Applicable to all nodes. -pinginterval &lt;int&gt; -&gt; Specifies the interval in seconds for ping commands. Applicable to "start" and "config set" modes. -pongtimeout &lt;int&gt; -&gt; Specifies timeout in seconds for the ping response. Applicable to "start" and "config set" modes.  C:\tempo\testPED-alpha\ped-server\Windows&gt;pedserver -m start Ped Server Version 1.0.1 (100001) Ped Server launched in startup mode. Starting background process Background process started Ped Server Process created, exiting this process. C:\tempo\testPED-alpha\ped-server\Windows&gt; </pre>
7	Run the command <code>pedserver -m show</code> to verify that the PED is detected, and the system is ready for remote connection.
8	<p>Start the PED Client - the Remote PED enabling process on the appliance (for example):</p> <pre>lunash:&gt; hsm ped connect -ip 192.2.12.16 -port 1503</pre> <p>The Remote PED Client in the HSM appliance connects with the listening PEDserver (your workstation).</p>

Step	Action
	 <pre> Cobra31.chrysalis-its.com - PuTTY Name      (short)  Description ----- show      sh         Show HSM Info login     logi        Login HSM SO logout    loge        Logout HSM SO init      i          Initialize HSM test      t          Test HSM migratekey m         Migrate a PED Key backup    b          Backup HSM restore   r          Restore HSM so-ped-key so-p       &gt; HSM SO-PED-Key capability c         &gt; HSM Capability policy    po         &gt; HSM Policy so-auth-limit so-auth-l &gt; HSM SO-Auth-Limit so-auth-action so-auth-a &gt; HSM SO-Auth-Action part-auth-limit part-auth-l &gt; HSM Part-Auth-Limit part-auth-action part-auth-a &gt; HSM Part-Auth-Action group     g          &gt; HSM Group debug     d          &gt; HSM Debug auto-activate a        &gt; HSM Auto-Activate ped       pe         &gt; HSM PED  These commands are for HSM objects.  [cobra31] lush:&gt;hsm ped connect 172.20.10.160 -port 1503  Luna PED operation required to connect to Remote PED - use orange PED key(s).  Ped Client Version 1.0.1 (10001) Ped Client launched in startup mode. Starting background process Background process started Ped Client Process created, exiting this process.  Command Result : 0 (Success) [cobra31] lush:&gt; </pre>
9	<p>When the PED prompts for an “rpk”, insert the imprinted Remote PED Key associated with the connecting HSM appliance, and press [Enter].</p> 
10	<p>Verify the Remote PED connection by performing an HSM login - the luna shell refers you to the PED. The Remote PED at your workstation prompts you to insert the blue SO PED Key(s) and press [Enter]. A successful login confirms that the Remote PED connection is running properly.</p>

Step	Action
11	Begin using and administering the remotely located SafeNet HSM appliance via ssh session, and providing PED Key authentication via the workstation-connected Remote PED, whenever requested. Review the Luna SA Help for information about timeouts with respect to Remote PED.

# Luna Client Software Installation

This chapter describes how to install the Luna Client software. After installing the hardware, you need to install the Luna Client software, as follows, before you can begin configuring your Luna HSM(s):

- For Luna SA, install the Luna Client on any computer that must connect to the appliance as a client.
- For Luna PCI-E, install the Luna Client on the workstation into which the Luna PCI-E HSM is installed.
- For Luna G5, install the Luna Client on the workstation to which the Luna G5 HSM is connected.
- Install the Luna Client on any computer that is to have a Luna Remote PED connected.

Choose the instructions for your operating system:

- For AIX, see "[AIX Luna Client Installation](#)" on page 54.
- For HP-UX, see "[HP-UX Luna Client Installation](#)" on page 60.
- For Linux, see "[Linux Luna Client Installation](#)" on page 66.
- For Solaris, see "[Solaris Luna Client Installation](#)" on page 76
- For Windows, see "[Windows Luna Client Installation](#)" on page 81 The following supplemental topics also apply to Windows:
  - "[Windows 2012 Luna Client Supplemental Configuration](#)" on page 93
  - "[Scripted / Unattended Installation on Windows](#)" on page 95



---

**Note:** Not all operating systems are supported for each Luna HSM type. Refer to the Customer Release Notes (see "[Customer Release Notes](#)" on page 6) for the most current information on supported platforms.

---

## AIX Luna Client Installation

These instructions assume that you have already acquired the Luna Client software, either on CD/DVD or in the form of a downloaded .tar archive.

Applicability to specific versions of AIX is summarized in the Customer Release Notes for the current release.



**Note:** Before installing a Luna® system, you should confirm that the product you have received is in factory condition and has not been tampered with in transit. Refer to the Content Sheet included with your product shipment. If you have any questions about the condition of the product that you have received, please contact SafeNet Support (800)545 6608 or [support@safenet-inc.com](mailto:support@safenet-inc.com) immediately

Each computer that connects to the Luna HSM appliance as a Client must have the cryptoki library, the vtl client shell and other utilities and supporting files installed.

Each computer that contains, or is connected to a Luna G5 or a Luna PCI-E HSM must have the cryptoki library and other utilities and supporting files installed.



**Note:** This example shows all the Luna Client products and components. Some items are not supported on all operating systems and therefore do not appear as you proceed through the installation script.

Do not install Luna client software on the same system as legacy Luna CA<sup>3</sup>, Luna CA4, Luna PCM, or Luna PCI software.

The software is intended for modern/current Luna HSMs, Luna SA, Luna PCI-E, Luna G5, Luna (Remote) Backup HSM.

### Prerequisites

Before starting the installation, ensure that you have satisfied the following prerequisites:

1. Ensure that you have a Random Number Generator (RNG) or Entropy Gathering Daemon (EGD) on your system at one of /dev/egd-pool, /etc/egd-pool, /etc/entropy, or /var/run/egd-pool.

### RNG/EGD

Cryptographic algorithms, including those that assure the security of communication – such as in OpenSSL and other protocols – depend upon random numbers for the creation of strong keys and certificates. A readily available source of random data is the entropy that exists in complex computer processes. Utilities exist for every operating system, to gather bits of system entropy into a pool, which can then be used by other processes.

Windows and Linux have these installed by default. Other systems might or might not. See your system administrator.

### You Need an Entropy Pool

In the case of Luna SA, the Luna Client administration tool (vtl) expects to find a source of randomness at /dev/random. If one is not found, vtl fails, because the link cannot be secured from the Client end.

If your system does have an entropy pool, but the random number generator (RNG) is not in the expected place, then you can create a symbolic link between the actual location and one of

`/dev/random`, `/dev/egd-pool`, `/etc/egd-pool`, `/etc/entropy`, or `/var/run/egd-pool`.

If your system does not have an entropy gathering daemon or random number generator, please direct your system administrator to install one, and point it to one of the named devices.

2. If you are installing the Luna PCI-E, or Luna G5, or Luna Remote Backup HSM clients, ensure that the following items are installed:
  - Kernel headers for build
  - rpm-build package
  - C compiler
  - make command

These items are required because the driver module is built on Linux before it is installed. If one of these items is missing, the driver build will fail and the module will not get installed.

## Install

**Check the Luna HSM Customer Release Notes** for any installation-related issues or instructions **before** you begin the following software installation process.



**CAUTION:** You must be logged in as **root** when you run the installation script.

Install Luna Client software on AIX as follows.

3. Log on to the client system, open a console or terminal window, and use **sudo** to gain administrative permissions for the installation.
4. If you have downloaded the Luna Client software as a .tar archive, skip to step 6.
5. Insert the DVD (mount it if you do not have automount).
6. Go to the DVD (`/cdrom` or whatever devicename your system uses) and the install directory:

```
cd /cdrom/AIX/32
or
cd /cdrom/AIX/64
```

(Not all platforms are supported with each release, so the available install options might not match the list above.)

7. Skip to step 9.
8. If you downloaded the software, copy or move the .tar archive (which usually has a name like "Luna Client\_5.x.y-nn.tar") to a suitable directory where you can untar the archive and launch the installation script.
9. Extract the contents from the archive. Type  

```
tar xvf Luna Client<version>.tar
```
10. Change directory to the software version suitable for your system (for example, under the "aix" subdirectory, choose 32-bit or 64-bit according to your system requirement).
11. To see the 'help', or a list of available installer options, type:  

```
./sh install.sh -? or ./sh install.sh --help
```

To install all available products and optional components, type:  
`./sh install.sh all`

To selectively install individual products and optional components, type the command without arguments:  
`./sh install.sh`

12. Type "y" if you agree to be bound by the license agreement.

```
[mylunaclient-1 32]$ sh install.sh
```

IMPORTANT: The terms and conditions of use outlined in the software license agreement (Document #008-010005-001\_053110) shipped with the product ("License") constitute a legal agreement between you and SafeNet Incorporated. Please read the License contained in the packaging of this product in its entirety before installing this product.

Do you agree to the License contained in the product packaging?

If you select 'yes' or 'y' you agree to be bound by all the terms and conditions set out in the License.

If you select 'no' or 'n', this product will not be installed.

(y/n)

13. A list of installable Luna products appears (might be different, depending on your platform). Select as many as you require, by typing the number of each (in any order) and pressing [Enter]. As each item is selected, the list updates, with a "\*" in front of any item that has been selected. This example shows item 1 has been selected.

Products

Choose Luna Products to be installed

```
*[1]: Luna SA
```

```
[N|n]: Next
```

```
[Q|q]: Quit
```

Enter selection:

(When the above was captured, AIX supported only Luna SA among SafeNet HSM products. To install any of the other SafeNet HSMs, including the Luna [Remote] Backup HSM, you will need one of the other supported host platforms.)

14. When selection is complete, type "N" or "n" for "Next", and press [Enter].<sup>1</sup>

If you wish to make a change, simply type a number again and press [Enter] to de-select a single item.

---

<sup>1</sup>

Products

Choose Luna Products to be installed

```
*[1]: Luna SA
```

```
[N|n]: Next
```

```
[Q|q]: Quit
```

Enter selection: n



15. The next list is called "Advanced" and includes additional items to install. Some items might be pre-selected to provide the optimum Luna HSM experience for the majority of customers, but you can change any selection in the [list].

#### Products

Choose Luna Components to be installed

- [1]: Luna Software Development Kit (SDK)
- \*[2]: Luna JSP (Java)
- \*[3]: Luna JCProv (Java)
- \*[4]: Crypto Command Center Provisioning Client
- [B|b]: Back to Products Selection
- [I|i]: Install
- [Q|q]: Quit

Enter selection: n

When the Components list is adjusted to your satisfaction, press [Enter].

If the script detects an existing cryptoki library, it stops and suggests that you uninstall your previous Luna software before starting the Luna Client installation again.

16. The system installs all packages related to the products and any optional components that you selected.

- By default, the Client programs are installed in the "/usr/safenet/lunaclient" directory.

As a general rule, do not modify the Chrystoki.conf/crystoki.ini file, unless directed to do so by SafeNet Customer Support.

If you do modify the file, never insert TAB characters - use individual space characters.

Avoid modifying the PED timeout settings. These are now hardcoded in the appliance, but the numbers in the Chrystoki.conf file must match.

### To uninstall the Luna HSM client software

- **# cd /usr/safenet/lunaclient/bin**
- **# ./sh uninstall.sh**

## JAVA

During the installation, the script asks if you wish to install Java. If you say "yes", the Luna Java files are installed below /usr/lunasa/jsp/. In order to use Java, you must have separately installed Java (JDK or run-time environment from the vendor of your choice) onto your system.

Copy the Luna Java files from their default location under /usr/lunasa/jsp/lib to the Java environment directory; example /usr/jre/lib/ext

The exact directory might differ depending on where you obtained your Java system, the version, and any choices that you made while installing and configuring it.



#### CAUTION: IMPORTANT!

Copy libLunaAPI.so to system lib (/usr/lib) in order to make either java5 or java6 work on AIX 6.1 64-bit client.

For additional Java-related information, see "Java Interfaces" on page 1 in the *SDK Reference Guide*.

## JSP Static Registration

You would choose static registration of providers if you want all applications to default to our (SafeNet) provider.

Once your client has externally logged in using `salogin` (see ) in the Reference section of this document) or your own HSM-aware utility, any application would be able to use Luna product without being designed to login to the HSM Partition.

