



One Identity Safeguard for Privileged Sessions 5.7

Installation Guide

Copyright 2018 One Identity LLC.

ALL RIGHTS RESERVED.

This guide contains proprietary information protected by copyright. The software described in this guide is furnished under a software license or nondisclosure agreement. This software may be used or copied only in accordance with the terms of the applicable agreement. No part of this guide may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording for any purpose other than the purchaser's personal use without the written permission of One Identity LLC.

The information in this document is provided in connection with One Identity products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of One Identity LLC products. EXCEPT AS SET FORTH IN THE TERMS AND CONDITIONS AS SPECIFIED IN THE LICENSE AGREEMENT FOR THIS PRODUCT, ONE IDENTITY ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL ONE IDENTITY BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF ONE IDENTITY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. One Identity makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. One Identity does not make any commitment to update the information contained in this document.

If you have any questions regarding your potential use of this material, contact:

One Identity LLC.
Attn: LEGAL Dept
4 Polaris Way
Aliso Viejo, CA 92656

Refer to our Web site (<http://www.OneIdentity.com>) for regional and international office information.

Patents

One Identity is proud of our advanced technology. Patents and pending patents may apply to this product. For the most current information about applicable patents for this product, please visit our website at <http://www.OneIdentity.com/legal/patents.aspx>.

Trademarks

One Identity and the One Identity logo are trademarks and registered trademarks of One Identity LLC. in the U.S.A. and other countries. For a complete list of One Identity trademarks, please visit our website at www.OneIdentity.com/legal. All other trademarks are the property of their respective owners.

Legend

-  **WARNING:** A WARNING icon indicates a potential for property damage, personal injury, or death.
-  **CAUTION:** A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.
-  **IMPORTANT, NOTE, TIP, MOBILE, or VIDEO:** An information icon indicates supporting information.

Contents

Preface	5
Summary of contents	5
About this document	6
Feedback	6
Introduction	7
Package contents inventory	8
One Identity Safeguard for Privileged Sessions Hardware Installation Guide	9
Installing the Safeguard for Privileged Sessions hardware	9
Installing two Safeguard for Privileged Sessions units in HA mode	12
Hardware specifications	13
One Identity Safeguard for Privileged Sessions Software Installation Guide	14
Installing the Safeguard for Privileged Sessions software	14
One Identity Safeguard for Privileged Sessions VMware Installation Guide	17
Limitations of Safeguard for Privileged Sessions under VMware	17
Installing Safeguard for Privileged Sessions under VMware ESXi/ESX	18
One Identity Safeguard for Privileged Sessions Hyper-V Installation Guide	20
Limitations of Safeguard for Privileged Sessions under Hyper-V	20
Installing Safeguard for Privileged Sessions under Hyper-V	21
Installing One Identity Safeguard for Privileged Sessions as a Kernel-based Virtual Machine	23
Limitations of Safeguard for Privileged Sessions under KVM	23
Installing Safeguard for Privileged Sessions as a Kernel-based Virtual Machine	24
Deploying One Identity Safeguard for Privileged Sessions from the Azure Marketplace	26
Prerequisites	26
Limitations	27
Deploy One Identity Safeguard for Privileged Sessions from the Microsoft Azure Marketplace	29

High Availability and redundancy in Microsoft Azure	31
Redundancy	31
High Availability	31
Virtual appliance maintenance	33
Modifying the disk size of a Safeguard for Privileged Sessions virtual appliance	33
About us	35
Contacting us	35
Technical support resources	35
Third-party contributions	36

Preface

Welcome to the One Identity Safeguard for Privileged Sessions 5 F7 Administrator Guide!

This document describes how to configure and manage the One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions). Background information for the technology and concepts used by the product is also discussed.

Summary of contents

[Introduction](#) provides background information and describes the main purpose of the One Identity Safeguard for Privileged Sessions Installation Guide.

[Package contents inventory](#) lists the contents of the package you receive with the One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions).

[One Identity Safeguard for Privileged Sessions Hardware Installation Guide](#) describes how to set up the Safeguard for Privileged Sessions hardware.

[Hardware specifications](#) describes the hardware specifications of the Safeguard for Privileged Sessions appliance.

[One Identity Safeguard for Privileged Sessions Software Installation Guide](#) describes how to install Safeguard for Privileged Sessions on certified hardware.

[One Identity Safeguard for Privileged Sessions VMware Installation Guide](#) describes how to install Safeguard for Privileged Sessions as a VMware virtual appliance.

[One Identity Safeguard for Privileged Sessions Hyper-V Installation Guide](#) describes how to install One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions) as a Hyper-V virtual appliance.

[Installing One Identity Safeguard for Privileged Sessions as a Kernel-based Virtual Machine](#) describes how to install One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions) as a Kernel-based Virtual Machine.

[Deploying One Identity Safeguard for Privileged Sessions from the Azure Marketplace](#) describes how to install One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions) from the Microsoft Azure Marketplace.

[Summary of contents](#) includes the text of the End User License Agreement applicable to Safeguard for Privileged Sessions products.

About this document

This guide is a work-in-progress document with new versions appearing periodically.

The latest version of this document can be downloaded from the [Safeguard for Privileged Sessions Documentation page](#).

Feedback

Any feedback is greatly appreciated, especially on what else this document should cover. General comments, errors found in the text, and any suggestions about how to improve the documentation is welcome at documentation@balabit.com.

Introduction

The aim of this guide is to provide detailed, step-by-step instructions on how to set up and install One Identity Safeguard for Privileged Sessions on unpacking it and any subsequent occasions that might require the re-installation of the product.

Note that the contents of this document were previously included in the [Administration Guide](#). This standalone guide was created to:

- Improve how information is organized in the One Identity Safeguard for Privileged Sessions documentation set.
- Make it easier for users to find information relevant to their roles, context, and how they use the product.

