CHARON Linux Toolkit V1.46 Users Guide

Contents

Purpose of this document

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

These scripts are designed to:

- **Manage start/stop guests at server boot with services and customized shutdown commands**:
  - Automatic start of the guests (virtual machines) at Linux server boot
  - Clean shutdown of the guests at CHARON server shutdown
  - Clean shutdown of one guest at will using customized shutdown scripts (using 'ssh', 'expect' or any customized tool)

- **Monitor the CHARON guests log file**
  - Alert on removal of the license dongle
  - Send alerts for all INFO, WARN and ERROR messages found (depending on the error level setting)

- **Alert on license approaching termination**
  - Number of days before expiration alert is sent can be customized

- **Provide menu driven options** like:
  - Start/stop guests (virtual machines)
  - Connection to guests console
  - Display license contents, gather license content and update (send C2V and apply V2C files)
  - Send configuration and log files by email
  - Edit configuration files
  - Gather CHARON server information: Hardware, Operating System, Storage, Network interfaces, CHARON version, Utilities version

Introduction

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Important note

This document applies to Linux Toolkit version 1.46

Kit download

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

Prerequisites

- Basic knowledge of Unix commands

- Basic knowledge of CHARON products

- CHARON qualified versions:

	CHARON-AXP V4.4 Build 147-07
	CHARON-AXP V4.5 Build 155-05 (+ patches)
	CHARON-AXP V4.6 Build 166-03 (+ patches)
	CHARON-AXP V4.7 Build 171-01 (+ patches)
	CHARON-AXP V4.8 Build 183-02
	CHARON-VAX V4.6 Build 165-02 (+ patches)
	CHARON-VAX V4.7 Build 171-01 (+ patches)
	CHARON-VAX V4.8 Build 183-02

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

	CentOS 7
	Red Hat Enterprise Linux Server release 6.2 to 6.8 Red Hat Enterprise Linux Server release 7 and up (7.*x*)

- Some packages have to be installed on the CHARON server:

  - Mandatory packages:
    - `glibc.i686`
    - `bc`
    - `perl`
    - `at`

  - Recommended packages:
    - `telnet` : recommended for connection from the CHARON server to the virtual machine console
    - `expect` : recommended if `ssh` cannot be used to execute shutdown commands from the console
    - `evince` : recommended for reading online documentation
    - `screen` : recommended, mandatory for CHARON-AXP V4.4
    - `postfix` : recommended, Mail Transport Agent used to send emails
    - `firefox` : recommended for checking and updating licenses, accessing online documentation

- All described operations will have to be performed on the CHARON server and logged in as '**root**' (no other user supported).
  ⚠️ The 'menu' must be used by one user at a time only

- CHARON-AXP and CHARON-VAX installations are supported when installed in **/opt/charon** folder only

- Mail service must have been configured. Mail transfer agent can be postfix, sendmail, ...

- ⚠️ Within the CHARON virtual machines configuration files:
  - do not use spaces or tabs between a parameter and its value as the toolkit does not handle this correctly, i.e.: *parameter=value* is correct, *parameter = value* is not correct.
  - do not add devices parameters on the same line, please split the line in 2 lines

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

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 operating system running on a Charon instance, for example, Tru64 UNIX, OpenVMS, Solaris or MPE

Note related to display/edit options

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

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

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

Note related to emails

There are 2 kinds of emails:

Type	Description
Results	Some menu options will allow you to send results via email. • Example: license display, log and configuration files. • The recipient will then be unique
Alerts	By default, the alert script will send alerts via email (plus `'wall'` notifications if enabled). A recipients list can be defined in this case. • Wall notification can be enabled/disabled from the menu • The alert script can be customized. You can for example use command lines linked to your monitoring software and disable emails.

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

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

Setup

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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:

```
# mkdir -p /opt/charon/utils
# cp /charon/charon_linux_toolkit.V1.46.tar /opt/charon/utils
```

- Extract the files from the tar file to the CHARON installation directory, subdirectory 'utils'

```
# cd /opt/charon/utils
# tar -xf charon_linux_toolkit.V1.46.tar
```

- Execute the installation script:

```
# ./menusetup
```

- The setup will check first your terminal settings, if set to `VT100` you will not be able to continue until you set the `TERM` value to `VT200`, dtterm or xterm (see how to here: Configuration)

- Mandatory and recommended packages installation will be checked.
  - ⚠ If some mandatory packages are missing you will not be able to continue.
  - ℹ If some recommended packages are missing, installation will continue. Installation of these packages can be done later if needed

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

- The `'menu'`, `'logtail'` and `'logview'` aliases will be created. They will be the commands you'll use to access the menu or to view virtual machines log files.

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

Example:

```
┌STROMASYS – Virtualization Technologies───────────────────────────V1.1a─┐
│ 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 7.1 Toolkit │
│ 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 (0 alerts)      Last update: Mon 21–Mar–2016 00:00:01 │
│ 8 – Lic. expiration alerts from guests  Disabled                        │
│                                                                         │
│ Enter your choice ('q' to quit): □                                      │
│                                                                         │
│                                                                         │
│                                                                         │
│                                                                         │
│                                                                         │
└─────────────────────────────────────────────────────────────────────┘
```

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

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

Upgrade

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

To upgrade the kit, you will need to:

- read the CHARON Linux Toolkit - Release notes for kit 1.46 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 .
```

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

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

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

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

You can then run the 'menu' command as usual

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

1. List installed services

```
# chkconfig --list | grep charon

charon_gstart      0:off    1:off    2:off    3:on     4:on     5:on     6:off

charon_logchk      0:off    1:off    2:off    3:on     4:on     5:on     6:off
```

2. Remove installed services

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

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

ℹ 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 V1.46

CHARON installation
  1 - Install/Upgrade/Remove CHARON
  2 - Network Configuration Utility (ncu)
License management
  3 - HASP license details
  4 - License driver management (aksusbd)
  5 - Request for new license or license update (send C2V file)
  6 - License update tool (apply V2C file)
  7 - License expiration check
Virtual Machines (guests)
  8 - Service management (Start, Stop, Manage automatic boot & shutdown)
  9 - Connection to guest console
 10 - Manage monitored guests logs
 11 - Send configuration and log files via email
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**:
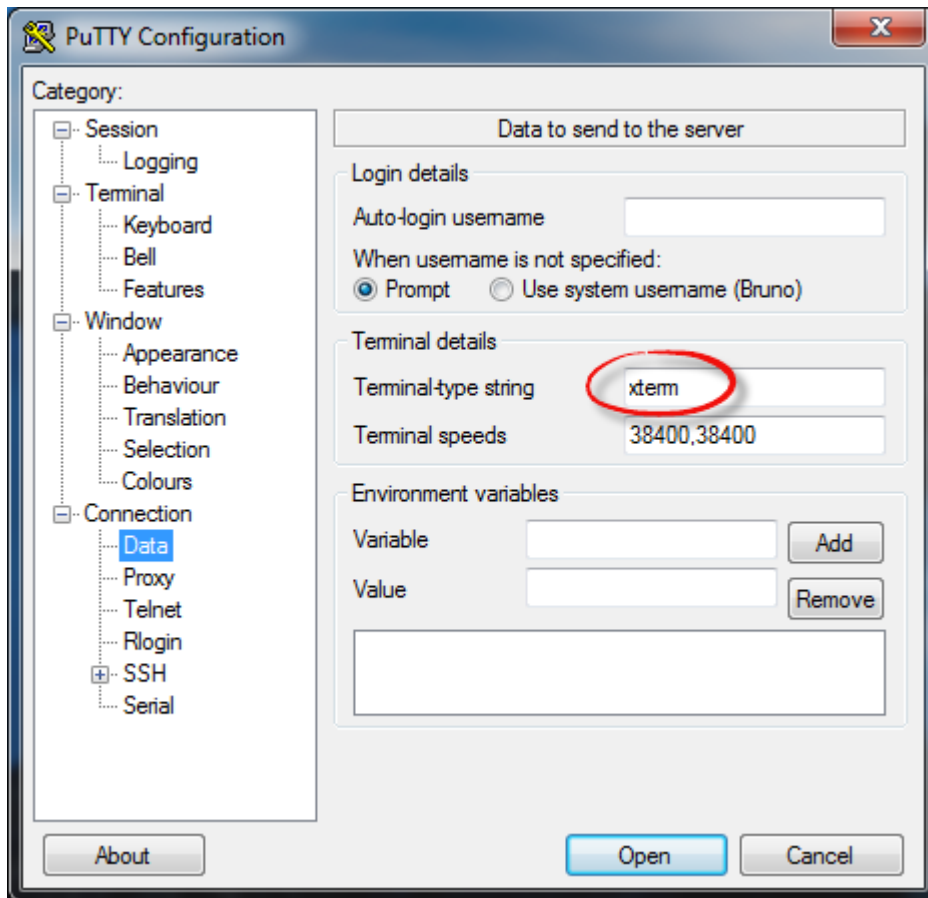
and maybe **Remote character set** parameter:
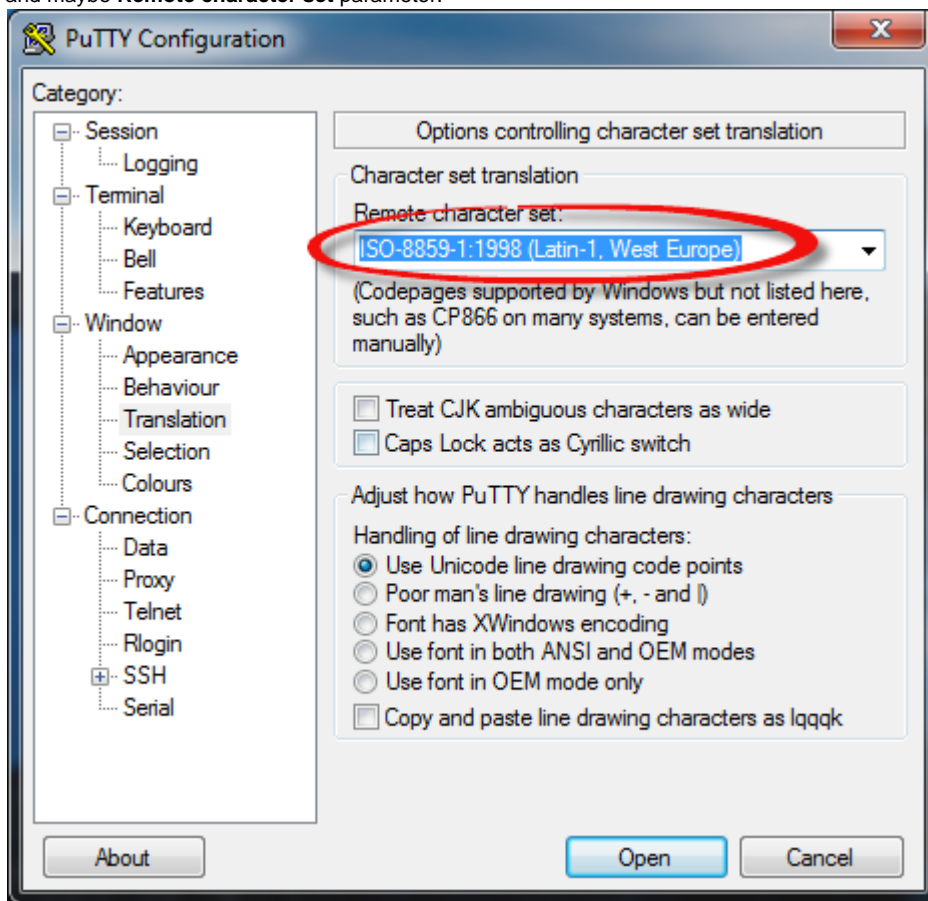
Recommended color scheme for 'putty' is (all other values can remain as they are by default):

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
- HASP license details
- License driver management (aksusbd)
- Request for New or Update license (send C2V file)
- License update tool (apply V2C file)
- License expiration check
- 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 - 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
- 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 to provide the .tar.gz file (kit) location, the .tar file if it has been unzipped or the folder where the kit was unzipped and extracted, the tool will install all packages. You can also provide a software license kit location if any, .tar or folder, the script will also perform the setup.

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

Notes:

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

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

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

- 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:

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

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

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

```
┌─STROMASYS - Virtualization Technologies────────────────────────V2.8─┐
│ Install/Upgrade/Remove CHARON                                        │
└──────────────────────────────────────────────────────────────────────┘

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


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

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

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

Enter kit location (folder), . for current folder, q to quit
: /charon       2

Searching for complete packs in /charon ...
Done.