Edit the `java.security` file located in the `\jre\lib\security` directory of your Java SDK/JRE 1.6.x or 1.7.x installation to read as follows:

```
security.provider.1=sun.security.provider.Sun
security.provider.2=com.sun.net.ssl.internal.ssl.Provider
security.provider.3=com.safenetinc.luna.provider.LunaProvider
security.provider.4=com.sun.rsa.jca.Provider
security.provider.5=com.sun.crypto.provider.SunJCE
security.provider.6=sun.security.jgss.SunProvider
```

You can set our provider in first position for efficiency if Luna HSM operations are your primary mode. However, if your application needs to perform operations not supported by the `LunaProvider` (secure random generation or random publickey verification, for example) then it would receive error messages from the HSM and would need to handle those gracefully before resorting to providers further down the list. We have found that having our provider in third position works well for most applications.

The modifications in the "java.security" file are global, and they might result in the breaking of another application that uses the default `KeyPairGenerator` without logging into the Luna SA first. This consideration might argue for using dynamic registration, instead.

## JSP Dynamic Registration

For your situation, you may prefer to employ dynamic registration of Providers, in order to avoid possible negative impacts on other applications running on the same machine. As well, the use of dynamic registration allows you to keep installation as straightforward as possible for your customers.

## Compatibility

We formally test Luna HSMs and our Java provider with SUN JDK for all platforms except AIX, and with IBM JDK for the AIX platform. We have not had problems with OpenJDK, although it has not been part of our formal test suite. The Luna JCE provider is compliant with the JCE specification, and should work with any JVM that implements the Java language specification.

Occasional problems have been encountered with respect to IBM JSSE.

GNU JDK shipped with most Linux systems has historically been incomplete and not suitable.

## Remove components

To uninstall the JSP component or the SDK component, you must uninstall Luna Client completely, then re-run the installation script without selecting the unwanted component(s).

```
sh uninstall.sh
```

## [Ctrl] [C] - If you interrupt the installation

Do not interrupt the installation script in progress, and ensure that your host computer is served by an uninterruptible power supply (UPS). If you press [Ctrl] [C], or otherwise interrupt the installation (OS problem, power outage, other), some components will not be installed. It is not possible to resume an interrupted install process. The result of an interruption depends on where, in the process, the interruption occurred (what remained to install before the process was stopped).

As long as the cryptoki RPM package is installed, any subsequent installation attempt results in refusal with the message "A version of Luna Client is already installed."

If components are missing or are not working properly after an interrupted installation, or if you wish to install any additional components at a later date (following an interrupted installation, as described), you would need to uninstall everything first. If 'sh uninstall.sh' is unable to do it, then you must uninstall all packages manually.

Because interruption of the install.sh script is not recommended, and mitigation is possible, this is considered a low-likelihood corner case, fully addressed by these comments.

## After Installation

When you have installed the software onto a Client, the next task is to configure the Luna HSM, as described in the *Configuration Guide*.

## HP-UX Luna Client Installation

These instructions assume that you have already acquired the Luna Client software, either on CD/DVD or in the form of a downloaded .tar archive.

Applicability to specific versions of HP-UX is summarized in the Customer Release Notes for the current release. See "Customer Release Notes" on page 6 for more information.



**Note:** Before installing a Luna® system, you should confirm that the product you have received is in factory condition and has not been tampered with in transit. Refer to the Content Sheet included with your product shipment. If you have any questions about the condition of the product that you have received, please contact SafeNet Support (800)545 6608 or [support@safenet-inc.com](mailto:support@safenet-inc.com) immediately

Each computer that connects to the Luna HSM appliance as a Client must have the cryptoki library, the vtl client shell and other utilities and supporting files installed.

Each computer that contains, or is connected to, a Luna G5 or a Luna PCI-E HSM must have the cryptoki library and other utilities and supporting files installed.



**Note:** This example shows all the Luna Client products and components. Some items are not supported on all operating systems and therefore do not appear as you proceed through the installation script.

Do not install Luna client software on the same system as legacy Luna CA<sup>3</sup>, Luna CA4, Luna PCM, or Luna PCI software.

The software is intended for modern/current Luna HSMs, Luna SA, Luna PCI-E, Luna G5, Luna (Remote) Backup HSM.

### Prerequisites

Before starting the installation, ensure that you have a Random Number Generator (RNG) or Entropy Gathering Daemon (EGD) on your system in one of the following locations:

- /dev/egd-pool
- /etc/egd-pool
- /etc/entropy
- /var/run/egd-pool

### RNG/EGD

Cryptographic algorithms, including those that assure the security of communication – such as in OpenSSL and other protocols – depend upon random numbers for the creation of strong keys and certificates. A readily available source of random data is the entropy that exists in complex computer processes. Utilities exist for every operating system, to gather bits of system entropy into a pool, which can then be used by other processes.

Windows and Linux have these installed by default. Other systems might or might not. See your system administrator.

## You Need an Entropy Pool

In the case of Luna SA, the Luna Client administration tool (`vtl`) expects to find a source of randomness at `/dev/random`. If one is not found, `vtl` fails, because the link cannot be secured from the Client end.

If your system does have an entropy pool, but the random number generator (RNG) is not in the expected place, then you can create a symbolic link between the actual location and one of the following:

- `/dev/random`
- `/dev/egd-pool`
- `/etc/egd-pool`
- `/etc/entropy`
- `/var/run/egd-pool`

If your system does not have an entropy gathering daemon or random number generator, please direct your system administrator to install one, and point it to one of the named devices.

## Installing the Luna Client Software

Check the Luna HSM Customer Release Notes for any installation-related issues or instructions before you begin the following software installation process.



### CAUTION:

You must be logged in as **root** when you run the installation script.

### To install the Luna Client software on HP-UX

1. Log on to the client system, open a console or terminal window, and use **sudo** to gain administrative permissions for the installation.
2. If you have downloaded the Luna Client software as a .tar archive, skip to step 6.
3. Insert the Luna Client software DVD (mount it if you do not have automount).
4. Go to the DVD (`/cdrom` or whatever device name your system uses) and the install directory for your architecture, for example:

<b>32-bit OS</b>	<code>cd /cdrom/hpux/32</code>
<b>64-bit OS</b>	<code>cd /cdrom/hpux/64</code>

5. Skip to step 9.
6. If you downloaded the software, copy or move the .tar archive (which usually has a name like "Luna Client\_5.x.y-nn.tar") to a suitable directory where you can untar the archive and launch the installation script.
7. Extract the contents from the archive. Type  
`tar xvf Luna Client<version>.tar`
8. Change directory to the software version suitable for your system (for example, under the "hpux" subdirectory, in the "x86" directory, choose 32-bit or 64-bit according to your system requirement).
9. Install the client software as follows:
  - To see the 'help', or a list of available installer options, type:

**`./sh install.sh -?` or `./sh install.sh --help`**

- To install all available products and optional components, type:

**`./sh install.sh all`**

- To selectively install individual products and optional components, type the command without arguments:

**`./sh install.sh`**

10. Type "y" if you agree to be bound by the license agreement:

```
[mylunaclient-1 32]$ sh install.sh
```

```
IMPORTANT: The terms and conditions of use outlined in the software
license agreement (Document #008-010005-001_053110) shipped with the product
("License") constitute a legal agreement between you and SafeNet Incorporated.
Please read the License contained in the packaging of this
product in its entirety before installing this product.
```

```
Do you agree to the License contained in the product packaging?
```

```
If you select 'yes' or 'y' you agree to be bound by all the terms
and conditions set out in the License.
```

```
If you select 'no' or 'n', this product will not be installed.
```

```
(y/n)
```

11. A list of installable Luna products appears (might be different, depending on your platform). Select as many as you require, by typing the number of each (in any order) and pressing [Enter]. As each item is selected, the list updates, with a "\*" in front of any item that has been selected. This example shows item 1 has been selected, and item 2 is about to be selected:

```
Products
Choose Luna Products to be installed
*[1]: Luna SA
[2]: Luna PCI-E
[N|n]: Next
[Q|q]: Quit
Enter selection: 2
```



**Note:** When the above was captured, HP-UX supported only Luna SA and Luna PCI-E among SafeNet HSM products. To install Luna G5 or the Luna [Remote] Backup HSM, you will need one of the other supported host platforms.

12. When selection is complete, type "N" or "n" for "Next", and press [Enter]. For example:

```
Products
Choose Luna Products to be installed
*[1]: Luna SA
[2]: Luna PCI-E
[N|n]: Next
[Q|q]: Quit
Enter selection: n
```

If you wish to make a change, simply type a number again and press [Enter] to de-select a single item.

13. The next list is called **Advanced** and includes additional items to install. Some items might be pre-selected to

provide the optimum Luna HSM experience for the majority of customers, but you can change any selection in the list.

#### Products

Choose Luna Components to be installed

```
[1]: Luna Software Development Kit (SDK)
*[2]: Luna JSP (Java)
*[3]: Luna JCProv (Java)
*[4]: Crypto Command Center Provisioning Client
*[5]: Luna SNMP subagent
[B|b]: Back to Products Selection
[I|i]: Install
[Q|q]: Quit
Enter selection: n
```

When the Components list is adjusted to your satisfaction, press [Enter].



**Note:** The installer includes the Luna SNMP Subagent as an option. After installation is complete, you will need to move the SafeNet MIB files to the appropriate directory for your SNMP application, and you will need to start the SafeNet subagent and configure for use with your agent. See the *Administration Guide* for more information.

If the script detects an existing cryptoki library, it stops and suggests that you uninstall your previous Luna software before starting the Luna Client installation again.

14. The system installs all packages related to the products and any optional components that you selected. By default, the Client programs are installed in the **/opt/safenet/lunaclient** directory.

As a general rule, do not modify the `Chrystoki.conf/crystoki.ini` file, unless directed to do so by SafeNet Customer Support.

If you do modify the file, never insert TAB characters - use individual space characters.

Avoid modifying the PED timeout settings. These are now hardcoded in the appliance, but the numbers in the `Chrystoki.conf` file must match.

## Uninstalling the Luna Client Software

You may need to uninstall the Luna Client software prior to upgrading to a new release, or if the software is no longer required.

### To uninstall the Luna HSM client software

- **# cd /opt/safenet/lunaclient/bin**
- **# ./sh uninstall.sh**

## Java Component Installation

During the installation, the script provides the opportunity to install Luna Java components. If you select Java components, the Luna Java files are installed in the **/opt/safenet/lunaclient/jsp/** directory. In order to use Java, you must have separately installed Java (JDK or run-time environment from the vendor of your choice) onto your system.

Copy the Luna Java library and jar files from their default location under **/opt/safenet/lunaclient/jsp/lib** to the Java environment directory, for example **/opt/jre/lib/ext**. The exact directory might differ depending on where you obtained your Java system, the version, and any choices that you made while installing and configuring it.

For additional Java-related information, see ["Java Interfaces" on page 1](#) in the *SDK Reference Guide*

## JSP Static Registration

You would choose static registration of providers if you want all applications to default to our (SafeNet) provider.

Once your client has externally logged in using salogin (see ) in the Reference section of this document) or your own HSM-aware utility, any application would be able to use Luna product without being designed to login to the HSM Partition.

Edit the java.security file located in the \jre\lib\security directory of your Java SDK/JRE 1.6.x or 1.7.x installation to read as follows:

```
security.provider.1=sun.security.provider.Sun
security.provider.2=com.sun.net.ssl.internal.ssl.Provider
security.provider.3=com.safenetinc.luna.provider.LunaProvider
security.provider.4=com.sun.rsa.jca.Provider
security.provider.5=com.sun.crypto.provider.SunJCE
security.provider.6=sun.security.jgss.SunProvider
```

You can set our provider in first position for efficiency if Luna HSM operations are your primary mode. However, if your application needs to perform operations not supported by the LunaProvider (secure random generation or random publickey verification, for example) then it would receive error messages from the HSM and would need to handle those gracefully before resorting to providers further down the list. We have found that having our provider in third position works well for most applications.

The modifications in the "java.security" file are global, and they might result in the breaking of another application that uses the default KeyPairGenerator without logging into the Luna SA first. This consideration might argue for using dynamic registration, instead.

