

Linux Utilities for IBM System z



# Installing and using the Stonesoft StoneGate client



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**Note**

Before using this information and the product it supports, read the information in Appendix B, "Notices," on page 25.

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## About this book

This document describes how to set up and use the Stonesoft StoneGate firewall in the context of Linux® Utilities for IBM® System z™ (Linux Utilities).

Linux Utilities are a suite of Linux solutions configured and tested on System z in a z/OS and Linux workload scenario. Linux Utilities provide specific infrastructure functions that are complimentary to functions on z/OS. With Linux Utilities you have an additional option to optimize your z/OS environment. Linux Utilities help to provide quick deployment, easy installation, and reduced time-to-market of infrastructure functions with minimal impact on z/OS skills and resources.

For more information on Linux Utilities visit [www.ibm.com/zseries/os/linux/utilities](http://www.ibm.com/zseries/os/linux/utilities). On this site you might also find updates to this document.

For information on running Linux on System z mainframes see:

- *z/VM and Linux on IBM System z: The Virtualization Cookbook for SLES9*, SG24-6695
- *z/VM and Linux on IBM System z: The Virtualization Cookbook for Red Hat Enterprise Linux 4*, SG24-7272



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## Chapter 1. Overview

The Stonesoft StoneGate High Availability Firewall is a combined firewall and virtual private network (VPN) solution which helps you to control the traffic to and from your network. The network can be best protected by running the firewall in an LPAR or virtual machine on System z, the safest server family of IBM. By making use of the System z hardware the requirement for an external firewall box (and the maintenance of the hardware and software of this) is removed.

The functions provided by the utility include:

- Protection of mainframe applications from network attacks,
- VPN between the mainframe and user workstations,
- High availability using hot standby or clustering,
- Firewall management from a secure workstation.

### Further information

Comprehensive information about Stonesoft StoneGate can be found at the Stonesoft website:

#### Main page

<http://www.stonesoft.com>

#### System z and zSeries page

[http://www.stonesoft.com/products/IBM\\_zSeries](http://www.stonesoft.com/products/IBM_zSeries)

#### StoneGate Manuals

<https://my.stonesoft.com/download/doc>

for the StoneGate FW/VPN and SMC Installation, Administration, and Reference guides.

#### Software downloads

<https://my.stonesoft.com/download>

The StoneGate Firewall software and the Stonesoft Management Center software can be downloaded from the links on this page.

**Note:** A valid StoneGate license is required to access the downloads. You will be asked to enter your proof of license (POL) or proof of serial number (POS) code.

#### Management Center

[http://www.stonesoft.com/products/Management\\_Center](http://www.stonesoft.com/products/Management_Center)

The Management Center must be installed on a workstation with network access to the System z machine before the firewall is installed on System z.

More documentation on each product can be found by following the "Support" links from these pages.

A general view of the StoneGate firewall, including an example installation on z/VM<sup>®</sup>, is given in the redbook:

#### Linux on zSeries and S/390: Best Security Practices

<http://www.redbooks.ibm.com/redbooks/pdfs/sg247023.pdf#page=99>



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## Chapter 2. Prerequisites

This section identifies prerequisites for the Stonesoft StoneGate firewall on System z.

A valid license for the StoneGate Firewall and the Stonesoft Management Center is required. The software for these must be obtained either on a CD from Stonesoft or by download from the website listed in Software downloads.

The firewall will be controlled from a Stonesoft Management Center installed on a workstation. If this is not already available on the network it must be prepared as described in the chapter "Installing the Management Center" in the StoneGate FW/VPN Installation Guide at <https://my.stonesoft.com/download/doc>.

The Stonesoft StoneGate firewall must be installed directly into an LPAR or virtual machine.

The StoneGate product is a complete package. A hardened Linux distribution is included as the base of the install package. Therefore no other Linux software or licence is required to deploy the firewall in the System z environment.