No  Product              Version Build  Installed Container  md5sum
─── ──────────────────── ─────── ────── ───────── ───────── ───────

  1 charon-axp               4.8  18302 -         tar.gz     OK
  2 charon-vax               4.8  18302 -         tar.gz     OK

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

The kit will then be unzipped, extracted and installed.

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


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


Loaded plugins: langpacks, product-id, search-disabled-repos, subscription-
              : manager
Examining aksusbd-2.5-1.i386.rpm: aksusbd-2.5-1.i386
Marking aksusbd-2.5-1.i386.rpm to be installed
Examining charon-axp-4.8-18302.el71.x86_64.rpm: charon-axp-4.8-18302.x86_64
Marking charon-axp-4.8-18302.el71.x86_64.rpm to be installed
Examining charon-license-4.8-18302.el71.x86_64.rpm: charon-license-4.8-18302.x86
_64
Marking charon-license-4.8-18302.el71.x86_64.rpm to be installed
Examining charon-utils-4.8-18302.el71.x86_64.rpm: charon-utils-4.8-18302.x86_64
Marking charon-utils-4.8-18302.el71.x86_64.rpm to be installed
Resolving Dependencies
```

...

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

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

Complete!
 Installation completed (error code 0)

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


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

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


Press enter
```

CHARON-AXP is now installed as shown below:

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


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

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

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

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

CHARON upgrade installation

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

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

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

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

Context:

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

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

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

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

```
┌─STROMASYS - Virtualization Technologies────────────────────────────V2.8─┐
│  Install/Upgrade/Remove CHARON                                          │
└─────────────────────────────────────────────────────────────────────────┘
Hostname:              rhel72.stromasys.com
Linux version:         Red Hat Enterprise Linux Server release 7.2 (Maipo)
                       Linux 3.10.0-327.28.3.el7.x86_64


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

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

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

Network Configuration Utility

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Description

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

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

Example

Two network adapters dedicated to CHARON, "ens34" and "ens35". "ens33" is used for managing the CHARON server:
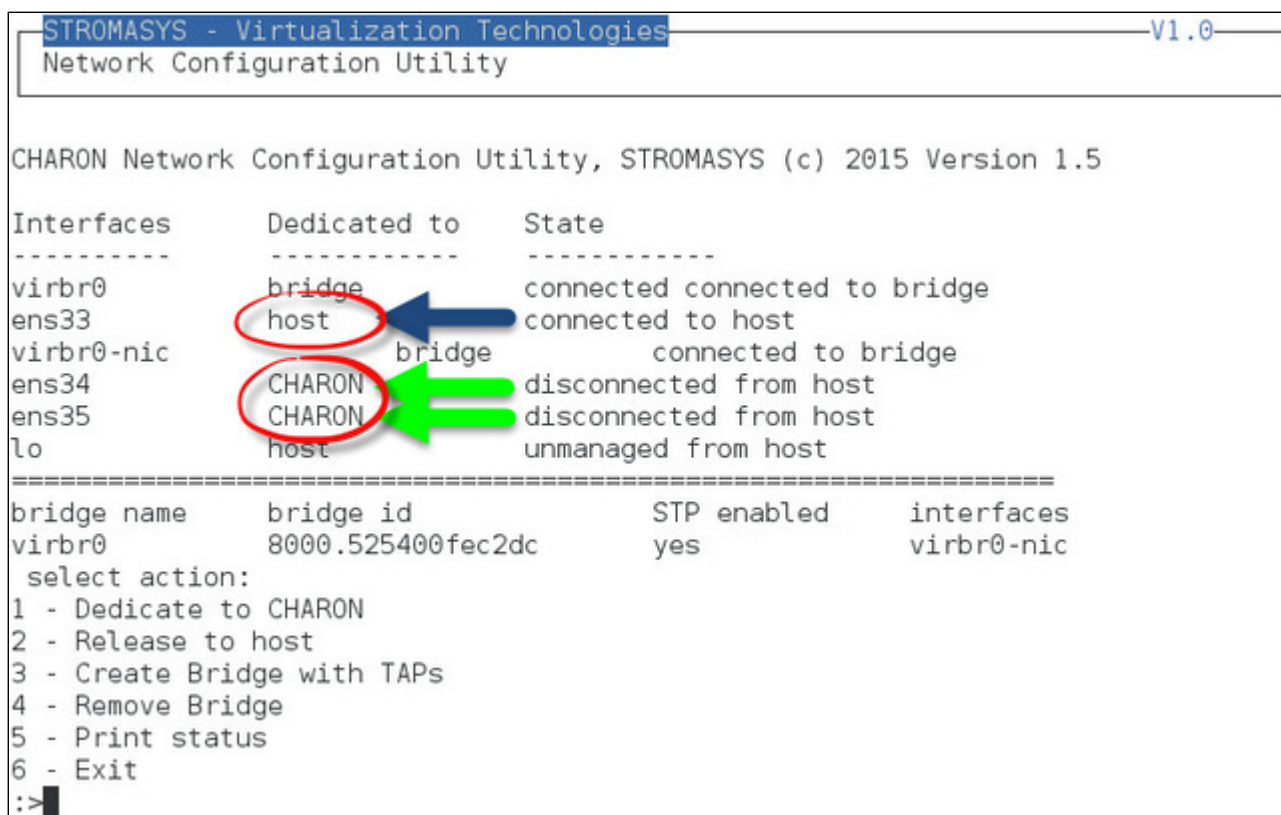
```
STROMASYS - Virtualization Technologies                          V1.0
Network Configuration Utility


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
:>
```

HASP license details

Description

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

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

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

`/opt/charon/utils/charon_licenses.list`

This 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"

License driver management (aksusbd)

Description

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

Example

```
┌─STROMASYS - Virtualization Technologies────────────────────V1.0─┐
│ License driver management (aksusbd)                            │
└────────────────────────────────────────────────────────────────┘

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

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

Request for New or Update license (send C2V file)

Description

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

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

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

Example

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


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

Enter your choice (q to quit) : 1

License number: 1000.806

Please wait, generating C2V file.....

C2V file generated: /tmp/1000.806_20160321_164344.c2v

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

Enter the email recipient (q to quit) []: Janeway@voyager.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 option 2 was used.

License update tool (apply V2C file)

Table of contents

Description

This option either:

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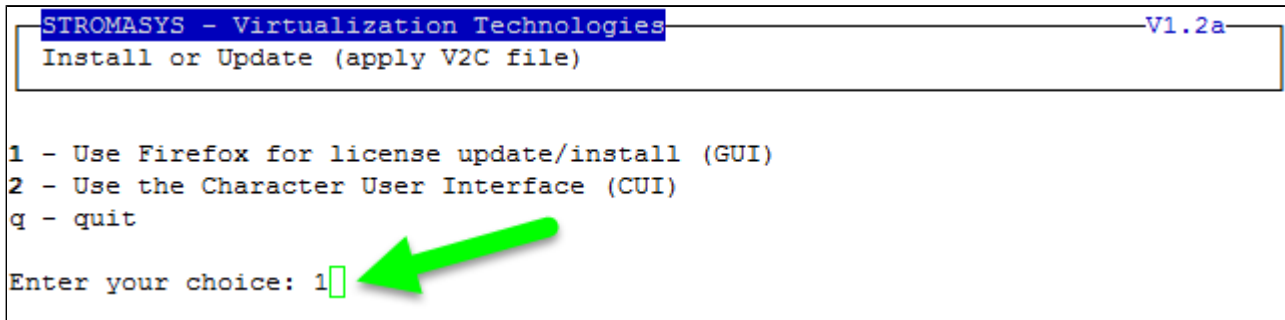
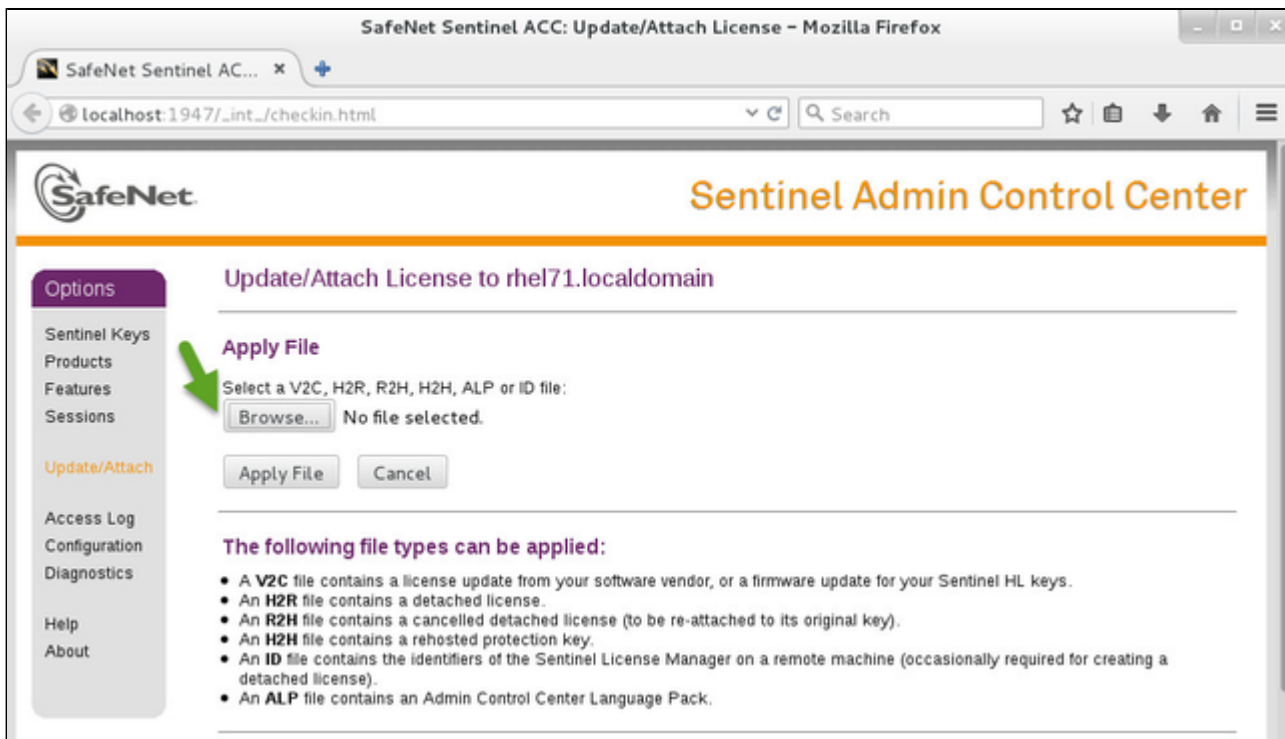## Using Graphical User Interface (GUI)