## JSP Dynamic Registration

For your situation, you may prefer to employ dynamic registration of Providers, in order to avoid possible negative impacts on other applications running on the same machine. As well, the use of dynamic registration allows you to keep installation as straightforward as possible for your customers.

## Compatibility

We formally test Luna HSMs and our Java provider with SUN JDK for all platforms except AIX, and with IBM JDK for the AIX platform. We have not had problems with OpenJDK, although it has not been part of our formal test suite. The Luna JCE provider is compliant with the JCE specification, and should work with any JVM that implements the Java language specification.

Occasional problems have been encountered with respect to IBM JSSE.

GNU JDK shipped with most Linux systems has historically been incomplete and not suitable.

## Remove Components

To uninstall the JSP component or the SDK component, you must uninstall Luna Client completely, then re-run the installation script without selecting the unwanted component(s).

**sh uninstall.sh**



## Interrupting the Installation

Do not interrupt the installation script in progress, and ensure that your host computer is served by an uninterruptible power supply (UPS). If you press [Ctrl] [C], or otherwise interrupt the installation (OS problem, power outage, other), some components will not be installed. It is not possible to resume an interrupted install process. The result of an interruption depends on where, in the process, the interruption occurred (what remained to install before the process was stopped).

As long as the cryptoki RPM package is installed, any subsequent installation attempt results in refusal with the message "A version of Luna Client is already installed."

If components are missing or are not working properly after an interrupted installation, or if you wish to install any additional components at a later date (following an interrupted installation, as described), you would need to uninstall everything first. If 'sh uninstall.sh' is unable to do it, then you must uninstall all packages manually.

Because interruption of the install.sh script is not recommended, and mitigation is possible, this is considered a low-likelihood corner case, fully addressed by these comments.

## After Installation

When you have installed the software onto a Client, the next task is to configure the Luna HSM.

## Linux Luna Client Installation

These instructions are tested for the Linux versions listed in the Customer Release Notes.

These instructions assume that you have already acquired the Luna Client software, either on CD/DVD or in the form of a downloaded .tar archive.

Applicability to specific versions of Linux is summarized in the Customer Release Notes for the current release.



**Note:** Before installing a Luna® system, confirm that the product you have received is in factory condition and has not been tampered with in transit. Refer to the Startup Guide included with your product shipment. If you have any questions about the condition of the product that you have received, please contact SafeNet Support (800)545 6608 or support@safenet-inc.com immediately

Each computer that connects to the Luna HSM appliance as a Client must have the cryptoki library, the vtl client shell and other utilities and supporting files installed.

Each computer that contains, or is connected to a Luna G5 or a Luna PCI-E HSM must have the cryptoki library and other utilities and supporting files installed.



**Note:** This example shows all the Luna Client products and components. Some items are not supported on all operating systems and therefore do not appear as you proceed through the installation script.

Do not install Luna client software on the same system as legacy Luna CA<sup>3</sup>, Luna CA4, Luna PCM, or Luna PCI software.

The software is intended for modern/current Luna HSMs, Luna SA, Luna PCI-E, Luna G5, Luna (Remote) Backup HSM.

## Prerequisites

Before starting the installation, ensure that you have satisfied the following prerequisites:

### Random Number Generator (RNG) or Entropy Gathering Daemon (EGD)

Ensure that you have a Random Number Generator (RNG) or Entropy Gathering Daemon (EGD) on your system in one of the following locations:

- /dev/egd-pool
- /etc/egd-pool,
- /etc/entropy
- /var/run/egd-pool

### RNG/EGD

Cryptographic algorithms, including those that assure the security of communication – such as in OpenSSL and other protocols – depend upon random numbers for the creation of strong keys and certificates. A readily available source of

random data is the entropy that exists in complex computer processes. Utilities exist for every operating system, to gather bits of system entropy into a pool, which can then be used by other processes.

Windows and Linux have these installed by default. Other systems may or may not. See your system administrator.

### You Need an Entropy Pool

In the case of Luna SA, the Luna Client administration tool (**vtl**) expects to find a source of randomness at **/dev/random**. If one is not found, **vtl** fails, because the link cannot be secured from the Client end.

If your system does have an entropy pool, but the random number generator (RNG) is not in the expected place, then you can create a symbolic link between the actual location and one of the following:

- `/dev/random`
- `/dev/egd-pool`
- `/etc/egd-pool`
- `/etc/entropy`
- `/var/run/egd-pool`

If your system does not have an entropy gathering daemon or random number generator, please direct your system administrator to install one, and point it to one of the named devices.

### Alien with Debian

The Luna Client software is provided as RPM packages. If you are installing on a Debian system, you must have "alien" installed before beginning the Luna Client installation. The Luna Client installation script invokes the alien conversion of RPMs to DEB packages. The install script will stop with a message if you attempt to install on a Debian system without the alien package already installed.

### Components Used to Build the Driver (Luna G5, PCI-E, and Remote Backup HSM)

If you are installing the Luna PCI-E, or Luna G5, or Luna Remote Backup HSM clients, ensure that the following items are installed:

- Kernel headers for build
- `rpm-build` package
- C compiler
- `make` command

These items are required because the driver module is built on Linux before it is installed. If one of these items is missing, the driver build will fail and the module will not be installed..

## Installing the Client Software

It is recommended that you refer to the Luna HSM Customer Release Notes for any installation-related issues or instructions before you begin the following software installation process.



**CAUTION:** You must be logged in as **root** when you run the installation script.

By default, the Client programs are installed in the `/usr/safenet/lunaclient` directory.

**To install the Luna client software on a Linux workstation**

1. Log on to the client system, open a console or terminal window, and use **sudo** to gain administrative permissions for the installation.
2. If you have downloaded the Luna Client software as a .tar archive, skip to step 6.
3. Insert the DVD (mount it if you do not have automount).
4. Go to the DVD (**/cdrom** or whatever devicename your system uses) and the install directory for your architecture:

**cd /cdrom/linux/32**

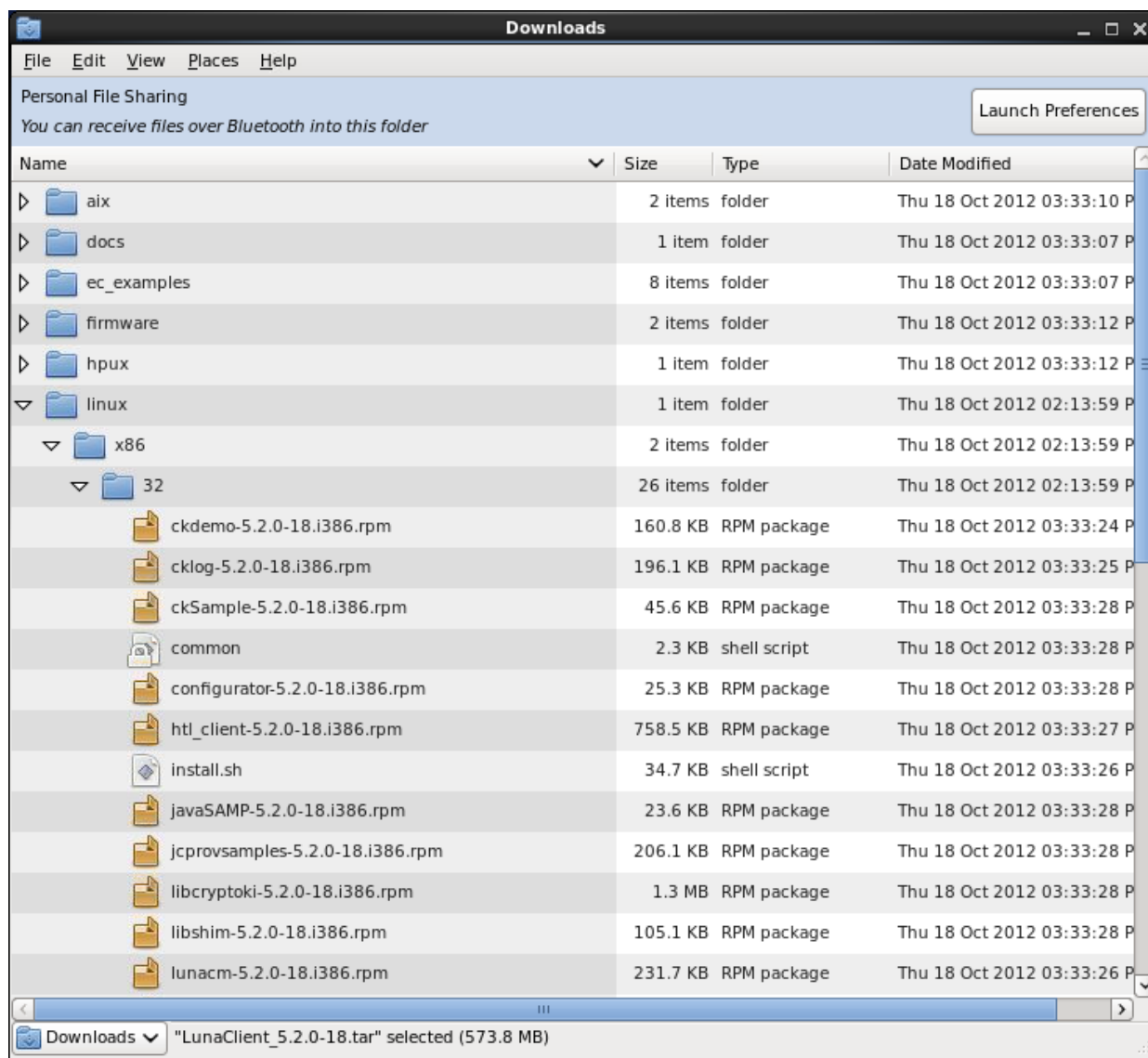
or

**cd /cdrom/linux/64**



**Note:** Not all platforms are supported with each release, so the available install options might not match the list above.

5. Skip to step 9.
6. If you downloaded the software, copy or move the **.tar** archive (which usually has a name like "Luna Client\_5.x.y-nn.tar") to a suitable directory where you can untar the archive and launch the installation script.
7. Extract the contents from the archive:  
**tar xvf <filename>.tar**
8. Change directory to the software version suitable for your system (for example, under the **linux** subdirectory, in the **x86** directory, choose 32-bit or 64-bit according to your system requirement).



9. To see the help, or a list of available installer options, type:

```
./sh install.sh -? or ./sh install.sh --help
```

To install all available products and optional components, type:

```
./sh install.sh all
```

To selectively install individual products and optional components, type the command without arguments:

```
./sh install.sh
```

10. Type **y** if you agree to be bound by the license agreement.
11. A list of installable Luna products appears (might be different, depending on your platform). Select as many as you require, by typing the number of each (in any order) and pressing [Enter]. As each item is selected, the list updates, with a "\*" in front of any item that has been selected. This example shows items 1 and 3 have been selected, and item 4 is about to be selected.

```

Products
Choose Luna Products to be installed
  * [1]: Luna SA
    [2]: Luna PCI-E
  * [3]: Luna G5
    [4]: Luna Remote Backup HSM
    [N|n]: Next
    [Q|q]: Quit
Enter selection: 4

```

12. When selection is complete, type "N" or "n" for "Next", and press [Enter]. If you wish to make a change, simply type a number again and press [Enter] to de-select a single item.
13. The next list is called "Advanced" and includes additional items to install. Some items might be pre-selected to provide the optimum Luna HSM experience for the majority of customers, but you can change any selection in the list. When the Components list is adjusted to your satisfaction, press [Enter].



**Note:** The installer includes the Luna SNMP Subagent as an option. If you select this option, you will need to move the SafeNet MIB files to the appropriate directory for your SNMP application after installation is complete, and you will need to start the SafeNet subagent and configure for use with your agent. See the *Administration Guide* for more information.

14. If the script detects an existing cryptoki library, it stops and suggests that you uninstall your previous Luna software before starting the Luna Client installation again.
15. The system installs all packages related to the products and any optional components that you selected.

As a general rule, do not modify the `Chrystoki.conf/crystoki.ini` file, unless directed to do so by SafeNet Customer Support.

If you do modify the file, never insert TAB characters - use individual space characters.

Avoid modifying the PED timeout settings. These are now hardcoded in the appliance, but the numbers in the `Chrystoki.conf` file must match.

