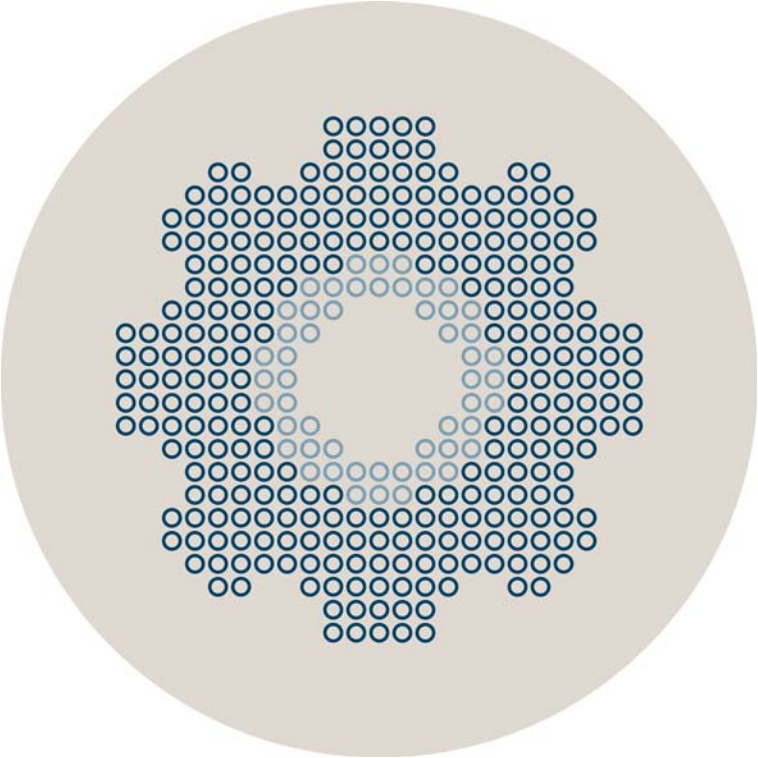


Stonesoft 5.5

IPS and Layer 2 Firewall Installation Guide

Intrusion Prevention System

Layer 2 Firewall

STONESOFT

Legal Information

End-User License Agreement

The use of the products described in these materials is subject to the then current end-user license agreement, which can be found at the Stonesoft website:
www.stonesoft.com/en/support/eula.html

Third Party Licenses

The Stonesoft software includes several open source or third-party software packages. The appropriate software licensing information for those products can be found at the Stonesoft website:
www.stonesoft.com/en/customer_care/support/third_party_licenses.html

U.S. Government Acquisitions

If Licensee is acquiring the Software, including accompanying documentation on behalf of the U.S. Government, the following provisions apply. If the Software is supplied to the Department of Defense (“DoD”), the Software is subject to “Restricted Rights”, as that term is defined in the DOD Supplement to the Federal Acquisition Regulations (“DFAR”) in paragraph 252.227-7013(c) (1). If the Software is supplied to any unit or agency of the United States Government other than DOD, the Government’s rights in the Software will be as defined in paragraph 52.227-19(c) (2) of the Federal Acquisition Regulations (“FAR”). Use, duplication, reproduction or disclosure by the Government is subject to such restrictions or successor provisions.

Product Export Restrictions

The products described in this document are subject to export control under the laws of Finland and the European Council Regulation (EC) N:o 1334/2000 of 22 June 2000 setting up a Community regime for the control of exports of dual-use items and technology (as amended). Thus, the export of this Stonesoft software in any manner is restricted and requires a license by the relevant authorities.

General Terms and Conditions of Support and Maintenance Services

The support and maintenance services for the products described in these materials are provided pursuant to the general terms for support and maintenance services and the related service description, which can be found at the Stonesoft website:
www.stonesoft.com/en/customer_care/support/

Replacement Service

The instructions for replacement service can be found at the Stonesoft website:
www.stonesoft.com/en/customer_care/support/rma/

Hardware Warranty

The appliances described in these materials have a limited hardware warranty. The terms of the hardware warranty can be found at the Stonesoft website:
www.stonesoft.com/en/customer_care/support/warranty_service/

Trademarks and Patents

The products described in these materials are protected by one or more of the following European and US patents: European Patent Nos. 1065844, 1189410, 1231538, 1231754, 1259028, 1271283, 1289183, 1289202, 1304830, 1304849, 1313290, 1326393, 1361724, 1379037, and 1379046 and US Patent Nos. 6,650,621; 6,856,621; 6,912,200; 6,996,573; 7,099,284; 7,127,739; 7,130,266; 7,130,305; 7,146,421; 7,162,737; 7,234,166; 7,260,843; 7,280,540; 7,325,248; 7,360,242; 7,386,525; 7,406,534; 7,461,401; 7,573,823; 7,721,084; and 7,739,727 and may be protected by other EU, US, or other patents, or pending applications. Stonesoft, the Stonesoft logo and StoneGate, are all trademarks or registered trademarks of Stonesoft Corporation. All other trademarks or registered trademarks are property of their respective owners.

Disclaimer

Although every precaution has been taken to prepare these materials, THESE MATERIALS ARE PROVIDED "AS-IS" and Stonesoft makes no warranty to the correctness of information and assumes no responsibility for errors, omissions, or resulting damages from the use of the information contained herein. All IP addresses in these materials were chosen at random and are used for illustrative purposes only.

Revision: SGIIG_20130618

Table of Contents

Introduction

Chapter 1

Preparing for Installation

Chapter 2

Chapter 3

Chapter 4

Configuring Engines

Chapter 5

Chapter 6

Chapter 7

INSTALLING ENGINES

UPGRADING

APPENDICES

INTRODUCTION

In this section:

CHAPTER 1

USING STONESOFT DOCUMENTATION

This chapter describes how to use the *IPS and Layer 2 Firewall Installation Guide* and lists other available documentation. It also provides directions for obtaining technical support and giving feedback.

The following sections are included:

▶ How to Use This Guide (page 8)
▶ Documentation Available (page 9)
▶ Contact Information (page 10)

How to Use This Guide

This *IPS and Layer 2 Firewall Installation Guide* is intended for administrators who install the Stonesoft IPS and Layer 2 Firewall system. It describes the IPS and Layer 2 Firewall engine installation step by step. The chapters in this guide are organized in the general order you should follow when installing the system.

Most tasks are explained using illustrations that include explanations on the steps you need to complete in each corresponding view in your own environment. The explanations that accompany the illustrations are numbered when the illustration contains more than one step for you to perform.

Typographical Conventions

The following conventions are used throughout the documentation:

Table 1.1 Typographical Conventions

Formatting	Informative Uses
User Interface text	Text you see in the User Interface (buttons, menus, etc.) and any other interaction with the user interface are in **bold-face**.
References, terms	Cross-references and first use of acronyms and terms are in *italics*.
`Command line`	File names, directories, and text displayed on the screen are `monospaced`.
`User input`	User input on screen is in **`monospaced bold-face`**.
`Command parameters`	Command parameter names are in *`monospaced italics`*.

We use the following ways to indicate important or additional information:

Note – Notes prevent commonly-made mistakes by pointing out important points.

Caution – Cautions prevent breaches of security, information loss, or system downtime. Cautions always contain critical information that you must observe.

Tip – Tips provide additional helpful information, such as alternative ways to complete steps.

Example Examples present a concrete scenario that clarifies the points made in the adjacent text.

Documentation Available

Stonesoft documentation is divided into two main categories: Product Documentation and Support Documentation. Each Stonesoft product has a separate set of manuals.

Product Documentation

The table below lists the available product documentation.

Table 1.2 Product Documentation

Guide	Description
Reference Guide	Explains the operation and features of the Stonesoft system comprehensively. Demonstrates the general workflow and provides example scenarios for each feature area. Available as separate guides for Stonesoft Management Center and Stonesoft Firewall/VPN, and as a combined guide for Stonesoft IPS and Stonesoft Layer 2 Firewall.
Installation Guide	Instructions for planning, installing, and upgrading a Stonesoft system. Available as separate guides for Stonesoft Management Center and Stonesoft Firewall/VPN, and as a combined guide for Stonesoft IPS and Stonesoft Layer 2 Firewall.
Online Help	Describes how to configure and manage the system step-by-step. Accessible through the Help menu and by using the Help button or the F1 key in any window or dialog. Available in the Stonesoft Management Client and the Stonesoft Web Portal. An HTML-based system is available in the Stonesoft SSL VPN Administrator through help links and icons.
Administrator's Guide	Describes how to configure and manage the system step-by-step. Available as a combined guide for Stonesoft Firewall/VPN, Stonesoft IPS, and Stonesoft Layer 2 Firewall, and as separate guides for Stonesoft SSL VPN and Stonesoft IPsec VPN Client.
User's Guide	Instructions for end-users. Available for the Stonesoft IPsec VPN Client and the Stonesoft Web Portal.
Appliance Installation Guide	Instructions for physically installing and maintaining Stonesoft appliances (rack mounting, cabling, etc.). Available for all Stonesoft hardware appliances.

PDF guides are available at http://www.stonesoft.com/en/customer_care/documentation/current/. The *Stonesoft Administrator's Guide*, and the *Reference Guides* and *Installation Guides* for Stonesoft Management Center, Stonesoft Firewall/VPN, Stonesoft IPS, and Stonesoft Layer 2 Firewall are also available as PDFs on the Management Center DVD.

Support Documentation

The Stonesoft support documentation provides additional and late-breaking technical information. These technical documents support the Stonesoft Guide books, for example, by giving further examples on specific configuration scenarios.

The latest Stonesoft technical documentation is available at the Stonesoft web site at http://www.stonesoft.com/support/.

System Requirements

The certified platforms for running Stonesoft engine software can be found at the product pages at http://www.stonesoft.com/en/products/ips/Software_Solutions/.

The hardware and software requirements for the version you are running can also be found in the Release Notes available at http://www.stonesoft.com/en/customer_care/kb/.

Supported Features

Not all features are supported on all platforms. See the Appliance Software Support Table at the Stonesoft Support Documentation pages for more information.

Contact Information

For street addresses, phone numbers, and general information about Stonesoft products and Stonesoft Corporation, visit our web site at http://www.stonesoft.com/.

Licensing Issues

You can view your current licenses at the License Center section of the Stonesoft web site at https://my.stonesoft.com/managelicense.do.

For license-related queries, e-mail order@stonesoft.com.

Technical Support

Stonesoft offers global technical support services for Stonesoft’s product families. For more information on technical support, visit the Support section at the Stonesoft web site at http://www.stonesoft.com/support/.

Your Comments

We want to make our products fulfill your needs as well as possible. We are always pleased to receive any suggestions you may have for improvements.

- To comment on software and hardware products, e-mail feedback@stonesoft.com.
- To comment on the documentation, e-mail documentation@stonesoft.com.

Other Queries

For queries regarding other matters, e-mail info@stonesoft.com.

PREPARING FOR INSTALLATION

In this section:

Chapter 2

Planning the Installation

This chapter provides important information to take into account before the installation can begin. The chapter also includes an overview to the installation process.

The following sections are included:

Introduction to Stonesoft IPS and Layer 2 Firewall

A Stonesoft IPS or Layer 2 Firewall system consists of the Stonesoft Management Center and one or more IPS and/or Layer 2 Firewall engines. IPS engines and Layer 2 Firewalls pick up network traffic, inspect it, and create event data for further processing by the Log Server.

You can install IPS engines in two basic ways:

- IDS (intrusion detection system) installation: engine capture and inspect all traffic in the connected network segment, but do not, by default, interrupt the flow of traffic in any way.
- IPS (intrusion prevention system) installation: engines are installed inline, so that all traffic that is to be inspected flows through the engine. In this setup, the engine itself can also be used to automatically block selected traffic according to how you configure it.

You can only install Layer 2 Firewalls inline.

The main features of Stonesoft IPS and Layer 2 Firewall include:

- Multiple detection methods: misuse detection uses fingerprints to detect known attacks. Anomaly detection uses traffic statistics to detect unusual network behavior. Protocol validation identifies violations of the defined protocol for a particular type of traffic. Event correlation processes event information to detect a pattern of events that might indicate an intrusion attempt.
- Response mechanisms: There are several response mechanisms to anomalous traffic. These include different alerting channels, traffic recording, TCP connection termination, traffic blacklisting, and traffic blocking with inline interfaces.

The IPS and Layer 2 Firewall engines are always managed centrally through the Stonesoft Management Center (SMC). You must have an SMC configured before you can proceed with installing the engines. The SMC can be used to manage a large number of different Stonesoft products. The SMC installation is covered in a separate guide. See the *SMC Reference Guide* for more background information on the SMC, and the *IPS and Layer 2 Firewall Reference Guide* for more background information on Stonesoft IPS engines and Layer 2 Firewalls.

Example Network Scenario

To get a better understanding of how Stonesoft IPS and Layer 2 Firewall fit into a network, you can consult the Example Network Scenario that shows you one way to deploy the system. See Example Network Scenario (page 141).

Overview to the Installation Procedure

1. Check the surrounding network environment as explained in Capture Interfaces (page 16).
2. Install licenses for the engines. See Installing Licenses (page 19).
3. If network address translation (NAT) is applied to communications between system components and the engines, define Contact Addresses. See Configuring NAT Addresses (page 25).
4. Define the IPS and Layer 2 Firewall element(s) in the Management Client. See Defining IPS Engines (page 33) and Defining Layer 2 Firewalls (page 49).
5. Generate the initial configuration for the engine(s). See Saving the Initial Configuration (page 61).
6. Install and configure the engine(s).
   - For hardware installation and initial configuration of Stonesoft appliances, see the *Appliance Installation Guide* that is delivered with each appliance.
   - For software installations, see Installing the Engine on Other Platforms (page 77).
7. Configure routing and install a policy on the engine(s). See Configuring Routing and Installing Policies (page 67).

The chapters and sections of this guide proceed in the order outlined above.

Important to Know Before Installation

Before you start the installation, you need to carefully plan the site that you are going to install. Consult the *IPS and Layer 2 Firewall Reference Guide* if you need more detailed background information on the operation of the system than what is offered in this chapter.

Supported Platforms

IPS engines and Layer 2 Firewalls can be run on the following general types of platforms:

- Purpose-built Stonesoft appliances.
- Standard Intel-compatible servers. Search for the version-specific *Hardware Requirements* in the technical documentation search at http://www.stonesoft.com/en/customer_care/kb/.
- Virtualization platforms that support the deployment of Open Virtual Format (OVF) templates. VMWare is officially supported. Other virtualization platforms may also be supported. There are some additional requirements and limitations when the IPS engine or Layer 2 Firewall is installed on a virtualization platform. See the Release Notes available at http://www.stonesoft.com/en/customer_care/kb/ for more information. Detailed instructions can be found in Installing the Engine on a Virtualization Platform (page 81).

The engines have an integrated, hardened Linux operating system that is always a part of the Stonesoft engine software, eliminating the need for separate operating system installation, configuration, and patching.

Date and Time Settings

The time settings of the engines do not need to be adjusted, as they are automatically synchronized to the Management Server's time setting. For this operation, the time is converted to UTC time according to the Management Server's time zone setting.

Capture Interfaces

IPS engines can be connected to a switch SPAN port or a network TAP to capture network traffic. Hubs can be used, but are not recommended. The considerations for these connection methods are explained below. Additionally, the IPS engine can be installed inline, so that the network traffic is routed through the engine, allowing active blocking of any connection. Layer 2 Firewalls can only be installed inline.

For more specific information on compatibility of different network devices and Stonesoft IPS engines and Layer 2 Firewalls, refer to the Stonesoft web site at http://www.stonesoft.com/support/.

Switch SPAN Ports

A *Switched Port Analyzer* (SPAN) port is used for capturing network traffic to a defined port on a switch. This is also known as *port mirroring*. The capturing is done passively, so it does not interfere with the traffic.

An IPS engine's capture interface can be connected directly to a SPAN port of a switch. All the traffic to be monitored must be copied to this SPAN port.

Network TAPs

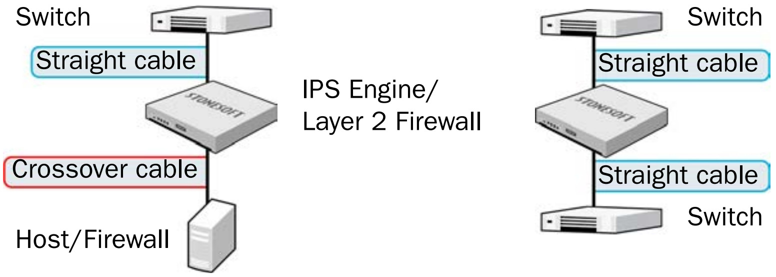
A *Test Access Port* (TAP) is a passive device located at the network wire between network devices. The capturing is done passively, so it does not interfere with the traffic. With a network TAP, the two directions of the network traffic is divided to separate wires. For this reason, the IPS engine needs two Capture interfaces for a network TAP; one capture interface for each direction of the traffic. The two related Capture interfaces must have the same *Logical interface* that combines the traffic of these two interfaces for inspection. You could also use the pair of Capture interfaces to monitor traffic in two separate network devices.

Cabling Guidelines

Follow standard cabling with inline interfaces: use straight cables to connect the engine to switches/hubs and crossover cables to connect the engine to hosts. Both crossover and straight cables may work when the engines are operating normally due to software-level correction, but only the correct type of cable allows traffic to flow when fail-open network cards must pass traffic without the help of higher-level features.

Also, make sure the cables are correctly rated (CAT 5e or CAT 6 in gigabit networks).

Illustration 2.1 Correct Cable Types

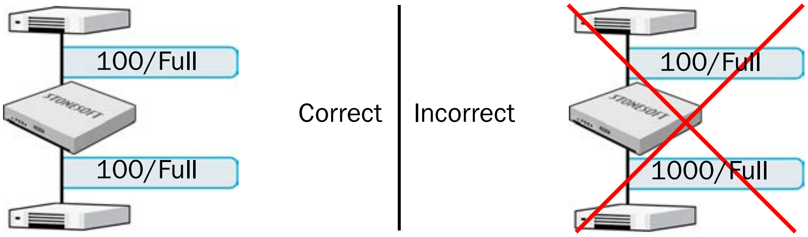


Speed And Duplex

Mismatched speed and duplex settings are a frequent source of networking problems. The basic principle for speed and duplex is simply that network cards at both ends of each cable must have identical settings. This principle also applies to the automatic negotiation setting: if one end of the cable is set to autonegotiate, the other end must also be set to autonegotiate. Gigabit standards require interfaces to use autonegotiation—fixed settings are not allowed at gigabit speeds.

Inline interfaces require additional consideration: since the engine acts as a “smart cable”, the settings must be matched on both links within each inline interface pair (identical settings on all four interfaces) instead of just matching settings at both ends of each cable (two + two interfaces). If one of the links has a lower maximum speed than the other link, the higher-speed link must be set to use the lower speed.

Illustration 2.2 Speed/Duplex Settings



Chapter 3

Installing Licenses

This chapter instructs how to generate and install licenses for IPS engines and Layer 2 Firewalls.

The following sections are included:

Getting Started with IPS and Layer 2 Firewall Licenses

Each IPS and Layer 2 Firewall engine must have its own license. IPS engines may use a Security Engine Node license or an IPS-specific license. Layer 2 Firewalls always use a Security Engine Node license. The correct type of license for each engine is generated based on your Management Server *proof-of-license* (POL) code or the appliance *proof-of-serial* (POS) code.

The Management Server's license may be limited to managing only a certain number of firewalls.

With appliances version 5.0 or newer, it is possible to download and install engine licenses automatically. For additional information on automatic downloading and installation of appliance licenses, see the *Stonesoft Administrator's Guide*.

If there is no connection between the Management Server and the Stonesoft License Center, the appliance can be used without a license for 30 days. After this you must generate the license(s) manually at the Stonesoft License Center web page and install them on the Management Server using the Management Client before you can bring your system fully operational.

What's Next?

- ▶ If you need new licenses, proceed as explained in the overview below.
- ▶ If you do not need new licenses for the IPS or Layer 2 Firewall engines and NAT is applied to communications between any system components, proceed to Configuring NAT Addresses (page 25).
- ▶ If you do not need new licenses for the IPS or Layer 2 Firewall engines and NAT is not applied to the communications, you are ready to define the IPS and Layer 2 Firewall element(s). Continue according to the element type:
  - Defining IPS Engines (page 33)
  - Defining Layer 2 Firewalls (page 49)

Configuration Overview

The following steps are needed for installing licenses for IPS and Layer 2 Firewall engines.

1. Generate the licenses at the Stonesoft web site. See Generating New Licenses (page 21).
2. Install the licenses in the Management Client. See Installing Licenses (page 22).

Generating New Licenses

You generate the licenses at the Stonesoft License Center based on your Management Server POL code, or the appliance POS code. Evaluation licenses are also available at the web site. If you are licensing several components of the same type, remember to generate one license for each component.

▼ To generate a new license

1. Browse to the Stonesoft License Center at my.stonesoft.com/managelicense.do.
2. Enter the required code (POL or POS) in the **License Identification** field and click **Submit**. The License Center page opens.
   - The proof-of-license (POL) code identifies a license. You can find it in the order delivery message sent by Stonesoft (usually by e-mail). Later on, this information is shown in the Licenses branch of the Administration Configuration view in the Management Client.
   - Stonesoft appliances additionally have a proof-of-serial number (POS) that you can find on a label attached to the appliance hardware.
3. Click **Register**. The License Generation page opens.
4. Enter the Management Server's POL code or the appliance POS code for the engines you want to license.
5. Click **Submit Request**. The license file is sent to you in a moment. It also becomes available for download at the license page.

Note – Evaluation license requests may need manual processing. See the license page for current delivery times and details.

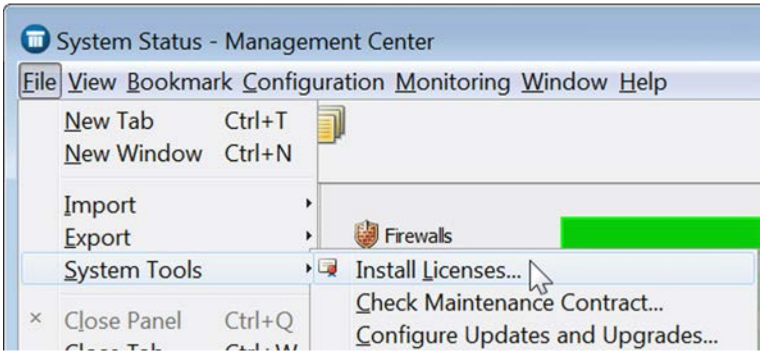
Installing Licenses

To install licenses, the license files must be available to the computer you use to run the Management Client.

Note – All licenses can be installed even though you have not yet defined all the elements the licenses will be bound to.

▼ To install licenses

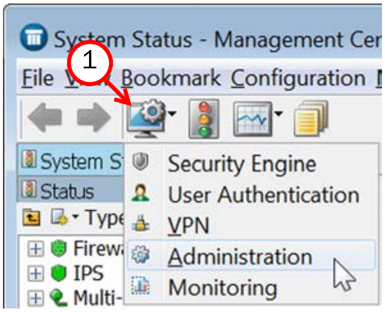
1. Select **File→System Tools→Install Licenses**.


System Status - Management Center
File View Bookmark Configuration Monitoring Window Help
New Tab Ctrl+T
New Window Ctrl+N
Import
Export
System Tools
Close Panel Ctrl+Q
Firewalls
Install Licenses...
Check Maintenance Contract...
Configure Updates and Upgrades...

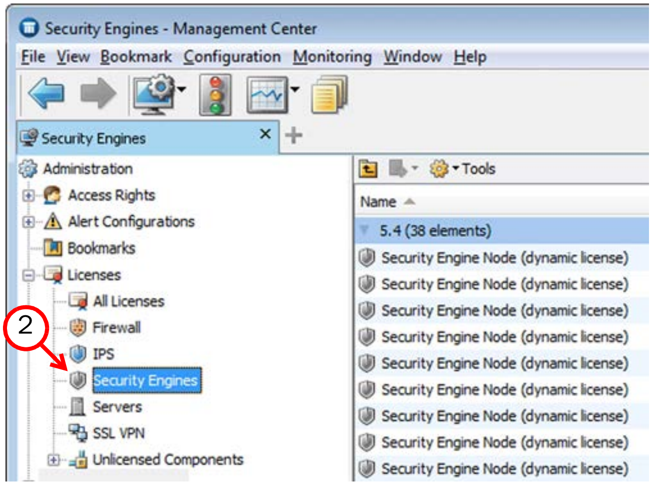
2. Select one or more license files in the dialog that opens and click **Install**.

▼ To check that the licenses were installed correctly

1. Click the Configuration icon in the toolbar and select **Administration**. The Administration Configuration view opens.



2. Browse to **Licenses→Security Engine** or **Licenses→IPS** depending on the type of licenses you have.


Security Engines - Management Center
File View Bookmark Configuration Monitoring Window Help
Security Engines
Administration
Access Rights
Alert Configurations
Bookmarks
Licenses
All Licenses
Firewall
2
IPS
Security Engines
Servers
SSL VPN
Unlicensed Components
Tools
Name
5.4 (38 elements)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)

You should see one license for each engine. If you have Management Server POL-bound engine licenses, you must bind them manually to the correct engines once you have configured the engine elements.

What's Next?

- If NAT is applied to communications between system components, proceed to Configuring NAT Addresses (page 25).
- Otherwise, you are ready to define the IPS engine and Layer 2 Firewall element(s). Proceed to Defining IPS Engines (page 33) or Defining Layer 2 Firewalls (page 49).

CHAPTER 4

CONFIGURING NAT ADDRESSES

This chapter contains the steps needed to configure Locations and contact addresses when a NAT (network address translation) operation is applied to the communications between the Security Engine and other system components.

The following sections are included:

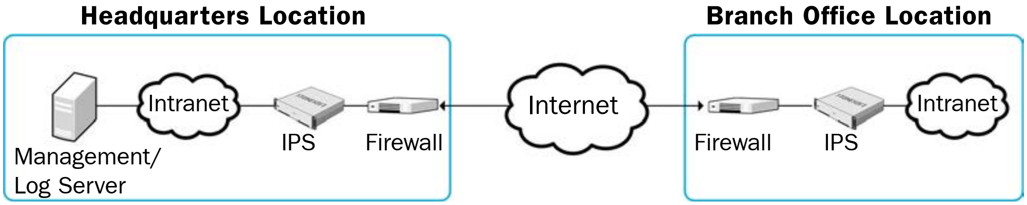
Getting Started with NAT Addresses

If there is *network address translation* (NAT) between communicating system components, the translated IP address may have to be defined for system communications. All communications between the system components are presented as a table in Default Communication Ports (page 133).

You use *Location* elements to configure system components for NAT. There is a Default Location to which all elements belong if you do not assign them a specific Location. If NAT is applied between two system components, you must separate them into different Locations and then add a contact address for the component that needs to be contacted.

You can define a Default contact address for contacting a system component (defined in the Properties dialog of the corresponding element). The component's Default contact address is used in communications when system components that belong to another Location contact the component and the component has no contact address defined for their Location.

Illustration 4.1 An Example Scenario for Using Locations



In the example scenario above, the same Management Server and Log Server manage system components both at a company's headquarters and in a branch office.

NAT could typically be applied at the following points:

- The Firewall at the headquarters or an external router may provide the SMC servers external IP addresses on the Internet. The external addresses must be defined as contact addresses so that the system components at the branch offices can contact the servers across the Internet.
- The branch office Firewall or an external router may provide external addresses for the system components at the branch office. Also in this case, the external IP addresses must be defined as contact addresses so that the Management Server can contact the components.

When contact addresses are needed, it may be enough to define a single new Location element, for example, for the branch office, and to group the system components at the branch office into the "Branch Office" Location. The same Location element could also be used to group together system components at any other branch office when they connect to the SMC servers at the headquarters.

Configuration Overview

To add contact addresses, proceed as follows:

1. Define Location element(s). See Defining Locations (page 27).
2. Define contact addresses for the Management Server and Log Server(s). See Adding SMC Server Contact Addresses (page 29).

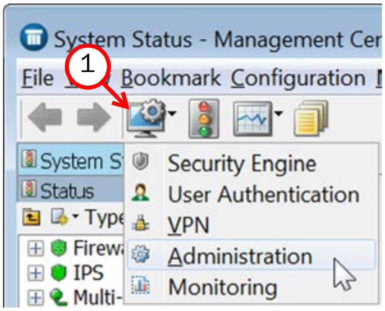
3. Select the correct Location for the engines when you create the IPS and Layer 2 Firewall elements. See Defining IPS Engines (page 33) and Defining Layer 2 Firewalls (page 49).

Defining Locations

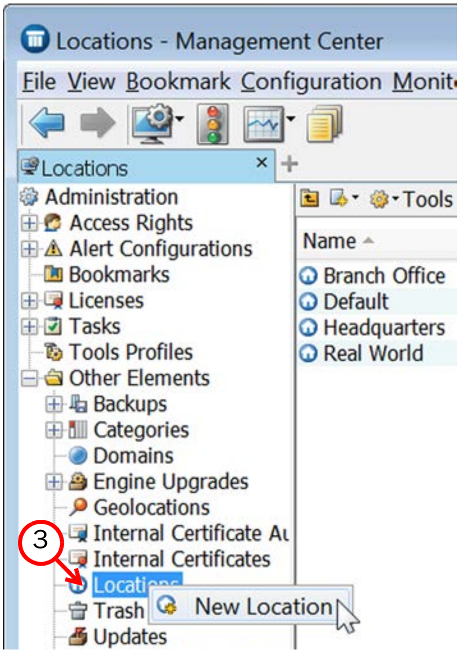
The first task is to group the system components into Location elements based on which components are on the same side of a NAT device. The elements that belong to the same Location element always use the primary IP address (defined in the Properties dialog of the element) when contacting each other.

▼ To create a new Location element

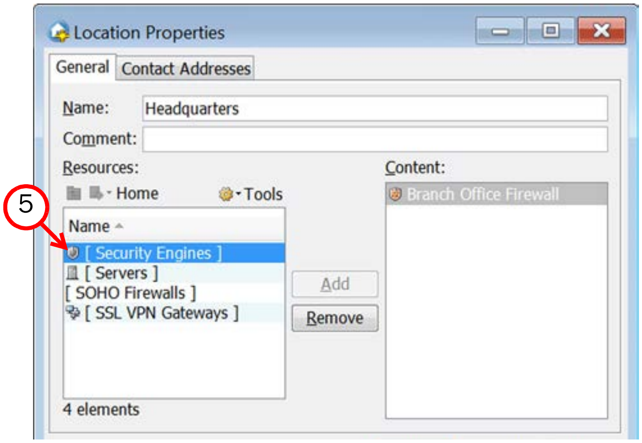
1. Click the Configuration icon in the toolbar, and select **Administration**. The Administration Configuration view opens.



