CHARON Linux Toolkit - Users Guide - Kit 42-43

Contents

Purpose of this document

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

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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

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Important note

This document applies to Linux Utilities kits version 42, dated December 2015 and version 43, dated January 2016

Kit download

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

Prerequisites

- Basic knowledge of Unix commands

- Basic knowledge of CHARON products

- CHARON qualified versions:

CHARON AXP	CHARON-AXP V4.4 Build 147-07
	CHARON-AXP V4.5 Build 155-05 minimum
	CHARON-AXP V4.6 Build 166-03 minimum
	CHARON-AXP V4.7 Build 171-01 minimum
CHARON VAX	CHARON-VAX V4.6 Build 165-02 minimum
	CHARON-VAX V4.7 Build 171-01 minimum

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

Fedora	Fedora 20, 21 and 22
Red Hat	Red Hat Enterprise Linux Server release 6.2 to 6.6
	Red Hat Enterprise Linux Server release 7 and 7.2

- The following packages have to be installed on the CHARON server:
  - `telnet` (mandatory 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)
  - `ssh` (recommended for executing shutdown commands with trusted connection between the CHARON server and the CHARON virtual machine)

- evince (recommended for reading online documentation)
- sendmail (mandatory)
- screen (mandatory)
- bc (mandatory)
- firefox

- 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.

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.
dsk0	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 emulated system, in which the Tru64 or OpenVMS system runs

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	Test	Advanced users with more features (colored)

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:

- **Results**: some menu options will allow you to send results via email (example: license display, log and configuration files). The recipient will then be unique
- **Alerts**: by default, the alert script will send alerts via email and 'wall' notifications. A recipient list can be defined in this case
  - Wall notification can be disabled from the menu
  - The alert script can be customized and then you can use command lines linked to your monitoring software and disable emails for example

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 mail you received.

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

Setup

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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 and kit number is 42:

```
# mkdir -p /opt/charon/utils
# cp /charon/charon_linux_toolkit.kit42.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.kit42.tar
```

- In order to activate the 'menu' command, execute the following command:

```
# ./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`, dtterm or xterm (see how to here: Configuration)

- Mandatory packages installation will be checked (`telnet`, `screen`, etc..): if one package is missing you will not be able to continue.

- If telnet is installed, you will be prompted to force the mode to character to avoid some input issues while connected to the guests console

- Recommended packages installation will be checked (`expect`, `evince`, etc...): if one package is missing you will be able to continue, installation of these packages can be done later if needed

- The '`menu`' alias will be created, this will be the command you'll use to access the menu

- Recursive 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
  - Select between HTML or pure TEXT emails
  - Mail recipients list (used for alerts, not for sending files like log and configuration files for example)
  - Customize emails footer: you can add here your disclaimer, information on CHARON server or any information you think useful
  - Enable/disable wall alert messages
  - Install or update the alert script (can be customized later)
  - Select the alert level from guests log files: 0 = none, 1 = informational+warning+error entries, 2 = warning+error entries, 3 = error entries only

Example:

```
┌─STROMASYS - Virtualization Technologies──────────────────────V1.1─┐
│ Alerts management                                                  │
└────────────────────────────────────────────────────────────────────┘

No  Parameter                           Current value(s)
──  ─────────────────────────────────   ────────────────
1 - Mail mode (text/html)               HTML
2 - Mail recipients list                jane@stromasys.com
                                        john@stromasys.com
3 - Create/Update alert mail footer     STROMASYS Bruno's VM - Linux Toolkit SOU
4 - 'wall' alert messages               Disabled
5 - Update/reinstall alert script       Installed (from example)
6 - Select guests log alert level       WARNING + ERROR
7 - View alerts history (374 alerts)    Last update: Tue 18-Aug-2015 12:23:21
8 - Lic. expiration alerts from guests  Disabled

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

For more see: Alerts management

- When the setup is completed either log out to activate the 'menu' alias or execute the following command:

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

The Interface Configuration Files (ifcfg) will have to be created/updated manually before starting a guest using the related network cards. See the CHARON products related documentation, Installation part and Network configuration chapter. Please note the NIC name and the corresponding "ifcfg-xxx" name file will have to be identical to run with the Toolkit, see How to customize network interfaces on Linux

Upgrade

To upgrade the kit, you will need:

- to read the CHARON Linux Toolkit - Release notes for kit 42 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.kit<newkit>.tar .
```

- You can then run the 'menu' command as usual

In case of upgrade from a kit older than 41 on a Fedora 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

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Menu launcher

Execute the following command:

```
# menu
```

to display the Toolkit menu:

```
┌─STROMASYS - Engineered solutions──────────────────────────────┐
│ CHARON Linux Toolkit #42                                      │
└───────────────────────────────────────────────────────────────┘
CHARON installation
  1 - Install/Upgrade/Remove CHARON
  2 - Network Configuration Utility (ncu)
License management
  3 - License key display/email
  4 - Request for New or Update license (send C2V file)
  5 - Install or Update (apply V2C file)
  6 - License expiration check
Virtual Machines (guests)
  7 - Service management (Start, Stop, Manage automatic boot & shutdown)
  8 - Connect to guest console
  9 - Edit configuration files
 10 - Manage monitored guests logs
 11 - Send configuration and log files via mail
Miscellaneous
 12 - Manage recursive jobs: license expiration check, log events, etc... (cron)
 13 - Alerts management
 14 + Show host information (OS, HW, CHARON version, utils 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**:
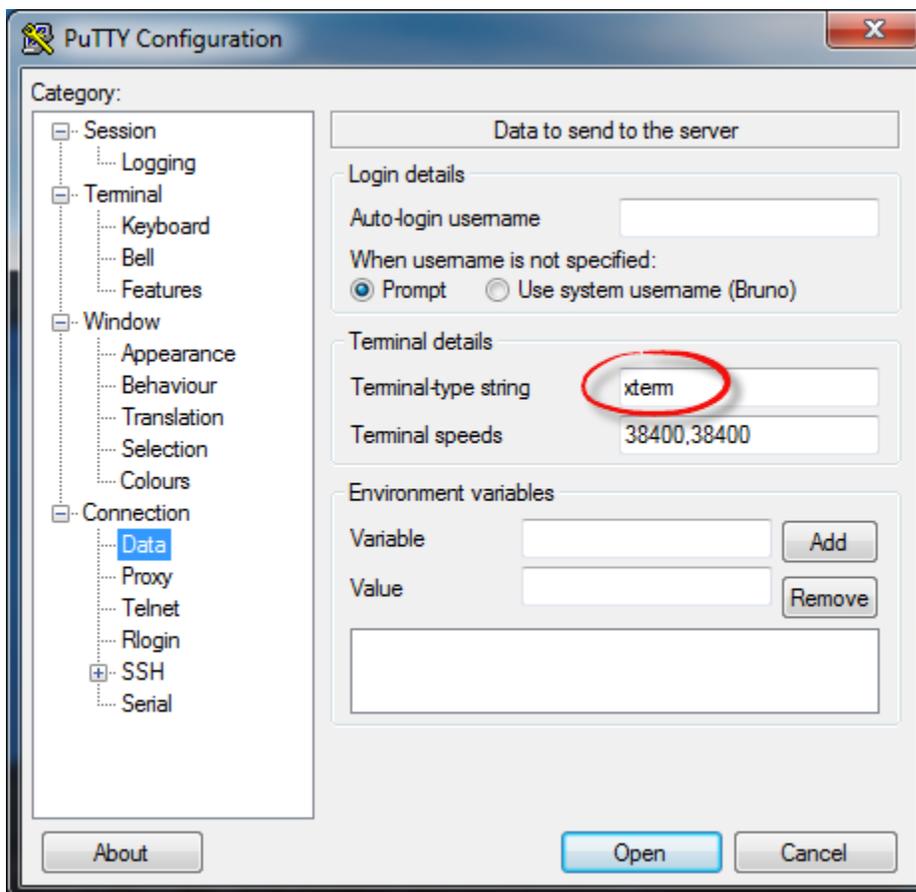
and maybe **Remote character set** parameter:
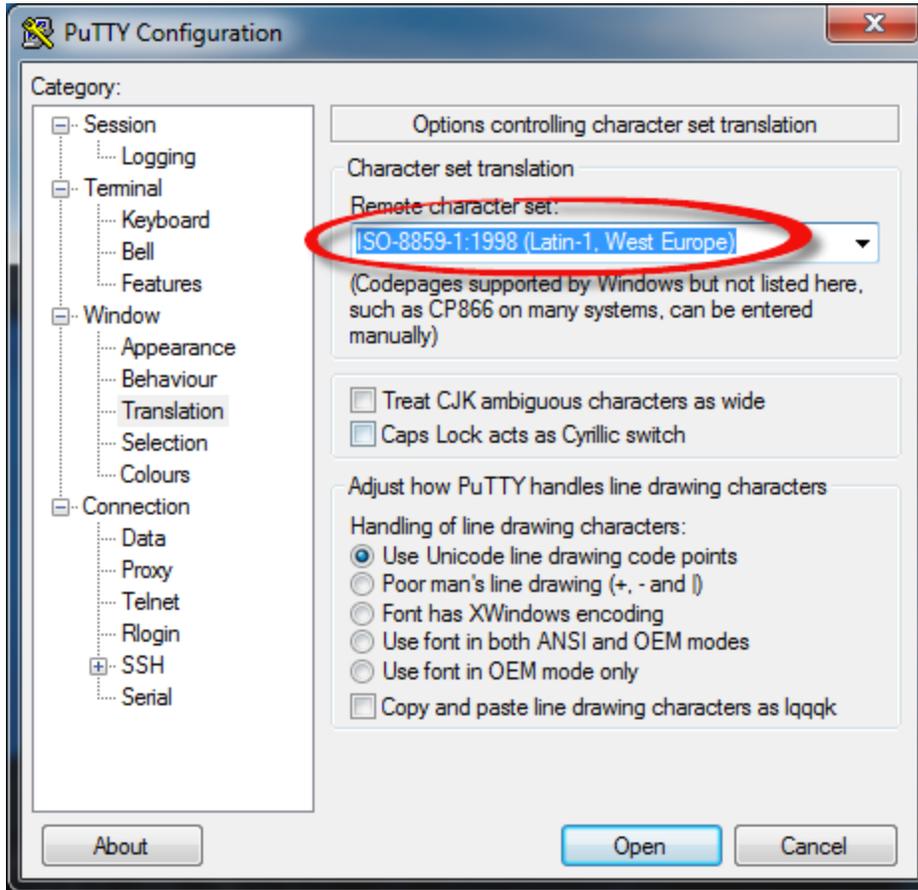
Recommended color scheme for 'putty' is (all other values can remain as they are by default):

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
- License key display/email
- Request for New or Update license (send C2V file)
- Install or Update (apply V2C file)
- License expiration check
- Service management (Start, Stop, Manage automatic boot & shutdown)
  - Service management - Update guests list
  - Service management - Start/stop guests
  - Service management - View guest log file
  - Service management - View guest manager log file
  - Service management - Install, update or manage service
  - Service management - Create/Edit guest stop script
  - Service management - Connect to guest console
  - Service management - Edit configuration files
  - Service management - Manage monitored guests logs
- Connect to guest console
- Edit configuration files
- Manage monitored guests logs
- Send configuration and log files via mail
- Manage recursive jobs: license expiration check, log events (cron)
- Alerts management
- Show host information (OS, HW, Charon version, utils and services)
- Documentation

Install/Upgrade/Remove CHARON

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Description

This option is designed to perform easy installation and uninstallation of CHARON. You have just to provide the .tar.gz file (kit) location, or .tar or the folder where you extracted the kit, if you did manually, and 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
```

- ℹ️ 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:

- OS is Red Hat Enterprise Linux 7.1
- We will install CHARON-AXP V4.7 Build 171-01
- License key is based on USB dongle
- We assume CHARON and the Linux Toolkit have been downloaded to the `/charon` folder:

```
[root@rhel71 /]# cd /charon
[root@rhel71 charon]# ls -l
total 86652
-rw-rw-r--. 1 stromasys stromasys 54400725 Nov 24 16:23 charon-axp-4.7-17101.68704.el71.tar.gz
-rw-rw-r--. 1 stromasys stromasys       73 Nov 24 16:23 charon-axp-4.7-17101.68704.el71.tar.gz.md5sum
-rw-r--r--. 1 root      root        501760 Nov 24 15:45 charon_linux_toolkit.V42.tar
-rw-rw-r--. 1 stromasys stromasys 33812584 Nov 24 16:24 charon-vax-4.7-17101.68704.el71.tar.gz
-rw-rw-r--. 1 stromasys stromasys       73 Nov 24 16:24 charon-vax-4.7-17101.68704.el71.tar.gz.md5sum
[root@rhel71 charon]#
```

Execute the "`menu`" command and select option 1:

```
┌─STROMASYS - Engineered solutions─────────────────────────────────┐
│ CHARON Linux Toolkit #42                                         │
└──────────────────────────────────────────────────────────────────┘

CHARON installation
   1 - Install/Upgrade/Remove CHARON
   2 - Network Configuration Utility (ncu)
License management
   3 - License key display/email
   4 - Request for New or Update license (send C2V file)
   5 - Install or Update (apply V2C file)
   6 - License expiration check
Virtual Machines (guests)
   7 - Service management (Start, Stop, Manage automatic boot & shutdown)
   8 - Connect to guest console
   9 - Edit configuration files
  10 - Manage monitored guests logs
  11 - Send configuration and log files via mail
Miscellaneous
  12 - Manage recursive jobs: license expiration check, log events, etc... (cron)
  13 - Alerts management
  14 + Show host information (OS, HW, CHARON version, utils and services)
  15 + Documentation

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

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───────────────────────V2.6─┐
│ Install/Upgrade/Remove CHARON                                      │
└────────────────────────────────────────────────────────────────────┘
Hostname:            rhel71.stromasys.net
Linux version:       Red Hat Enterprise Linux Server release 7.1 (Maipo)
                     Linux 3.10.0-229.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

No  Product              Version Build  Installed Type        md5sum
─── ──────────────────── ─────── ────── ───────── ────────    ──────
  1 charon-axp               4.7  17101 no         tar.gz      OK
  2 charon-vax               4.7  17101 no         tar.gz      OK
                                                        3
Select the kit you want to use (q to quit): 1
```

The kit will then be unzipped, extracted and installed.