## Uninstalling the Luna HSM Client Software

```
cd /usr/safenet/lunaclient/bin
```

```
./sh uninstall.sh
```

## Java

During the installation, the script provides the opportunity to install Luna Java components. If you select Java components, the Luna Java files are installed below `/usr/safenet/lunaclient/jsp/`. In order to use Java, you must have separately installed Java (JDK or run-time environment from the vendor of your choice) onto your system.

Copy the Luna Java library and jar files from their default location under `/usr/safenet/lunaclient/jsp/lib` to the Java environment directory, for example `/usr/jre/lib/ext`.

The exact directory might differ depending on where you obtained your Java system, the version, and any choices that you made while installing and configuring it.

For additional Java-related information, see "Java Interfaces" on page 1 in the *SDK Reference Guide*.

## JSP Static Registration

You would choose static registration of providers if you want all applications to default to our (SafeNet) provider.

Once your client has externally logged in using `salogin` (see ) in the Reference section of this document) or your own HSM-aware utility, any application would be able to use Luna product without being designed to login to the HSM Partition.

Edit the `java.security` file located in the `\jre\lib\security` directory of your Java SDK/JRE 1.6.x or 1.7.x installation to read as follows:

```
security.provider.1=sun.security.provider.Sun
security.provider.2=com.sun.net.ssl.internal.ssl.Provider
security.provider.3=com.safenetinc.luna.provider.LunaProvider
security.provider.4=com.sun.rsa.jca.Provider
security.provider.5=com.sun.crypto.provider.SunJCE
security.provider.6=sun.security.jgss.SunProvider
```

You can set our provider in first position for efficiency if Luna HSM operations are your primary mode. However, if your application needs to perform operations not supported by the `LunaProvider` (secure random generation or random publickey verification, for example) then it would receive error messages from the HSM and would need to handle those gracefully before resorting to providers further down the list. We have found that having our provider in third position works well for most applications.

The modifications in the "java.security" file are global, and they might result in the breaking of another application that uses the default `KeyPairGenerator` without logging into the Luna SA first. This consideration might argue for using dynamic registration, instead.

## JSP Dynamic Registration

For your situation, you may prefer to employ dynamic registration of Providers, in order to avoid possible negative impacts on other applications running on the same machine. As well, the use of dynamic registration allows you to keep installation as straightforward as possible for your customers.

## Compatibility

We formally test Luna HSMs and our Java provider with SUN JDK for all platforms except AIX, and with IBM JDK for the AIX platform. We have not had problems with OpenJDK, although it has not been part of our formal test suite. The Luna JCE provider is compliant with the JCE specification, and should work with any JVM that implements the Java language specification.

Occasional problems have been encountered with respect to IBM JSSE.

GNU JDK shipped with most Linux systems has historically been incomplete and not suitable.

## Removing components

To uninstall the JSP component or the SDK component, you must uninstall Luna Client completely, then re-run the installation script without selecting the unwanted component(s).

**sh uninstall.sh**

## [Ctrl] [C] - If you interrupt the installation

Do not interrupt the installation script in progress, and ensure that your host computer is served by an uninterruptible power supply (UPS). If you press [Ctrl] [C], or otherwise interrupt the installation (OS problem, power outage, other), some components will not be installed. It is not possible to resume an interrupted install process. The result of an interruption depends on where, in the process, the interruption occurred (what remained to install before the process was stopped).

As long as the cryptoki RPM package is installed, any subsequent installation attempt results in refusal with the message "A version of Luna Client is already installed."

If components are missing or are not working properly after an interrupted installation, or if you wish to install any additional components at a later date (following an interrupted installation, as described), you would need to uninstall everything first. If 'sh uninstall.sh' is unable to do it, then you must uninstall all packages manually.

Because interruption of the install.sh script is not recommended, and mitigation is possible, this is considered a low-likelihood corner case, fully addressed by these comments.

## Scripted or Unattended Installation

If you prefer to run the installation from a script, rather than interactively, run the command with the options -p <list of Luna products> and -c <list of Luna components>. To see the syntax, run the command with --help like this:

```
[myhost]$ sh ../Luna_Client_5.3.0-5x/linux/64/install.sh --help
Installing from ../Luna_Client_5.3.0-x/linux/64
```

At least one product should be specified.

usage:

```
install.sh      - Luna Client install through menu
install.sh help - Display scriptable install options
install.sh all  - Complete Luna Client install
```

```
install.sh -p [sa|pci|g5|rb] [-c sdk|jsp|jcprov|ldpc|snmp]
```

```
-p <list of Luna products>
```

```
-c <list of Luna components> - Optional. All components are installed if not provided
```

Luna products options

```
sa      - Luna SA
pci     - Luna PCI-E
g5      - Luna G5
rb      - Luna Remote Backup HSM
```

Luna components options

```
sdk     - Luna SDK
jsp     - Luna JSP (Java)
jcprov  - Luna JCPROV (Java)
ldpc    - Crypto Command Center Provisioning Client
snmp    - Luna SNMP subagent
```

```
[myhost]$
```

For scripted/automated installation, your script will need to capture and respond to the License Agreement prompt, and to the confirmation prompt. For example:



```
[myhost]$ ./install.sh all
Installing from /home/me/Downloads/Luna Client_5.3.0/linux/64

IMPORTANT: The terms and conditions of use outlined in the software
license agreement (Document #008-010005-001_053110) shipped with the product
("License") constitute a legal agreement between you and SafeNet Inc.
Please read the License contained in the packaging of this
product in its entirety before installing this product.

Do you agree to the License contained in the product packaging?

If you select 'yes' or 'y' you agree to be bound by all the terms
and conditions set out in the License.

If you select 'no' or 'n', this product will not be installed.

(y/n) y

Complete Luna Client will be installed. This includes Luna SA,
Luna PCI-E, Luna G5 AND Luna Remote Backup HSM.

Select 'yes' or 'y' to proceed with the install.

Select 'no' or 'n', to cancel this install.

Continue (y/n)? y
```

For example, to automate installation for our testing, we use:

```
if product == 'all':
cmd = '/bin/bash %s %s'%(install_cmd, product) # install.sh all
```

## SUSE Linux on IBM PPC

JCE un-restriction files must be downloaded from IBM, not from SUN, for this platform. Attempting to use SUN JCE un-restriction files on IBM PowerPC systems with SUSE Linux causes signing errors with Java 5 and Java 6.

## 32-bit Client on 64-bit RedHat 6

While no errors normally appear when installing 64-bit client on 64-bit RedHat 6, some preparation is required to avoid installation errors when installing 32-bit Client on 64-bit OS. Do the following:

- `yum install glibc.i686`
- `yum upgrade libstdc++`
- `yum install libstdc++.i686`
- `yum install libgcc.i686`

Then run the 32-bit installer

**`./install.sh`**

Failure to perform those steps before launching the installer can result in output like the following:

```
Installing the Luna Client 5.3.0-5...
Adding new version of configurator
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
```

```

Preparing... ##### [100%]
1:configurator ##### [100%]
Adding new version of libcryptoki
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:libcryptoki ##### [100%]
Checking for /etc/Chrystoki.conf.rpmsave
Using new /etc/Chrystoki.conf
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
/var/tmp/rpm-tmp.ndfBQQ: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
Adding new version of libshim
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:libshim ##### [100%]
Adding new version of lunacm
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:lunacm ##### [100%]
Adding new version of lunacmu
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:lunacmu ##### [100%]
Adding new version of ckdemo
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:ckdemo ##### [100%]
Adding new version of multitoken
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:multitoken ##### [100%]
Adding new version of cklog
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:cklog ##### [100%]
Adding new version of salogin

```

```

/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:salgin ##### [100%]
Adding new version of vtl
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:vtl ##### [100%]
Adding new version of htl_client
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:htl_client ##### [100%]
/var/tmp/rpm-tmp.bLgGlF: /usr/safenet/lunaclient/bin/configurator: /lib/ld-linux.so.2: bad ELF
interpreter: No such file or directory
Starting htl_client:/etc/init.d/htlc_service: /usr/safenet/lunaclient/htl/htl_client: /lib/ld-
linux.so.2: bad ELF interpreter: No such file or directory
FAILED
warning: %post(htl_client-5.3.0-5.i386) scriptlet failed, exit status 1
Adding new version of javaSAMP
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:javaSAMP ##### [100%]
Adding new version of ckSample
/home/builds/Luna Client/CLT_SDK/5.3.0/Luna Client_5.3.0-5/Luna Client_5.3.0-5/linux/32
Preparing... ##### [100%]
1:ckSample ##### [100%]

```

If the installation script proceeds to the end, with the above errors, the installation appears successful, but you are unable to create certs. Re-do.

## After Installation

When you have installed the software onto a Client, the next task is to configure the Luna HSM, as described in the *Configuration Guide*.

## Solaris Luna Client Installation

These instructions assume that you have already acquired the Luna client software, either on CD/DVD or in the form of a downloaded .tar archive.

Applicability to specific versions of Solaris is summarized in the Customer Release Notes for the current release.



**Note:** Before installing a Luna system, you should confirm that the product you have received is in factory condition and has not been tampered with in transit. Refer to the Startup Guide included with your product shipment. If you have any questions about the condition of the product that you have received, contact SafeNet Support.

Each computer that connects to the Luna HSM appliance as a client must have the cryptoki library, the vtl client shell and other utilities and supporting files installed.

Each computer that contains, or is connected to a Luna G5 or a Luna PCI-E HSM must have the cryptoki library and other utilities and supporting files installed.



**Note:** This example shows all the Luna client products and components. Some items are not supported on all operating systems and therefore do not appear as you proceed through the installation script.

Do not install Luna client software on the same system as legacy Luna CA<sup>3</sup>, Luna CA4, Luna PCM, or Luna PCI software.

The software is intended for modern/current Luna HSMs, Luna SA, Luna PCI-E, Luna G5, Luna (Remote) Backup HSM.

## Prerequisites

Before starting the installation, ensure that you have satisfied the following prerequisites:

### Random Number Generator (RNG) or Entropy Gathering Daemon (EGD)

Ensure that you have a Random Number Generator (RNG) or Entropy Gathering Daemon (EGD) on your system in one of the following locations:

- /dev/egd-pool
- /etc/egd-pool,
- /etc/entropy
- /var/run/egd-pool

### RNG/EGD

Cryptographic algorithms, including those that assure the security of communication – such as in OpenSSL and other protocols – depend upon random numbers for the creation of strong keys and certificates. A readily available source of random data is the entropy that exists in complex computer processes. Utilities exist for every operating system, to gather bits of system entropy into a pool, which can then be used by other processes.

Windows and Linux have these installed by default. Other systems may or may not. See your system administrator.

## You Need an Entropy Pool

In the case of Luna SA, the Luna Client administration tool (**vtl**) expects to find a source of randomness at **/dev/random**. If one is not found, **vtl** fails, because the link cannot be secured from the Client end.

If your system does have an entropy pool, but the random number generator (RNG) is not in the expected place, then you can create a symbolic link between the actual location and one of the following:

- `/dev/random`
- `/dev/egd-pool`
- `/etc/egd-pool`
- `/etc/entropy`
- `/var/run/egd-pool`

If your system does not have an entropy gathering daemon or random number generator, please direct your system administrator to install one, and point it to one of the named devices.

## Installing the Client Software

It is recommended that you refer to the Luna HSM Customer Release Notes for any installation-related issues or instructions before you begin the following software installation process.



**CAUTION:** You must be logged in as **root** when you run the installation script.

By default, the Client programs are installed in the **/opt/safenet/lunaclient/bin** directory.