2. Expand **Other Elements** in the tree view.



3. Right-click **Locations** and select **New Location**. The Location Properties dialog opens.



Name: Headquarters

Comment:

Resources:

Name
- [Security Engines]
- [Servers]
- [SOHO Firewalls]
- [SSL VPN Gateways]

4 elements

Content:

- Branch Office Firewall

4. Type in a **Name**.
5. Select the element(s) that belong to the Location and click **Add**.
6. Click **OK**.

Repeat to add other Locations as necessary.

What's Next?

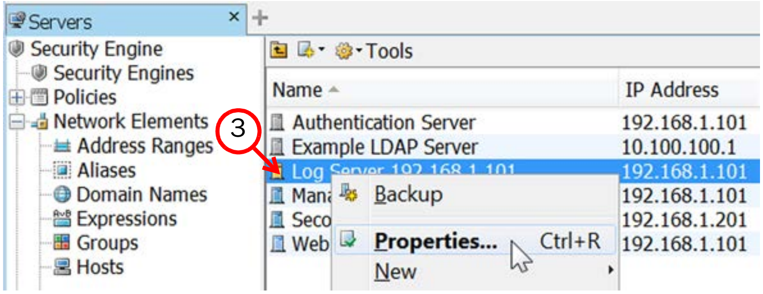
- If your Management Server or Log Server needs a contact address, proceed to Adding SMC Server Contact Addresses (page 29).
- If you plan to add contact addresses only for IPS or Layer 2 Firewall elements, proceed to Defining IPS Engines (page 33) or Defining Layer 2 Firewalls (page 49).

Adding SMC Server Contact Addresses

The Management Server and the Log Server can have more than one contact address for each Location. This allows you, for example, to define a contact address for each Internet link in a Multi-Link configuration for remotely managed components.

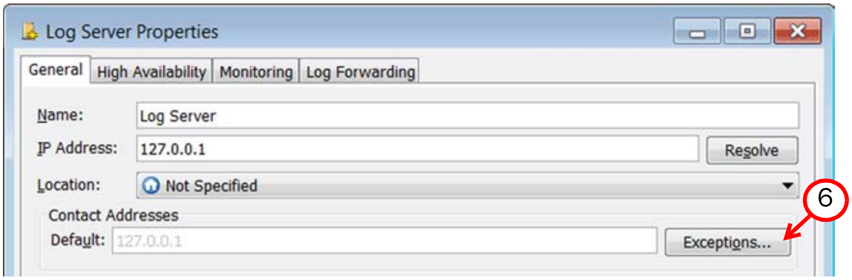
▼ To define the Management Server and Log Server contact addresses

1. Click the Configuration icon in the toolbar and select **Security Engine**. The Security Engine Configuration view opens.
2. Expand the **Network Elements** branch and select **Servers**.
3. Right-click a server and select **Properties**. The Properties dialog for that server opens.



Name	IP Address
Authentication Server	192.168.1.101
Example LDAP Server	10.100.100.1
Log Server 192.168.1.101	192.168.1.101
Mana	192.168.1.101
Seco	192.168.1.201
Web	192.168.1.101

4. Select the **Location** of this server.
5. Enter the **Default** contact address. If the server has multiple alternative IP addresses, separate the addresses with commas.



Name: Log Server
IP Address: 127.0.0.1
Location: Not Specified
Default: 127.0.0.1

6. Click **Exceptions** and define Location-specific contact addresses if the Default Contact Address(es) are not valid from all other Locations.

Note – Elements grouped in the same Location element always use the primary IP address (defined in the Properties dialog of the element) when contacting each other. All elements not specifically put in a certain Location are treated as if they belonged to the same Location.

7. Click **OK** to close the server properties and define the contact addresses for other servers in the same way.

What's Next?

▶ Defining IPS Engines (page 33).

▶ Defining Layer 2 Firewalls (page 49)

Configuring Engines

In this section:

CHAPTER 5

DEFINING IPS ENGINES

This chapter contains the steps needed to complete the IPS engine configuration that prepares the Management Center for IPS engine installation.

Very little configuration is done directly on the engines. Most of the configuration is done using the Management Client, so the engines cannot be successfully installed before defining them in the Management Center as outlined in this chapter.

The following sections are included:

Getting Started with Defining IPS Engines

The IPS engine elements are a tool for configuring nearly all aspects of your physical IPS components.

An important part of the IPS engine elements are the interface definitions. There are two main categories of IPS engine interfaces:

- Interfaces for system communications. These are used when the IPS engine is the source or the final destination of the communications (for example, in system communications between the IPS engine and the Management Server). You must define at least one interface that is dedicated to system communications for each IPS engine element.
- Interfaces for inspecting traffic. You must define one or more traffic inspection interfaces for each IPS engine element.

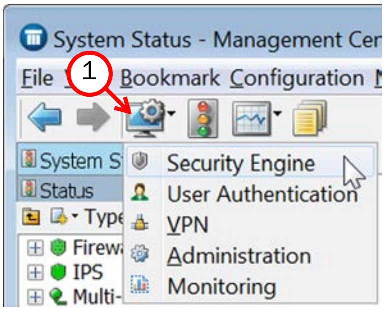
The interfaces have their own numbering in the Management Center called Interface ID. The numbering is independent of the operating system interface numbering on the engines. However, if you do the engine's initial configuring using the automatic USB memory stick configuration method, the Interface IDs in the Management Center are mapped to match the physical interface numbering in the operating system (eth0 is mapped to Interface ID 0 and so on). If you do the initial configuration manually, you can freely choose how the Interface IDs in the Management Center are mapped to the physical interfaces.

Creating Engine Elements

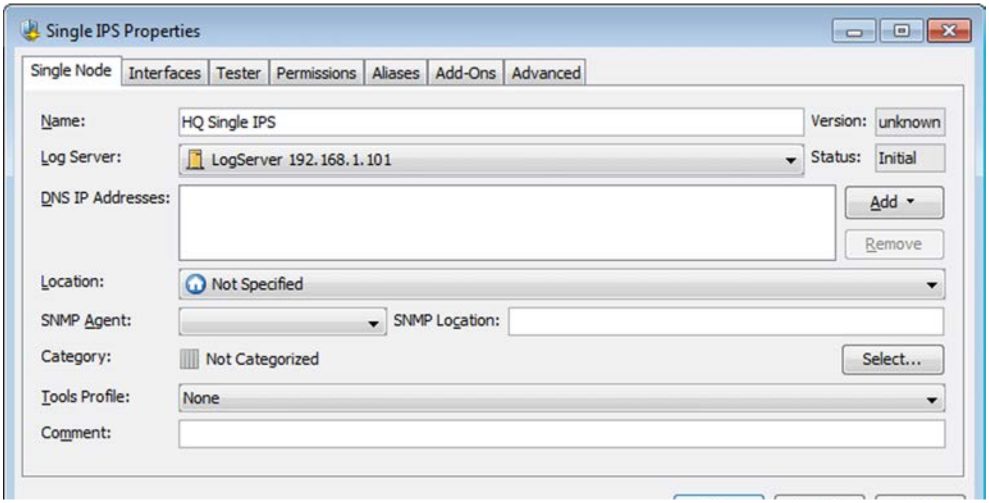
This section covers the basic configuration of IPS engine elements. For complete instructions on configuring IPS engine properties, see the Management Client *Online Help* or the *Stonesoft Administrator's Guide*.

▼ To create an engine element

1. Click the Configuration icon in the toolbar and select **Security Engine**. The Security Engine Configuration view opens.



2. Right-click **Security Engines** and select one of the following:
   - **New→IPS Cluster**
   - **New→Single IPS**



Single IPS Properties

Single Node | Interfaces | Tester | Permissions | Aliases | Add-Ons | Advanced

Name: HQ Single IPS

Version: unknown

Log Server: LogServer 192.168.1.101

Status: Initial

DNS IP Addresses:

Location: Not Specified

SNMP Agent:

SNMP Location:

Category: Not Categorized

Tools Profile: None

Comment:

3. Enter a unique **Name**.
4. Select the **Log Server** that stores the log events that the IPS engine creates. If no Log Server is selected, the engine does not make any traffic recordings.
5. (*Optional*) Define one or more **DNS IP Addresses** for the IPS engine. These are the IP addresses of the DNS server(s) that the IPS engine uses to resolve domain names and web filtering categorization services (which are defined as URLs).
   - To enter a single IP address manually, click **Add** and select **IP Address**. Enter the IP address in the dialog that opens.
   - To define an IP address by using a Network element, click **Add** and select **Network Element**. Select a predefined Alias element that represents the IP address of the DNS for a dynamic network interface, a Host element, or an External DNS Server element from the dialog that opens, or click the New icon and select **Host** or **External DNS Server** to define a new element.
6. Select the correct **Location** for this engine if there is a NAT device between system components affecting this IPS engine's communications.

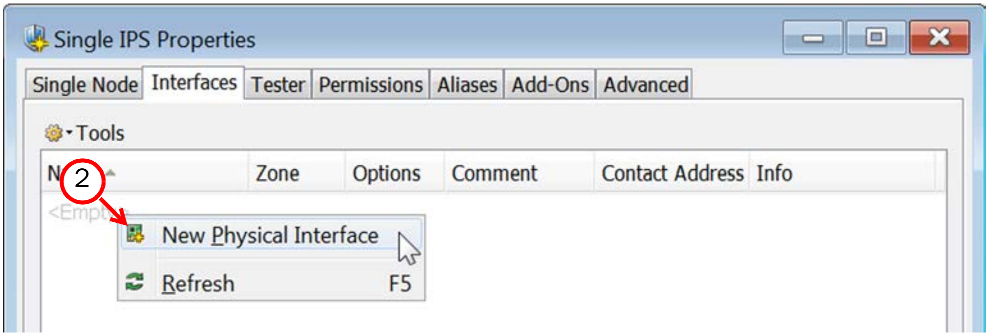
Defining System Communication Interfaces for IPS Engines

Each IPS engine needs at least one interface for communicating with other system components. More than one system communication interface can be added to provide a primary and a backup interface for Management Server communications.

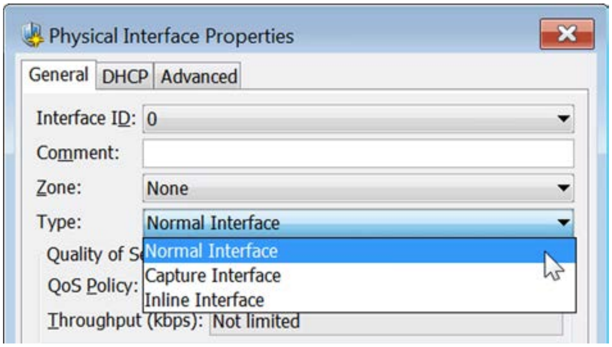
Defining Physical Interfaces

▼ To define a physical interface

1. Switch to the **Interfaces** tab.



2. Right-click and select **New Physical Interface**. The Physical Interface Properties dialog opens.



Interface ID: 0
Comment:
Zone: None
Type: Normal Interface
Quality of S
QoS Policy:
Throughput (kbps): Not limited

3. Select the **Interface ID**.
4. Select **Normal Interface** as the **Type**.
5. Click **OK**.

The physical interface is added to the interface list. Add the necessary number of interfaces in the same way.

What's Next?

- If you want to add VLANs to the physical interface, continue by Defining VLAN Interfaces (page 37).
- Otherwise, continue by Defining IP Addresses (page 38).

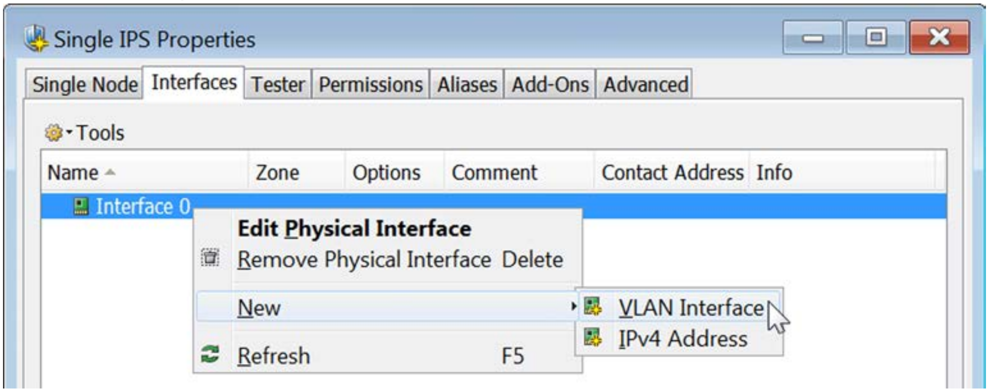
Defining VLAN Interfaces

VLANs divide a single physical network link into several virtual links. You can add up to 4094 VLANS per interface.

Caution – Do not add any manual VLAN definitions to an interface you want to use for sending resets. Adding VLANs prevents selecting the interface as a reset interface and also removes the reset interface from any existing selections.

▼ To define a VLAN Interface

1. Right-click a physical interface and select **New→VLAN Interface**. The VLAN Interface Properties dialog opens.



2. Enter the **VLAN ID** (1-4094).

Note – The VLAN ID must be the same VLAN ID used in the switch at the other end of the VLAN trunk.

3. Click **OK.**

The specified VLAN ID is added to the physical interface.

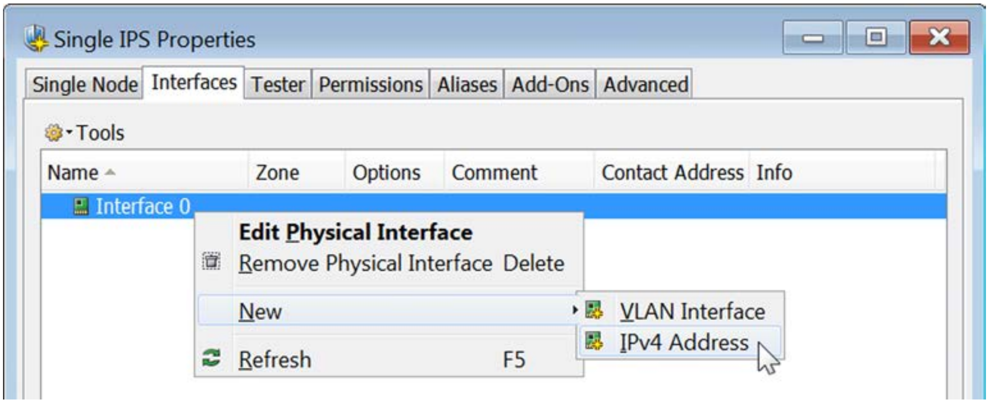
Repeat the steps above to add further VLANs to the interface.

The VLAN interface is now ready to be used as a network interface. The VLAN interface is identified as `Interface-ID.VLAN-ID`, for example `2.100` for Interface ID 2 and VLAN ID 100.

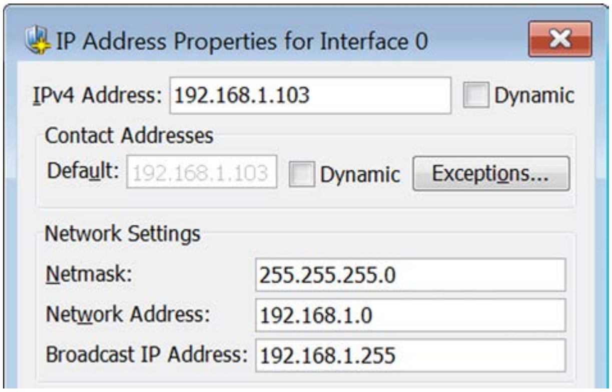
Defining IP Addresses

▼ To define an IP address for a single IPS

1. Right-click a physical interface or a VLAN interface and select **New→IPv4 Address**. The IP Address Properties dialog opens.



2. Configure the IP address information.
   - Enter the **IPv4 Address** and **Network Settings** to define a static IP address.
   - Select the **Dynamic** option (top right) and the **DHCP index** if the interface gets its IP address from a DHCP server. The DHCP Index is an arbitrary number of your choice that distinguishes different DHCP interfaces from one another.


IP Address Properties for Interface 0

IPv4 Address: 192.168.1.103 □ Dynamic

Contact Addresses

Default: 192.168.1.103 □ Dynamic Exceptions...

Network Settings

Netmask: 255.255.255.0

Network Address: 192.168.1.0

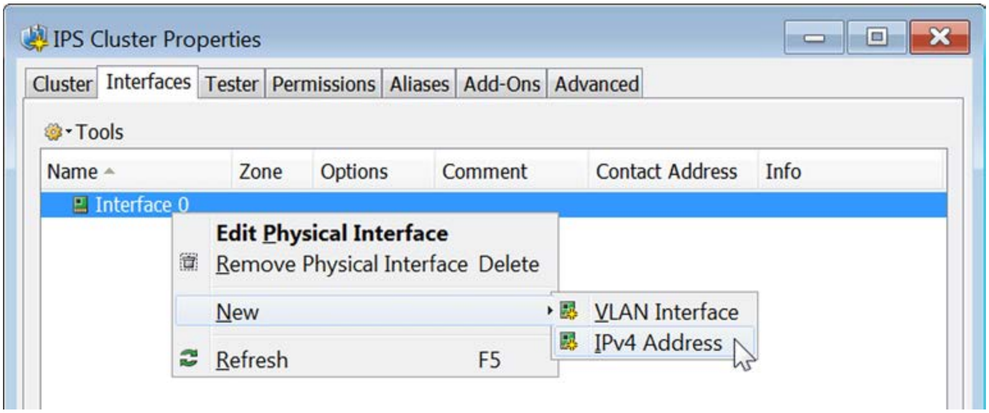
Broadcast IP Address: 192.168.1.255

3. If NAT is applied to system communications, enter a **Contact Address** to define the translated IP address of this engine.
4. Click **OK** to close the IP Address Properties dialog.

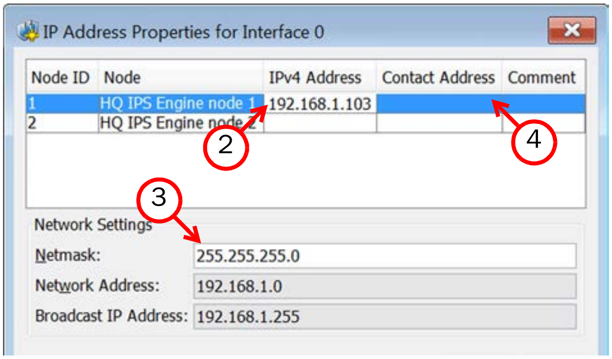
You can define several IP addresses for the same physical network interface. Before you continue, write down the networks to which each Interface ID is connected.

▼ To define IP addresses for an IPS cluster

1. Right-click a physical interface or a VLAN interface and select **New→IPv4 Address**. The IP Address Properties dialog opens.



2. Double-click the **IPv4 Address** cell and enter the IPv4 address. Repeat for each node.
3. Enter the **Netmask.**



IP Address Properties for Interface 0

Node ID	Node	IPv4 Address	Contact Address	Comment
1	HQ IPS Engine node 1	192.168.1.103		
2	HQ IPS Engine node 2			

Network Settings

Netmask: 255.255.255.0

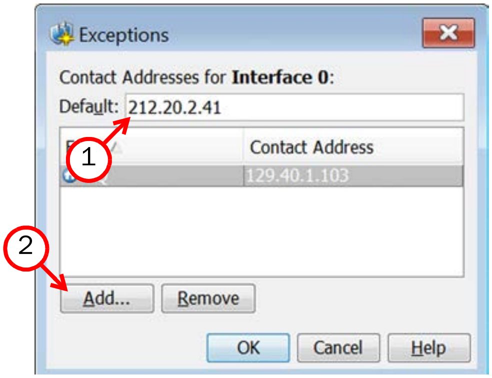
Network Address: 192.168.1.0

Broadcast IP Address: 192.168.1.255

4. If NAT is applied to system communications, double-click the **Contact Address** cell and continue as explained in To define a contact address. Otherwise, click **OK** to close the IP Address Properties dialog.

▼ To define a contact address

1. Enter the **Default** contact address to define the translated IP address of this engine. This address is used by default by components in a different Location.
2. (*Optional*) Click **Add** to define a different contact address for contacting this engine from some specific Location.



Exceptions

Contact Addresses for **Interface 0**:

Default: 212.20.2.41

	Contact Address
	129.40.1.103

3. Click **OK** to close the Contact Addresses dialog.
4. Click **OK** to close the IP Address Properties dialog.

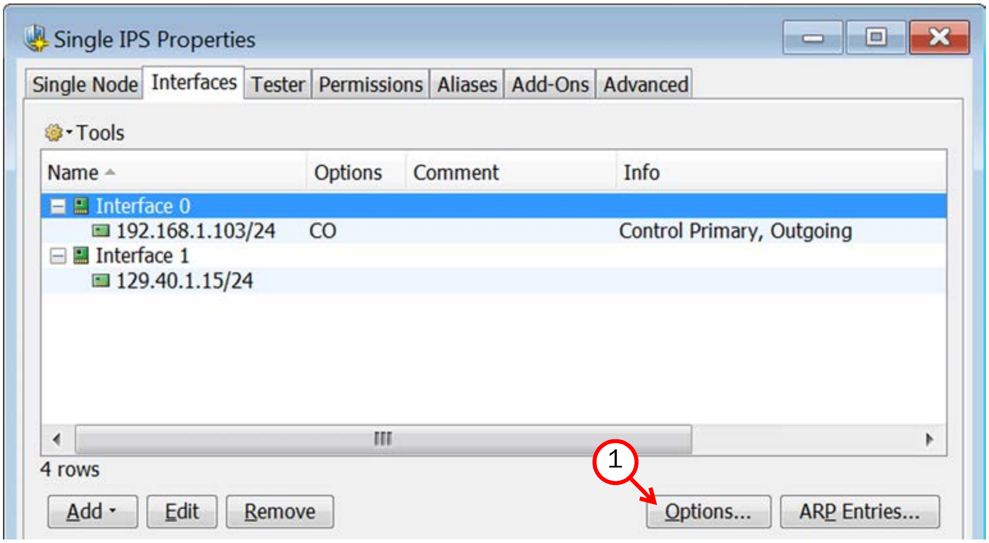
You can define several IP addresses for the same physical network interface. Before you continue, write down the networks to which each Interface ID is connected.

Setting Interface Options for IPS Engines

Interface options allow you to select which interfaces are used for which types of system communications.

▼ To set the Interface Options

1. Click **Options**. The Interface Options dialog opens.



Single IPS Properties

Name	Options	Comment	Info
Interface 0			
192.168.1.103/24	CO		Control Primary, Outgoing
Interface 1			
129.40.1.15/24			

4 rows

2. Select the **Primary** Control Interface for communications with the Management Server.

3. (*Optional*) Select a **Backup** Control interface that is used if the Primary interface is not available.
4. (*IPS Cluster only*) Select the **Primary** Heartbeat Interface for communications between the nodes of the cluster. This must not be a VLAN interface.

Caution – Heartbeat traffic is time-critical. A dedicated network (without other traffic) is strongly recommended for security and reliability of heartbeat communication.

5. (*IPS Cluster only, recommended*) Select a second Physical Interface as the **Backup** Heartbeat interface.
6. (*Single IPS only*) Select **Node-initiated contact to Management Server** if the IPS engine is behind a device that applies dynamic NAT to the inbound management connections or blocks them.
7. Select the **Default IP Address for outgoing traffic**.
8. Click **OK**.

Defining Traffic Inspection Interfaces for IPS Engines

IPS engines pick up passing network traffic for inspection in real time. The traffic can either be captured for inspection through the engine's capture interfaces, or it can be inspected as it flows through the engine's inline interfaces. You can define both capture interfaces and inline interfaces for the same IPS engine.

An IPS engine can actively filter only traffic that attempts to pass through its inline interfaces. However, it can reset traffic picked up through capture interfaces if you set up specific reset interfaces. The reset interfaces can send TCP resets and ICMP "destination unreachable" messages when the communications trigger a response. You can use a system communications interface for sending resets if the resets are routed correctly through that interface and there are no VLANs on the interface.

When traffic is inspected, it may be important to know the interface through which it arrives to the IPS engine. It is also important to be able to distinguish an IPS engine's capture interfaces from its inline interfaces. Logical Interface elements are used for both these purposes. They allow you to group together interfaces that belong to the same network segment and to identify the type of the traffic inspection interface (capture interface or inline interface).

What's Next?

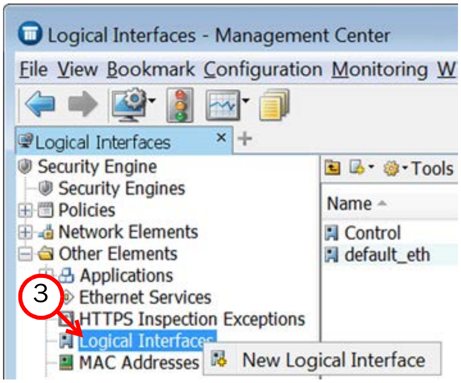
- If you want to create both capture and inline interfaces on the same IPS engine, or if you want to create logical interfaces to distinguish interfaces from each other, proceed to Defining Logical Interfaces (page 42).
- If you do not want to use an existing system communication interface as the reset interface, define the new reset interfaces as instructed in Defining Reset Interfaces (page 43).
- To define capture interfaces, proceed to Defining Capture Interfaces (page 44).
- To define inline interfaces, proceed to Defining Inline Interfaces (page 45).

Defining Logical Interfaces

A Logical Interface is used in the IPS policies and the traffic inspection process to represent a network segment. The Stonesoft system contains one default Logical Interface. A Logical interface can represent any number or combination of interfaces and VLAN interfaces, except that the same Logical interface cannot be used to represent both capture interfaces and inline interfaces on the same IPS engine. The rules in the ready-made IPS Template match all Logical Interfaces.

▼ To define a Logical interface

1. Click the Configuration icon in the toolbar and select **Security Engine**. The Security Engine Configuration view opens.
2. Expand the **Other Elements** branch.



3. Right-click **Logical Interfaces** and select **New Logical Interface**. The Logical Interface Properties dialog opens.
4. Enter a unique **Name**.
5. (*Optional*) If you use VLAN tagging on capture or inline interfaces, select **View interface as one LAN** if you do not want the IPS engine to see a single connection as multiple connections when a switch passes traffic between different VLANs and all traffic is mirrored to the IPS engine through a SPAN port.
6. Click **OK**.

Repeat these steps to define any additional Logical Interfaces.

What's Next?

- If you want to use reset interfaces together with capture interfaces, define the reset interfaces first. Proceed to Defining Reset Interfaces (page 43).
- To define capture interfaces, proceed to Defining Capture Interfaces (page 44).
- To define inline interfaces, proceed to Defining Inline Interfaces (page 45).

Defining Reset Interfaces

Reset interfaces can deliver TCP resets and ICMP “destination unreachable” messages to interrupt communications picked up from capture interfaces when the communications trigger a response.

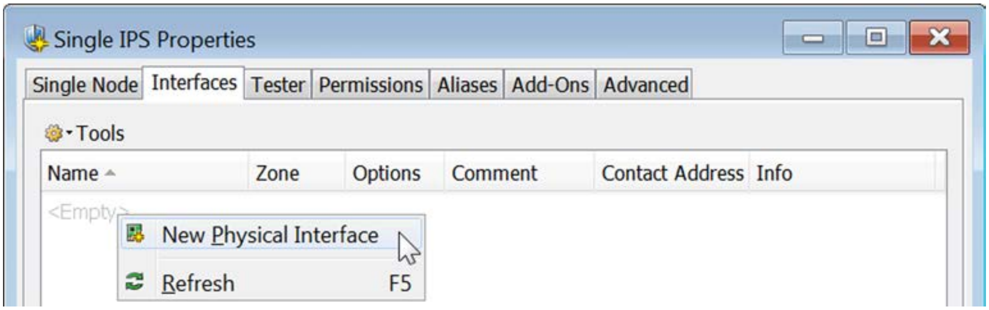
VLANs are supported for sending resets, but the correct VLAN is selected automatically. An interface you want to use as the reset interface must not have any manually added VLAN configuration.

The reset interface must be in the same broadcast domain as the capture interface that uses the reset interface. The resets are sent using the IP addresses and MAC addresses of the communicating hosts.

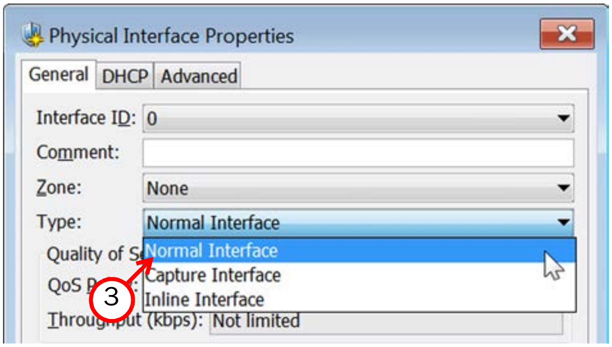
Note – An interface that is used *only* as a reset interface must not have an IP address.

▼ To define a reset interface

1. Right-click and select **New Physical Interface**. The Physical Interface Properties dialog opens.



2. Select the **Interface ID**.



Interface ID: 0

Comment:

Zone: None

Type: Normal Interface

Quality of S

QoS P

Throughput (kbps): Not limited

3. Select **Normal Interface** as the **Type**.
4. Click **OK**.

This interface can now be used as a reset interface. When you set up the physical network, make sure that the reset interface connects to the same network as the capture interface(s).

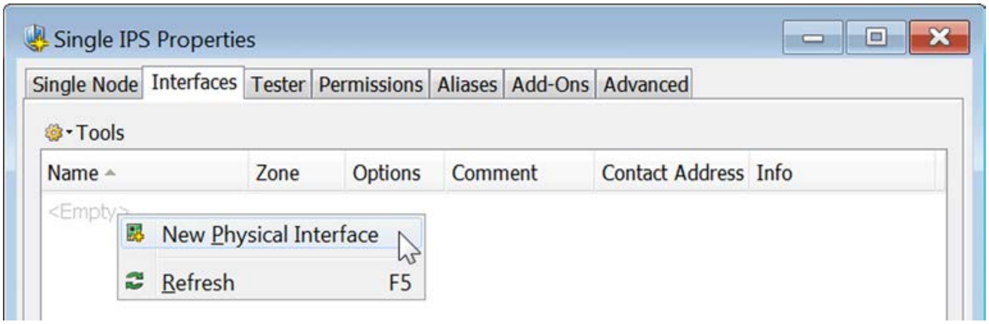
Defining Capture Interfaces

Capture interfaces listen to traffic that is not routed through the IPS engine. You can have as many capture interfaces as there are available physical ports on the IPS engine (there are no license restrictions regarding this interface type).