Select option 1 from the menu:

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

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

Using Character User Interface (CUI)

Select option 2 from the menu:

```
┌STROMASYS - Virtualization Technologies────────────────────V1.2a─┐
│ Install or Update (apply V2C file)                              │
│                                                                 │
│                                                                 │
│1 - Use Firefox for license update/install (GUI)                │
│2 - Use the Character User Interface (CUI)                       │
│q - quit                                                         │
│                                                                 │
│Enter your choice: 2█                                            │
└─────────────────────────────────────────────────────────────────┘
```

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

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

Example:

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

Example:

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


Available options
1 - Install or update license
2 - Change license files folder [/charon/licenses]
q - Quit
                                    1
Enter your choice: 1
Available license files
 1 - 0020_1000.800_11-May-2016_fmt.v2c
 2 - 0020_1000.800_11-May-2016.v2c
 3 - 0005_1000.806_300_fmt.v2c
 4 - 0005_1000.806_300.v2c
 5 - 0007_1000.806_720_fmt.v2c             Files are sorted by
 6 - 0007_1000.806_720.v2c                   license then
 7 - 0008_1000.806_20-Jul-2016_fmt.v2c    sequence number
 8 - 0008_1000.806_20-Jul-2016.v2c
 9 - 0010_1000.806_360_fmt.v2c
10 - 0010_1000.806_360.v2c
11 - 0014_1000.806_360_fmt.v2c
12 - 0014_1000.806_360.v2c

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

Multiple selections available / comma or blank separated
Enter your choice (q to quit) : 11 12
                                           2
Error codes explanations::
- Code 18 means the dongle is not connected
- Code 55 means you tried to apply a V2C file with an update counter that
  is out of sequence with update counter in the Sentinel protection key
- Code 65 means the (software) license has already been applied

Applying 0014_1000.806_360_fmt.v2c ...
```

The license updates will be applied in the order specified.

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

License expiration check

Description

This option checks the license expiration dates interactively.

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

Alert levels are defined as follows:

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

Examples

Example - Regular license

Example - Software License

```
STROMASYS - Virtualization Technologies                          V1.7b
 License expiration check


Product Name                        Expiration          Alert level

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

Press ENTER to continue.
```

Example - Runtime limited license

```
STROMASYS - Virtualization Technologies                          V1.7b
 License expiration check


Product Name                        Expiration          Alert level

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

Press ENTER to continue.
```

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

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Description

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

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

- **Startup**: the virtual machine is executed in detached mode (using '-d' parameter) and then requires the console to be set as virtual serial line.
    - Connection to the console will be performed using `telnet` on the defined localhost / port. This can also be performed using other utilities like `putty`. If there is more than one guest on the server, guests are started in parallel.
    - Before the guest starts, the network interfaces used will be checked and all the offload parameters will be set offline

- **Shutdown**: a common shutdown script can be created for guests shutdown. See "Service management - Create/Edit guest stop script" for details.
    - If the script does not exist, the virtual machine process is killed without proper guest shutdown.
    - If the script exists, it executes the customer defined command lines to perform a proper shutdown (using 'ssh' or 'expect' for example). If the virtual machine process is still running after execution, the stop operation is considered as failed so for Linux systems not using `systemd` (Red Hat 6) the script must stop the emulator either by sending a "`power off`" at SRM prompt (AXP) or F6 key (VAX) with 'expect' or just by killing the process. For Linux systems using `systemd` (Red Hat 7 and Fedora), the process is killed by the system.
    - If there is more than one guest on the server, guests are stopped in sequential mode during server shutdown based on their order in the guests list. This order can be modified from the menu. ⚠ This is valid only for Linux systems not using `systemd` (Red Hat 6), for other systems, the services description files will have to be modified to add dependencies using `Before=` or `After=` for example. ℹ For more information, see manpages: # **man systemd.unit**

Menu description

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

Column	Description
Emulator/Config File	Emulator used with its configuration file name (shortened)
CPU	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 hardware limitations, CHARON licenses and also licenses on the virtual machine side (Tru64 or OpenVMS)
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. ⚠️ If not found, a service stop request will induce a kill of the emulator process - To customize: the script exists and a case line has been added for the specified configuration file. It must however be customized with some commands to perform a clean shutdown of the guest (OpenVMS or Tru64 virtual machine). ℹ️ For more information and examples, 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 a new guest has been added after initialization.
B	Displays the automatic boot on server startup value, Yes or No. ⚠️ This means the CHARON virtual machine will be started. To automatically boot the virtual machine on startup, please refer to the CHARON-AXP or CHARON-VAX users guides and console settings.

- Depending on settings and virtual machine state, more information can be displayed
    - Auto-restart settings (feature managed by `systemd`, described here: How to restart CHARON-VAX/AXP on Linux automatically on failure)
    - Description (not available on Red Hat Enterprise Linux 6.x)
    - Start date
    - Guest OS response (optional, see Service management - Create/Edit guest stop script / Optional guest display status script)
    - Network Interfaces settings

- The third part displays the available options that are detailed in the Menu options chapter further.

Examples

Red Hat 7.x - Virtual machine up and running

```
┌STROMASYS - Virtualization Technologies────────────────────────────V2.3a─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown)      │
└─────────────────────────────────────────────────────────────────────────┘

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 147M/7.6G (1%)

Emulator/Config File          Cpu Mem  State                 Stop script     B
─────────────────────────     ─── ───  ─────                 ───────────     ─
- ds20/myds20                  2 512M  ACTIVE                Customized      N
  Auto-restart: on-failure after 20s, max 2 times in 600 seconds
  Description: Alphaserver DS20 Tru64 DEMO
  Started: Tue 2016-03-22 13:40:54 CET (PID=1916)
  Guest OS response: Return 255
  Network: EWA0/charon-myds20

Available options
─────────────────────────────────────────────────────────────────────────

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

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

ℹ Guest OS response returns error code 255, meaning the Tru64 system is not booted (still at SRM prompt)

Red Hat 7.x - Virtual machine restarting after failure

```
┌STROMASYS – Virtualization Technologies──────────────────V2.3a─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown) │
└─────────────────────────────────────────────────────────────────┘


Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 2.0G/7.6G (25%)

Emulator/Config File          Cpu Mem  State               Stop script       B
────────────────────────────────────────────────────────────────────────────
- ds20/myds20                 2 512M   ACTIVATING          Customized        N
  Auto-restart: on-failure after 20s, max 2 times in 600 seconds
  Description: Alphaserver DS20 Tru64 DEMO
  Substate: auto-restart
  Guest OS response: N/A
  Network: EWA0/charon-myds20

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

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

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

Red Hat 7.x - Virtual machine stopped by administrator

```
┌STROMASYS – Virtualization Technologies──────────────────V2.3a─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown) │
└─────────────────────────────────────────────────────────────────┘


Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 2.0G/7.6G (25%)

Emulator/Config File          Cpu Mem  State               Stop script       B
────────────────────────────────────────────────────────────────────────────
- ds20/myds20                 2 512M   INACTIVE  REQUESTED  Customized        N
  Auto-restart: on-failure after 20s, max 2 times in 600 seconds
  Description: Alphaserver DS20 Tru64 DEMO
  Stopped: Tue 2016-03-22 13:44:05 CET (success)
  Guest OS response: N/A
  Network: EWA0/charon-myds20

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

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

Menu options

- Service management - Update guests list
- Service management - Start/stop guests
- Service management - View guest 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

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Description

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

Add guest

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

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

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

ℹ Some checks are performed to verify the same network interface and same console ports are not already used, vdisk files if used exist or not, etc...
⚠ This does not guarantee the configuration file is correct. Please refer to the corresponding CHARON product and version for configuration file details.

Once added, the guest can be started directly.

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

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


Server boot: 05-Feb-2016 11:32   CPUs: 8   Memory(free/tot): 2.0G/7.6G (25%)

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

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

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

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

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

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 2.0G/7.6G (25%)

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

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

Enter your choice: 1        2
```

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
```

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

Once the clone is completed, we can leave the clone utility (**1** & **2** below) then use (**3**) and customize the newly created file (**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 th
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
n - nano  (basic)
v - vi    (advanced users)
m - vim   (advanced users)                    5
Select the editor you want to use: m
```

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

Using the selected editor, the 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=10003    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="eno67109424"

set PKA container[0] = "/data/disks/pluto_tru64.vdisk"
set PKA container[400] = "/kits/V5.1Br2650_O1.iso"      4
~
```

Notes on the above example:

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

We can see below the virtual disk is missing:

```
Log file is set to: /charon/logs/pluto.log

Log file /charon/logs/pluto.log added to log monitor service.
Service charon_logmon_pluto.service is enabled.

 Checking virtual disks (.vdisk) files...
- /data/disks/pluto_tru64.vdisk: file does not exist or is empty  ❌
Done.

 Checking network interfaces...
Done..

Do you want to start this guest (y/n) or re-edit the file (e) ? e
```

This does not prevent CHARON from starting but it is highly recommended to solve this, from a separate session as explained above with the `mkdskcmd` command, to re-edit the configuration file and then to leave the editor again.