```
Checking charon-axp-4.7-17101.68704.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, 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-4.7-17101.68704.el73.x86_64.rpm: charon-axp-4.7-17101.x86_6
4
Marking charon-axp-4.7-17101.68704.el73.x86_64.rpm to be installed
Examining charon-license-4.7-17101.68704.el73.x86_64.rpm: charon-license-4.7-171
01.x86_64
Marking charon-license-4.7-17101.68704.el73.x86_64.rpm to be installed
Examining charon-utils-4.7-17101.68704.el73.x86_64.rpm: charon-utils-4.7-17101.x
86_64
Marking charon-utils-4.7-17101.68704.el73.x86_64.rpm to be installed
Resolving Dependencies
```

...

```
  Verifying  : aksusbd-2.5-1.i386                                          1/4
  Verifying  : charon-license-4.7-17101.x86_64                             2/4
  Verifying  : charon-axp-4.7-17101.x86_64                                 3/4
  Verifying  : charon-utils-4.7-17101.x86_64                               4/4

Installed:
  aksusbd.i386 0:2.5-1                      charon-axp.x86_64 0:4.7-17101
  charon-license.x86_64 0:4.7-17101        charon-utils.x86_64 0:4.7-17101

Complete!
 Installation completed (error code 0)

Output saved to /opt/charon/log/yum.install.20151125_175219


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──────────────────V2.6──┐
 │ Install/Upgrade/Remove CHARON                                  │
 └───────────────────────────────────────────────────────────────┘
Hostname:            rhel71.stromasys.net
Linux version:       Red Hat Enterprise Linux Server release 7.1 (Maipo)
                     Linux 3.10.0-229.el7.x86_64

Installed packages
- License driver:    aksusbd-2.5-1.i386
- Base products:     charon-axp V4.7 B17101  ✔
- Packages :         axp/4.7 license/4.7 utils/4.7

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

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

CHARON upgrade installation example

- All running virtual machines have to be shutdown before upgrade
- If you upgrade from a Build lower than 16803, you will need to uninstall the installed Build first. Starting with build 16803, upgrades can be performed without uninstall
- ⚠️ Version 4.7 exception: upgrading to version 4.7 requires all previous versions to be uninstalled

Context:

- OS is Red Hat Enterprise Linux 7.1
- We will upgrade CHARON-AXP V4.6 Build 168-03 to V4.6 Build 168-04
- We assume the patch has been downloaded to the `/charon` folder:

```
[root@rhel71 charon]# ls -l
total 49916
drwxrwxr-x. 2  500  500     4096 Jun 25 18:24 charon-axp-4.6-16803.68704.el65
-rw-r--r--. 1 root root       73 Jun 25 18:15 charon-axp-4.6-16803.68704.el65.ta
r.gz.md5sum
-rw-r--r--. 1 root root 48731653 Jun 25 18:31 charon-axp-4.6-16804.68704.el65.ta
r.gz
-rw-r--r--. 1 root root       73 Jun 25 18:31 charon-axp-4.6-16804.68704.el65.ta
r.gz.md5sum
-rw-r--r--. 1 root root  2365440 May  6 14:28 charon_linux_toolkit.V41.tar
```

Execute the "`menu`" command and select option 1, select installation as described below:

```
┌STROMASYS - Virtualization Technologies─────────────────────────V2.4e─┐
│ Install/Upgrade/Remove CHARON                                        │
└──────────────────────────────────────────────────────────────────────┘
Hostname:           rhel71.localdomain
Linux version:      Red Hat Enterprise Linux Server release 7.1 (Maipo)
                    Linux 3.10.0-229.4.2.el7.x86_64

Installed packages
- License driver:   aksusbd-2.4-1.i386
- Base products:    charon-base V4.6 B16803
- Packages :        axp/4100 axp/ds10 axp/ds20 axp/es40 axp/gs160
                    axp/gs320 axp/gs80

Note: If you upgrade from a Build lower than 16803, you need to uninstall the
      installed Build first.

Enter your choice (i/u/r/s/q/?): i       1

Enter kit location (folder), . for current folder, q to quit
[/charon] :

No  Product              Version Build  Type         md5sum
───────────────────────────────────────────────────────────
   1 charon-axp             4.6  16803 folder        -
   2 charon-axp             4.6  16804 tar.gz        OK
                                                    2
Select the kit you want to use (q to quit): 2
```

Upgrade will executed. Once completed, you can check the installed version:

```
┌STROMASYS - Virtualization Technologies─────────────────────────V2.4e─┐
│ Install/Upgrade/Remove CHARON                                        │
└──────────────────────────────────────────────────────────────────────┘
Hostname:           rhel71.localdomain
Linux version:      Red Hat Enterprise Linux Server release 7.1 (Maipo)
                    Linux 3.10.0-229.4.2.el7.x86_64

Installed packages
- License driver:   aksusbd-2.4-1.i386
- Base products:    charon-base V4.6 B16804
- Packages :        axp/4100 axp/ds10 axp/ds20 axp/es40 axp/gs160
                    axp/gs320 axp/gs80

Note: If you upgrade from a Build lower than 16803, you need to uninstall the
      installed Build first.

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

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:

- OS is Red Hat Enterprise Linux 7.1
- We will install CHARON-VAX V4.7 Build 171-01 on a server where CHARON-AXP V4.7 Build 171-01 is already installed
- We assume the patch has 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──────────────V2.6─┐
│ Install/Upgrade/Remove CHARON                            │
└──────────────────────────────────────────────────────────

Hostname:          rhel71.stromasys.net
Linux version:     Red Hat Enterprise Linux Server release 7.1 (Maipo)
                   Linux 3.10.0-229.el7.x86_64

Installed packages
- License driver:  aksusbd-2.5-1.i386
- Base products:   charon-axp V4.7 B17101
- Packages :       axp/4.7 license/4.7 utils/4.7

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

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

Enter kit location (folder), . for current folder, q to quit
[/charon] :

No  Product            Version  Build  Installed Type      md5sum

  1 charon-axp            4.7   17101  yes       folder    -
  2 charon-vax           4.7   17101  no        tar.gz      OK

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

ⓘ The program remembers the folder where you stored the kit during installation so you will have just to press enter when asking for the kit location at next installation

We can now proceed with the installation of CHARON-VAX. Once completed, you can check the installed packages:

```
┌─STROMASYS - Virtualization Technologies────────────────────V2.6─┐
│  Install/Upgrade/Remove CHARON                                  │
└─────────────────────────────────────────────────────────────────┘
Hostname:              rhel71.stromasys.net
Linux version:         Red Hat Enterprise Linux Server release 7.1 (Maipo)
                       Linux 3.10.0-229.el7.x86_64

Installed packages
- License driver:      aksusbd-2.5-1.i386
- Base products:       charon-axp V4.7 B17101 ✔
                       charon-vax V4.7 B17101
- Packages :           axp/4.7 license/4.7 utils/4.7 vax/4.7

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

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

Network Configuration Utility

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Description

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

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

Example

We will dedicate 2 network adapters to CHARON, "ens34" and "ens35". "ens33" is used for managing the CHARON server.

```
┌─STROMASYS - Virtualization Technologies──────────────────────V1.0─┐
│ Network Configuration Utility                                     │
└───────────────────────────────────────────────────────────────────┘

CHARON Network Configuration Utility, STROMASYS (c) 2015 Version 1.5

Interfaces      Dedicated to      State
---------       ------------      -----------
virbr0          bridge            connected connected to bridge
ens33           host              connected to host
virbr0-nic      bridge                connected to bridge
ens34           CHARON            disconnected from host
ens35           CHARON            disconnected from host
lo              host              unmanaged from host
==================================================================
bridge name     bridge id                 STP enabled     interfaces
virbr0          8000.525400fec2dc         yes             virbr0-nic
 select action:
1 - Dedicate to CHARON
2 - Release to host
3 - Create Bridge with TAPs
4 - Remove Bridge
5 - Print status
6 - Exit
:>█
```

License key display/email

Description

This option will allow you to display the license content.

ℹ️ 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

One displayed, the program will allow you to send the result via email.

> Licenses descriptions can be added to the display list by manually creating the following file: /opt/charon/utils/charon_licens
> es.list
>
> This file will contain first 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**:
>
> ```
> # cat /opt/charon/utils/charon_licenses.list
> 1000.800;Main license, path 2/0/0;2
> ```

Example

```
┌STROMASYS - Virtualization Technologies───────────────────────V1.4─┐
│  License key display/email                                        │
└───────────────────────────────────────────────────────────────────┘

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

...

```
┌STROMASYS - Virtualization Technologies───────────────────────V1.4─┐
│  License key display/email                                        │
└───────────────────────────────────────────────────────────────────┘

License number Type Key ID             Description
────────────── ──── ──────             ───────────

1000.800       USB  367006676          Main license, path 2/0/0


Available editors
g - gedit (windows notepad like)
n - nano   (basic text editor)
v - vi     (advanced users standard text editor)
m - vim    (advanced users improved text editor)
q - quit
Select the editor you want to use: m



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

Enter the email recipient (q to quit) []: kirk@enterprise.uss
```

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

Request for New or Update license (send C2V file)

Description

This option creates a C2V file to be sent to Stromasys in order to update your 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─────────────────V1.5─┐
│ Create and send C2V file                                     │
└──────────────────────────────────────────────────────────────┘


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

Enter your choice (q to quit) : 1

License number: 1002922

Please wait, generating C2V file...

C2V file generated: /tmp/1002922_20150818_134230.c2v

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

Enter the email recipient (q to quit) []: kirk@enterprise.uss█
```

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 you used option 2.

Install or Update (apply V2C file)

Table of contents

Description

This option either:

- opens Firefox Web browser (Graphical User Interface) in order to apply the V2C file you received from Stromasys or
- if the `hasp_update` executable file is present, coming from the CHARON kit (starting V4.6) or from a provided HASP SL 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────────────────────V1.1─
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───────────────────────V1.1─┐
│ 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█                                               │
│                                                                    │
└────────────────────────────────────────────────────────────────────┘
```
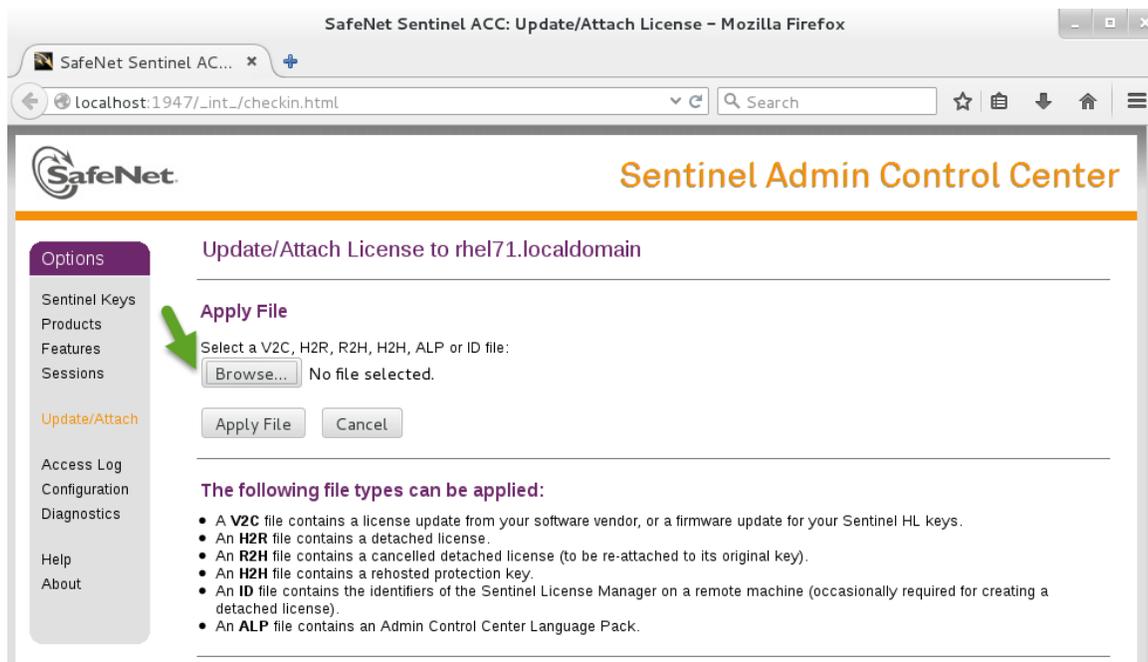
You will have, if not already done, to specify the container (folder) where you store all the .v2c files.

Example:

```
┌─STROMASYS - Virtualization Technologies───────────────────────V1.1─┐
│ Install or Update (apply V2C file)                                 │
│                                                                    │
│                                                                    │
│ Available options                                                  │
│1 - Install new license                                             │
│2 - Update license                                                  │
│3 - set license files folder                                        │
│q - quit                                                            │
│                                                                    │
│Enter your choice: 3                                                │
│                                                                    │
│Enter the folder name [] (q to quit): /charon/licenses             │
└────────────────────────────────────────────────────────────────────┘
```

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

Install or update your license:

- In case the license is installed on the USB dongle for the first time, use option 1.
- In case you add new products, update settings (more cpus, more memory...) or extend the expiration date, option 2 will be used.

Example:

```
┌STROMASYS - Virtualization Technologies────────────────────────V1.1─┐
│ Install or Update (apply V2C file)                                 │
│                                                                    │
└────────────────────────────────────────────────────────────────────┘

 Available options
1 - Install new license
2 - Update license
3 - set license files folder
q - quit

Enter your choice: 3

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

The license updates will be applied in the order specified.

💡 In case errors are detected during update, common errors codes and their explanation are displayed.