### To install the Luna client software on a Linux workstation

1. Log on to the client system, open a console or terminal window, and use **su** to gain administrative permissions for the installation.
2. Access the Luna client software:

<b>DVD</b>	<ol style="list-style-type: none"> <li>1. Insert the DVD (mount it if you do not have automount).</li> <li>2. Go to the DVD (<b>/cdrom</b> or whatever device name your system uses).</li> </ol>
<b>Tar archive</b>	<ol style="list-style-type: none"> <li>1. Copy or move the <b>.tar</b> archive to a suitable directory where you can untar the archive and launch the installation script.</li> <li>2. Extract the contents from the archive: <b>tar xvf &lt;filename&gt;.tar</b></li> </ol>

3. Go to the install directory for your architecture:

Architecture	Path
Solaris Sparc 32-bit	<dvd_or_tarball_path>/solaris/sparc/32
Solaris Sparc 64-bit	<dvd_or_tarball_path>/solaris/sparc/64
Solaris x86 32-bit	<dvd_or_tarball_path>/solaris/x86/32
Solaris x86 64-bit	<dvd_or_tarball_path>/solaris/x86/64



**Note:** Not all platforms are supported with each release, so the available install options might not match the list above. Refer to the Customer Release Notes for more information.

4. To see the help, or a list of available installer options, type:

**sh install.sh -?** or **sh install.sh --help**

To install all available products and optional components, type:

**sh install.sh all**

To selectively install individual products and optional components, type the command without arguments:

**sh install.sh**

5. Type **y** if you agree to be bound by the license agreement.
6. A list of installable Luna products is displayed (might be different, depending on your platform). Select as many as you require, by typing the number of each (in any order) and pressing [Enter]. As each item is selected, the list updates, with a "\*" in front of any item that has been selected. The following example shows that items 1 and 3 have been selected, and item 4 is about to be selected.

```
Products
Choose Luna Products to be installed
*[1]: Luna SA
[2]: Luna PCI-E
*[3]: Luna G5
[4]: Luna Remote Backup HSM
[N|n]: Next
[Q|q]: Quit
Enter selection: 4
```

7. When the selection is complete, type "N" or "n" for "Next", and press [Enter]. If you wish to make a change, simply type a number again and press [Enter] to de-select a single item.
8. The next list is called "Advanced" and includes additional items to install. Some items might be pre-selected to provide the optimum Luna HSM experience for the majority of customers, but you can change any selection in the list. When the Components list is adjusted to your satisfaction, press [Enter].



**Note:** The installer includes the Luna SNMP Subagent as an option. If you select this option, you will need to move the SafeNet MIB files to the appropriate directory for your SNMP application after installation is complete, and you will need to start the SafeNet subagent and configure for use with your agent. See the *Administration Guide* for more information.

9. If the script detects an existing cryptoki library, it stops and suggests that you uninstall your previous Luna software before starting the Luna Client installation again.
10. The system installs all packages related to the products and any optional components that you selected.

As a general rule, do not modify the `Chrystoki.conf/crystoki.ini` file, unless directed to do so by SafeNet Customer Support.

If you do modify the file, never insert TAB characters - use individual space characters.

Avoid modifying the PED timeout settings. These are now hardcoded in the appliance, but the numbers in the `Chrystoki.conf` file must match.

## Uninstalling the Luna HSM Client Software

```
cd /opt/safenet/lunaclient/bin
```

```
sh uninstall.sh
```

### Java

During the installation, the script provides the opportunity to install Luna Java components. If you select Java components, the Luna Java files are installed below `/opt/safenet/lunaclient/jsp/`. In order to use Java, you must have separately installed Java (JDK or run-time environment from the vendor of your choice) onto your system.

Copy the Luna Java library and jar files from their default location under `/opt/safenet/lunaclient/jsp/lib` to the Java environment directory, for example `/opt/jre/lib/ext`.

The exact directory might differ depending on where you obtained your Java system, the version, and any choices that you made while installing and configuring it.

For additional Java-related information, see ["Java Interfaces" on page 1](#) in the *SDK Reference Guide*.

### JSP Static Registration

You would choose static registration of providers if you want all applications to default to our (SafeNet) provider.

Once your client has externally logged in using `salogin` (see ) in the Reference section of this document) or your own HSM-aware utility, any application would be able to use Luna product without being designed to login to the HSM Partition.

Edit the `java.security` file located in the `\jre\lib\security` directory of your Java SDK/JRE 1.6.x or 1.7.x installation to read as follows:

```
security.provider.1=sun.security.provider.Sun
security.provider.2=com.sun.net.ssl.internal.ssl.Provider
security.provider.3=com.safenetinc.luna.provider.LunaProvider
security.provider.4=com.sun.rsa.jca.Provider
security.provider.5=com.sun.crypto.provider.SunJCE
security.provider.6=sun.security.jgss.SunProvider
```

You can set our provider in first position for efficiency if Luna HSM operations are your primary mode. However, if your application needs to perform operations not supported by the `LunaProvider` (secure random generation or random publickey verification, for example) then it would receive error messages from the HSM and would need to handle those gracefully before resorting to providers further down the list. We have found that having our provider in third position works well for most applications.

The modifications in the `"java.security"` file are global, and they might result in the breaking of another application that uses the default `KeyPairGenerator` without logging into the Luna SA first. This consideration might argue for using dynamic registration, instead.

### JSP Dynamic Registration

For your situation, you may prefer to employ dynamic registration of Providers, in order to avoid possible negative impacts on other applications running on the same machine. As well, the use of dynamic registration allows you to keep installation as straightforward as possible for your customers.

## Compatibility

We formally test Luna HSMs and our Java provider with SUN JDK for all platforms except AIX, and with IBM JDK for the AIX platform. We have not had problems with OpenJDK, although it has not been part of our formal test suite. The Luna JCE provider is compliant with the JCE specification, and should work with any JVM that implements the Java language specification.

Occasional problems have been encountered with respect to IBM JSSE.

GNU JDK shipped with most Linux systems has historically been incomplete and not suitable.

## Removing components

To uninstall the JSP component or the SDK component, you must uninstall Luna Client completely, then re-run the installation script without selecting the unwanted component(s).

**sh uninstall.sh**

## [Ctrl] [C] - If you interrupt the installation

Do not interrupt the installation script in progress, and ensure that your host computer is served by an uninterruptible power supply (UPS). If you press [Ctrl] [C], or otherwise interrupt the installation (OS problem, power outage, other), some components will not be installed. It is not possible to resume an interrupted install process. The result of an interruption depends on where, in the process, the interruption occurred (what remained to install before the process was stopped).

As long as the cryptoki RPM package is installed, any subsequent installation attempt results in refusal with the message "A version of Luna Client is already installed."

If components are missing or are not working properly after an interrupted installation, or if you wish to install any additional components at a later date (following an interrupted installation, as described), you would need to uninstall everything first. If 'sh uninstall.sh' is unable to do it, then you must uninstall all packages manually.

Because interruption of the install.sh script is not recommended, and mitigation is possible, this is considered a low-likelihood corner case, fully addressed by these comments.

## After Installation

When you have installed the software onto a Client, the next task is to configure the Luna HSM, as described in the *Configuration Guide*.



## Windows Luna Client Installation

Applicability to specific versions of Windows is summarized in the Customer Release Notes for this release.



**Note:** Before installing a Luna® system, you should confirm that the product you have received is in factory condition and has not been tampered with in transit. Refer to the Startup Guide included with your product shipment. If you have any questions about the condition of the product that you have received, please contact SafeNet Support (800)545 6608 or [support@safenet-inc.com](mailto:support@safenet-inc.com) immediately.

### Required Client Software

Each computer that connects to the Luna SA as a Client must have the cryptoki library, the vtl client shell and other utilities and supporting files installed.

Each computer that contains, or is connected to a Luna PCI-E or a Luna G5 HSM must have the cryptoki library and other utilities and supporting files installed.



**Note: .NET framework** - before installing Luna Client on Windows 2012 platform, install Microsoft .NET framework version 3.5, first. You can have other versions of .NET on your system (there is no conflict), but 3.5 is needed for Luna Client to launch HTL on Windows 2012. For additional information see "Windows 2012 Luna Client Supplemental Configuration" on page 93. On Windows Server 2008, Luna Client installs and HTL works without additional Windows components.

### Installing the Luna Client Software

The supported Windows servers are 64-bit. They allow running of 32-bit or 64-bit applications.

For compatibility of our HSMs with Windows in general, we provide both 32-bit and 64-bit libraries for use with your applications as appropriate, but our supplied tools (lunacm, cmu, multitoken, etc.) are 64-bit versions only. This is because 64-bit tools are all that is needed on a 64-bit OS, but we mention it in case you were looking for 32-bit equivalents - there aren't any because none are needed.

For compatibility of our HSMs with Windows CAPI we have Luna CSP, and for the newer Windows CNG we have Luna KSP. If you are using either, then a section near the end of this chapter has additional specific instructions.

Interactive (prompted) and non-interactive (no prompts) installation options are available.

#### To install the Luna client software

1. Log into Windows as "Administrator", or as a user with administrator privileges (see Troubleshooting tips, below).
2. Insert the Luna Client Software DVD into your optical drive.
3. Click **Start > Run** and then type:

**d:\windows\64\Luna Client.msi**

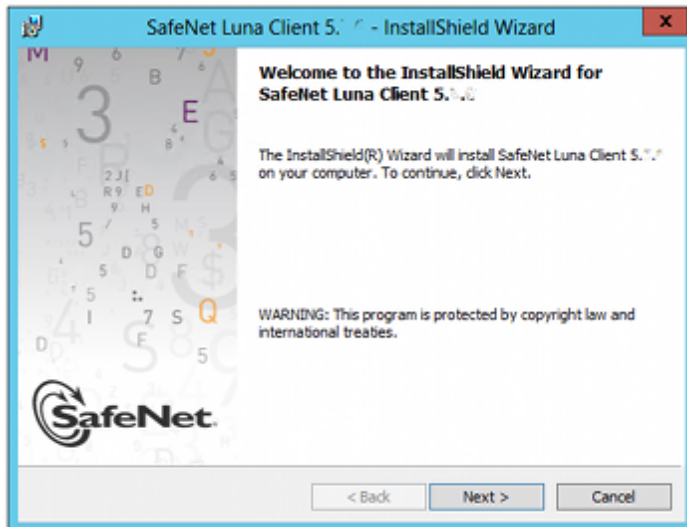
where "d" is your CDROM drive

or use Explorer to navigate the CD directories and double click the appropriate **Luna Client.msi**.

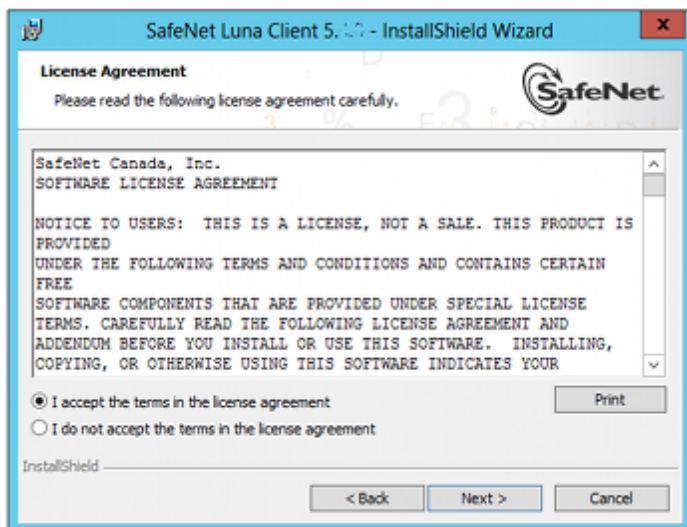


**Note:** The installer is 64-bit only. If you have 32-bit applications, proceed with the 64-bit installation, then see "Using 32-bit Applications With the Luna Client " on page 87.

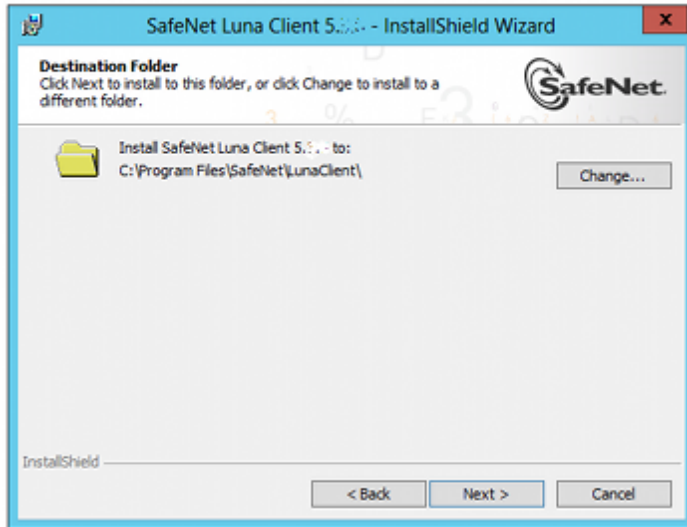
4. At the Welcome screen, click **Next**.