Package contents inventory

Carefully unpack all server components from the packing cartons. The following items should be packaged with the One Identity Safeguard for Privileged Sessions:

- A One Identity Safeguard for Privileged Sessions appliance, pre-installed with the latest One Identity Safeguard for Privileged Sessions firmware.
- One Identity Safeguard for Privileged Sessions accessory kit, including the following:
 - One Identity Safeguard for Privileged Sessions 5 F7 Packaging Checklist (this document).
 - GPL v2.0 license.
- Rack mount hardware (depending on appliance type).
- Power cable.

The default BIOS and IPMI passwords are in the documentation.

One Identity Safeguard for Privileged Sessions Hardware Installation Guide

This document describes how to set up the One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions) hardware. Refer to the following documents for step-by-step instructions:

- *One Identity Safeguard for Privileged Sessions T-1*: see the *SC512 Chassis Series User's Manual, Chapter 6: Rack Installation*, available online at <http://www.supermicro.com/manuals/chassis/1U/SC512.pdf>.
- *One Identity Safeguard for Privileged Sessions T-4*: see the *SC815 Chassis Series User's Manual, Chapter 6: Rack Installation*, available online at <http://www.supermicro.com/manuals/chassis/1U/SC815.pdf>.
- *One Identity Safeguard for Privileged Sessions T-10*: see the *SC219 Chassis Series User's Manual, Chapter 5: Rack Installation*, available online at <http://www.supermicro.com/manuals/chassis/2U/SC219.pdf>.
- For details on how to install a single Safeguard for Privileged Sessions unit, see [Installing the Safeguard for Privileged Sessions hardware](#).
- For details on how to install a two Safeguard for Privileged Sessions units in high availability mode, see [Installing two Safeguard for Privileged Sessions units in HA mode](#).

Installing the Safeguard for Privileged Sessions hardware

Purpose:

To install a single Safeguard for Privileged Sessions unit, complete the following steps.

Steps:

1. Unpack Safeguard for Privileged Sessions.
2. *Optional step:* Install Safeguard for Privileged Sessions into a rack with the slide rails. Slide rails are available for all Safeguard for Privileged Sessions appliances.
3. Connect the cables.
 - a. Connect the Ethernet cable facing your LAN to the Ethernet connector labeled as 1. This is physical interface 1 of Safeguard for Privileged Sessions. This interface is used for the initial configuration of Safeguard for Privileged Sessions, and for monitoring connections. (For details on the roles of the different interfaces, see "[Network interfaces](#)" in the [Administration Guide](#).)
 - b. *Optional step:* To use Safeguard for Privileged Sessions across multiple physical (L1) networks, you can connect additional networks using physical interface 2 (Ethernet connector 2) and physical interface 3 (Ethernet connector 3).
 - c. Connect an Ethernet cable that you can use to remotely support the Safeguard for Privileged Sessions hardware to the IPMI interface of Safeguard for Privileged Sessions. For details, see the following documents:

For Safeguard for Privileged Sessions T4 and T10, see the [X9 SMT IPMI User's Guide](#). For Safeguard for Privileged Sessions T1, see the [SMT IPMI User's Guide](#).



CAUTION:

Connect the IPMI before plugging in the power cord. Failing to do so will result in IPMI failure.

It is not necessary for the IPMI interface to be accessible from the Internet, but the administrator of Safeguard for Privileged Sessions must be able to access it for support and troubleshooting purposes in case vendor support is needed. The following ports are used by the IPMI interface:

- Port 623 (UDP): IPMI (cannot be changed)
- Port 5123 (UDP): floppy (cannot be changed)
- Port 5901 (TCP): video display (configurable)
- Port 5900 (TCP): HID (configurable)
- Port 5120 (TCP): CD (configurable)
- Port 80 (TCP): HTTP (configurable)

Access to information available only via the IPMI interface is not mandatory, but highly recommended to speed up the support and troubleshooting processes.

- d. *Optional step:* Connect the Ethernet cable connecting Safeguard for Privileged Sessions to another Safeguard for Privileged Sessions node to the Ethernet connector labeled as 4. This is the high availability (HA) interface of Safeguard for Privileged Sessions. (For details on the roles of the different interfaces, see

"Network interfaces" in the Administration Guide.)

- e. *Optional step:* The T-10 appliance is equipped with a dual-port SFP+ interface card labeled A and B. Optionally, connect a supported SFP+ module to these interfaces.

NOTE:

For a list of compatible connectors, see Linux Base Driver for 10 Gigabit Intel Ethernet Network Connection. Note that SFP transceivers encoded for non Intel hosts may be incompatible with the Intel 82599EB host chipset found in Safeguard for Privileged Sessions.

4. Power on the hardware.
5. Change the BIOS password on the One Identity Safeguard for Privileged Sessions. The default password is ADMIN or changeme, depending on your hardware.
6. Change the IPMI password on the One Identity Safeguard for Privileged Sessions. The default password is ADMIN or changeme, depending on your hardware.

NOTE:

Ensure that you have the latest version of IPMI firmware installed. You can download the relevant firmware from [the One Identity Knowledge base](#).

To change the IPMI password, connect to the IPMI remote console.

NOTE:

If you encounter issues when connecting to the IPMI remote console, add the DNS name or the IP address of the IPMI interface to the exception list (whitelist) of the Java console. For details on how to do this, see the Java FAQ entry titled [How can I configure the Exception Site List?](#)

7. Following boot, Safeguard for Privileged Sessions attempts to receive an IP address automatically via DHCP. If it fails to obtain an automatic IP address, it starts listening for HTTPS connections on the 192.168.1.1 IP address.

To configure Safeguard for Privileged Sessions to listen for connections on a custom IP address, complete the following steps:

- a. Access Safeguard for Privileged Sessions from the local console, and log in with username root and password default.
- b. In the Console Menu, select **Shells > Core shell**.
- c. Change the IP address of Safeguard for Privileged Sessions:
ifconfig eth0 <IP-address> netmask 255.255.255.0
Replace <IP-address> with an IPv4 address suitable for your environment.
- d. Set the default gateway using the following command:
route add default gw <IP-of-default-gateway>

Replace <IP-of-default-gateway> with the IP address of the default gateway.