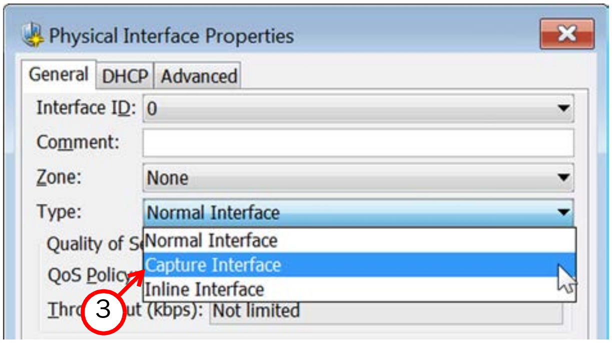
External equipment must be set up to mirror traffic to the capture interface. You can connect a capture interface to a switch SPAN port or a network TAP to capture traffic. For more information, see Capture Interfaces (page 16).

▼ To define a capture interface

1. Right-click and select **New Physical Interface**. The Physical Interface Properties dialog opens.



2. Select the **Interface ID**.



Interface ID: 0

Comment:

Zone: None

Type: Normal Interface

Thro ut (kbps): Not limited

3. Select **Capture Interface** as the **Type**.
4. (*Optional*) Select a TCP **Reset Interface** for traffic picked up through this capture interface.
5. If your configuration requires you to change the **Logical Interface**, click **Select** and select the Logical interface in the dialog that opens.
6. Click **OK**.

Repeat these steps to define any additional capture interfaces.

What's Next?

- ▶ To define inline interfaces, proceed to Defining Inline Interfaces (page 45).
- ▶ To define how an inline IPS engine handles traffic when the traffic load is too high, proceed to Bypassing Traffic on Overload (page 46).
- ▶ Otherwise, proceed to Finishing the Engine Configuration (page 47).

Defining Inline Interfaces

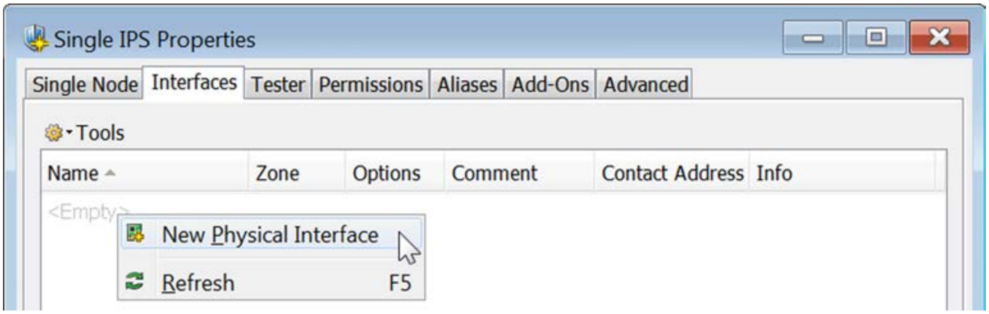
The number of inline interfaces you can have are limited by the license in use. One inline interface always comprises two physical interfaces, as the traffic is forwarded from one interface to the other. The allowed traffic passes through as if it was going through a network cable. The traffic you want to stop is dropped by the IPS engine.

Inline interfaces (like capture interfaces) are associated with a Logical Interface, which is used in the IPS policies and the traffic inspection process to represent one or more IPS engine interfaces.

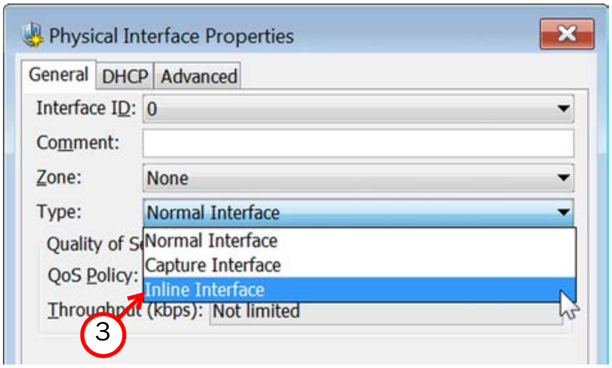
Fail-open network cards have fixed pairs of ports. Take particular care to map these ports correctly during the initial configuration of the engine. Otherwise, the network cards do not correctly fail open when the IPS engine is offline. If you use the automatic USB memory stick configuration method for the engine's initial configuration, the ports are configured automatically. See Configuring the Engine Automatically with a USB Stick (page 82) for more information.

▼ To define an inline interface

1. Right-click and select **New Physical Interface**. The Physical Interface Properties dialog opens.



2. Select the **Interface ID**.



Interface ID: 0
Comment:
Zone: None
Type: Normal Interface
Quality of S
QoS Policy:
Throughput (kbps): Not limited

3. Select **Inline Interface** as the **Type**.
4. (*Optional*) Change the automatically selected **Second Interface ID**.
5. Leave **Inspect Unspecified VLANs** selected if you want the IPS engine to inspect traffic also from VLANs that are not included in the IPS engine's interface configuration.
6. If your configuration requires you to change the **Logical Interface** from Default_Eth, click **Select** and select the Logical interface in the dialog that opens.

7. Click **OK**.

Repeat these steps to define any additional inline interfaces.

What's Next?

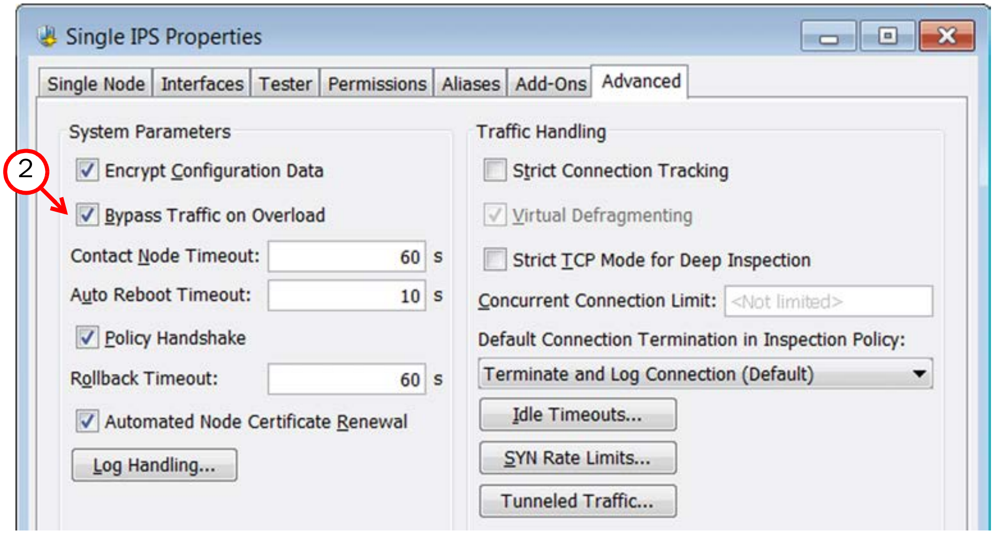
- ▶ To define how an inline IPS engine handles traffic when the load is too high, proceed to Bypassing Traffic on Overload (page 46).
- ▶ Otherwise, proceed to Finishing the Engine Configuration (page 47).

Bypassing Traffic on Overload

By default, inline IPS engines inspect all connections. If the traffic load is too high for the inline IPS engine to inspect all the connections, some traffic may be dropped. Alternatively, inline IPS engines can dynamically reduce the number of inspected connections if the load is too high. This can improve performance in evaluation environments, but some traffic may pass through without any access control or inspection.

▼ To bypass traffic on overload

1. Switch to the **Advanced** tab.



Single IPS Properties

System Parameters

- ☑ Encrypt Configuration Data
- ☑ Bypass Traffic on Overload
- Contact Node Timeout: 60 s
- Auto Reboot Timeout: 10 s
- ☑ Policy Handshake
- Rollback Timeout: 60 s
- ☑ Automated Node Certificate Renewal

Traffic Handling

- □ Strict Connection Tracking
- ☑ Virtual Defragmenting
- □ Strict TCP Mode for Deep Inspection
- Concurrent Connection Limit: <Not limited>
- Default Connection Termination in Inspection Policy: Terminate and Log Connection (Default)

2. Select **Bypass Traffic on Overload**.

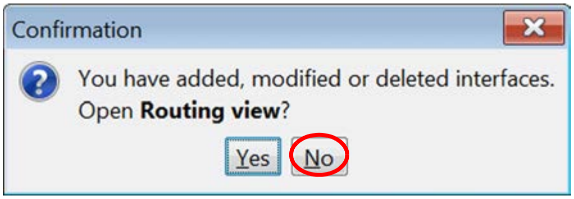
What's Next?

- ▶ Proceed to Finishing the Engine Configuration (page 47).

Finishing the Engine Configuration

▼ To finish the engine configuration

1. Write down the networks to which each Interface ID is connected
2. Click **OK** close the engine properties. The following notification opens.



Confirmation

You have added, modified or deleted interfaces. Open **Routing view**?

3. Click **No**.

What's Next?

▶ You are now ready to transfer the configuration to the physical IPS engines. Proceed to Saving the Initial Configuration (page 61).

CHAPTER 6

DEFINING LAYER 2 FIREWALLS

This chapter contains the steps needed to complete the Layer 2 Firewall engine configuration that prepares the Management Center for a Stonesoft Layer 2 Firewall engine installation.

Very little configuration is done directly on the engines. Most of the configuration is done using the Management Client, so the engines cannot be successfully installed before defining them in the Management Center as outlined in this chapter.

The following sections are included:

Getting Started with Defining Layer 2 Firewalls

The Layer 2 Firewall engine elements are a tool for configuring nearly all aspects of your physical Layer 2 Firewall components.

An important part of the Layer 2 Firewall engine elements are the interface definitions. There are two main categories of Layer 2 Firewall engine interfaces:

- *Normal Interfaces* for system communications. These are used when the Layer 2 Firewall engine is the source or the final destination of the communications (for example, in control communications between the Layer 2 Firewall engine and the Management Server). You must define at least one interface that is dedicated to system communications for each Layer 2 Firewall engine element.
- *Inline Interfaces* for inspecting traffic. You must define one or more traffic inspection interfaces for each Layer 2 Firewall engine element.

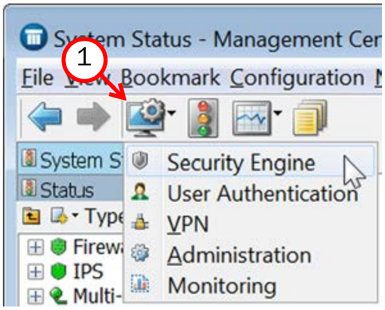
The interfaces have their own numbering in the Management Center called Interface ID. The numbering is independent of the operating system interface numbering on the engines. However, if you do the engine's initial configuring using the automatic USB memory stick configuration method, the Interface IDs in the Management Center are mapped to match the physical interface numbering in the operating system (eth0 is mapped to Interface ID 0 and so on). If you do the initial configuration manually, you can freely choose how the Interface IDs in the Management Center are mapped to the physical interfaces.

Creating Engine Elements

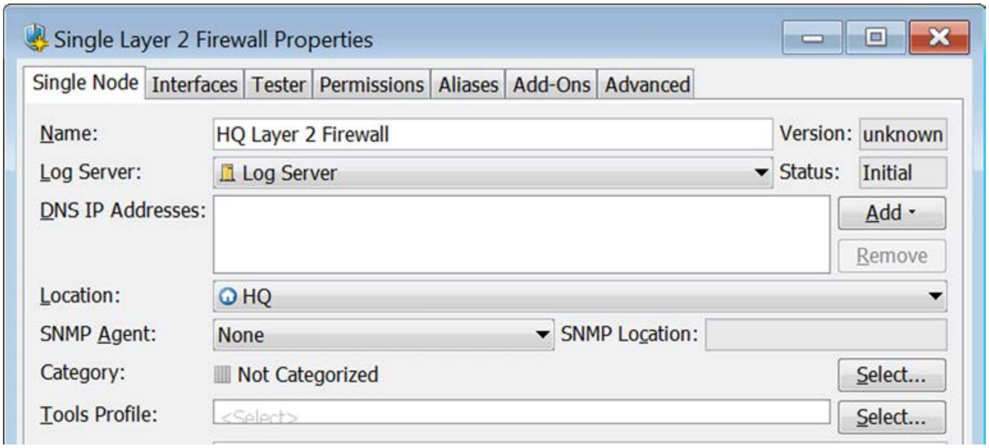
This section covers the basic configuration of Layer 2 Firewall engine elements. For complete instructions on configuring Layer 2 Firewall engine properties, see the Management Client *Online Help* or the *Stonesoft Administrator's Guide*.

▼ To create an engine element

1. Click the Configuration icon in the toolbar and select **Security Engine**. The Security Engine Configuration view opens.



2. Right-click **Security Engines** and select one of the following:
   - **New→Single Layer 2 Firewall**
   - **New→Layer 2 Firewall Cluster**



Name: HQ Layer 2 Firewall

Version: unknown

Log Server: Log Server

Status: Initial

DNS IP Addresses:

Location: HQ

SNMP Agent: None

SNMP Location:

Category: Not Categorized

Tools Profile: <Select>

3. Enter a unique **Name**.
4. Select the **Log Server** that stores the log events that the Layer 2 Firewall engine creates.
5. (*Optional*) Define one or more **DNS IP Addresses** for the Layer 2 Firewall engine. These are the IP addresses of the DNS server(s) that the Layer 2 Firewall engine uses to resolve domain names and web filtering categorization services (which are defined as URLs).
   - To enter a single IP address manually, click **Add** and select **IP Address**. Enter the IP address in the dialog that opens.
   - To define an IP address by using a Network element, click **Add** and select **Network Element**. Select a predefined Alias element that represents the IP address of the DNS of a dynamic network interface, a Host element, or an External DNS Server element from the dialog that opens, or click the New icon and select **Host** or **External DNS Server** to define a new element.
6. Select the correct **Location** for this engine if there is a NAT device between system components affecting this engine's communications.

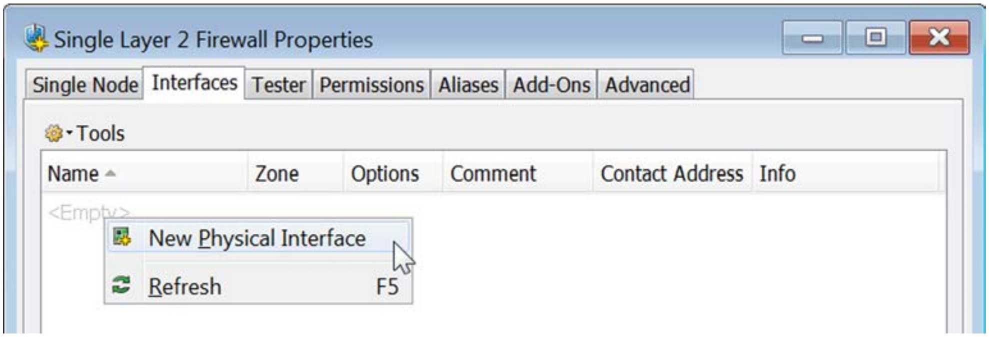
Defining System Communication Interfaces for Layer 2 Firewall Engines

Each Layer 2 Firewall engine needs at least one interface for communicating with other system components. More than one system communication interface can be added to provide a primary and a backup interface for Management Server communications.

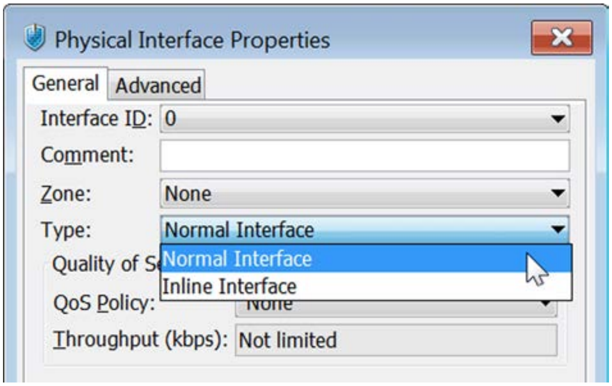
Defining Physical Interfaces

▼ To define a physical interface

1. Switch to the **Interfaces** tab.



2. Right-click and select **New Physical Interface**. The Physical Interface Properties dialog opens.



Interface ID: 0
Comment:
Zone: None
Type: Normal Interface
Quality of S
QoS Policy: None
Throughput (kbps): Not limited

3. Select the **Interface ID**.
4. Select **Normal Interface** as the **Type**.
5. Click **OK**.

The physical interface is added to the interface list. Add the necessary number of interfaces in the same way.

What's Next?

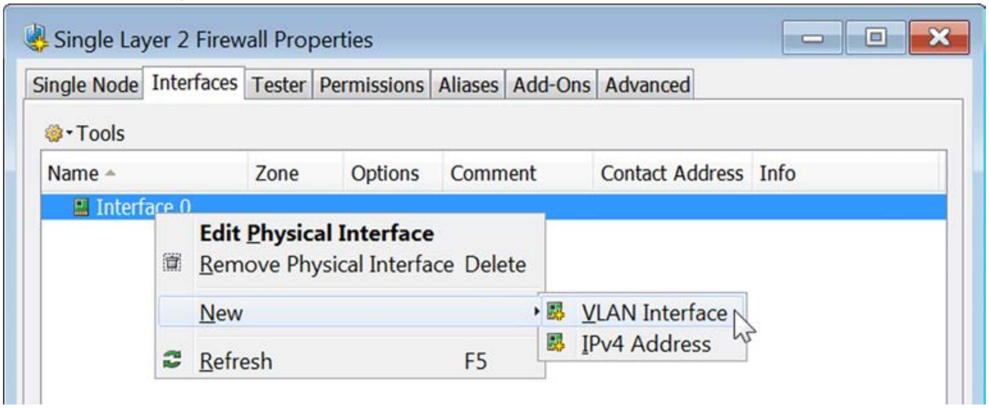
- ▶ If you want to add VLANs to the physical interface, continue by Defining VLAN Interfaces (page 53).
- ▶ Otherwise, continue by Defining IP Addresses (page 54).

Defining VLAN Interfaces

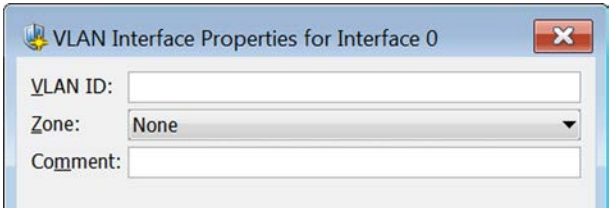
VLANs divide a single physical network link into several virtual links. You can add up to 4094 VLANS per interface.

▼ To define a VLAN Interface

1. Right-click a physical interface and select **New→VLAN Interface**. The VLAN Interface Properties dialog opens.



2. Enter the **VLAN ID** (1-4094).



VLAN ID:

Zone: None

Comment:

Note – The VLAN ID must be the same VLAN ID used in the switch at the other end of the VLAN trunk.

3. Click **OK.**

The specified VLAN ID is added to the physical interface.

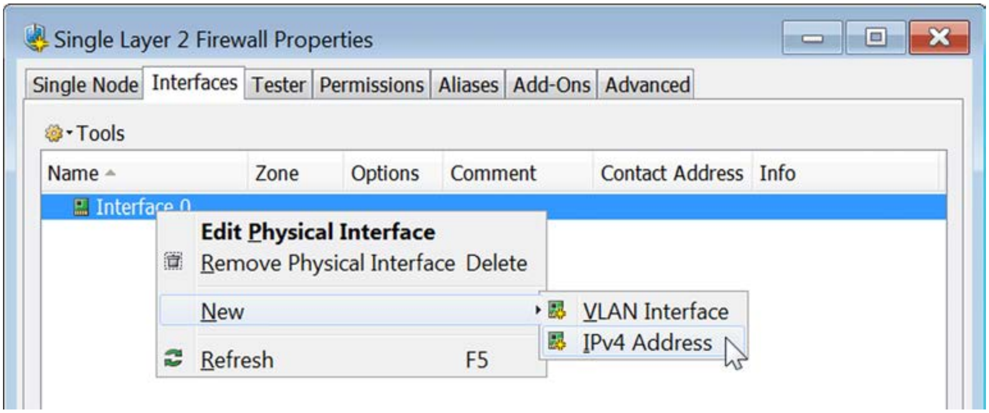
Repeat the steps above to add further VLANs to the interface.

The VLAN interface is now ready to be used as a network interface. The VLAN interface is identified as *`Interface-ID.VLAN-ID`*, for example `2.100` for Interface ID 2 and VLAN ID 100.

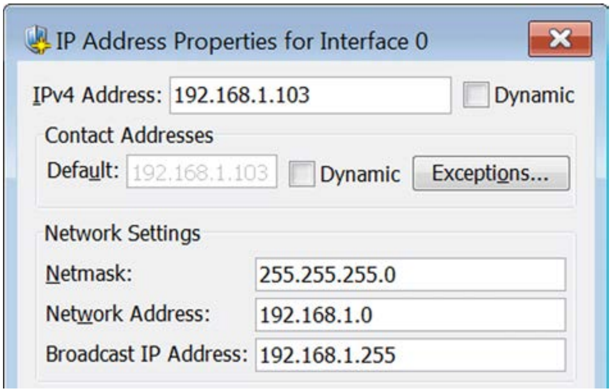
Defining IP Addresses

▼ To define an IP address for a Single Layer 2 Firewall

1. Right-click a physical interface or a VLAN interface and select **New→IPv4 Address**. The IP Address Properties dialog opens.



2. Configure the IP address information.
   - Enter the **IPv4 Address** and **Network Settings** to define a static IP address.
   - Select the **Dynamic** option (top right) and the **DHCP index** if the interface gets its IP address from a DHCP server. The DHCP Index is an arbitrary number of your choice that distinguishes different DHCP interfaces from one another.



IP Address Properties for Interface 0

IPv4 Address: 192.168.1.103 □ Dynamic

Contact Addresses

Default: 192.168.1.103 □ Dynamic Exceptions...

Network Settings

Netmask: 255.255.255.0

Network Address: 192.168.1.0

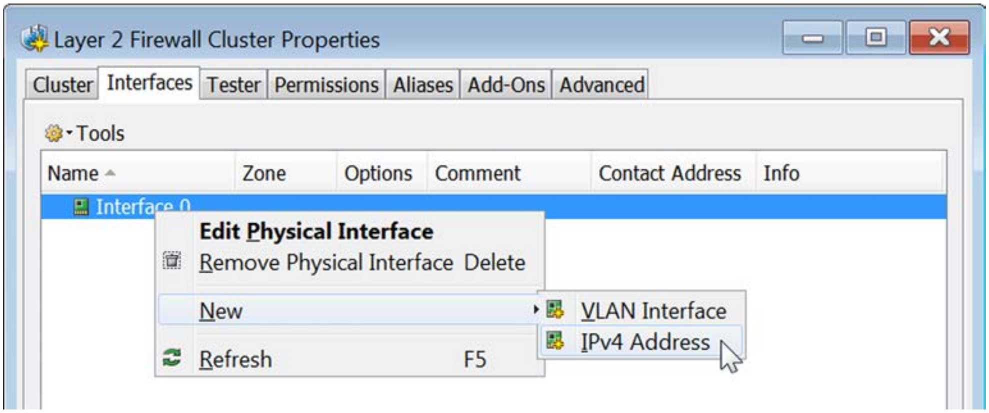
Broadcast IP Address: 192.168.1.255

3. If NAT is applied to system communications, enter a **Contact Address** to define the translated IP address of this engine.
4. Click **OK** to close the IP Address Properties dialog.

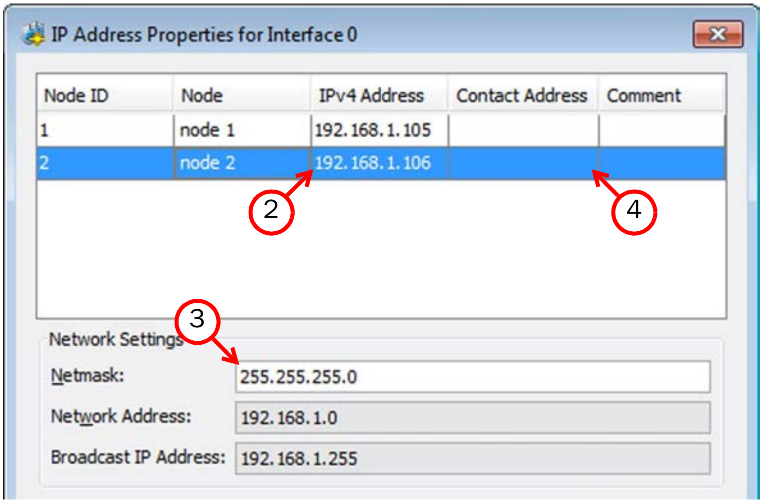
You can define several IP addresses for the same physical network interface. Before you continue, write down the networks to which each Interface ID is connected.

▼ To define IP addresses for a Layer 2 Firewall Cluster

1. Right-click a physical interface or a VLAN interface and select **New→IPv4 Address**. The IP Address Properties dialog opens.



2. Double-click the **IPv4 Address** cell and enter the IPv4 address. Repeat for each node.



Node ID	Node	IPv4 Address	Contact Address	Comment
1	node 1	192.168.1.105		
2	node 2	192.168.1.106		

Network Settings

Netmask: 255.255.255.0

Network Address: 192.168.1.0

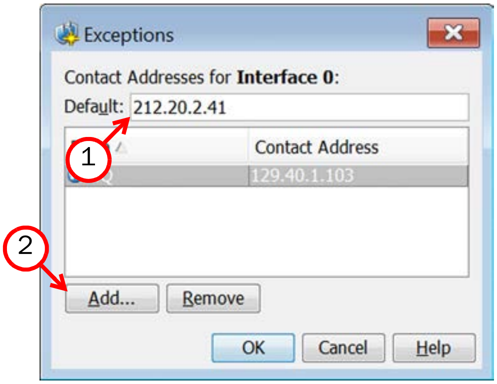
Broadcast IP Address: 192.168.1.255

3. Enter the **Netmask**.

4. If NAT is applied to system communications, double-click the **Contact Address** cell and continue as explained in To define a contact address (page 56). Otherwise, click **OK** to close the IP Address Properties dialog.

▼ To define a contact address

1. Enter the **Default** contact address to define the translated IP address of this engine. This address is used by default by components in a different Location.
2. (*Optional*) Click **Add** to define a different contact address for contacting this engine from some specific Location.



Exceptions

Contact Addresses for **Interface 0**:

Default: 212.20.2.41

	Contact Address
	129.40.1.103

3. Click **OK** to close the Exceptions dialog.
4. Click **OK** to close the IP Address Properties dialog.

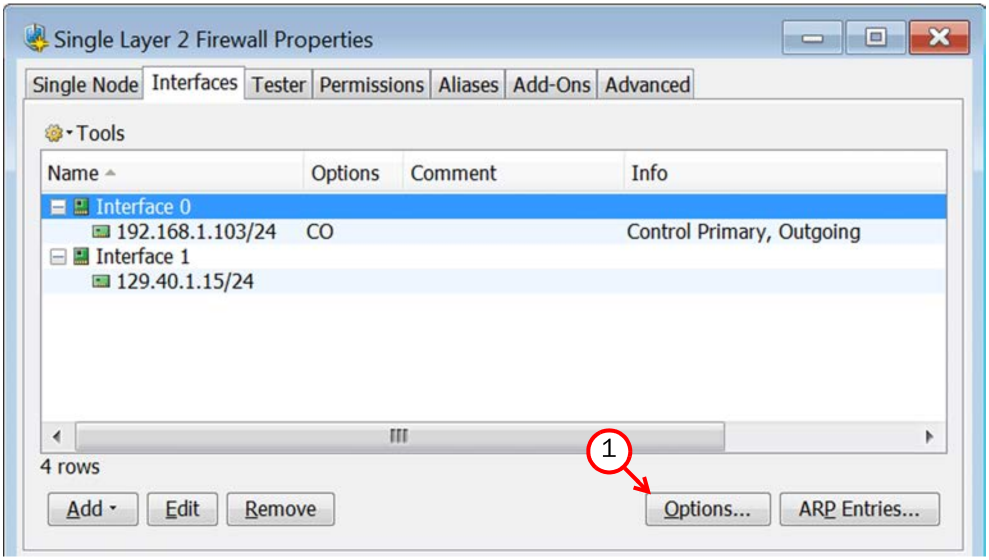
You can define several IP addresses for the same physical network interface. Before you continue, write down the networks to which each Interface ID is connected.

Setting Interface Options for Layer 2 Firewall Engines

Interface options allow you to select which interfaces are used for which types of system communications.

▼ To set the Interface Options

1. Click **Options**. The Interface Options dialog opens.



Single Layer 2 Firewall Properties

Name	Options	Comment	Info
Interface 0			
192.168.1.103/24	CO		Control Primary, Outgoing
Interface 1			
129.40.1.15/24			

4 rows

2. Select the **Primary** Control Interface for communications with the Management Server.

3. (*Optional*) Select a **Backup** Control interface that is used if the Primary interface is not available.
4. (*Layer 2 Firewall Cluster only*) Select the **Primary Heartbeat Interface** for communications between the nodes of the cluster. This must not be a VLAN interface.

Caution – Heartbeat traffic is time-critical. A dedicated network (without other traffic) is strongly recommended for security and reliability of heartbeat communication.

5. (*Layer 2 Firewall Cluster only, recommended*) Select a second Physical Interface as the **Backup Heartbeat interface**.
6. (*Single Layer 2 Firewall only*) Select **Node-initiated contact to Management Server** if the Layer 2 Firewall engine is behind a device that applies dynamic NAT to the inbound management connections or blocks them.
7. (*Optional*) Select the **Default IP Address for Outgoing Traffic**.
8. Click **OK**.

Defining Traffic Inspection Interfaces for Layer 2 Firewall Engines

Layer 2 Firewall engines pick up passing network traffic for inspection in real time. The traffic is inspected as it flows through the engine’s inline interfaces.

When traffic is inspected, it may be important to know the interface through which it arrives to the Layer 2 Firewall engine. Logical Interface elements are used for this purpose. They allow you to group together interfaces that belong to the same network segment.

What’s Next?

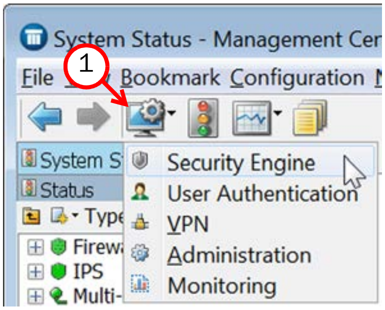
- If you want to create logical interfaces to distinguish interfaces from each other, proceed to Defining Logical Interfaces.
- To define inline interfaces, proceed to Defining Inline Interfaces (page 59).