A firewall in an LPAR will require at least 128 megabytes of memory and two dedicated DASD blocks of at least 2.3 gigabytes each. A firewall in a virtual machine will require at least 128 megabytes of memory and two CMS minidisks of at least 1 gigabyte each. Detailed requirements are listed in the "StoneGate for zSeries Hardware Requirements" document listed on the Stonesoft page [http://www.stonesoft.com/products/IBM\\_zSeries](http://www.stonesoft.com/products/IBM_zSeries).

Check the website in Software downloads for the latest version of the Stonesoft StoneGate client.



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## Chapter 3. Capacity planning

Usage limits of the Stonesoft StoneGate firewall.

Limitations of the firewall are listed in the release notes for the version in use. These are found in the "Support" area of the StoneGate web-site. See Chapter 1, "Overview," on page 1 for details.



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## Chapter 4. Installation

Installation of the Stonesoft StoneGate firewall on System z

The Stonesoft StoneGate firewall is installed as a complete Linux on System z machine. This may be a virtual machine running under z/VM or a logical machine running in a LPAR. Note that the package is complete in itself and is not installed on an existing Linux system.

The firewall also requires the StoneGate Management Center to be installed on a workstation. General instructions for this and for the installation of the firewall on z/VM are given in the *StoneGate FW/VPN and SMC Installation Guide* document in the "StoneGate Manuals" section of the "Support" area of the Stonesoft web-site. Further instructions are listed in the release notes for the version in use.

Installation on a LPAR is described separately in the document *How to install StoneGate firewall engine on IBM zSeries LPAR*. This document, and the release notes, are found by searching for "document subject IBM zSeries" in the "StoneGate Technical Documentation" section of the "Support" area of the web-site. See Chapter 1, "Overview," on page 1 for details.

An example of the installation procedure is given in Appendix A, "Example installation," on page 17.



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## Chapter 5. Configuration

Configuring theStonesoft StoneGate High Availability Firewall.

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### Configuration from the Management Center

Instructions for the configuration of the Stonesoft StoneGate firewall.

The configuration is performed from the Stonesoft StoneGate Management Center workstation. Instructions on performing the configuration are given in the "StoneGate FW/VPN Administrator" documents listed on the Stonesoft web page <https://my.stonesoft.com/download/doc>.

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### Backing up the configuration

Instructions for backing up the configuration settings of the Stonesoft StoneGate firewall

Configuration back-ups are performed from the Stonesoft StoneGate Management Center workstation.

The procedures to follow are itemized in the "Backups" chapter of the *StoneGate Management Center Administrator's Guide* found at <https://my.stonesoft.com/download/doc>.



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## Chapter 6. Operation

How to use the Stonesoft StoneGate firewall

### **User interface**

The online interface to the firewall is through the Stonesoft StoneGate Management Center workstation. See “Configuration from the Management Center” on page 9 for details



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## Chapter 7. Tuning

Tuning the Stonesoft StoneGate firewall.

### **Tuning on Linux**

Tuning is performed from the Stonesoft StoneGate Management Center workstation. See “Configuration from the Management Center” on page 9 for details.



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## Chapter 8. Service and upgrade

Migrating to the latest version of the Stonesoft StoneGate firewall.

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### Obtaining updates

How to obtain fixes to the current release of the Stonesoft StoneGate firewall and where to acquire a new release

The latest version of the Stonesoft StoneGate can be downloaded from the Stonesoft web-site. See Chapter 1, "Overview," on page 1 for details.

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### Updating on Linux

How to install updates to the Stonesoft StoneGate firewall for Linux on System z.

The firewall utility is supplied as a complete system which includes a Linux distribution. Updates should be applied by re-installing the complete system.



## Appendix A. Example installation

### Installing the Firewall Engines

In this example we are running z/VM 5.2 on a z990 processor. Our plan is to configure a firewall cluster to enable High Availability functionality. In the cluster two nodes were defined, one online and the other in standby mode. This particular configuration required an OSA Express with Layer 2 support (Link Layer). For further details of this feature see <http://www-03.ibm.com/systems/z/networking/features2.html>

The MAC address associated with the primary server is transferred to the standby node in the event of a failure and only OSA Layer 2 provides unique MAC addressing capabilities. A second OSA Layer 2 card is added for redundancy.