- e. Type **exit**, then select **Logout** from the Console Menu.
8. Connect to the Safeguard for Privileged Sessions web interface from a client machine and complete the Welcome Wizard as described in "[The Welcome Wizard and the first login](#)" in the [Administration Guide](#).

NOTE:

The [Administration Guide](#) is available on the [Safeguard for Privileged Sessions Documentation page](#).

Installing two Safeguard for Privileged Sessions units in HA mode

Purpose:

To install Safeguard for Privileged Sessions with high availability support, complete the following steps.

Steps:

1. For the first Safeguard for Privileged Sessions unit, complete [Installing the Safeguard for Privileged Sessions hardware](#).
2. For the second Safeguard for Privileged Sessions unit, complete Steps 1-3 of [Installing the Safeguard for Privileged Sessions hardware](#).
3. Connect the two units with an Ethernet cable via the Ethernet connectors labeled as 4.
4. Power on the second unit.
5. Change the BIOS and IPMI passwords on the second unit. The default password is ADMIN or changeme, depending on your hardware.
6. Connect to the Safeguard for Privileged Sessions web interface of the first unit from a client machine and enable the high availability mode. Navigate to **Basic Settings > High Availability** . Click **Convert to Cluster**, then reload the page in your browser.
7. Click **Reboot Cluster**.
8. Wait until the slave unit synchronizes its disk to the master unit. Depending on the size of the hard disks, this may take several hours. You can increase the speed of the synchronization via the Safeguard for Privileged Sessions web interface at **Basic Settings > High Availability > DRBD sync rate limit**.

Hardware specifications

Safeguard for Privileged Sessions appliances are built on high performance, energy efficient, and reliable hardware that are easily mounted into standard rack mounts.

Table 1: Hardware specifications

Product	Redundant PSU	Processor	Memory	Capacity	RAID	IPMI
Safeguard for Privileged Sessions T-1	No	Intel(R) Xeon (R) X3430 @ 2.40GHz	2 x 4 GB	2 x 1 TB	Software RAID	Yes
Safeguard for Privileged Sessions T-4	Yes	Intel(R) Xeon (R) E3-1275V2 @ 3.50GHz	2 x 4 GB	4 x 2 TB	LSI MegaRAID SAS 9271-4i SGL	Yes
Safeguard for Privileged Sessions T-10	Yes	2 x Intel(R) Xeon(R) E5-2630V2 @ 2.6GHz	8 x 4 GB	13 x 1 TB	LSI 2208 (1GB cache)	Yes

The Safeguard for Privileged Sessions T-10 appliance is equipped with a dual-port 10Gbit interface. This interface has SFP+ connectors (not RJ-45) labeled A and B, and can be found right of the Label 1 and 2 Ethernet interfaces. If you want faster communication, for example, in case of high data load, you can connect up to two 10Gbit network cards. These cards are not shipped with the original package and have to be purchased separately.

One Identity Safeguard for Privileged Sessions Software Installation Guide

This document describes how to install the One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions) software on a certified hardware. The list of certified hardware is available at One Identity.

Note that installing and reinstalling Safeguard for Privileged Sessions can take a long time, especially for a HA cluster. There are no supported workarounds for reducing the necessary downtime. One Identity recommends testing Safeguard for Privileged Sessions in a virtual environment, and using physical hardware only for verifying HA functionality and measuring performance.

Installing the Safeguard for Privileged Sessions software

Prerequisites:

When installing Safeguard for Privileged Sessions on a physical hardware, make sure that you use a One Identity-supported appliance, and that every hard disk required for the particular appliance is inserted. Installing Safeguard for Privileged Sessions without the required number of hard disks can cause erroneous behavior.

Purpose:

To install a new Safeguard for Privileged Sessions on a server, complete the following steps:

Steps:

1. Login to your [support portal](#) and download the latest One Identity Safeguard for Privileged Sessions installation ISO file. Note that you need to have partner access to download One Identity Safeguard for Privileged Sessions ISO files. If you are a partner but do not see the ISO files, you can request partner access within [support portal](#).
2. Mount the ISO image, or burn it to a CD-ROM.
3. Connect your computer to the IPMI interface of Safeguard for Privileged Sessions. For details, see the following documents:
For Safeguard for Privileged Sessions T4 and T10, see the [X9 SMT IPMI User's Guide](#).
For Safeguard for Privileged Sessions T1, see the [SMT IPMI User's Guide](#).
4. Power on the server.
5. Login to the IPMI web interface, and boot the One Identity Safeguard for Privileged Sessions installation CD on the server using a virtual CD-ROM. For details, see the following documents:
For Safeguard for Privileged Sessions T4 and T10, see the [X9 SMT IPMI User's Guide](#).
For Safeguard for Privileged Sessions T1, see the [SMT IPMI User's Guide](#).
6. When the One Identity Safeguard for Privileged Sessions installer starts, select **Installer**, press Enter, and wait until the server finishes the boot process.

TIP:

For testing purposes, you can speed up installation at the expense of slowing down RAID synchronization. Add the following kernel parameter to **Installer** in GRUB:

```
lazy_itable_init=true
```

This option defers full filesystem initialization, requiring the kernel to finish it during RAID synchronization, which slows that process down considerably. This is not recommended in a production environment.

7. Installing Safeguard for Privileged Sessions will completely delete the contents of the hard disks. If you want to proceed installing Safeguard for Privileged Sessions, enter **Y** to start the installation process. Depending on the size of the disks, the installation process takes from a few minutes to an hour to complete.

CAUTION:

Hazard of data loss! All data on the disks will be deleted.

8. The installer displays the following message: **Waiting for RAID sync...**, and starts to synchronize the disks of Safeguard for Privileged Sessions.
 - You are recommended to wait until the synchronization finishes. RAID synchronization is a two-step process, the progress of the active step is indicated on the progress bar. Wait until both steps are completed. Note that this synchronization takes several hours, depending on the size of the hard

disks (about 8 hours on the average).