Defining Logical Interfaces

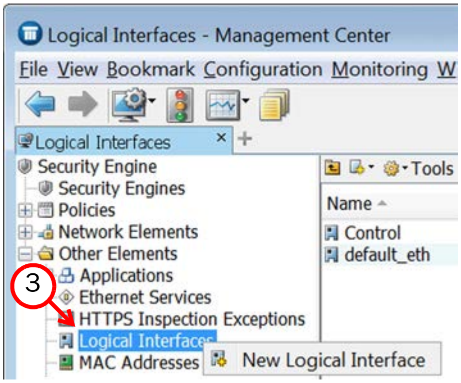
A Logical Interface is used in the Layer 2 Firewalls Policies and the traffic inspection process to represent a network segment. The Stonesoft system contains one default Logical Interface. A Logical interface can represent any number or combination of interfaces and VLAN interfaces. The rules in the ready-made Layer 2 Firewall Template match all Logical Interfaces.

▼ To define a Logical interface

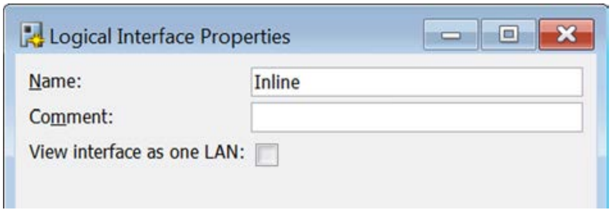
1. Click the Configuration icon in the toolbar and select **Security Engine**. The Security Engine Configuration view opens.



2. Expand the **Other Elements** branch.



3. Right-click **Logical Interfaces** and select **New Logical Interface**. The Logical Interface Properties dialog opens.



Logical Interface Properties

Name: Inline

Comment:

View interface as one LAN: □

4. Enter a unique **Name**.

5. (*Optional*) If you use VLAN tagging on inline interfaces, select **View interface as one LAN** if you do not want the Layer 2 Firewall engine to see a single connection as multiple connections when a switch passes traffic between different VLANs.

6. Click **OK**.

Repeat these steps to define any additional Logical Interfaces.

What's Next?

- ▶ Proceed to Defining Inline Interfaces (page 59).

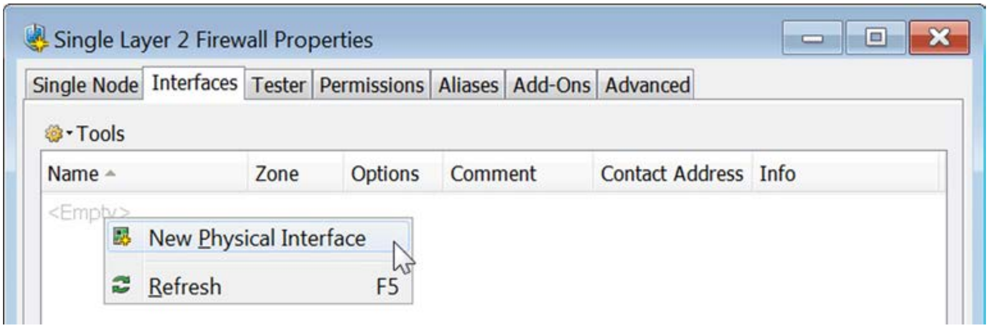
Defining Inline Interfaces

The number of inline interfaces you can have are limited by the license in use. One inline interface always comprises two physical interfaces, as the traffic is forwarded from one interface to the other. The allowed traffic passes through as if it was going through a network cable. The traffic you want to stop is dropped by the Layer 2 Firewall engine.

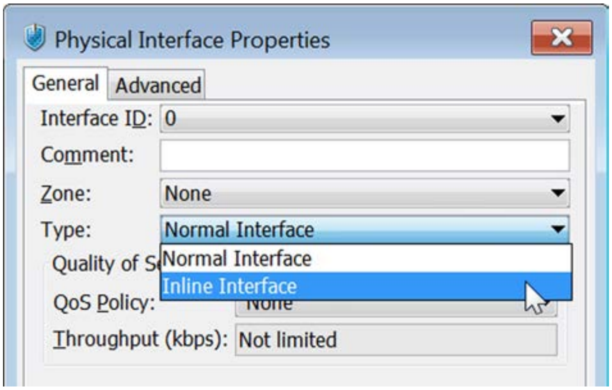
Inline interfaces are associated with a Logical Interface, which is used in the Layer 2 Firewall policies and the traffic inspection process to represent one or more Layer 2 Firewall engine interfaces.

▼ To define an inline interface

1. Right-click and select **New Physical Interface**. The Physical Interface Properties dialog opens.



2. Select the **Interface ID**.
3. Select **Inline Interface** as the **Type**.



Interface ID: 0

Comment:

Zone: None

Type: Normal Interface

QoS Policy: None

Throughput (kbps): Not limited

4. (*Optional*) Change the automatically selected **Second Interface ID**.
5. Leave **Inspect Unspecified VLANs** selected if you want the Layer 2 Firewall engine to inspect traffic also from VLANs that are not included in the engine's interface configuration.
6. If your configuration requires you to change the **Logical Interface** from Default_Eth, click **Select** and select the Logical interface in the dialog that opens.
7. Click **OK**.

Repeat these steps to define any additional inline interfaces.

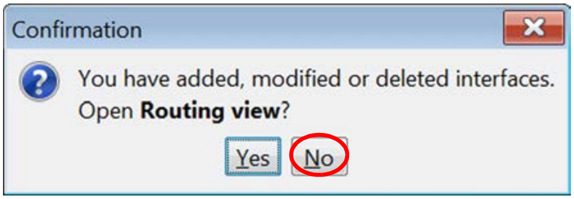
What's Next?

▶ Proceed to Finishing the Engine Configuration.

Finishing the Engine Configuration

▼ To finish the engine configuration

1. Write down the networks to which each Interface ID is connected
2. Click **OK** close the engine properties. The following notification opens.



Confirmation

You have added, modified or deleted interfaces. Open **Routing view**?

3. Click **No**.

What's Next?

▶ You are now ready to transfer the configuration to the physical Layer 2 Firewall engines. Proceed to Saving the Initial Configuration (page 61).

CHAPTER 7

SAVING THE INITIAL CONFIGURATION

This chapter explains how to save the initial configuration in the Management Center and how to transfer it to the physical engines.

The following sections are included:

Configuration Overview

Once you have configured the engine elements in the Management Client, you must transfer the initial configuration to the physical engines.

You must complete the following steps:

1. Save the initial configuration in the Management Client. See Saving the Initial Configuration for Engines (page 62).
2. Transfer the initial configuration to the physical engines. See Transferring the Initial Configuration to the Engines (page 66).

Saving the Initial Configuration for Engines

The initial configuration sets some basic parameters for the engines and triggers the creation of one-time passwords needed to establish a connection with the Management Server.

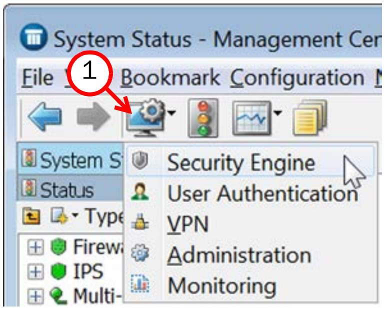
There are three ways to initialize your engines and establish contact between them and the Management Server.

- You can write down the one-time password and enter all information manually in the command-line Engine Configuration Wizard on the engines.
- You can save the configuration on a floppy disk or a USB memory stick and make some manual changes in the command-line Engine Configuration Wizard on the engines.
- You can save the initial configuration on a USB memory stick and use the memory stick to automatically configure the engine without using the Engine Configuration Wizard.

Note – The automatic configuration is primarily intended to be used with Stonesoft appliances, and may not work in all other environments.

▼ To save the initial configuration

1. Click the Configuration icon in the toolbar and select **Security Engine**. The Security Engine Configuration view opens.



2. Select **Security Engines**. A list of Security Engines opens.

3. Right-click an engine element and select **Configuration→Save Initial Configuration**. The Initial Configuration dialog opens.

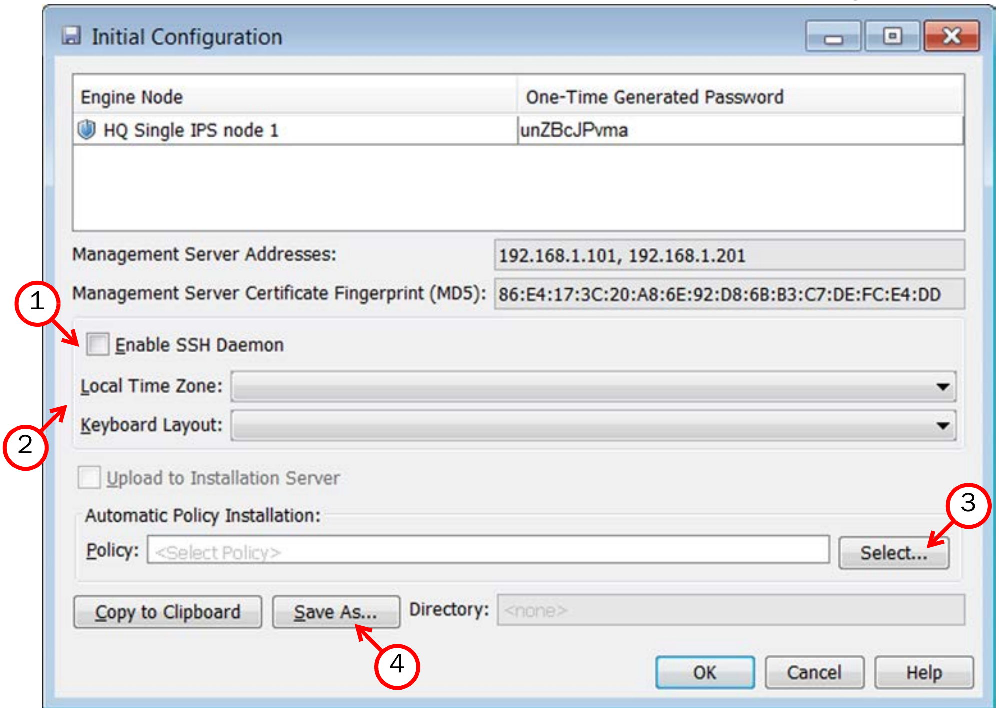
What's Next?

- If you want to use automatic configuration, proceed to Preparing for Automatic Configuration.
- If you want to use the Engine Configuration Wizard, proceed to Preparing for Configuration Using the Engine Configuration Wizard (page 64).

Preparing for Automatic Configuration

▼ To prepare for automatic configuration

1. (*Optional*) Select **Enable SSH Daemon** to allow remote access to the engine command line.



Initial Configuration

Engine Node	One-Time Generated Password
HQ Single IPS node 1	unZBcJPvma

Management Server Addresses: 192.168.1.101, 192.168.1.201

Management Server Certificate Fingerprint (MD5): 86:E4:17:3C:20:A8:6E:92:D8:6B:B3:C7:DE:FC:E4:DD

□ Enable SSH Daemon

Local Time Zone:

Keyboard Layout:

□ Upload to Installation Server

Automatic Policy Installation:

Policy: <Select Policy>

Directory: <none>

- Enabling SSH in the initial configuration gives you remote command line access in case the configuration is imported correctly, but the engine fails to establish contact with the Management Server.
- Once the engine is fully configured, SSH access can be set on or off using the Management Client. We recommend that you enable the SSH access in the Management Client when needed and disable the access again when you are finished. Make sure your Access rules allow SSH access to the engines from the administrators' IP addresses only.

Caution – If you enable SSH, set the password for command line access after the initial configuration either through the Management Client or by logging in to the command line. When the password is not set, anyone with SSH access to the engine can set the password.

2. Select the **Local Time Zone** and **Keyboard Layout** for the engine.
   - The time zone selection is used only for converting the UTC time that the engines use internally for display on the command line. All internal operations use UTC time, which is synchronized with the Management Server's time once the engine is configured. For external operations, engines use the time zone of their geographical location.
3. *(Optional)* Click **Select** and select the appropriate policy if you already have a policy you want to use. The selected policy is automatically installed after the engine has contacted the Management Server. See Installing the Initial Policy (page 70) for descriptions of the available pre-defined policies.
4. Click **Save As** and save the configuration on the root of a USB memory stick, so that the engine can boot from it.

Caution – Handle the configuration files securely. They include the one-time password that allows establishing trust with your Management Server.

5. Click **Close**.

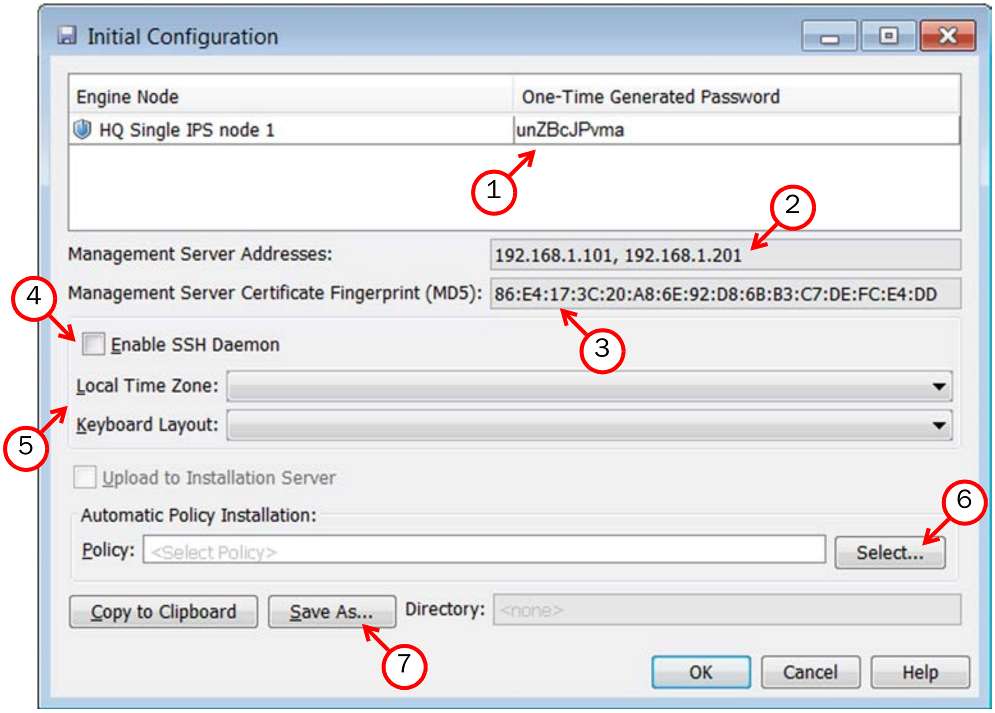
What's Next?

▶ Transferring the Initial Configuration to the Engines (page 66)

Preparing for Configuration Using the Engine Configuration Wizard

▼ To prepare for configuration using the Engine Configuration Wizard

1. If you plan to enter the information manually, write down or copy the **One-Time Password** for each engine. Keep track of which password belongs to which engine node.



Initial Configuration

Engine Node	One-Time Generated Password
HQ Single IPS node 1	unZBcJPvma

Management Server Addresses: 192.168.1.101, 192.168.1.201

Management Server Certificate Fingerprint (MD5): 86:E4:17:3C:20:A8:6E:92:D8:6B:B3:C7:DE:FC:E4:DD

☐ Enable SSH Daemon

Local Time Zone:

Keyboard Layout:

☐ Upload to Installation Server

Automatic Policy Installation:

Policy: <Select Policy>

Directory: <none>

2. If you plan to enter the information manually, write down or copy the **Management Server Addresses**.

3. *(Optional)* If you plan to enter the information manually, write down or copy the **Management Server Certificate Fingerprint** for additional security.

4. *(Optional)* If you plan to import the configuration in the Engine Configuration Wizard, select **Enable SSH Daemon** to allow remote access to the engine command line.
   - Enabling SSH in the initial configuration gives you remote command line access in case the configuration is imported correctly, but the engine fails to establish contact with the Management Server.
   - Once the engine is fully configured, SSH access can be set on or off using the Management Client. We recommend that you enable the SSH access in the Management Client when needed and disable the access again when you are finished. Make sure your Access rules allow SSH access to the engines from the administrators’ IP addresses only.

Caution – If you enable SSH, set the password for command line access after the initial configuration either through the Management Client or by logging in to the command line. When the password is not set, anyone with SSH access to the engine can set the password.

5. (*Optional*) If you plan to import the configuration in the Engine Configuration Wizard, select the **Local Time Zone** and **Keyboard Layout**.
   - The time zone selection is used only for converting the UTC time that the engines use internally for display on the command line. All internal operations use UTC time, which is synchronized with the Management Server’s time once the engine is configured. For external operations, engines use the time zone of their geographical location.

6. (*Optional*) Click **Select** and select the appropriate policy if you already have a policy you want to use. The selected policy is automatically installed after the engine has contacted the Management Server. See Installing the Initial Policy (page 70) for descriptions of the available pre-defined policies.

7. If you plan to import the configuration in the Engine Configuration Wizard, click **Save As** and save the configuration on a USB memory stick.

Caution – Handle the configuration files securely. They include the one-time password that allows establishing trust with your Management Server.

8. Click **Close**.

What’s Next?

▶ Transferring the Initial Configuration to the Engines (page 66)

Transferring the Initial Configuration to the Engines

You are now ready to install the engine(s). The initial configuration is transferred to the engines during the installation.

What's Next?

- If you have a Stonesoft appliance, see the installation and initial configuration instructions in the *Appliance Installation Guide* that was delivered with the appliance. After this, return to this guide to set up basic routing and policies (see Configuring Routing and Installing Policies (page 67) or see the more detailed instructions in the Management Client *Online Help* or the *Stonesoft Administrator's Guide*).
- If you are using another type of device as the engine, proceed to Installing the Engine on Other Platforms (page 77).

CHAPTER 8

CONFIGURING ROUTING AND INSTALLING POLICIES

After successfully installing the engines and establishing contact between the engine(s) and the Management Server, the engines are left in the initial configuration state. Now you must define basic routing and policies to be able to use the engines to inspect traffic. Both of these tasks are done using the Management Client.

The following sections are included:

Configuring Routing

Routing is configured entirely through the Management Client. The routing information of IPS engines and Layer 2 Firewalls is only used for system communications. The inspected traffic is not routed. Inline interfaces are always fixed as port pairs; traffic that enters through one port is automatically forwarded to the other port.

Most often only one or two simple tasks are needed to define routing information for IPS and Layer 2 Firewall elements:

- Define the default route. This is the route packets to any IP addresses not specifically included in the routing configuration should take.
- Add routes to your internal networks that are not directly connected to the IPS engine or Layer 2 Firewall if the networks cannot be reached through the default gateway.

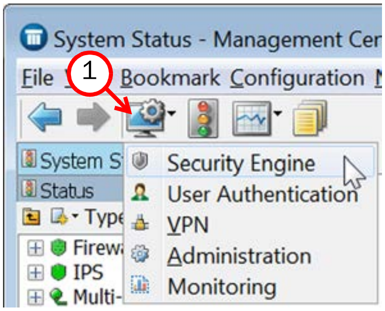
Routing is most often done using the following elements:

- **Network** elements: represent a group of IP addresses.
- **Router** elements: represent the gateway devices that will forward packets to the networks you add in the routing configuration.

When you modify interfaces and then close the engine properties, you always receive a notification that allows you to open the Routing view directly. You can view the Routing view at any other time by selecting **Configuration→Routing** from the menu.

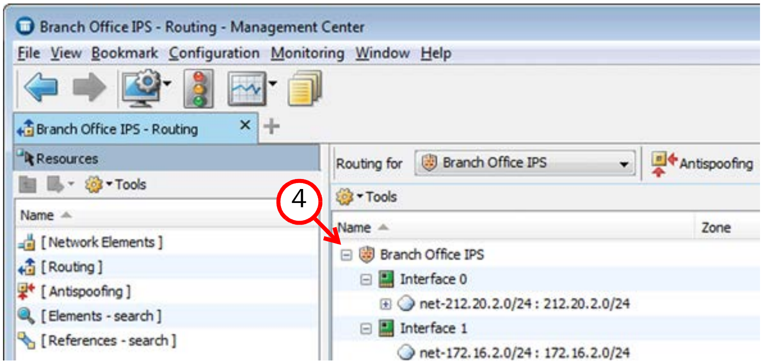
▼ To view routing information

1. Click the Configuration icon in the toolbar and select **Security Engine**. The Security Engine Configuration view opens.



2. Select **Security Engines**. A list of Security Engines opens.
3. Right-click the engine whose routing you want to configure and select **Routing**. The Routing view for the selected element opens.

All the IPS or Layer 2 Firewall element's physical interfaces and their network definitions have been automatically added to the Routing view. You can select another element to view its routing information.



4. Expand the routing tree to view all the routing information for the interfaces.

Note – Networks are only added automatically. Networks and interfaces are never deleted automatically. Inappropriate elements are marked with a symbol to show that they are invalid. You must delete the invalid elements manually if you do not want them to be shown in the Routing view.

Adding Next-Hop Routers

You may need to define a default route in case the Management Center (Management Servers and Log Servers) and other system components are not located on a directly connected network. Other routes may be needed in addition to the default route if one or more system components are not directly connected and cannot be reached through the default gateway. To add the default route or to add other routes, you must first add a Router element to represent the gateway devices that forward packets to the networks.

▼ To add a router

1. Right-click the Network and select **New→Router**. The Router Properties dialog opens.
2. Fill in the **Name** and **IP Address** for the Router.

What's Next?

- ▶ If you want to define the default route, continue by Adding the Default Route (page 70).
- ▶ If you want to add other routes, continue by Adding Other Routes (page 70).

Adding the Default Route

▼ To add the default route

➥ Right-click the Router and select **New→Any Network**.

You are not actually creating a new element, just inserting the existing default element **Any Network**.

What's Next?

▶ To add other routes, proceed to Adding Other Routes.

▶ Otherwise, proceed to Installing the Initial Policy (page 70).

Adding Other Routes

▼ To add other routes

1. Right-click the Router and select **New→Network**. The Network Properties dialog opens.
2. Give the network a unique a **Name** and define the network space.

Repeat these steps to add any additional Networks to the Router element.

The routing configuration changes are transferred to the engine with the other configuration information when you install a policy on the engine.

Installing the Initial Policy

To be able to inspect traffic, the engines must have a policy installed on them. Installing one of the predefined policies provides an easy way to begin using the system. You can then fine-tune the system as needed. The following table describes the default policy elements for IPS and Layer 2 Firewall engines.

Table 8.1 Default Policy Elements for Stonesoft IPS and Layer 2 Firewall Engines

Element Type	Default Element Name	Description
IPS Template Policy	IPS Template	A Template Policy that contains the predefined Access rules necessary for the IPS engine to communicate with the Management Center and some external components. The IPS Template Policy uses Inspection rules from the High-Security Inspection Policy. The IPS Template Policy provides an easy starting point for determining what kinds of rules your system needs.

Table 8.1 Default Policy Elements for Stonesoft IPS and Layer 2 Firewall Engines (Continued)

Element Type	Default Element Name	Description
IPS Policy	Customized High-Security Inspection IPS Policy	An IPS Policy that is based on the IPS Template. The Customized High-Security Inspection IPS Policy contains a set of customized rules that were used when Stonesoft IPS was tested at ICSA Labs and NSS Labs.
	Default IPS Policy	An IPS Policy that is based on the IPS Template. The Default IPS Policy does not add any rules to those defined in the IPS Template. It allows you to install the predefined rules in the IPS Template on the IPS engine right after installation (since Template Policies cannot be installed on the engines).
Layer 2 Firewall Template Policy	Layer 2 Firewall Template	A Template Policy that contains the predefined Access rules necessary for the Layer 2 Firewall to communicate with the Management Center and some external components. The Layer 2 Firewall Template uses Inspection rules from the No Inspection Policy. The rules in the No Inspection Policy do not enforce inspection.
	Layer 2 Firewall Inspection Template	A Template Policy that is based on the Layer 2 Firewall Template. It uses Inspection rules from the High-Security Inspection Policy. The Layer 2 Firewall Inspection Template enables deep inspection for all traffic.
Inspection Policy	No Inspection Policy	An Inspection Policy with a set of Inspection rules that do not enforce inspection.
	Medium-Security Inspection Policy	An Inspection Policy with a set of Inspection rules for detecting common threats. The Medium-Security Inspection Policy logs Situations categorized as Suspected Attacks but allows the traffic to pass. The Medium-Security Inspection Policy is suitable for Firewall and Layer 2 Firewall deployments. It is also suitable for inline IPS deployments in asymmetrically-routed networks and IPS deployments in IDS mode. The risk of false positives is low in production use.
	High-Security Inspection Policy	An Inspection Policy with a set of Inspection rules for detecting common threats. The High-Security Inspection Policy terminates Suspected Attacks with an alert. The High-Security Inspection Policy is suitable for Firewall, Layer 2 Firewall, and inline IPS deployments in which extended inspection coverage and strong evasion protection is required. The risk of false positives is moderate in production use. The High-Security Inspection Policy terminates a connection if the security engine cannot see the whole connection. It is recommended that you use the High-Security Inspection Policy as a starting point for your Inspection Policies.

Table 8.1 Default Policy Elements for Stonesoft IPS and Layer 2 Firewall Engines (Continued)

Element Type	Default Element Name	Description
Inspection Policy (*cont.*)	Customized High-Security Inspection Policy	An Inspection Policy that is based on the High-Security Inspection Policy and contains a set of customized Inspection rules. The High-Security Inspection Policy is an example of a highly customized Inspection Policy for network environments in which unconditional inspection coverage and evasion protection are required. The risk of false positives is high in production use. The High-Security Inspection Policy was used when Stonesoft IPS was tested at ICSA Labs and NSS Labs. It provides an example of a customized Inspection Policy.

The default policy elements are introduced into the system when you import and activate a recent dynamic update package (for example, during the installation). The elements may change when you install newer update packages. None of the default policy elements can be modified. However, you can make copies of the default policies if you need to create a modified version. See the *IPS and Layer 2 Firewall Reference Guide* for more information on the predefined policies and templates.

▼ To install a ready-made policy

1. Click the Configuration icon in the toolbar and select **Security Engine**. The Security Engine Configuration view opens.
2. Expand the **Policies** branch and select **IPS Policies** or **Layer 2 Firewall Policies**.
3. Right-click one of the ready-made policies and select **Install Policy**. The Policy Upload Task Properties dialog opens.
4. Select the engine(s).
5. Click **Add**. The selected engines are added to the Target list.
6. Click **OK**. A new tab opens to show the progress of the policy installation.
7. Check that the policy installation is successful.

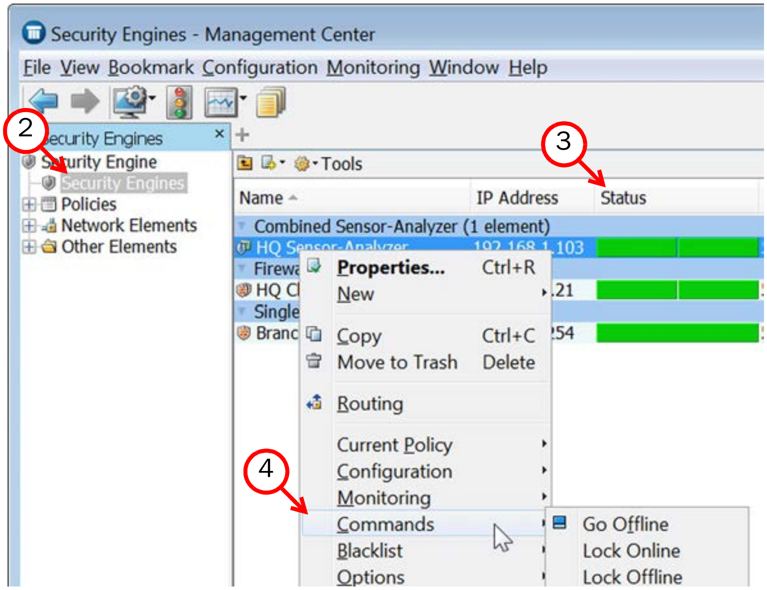
When you install a policy, all the rules in the policy as well as all the IPS engine’s other configuration information (including interface definitions and routing information) are transferred to the engines.

Commanding Engines

After a successful policy installation, your system is ready to process traffic. You can control the engines using the right-click menu.

▼ To check system status and issue commands to engines

1. Click the Configuration icon in the toolbar and select **Security Engine**. The Security Engine Configuration view opens.
2. Select **Security Engines**.



3. Check the status of the engines in the **Status** column. You can select an element to view more information about it in the **Info** panel at the bottom of the window.
4. Use the **Commands** menu to command engines Online/Offline. Only engines in **Online** mode process traffic.

This concludes the configuration instructions in this *Installation Guide*. To continue setting up your system, consult the Management Client *Online Help* (or the *Stonesoft Administrator's Guide*), particularly the *Getting Started* section.

Installing Engines

In this section:

CHAPTER 9

INSTALLING THE ENGINE ON OTHER PLATFORMS

This chapter describes how to install IPS and Layer 2 Firewall engines on standard Intel or Intel-compatible platforms, or on a virtualization platform.

The following sections are included:

Installing the Engine on Intel-Compatible Platforms

Stonesoft hardware appliances are delivered with pre-installed software. If you are using a Stonesoft appliance, configure the software as instructed in the *Appliance Installation Guide* delivered with the appliance.

On other systems, the software is installed from DVDs. Depending on your order, you may have received ready-made Management Center and Security Engine DVDs. If the DVDs are not included in the order, you will first have to create them.

Caution – Check that the Automatic Power Management (APM) and Advanced Configuration and Power Interface (ACPI) settings are disabled in BIOS. Otherwise, the engine may not start after installation or may shut down unexpectedly.

Note – The engines must be dedicated to the IPS or Layer 2 Firewall. No other software can be installed on them.

Configuration Overview

1. If you do not have ready-made installation DVDs, obtain the files from the Stonesoft web site. See Downloading the Installation Files (page 78).
2. Start the installation and select the installation type. See Starting the Installation (page 80).
3. Configure the engines and establish contact with the Management Server. See Configuring the Engine in the Engine Configuration Wizard (page 83).

What's Next?

▶ If you have ready-made DVDs, proceed to Starting the Installation (page 80).

▶ Otherwise, start by Downloading the Installation Files.

Downloading the Installation Files

1. Go to the download page at the Stonesoft web site: https://my.stonesoft.com/download.
2. Download the `.iso` image files.

What's Next?

▶ Continue by Checking File Integrity (page 79).

Checking File Integrity

Before installing the IPS or Layer 2 Firewall engine from downloaded files, check that the installation files have not become corrupt or been modified. Using corrupt files may cause problems at any stage of the installation and use of the system. File integrity is checked by generating an MD5 or SHA-1 file checksum of the downloaded files and by comparing the checksum with the checksum on the download page at the Stonesoft web site.

Windows does not have MD5 or SHA-1 checksum tools by default, but there are several third-party programs available.