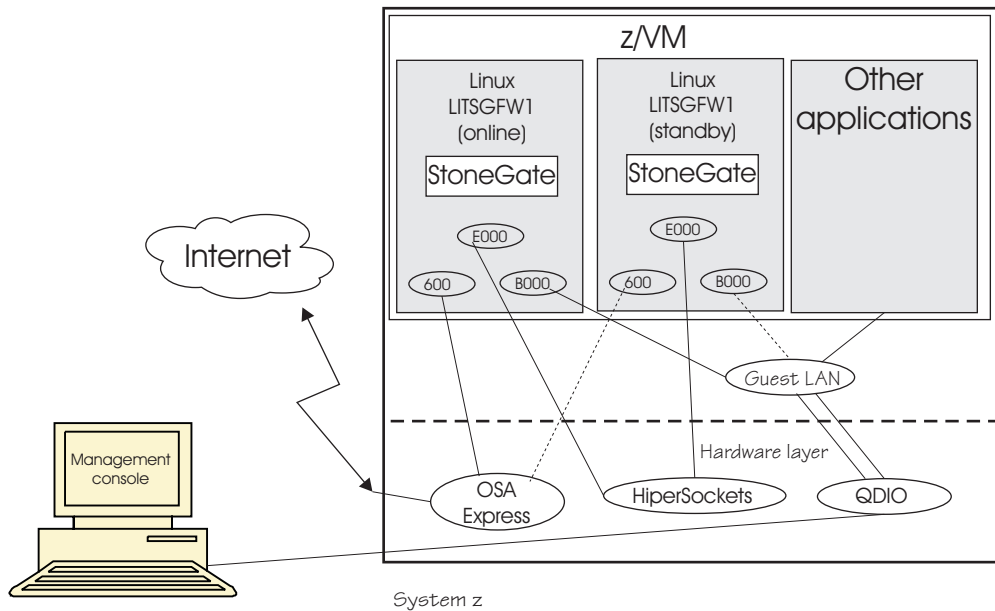


Figure 1. Example configuration

For the install, we followed the Stonesoft StoneGate Installation Guide: *Installing the Engine on the IBM zSeries Platform*. We defined two VM guests called LITSGFW1 and LITSGFW2. The z/VM directory entries used, showing network definitions and the size of our DASD partitions, are:

```
USER LITSGFW1 TEST4LIT 256M 512M G
  INCLUDE LINDFLT
  CPU 0
  CPU 1
  IPL 202
  MACHINE ESA 3
** OSA Express with Layer 2 support
  DEDICATE 0600 0600
  DEDICATE 0601 0601
  DEDICATE 0602 0602
** HiperSocket for heartbeat
  DEDICATE E000 E000
  DEDICATE E001 E001
  DEDICATE E002 E002
```

```

** Guest LAN definition
  NICDEF 0B00 TYPE QDIO LAN SYSTEM PRVV74
  MDISK 0191 3390 420 100 VM3126 MR READPASS WRITPASS MULTPASS
  MDISK 0201 3390 1 1669 VM532E MR READPASS WRITPASS MULTPASS
  MDISK 0202 3390 1670 END VM532E MR READPASS WRITPASS MULTPASS

USER LITSGFW2 TEST4LIT 256M 512M G
  INCLUDE LINDFLT
  CPU 0
  CPU 1
  IPL 202
  MACHINE ESA 3
** OSA Express with Layer 2 support
  DEDICATE 600 700
  DEDICATE 601 701
  DEDICATE 602 702
** HiperSocket for heartbeat
  DEDICATE E000 E004
  DEDICATE E001 E005
  DEDICATE E002 E006
** Guest LAN definition
  NICDEF 0B00 TYPE QDIO LAN SYSTEM PRVV74
  MDISK 0191 3390 540 100 VM3127 MR READPASS WRITPASS MULTPASS
  MDISK 0201 3390 1 1669 VM832E MR READPASS WRITPASS MULTPASS
  MDISK 0202 3390 1670 END VM832E MR READPASS WRITPASS MULTPASS

