



CHARON Linux Toolkit V1.47

Users Guide



Contents

Purpose of this document	3
Introduction	4
Setup	8
Menu options	11
Install/Upgrade/Remove CHARON	15
Network Configuration Utility	20
HASP license details	21
License driver management (aksusbd)	22
Request for New or Update license (send C2V file)	23
License update tool (apply V2C file)	24
License expiration check	27
VM Management (add/remove VM, start, stop, console connection, ...)	29
VM management - Update guests list	34
VM management - Start/stop guests	48
VM management - View guest log file	58
VM management - Install, update or manage service	62
VM management - Create/Edit guest stop script	66
VM management - Connect to guest console	75
VM management - Edit configuration files	79
VM management - Manage monitored guests logs	82
Manage monitored guests logs	83
Send configuration and log files via mail	85
Preferences	87
Manage recurring jobs: license expiration check, log events (cron)	88
Alerts management	91
Show host information (OS, HW, Charon version, utils and services)	100
Documentation	101
Additional command lines	102
Tips and Tricks	106
Alert emails examples	111
Quick Setup Guide	117
Appendixes	119
Connection to guest console blocked by firewall	120
How to restart CHARON-VAX/AXP on Linux automatically on failure	121

Purpose of this document

This document is the user's guide of the "CHARON Linux Toolkit" scripts.

These scripts are designed to:

- **Manage start/stop guests at server boot with services and customized shutdown commands:**
 - Automatic start of the guests (virtual machines) at Linux server boot
 - Clean shutdown of the guests at Charon server shutdown
 - Clean shutdown of one guest at will using customized shutdown scripts (using 'ssh', 'expect' or any customized tool)
- **Monitor the CHARON guests log file**
 - Alert on removal of the license dongle
 - Send alerts for all INFO, WARN and ERROR messages found (depending on the error level setting)
- **Alert on license approaching termination**
 - Number of days before expiration alert is sent can be customized
- **Provide menu driven options** like:
 - Start/stop guests (virtual machines)
 - Connection to guests console
 - Display license contents, gather license content and update (send C2V and apply V2C files)
 - Send configuration and log files by email
 - Edit configuration files
 - Gather Charon server information: Hardware, Operating System, Storage, Network interfaces, Charon version, Utilities version

Introduction

Table of contents

- Important note
- Kit download
- Prerequisites
- Conventions
 - Throughout the document(s) these conventions are followed
 - The following definitions apply
- Note related to display/edit options
- Note related to emails

Important note



This document applies to Linux Toolkit version 1.47

Kit download

To download the kit, you must issue a request via email to the Stromasys support team (support@stromasys.com) or ask your reseller

Prerequisites

- Basic knowledge of Unix commands
- Basic knowledge of Charon products
- Charon qualified versions:

	Charon-AXP V4.5 Build 155-05 (+ patches) Charon-AXP V4.6 Build 166-03 (+ patches) Charon-AXP V4.7 Build 171-01 (+ patches) Charon-AXP V4.8 Build 183-02 (+ patches)
	Charon-VAX V4.6 Build 165-02 (+ patches) Charon-VAX V4.7 Build 171-01 (+ patches) Charon-VAX V4.8 Build 183-02 (+ patches)

- Scripts have been tested and validated on the following Linux distributions/versions:

	CentOS 7
	Red Hat Enterprise Linux Server release 6.x Red Hat Enterprise Linux Server release 7.x

- Some packages have to be installed on the Charon server:
 - Mandatory packages:
 - `glibc.i686`
 - `bc`
 - `perl`
 - `at`
 - Recommended packages:
 - `telnet` : recommended for connection from the Charon server to the virtual machine console
 - `expect` : recommended if `ssh` cannot be used to execute shutdown commands from the console
 - `evince` : recommended for reading online documentation
 - `postfix` : recommended, Mail Transport Agent used to send emails
 - `firefox` : recommended for checking and updating licenses, accessing online documentation
- All described operations will have to be performed on the Charon server and logged in as '**root**' (no other user supported).
 - ⚠ The '**menu**' must be used by one user at a time only
- Charon-AXP and Charon-VAX installations are supported when installed in `/opt/charon` folder only
- Mail service must have been configured. Mail transfer agent can be postfix, sendmail, ...
- ⚠ Within the Charon virtual machines configuration files:
 - do not use spaces or tabs between a parameter and its value as the toolkit does not handle this correctly, i.e.: `parameter=value` is correct, `parameter = value` is not correct.
 - do not add devices parameters on the same line, please split the line in 2 lines

Unsupported	Supported
<pre>set PKA container[600]= "/home/vdisk/axp/ALPHA084.iso" media_type[600]="RRD47"</pre>	<pre>set PKA container[600]= "/home/vdisk/axp/ALPHA084.iso" set PKA media_type[600]="RRD47"</pre>

Conventions

Throughout the document(s) these conventions are followed

Notation	Description
\$	The dollar sign in interactive examples indicates an operating system prompt for VMS. The dollar sign can also indicate non superuser prompt for UNIX / Linux.
#	The number sign represents the superuser prompt for UNIX / Linux.
>	The right angle bracket in interactive examples indicates an operating system prompt for Windows command (cmd.exe).
User input	Bold monospace type in interactive examples indicates typed user input.
<path>	Bold monospace type enclosed by angle brackets indicates command parameters and parameter values.
Output	Monospace type in interactive examples, indicates command response output.
[]	In syntax definitions, brackets indicate items that are optional.
...	In syntax definitions, a horizontal ellipsis indicates that the preceding item can be repeated one or more times.
<i>disk0</i>	Italic monospace type, in interactive examples, indicates typed context dependent user input.

The following definitions apply

Term	Description
Host	The system on which the emulator runs, also called the Charon server
Guest	The operating system running on a Charon instance, for example, Tru64 UNIX, OpenVMS, Solaris or MPE

Note related to display/edit options

Some menu options will allow you to display or edit files using available editors (if installed) between:


Editor	Interface	Description
gedit	Graphical	Windows notepad like
emacs	Graphical	Windows notepad like, advanced
nano	Text	Basic text editor
vi	Text	Advanced users
vim	Text	Advanced users with more features (colored & highlights)
gvim	Graphical	Advanced users with more features (colored & highlights)

Select the one you prefer or refer to 'man pages' for more information on available ones.

Note related to emails

There are 2 kinds of emails:

Type	Description
Results	Some menu options will allow you to send results via email. <ul style="list-style-type: none"> • Example: license display, log and configuration files. • The recipient will then be unique
Alerts	By default, the alert script will send alerts via email (plus 'wall' notifications if enabled). A recipients list can be defined in this case. <ul style="list-style-type: none"> • Wall notification can be enabled/disabled from the menu • The alert script can be customized. You can for example use command lines linked to your monitoring software and disable emails.

 Do not use Stromasys email address to send results directly, for example to support@stromasys.com. The sender will be unknown to us, it is then recommended to send results to yourself first and to forward us the email you received.

 Both use 'sendmail' command to send emails. Mail transfer agent can be postfix, sendmail, ...

Setup

Table of contents

- Installation
- Upgrade

Installation

The tools are provided in a tar file that must be extracted into the `/opt/charon/Utils` folder.

- If the folder does not exist, by default created at Charon installation, create it and copy the tar file in this directory. In the example below, we assume the tar file was downloaded in the `/charon` folder:



```
# mkdir -p /opt/charon/Utils
# cp /charon/charon_linux_toolkit.V1.47.tar /opt/charon/Utils
```

- Extract the files from the tar file to the Charon installation directory, subdirectory 'Utils'

```
# cd /opt/charon/Utils
# tar -xf charon_linux_toolkit.V1.47.tar
```

- Execute the installation script:

```
# ./menusetup
```

- The setup will check first your terminal settings, if set to `VT100` you will not be able to continue until you set the `TERM` value to `VT200`, `dterm` or `xterm` (see how to here: [Configuration](#))
- Mandatory and recommended packages installation will be checked.
 -  If some mandatory packages are missing you will not be able to continue.
 -  If some recommended packages are missing, installation will continue. Installation of these packages can be done later if needed
- If 'telnet' is installed, you will be prompted to force the mode to character to avoid some input issues while connected to the guests consoles
- The 'menu', 'logtail', 'logview' and 'vmlist' aliases will be created. They will be the commands you'll use to access the menu or to view virtual machines states and log files.
- Preferences can be defined during the setup or later, they are related to the default editors used with text and graphical user interfaces, Out Of Memory (OOM) Killer settings and continuous log view when starting a guest (virtual machine)
- Recurring jobs will be added in the `crontab` file:
 - if the `crontab` file does not exist, it will be automatically filled
 - if it already exists, you will be prompted to update it via the selected editor: a check will be performed and the missing entries will be added

- Alerts parameters will now have to be filled (see [Alerts management](#) chapter for more if needed)
 - Select between HTML or pure TEXT emails
 - Mail recipients list (used for alerts, not for sending files like log and configuration files for example)
 - Mail sender (can be used to change the displayed name of the sender)
 - Customize emails footer: if needed, add here your disclaimer, information on the CHARON server or any information you think useful
 - Enable/disable wall alert messages
 - Install or update the alert script. It can be customized later, in this case it is recommended to do this once the virtual machines are installed
 - Select the alert level from guests log files: 0 = none, 1 = informational+warning+error entries, 2 = warning+error entries (default), 3 = error entries only
 - View alerts if any
 - Enable or disable license expiration alerts from guests logs: 1 alert per hour if enabled, 1 (default) or more alerts per day as defined per the recursive jobs settings
 - The alerts simulator can be used to send all the know alerts via email (for checks)

Example:

```

STROMASYS - Virtualization Technologies V1.3
Alerts management

No  Parameter                               Current value(s)
---  -
1 - Mail mode (text/html)                  HTML
2 - Mail recipients list                   ██████████@stromasys.com
3 - Mail sender (optional)                 BrunoPC RedHat7 LTK
4 - Create/Update alert mail footer        STROMASYS Bruno PC - RHEL 7.x Toolkit So
5 - 'wall' alert messages                  Disabled
6 - Update/reinstall alert script          Installed (from example)
7 - Select guests log alert level          WARNING + ERROR
8 - View alerts history (550 alerts)       Last update: Thu 14-Sep-2017 12:25:51
9 - Lic. expiration alerts from guests    Disabled
10- Alerts simulator

Enter your choice ('q' to quit): █

```

- When the setup is completed either log out to define the command aliases or execute the following command:

```
# . /etc/profile.d/charon_menu.sh
```

Upgrade

Except if mentioned in the release notes, an upgrade does not require the Charon virtual machines to be stopped

To upgrade the kit, you will need to:

- read the [CHARON Linux Toolkit - Release notes for kit 1.47](#) document
- copy and extract the files from the tar file to the CHARON installation directory, subdirectory 'utils'

```
# cd /opt/charon/utils
# tar -xf charon_linux_toolkit.V1.47.tar
```

- To install newly defined aliases (logtail, logview, vmlist, ...), please run the following command:

```
# cd /opt/charon/utils (if not already done)
# ./menusetup -a
```

then either logout or execute the following command for the changes to take effect:

```
# . /etc/profile.d/charon_menu.sh
```

You can then run the 'menu' command as usual

In case of upgrade from a kit older than 41 on a CentOS 7 or Red Hat 7 system, you must first stop all services, including the virtual machines running, and remove the services that were defined using the previous method as described below:


1. List installed services

```
# chkconfig --list | grep charon
charon_gstart    0:off    1:off    2:off    3:on     4:on     5:on     6:off
charon_logchk   0:off    1:off    2:off    3:on     4:on     5:on     6:off
```

2. Remove installed services

```
# chkconfig --del charon_gstart
# chkconfig --del charon_logchk
```

Once these services are removed, you can perform a standard kit upgrade

 Services will have to be redefined or updated from the 'menu', they will then use the 'systemd' features

Menu options

Table of Contents

- Menu launcher
- Configuration
- Menu Options

Menu launcher

Execute the following command:

```
# menu
```

to display the Toolkit menu:

```
STROMASYS - Engineered solutions
Charon Linux Toolkit V1.47

Charon installation
 1 - Install/Upgrade/Remove Charon
 2 - Network Configuration Utility (ncu)
License management
 3 - HASP license details
 4 - License driver management (aksusbd)
 5 - Request for new license or license update (send C2V file)
 6 - License update tool (apply V2C file)
 7 - License expiration check
Virtual Machines (guests)
 8 - VM Management (add/remove VM, start, stop, console connection, ...)
 9 - Manage monitored guests logs
10 - Send configuration and log files via email
Miscellaneous
11 - Preferences
12 - Manage recurring jobs: license expiration check, log events, etc... (cron)
13 - Alerts management
14 + Show host information (OS, HW, Charon version, utilities and services)
15 + Documentation

Enter your choice ('q' to quit): █
```

Configuration

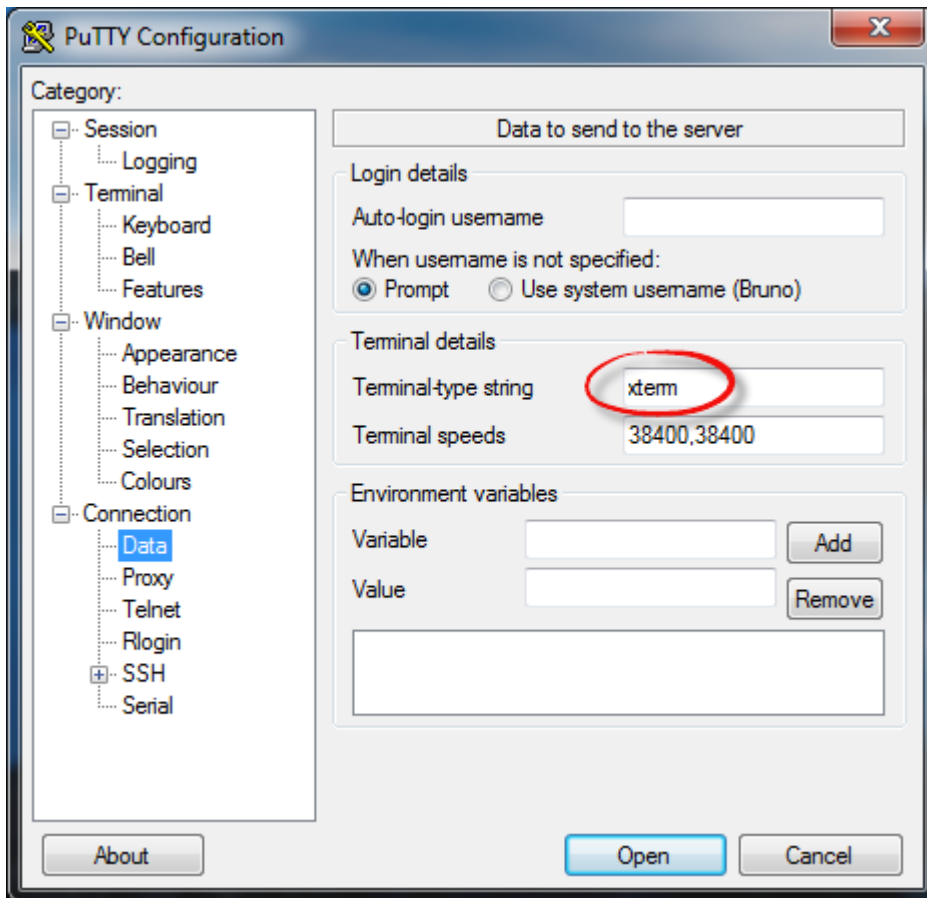
If the menu does not correctly display line drawing, change the terminal settings. If set to vt100 for example, you will see lowercase characters in place of menu borders.

To correct this, enter the following commands:

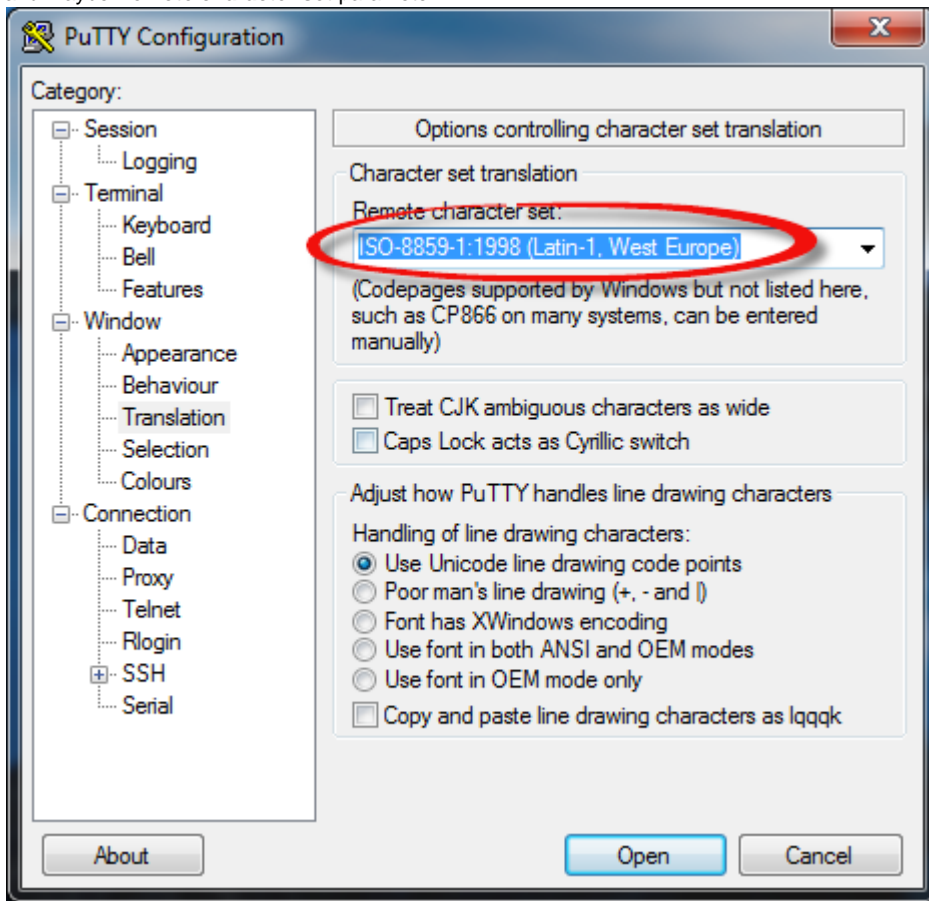
```
# echo $TERM
vt100
# TERM=vt200
# export TERM
# menu
```

Notes:

- New `TERM` value can also be set to `xterm`
- If you're using putty, you'll maybe have to force the **Terminal-type string**:



and maybe **Remote character set** parameter:



Recommended color scheme for 'putty' is (all other values can remain as they are by default):

Color to adjust	Red	Green	Blue
Default Foreground	0	0	0
Default Foreground Bold	0	0	160
Default Background	255	255	255
Default Background Bold	192	192	192
ANSI White	223	223	223

Menu Options

- Install/Upgrade/Remove CHARON
- Network Configuration Utility
- HASP license details
- License driver management (aksusbd)
- Request for New or Update license (send C2V file)
- License update tool (apply V2C file)
- License expiration check
- VM Management (add/remove VM, start, stop, console connection, ...)
 - VM management - Update guests list
 - VM management - Start/stop guests
 - VM management - View guest log file
 - VM management - Install, update or manage service
 - VM management - Create/Edit guest stop script
 - VM management - Connect to guest console
 - VM management - Edit configuration files
 - VM management - Manage monitored guests logs
- Manage monitored guests logs
- Send configuration and log files via mail
- Preferences
- Manage recurring jobs: license expiration check, log events (cron)
- Alerts management
- Show host information (OS, HW, Charon version, utils and services)
- Documentation


Install/Upgrade/Remove CHARON

Table of contents

- Description
- Fresh CHARON installation example
- CHARON upgrade installation
- Installation of CHARON-AXP and CHARON-VAX on the same Linux server

Description

This option is designed to perform easy installation and uninstallation of CHARON. You have to provide the .tar.gz file (kit) location, the .tar file if it has been unzipped or the folder where the kit was unzipped and extracted, the tool will install all packages. You can also provide a software license kit location if any, .tar or folder, the script will also perform the setup.

 It is recommended to locate all CHARON kits in the same folder as this menu will remind the last folder you used in the previous session (if not, you will be prompted to select the folder)

Notes:



- Zipped kits will be unzipped automatically (.tar.gz file)
- .tar files will be removed once extracted into their destination folder
- If the kit is provided with a .md5sum file and this file is present in the same folder as the kit, the md5sum check will be automatically performed.
- To display the options available, type "?" and press enter:

```
Enter your choice (i/u/r/s/q/?): ?
```

Enter:

```

i      - to install
u      - to uninstall (available if a product is at least installed)
r      - to reload the screen (refresh)
s      - to install/uninstall Software license
q      - to quit
? or h - to display this message
```

-  To upgrade CHARON-AXP or CHARON-VAX, you will need to stop the running virtual machines (AXP and VAX), uninstall the current version and install the new one.
 - If you only upgrade the CHARON Linux Toolkit, you will not have to stop the running virtual machines except if notified in the [Release notes](#) document.
-  To remove CHARON-AXP or CHARON-VAX, you must ensure there is no running virtual machine related to the product
- The installation log will be stored in the /opt/charon/log folder with names yum.install.<date> (name is given at the end of the installation process)

Fresh CHARON installation example

Context:

- Operating system used is Red Hat Enterprise Linux 7.2
- We will install CHARON-AXP V4.8 Build 183-02
- License key is based on USB dongle
- We assume CHARON kits have been downloaded to the /charon folder:

```
[root@rhel72 ~]# cd /charon
[root@rhel72 charon]# ls -l *4.8*
-rw-r-----. 1 root root 57419115 Dec 29 14:16 charon-axp-4.8-18302.el71.tar.gz
-rw-r--r--. 1 root root          67 Dec 29 14:17 charon-axp-4.8-18302.el71.tar.gz.md5sum
-rw-r-----. 1 root root 35780502 Dec 29 14:17 charon-vax-4.8-18302.el71.tar.gz
-rw-r--r--. 1 root root          67 Dec 29 14:17 charon-vax-4.8-18302.el71.tar.gz.md5sum
```

For a fresh installation the setup does not know where you use to store the CHARON kits so enter the kit location (2) and select the kit you want to install (3):

```

STROMASYS - Virtualization Technologies V2.8
Install/Upgrade/Remove CHARON

Hostname:          rhel72.stromasys.com
Linux version:    Red Hat Enterprise Linux Server release 7.2 (Maipo)
                  Linux 3.10.0-327.28.3.el7.x86_64

Installed packages
- License driver:  Not installed or Software license
- Base products:  No one installed

Note: If you perform an upgrade, please uninstall the current build first

Enter your choice (i/r/s/q/?): i 1
Enter kit location (folder), . for current folder, q to quit
: /charon 2
Searching for complete packs in /charon ...
Done.

No  Product                Version Build  Installed Container  md5sum
-----
  1 charon-axp                4.8  18302  -          tar.gz        OK
  2 charon-vax                4.8  18302  -          tar.gz        OK

Select the kit you want to use (q to quit): 1 3

```

The kit will then be unzipped, extracted and installed.

```

Checking charon-axp-4.8-18302.el71.tar.gz file (md5sum) ...
Success.
Unzipping file...
Extracting tar file...
Done.
Removing tar file...

Notes: - Starting with V4.6 B16603, if you're installing both
          CHARON-AXP and CHARON-VAX, they must be the same build number

Loaded plugins: langpacks, product-id, search-disabled-repos, subscription-
                : manager
Examining aksusbd-2.5-1.i386.rpm: aksusbd-2.5-1.i386
Marking aksusbd-2.5-1.i386.rpm to be installed
Examining charon-axp-4.8-18302.el71.x86_64.rpm: charon-axp-4.8-18302.x86_64
Marking charon-axp-4.8-18302.el71.x86_64.rpm to be installed
Examining charon-license-4.8-18302.el71.x86_64.rpm: charon-license-4.8-18302.x86_
_64
Marking charon-license-4.8-18302.el71.x86_64.rpm to be installed
Examining charon-utils-4.8-18302.el71.x86_64.rpm: charon-utils-4.8-18302.x86_64
Marking charon-utils-4.8-18302.el71.x86_64.rpm to be installed
Resolving Dependencies

```



```

Verifying   : aksusbd-2.5-1.i386                1/4
Verifying   : charon-axp-4.8-18302.x86_64      2/4
Verifying   : charon-utils-4.8-18302.x86_64    3/4
Verifying   : charon-license-4.8-18302.x86_64  4/4

Installed:
 aksusbd.i386 0:2.5-1                charon-axp.x86_64 0:4.8-18302
 charon-license.x86_64 0:4.8-18302  charon-utils.x86_64 0:4.8-18302

Complete!
Installation completed (error code 0)

Output saved to /opt/charon/log/yum.install.20161229_144021

PATH not set, it is recommended to logoff and login before using CHARON
or to leave the menu then run:

# . /etc/profile.d/charon_axp.sh (for CHARON-AXP before V4.6)
and/or
# . /etc/profile.d/charon.sh      (for CHARON-VAX & CHARON-AXP > V4.6)

Press enter

```

CHARON-AXP is now installed as shown below:

```

STROMASYS - Virtualization Technologies V2.8
Install/Upgrade/Remove CHARON

Hostname:          rhel72.stromasys.com
Linux version:    Red Hat Enterprise Linux Server release 7.2 (Maipo)
                  Linux 3.10.0-327.28.3.el7.x86_64

Installed packages
- License driver:  aksusbd-2.5-1.i386 ✓
- Base products:   charon-axp V4.8 B18302 ✓
- Packages :       axp/4.8 license/4.8 utils/4.8

Note: If you perform an upgrade, please uninstall the current build first

Enter your choice (i/u/r/s/q/?): █

```

CHARON upgrade installation

To upgrade a CHARON product version or to install patches, please refer to the appropriate release notes first.