▼ To check MD5 or SHA-1 file checksum

1. Look up the correct checksum at https://my.stonesoft.com/download/.
2. Change to the directory that contains the file(s) to be checked.
3. Generate a checksum of the file using the command **`md5sum`** *`filename`* or **`sha1sum`** *`filename`*, where *`filename`* is the name of the installation file.
4. Compare the displayed output to the checksum on the web site. They must match.

Caution – Do not use files that have invalid checksums. If downloading the files again does not help, contact Stonesoft technical support to resolve the issue.

What's Next?

▶ Continue by Creating the Installation DVD.

Creating the Installation DVD

Once you have checked the integrity of the installation files, create the installation DVD from the files. Use a CD-burning application that can correctly read and burn the CD-structure stored in the `.iso` images. If the end result is a DVD file with the original `.iso` file on it, the DVD cannot be used for installation.

What's Next?

▶ Continue by Starting the Installation (page 80).

Starting the Installation

Before you start installing the engines, make sure you have the initial configuration or a one-time password for management contact for each IPS and Layer 2 Firewall engine. These are generated in the Management Center. See Saving the Initial Configuration for Engines (page 62) for more information.

What you see on your screen during the installation may differ from the illustrations in this guide depending on your system configuration.

Caution – Installing the engine software deletes all existing data on the hard disk.

▼ To install an engine from a DVD

1. Insert the engine installation DVD into the drive and reboot the machine. The License Agreement appears.
2. Type **YES** and press Enter to accept the license agreement and continue with the configuration.
3. Select the type of installation: **Full Install** and **Full Install in expert mode**.
   - Type **1** for the normal **Full Install**.
   - Type **2** for the **Full Install in expert mode** if you want to partition the hard disk manually, and continue in Installing the Engine in Expert Mode (page 90).
4. Enter the number of processors:
   - For a uniprocessor machine, type **1** and press Enter.
   - For a multiprocessor machine, type **2** and press Enter.
5. Type **YES** and press Enter to accept automatic hard disk partitioning. The installation process starts.

What's Next?

- ▶ If you want to use the automatic configuration method, do not reboot after the installation finishes. Continue as expalained in Configuring the Engine Automatically with a USB Stick (page 82).
- ▶ Otherwise, remove the DVD and press Enter to reboot when prompted to do so. The Engine Configuration Wizard starts. Continue as explained in Configuring the Engine in the Engine Configuration Wizard (page 83).

Installing the Engine on a Virtualization Platform

The IPS or Layer 2 Firewall engine can be installed as a Security Engine on virtualization platforms that support the deployment of Open Virtual Format (OVF) templates. The same Security Engine software can be used in the Firewall/VPN role, IPS role, or Layer 2 Firewall role. The engine role is selected during the initial configuration of the engine. The following role-specific requirements and limitations apply when the engine is installed on a virtualization platform:

Table 9.1 Role-Specific Requirements and Limitations

Role	Virtual Network Interface Requirements	Limitations for Clusters
IPS	A minimum of three virtual network interfaces.	Clustering is not supported.
Layer 2 Firewall	A minimum of three virtual network interfaces.	Clustering is not supported.

▼ To install the engine on a virtualization platform

1. Install the Stonesoft Management Center as instructed in the *Stonesoft Management Center Installation Guide*.
2. (*Recommended*) Create the resource pool where you will import the virtual appliance package and configure it according to your requirements.
3. Configure the virtual switches to which the IPS or Layer 2 Firewall inline interfaces will be connected:
   - Create a new port group and assign All (4095) as the VLAN ID.
   - Enable the use of promiscuous mode.
4. Download the license from the Stonesoft web site at https://my.stonesoft.com/managelicense.do.
5. Download the virtual appliance package from the Stonesoft web site at https://my.stonesoft.com/download.do.
   - The Stonesoft Security Engine virtual appliance package consists of two files: a compressed disk image file and an OVF file.
   - The OVF file specifies how the virtualization platform creates the appliance and connects it in the virtualized environment.
6. Extract the files from the virtual appliance package.
7. Deploy the OVF template according to the deployment procedure for your virtualization platform.
   - For detailed configuration instructions, see the product documentation for your virtualization platform.
8. Map the networks defined in the OVF template to the networks in your virtualized environment.

What's Next?

▶ Continue by Configuring the Engine in the Engine Configuration Wizard (page 83).

Configuring the Engine Automatically with a USB Stick

The automatic configuration is primarily intended to be used with Stonesoft appliances, and may not work in all environments when you use your own hardware. If the automatic configuration does not work, you can still run the Engine Configuration Wizard as explained in the next section and import or enter the information manually.

When automatic configuration is used, Interface IDs are mapped to physical interfaces in sequential order: Interface ID 0 is mapped to eth0, Interface ID 1 is mapped to eth1, and so on.

Note – The imported configuration does not contain a password for the root account on the engine, so you must set the password manually in the Management Client before you can log in for command line access to the engine. See the Management Client *Online Help* or the *Stonesoft Administrator's Guide* for more information.

▼ To install and configure the engine with a USB stick

1. Make sure you have a physical connection to the appliance using a monitor and keyboard or a serial cable.
2. Insert the USB stick.
3. Remove the DVD and press Enter at the installation finished prompt. The engine reboots, imports the configuration from the USB stick, and makes initial contact to the Management Server.
   - If the automatic configuration fails, and you do not have a display connected, you can check for the reason in the log (`sg_autoconfig.log`) written on the USB stick.
   - If you see a "connection refused" error message, ensure that the Management Server IP address is reachable from the node.

The configuration is complete when the engine successfully contacts the Management Server and reboots itself.

What's Next?

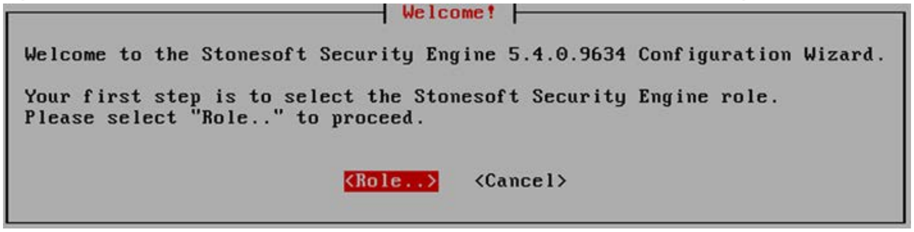
▶ Continue as explained in After Successful Management Server Contact (page 90).

Configuring the Engine in the Engine Configuration Wizard

If you have stored the configuration on a USB memory stick, you can import it to reduce the need for typing in information. See Saving the Initial Configuration for Engines (page 62) for more information about saving the initial configuration.

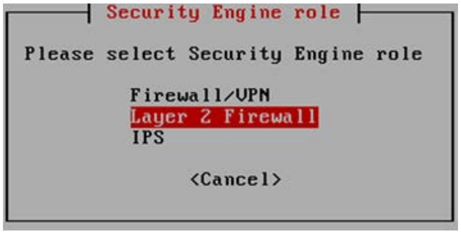
▼ To select the role and the configuration method

1. Highlight **Role** and press Enter to select the role for the Security Engine.

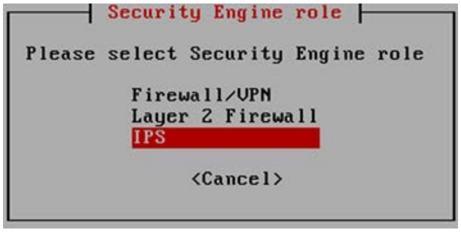


```
Welcome!

Welcome to the Stonesoft Security Engine 5.4.0.9634 Configuration Wizard.

Your first step is to select the Stonesoft Security Engine role.
Please select "Role.." to proceed.

<Role..>    <Cancel>
```

2. Highlight **Layer 2 Firewall** or **IPS** and press Enter. The role-specific Engine Configuration Wizard starts.

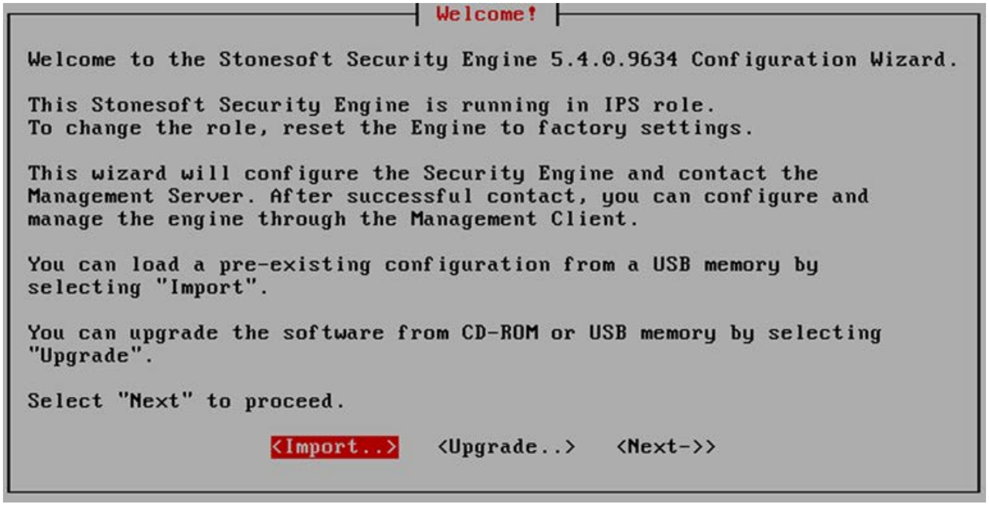


```
Security Engine role

Please select Security Engine role

Firewall/VPN
Layer 2 Firewall
IPS

<Cancel>
```



```
Security Engine role

Please select Security Engine role

Firewall/VPN
Layer 2 Firewall
IPS

<Cancel>
```

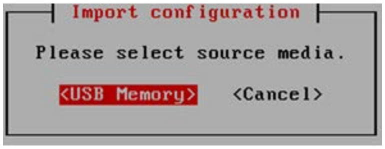
3. Select one of the following configuration methods:
   - Highlight **Import** and press Enter to import a saved configuration.
   - Highlight **Next** and press Enter to manually configure the engine's settings. Proceed to Configuring the Operating System Settings (page 84).



```
Welcome!

Welcome to the Stonesoft Security Engine 5.4.0.9634 Configuration Wizard.

This Stonesoft Security Engine is running in IPS role.
To change the role, reset the Engine to factory settings.

This wizard will configure the Security Engine and contact the
Management Server. After successful contact, you can configure and
manage the engine through the Management Client.

You can load a pre-existing configuration from a USB memory by
selecting "Import".

You can upgrade the software from CD-ROM or USB memory by selecting
"Upgrade".

Select "Next" to proceed.

<Import..>    <Upgrade..>    <Next->>
```

▼ To import the configuration

1. Select **USB Memory** and press Enter.



```
Import configuration

Please select source media.
```

2. Select the correct configuration file for this engine.
3. Highlight **Next** and press Enter to continue.

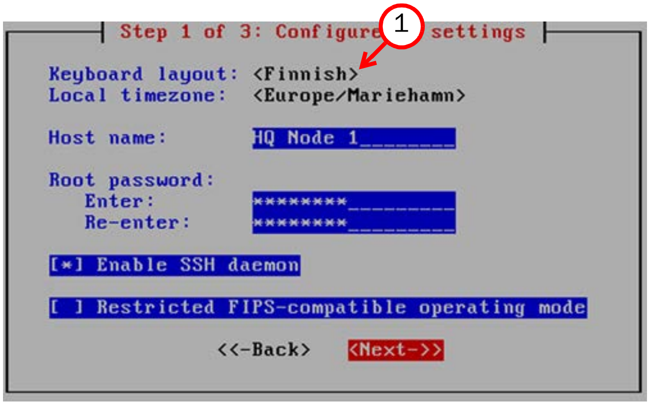
What's Next?

▶ Continue by Configuring the Operating System Settings.

Configuring the Operating System Settings

▼ To set the keyboard layout

1. Highlight the entry field for **Keyboard Layout** and press Enter. The Select Keyboard Layout dialog opens.



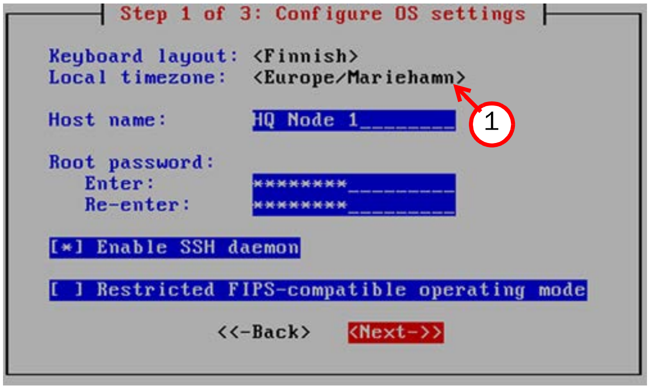
```
Step 1 of 3: Configure settings

Keyboard layout: <Finnish>
Local timezone:  <Europe/Mariehamn>

Host name:       HQ Node 1________

Root password:
   Enter:        *********_________
   Re-enter:     *********_________

[*] Enable SSH daemon

[ ] Restricted FIPS-compatible operating mode
```

2. Highlight the correct layout and press Enter. Type the first letter to move forward more quickly.

Tip – If the desired keyboard layout is not available, use the best-matching available layout, or select US_English.

▼ To set the engine’s timezone

1. Highlight the entry field for **Local Timezone** and press Enter.



```
Step 1 of 3: Configure OS settings

Keyboard layout: <Finnish>
Local timezone:  <Europe/Mariehamn>

Host name:       HQ Node 1_________

Root password:
   Enter:        *********_________
   Re-enter:     *********_________

[*] Enable SSH daemon

[ ] Restricted FIPS-compatible operating mode

              <<-Back>    <Next->>
```

2. Select the correct timezone.

The timezone setting only affects the way the time is displayed on the engine command line. The engine always uses UTC time. The engine’s clock is automatically synchronized with the Management Server’s clock.

▼ To set the rest of the operating system settings

1. Type in the name of the engine.
2. Enter and confirm the password for the user `root`. This is the only account for engine command line access.
3. (*Optional*) Highlight **Enable SSH Daemon** and press the spacebar to allow remote access to engine command line using SSH.

Note – Unless you have a specific need to enable SSH access to the engine command line, we recommend leaving it disabled.

4. Highlight **Next** and press Enter. The Configure Network Interfaces page opens.

What’s Next?

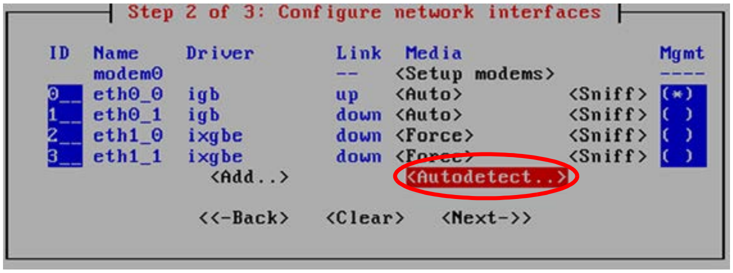
▶ Continue by Configuring the Network Interfaces (page 86).

Configuring the Network Interfaces

The Engine Configuration Wizard can automatically detect which network cards are in use. You can also add interfaces manually if necessary. If the list is not populated automatically, you can launch the autodetect as explained in the illustration below.

▼ To add the network interfaces

➥ Highlight **Autodetect** and press Enter.



```
Step 2 of 3: Configure network interfaces

ID   Name     Driver      Link   Media                  Mgmt
     modem0               --     <Setup modems>         ----
0__  eth0_0   igb         up     <Auto>        <Sniff>  (*)
1__  eth0_1   igb         down   <Auto>        <Sniff>  ( )
2__  eth1_0   ixgbe       down   <Force>       <Sniff>  ( )
3__  eth1_1   ixgbe       down   <Force>       <Sniff>  ( )
                <Add..>           <Autodetect..>

              <<-Back>    <Clear>    <Next->>
```

Check that the detected drivers are correct and that all interfaces have been detected.

What's Next?

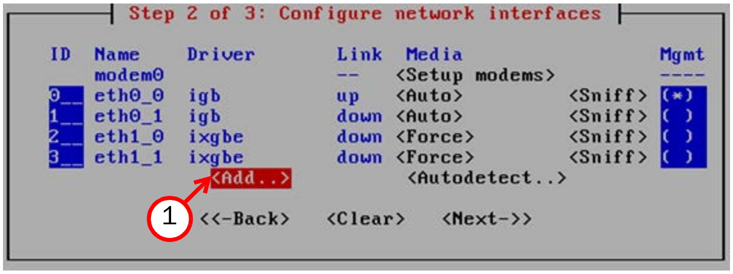
▶ If there are problems, add the network interfaces manually as explained in Defining the Network Interface Drivers Manually.

▶ Otherwise, proceed to Mapping the Physical Interfaces to Interface IDs (page 87).

Defining the Network Interface Drivers Manually

▼ To define the network interface drivers manually

1. Highlight **Add** and press Enter.



```
Step 2 of 3: Configure network interfaces

ID   Name     Driver      Link   Media                  Mgmt
     modem0               --     <Setup modems>         ----
0__  eth0_0   igb         up     <Auto>        <Sniff>  (*)
1__  eth0_1   igb         down   <Auto>        <Sniff>  ( )
2__  eth1_0   ixgbe       down   <Force>       <Sniff>  ( )
3__  eth1_1   ixgbe       down   <Force>       <Sniff>  ( )
                <Add..>           <Autodetect..>

              <<-Back>    <Clear>    <Next->>
```

2. Select a driver that is used for your network card(s) and press Enter.

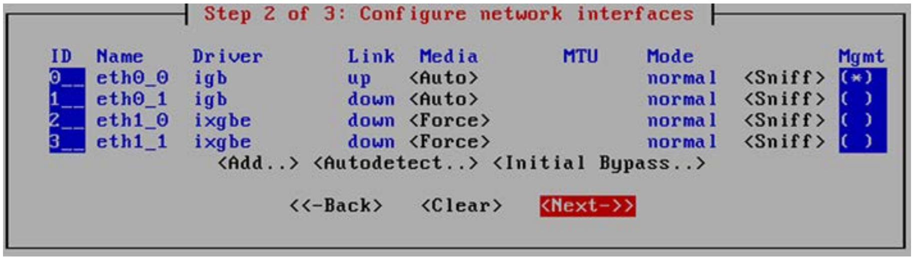
What's Next?

▶ Repeat as necessary, then map the interfaces to Interface IDs as explained in Mapping the Physical Interfaces to Interface IDs (page 87).

Mapping the Physical Interfaces to Interface IDs

▼ To map the physical interfaces to Interface IDs

1. Change the **ID**s as necessary to define how physical interfaces are mapped to the interface IDs you defined in the IPS or Layer 2 Firewall element.



```
                    Step 2 of 3: Configure network interfaces

   ID  Name    Driver        Link  Media       MTU    Mode            Mgmt
   0__ eth0_0  igb           up   <Auto>             normal  <Sniff> (*)
   1__ eth0_1  igb           down <Auto>             normal  <Sniff> ( )
   2__ eth1_0  ixgbe         down <Force>            normal  <Sniff> ( )
   3__ eth1_1  ixgbe         down <Force>            normal  <Sniff> ( )
             <Add..> <Autodetect..> <Initial Bypass..>

                  <<-Back>   <Clear>   <Next->>
```

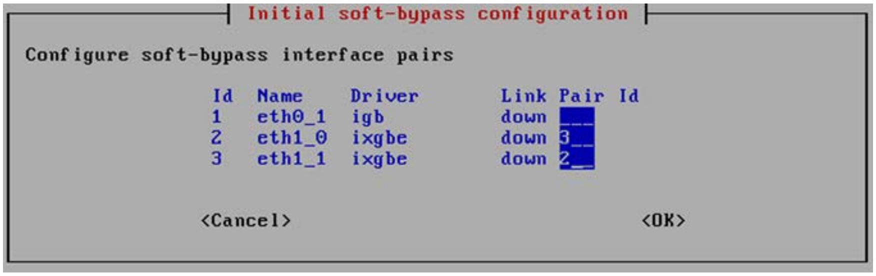
2. If necessary, highlight the **Media** column and press Enter to match the speed/duplex settings to those used in each network.

Tip – You can use the Sniff option to troubleshoot the network interfaces. Select **Sniff** on an interface to run the network sniffer on that interface

3. Highlight the **Mgmt** column and press the spacebar to select the interface for contact with the Management Server.

Note – The Management interface must be the same interface that is configured as the Management Interface for the corresponding engine element in the Management Center.

4. *(Optional, IPS only)* Highlight **Initial Bypass** and press Enter if you want to set the IPS engine temporarily to the initial bypass state and define one or more soft-bypass interface pairs through which traffic flows.
   - Setting the appliance to the initial bypass state can be useful during IPS appliance deployment if bypass network interface pairs on the appliance are in the Normal mode. Initial bypass allows traffic to flow through the IPS appliance until the initial configuration is ready and an IPS policy is installed on the appliance. Do not set the initial bypass state when the bypass network interface pairs are in the Bypass mode.
   - In the illustration below, interface 2 is soft-bypassed with interface 3.



```
               Initial soft-bypass configuration

 Configure soft-bypass interface pairs

                Id  Name    Driver      Link Pair Id
                1   eth0_1  igb         down ___
                2   eth1_0  ixgbe       down 3__
                3   eth1_1  ixgbe       down 2__


             <Cancel>                           <OK>
```

5. Highlight **Next** and press Enter to continue.

What's Next?

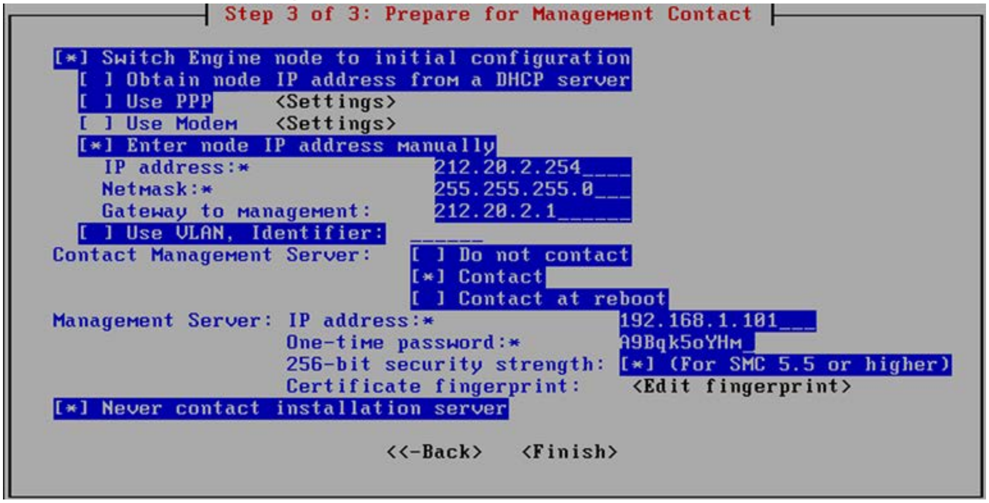
▶ Proceed to Contacting the Management Server (page 88).

Contacting the Management Server

The Prepare for Management Contact page opens. If the initial configuration was imported, most of this information is automatically filled in.

Note – If there is an intermediate firewall between this engine and the Management Server, make sure that the intermediate firewall's policy allows the initial contact and all subsequent communications. See Default Communication Ports (page 133) for a listing of the ports and protocols used.

Before the engine can make initial contact with the Management Server, you activate an initial configuration on the engine. The initial configuration contains the information that the engine needs to connect to the Management Server for the first time.



```
                    Step 3 of 3: Prepare for Management Contact

   [*] Switch Engine node to initial configuration
     [ ] Obtain node IP address from a DHCP server
     [ ] Use PPP      <Settings>
     [ ] Use Modem    <Settings>
     [*] Enter node IP address manually
       IP address:*                 212.20.2.254____
       Netmask:*                    255.255.255.0___
       Gateway to management:       212.20.2.1______
     [ ] Use VLAN, Identifier:    ______
   Contact Management Server:     [ ] Do not contact
                                  [*] Contact
                                  [ ] Contact at reboot
   Management Server: IP address:*                 192.168.1.101___
                      One-time password:*          A9Bqk5oYHm_
                      256-bit security strength:   [*] (For SMC 5.5 or higher)
                      Certificate fingerprint:      <Edit fingerprint>
   [*] Never contact installation server

                          <<-Back>    <Finish>
```

What's Next?

- If the IP address of the control interface is assigned by a DHCP server, select **Obtain Node IP address from a DHCP server** and continue in Filling in the Management Server Information.
- If the IP address of the control interface is static, select **Enter node IP address manually** and fill in the **IP address** and **Netmask** (always), and **Gateway to management** (if the Management Server is not in a directly connected network).

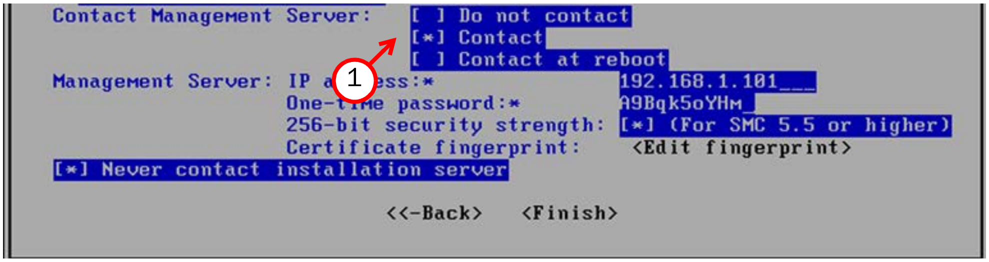
Filling in the Management Server Information

In the second part of the configuration, you define the information needed for establishing a trust relationship between the engine and the Management Server.

If you do not have a one-time password for this engine, see the Saving the Initial Configuration (page 61).

▼ To fill in the Management Server information

1. Select **Contact** or **Contact at Reboot** and press the spacebar.



```
Contact Management Server:  [ ] Do not contact
                            [*] Contact
                            [ ] Contact at reboot
Management Server: IP address:*              192.168.1.101___
                   One-time password:*       A9Bqk5oYHm_
                   256-bit security strength: [*] (For SMC 5.5 or higher)
                   Certificate fingerprint:    <Edit fingerprint>
[*] Never contact installation server

                        <<-Back>    <Finish>
```

2. Enter the Management Server IP address and the one-time password.

Note – The one-time password is engine-specific and can be used only for one initial connection to the Management Server. Once initial contact has been made, the engine receives a certificate from the Management Server for identification. If the certificate is deleted or expires, you must repeat the initial contact using a new one-time password.

3. (*Optional*) Select **256-bit Security Strength** and press the spacebar to use 256-bit encryption for the connection to the Management Server. 256-bit encryption must also be enabled for the Management Server. See the *Stonesoft Management Center Installation Guide* for more information.
4. (*Optional*) Highlight **Edit Fingerprint** and press Enter. Fill in the Management Server's certificate fingerprint (also shown when you saved the initial configuration). Filling in the certificate fingerprint increases the security of the communications.
5. Highlight **Finish** and press Enter. The engine now tries to make initial Management Server contact.

- If you see a "connection refused" error message, ensure that the one-time password is correct and the Management Server IP address is reachable from the node. Save a new initial configuration if you are unsure about the password.
- If there is a firewall between the engine and the Management Server or Log Server, make sure that the firewall's policy allows the initial contact and the subsequent communications. See Default Communication Ports (page 133) for a list of the ports and protocols used.

If the initial management contact fails for some reason, the configuration can be started again with the `sg-reconfigure` command.

What's Next?

▶ Continue as explained in After Successful Management Server Contact (page 90).

After Successful Management Server Contact

The initial configuration does not contain any working IPS or Layer 2 Firewall policy. You must install a policy on the engine using the Management Client to make it operational. After you see a notification that Management Server contact has succeeded, the IPS or Layer 2 Firewall engine installation is complete and the engine is ready to receive a policy. The engine element's status changes in the Management Client from **Unknown** to **No Policy Installed**, and the connection state is **Connected**, indicating that the Management Server can connect to the node.

What's Next?

- To finish the engine configuration, proceed to Configuring Routing and Installing Policies (page 67).

Installing the Engine in Expert Mode

To start the installation, reboot from the DVD. See Installing the Engine on Intel-Compatible Platforms (page 78).

The difference between the normal and expert installation is that in expert mode, you partition the hard disk manually. If you are unfamiliar with partitioning hard disks in Linux, we recommend that you use the normal installation process.

Caution – When using the command prompt, use the `reboot` command to reboot and `halt` command to shut down the node. Do not use the `init` command. You can also reboot the node using the Management Client.

Partitioning the Hard Disk Manually

Typically, you need five partitions for the IPS or Layer 2 Firewall as explained in Table 9.2. The partitions are allocated in two phases. First, disk partitions are created and second, the partitions are allocated for their use purposes.

Caution – Partitioning deletes all the existing data on the hard disk.

To partition the hard disk

1. If you are asked whether you want to create an empty partition table, type **y** to continue.
2. When prompted, press Enter to continue. The partition table is displayed.
3. Create the partitions for the engine as follows:

Table 9.2 Partitions for the Engine

Partition	Flags	Partition Type	Filesystem Type	Size	Description
Engine root A	bootable	Primary	Linux	200 MB	The bootable root partition for the engine.

Table 9.2 Partitions for the Engine (Continued)

Partition	Flags	Partition Type	Filesystem Type	Size	Description
Engine root B		Primary	Linux	200 MB	Alternative root partition for the engine. Used for the engine upgrade.
Swap		Logical	Linux swap	Twice the size of physical memory.	Swap partition for the engine.
Data		Logical	Linux	500 MB or more	Used for the boot configuration files and the root user's home directory.
Spool		Logical	Linux	All remaining free disk space.	Used for spooling

4. Check that the partition table information is correct.
5. Select **Write** to commit the changes and confirm by typing **yes**.
6. Select **Quit** and press Enter.

Allocating Partitions

After partitioning the hard disk, the partitions are allocated for the engine.

▼ To allocate the partitions

1. Check that the partition table is correct. Type **yes** to continue.
2. Using the partition numbers shown in the partition table, assign the partitions for the engine, for example:
   - For the engine root A partition, type **1**.
   - For the engine root B partition, type **2**.
   - For the swap partition, type **5**.
   - For the data partition, type **6**.
   - For the spool partition, type **7**.
3. Check the partition allocation and type **yes** to continue. The engine installation starts.
4. When installation is complete, remove the DVD from the machine and press Enter to reboot.

What's Next?

▶ Continue the configuration as described in Configuring the Engine Automatically with a USB Stick (page 82) or Configuring the Engine in the Engine Configuration Wizard (page 83).

UPGRADING

In this section:

CHAPTER 10

UPGRADING

This chapter explains how to upgrade your IPS and Layer 2 Firewall engines. When there is a new version of the IPS and Layer 2 Firewall engine software, you should upgrade as soon as possible.