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

```
Log file is set to: /charon/logs/pluto.log

Log file /charon/logs/pluto.log was already added to log monitor service.
Service charon_logmon_pluto.service is enabled.

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

 Checking network interfaces...
Done..

Do you want to start this guest (y/n) or re-edit the file (e) ? y
Starting charon_logmon_pluto.service at 22-Mar-2016 14:46:36
Status: active
Restarting aksusbd log monitor service...
 Starting charon_pluto.service at 22-Mar-2016 14:46:40
Mar 22 14:46:40 Starting CHARON as4100/pluto...
Mar 22 14:46:40 [INFO ] aksusbd monitor service status is: active
Mar 22 14:46:40 [INFO ] Log monitor service status is: active
Mar 22 14:46:40 [INFO ] Verifying license presence
Mar 22 14:46:48 [INFO ] License found.
Mar 22 14:46:48 [INFO ] Checking network settings...
Mar 22 14:46:48 [INFO ] Switching off all offload parameters for interface eno67
109424
Mar 22 14:46:48 [INFO ] Checking vdisk files if any...
Mar 22 14:46:48 [INFO ] Starting emulator: /opt/charon/bin/as4100 -d /charon/plu
to.cfg
Mar 22 14:46:49 Started CHARON as4100/pluto.

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

...

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

20160322:144649:INFO :0:000003A5:hexane.cxx(5312):  session is loading built-in
configuration "AlphaServer_4100"...
20160322:144649:INFO :0:000003A6:hexane.cxx(5336):  session has finished loading
 built-in configuration "AlphaServer_4100".
20160322:144649:INFO :0:000003AA:hexane.cxx(5425):  session is loading configura
tion file "/charon/pluto.cfg"...
20160322:144649:INFO :0:000003AB:hexane.cxx(5455):  session has finished loading
 configuration file "/charon/pluto.cfg".
20160322:144649:INFO :0:000003F2:sesmgr.cxx(1471):  session: default log file si
ze limit is 4194304 bytes
20160322:144649:INFO :0:0000032B:hexane.cxx(2547):  Start request received.
20160322:144650:INFO :0:000003AC:hexane.cxx(1287):  session's process affinity i
s 00000000000000FF, system affinity is 00000000000000FF.
20160322:144650:INFO :0:000003D1:hexane.cxx(1541):  session's I/O domain affinit
y is 0000000000000003, CPU domain affinity is 00000000000000FC
20160322:144650:INFO :0:000003BA:ll_sentine( 725):  Looking for a license key ..
.
20160322:144652:INFO :0:000003DC:ll_sentine( 820):  ... found license key 367006
676.
20160322:144652:INFO :0:0000024D:hexane.cxx(2688):  STROMASYS SA, (C) 2009-2015
20160322:144652:INFO :0:00000350:hexane.cxx(2734):  CHARON-AXP/4100 (AlphaServer
 4100), V 4.7 B 17101, Sep 22 2015 / 1000.800 / 367006676
20160322:144652: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
20160322:144652:INFO :0:0000009D:hexane.cxx(2838):  License info:
CHARON product code: "CHAXP-806xx-xI".
Licensed to: "Stromasys - Bruno Miretti".
Date limited license, limited to: 16/Jun/2016 01:55:00.
Warning: setting the host system date back will permanently invalidate the licen
se key.

20160322:144652:INFO :0:00000097:hexane.cxx(2847):  OS Environment: Linux 3.10.0
-327.3.1.el7.x86_64 #1 SMP Fri Nov 20 05:40:26 EST 2015 x86_64.
20160322:144652: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
20160322:144652:INFO :0:00000099:hexane.cxx(2857):  Host Memory:    7936Mb
20160322:144652:INFO :0:000003F2: srlio.cxx(2526):  OPA0: default log file size
limit is 4194304 bytes
20160322:144654:ERROR:2:000?????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.
20160322:144654:INFO :0:0000034B:scsi_disk.( 566):  PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20160322:144654:INFO :0:0000032C:hexane.cxx(2589):  "pluto" started.
```

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

Press **CTRL-C** at any time to leave the log file view. The service status will then be displayed for information (this view depends on Linux distribution and version):

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 started at Linux server boot.

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

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** & **2**) the as4100/pluto guest, currently in active state:

```
Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 217M/7.6G (2%)

Emulator/Config File          Cpu Mem  State                Stop script        B
─────────────────────         ─── ───  ─────                ───────────        ─
 1- as4100/pluto               1 256M  ACTIVE               Not found          Y
    Description: CHARON as4100/pluto
    Started: Tue 2016-03-22 14:46:49 CET (PID=18646)
    Network: EWA0/eno67109424

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

Enter your choice: 2
```
1

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

Emulator/Config File          Cpu Mem  State                Stop script        B
─────────────────────         ─── ───  ─────                ───────────        ─
 1- as4100/pluto               1 256M  ACTIVE               Not found          Y
    Description: CHARON as4100/pluto
    Started: Tue 2016-03-22 14:46:49 CET (PID=18646)
    Network: EWA0/eno67109424


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

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

```
No stop script found, emulator will be killed without proper shutdown !!!
Do you want to stop the guest now (y/n) ? y
 Stopping charon_pluto.service at 22-Mar-2016      49
Mar 22 14:46:49 Started CHARON as4100/pluto.
Mar 22 15:00:49 Stopping CHARON as4100/pluto...
Mar 22 15:00:49 [INFO ] Stopping...
Mar 22 15:00:49 [WARN ] No stop script defined, sending KILL signal to emulator,
 pid 18646
Mar 22 15:00:49 [INFO ] Waiting for process id 18646 termination
Mar 22 15:00:49 charon_pluto.service: main process exited, code=killed, status=9
/KILL
Mar 22 15:00:54 [INFO ] Process id 18646 has terminated
Mar 22 15:01:01 Stopped CHARON as4100/pluto.
Mar 22 15:01:01 Unit charon_pluto.service entered failed state.
Mar 22 15:01:01 charon_pluto.service failed.

 Service status
failed

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.
Do you want to remove the log monitoring service (y/n) ? y
Removed symlink /etc/systemd/system/multi-user.target.wants/charon_logmon_pluto.
service.

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 1.7G/7.6G (21%)

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

Guests list is empty.

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 1.7G/7.6G (21%)

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

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

Enter your choice:
```

Another guest can be added if needed (**2**).

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

Enable/Disable start at server boot

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

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

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

```
Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 221M/7.6G (2%)

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

 1- as4100/pluto              1 256M  ACTIVE           Not found        Y
    Description: CHARON as4100/pluto
    Started: Tue 2016-03-22 15:05:32 CET (PID=31048)
    Network: EWA0/eno67109424

Available options
_____

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

Enter your choice: 3
```

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

```
Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 236M/7.6G (3%)

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

 1- as4100/pluto              1 256M  ACTIVE           Not found        Y
    Description: CHARON as4100/pluto
    Started: Tue 2016-03-22 15:05:32 CET (PID=31048)
    Network: EWA0/eno67109424


Please confirm as4100/pluto boot change to NO (y/n) : y
Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 233M/7.6G (2%)

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

 1- as4100/pluto              1 256M  ACTIVE           Not found        N
    Description: CHARON as4100/pluto
    Started: Tue 2016-03-22 15:05:32 CET (PID=31048)
    Network: EWA0/eno67109424


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

Edit guests lists (for stop order)

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

⚠️ Use with caution, do not add nor delete lines (or at your own risk)

❌ This option is not active for Linux systems using `systemd` (Red Hat Enterprise Linux 7 and Fedora).

✅ For Linux systems using `systemd` (Red Hat Enterprise Linux 7 and Fedora), the services description files will have to be modified to add dependencies using `Before=` or `After=` for example if you want to define a start and stop order.

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

Service management - Start/stop guests

Table of Contents

Description

Manual start and stop of 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                          V2.3a
Service management (Start, Stop, Manage automatic boot & shutdown)


Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 236M/7.6G (3%)

Emulator/Config File        Cpu Mem  State              Stop script     B

- as4100/pluto               1 256M  ACTIVE             Not found       N
  Description: CHARON as4100/pluto
  Started: Tue 2016-03-22 15:05:32 CET (PID=31048)
  Network: EWA0/eno67109424

Available options

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

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

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 254M/7.6G (3%)

Emulator/Config File        Cpu Mem  State              Stop script     B

 1- as4100/pluto              1 256M  ACTIVE             Not found       N
    Description: CHARON as4100/pluto
    Started: Tue 2016-03-22 15:05:32 CET (PID=31048)
    Network: EWA0/eno67109424

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

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

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

```
 Stopping charon_pluto.service at 22-Mar-2016 15:36:04
Mar 22 15:05:32 Started CHARON as4100/pluto.
Mar 22 15:36:04 Stopping CHARON as4100/pluto...
Mar 22 15:36:04 [INFO ] Stopping...
Mar 22 15:36:04 [WARN ] No stop script defined, sending KILL signal to emulator,
 pid 31048
Mar 22 15:36:05 [INFO ] Waiting for process id 31048 termination
Mar 22 15:36:05 charon_pluto.service: main process exited, code=killed, status=9
/KILL
Mar 22 15:36:10 [INFO ] Process id 31048 has terminated
Mar 22 15:36:17 Stopped CHARON as4100/pluto.
Mar 22 15:36:17 Unit charon_pluto.service entered failed state.
Mar 22 15:36:17 charon_pluto.service failed.

 Service status
failed

Press enter
```

```
┌STROMASYS - Virtualization Technologies─────────────────────V2.3a─┐
│  Service management (Start, Stop, Manage automatic boot & shutdown) │
└────────────────────────────────────────────────────────────────┘


Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 1.7G/7.6G (22%)


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

- as4100/pluto                  1 256M  FAILED               Not found        N
   Description: CHARON as4100/pluto
   Stopped: Tue 2016-03-22 15:36:17 CET (signal/KILL)
   Network: EWA0/eno67109424


Available options
────────────────────────────────────────────────────────────────

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

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

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─────────────────────V2.3a─
  Service management (Start, Stop, Manage automatic boot & shutdown)


Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 1.7G/7.6G (22%)

Emulator/Config File        Cpu Mem  State              Stop script     B
───────────────────────────────────────────────────────────────────── ─ ─
- as4100/pluto                1 256M  FAILED             Not found       N
  Description: CHARON as4100/pluto
  Stopped: Tue 2016-03-22 15:36:17 CET (signal/KILL)
  Network: EWA0/eno67109424

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

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

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 1.7G/7.6G (22%)

Emulator/Config File        Cpu Mem  State              Stop script     B
───────────────────────────────────────────────────────────────────── ─ ─
 1- as4100/pluto              1 256M  FAILED             Not found       N
    Description: CHARON as4100/pluto
    Stopped: Tue 2016-03-22 15:36:17 CET (signal/KILL)
    Network: EWA0/eno67109424


                                                          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 22-Mar-2016 15:40:13
Mar 22 15:36:17 charon_pluto.service failed.
Mar 22 15:40:13 Starting CHARON as4100/pluto...
Mar 22 15:40:13 [INFO ] aksusbd monitor service status is: active
Mar 22 15:40:13 [INFO ] Log monitor service status is: active
Mar 22 15:40:13 [INFO ] Verifying license presence
Mar 22 15:40:19 [INFO ] License found.
Mar 22 15:40:19 [INFO ] Checking network settings...
Mar 22 15:40:19 [INFO ] Switching off all offload parameters for interface eno67
109424
Mar 22 15:40:19 [INFO ] Checking vdisk files if any...
Mar 22 15:40:19 [INFO ] Starting emulator: /opt/charon/bin/as4100 -d /charon/plu
to.cfg
Mar 22 15:40:19 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)

20160322:154022:INFO :0:00000350:hexane.cxx(2734):  CHARON-AXP/4100 (AlphaServer
 4100), V 4.7 B 17101, Sep 22 2015 / 1000.800 / 367006676
20160322:154022: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
20160322:154022:INFO :0:0000009D:hexane.cxx(2838):  License info:
CHARON product code: "CHAXP-806xx-xI".
Licensed to: "Stromasys - Bruno Miretti".
Date limited license, limited to: 16/Jun/2016 01:55:00.
Warning: setting the host system date back will permanently invalidate the licen
se key.