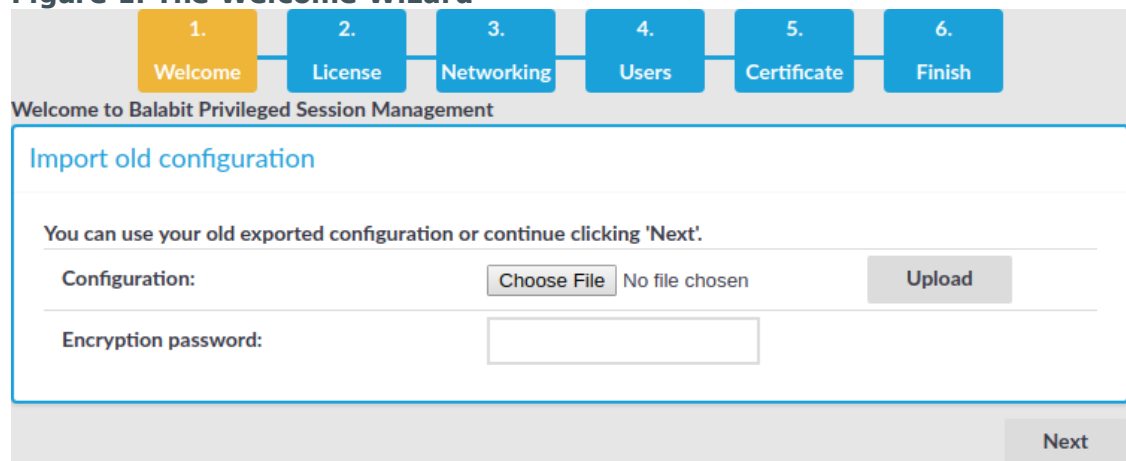
- To skip the RAID synchronization, press **Ctrl+Alt+Delete** to reboot Safeguard for Privileged Sessions. Note that the system will automatically perform the synchronization after the first boot, but in this case the process will take several days.
9. When the installation is finished, the Installation finished successfully message is displayed. Unmount the installation media, then press **Ctrl+Alt+Delete** to reboot Safeguard for Privileged Sessions. Wait until the system reboots and displays the IP address it accepts management connections on.

If you are installing the slave node of a Safeguard for Privileged Sessions cluster, skip this step. Enter the IP address displayed in the previous step into your browser and verify that the Welcome Wizard of the One Identity Safeguard for Privileged Sessions is available. (If you have to create an alias IP address for your computer that falls into the 192.168.1.0/24 subnet (for example 192.168.1.10), see ["The initial connection to Safeguard for Privileged Sessions" in the Administration Guide.](#))

NOTE:

For details on the supported web browsers and operating systems, see ["Supported web browsers and operating systems" in the Administration Guide.](#)

Figure 1: The Welcome Wizard



10.

11. Power off the system.

One Identity Safeguard for Privileged Sessions VMware Installation Guide

This tutorial describes the possibilities and limitations of installing One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions) 5 F7 as a virtual appliance under a VMware ESXi server.

Limitations of Safeguard for Privileged Sessions under VMware

The following limitations apply to running version 5 F7 of Safeguard for Privileged Sessions under VMware:

- Safeguard for Privileged Sessions can be installed under the following VMware versions:
 - VMware ESXi 5.5 or later.
 - VMware ESXi 6.0 or later.
 - VMware ESXi 6.5 or later.
- Safeguard for Privileged Sessions can only use fixed disk space assigned to the virtual host, it is not possible to use on-demand disk allocation scenarios. To increase the size of the virtual disk, see [Modifying the disk size of a Safeguard for Privileged Sessions virtual appliance](#) on page 33.
- If High Availability (HA) operation mode is required in a virtual environment, use the HA function provided by the virtual environment.
- Hardware-related alerts and status indicators of Safeguard for Privileged Sessions may display inaccurate information, for example, display degraded RAID status.

Installing Safeguard for Privileged Sessions under VMware ESXi/ESX

Purpose:

To install a new Safeguard for Privileged Sessions under VMware ESXi or ESX, complete the following steps:

Steps:

1. Create the virtual machine for Safeguard for Privileged Sessions using the following settings. Note that these settings are suitable for evaluation purposes. To test Safeguard for Privileged Sessions under significant load, contact One Identity for recommendations.
 - Guest operating system: *Linux/Ubuntu 64-bit*
 - Allocate memory for the virtual machine. Safeguard for Privileged Sessions requires a minimum of 4 GiB (8 GiB is recommended) of memory. The recommended size for the memory depends on the exact environment, but consider the following:
 - The base system requires 4 GiB of memory.
 - Safeguard for Privileged Sessions requires about 1-5 MiB of memory for every active connection, depending on the type of the connection — graphical protocols require more memory.
 - The hard disk controller must be *LSI Logic Parallel*.
 - Do not use RAID for the hard disk, use the data duplication features of your virtual environment instead. That way, a single hard disk is sufficient for the system. If you need to use the built-in RAID support of Safeguard for Privileged Sessions for some reason, use two hard disks, and Safeguard for Privileged Sessions will automatically use them in software RAID.

CAUTION:

Hazard of data loss! When you install or reinstall Safeguard for Privileged Sessions in a virtual environment, always create new hard disks. Using existing hard disks can cause unexpected behavior and operational problems.

- Configure a fixed size disk with at least 8 GiB space. About 5 GiB is required for the base system, the remaining disk space is used to store data. To increase the initial disk size, see [Modifying the disk size of a Safeguard for Privileged Sessions virtual appliance](#).
- Safeguard for Privileged Sessions requires 4 network cards, all of them must be *VMXNET3*.

NOTE:

Safeguard for Privileged Sessions will use the network card with the lowest PCI ID as eth0 (Physical interface 1), the card with the second lowest PCI ID as eth1 (the Physical interface 2), and so on. In some cases, this might differ from the labels in the VMWare management interface, for example, it is possible that eth0 will be labeled as Network adapter 4, and as a result, the Safeguard for Privileged Sessions Welcome Wizard will not be available on Network adapter 1.

Enable, but do not attach the fourth (eth3) network card to a network.