The following sections are included:

Getting Started With Upgrading

How Engine Upgrades Work

The primary way to upgrade engines is a remote upgrade through the Management Server. The upgrade package is imported on the Management Server manually or automatically. You can then apply it to selected engines through the Management Client. Alternatively, the upgrade can be done on the command line when it is more convenient (for example, for spare appliances in storage).

The engines have two alternative partitions for the engine software. When you install a new software version, the new version is installed on the inactive partition and the current version is preserved to allow rollback if the upgrade is unsuccessful. If the engine is not able to return to operation, the engine automatically rolls back to the previous software version at the next reboot. You can also use the **sg-toggle-active** command to roll back to the previous engine version. See Command Line Tools (page 111) for more information.

You can upload and activate the new software separately. For example, you can upload the upgrade during office hours and activate it later during a service window.

The currently installed working configuration (routing, policies, etc.) is stored separately and is not changed in an upgrade or a rollback. Although parts of the configuration may be version-specific (for example, if system communication ports are changed), the new version can use the existing configuration. Any potential version-specific adjustments are made when you refresh the policy after the upgrade.

Limitations

It is not possible to upgrade between 32-bit and 64-bit versions of the software. If you are running the software on a compatible standard server, you can reinstall the software using the other version. In clusters, 32-bit and 64-bit nodes cannot be online simultaneously. Stonesoft appliances support only the software architecture version that they are pre-installed with. Changing the architecture for third-party hardware using software licenses requires a full re-installation using a DVD.

Due to changes in the IPS components, additional steps are required for upgrading legacy Sensors, Sensor Clusters, and combined Sensor-Analyzers to version 5.4 or higher. See Upgrading Legacy IPS Engines (page 104).

What Do I Need to Know Before I Begin

The Management Center must be up to date before you upgrade the engines. An old Management Center version may not be able to recognize the new engine versions or generate a valid configuration for them. A newer Stonesoft Management Center version is compatible with several older engine versions. See the Release Notes available at http://www.stonesoft.com/en/customer_care/kb/ for version-specific compatibility information.

During a cluster upgrade, it is possible to have the upgraded nodes online and operational side by side with the older version nodes. This way, you can upgrade the nodes one by one while the other nodes handle the traffic. However, you must upgrade all the nodes to the same version as soon as possible, as prolonged use with mismatched versions is not supported.

To check the current engine software version, select the engine in the System Status view. The engine version is displayed on the General tab in the Info panel. If the Info panel is not shown, select **View→Info**.

Before upgrading the engines, read the Release Notes for the new engine version.

Configuration Overview

The following steps are needed for upgrading the engines:

1. *(If automatic download of engine upgrades is not enabled)* Obtain the installation files and check the installation file integrity. See Obtaining Installation Files (page 97).
2. (*If you are upgrading engines locally)* Create the installation DVDs from the files with a DVD-burning application that can correctly read and burn the DVD-structure stored in the .iso images.
3. *(If automatic license updates are not enabled)* Update the licenses. See Upgrading or Generating Licenses (page 98).
4. Upgrade the engines one at a time. Confirm that the upgraded engine operates normally before upgrading the next engine. See Upgrading Engines Remotely (page 102) or Upgrading Engines Locally (page 106).

Obtaining Installation Files

If the Management Server is not set up to download engine upgrades automatically or if you want to upgrade engines locally, you must download the installation files manually and check the installation file integrity using the MD5 or SHA-1 file checksums. Windows does not have MD5 or SHA-1 checksum programs by default, but there are several third-party programs available.

▼ To manually download an engine upgrade file

1. Go to the Stonesoft Downloads page at https://my.stonesoft.com/download.do.
2. Enter the Proof-of-License (POL) or Proof-of-Serial (POS) code in the **License Identification** field and click **Submit**.
3. Click **Stonesoft Security Engine Downloads**. The Stonesoft Security Engine Downloads page opens.
4. Download the installation file. There are two types of packages available:
   - The .zip file is used in the remote upgrade on all supported platforms. It can also be used for a local upgrade from a USB memory stick or a non-bootable DVD.
   - The .iso download allows you to create a bootable installation DVD for a local upgrade on all supported platforms.
5. Change to the directory that contains the file(s) to be checked.
6. *(Linux only)* Generate a checksum of the file using the command **md5sum** *filename* or **sha1sum** *filename*, where *filename* is the name of the installation file.
   - For Windows, see the documentation for the third-party checksum program.

Example

```
$ md5sum sg_engine_1.0.0.1000.iso
869aecd7dc39321aa2e0cfaf7fafdb8f sg_engine_1.0.0.1000.iso
```

7. Compare the displayed output to the checksum on the web site.

Caution – Do not use files that have invalid checksums. If downloading the files again does not help, contact Stonesoft Support to resolve the issue.

▼ To prepare a downloaded .zip file for a remote upgrade

1. Log in to the Management Client and select **File→Import→Import Engine Upgrades**.
2. Select the engine upgrade (`sg_engine_`*`version`*`_`*`platform`*`.zip`) file and click **Import**. The status bar at the bottom of the Management Client window shows the progress of the import.

▼ To prepare a downloaded .zip file for a local upgrade

➥ Copy the file to the root directory of a USB memory stick or a DVD.

▼ To prepare a downloaded .iso file for a local upgrade

➥ Create the installation DVD for the engines with a DVD-burning application that can correctly read and burn the DVD-structure stored in the .iso images. If the end result is a DVD file with the original .iso file on it, the DVD cannot be used for installation.

What's Next?

- If you are sure you do not need to upgrade your licenses, continue by Upgrading Engines Remotely (page 102) or Upgrading Engines Locally (page 106).
- Otherwise, continue by Upgrading or Generating Licenses.

Upgrading or Generating Licenses

When you installed the engine software for the first time, you installed licenses that work with all versions of the engine up to that particular version. If the first two numbers in the old and the new versions are the same, the upgrade can be done without upgrading licenses (for example, when upgrading from 1.2.3 to 1.2.4). When either of the first two numbers in the old version and the new version are different, you must first upgrade your licenses (for example, when upgrading from 1.2.3 to 1.3.0). By default, licenses are regenerated and installed automatically. You can also upgrade the licenses at the Stonesoft web site. You can view and download your current licenses online at the Stonesoft License Center at www.stonesoft.com/en/customer_care/licenses/.

What's Next?

- If you do not need to upgrade licenses and you want to upgrade the engines, proceed to Upgrading Engines Remotely (page 102) or Upgrading Engines Locally (page 106).
- If you need new licenses and you want to upgrade the licenses one at a time, proceed to Upgrading Licenses Under One Proof Code (page 99).
- If you need new licenses and you want to upgrade several licenses at once, proceed to Upgrading Licenses Under Multiple Proof Codes (page 99).

Upgrading Licenses Under One Proof Code

A license file generated under one proof-of-license (POL) or proof-of-serial (POS) code can contain the license information for several components. You can also use the multi-upgrade form to upgrade the licenses. See Upgrading Licenses Under Multiple Proof Codes (page 99).

▼ To generate a new license

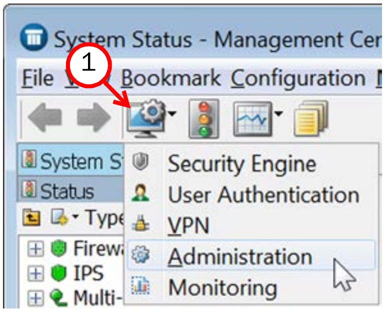
1. Go to the Stonesoft License Center at www.stonesoft.com/en/customer_care/licenses/.
2. Enter the POL or POS code in the **License Identification** field and click **Submit**. The License Center page opens.
3. Click **Update**. The License View page opens.
4. Follow the directions to upgrade the license.

Upgrading Licenses Under Multiple Proof Codes

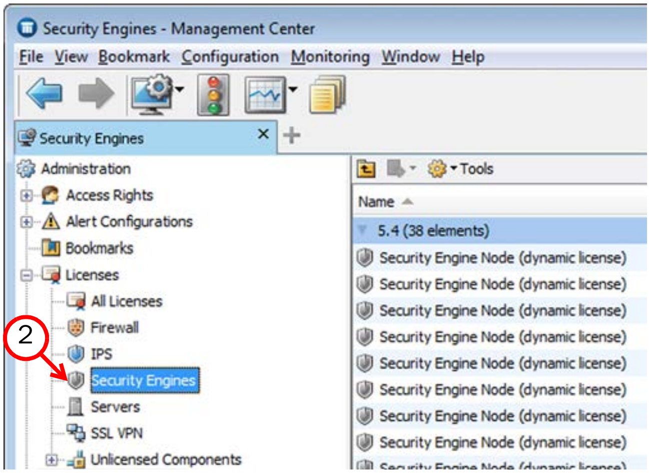
If you have several existing licenses with different proof-of-license (POL) or proof-of-serial (POS) codes that you need to upgrade, you can generate all of the new licenses at the same time.

▼ To upgrade multiple licenses

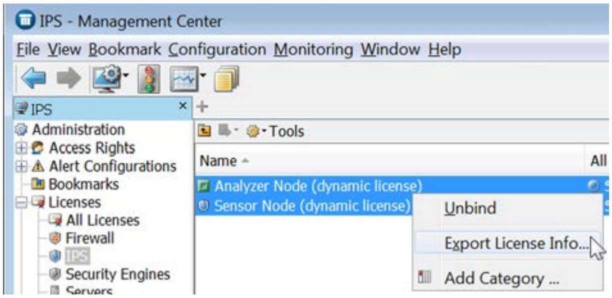
1. Click the **Configuration** icon and select **Administration**. The Administration Configuration view opens.



2. Browse to **Licenses→Security Engines** or **Licenses→IPS** depending on the type of licenses you have.

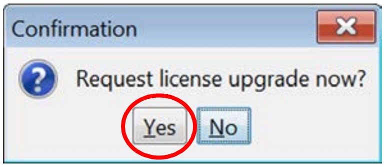

Security Engines - Management Center
File
View
Bookmark
Configuration
Monitoring
Window
Help
Security Engines
Administration
Access Rights
Alert Configurations
Bookmarks
Licenses
All Licenses
Firewall
IPS
Security Engines
Servers
SSL VPN
Unlicensed Components
2
Tools
Name
5.4 (38 elements)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)

3. Ctrl-select or Shift-select the licenses you want to upgrade.



4. Right-click one of the selected items and select **Export License Info**. The Save License Upgrade Request dialog opens.

5. Select the location at which to save the license file in the dialog that opens. You are prompted to request a license upgrade.



Request license upgrade now?

6. Click **Yes**. The Stonesoft web site opens.

7. Browse to **Customer Care→Licenses**.

8. Enter the POL or POS code in the **License Identification** field and click **Submit**. The License Center page opens.

9. Click the **Multi-Upgrade Licenses** link on the right. The Upload Multi-Upgrade Licenses page opens.

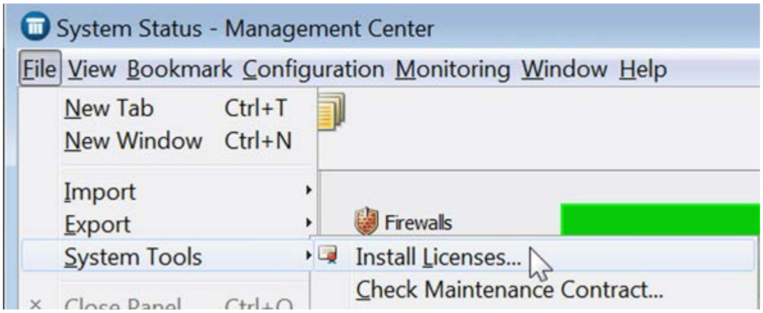
10. Enter the information needed for the upgrade request and select or upload the license file(s) to update.

11. Click **Submit** to upload the license request. A confirmation page opens, showing the details of your request.
    - The upgraded licenses are e-mailed to you in a .zip file.

Installing Licenses

▼ To install licenses

1. Select **File→System Tools→Install Licenses**.


System Status - Management Center
File View Bookmark Configuration Monitoring Window Help
New Tab Ctrl+T
New Window Ctrl+N
Import
Export
System Tools
Close Panel Ctrl+Q
Firewalls
Install Licenses...
Check Maintenance Contract...

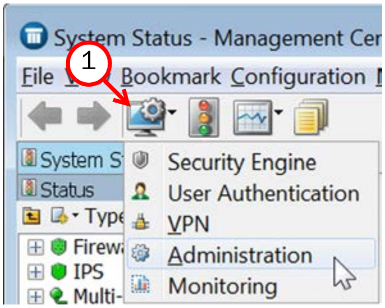
2. Select one or more license files and click **Install**. The new licenses are installed.

Checking the Licenses

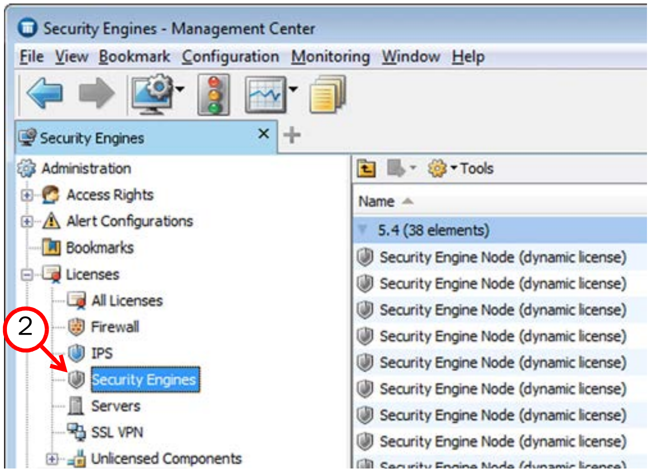
After installing the upgraded licenses, check the license information. When you upgrade licenses, the old licenses are automatically replaced with the new licenses.

▼ To check the licenses

1. Click the **Configuration** icon and select **Administration**. The Administration Configuration view opens.



2. Browse to **Licenses→Security Engines** or **Licenses→IPS**, depending on the type of licenses you have. The licenses and their status are displayed.


Security Engines - Management Center
File
View
Bookmark
Configuration
Monitoring
Window
Help
Security Engines
Administration
Access Rights
Alert Configurations
Bookmarks
Licenses
All Licenses
Firewall
IPS
Security Engines
Servers
SSL VPN
Unlicensed Components
2
Tools
Name
5.4 (38 elements)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)
Security Engine Node (dynamic license)

3. Verify that all of the engines are correctly licensed.
   - If any engines are not correctly licensed, you may need to upgrade or generate the licenses again. See Upgrading or Generating Licenses (page 98).

What's Next?

- ▶ If you want to upgrade the engines remotely through the Management Server, proceed to Upgrading Engines Remotely (page 102).
- ▶ If you want to upgrade the engines on the engine command line, proceed to Upgrading Engines Locally (page 106).

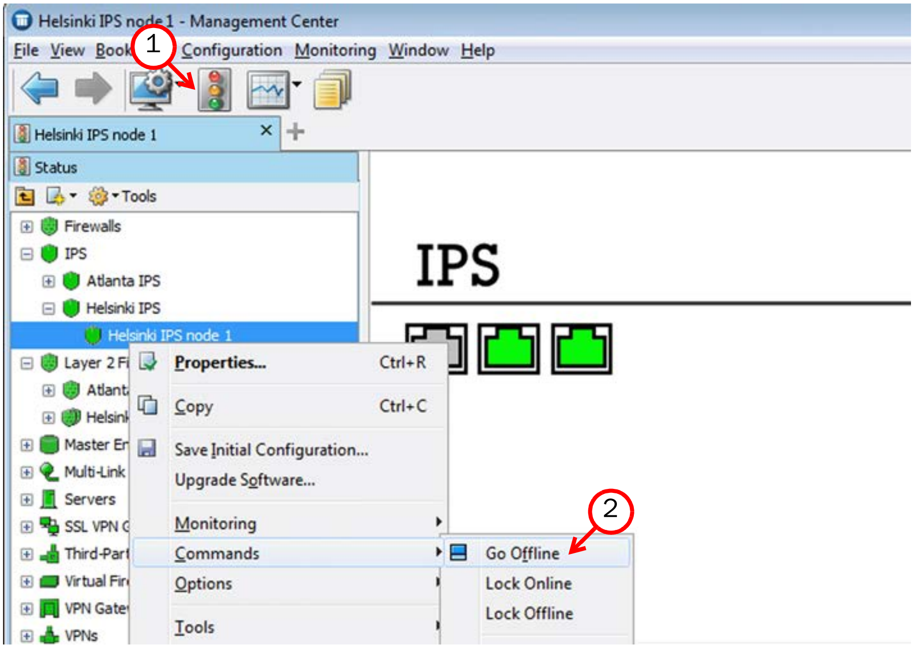
Upgrading Engines Remotely

You can upgrade the engines through the Management Server by importing the upgrade package manually or automatically. You can then activate the upgrade package or you can transfer the upgrade package to the engine and activate it separately later, for example, during a break in service. You can also create a scheduled Task for the remote upgrade as instructed in the *Stonesoft Administrator's Guide* or in the Management Client *Online Help*.

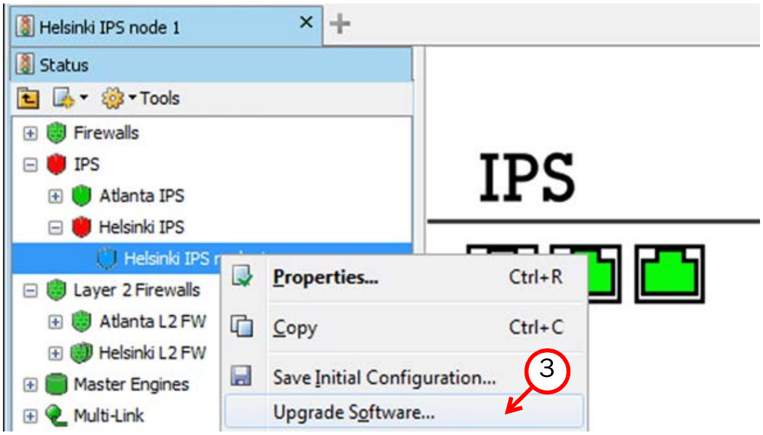
During an IPS or Layer 2 Firewall Cluster upgrade, it is possible to have the upgraded nodes online and operational alongside the older version nodes. However, you must upgrade all the nodes to the same version as soon as possible, as prolonged use with mismatched versions is not supported.

▼ To upgrade the engine

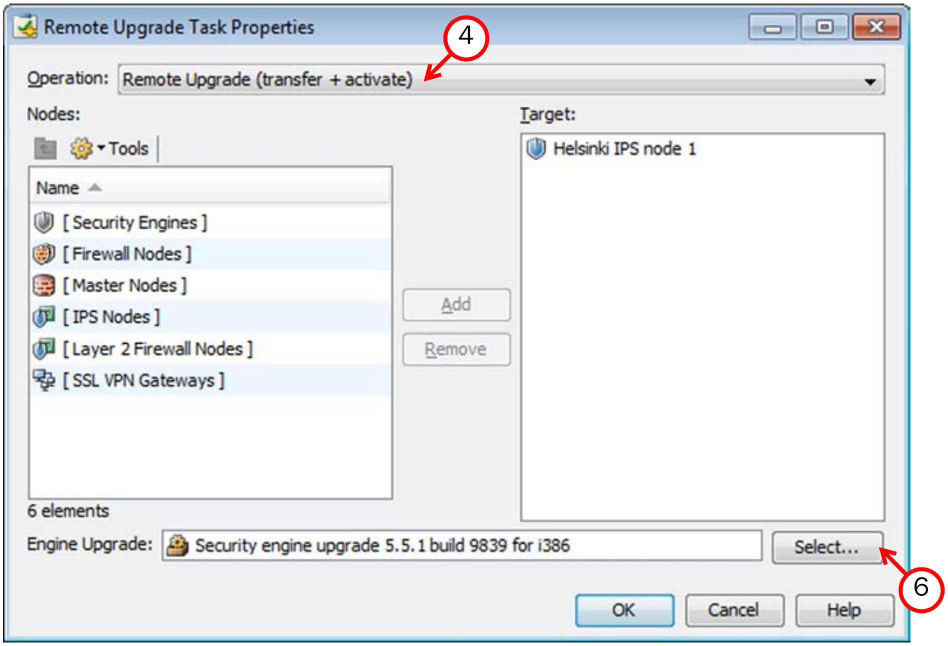
1. Click the System Status icon. The System Status view opens.



2. If you want to activate the new version immediately, right-click the engine node and select **Commands→Go Offline**.



3. Right-click the engine node and select **Upgrade Software**. The Remote Upgrade Task Properties dialog opens.



Operation: Remote Upgrade (transfer + activate)

Target: Helsinki IPS node 1

Engine Upgrade: Security engine upgrade 5.5.1 build 9839 for i386

4. Select the type of **Operation** you want to perform:
   - **Remote Upgrade (transfer + activate)**: install the new software and reboot the node with the new version of the software.
   - **Remote Upgrade (transfer)**: install the new software on the node without an immediate reboot and activation. The node continues to operate with the currently installed version until you choose to activate the new version.
   - **Remote Upgrade (activate)**: reboot the node and activate the new version of the software that has been installed earlier.

5. Check the **Target** node selection and change it, if necessary.

6. Select the correct **Engine Upgrade** file and click **OK**. A new tab opens, showing the progress of the upgrade. The time it takes to upgrade the node varies depending on the

performance of your engine and the network environment. Click **Abort** if you want to stop the upgrade.

7. Refresh the policy of the upgraded engine to make sure any possible changes specific to the new software version are transferred to the engine.

If you chose to activate the new configuration, the engine is automatically rebooted and the upgraded engine is brought to the online state once the engine is successfully upgraded.

If you are upgrading an IPS or Layer 2 Firewall Cluster, we recommend beginning the upgrade on the next node only when the upgraded node is back online.

What's Next?

- Upgrade any other engines in the same way.
- Otherwise, the upgrade is complete.

Upgrading Legacy IPS Engines

Prior to version 5.4, IPS engines consisted either of separate Sensor and Analyzer engines, or combined Sensor-Analyzer engines. In version 5.4, the Analyzer functionalities have been transferred to the Log Server and to the Security Engines, and the Analyzer is no longer used. Because of this change, additional steps are required for upgrading legacy Sensors, Sensor Clusters, and combined Sensor-Analyzers to version 5.4 or higher. To begin the upgrade, proceed to the relevant section below:

What's Next?

- Upgrading Sensors and Sensor Clusters
- Upgrading a Legacy Sensor-Analyzer to a Single IPS Engine (page 105)

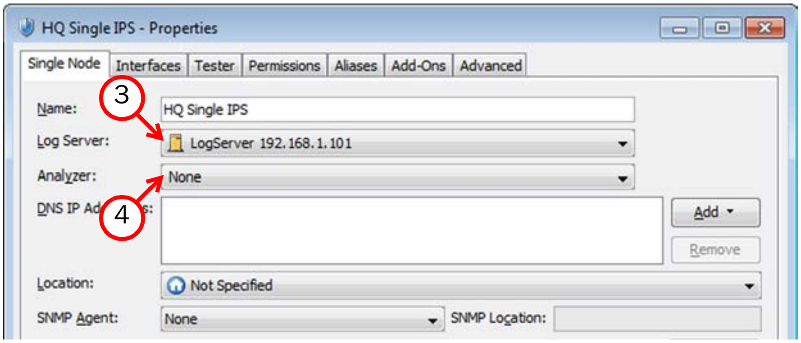
Upgrading Sensors and Sensor Clusters

To upgrade Sensors and Sensor Clusters

1. Upgrade the engine software as instructed in Upgrading Engines Remotely (page 102).

Note – If you are upgrading a legacy Sensor Cluster, upgrade all the nodes of the cluster before proceeding to Step 2.

2. Open the properties of the upgraded engine or engine cluster.



HQ Single IPS - Properties

Name: HQ Single IPS

Log Server: LogServer 192.168.1.101

Analyzer: None

DNS IP Addresses:

Location: Not Specified

SNMP Agent: None

SNMP Location:

3. Make sure a **Log Server** is selected.
4. Select **None** for the **Analyzer**.
5. Click **OK**.
6. Refresh the policy of upgraded engine to make sure any possible changes specific to the new software version are transferred to the engine.

What's Next?

▶ Upgrade any other legacy Sensors or Sensor Clusters in the same way, then proceed to Removing Unused Analyzer Elements (page 106)

Upgrading a Legacy Sensor-Analyzer to a Single IPS Engine

When you upgrade a legacy Sensor-Analyzer engine, you convert the combined Sensor-Analyzer into a Single IPS element. The Analyzer element is automatically removed during the conversion.

▼ To upgrade a legacy Sensor-Analyzer to a Single IPS engine

1. Select **Monitoring→System Status**. The System Status view opens.
2. Expand the Sensor-Analyzer element until you can see the Sensor and Analyzer nodes.
3. Upgrade the engine software as instructed in Upgrading Engines Remotely (page 102).
4. Right-click the Sensor-Analyzer element and select **Configuration→Upgrade to Single IPS**. The Sensor-Analyzer properties dialog opens.
5. Select the **Log Server** to which event data is sent.
6. Make sure **None** is selected for the **Analyzer**.
7. Click **OK**. The conversion begins.
8. Refresh the policy of the upgraded engine to make sure any possible changes specific to the new software version are transferred to the engine.

What's Next?

▶ Upgrade any other legacy Sensor-Analyzers in the same way.

▶ Otherwise, the upgrade is complete.

Removing Unused Analyzer Elements

When you upgrade legacy Sensors or Sensor Clusters to version 5.4 IPS engines, existing Analyzer elements are kept in the system, but are no longer used. After all legacy Sensors or Sensor Clusters have been upgraded, you can safely remove any unused Analyzer elements.

▼ To remove an unused Analyzer element

1. Select **Monitoring→System Status**. The System Status view opens.
2. Right-click the Analyzer and select **Tools→References**. If there are any references to the Analyzer, remove the references before deleting the element.
3. Right-click the Analyzer element and select **Delete**. You are prompted to confirm that you want to move the element to the Trash.
4. Click **Yes**. The element is moved to the Trash.
   - (*Multiple Management Servers*) If the Management Server databases are not synchronized, you are prompted again to confirm that you want to move the Analyzer element to the Trash. Type **YES** to confirm.
5. Select **View→Trash**.
6. Right-click the Analyzer element that you moved to the Trash and select **Delete**. A confirmation dialog opens.
7. Click **Yes** to permanently delete the Analyzer element.

Upgrading Engines Locally

It is also possible to upgrade the engines on the engine command line as described in this section. Upgrading locally requires a physical connection to the engine using a monitor and keyboard or a serial cable.

During an IPS or Layer 2 Firewall cluster upgrade, it is possible for the upgraded nodes to be online and operational side by side with the older version nodes. However, you must upgrade all the nodes to the same version as soon as possible, as prolonged use with mismatched versions is not supported.

What's Next?

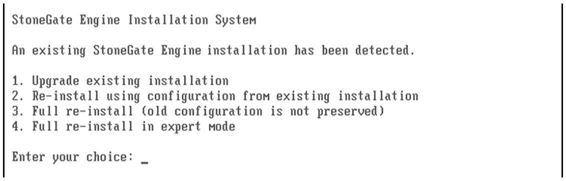
- ▶ If the hardware has a DVD drive (a USB DVD drive can be used) and you have an installation DVD, proceed to Upgrading From an Engine Installation DVD (page 107).
- ▶ If you want to upgrade from a .zip file on a USB stick or on a DVD, proceed to Upgrading From a .zip File (page 108).

Upgrading From an Engine Installation DVD

You can upgrade the engines to the latest version from a DVD that was shipped to you by Stonesoft, or from a DVD that you have created from an .iso image that you downloaded from the Stonesoft web site.

▼ To upgrade the engine from an engine installation DVD

1. Log in to the node as **root** with the password you set for the engine (you can set the password through the Management Client).
2. Insert the DVD into the engine's DVD drive.
3. Reboot the node from the DVD with the command **reboot** (*recommended*) or by cycling the power (if you cannot log in). You are promoted to select the upgrade type.



```
StoneGate Engine Installation System

An existing StoneGate Engine installation has been detected.

1. Upgrade existing installation
2. Re-install using configuration from existing installation
3. Full re-install (old configuration is not preserved)
4. Full re-install in expert mode

Enter your choice: _
```

4. Enter **1** to upgrade the existing installation and press Enter to continue. The upgrade process starts.
5. When the process is finished, eject the DVD and press Enter to reboot.
   - If the Engine Configuration Wizard opens, configure the engine in the same way as after the first installation. See Configuring the Engine in the Engine Configuration Wizard (page 83) for instructions.
6. When the upgrade is finished, right-click the node in the Management Client and select **Commands→Go Online**.

If you are upgrading an IPS or Layer 2 Firewall Cluster, we recommend beginning the upgrade on the next node only when the upgraded node is back online.

What's Next?

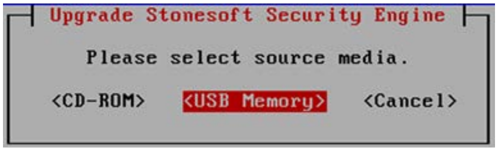
- ▶ Upgrade any other engines in the same way.
- ▶ Otherwise, the upgrade is complete.

Upgrading From a .zip File

Follow the instructions below if you want to use a .zip file to upgrade the engine software locally on the engine command line.

▼ To upgrade the engine locally from a .zip file

1. Log in to the node as **`root`** with the password set for the engine (you can set the password through the Management Client).
2. Insert the USB stick or the DVD.
3. Run the command `sg-reconfigure`. The Engine Configuration Wizard opens.
4. Select **Upgrade** and press Enter.



Upgrade Stonesoft Security Engine

Please select source media.

5. Select the source media where the upgrade file is located.
6. (*Optional*) If you have not already done so, select **Calculate SHA1** to calculate the checksum. The calculation takes some time. The calculated checksum must be identical to the one from the .zip file.

Caution – Do not use files that have invalid checksums. Select Cancel if the checksum does not match and acquire a new copy of the upgrade file.

7. Select **OK**. The software is upgraded.
8. When prompted, press Enter. The engine reboots to the new version.

What's Next?

- ▶ Upgrade any other engines in the same way.
- ▶ Otherwise, the upgrade is complete.

APPENDICES

In this section:

Appendix A

Command Line Tools

This appendix describes the command line tools for Stonesoft Management Center and the engines.

Note – Using the Management Client is the recommended configuration method, as most of the same tasks can be done through it.

The following sections are included:

Management Center Commands

Management Center commands include commands for the Management Server, Log Server, Web Portal Server, and Authentication Server. Most of the commands are found in the `<`*`installation directory`*`>/bin/` directory. In Windows, the command line tools are `*.bat` script files. In Linux, the files are `*.sh` scripts.