20160322:154022:INFO :0:00000097:hexane.cxx(2847):  OS Environment: Linux 3.10.0
-327.3.1.el7.x86_64 #1 SMP Fri Nov 20 05:40:26 EST 2015 x86_64.
20160322:154022: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
20160322:154022:INFO :0:00000099:hexane.cxx(2857):  Host Memory:    7936Mb
20160322:154023:INFO :0:000003F2: srlio.cxx(2526):  OPA0: default log file size
limit is 4194304 bytes
20160322:154024: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.
20160322:154024:INFO :0:0000034B:scsi_disk.( 566):  PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20160322:154024:INFO :0:0000032C:hexane.cxx(2589):  "pluto" started.  ✔
20160322:154024:INFO :0:00000348:scsi_disk.( 554):  PKA_0 is being set OFFLINE
20160322:154024:INFO :0:0000034B:scsi_disk.( 566):  PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20160322:154024:INFO :0:00000348:scsi_cdrom(1233):  PKA_400 is being set OFFLINE
20160322:154024:INFO :0:00000348:scsi_disk.( 554):  PKA_0 is being set OFFLINE
20160322:154024:INFO :0:00000348:scsi_cdrom(1233):  PKA_400 is being set OFFLINE
20160322:154024:INFO :0:0000034B:scsi_disk.( 566):  PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20160322:154024:INFO :0:00000348:scsi_disk.( 554):  PKA_0 is being set OFFLINE
20160322:154024:INFO :0:0000034B:scsi_disk.( 566):  PKA_0 is being set ONLINE
```

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

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

Example3 - Guest stop with stop script defined

Context: Red Hat Enterprise Linux 7.1 server with CHARON-AXP V4.7 installed, as4100/pluto guest running (not booted). Stop script created and customized, using the "`expect`" utility (see "Service management - Create/Edit guest stop script") and the expect script example provided in the kit.

```
┌STROMASYS – Virtualization Technologies─────────────────────V2.3a─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown)│
└───────────────────────────────────────────────────────────────────┘


Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 222M/7.6G (2%)

Emulator/Config File          Cpu Mem  State                Stop script      B
──────────────────────────    ─── ───  ─────                ───────────      ─
- as4100/pluto                  1 256M  ACTIVE               Customized       N
   Description: CHARON as4100/pluto
   Started: Tue 2016-03-22 15:40:19 CET (PID=17556)
   Network: EWA0/eno67109424

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

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

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 223M/7.6G (2%)

Emulator/Config File          Cpu Mem  State                Stop script      B
──────────────────────────    ─── ───  ─────                ───────────      ─
 1- as4100/pluto                1 256M  ACTIVE               Customized       N
      Description: CHARON as4100/pluto
      Started: Tue 2016-03-22 15:40:19 CET (PID=17556)
      Network: EWA0/eno67109424


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

```
 Stopping charon pluto.service at 22-Mar-2016 15:47:24
Mar 22 15:40:19 Started CHARON as4100/pluto.
Mar 22 15:47:24 Stopping CHARON as4100/pluto...
Mar 22 15:47:24 [INFO ] Stopping...
Mar 22 15:47:24 [INFO ] Executing stop script. Emulator pid is 17556.
Mar 22 15:47:2  %EXPECT-I-BEGIN, Starting / UNIX... [2016-03-22 15:47:24]
Mar 22 15:47:2  %EXPECT-I-SNDRET, Sending carriage return... [2016-03-22 15:47:2
4]
Mar 22 15:47:2  %EXPECT-I-FOUND, Found SRM prompt [2016-03-22 15:47:25]
Mar 22 15:47:2  %EXPECT-I-POWEROFF, Sending power off... [2016-03-22 15:47:25]
Mar 22 15:47:2  %EXPECT-S-POWEROFF, power off completed. [2016-03-22 15:47:26]
Mar 22 15:47:2  %EXPECT-I-END, Exited with code 0. [2016-03-22 15:47:28]
Mar 22 15:47:28 [INFO ] Success.
Mar 22 15:47:29 [INFO ] Process id 17556 has terminated
Mar 22 15:47:36 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                    V2.3a
  Service management (Start, Stop, Manage automatic boot & shutdown)


Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 1.7G/7.6G (22%)

Emulator/Config File        Cpu Mem  State                  Stop script      B

- as4100/pluto                1 256M  INACTIVE  REQUESTED   Customized       N
   Description: CHARON as4100/pluto
   Stopped: Tue 2016-03-22 15:47:36 CET (success)        ✓
   Network: EWA0/eno67109424

Available options

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

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

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

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

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

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 1.7G/7.6G (22%)

Emulator/Config File          Cpu Mem  State              Stop script     B

 1- as4100/pluto               1 256M  INACTIVE  REQUESTED Customized      N
     Description: CHARON as4100/pluto
     Stopped: Tue 2016-03-22 15:47:36 CET (success)
     Network: EWA0/eno67109424

 charon_pluto.service status
â charon_pluto.service - CHARON as4100/pluto
   Loaded: loaded (/etc/systemd/system/charon_pluto.service; disabled; vendor pr
eset: disabled)
   Active: inactive (dead) since Tue 2016-03-22 15:47:36 CET; 11min ago
  Process: 25944 ExecStop=/opt/charon/utils/charon_gstart stop /charon/pluto.cfg
 (code=exited, status=0/SUCCESS)
  Process: 16709 ExecStart=/opt/charon/utils/charon_gstart start /charon/pluto.c
fg (code=exited, status=0/SUCCESS)
 Main PID: 17556 (code=exited, status=0/SUCCESS)

Mar 22 15:40:13 rhel70.stromasys.com charon_gstart[16709]: [INFO ] Log monitor s
ervice status is: active
Mar 22 15:40:13 rhel70.stromasys.com charon_gstart[16709]: [INFO ] Verifying lic
ense presence
Mar 22 15:40:19 rhel70.stromasys.com charon_gstart[16709]: [INFO ] License found
.
Mar 22 15:40:19 rhel70.stromasys.com charon_gstart[16709]: [INFO ] Checking netw
ork settings...
Mar 22 15:40:19 rhel70.stromasys.com charon_gstart[16709]: [INFO ] Switching off
 all offload parameters for interface eno67109424
Mar 22 15:40:19 rhel70.stromasys.com charon_gstart[16709]: [INFO ] Checking vdis
k files if any...
Mar 22 15:40:19 rhel70.stromasys.com charon_gstart[16709]: [INFO ] Starting emul
ator: /opt/charon/bin/as4100 -d /charon/pluto.cfg
Mar 22 15:40:19 rhel70.stromasys.com systemd[1]: Started CHARON as4100/pluto.
Mar 22 15:47:24 rhel70.stromasys.com systemd[1]: Stopping CHARON as4100/pluto...
Mar 22 15:47:24 rhel70.stromasys.com charon_gstart[25944]: [INFO ] Stopping...
```

```
Mar 22 15:47:24 rhel70.stromasys.com charon_gstart[25944]: [INFO ] Executing sto
p script. Emulator pid is 17556.
Mar 22 15:47:28 rhel70.stromasys.com charon_gstart[25944]: %EXPECT-I-BEGIN, Star
ting / UNIX... [2016-03-22 15:47:24]
Mar 22 15:47:28 rhel70.stromasys.com charon_gstart[25944]: %EXPECT-I-SNDRET, Sen
ding carriage return... [2016-03-22 15:47:24]
Mar 22 15:47:28 rhel70.stromasys.com charon_gstart[25944]: %EXPECT-I-FOUND, Foun
d SRM prompt [2016-03-22 15:47:25] ✔
Mar 22 15:47:28 rhel70.stromasys.com charon_gstart[25944]: %EXPECT-I-POWEROFF, S
ending power off... [2016-03-22 15:47:25]
Mar 22 15:47:28 rhel70.stromasys.com charon_gstart[25944]: %EXPECT-S-POWEROFF, p
ower off completed. [2016-03-22 15:47:26] ✔
Mar 22 15:47:28 rhel70.stromasys.com charon_gstart[25944]: %EXPECT-I-END, Exited
 with code 0. [2016-03-22 15:47:28]
Mar 22 15:47:28 rhel70.stromasys.com charon_gstart[25944]: [INFO ] Success.
Mar 22 15:47:29 rhel70.stromasys.com charon_gstart[25944]: [INFO ] Process id 17
556 has terminated
Mar 22 15:47:36 rhel70.stromasys.com systemd[1]: Stopped CHARON as4100/pluto.

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

We can see above, the `expect` utility has been used, did connect to the console, found the SRM prompt (the as4100 was not booted) and then issued a "`power off`" command (⚠️ This depends of what you decide to display in the guest stop script)

❓ With Linux systems not using `systemd` (Red Hat Enterprise Linux 6), 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

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

Notes:

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

Example:

```
┌STROMASYS - Virtualization Technologies─────────────────────────V2.3a─┐
│  Service management (Start, Stop, Manage automatic boot & shutdown)  │
└──────────────────────────────────────────────────────────────────────┘


Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 1.7G/7.6G (21%)

Emulator/Config File          Cpu Mem  State                    Stop script      B
─────────────────────────────────────────────────────────────────────────────────
- as4100/pluto                  1 256M  INACTIVE  REQUESTED  Customized         N
   Description: CHARON as4100/pluto
   Stopped: Tue 2016-03-22 15:47:36 CET (success)
   Network: EWA0/eno67109424

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

Enter your choice (enter to refresh, q to quit): 3

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 1.7G/7.6G (21%)

Emulator/Config File          Cpu Mem  State                    Stop script      B
─────────────────────────────────────────────────────────────────────────────────
 1- as4100/pluto                1 256M  INACTIVE  REQUESTED  Customized         N
     Description: CHARON as4100/pluto
     Stopped: Tue 2016-03-22 15:47:36 CET (success)
     Network: EWA0/eno67109424


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

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

Examples

Example1 - Continuous view

We can see below at point:

(**1**) The utility displays the last 12 lines of the current log file. In this case the guest was in stopped state.