- To index connections without significant delay, add two CPU cores to the virtual machine. Note that these settings are suitable for evaluation purposes. To test Safeguard for Privileged Sessions under significant load, contact One Identity for recommendations. The resource requirements of indexing depend heavily on the amount and type of the indexed traffic, and can also require using external indexer hosts (for details on external indexers, see "[HTTP indexer configuration format](#)" in the [Administration Guide](#)).
2. After creating the virtual machine, edit the settings of the machine. Set the following options:
 - a. Under **Options > VMware Tools** enable the **Shutdown, Suspend, Reset** options, otherwise the Safeguard for Privileged Sessions administrator will not be able to access these functions from the Safeguard for Privileged Sessions web interface.
 - b. Under **Options > Boot options** enable the **Force BIOS Setup** option. This is required to be able to check the system time (and modify it if needed) before installing Safeguard for Privileged Sessions.
 3. Login to your [support portal](#) and download the latest One Identity Safeguard for Privileged Sessions installation ISO file. Note that you need to have purchased Safeguard for Privileged Sessions as a virtual appliance or have partner access to download One Identity Safeguard for Privileged Sessions ISO files. If you are a partner but do not see the ISO files, you can request partner access within [support portal](#).
 4. Mount the ISO image and boot the virtual machine. Follow the on-screen instructions to install Safeguard for Privileged Sessions.

One Identity Safeguard for Privileged Sessions Hyper-V Installation Guide

This tutorial describes the possibilities and limitations of installing One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions) 5 F7 as a virtual appliance under a Hyper-V server.

Limitations of Safeguard for Privileged Sessions under Hyper-V

Version 5 F7 of Safeguard for Privileged Sessions has no special support for running under Hyper-V. While the basic functionality of Safeguard for Privileged Sessions is not affected by running as a virtual appliance, the following limitations apply:

- If High Availability (HA) operation mode is required in a virtual environment, use the HA function provided by the virtual environment.
- Hardware-related alerts and status indicators of Safeguard for Privileged Sessions may display inaccurate information, for example, display degraded RAID status.
- When running Safeguard for Privileged Sessions under Microsoft Hyper-V, ensure that the network interfaces are actually connected to the network. When running under Hyper-V, Safeguard for Privileged Sessions indicates on the **Basic Settings > Network > Ethernet links** page that there is a link even if the network interface is configured and enabled, but not connected to the network.
- When rebooting Safeguard for Privileged Sessions in Hyper-V, the following critical error message may appear in the event log of the Hyper-V host:

<Virtual machine name> was reset because an unrecoverable error occurred on a virtual processor that caused a triple fault.

This is normal, there is no problem with Safeguard for Privileged Sessions. For details, see [Triple fault in event log shows reset of Linux virtual machines](#).

Installing Safeguard for Privileged Sessions under Hyper-V

Purpose:

To install a new Safeguard for Privileged Sessions under Hyper-V, complete the following steps:

Steps:

1. Create the virtual machine for Safeguard for Privileged Sessions using the following settings. Note that these settings are suitable for evaluation purposes. To test Safeguard for Privileged Sessions under significant load, contact One Identity for recommendations.
 - Choose **Generation 1** for the virtual machine.
 - Allocate memory for the virtual machine. Safeguard for Privileged Sessions requires a minimum of 4 GiB (8 GiB is recommended) of memory. The recommended size for the memory depends on the exact environment, but consider the following:
 - The base system requires 4 GiB of memory.
 - Safeguard for Privileged Sessions requires about 1-5 MiB of memory for every active connection, depending on the type of the connection — graphical protocols require more memory.
 - Configure a fixed size disk with at least 8 GiB space. About 5 GiB is required for the base system, the remaining disk space is used to store data. To increase the initial disk size, see [Modifying the disk size of a Safeguard for Privileged Sessions virtual appliance](#).
 - Do not use RAID for the hard disk, use the data duplication features of your virtual environment instead. That way, a single hard disk is sufficient for the system. If you need to use the built-in RAID support of Safeguard for Privileged Sessions for some reason, use two hard disks, and Safeguard for Privileged Sessions will automatically use them in software RAID.

CAUTION:

Hazard of data loss! When you install or reinstall Safeguard for Privileged Sessions in a virtual environment, always create new hard disks. Using existing hard disks can cause unexpected behavior and operational problems.

- Safeguard for Privileged Sessions requires 4 network cards. After completing the steps of the **New Virtual Machine Wizard**, add three additional network cards in the **Settings** of the virtual machine.

Enable, but do not attach the fourth (eth3) network card to a network.

- To index connections without significant delay, add two CPU cores to the virtual machine. Note that these settings are suitable for evaluation purposes. To test Safeguard for Privileged Sessions under significant load, contact One Identity for recommendations. The resource requirements of indexing depend heavily on the amount and type of the indexed traffic, and can also require using external indexer hosts (for details on external indexers, see "[HTTP indexer configuration format](#)" in the [Administration Guide](#)).
2. Login to your [support portal](#) and download the latest One Identity Safeguard for Privileged Sessions installation ISO file. Note that you need to have purchased Safeguard for Privileged Sessions as a virtual appliance or have partner access to download One Identity Safeguard for Privileged Sessions ISO files. If you are a partner but do not see the ISO files, you can request partner access within [support portal](#).
 3. Mount the ISO image and boot the virtual machine. Follow the on-screen instructions to install Safeguard for Privileged Sessions.

Installing One Identity Safeguard for Privileged Sessions as a Kernel-based Virtual Machine

This tutorial describes the possibilities and limitations of installing One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions) 5 F7 as a virtual appliance using the [Kernel-based Virtual Machine \(KVM\)](#) solution.

Limitations of Safeguard for Privileged Sessions under KVM

The following limitations apply to running version 5 F7 of Safeguard for Privileged Sessions under KVM:

- Safeguard for Privileged Sessions can be installed under KVM on most modern Linux distributions. One Identity currently tests the following KVM version:

```
# virsh version
Compiled against library: libvirt 1.2.17
Using library: libvirt 1.2.17
Using API: QEMU 1.2.17
Running hypervisor: QEMU 1.5.3
```

- Safeguard for Privileged Sessions can only use fixed disk space assigned to the virtual host, it is not possible to use on-demand disk allocation scenarios.
- If High Availability (HA) operation mode is required in a virtual environment, use the HA function provided by the virtual environment.
- Hardware-related alerts and status indicators of Safeguard for Privileged Sessions may display inaccurate information, for example, display degraded RAID status.