- All running virtual machines have to be shutdown before upgrade
- Upgrading to a new version requires all previous versions to be uninstalled

Installation of CHARON-AXP and CHARON-VAX on the same Linux server

Starting with build 16803, if you install CHARON-AXP and CHARON-VAX on the same server, they must be the same build

Context:

- Operating system used is Red Hat Enterprise Linux 7.2
- We will install CHARON-VAX V4.8 Build 183-02 on a server where CHARON-AXP V4.8 Build 183-02 is already installed
- We assume the kits have been downloaded to the /charon folder

Execute the "menu" command and select option 1 and ensure the already installed CHARON-AXP build matches the CHARON-VAX:

```

STROMASYS - Virtualization Technologies V2.8
Install/Upgrade/Remove CHARON

Hostname:          rhel72.stromasys.com
Linux version:    Red Hat Enterprise Linux Server release 7.2 (Maipo)
                  Linux 3.10.0-327.28.3.el7.x86_64

Installed packages
- License driver: aksusbd-2.5-1.i386
- Base products:  charon-axp V4.8 B18302
- Packages :      axp/4.8 license/4.8 utils/4.8

Note: If you perform an upgrade, please uninstall the current build first

Enter your choice (i/u/r/s/q/?): i 1
Enter kit location (folder), . for current folder, q to quit
[/charon] : 2
Searching for complete packs in /charon ...
Done.

No  Product          Version Build  Installed Container  md5sum
---  ---
 1 charon-axp         4.8 18302 yes      folder              -
 2 charon-vax         4.8 18302 -        tar.gz              OK

Select the kit you want to use (q to quit): 2 3

```

i (2): The program remembers the folder where you stored the kit during previous installation so just press enter.

CHARON-VAX installation begins. Once completed, the installed packages are listed:

```
STROMASYS - Virtualization Technologies V2.8
Install/Upgrade/Remove CHARON

Hostname:          rhel72.stromasys.com
Linux version:    Red Hat Enterprise Linux Server release 7.2 (Maipo)
                  Linux 3.10.0-327.28.3.el7.x86_64

Installed packages
- License driver: aksusbd-2.5-1.i386
- Base products:  charon-axp V4.8 B18302
                  charon-vax V4.8 B18302 ✓
- Packages :      axp/4.8 license/4.8 utils/4.8 vax/4.8

Note: If you perform an upgrade, please uninstall the current build first


Enter your choice (i/u/r/s/q/?): █
```

Network Configuration Utility

Table of contents

- Description
- Example

Description

This option will execute the "Network Configuration Utility" (ncu) if installed.  Linux distribution/version and CHARON product version dependent

Refer to the corresponding CHARON product version documentation for more information on 'ncu' ("Installation" chapter then "Configuration with NCU utility")

Example

One network adapter, "eno50332216" is dedicated to Charon:

```

STROMASYS - Virtualization Technologies V1.1
Network Configuration Utility

CHARON Network Configuration Utility, STROMASYS (c) 2016 Version 1.6

Interfaces          Dedicated to      State
-----          -
virbr0             host             connected to host
eno16777736       host             connected to host
eno67109440       host             connected to host
eno50332216       CHARON           unmanaged by host
lo                 host             unmanaged by host
virbr0-nic        bridge           unmanaged by bridge

=====
bridge name      bridge id          STP enabled      interfaces
=====
virbr0  8000.525400aa3ad4  yes              virbr0-nic
=====

select action:
1 - Dedicate to CHARON
2 - Release to host
3 - Create Bridge with TAPs
4 - Remove Bridge
5 - Add VLAN          (disabled, because vlan control package is not found)
)
6 - Remove VLAN       (disabled, because vlan control package is not found)
)
7 - Print status
8 - Exit
:>


```

HASP license details

Description

This option displays the license content and optionally can be used to send the license content, human readable, via email

 It will work even if you are logged in via 'ssh'. See [CHARON on Linux - Cannot get license information or run guests over ssh](#) for more information

 Licenses descriptions (usage, location, etc...) can be added to the display list by manually creating the following file:

```
/opt/charon/Utils/charon_licenses.list
```

This optional file can contain the license number, a description and an ANSI color code (see "# man terminfo" and search for "Color Handling"), each parameter separated by a semicolon. One line per license.

Example:

We describe here the license 1002922 as "Main license, from of the tower" with a green color (ANSI code 2)

```
# cat /opt/charon/Utils/charon_licenses.list
1002922;Main license, front of the tower;2
```

Example

```
STROMASYS - Virtualization Technologies V1.5
HASP license details


Please wait, generating output...█
```

Once the file is generated, you'll either be prompted to select the editor you want to use or the editor will be opened automatically if you did setup your preferences.

```
STROMASYS - Virtualization Technologies V1.5
HASP license details

License number Type Key ID Description
-----
1002922 USB 879642840 Main license, front of the tower

Do you want to send file via mail (y/n) ? y
Enter the email recipient (q to quit) []: kirk@enterprise.uss
```

 If you decide to send the result via email, you will receive one with subject: "[CHARON] View license HASP_SRM_VIEW"

License driver management (aksusbd)

Description

This option is used to displays the license driver service status and to restart it if needed

Example

```
STROMASYS - Virtualization Technologies V1.0
License driver management (aksusbd)

Driver service status:
● aksusbd.service - LSB: Sentinel LDK RTE
   Loaded: loaded (/etc/rc.d/init.d/aksusbd)
   Active: active (running) since Mon 2017-02-20 16:07:36 CET; 53min ago
     Docs: man:systemd-sysv-generator(8)
  Process: 88701 ExecStop=/etc/rc.d/init.d/aksusbd stop (code=exited, status=0/SUCCESS)
  Process: 89027 ExecStart=/etc/rc.d/init.d/aksusbd start (code=exited, status=0/SUCCESS)
    CGroup: /system.slice/aksusbd.service
            └─89044 /usr/sbin/aksusbd
            └─89083 /usr/sbin/winehasp
            └─89112 /usr/sbin/hasplmd -s

Do you want to restart the service (y/n) ? y
```

Request for New or Update license (send C2V file)

Description

This option creates a C2V (Customer to Vendor) file to be sent to Stromasys in order to update a license.

- If you use a hardware license (USB stick) then use option 1.
- Option 2 is used to generate a fingerprint to obtain a software license (no USB stick)



Send it first to yourself and not directly to Stromasys as mentioned in the Note related to emails

Example

```

STROMASYS - Virtualization Technologies V1.6
Create and send C2V file

Collect information to:
1 - Update a license (1 dongle detected)
2 - Generate a Software License (fingerprint)

Enter your choice (q to quit) : 1

License number: 1000.806

Please wait, generating C2V file.....

C2V file generated: /tmp/1000.806_20160321_164344.c2v

Do you want to send file via mail (y/n) ? y

Enter the email recipient (q to quit) []: Janeway@voyager.us

```

Enter the email recipient or press enter to use the latest recipient entered from any other menu option that sends emails.

You will then receive an email with subject: "[CHARON] C2V file / License xxx" where xxx represents the license number or "[CHARON] C2V file / Collect for Software License" if option 2 was used.

License update tool (apply V2C file)

Table of contents

- Description
- Using Graphical User Interface (GUI)
- Using Character User Interface (CUI)

Description

This option either:

- opens Firefox Web browser (Graphical User Interface) in order to apply the V2C (Vendor to Customer) file received from Stromasys or
- if the 'hasp_update' executable file is present, coming from the CHARON kit (starting with V4.6) or from a provided HASP SL (Software License) runtime package, allows you to apply updates from a Character User Interface.

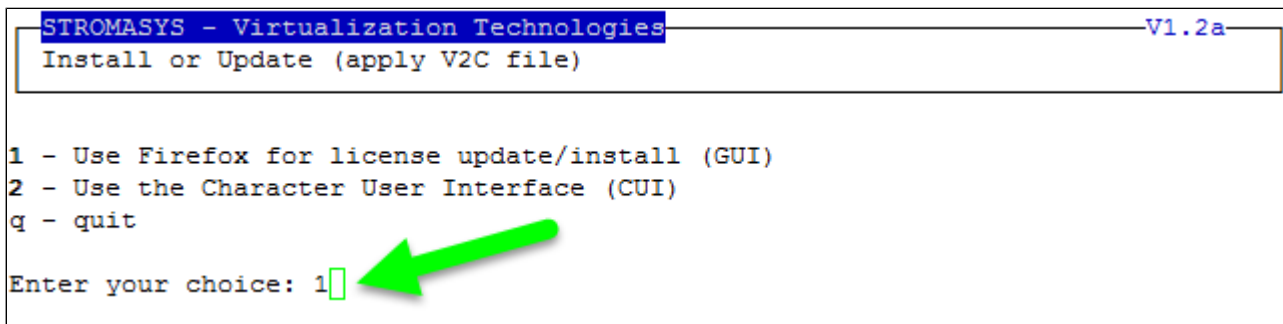
Using Graphical User Interface (GUI)

Select option 1 from the menu:

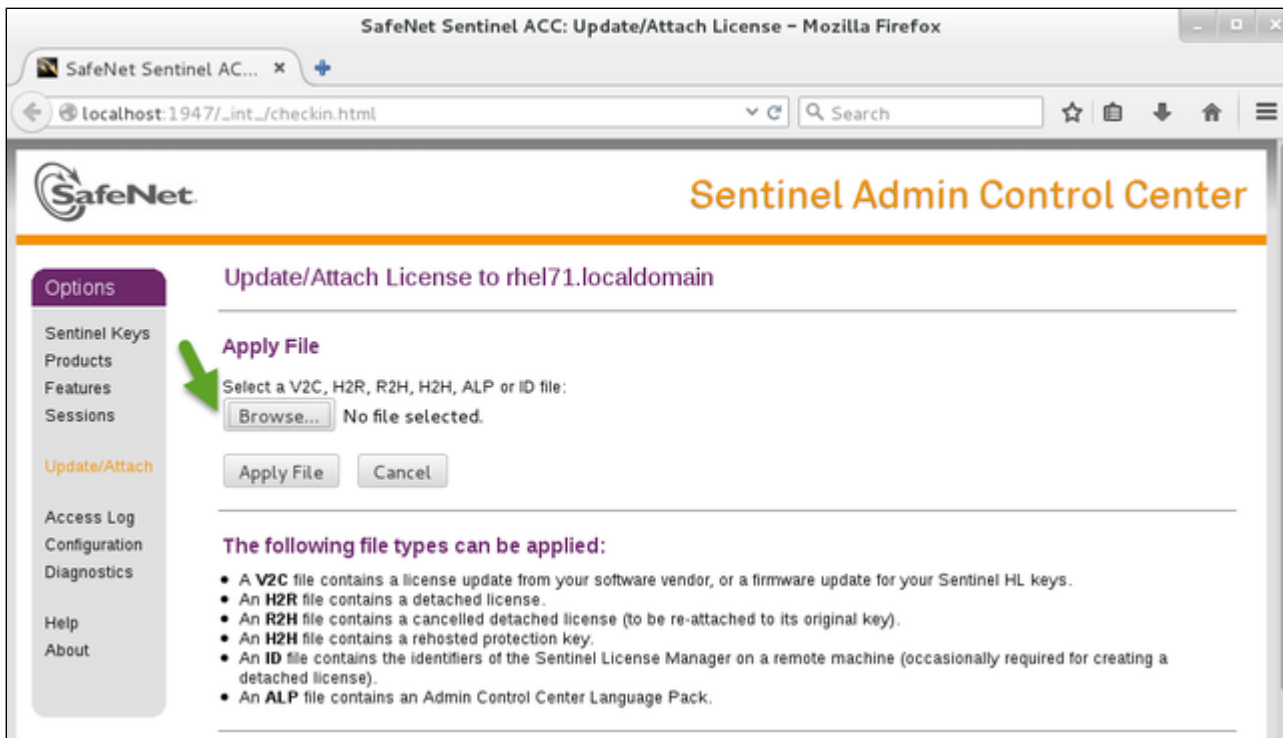
```
STROMASYS - Virtualization Technologies V1.2a
Install or Update (apply V2C file)

1 - Use Firefox for license update/install (GUI)
2 - Use the Character User Interface (CUI)
q - quit

Enter your choice: 1
```



and click on the Browse button to select and apply the V2C files:



⚠ In case of update, install the `_fmt.v2c` file first (`_fmt` = format)


Using Character User Interface (CUI)

Select option 2 from the menu:

```
STROMASYS - Virtualization Technologies V1.2a
Install or Update (apply V2C file)

1 - Use Firefox for license update/install (GUI)
2 - Use the Character User Interface (CUI)
q - quit

Enter your choice: 2
```



You will have, if not already done, to specify the container (folder) where you store the `.v2c` files.

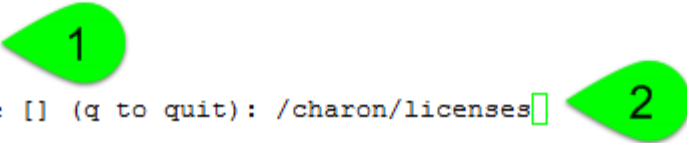
⚠ The specified folder must already exist. In the example below, the "`# mkdir -p /charon/licenses`" command was used to create the container

Example:

```
STROMASYS - Virtualization Technologies V1.2a
Install or Update (apply V2C file)

Available options
1 - Install or update license
2 - Set license files folder
q - Quit

Enter your choice: 2
Enter the folder name [] (q to quit): /charon/licenses
```



Example:

```

STROMASYS - Virtualization Technologies V1.2a
Install or Update (apply V2C file)

Available options
1 - Install or update license
2 - Change license files folder [/charon/licenses]
q - Quit

Enter your choice: 1
Available license files
1 - 0020_1000.800_11-May-2016_fmt.v2c
2 - 0020_1000.800_11-May-2016.v2c
3 - 0005_1000.806_300_fmt.v2c
4 - 0005_1000.806_300.v2c
5 - 0007_1000.806_720_fmt.v2c
6 - 0007_1000.806_720.v2c
7 - 0008_1000.806_20-Jul-2016_fmt.v2c
8 - 0008_1000.806_20-Jul-2016.v2c
9 - 0010_1000.806_360_fmt.v2c
10 - 0010_1000.806_360.v2c
11 - 0014_1000.806_360_fmt.v2c
12 - 0014_1000.806_360.v2c

Note: To update a license, please install the '_fmt' file first.

Multiple selections available / comma or blank separated
Enter your choice (q to quit) : 11 12

Error codes explanations::
- Code 18 means the dongle is not connected
- Code 55 means you tried to apply a V2C file with an update counter that
  is out of sequence with update counter in the Sentinel protection key
- Code 65 means the (software) license has already been applied

Applying 0014_1000.806_360_fmt.v2c ...

```

The license updates will be applied in the order specified.

? Common errors codes translations are displayed. If the error code is not listed here, please have a look at this article: [hasp_update utility returns error message](#) (if the code is not listed in this page, please contact our support)

License expiration check

Description

This option checks the license expiration dates interactively.

i This check is also performed automatically, by default everyday at 09:00 AM, and starts sending alerts 15 days before expiration. See [Manage recursive jobs: license expiration check, log events \(cron\)](#) for more and customization.

Alert levels are defined as follows:

Days before expiration (date limited license)	Hours before expiration (time limited license)	Alert Level
More than 7	More than 72 hours	INFORMATIONAL
Between 4 and 7	Between 49 and 72 hours	MINOR
Between 2 and 3	Between 25 and 48 hours	MAJOR
Less than 2	Between 0 and 24 hours	CRITICAL
< 0	0 hours and 0 minutes	EXPIRED

Examples

Example - Regular license

```

STROMASYS - Virtualization Technologies V1.7b
License expiration check

Product Name                               Expiration                               Alert level
-----
License: 1000.800 (USB) KeyID: 367006676   Main license, path 2/0/0
CHARON-AXP/4100                             16-Jun-2016                             Informational
CHARON-AXP/DS10                             16-Jun-2016                             Informational
CHARON-AXP/DS20                             16-Jun-2016                             Informational
CHARON-AXP/ES40                             16-Jun-2016                             Informational
CHARON-AXP/GS80                             16-Jun-2016                             Informational
CHARON-AXP/SMA VAR all Signatures for Windows 16-Jun-2016                             Informational
CHARON-VAX/XM Plus for Windows              16-Jun-2016                             Informational
CHARON-VAX/XL Plus for Windows              16-Jun-2016                             Informational
CHARON-VAX-66xx all models                  16-Jun-2016                             Informational

Press ENTER to continue.

```

Example - Software License

STROMASYS - Virtualization Technologies V1.7b
 License expiration check

Product Name	Expiration	Alert level
License: 7002166 (Soft)		
CHARON-AXP/4100	Unlimited	Informational
CHARON-AXP/DS10	Unlimited	Informational
CHARON-AXP/DS20	Unlimited	Informational
CHARON-AXP/ES40	Unlimited	Informational
CHARON-VAX/XL Plus for Windows	Unlimited	Informational
CHARON-VAX/XM Plus for Windows	Unlimited	Informational

Press ENTER to continue.

Example - Runtime limited license

STROMASYS - Virtualization Technologies V1.7b
 License expiration check

Product Name	Expiration	Alert level
License: 1000.806 (USB) KeyID: 1619329274 Backup license, path 1/0/0		
CHARON-AXP/4100	360 hours 0 minutes & up to 11-Aug-2016	Informational
CHARON-AXP/DS10	360 hours 0 minutes & up to 11-Aug-2016	Informational
CHARON-AXP/DS20	360 hours 0 minutes & up to 11-Aug-2016	Informational
CHARON-AXP/ES40	360 hours 0 minutes & up to 11-Aug-2016	Informational
CHARON-AXP/GS80	360 hours 0 minutes & up to 11-Aug-2016	Informational
CHARON-AXP/SMA VAR all Signatures for Windows	360 hours 0 minutes & up to 11-Aug-2016	Informational
CHARON-VAX/XM Plus for Windows	360 hours 0 minutes & up to 11-Aug-2016	Informational
CHARON-VAX/XL Plus for Windows	360 hours 0 minutes & up to 11-Aug-2016	Informational
CHARON-VAX-66xx all models	360 hours 0 minutes & up to 11-Aug-2016	Informational

Press ENTER to continue.

VM Management (add/remove VM, start, stop, console connection, ...)

Table of Contents

- Description
- Menu description
- Examples
 - Red Hat 7.x - Virtual machine up and running, another one down
 - Red Hat 7.x - One virtual machine is restarting after failure
 - Red Hat 7.x - All virtual machines stopped by administrator (requested)
- Menu options

Description





This menu option manages the CHARON virtual machines (guests) defined as services. It is used to create, delete, start and stop virtual machines on user request or upon system request (Linux server boot & shutdown).