Note – If you installed the Management Server in the `C:\Program Files\Stonesoft\Management Center` **directory in Windows, some of the program data is stored in the** `C:\ProgramData\Stonesoft\Management Center` **directory. Command line tools may be found in the** `C:\Program Files\Stonesoft\Management Center\bin` **and/or the** `C:\ProgramData\Stonesoft\Management Center\bin` **directory.**

Commands that require parameters must be run through the command line (cmd.exe in Windows). Commands that do not require parameters can alternatively be run through a graphical user interface, and may be added as shortcuts during installation.

Caution – `login` **and** `password` **parameters are optional. Giving them as Command Line parameters may pose a security vulnerability. Do not enter login and password information unless explicitly prompted to do so by a Command Line tool.**

Table A.1 Management Center Command Line Tools

Command	Description
sgArchiveExport [**host=**<*Management Server Address* [*Domain*]>] [**login**=<*login name*>] [**pass**=<*password*>] [**format**=**<*exporter format: CSV or* **XML*>] **i=**<*input files and/or directories*> [**o=**<*output file name*>] [**f=**<*filter file name*>] [**e=**<*filter expression*>] [**-h** | **-help** | **-?**] [**-v**]	Displays or exports logs from archive. This command is only available on the Log Server. The operation checks privileges for the supplied administrator account from the Management Server to prevent unauthorized access to the logs. Enclose details in double quotes if they contain spaces. **Host** specifies the address of the Management Server. If the parameter is not defined, the loopback address (localhost) is used. **login** defines the username for the account that is used for this operation. If this parameter is not defined, the username `root` is used. **pass** defines the password for the user account. **format** defines the file format for the output file. If this parameter is not defined, the XML format is used. **i** defines the source from which the logs will be exported. Can be a folder or a file. The processing recurses into subfolders. **o** defines the destination file where the logs will be exported. If this parameter is not defined, the output is displayed on screen. **f** defines a file that contains the filtering criteria you want to use for filtering the log data. You can export log filters individually in the Management Client through **Tools→Save for Command Line Tools** in the filter's right-click menu. **e** allows you to type in a filter expression manually (using the same syntax as exported filter files). **-h**, **-help**, or **-?** displays information on using the script. **-v** displays verbose output on the command execution. **Example** (exports logs from one full day to a file using a filter): `sgArchiveExport login=admin pass=abc123 i=c:/stonesoft/Stonesoft/data/archive/firewall/year2011/month12/./sgB.day01/ f=c:/stonesoft/Stonesoft/export/MyExportedFilter.flp format=CSV o=MyExportedLogs.csv`

Table A.1 Management Center Command Line Tools (Continued)

Command	Description
sgBackupAuthSrv [**pwd=**<*password*>] [**path=**<*destpath*>] [**nodiskcheck**] [**comment=**<*comment*>] [**-h** | **--help**]	Creates a backup of Authentication Server user information. The backup file is stored in the <*installation directory*>/backups/ directory. Backing up the Authentication only backs up Users, not the configuration of the Authentication Server. The Authentication Server configuration is included in the Management Server backup. **pwd** enables encryption. **path** defines the destination path. **nodiskcheck** ignores free disk check before creating the backup. **comment** allows you to enter a comment for the backup. The maximum length of a comment is 60 characters. **-h** or **--help** displays information on using the script. Also see **sgRestoreAuthBackup**.
sgBackupLogSrv [**pwd=**<*password*>] [**path=**<*destpath*>] [**nodiskcheck**] [**comment=**<*comment*>] [**nofsstorage**] [**-h** | **--help**]	Creates a backup of Log Server configuration data. The backup file is stored in the <*installation directory*>/backups/ directory. Twice the size of log database is required on the destination drive. Otherwise, the operation fails. **pwd** entering a password enables encryption. **path** defines the destination path. **nodiskcheck** ignores free disk check before creating the backup. **comment** allows you to enter a comment for the backup. The maximum length of a comment is 60 characters. **nofsstorage** creates a backup only of the log server configuration without the log data. **-h** or **--help** displays information on using the script. Also see **sgRestoreLogBackup**.
sgBackupMgtSrv [**pwd=**<*password*>] [**path=**<*destpath*>] [**nodiskcheck**] [**comment=**<*comment*>] [**-h** | **--help**]	Creates a complete backup of the Management Server (including both the local configuration and the stored information in the configuration database). The backup file is stored in the <*installation directory*>/backups/ directory. Twice the size of the Management Server database is required on the destination drive. Otherwise, the operation fails. **pwd** entering a password enables encryption. **path** defines the destination path. **nodiskcheck** ignores free disk check before creating the backup. **comment** allows you to enter a comment for the backup. The maximum length of a comment is 60 characters. **-h** or **--help** displays information on using the script. Also see **sgRestoreMgtBackup** and **sgRecoverMgtDatabase**.

Table A.1 Management Center Command Line Tools (Continued)

Command	Description
sgCertifyAuthSrv	Contacts the Management Server and creates a new certificate for the Authentication Server to allow secure communications with other system components. Renewing an existing certificate does not require changing the configuration of any other system components.
sgCertifyLogSrv [**host=**<*Management Server Address* [\Domain]>]	Contacts the Management Server and creates a new certificate for the Log Server to allow secure communications with other system components. Renewing an existing certificate does not require changing the configuration of any other system components. **host** specifies the address of the Management Server. If the parameter is not defined, the loopback address (localhost) is used. **Domain** specifies the administrative Domain the Log Server belongs to if the system is divided into administrative Domains. If the Domain is not specified, the Shared Domain is used. The Log Server needs to be shut down before running this command. Restart the server after running this command.
sgCertifyMgtSrv	Creates a new certificate for the Management Server to allow secure communications between the Stonesoft system components. Renewing an existing certificate does not require changes on any other system components. The Management Server needs to be shut down before running this command. Restart the server after running this command.
sgCertifyWebPortalSrv [**host=**<*Management Server Address* [\Domain]>]	Contacts the Management Server and creates a new certificate for the Web Portal Server to allow secure communications with other system components. Renewing an existing certificate does not require changing the configuration of any other system components. **host** specifies the address of the Management Server. If the parameter is not defined, the loopback address (localhost) is used. **Domain** specifies the administrative Domain the Web Portal Server belongs to if the system is divided into administrative Domains. If the Domain is not specified, the Shared Domain is used. The Web Portal Server needs to be shut down before running this command. Restart the server after running this command.
sgChangeMgtIPOnAuthSrv <*IP address*>	Changes the Management Server's IP address in the Authentication Server's local configuration to the IP address you give as a parameter. Use this command if you change the Management Server's IP address. Restart the Authentication Server after running this command.

Table A.1 Management Center Command Line Tools (Continued)

Command	Description
sgChangeMgtIPOnLogSrv *<IP address>*	Changes the Management Server's IP address in the Log Server's local configuration to the IP address you give as a parameter. Use this command if you change the Management Server's IP address. Restart the Log Server service after running this command.
sgChangeMgtIPOnMgtSrv *<IP address>*	Changes the Management Server's IP address in the local configuration to the IP address you give as a parameter. Use this command if you change the Management Server's IP address. Restart the Management Server service after running this command.
sgClient	Starts a locally installed Stonesoft Management Client.
sgCreateAdmin	Creates an unrestricted (superuser) administrator account. The Management Server needs to be stopped before running this command.
sgExport [**host=**<*Management Server Address* [\Domain]>] [**login**=<*login name*>] [**pass**=<*password*>] **file=**<*file path and name*> [**type**=<*all*|*nw*|*ips*|*sv*|*rb*|*al*>] [**name**= <*element name 1, element name 2, ...*>] [**recursion**] [**-system**] [**-h** | **-help** | -?]	Exports elements stored on the Management Server to an XML file. Enclose details in double quotes if they contain spaces. **host** specifies the address of the Management Server. If the parameter is not defined, the loopback address (localhost) is used. **Domain** specifies the administrative Domain for this operation if the system is divided into administrative Domains. If the Domain is not specified, the Shared Domain is used. **login** defines the username for the account that is used for this operation. If this parameter is not defined, the username root is used. **pass** defines the password for the user account. **file** defines the name and location of the export ZIP file. **type** specifies which types of elements are included in the export file: all for all exportable elements nw for network elements ips for IPS elements sv for services rb for security policies al for alerts vpn for VPN elements. name allows you to specify by name the element(s) that you want to export. **recursion** includes referenced elements in the export, for example, the network elements used in a policy that you export. **-system** includes any system elements that are referenced by the other elements in the export. **-h**, **-help**, or **-?** displays information on using the script.

Table A.1 Management Center Command Line Tools (Continued)

Command	Description
sgHA [**host=**<*Management Server Address* [\Domain]>] [**login**=<*login name*>] [**pass**=<*password*>] [**master**=<*Management Server used as master server for the operation*>] [**-set-active**] [**-set-standby**] [**-sync**] [**-fullsync**] [**-check**] [**-retry**] [**-isolate**] [**-force**] [**-restart**] [**-h**|**-help**|**-?**]	Controls active and standby Management Servers. **host** specifies the address of the Management Server. If the parameter is not defined, the loopback address (localhost) is used. **Domain** specifies the administrative Domain for this operation if the system is divided into administrative Domains. If the Domain is not specified, the Shared Domain is used. **login** defines the username for the account that is used for this operation. If this parameter is not defined, the username `root` is used. **pass** defines the password for the user account. **master** defines the Management Server used as a master Management Server for the operation. **-set-active** activates and locks all administrative Domains. **-set-standby** deactivates and unlocks all administrative Domains. **-sync** performs full database replication. It replicates the database from the master Management Server to the specified Management Server. **-fullsync** performs full database replication with the master Management Server's backup. **-check** checks that the Management Server's database is in sync with the master Management Server. **-retry** retries replication if this has been stopped due to a recoverable error. **-isolate** isolates the Management Server from database replication. This is an initial requirement for synchronization. **-force** enforces the operation even if all Management Servers are not in sync. Note that using this option may cause instability if used carelessly. **-restart** restarts the specified Management Server. **-h**, **-help**, or **-?** displays information on using the script.

Table A.1 Management Center Command Line Tools (Continued)

Command	Description
sgImport [**host=**<*Management Server Address* [\Domain]>] [**login**=<*login name*>] [**pass**=<*password*>] **file=**<*file path and name*> [**-replace_all**] [**-h**|**-help**|-?]	Imports Stonesoft Management Server database elements from a Stonesoft XML file. When importing, existing (non-default) elements are overwritten if both the name and type match. **host** specifies the address of the Management Server. If the parameter is not defined, the loopback address (localhost) is used. **Domain** specifies the administrative Domain for this operation if the system is divided into administrative Domains. If the Domain is not specified, the Shared Domain is used. **login** defines the username for the account that is used for this operation. If this parameter is not defined, the username `root` is used. **pass** defines the password for the user account. **file** defines the ZIP file whose contents you want to import. **-replace_all** ignores all conflicts by replacing all existing elements with new ones. **-h**, **-help**, or **-?** displays information on using the script.
sgImportExportUser [**host=**<*Management Server Address* [\Domain]>] [**login**=<*login name*>] [**pass**=<*password*>] **action=**<*import*|*export*> **file=**<*file path and name*> [**-h**|**-help**|**-?**]	Imports and exports a list of Users and User Groups in an LDIF file from/to a Stonesoft Management Server's internal LDAP database. To import User Groups, all User Groups in the LDIF file must be directly under the **stonesoft** top-level group (dc=stonesoft). **The user information in the export file is stored as plaintext. Handle the file securely.** **host** specifies the address of the Management Server. If the parameter is not defined, the loopback address (localhost) is used. **Domain** specifies the administrative Domain for this operation if the system is divided into administrative Domains. If the Domain is not specified, the Shared Domain is used. **login** defines the username for the account that is used for this operation. If this parameter is not defined, the username `root` is used. **pass** defines the password for the user account. **action** defines whether users are imported or exported. **file** defines the file that is used for the operation. **Example**: `sgImportExportUser login=admin pass=abc123 action=export file=c:\temp\exportedusers.ldif` **-h**, **-help**, or **-?** displays information on using the script.

Table A.1 Management Center Command Line Tools (Continued)

Command	Description
sgInfo **SG_ROOT_DIR** **FILENAME** [**fast**] [**-nolog**] [**-client**] [**-h**|**-help**|-?]	Creates a ZIP file that contains copies of configuration files and the system trace files. The resulting ZIP file is stored in the logged in user's home directory. The file location is displayed on the last line of screen output. Provide the generated file to Stonesoft support for troubleshooting purposes. **SG_ROOT_DIR** Stonesoft Management Center installation directory. **FILENAME** name of output file. **-nolog** extended log server information is NOT collected. **-client** collects traces only from the Management Client. **-h**, **-help**, or **-?** displays information on using the script.
sgOnlineReplication [**login**=<*login name*>] [**pass**=<*password*>] [**active-server=**<*name of active Management Server*>] [**standby-server=**<*name of additional Management Server*>] [**standby-server-address=**<*IP address of additional Management Server*>] [**-nodisplay**] [**-h**|**-help**|**-?**]	Replicates the Management Server's database from the active Management Server to an additional Management Server. The Management Server to which the database is replicated must be shut down before running this command. Restart the Management Server after running this command. **Note!** Use this script to replicate the database only if the additional Management Server's configuration has been corrupted, the additional Management Server's certificate has expired, or in new SMC installations if the automatic database replication between the Management Servers has not succeeded. Otherwise, synchronize the database with the **sgHA** command or through the Management Client. See the *Stonesoft Administrator's Guide* for more information. **pass** defines the password for the user account. **active-server** option specifies the IP address of the active Management Server from which the Management database is replicated. **standby-server** option specifies the name of the additional Management Server to which the Management database is replicated. **standby-server-address** option specifies the IP address of the additional Management Server to which the Management database is replicated. **-nodisplay** sets a text only console. **-h**, **-help**, or **-?** displays information on using the script. The return values are: **0** OK **8** sgOnlineReplication.sh failed to initialize properly **9** login failed **11** unknown error **12** bad command line arguments **13** replication canceled by user.

Table A.1 Management Center Command Line Tools (Continued)

Command	Description
sgReinitializeLogServer	**Note!** This script is located in <*installation directory*>/bin/install. Creates a new Log Server configuration if the configuration file has been lost.
sgRestoreArchive <ARCHIVE_DIR>	Restores logs from archive files to the Log Server. This command is available only on the Log Server. **ARCHIVE_DIR** is the number of the archive directory (0 – 31) from where the logs will be restored. By default, only archive directory 0 is defined. The archive directories can be defined in the <*installation directory*>/data/LogServerConfiguration.txt file: ARCHIVE_DIR_*xx*=*PATH*.
sgRestoreAuthBackup [**-pwd=**<*password*>] [**-backup=**<*backup file name*>] [**-nodiskcheck**] [**-h**|**-help**]	Restores the Authentication Server user information from a backup file in the <*installation directory*>/backups/ directory. Apply the Authentication Server's configuration after this command. **-pwd** defines a password for encrypted backup. **-backup** defines a name for the backup file. **-nodiskcheck** ignores free disk check before backup restoration. **-h** or **-help** displays information on using the script.
sgRestoreLogBackup [**-pwd=**<*password*>] [**-backup=**<*backup file name*>] [**-nodiskcheck**] [**-overwrite-syslog-template**] [**-h**|**-help**]	Restores the Log Server (logs and/or configuration files) from a backup file in the <*installation directory*>/backups/ directory. Apply the Authentication Server's configuration after this command. **-pwd** defines a password for encrypted backup. **-backup** defines a name for the backup file. **-nodiskcheck** ignores free disk check before backup restoration. **-overwrite-syslog-template** overwrites a syslog template file if found in the backup. **-h** or **-help** displays information on using the script.
sgRestoreMgtBackup [**-pwd**=<*password*>] [**-backup**=<*backup file name*>] [**-nodiskcheck**] [**-h**|**-help**]	Restores the Management Server (database and/or configuration files) from a backup file in the <*installation directory*>/backups/ directory. **-pwd** defines a password for encrypted backup. **-backup** defines a name for the backup file. **-nodiskcheck** ignores free disk check before backup restoration. **-h** or **-help** displays information on using the script.

Table A.1 Management Center Command Line Tools (Continued)

Command	Description
sgRevert	**Note!** This script is located in <*installation directory*>/bin/uninstall. Reverts to the previous installation saved during the upgrade process. The previous installation can be restored at any time, even after a successful upgrade.
sgShowFingerPrint	Displays the CA certificate's fingerprint on the Management Server.
sgStartAuthSrv	Starts the Authentication Server.
sgStartLogSrv	Starts the Log Server and its database.
sgStartMgtDatabase	Starts the Management Server's database. There is usually no need to use this script.
sgStartMgtSrv	Starts the Management Server and its database.
sgStartWebPortalSrv	Starts the Web Portal Server.
sgStopLogSrv	Stops the Log Server.
sgStopMgtSrv	Stops the Management Server and its database.
sgStopMgtDatabase	Stops the Management Server's database. There is usually no need to use this script.
sgStopWebPortalSrv	Stops the Web Portal Server.
sgStopRemoteMgtSrv [**host=<***Management Server Host Name***>**] [**login=<***login name*>] [**pass=<***password*>] [**-h**|**-help**|**-?**]	Stops the Management Server service when run without arguments. To stop a remote Management Server service, provide the arguments to connect to the Management Server. **host** is the Management Server's host name if not localhost. **login** is a Stonesoft administrator account for the login. **pass** is the password for the administrator account. **-h**, **-help**, or **-?** displays information on using the script.

Table A.1 Management Center Command Line Tools (Continued)

Command	Description
sgTextBrowser [**host=**<*Management Server address* [\Domain]>] [**login**=<*login name*>] [**pass**=<*password*>] [**format**=<*CSV*|*XML*>] [**o=**<*output file*>] [**f=**<*filter file*>] [**e=**<*filter expression*>] [**m=**<*current*|*stored*>] [**limit=**<*maximum number of unique records to fetch*>] [**-h**|**-help**|**-?**]	Displays or exports current or stored logs. This command is available on the Log Server. Enclose the file and filter names in double quotes if they contain spaces. **host** defines the address of the Management Server used for checking the login information. If this parameter is not defined, Management Server is expected to be on the same host where the script is run. If Domains are in use, you can specify the Domain the Log Server belongs to. If domain is not specified, the Shared Domain is used. **login** defines the username for the account that is used for this export. If this parameter is not defined, the username root is used. **pass** defines the password for the user account used for this operation. **format** defines the file format for the output file. If this parameter is not defined, the XML format is used. **o** defines the destination output file where the logs will be exported. If this parameter is not defined, the output is displayed on screen. **f** defines the Stonesoft exported filter file that you want to use for filtering the log data. **e** defines the filter that you want to use for filtering the log data. Type the name as shown in the Management Client. **m** defines whether you want to view or export logs as they arrive on the Log Server (current) or logs stored in the active storage directory (stored). If this option is not defined, the current logs are used. **limit** defines the maximum number of unique records to be fetched. The default value is unlimited. **-h**, **-help**, or **-?** displays information on using the script.

Engine Commands

The commands in the following two tables can be run on the command line on Firewall, Virtual Firewall, Layer 2 Firewall, and/or IPS engines.

Note – All command line tools that are available in the Firewall role are also available for Virtual Firewalls. However, there is no direct access to the command line of Virtual Firewalls. Commands to Virtual Firewalls must be sent from the command line of the Master Engine using the `se-virtual-engine` command.

Table A.2 Stonesoft Engine Command Line Tools

Command	Engine Role	Description

`se-virtual-engine`
`-l | --list`
`-v` `<`*`virtual engine ID`*`>`
`-e | --enter`
`-E` `"<`*`command [options]`*`>"`
`-h | --help`
	Firewall (*Master Engine only)*	Used to send commands to Virtual Firewalls from the command line of the Master Engine. All commands that can be used for the Firewall role can also be used for Virtual Firewalls.
		`-l` or **`--list`** list the active Virtual Security Engines.
		`- v <virtual engine ID>` specifies the ID of the Virtual Security Engine on which to execute the command.
		`-e` or **`--enter`** enters the command shell for the Virtual Security Engine specified with the `-v` option. To exit the command shell, type `exit`.
		`-E` `"<`*`command [options]`*`>"` executes the specified command on the Virtual Security Engine specified with the `-v` option.
		`-h` or **`--help`** shows the help message for the se-virtual-engine command.

Table A.2 Stonesoft Engine Command Line Tools (Continued)

Command	Engine Role	Description

sg-blacklist
show [-v] [-f *FILENAME*] |
add [
[**-i** *FILENAME*] |
[**src** *IP_ADDRESS/MASK*]
[src6 *IPv6_ADDRESS/PREFIX*]
[dst *IP_ADDRESS/MASK*]
[dst6 *IPv6_ADDRESS/PREFIX*]
[**proto** *{tcp|udp|icmp|NUM}*]
[**srcport** *PORT{-PORT}*]
[**dstport** *PORT{-PORT}*]
[**duration** *NUM*]
] |
del [
[**-i** *FILENAME*] |
[**src** *IP_ADDRESS/MASK*]
[src6 *IPv6_ADDRESS/PREFIX*]
[dst *IP_ADDRESS/MASK*]
[dst6 *IPv6_ADDRESS/PREFIX*]
[**proto** *{tcp|udp|icmp|NUM}*]
[**srcport** *PORT{-PORT}*]
[**dstport** *PORT{-PORT}*]
[**duration** *NUM*]
] |
iddel *NODE_ID ID* |
flush
	Firewall, Layer 2 Firewall, IPS	Used to view, add, or delete active blacklist entries. The blacklist is applied as defined in Access Rules.
		Commands:
		show displays the current active blacklist entries in format: engine node ID | blacklist entry ID | (internal) | entry creation time | (internal) | address and port match | originally set duration | (internal) | (internal). Use the `-f` option to specify a storage file to view (`/data/blacklist/db_<number>`). The **-v** option adds operation's details to the output.
		add creates a new blacklist entry. Enter the parameters (see below) or use the **-i** option to import parameters from a file.
		del deletes the first matching blacklist entry. Enter the parameters (see below) or use the **-i** option to import parameters from a file.
		iddel *NODE_ID ID* removes one specific blacklist entry on one specific engine. `NODE_ID` is the engine's ID, `ID` is the blacklist entry's ID (as shown by the `show` command).
		flush deletes all blacklist entries.
		Add/Del Parameters:
		Enter at least one parameter. The default value is used for the parameters that you omit. You can also save parameters in a text file; each line in the file is read as one blacklist entry.
		src *IP_ADDRESS/MASK* defines the source IP address and netmask to match. Matches any IP address by default.
		src6 *IPv6_ADDRESS/PREFIX* defines the source IPv6 and prefix length to match. Matches any IPv6 address by default.
		dst *IP_ADDRESS/MASK* defines the destination IP address and netmask to match. Matches any IP address by default.
		dst6 *IPv6_ADDRESS/PREFIX* defines the destination IPv6 address and prefix length to match. Matches any IPv6 address by default.
		proto *{tcp|udp|icmp|NUM}* defines the protocol to match by name or protocol number. Matches all IP traffic by default.
		srcport *PORT[-PORT]* defines the TCP/UDP source port or range to match. Matches any port by default.
		dstport *PORT[-PORT]* defines the TCP/UDP destination port or range to match. Matches any port by default.
		duration *NUM* defines in seconds how long the entry is kept. Default is 0, which cuts current connections, but is not kept.
		Examples:
		`sg-blacklist add src 192.168.0.2/32 proto tcp dstport 80 duration 60`
		`sg-blacklist add -i myblacklist.txt`
		`sg-blacklist del dst 192.168.1.0/24 proto 47`

Table A.2 Stonesoft Engine Command Line Tools (Continued)

Command	Engine Role	Description
sg-bootconfig [**--primary-console**=*tty0*|*ttyS PORT,SPEED*] [**--secondary-console**= [*tty0*|*ttyS PORT,SPEED*]] [**--flavor**=*up*|*smp*] [**--initrd**=*yes*|*no*] [**--crashdump**=*yes*|*no*|*Y@X*] [**--append**=*kernel options*] [**--help**] **apply**	Firewall, Layer 2 Firewall, IPS	Used to edit boot command parameters for future bootups. **--primary-console**=*tty0*|*ttyS PORT,SPEED* parameter defines the terminal settings for the primary console. **--secondary-console**= [*tty0*|*ttyS PORT,SPEED*] parameter defines the terminal settings for the secondary console. **--flavor**=*up*|*smp* [*-kdb*] parameter defines whether the kernel is uniprocessor or multiprocessor. **--initrd**=*yes*|*no* parameter defines whether Ramdisk is enabled or disabled. **--crashdump**=*yes*|*no*|*Y@X* parameter defines whether kernel crashdump is enabled or disabled, and how much memory is allocated to the crash dump kernel (Y). The default is 24M. X must always be 16M. **--append**=*kernel options* parameter defines any other boot options to add to the configuration. **--help** parameter displays usage information. **apply** command applies the specified configuration options.
sg-clear-all	Firewall, Layer 2 Firewall, IPS	**Note! Use this only if you want to clear all configuration information from the engine.** This command resets all configuration information from the engine. It does not remove the engine software. After using this command, you must reconfigure the engine using the sg-reconfigure command.
sg-cluster **[-v *<virtual engine ID>*]** **[status [-c *SECONDS*]]** **[versions]** **[online]** **[lock-online]** **[offline]** **[lock-offline]** **[standby]** **[safe-offline]** **[force-offline]**	Firewall, Layer 2 Firewall, IPS	Used to display or change the status of the node. **-v *<virtual engine ID>*** (*Master Engine only*) option specifies the ID of the Virtual Security Engine on which to execute the command. **status** [**-c** *SECONDS*] command displays cluster status. When **-c** *SECONDS* is used, status is shown continuously with the specified number of seconds between updates. **version** command displays the engine software versions of the nodes in the cluster. **online** command sends the node online. **lock-online** command sends the node online and keeps it online even if another process tries to change its state. **offline** command sends the node offline. **lock-offline** command sends the node offline and keeps it offline even if another process tries to change its state. **standby** command sets an active node to standby. **safe-offline** command sets the node to offline only if there is another online node. **force-offline** command sets the node online regardless of state or any limitations. Also sets all other nodes offline.

Table A.2 Stonesoft Engine Command Line Tools (Continued)

Command	Engine Role	Description
sg-contact-mgmt	Firewall, Layer 2 Firewall, IPS	Used for establishing a trust relationship with the Management Server as part of engine installation or reconfiguration (see `sg-reconfigure` below). The engine contacts the Management Server using the one-time password created when the engine's initial configuration is saved.
sg-dynamic-routing **[start]** **[stop]** **[restart]** **[force-reload]** **[backup** *<file>*] **[restore** *<file>*] **[sample-config]** **[route-table]** **[info]**	Firewall	`start` starts the Quagga routing suite. `stop` stops the Quagga routing suite and flushes all routes made by zebra. `restart` restarts the Quagga routing suite. `force-reload` forces reload of the saved configuration. `backup` *<file>* backs up the current configuration to a compressed file. `restore` *<file>* restores the configuration from the specified file. `sample-config` creates a basic configuration for Quagga. `route-table` prints the current routing table. `info` displays the help information for the sg-dynamic-routing command, and detailed information about Quagga suite configuration with vtysh.
sg-ipsec -d [**-u** *<username[@domain]>* | **-si** *<session id>* | **-ck** *<ike cookie>* | **-tri** *<transform id>* **-ri** *<remote ip>* | **-ci** *<connection id>*]	Firewall	Deletes VPN-related information (use `vpninfo` command to view the information). Option **-d** (for delete) is mandatory. **-u** deletes the VPN session of the named VPN client user. You can enter the user account in the form <username@domain> if there are several user storage locations (LDAP domains). **-si** deletes the VPN session of a VPN client user based on session identifier. **-ck** deletes the IKE SA (Phase one security association) based on IKE cookie. **-tri** deletes the IPSEC SAs (Phase two security associations) for both communication directions based on transform identifier. **-ri** deletes all SAs related to a remote IP address in gateway-to-gateway VPNs. **-ci** deletes all SAs related to a connection identifier in gateway-to-gateway VPNs.

Table A.2 Stonesoft Engine Command Line Tools (Continued)

Command	Engine Role	Description
sg-logger **-f** *FACILITY_NUMBER* **-t** *TYPE_NUMBER* [**-e** *EVENT_NUMBER*] [**-i** *"INFO_STRING"*] [**-s**] [**-h**]	Firewall, Layer 2 Firewall, IPS	Used in scripts to create log messages with the specified properties. **-f** *FACILITY_NUMBER* parameter defines the facility for the log message. **-t** *TYPE_NUMBER* parameter defines the type for the log message. **-e** *EVENT_NUMBER* parameter defines the log event for the log message. The default is 0 (H2A_LOG_EVENT_UNDEFINED). **-i** *"INFO_STRING"* parameter defines the information string for the log message. **-s** parameter dumps information on option numbers to stdout **-h** parameter displays usage information.
sg-raid [**-status**] [**-add**] [**-re-add**] [**-force**] [**-help**]	Firewall, Layer 2 Firewall, IPS	Configures a new hard drive. This command is only for Stonesoft appliances that support RAID (Redundant Array of Independent Disks) and have two hard drives. **-status** option displays the status of the hard drive. **-add** options adds a new empty hard drive. Use **-add -force** if you want to add a hard drive that already contains data and you want to overwrite it. **-re-add** adds a hard drive that is already partitioned. This command prompts for the drive and partition for each degraded array. Use **-re-add -force** if you want to check all the arrays. **-help** option option displays usage information.
sg-reconfigure [**--boot**] [**--maybe-contact**] [**--no-shutdown**]	Firewall, Layer 2 Firewall, IPS	Used for reconfiguring the node manually. **--boot** option applies bootup behavior. Do not use this option unless you have a specific need to do so. **--maybe-contact** option contacts the Management Server if requested. This option is only available on firewall engines. **--no-shutdown** option allows you to make limited configuration changes on the node without shutting it down. Some changes may not be applied until the node is rebooted.
sg-selftest [**-d**] [**-h**]	Firewall	Runs cryptography tests on the engine. **-d** option runs the tests in debug mode. **-h** option displays usage information.
sg-status [**-l**] [**-h**]	Firewall, Layer 2 Firewall, IPS	Displays information on the engine's status. **-l** option displays all available information on engine status. **-h** option displays usage information.