❓ If the error code is not listed there, you can have a look at this article: hasp_update utility returns error message (if the code is not listed there, 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)

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 - Valid licenses

```
┌STROMASYS - Virtualization Technologies──────────────────V1.5e──┐
│ License expiration check                                        │
│                                                                 │
│                                                                 │
│ Product Name                         Expiration      Alert level│
│                                                                 │
│ License: 1000.800 (USB) KeyID: 367006676  Main license, path 2/0/0
│ CHARON-AXP/4100                      12-May-2016     INFORMATIONAL│
│ CHARON-AXP/DS10                      12-May-2016     INFORMATIONAL│
│ CHARON-AXP/DS20                      12-May-2016     INFORMATIONAL│
│ CHARON-AXP/ES40                      12-May-2016     INFORMATIONAL│
│ CHARON-AXP/GS80                      12-May-2016     INFORMATIONAL│
│ CHARON-AXP/SMA VAR all Signatures for Windows  12-May-2016  INFORMATIONAL│
│ CHARON-VAX/XM Plus for Windows       12-May-2016     INFORMATIONAL│
│ CHARON-VAX/XL Plus for Windows       12-May-2016     INFORMATIONAL│
│ CHARON-VAX-66xx all models           12-May-2016     INFORMATIONAL│
│                                                                 │
│ Press ENTER to continue.                                        │
```

Example - Expired Software License

```
STROMASYS - Virtualization Technologies                         V1.5e
License expiration check


Product Name                          Expiration          Alert level

License: 7002058 (Soft)
CHARON-AXP/DS20                       14-May-2015          EXPIRED

Press ENTER to continue.
```

Example - Runtime limited license

```
STROMASYS - Virtualization Technologies                         V1.5e
License expiration check


Product Name                          Expiration          Alert level

License: 1000.806 (USB) KeyID: 1619329274   Backup license, path 1/0/0
CHARON-AXP/DS20                             23 hours 45 minutes CRITICAL
CHARON-VAX/XM for Windows                   23 hours 45 minutes CRITICAL

Press ENTER to continue.
```

Service management (Start, Stop, Manage automatic boot & shutdown)

Table of Contents

Description

Guests (CHARON virtual machines) are managed as services, this menu option allows you to start and stop them on your or on 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 (⚠ 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 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' tool 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 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. ℹ For more information, see manpages: # **man systemd.unit**

Menu description

- The first part of the menu displays **server information** like server boot time, current time (at display), 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	Displays the number of CPUs by looking into configuration file settings (set n_of_cpus ...) first then using default value for the selected hardware. If no information is available, "-" is displayed instead. ⚠️ The number of CPUs displayed does 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 HW limitations, CHARON licenses and also licenses on the virtual machine side
Mem	Displays the amount of memory defined in the configuration file (if defined). If no information is available, "-" is displayed instead.
State	- For Red Hat 6 - 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: - 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 `systemd`) - can be either ACTIVE, ACTIVATING, INACTIVE, DEACTIVATING, FAILED or UNKNOWN - If the guest is in STOPPED state, an additional information will be displayed: - 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	Displays the status of the stop script used to perform a clean shutdown of the guest. Can be: - Not found: the script has not been created. ⚠️ In this case, 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 your commands to perform a clean shutdown of the guest (OpenVMS or Tru64 virtual machine). ℹ️ For more information, see Service 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 you added a new guest.
B	Displays the Boot server startup value, Yes or No.

- The third part displays the available options that are detailed below.

Examples

Red Hat 6 - Virtual machine up and running

```
┌STROMASYS - Virtualization Technologies─────────────────────────V2.2─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown)   │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘

Server booted on: Mon 06-Jul-2015 17:33:00 - Current: Tue 18-Aug-2015 14:22:53
Number of CPUs: 3 - Memory(free/tot): 2,598,836kB / 8,053,848kB (32%)

Emulator/Config File          Cpu Mem   State              Stop script      B
──────────────────────        ─── ───   ─────              ───────────      ─

- as4100/pluto                  1 256M   RUNNING            Customized       N
  Started: Tue 18-Aug-2015 14:22:10

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 - Install or update service   q - quit

Enter your choice (enter to refresh): █
```

Red Hat 7 - Virtual machine up and running

```
┌STROMASYS - Virtualization Technologies─────────────────────────V2.2─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown)   │
│                                                                     │
└─────────────────────────────────────────────────────────────────────┘

Server booted on: Wed 29-Jul-2015 13:43:00 - Current: Tue 18-Aug-2015 14:28:50
Number of CPUs: 3 - Memory(free/tot): 1,060,864kB / 3,868,776kB (27%)

Emulator/Config File          Cpu Mem   State              Stop script      B
──────────────────────        ─── ───   ─────              ───────────      ─

- as4100/pluto                  1 256M   ACTIVE             Customized       N
  Description: DEMO as4100 pluto
  Started: Tue 2015-08-18 14:28:28 CEST (PID=39209)

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): █
```

ℹ Due to improvements added in service management with systemd, more information is displayed on the service

Red Hat 7 - Virtual machine failed due to kill signal sent by the administrator

```
┌STROMASYS - Virtualization Technologies─────────────────────V2.2─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown) │
└─────────────────────────────────────────────────────────────────┘


Server booted on: Wed 29-Jul-2015 13:43:00 - Current: Tue 18-Aug-2015 14:30:42
Number of CPUs: 3 - Memory(free/tot): 2,607,972kB / 3,868,776kB (67%)

Emulator/Config File          Cpu Mem  State                Stop script        B
                              ─────────────────────────────────────────────────
- as4100/pluto                  1 256M  FAILED               Customized         N
  Description: DEMO as4100 pluto
  Stopped: Tue 2015-08-18 14:30:41 CEST (Result: signal/KILL)

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): █
```

ℹ A "`kill -kill <pid>`" command has been sent to the virtual machine process.

Menu options

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

Service management - Update guests list

Table of Contents

Description

This option allows you to add virtual machines (guests), remove, enable/disable start at server boot or change the stop order.

Add guest

Available emulated hardware is displayed based on installed packages. You can also display available hardware you can use based on your license by entering "v".

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

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

ℹ A check is performed to verify the same network interface and same console ports are not already used.

Once added, you can start the guest directly.

Example: Red Hat Enterprise Linux 7.1 server with CHARON-AXP V4.7 installed

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


Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Thu 26-Nov-2015 15:11:30
Number of CPUs: 8 - Memory(free/tot): 5,966,384kB / 8,010,720kB (74%)

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

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): ▐
```

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

```
Enter your choice (enter to refresh): 1        1

Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Thu 26-Nov-2015 15:16:00
Number of CPUs: 8 - Memory(free/tot): 5,964,600kB / 8,010,720kB (74%)

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
                         2

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 conditionned
(v to view HW on license key, q to quit): as4100      1

Virtual Hardware selected: CHARON-AXP, Version 4.7 (Build 17101)

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      2


Enter source file (q to quit) : /opt/charon/cfg/as4100.cfg.template      3
Last modified on Sep 22 08:40

Enter target file (q to quit) : /charon/pluto.cfg      4

Please confirm (y/n) ? y      5
```

ⓘ 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) and use (**3**) and customize the newly created file (**4** & **5**):

```
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    3

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        4

Available editors
g - gedit (windows notepad like)
n - nano  (basic text editor)
v - vi    (advanced users standard text editor)
m - vim   (advanced users improved tex   5   tor)
Select the editor you want to use: m
```

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

Using the selected editor, "as4100/pluto" configuration file can be customized:

```
#----------------------------------------------------------------------------
# AS4100 / pluto - demo
#----------------------------------------------------------------------------
set session hw_model="AlphaServer_4100"
set session configuration_name="pluto"

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=10011   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="ens34"

set PKA container[0] = "/data/disks/pluto_tru64.vdisk"
set PKA container[300] = "/charon/V5.1Br2650_01.iso"        4
~
```

Notes:

- **1** & **2** above: The log rotation mechanism will be used in this example. Ensure corresponding folder exist before starting the virtual machine
- **3** above: The console is defined as a virtual serial line on port 10011 (default). Ensure the port number is unique
- **4** above: The iso file will be used to install Tru64 V5.1B r2650 and the virtual disk that will be used as the system disk has to be created using the "mkdskcmd" command. Ensure the virtual disk exists before starting the virtual machine.
  Example:

```
[root@rhel71 Desktop]# mkdir -p /data/disks

[root@rhel71 Desktop]# mkdskcmd -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
```

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

We can see below the rotating log file name (**1**) and a parameter is missing in the /etc/sysconfig/network-scripts/ifcfg-ens34. It does not prevent CHARON from starting but it's preferable to solve this (from a separate session) and re-edit the configuration file then leave the editor again (**2**):

We can now start the guest (**1**) and optionally have a continuous view of the log file (**2**):

```
 Checking virtual disks (.vdisk) files...
Done.

 Checking network interfaces...

Do you want to start this guest (y/n) or re-edit the file (e) ? y      1
Starting charon_logmon_pluto.service at 27-Nov-2015 15:49:41
Status: active
Restarting aksusbd log monitor service...
 Starting charon_pluto.service at 27-Nov-2015 15:49:45
Nov 27 15:24:18 charon_pluto.service failed.
Nov 27 15:49:45 Starting CHARON as4100/pluto...
Nov 27 15:49:45 [INFO ] aksusbd monitor service status is: active
Nov 27 15:49:45 [INFO ] Log monitor service status is: active
Nov 27 15:49:45 [INFO ] Verifying license presence
Nov 27 15:49:53 [INFO ] License found.
Nov 27 15:49:53 [INFO ] Checking network settings...
Nov 27 15:49:53 [INFO ] Switching off all offload parameters for interface ens34
Nov 27 15:49:53 [INFO ] Checking vdisk files if any...
Nov 27 15:49:53 [INFO ] Starting emulator: /opt/charon/bin/as4100 -d /charon/plu
to.cfg
Nov 27 15:49:53 Started CHARON as4100/pluto.

Do you want to view the log file (y/n) ? y      2
```

...

```
 Continuous view of /charon/logs/pluto.log
Press CTRL-C to stop (it is recommended to enlarge screen to 132 cols minimum)
_____
20151127:154957:INFO :0:00000336:hexane.cxx(2761):  The end user of this softwar
e 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
20151127:154957:INFO :0:0000009D:hexane.cxx(2838):  License info:
CHARON product code: "CHAXP-806xx-xI".
Licensed to: "Stromasys SA".
Date limited license, limited to: 12/May/2016 01:55:00.
Warning: setting the host system date back will permanently invalidate the licen
se key.

20151127:154957:INFO :0:00000097:hexane.cxx(2847):  OS Environment: Linux 3.10.0
-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29 EDT 2015 x86_64.
20151127:154957:INFO :0:00000098:hexane.cxx(2852):  Host CPU:       GenuineIntel
, Family 6, Model 60, Stepping 3, Intel(R) Core(TM) i7-4771 CPU @ 3.50GHz, 4 Cor
es per Chip, 1 Threads per Core, at ~3498 MHz, 8 cpu's available
20151127:154957:INFO :0:00000099:hexane.cxx(2857):  Host Memory:    7936Mb
20151127:154957:INFO :0:000003F2: srlio.cxx(2526):  OPA0: default log file size
limit is 4194304 bytes
20151127:154958:ERROR:2:00000352:rawhide_ro(2970):  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 and is being re-initialized accordingly. Check setting
s of console environment and/or system date and time.
20151127:154958:INFO :0:0000034B:scsi_disk.( 566):  PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20151127:154958:INFO :0:0000032C:hexane.cxx(2589):  "pluto" started.
20151127:154958:INFO :0:00000348:scsi_disk.( 554):  PKA_0 is being set OFFLINE
20151127:154958:INFO :0:0000034B:scsi_disk.( 566):  PKA_0 is being set ONLINE
```

ℹ The error message above 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 service status will then be displayed for information (this view depends on Linux distribution and version):

Press enter and enter 'q' multiple times until you reach the "Service management" menu: we can see below the service is active, meaning the emulator is running (⚠ this does not mean "booted") and will be automatically restarted on Linux server reboot. 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)

Remove guest

⚠️ Before removing a guest, you must ensure the it has been stopped. A check will automatically be performed before removal and you will be proposed to stop it. The way the guest is stopped is dependent on the "Stop script" existence and settings (see Service management - Create/Edit guest stop script)

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

Example: Red Hat Enterprise Linux 7.1 server with CHARON-AXP V4.7 installed, virtual machine as4100/pluto installed

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

```
Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:21:31
Number of CPUs: 8 - Memory(free/tot): 236,492kB / 8,010,720kB (2%)

Emulator/Config File          Cpu Mem  State                Stop script      B
                              ___ ___  _____                _____      _
 1- as4100/pluto               1 256M  ACTIVE               Not found        Y
    Description: CHARON as4100/pluto
    Started: Fri 2015-11-27 15:49:53 CET (PID=1998)

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 booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:21:33
Number of CPUs: 8 - Memory(free/tot): 235,664kB / 8,010,720kB (2%)

Emulator/Config File          Cpu Mem  State                Stop script      B
                              ___ ___  _____                _____      _
 1- as4100/pluto               1 256M  ACTIVE               Not found        Y
    Description: CHARON as4100/pluto
    Started: Fri 2015-11-27 15:49:53 CET (PID=1998)

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

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

```
No stop script found, emulator will be killed without proper shutdown !!!   ⬅
Do you want to stop the guest now (y/n) ? y           1
 Stopping charon_pluto.service at 27-Nov-2015   2:43
Nov 27 15:49:53 Started CHARON as4100/pluto.
Nov 27 16:22:43 Stopping CHARON as4100/pluto...
Nov 27 16:22:43 [INFO ] Stopping...
Nov 27 16:22:43 :no stop script,kill 1998[WARN ] No stop script defined, sending
 KILL signal to emulator, pid 1998
Nov 27 16:22:44 [INFO ] Waiting for process id 1998 termination
Nov 27 16:22:44 charon_pluto.service: main process exited, code=killed, status=9
/KILL
Nov 27 16:22:49 [INFO ] Process id 1998 has terminated
Nov 27 16:22:56 Stopped CHARON as4100/pluto.
Nov 27 16:22:56 Unit charon_pluto.service entered failed state.
Nov 27 16:22:56 charon_pluto.service failed.

 Service status
failed        2

Press enter
```

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.                        1
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 booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:25:55
Number of CPUs: 8 - Memory(free/tot): 1,777,908kB / 8,010,720kB (22%)

Emulator/Config File          Cpu Mem  State                 Stop script      B
_____   ___ ____ _____   _____ _
None.