The service works with a guests list containing the emulator executable file name, configuration file and, optionally, the `auto_boot` on server startup parameter (⚠ at service level, not same as SRM console level) parameters:

- **Startup:** the virtual machine is executed in detached mode (using `-d` parameter) and then requires the console to be set as virtual serial line.
 - Connection to the console will be performed using `telnet` on the defined localhost / port. This can also be performed using other utilities like `putty`. If there is more than one guest on the server, guests are started in parallel.
 - Before the guest starts, the network interfaces used will be checked and all the offload parameters will be set offline
- **Shutdown:** a common shutdown script can be created for guests shutdown. See "[Service management - Create/Edit guest stop script](#)" for details.
 - If the script does not exist, the virtual machine process is killed without proper guest shutdown.
 - If the script exists, it executes the customer defined command lines to perform a proper shutdown (using `ssh` or `expect` for example). If the virtual machine process is still running after execution, the stop operation is considered as failed so for Linux systems not using `systemd` (Red Hat 6) the script must stop the emulator either by sending a `power off` at SRM prompt (AXP) or F6 key (VAX) with `expect` or just by killing the process. For Linux systems using `systemd` (Red Hat 7 and Fedora), the process is killed by the system.
 - If there is more than one guest on the server, guests are stopped in sequential mode during server shutdown based on their order in the guests list. This order can be modified from the menu. ⚠ This is valid only for Linux systems not using `systemd` (Red Hat 6), for other systems, the services description files will have to be modified to add dependencies using `Before=` or `After=` for example. ⓘ For more information, see manpages: # `man systemd.unit`

Menu description

- The first part of the menu displays **server information**: server boot time, number of CPUs and Memory Free / Total.
- The second part displays the **list of virtual machines** (guests) managed. Column details:

Column	Description
Emulator/Config File	Emulator used with its configuration file name (shortened)
CPU	<p>Displays the number of CPUs by looking into configuration file settings (set <code>n_of_cpus ...</code>) first then using default value for the selected hardware. If no information is available, "-" is displayed instead.</p> <p> The number of CPUs displayed does not represent the number defined in the configuration file or the default number of cpus for this hardware model. The real number of CPUs the virtual machine owns depends on the CHARON server hardware limitations, CHARON licenses and also licenses on the virtual machine side (Tru64 or OpenVMS)</p>
Mem	Displays the amount of memory defined in the configuration file (if defined). If no information is available, "-" is displayed instead.
State	<ul style="list-style-type: none"> • For Red Hat 6 <ul style="list-style-type: none"> • can be either RUNNING, STARTING, STARTING/ALL (if all guests have been started at the same time), STOPPED. • If the guest is in STOPPED state, an additional information will be displayed: <ul style="list-style-type: none"> • REQUESTED: the service has been stopped by user request or has not been started on Linux server boot due to boot parameter set to off • FAILURE: the guest process failed • For Red Hat 7 and Fedora (using both <code>systemd</code>) <ul style="list-style-type: none"> • can be either ACTIVE, ACTIVATING, INACTIVE, DEACTIVATING, FAILED or UNKNOWN • If the guest is in STOPPED state, an additional information will be displayed: <ul style="list-style-type: none"> • REQUESTED: the service has been stopped by user request or has not been started on Linux server boot due to boot parameter set to off • FAILURE: the guest process failed
Stop script	<p>Displays the status of the stop script used to perform a clean shutdown of the guest. Can be:</p> <ul style="list-style-type: none"> • Not found: the script has not been created.  If not found, a service stop request will induce a kill of the emulator process • To customize: the script exists and a case line has been added for the specified configuration file. It must however be customized with some commands to perform a clean shutdown of the guest (OpenVMS or Tru64 virtual machine).  For more information and examples, see VM management - Create/Edit guest stop script • Case not set: the script exists but does not relate to the specified configuration file. This means it has either been created manually or initialized automatically by the menu and a new guest has been added after initialization.
B	<p>Displays the automatic boot on server startup value, Yes or No.</p> <p> This means the CHARON virtual machine will be started. To automatically boot the virtual machine on startup, please refer to the CHARON-AXP or CHARON-VAX users guides and console settings.</p>

- Depending on settings and virtual machine state, more information can be displayed
 - Auto-restart settings (feature managed by `systemd`, described here: [How to restart CHARON-VAX/AXP on Linux automatically on failure](#))
 - Service start and/or stop timeouts
 - Description (not available on Red Hat Enterprise Linux 6.x)
 - Start date
 - Protected against Out Of Memory Killer (OOM Killer)
 - Guest OS response (optional, see [Service management - Create/Edit guest stop script / Optional guest display status script](#))
 - Network Interfaces settings
- The third part displays the available options that are detailed in the [Menu options](#) chapter further.

Examples

Red Hat 7.x - Virtual machine up and running, another one down

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.5G/5.7G (45%)

Emulator/Config File      Cpu Mem  State                Stop script  B
-----
- as4100/pluto            1 256M  ACTIVE              Customized   N
  Auto-restart: on-failure after 20s, max 2 times in 600 seconds
  Description: as4100 pluto Tru64 V5.1B
  Started: Thu 2017-09-14 14:31:05 CEST PID=40241. Protected/OOM Killer
  Guest OS response: 14:38 up 6 mins - pluto V5.1
  Network: EWA0/eno50332216
- vx4k106/vx4k106        1 128M  INACTIVE  REQUESTED  Customized   N
  Description: CHARON vx4k106/vx4k106 VMS 6.2
  Stopped: Thu 2017-09-14 14:30:13 CEST (success)
  Network: EZA0/eno50332216(3)
Caption: (3)=NIC already used

Available options
1 - Update guests list          5 - Create/Edit guest stop script
2 - Start/stop guests          6 - Connect to guest console
3 - View latest guest log file 7 - Edit configuration files
4 - Manage 'systemd' services  8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): █

```

The guest OS response is based on an optional script performing an ssh connection to the Tru64 system. For more, see: [VM management - Create/Edit guest stop script](#)

i If the guest OS response returns error code 255, this means Tru64 or OpenVMS system is not booted (still at SRM prompt)

? We can see above the 2 virtual machines use the same NIC and a warning message is displayed

Red Hat 7.x - One virtual machine is restarting after failure

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.9G/5.7G (69%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
- as4100/pluto            1 256M  ACTIVATING ✓ Customized  N
  Auto-restart: on-failure after 20s, max 2 times in 600 seconds
  Description: as4100 pluto Tru64 V5.1B
  Substate: auto-restart
  Guest OS response: N/A
  Network: EWA0/eno50332216
- vx4k106/vx4k106        1 128M  INACTIVE  REQUESTED Customized  N
  Description: CHARON vx4k106/vx4k106 VMS 6.2
  Stopped: Thu 2017-09-14 14:30:13 CEST (success)
  Network: EZA0/eno50332216(3)

Caption: (3)=NIC already used

Available options

1 - Update guests list          5 - Create/Edit guest stop script
2 - Start/stop guests          6 - Connect to guest console
3 - View latest guest log file 7 - Edit configuration files
4 - Manage 'systemd' services  8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): █

```

i Enabling auto restart on failure is managed by `systemd` and is described here: [How to restart CHARON-VAX/AXP on Linux automatically on failure](#)

Red Hat 7.x - All virtual machines stopped by administrator (requested)

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.9G/5.7G (69%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
1- as4100/pluto           1 256M  INACTIVE  REQUESTED  Customized  N
  Auto-restart: on-failure after 20s, max 2 times in 600 seconds
  Description: as4100 pluto Tru64 V5.1B
  Stopped: Thu 2017-09-14 14:53:47 CEST (success)
  Guest OS response: N/A
  Network: EWA0/eno50332216

2- vx4k106/vx4k106       1 128M  INACTIVE  REQUESTED  Customized  N
  Description: CHARON vx4k106/vx4k106 VMS 6.2
  Stopped: Thu 2017-09-14 14:30:13 CEST (success)
  Network: EZA0/eno50332216(3)

Caption: (3)=NIC already used

Select the guest you want to start/stop (q to quit, enter to refresh): █

```

Menu options

- VM management - Update guests list
- VM management - Start/stop guests
- VM management - View guest log file
- VM management - Install, update or manage service
- VM management - Create/Edit guest stop script
- VM management - Connect to guest console
- VM management - Edit configuration files
- VM management - Manage monitored guests logs

VM management - Update guests list

Table of Contents

- Description
- Add guest
- Remove guest
- Enable/Disable start at server boot
- Edit guests lists (for stop order)

Description

Add, remove and enable/disable auto start virtual machines (guests) at server boot.


Add guest

Available emulated hardware is displayed based on installed packages. A list of available hardware emulators can be displayed based on the attached license by entering "v".

Select the emulator to add based on the "Available emulated hardware" list then enter the name of the configuration file previously created/edited (out of the menu) or clone (c) an existing one based on the list that can be displayed by entering "l".

Once cloned, the configuration file must be edited to change settings like disks, network interface(s), etc..

 Some checks are performed to verify the same network interface and same console ports are not already used, vdisk files if used exist or not, etc...

 This does not guarantee the configuration file is correct. Please refer to the corresponding CHARON product and version for configuration file details.

Once added, the guest can be started directly.

Example: Red Hat Enterprise Linux 7.3 server with CHARON-AXP V4.8 installed

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

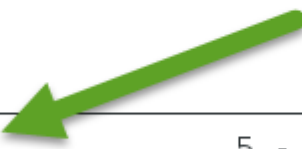
Server boot: 14-Sep-2017 12:25  CPUs: 4  Memory(free/tot): 3.8G/5.7G (67%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
None.

Available options
1 - Update guests list    5 - Create/Edit guest stop script
2 - Start/stop guests    6 - Connect to guest console
3 - View latest guest log file  7 - Edit configuration files
4 - Manage 'systemd' services  8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): █

```



We are now going to update the guests list and add a virtual machine:

```

Enter your choice (enter to refresh, q to quit): 1
Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (67%)
Emulator/Config File      Cpu Mem  State      Stop script  B
-----
None.
Available options
1 - Add guest
2 - Remove guest
3 - Enable/Disable start at server boot
4 - Edit guests list (for stop order)
q - quit
Enter your choice: 1


```

An AlphaServer 4100 (1) will be added by cloning the as4100 configuration file template (2 & 3) to the /charon/pluto.cfg (4 & 5):

```

Available emulated hardware
as1000 as1000a as1200 as2000 as2100 as400 as4000 as4100 as800 ds10 ds10l ds15 ds
20 ds25 es40 es45 gs160 gs320 gs80 mv3k196 mv3k198 mv3k6 mv3k9 mvii vs4k90 vx3k6
vx3k6_128 vx3k6_512 vx3k9 vx3k9_128 vx3k9_512 vx4k106 vx4k108 vx4k700 vx4k705 v
x6k310 vx6k610 vx6k620 vx6k630 vx6k640 vx6k650 vx6k660
Select virtual HW model, license conditioned
(v to view HW on license key, q to quit): as4100
Virtual Hardware selected: CHARON-AXP, Version 4.8 (Build 18303)
Configuration file selection
Please enter configuration file full path ('l' to list available ones in the
default directory, 'c' to clone file, 'q' to quit) : c
Enter source file (q to quit) : /opt/charon/cfg/as4100.cfg.template
Last modified on Apr 10 07:59
Enter target file (q to quit) : /charon/pluto.cfg
Please confirm (y/n) ? y


```

 Use the 'l' option to list available configuration files and templates

Once the clone is completed, we can leave the clone utility (1 & 2 below) then use (3) and customize the newly created file:

```
Copying '/opt/charon/cfg/as4100.cfg.template' to '/charon/pluto.cfg' ...
Done.
Enter target file (q to quit) : q 1
Enter source file (q to quit) : q 2
Configuration file selection
Please enter configuration file full path ('l' to list available ones in the
default directory, 'c' to clone file, 'q' to quit) : /charon/pluto.cfg
Console settings not set to 'virtual_serial_line'. Please check.
Guest added.
Service charon_pluto.service is enabled.
Configuration file must be updated before starting the guest.
Do you want to edit this file (y/n) ? y 3
```

 If you don't edit the file now, you won't be prompted to start the guest (virtual machine).

 The editor will be asked if you did not set your favorite one in the preferences option.

Using the selected editor, the configuration file can be customized:

```
#INFO: AS4100 pluto demo - Development server
set session hw_model="AlphaServer_4100"
set session configuration_name = "pluto"

#set session log="/charon/pluto.log" log_method="append"
set session log="/charon/logs" 1

set ace cpu_architecture = EV56
set rom dsrdb[0] = 1408 system_name = "AlphaServer 4100 5/400"

set session n_of_cpus=1
set ram size=256

set rom container="/charon/pluto.bin"
set toy container="/charon/pluto.dat"

load virtual_serial_line OPA0 port=10012 3
set OPA0 stop_on = F6
set OPA0 break_on = "Ctrl-P"
set OPA0 log = "/charon/logs" 2

load DE500BA/dec21x4x EWA interface=EWA0
load packet_port/chnetwrk EWA0 interface="eno50332216"
#load packet_port/chnetwrk EWA0 interface="(disabled)"

#INFO: DKA0 = Tru64 system disk
set PKA container[0] = "/data/disks/pluto_tru64.vdisk" 4

#INFO: DKA100 = Data 1 5
set PKA container[100] = "/data/disks/pluto_data1.vdisk"
```

Notes on the above example:

- **1 & 2** : The log rotation mechanism will be used in this example. Ensure the corresponding folder, here `/charon/logs`, exists before starting the virtual machine
- **3** : The console is defined as a virtual serial line on port 10003 (default). Ensure the port number is unique if multiple virtual machines will run on the same server
- **4** : The iso file will be used to install Tru64 V5.1B r2650. The virtual disk that will be used as the system disk, `pluto_tru64`, has to be created using the "mkdiskcmd" command. Ensure the virtual disk exists before starting the virtual machine.

Example:

```
[root@rhel71 Desktop]# mkdir -p /data/disks
[root@rhel71 Desktop]# mkdiskcmd -o /data/disks/pluto_tru64.vdisk -d rz29
Please wait...


100% done

Success.
[root@rhel71 Desktop]# ls -l /data/disks/pluto_tru64.vdisk
-rw-r--r--. 1 root root 4290600960 Nov 26 15:49 /data/disks/pluto_tru64.vdisk
```

- **5** : Lines starting with "#INFO:" are comments that will be displayed when accessing the console

When leaving the editor, the guest log file name is extracted and the monitoring service is automatically enabled (installed).

```
Log file is set to: /charon/logs/pluto.log
Log file /charon/logs/pluto.log added to log monitor service.
Service charon_logmon_pluto.service is enabled.
Checking virtual disks and iso files...
Done. ✓
Checking network interfaces...
Done. ✓
Do you want to start this guest (y/n) or re-edit the file (e) ? y
```



We can now start the guest. If the preferences have been set to have a continuous view of the log file, the log will be displayed:

```
Starting charon_logmon_pluto.service at 05-Oct-2017 14:54:47
Status: active
Restarting aksusbd log monitor service...
Starting charon_pluto.service at 05-Oct-2017 14:54:52
Oct 04 17:56:32 [WARN ] Service stopped (requested)
Oct 05 14:54:52 Starting CHARON as4100/pluto...
Oct 05 14:54:52 [INFO ] aksusbd monitor service status is: active
Oct 05 14:54:52 [INFO ] Log monitor service status is: active
Oct 05 14:54:52 [INFO ] Verifying license presence
Oct 05 14:54:58 [INFO ] License found.
Oct 05 14:54:58 [INFO ] Checking network settings...
Oct 05 14:54:58 [INFO ] Switching off all offload parameters for interface eno50
332216
Oct 05 14:54:58 [INFO ] Checking vdisk files if any...
Oct 05 14:54:58 [INFO ] Starting emulator: /opt/charon/bin/as4100 -d /charon/plu
to.cfg
Oct 05 14:54:58 [INFO ] OOM process killing prevention is enabled
Oct 05 14:54:58 [INFO ] Process 117813 is now protected
Oct 05 14:54:58 Started CHARON as4100/pluto.
```

...

```
20171005:153729:INFO :0:000003A5:hexane.cxx(5352): session: loading built-in configuration "AlphaServer 4100"...
20171005:153729:INFO :0:000003A6:hexane.cxx(5376): session: ... done loading built-in configuration "AlphaServer_4100"
20171005:153729:INFO :0:000003AA:hexane.cxx(5450): session: loading configuration on file "/charon/pluto.cfg"...
20171005:153729:INFO :0:000003AB:hexane.cxx(5474): session: ... done loading configuration file "/charon/pluto.cfg"
20171005:153729:INFO :0:000003F2:sesmgr.cxx(1480): session: default log file size limit is 4194304 bytes
20171005:153729:INFO :0:0000032B:hexane.cxx(2588): Start request received.
20171005:153730:INFO :0:000003AC:hexane.cxx(1311): session: process affinity is 0000000000000000F, system affinity is 0000000000000000F
20171005:153730:INFO :0:000003D1:hexane.cxx(1575): session: I/O domain affinity is 00000000000000001, CPU domain affinity is 0000000000000000E
20171005:153730:INFO :0:000003BA:ll_sentine( 730): Looking for a license key ..
.
20171005:153733:INFO :0:000003DC:ll_sentine( 825): ... found license key 879642840.
20171005:153733:INFO :0:0000024D:hexane.cxx(2729): STROMASYS SA, (C) 2009-2016
20171005:153733:INFO :0:00000408:hexane.cxx(2771): CHARON-AXP (AlphaServer 4100), V 4.8 B 18303, Apr 10 2017 / 1002922 / 879642840
20171005:153733:INFO :0:00000336:hexane.cxx(2812): The end user of this software has agreed to STROMASYS' Terms and Conditions for Software License and Limited Warranty, as described at: http://www.stromasys.com/pub/doc/30-17-033.pdf
20171005:153733:INFO :0:0000009D:hexane.cxx(2876): License info:
CHARON product code: "CHAXP-470xx-WI-LI".
Licensed to: "Stromasys - Bruno Miretti".
Date limited license, limited to: 26/Oct/2017 01:55:00.
Warning: setting the host system date back will permanently invalidate the license key.

20171005:153733:INFO :0:00000097:hexane.cxx(2885): OS Environment: Linux 3.10.0-514.26.2.el7.x86_64 #1 SMP Fri Jun 30 05:26:04 UTC 2017 x86_64.
20171005:153733:INFO :0:00000098:hexane.cxx(2890): Host CPU: AuthenticAMD, Family 21, Model 2, Stepping 0, AMD FX(tm)-8350 Eight-Core Processor, 1 Sockets, 4 Cores per Socket, 1 Threads per Core, at ~4013 MHz, 4 cpu's available
20171005:153733:INFO :0:00000099:hexane.cxx(2895): Host Memory: 5888Mb
20171005:153733:WARN :1:00000354:hexane.cxx(3014): 4 host CPUs detected but 8 recommended, performance might be limited.
20171005:153733:WARN :1:00000353:hexane.cxx(3032): The host system is below recommended
```




```

ommended specifications.
20171005:153733:INFO :0:000003F2:srlio.cxx(2524): OPA0: default log file size
limit is 4194304 bytes
20171005:153735:ERROR:2:00000352:axprom.cxx( 585): rom: Unable to read containe
r file "/charon/pluto.bin". It is out-of-date, not readable or not valid for the
specified hardware model. Check settings of console environment and/or date and
time.
20171005:153735:INFO :0:0000034B:scsi_disk.( 574): PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20171005:153735:INFO :0:0000034B:scsi_disk.( 574): PKA_100 is being set ONLINE
container = "/data/disks/pluto_data1.vdisk"
20171005:153735:INFO :0:0000034B:scsi_disk.( 574): PKA_100 is being set ONLINE
container = "/data/disks/pluto_data1.vdisk"
20171005:153735:INFO :0:00000400:ethdev.cxx( 377): EWA: RX FIFO size is 512KB.
20171005:153735:INFO :0:0000032C:hexane.cxx(2630): "pluto" started.
20171005:153735:INFO :0:00000348:scsi_disk.( 562): PKA_0 is being set OFFLINE
20171005:153735:INFO :0:0000034B:scsi_disk.( 574): PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20171005:153735:INFO :0:00000348:scsi_disk.( 562): PKA_0 is being set OFFLINE
20171005:153735:INFO :0:0000034B:scsi_disk.( 574): PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20171005:153735:INFO :0:00000348:scsi_disk.( 562): PKA_101 is being set OFFLINE
20171005:153735:INFO :0:0000034B:scsi_disk.( 574): PKA_101 is being set ONLINE
container = "/data/disks/pluto_data1.vdisk"
----- Press CTRL-C to stop the continuous log view -----

```

i The error message above (white/red) is expected the first time the virtual machine is started. It tells the .bin file does not exist as it is initialized when console parameters are set

Press **CTRL-C** at any time to leave the log file view.

 The "pluto" started message above, code 32C means the guest is UP and ready to be installed/booted

Enter 'q' twice to reach the "Service management" menu:

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

Available emulated hardware
as1000 as1000a as1200 as2000 as2100 as400 as4000 as4100 as800 ds10 ds10l ds15 ds
20 ds25 es40 es45 gs160 gs320 gs80 mv3k196 mv3k198 mv3k6 mv3k9 mvii vs4k90 vx3k6
vx3k6_128 vx3k6_512 vx3k9 vx3k9_128 vx3k9_512 vx4k106 vx4k108 vx4k700 vx4k705 v
x6k310 vx6k610 vx6k620 vx6k630 vx6k640 vx6k650 vx6k660

Select virtual HW model, license conditioned
(v to view HW on license key, q to quit): q 1


Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)

Emulator/Config File      Cpu Mem State      Stop script  B
-----
1- as4100/pluto           1 256M ACTIVE      Not found    Y
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 15:37:29 CEST PID=11779. Protected/OOM Killer
  Network: EWA0/eno50332216

Available options
1 - Add guest
2 - Remove guest
3 - Enable/Disable start at server boot
4 - Edit guests list (for stop order)
q - quit

Enter your choice: q 2

```

We can see below the service is active, meaning the emulator is running ( this does not mean "booted") and will be automatically started at Linux server boot ("B" column on the right side)

The "Stop script" column shows the script has not been initialized meaning the guest will receive a SIGKILL signal upon stop request. This will be explained further (see [Service management - Create/Edit guest stop script](#))

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)

Emulator/Config File	Cpu	Mem	State	Stop script	B
- as4100/pluto Description: CHARON as4100/pluto Started: Thu 2017-10-05 15:37:29 CEST PID=11779. Protected/OOM Killer Network: EWA0/eno50332216	1	256M	ACTIVE	Not found	Y

Available options

- | | |
|--------------------------------|-----------------------------------|
| 1 - Update guests list | 5 - Create/Edit guest stop script |
| 2 - Start/stop guests | 6 - Connect to guest console |
| 3 - View latest guest log file | 7 - Edit configuration files |
| 4 - Manage 'systemd' services | 8 - Manage monitored guests logs |

Enter your choice (enter to refresh, q to quit): █

Remove guest

! Before removing a guest, please ensure it has been properly stopped (a check will automatically be performed before removal). The way the guest is stopped depends on the "Stop script" existence and settings (see [Service management - Create/Edit guest stop script](#))

i If the guest log is monitored, you will be proposed to stop and remove the monitoring service

Example: Red Hat Enterprise Linux 7.3 server with CHARON-AXP V4.8 installed, virtual machine as4100/pluto installed

We are now going to remove (1 & 2) the as4100/pluto guest, currently in active state:

```

Server boot: 14-Sep-2017 12:25  CPUs: 4  Memory(free/tot): 2.4G/5.7G (42%)
Emulator/Config File          Cpu Mem  State          Stop script  B
-----
1- as4100/pluto              1 256M  ACTIVE          Not found    Y
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 15:37:29 CEST PID=11779. Protected/OOM Killer
  Network: EWA0/eno50332216

Available options
1 - Add guest
2 - Remove guest
3 - Enable/Disable start at server boot
4 - Edit guests list (for stop order)
q - quit

Enter your choice: 2 1

Server boot: 14-Sep-2017 12:25  CPUs: 4  Memory(free/tot): 2.4G/5.7G (42%)
Emulator/Config File          Cpu Mem  State          Stop script  B
-----
1- as4100/pluto              1 256M  ACTIVE          Not found    Y
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 15:37:29 CEST PID=11779. Protected/OOM Killer
  Network: EWA0/eno50332216

Please confirm the removal of as4100/pluto.cfg (y/n) : y 2

```

No stop script has been defined so this guest will be stopped (1 below) without proper shutdown (emulator process will receive a SIGKILL). The service status will then be considered as failed (last line in the screenshot below) and deleted:

```
No stop script found, emulator will be killed without proper shutdown !!!  
Do you want to stop the guest now (y/n) ? y  
Stopping charon_pluto.service at 05-Oct-2017 15:57:23  
Oct 05 15:37:29 Started CHARON as4100/pluto.  
Oct 05 15:57:23 Stopping CHARON as4100/pluto...  
Oct 05 15:57:23 [INFO ] Stopping...  
Oct 05 15:57:23 [WARN ] No stop script defined, sending KILL signal to emulator,  
pid 11779  
Oct 05 15:57:23 [INFO ] Waiting for process id 11779 termination  
Oct 05 15:57:24 charon_pluto.service: main process exited, code=killed, status=9  
/KILL  
Oct 05 15:57:28 [INFO ] Process id 11779 has terminated  
Oct 05 15:57:35 Stopped CHARON as4100/pluto.  
Oct 05 15:57:35 Unit charon_pluto.service entered failed state.  
Oct 05 15:57:35 charon_pluto.service failed.
```

As the guest has been deleted, the log monitoring service can also be removed (1 below):

```
Removing from guests list...  
Done.  
Configuration file is kept in place.  
Do you want to remove the log monitoring service (y/n) ? y  
Removed symlink /etc/systemd/system/multi-user.target.wants/charon_logmon_pluto.  
service.  
  
Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (67%)  
  
Emulator/Config File Cpu Mem State Stop script B  
-----  
None.  
  
Guests list is empty.  
  
Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (67%)  
  
Emulator/Config File Cpu Mem State Stop script B  
-----  
None.  
  
Available options  
-----  
1 - Add guest  
2 - Remove guest  
3 - Enable/Disable start at server boot  
4 - Edit guests list (for stop order)  
q - quit  
  
Enter your choice: █
```

Another guest can be added if needed (2).

i Multiple CHARON guests can be added on the Linux server. This is however limited by the license (available products and instances allowed) and the Linux server hardware configuration.

Enable/Disable start at server boot

Use this option if you want (default) or do not want a guest to be started at Linux server boot

i By default newly added guests are started automatically at Linux server boot (**!** this does not mean "booted")

Example: Red Hat Enterprise Linux 7.3 server with CHARON-AXP V4.8 installed, virtual machine as4100/pluto installed

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)

Emulator/Config File      Cpu Mem State      Stop script  B
-----
- as4100/pluto            1 256M ACTIVE      Not found    Y
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 16:03:11 CEST PID=25138. Protected/OOM Killer
  Network: EWA0/eno50332216

Available options
1 - Update guests list          5 - Create/Edit guest stop script
2 - Start/stop guests          6 - Connect to guest console
3 - View latest guest log file 7 - Edit configuration files
4 - Manage 'systemd' services  8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): 1

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)

Emulator/Config File      Cpu Mem State      Stop script  B
-----
1- as4100/pluto            1 256M ACTIVE      Not found    Y
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 16:03:11 CEST PID=25138. Protected/OOM Killer
  Network: EWA0/eno50332216

Available options
1 - Add guest
2 - Remove guest
3 - Enable/Disable start at server boot
4 - Edit guests list (for stop order)
q - quit

Enter your choice: 3

```

We are now going to prevent from the as4100/pluto guest to be started automatically (1). Once completed enter 'n' to return to the previous menu (2):

```

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
1- as4100/pluto           1 256M  ACTIVE      Not found    Y
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 16:03:11 CEST PID=25138. Protected/OOM Killer
  Network: EWA0/eno50332216

Please confirm as4100/pluto boot change to NO (y/n) : y
Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)





Emulator/Config File      Cpu Mem  State      Stop script  B
-----
1- as4100/pluto           1 256M  ACTIVE      Not found    N
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 16:03:11 CEST PID=25138. Protected/OOM Killer
  Network: EWA0/eno50332216

Please confirm as4100/pluto boot change to YES (y/n) : n

```

Edit guests lists (for stop order)

Use this option to change the order of managed guests using the text editor of your choice

-  Use with caution, do not add nor delete lines (or at your own risk)
-  This option is not active for Linux systems using `systemd` (Red Hat Enterprise Linux 7 and Fedora).
-  For Linux systems using `systemd` (Red Hat Enterprise Linux 7 and Fedora), the services description files will have to be modified to add dependencies using `Before=` or `After=` for example if you want to define a start and stop order.
-  For more information, see manpages: # `man systemd.unit`

VM management - Start/stop guests

Table of Contents

- Description
- Examples
 - Example1 - Guest stop with no stop script defined
 - Example2 - Guest start
 - Example3 - Guest stop with stop script defined

Description

Manual start and stop of managed guests.

Examples

Example1 - Guest stop with no stop script defined

Context: Red Hat Enterprise Linux 7.3 server with CHARON-AXP V4.8 installed, as4100/pluto guest running

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)

Emulator/Config File      Cpu Mem State      Stop script  B
-----
- as4100/pluto            1 256M ACTIVE      Not found    N
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 16:03:11 CEST PID=25138. Protected/OOM Killer
  Network: EWA0/eno50332216

Available options
1 - Update guests list          5 - Create/Edit guest stop script
2 - Start/stop guests          6 - Connect to guest console
3 - View latest guest log file  7 - Edit configuration files
4 - Manage 'systemd' services   8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): 2 1

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)

Emulator/Config File      Cpu Mem State      Stop script  B
-----
1- as4100/pluto            1 256M ACTIVE      Not found    N
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 16:03:11 CEST PID=25138. Protected/OOM Killer
  Network: EWA0/eno50332216

No stop script found, emulator will be killed without proper shutdown !!!

Please confirm you want to stop as4100/pluto.cfg (y/n) : y 2

```

Due to the absence of stop script, the service receives a SIGKILL signal and then, once stopped, is considered as failed:

```
Stopping charon_pluto.service at 05-Oct-2017 16:11:50
Oct 05 16:03:11 Started CHARON as4100/pluto.
Oct 05 16:11:50 Stopping CHARON as4100/pluto...
Oct 05 16:11:50 [INFO ] Stopping...
Oct 05 16:11:50 [WARN ] No stop script defined, sending KILL signal to emulator,
pid 25138
Oct 05 16:11:50 [INFO ] Waiting for process id 25138 termination
Oct 05 16:11:50 charon_pluto.service: main process exited, code=killed, status=9
/KILL
Oct 05 16:11:55 [INFO ] Process id 25138 has terminated
Oct 05 16:12:02 Stopped CHARON as4100/pluto.
Oct 05 16:12:02 Unit charon_pluto.service entered failed state.
Oct 05 16:12:02 charon_pluto.service failed. X
```

STROMASYS - Virtualization Technologies V2.4a

Virtual Machines Management

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (67%)

Emulator/Config File	Cpu	Mem	State	Stop script	B
- as4100/pluto Description: CHARON as4100/pluto Stopped: Thu 2017-10-05 16:12:02 CEST (signal/KILL) Network: EWA0/eno50332216	1	256M	FAILED	Not found	N

Available options

1 - Update guests list	5 - Create/Edit guest stop script
2 - Start/stop guests	6 - Connect to guest console
3 - View latest guest log file	7 - Edit configuration files
4 - Manage 'systemd' services	8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): █

Example2 - Guest start

Context: Red Hat Enterprise Linux 7.3 server with CHARON-AXP V4.8 installed, as4100/pluto guest stopped/failed (see above)

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (67%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
- as4100/pluto            1 256M  FAILED     Not found    N
  Description: CHARON as4100/pluto
  Stopped: Thu 2017-10-05 16:12:02 CEST (signal/KILL)
  Network: EWA0/eno50332216

Available options

1 - Update guests list          5 - Create/Edit guest stop script
2 - Start/stop guests          6 - Connect to guest console
3 - View latest guest log file 7 - Edit configuration files
4 - Manage 'systemd' services  8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): 2 1

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (67%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
1- as4100/pluto            1 256M  FAILED     Not found    N
  Description: CHARON as4100/pluto
  Stopped: Thu 2017-10-05 16:12:02 CEST (signal/KILL)
  Network: EWA0/eno50332216

Please confirm you want to start as4100/pluto.cfg (y/n) : y 2

```

Depending on preferences that have been set, the log will be displayed:

```
Starting charon pluto.service at 05-Oct-2017 16:15:55
Oct 05 16:12:02 charon_pluto.service failed.
Oct 05 16:15:56 Starting CHARON as4100/pluto...
Oct 05 16:15:56 [INFO ] aksusbd monitor service status is: active
Oct 05 16:15:56 [INFO ] Log monitor service status is: active
Oct 05 16:15:56 [INFO ] Verifying license presence
Oct 05 16:15:59 [INFO ] License found.
Oct 05 16:15:59 [INFO ] Checking network settings...
Oct 05 16:15:59 [INFO ] Switching off all offload parameters for interface eno50
332216
Oct 05 16:15:59 [INFO ] Checking vdisk files if any...
Oct 05 16:15:59 [INFO ] Starting emulator: /opt/charon/bin/as4100 -d /charon/plu
to.cfg
Oct 05 16:15:59 [INFO ] OOM process killing prevention is enabled
Oct 05 16:16:00 [INFO ] Process 36839 is now protected
Oct 05 16:16:00 Started CHARON as4100/pluto.
```

```
Continuous view of /charon/logs/pluto.log
Press CTRL-C to stop (it is recommended to enlarge screen to 132 cols minimum)
```

...

```

20171005:161603:INFO :0:00000097:hexane.cxx(2885): OS Environment: Linux 3.10.0
-514.26.2.el7.x86_64 #1 SMP Fri Jun 30 05:26:04 UTC 2017 x86_64.
20171005:161603:INFO :0:00000098:hexane.cxx(2890): Host CPU: AuthenticAMD
, Family 21, Model 2, Stepping 0, AMD FX(tm)-8350 Eight-Core Processor
, 1 Sockets, 4 Cores per Socket, 1 Threads per Core, at ~4013 MHz, 4 cpu's avail
lable
20171005:161603:INFO :0:00000099:hexane.cxx(2895): Host Memory: 5888Mb
20171005:161603:WARN :1:00000354:hexane.cxx(3014): 4 host CPUs detected but 8 r
ecommended, performance might be limited.
20171005:161603:WARN :1:00000353:hexane.cxx(3032): The host system is below rec
ommended specifications.
20171005:161603:INFO :0:000003F2:srlio.cxx(2524): OPA0: default log file size
limit is 4194304 bytes
20171005:161605:ERROR:2:00000352:axprom.cxx( 585): rom: Unable to read containe
r file "/charon/pluto.bin". It is out-of-date, not readable or not valid for the
specified hardware model. Check settings of console environment and/or date and
time.
20171005:161606:INFO :0:0000034B:scsi_disk.( 574): PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20171005:161606:INFO :0:0000034B:scsi_disk.( 574): PKA_101 is being set ONLINE
container = "/data/disks/pluto_data1.vdisk"
20171005:161606:INFO :0:0000034B:scsi_disk.( 574): PKA_100 is being set ONLINE
container = "/data/disks/pluto_data1.vdisk"
20171005:161606:INFO :0:00000400:ethdev.cxx( 377): EWA: RX FIFO size is 512KB.
20171005:161606:INFO :0:0000032C:hexane.cxx(2630): "pluto" started. ✓
20171005:161606:INFO :0:00000348:scsi_disk.( 562): PKA_0 is being set OFFLINE
20171005:161606:INFO :0:0000034B:scsi_disk.( 574): PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20171005:161606:INFO :0:00000348:scsi_disk.( 562): PKA_0 is being set OFFLINE
20171005:161606:INFO :0:0000034B:scsi_disk.( 574): PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20171005:161606:INFO :0:00000348:scsi_disk.( 562): PKA_101 is being set OFFLINE
20171005:161606:INFO :0:0000034B:scsi_disk.( 574): PKA_101 is being set ONLINE
container = "/data/disks/pluto_data1.vdisk"
----- Press CTRL-C to stop the continuous log view -----

```

i The error message above (white/red) is expected the first time the virtual machine is started. It tells the .bin file does not exist as it is initialized when console parameters are set

Press **CTRL-C** at any time to leave the log file view.

Example3 - Guest stop with stop script defined

Context: Red Hat Enterprise Linux 7.3 server with CHARON-AXP V4.8 installed, as4100/pluto guest running (not booted). Stop script created and customized, using the "expect" utility (see "VM management - Create/Edit guest stop script") and the expect script example provided in the kit.

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
- as4100/pluto            1 256M  ACTIVE     Customized   N
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 16:16:00 CEST PID=36839. Protected/OOM Killer
  Network: EWA0/eno50332216

Available options
1 - Update guests list          5 - Create/Edit guest stop script
2 - Start/stop guests          6 - Connect to guest console
3 - View latest guest log file  7 - Edit configuration files
4 - Manage 'systemd' services  8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): 2 1

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
1- as4100/pluto            1 256M  ACTIVE     Customized   N
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 16:16:00 CEST PID=36839. Protected/OOM Killer
  Network: EWA0/eno50332216

Please confirm you want to stop as4100/pluto.cfg (y/n) : y 2

```

```

Stopping charon pluto.service at 05-Oct-2017 16:22:44
Oct 05 16:16:00 Started CHARON as4100/pluto.
Oct 05 16:22:44 Stopping CHARON as4100/pluto...
Oct 05 16:22:44 [INFO ] Stopping...
Oct 05 16:22:44 [INFO ] Executing stop script. Emulator pid is 36839.
Oct 05 16:22:48 %EXPECT-I-BEGIN, Starting / UNIX... [2017-10-05 16:22:44]
Oct 05 16:22:48 %EXPECT-I-SNDRET, Sending carriage return... [2017-10-05 16:22:44]
Oct 05 16:22:48 %EXPECT-I-FOUND, Found SRM prompt [2017-10-05 16:22:44]
Oct 05 16:22:48 %EXPECT-I-POWEROFF, Sending power off... [2017-10-05 16:22:44]
Oct 05 16:22:48 %EXPECT-S-POWEROFF, power off completed. [2017-10-05 16:22:46]
Oct 05 16:22:48 %EXPECT-I-END, Exited with code 0. [2017-10-05 16:22:48]
Oct 05 16:22:48 [INFO ] Success.
Oct 05 16:22:48 [INFO ] Process id 36839 has terminated
Oct 05 16:22:55 Stopped CHARON as4100/pluto.

```

We can see below the guest has been properly stopped and is now in INACTIVE / REQUESTED state:

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (67%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
- as4100/pluto            1 256M  INACTIVE  REQUESTED  Customized  N
  Description: CHARON as4100/pluto
  Stopped: Thu 2017-10-05 16:22:55 CEST (success)
  Network: EWA0/eno50332216

Available options

1 - Update guests list      5 - Create/Edit guest stop script
2 - Start/stop guests      6 - Connect to guest console
3 - View latest guest log file 7 - Edit configuration files
4 - Manage 'systemd' services 8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): █

```

💡 As we are running Red Hat Enterprise Linux 7.3 server, `systemd` allows us to check the status of the service.

Use option 4 of the menu can help seeing the result of the shutdown commands:

Available options

- | | |
|--------------------------------|-----------------------------------|
| 1 - Update guests list | 5 - Create/Edit guest stop script |
| 2 - Start/stop guests | 6 - Connect to guest console |
| 3 - View latest guest log file | 7 - Edit configuration files |
| 4 - Manage 'systemd' services | 8 - Manage monitored guests logs |

Enter your choice (enter to refresh, q to quit): 4 

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (67%)

Emulator/Config File	Cpu	Mem	State	Stop script	B
1- as4100/pluto Description: CHARON as4100/pluto Stopped: Thu 2017-10-05 16:22:55 CEST (success) Network: EWA0/eno50332216	1	256M	INACTIVE	REQUESTED Customized	N

charon_pluto.service status

```
● charon_pluto.service - CHARON as4100/pluto
   Loaded: loaded (/etc/systemd/system/charon_pluto.service; disabled; vendor preset: disabled)
   Active: inactive (dead) since Thu 2017-10-05 16:22:55 CEST; 2min 44s ago
     Process: 43653 ExecStop=/opt/charon/utils/charon_gstart stop /charon/pluto.cfg (code=exited, status=0/SUCCESS)
     Process: 35798 ExecStart=/opt/charon/utils/charon_gstart start /charon/pluto.cfg (code=exited, status=0/SUCCESS)
    Main PID: 3683 (code=exited, status=0/SUCCESS)

Oct 05 16:15:59 ceres.stromasys.com charon_gstart[35798]: [INFO ] License found.
Oct 05 16:15:59 ceres.stromasys.com charon_gstart[35798]: [INFO ] Checking network settings...
Oct 05 16:15:59 ceres.stromasys.com charon_gstart[35798]: [INFO ] Switching off all offload parameters for interface eno50332216
Oct 05 16:15:59 ceres.stromasys.com charon_gstart[35798]: [INFO ] Checking vdisk files if any...
Oct 05 16:15:59 ceres.stromasys.com charon_gstart[35798]: [INFO ] Starting emulator: /opt/charon/bin/as4100 -d /charon/pluto.cfg
Oct 05 16:15:59 ceres.stromasys.com charon_gstart[35798]: [INFO ] OOM process killing prevention is enabled
```



```

Oct 05 16:16:00 ceres.stromasys.com charon_gstart[35798]: [INFO ] Process 36839
is now protected
Oct 05 16:16:00 ceres.stromasys.com systemd[1]: Started CHARON as4100/pluto.
Oct 05 16:22:44 ceres.stromasys.com systemd[1]: Stopping CHARON as4100/pluto...
Oct 05 16:22:44 ceres.stromasys.com charon_gstart[43653]: [INFO ] Stopping...
Oct 05 16:22:44 ceres.stromasys.com charon_gstart[43653]: [INFO ] Executing stop
script. Emulator pid is 36839.
Oct 05 16:22:48 ceres.stromasys.com charon_gstart[43653]: %EXPECT-I-BEGIN, Start
ing / UNIX... [2017-10-05 16:22:44]
Oct 05 16:22:48 ceres.stromasys.com charon_gstart[43653]: %EXPECT-I-SNDRET, Send
ing carriage return... [2017-10-05 16:22:44]
Oct 05 16:22:48 ceres.stromasys.com charon_gstart[43653]: %EXPECT-I-FOUND, Found
SRM prompt [2017-10-05 16:22:44] ✓
Oct 05 16:22:48 ceres.stromasys.com charon_gstart[43653]: %EXPECT-I-POWEROFF, Se
nding power off... [2017-10-05 16:22:44]
Oct 05 16:22:48 ceres.stromasys.com charon_gstart[43653]: %EXPECT-S-POWEROFF, po
wer off completed. [2017-10-05 16:22:46] ✓
Oct 05 16:22:48 ceres.stromasys.com charon_gstart[43653]: %EXPECT-I-END, Exited
with code 0. [2017-10-05 16:22:48]
Oct 05 16:22:48 ceres.stromasys.com charon_gstart[43653]: [INFO ] Success.
Oct 05 16:22:48 ceres.stromasys.com charon_gstart[43653]: [INFO ] Process id 368
39 has terminated
Oct 05 16:22:55 ceres.stromasys.com systemd[1]: Stopped CHARON as4100/pluto.

Do you want to edit the .service file (y/n) ? █

```

We can see above, the `expect` utility has been used, did connect to the console, found the SRM prompt (the as4100 was not booted) and then issued a "`power off`" command.

⚠ This depends of what you decide to display in the guest stop script.

❓ With Linux systems not using `systemd` (Red Hat Enterprise Linux 6.x), we would have to look into a log file defined in the stop script / output redirection. For more information, see "[VM management - Create/Edit guest stop script](#)".

VM management - View guest log file

Table of Contents

- Description
- Examples
 - Example1 - Continuous view
 - Example2 - Log edition

Description

Use this option to either edit the log files using a selected text editor or to have a continuous view ("live") of the log file for the selected guest.

Notes:

- Rotating log files are supported only with CHARON-AXP and CHARON-VAX V4.7 minimum and Linux Toolkit 42 minimum
- Log files are automatically archived at guest start whatever the log_method parameter is set in the configuration file so a new one is created each time.
- The logs are kept for 60 days by default. See "[Manage recursive jobs: license expiration check, log events \(cron\)](#)" to change settings.
- When using the log file edition, only 16 most recent ones are displayed in the list. To get older files, you will need to find them in the log file folder with name identical to the defined log file and with extension:
 - ".upto<YYYY-MM-DD-HHMNSE>" (example: /charon/pluto.log.upto2015-07-02-172824) if the virtual machine is not using rotating log files [or](#)
 - as defined by the log rotation mechanism (example: /charon/logs/pluto-2015-11-30-14-13-55-000000000.log)

Example:

```

STROMASYS - Virtualization Technologies V2.4a
Virtual Machines Management

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (67%)

Emulator/Config File      Cpu Mem State          Stop script  B
-----
- as4100/pluto            1 256M INACTIVE  REQUESTED  Customized  N
  Description: CHARON as4100/pluto
  Stopped: Thu 2017-10-05 16:22:55 CEST (success)
  Network: EWA0/eno50332216

Available options
1 - Update guests list          5 - Create/Edit guest stop script
2 - Start/stop guests          6 - Connect to guest console
3 - View latest guest log file 7 - Edit configuration files
4 - Manage 'systemd' services  8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): 3
Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (67%)

Emulator/Config File      Cpu Mem State          Stop script  B
-----
1- as4100/pluto            1 256M INACTIVE  REQUESTED  Customized  N
  Description: CHARON as4100/pluto
  Stopped: Thu 2017-10-05 16:22:55 CEST (success)
  Network: EWA0/eno50332216

Found definition of log file: /charon/logs/pluto.log

Do you want a continuous view (1) or an editor view (2) (q to quit) ? █

```

Examples

Example1 - Continuous view

We can see below at point:

- (1) The utility displays the last 12 lines of the current log file. In this case the guest was in stopped state.
- (2) The log file became inaccessible. Reason the guest has been started hence the current log file was archived and a new one was created
- (3) The continuous view continues with the newly detected log file

```
Continuous view of /charon/logs/pluto.log
Press CTRL-C to stop (it is recommended to enlarge screen to 132 cols minimum)

20171005:161606:INFO :0:0000034B:scsi_disk.( 574): PKA_100 is being set ONLINE
container = "/data/disks/pluto_data1.vdisk"
20171005:161606:INFO :0:00000348:scsi_disk.( 562): PKA_100 is being set OFFLINE
20171005:161606:INFO :0:0000034B:scsi_disk.( 574): PKA_100 is being set ONLINE
container = "/data/disks/pluto_data1.vdisk"
20171005:162005:INFO :0:000003E6:ll_sentine(1829): Performing regular license c
heck ...
20171005:162008:INFO :0:000003DC:ll_sentine(1922): ... found license key 879642
840.
20171005:162244:INFO :0:SERVICE STOP REQUEST
20171005:162246:INFO :0:000003D7:hexane.cxx(4946): All virtual CPUs of "pluto"
have been stopped by now.
20171005:162246:INFO :0:0000032D:hexane.cxx(2674): "AlphaServer 4100" stop requ
est received.
20171005:162246:INFO :0:0000014C:lnxpackpor( 427): EWA0: ^opping network inter
face ... please wait.
20171005:162246:INFO :0:0000032E:hexane.cxx(2692): Stopped.
tail: '/charon/logs/pluto.log' has been replaced; following end of new file
20171005:164645:INFO :0:000003A5:hexane.cxx(5352): session: loading built-in co
nfiguration "AlphaServer_4100"...
20171005:164645:INFO :0:000003A6:hexane.cxx(5353): session: ... done loading bu
ilt-in configuration "AlphaServer_4100"
20171005:164645:INFO :0:000003AA:hexane.cxx(5450): session: loading configurati
on file "/charon/pluto.cfg"...
20171005:164645:INFO :0:000003AB:hexane.cxx(5474): session: ... done loading co
nfiguration file "/charon/pluto.cfg"
20171005:164645:INFO :0:000003F2:sesmgr.cxx(1480): session: default log file si
ze limit is 4194304 bytes
20171005:164645:INFO :0:0000032B:hexane.cxx(2588): Start request received.
20171005:164646:INFO :0:000003AC:hexane.cxx(1311): session: process affinity is
000000000000000F, system affinity is 000000000000000F
20171005:164646:INFO :0:000003D1:hexane.cxx(1575): session: I/O domain affinity
is 0000000000000001, CPU domain affinity is 000000000000000E
20171005:164646:INFO :0:000003BA:ll_sentine( 730): Looking for a license key ..
.
20171005:164649:INFO :0:000003DC:ll_sentine( 825): ... found license key 879642
840.
20171005:164649:INFO :0:0000024D:hexane.cxx(2729): STROMASYS SA, (C) 2009-2016
20171005:164649:INFO :0:00000408:hexane.cxx(2771): CHARON-AXP (AlphaServer 4100
```