5. Accept the software license agreement.



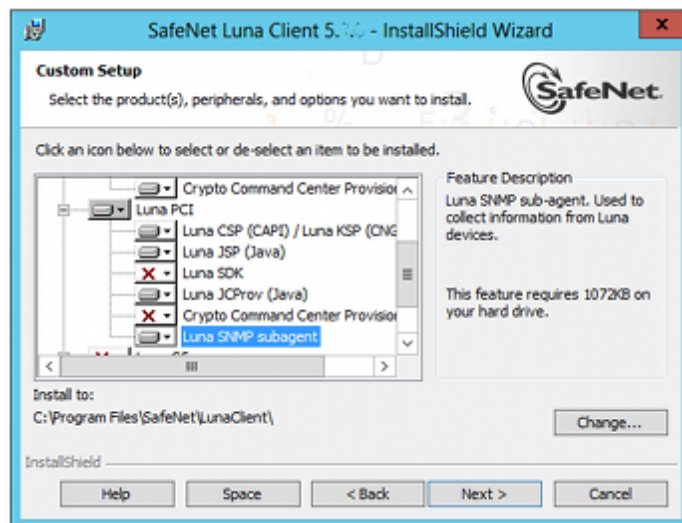
6. In the **Choose Destination Location** dialog, accept the default that is offered, or make a change if you prefer.



7. Click to select any of the Luna Product software options that you wish to install. Any that are marked with a red "X" are currently de-selected and will not be installed when you proceed. You must accept at least the major feature for your HSM. You can select all, if you wish - there is no conflict.

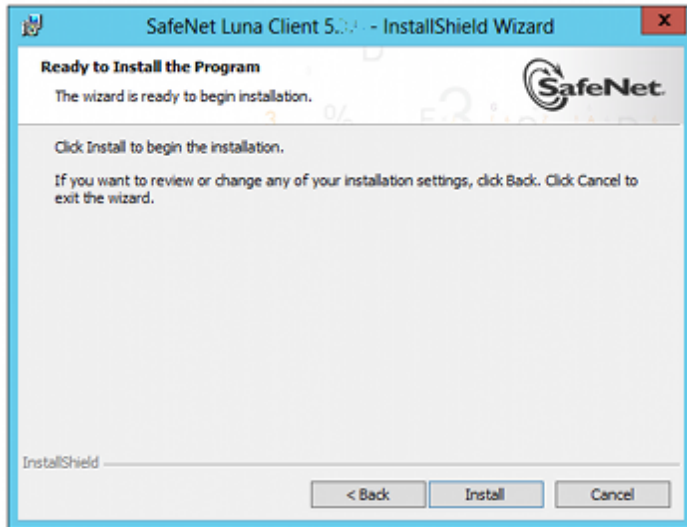
The installer includes the Luna SNMP Subagent as an option with any of the Luna HSMs, except Luna SA (which has agent and subagent built in). For any of Luna PCI-E, Luna G5, or Luna Backup HSMs, include the subagent with any of the products, if desired - it doesn't matter which; it's the same subagent, and it goes to the same location on your hard disk.

After installation is complete, you will need to move the SafeNet MIB files to the appropriate directory for your SNMP application, and you will need to start the SafeNet subagent and configure for use with your agent, as described in the *Administration Guide*.



8. On the **Ready to Install** page click **Install**.

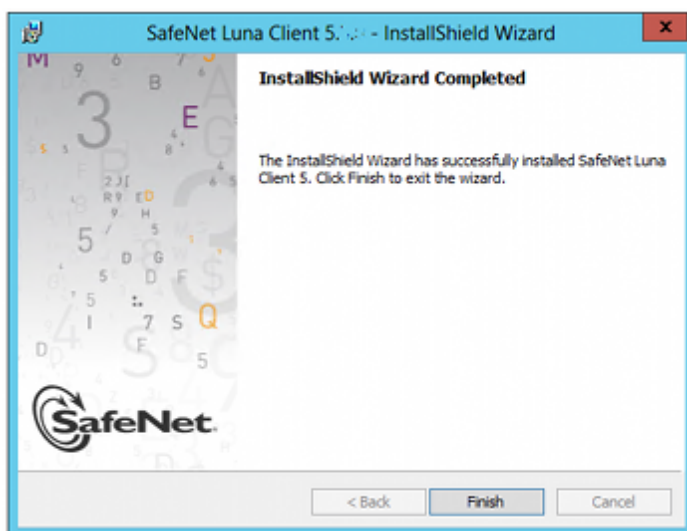
If you wish to modify any of your previous selections, you can still click **Back** to see previous pages. Once you click **Install**, you are committed to the installation.



9. If Windows presents a security notice asking if you wish to install the device driver from SafeNet, click **Install** to accept.



10. If you choose not to install the driver, your Luna Client cannot function with any locally connected Luna hardware (which includes Luna PCI-E, Luna G5, or Luna [Remote] Backup HSMs).
11. When the installation completes, click **Finish**.



As a general rule, do not modify the Chrystoki.conf/crystoki.ini file, unless directed to do so by SafeNet Customer Support.

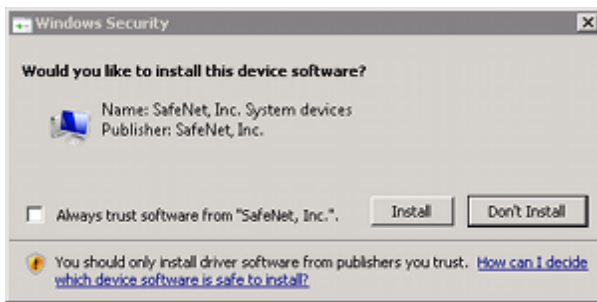
If you do modify the file, never insert TAB characters - use individual space characters.

Avoid modifying the PED timeout settings. These are now hardcoded in the appliance, but the numbers in the Chrystoki.conf file must match.

## Using msixec for scripted or unattended installation of the Luna Client

You can use the **msiexec** command to install the Luna client from the command line, or from a script. The **msiexec** command includes various command line switches (see the Microsoft documentation for details) that allow you to install the Luna client with varying levels of user interaction, including a quiet mode (**/qn**) that requires no user interaction.

However, since the Luna client includes a device driver, the following confirmation dialog is displayed when you install the Luna client using the **msiexec** command, regardless of the command line switches you use:



If you check the **Always trust software from "SafeNet, Inc."** checkbox, this dialog will not be displayed on subsequent installs, allowing for a truly "silent" install that requires no user interaction. That option was introduced with Windows 2008.

For more detailed information, see "[Scripted / Unattended Installation on Windows](#)" on page 95.

## Java

During the installation, if you allow our Java Security Provider to be installed, the Luna Java files are installed below **C:\Program Files\Luna Client\JSP\lib**. In order to use our JSP, you must have separately installed Java (JDK or run-time environment from the vendor of your choice) onto your system.

Copy the Luna Java files from their default location under **C:\Program Files\SafeNet\Luna Client\JSP\lib** to the Java environment directory, for example **C:\Program Files\Java\jre6\lib\ext**.



**Note:** The exact directory might differ depending on where you obtained your Java system, the version, and any choices that you made while installing and configuring it.

## Java 7 Library Path Issue

SafeNet has traditionally recommended that you put **LunaAPI.dll** in the `<java install dir>/lib/ext` folder.

However, Java 7 for Windows has removed this directory from the Java library path. As a result, when a Java 7 application on Windows uses the Luna provider, it cannot find the **LunaAPI.dll** library, causing the application to fail.

To address this problem, we suggest that you use one of the following methods to add **LunaAPI.dll** to the Java 7 search path:

- Put **LunaAPI.dll** in an arbitrary folder and add that folder to the system path. Java 7 will search the system path for **LunaAPI.dll**.
- Put LunaAPI.dll in the Windows system folder. This folder varies by operating system and DLL type, as follows:
  - - 32-bit Windows, 32-bit LunaAPI.dll: C:\Windows\System32
  - - 64-bit Windows, 64-bit LunaAPI.dll: C:\Windows\System32
  - - 64-bit Windows, 32-bit LunaAPI.dll: C:\Windows\SysWOW64

For additional Java-related information, see "[Java Interfaces](#)" on page 1 in the *SDK Reference Guide*.

## JSP Static Registration

You would choose static registration of providers if you want all applications to default to our (SafeNet) provider.

Once your client has externally logged in using salogin (see ) in the Reference section of this document) or your own HSM-aware utility, any application would be able to use Luna product without being designed to login to the HSM Partition.

Edit the java.security file located in the \jre\lib\security directory of your Java SDK/JRE 1.6.x or 1.7.x installation to read as follows:

```
security.provider.1=sun.security.provider.Sun
security.provider.2=com.sun.net.ssl.internal.ssl.Provider
security.provider.3=com.safenetinc.luna.provider.LunaProvider
security.provider.4=com.sun.rsa.jca.Provider
security.provider.5=com.sun.crypto.provider.SunJCE
security.provider.6=sun.security.jgss.SunProvider
```

You can set our provider in first position for efficiency if Luna HSM operations are your primary mode. However, if your application needs to perform operations not supported by the LunaProvider (secure random generation or random publickey verification, for example) then it would receive error messages from the HSM and would need to handle those gracefully before resorting to providers further down the list. We have found that having our provider in third position works well for most applications.

The modifications in the "java.security" file are global, and they might result in the breaking of another application that uses the default KeyPairGenerator without logging into the Luna SA first. This consideration might argue for using dynamic registration, instead.

## JSP Dynamic Registration

For your situation, you may prefer to employ dynamic registration of Providers, in order to avoid possible negative impacts on other applications running on the same machine. As well, the use of dynamic registration allows you to keep installation as straightforward as possible for your customers.

## Compatibility

We formally test Luna HSMs and our Java provider with SUN JDK for all platforms except AIX, and with IBM JDK for the AIX platform. We have not had problems with OpenJDK, although it has not been part of our formal test suite. The Luna JCE provider is compliant with the JCE specification, and should work with any JVM that implements the Java language specification.

Occasional problems have been encountered with respect to IBM JSSE.

GNU JDK shipped with most Linux systems has historically been incomplete and not suitable.

## CSP and KSP

Luna CSP allows you to use the Luna HSM with Microsoft CAPI, which is supported on 32-bit and on 64-bit Windows.

Luna KSP allows you to use the Luna HSM with Microsoft CNG, which is newer, has additional functions, and supersedes CAPI.

Both of these require modifications to the Windows Registry.

### Luna CSP

For Luna CSP, the utility **register.exe** takes care of the registry.

Just remember to run the 64-bit version, the 32-bit version, or both, depending on the applications you are running.

- Register the csp dll:  
# register.exe /library
- Register the partition:  
# register <no arguments>

### Luna KSP

For Luna KSP, the utility **KspConfig.exe** takes care of the registry. Follow instructions for the use of the graphical KspConfig.exe as described in "KSP for CNG" on page 1 in the *SDK Reference Guide*. Just remember to run the 64-bit version, the 32-bit version, or both, depending on the applications you are running.



**Note:** The **cryptoki.ini** file, which specifies many configuration settings for your HSM and related software, includes a line that specifies the path to the appropriate libNT for use with your application(s). Verify that the path is correct



**Note:** If Luna CSP (CAPI) / Luna KSP (CNG) is selected at installation time then the **SafeNetKSP.dll** file is installed in these two locations:  
- **C:\Windows\System32** (used for 64-bit KSP)  
- **C:\Windows\SysWOW64** (used for 32-bit KSP)

## Using 32-bit Applications With the Luna Client

Luna Client 32-bit libraries (**cryptoki.dll**, **cklog.dll**, etc.) and versions of CSP and KSP libraries and tools are installed in the **C:\Program Files\SafeNet\Luna Client\win32** directory.