```

The Stonesoft instructions recommend assigning two read/write DASDs. For these we defined two minidisks on a single 3390 Model 3 ECKD device. To find the minimum partition sizes required we selected the Expert Install mode option. In the directory entries above devices 0600-0602 and 0700-0702 are OSA Express with Layer 2 support used to access our Public LAN. Devices E000-E002 and E004-E006 are Hipersocket used for the heartbeat between the engines. Device 0B00 is a Guest LAN used for our Internal/Private network.

We added the necessary RACF definitions for the guests, and downloaded the Stonesoft StoneGate code to our local server. Note that StoneGate installs as an entirely self-contained package. It comes with its own hardened instance of Linux included. As such, it does not install on top of an existing Linux server. We transferred the StoneGate files SGINST.KERNEL, SGINST.INITRD, SGINST.PARMPFILE and SGINST.EXEC to guest LITSGFW1 using FTP.

The following are the prompts and our replies (in **bold**). From the LITSGFW1 console we issued:

**SGINST EXEC**

License agreement must be accepted before continuing.  
Type YES to continue and NO to cancel.  
**YES**

Do you want to continue?  
**YES**

Enter the device number of first DASD:  
**201**

Enter the device number of second DASD:  
**202**

```

ldm_validate_partition_table(): Disk read failed.
0201(ECKD) at ( 94: 0) is dasda : active at blocksize: 1024, 826155 blocks, 806 MB
0202(ECKD) at ( 94: 4) is dasdb : active at blocksize: 4096, 300420 blocks, 1173 MB

```

Check that the DASDs are correct.

Type YES to continue and NO to cancel.  
Do you want to continue?  
**YES**

Existing StoneGate installation has not been detected.

1. Full install
2. Full install in expert mode

Enter your choice:  
**1**

Formatting volumes.

```
root A: /dev/discs/disc0/part1
root B: /dev/discs/disc0/part2
swap: /dev/discs/disc0/part3
data: /dev/discs/disc1/part1
spool: /dev/discs/disc1/part2
```

Check that partitions have been assigned correctly.  
Type YES to continue and NO to cancel.

Do you want to continue?  
**YES**

Creating filesystems...  
Extracting StoneGate image...  
Installing boot loader...  
Executing zIPL (disc0/part1)...  
The StoneGate can be started by IPLing the DASD number 0202  
Installation finished! Please IPL the DASD to continue.

### **ipl 202 clear**

Welcome to the StoneGate Engine Configuration Wizard.

This wizard will configure the StoneGate engine and contact the management server. After this you can perform all tasks using the administration client.

Step 1 of 3: Configure OS settings

-----  
Current OS settings:

- Host name not set
- Sshd enabled: no
- Root password is not set
- Timezone not set

Are you happy with these settings (Y/N)?  
**N**

Host name: litsgfw1  
Enable SSH daemon (Y/N)?  
**Y**

=== Change root password ===

Enter new root password:  
**xxxxxxx**

Re-Enter it:  
**xxxxxxx**

Select timezone (empty or prefix = list zones):  
**EST**

Selected: EST

```

Current OS settings:
- Host name: 'litsgfw1'
- Sshd enabled: yes
- Root password has been changed
- Timezone: EST
Are you happy with these settings (Y/N)?
Y

```

Step 2 of 3: Configure network interfaces

```

-----
Current network interfaces:
Id Interf. Driver  Devno  MAC                Type  Status
-----
R)reprobe channels, P)rint channels, A)dd driver, C)lear all,
M)gmt interface, N)IC id mapping, S)niff, rE)move NIC, O)ther options, D)one:
A

```

Detected following channels:

```

Type  In use Reg. Channel DevNo(s)
-----
qeth (0x10) no no 0x0600,0x0601,0x0602
qeth (0x10) no no 0xe000,0xe001,0xe002
qeth (0x10) no no 0x0b00,0x0b01,0x0b02