 The continuous log view can be called using the command line "logtail", see [Additional command lines](#)

Example2 - Log edition

Select editor view (1), the log file (2) and specify if you want to display or not the "regular license check" messages (3). The editor will be selected depending on the preferences:

```
Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (42%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
1- as4100/pluto           1 256M  ACTIVE     Customized   N
  Description: CHARON as4100/pluto
  Started: Thu 2017-10-05 16:46:45 CEST PID=50621. Protected/OOM Killer
  Network: EWA0/eno50332216

Found definition of log file: /charon/logs/pluto.log


Do you want a continuous view (1) or an editor view (2) (q to quit) ? 2 1
Log files found (most recent ones):

No  From                               To                               Size      Lines
---  ---                               ---                               ---      ---
1  Wed 04-Oct-2017 16:31:00          Wed 04-Oct-2017 17:34:07          13,001    169
2  Wed 04-Oct-2017 17:46:35          Wed 04-Oct-2017 17:56:32          11,261    149
3  Thu 05-Oct-2017 14:54:58          Thu 05-Oct-2017 15:01:27           4,961     59
4  Thu 05-Oct-2017 15:02:24          Thu 05-Oct-2017 15:04:47           4,613     55
5  Thu 05-Oct-2017 15:37:29          Thu 05-Oct-2017 15:57:23           5,556     64
6  Thu 05-Oct-2017 16:03:11          Thu 05-Oct-2017 16:11:50           5,413     63
7  Thu 05-Oct-2017 16:15:59          Thu 05-Oct-2017 16:22:46           5,196     59
8  Thu 05-Oct-2017 16:46:45          Thu 05-Oct-2017 16:50:07           4,742     56
Lock status: <Monitored> <Guest running>

Select the log file you want to view (q to quit, r to refresh): 8 2
File selected: /charon/logs/pluto-2017-10-05-16-46-45-0000000000.log

Do you want the full log or its shortened version without 'regular license
check' messages ['f' for full (default), 's' for short, 'q' to quit] ? s 3
```

Notes:

- 'From' date is either based on the first line including a date found in the log file or on file creation time
- 'To' date corresponds to the date time the file was archived (renamed before guest start)
-  It is highly recommended to use 'vim' or 'gvim' (if possible and if installed) to have the benefits of log highlighting

 The log edition can be called using the command line "logview", see [Additional command lines](#)



VM management - Install, update or manage service

Table of Contents

- Description
- Examples
 - Red Hat Enterprise Linux 6 server
 - Red Hat Enterprise Linux 7 server (using systemd)

Description

Depending on Linux distribution and version, this option will have different names and functions:

Red Hat 6	<p>Option name: Install or update service</p> <p>Allows you to install (after fresh install) or update guests management service (kit upgrade).</p> <p> Updating the service does not require the guests to be shutdown & restarted</p>
Red Hat 7.x and CentOS 7.x	<p>Option name: Manage 'systemd' services</p> <p>Allows you to view the service status and update the service configuration file (to add dependencies, description, etc...)</p> <p> Be extremely cautious when updating the file. Preferably limit updates to:</p> <ul style="list-style-type: none"> • Description=, After=, Before=, Wants= parameters in the Unit section • TimeoutStopSec= in the Service section • Restart=, RestartSec=, StartLimitInterval=, StartLimitBurst= parameters in the Service section as described in the How to restart CHARON-VAX/AXP on Linux automatically on failure chapter.

Examples

Red Hat Enterprise Linux 6 server

Below, an alert is displayed telling the service must be reinstalled (after kit upgrade):

```

STROMASYS - Virtualization Technologies V2.3a
Service management (Start, Stop, Manage automatic boot & shutdown)

New version found, please update service!
Server boot: 13-Jan-2016 15:29 CPUs: 4 Memory(free/tot): 3087/3833 (80%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
None.

Available options
1 - Update guests list      5 - Create/Edit guest stop script
2 - Start/stop guests      6 - Connect to guest console
3 - View latest guest log file  7 - Edit configuration files
4 - Install or update service  8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit):

```

In this case, the current version 2.3 will be replaced by 2.3a:

```

Enter your choice (enter to refresh, q to quit): 4
Current: script version in init.d is 2.3
New:    script version in /utils is 2.3a
Do you want to copy from /utils to init.d (y/n) ? y
Copying file from /utils to init.d ...
Copied.
Installing service 'charon_gstart' ...
Done.

Press enter

```

Red Hat Enterprise Linux 7 server (using systemd)

```

STROMASYS - Virtualization Technologies V2.3a
Service management (Start, Stop, Manage automatic boot & shutdown)

Server boot: 05-Feb-2016 11:32 CPUs: 8 Memory(free/tot): 215M/7.6G (2%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
- as4100/pluto            1 256M  ACTIVE    Customized   N
  Description: CHARON as4100/pluto
  Started: Tue 2016-03-22 16:05:13 CET (PID=2852)
  Network: EWA0/eno67109424

Available options

1 - Update guests list          5 - Create/Edit guest stop script
2 - Start/stop guests          6 - Connect to guest console
3 - View latest guest log file 7 - Edit configuration files
4 - Manage 'systemd' services  8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): 4

```

We can see below the service is active and its most recent events:

Emulator/Config File	Cpu Mem	State	Stop script	B
1- as4100/pluto	1 256M	ACTIVE	Customized	N

```

Description: CHARON as4100/pluto
Started: Tue 2016-03-22 16:05:13 CET (PID=2852)
Network: EWA0/eno67109424

charon pluto.service status
â charon_pluto.service - CHARON as4100/pluto
  Loaded: loaded (/etc/systemd/system/charon_pluto.service; disabled; vendor pr
  eset: disabled)
  Active: active (running) since Tue 2016-03-22 16:05:13 CET; 26min ago
  Process: 25944 ExecStop=/opt/charon/utils/charon_gstart stop /charon/pluto.cfg
 (code=exited, status=0/SUCCESS)
  Process: 1987 ExecStart=/opt/charon/utils/charon_gstart start /charon/pluto.cf
  g (code=exited, status=0/SUCCESS)
  Main PID: 2852 (pluto)
  CGroup: /system.slice/charon_pluto.service
          ââ2852 /opt/charon/bin/as4100 -d /charon/pluto.cfg

Mar 22 16:05:08 rhel70.stromasys.com systemd[1]: Starting CHARON as4100/pluto...
Mar 22 16:05:08 rhel70.stromasys.com charon_gstart[1987]: [INFO ] aksusbd monito
  r service status is: active
Mar 22 16:05:08 rhel70.stromasys.com charon_gstart[1987]: [INFO ] Log monitor se
  rvice status is: active
Mar 22 16:05:08 rhel70.stromasys.com charon_gstart[1987]: [INFO ] Verifying lice
  nse presence
Mar 22 16:05:13 rhel70.stromasys.com charon_gstart[1987]: [INFO ] License found.
Mar 22 16:05:13 rhel70.stromasys.com charon_gstart[1987]: [INFO ] Checking netwo
  rk settings...
Mar 22 16:05:13 rhel70.stromasys.com charon_gstart[1987]: [INFO ] Switching off
  all offload parameters for interface eno67109424
Mar 22 16:05:13 rhel70.stromasys.com charon_gstart[1987]: [INFO ] Checking vdisk
  files if any...
Mar 22 16:05:13 rhel70.stromasys.com charon_gstart[1987]: [INFO ] Starting emula
  tor: /opt/charon/bin/as4100 -d /charon/pluto.cfg
Mar 22 16:05:13 rhel70.stromasys.com systemd[1]: Started CHARON as4100/pluto.

Do you want to edit the .service file (y/n) ? y
  
```

Now, we're going to update the default service description, here "CHARON as4100/pluto", using the "vim" editor:

```

[Unit]
Description=CHARON as4100/pluto DEMO
After=charon_logmon_pluto.service atd.service postfix.service ncu.service aksusb
  d.service
Wants=aksusbd.service

[Service]
Type=forking
WorkingDirectory=/opt/charon/log
ExecStart=/opt/charon/utils/charon_gstart start /charon/pluto.cfg
ExecStop=/opt/charon/utils/charon_gstart stop /charon/pluto.cfg

[Install]
WantedBy=multi-user.target
  
```


Result:

```

STROMASYS - Virtualization Technologies V2.3a
Service management (Start, Stop, Manage automatic boot & shutdown)

Server boot: 05-Feb-2016 11:32 CPUs: 8 Memory(free/tot): 213M/7.6G (2%)

Emulator/Config File      Cpu Mem  State                Stop script  B
-----
- as4100/pluto            1 256M  ACTIVE              Customized   N
  Description: CHARON as4100/pluto DEMO
  Started: Tue 2016-03-22 16:05:13 CET (PID=2852)
  Network: EWA0/eno67109424

Available options
-----
1 - Update guests list          5 - Create/Edit guest stop script
2 - Start/stop guests          6 - Connect to guest console
3 - View latest guest log file  7 - Edit configuration files
4 - Manage 'systemd' services  8 - Manage monitored guests logs

Enter your choice (enter to refresh, q to quit): 

```

VM management - Create/Edit guest stop script


Table of Contents

- Description
- Explanation on the example file
 - Example with SSH, Tru64 guest
 - Example with SSH, OpenVMS guest
 - Example with Expect tool, Tru64 guest
 - Example with Expect tool, AXP VMS guest
 - Example with Expect tool, VAX VMS guest
- Optional guest display status script

Description

Use this option to edit the stop script that will be executed at service shutdown. The script is unique and uses the configuration file (full name) to select commands to be executed at guest shutdown (selected by "case in...").


If the script does not exist, it will be generated automatically based on existing guests list and will by default do nothing except preparing the script skeleton.


 If guests are added after the script initialization, they will have to be inserted manually. This consists in adding a chapter for the new configuration file in the "case in..." command.

To be able to perform a clean shutdown of your Tru64 or OpenVMS virtual machine, you will have either to add your own shutdown scripts or to use the examples provided in the "charon_gstart.stop.example" script located in the "/opt/charon/utils" folder.

In this script, examples are provided for clean shutdown using "ssh" or "expect" thanks to the "guest_shutdown.exp" script (provided as an example). See [Tips and Tricks - Shutdown guests with Expect tool](#) for more.

Notes:

- Basic knowledge of shell programming is needed to implement the clean shutdown / stop script.
- "ssh" will require a trust to be created between the Linux server and the Tru64 or OpenVMS guest.
- "expect" will require you pass user and password to the script to enable it to connect to the OPA0 console via 'telnet' and execute the shutdown commands. The "guest_shutdown.exp" script can perform operations to log off a user connected on the console (if the prompt is detected), enter a username/password to login (if "login:" or "username:" is detected), execute the shutdown command (if the prompt is detected) and detect the SRM prompt (>>>) to issue the "power off" command (AXP) or send the F6 key (VAX) if enabled.
 - Note any local existing connection to the console has to be killed before executing the expect script.
 -  If the console is locked from an external connection or if the prompt is not detected after sending a carriage return, the expect script will fail.

 When editing this script (/opt/charon/utils/charon_gstart.stop) you will be proposed to edit the example file at the same time to facilitate copy/paste operations if needed.


Note for Red Hat Enterprise Linux 7.x and CentOS 7.x

If your application and server needs time to shutdown, it could be necessary to give more time in the service definition to prevent from the service stop procedure to fail due to timeout.

To do so, open the "Manage 'systemd' services" option and edit the service configuration file. You can then add the TimeoutStopSec= parameter in the Service section.


Example:

```
[Service]
...
TimeoutStopSec=3min
```

 More information can be found using the "# man systemd.service" command on your Linux server

Explanation on the example file

Example with SSH, Tru64 guest

 An `ssh` trust between the CHARON Linux server and the Tru64 guest must have been previously configured in order to use this method. See [Tips and Tricks](#) for help to setup the trust.

```
#=====
# Example with SSH, Tru64 guest
#=====
/opt/charon/cfg/pluto.cfg)
HOSTNAM="pluto"
```

The case is defined for this configuration file

Replace here by your Tru64 hostname or IP address

```
ssh -o ConnectTimeout=2 ${HOSTNAM} date >/dev/null 2>&1
if test $? = 0
then
  SSHOUT=/opt/charon/log/console.stop.`basename $1|sed "s=\.cfg==g"`.${LOGDAT}.log
  ssh ${HOSTNAM} "/sbin/shutdown -h now" >>${SSHOUT} 2>&1
  sleep 5
  while test 1
  do
    ping -c2 ${HOSTNAM} >/dev/null 2>&1
    #--- Break if the system is no more responding
    test $? = 0 || break
    sleep 5
  done
  sleep 5
fi
```

1

```
#--- Killing/stopping the emulator
PID=`ps -ef|grep "$2 -d $1"|grep -v grep|awk '{print $2}'`
if test ${IS_SYSTEMD} = 0
then
  test -n "${PID}" && kill -9 ${PID}
else
  SVC=`basename $1 | sed "s=\.cfg==g"`
  test -n "${PID}" && systemctl kill charon_${SVC}
fi
```

2

```
#--- Logging the emulator stopped in the log file
get_logfile $1
echo "`date +%Y%m%d:%H%M%S`:INFO :0:Emulator stopped at `date`" >>${LOGF}
```


3

```
exit 0
;;
```

Principle

1. Check the guest can be reached via "`ssh`" (adapt the `ConnectTimeout` value to your needs), if yes, issue the `shutdown` command, wait a few seconds and check if the guest can be "pinged" and repeat with an interval of 5 seconds. If the guest cannot be pinged, assume the shutdown procedure is complete
2. Kill the emulator process (Red Hat Enterprise Linux 6.x) or use the service kill command (RHEL 7.x and CentOS 7.x). Note: the shutdown commands does not power off nor stop the emulator process, that's why this operation is needed
3. Report the stop information within the guest log file

Example with SSH, OpenVMS guest

 An `ssh` trust between the CHARON Linux server and the OpenVMS guest must have been previously configured in order to use this method. See [Tips and Tricks](#) for help to setup the trust.

```
#=====
# Example with SSH, OpenVMS guest
#=====
/opt/charon/cfg/vms.cfg)
HOSTNAM="vms"
ping -c2 ${HOSTNAM} >/dev/null 2>&1
if test $? = 0
then
    SSHOUT=/opt/charon/log/console.stop.`basename $1|sed "s=\.cfg==g"`.${LOGDAT}.log
    ssh system@${HOSTNAM} "@SYS$SYSTEM:SHUTDOWN 0 CHARONSERVICE NO YES LATER NO NONE" >>
    ${SSHOUT} 2>&1
    sleep 5
    while test 1
    do
        ping -c2 ${HOSTNAM} >/dev/null 2>&1
        #-- break if the system is no more responding
        test $? = 0 || break
        sleep 5
    done
    sleep 5
fi
```

The case is defined for this configuration file

Replace here by your OpenVMS hostname or IP address

1

```
#--- Killing the emulator
PID=`ps -ef|grep "$2 -d $1"|grep -v grep|awk '{print $2}'`
if test ${IS_SYSTEMD} = 0
then
    test -n "${PID}" && kill -9 ${PID}
else
    SVC=`basename $1 | sed "s=\.cfg==g"`
    test -n "${PID}" && systemctl kill charon_${SVC}
fi
```

2

```
#--- Logging the emulator stopped in the log file
get_logfile $1
echo "`date +%Y%m%d:%H%M%S`:INFO :0:Emulator stopped at `date`" >>${LOGF}
```

3

```
exit 0
;;
```

Principle

1. Check the guest can be pinged (an "`ssh`" command as for the Tru64 example above can also be used), if yes, issue the `shutdown` command, wait a few seconds and check if the guest can be "pinged" and repeat with an interval of 5 seconds. If the guest cannot be pinged, assume the shutdown procedure is complete
2. Kill the emulator process (Red Hat Enterprise Linux 6.x) or use the service kill command (RHEL 7.x and CentOS 7.x). Note: the shutdown commands does not power off nor stop the emulator process, that's why this operation is needed
3. Report the stop information within the guest log file

Example with Expect tool, Tru64 guest

```
#=====
# Example with Expect tool, AXP Tru64 guest
#=====
/opt/charon/cfg/tru64example.cfg)
#--- Killing active connection to console if any
CHK=`grep -v ^# $1 | grep -w load | grep -w virtual_serial_line | grep OPA`
PORT=`echo ${CHK} | sed "s:\(^.*port=\)\(.*$\):~2:g"`
PID=`ps -ef|grep telnet|grep localhost|grep $PORT|grep -v script|awk '{print \$2}'`
test -n "${PID}" && kill -9 ${PID}

#--- Specify username, password and prompt below
EXPUSR="root"
EXPPWD="charon"
EXPPRT="# "

#--- Executing the expect script:
#--- * no need to stop the emulator because the power off is done cleanly with expect
EXPOUT=/opt/charon/log/console.stop.`basename $1|sed "s=\.cfg==g"`.${LOGDAT}.log
/opt/charon/utls/guest_shutdown.exp ${PORT} ${EXPUSR} ${EXPPWD} "${EXPPRT}" UNIX >>
${EXPOUT} 2>&1
RET=$?
test ${IS_SYSTEMD} = 1 && strings ${EXPOUT} | grep "%EXPECT-"

exit ${RET}
;;
```

The case is defined for this configuration file

1

2

3

Principle

1. Check if there's an active connection to the console on the local host, kill if any.
Reminder: ⚠️ If the console is locked from an external connection or if the prompt is not detected after sending a carriage return, the expect script will fail.
2. Replace the user (EXPUSR), password (EXPPWD) and shell prompt (EXPPRT) with the ones corresponding to your guest (shell prompt is used to determine if a user is logged on the console)
3. Execute the "expect" script and report all output to /opt/charon/log/console.stop.<guest name>.log. Note: no need to kill the emulator process here as the "power off" command is executed.

Example with Expect tool, AXP VMS guest

```
#=====
# Example with Expect tool, AXP VMS guest
#=====
/opt/charon/cfg/kerberos.cfg)
```

The case is defined for this configuration file

```
#--- Killing active connection to console if any
CHK=`grep -v ^# $1 | grep -w load | grep -w virtual_serial_line | grep OPA`
PORT=`echo ${CHK} | sed "s:\(^\.*port=\)\(.*\):\2:g"`
PID=`ps -ef|grep telnet|grep localhost|grep $PORT|grep -v script|awk '{print \$2}'`
test -n "${PID}" && kill -9 ${PID}
```

1

```
#--- Specify username, password and prompt below
EXPUSR="system"
EXPPWD="charon"
EXPPRT="> "
```

2

```
#--- Executing the expect script:
#---- * no need to stop the emulator because the power off is done cleanly with expect
#
EXPOUT=/opt/charon/log/console.stop.`basename $1|sed "s=\.cfg==g"`.${LOGDAT}.log
/opt/charon/utils/guest_shutdown.exp ${PORT} ${EXPUSR} ${EXPPWD} "${EXPPRT}" VMS >>
${EXPOUT} 2>&1
RET=$?
test ${IS_SYSTEMD} = 1 && strings ${EXPOUT} | grep "%EXPECT-"

exit ${RET}
```

3

Principle

1. Check if there's an active connection to the console on the local host, kill if any.
Reminder: ⚠️ If the console is locked from an external connection or if the prompt is not detected after sending a carriage return, the expect script will fail.
2. Replace the user (EXPUSR), password (EXPPWD) and shell prompt (EXPPRT) with the ones corresponding to your guest (shell prompt is used to determine if a user is logged on the console)
3. Execute the "expect" script and report all output to `/opt/charon/log/console.stop.<guest name>.log`. No need to kill the emulator process here as the "power off" command is executed.

Example with Expect tool, VAX VMS guest

```
#=====
# Example with Expect tool, VAX VMS guest
#=====
/opt/charon/cfg/mymv3k198.cfg)
#--- Killing active connection to console if any
CHK=`grep -v ^# $1 | grep -w load | grep -w virtual_serial_line | grep OPA`
PORT=`echo ${CHK} | sed "s:\(^\.*port=\)\(.*\):\2:g"`
PID=`ps -ef|grep telnet|grep localhost|grep $PORT|grep -v script|awk '{print \$2}'`
test -n "${PID}" && kill -9 ${PID}

#--- Specify username, password and prompt below
EXPUSR="system"
EXPPWD="charon"
EXPPRT="> "

#--- Executing the expect script:
EXPOUT=/opt/charon/log/console.stop.`basename $1|sed "s\.cfg==g"`.${LOGDAT}.log
/opt/charon/utls/guest_shutdown.exp ${PORT} ${EXPUSR} ${EXPPWD} "${EXPPRT}" VMS >>
${EXPOUT} 2>&1
RET=$?
test ${IS_SYSTEMD} = 1 && strings ${EXPOUT} | grep "%EXPECT-"
if test ${RET} = 9
then
#--- Killing the emulator if stop_on=F6 is not set (no 'power off' command for VAX)
PID=`ps -ef|grep "$2 -d $1"|grep -v grep|awk '{print $2}'`
test -n "${PID}" && kill -9 ${PID}
#--- Logging the emulator stopped in the log file
get_logfile $1
echo "`date +%Y%m%d:%H%M%S`:INFO :0:Emulator stopped at `date`" >>${LOGF}
RET=0
fi

exit ${RET}
;;
```

The case is defined for this configuration file

1

2

3

Principle

1. Check if there's an active connection to the console on the local host, kill if any.
Reminder: ⚠️ If the console is locked from an external connection or if the prompt is not detected after sending a carriage return, the expect script will fail.
2. Replace the user (EXPUSR), password (EXPPWD) and shell prompt (EXPPRT) with the ones corresponding to your guest (shell prompt is used to determine if a user is logged on the console)
3. Execute the "expect" script and report all output to /opt/charon/log/console.stop.<guest name>.log.
 - a. VAX systems have no "power off" command so the F6 key will be sent.
 - b. The F6 key can be enabled or not in the configuration file. The expect script will send it if the "power off" command fails and if F6 operation fails, it will exit with return code 9 meaning the emulator process will have to be killed.
 - c. If the "expect" script returns the error code 9, this means the F6 key is not defined in the configuration file and then the emulator process must be killed
 - d. Report the stop information within the guest log file

Optional guest display status script

It is possible to create a script, "/opt/charon/utils/charon_gstart.chkrun" (an example is provided in the 'charon_gstart.chkrun.example' file) that will add a status line while displaying the guests list for running guests only. This script, if needed, has to be created manually and must be executable.

This status line is the result of the command you executed for that guest (known by its configuration file), for example a ping, an ssh command displaying uptime (Tru64) or boottime (OpenVMS).