Guests list is empty.

Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:25:55
Number of CPUs: 8 - Memory(free/tot): 1,776,856kB / 8,010,720kB (22%)

Emulator/Config File          Cpu Mem  State                 Stop script      B
_____   ___ ____ _____   _____ _
None.

Available options
_____

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

Enter your choice: q
```

We can now add another guest if needed (**2**).

ℹ You can add multiple CHARON guests on the Linux server. This is however limited by your 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

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

Example: Red Hat Enterprise Linux 7.1 server with CHARON-AXP V4.7 installed, virtual machine as4100/pluto installed

```
Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:29:55
Number of CPUs: 8 - Memory(free/tot): 221,940kB / 8,010,720kB (2%)

Emulator/Config File            Cpu Mem  State              Stop script       B

 1- as4100/pluto                  1 256M  ACTIVE             Not found         Y
    Description: CHARON as4100/pluto
    Started: Fri 2015-11-27 16:29:20 CET (PID=25480)

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 booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:30:42
Number of CPUs: 8 - Memory(free/tot): 216,852kB / 8,010,720kB (2%)

Emulator/Config File            Cpu Mem  State              Stop script       B

 1- as4100/pluto                  1 256M  ACTIVE             Not found         Y
    Description: CHARON as4100/pluto
    Started: Fri 2015-11-27 16:29:20 CET (PID=25480)


Please confirm as4100/pluto boot change to NO (y/n) : y
Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:30:46
Number of CPUs: 8 - Memory(free/tot): 216,740kB / 8,010,720kB (2%)

Emulator/Config File            Cpu Mem  State              Stop script       B

 1- as4100/pluto                  1 256M  ACTIVE             Not found         N
    Description: CHARON as4100/pluto
    Started: Fri 2015-11-27 16:29:20 CET (PID=25480)


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.

ℹ For more information, see manpages: # **man systemd.unit**

Service management - Start/stop guests

Table of Contents

Description

This option allows you to start and stop managed guests.

Examples

Example1 - Guest stop with no stop script defined

Context: Red Hat Enterprise Linux 7.1 server with CHARON-AXP V4.7 installed, as4100/pluto guest running

```
┌STROMASYS - Virtualization Technologies───────────────────V2.2e─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown) │
└────────────────────────────────────────────────────────────────┘


Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:41:00
Number of CPUs: 8 - Memory(free/tot): 217,240kB / 8,010,720kB (2%)

Emulator/Config File          Cpu Mem  State               Stop script       B
_____

- as4100/pluto                 1 256M  ACTIVE              Not found         N
   Description: CHARON as4100/pluto
   Started: Fri 2015-11-27 16:29:20 CET (PID=25480)

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): 2       ◄  1

Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:41:29
Number of CPUs: 8 - Memory(free/tot): 214,824kB / 8,010,720kB (2%)

Emulator/Config File          Cpu Mem  State               Stop script       B
_____

 1- as4100/pluto                1 256M  ACTIVE              Not found         N
    Description: CHARON as4100/pluto
    Started: Fri 2015-11-27 16:29:20 CET (PID=25480)


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 failed:

```
Stopping charon_pluto.service at 27-Nov-2015 16:46:50
Nov 27 16:29:20 Started CHARON as4100/pluto.
Nov 27 16:46:50 Stopping CHARON as4100/pluto...
Nov 27 16:46:50 [INFO ] Stopping...
Nov 27 16:46:50 [WARN ] No stop script defined, sending KILL signal to emulator,
 pid 25480
Nov 27 16:46:50 [INFO ] Waiting for process id 25480 termination
Nov 27 16:46:50 charon_pluto.service: main process exited, code=killed, status=9
/KILL
Nov 27 16:46:55 [INFO ] Process id 25480 has terminated
Nov 27 16:47:02 Stopped CHARON as4100/pluto.
Nov 27 16:47:02 Unit charon_pluto.service entered failed state.
Nov 27 16:47:02 charon_pluto.service failed.

 Service status
failed

Press enter
```

```
┌─STROMASYS - Virtualization Technologies──────────────────────V2.2e─┐
│  Service management (Start, Stop, Manage automatic boot & shutdown)│
└────────────────────────────────────────────────────────────────────┘


Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:48:17
Number of CPUs: 8 - Memory(free/tot): 1,722,204kB / 8,010,720kB (21%)


Emulator/Config File          Cpu Mem  State                Stop script        B
────────────────────────      ─── ───  ─────                ───────────        ─
- as4100/pluto                  1 256M  FAILED               Not found          N
   Description: CHARON as4100/pluto
   Stopped: Fri 2015-11-27 16:47:02 CET (signal/KILL)

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): ☐
```

Example2 - Guest start

Context: Red Hat Enterprise Linux 7.1 server with CHARON-AXP V4.7 installed, as4100/pluto guest stopped/failed (see above)

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


Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 16:48:17
Number of CPUs: 8 - Memory(free/tot): 1,722,204kB / 8,010,720kB (21%)

Emulator/Config File          Cpu Mem  State              Stop script     B

- as4100/pluto                  1 256M  FAILED             Not found       N
   Description: CHARON as4100/pluto
   Stopped: Fri 2015-11-27 16:47:02 CET (signal/KILL)

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): 2        1

Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 17:01:57
Number of CPUs: 8 - Memory(free/tot): 1,704,104kB / 8,010,720kB (21%)

Emulator/Config File          Cpu Mem  State              Stop script     B

 1- as4100/pluto                1 256M  FAILED             Not found       N
     Description: CHARON as4100/pluto
     Stopped: Fri 2015-11-27 16:47:02 CET (signal/KILL)

                                                              2

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

We can optionally have a continuous view of the log file:

```
 Starting charon_pluto.service at 27-Nov-2015 17:03:38
Nov 27 16:47:02 charon_pluto.service failed.
Nov 27 17:03:38 Starting CHARON as4100/pluto...
Nov 27 17:03:38 [INFO ] aksusbd monitor service status is: active
Nov 27 17:03:38 [INFO ] Log monitor service status is: active
Nov 27 17:03:38 [INFO ] Verifying license presence
Nov 27 17:03:43 [INFO ] License found.
Nov 27 17:03:43 [INFO ] Checking network settings...
Nov 27 17:03:43 [INFO ] Switching off all offload parameters for interface ens34
Nov 27 17:03:43 [INFO ] Checking vdisk files if any...
Nov 27 17:03:43 [INFO ] Starting emulator: /opt/charon/bin/as4100 -d /charon/plu
to.cfg
Nov 27 17:03:43 Started CHARON as4100/pluto.

Do you want to view the log file (y/n) ? y
```

...

```
 Continuous view of /charon/logs/pluto.log
Press CTRL-C to stop (it is recommended to enlarge screen to 132 cols minimum)
─────────────────────────────────────────────────────────────────────────
20151127:170347:INFO :0:00000336:hexane.cxx(2761):  The end user of this softwar
e 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
20151127:170347:INFO :0:0000009D:hexane.cxx(2838):  License info:
CHARON product code: "CHAXP-806xx-xI".
Licensed to: "Stromasys SA".
Date limited license, limited to: 12/May/2016 01:55:00.
Warning: setting the host system date back will permanently invalidate the licen
se key.

20151127:170347:INFO :0:00000097:hexane.cxx(2847):  OS Environment: Linux 3.10.0
-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29 EDT 2015 x86_64.
20151127:170347:INFO :0:00000098:hexane.cxx(2852):  Host CPU:       GenuineIntel
, Family 6, Model 60, Stepping 3, Intel(R) Core(TM) i7-4771 CPU @ 3.50GHz, 4 Cor
es per Chip, 1 Threads per Core, at ~3498 MHz, 8 cpu's available
20151127:170347:INFO :0:00000099:hexane.cxx(2857):  Host Memory:    7936Mb
20151127:170347:INFO :0:000003F2: srlio.cxx(2526):  OPA0: default log file size
limit is 4194304 bytes
20151127:170348:ERROR:2:00000352:rawhide_ro(2970):   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 and is being re-initialized accordingly. Check setting
s of console environment and/or system date and time.
20151127:170348:INFO :0:0000034B:scsi_disk.( 566):  PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20151127:170348:INFO :0:0000032C:hexane.cxx(2589):  "pluto" started.
20151127:170348:INFO :0:00000348:scsi_disk.( 554):  PKA_0 is being set OFFLINE
20151127:170348:INFO :0:0000034B:scsi_disk.( 566):  PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20151127:170348:INFO :0:00000348:scsi_cdrom(1233):  PKA_300 is being set OFFLINE
```

ⓘ The error message above 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 7.1 server with CHARON-AXP V4.7 installed, as4100/pluto guest running. Stop script created and customized based on the example provided with the "`expect`" utility (see "Service management - Create/Edit guest stop script") and the expect script example provided in the kit.

```
┌─STROMASYS - Virtualization Technologies──────────────V2.2e─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown)  │
└────────────────────────────────────────────────────────┘


Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 17:23:42
Number of CPUs: 8 - Memory(free/tot): 171,048kB / 8,010,720kB (2%)

Emulator/Config File          Cpu Mem  State            Stop script        B
─────────────────────         ─── ───  ─────            ───────────        ─
- as4100/pluto                  1 256M  ACTIVE           Customized         N
  Description: CHARON as4100/pluto
  Started: Fri 2015-11-27 17:03:43 CET (PID=12792)

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): 2    ◁ 1

Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 17:23:45
Number of CPUs: 8 - Memory(free/tot): 171,316kB / 8,010,720kB (2%)

Emulator/Config File          Cpu Mem  State            Stop script        B
─────────────────────         ─── ───  ─────            ───────────        ─
 1- as4100/pluto                1 256M  ACTIVE           Customized         N
    Description: CHARON as4100/pluto
    Started: Fri 2015-11-27 17:03:43 CET (PID=12792)


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

```
 Stopping charon_pluto.service at 27-Nov-2015 17:25:43
Nov 27 17:03:43 Started CHARON as4100/pluto.
Nov 27 17:25:43 Stopping CHARON as4100/pluto...
Nov 27 17:25:43 [INFO ] Stopping...
Nov 27 17:25:43 [INFO ] Executing stop script. Emulator pid is 12792.
Nov 27 17:25:47 %EXPECT-I-BEGIN, Starting / UNIX... [2015-11-27 17:25:43]
Nov 27 17:25:4  %EXPECT-I-SNDRET, Sending carriage return... [2015-11-27 17:25:4
3]
Nov 27 17:25:4  %EXPECT-I-FOUND, Found SRM prompt [2015-11-27 17:25:43]
Nov 27 17:25:4  %EXPECT-I-POWEROFF, Sending power off... [2015-11-27 17:25:43]
Nov 27 17:25:4  %EXPECT-S-POWEROFF, power off completed. [2015-11-27 17:25:45]
Nov 27 17:25:4  %EXPECT-I-END, Exited with code 0. [2015-11-27 17:25:47]
Nov 27 17:25:47 [INFO ] Success.
Nov 27 17:25:47 [INFO ] Process id 12792 has terminated
Nov 27 17:25:54 Stopped CHARON as4100/pluto.

 Service status
inactive

Press enter
```

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

```
┌STROMASYS - Virtualization Technologies─────────────────V2.2e─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown) │
└──────────────────────────────────────────────────────────────┘

Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 17:27:26
Number of CPUs: 8 - Memory(free/tot): 1,708,008kB / 8,010,720kB (21%)

Emulator/Config File          Cpu Mem  State                      Stop script      B

- as4100/pluto                  1 256M  INACTIVE   REQUESTED  Customized          N
  Description: CHARON as4100/pluto
  Stopped: Fri 2015-11-27 17:25:54 CET (success)          ✔

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): □
```

As we are running Red Hat Enterprise Linux 7.1 server, `systemd` allows us to check the status of the service.