Installing Safeguard for Privileged Sessions as a Kernel-based Virtual Machine

Purpose:

To install a new Safeguard for Privileged Sessions as a Kernel-based Virtual Machine, complete the following steps:

Steps:

1. Create the virtual machine for Safeguard for Privileged Sessions using the following settings. Note that these settings are suitable for evaluation purposes. To test Safeguard for Privileged Sessions under significant load, contact One Identity for recommendations.
 - Guest operating system: *Linux/Ubuntu 64-bit*
 - Allocate memory for the virtual machine. Safeguard for Privileged Sessions requires a minimum of 4 GiB (8 GiB is recommended) of memory. The recommended size for the memory depends on the exact environment, but consider the following:
 - The base system requires 4 GiB of memory.
 - Safeguard for Privileged Sessions requires about 1-5 MiB of memory for every active connection, depending on the type of the connection — graphical protocols require more memory.
 - The hard disk controller must be *virtio*.
 - Do not use RAID for the hard disk, use the data duplication features of your virtual environment instead. That way, a single hard disk is sufficient for the system. If you need to use the built-in RAID support of Safeguard for Privileged Sessions for some reason, use two hard disks, and Safeguard for Privileged Sessions will automatically use them in software RAID.

CAUTION:

Hazard of data loss! When you install or reinstall Safeguard for Privileged Sessions in a virtual environment, always create new hard disks. Using existing hard disks can cause unexpected behavior and operational problems.

- Configure a fixed size disk with at least 8 GiB space. About 5 GiB is required for the base system, the remaining disk space is used to store data. To increase the initial disk size, see [Modifying the disk size of a Safeguard for Privileged Sessions virtual appliance](#).
- Safeguard for Privileged Sessions requires 4 network cards, all of them must

be *virtio*.

NOTE:

Safeguard for Privileged Sessions will use the network card with the lowest PCI ID as eth0 (Physical interface 1), the card with the second lowest PCI ID as eth1 (the Physical interface 2), and so on. In some cases, this might differ from the labels in the VMWare management interface, for example, it is possible that eth0 will be labeled as Network adapter 4, and as a result, the Safeguard for Privileged Sessions Welcome Wizard will not be available on Network adapter 1.

Configure unused network cards — at least the fourth (eth3) — to use internal NAT.

- To index connections without significant delay, add two CPU cores to the virtual machine. Note that these settings are suitable for evaluation purposes. To test Safeguard for Privileged Sessions under significant load, contact One Identity for recommendations. The resource requirements of indexing depend heavily on the amount and type of the indexed traffic, and can also require using external indexer hosts (for details on external indexers, see "[HTTP indexer configuration format](#)" in the [Administration Guide](#)).
2. Login to your [support portal](#) and download the latest One Identity Safeguard for Privileged Sessions installation ISO file. Note that you need to have purchased Safeguard for Privileged Sessions as a virtual appliance or have partner access to download One Identity Safeguard for Privileged Sessions ISO files. If you are a partner but do not see the ISO files, you can request partner access within [support portal](#).
 3. Mount the ISO image and boot the virtual machine. Follow the on-screen instructions to install Safeguard for Privileged Sessions.

Deploying One Identity Safeguard for Privileged Sessions from the Azure Marketplace

This guide provides detailed descriptions for deploying One Identity Safeguard for Privileged Sessions (Safeguard for Privileged Sessions) from the Microsoft Azure Marketplace.

Before you start:

Before you start evaluating Safeguard for Privileged Sessions, make sure you understand what Safeguard for Privileged Sessions is and how it works. This information can greatly help you get Safeguard for Privileged Sessions operational. Read the following:

- ["Introduction" in the Administration Guide](#)
- ["The concepts of Safeguard for Privileged Sessions" in the Administration Guide](#)

Prerequisites

The following prerequisites must be met to deploy Safeguard for Privileged Sessions in Microsoft Azure:

- You have a valid One Identity Safeguard for Privileged Sessions license. When deployed from the Microsoft Azure Marketplace, the One Identity Safeguard for Privileged Sessions uses the "Bring your own license" model. Note that to deploy two active Safeguard for Privileged Sessions nodes as an availability set, you must purchase two standalone Safeguard for Privileged Sessions licenses. To purchase a license, [contact our Sales Team](#).
- Microsoft recommends to use the [Azure Resource Manager \(ARM\) deployment model](#). When you install Safeguard for Privileged Sessions from the Azure Marketplace, Safeguard for Privileged Sessions supports only this deployment method. If you need to deploy Safeguard for Privileged Sessions into an infrastructure that uses the

Classic deployment model, contact your One Identity sales representative.

- You have a Microsoft Azure account.

Limitations

The following limitations apply to Safeguard for Privileged Sessions when you deploy it from the Microsoft Azure Marketplace.

⚠ CAUTION:

Do not export or import configuration between a physical Safeguard for Privileged Sessions deployment and a virtual one. Because of the differences and limitations between physical and virtual appliances, configure the virtual appliance from scratch to ensure proper functionality. When you migrate a virtual Safeguard for Privileged Sessions to another one, you can export and import the configuration.

- Root login is not available on the console.
- SSH access is only available after you have completed the Welcome Wizard.
- Currently, the data that is entered during the provisioning phase (for example username, IP address) of creating the virtual machine in Azure is not transferred to Safeguard for Privileged Sessions. Therefore, only the data entered in the Welcome Wizard will be used.
- By default, you can only use Physical interface 1 (eth0) of Safeguard for Privileged Sessions, with a single IP address. Aside from changing the IP address of Safeguard for Privileged Sessions, do not modify other interface-related settings (additional logical interfaces, IP forwarding, and so on) on the **Basic Settings > Network** page of Safeguard for Privileged Sessions.