Display output example:

```

STROMASYS - Virtualization Technologies V1.18
Connection to guest console

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (41%)


Emulator/Config File      Cpu Mem  State                Stop script  B
-----
1- as4100/pluto           1 256M  ACTIVE              Customized   N
  Description: CHARON as4100/pluto
  Started: Fri 2017-10-06 15:48:28 CEST PID=99892. Protected/OOM Killer
  Guest OS response: 15:54 up 5 mins - pluto V5.1 ←
  Port: 10012
  Console log/configuration file: /charon/logs/pluto-OPA0.log
  Network: EWA0/eno50332216


k- Kill active telnet connection(s) on console(s)
v- View console log files

Choice ('q' to quit): █

```


Script example:

 In this example, we'll use "ssh" to display the guest "uptime" and the result of the "uname -nr" command (name of the node + release number of the operating system)

 The last 2 lines are mandatory

```
# touch /opt/charon/utils/charon_gstart.chkrun
# chmod 744 /opt/charon/utils/charon_gstart.chkrun
# vim /opt/charon/utils/charon_gstart.chkrun

#!/bin/sh
#
# Parameter $1: contains full path to cfg file
#
case "$1"
in
  /charon/pluto.cfg)
    ssh -o ConnectTimeout=2 pluto "uptime|cut -f1 -d',';echo ' - ';uname -nr" 2>/dev/null
    RETVAL=$?
    ;;
  *)
    echo "Invalid parameter '$1'"
    RETVAL=1
    ;;
esac
echo "==RETVAL=${RETVAL}=="
exit ${RETVAL}
```

Example file provided (contains example for Tru64 and OpenVMS):

```

[root@rhel70 utils]# cat charon_gstart.chkrun.example
#!/bin/sh
#
# Parameter $1: contains full path to cfg file
#
case "$1"
in
  /opt/charon/cfg/pluto.cfg)
    ssh -o ConnectTimeout=2 pluto "uptime | cut -f1 -d','" 2>/dev/null
    RETVAL=$?
    ;;
  /opt/charon/cfg/vms.cfg)
    ssh -o ConnectTimeout=2 system@vms "write sys$output \"Booted ''f\${getsysi(\"boottime\")}'\" 2>/dev/null
    RETVAL=$?
    ;;
*)
  echo "Invalid parameter '$1'"
  RETVAL=1
  ;;
esac
echo "==RETVAL=${RETVAL}=="
exit ${RETVAL}

```

The example file is "/opt/charon/utils/charon_gstart.chkrun.example".

VM management - Connect to guest console


Table of contents

- Description
- Special comments in configuration file
- Example

Description



Use this option to connect to the guests consoles.

Notes:

-  "telnet" package must be installed, it will be used to connect from the CHARON server to the virtual machine console
- The session will be recorded in a log file:
 - If 'set OPA0 log=' is found in the configuration file (not available with all CHARON products versions), the log will be stored in the temporary folder: '/tmp/console.<configuration file name shortened>.tmp.log' and will be overwritten for each session. It is just kept for information as the console log is managed by the CHARON emulator itself.
 - If there is no 'set OPA0 log=' line in the configuration file, the file will be located in '/opt/charon/log/console.<configuration file name shortened>.log'
- If 'stop_on' and/or 'break_on' features are enabled in the configuration file, this will be reminded before starting the telnet session
- To leave the telnet session, press the escape character which is by default **CTRL + J**. This character can be changed in the /root/.telnetrc file by defining the 'set escape' parameter:

Example:

```
# cat /root/.telnetrc
DEFAULT
mode char
set escape ^
#
```

-  Pressing the escape key will lead you to the 'telnet>' prompt. To leave the session, enter 'quit'
- If a connection to the console is active from the server, you will be prompted to kill the previous one.
- If a connection to the console is active from another location, it will be displayed but will not be killed. This will have to be done manually.
- Emulator termination check:
 - For CHARON-AXP, if the 'power off' command is detected (or shortened command), the guest STOP state will be set to REQUESTED
 - If the emulator is no more running when you leave the session, you will have to confirm that is requested or not
-  The console port number is displayed per guest. If a port number is used more than once, an alert will be displayed

Special comments in configuration file

For ease of use, it is possible to add formatted comments in the configuration file. These comments will appear before connecting to the console and can be used to describe the configuration, disks usage, etc...

To enable this feature, edit the configuration file and add comments starting with "#INFO:"

Example:

```
#-----
#INFO: AS4100 / pluto - demo for documentation purpose ✓
#-----
set session hw_model = AlphaServer_4100
set session configuration_name = "pluto"

set session log = "/charon/logs"

set ace cpu_architecture = EV56
set rom dsrdb[0] = 1408 system_name = "AlphaServer 4100 5/400"

set session n_of_cpus=1
set ram size=256

set rom container="/charon/pluto.bin"
set toy container="/charon/pluto.dat"

load virtual_serial_line OPA0 port=10003
set OPA0 stop_on = F6
set OPA0 break_on = "Ctrl-P"
set OPA0 log = "/charon/logs"

load DE500BA/dec21x4x EWA interface=EWA0
load packet_port/chnetwrk EWA0 interface="eno67109424"

#INFO: DKA0 = Tru64 V5.1b system disk ✓
set PKA container[0] = "/data/disks/pluto_tru64.vdisk"
#INFO: DKA400 = Tru64 installation CDROM 01 (iso) ✓
set PKA container[400] = "/kits/V5.1Br2650_01.iso"
```

Example

```

STROMASYS - Virtualization Technologies V1.18
Connection to guest console

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.4G/5.7G (41%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
1- as4100/pluto           1 256M  ACTIVE     Customized   N
  Description: CHARON as4100/pluto
  Started: Fri 2017-10-06 16:19:43 CEST PID=120695. Protected/OOM Killer
  Guest OS response: 16:21 up 1 min - pluto V5.1
  Port: 10012
  Console log/configuration file: /charon/logs/pluto-OPA0.log
  Network: EWA0/eno50332216

k- Kill active telnet connection(s) on console(s)
v- View console log files

Choice ('q' to quit): 1

Configuration description:
AS4100 pluto demo - Development server
DKA0  = Tru64 system disk
DKA100 = Data 1
DKA101 = Data 2
MKA601 = Tape 1
MKA602 = Tape 2

Press enter

```

These lines are extracted from the configuration file, comment lines starting with "#INFO:"

```
Console settings correctly set to:  
load virtual_serial_line OPA0 port=10012
```

To leave the console, press the escape character as shown below in the line 'Escape character is...' and enter 'quit' at the 'telnet>' prompt.

Default escape character can be changed in the \$HOME/.telnetrc file under the machine or DEFAULT paragraph with the command: set escape <newchar>

WARNING The virtual machine can be powered off by pressing F6
WARNING The virtual machine can be stopped by pressing CTRL-P



```
Script started, file is /tmp/console.pluto.tmp.log  
Trying ::1...  
telnet: connect to address ::1: Connection refused  
Trying 127.0.0.1...  
Connected to localhost.  
Escape character is (^)'.  
  
#####  
root passwd = ██████████  
#####
```

```
HP Tru64 UNIX V5.1B (Rev. 2650) (pluto) console
```






```
login: █
```

VM management - Edit configuration files

Description

Use this option to edit the virtual machine(s) configuration file(s).

Notes:

-  Changes will be applied on emulator restart
-  Some checks will be performed on network interface upon exit:
 - If virtual disk files (.vdisk) are used then their existence will be checked.
 - If the log file defined is a folder, an error message is displayed (currently not supported)
 -  If you change the log file name, you must remove the previous log monitoring service associated with this log file and recreate the service. See [Manage monitored guests logs](#)
 - If the network interface does not exist, an error message is displayed
 - If the network interface has an assigned IP address, an error message is displayed
 - If the network interface is not managed by 'ncu', an error message will be displayed
 - If the network interface is used in another configuration file, an error message will be displayed
-  All offload parameters will be switched off automatically at guest start.
-  Rotating log files are supported only with CHARON-AXP and CHARON-VAX V4.7 minimum and Linux Toolkit 42 minimum

Example

We will add several issues in the "pluto" virtual machine configuration file:

- the log file will be changed from a rotating log file set to "/charon/logs" to another one which is a folder or a file that does not exist: "/charon/logsINEX"
- the network interface "ensINEX" will be added whereas this interface does not exist,
- a virtual disk that does not exist will be added

```

STROMASYS - Virtualization Technologies V1.6
Edit configuration files

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (66%)

Emulator/Config File      Cpu Mem  State          Stop script  B
-----
1- as4100/pluto           1 256M  INACTIVE      REQUESTED    Customized   N
Description: CHARON as4100/pluto
Stopped: Fri 2017-10-06 16:29:41 CEST (success)
Guest OS response: N/A
Network: EWA0/eno50332216

Note: changes will be taken into account on service/guest restart

```

Depending on preferences, the file will be edited in the preferred editor or you will be prompted to select the editor.

When the editor will be closed, in our case 'gedit', some checks will be performed:

```
STROMASYS - Virtualization Technologies V1.6
Edit configuration files

Configuration description
Configuration file: /charon/pluto.cfg

AS4100 pluto demo - Development server
DKA0    = Tru64 system disk
DKA100  = Data 1
DKA101  = Data 2
MKA601  = Tape 1
MKA602  = Tape 2

Log file is set to: /charon/logs/pluto.log (rotating log file)

Checking virtual disks and iso files...
- /data/disks/pluto_dataXXX.vdisk: file does not exist or is empty X
Done.

Checking network interfaces...
warning/ncu: Interface 'eno50332216' is not managed by 'ncu' (EWA0) X

Press enter
```


When the issue have been solved, the following output is displayed:

```
STROMASYS - Virtualization Technologies V1.6
Edit configuration files

Configuration description
Configuration file: /charon/pluto.cfg

AS4100 pluto demo - Development server
DKA0   = Tru64 system disk
DKA100 = Data 1
DKA101 = Data 2
MKA601 = Tape 1
MKA602 = Tape 2

Log file is set to: /charon/logs/pluto.log (rotating log file) ✓

Checking virtual disks and iso files...
Done. ✓

Checking network interfaces...
Done. ✓

Press enter
```

VM management - Manage monitored guests logs

Description

This option is also available from the main menu.

Please follow this link: [Manage monitored guests logs](#)

Manage monitored guests logs

Description

A service can be defined in order to monitor the guests log files to look for key removal messages (based on interval defined on the dongle) and/or informational, warning and error messages. It also monitors in parallel dongle removal (immediate mode).

The service works with a list of log files to be monitored.

⚠ The log file name must be defined with full path within the configuration file.

⚠ Rotating log files are supported only with CHARON-AXP and CHARON-VAX V4.7 minimum and Linux Toolkit 42 minimum

Management

This option offers the possibility to edit the log file list, start/stop monitoring for a guest, view the guest log file, view the monitoring log file, install or update log monitoring service for Linux servers without "systemd" feature (Red Hat 6) or to manage "systemd" services for Linux servers with "systemd" (Red Hat 7 and Fedora) and to start/restart the aksusb log monitoring.

Example1 - Red Hat Enterprise Linux 6:

```

STROMASYS - Virtualization Technologies V2.0a
Manage monitored guests logs

Service status
aksusb monitoring service is running ✓

Logs checked / Monitoring status
/opt/charon/log/pluto.log, running, last modified on Jul 9 16:26 ✓
/opt/charon/log/myvax.log, running, last modified on Jul 9 16:26 ✓

Available options
1 - Update log files list
2 - Start/stop monitoring log file
3 - View guest log files
4 - View monitoring log file
5 - Install or update service
6 - Start or Restart aksusb log monitor
7 - Send/mail configuration and log files
q - quit

Enter your choice (enter to refresh): █

```

Example2 - Red Hat Enterprise Linux 7:

```

STROMASYS - Virtualization Technologies V2.2b
Manage monitored guests logs

Service status
aksusbd monitoring service is enabled, running ✓





Logs checked / Monitoring status
/charon/logs/pluto.log, enabled, running, last modified on Mar 22 16:05
Rotating log file / pluto-2016-03-22-16-05-13-000000000.log ✓

Available options
1 - Update log files list          5 - Manage 'systemd' services
2 - Start/stop monitoring log file 6 - Start or Restart aksusbd log monitor
3 - View guest log files          7 - Send/mail configuration and log files
4 - View monitoring log file      q - quit

Enter your choice (enter to refresh): █

```

Notes:

- The list of monitored log files is automatically filled with the log files found in the configuration files for guests defined with the [Service management \(Start, Stop, Manage automatic boot & shutdown\)](#) menu option when selecting the "Update log files list" option 1.
- The install/update service option will just restart the log monitoring service and not the guest.
- The aksusbd log monitoring will look into the `/var/log/messages` log file (Red Hat 6) or will check the `journalctl` (Red Hat 7 and Fedora) and will send an alert on dongle removal and dongle detected quite immediately
- The guest log monitoring:
 - will send alerts when information, warning and error messages will be detected depending on the alert level defined at [Alerts management - Select guests log alert level](#). Note alerts will be send in a bulk email message by default: one alert every 1 minute based on crontab entry settings for `/opt/charon/utils/charon_logevent` (see [Manage recursive jobs: license expiration check, log events \(cron\)](#))
 - It will also send alerts on guest start and stop
 - Dongle removal and detection alert messages will be sent based on license check interval defined with the license (default is 1 hour).
 - Each time a license is detected in the guest log file, an expiration check will occur and will send alerts if necessary
 - On rare cases, the dongle can be seen as unplugged whereas it is still plugged in leading the virtual machine to stop. The log monitoring feature is then able to detect this case and perform the necessary actions. More information is available in our Knowledge base in this article: [CHARON for Linux - Detected removal of the license whereas dongle is connected](#)
-  If you remove a guest from the "Service management - Update guests list" option, the log monitoring service will be removed from the list
- In case you're using regular (main) and backup license dongles, you will receive a "License dongle found" alert on dongle switch.
-  If the alert tells you the license detected is a "Runtime limited license", you'll have to replace your regular dongle as soon as possible.
-  If you have more than one virtual machine running on the same server, do not use the same log file name more than once even if the log folders are different
-  If you change the folder of an existing virtual machine, you'll have to update the service manually (Red Hat Enterprise Linux 7+ and Fedora)

Send configuration and log files via mail

Description

Use this option to send configuration and log files to an email recipient.

Notes:

- ★ Only for guests defined in the **Service management (Start, Stop, Manage automatic boot & shutdown)** menu option
- 🔔 Do not send these files directly to our support team otherwise the sender will not be recognized by our ticketing tool. Please send it to you then forward it to our support team.
- ✅ By default, the 3 most recent log files and the configuration file will be included in the email, zipped
- ℹ️ Email subject will be "[CHARON] Configuration and log files for XXXX" where "XXXX" represents the shortened configuration file name (without extension).
- ℹ️ Configuration and log files (latest 64 lines) will be displayed within the message body and will also be attached to the email as a zip file.

Example

```

STROMASYS - Virtualization Technologies V1.7
Send configuration and log files via mail

Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 3.8G/5.7G (66%)

Emulator/Config File      Cpu Mem  State          Stop script  B
-----
1- as4100/pluto           1 256M  INACTIVE  REQUESTED  Customized  N
  Description: CHARON as4100/pluto
  Stopped: Fri 2017-10-06 16:29:41 CEST (success)
  Guest OS response: N/A
  Network: EWA0/eno50332216

Enter the email recipient (q to quit) []: ██████████@stromasys.com 1
Confirm (y/n) : y

Number of logs to send [default = 3 latest] ('q' to quit) : 5 2



Sending configuration and log files to ██████████@stromasys.com...
Done.

Press enter



```

Below is an example of email received:



[CHARON] Configuration and log files for pluto

 BrunoPC RedHat7 LTK <[REDACTED]@gmail.com> Today, 13:46


Inbox

  pluto_cfglogs.zip 10 KB

⌵ Show all 1 attachments (10 KB) Download Save to OneDrive - Stromasys Inc

 Action Items 

Please find attached configuration and log files for pluto

Configuration file

```
#INFO: AS4100 pluto demo - Development server
set session hw_model="AlphaServer_4100"
set session configuration_name = "pluto"

#set session log="/charon/pluto.log" log_method="append"
set session log="/charon/logs"

set ace cpu_architecture = EV56
set rom dsrdb[0] = 1408 system_name = "AlphaServer 4100 5/400"

set session n_of_cpus=1
set ram size=256

set rom container="/charon/pluto.bin"
```

Preferences

Description

This option allows the users to define the following settings:

- default editor for Character User Interface and Graphical User Interface with the selection mode, automatic or on demand. Automatic means the GUI will be preferred (if defined) if available otherwise the CUI editor will be used
- continuous log view:
 - start or not when the virtual machine is started from the menu
 - display or not a reminder to tell how to exit from the view (CTRL-C)
- Out Of Memory killer settings. The following settings are used to prevent OOM Killer to kill the processes if the available memory is low.
 - Globally disabled or not
 - disabled per virtual machine. Note: when displaying the list of Virtual Machines, a message will be displayed to confirm the running VM is protected against OOM Killer ("Protected/OOM Killer")

Example

```

STROMASYS - Virtualization Technologies V1.1
Preferences

1 - Default editor:
  Character User Interface (CUI) = vim
  Graphical User Interface (GUI) = gedit
  Selection mode = auto

2 - Continuous log view:
  Automatically start with guest start: true
  Press CTRL-C line display/reminder: enabled

3 - Out Of Memory (OOM) settings
  OOM global status = enabled
  Charon VM process killing prevention = enabled

Enter your choice ('q' to quit):

```

Manage recurring jobs: license expiration check, log events (cron)

Table of Contents

- Description
- Scheduled jobs details
 - Expiration check alert (charon_expchk)
 - Monitor abnormal termination of the guests (charon_mongstop)
 - Log events (charon_logevent)
 - Logs archiving utility

Description

Use this option to check and open the root's "crontab" file in order to schedule recursive jobs.

Example:

```
STROMASYS - Virtualization Technologies V1.7
Manage recurring jobs (cron)

Checking...
Checking 'charon_expchk' presence in crontab file...
Checking 'charon_logevent' presence in crontab file...
Checking 'charon_logarchive' presence in crontab file...
Done.

Updating crontab...
crontab: no changes made to crontab

Checking...
Checking 'charon_expchk' presence in crontab file...
Checking 'charon_logevent' presence in crontab file...
Checking 'charon_logarchive' presence in crontab file...
Done.
Press ENTER to continue.
```


Notes:

- Alerts will be sent using the common alert script, see chapter Alerts management - Update/reinstall common alert script
- License expiration alert levels are explained here: [License expiration check](#)
- If the "crontab" file does not exist, it is initialized with comments in order to facilitate settings like this:


```
# root crontab
#-----
# Syntax:
#
# * * * * * command to execute
# |   |   |   |   |
# |   |   |   |   +----- day of week (0 - 6) (0 to 6 are Sunday to Saturday, or use names)
# |   |   |   +----- month (1 - 12)
# |   +----- day of month (1 - 31)
# +----- hour (0 - 23)
# +----- min (0 - 59)
#
# Checks for license expiration: runs everyday at 09:00 with alert set to 15 days before expiration
0 9 * * * /opt/charon/utils/charon_expchk 15
#
# Monitor unrequested guests stop
* * * * * /opt/charon/utils/charon_mongstop
#
# Log events report
* * * * * /opt/charon/utils/charon_logevent
#
# Logs archiving utility (each Monday 00:00)
0 0 * * 1 /opt/charon/utils/charon_logarchive -keep=60 -zip
```

Scheduled jobs details

Expiration check alert (charon_expchk)

 The expiration check alert sends alerts by default 15 days before expiration (7 days in interactive mode).

This number of days can be changed using parameter 1 as number of days

Example for 21 days, running everyday at 08:00AM and 04:00PM (16:00):

```
0 8,16 * * * /opt/charon/utils/charon_expchk 21
```

More details on crontab at: <http://en.wikipedia.org/wiki/Crontab> (credits: wikipedia)

The '-nomail' parameter can be used to make the script check if the license dongle can be read: if not or if a timeout is detected, the aksusb drivers are restarted. This is mainly used for debugging.

Monitor abnormal termination of the guests (charon_mongstop)

This job is active by default, it is recommended not to prevent it from running. It's goal is to send alerts if a guest has been stopped whereas it was not requested.

It is used only with Red Hat Enterprise Linux 6.x.

Red Hat Enterprise Linux 7.x and CentOS 7.x are using `systemd` feature to monitor service abnormal termination so the corresponding lines will not be added in the crontab.

Log events (charon_logevent)

This job is active by default, it is recommended not to prevent it from running. It's goal is to scan for events in the guests active log files and send alerts based on alert level defined by the administrator. It runs by default every 1 minute so alerts will be sent in bulk mode rather than one alert per error detected. The interval can be updated at your convenience.

Logs archiving utility

This utility will archive services log files and guests console log files (if not managed by the emulator itself)

Default from the `crontab` entry is to keep files for 60 days and then zip older log files. Zipped files will be kept for 6 months

Alerts management

Table of contents

- Description
- Settings
 - Mail mode (TEXT/HTML)
 - Mail recipients list
 - Mail sender
 - Create/update alert mail footer
 - Enable/disable wall alert messages
 - Update/reinstall common alert script
 - Select guests log alert level
 - View alerts history
 - License expiration alerts from guests
 - Alerts simulator

Description

Use this option to change alert management settings as shown below:

```

STROMASYS - Virtualization Technologies V1.3
Alerts management

No  Parameter                               Current value(s)
---  -
1 - Mail mode (text/html)                 HTML
2 - Mail recipients list                  ██████████@stromasys.com
3 - Mail sender (optional)                BrunoPC RedHat7 LTK
4 - Create/Update alert mail footer       STROMASYS Bruno PC - RHEL 7.x Toolkit So
5 - 'wall' alert messages                 Disabled
6 - Update/reinstall alert script         Installed (from example)
7 - Select guests log alert level         WARNING + ERROR
8 - View alerts history (634 alerts)      Last update: Mon 09-Oct-2017 13:53:01
9 - Lic. expiration alerts from guests    Disabled
10- Alerts simulator

Enter your choice ('q' to quit): █

```


Settings

Mail mode (TEXT/HTML)

Alerts are by default sent in HTML format. With some mail clients, HTML mails are not correctly displayed or even rejected. This option is used to switch between HTML format and pure TEXT format.

HTML mail example:

[CHARON] Emulator pluto stopped

 BrunoPC RedHat7 LTK <[REDACTED]@gmail.com>
Today, 14:19
[REDACTED]

Inbox

Severity Level: **CRITICAL**
License number: [1002922](#)


Emulator stopped at 2017-10-09 14:12:56
Service stop requested by user or shutdown.

License dongle (LSUSB state): **CONNECTED**

STROMASYS Bruno PC - RHEL 7.x Toolkit Source (ceres)

TEXT mail example:

[CHARON] Emulator pluto started

 BrunoPC RedHat7 LTK <[REDACTED]@gmail.com>
Today, 14:10
[REDACTED]

Inbox


Severity Level: INFORMATIONAL
License number: 1002922
Virtual machine (guest): pluto

Emulator start request on 2017-10-09 14:09:50

STROMASYS Bruno PC - RHEL 7.x Toolkit Source (ceres)

Mail recipients list

All alerts coming from monitoring scripts and checks scripts are sent using a common alert script that sends emails (via "sendmail") to the recipients list that can be defined using this option.

 The common alert script can be customized too if you prefer not to receive emails and use commands from your monitoring software for example.