Table A.2 Stonesoft Engine Command Line Tools (Continued)

Command	Engine Role	Description
sg-toggle-active *SHA1 SIZE* | **--force** [**--debug**]	Firewall, Layer 2 Firewall, IPS	Switches the engine between the active and the inactive partition. This change takes effect when you reboot the engine. You can use this command, for example, if you have upgraded an engine and want to switch back to the earlier engine version. When you upgrade the engine, the active partition is switched. The earlier configuration remains on the inactive partition. To see the currently active (and inactive) partition, see the directory listing of `/var/run/stonegate` (**`ls -l /var/run/stonegate)`**. The *SHA1 SIZE* option is used to verify the signature of the inactive partition before changing it to active. If you downgrade the engine, check the checksum and the size of the earlier upgrade package by extracting the signature and size files from the sg_engine_[version.build]_i386.zip file. **--debug** option reboots the engine with the debug kernel. **--force** option switches the active configuration without first verifying the signature of the inactive partition.
sg-upgrade	Firewall	Upgrades the node by rebooting from the installation DVD. Alternatively, the node can be upgraded remotely using the Management Client.
sg-version	Firewall, Layer 2 Firewall, IPS	Displays the software version and build number for the node.
sginfo [**-f**] [**-d**] [**-s**] [**-p**] [**--**] [**--help**]	Firewall, Layer 2 Firewall, IPS	Gathers system information you can send to Stonesoft support if you are having problems. Use this command only when instructed to do so by Stonesoft support. **-f** option forces sgInfo even if the configuration is encrypted. **-d** option includes core dumps in the sgInfo file. **-s** option includes slapcat output in the sgInfo file. **-p** option includes passwords in the sgInfo file (by default passwords are erased from the output). **--** option creates the sgInfo file without displaying the progress **--help** option displays usage information.

The table below lists some general Linux operating system commands that may be useful in running your engines. Some commands can be stopped by pressing `Ctrl+c`.

Table A.3 General Command Line Tools on Engines

Command	Description
dmesg	Shows system logs and other information. Use the -h option to see usage.
halt	Shuts down the system.
ip	Displays IP address information. Type the command without options to see usage. **Example:** type **ip addr** for basic information on all interfaces.
ping	Tests connectivity with ICMP echo requests. Type the command without options to see usage.
ps	Reports the status of running processes.
reboot	Reboots the system.
scp	Secure copy. Type the command without options to see usage.
sftp	Secure FTP. Type the command without options to see usage.
ssh	SSH client (for opening a terminal connection to other hosts). Type the command without options to see usage.
tcpdump	Gives information on network traffic. Use the **-h** option to see usage. You can also analyze network traffic by creating tcpdump files from the Management Client with the Traffic Capture feature. See the *Stonesoft Administrator's Guide* for more information.
top	Displays the top CPU processes taking most processor time. Use the **-h** option to see usage.
traceroute	Traces the route packets take to the specified destination. Type the command without options to see usage.
vpninfo	Displays VPN information and allows you to issue some basic commands. Type the command without options to see usage.

Server Pool Monitoring Agent Commands

You can test and monitor the Server Pool Monitoring Agents on the command line with the commands described in the table below.

Table A.4 Server Pool Monitoring Agent Commands

Command	Description
agent [-v *level*] [-c *path*] [test [*files*]] [syntax [*files*]]	(*Windows only*) Allows you to test different configurations before activating them. -v *level* Set the verbosity level. The default level is 5. Levels 6-8 are for debugging where available. -c *path* Use the specified path as the first search directory for the configuration. test [*files*] Run in the test mode - status queries do not receive a response. If you specify the files, they are used for reading the configuration instead of the default files. The output is directed to syslog or eventlog instead of the console where the command was run unless you use the -d option. syntax [*files*] Check the syntax in the configuration file. If no files are specified, the default configuration files are checked.
sgagentd [-d] [-v *level*] [-c *path*] [test [*files*]] [syntax [*files*]]	(*Linux only*) Allows you to test different configurations before activating them. -d Don't Fork as a daemon. All log messages are printed to stdout or stderr only. -v *level* Set the verbosity level. The default level is 5. Levels 6-8 are for debugging where available. -c *path* Use the specified path as the first search directory for the configuration. test [*files*] Run in the test mode - status queries do not receive a response. If you specify the files, they are used for reading the configuration instead of the default files. The output is directed to syslog or eventlog instead of the console where the command was run unless you use the -d option. syntax [*files*] Check the syntax in the configuration file. If no files are specified, the default configuration files are checked. The output is directed to syslog or eventlog instead of the console where the command was run unless you use the -d option.

Table A.4 Server Pool Monitoring Agent Commands (Continued)

Command	Description
sgmon [*status*|*info*|*proto*] [-p *port*] [-t *timeout*] [-a *id*] *host*	Sends a UDP query to the specified host and waits for a response until received, or until the timeout limit is reached. The request type can be defined as a parameter. If no parameter is given, `status` is requested. The commands are: `status` - query the status. `info` - query the agent version. `proto` - query the highest supported protocol version. `-p` *`port`* Connect to the specified port instead of the default port. `-t` *`timeout`* Set the timeout (in seconds) to wait for a response. `-a` *`id`* Acknowledge the received log messages up to the specified id. Each response message has an id, and you may acknowledge more than one message at a given time by using the id parameter. Note that messages acknowledged by sgmon will no longer appear in the firewall logs. *`host`* The IP address of the host to connect to. To get the status locally, you may give `localhost` as the host argument. This parameter is mandatory. **Return value**: 0 if the response was received 1 if the query timed out -1 in case of an error

Appendix B

Default Communication Ports

This chapter lists the default ports used in connections between Stonesoft components and the default ports Stonesoft components use with external components.

The following sections are included:

Management Center Ports

The illustrations below present an overview to the most important default ports used in communications between the Stonesoft Management Center (SMC) components and from the SMC to external services. See the table below for a complete list of default ports.

Illustration B.1 Destination Ports for Basic Communications Within SMC

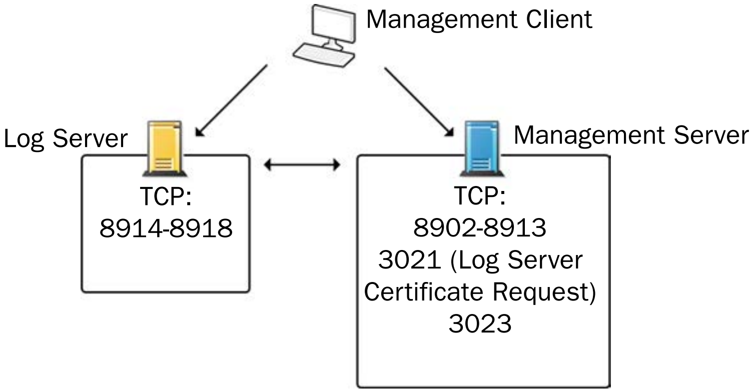
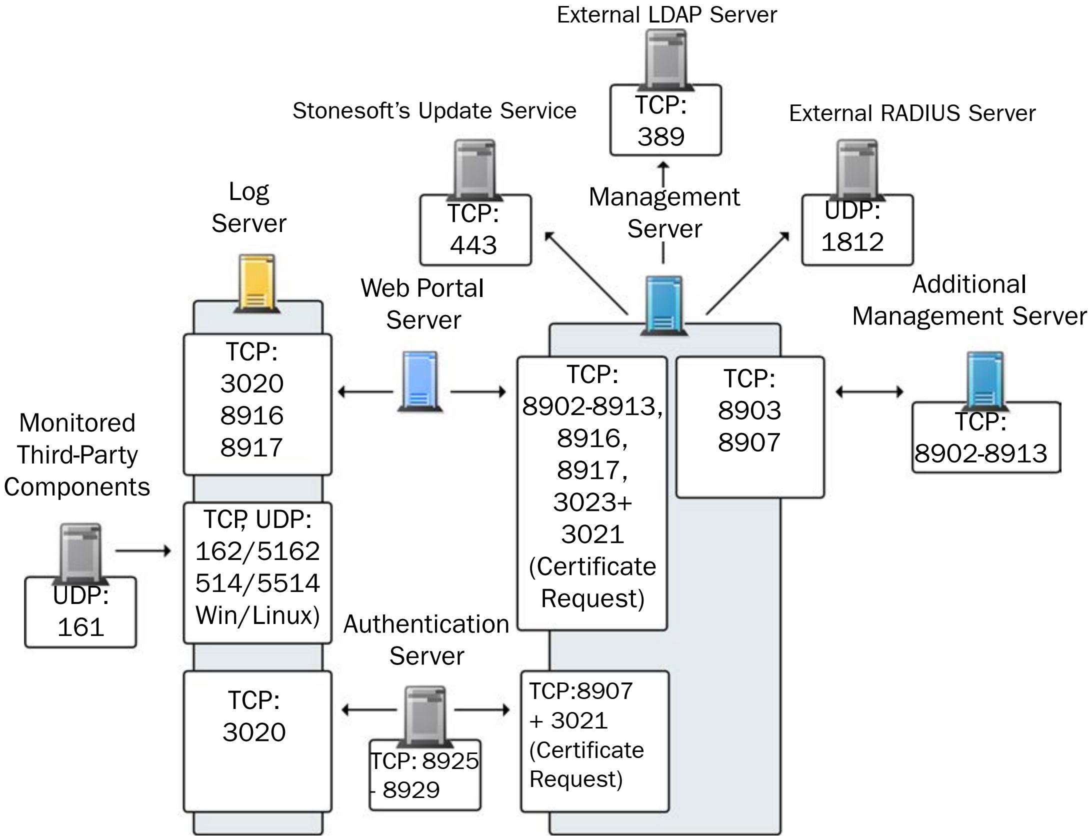


Illustration B.2 Default Destination Ports for Optional SMC Components and Features



The table below lists all default ports SMC uses internally and with external components. Many of these ports can be changed. The name of corresponding default Service elements are also included for your reference. For information on communications between SMC components and the engines, see the separate listings.

Table B.1 Management Center Default Ports

Listening Host	Port/ Protocol	Contacting Hosts	Service Description	Service Element Name
Additional Management Servers	8902-8913/TCP	Management Server	Database replication (push) to the additional Management Server.	SG Control
Authentication Server	8925-8929/TCP	Management Server	Stonesoft Management Server commands to Authentication Server.	SG Authentication Commands
Authentication Server node	8988-8989/TCP	Authentication Server node	Data synchronization between Authentication Server nodes.	SG Authentication Sync
DNS server	53/UDP, 53/TCP	Management Client, Management Server, Log Server	DNS queries.	DNS (UDP)
LDAP server	389/TCP	Management Server	External LDAP queries for display/ editing in the Management Client.	LDAP (TCP)
Log Server	162/UDP, 5162/UDP	Monitored third-party components	SNMPv1 trap reception from third-party components. Port 162 is used if installed on Windows, port 5162 if installed on Linux.	SNMP (UDP)
Log Server	514/TCP, 514/UDP, 5514/TCP, 5514/UDP	Monitored third-party components	Syslog reception from third-party components. Port 514 is used if installed on Windows, port 5514 if installed on Linux.	Syslog (UDP) [*Partial match*]
Log Server	2055/UDP	Monitored third-party components	NetFlow or IPFIX reception from third-party components. Port 2055 is used in both Windows and Linux.	NetFlow (UDP)
Log Server	3020/TCP	Authentication Server, Log Server, Web Portal Server, Security Engines	Alert sending from the Authentication Server, Log Server, and Web Portal Server. Log and alert messages; monitoring of blacklists, connections, status, and statistics from Security Engines.	SG Log
Log Server	8914-8918/TCP	Management Client	Log browsing.	SG Data Browsing
Log Server	8916-8917/TCP	Web Portal Server	Log browsing.	SG Data Browsing (Web Portal Server)

Table B.1 Management Center Default Ports (Continued)

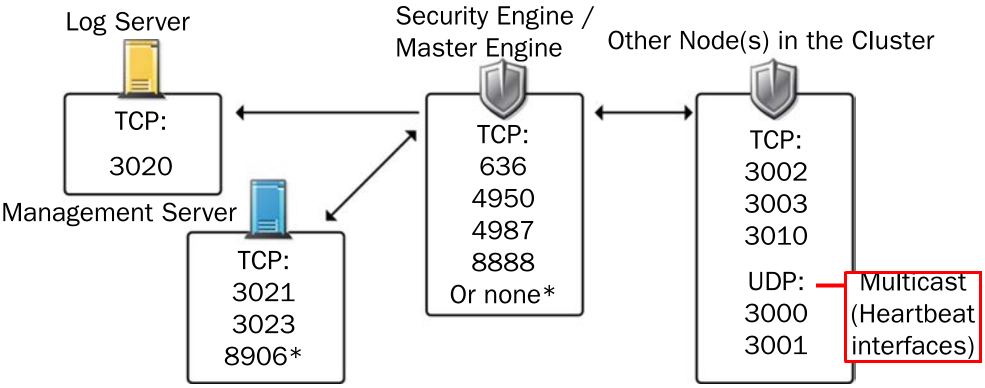
Listening Host	Port/ Protocol	Contacting Hosts	Service Description	Service Element Name
Management Server	3021/TCP	Log Server, Web Portal Server	System communications certificate request/renewal.	SG Log Initial Contact
Management Server	8902-8913/TCP	Management Client, Log Server, Web Portal Server	Monitoring and control connections.	SG Control
Management Server	3023/TCP	Additional Management Servers, Log Server, Web Portal Server	Log Server and Web Portal Server status monitoring. Status information from an additional Management Server to the active Management Server.	SG Status Monitoring
Management Server	8903, 8907/TCP	Additional Management Servers	Database replication (pull) to the additional Management Server.	SG Control
Management Server	8907/TCP	Authentication Server	Status monitoring.	SG Control
Monitored third-party components	161/UDP	Log Server	SNMP status probing to external IP addresses.	SNMP (UDP)
RADIUS server	1812/UDP	Management Server	RADIUS authentication requests for administrator logins. The default ports can be modified in the properties of the RADIUS Server element.	RADIUS (Authentication)
Stonesoft servers	443/TCP	Management Server	Update packages, engine upgrades, and licenses from update.stonesoft.com and smc.stonesoft.com.	HTTPS
Syslog server	514/UDP, 5514/UDP	Log Server	Log data forwarding to syslog servers. The default ports can be modified in the LogServerConfiguration.txt file.	Syslog (UDP) [*Partial match*]
Third-party components	2055/UDP	Log Server	NetFlow or IPFIX forwarding to third-party components. Port 2055 is used in both Windows and Linux.	NetFlow (UDP)

Security Engine Ports

The illustrations below present an overview to the most important default ports used in communications between Security Engines and the SMC and between clustered Security Engine nodes. See the table below for a complete list of default ports for the engines.

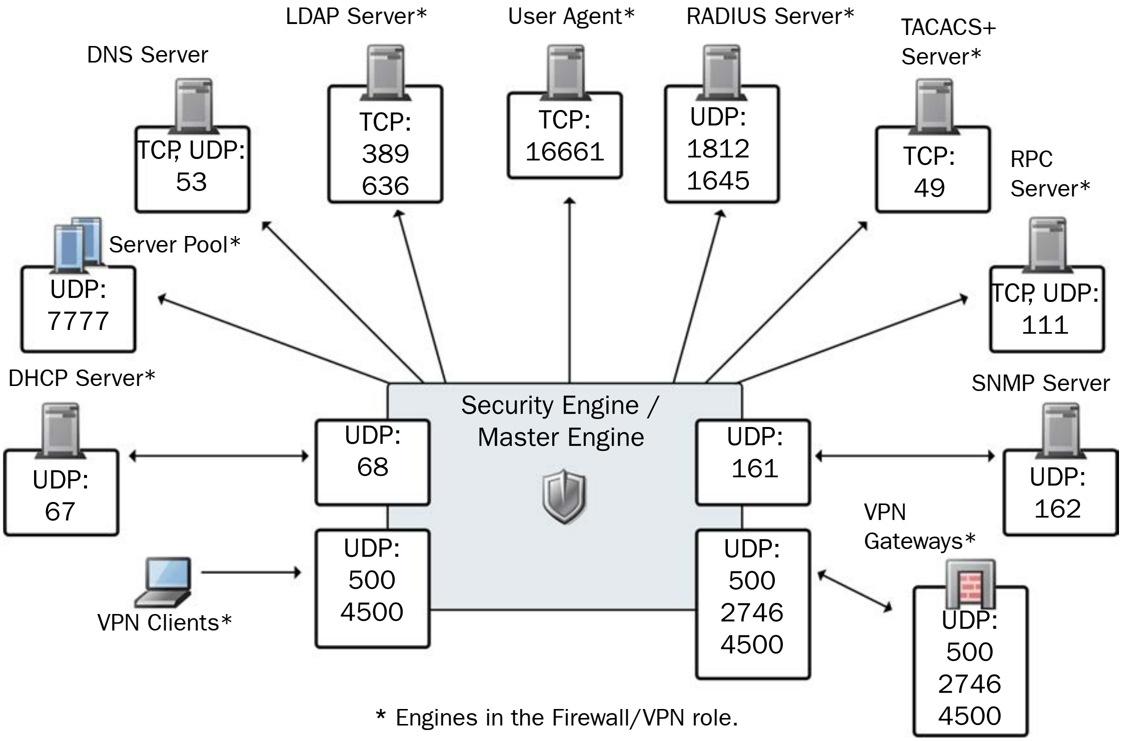
Note – Master Engines use the same default ports as clustered Security Engines. Virtual Security Engines do not communicate directly with other system components.

Illustration B.3 Destination Ports for Basic Security Engine Communications



*Single engines with “Node-initiated Contact to Management Server” selected.

Illustration B.4 Default Destination Ports for Security Engine Service Communications



* Engines in the Firewall/VPN role.

The table below lists all default ports the Security Engines use internally and with external components. Many of these ports can be changed. The name of corresponding default Service elements are also included for your reference.

Table B.2 Security Engine and Master Engine Default Ports

Listening Host	Port/Protocol	Contacting Hosts	Service Description	Service Element Name
Anti-virus signature server	80/TCP	Firewall	Anti-virus signature update service.	HTTP
Authentication Server	8925-8929/ TCP	Firewall, Master Engine	User directory and authentication services.	LDAP (TCP), RADIUS (Authentication)
BrightCloud Server	2316/TCP	Firewall, Layer 2 Firewall, IPS, Master Engine	BrightCloud web filtering update service.	BrightCloud update
DHCP server	67/UDP	Firewall	Relayed DHCP requests and requests from a firewall that uses dynamic IP address.	BOOTPS (UDP)
DNS server	53/UDP, 53/TCP	Firewall, Master Engine	Dynamic DNS updates.	DNS (TCP)
Firewall	67/UDP	Any	DHCP relay on firewall engine.	BOOTPS (UDP)
Firewall	68/UDP	DHCP server	Replies to DHCP requests.	BOOTPC (UDP)
Firewall, Master Engine	500/UDP	VPN clients, VPN gateways	VPN negotiations, VPN traffic.	ISAKMP (UDP)
Firewall, Master Engine	636/TCP	Management Server	Internal user database replication.	LDAPS (TCP)
Firewall, Master Engine	2543/TCP	Any	User authentication (Telnet) for Access rules.	SG User Authentication
Firewall	2746/UDP	Stonesoft VPN gateways	UDP encapsulated VPN traffic (engine versions 5.1 and lower).	SG UDP Encapsulation
Firewall, Master Engine	4500/UDP	VPN client, VPN gateways	VPN traffic using NAT-traversal.	NAT-T
Firewall Cluster Node, Master Engine cluster node	3000-3001/ UDP 3002-3003, 3010/TCP	Firewall Cluster Node, Master Engine cluster node	Heartbeat and state synchronization between clustered Firewalls.	SG State Sync (Multicast), SG State Sync (Unicast), SG Data Sync
Firewall, Layer 2 Firewall, IPS, Master Engine	4950/TCP	Management Server	Remote upgrade.	SG Remote Upgrade

Table B.2 Security Engine and Master Engine Default Ports (Continued)

Listening Host	Port/Protocol	Contacting Hosts	Service Description	Service Element Name
Firewall, Layer 2 Firewall, IPS, Master Engine	4987/TCP	Management Server	Management Server commands and policy upload.	SG Commands
Firewall, Layer 2 Firewall, IPS	8888/TCP	Management Server	Connection monitoring for engine versions 5.1 and lower.	SG Legacy Monitoring
Firewall, Layer 2 Firewall, IPS, Master Engine	15000/TCP	Management Server, Log Server	Blacklist entries.	SG Blacklisting
Firewall, Layer 2 Firewall, IPS, Master Engine	161/UDP	SNMP server	SNMP monitoring.	SNMP (UDP)
IPS Cluster Node	3000-3001/ UDP 3002-3003, 3010/TCP	IPS Cluster Node	Heartbeat and state synchronization between clustered IPS engines.	SG State Sync (Multicast), SG State Sync (Unicast), SG Data Sync
LDAP server	389/TCP	Firewall, Master Engine	External LDAP queries, including StartTLS connections.	LDAP (TCP)
Layer 2 Firewall Cluster Node	3000-3001/ UDP 3002-3003, 3010/TCP	Layer 2 Firewall Cluster Node	Heartbeat and state synchronization between clustered Layer 2 Firewalls.	SG State Sync (Multicast), SG State Sync (Unicast), SG Data Sync
Log Server	3020/TCP	Firewall, Layer 2 Firewall, IPS, Master Engine	Log and alert messages; monitoring of blacklists, connections, status, and statistics.	SG Log
Management Server	3021/TCP	Firewall, Layer 2 Firewall, IPS, Master Engine	System communications certificate request/renewal (initial contact).	SG Initial Contact
Management Server	3023/TCP	Firewall, Layer 2 Firewall, IPS, Master Engine	Monitoring (status) connection.	SG Status Monitoring
Management Server	8906/TCP	Firewall, Layer 2 Firewall, IPS	Management connection for single engines with “Node-Initiated Contact to Management Server” selected.	SG Dynamic Control
RADIUS server	1812, 1645/ UDP	Firewall, Master Engine	RADIUS authentication requests.	RADIUS (Authentication), RADIUS (Old)

Table B.2 Security Engine and Master Engine Default Ports (Continued)

Listening Host	Port/Protocol	Contacting Hosts	Service Description	Service Element Name
RPC server	111/UDP, 111/TCP	Firewall, Master Engine	RPC number resolve.	SUNRPC (UDP), Sun RPC (TCP)
Server Pool Monitoring Agents	7777/UDP	Firewall, Master Engine	Polls to the servers' Server Pool Monitoring Agents for availability and load information.	SG Server Pool Monitoring
SNMP server	162/UDP	Firewall, Layer 2 Firewall, IPS, Master Engine	SNMP traps from the engine.	SNMP Trap (UDP)
TACACS+ server	49/TCP	Firewall, Master Engine	TACACS+ authentication requests.	TACACS (TCP)
User Agent	16661/TCP	Firewall, Master Engine	Queries for matching Users and User Groups with IP addresses.	SG Engine to User Agent
VPN gateways	500/UDP, 2746/UDP (Stonesoft gateways only), or 4500 UDP.	Firewall, Master Engine	VPN traffic. Ports 2746 and 4500 may be used depending on encapsulation options.	ISAKMP (UDP)

Appendix C

Example Network Scenario

To give you a better understanding of how Stonesoft IPS fits into a network, this section outlines a network with IPS engines.

All illustrations of the software configuration in the subsequent chapters are filled in according to this example scenario; this way, you can compare how the settings in the various dialogs relate to overall network structure whenever you like.

The following sections are included:

Overview of the Example Network

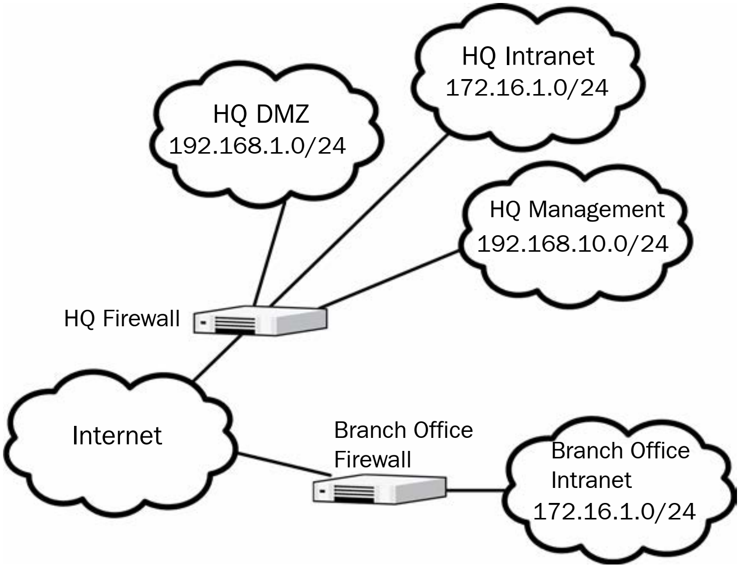
Two example IPS installations are described in this Guide:

- an IPS cluster in the Headquarters Intranet network.
- a single IPS in the Headquarters DMZ network.

The network scenario for these installations is based on the example network in Illustration C.1.

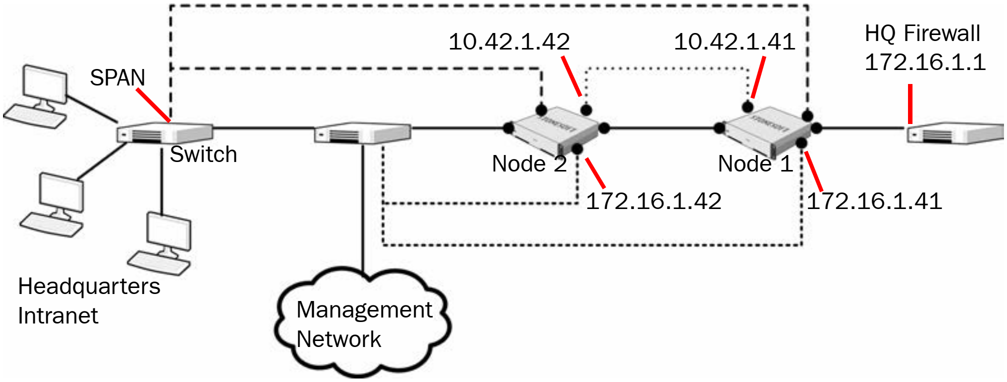
See the *IPS and Layer 2 Firewall Reference Guide* for more information on deploying the Stonesoft IPS components.

Illustration C.1 Example Network Scenario



Example Headquarters Intranet Network

Illustration C.2 Example Headquarters Intranet Network



HQ IPS Cluster

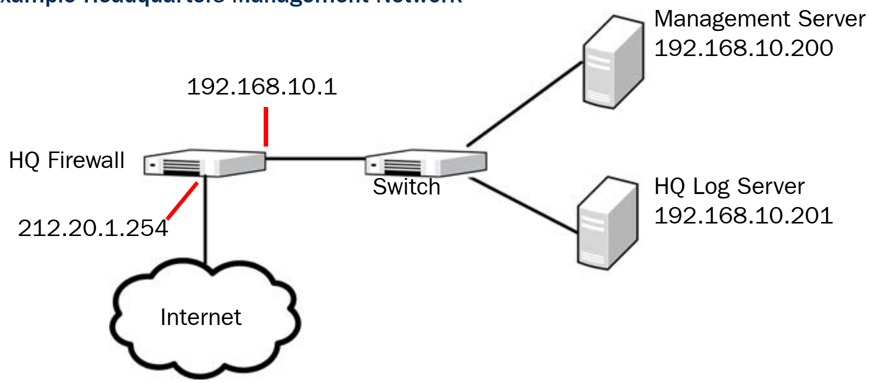
In the example scenario, *HQ IPS Cluster* is an inline serial cluster located in the Headquarters network. The cluster consists of two IPS engine nodes: *Node 1* and *Node 2*.

Table C.1 IPS Cluster in the Example Scenario

Network Interface	Description
Capture Interfaces	The HQ IPS Cluster's Capture Interface on each node is connected to a SPAN port in the Headquarters Intranet switch. All the traffic in this network segment is forwarded to the SPAN ports for inspection.
Inline Interfaces	The cluster is deployed in the path of traffic between the Firewall and the Headquarters Intranet switch. All the traffic flows through each node's inline interface pair.
Normal Interfaces	The normal interface on each node is connected to the Headquarters Intranet switch. Node 1's IP address is 172.16.1.41 and Node 2's address is 172.16.1.42. This normal interface is used for control connections from the Management Server, sending events to the HQ Log Server, and for sending TCP resets.
Heartbeat interfaces	The nodes have dedicated heartbeat interfaces. Node 1 uses the IP address 10.42.1.41 and Node 2 uses the IP address 10.42.1.42.

Example Headquarters Management Network

Illustration C.3 Example Headquarters Management Network



HQ Firewall

The HQ Firewall provides NAT for the Headquarters Management network. The HQ Firewall uses the following IP addresses with the Headquarters Management Network:

- Internal: 192.168.10.1
- External: 212.20.1.254

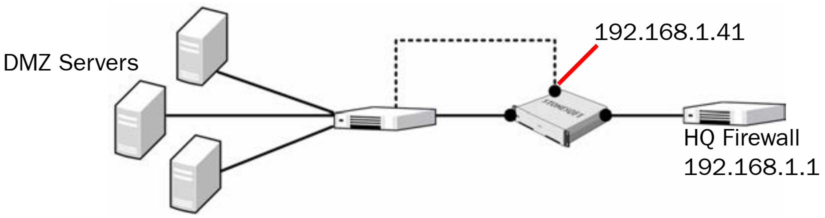
Management Center Servers

Table C.2 SMC Servers in the Example Scenario

SMC Server	Description
Management Server	The Management Server in the Headquarters' Management Network with the IP address 192.168.10.200. This Management Server manages all the Stonesoft IPS engines, Firewalls, and Log Servers of the example network.
HQ Log Server	This server is located in the Headquarters' Management Network with the IP address 192.168.10.201. This Log Server receives alerts, log data, and event data from the DMZ IPS and from the HQ IPS Cluster.

Example Headquarters DMZ Network

Illustration C.4 Example Headquarters DMZ Network



DMZ IPS

In the example scenario, the *DMZ IPS* in the Headquarters DMZ network is a single inline IPS engine.

Table C.3 Single IPS in the Example Scenario

Network Interface	Description
Inline Interfaces	The DMZ IPS is deployed in the path of traffic between the Firewall and the DMZ network switch. All the traffic flows through the IPS engine's inline interface pair.
Normal Interfaces	The normal interface is connected to the DMZ network using the IP address 192.168.1.41. This normal interface is used for control connections from the Management Server, sending event information to the HQ Log Server, and for TCP connection termination.

Index

Stonesoft Guides

Administrator’s Guides - step-by-step instructions for configuring and managing the system.

Installation Guides - step-by-step instructions for installing and upgrading the system.

Reference Guides - system and feature descriptions with overviews to configuration tasks.

User's Guides - step-by-step instructions for end-users.

For more documentation, visit
www.stonesoft.com/support/

Stonesoft Corporation

Itälahdenkatu 22 A
FI-00210 Helsinki
Finland

Tel. +358 9 476 711
Fax +358 9 4767 1349

Stonesoft Inc.

1050 Crown Pointe Parkway
Suite 900
Atlanta, GA 30338
USA

Tel. +1 770 668 1125
Fax +1 770 668 1131