```

Select the device layer:

```

iucv
qeth
Your selection:
qeth

```

QETH for OSA-Express and Hipersockets channel device selected

Parameter syntax:  
 <devname>,<read\_devno>,<write\_devno>,<data\_devno>,<memusage>,<port\_no>,<chksum\_recv>  
 Please refer to IBM document 'Linux for zSeries and S/390: Device Drivers and Installation Commands' for more comprehensive syntax.  
 Please also remember to add 'enable\_takeover' parameter to IP takeover mode cluster interfaces.

HiperSockets example:  
 qeth1,0x7c00,0x7c01,0x7c02

OSA-Express example:  
 qeth2,0x500,0x501,0x502;add\_parms,0x10,0x500,0x502,portname:PORT123

Parameters (or P)rint channels):  
 qeth0,0x0600,0x0601,0x0602;add\_parms,0x10,0x0600,0x0602,enable\_takeover

You have given the following configuration:

```

- Module: qeth
- Parameters: qeth0,0x0600,0x0601,0x0602;
              add_parms,0x10,0x0600,0x0602,enable_takeover

```

Is it correct (Y/N)?  
 Y

```

-----
Current network interfaces:
Id Interf. Driver  Devno  MAC                Type  Status
-----
0 eth0  qeth    0x0600 00:09:6b:1a:2b:15 ether no link (mgmt)
-----
R)reprobe channels, P)rint channels, A)dd driver, C)lear all,
M)gmt interface, N)IC id mapping, S)niff, rE)move NIC, O)ther options, D)one:
A

```

Detected following channels:

```
Type  In use Reg. Channel DevNo(s)
```

```
-----  
qeth (0x10) no no 0x0600,0x0601,0x0602  
qeth (0x10) no no 0xe000,0xe001,0xe002  
qeth (0x10) no no 0x0b00,0x0b01,0x0b02
```

Select the device layer:

```
iucv  
qeth
```

Your selection:

**qeth**

QETH for OSA-Express and Hipersockets channel device selected

Parameter syntax:

```
<devname>,<read_devno>,<write_devno>,<data_devno>,<memusage>,<port_no>,<chksum_recv>
```

Please refer to IBM document 'Linux for zSeries and S/390: Device Drivers and Installation Commands' for more comprehensive syntax.

Please also remember to add 'enable\_takeover' parameter to IP takeover mode cluster interfaces.

HiperSockets example:

```
qeth1,0x7c00,0x7c01,0x7c02
```

OSA-Express example:

```
qeth2,0x500,0x501,0x502;add_parms,0x10,0x500,0x502,portname:PORT123
```

Parameters (or P)rint channels):

**qeth1,0xe000,0xe001,0xe002;add\_parms,0x10,0xe000,0xe002**

You have given the following configuration:

- Module: qeth
- Parameters: qeth1,0xe000,0xe001,0xe002;add\_parms,0x10,0xe000,0xe002

Is it correct (Y/N)?

**Y**

Current network interfaces:

Id	Interf.	Driver	Devno	MAC	Type	Status
0	eth0	qeth	0x0600	00:09:6b:1a:2b:15	ether	no link (mgmt)
1	hsi1	qeth	0xe000	No MAC / GuestLAN	ether	no link

R)reprobe channels, P)rint channels, A)dd driver, C)lear all, M)gmt interface, N)IC id mapping, S)niff, rE)move NIC, O)ther options, D)one:

**A**

Detected following channels:

```
Type  In use Reg. Channel DevNo(s)
```

```
-----  
qeth (0x10) no no 0x0600,0x0601,0x0602  
qeth (0x10) no no 0xe000,0xe001,0xe002  
qeth (0x10) no no 0x0b00,0x0b01,0x0b02
```

Select the device layer:

```
iucv  
qeth
```

Your selection:

**qeth**

QETH for OSA-Express and Hipersockets channel device selected

Parameter syntax:

```
<devname>,<read_devno>,<write_devno>,<data_devno>,<memusage>,<port_no>,<chksum_recv>
```

Please refer to IBM document 'Linux for zSeries and S/390: Device Drivers and Installation Commands' for more comprehensive syntax.