 Do not add blank lines and set one recipient per line

Mail sender

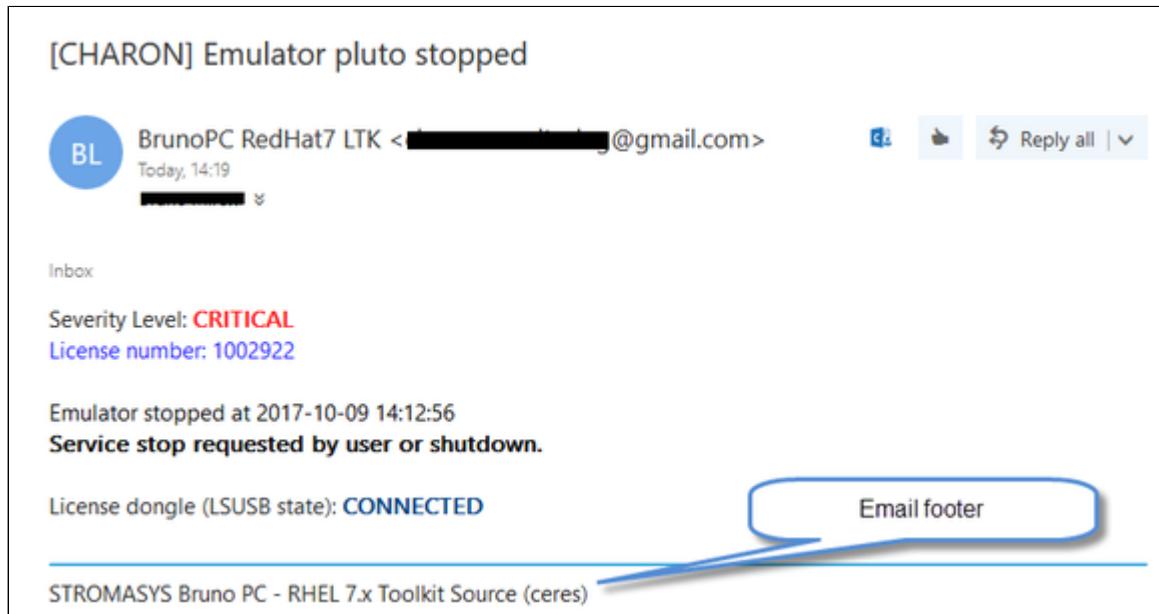
This optional option allows you to define the sender name instead of the default one (root@hostname)

Create/update alert mail footer

Used to add comments at the end of the mail.

 HTML tags like new line, font and bold can be added within the file. In case the format is switched to TEXT, these tags will be automatically removed from the text mail.

Example:



Enable/disable wall alert messages

This option enables or disables (default) the "wall" messages sent via the alert script.

Update/reinstall common alert script

All alerts coming from monitoring scripts and checks scripts are sent using a common alert script.

If this script does not exist, it is initialized by copying an example provided in the kit.

If it exists and is different from the original one, you are invited to reinitialize it from the default one:

- Answer "yes" if you did not change the original script file and you have updated the Linux Toolkit (read the corresponding release notes)
- Do not answer "yes" if you customized your own alert script.

 In case you've overwritten the existing alert script, the previous version can be restored from the "/charon/archive" folder

Example:

```

STROMASYS - Virtualization Technologies V1.3
Alerts management

No  Parameter                               Current value(s)
---  -
1 - Mail mode (text/html)                   HTML
2 - Mail recipients list                    [REDACTED]@stromasys.com
3 - Mail sender (optional)                  BrunoPC RedHat7 LTK
4 - Create/Update alert mail footer         STROMASYS Bruno PC - RHEL 7.x Toolkit So
5 - 'wall' alert messages                   Disabled
6 - Update/reinstall alert script           Customized
                                           Last update: Mon 09-Oct-2017 14:24:46
7 - Select guests log alert level           WARNING + ERROR
8 - View alerts history (642 alerts)        Last update: Mon 09-Oct-2017 14:13:01
9 - Lic. expiration alerts from guests     Disabled
10- Alerts simulator

Enter your choice ('q' to quit): 6

Do you want to reinstall the alert script from the kit ?
If you customized it, it will be saved and overwritten (y/n) : y

```

This script can be customized to send alerts the way you want, adding for example commands to link with your monitoring tool. It is based on an alert code passed as parameter 1.

All other parameters are information related to the alert. The script uses templates in order to send emails and wall messages (see "/opt/charon/utills/templates/*.mail" and "/opt/charon/utills/templates/*.wall" files if needed).













The table below lists all available values for parameter 1 in case you plan to customize the scripts and send alerts by your own (monitoring software lines of commands, snmptrap, etc...)

Parameter 1 can have the following values:

Parameter 1	Severity	Description
ABORTED	CRITICAL	Guest has stopped without user or service request
AKSUBSFAIL	CRITICAL	If the dongle is detected as removed whereas it is disconnected, the aksusb daemons are restarted. If the restart fails after 15 tries, this message is sent
BOOTDUPL	WARNING	Tried to start a guest that is already running or a guest is found more than once in the guests list
BOOTNOTFND	CRITICAL	The file containing the guests to start is empty or not found
EMULSTART	INFORMATIONAL	Emulator has been started
EXPCHK	CRITICAL, MAJOR, MINOR, INFORMATION	The license is about to expire
FOUND	INFORMATIONAL	License dongle found at startup
HASPWARN	CRITICAL	Warning messages found in the license, guests cannot start
IFCFGADDR	CRITICAL	The network interface defined in the configuration has already an assigned IP address, cannot be used for guest
IFCFGCRIT	CRITICAL	One parameter in the ifcfg-ethN file is not configured correctly (mandatory value)
IFCFGUNKN	CRITICAL	The interface name defined in the configuration file is not valid (not found with 'ifconfig <eth>' command)
IFCFGWARN	WARNING	One parameter in the ifcfg-ethN file is not configured correctly (recommended value)
INVALID	CRITICAL	Invalid configuration on dongle to start the guest
NOTFOUND	CRITICAL	The guests have not been able to start at boot due to dongle disconnected
REMOVED	CRITICAL	Dongle has been removed: the guest sees the dongle as disconnected and will stop after the defined interval if the dongle is not replaced
REMOVRESET	ERROR	Dongle seen as removed whereas not disconnected (aksusb driver failure). In this case the USB is reset and drivers are restarted (⚠️ Not valid if the dongle is a network dongle and then located on another server)
STOPPED	CRITICAL	Guest has been stopped, reasons explained in parameters 4, 5 and 6
STOPPEDREQ	INFORMATIONAL	Guest has been stopped, requested by user or shutdown
TESTMAIL	INFORMATIONAL	Used to test email mode when setting HTML or pure TEXT
TOEXIT	CRITICAL	The guest is about to exit, reasons explained in parameters 4 and 5
USBDISCONNECT	MAJOR	Dongle has been removed (immediate detection)

Select guests log alert level

Select the alert level to send alerts when events are found in the guest log file:

Level	Information	Warning	Error
0			
1			
2			
3			

★ Requires the "charon_logevent" entry activated in the "crontab" file => menu option "Manage recursive jobs: license expiration check, log events (cron)"

 This does not affect guest startup alerts. You will receive alerts when a guest starts or stop whatever the level is.

View alerts history

This option will allow you to view the alerts history sent via the alert script. Alerts can be viewed in a continuous way or using a text editor.

Example - Continuous view:

```
Continuous view of /opt/charon/log/charon_alerts.log
Press CTRL-C to stop

20171009:142736:ALERT:Emulator pluto started 1
Severity Level: INFORMATIONAL
License number: 1002922
Virtual machine (guest): pluto

Emulator start request on 2017-10-09 14:27:26

20171009:142741:ALERT:License dongle found for pluto 2
Severity Level: INFORMATIONAL
License number: 1002922
Key ID: 879642840
Description: Main license, front of the tower
Virtual machine (guest): pluto

Date limited license, limited to: 26/Oct/2017 01:55:00.

20171009:142751:ALERT:License dongle disconnected 3
Severity Level: MAJOR

Disconnection of a USB license dongle detected (0 connected)
This can be due to physical disconnection or USB and/or HASP driver reset (aksus
bd)
Please check.

20171009:142801:ALERT: 4
Events count:
INFORMATIONAL: Not monitored
WARNING: 2
ERROR: 0

Events:


20171009:142730:WARN :1:00000354:hexane.cxx(3014): 4 host CPUs detected but 8 r
ecommended, performance might be limited.
20171009:142730:WARN :1:00000353:hexane.cxx(3032): The host system is below rec
ommended specifications.
```


```
20171009:142815:ALERT:License dongle found for all CHARON virtual machines on se
rver ceres.stromasys.com
Severity Level: INFORMATIONAL
License number: 1002922
Key ID: NA
Description: NA
Virtual machine (guest): all CHARON virtual machines on server ceres.stromasys.c
om

Detected connection of a USB license dongle
Connected: 1
```



We can see above:


1. A message telling the emulator is started
2. A message telling the license (main one) is found and that also displays its expiration date
3. The main license dongle has been unplugged and the aksusbcd monitor reported the alert (immediate). We can see one license (backup one) is still connected
4. Warning messages are sent for the hardware requirements
5. The license dongle was plugged in again.
 -  We do not see here any dongle removal alert reported by the emulator itself, this is because by default the emulator checks for dongle presence every 1 hour (deferred)

 Press CTRL-C to get back to the previous menu

License expiration alerts from guests

This option will toggle on/off the WARNING alerts sent from the guest log file. By default these alerts are sent once per hour 120 hours before expiration whatever the license interval check is set to.

If you have setup the log level alert option to receive WARNING messages then you will receive one alert per hour. This option can be disabled if the expiration check entry is set in the crontab (by default).

 Backup licenses (time limited): please take care of the time remaining that will be reported in the license detection alert, if the number of remaining hours is less than 24, you could not receive any alert from the license expiration check that runs everyday at 09:00 AM by default. It is possible to make it run more than once a day in this case.

Alerts simulator

This option will allow you to send all the available alerts for tests.

Show host information (OS, HW, Charon version, utils and services)

Description

Opens a submenu that provides information on the CHARON server:

- Hostname
- Operating system name, kernel version, uptime
- Hardware: CPU, memory, USB devices
- Storage: file systems
- Network interfaces
- CHARON version: programs found and installed packages
- CHARON utils and services: scripts version, services status, content of configuration files, etc...

Output can be:

- displayed to terminal or
- sent to an html file and opened with Firefox or
- sent via email with the content of the `/opt/charon/log` folder (zipped) for debugging

Menu options list

```
STROMASYS - Engineered solutions
STROMASYS - Virtualization Technologies V1.47
```

Show host Information (full)

- 1 - Display with enhanced video
- 2 - Display pure text
- 3 - Send pure text file to recipient
- 4 - Generate and open HTML file
- 5 - Send HTML file to recipient

Show host Information (by group)

- 6 - Operating system
- 7 - Hardware
- 8 - Storage
- 9 - Network
- 10 - CHARON version
- 11 - CHARON utils and services

Enter your choice ('q' to quit): █

Documentation

Description

Use this option to:

- either open the attached documents: users guide (PDF file / "evince" required) or release notes (text file / using "vi")
- or to access our online Product Documentation and Knowledge Base space (using "firefox")

Note

Please note the users guide and the release notes latest versions will be available first on our [online product documentation web site](#). The kit attached documents, could be outdated.

Menu options

```
STROMASYS - Engineered solutions
STROMASYS - Virtualization Technologie V1.47
```

Documentation

- 1 - Local PDF document (evince)
- 2 - Online documentation (firefox)
- 3 - Product documentation and Knowledge Base (firefox)

CHARON Linux Toolkit version 1.47 (09-Oct-2017 14:57)

- 4 - View release notes (vi)

Other command lines

- 5 - vmlist - displays the status of defined guests
- 6 - logtail - continuous display of guest log files
- 7 - logview - editor view of guest log files

Enter your choice ('q' to quit):

Additional command lines

Table of Contents

- Virtual machines list and status (vmlist)
 - Usage
 - Description
 - Parameters
 - Example
- Virtual machine log view (logview)
 - Usage
 - Description
 - Parameters
 - Example
- Virtual machine log tail (logtail)
 - Usage
 - Description
 - Parameters
 - Example

Virtual machines list and status (vmlist)

Usage

```
# vmlist
```

Description

Display the list of managed virtual machines and their status

Parameters

-h : display help text

Example

```
# vmlist
Server boot: 14-Sep-2017 12:25 CPUs: 4 Memory(free/tot): 2.3G/5.7G (41%)

Emulator/Config File      Cpu Mem  State                Stop script  B
-----
- as4100/pluto            1 256M  ACTIVE              Customized   N
  Auto-restart: on-failure after 30s, max 2 times in 600 seconds
  Service Timeouts: Stop=3min
  Description: CHARON as4100/pluto
  Started: Tue 2017-10-10 12:14:43 CEST PID=53138. Protected/OOM Killer
  Guest OS response: 12:16 up 1 min - pluto V5.1
  Network: EWA0/eno50332216
```

Virtual machine log view (logview)

Usage

```
# logview [options] [logfile]
```

i The log files can also be edited from the menu "Service management" "View latest guest log file"

Description

Uses 'vim' editor to view a CHARON virtual machine log file with highlights.

If <logfile> is empty, the script will look for available log files in the virtual machines list managed by the Toolkit. If only one is managed, the current log will be selected, if more than one virtual machine is present, a selection menu will appear.

i It is recommended to enlarge the current terminal window to at least 132 columns. If using the graphical version of 'vim' (# logview -g) the window size is set to 32 lines and 160 columns by default.

Parameters

-h : display help text

-g or --gui : use 'gvim' instead of 'vim' (if installed)

-s or --short : edit a copy of the log file without 'regular license check' messages


Example

```
[root@rhel70 utils]# logview
Log files found
1 - /charon/mvax4106.log
   Configuration: /charon/mvax4106.cfg
   Lines: 79 - Dated 2016-03-11 15:55:10
2 - /charon/logs/myds20.log
   Configuration: /charon/myds20.cfg
   Lines: 232 - Dated 2016-03-14 12:32:32 (rotating log file)
Select the log file (q to quit): 2
```

```

20160314:123232:INFO :0:000003A5:hexane.cxx(5312): session is loading built-in configuration "AlphaServer_DS20"...
20160314:123232:INFO :0:000003A6:hexane.cxx(5336): session has finished loading built-in configuration "AlphaServer_DS20".
20160314:123232:INFO :0:000003AA:hexane.cxx(5425): session is loading configuration file "/charon/myds20.cfg"...
20160314:123232:INFO :0:000003AB:hexane.cxx(5455): session has finished loading configuration file "/charon/myds20.cfg".
20160314:123232:INFO :0:000003F2:sesmgr.cxx(1471): session: default log file size limit is 4194304 bytes
20160314:123232:INFO :0:0000032B:hexane.cxx(2447): Start request received.
20160314:123233:INFO :0:000003AC:hexane.cxx(1287): session's process affinity is 00000000000000FF, system affinity is 00000000000000
OFF.
20160314:123233:INFO :0:000003D1:hexane.cxx(1541): session's I/O domain affinity is 0000000000000003, CPU domain affinity is 000000
00000000FC
20160314:123233:INFO :0:000003EA:ll_license: 775: Looking for a license key ...
20160314:123233:INFO :0:000003DC:ll_license: 320: ... (Found license key 1619323274.
20160314:123235:INFO :0:0000024D:hexane.cxx(2688): STROMASYS SA, (C) 2009-2015
20160314:123235:INFO :0:00000350:hexane.cxx(2734): CHARON-AXP/DS20 (AlphaServer DS20), V 4.7 B 17101, Sep 22 2015 / 1000.806 / 1619
329274
20160314:123235:INFO :0:00000396:hexane.cxx(2761): The end user of this software has agreed to STROMASYS' Terms and Conditions for
Software License and Limited Warranty, as described at: http://www.stromasys.com/pub/doc/30-17-033.pdf
20160314:123235:INFO :0:0000009D:hexane.cxx(2838): License info:
CHARON product code: "CHAXP-802xx-xI".
Licensed to: "Stromasys - Bruno Miretti".
Date limited license, limited to: 11/Aug/2016 01:55:00.
Warning: setting the host system date back will permanently invalidate the license key.

```

 For ease of use, it is also possible to copy the charonlog.vimrc file to \$HOME/.vimrc. Doing so will make 'vim' highlight log lines by default (if you prefer to use 'vim' rather than 'logview')

Virtual machine log tail (logtail)

Usage

```
# logtail [options] [logfile]
```

i The log files can also be continuously viewed from the menu "Service management" "View latest guest log file"

Description

Continuous view of a CHARON virtual machine log file with highlights.

Press <CTRL-C> to stop the view.

If <logfile> is empty, the script will look for available log files in the virtual machines list managed by the Toolkit. If only one is managed, the current log will be selected, if more than one virtual machine is present, a selection menu will appear.

i It is recommended to enlarge the current terminal window to at least 132 columns.

Parameters

-h : display help text

Example

```
# logtail /charon/logs/myds20.log
```

```
Continuous view of /charon/logs/myds20.log
Press CTRL-C to stop

20160314:140408:INFO :0:00000348:scsi_disk.( 554): PKA_200 is being set OFFLINE
20160314:140408:INFO :0:0000034B:scsi_disk.( 566): PKA_200 is being set ONLINE
container = "/data/disks/zlsb01_app.vdisk"
20160314:140408:INFO :0:00000348:scsi_cdrom(1233): PKA_400 is being set OFFLINE
20160314:140408:INFO :0:0000034B:scsi_disk.( 566): PKA_0 is being set ONLINE
container = "/data/disks/myds20.vdisk"
20160314:140430:INFO :0:000003D7:hexane.cxx(4928): All virtual CPUs of "myds20" have been stopped by now.
20160314:140430:INFO :0:0000032D:hexane.cxx(2633): "AlphaServer DS20" stop request received.
20160314:140430:INFO :0:0000014C:lnxpackpor( 416): EWA0: Stopping network interface ... please wait.
20160314:140430:INFO :0:00000348:ataunit.cx(1738): ide0 is being set OFFLINE
20160314:140430:INFO :0:00000348:ataunit.cx(1738): ide1 is being set OFFLINE
20160314:140430:INFO :0:0000032E:hexane.cxx(2651): Stopped.
```

Tips and Tricks

Table of contents

- 'vi' and 'vim' text editors
- 'gedit' graphical editor
- 'nano' text editor
- How to setup 'ssh' trusts between Linux and Tru64
- How to setup 'ssh' trusts between Linux and VMS
- Shutdown guests with Expect tool
 - Introduction
 - Script usage
- How to restart CHARON-VAX/AXP on Linux automatically on failure

'vi' and 'vim' text editors

Notes:

- When typing text, press <ESC> once finished. In case you're blocked, press also <ESC> before executing commands described below
- both editors use case sensitive commands

Request	Command
To quit without saving	Press ':' then enter 'q'
To quit with saving	Press ':' then enter 'x' or 'wq'
Go to top of file	Press ':' then enter '0'
Go to last line	Press 'G'
Search pattern	Press '/' then enter your search text. Press then 'n' for next (forward) or 'N' for backward
Remove current character	Press 'x'
Insert text	Press 'i' (press ESC once text completed)
Insert line	Press 'o' for a line below cursor, 'O' for a line above cursor (press ESC once text completed)
Delete a line	Press 'dd'

'gedit' graphical editor

'gedit' is a graphical text editor, users familiar with Windows notepad should not encounter difficulties to use it.

Request	Command
To quit	close the window by clicking on the cross top right corner
Save file	Press <CTRL-S>

'nano' text editor

'nano' is a basic text editor, very simple to use and displaying available commands at the bottom of the screen. For example, to leave 'nano', use ^X (press CTRL + X)

How to setup 'ssh' trusts between Linux and Tru64

Notes

- The prompts will tell you where to execute the commands, "Tru64#" (root user) or "Linux#" (root user)
- Remember Linux/Unix is case sensitive
- If hosts are not known by each other, fill the `/etc/hosts` file for example (using `vi` for example)
- `linuxhost` represents the name of your CHARON server (can be any name you want)
- `tru64host` represents the hostname of your Tru64 virtual machine

- Generate the key

```
Linux# cd /root/.ssh
Linux# ssh-keygen -t rsa

Do not specify a passphrase
Linux# ssh-keygen -e -f id_rsa.pub > linuxhost.pub
```

- Copy the `linuxhost.pub` file, or use copy/paste, in the `/.ssh2` folder on the Tru64 host
- Define the **authorization** file:

```
Tru64# cd /.ssh2
Tru64# echo "Key linuxhost.pub" >> authorization
```

- Initialize the first ssh connection (answer 'yes' to confirm)

```
Linux# ssh tru64host date
```

then retry the same command to verify the trust is working.



If an error occurs, you can check and clean the `/root/.ssh/known_host` file on the Linux host

How to setup 'ssh' trusts between Linux and VMS

Notes

- The prompts will tell you where to execute the commands, "VMS\$" (system user) or "Linux#" (root user)
- Remember Linux/Unix is case sensitive, VMS is not
- Linux: if VMS host is not known, add it to `/etc/hosts` for example
- VMS: if Linux is not known, add it using: `$ UCX SET HOST LINUX /ADDR=xx.xx.xx.xx`

- Enable SSH on the VMS server:

```
VMS$ SET DEF SYS$LOGIN
VMS$ @TCPIP$CONFIG
```

- Select then:
 - Option 3 - Server components then enable and start service SSH, option 19
 - then Option 2 - Enable & Start service on this node

```

...
* Create a new default server host key? YES: YES
  Creating private key file: TCPIP$SSH_DEVICE:TCPIP$SSH.SSH2]HOSTKEY
  Creating public key file: TCPIP$SSH_DEVICE:TCPIP$SSH.SSH2]HOSTKEY.PUB
...

```

- Generate the key on the Linux server and convert it to be readable by VMS


```

Linux# ssh-keygen -t rsa

Do not specify a passphrase
Linux# ssh-keygen -e -f /root/.ssh/id_rsa.pub > /root/.ssh/linuxserver.pub

```


- Copy the generated file `/root/.ssh/linuxserver.pub` (or use copy/paste between putty session for example) to the VMS system in the `sys$SYSROOT:[SYSMGR.SSH2]` directory

 If this folder does not exist, create it using the following command: \$ **CREATE /DIRECTORY SYS\$SYSROOT:[SYSMGR.SSH2]**

- On the VMS system add the Linux server key to the authorized keys:

```


VMS$ SET DEF SYS$SYSLOGIN
VMS$ SET DEF SYS$SYSROOT:[.SSH2]
VMS$ OPEN/WRITE TMP AUTHORIZATION.

 If the file already exists, use /APPEND instead of /WRITE
VMS$ WRITE TMP "KEY LINUXSERVER.PUB"
VMS$ CLOSE TMP

```

 Do not forget the dot at the end of the authorization file name

- Perform some tests (examples)

 Charon server name "charon", vms system name "pluto":

```

charon# ssh system@pluto "show system /noproc"
OpenVMS V7.3-2 on node PLUTO 27-SEP-2013 11:50:14.37 Uptime 0 19:20:07

```

Shutdown guests with Expect tool

Introduction

In case SSH cannot be used to perform clean shutdown of the guests, the "expect" tool can be used to connect to the console, perform the login operation and execute the shutdown command depending on the console status (at login prompt, shell prompt or SRM prompt)

 In this case the password is sent without encryption.

To facilitate use of "expect" for shutdown, an example is provided in the "guest_shutdown.exp" script located in the `/opt/charon/utils` folder. If you plan to customize the script, you'll have to create a copy and not use it directly as it will be overwritten in case of Toolkit upgrade.

'telnet' and 'expect' packages must be installed in order to use this feature.


The following error message can be returned when stopping the virtual machine when trying to use the expect script example:


- if expect package is not installed: "Stop script returned error code 126".
- if telnet is not installed: "%EXPECT-F-NOSRM, Cannot continue, 'telnet' is not installed" then "Stop script returned error code 4"

Caution: the virtual machine process will be however killed by service management process


Console locked:

Any active session to the console must be killed before the "expect" script is executed.