The **win32** directory content is as follows:

- cklog201.dll
- cklog201.dll.sig
- cryptoki.dll
- cryptoki.dll.sig
- shim.dll

- shim.dll.sig
- **jsp** directory which contains:
  - LunaAPI.dll

If the Luna CSP (CAPI) / Luna KSP(CNG) feature is installed, the following are also installed under **win32**:

- csp directory which contains:
  - keymap
  - LunaCSP.dll
  - LunaCSP.sig
  - ms2Luna
  - register
- KSP directory that contains:
  - kspcmd
  - KspConfig
  - ksputil
  - ms2Luna

In order to properly use the 32-bit library and tools on 64-bit systems there are two basic approaches:

### Direct loading of library

Set your application to load the 32-bit library installed under the win32 directory, and run your application. For an example on how to load the cryptoki library dynamically, please refer to the Luna SDK.

This should work for any application that directly points to the needed library, and represents the majority of customer applications.

### Loading the library via the configuration file

If you require your 32-bit Windows application to run on 64-bit Windows and your application uses the crystoki.ini to find the location of the cryptoki library (such as applications that use ckbridge - no longer distributed - or that use CSP), we recommend creating a new copy of the crystoki.ini file under the win32 directory to point to the 32-bit cryptoki library as described below:

- Install Luna Client and configure the HSM or SA client as you would normally do.
- Create a copy of the crystoki.ini file and store it in the win32 directory.
- Modify the LibNT entry in the file (the copy in the win32 directory) to point to the cryptoki.dll library located in the win32 directory  
 LibNT=C:\Program Files\SafeNet\Luna Client\win32\cryptoki.dll
- Open a new DOS prompt (to be used to run your application).
- Set the ChrystokiConfigurationPath environment variable to point to the win32 directory set  
 ChrystokiConfigurationPath= C:\Program Files\SafeNet\Luna Client\win32\
- Run your application.

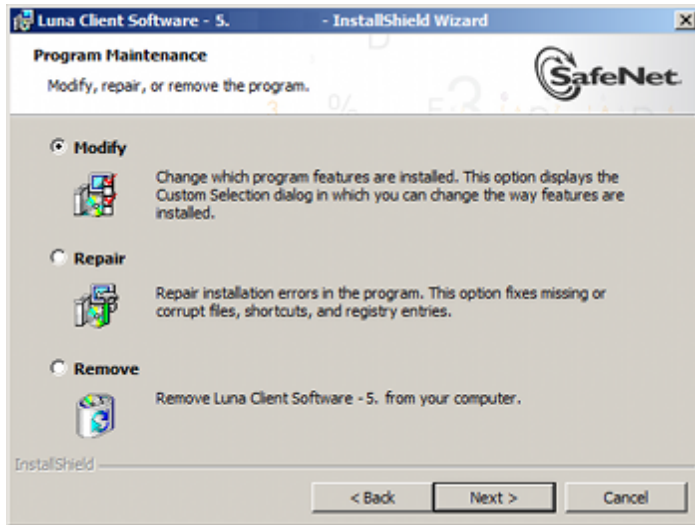


## Uninstalling, Modifying, or Repairing the Luna Client Software

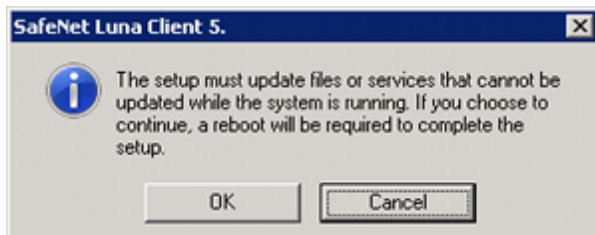
At any time, you might need to uninstall Luna Client, or to modify the installation (perhaps to add a component or product that you did not previously install), or to repair the installed software.

### To uninstall, modify, or repair the Luna client software

1. Run the **Luna Client.msi** program again. Because the software is already installed on your computer, after you click through the Welcome page, this dialog is displayed:



2. Choose the desired option, click **Next**, and follow the prompts. It is possible that you might see a message like this:



Ignore that message if you see it while uninstalling Luna Client. You do not need to restart your computer, and you will not be prompted to do so.

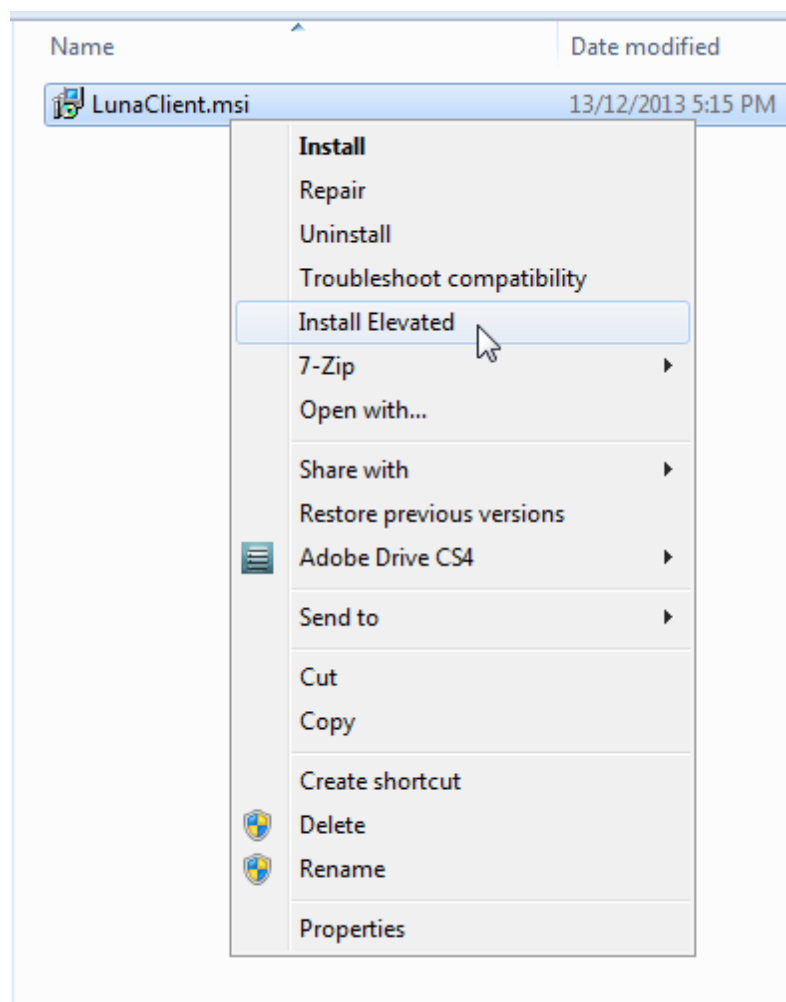
## After Installation

When you have installed the software onto a Client, the next task is to configure the Luna HSM, as described in the *Configuration Guide*.

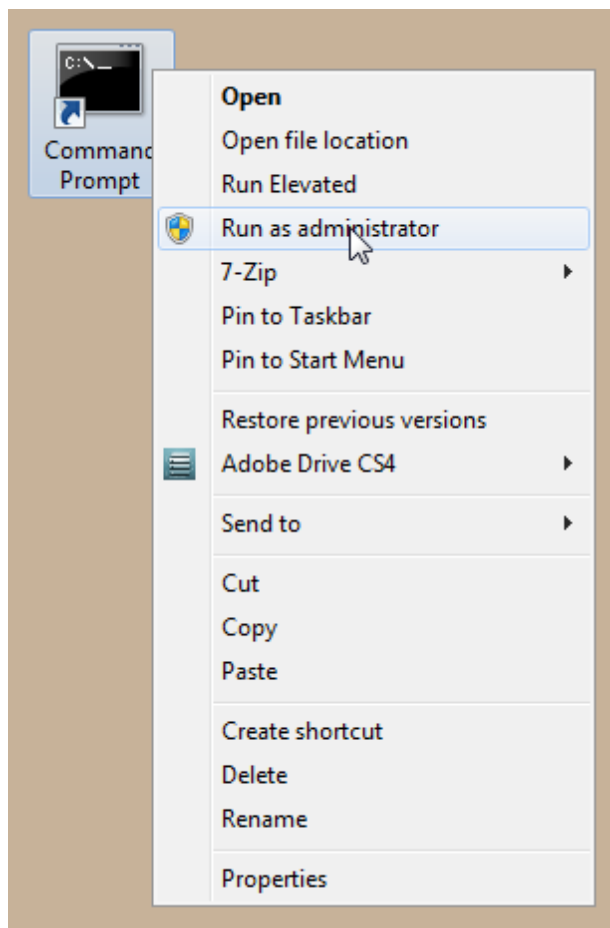
Open a new command-line/console window to allow the library path to be found before you run `lunacm` or other utilities that require the library.

## Troubleshooting

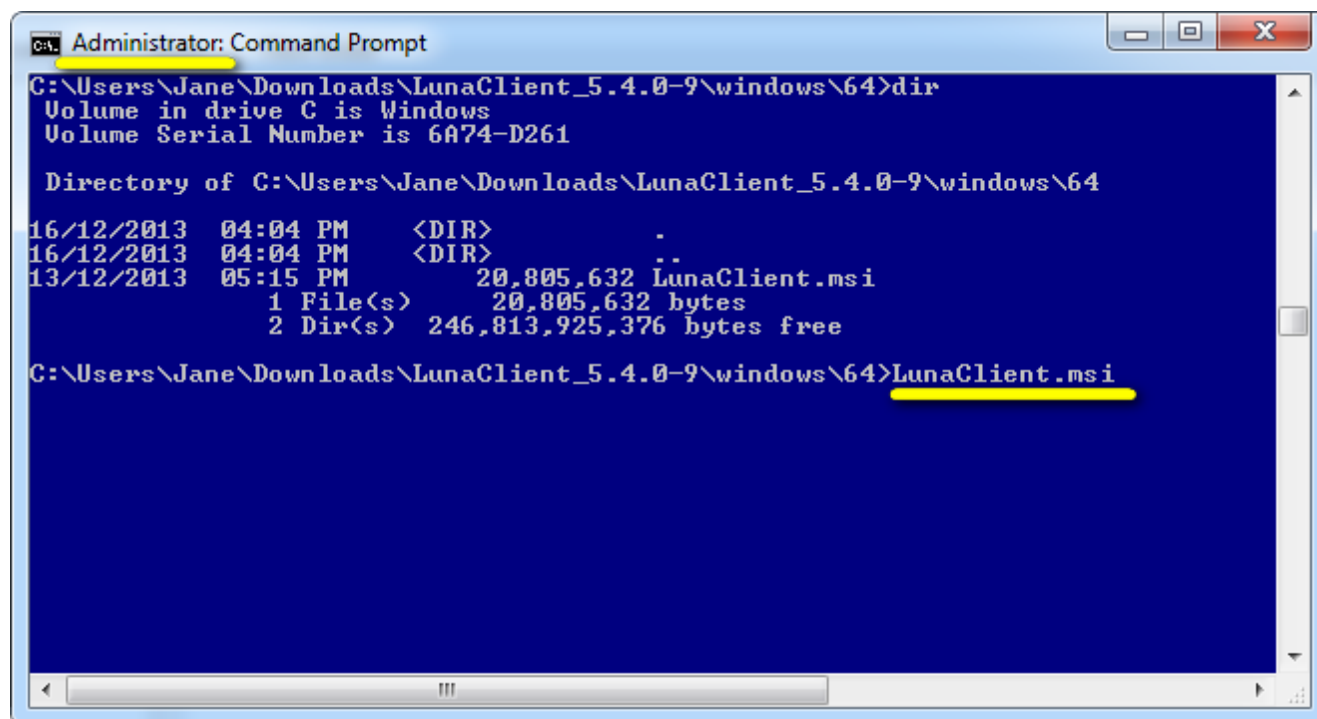
If you are not the Administrator of the computer on which LunaClient is being installed, or if the bundle of permissions in your user profile does not allow you to launch the installer with "Run as Administrator", then some services might not install properly. One option is to have the Administrator perform the installation for you.



Another approach might be possible. If you have sufficient elevated permissions, you might be able to right-click and open a Command Prompt window as Administrator.



If that option is available, then you can use the command line to move to the location of the LunaClient.msi file and launch it there, which permits the needed services to load for HTL, PedClient, and other Luna features.