(**2**) The log file became inaccessible. Reason the guest has been started hence the current log file was archived and a new one was created

(**3**) The continuous view continues with the newly detected log file

```
Continuous view of /charon/logs/pluto.log
Press CTRL-C to stop (it is recommended to enlarge screen to 132 cols minimum)
_____
container = "/data/disks/pluto_tru64.vdisk"
20160322:154024:INFO :0:00000348:scsi_disk.( 554):  PKA_0 is being set OFFLINE
20160322:154024:INFO :0:0000034B:scsi_disk.( 566):  PKA_0 is being set ONLINE
container = "/data/disks/pluto_tru64.vdisk"
20160322:154024:INFO :0:00000348:scsi_cdrom(1233):  PKA_400 is being set OFFLINE
20160322:154504:INFO :0:000003E6:ll_sentine(1820):  Performing regular license c
heck ...
20160322:154506:INFO :0:000003DC:ll_sentine(1913):  ... found license key 367006
676.
20160322:154724:INFO :0:SERVICE STOP REQUEST
20160322:154726:INFO :0:000003D7:hexane.cxx(4928):  All virtual CPUs of "pluto"
have been stopped by now.
20160322:154726:INFO :0:0000032D:hexane.cxx(2633):  "AlphaServer 4100" stop requ
est received.
20160322:154726:INFO :0:0000014C:lnxpackpor( 416):  EWA0    pping    vork inter
face ... please wait.
20160322:154727:INFO :0:0000032E:hexane.cxx(2651):  Stopped.
tail: â/charon/logs/pluto.logâ has been replaced;  following end of new file
20160322:160513:INFO :0:000003A5:hexane.cxx(5312):  session is loading built-in
configuration "AlphaServer_4100"...
20160322:160513:INFO :0:000003A6:hexane.cxx(5336):  sess    s finished loading
 built-in configuration "AlphaServer_4100".
20160322:160513:INFO :0:000003AA:hexane.cxx(5425):  session is loading configura
tion file "/charon/pluto.cfg"...
20160322:160513:INFO :0:000003AB:hexane.cxx(5455):  session has finished loading
 configuration file "/charon/pluto.cfg".
20160322:160513:INFO :0:000003F2:sesmgr.cxx(1471):  session: default log file si
ze limit is 4194304 bytes
20160322:160513:INFO :0:0000032B:hexane.cxx(2547):  Start request received.
20160322:160514:INFO :0:000003AC:hexane.cxx(1287):  session's process affinity i
s 00000000000000FF, system affinity is 00000000000000FF.
20160322:160514:INFO :0:000003D1:hexane.cxx(1541):  session's I/O domain affinit
y is 0000000000000003, CPU domain affinity is 00000000000000FC
20160322:160514:INFO :0:000003BA:ll_sentine( 725):  Looking for a license key ..
.
20160322:160517:INFO :0:000003DC:ll_sentine( 820):  ... found license key 367006
676.
```

Example2 - Log edition

Select editor view (1), the log file (2), the editor (3) and specify if you want to display or not the "regular license check" messages (4):

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

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 212M/7.6G (2%)

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

 1- as4100/pluto              1 256M  ACTIVE              Customized     N
      Description: CHARON as4100/pluto
      Started: Tue 2016-03-22 16:05:13 CET (PID=2852)
      Network: EWA0/eno67109424


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

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

No  From                     To                    Size        Lines
__  _____   _____ _____  _____

 1  Tue 22-Mar-2016 14:46:49  Tue 22-Mar-2016 15:00:49   4,293      46
 2  Tue 22-Mar-2016 15:05:32  Tue 22-Mar-2016 15:36:04   4,815      52
 3  Tue 22-Mar-2016 15:40:19  Tue 22-Mar-2016 15:47:27   4,308      46
 4  Tue 22-Mar-2016 16:05:13  Tue 22-Mar-2016 16:05:19   3,432      38
      Lock status: <Guest running> <Monitored>

Select the log file you want to view (q to quit, r to refresh): 4    2

File selected: /charon/logs/pluto-2016-03-22-16-05-13-000000000.log


Available editors
n - nano  (basic)
v - vi    (advanced users)
m - vim   (advanced users)
q - quit
Select the editor you want to use: m     3

Do you want the full log or its shortened version without 'regular license   4
check' messages ['f' for full (default), 's' for short, 'q' to quit] ? f
```

Notes:

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

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 Updating the service does not require the guests to be shutdown & restarted
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):

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


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

Emulator/Config File          Cpu Mem  State              Stop script      B

None.

Available options

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

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

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

```
Enter your choice (enter to refresh, q to quit): 4        1

Current: script version in init.d is 2.3
New:     script version in /utils is 2.3a
Do you want to copy from /utils to init.d (y/n) ? y        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                    V2.3a
  Service management (Start, Stop, Manage automatic boot & shutdown)


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

Emulator/Config File        Cpu Mem  State                Stop script      B

- as4100/pluto                1 256M  ACTIVE               Customized       N
  Description: CHARON as4100/pluto
  Started: Tue 2016-03-22 16:05:13 CET (PID=2852)
  Network: EWA0/eno67109424

Available options

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

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

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

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

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

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

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

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

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

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

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

Result:

```
┌STROMASYS - Virtualization Technologies─────────────────────────V2.3a─┐
│  Service management (Start, Stop, Manage automatic boot & shutdown)  │
│                                                                      │
│                                                                      │
│ Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 213M/7.6G (2%)
│                                                                      │
│ Emulator/Config File          Cpu Mem  State              Stop script    B
│ ──────────────────────        ─── ───  ─────              ───────────    ─
│ - as4100/pluto                 1 256M  ACTIVE             Customized     N
│   Description: CHARON as4100/pluto DEMO
│   Started: Tue 2016-03-22 16:05:13 CET (PID=2852)
│   Network: EWA0/eno67109424
│
│ Available options
│ ─────────────────────────────────────────────────────────────────────
│ 1 - Update guests list         5 - Create/Edit guest stop script
│ 2 - Start/stop guests          6 - Connect to guest console
│ 3 - View latest guest log file 7 - Edit configuration files
│ 4 - Manage 'systemd' services  8 - Manage monitored guests logs
│
│ Enter your choice (enter to refresh, q to quit): ▯
```

Service management - Create/Edit guest stop script

Table of Contents

Description

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

If the script does not exist, it will be generated automatically based on existing guests list and will by default do nothing except preparing the script skeleton. ⚠ Guests added after script creation will have to be inserted manually.

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

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

Notes:

- ■ "`ssh`" will require a trust to be created between the Linux server and the Tru64 or OpenVMS guest.

- ■ "`expect`" will require you pass user and password to the script to enable it to connect to the OPA0 console via '`telnet`' and execute the shutdown commands. The "`guest_shutdown.exp`" script can perform operations to log off a user connected on the console (if the prompt is detected), enter a username/password to login (if "`login:`" or "`username:`" is detected), execute the shutdown command (if the prompt is detected) and detect the SRM prompt (>>>) to issue the "`power off`" command (AXP) or send the F6 key (VAX) if enabled.
    - ■ Note any local existing connection to the console has to be killed before executing the expect script.
    - ■ ⚠ If the console is locked from an external connection or if the prompt is not detected after sending a carriage return, the expect script will fail.

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

Explanation on the example file

Example with SSH, Tru64 guest

💡 An `ssh` trust between the CHARON Linux server and the Tru64 guest must have been previously configured in order to use this method.

- ■ 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. ℹ 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

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   po   of   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.

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 15:07:2  %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 15:07:33 Stopped CHARON as4100/pluto DEMO.

 Service status
inactive

Press enter
```

Example with Expect tool, AXP VMS guest

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
    #-------------------------------------------------------------------------
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 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
    ;;
```

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

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
    #-------------------------------------------------------------------------
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:
    #
    # *** 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}
    ;;
```

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

Optional guest display status script

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

This status line is the result of the command you executed for that guest, for example a `ping`, an `ssh` command displaying `uptime` (Tru64) or `boottime` (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 "$1"
in                                              Tru64
  /opt/charon/cfg/pluto.cfg)
    ssh -o ConnectTimeout=2 pluto "uptime cut -f1 -d','" 2>/dev/null
    RETVAL=$?
    ;;                          OpenVMS
  /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}
```

ℹ️ Example file is: "`/opt/charon/utils/charon_gstart.chkrun.example`"

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

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

<u>Notes</u>:

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

Example

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

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

```
STROMASYS - Virtualization Technologies                        V1.5
  Edit configuration files

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 172M/7.6G (2%)

Emulator/Config File          Cpu Mem  State              Stop script      B

 1- as4100/pluto                1 256M  ACTIVE             Customized       N
      Description: CHAR    4100/pluto DEMO
      Started: Tue 2016-0 -22 16:05:13 CET (PID=2852)
      Network: EWA0/eno67109424(2)

Caption: (2)=NIC not managed by ncu



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

Available editors
n - nano  (basic)
v - vi    (advanced users)
m - vim   (advanced users)
Select the editor you want to use: m
```

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

```
┌─STROMASYS - Virtualization Technologies──────────────────────V1.5─┐
│  Edit configuration files                                         │
│                                                                   │
└───────────────────────────────────────────────────────────────────┘

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

 AS4100 / pluto - demo for documentation purpose
 DKA0   = Tru64 V5.1b system disk
 DKA400 = Tru64 installation CDROM O1 (iso)


 Checking virtual disks (.vdisk) files...
- /data/disks/pluto_nofile.vdisk: file does not exist or is empty   ✘
Done.

 Checking network interfaces...
Warning/ncu: Interface 'eno67109424' is not managed by 'ncu' (EWA0)  ✘

Press enter
```

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

```
┌─STROMASYS - Virtualization Technologies──────────────────────V1.5─┐
│  Edit configuration files                                         │
│                                                                   │
└───────────────────────────────────────────────────────────────────┘

 Configuration description
Configuration file: /charon/pluto.cfg
Log file is set to: /charon/logs/pluto.log (rotating log file)  ✔

 AS4100 / pluto - demo for documentation purpose
 DKA0   = Tru64 V5.1b system disk
 DKA400 = Tru64 installation CDROM O1 (iso)


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

 Checking network interfaces...
Done. ✔

Press enter
```

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

Table of contents

Description

Use this option to connect to the guests consoles.

Notes:

- ⚠️ "`telnet`" package must be installed, it will be used to connect from the CHARON server to the virtual machine console
- The session will be recorded in a log file:
  - If '`set OPA0 log=`' is found in the configuration file (not available with all CHARON products versions), the log will be stored in the temporary folder: '`/tmp/console.<configuration file name shortened>.tmp.log`' and will be overwritten for each session. It is just kept for information as the console log is managed by the CHARON emulator itself.
  - If there is no '`set OPA0 log=`' line in the configuration file, the file will be located in '`/opt/charon/log/console.<configuration file name shortened>.log`'
- If '`stop_on`' and/or '`break_on`' features are enabled in the configuration file, this will be reminded before starting the telnet session
- To leave the telnet session, press the escape character which is by default **CTRL** + **]** . 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 another location, it will be displayed but will not be killed. This will have to be done manually.
- Emulator termination check:
  - For CHARON-AXP, if the '`power off`' command is detected (or shortened command), the guest STOP state will be set to REQUESTED
  - If the emulator is no more running when you leave the session, you will have to confirm that is requested or not
- 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 CHARON-AXP versions V4.4 and older 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 with output log recording will be engaged in the background.