The number of interfaces you can use depends on the size of your Azure VM. If your VM allows you to use multiple interfaces, you can configure multiple interfaces in Safeguard for Privileged Sessions. For details, see [VM with multiple NICs](#).

- The **Seal the box** functionality is not available.
- The High Availability support of Safeguard for Privileged Sessions was designed to work between two physical Safeguard for Privileged Sessions appliances. This feature is not available in Azure environments. For further details, see the [High Availability and redundancy in Microsoft Azure](#).
- Due to Azure requirements, an additional 5-minute delay has been added to the boot process. This ensures that the root device appears in the system.
- The size of the hard disk in Azure is 100 Gb. You cannot extend this virtual disk size later, nor can you write to Samba or other disks. In case you run out of disk space, either configure a **Backup policy** and an **Archive policy** if you have a server for this purpose, or configure a **Cleanup policy** that deletes the audit trails at certain time intervals. For details, see ["Data and configuration backups" in the](#)

[Administration Guide](#) and ["Archiving or cleaning up the collected data" in the Administration Guide](#).

- Safeguard for Privileged Sessions currently cannot receive its IP address using DHCP. Make sure that:
 - The IP address you have configured in Azure and the IP address that you configure for Safeguard for Privileged Sessions for the **Physical interface 1** on the Networking settings part of the Welcome Wizard are the same. Otherwise, you will not be able to access Safeguard for Privileged Sessions.
 - You set the internal IP static on the Network Interfaces tab of the Virtual Machine.
 - Do not assign a public IP address to Safeguard for Privileged Sessions, use Safeguard for Privileged Sessions as a component of your internal infrastructure. If you absolutely must configure Welcome Wizard from a publicly accessible IP address, note that Safeguard for Privileged Sessions will be publicly accessible. If you assign a public IP to the web management interface, consider the following:
 - Select a complex passphrase.
 - Limit access to the management interface based on the source IP address, and make sure that brute-force protection for the administrator web login is enabled (they are enabled by default). For details, see ["Configuring user and administrator login addresses" in the Administration Guide](#).
 - Configure an email alert or SNMP trap for administrator logon events. For details, see ["Configuring e-mail alerts" in the Administration Guide](#) and ["Configuring SNMP alerts" in the Administration Guide](#).
 - Forward the logs of Safeguard for Privileged Sessions to a log server (for example, to a [syslog-ng server](#), or an [syslog-ng Store Box appliance](#)) so that if the local logs are compromised, you still have an authentic copy of the original logs.
 - For security reasons, disable SSH access to Safeguard for Privileged Sessions when it is not needed. Accessing the Safeguard for Privileged Sessions host directly using SSH is not recommended or supported, except for troubleshooting purposes. If you enable SSH access, restrict the clients that can access Safeguard for Privileged Sessions based on their source IP address, and make sure that brute-force protection is enabled (they are enabled by default). For details, see ["Enabling SSH access to the Safeguard for Privileged Sessions host" in the Administration Guide](#).
 - To prevent unauthorized access to the audit trail files recorded on Safeguard for Privileged Sessions, configure proper access control rules for the user groups and encrypt every audit trail. If you use encryption, store your keys in the personal or in the temporary key store. For details, see ["Encrypting audit trails" in the Administration Guide](#),
- Upgrading Safeguard for Privileged Sessions in Azure is the same as upgrading a

physical appliance: you have to upload the firmware on the Safeguard for Privileged Sessions web interface. For detailed instructions, see [Upgrade Guide](#).

Deploy One Identity Safeguard for Privileged Sessions from the Microsoft Azure Marketplace

Purpose:

To have a One Identity Safeguard for Privileged Sessions running in Microsoft Azure, complete the following steps.

Steps:

1. Deploy One Identity Safeguard for Privileged Sessions from the Microsoft Azure Marketplace

Create and configure a One Identity Safeguard for Privileged Sessions virtual machine (VM) in the Azure portal. For details, see the [Microsoft Azure documentation](#), here we just describe the Safeguard for Privileged Sessions-specific settings.

- a. [Login to the Azure portal](#), select **One Identity Safeguard for Privileged Sessions** from the Azure Marketplace, then click **Create**.
- b. Fill the required fields of the **Basics** blade. Note that you must fill the **User name** and **Authentication Password/SSH public key** fields, but Safeguard for Privileged Sessions will not actually use these settings (Safeguard for Privileged Sessions will use the parameters you configure in the Safeguard for Privileged Sessions Welcome Wizard).
- c. Choose a size for the VM. If you want to use this machine in production and need help about sizing or architecture design, contact your One Identity sales representative.

The number of interfaces you can use depends on the size of your Azure VM. If your VM allows you to use multiple interfaces, you can configure multiple interfaces in Safeguard for Privileged Sessions. For details, see [VM with multiple NICs](#).

- d. On the **Settings** blade, disable monitoring.
- e. When the deployment is finished, navigate to the network settings of the new VM in the Azure portal. Change the IP address of the Safeguard for Privileged Sessions network interface to Static, and note down the IP address and the hostname (you will need it in the Safeguard for Privileged Sessions Welcome Wizard).

- f. If you want to backup or archive data from Safeguard for Privileged Sessions into Azure, [create an Azure File Share](#). Note down the following information of the file share, because you will need it to configure Safeguard for Privileged Sessions backups and archiving: URL, Username, Password.

⚠ CAUTION:

If you have multiple Safeguard for Privileged Sessions VMs, make sure to use a separate file share for each Safeguard for Privileged Sessions.

2. Complete the Safeguard for Privileged Sessions Welcome Wizard

Complete the Safeguard for Privileged Sessions Welcome Wizard (for details, see ["Configuring Safeguard for Privileged Sessions with the Welcome Wizard" in the Administration Guide](#)). Note the following points specific for Azure deployments. When configuring the network settings of Safeguard for Privileged Sessions note the following points.

⚠ CAUTION:

Do not export or import configuration between a physical Safeguard for Privileged Sessions deployment and a virtual one. Because of the differences and limitations between physical and virtual appliances, configure the virtual appliance from scratch to ensure proper functionality. When you migrate a virtual Safeguard for Privileged Sessions to another one, you can export and import the configuration.