The screenshot shows a Windows Command Prompt window titled "Administrator: Command Prompt". The command prompt is running in the directory C:\Users\Jane\Downloads\LunaClient\_5.4.0-9\windows\64. The user has entered the command 'dir', which has produced the following output:

```
C:\Users\Jane\Downloads\LunaClient_5.4.0-9\windows\64>dir
Volume in drive C is Windows
Volume Serial Number is 6A74-D261

Directory of C:\Users\Jane\Downloads\LunaClient_5.4.0-9\windows\64

16/12/2013  04:04 PM    <DIR>          .
16/12/2013  04:04 PM    <DIR>          ..
13/12/2013  05:15 PM                20,805,632  LunaClient.msi
               1 File(s)                20,805,632 bytes
               2 Dir(s)  246,813,925,376 bytes free

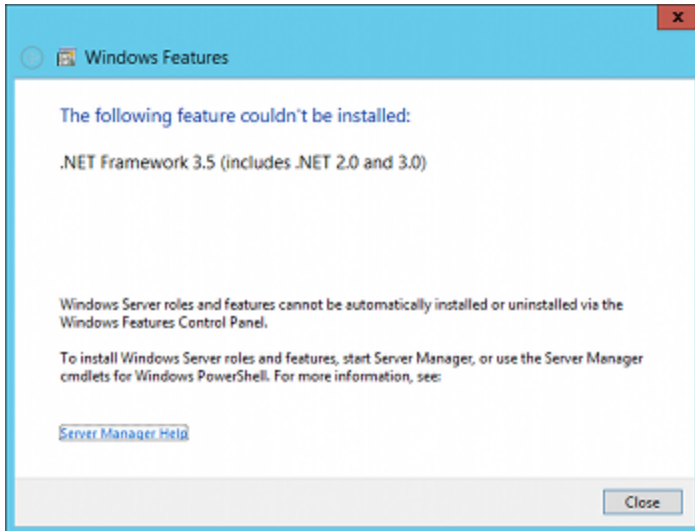
C:\Users\Jane\Downloads\LunaClient_5.4.0-9\windows\64>LunaClient.msi
```

The file 'LunaClient.msi' is highlighted in yellow in the original image.

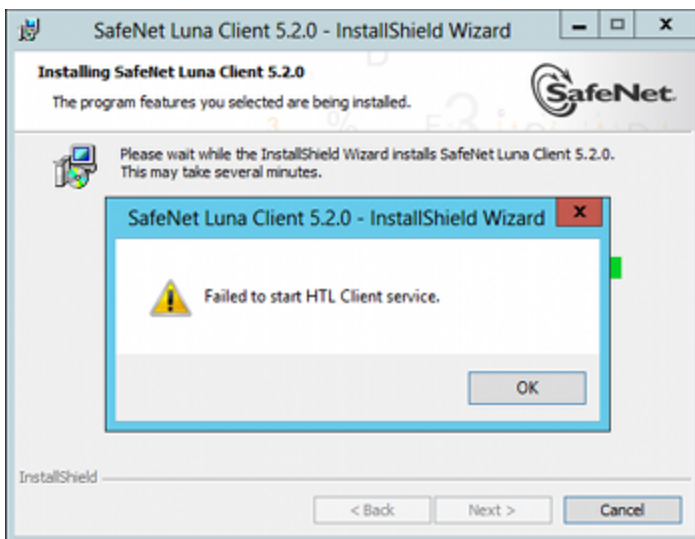
## Windows 2012 Luna Client Supplemental Configuration

If you are installing the Luna client on Windows 2012, some additional configuration is required to install the .NET framework that is required for the HTL Client Service.

If your Windows Server 2012 instance is not properly configured with .NET Framework, the following alert message appears during the Luna Client installation:



When you close the alert, a message about the HTL Client service appears.



To avoid this issue, install Microsoft .NET Framework 3.5 on your Windows Server 2012 instance before you run the Luna Client 5.x installer.

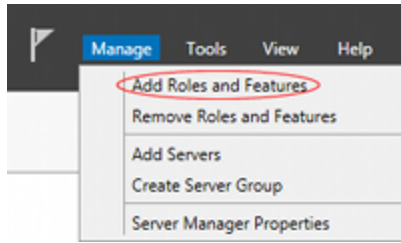
## Installing the .NET Framework 3.5 on Windows Server 2012

The .NET Framework 3.5 is required by the HTL Client service.

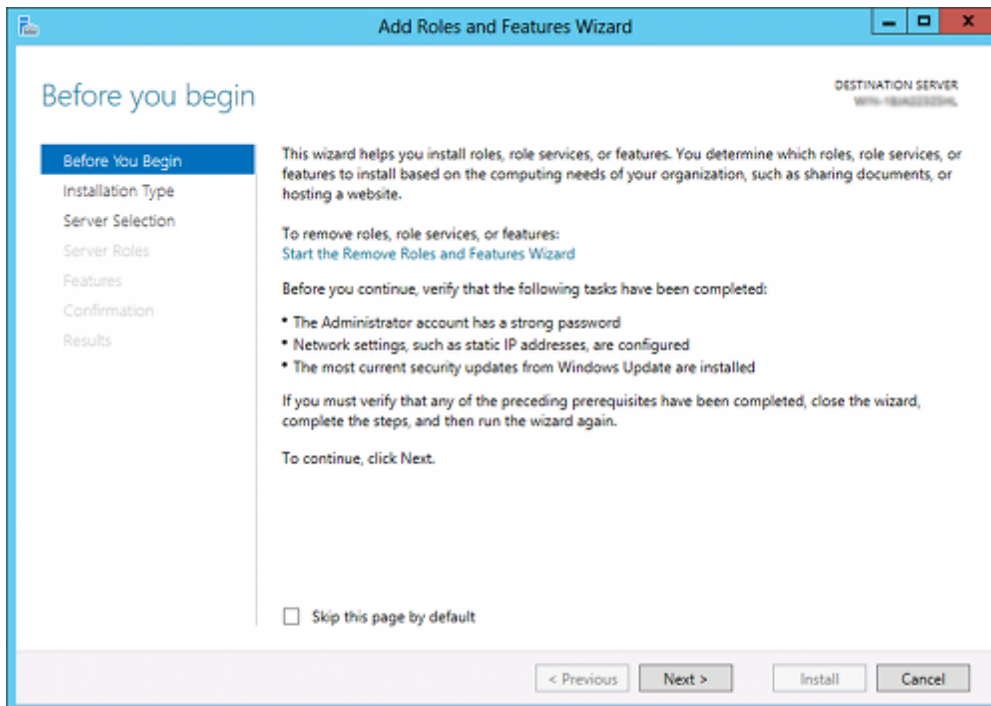
### To install the .NET Framework 3.5 on Windows Server 2012

1. On your Windows Server 2012, launch **Server Manager**.

2. In Server Manager, click the **Manage** button and select **Add Roles and Features**.



3. Configure the Add Roles and Features Wizard as follows:
  - a. Select **Role-based or feature-based** as the Installation type,
  - b. Select your server.
  - c. Check the **Application Server** role.
  - d. Click **Next**.



4. Click through the remaining screens to confirm your installation source and then click **Install**.  
After the installation has completed, you will be able to install the Luna Client on Windows Server 2012.

## Scripted / Unattended Installation on Windows

The Windows software installation section describes interactive installation on Windows systems, using the graphical, interactive installer. This section describes how to perform unattended or scripted installations on Windows platforms.

### Installing the Luna Client For All Luna Products

From the location of **Luna Client.msi**, run the following command:

```
msiexec.exe /i Luna Client.msi /I lunaclient_wininstall.log /quiet addlocal=all /qn
```

The setting **/I lunaclient\_wininstall.log** is optional and will place the installation logs into the file **lunaclient\_wininstall.log**.

### Windows security popup on each Luna product driver install

The windows security notice (below) appears because “SafeNet, Inc.” is not among the trusted publishers on your computer:

- If you check the **Always trust software from...** checkbox and then click on the **Install** button the dialog will not appear on future installations, on that computer.
- If you do not check the **Always trust software from...** checkbox then you might see the dialog three times, once for each of the three Luna products (Luna PCI-E, Luna G5 and Luna Remote Backup HSM) that install a driver on your computer.



This is a Windows security requirement, introduced with Windows 2008, and is not under our control. Installing marks the publisher (in this case, SafeNet, Inc.) as trusted for future installations.

### Installing the Luna Client For Luna SA

From the location of **Luna Client.msi** run the following commands:

1. Install default Luna Client components for Luna SA

```
msiexec.exe /i Luna Client.msi /I lunaclient_wininstall.log /quiet addlocal=SA /qn
```

2. Install all Luna Client components for Luna SA

```
msiexec.exe /i Luna Client.msi /I lunaclient_wininstall.log /quiet addlocal=SA, SA_CSP_KSP, SA_JSP, SA_SDK, SA_JCProv, SA_LDPC /qn
```

Product or component	Description
SA_CSP_KSP	Install Luna CSP and KSP components
SA_JSP	Install Luna JSP component
SA_SDK	Install Luna SDK component
SA_JCProv	Install Luna JC PROV component
SA_LDPC	Install Crypto Command Center Client component



**Note:** If you wish to install only some of the components, just specify the ones you want after the product name (SA in this example).



**Note:** The Windows security warning mentioned in section 1 (above) does not appear when only Luna SA is installed, because no driver is required. It appears only if you also install Luna PCI-E, or Luna G5, or Luna Backup HSM on the client computer.

## Installing the Luna Client for Luna PCI-E

From the location of **Luna Client.msi** run the following commands:

1. Install default Luna Client components for Luna PCI-E

```
msiexec.exe /i Luna Client.msi /I lunaclient_wininstall.log /quiet addlocal=PCI /qn
```

2. Install all Luna Client components for Luna PCI-E

```
msiexec.exe /i Luna Client.msi /I lunaclient_wininstall.log /quiet addlocal=PCI, PCI_CSP_KSP, PCI_JSP, PCI_SDK, PCI_JCProv, PCI_SNMP /qn
```

Product or component	Description
PCI_CSP_KSP	Install Luna CSP and KSP components
PCI_JSP	Install Luna JSP component
PCI_SDK	Install Luna SDK component
PCI_JCProv	Install Luna JC PROV component
PCI_SNMP	Install Luna SNMP subagent component



**Note:** The Windows security warning mentioned in section 1 (above) also appears when you install Luna PCI-E, unless you have already accepted a driver installation, and therefore recognized SafeNet, Inc. as a trusted publisher.

## Installing the Luna Client For Luna G5

From the location of **Luna Client.msi** run the following command:



1. Install default Luna Client components for Luna G5

```
msiexec.exe /i Luna Client.msi /I lunaclient_wininstall.log /quiet addlocal=G5 /qn
```

2. Install all Luna Client components for Luna G5

```
msiexec.exe /i Luna Client.msi /I lunaclient_wininstall.log /quiet addlocal=G5, G5_CSP_KSP, G5_JSP, G5_SDK, G5_JCProv, G5_SNMP /qn
```

Product or component	Description
G5_CSP_KSP	Install Luna CSP and KSP components
G5_JSP	Install Luna JSP component
G5_SDK	Install Luna SDK component
G5_JCProv	Install Luna JC PROV component
G5_SNMP	Install Luna SNMP subagent component



**Note:** The Windows security warning mentioned in section 1 (above) also appears when you install Luna G5, unless you have already accepted a driver installation, and therefore recognized SafeNet, Inc. as a trusted publisher.

## Installing the Luna Client for Luna Remote Backup HSM

From the location of **Luna Client.msi** run the following command:

```
msiexec.exe /i Luna Client.msi /I lunaclient_wininstall.log /quiet addlocal=RB, RB_SNMP /qn
```

Product or component	Description
RB_SNMP	Install Luna SNMP subagent component



**Note:** The Windows security mentioned in section 1 (above) also appears when you install Luna Remote Backup HSM, unless you have already accepted a driver installation, and therefore recognized SafeNet, Inc. as a trusted publisher.

## Installing the Luna Client for Remote PED

From the location of **Luna Client.msi** run the following command:

```
msiexec.exe /i Luna Client.msi /I lunaclient_wininstall.log /quiet addlocal=RP /qn
```



**Note:** When msiexec.exe is used to install Luna Client there is no message confirming that the installation has completed. The msiexec.exe utility just returns to the command line when the installation finishes.