Please also remember to add 'enable\_takeover' parameter to IP takeover mode cluster interfaces.

HiperSockets example:

qeth1,0x7c00,0x7c01,0x7c02

OSA-Express example:

qeth2,0x500,0x501,0x502;add\_parms,0x10,0x500,0x502,portname:PORT123

You have given the following configuration:

Parameters (or P)rint channels): qeth2,0x0b00,0x0b01,0x0b02;  
add\_parms,0x10,0x0b00,0x0b02

- Module: qeth

- Parameters: qeth2,0x0b00,0x0b01,0x0b02;add\_parms,0x10,0x0b00,0x0b02

Is it correct (Y/N)?

Y

Current network interfaces:

Id	Interf.	Driver	Devno	MAC	Type	Status
0	eth0	qeth	0x0600	00:09:6b:1a:2b:15	ether	no link (mgmt)
1	hsi1	qeth	0xe000	No MAC /	GuestLAN	ether no link
2	eth2	qeth	0x0b00	No MAC /	GuestLAN	ether no link

R)reprobe channels, P)rint channels, A)dd driver, C)lear all,  
M)gmt interface, N)IC id mapping, S)niff, rE)move NIC, O)ther options, D)one:  
M

Management interface NIC id: 2

Current network interfaces:

Id	Interf.	Driver	Devno	MAC	Type	Status
0	eth0	qeth	0x0600	00:09:6b:1a:2b:15	ether	no link
1	hsi1	qeth	0xe000	No MAC /	GuestLAN	ether no link
2	eth2	qeth	0x0b00	No MAC /	GuestLAN	ether no link (mgmt)

R)reprobe channels, P)rint channels, A)dd driver, C)lear all,  
M)gmt interface, N)IC id mapping, S)niff, rE)move NIC, O)ther options, D)one:  
D

Step 3 of 3: Prepare for management contact

Current management contact settings:

Switch to initial configuration: No

- Node IP address not set

- Node netmask not set

- Gateway IP address not set

Perform initial contact: No

- Management IP address not set

- Management One-time password not set

- Key fingerprint not set

Are you happy with these settings (Y/N)?

N

Switch to initial configuration (Y/N)?

Y

Enter data for switching to the initial configuration and/or  
contacting the management server. Fields marked with \* must be filled.  
Firewall node:

Node IP address:\* **192.168.74.200**

Netmask:\* **255.255.255.0**

Gateway to management: **192.168.74.114**

Use VLAN (Y/N)? N

Perform new initial contact (Y/N)?

Y

```
Enter data required for contacting the management server.
Fields marked with * must be filled, others are optional.
Management IP address: 192.168.71.26
One-time password:* xxxxxxxx
```

NOTE: this one time password was generated when we saved the initial configuration in the Configure the Firewall Cluster step above. A password is generated for each engine defined.

```
Key fingerprint: enter
```

```
Current management contact settings:
Switch to initial configuration: Yes
- Node IP address: '192.168.74.200'
- Node netmask: '255.255.255.0'
- Gateway IP address not set
Perform initial contact: Yes
- Management IP address: '192.168.71.26'
- Management One-time password: 'xxxxxxx'
- Key fingerprint:
Are you happy with these settings (Y/N)?
Y
```

```
Your choices:
```

```
-----
R) Reconfigure
P) Print current settings
S) Save and exit
C) Cancel
-----
```

```
Your selection:
```

```
S
```

```
Restarting StoneGate...
warning: Couldn't get cp configuration
warning: Could not get hardware MAC for interface eth2 (1663)
Contacting management system...
Contact succeeded!
```

The second guest, LITSGFW2, was configured by repeating the same steps.



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## Appendix B. Notices

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Installing and using the Stonesoft StoneGate client

Publication No. SC33-8321-00

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