Use option 5 of the menu can help seeing the result of the shutdown commands:

```
Enter your choice (enter to refresh): 5  ⬅

Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Fri 27-Nov-2015 17:28:16
Number of CPUs: 8 - Memory(free/tot): 1,704,692kB / 8,010,720kB (21%)

Emulator/Config File          Cpu Mem  State                      Stop script      B
───────────────────────────────────────────────────────────────────────────────
 1- as4100/pluto                1 256M  INACTIVE   REQUESTED  Customized          N
    Description: CHARON as4100/pluto
    Stopped: Fri 2015-11-27 17:25:54 CET (success)

 charon_pluto.service status
● charon_pluto.service - CHARON as4100/pluto
   Loaded: loaded (/etc/systemd/system/charon_pluto.service; disabled; vendor pr
eset: disabled)
   Active: inactive (dead) since Fri 2015-11-27 17:25:54 CET; 2min 22s ago
  Process: 26053 ExecStop=/opt/charon/utils/charon_gstart stop /charon/pluto.cfg
 (code=exited, status=0/SUCCESS)
  Process: 11977 ExecStart=/opt/charon/utils/charon_gstart start /charon/pluto.c
fg (code=exited, status=0/SUCCESS)
 Main PID: 12792 (code=exited, status=0/SUCCESS)

Nov 27 17:03:38 rhel71.stromasys.net charon_gstart[11977]: [INFO ] Log monitor s
ervice status is: active
Nov 27 17:03:38 rhel71.stromasys.net charon_gstart[11977]: [INFO ] Verifying lic
ense presence
Nov 27 17:03:43 rhel71.stromasys.net charon_gstart[11977]: [INFO ] License found
.
Nov 27 17:03:43 rhel71.stromasys.net charon_gstart[11977]: [INFO ] Checking netw
ork settings...
Nov 27 17:03:43 rhel71.stromasys.net charon_gstart[11977]: [INFO ] Switching off
 all offload parameters for interface ens34
Nov 27 17:03:43 rhel71.stromasys.net charon_gstart[11977]: [INFO ] Checking vdis
k files if any...
Nov 27 17:03:43 rhel71.stromasys.net charon_gstart[11977]: [INFO ] Starting emul
```

```
ator: /opt/charon/bin/as4100 -d /charon/pluto.cfg
Nov 27 17:03:43 rhel71.stromasys.net systemd[1]: Started CHARON as4100/pluto.
Nov 27 17:25:43 rhel71.stromasys.net systemd[1]: Stopping CHARON as4100/pluto...
Nov 27 17:25:43 rhel71.stromasys.net charon_gstart[26053]: [INFO ] Stopping...
Nov 27 17:25:43 rhel71.stromasys.net charon_gstart[26053]: [INFO ] Executing sto
p script. Emulator pid is 12792.
Nov 27 17:25:47 rhel71.stromasys.net charon_gstart[26053]: %EXPECT-I-BEGIN, Star
ting / UNIX... [2015-11-27 17:25:43]
Nov 27 17:25:47 rhel71.stromasys.net charon_gstart[26053]: %EXPECT-I-SNDRET, Sen
ding carriage return... [2015-11-27 17:25:43]
Nov 27 17:25:47 rhel71.stromasys.net charon_gstart[26053]: %EXPECT-I-FOUND, Foun
d SRM prompt [2015-11-27 17:25:43]✔
Nov 27 17:25:47 rhel71.stromasys.net charon_gstart[26053]: %EXPECT-I-POWEROFF, S
ending power off... [2015-11-27 17:25:43]
Nov 27 17:25:47 rhel71.stromasys.net charon_gstart[26053]: %EXPECT-S-POWEROFF, p
ower off completed. [2015-11-27 17:25:45]✔
Nov 27 17:25:47 rhel71.stromasys.net charon_gstart[26053]: %EXPECT-I-END, Exited
 with code 0. [2015-11-27 17:25:47]
Nov 27 17:25:47 rhel71.stromasys.net charon_gstart[26053]: [INFO ] Success.
Nov 27 17:25:47 rhel71.stromasys.net charon_gstart[26053]: [INFO ] Process id 12
792 has terminated
Nov 27 17:25:54 rhel71.stromasys.net systemd[1]: Stopped CHARON as4100/pluto.

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

ℹ️ 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), we would have to look into a log file defined in the stop script / output redirection. For more information, see "Service management - Create/Edit guest stop script".

Service management - View guest log file

Table of Contents

Description

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

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

ℹ Log files are automatically archived, whatever the log_method parameter is set in the configuration file, at guest start 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.

ℹ 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─────────────────V2.2e─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown)
│
│
Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Mon 30-Nov-2015 14:07:30
Number of CPUs: 8 - Memory(free/tot): 1,830,644kB / 8,010,720kB (22%)


Emulator/Config File          Cpu Mem  State                    Stop script       B
─────────────────────────────────────────────────────────────────────────────────
- as4100/pluto                  1 256M  INACTIVE   REQUESTED  Customized          N
  Description: CHARON as4100/pluto
  Stopped: Fri 2015-11-27 17:25:54 CET (success)

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): 3      ⬅

Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Mon 30-Nov-2015 14:07:36
Number of CPUs: 8 - Memory(free/tot): 1,829,736kB / 8,010,720kB (22%)

Emulator/Config File          Cpu Mem  State                    Stop script       B
─────────────────────────────────────────────────────────────────────────────────
 1- as4100/pluto                1 256M  INACTIVE   REQUESTED  Customized          N
    Description: CHARON as4100/pluto
    Stopped: Fri 2015-11-27 17:25:54 CET (success)


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 tool displays the latest 12 lines of the current log file: in this case the guest was in stopped state.

(**2**) The log file became inaccessible. Reason if we started the guest: the current log file was then archived and a new one is 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)

20151127:171005:INFO :0:000003DC:ll_sentine(1913):  ... found license key 367006
676.
20151127:171503:INFO :0:000003E6:ll_sentine(1820):  Performing regular license c
heck ...
20151127:171505:INFO :0:000003DC:ll_sentine(1913):  ... found license key 367006
676.
20151127:172002:INFO :0:000003E6:ll_sentine(1820):  Performing regular license c
heck ...
20151127:172005:INFO :0:000003DC:ll_sentine(1913):  ... found license key 367006
676.
20151127:172503:INFO :0:000003E6:ll_sentine(1820):  Performing regular license c
heck ...
20151127:172505:INFO :0:000003DC:ll_sentine(1913):  ... found license key 367006
676.
20151127:172543:INFO :0:SERVICE STOP REQUEST
20151127:172545:INFO :0:000003D7:hexane.cxx(4928):  All virtual CPUs of "pluto"
have been stopped by now.
20151127:172545:INFO :0:0000032D:hexane.cxx(2633):  "AlphaServer 4100" stop requ
est received.
20151127:172545:INFO :0:0000014C:lnxpackpor( 416):  EWA0: S    ng network inter
face ... please wait.
20151127:172545:INFO :0:0000032E:hexane.cxx(2651):   Stopped.
tail: '/charon/logs/pluto.log' has been replaced;  following end of new file
20151130:141351:INFO :0:000003A5:hexane.cxx(5312):  session is loading built-in
configuration "AlphaServer_4100"...
20151130:141351:INFO :0:000003A6:hexane.cxx(5336):  session has     hed loading
 built-in configuration "AlphaServer_4100".
20151130:141351:INFO :0:000003AA:hexane.cxx(5425):  session is loading configura
tion file "/charon/pluto.cfg"...
20151130:141351:INFO :0:000003AB:hexane.cxx(5455):  session has finished loading
 configuration file "/charon/pluto.cfg".
20151130:141351:INFO :0:000003F2:sesmgr.cxx(1471):  session: default log file si
ze limit is 4194304 bytes
20151130:141351:INFO :0:0000032B:hexane.cxx(2547):   Start request received.
20151130:141352:INFO :0:000003AC:hexane.cxx(1287):  session's process affinity i
s 00000000000000FF, system affinity is 00000000000000FF.
20151130:141352:INFO :0:000003D1:hexane.cxx(1541):  session's I/O domain affinit
y is 0000000000000003, CPU domain affinity is 00000000000000FC
```

Example2 - Log edition

Select editor view (**1**) then the log file (**2**) and finally the editor (**3**):

```
Emulator/Config File          Cpu Mem  State              Stop script      B
 _____           ___ ___  _____              _____      _
 1- as4100/pluto               1 256M  ACTIVE             Customized       N
    Description: CHARON as4100/pluto
    Started: Mon 2015-11-30 14:13:51 CET (PID=12386)


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
tail: cannot open '20' for reading: No such file or directory
Log files found (most recent ones):

No  From                      To                         Size         Lines
    _____     _____      ____         _____

 1  Fri 27-Nov-2015 14:30:40  Fri 27-Nov-2015 14:54:38   4,587          49
 2  Fri 27-Nov-2015 14:55:23  Fri 27-Nov-2015 14:57:56   3,891          41
 3  Fri 27-Nov-2015 14:58:29  Fri 27-Nov-2015 15:24:06   4,761          51
 4  Fri 27-Nov-2015 15:49:53  Fri 27-Nov-2015 16:22:43   5,109          55
 5  Fri 27-Nov-2015 16:29:20  Fri 27-Nov-2015 16:46:50   4,587          49
 6  Fri 27-Nov-2015 17:03:43  Fri 27-Nov-2015 17:25:45   5,124          55
 7  Mon 30-Nov-2015 14:13:51  Mon 30-Nov-2015 14:30:05   4,248          47
    Lock status: <Guest running> <Monitored>

Select the log file you want to view (q to quit, r to refresh): 7     2

File selected: /charon/logs/pluto-2015-11-30-14-13-51-000000000.log



Available editors
g - gedit (windows notepad like)
n - nano  (basic text editor)
v - vi    (advanced users standard text editor)
m - vim   (advanced users improved text editor)
q - quit                                          3
Select the editor you want to use: m
```

Notes:

- '**From**' date is either based on first event line including a date found in the log file or on file creation time
- '**To**' date is based on time the file was archived (renamed before guest start)

Service management - View guest manager log file

Description

This option is mainly used for debugging, it displays the log file of the service manager (start & stop sequences initiated, checks, etc...)

Example

```
Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Mon 30-Nov-2015 14:45:32
Number of CPUs: 8 - Memory(free/tot): 279,624kB / 8,010,720kB (3%)

Emulator/Config File          Cpu Mem  State              Stop script      B

- as4100/pluto                 1 256M  ACTIVE             Customized       N
  Description: CHARON as4100/pluto
  Started: Mon 2015-11-30 14:13:51 CET (PID=12386)

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): 4       1

tail: cannot open '20' for reading: No such file or directory
Log files found (most recent ones):

No  From                    To                      Size        Lines
__  _____     _____     _____     _____
 1  Thu 26-Nov-2015 16:42:19  Fri 27-Nov-2015 17:25:47     5,270          78
 2  Mon 30-Nov-2015 14:13:51  <unknown>                      496           6

Select the log file you want to view (q to quit, r to refresh): 2    2

File selected: /opt/charon/log/charon_gstart.log


Available editors
g - gedit (windows notepad like)
n - nano  (basic text editor)
v - vi    (advanced users standard text editor)
m - vim   (advanced users improved text editor)
q - quit                                       3
Select the editor you want to use: m
```

Service management - Install, update or manage service

Table of Contents

Description

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

Red Hat 6	Option name: **Install or update service**
	Allows you to install (after fresh install) or update guests management service (kit upgrade).
	ℹ️ Service update does not require guests shutdown & restart
Red Hat 7.x and Fedora	Option name: **Manage 'systemd' services**
	Allows you to view the service status and update the service configuration file (to add dependencies, description, etc...)
	⚠️ Be extremely cautious when updating the file. Preferably limit updates to `Description=`, `After=`, `Before=`, `Wants=` parameters

Examples

Red Hat Enterprise Linux 6 server

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

In this case, the current version 2.2c will be replaced by the 2.2d:

```
Enter your choice (enter to refresh): 5        1

Current: script version in init.d is 2.2c
New:     script version in /utils is 2.2d
Do you want to copy from /utils to init.d (y/n) ? y      2

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                      V2.2e
Service management (Start, Stop, Manage automatic boot & shutdown)


Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Mon 30-Nov-2015 14:50:23
Number of CPUs: 8 - Memory(free/tot): 278,944kB / 8,010,720kB (3%)

Emulator/Config File          Cpu Mem  State                 Stop script       B
                              ___ ___  _____       _____       _
- as4100/pluto                  1 256M  ACTIVE               Customized        N
  Description: CHARON as4100/pluto
  Started: Mon 2015-11-30 14:13:51 CET (PID=12386)

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): 5
```

We can see below the service is active:

```
Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Mon 30-Nov-2015 14:51:23
Number of CPUs: 8 - Memory(free/tot): 283,360kB / 8,010,720kB (3%)

Emulator/Config File          Cpu Mem  State                  Stop script      B
_____  ___ ___  _____ _____  _

 1- as4100/pluto                1 256M  ACTIVE                 Customized       N
    Description: CHARON as4100/pluto
    Started: Mon 2015-11-30 14:13:51 CET (PID=12386)

 charon_pluto.service status
● charon_pluto.service - CHARON as4100/pluto
   Loaded: loaded (/etc/systemd/system/charon_pluto.service; disabled; vendor pr
eset: disabled)
   Active: active (running) since Mon 2015-11-30 14:13:51 CET; 37min ago
  Process: 11591 ExecStart=/opt/charon/utils/charon_gstart start /charon/pluto.c
fg (code=exited, status=0/SUCCESS)
 Main PID: 12386 (pluto)
   CGroup: /system.slice/charon_pluto.service
           └─12386 /opt/charon/bin/as4100 -d /charon/pluto.cfg

Nov 30 14:13:46 rhel71.stromasys.net systemd[1]: Starting CHARON as4100/pluto...
Nov 30 14:13:46 rhel71.stromasys.net charon_gstart[11591]: [INFO ] aksusbd monit
or service status is: active
Nov 30 14:13:46 rhel71.stromasys.net charon_gstart[11591]: [INFO ] Log monitor s
ervice status is: active
Nov 30 14:13:46 rhel71.stromasys.net charon_gstart[11591]: [INFO ] Verifying lic
ense presence
Nov 30 14:13:51 rhel71.stromasys.net charon_gstart[11591]: [INFO ] License found
.
Nov 30 14:13:51 rhel71.stromasys.net charon_gstart[11591]: [INFO ] Checking netw
ork settings...
Nov 30 14:13:51 rhel71.stromasys.net charon_gstart[11591]: [INFO ] Switching off
 all offload parameters for interface ens34
Nov 30 14:13:51 rhel71.stromasys.net charon_gstart[11591]: [INFO ] Checking vdis
k files if any...
Nov 30 14:13:51 rhel71.stromasys.net charon_gstart[11591]: [INFO ] Starting emul
ator: /opt/charon/bin/as4100 -d /charon/pluto.cfg
Nov 30 14:13:51 rhel71.stromasys.net 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─────────────────────────V2.2e─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown)    │
│                                                                       │
│                                                                       │
│Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Mon 30-Nov-2015 14:56:07│
│Number of CPUs: 8 - Memory(free/tot): 281,112kB / 8,010,720kB (3%)     │
│                                                                       │
│Emulator/Config File          Cpu Mem  State             Stop script      B│
│_____ ___ ___  _____   _____     _│
│                                                                       │
│- as4100/pluto                1 256M  ACTIVE             Customized      N│
│  Description  CHARON as4100/pluto DEMO                                 │
│  Started: Mon 2015-11-30 14:13:51 CET (PID=12386)                     │
│                                                                       │
│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):                                  │
└───────────────────────────────────────────────────────────────────────┘
```

Service management - Create/Edit guest stop script

Table of Contents

Description

This option will allow you 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.

If the script does not exist, it will generated automatically based on existing guests and will by default do nothing. Note that guests added after script creation will have to be inserted manually.

You will have either to add your own shutdown scripts or to get examples provided in the "`charon_gstart.stop.example`" script located in the "`/opt/charon/utils`" folder.

Examples are provided for clean shutdown using "`ssh`" or "`expect`" thanks to the "`guest_shutdown.exp`" script given as an example. See Tips and Tricks - Shutdown guests with Expect tool for more.

"`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 and execute the shutdown commands. The "`guest_shutdown.exp`" script can perform operations to log off 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 will 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.