- a. Into the **Physical interface EXT or 1 — IP address** field, enter the static IP address of the Safeguard for Privileged Sessions VM that you set on the Azure portal.
- b. **Default GW:** The default gateway is usually the first address in a subnet (for example, if your subnet is 10.7.0.0/24, then the gateway will be 10.7.0.1).
- c. **Hostname:** Use the hostname you have configured for the Safeguard for Privileged Sessions VM on the Azure portal.
- d. **DNS server:** You can use any DNS server that the Safeguard for Privileged Sessions VM can access, even public ones.

3. Configure Safeguard for Privileged Sessions

Login to Safeguard for Privileged Sessions and configure it.

- a. Configure backups for Safeguard for Privileged Sessions. For backup and archiving purposes One Identity recommends the built-in file shares of Azure. For details on configuring backups, see ["Data and configuration backups" in the Administration Guide](#).
- b. Configure archiving for Safeguard for Privileged Sessions. For backup and archiving purposes One Identity recommends the built-in file shares of Azure.

For details on configuring backups, see ["Archiving or cleaning up the collected data" in the Administration Guide](#). Configuring Archiving policy is highly recommended: because if the disk of the VM fills up, Safeguard for Privileged Sessions stops working.

- c. Configure a server: set up a host that is on the same subnet as Safeguard for Privileged Sessions, and enable Remote Desktop (RDP) or Secure Shell (SSH) access to it.
- d. Configure a connection on Safeguard for Privileged Sessions to forward the incoming RDP or Secure Shell (SSH) connection to the host and establish a connection to the host. See ["Logging in to Safeguard for Privileged Sessions and configuring the first connection" in the Administration Guide](#) for details.
- e. Replay your session in the browser. See ["Replaying audit trails in your browser in Search \(classic\)" in the Administration Guide](#) for details.

In case you have questions about Safeguard for Privileged Sessions, or need assistance, contact your One Identity representative.

High Availability and redundancy in Microsoft Azure

In a Microsoft Azure deployment, the high-availability and redundancy of the Safeguard for Privileged Sessions appliance is provided by the Microsoft Azure infrastructure, according to the [Azure Storage SLA](#).

Redundancy

The data in your Microsoft Azure storage account is always replicated to ensure durability and high availability, meeting the Azure Storage SLA. The exact type of replication depends on your storage account settings, but every disk is stored in 3 copies.

For details, see [Locally redundant storage](#) in the *Azure Storage replication* document, and [Service Healing - Auto-recovery of Virtual Machines](#).

High Availability

If a hardware failure occurs, Azure moves the Virtual Machine to another location and restarts it in 5-15 minutes. In case you require higher SLA, you are recommended to deploy two standalone Safeguard for Privileged Sessions nodes into an availability set. Note that to deploy two active Safeguard for Privileged Sessions nodes as an availability set, you must purchase two standalone Safeguard for Privileged Sessions licenses.

For details, see [Locally redundant storage](#) in the *Azure Storage replication* document, and [Service Healing - Auto-recovery of Virtual Machines](#).

Virtual appliance maintenance

Modifying the disk size of a Safeguard for Privileged Sessions virtual appliance

Purpose:

Safeguard for Privileged Sessions can only use fixed disk space assigned to the virtual host. If you must increase the size of the virtual disk, complete the following steps. Online disk resize can grow the filesystem up to 1024x size of the original size.

Prerequisites:

You can resize the disk that way only if you originally installed Safeguard for Privileged Sessions version 5 LTS or later. This method will not work if you upgraded to 5 LTS from an earlier version.

1. **Warning! Hazard of data loss!**

Create a full system backup (configuration and data backup). For detailed instructions, see "[Data and configuration backups](#)" in the [Administration Guide](#).

2. Power down the virtual machine.
3. Increase the storage size.
4. Power on the Safeguard for Privileged Sessions virtual machine.
5. Login to Safeguard for Privileged Sessions as root locally (or remotely using SSH) to access the Console menu.
6. Select **Shells > Boot Shell**.
7. Issue the following command: **parted /dev/Xda resizepart**
Letter X might vary on different systems. Usually it is 's' or 'v'. Check your system before issuing this command.
8. Answer the on-screen questions with the following answers:

- **Fix/Ignore?** > fix
- **Partition number?** > 4
- **Warning: Partition /dev/sda4 is being used. Are you sure you want to continue? Yes/No?** > yes
- **End?** > -0
- **Fix/Ignore?** > fix

For example:

```
(boot/master/ip99)root@scb1:~# parted /dev/sda resizepart
Warning: Not all of the space available to /dev/sda appears to be used, you can
fix the GPT to use all of the space (an extra 4194304 blocks) or continue with
the current setting?
Fix/Ignore? fix
Partition number? 4
Warning: Partition /dev/sda4 is being used. Are you sure you want to continue?
Yes/No? yes
End? [22.5GB]? -0
Information: You may need to update /etc/fstab.
```

9. Issue the following command: **resize2fs /dev/Xda4**

Letter X might vary on different systems. Usually it is 's' or 'v'. Check your system before issuing this command.

One Identity solutions eliminate the complexities and time-consuming processes often required to govern identities, manage privileged accounts and control access. Our solutions enhance business agility while addressing your IAM challenges with on-premises, cloud and hybrid environments.

Contacting us

For sales or other inquiries, visit <https://www.oneidentity.com/company/contact-us.aspx> or call +1-800-306-9329.

Technical support resources

Technical support is available to One Identity customers with a valid maintenance contract and customers who have trial versions. You can access the Support Portal at <https://support.oneidentity.com/>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request
- View Knowledge Base articles
- Sign up for product notifications
- Download software and technical documentation
- View how-to-videos at www.YouTube.com/OneIdentity
- Engage in community discussions
- Chat with support engineers online
- View services to assist you with your product

Third-party contributions

This appendix includes the open source licenses and attributions applicable to One Identity Safeguard for Privileged Sessions.