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

Special comments in configuration file

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

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

Example:

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

set session log = "/charon/logs"

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

set session n_of_cpus=1
set ram size=256

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

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

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

#INFO: DKA0   = Tru64 V5.1b system disk ✔
set PKA container[0] = "/data/disks/pluto_tru64.vdisk"
#INFO: DKA400 = Tru64 installation CDROM O1 (iso) ✔
set PKA container[400] = "/kits/V5.1Br2650_O1.iso"
```

Example

```
┌─STROMASYS - Virtualization Technologies──────────────────────────V1.16c─┐
│  Connect to guest console                                               │
└─────────────────────────────────────────────────────────────────────────┘

Server boot: 05-Feb-2016 11:32   CPUs: 8   Memory(free/tot): 165M/7.6G (2%)

Emulator/Config File           Cpu Mem  State              Stop script      B
─────────────────────          ─── ───  ─────              ───────────      ─
 1- as4100/pluto                1 256M  ACTIVE             Customized       N
      Description: CHARON as4100/pluto DEMO
      Started: Tue 2016-03-22 16:05:13 CET (PID=2852)
      Port: 10003
      Console log/configuration file: /charon/logs
      Network: EWA0/eno67109424

 a- Enable/disable console autoconnect feature (state is disabled)
 k- Kill active telnet connection(s) on console(s)
 v- View console log files

Choice ('q' to quit): 1

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

──────────────────────────────────────────────────────────────────────────

Configuration description:
 AS4100 / pluto - demo for documentation purpose
 DKA0   = Tru64 V5.1b system disk
 DKA400 = Tru64 installation CDROM O1 (iso)

──────────────────────────────────────────────────────────────────────────


Press enter
```

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

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

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

 WARNING   The virtual machine can be powered off by pressing F6
 WARNING   The virtual machine can be stopped by pressing CTRL-P
Script started, file is /tmp/console.pluto.tmp.log
Trying ::1...
telnet: connect to address ::1: Connection refused
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.

P00>>>
```

Manage monitored guests logs

Description

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

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

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

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

Management

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

Example1 - Red Hat Enterprise Linux 6:

Example2 - Red Hat Enterprise Linux 7:

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


Service status

aksusbd monitoring service is enabled, running ✓

Logs checked / Monitoring status

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

Available options

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

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

Notes:

- The list of 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
    - On rare cases, the dongle can be seen as unplugged whereas it is still plugged in leading the virtual machine to stop. The log monitoring feature is then able to detect this case and perform the necessary actions. More information is available in our Knowledge base in this article: CHARON for Linux - Detected removal of the license whereas dongle is connected
- 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

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

Notes:

⭐ Only for guests defined in the Service management (Start, Stop, Manage automatic boot & shutdown) menu option

💡 Do not send these files directly to our support team otherwise the sender will not be recognized by our ticketing tool: first send it to you then forward it to our support team

✅ By default, the 3 most recent log files and the configuration file will be included in the email, zipped

ℹ️ Email subject will be "[CHARON] Configuration and log files for XXXX" where "XXXX" represents the shortened configuration file name (without extension).

ℹ️ Configuration and log files (latest 64 lines) will be displayed within the message body and will also be attached to the email (zip file)

Example

```
┌─STROMASYS - Virtualization Technologies─────────────────────V1.5─┐
│ Send configuration and log files via mail                        │
│                                                                  │
└──────────────────────────────────────────────────────────────────┘

Server boot: 05-Feb-2016 11:32  CPUs: 8  Memory(free/tot): 173M/7.6G (2%)

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


Enter the email recipient (q to quit) [bruno.miretti@stromasys.com]:      ◀ 1

Number of logs to send [default = 3 latest] '('q' to quit) : 7  ◀ 2

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

Press enter
```
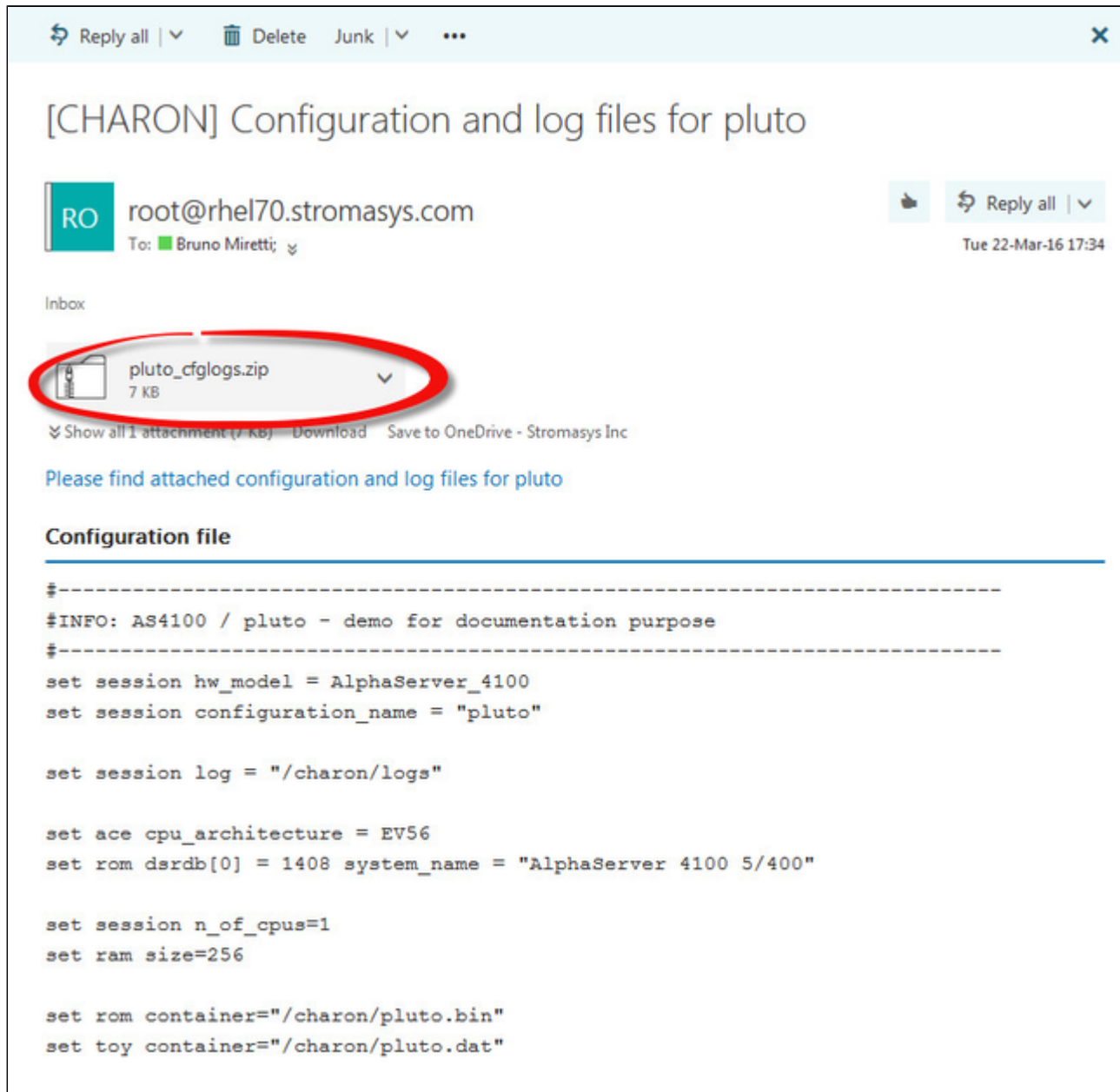
Below is an example of email received:

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

Table of Contents

Description

Use this option to check and open 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: █
```

Notes:

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

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

Scheduled jobs details

Expiration check alert (charon_expchk)

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

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

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

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

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

The '-nomail' parameter can be used to make the script check if the license dongle can be read: if not or if a timeout is detected, the `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

Table of contents

Description

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

```
STROMASYS - Virtualization Technologies──────────────────────────V1.1a──
 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 7.1 Toolkit
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 (18 alerts)    Last update: Tue 22-Mar-2016 16:05:28
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 that sends emails (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:
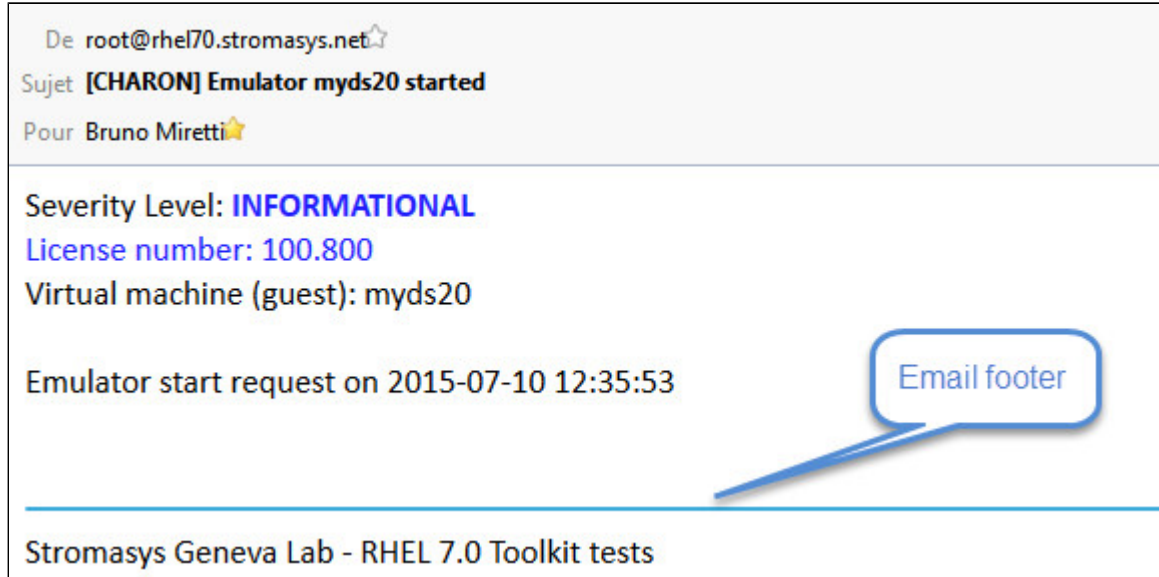
Enable/disable wall alert messages

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

Update/reinstall common alert script

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

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

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

- Answer "`yes`" if you did not change the original script file and you have updated the Linux Toolkit (read the corresponding release notes)
- Do not answer "`yes`" if you customized your own alert script.
  - 💡 In case you've overwritten the existing alert script, the previous version can be restored from the "`/charon/archive`" folder

Example:

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

All other parameters are information related to the alert. The script uses templates in order to send emails and `wall` messages (see "`/opt/charon/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 have the following values:

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)"

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

View alerts history

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

Example - Continuous view:

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

20160322:160522:ALERT:Emulator pluto started                  (1)
Severity Level: INFORMATIONAL
License number: 1000.800
Virtual machine (guest): pluto

Emulator start request on 2016-03-22 16:05:13


20160322:160528:ALERT:License dongle found for pluto          (2)
Severity Level: INFORMATIONAL
License number: 1000.800
Key ID: 367006676
Description: Main license, path 2/0/0
Virtual machine (guest): pluto

Date limited license, limited to: 16/Jun/2016 01:55:00.


20160322:174611:ALERT:License dongle disconnected             (3)
Severity Level: MAJOR

Disconnection of a USB license dongle detected (1 connected)
This can be due to physical disconnection or USB and/or HASP driver reset (aksus
bd)
Please check.


20160322:174704:ALERT:License dongle found for all CHARON virtual machines on se
rver rhel70.stromasys.com                                      (4)
Severity Level: INFORMATIONAL
License number: 1000.806
Key ID: NA
Description: NA
Virtual machine (guest): all CHARON virtual machines on server rhel70.stromasys.
com

Detected connection of a USB license dongle
Connected: 2
```

We can see above:

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

💡 Press CTRL-C to get back to the previous menu

License expiration alerts from guests

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

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

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

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

Description

Opens a submenu that provides information on the CHARON server:

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

Output can be:

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

Menu options list

```
┌STROMASYS - Engineered solutions──────────────────────────────┐
│ STROMASYS - Virtualization Technologies V1.44                │
└──────────────────────────────────────────────────────────────┘
Show host Information (full)
  1 - Display with enhanced video
  2 - Display pure text
  3 - Send pure text file to recipient
  4 - Generate and open HTML file
  5 - Send HTML file to recipient
Show host Information (by group)
  6 - Operating system
  7 - Hardware
  8 - Storage
  9 - Network
 10 - CHARON version
 11 - CHARON utils and services

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

Documentation

Description

Use this option to:

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

> **Note**
> Please note the users guide and the release notes latest versions will be available first on our online product documentation web site. The kit attached documents, could be outdated.