Explanation on the example file

Example with SSH

Example below is for Tru64. The only difference with OpenVMS is the username and shutdown command to be passed

You will have to create an `ssh` trust between the CHARON Linux server and the Tru64 guest in order to use this option.

- Update the configuration file name
- Replace the existing hostname "pluto" with your Tru64 guest hostname

```
#============================================================================
# Example with SSH, Tru64 guest
#============================================================================
/opt/charon/cfg/pluto.cfg)
1   ssh -o ConnectTimeout=2 pluto date >/dev/null 2>&1
    if test $? = 0
    then
2     ssh pluto "/sbin/shutdown -h now" >>/opt/charon/log/console.`basename $1|sed "s=\.cfg==g"`.log 2>&1
      sleep 5     3
      while test 1
      do
4       ping -c2 pluto >/dev/null 2>&1
        #------ break if the system is no more responding
        test $? = 0 || break
        sleep 5
      done
      sleep 5
    fi

    #------ Killing the emulator
    PID=`ps -ef|grep "$2 -d $1"|grep -v grep|awk '{print $2}'`
5   test -n "${PID}" && kill -9 ${PID}

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

Principle

1. Check the guest can be accessed via "`ssh`" (adapt the ConnectTimeout to your needs)
2. Issue the `shutdown` command
3. Wait a few seconds
4. 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
5. Kill the emulator process (the shutdown commands does not power off nor stop the emulator process)
6. Report the stop information within the guest log file

Example with Expect tool, Tru64 guest

You will have here to replace the user **(1),** password **(2)** and shell prompt **(3)** with the ones corresponding to your guest (shell prompt is used to determine if a user is logged on the console)

```
#============================================================================
# Example with Expect tool, Tru64 guest
#============================================================================
/opt/charon/cfg/tru64example.cfg)
    #----------------------------------------------------------------------
    # Killing active connection to console if any
    #----------------------------------------------------------------------
1   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}

    #--- Executing the expect script:
    #---- * no need to stop the emulator because  1 po  2 of  3  done cleanly with expect
    #
2   /opt/charon/utils/guest_shutdown.exp ${PORT} root charon "# " UNIX >>/opt/charon/log/console.`basename $1|sed "s=\.cfg==g"`.log 2>&1
    ;;
```

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. Execute the "`expect`" script and report all output to `/opt/charon/console.<guest name>.log`. No need to kill the emulator process here as the "`power off`" command is executed.

Example with Expect tool, Tru64 guest, variant for systemd

This example is quite the same as the one above except the "expect" script messages will be made available to the service status.

You will have here to replace the user **(1)**, password **(2)** and shell prompt **(3)** with the ones corresponding to your guest (shell prompt is used to determine if a user is logged on the console)

```
#=========================================================================
# Example with Expect tool, Tru64 guest, variant for systemd
#=========================================================================
/opt/charon/cfg/tru64systemd.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}

  #--- Executing the expect script:
  #---- * no need to stop the emulator because the power off is done cleanly with expect
  #
  EXPOUT=/opt/charon/log/`basename $1|sed "s=\.cfg==g"`.expect.log
```

1 ```
/opt/charon/utils/guest_shutdown.exp ${PORT} root charon "# " UNIX >${EXPOUT} 2>&1
RET=$?
```
2 ```
cat ${EXPOUT} >>/opt/charon/log/console.`basename $1|sed "s=\.cfg==g"`.log
#---- * displaying EXPECT script messages to default output so that
#         results will be available using the "systemctl -l status charon_..."
#         command
```
3 ```
strings ${EXPOUT} | grep "%EXPECT-"
exit ${RET}
;;
```

**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. Execute the "expect" script **(1)** and report all output to `/opt/charon/<guest name>.expect.log`. No need to kill the emulator process here as the "power off" command is executed.
3. Append the output of this file to **(2)** the `/opt/charon/console.<guest name>.log` file for history
4. Search for the "expect" script messages and displays them in `stdout` **(3)**, they will be logged in the service status and will be displayed when stopping the service interactively.

**Example**:

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


 Stopping charon_pluto.service at 30-Nov-2015 15:07:21
Nov 30 14:13:51 Started CHARON as4100/pluto.
Nov 30 15:07:21 Stopping CHARON as4100/pluto DEMO...
Nov 30 15:07:21 [INFO ] Stopping...
Nov 30 15:07:21 [INFO ] Executing stop script. Emulator pid is 12386.
Nov 30 15:07:25 %EXPECT-I-BEGIN, Starting / UNIX... [2015-11-30 15:07:21]
Nov 30 15:07:25 %EXPECT-I-SNDRET, Sending carriage return... [2015-11-30 15:07:2
1]
Nov 30 15:07:25 %EXPECT-I-FOUND, Found SRM prompt [2015-11-30 15:07:21]
Nov 30 15:07:25 %EXPECT-I-POWEROFF, Sending power off... [2015-11-30 15:07:21]
Nov 30 15:07:25 %EXPECT-S-POWEROFF, power off completed. [2015-11-30 15:07:23]
Nov 30 15:07:25 %EXPECT-I-END, Exited with code 0. [2015-11-30 15:07:25]
Nov 30 15:07:25 [INFO ] Success.
Nov 30 15:07:25 [INFO ] Process id 12386 has terminated
Nov 30 15:07:35 Stopped CHARON as4100/pluto DEMO.

 Service status
inactive

Press enter
```

Example with Expect tool, AXP VMS guest

You will have here to replace the user **(1),** password **(2)** and shell prompt **(3)** with the ones corresponding to your guest (shell prompt is used to determine if a user is logged on the console)

```
#==============================================================================
# Example with Expect tool, AXP VMS guest
#==============================================================================
/opt/charon/cfg/kerberos.cfg)
    #---------------------------------------------------------------------
    # Killing active connection to console if any
    #---------------------------------------------------------------------
    CHK=`grep -v ^# $1 | grep -w load | grep -w virtual_serial_line | grep OPA`
 1  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}

    #--- Executing the expect script:
    #---- * no need to stop the emulator because the power off is done cleanly with expect
    #
    # *** Update username/password below ***
 2  /opt/charon/utils/guest_shutdown.exp ${PORT} system charon0 "> "(VMS)>>/opt/charon/log/console.`basename $1|sed "s=\.cfg==g"`.log 2>&1
    ;;
```

(markers 1, 2, 3 over "system charon0 ", "> ", "VMS")

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. Execute the "`expect`" script and report all output to `/opt/charon/console.<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

You will have here to replace the user **(1),** password **(2)** and shell prompt **(3)** with the ones corresponding to your guest (shell prompt is used to determine if a user is logged on the console)

ℹ 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 this operation fails, it will exit with return code 9 meaning the emulator process will have to be killed.

```
#==============================================================================
# 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`
 1  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}

    #--- Executing the expect script:
    #
    # *** Update username/password below ***
 2  /opt/charon/utils/guest_shutdown.exp ${PORT} system charon0 "> "(VMS)>>/opt/charon/log/console.`basename $1|sed "s=\.cfg==g"`.log 2>&1
    if test $? = 9
    then
 3    #------ 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}
    fi

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

(markers 1, 2, 3 over "system charon0 ", "> ", "VMS")

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. Execute the "`expect`" script and report all output to `/opt/charon/console.<guest name>.log`. VAx systems have no "`power off`" command so the F6 key will be sent.
3. If the "`expect`" script returns the error code 9, this means the F6 key is not defined in the configuration and then the emulator process must be killed
4. Report the stop information within the guest log file

<div style="background:yellow">**Optional guest display status script**</div>

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. 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, for example a `ping`, an `ssh` command displaying `uptime` (Tru64) or `bo ottime` (OpenVMS).

Display output example:

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


Server booted on: Mon 27-Jul-2015 18:34:00 - Current: Tue 18-Aug-2015 16:03:28
Number of CPUs: 8 - Memory(free/tot): 1,512,348kB / 8,011,116kB (18%)

Emulator/Config File          Cpu Mem  State                    Stop script    B

- vx4k106/mvax4106            1 128M  INACTIVE    REQUESTED   Customized      N
  Description: Microvax 4000-106 DEMO
  Stopped: Mon 2015-08-17 14:55:16 CEST (Result: success)
- ds20/myds20                 2 512M  ACTIVE                  Customized      Y
  Description: Alphaserver DS20 DEMO
  Started: Fri 2015-08-14 15:16:04 CEST (PID=26514)
  Guest OS response: 16:02 up 4 days myds20 V5.1

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): █
```

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)

```
# touch /opt/charon/utils/charon_gstart.chkrun

# chmod 744 /opt/charon/utils/charon_gstart.chkrun

# vim /opt/charon/utils/charon_gstart.chkrun
```

```sh
#!/bin/sh
#
# Parameter $1: contains full path to cfg file
#
case "$1"
in
   /charon/myds20.cfg)
      ssh -o ConnectTimeout=2 myds20 "uptime|cut -f1 -d',';uname -nr" 2>/dev/null
      RETVAL=$?
      ;;
   *)
      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@vm "write sys\$output \"Booted ''f\$getsyi(\"boottime\")'\" 2>/dev/null
    RETVAL=$?
    ;;
  *)
    echo "Invalid parameter '$1'"
    RETVAL=1
    ;;
esac
echo "==RETVAL=${RETVAL}=="
exit ${RETVAL}
```

Service management - Connect to guest console

Description

This option is also available from the main menu.

Please follow this link: **Connect to guest console**

Service management - Edit configuration files

Description

This option is also available from the main menu.

Please follow this link: **Edit configuration files**

Service management - Manage monitored guests logs

Description

This option is also available from the main menu.

Please follow this link: **Manage monitored guests logs**

Connect to guest console

Description

This option will allow you to connect to the guests consoles.

<u>Notes</u>:

- ⚠️ "`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 +]** . 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 ²
#
```

  ℹ️ 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 anothe 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
- ℹ️ The console port number is displayed per guest. If a port number is used more than once, an alert will be displayed

Autoconnect feature

This feature has been implemented to prevent from buffer issues with old CHARON-AXP versions where a connection to the console had to be active for the guest not to be blocked (hang). This could prevent from booting the system.

Advantage of this feature is it will record console output for CHARON products versions that have not the console log feature implemented and activated: every 1 minute, a crontab job (`/opt/charon/utils/charon_console_autoconnect`) will check if a connection to the console is active or not. If not, a `telnet` session will be engaged in the background.

This feature can also be disabled from this menu and is automatically disabled for the guest that have console log recording with the '`set OPA0 log=`' option.

Example

Connect to guest console main screen

```
┌STROMASYS - Virtualization Technologies──────────────────────────V1.14──┐
│ Connect to guest console                                               │
└────────────────────────────────────────────────────────────────────────
Server booted on: Mon 27-Jul-2015 18:34:00 - Current: Thu 30-Jul-2015 12:02:34
Number of CPUs: 8 - Memory(free/tot): 3,170,720kB / 8,011,116kB (39%)

Emulator/Config File          Cpu Mem  State                Stop script    B
                              ────────────────────────────────────────────────
 1- vx4k106/mvax4106            1 128M  ACTIVE               Customized     N
    Description: Microvax 4000-106 DEMO
    Started: Thu 2015-07-30 11:59:27 CEST (PID=23345)
    Port: 10003 -> CONSOLE LOCKED BY AUTOCONNECT UTILITY
 2- ds20/myds20                 2 512M  ACTIVE               Customized     Y
    Description: Alphaserver DS20 DEMO
    Started: Thu 2015-07-30 11:59:02 CEST (PID=19391)
    Guest running / 12:02 up 2 mins myds20 V5.1
    Port: 10004
    Console log/configuration file: /consolelogs

 a- Enable/disable console autoconnect feature (state is enabled)
 v- View console log files

Choice ('q' to quit): █
```

We can see above:

- the console is already locked by the autoconnect utility for the "mvax4106" virtual machine because:
    - the autoconnect feature is enabled and
    - the configuration file does not contain any specification to the console log (no "`set OPA0 log = ...`" line)
- the console is free for "myds20" virtual machine because:
    - the configuration file contains a specification to the console log: "`set OPA0 log = /consolelogs`" (which corresponds to a folder)
    - no one is connected to the console

<div style="background-color: gold; padding: 10px;">

Connection to a virtual machine without console log defined in the configuration file

</div>

We will now connect to the "mvax4106" virtual machine console and kill the active session:

```
Choice ('q' to quit): 1

Console settings correctly set to:
load virtual_serial_line OPA0 port=10003

A local connection is already active on port 10003.

Do you want to abort current connection (y/n) ? y
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
Script started, file is /opt/charon/log/console.mvax4106.log
Trying ::1...
telnet: connect to address ::1: Connection refused
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'

>>>
```

ℹ️ We can see above the F6 key is enabled in the configuration file and the telnet escape character has not been customized (set to default **CTRL +]**). We see also the session is recorded to the "`/opt/charon/log/console.mvax4106.log`" file (append mode).

Connection to a virtual machine with console log defined in the configuration file

Connection to the "myds20" virtual machine console:

```
Choice ('q' to quit): 2  ⬅

Console settings correctly set to:
load virtual_serial_line OPA0 port=10004

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  ✔
Script started, file is /tmp/console.myds20.tmp.log
Trying ::1...
telnet: connect to address ::1: Connection refused
Trying 127.0.0.1...
Connected to localhost.
Escape character is ('^]').


 ┌─────────────────────┐
 │ STROMASYS LAB DEMO  │
 └─────────────────────┘



Compaq Tru64 UNIX V5.1B (Rev. 2650) (myds20) console

login:
```

ℹ We can see above, compared to the "mvax4106" console connection performed previously, the session is recorded to the "`/tmp/console/myds20.tmp.log`" file (overwrite mode), valid then only for this session because it will also be recorded by the emulator itself within the "`/console logs`" folder.