 For example, if you are connected via "telnet" on the localhost/port (the kill is not done inside the expect script). See examples in the "`/opt/charon/utils/charon_gstart.stop.example`" file.

 If the console is locked from another host (if you use `putty` for example), you will have to cancel the connection by yourself otherwise the shutdown will not be performed cleanly.

This script can handle the following situations:

- No user connected on the console:
 - **Expect:** "Username: " (VMS) or "login: " (Tru64)
 - **Action:** An interactive session will be initiated based on <user> and <password> provided in the parameters
- A user is connected on the console:
 - **Expect:** <prompt> provided in the parameters
 -  This user must have privileges to perform shutdown as no logout will be issued
 - **Action:** Depending on the Operating system parameter (see <opsys> below), the shutdown command will be sent
- Console is at SRM prompt:
 - **Expect:** '>>>' (so works with VAX and Alpha with "P00>>>")
 - **Action:** A 'power off' command will be issued. If the command is not recognized, the F6 key will be sent (this must be enabled within the configuration file). If the F6 key did not stop the emulator, the script will exit with error code 9 meaning you will have to kill the emulator process yourself (see examples in the "`/opt/charon/utils/charon_gstart.stop.example`" file)

Script usage

Usage:

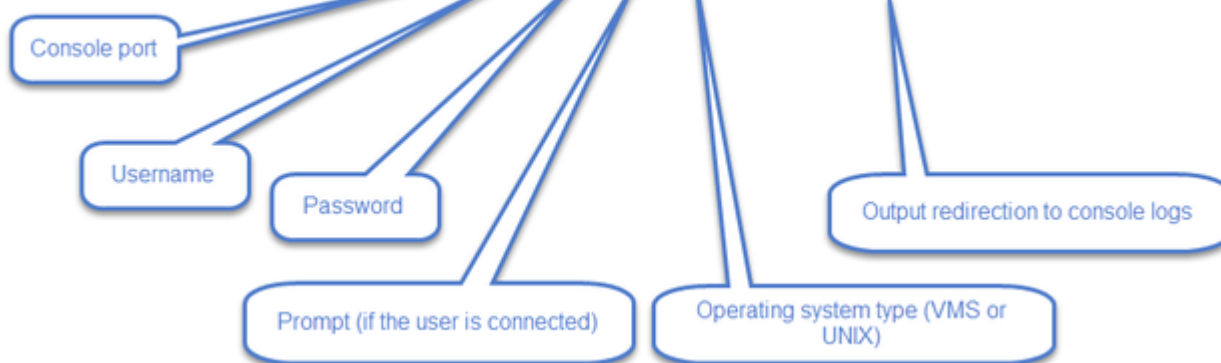
```
# path/script <port> <user> <password> <prompt> <opsys>
```

Parameters:

Parameter	Description
<port>	telnet port number (example: 10003)
<user>	username for login (must be able to perform shutdown)
<password>	password
<prompt>	shell prompt (including end space) or last characters of the prompt
<opsys>	VMS or UNIX

Example:

```
/opt/charon/utils/guest_shutdown.exp 10004 system 12345 "> " VMS >>/opt/charon/log/console.vmsexample.log 2>&1
```



i Examples are given in the `/opt/charon/utils/charon_gstart.stop.example` file

How to restart CHARON-VAX/AXP on Linux automatically on failure

! This part only applies to Linux distributions using `systemd` thus Red Hat Enterprise Linux 6.x versions are not concerned.

- Edit the service configuration file and add the following parameters using the "VM Management" option from the menu then "Manage 'systemd services'".
- Update the service and server boot parameters as described in the appendix [How to restart CHARON-VAX/AXP on Linux automatically on failure](#)

Alert emails examples

Table of contents

- License dongle not present
- License dongle now connected
- Emulator start information
- Emulator start - License information
- Dongle disconnection: immediate detection
- Dongle disconnection: emulator detection based on check interval
- Dongle false disconnection detected - recovery action engaged
- Emulator stopped - no action taken
- Emulator stopped without service request
- Errors found in the emulator's log file
- Emulator stopped by user request
- License expiration check

License dongle not present

[CHARON] License key not found at boot
root@charonrhel64.localdomain
-

Sent: Tue 4/15/2014 1:34 PM
To: Bruno Miretti

Severity Level: **CRITICAL**

License key not found at startup after 5 tries.
Please check.

STROMASYS GENEVA LAB - Linux Utilities SOURCES

License dongle now connected

[CHARON] License key found for GLOBAL
root@charonrhel64.localdomain

Sent: Tue 4/15/2014 1:40 PM
To: Bruno Miretti

Severity Level: **INFORMATIONAL**
License number: 1000.800
Hostname: GLOBAL

aksusb daemon: detected usb connection

STROMASYS GENEVA LAB - Linux Utilities SOURCES

Emulator start information

[CHARON] Emulator vms started

root@charonrhel64.localdomain

Sent: Tue 4/15/2014 1:41 PM

To: Bruno Miretti

Severity Level: **INFORMATIONAL**

License number: 1000.800

Hostname: vms

Emulator start request on 2014-04-15 13:40:22

STROMASYS GENEVA LAB - Linux Utilities SOURCES

Emulator start - License information

[CHARON] License key found for vms

root@charonrhel64.localdomain

Sent: Tue 4/15/2014 1:41 PM

To: Bruno Miretti

Severity Level: **INFORMATIONAL**

License number: 1000.800

Hostname: vms

Date limited license, limited to: 2/Apr/2015 01:55:00.

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Dongle disconnection: immediate detection

[CHARON] License key disconnected

root@charonrhel64.localdomain

Sent: Tue 4/15/2014 12:04 AM

To: Bruno Miretti

Severity Level: **MAJOR**

aksubd daemon: detected usb disconnection.

Please check.

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Dongle disconnection: emulator detection based on check interval

[CHARON] License key removed

root@charonrhel64.localdomain

Sent: Tue 4/15/2014 12:22 AM

To: Bruno Miretti

Severity Level: **CRITICAL**

License number: 1000.800

Hostname: vms

Date limited license, limited to: 2/Apr/2015 01:55:00.

Normal operation is supported for 59 minutes from now.

AKSUSB daemon is running! WINEHASP daemon is running! HASPLM daemon is running!

LSUSB state: **DISCONNECTED**

STROMASYS GENEVA LAB - Linux Utilities SOURCES

Dongle false disconnection detected - recovery action engaged

? It can occur, due to hardware failure or driver problem, the dongle is seen as disconnected whereas it is still physically connected to the server. The Toolkit contains a workaround to prevent from the virtual machine to stop in case the license is no more reachable. A message as follows is then sent:

From: root@rhel70.stromasys.com <root@rhel70.stromasys.com>

Sent: Tuesday, May 9, 2017 04:10

To: Bruno Miretti

Subject: [CHARON] License dongle removed or connection issue

Severity Level: **CRITICAL**

License number: 1000.800

Virtual machine (guest): mvax4106

Date limited license, limited to: 19/Oct/2017 01:55:00.

Normal operation is supported for 4 minutes from now.

AKSUSB is running. WINEHASP is running. HASPLM is running.



LSUSB state: **CONNECTED**

WARNING:


An USB reset is on going as the virtual machine detected the absence of the license dongle whereas it is seen as connected by the system. Please check if the license dongle can be read before next license check either using 'hasp_srm_view' utility or menu option 2 !

Stromasys Geneva Lab - RHEL 7.2 Toolkit tests (153)

Other messages will be sent:

	[CHARON] License dongle found for mvax4106	• ← root@GVALAB - T... 04:15
	[CHARON] Events found in mvax4106.log	• ← root@GVALAB - T... 04:11
	[CHARON] License dongle found for all CHARON virtual machines on server rhel70.stromasys.com	• ← root@GVALAB - T... 04:10
	[CHARON] License dongle disconnected	• ← root@GVALAB - T... 04:10
	[CHARON] License dongle removed or connection issue 	• ← root@GVALAB - T... 04:10

A "dongle disconnected" message followed by a "dongle found" message will be sent, this is due to the USB reset. If the USB reset operation is successful then the license dongle found message for the virtual machine is sent, meaning the recovery operation did prevent the virtual machine to stop.

 An event can be generated with the error level meaning the license is no more reachable. This event is cleared if the dongle found message is sent.

Emulator stopped - no action taken

<p>[CHARON] Emulator vms stopped</p> <p>root@charonrhel64.localdomain</p> <p>Sent: Tue 4/15/2014 1:22 AM</p> <p>To: Bruno Miretti</p> <hr/> <p>Severity Level: CRITICAL</p> <p>License number: 1000.800</p> <p>Emulator stopped at 2014-04-15 01:22:04</p> <p>Product or license has terminated</p> <p>License key (LSUSB state): DISCONNECTED</p> <hr/> <p>STROMASYS GENEVA LAB - Linux Utilities SOURCES</p>
--

Emulator stopped without service request

<p>[CHARON] Emulator vms failed</p> <p>root@charonrhel64.localdomain</p> <p>Sent: Tue 4/15/2014 1:23 AM</p> <p>To: Bruno Miretti</p> <hr/> <p>Severity Level: CRITICAL</p> <p>Guest stopped without service request</p> <p>Executable name: /opt/charon/bin/axp/as4100</p> <p>Configuration file name: /opt/charon/cfg/vms.cfg</p> <hr/> <p>STROMASYS GENEVA LAB - Linux Utilities SOURCES</p>

Errors found in the emulator's log file

[CHARON] CHARON Events found in vms.log

root@charonrhel64.localdomain

Sent: Mon 4/14/2014 5:23 PM

To: Bruno Miretti

Events count:

INFORMATIONAL: Not monitored

WARNING: Not monitored

ERROR: 1

Events:

- 20140414:172205 ERROR:2:00000352.rawhide_ro(2968): rom: Unable to read container file "/opt/charon/vms.bin". It is out-of-date, not readable or not valid for the specified hardware model and is being re-initialized accordingly. Check settings of console environment and/or system date and time.

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Emulator stopped by user request

[CHARON] Emulator vms stopped

root@charonrhel64.localdomain

Sent: Mon 4/14/2014 5:21 PM

To: Bruno Miretti

Severity Level: **CRITICAL**

License number: 1000.800

Emulator stopped at 2014-04-14 17:21:09

Service stop requested by user or shutdown.

License key (LSUSB state): **CONNECTED**

STROMASYS GENEVA LAB - Linux Utilities SOURCES

License expiration check

[CHARON] License expiration check

✕ SUPPRIMER ← RÉPONDRE ⬅️ RÉPONDRE À TOUS ➡️ TRANSFÉRER ⋮



root@rhel70.stromasys.net
mar. 18/08/2015 09:00

marquer comme non lu

À : Bruno Miretti;

Alert requested 15 days before expiration

License: 100.800 (USB)

Description: **Main license, path 2/0/0**

No expired product found.

License: 1000.806 (USB)

Description: **Backup license, path 1/0/0**

Product: CHARON-AXP/DS20, Time remaining: 0 hours and 0 minutes, severity **EXPIRED**

Product: CHARON-VAX/XM for Windows, Time remaining: 0 hours and 0 minutes, severity **EXPIRED**

Please contact your reseller or support@stromasys.com

Stromasys Geneva Lab - RHEL 7.0 Toolkit tests

Quick Setup Guide

Introduction

This article summarizes the operations to be performed to make your emulator running with the CHARON Linux Toolkit.

Preparation

- Create a folder to store the CHARON products and CHARON Linux Toolkit(s)

Example:

```
# mkdir /charon
```

- Download the kits in this folder from the Stromasys sftp server using 'sftp' or your browser with the link provided by Stromasys.
- Optionally create a folder where to store your licenses (C2V and V2C files)

Example:




```
# mkdir /charon/licenses
```

- Install the CHARON Linux Toolkit as described in the [Setup](#) page.
- Install the CHARON product(s) you need from menu option "Install/Upgrade/Remove CHARON"
- Dedicate network interfaces to CHARON using menu option "Network Configuration Utility" (see your CHARON product documentation / networking chapter).
- Check the license can be read using the "HASP license details" menu option
- Prepare your configuration file(s) or use the clone utility available from the "VM management - Update guests list" menu (see further).
- Prepare your storage configuration and create your [vdisk files](#) using the "mkdiskcmd" command if needed.

Example:

```
# mkdiskcmd -o /data/vms0_rz28.dsk -d rz28
```

Virtual machines creation

- Use the "VM management - Update guests list" option from the "Service management (Start, Stop, Manage automatic boot & shutdown)" menu option to add and start your new virtual machine (guest)
 - If you're running Red Hat Enterprise Linux 6, first install the service using the "Install or update service" option.
 - Optionally, use option "Enable/Disable start at server boot" to prevent the guest from starting automatically when the Linux server is booted
 - Optionally (but highly recommended), use option "Create/Edit guest stop script" to define the stop script that will be used to perform a clean shutdown of the virtual machine at service stop. See examples provided in the `'/opt/charon/utils/charon_gstart.stop.example'` file.
 -  It is recommended to test your shutdown scripts before going on production
 - Optionally, create the `'/opt/charon/utils/charon_gstart.chkrun'` file, by copying the `'charon_gstart.chkrun.example'` file for example, to add information about the guest state when displaying the guests list. See [Optional guest display status script](#)
 -  The log file monitoring service is created automatically.
- Connect to the guest console using the "Connect to guest console" menu option and install or restore the operating system. If `'telnet'` is not installed, you can connect via `putty` for example ( in this case some firewall settings will have to be set, see [Connection to guest console blocked by firewall](#))

Post installation checks

- You can remove the USB dongle, if any, to verify the dongle removal is identified by the askusbcd log monitor service:
 - If you enabled the `'wall'` alerts from the "Alerts management" menu, you should receive an immediate `'wall'` message.
 - If you disabled the `'wall'` alerts from the "Alerts management" menu (default), you can have a look at the alerts history from the "Alerts management" menu
 - If the mail has been correctly configured, you will receive an alert with subject: "[CHARON] License dongle disconnected" quite immediately. The immediate alert can be followed by an alert coming from the virtual machine log monitoring announcing the time remaining before stop

Appendixes

Contents

- Connection to guest console blocked by firewall
- How to restart CHARON-VAX/AXP on Linux automatically on failure

Connection to guest console blocked by firewall

Problem

Connections refused to guests console when connecting via telnet to localhost with the port number specified in the configuration file (10003, 10004, ...).

This can be caused by firewall settings.

Example1:

```
# telnet charonserver 10003
telnet: connect to address 192.168.42.42: Connection refused
```

Example2:

```
# telnet charonserver 10003
Trying 192.168.42.42...
telnet: connect to address 192.168.42.42: No route to host
```

Solution

To ensure the TCP ports are not blocked by the firewall, please execute the following commands:

```
# iptables -I INPUT -p tcp --dport <port> --syn -j ACCEPT
# iptables -I INPUT -p udp --dport <port> -j ACCEPT
# service iptables save
```

Example:

```
# iptables -I INPUT -p tcp --dport 10003 --syn -j ACCEPT
# iptables -I INPUT -p udp --dport 10003 -j ACCEPT
# iptables -I INPUT -p tcp --dport 10004 --syn -j ACCEPT
# iptables -I INPUT -p udp --dport 10004 -j ACCEPT
# service iptables save
```

Related articles

- [CHARON Linux server - Connection to guest console blocked by firewall](#)
- [Guest system hangs with TX overflow messages in the log file](#)
- [Enabling TCP keepalive for console connections](#)

How to restart CHARON-VAX/AXP on Linux automatically on failure

Table of contents


- Description
- Step-by-step guide
- Notes
 - Autoboot
 - Charon-AXP
 - Charon-VAX
 - Restart limit reached
 - CHARON Linux Toolkit integration
- Links
- Related articles

Description

In case of unrequested CHARON virtual machine stop, it is possible, using the `systemd` features, to restart CHARON emulator automatically

Step-by-step guide

Additional considerations

- To perform this procedure, you must have the necessary privileges to handle `systemd` service and execute `systemctl` commands
- This documentation applies only to Linux distributions including the `systemd` feature.  This does not apply to Red Hat Enterprise Linux 6

1. Setup your CHARON virtual machine as a service. To do so, refer to the corresponding documentation.
Example: [Running CHARON-AXP for Linux - Running as system service](#)
2. Edit the service configuration file and add the following parameters:

Parameter	Type	Description
<code>Restart</code>	text	Configures whether the service shall be restarted when the service process exits, is killed, or a timeout is reached
<code>RestartSec</code>	numeric	Configures the time to sleep before restarting a service (as configured with <code>Restart=</code>). Takes a unit-less value in seconds, or a time span value such as "5min 20s". Defaults to 100ms.
<code>StartLimitInterval</code>	numeric	Configure service start rate limiting. By default, services which are started more than 5 times within 10 seconds are not permitted to start any more times until the 10 second interval ends. With these two options, this rate limiting may be modified. Use <code>StartLimitInterval=</code> to configure the checking interval (defaults to <code>DefaultStartLimitInterval=</code> in manager configuration file, set to 0 to disable any kind of rate limiting). Use <code>StartLimitBurst=</code> to configure how many starts per interval are allowed (defaults to <code>DefaultStartLimitBurst=</code> in manager configuration file).
<code>StartLimitBurst</code>	numeric	



More parameters can be defined for auto-restart. Please refer to your Linux distribution documentation (see [Links](#) further)

Example: The following service will restart in case of failure (`Restart=on-failure`) after 30 seconds (`RestartSec=30`) with a limit of 2 (`StartLimitBurst=2`) within 10 minutes (`StartLimitInterval=600`)

```
# vim /usr/lib/systemd/system/as4100.service

[Unit]
Description=DEMO as4100
After=atd.service postfix.service ncu.service aksusbd.service
Wants=aksusbd.service

[Service]
Type=forking
WorkingDirectory=/charon/log
ExecStart=/opt/charon/bin/as4100 -d /my_services/as4100-service.cfg
ExecStop=/charon/scripts/mystopscript /my_services/as4100-service.cfg
Restart=on-failure
RestartSec=30
StartLimitInterval=600
StartLimitBurst=2

[Install]
WantedBy=multi-user.target
```

3. Reload systemd manager configuration:

```
# systemctl daemon-reload
```

Notes

Autoboot

Restarting CHARON emulator does not mean booting the OpenVMS or Tru64 virtual system. You will need to setup the flags at SRM level for autoboot.



See the related documentation of your emulator

Charon-AXP

The default boot device and the action to be performed on boot have to be set

Example for Charon-AXP:

```
P00>>> set bootdef_dev dka0
P00>>> set auto_action restart
```

Charon-VAX

CHARON-VAX can be configured to automatically boot an operating system at start up.

The MicroVAX 3100, VAX 6310 and VAX 4000 models boot automatically if the correct boot flags are set at the VAX console level:

```
>>>set halt reboot
```

Please check that the TOY, EEPROM and ROM containers (see above) are enabled so the console changes are saved upon reboots.

The ROM of certain VAX models (MicroVAX II, MicroVAX 3600, MicroVAX 3900, VAXserver 3600 and VAXserver 3900) does not allow the SRM console to accept the above command to enable auto booting. As a workaround, a specific setting can be defined in the configuration file:

```
set bdr boot=auto
```

The CHARON-VAX 6000 models have a similar configuration setting:

```
set xmi boot=auto
```

Restart limit reached

In case the StartLimitBurst is reached during the interval, you will not be able to restart the service until you reset the failure counter.

Example:

```
# systemctl start charon_pluto
Job for charon_pluto.service failed. See 'systemctl status charon_pluto.service' and 'journalctl -xn' for
details.

# systemctl status charon_pluto
charon_pluto.service - DEMO as4100 pluto
   Loaded: loaded (/etc/systemd/system/charon_pluto.service; disabled)
   Active: failed (Result: start-limit) since Mon 2015-09-28 15:59:36 CEST; 3min 10s ago
     Process: 67122 ExecStop=/opt/charon/utils/charon_gstart stop /charon/pluto.cfg (code=exited,
status=0/SUCCESS)
     Process: 62391 ExecStart=/opt/charon/utils/charon_gstart start /charon/pluto.cfg (code=exited,
status=0/SUCCESS)
    Main PID: 62795 (code=killed, signal=KILL)

Sep 28 15:59:16 rhel71.localdomain systemd[1]: Unit charon_pluto.service entered failed state.
Sep 28 15:59:36 rhel71.localdomain systemd[1]: charon_pluto.service holdoff time over, scheduling restart.
Sep 28 15:59:36 rhel71.localdomain systemd[1]: Stopping DEMO as4100 pluto...
Sep 28 15:59:36 rhel71.localdomain systemd[1]: Starting DEMO as4100 pluto...
Sep 28 15:59:36 rhel71.localdomain systemd[1]: charon_pluto.service start request repeated too quickly,
refusing to start.
Sep 28 15:59:36 rhel71.localdomain systemd[1]: Failed to start DEMO as4100 pluto.
Sep 28 15:59:36 rhel71.localdomain systemd[1]: Unit charon_pluto.service entered failed state.
Sep 28 15:59:54 rhel71.localdomain systemd[1]: Starting DEMO as4100 pluto...
Sep 28 15:59:54 rhel71.localdomain systemd[1]: charon_pluto.service start request repeated too quickly,
refusing to start.
Sep 28 15:59:54 rhel71.localdomain systemd[1]: Failed to start DEMO as4100 pluto.

# systemctl reset-failed charon_pluto
# systemctl start charon_pluto
# systemctl is-active charon_pluto
active
```

CHARON Linux Toolkit integration

The CHARON Linux Toolkit, starting version 41, is able to manage the auto-restart settings.

i Starting with kit version 42, if auto-restart settings are defined they will be displayed in the virtual machines lists while navigating in the menu options and the failure counter will be reset on each start (from the menu)

Example:

```

STROMASYS - Virtualization Technologies V2.2b
Service management (Start, Stop, Manage automatic boot & shutdown)

Server booted on: Wed 29-Jul-2015 13:43:00 - Current: Mon 28-Sep-2015 16:11:32
Number of CPUs: 3 - Memory(free/tot): 832,136kB / 3,868,776kB (21%)

Emulator/Config File      Cpu Mem  State      Stop script  B
-----
- as4100/pluto            1 256M  ACTIVE    Customized   N
  Auto-restart on-failure after 20s, max 2 times in 600 seconds
  Description: DEMO as4100 pluto
  Started: Mon 2015-09-28 16:03:39 CEST (PID=70658)

Available options

1 - Update guests list      6 - Create/Edit guest stop script
2 - Start/stop guests      7 - Connect to guest console
3 - View latest guest log file  8 - Edit configuration files
4 - View guest manager log file  9 - Manage monitored guests logs
5 - Manage 'systemd' services  q - quit

Enter your choice (enter to refresh): █

```

Links

- Red Hat Enterprise Linux 7 - Managing System Services: https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/System_Administrators_Guide/sect-Managing_Services_with_systemd-Services.html
- Fedora - Services and daemons: https://docs.fedoraproject.org/en-US/Fedora/22/html/System_Administrators_Guide/ch-Services_and_Daemons.html
- FreeDesktop.org - systemd.service: <http://www.freedesktop.org/software/systemd/man/systemd.service.html>

Related articles

- How to restart CHARON-VAX/AXP on Windows automatically on failure
- Tru64 system stops with fan failure message