Edit configuration files

Description

This option will allow you to edit the 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 NM_CONTROLLED parameter is not set to "NO" in the Interface Configuration File (`ifcfg-...`), an error message is displayed
    - If ONBOOT parameter is not set to "NO" in the Interface Configuration File (`ifcfg-...`), an error message is 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────────────────V1.4a─┐
│ Edit configuration files                                    │
└─────────────────────────────────────────────────────────────┘
Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Mon 30-Nov-2015 15:23:49
Number of CPUs: 8 - Memory(free/tot): 279,048kB / 8,010,720kB (3%)

Emulator/Config File          Cpu Mem  State              Stop script       B

 1- as4100/pluto                1 256M  ACTIVE             Customized        N
      Description: CHARON as4100/pluto DEMO
      Started: Mon 2015-11-30 15:15:05 CET (PID=16028)


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

Available editors
g - gedit (windows notepad like)
n - nano  (basic text editor)
v - vi    (advanced users standard text editor)
m - vim   (advanced users improved text editor)
Select the editor you want to use: m
```

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

```
┌─STROMASYS - Virtualization Technologies────────────────V1.4a─┐
│  Edit configuration files                                    │
│                                                              │
│                                                              │
│ Log file is set to: /charon/logsINEX                         │
│                                                              │
│  WARNING                                                     │
│ The log file name or its mode has changed !                  │
│ Please update the log monitoring service definition file:    │
│ Use 'Manage monitored guests logs' option and 'Update log files list' │
│ then "Manage 'systemd' services" option. Finally restart the service. │
│ Expected log file in "ExecStart=" and "ExecStop=" lines is:  │
│ /charon/logsINEX                                             │
│                                                              │
│                                                              │
│  Checking virtual disks (.vdisk) files...                    │
│ - /data/disks/pluto_inex.vdisk: file does not exist or is empty │
│ Done.                                                        │
│                                                              │
│  Checking network interfaces...                              │
│ Network interface ensINEX for guest 'pluto': configuration issue found in ifcfg- │
│ ensINEX file:                                                │
│ ERROR: Interface ensINEX does not exist                      │
│                                                              │
│ Notes: if you update the ifcfg file, the network service must be restarted │
│        and the guest(s) must be powered off/on (a Linux server reboot is │
│        recommended)                                          │
│                                                              │
│                                                              │
│ Press enter                                                  │
└──────────────────────────────────────────────────────────────┘
```

When no issue is found, the following output is displayed:

```
┌─STROMASYS - Virtualization Technologies────────────────V1.4a─┐
│  Edit configuration files                                    │
│                                                              │
│                                                              │
│ Log file is set to: /charon/logs/pluto.log (rotating log file) ✔ │
│                                                              │
│  Checking virtual disks (.vdisk) files...                    │
│ Done. ✔                                                      │
│                                                              │
│  Checking network interfaces... ✔                            │
│                                                              │
│ Press enter                                                  │
└──────────────────────────────────────────────────────────────┘
```

Manage monitored guests logs

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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 6:

```
┌STROMASYS - Virtualization Technologies───────────────────V2.0a─┐
  Manage monitored guests logs


Service status
───────────────────────────────────────────────────────────────
aksusbd 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          5 - Install or update service
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): ▮
```

Example2 - Red Hat 7:

```
STROMASYS - Virtualization Technologies                    V2.2a
  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 Nov 30 15:15
  Rotating log file / pluto-2015-11-30-15-15-05-000000000.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 monitorted 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
- ℹ️ 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

This option offers the possibility to send configuration and log file from the select guest 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: first send it to you then forward it to our support team

✅ 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

Example

```
STROMASYS - Virtualization Technologies─────────────────V1.4c─
Send configuration and log files (3 latest ones) via mail


Server booted on: Thu 26-Nov-2015 14:48:00 - Current: Mon 30-Nov-2015 15:44:47
Number of CPUs: 8 - Memory(free/tot): 278,520kB / 8,010,720kB (3%)

Emulator/Config File          Cpu Mem  State               Stop script       B

 1- as4100/pluto                1 256M  ACTIVE              Customized        N
    Description: CHARON as4100/pluto DEMO
    Started: Mon 2015-11-30 15:15:05 CET (PID=16028)


Enter the email recipient (q to quit) [bruno.miretti@stromasys.com]:  [Enter]

Sending configuration and log files to bruno.miretti@stromasys.com...
Done.

Press enter
```

Below is an example of email received:

De root@rhel71.stromasys.net

Sujet **[CHARON] Configuration and log files for pluto**

Pour Bruno Miretti

Please find attached configuration and log files for pluto

Configuration file

```
#-------------------------------------------------------------------------
# AS4100 / pluto - demo
#-------------------------------------------------------------------------
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=10011
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="ens34"

set PKA container[0] = "/data/disks/pluto_tru64.vdisk"
set PKA container[300] = "/charon/V5.1Br2650_O1.iso"
```

Log files

Current log file: /charon/logs/pluto-2015-11-30-15-15-05-000000000.log
```
20151130:151505:INFO :0:000003A5:hexane.cxx(5312): session is loading built-in configuration "AlphaServer_4100"...
20151130:151505:INFO :0:000003A6:hexane.cxx(5336): session has finished loading built-in configuration "AlphaServer_4100".
20151130:151505:INFO :0:000003AA:hexane.cxx(5425): session is loading configuration file "/charon/pluto.cfg"...
20151130:151505:INFO :0:000003AB:hexane.cxx(5455): session has finished loading configuration file "/charon/pluto.cfg".
20151130:151505:INFO :0:000003E2:cocmon.cxx(1471): session: default log file size limit is 4194304 bytes
```

▲ 1 pièce jointe : pluto_cfglogs.zip 5,3 Ko

  pluto_cfglogs.zip 5,3 Ko

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

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Description

This option checks and opens the `root`'s `"crontab"` file in order to schedule recursive jobs.

Example:

```
STROMASYS - Virtualization Technologies                              V1.5
Manage recursive jobs (cron)


 Checking...
Checking 'charon_expchk' presence in crontab file...
Checking 'charon_mongstop' presence in crontab file...
Checking 'charon_logevent' presence in crontab file...
Checking 'charon_console_autoconnect' presence in crontab file...
Checking 'charon_logarchive' presence in crontab file...
Done.   ✔

Available editors
g - gedit (windows notepad like)
n - nano  (basic text editor)
v - vi    (advanced users standard text editor)
m - vim   (advanced users improved text editor)
q - quit
Select the editor you want to use: █
```

<u>Notes</u>:

- 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
#
# Console autoconnect utility
* * * * * /opt/charon/utils/charon_console_autoconnect

# Logs archiving utility (each Monday 00:00)
0 0 * * 1 /opt/charon/utils/charon_logarchive -keep=60 -zip
```

Expiration check alert (charon_expchk)

ℹ 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 `aksusbd` 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 mainly used if you're running on Red Hat Enterprise Linux 6; version 7 and Fedora are using `systemd` feature to alert in case of service abnormal termination

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.

Console autoconnect (charon_console_autoconnect)

This utility will check if the guest is running: if the console log is not defined in the configuration file (`set OPA0 log=xxx`), it will check no one is connected to the console via "`telnet localhost <port>`". If no one is connected, it will connect to the console using the '`screen`' command and will record the console output.

For more information, see Connect to guest console - Autoconnect feature

Notes:

- If you want to connect to the console, via Connect to guest console menu option, you will have the option to kill the active one and then connect interactively.
- It is possible to disable this feature from the Connect to guest console menu.

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

Description

This option will allow you to change alert management settings as shown below:

```
STROMASYS - Virtualization Technologies                    V1.1
  Alerts management


No  Parameter                           Current value(s)

1 - Mail mode (text/html)              HTML
2 - Mail recipients list              bruno.miretti@stromasys.com
3 - Create/Update alert mail footer   STROMASYS Bruno PC - Toolkit Source
4 - 'wall' alert messages             Disabled
5 - Update/reinstall alert script     Installed (from example)
6 - Select guests log alert level     WARNING + ERROR
7 - View alerts history (210 alerts)  Last update: Tue 18-Aug-2015 14:30:41
8 - Lic. expiration alerts from guests Disabled

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:

De root@rhel70.stromasys.net
Sujet **[CHARON] Emulator myds20 started**
Pour Bruno Miretti

Severity Level: **INFORMATIONAL**
License number: 100.800
Virtual machine (guest): myds20

Emulator start request on 2015-07-10 12:35:53

Stromasys Geneva Lab - RHEL 7.0 Toolkit tests

TEXT mail example:

```
   De  root@rhel70.stromasys.net
Sujet  [CHARON] Emulator mvax4106 started
 Pour  Bruno Miretti


Severity Level: INFORMATIONAL
License number: 100.800
Virtual machine (guest): mvax4106

Emulator start request on 2015-07-31 13:47:05




-------------------------------------------------
Stromasys Geneva Lab - RHEL 7.0 Toolkit tests
```

Mail recipients list

All alerts coming from monitoring scripts and checks scripts are sent using a common alert script which by default sends a `"wall"` message to all connected users and an email (via `"sendmail"`) to the recipients list that can be defined using this option.

ℹ️ 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

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:

```
   De  root@rhel70.stromasys.net
Sujet  [CHARON] Emulator myds20 started
 Pour  Bruno Miretti

Severity Level: INFORMATIONAL
License number: 100.800
Virtual machine (guest): myds20

Emulator start request on 2015-07-10 12:35:53        Email footer


Stromasys Geneva Lab - RHEL 7.0 Toolkit tests
```

Enable/disable wall alert messages

Alerts are by default sent via email (`sendmail`) and via via "`wall`" messages to all the connected users .

This option enables or disables these "`wall`" messages.

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──────────────V1.1──
 Alerts management


No  Parameter                          Current value(s)
─                                      ─
1 - Mail mode (text/html)              HTML
2 - Mail recipients list               bruno.miretti@stromasys.com
3 - Create/Update alert mail footer    Stromasys Geneva Lab - RHEL 7.0 Toolkit
4 - Enable/disable wall alert messages Disabled
5 - Update/reinstall alert script      Customized
                                       Last update: Fri 31-Jul-2015 14:02:56
6 - Select guests log alert level      WARNING + ERROR
7 - View alerts history (18 alerts)    Last update: Fri 31-Jul-2015 13:48:01

Enter your choice ('q' to quit): 5  ⬅

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

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/char on/utils/templates/*.mail`" and "`/opt/charon/utils/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 be the following:

Parameter 1	Severity	Description
ABORTED	CRITICAL	Guest has stopped without user or service request
AKSUSBFAIL	CRITICAL	If the dongle is detected as removed whereas it is disconnected, the askusb 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-eth*N* 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-eth*N* 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)"

ℹ 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:

We can see above:

1. A message telling the emulator is started
2. A message telling the license is found and that also displays its expiration date
3. The license dongle has been unplugged and the `aksusbd` monitor reported the alert (immediate)
4. The license dongle was plugged in again.

    ℹ️ 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 alerts 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.

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

88 / 108

Description

Opens a submenu that provides information on the running 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
- Current kit version/date with an option to view release notes

💡 Output can be displayed directly, sent to html file and opened with Firefox or sent via email

Menu options list

```
STROMASYS - Engineered solutions
STROMASYS - Virtualization Technologies #42

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

This option will either open the attached documents, users guide (PDF file / "`evince`" required) and release notes (text file / using "`vi`") or will lead you to the online version of the documentation or our Product Documentation and Knowledge Base space (using "`firefox`")

> **Note**
> Please note the users guide and release notes latest versions will be available first on the WEB. The kit attached documents, could be outdated.

Menu options

```
STROMASYS - Engineered solutions
STROMASYS - Virtualization Technologie #42

Documentation
  1 - Local PDF document (evince)
  2 - Online documentation (firefox)
  3 - Product documentation and Knowledge Base (firefox)
CHARON Linux Toolkit version 42 (27-Nov-2015 16:59)
  4 - View release notes (vi)

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

Technical part

Table of contents

Scripts and files description

All scripts and files are located in the /opt/charon/utils folder except for .charon* files. The "Custom" column below indicates the file will not be overwritten with new kit installation/upgrade.

Greyed cells represent obsolete files that could be present if you upgrade from a previous kit

File	Type	Custom	Description
`charon_check.alertcmd`	Shell script	✅	Common script file used for alerts. If it does not exist, it is cloned from the example file (see below)
`charon_check.alertcmd.example`	Shell script		Example of common script file used for alerts. By default alerts are 'wall' and 'mailx' based
`charon_check.mailfooter`	Data file	✅	Contains the mail footer used to send email alerts (see above)
`charon_check.mailto`	Data file	✅	Contains the mail recipients list used to send email alerts (see above)
`charon_common`	Shell script		Script file including common variables and functions
`charon_common_menu`	Shell script		Script file including common variables and functions for menus
`charon_console_autoconnect`	Shell script		Script executed in the crontab file to connect to the guests console if no user is already connected, records all console output
`charon_expchk`	Shell script		License expiration check or key reading check with '-nomail' parameter
`charon_gstart`	Shell script		Manages start/stop of the guests, defined as a service
`charon_gstart.boot`	Data file	✅	Contains the guests list for start/stop: HW emulator and configuration file
`charon_gstart.chkrun`	Shell script	✅	Optional script, user made, used to display status of the guest by the guest start menu (charon_menu_gstart)
`charon_gstart.chkrun.example`	Shell script		Example for the one one above
`charon_gstart.stop`	Shell script	✅	Optional script that enables the customer to insert proper guests shutdown commands (based on 'ssh' or 'expect' tool for example). This script is generated on user request.
`charon_gstart.stop.example`	Shell script		Example for the script above including 'ssh' and 'expect' usage for VMS and Tru64 operating systems.
`charon_licenses.list`	Data file	✅	Optional file that contains the list of licenses (number), their description and a display color code
`charon_linux_toolkit.V`*`xx`*`.tar`	Tar file		Contains the full Linux Toolkit package where "xx" represents the kit number (starting with kit number 41)
`charon_linux_utils.kit`*`xx`*`.tar`	Tar file		Contains the full Linux utils kit where "xx" represents the kit number (kits number 40 and below)

`CHARON_Linux_Toolkit_UG.pdf`	Document		Toolkit users guide, PDF format (starting with kit number 41)
`charon_linux_utils.pdf`	Document		Utilities users guide, PDF format (kits number 40 and below)
`charon_logarchive`	Shell script		Manage services and guests console logs archiving
`charon_logchk`	Shell script		Manages guests log monitoring, defined as a service
`charon_logchk.list`	Data file	✅	Contains the list of guests log files to monitor
`charon_logevent`	Shell script		Check for new events in the guests log files and sends alerts depending on the selected level
`charon_menu_alertsmgr`	Shell script		Menu: Alerts management
`charon_menu_alertcmd`	Shell script		Menu: alert script editing (kits number 40 and below)
`charon_menu_alert.dat`	Data file		Contains the options list for the alerts menu (kits number 40 and below)
`charon_menu_c2v`	Shell script		Menu: creates and send C2V file
`charon_menu_console`	Shell script		Menu: connection to guest console
`charon_menu_cron`	Shell script		Menu: edit crontab for license expiration check
`charon_menudoc.dat`	Data file		Contains the options list for the Documentation submenu
`charon_menu_editcfg`	Shell script		Menu: edit guests configuration file
`charon_menu_gstart`	Shell script		Menu: guests start/stop management, install service, edit guests list, etc…
`charon_menu_hostinfo`	Shell script		Menu: host information report management
`charon_menuhostinfo.dat`	Data file		Contains the options list for the Host information submenu
`charon_menu_logchk`	Shell script		Menu: guests log monitoring management
`charon_menu_logevent`	Shell script		Menu: selection for the of guests logs alert level (kits number 40 and below)
`charon_menu_mailfooter`	Shell script		Menu: customize alerts email footer (kits number 40 and below)
`charon_menu_mailmode`	Shell script		Menu: selection of the alert emails mode, HTML or pure TEXT (kits number 40 and below)
`charon_menu_mailto`	Shell script		Menu: mail recipients list management (kits number 40 and below)
`charon_menu_ncu`	Shell script		Menu: check if `ncu` is installed and execute it
`charon_menumain.dat`	Data file		Contains the options list for the main menu
`charon_menu_sendlogs`	Shell script		Menu: send configuration and log files via email
`charon_menu_showlic`	Shell script		Menu: show license content
`charon_menu_v2c`	Shell script		Menu: Install or Update (apply V2C file)
`charon_menu_walloff`	Shell script		Menu: enable/disable alert wall messages (kits number 40 and below)

`charon_mongstop`	Shell script		Monitors abnormal termination of the services (guests)
`charon_setup`	Shell script		Charon installation/upgrade/remove script
`charon_showhostinfo`	Shell script		Gather Charon server information
`events`	Folder		Contains the events found in guests log files that will be sent via mail. Contains only events detected since last charon_logevent script execution (crontab)
`fixgedit`	Shell script		Prevents from gedit command to display garbage messages. Execute this script before like this: # . /opt/charon/utils/fixgedit
`guest_shutdown.exp`	Expect script		This 'expect' script contains sequence for Tru64 and VMS shutdown. See explanation in the Tips and Tricks chapter
`haspruntime.errorcodes`	Data file		With the introduction of new ERROR message in the log file (code 000003E8), this file is used to translate the HASP runtime error code number to text.
`kit.version`	Data file		Contains kit version and release date (updated by the maketar script below)
`menu_mod.pl`	Perl script		Menu display based on data file
`menusetup`	Shell script		Kit installation script, setup the 'menu' command
`MyTput.pm`	Perl module		Contains enhanced display commands used by `menu_mod.pl`
`pluto.cfg.example`	Data file		Configuration file used for guests tests
`release-notes`	Text file		Release notes
`requests`	Folder		Contains flag files that determines the guest has been stopped properly (requested stop). If the guest is stopped and the file does not exist, it indicates an abnormal termination of the guest Flag files are empty and have the following name: configuration file name + ".stop" (example: `pluto.cfg.stop`)
`ssh-linux-openvms-setup.readme`	Text file		Tips on how to create ssh trust between Linux and Openvms
`ssh-linux-tru64-setup.readme`	Text file		Tips on how to create ssh trust between Linux and Tru64
`templates`	Folder		Contains templates used to send alerts via 'mailx' and 'wall' + templates to create 'systemd' services
`$HOME/.charon.autoconnect`	Data file	✅	Console autoconnect enabled (contains 1) or disabled (contains 0)
`$HOME/.charonconslogdir`	Data file	✅	Location for the console log file can be changed by placing the desired folder name in this file. Default is /opt/charon/log folder if this file is not created
`$HOME/.charonkitfolder`	Data file	✅	Contains the Charon kit location provided at installation
`$HOME/.charon.lastrecipient`	Data file	✅	Contains the last email recipient used for the above options in order to prevent from typing again the email address
`$HOME/.charonlogevent`	Data file	✅	Contains the alert level selected for guests log files events
`$HOME/.charonmailmode`	Data file	✅	Contains mail mode used to send email alerts, either HTML (default if the file does not exist) or TEXT. Used by charon_check.alertcmd script
`$HOME/.charonsoftlicfolder`	Data file	✅	Contains the software license kit location (where the dinst and dunst script files are located)
`$HOME/.charon.recipient`	Data file	✅	Contains the email recipient selected when sending hasp_srm_view output, C2V file or host information html report
`$HOME/.charonwalloff`	Data file	✅	Exists if the "wall" message are disabled

$HOME/.charon.expchk.nodongle	Data file	✅	Exists if the expiration check script has detected the absence of the dongle. This is to prevent from sending expiration alert messages if no dongle is present (the alert will be sent only once)
$HOME/.charonlicfolder	Data file	✅	Contains the folder name where all the license files, C2V and V2C, are located

Notes:

- Menu data files format is detailed using the following command:

```
# /opt/charon/utils/menu_mod.pl -fd
```

Manual services management

Request	Command	
	Linux distribution without `systemd` (Red Hat Enterprise Linux 6)	**Linux distribution using `systemd` (Red Hat Enterprise Linux 7 and Fedora)**
Services list	`# chkconfig –list	grep ^Charon`  There are 2 services that can be installed:  • `charon_gstart`: guests start/stop • `charon_logchk`: log monitoring	`# systemctl	grep ^charon`  Typically there is:  • one service for dongle connection/disconnection monitoring (`charon_m onusb`) • 2 services per guest (virtual machine), one for the emulator itself and one for the log monitoring
Disabling service start at boot	`# chkconfig <service> off`	`# systemctl disable <service>` ⚠ It is not recommended to use command line to do so, please use menu option 7
Enabling service start at boot	`# chkconfig <service> on`	`# systemctl enable <service>` ⚠ It is not recommended to use command line to do so, please use menu option 7

Start or Stop service	`# service <service> start`
	
	`# service <service> stop`
	
	Without supplemental parameter, all guests or logs monitoring are stopped
	
	To stop a dedicated guest, add the configuration file name
	
	To stop a dedicated log file monitoring, add the log file name
	
	Files can be truncated to their name only, directory and extension will be automatically completed
	
	Example:
	
	`# service charon_gstart stop pluto`
	
	`# service charon_gstart stop /opt/charon/cfg/pluto.cfg`
		`# systemctl start <service>`
		
		`# systemctl stop <service>`
		
		Example:
		
		`# systemctl start charon_pluto`

Service status	`# service <service> status`	`# systemctl status <service>` Use of the following options is recommended: "`-l --lines=xx`" where "*xx*" is the number of lines from the journal to show, counting the most recent ones.

Service removal	# **chkconfig –del** <service>	First disable the service:
		# **systemctl disable** <service>
		then remove (optional) the associated service file:
		# **rm /etc/systemd/system/**<service>**.service**
		Example:
		# **systemctl disable** charon_pluto
		# **systemctl disable** charon_logmon_pluto
		# **rm /etc/systemd/system/**charon_pluto**.service**
		# rm /etc/systemd/system/charon_logmon_pluto**.service**
		⚠️ It is not recommended to use command line to do so, please use menu option 6

Tips and Tricks

Table of contents

'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 is case sensitive

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 dsa
Linux# ssh-keygen -e -f id_dsa.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.

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
...
```

- If VMS has to connect to Linux, configure the SSH CLIENT:

```
...
* Do you want to configure SSH CLIENT [NO]: YES
...
```

Select then:

- Option 2 - Enable & Start service on this node
- Exit with **E** twice

- Copy these files from the default SSH user for the SYSTEM one:

```
VMS$ SET DEF SYS$LOGIN
VMS$ CREATE/DIR [.SSH2]
VMS$ COPY TCPIP$SSH_DEVICE:[TCPIP$SSH.SSH2]HOSTKEY [.SSH2]
VMS$ COPY TCPIP$SSH_DEVICE:[TCPIP$SSH.SSH2]HOSTKEY.PUB [.SSH2]
VMS$ COPY TCPIP$SSH_DEVICE:[TCPIP$SSH.SSH2]SSH2_CONFIG [.SSH2]
VMS$ EDIT [.SSH2]SSH2_CONFIG
```

⚠️ Uncomment: **BatchMode   yes**

⚠️ Find and set: **AllowedAuthentications   publickey, password**

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

```
...
* Do you want to configure SSH CLIENT [NO]: YES
...

Linux# ssh-keygen -t dsa (then 3 times Enter with default values)
Linux# ssh-keygen -e -f /root/.ssh/id_dsa.pub > /root/.ssh/linux.pub
```

- Copy the file **/root/.ssh/**linux.**pub**, or use copy/paste, to the VMS system in the **SYS$SYSROOT:[SYSMGR.SSH2]** directory

- Copy the **hostkey.pub** file from the VMS system to the Linux one:

```
Linux# ssh system@VMS "type [.SSH2]HOSTKEY.PUB" >/root/.ssh/VMS.orig.pub
```

⚠️ Enter **YES** then the VMS system password

- Import the VMS public key and add it to the authorized keys:

```
Linux# ssh-keygen -i -f /root/.ssh/VMS.orig.pub >/root/.ssh/VMS.pub
Linux# cat /root/.ssh/VMS.pub >>/root/.ssh/authorized_keys
```

- Define the VMS identification file:

```
VMS$ SET DEF SYS$SYSLOGIN
VMS$ SET DEF SYS$SYSROOT:[.SSH2]
VMS$ OPEN/WRITE TMP IDENTIFICATION.
VMS$ WRITE TMP "IDKEY HOSTKEY"
VMS$ CLOSE TMP
```

⚠ Do not forget the dot at the end of the identification file name

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

```
VMS$ SET DEF SYS$SYSLOGIN
VMS$ SET DEF SYS$SYSROOT:[.SSH2]
VMS$ OPEN/WRITE TMP AUTHORIZATION.
VMS$ WRITE TMP "KEY LINUX.PUB"
VMS$ CLOSE TMP
```

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

- Perform tests (examples)

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

```
charon# ssh system@pluto "show system"
OpenVMS V7.3-2 on node PLUTO 27-SEP-2013 11:50:14.37 Uptime 0 19:20:07
Pid Process Name State Pri I/O CPU Page flts Pages
00000201 SWAPPER HIB 16 0 0 00:00:02.55 0 0
00000204 LANACP HIB 14 70 0 00:00:00.05 109 135
...
```

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 and perform the login operation then execute the shutdown command.

⚠ 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` f older. 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.

Console locked:

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

ℹ 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:

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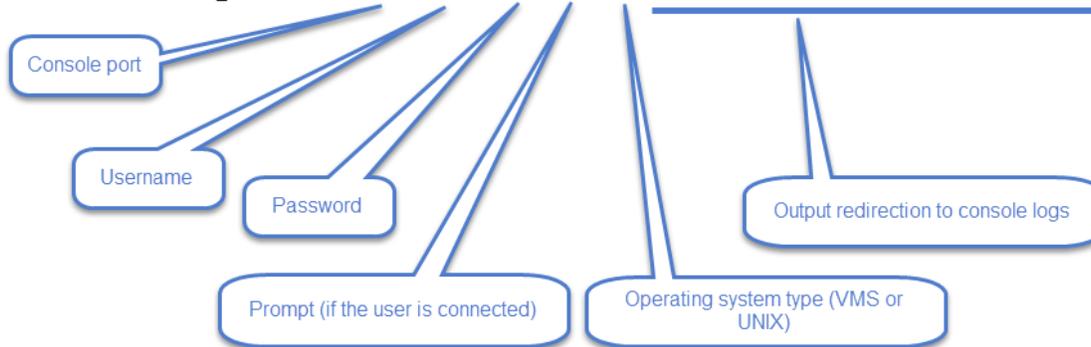# path/script <port> <user> <password> <prompt> <opsys>
```

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
```

Console port
Username
Password
Prompt (if the user is connected)
Operating system type (VMS or UNIX)
Output redirection to console logs

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

Alert emails examples

Table of contents

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

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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**

aksusb 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

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Emulator stopped - no action taken

[CHARON] Emulator vms stopped

root@charonrhel64.localdomain

Sent: Tue 4/15/2014 1:22 AM
To: Bruno Miretti

Severity Level: **CRITICAL**
License number: 1000.800

Emulator stopped at 2014-04-15 01:22:04
Product or license has terminated

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

STROMASYS GENEVA LAB - Linux Utilities SOURCES

Emulator stopped without service request

[CHARON] Emulator vms failed

root@charonrhel64.localdomain

Sent: Tue 4/15/2014 1:23 AM
To: Bruno Miretti

Severity Level: CRITICAL
Guest stopped without service request

Executable name: /opt/charon/bin/axp/as4100
Configuration file name: /opt/charon/cfg/vms.cfg

STROMASYS GENEVA LAB - Linux Utilities SOURCES

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   •••

marquer comme non lu

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

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

ℹ **This article will list the operations to be performed to make your emulator running with the CHARON Linux Toolkit.**

- 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" (ncu) or configure the ifcfg files accordingly (see your CHARON product documentation / networking chapter).

  ℹ In both cases, offloading parameters will be disabled.

- Check the license can be read using the "License key display/email" menu option

- Prepare your configuration file(s) or use the clone utility available from the "Service management - Update guests list" menu (see further).

- Prepare your storage configuration and create your vdisk files using the "mkdskcmd" command if needed.
  Example:

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

- Use the "Service 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

    - ℹ Starting with kit 41, 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.

- You can remove the USB dongle to verify the dongle removal is identified by the askusbd log monitor service:

  - If you did not disable 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, 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"