Menu options

```
STROMASYS - Engineered solutions
STROMASYS - Virtualization Technologie V1.46

Documentation
  1 - Local PDF document (evince)
  2 - Online documentation (firefox)
  3 - Product documentation and Knowledge Base (firefox)
CHARON Linux Toolkit version 1.46 (23-Nov-2016 11:26)
  4 - View release notes (vi)

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

Additional command lines

Table of Contents

Virtual machines list and status (vmlist)

Usage

```
# vmlist
```

Description

Display the list of managed virtual machines and their status

Parameters

-h   : display help text

Example

```
# vmlist
Server boot: 26-Jul-2016 16:16  CPUs: 3  Memory(free/tot): 122M/3.7G (3%)

Emulator/Config File          Cpu Mem  State                 Stop script      B

- as4100/pluto                  1 256M  ACTIVE                Customized       N
    Auto-restart: on-failure after 20s, max 2 times in 600 seconds
    Description: DEMO as4100 pluto
    Started: Wed 2016-11-23 11:51:45 CET (PID=23667)
    Network: EWA0/eno50332216
```

Virtual machine log view (logview)

Usage

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

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

Description

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

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

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

Parameters

-h   : display help text

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

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

Example

```
[root@rhel70 utils]# logview
Log files found
 1 - /charon/mvax4106.log
     Configuration: /charon/mvax4106.cfg
     Lines: 79 - Dated 2016-03-11 15:55:10

 2 - /charon/logs/myds20.log
     Configuration: /charon/myds20.cfg
     Lines: 232 - Dated 2016-03-14 12:32:32 (rotating log file)

Select the log file (q to quit): 2
```

```
20160314:123232:INFO :0:000003A5:hexane.cxx(5312):  session is loading built-in configuration "AlphaServer_DS20"...
20160314:123232:INFO :0:000003A6:hexane.cxx(5336):  session has finished loading built-in configuration "AlphaServer_DS20".
20160314:123232:INFO :0:000003AA:hexane.cxx(5425):  session is loading configuration file "/charon/myds20.cfg"...
20160314:123232:INFO :0:000003AB:hexane.cxx(5455):  session has finished loading configuration file "/charon/myds20.cfg".
20160314:123232:INFO :0:000003F2:sesmgr.cxx(1471):  session: default log file size limit is 4194304 bytes
20160314:123232:INFO :0:0000032B:hexane.cxx(2547):  Start request received.
20160314:123233:INFO :0:000003AC:hexane.cxx(1287):  session's process affinity is 00000000000000FF, system affinity is 0000000000000
0FF.
20160314:123233:INFO :0:000003D1:hexane.cxx(1541):  session's I/O domain affinity is 0000000000000003, CPU domain affinity is 000000
00000000FC
20160314:123233:INFO :0:000003BA:ll_sentine(725):   Looking for a license key ...
20160314:123235:INFO :0:000003DC:ll_sentine(820):   ... found license key 1619329274.
20160314:123235:INFO :0:0000024D:hexane.cxx(2688):  STROMASYS SA, (C) 2009-2015
20160314:123235:INFO :0:00000350:hexane.cxx(2734):  CHARON-AXP/DS20 (AlphaServer DS20), V 4.7 B 17101, Sep 22 2015 / 1000.806 / 1619
329274
20160314:123235:INFO :0:00000336:hexane.cxx(2761):  The end user of this software has agreed to STROMASYS' Terms and Conditions for
Software License and Limited Warranty, as described at: http://www.stromasys.com/pub/doc/30-17-033.pdf
20160314:123235:INFO :0:0000009D:hexane.cxx(2838):  License info:
CHARON product code: "CHAXP-802xx-xI".
Licensed to: "Stromasys - Bruno Miretti".
Date limited license, limited to: 11/Aug/2016 01:55:00.
Warning: setting the host system date back will permanently invalidate the license key.
```

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

Virtual machine log tail (logtail)

Usage

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

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

Description

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

Press <CTRL-C> to stop the view.

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

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

Parameters

-h : display help text

Example

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

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

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

Tips and Tricks

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'vi' and 'vim' text editors

Notes:

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

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

'gedit' graphical editor

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

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

'nano' text editor

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

How to setup 'ssh' trusts between Linux and Tru64

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

- Generate the key

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

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

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

- Define the **authorization** file:

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

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

```
Linux# ssh tru64host date
```

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

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

How to setup 'ssh' trusts between Linux and VMS

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

- Enable SSH on the VMS server:

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

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

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

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

```
Linux# ssh-keygen -t rsa

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

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

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

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

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

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

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

- Perform some tests (examples)

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

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

Shutdown guests with Expect tool

Introduction

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

⚠ In this case the password is sent without encryption.

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

> `'telnet'` and `'expect'` packages must be installed in order to use this feature.
>
> The following error message can be returned when stopping the virtual machine when trying to use the expect script example:
>
> - if expect package is not installed: "`Stop script returned error code 126`".
> - if telnet is not installed: "`%EXPECT-F-NOSRM, Cannot continue, 'telnet' is not installed`" then "`Stop script returned error code 4`"
>
> Caution: the virtual machine process will be however killed by service management process

> **Console locked:**
>
> Any active session to the console must be killed before the `"expect"` script is executed.
>
> 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

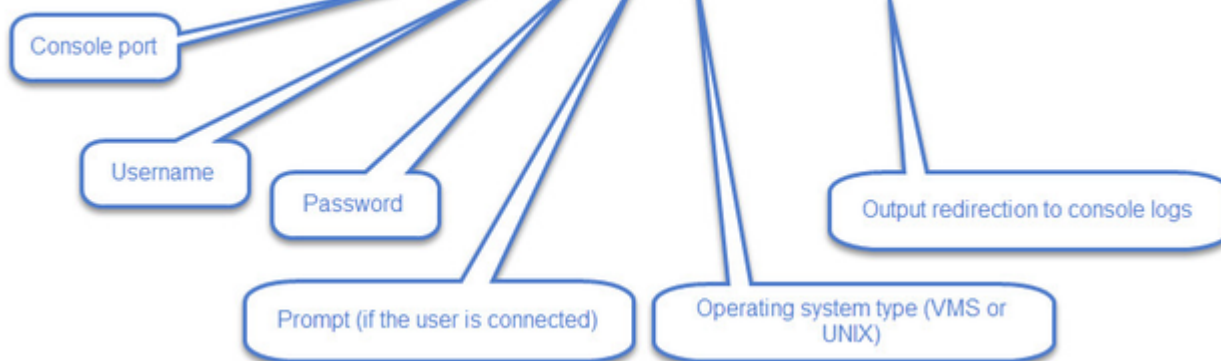**Usage**:

```
# 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:

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

Alert emails examples

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License dongle not present

[CHARON] License key not found at boot

root@charonrhel64.localdomain

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

Severity Level: **CRITICAL**

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

STROMASYS GENEVA LAB - Linux Utilities SOURCES

License dongle now connected

[CHARON] License key found for GLOBAL

root@charonrhel64.localdomain

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

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

aksusb daemon: detected usb connection

STROMASYS GENEVA LAB - Linux Utilities SOURCES

Emulator start information

[CHARON] Emulator vms started

root@charonrhel64.localdomain

Sent: Tue 4/15/2014 1:41 PM
To: Bruno Miretti

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

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

STROMASYS GENEVA LAB - Linux Utilities SOURCES

Emulator start - License information

[CHARON] License key found for vms

root@charonrhel64.localdomain

Sent: Tue 4/15/2014 1:41 PM
To: Bruno Miretti

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

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

STROMASYS GENEVA LAB - Linux Utilities SOURCES

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.

STROMASYS GENEVA LAB - Linux Utilities SOURCES

Dongle disconnection: emulator detection based on check interval

[CHARON] License key removed

root@charonrhel64.localdomain

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

To: Bruno Miretti

Severity Level: **CRITICAL**

License number: 1000.800

Hostname: vms

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

Normal operation is supported for 59 minutes from now.

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

LSUSB state: DISCONNECTED

STROMASYS GENEVA LAB - Linux Utilities SOURCES

Dongle false disconnection detected - recovery action engaged

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

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

Sent: Tuesday, May 9, 2017 04:10

To: Bruno Miretti

Subject: [CHARON] License dongle removed or connection issue

Severity Level: **CRITICAL**

License number: 1000.800

Virtual machine (guest): mvax4106

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

Normal operation is supported for 4 minutes from now.

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

LSUSB state: CONNECTED

WARNING:

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

Stromasys Geneva Lab - RHEL 7.2 Toolkit tests (153)

Other messages will be sent:

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

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

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

Emulator stopped - no action taken

[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.

STROMASYS GENEVA LAB - Linux Utilities SOURCES

Emulator stopped by user request

[CHARON] Emulator vms stopped

root@charonrhel64.localdomain

Sent: Mon 4/14/2014 5:21 PM
To: Bruno Miretti

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

Emulator stopped at 2014-04-14 17:21:09
Service stop requested by user or shutdown.

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

STROMASYS GENEVA LAB - Linux Utilities SOURCES

License expiration check

[CHARON] License expiration check

✕ SUPPRIMER   ← RÉPONDRE   ⇐ RÉPONDRE À TOUS   → TRANSFÉRER   •••

root@rhel70.stromasys.net

mar. 18/08/2015 09:00

marquer comme non lu

À : Bruno Miretti;

Alert requested 15 days before expiration

License: 100.800 (USB)
Description: Main license, path 2/0/0

No expired product found.

License: 1000.806 (USB)
Description: Backup license, path 1/0/0

Product: CHARON-AXP/DS20, Time remaining: 0 hours and 0 minutes, severity EXPIRED
Product: CHARON-VAX/XM for Windows, Time remaining: 0 hours and 0 minutes, severity EXPIRED

Please contact your reseller or support@stromasys.com

Stromasys Geneva Lab - RHEL 7.0 Toolkit tests

Quick Setup Guide

Introduction

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

Preparation

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

  ```
  # mkdir /charon
  ```

- Download the kits in this folder from the Stromasys sftp server using 'sftp' or your browser with the link provided by Stromasys.

- Optionally create a folder where to store your licenses (C2V and V2C files)
  Example:

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

- Install the CHARON Linux Toolkit as described in the Setup page.

- Install the CHARON product(s) you need from menu option "Install/Upgrade/Remove CHARON"

- Dedicate network interfaces to CHARON using menu option "Network Configuration Utility" (see your CHARON product documentation / networking chapter).

- Check the license can be read using the "HASP license details" menu option

- Prepare your configuration file(s) or use the clone utility available from the "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
  ```

Virtual machines creation

- 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

    - ℹ️ The log file monitoring service is created automatically.

- Connect to the guest console using the "Connect to guest console" menu option and install or restore the operating system. If '`telnet`' is not installed, you can connect via `putty` for example (⚠️ in this case some firewall settings will have to be set, see Connection to guest console blocked by firewall)

Post installation checks

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

    - If you enabled the '`wall`' alerts from the "Alerts management" menu, you should receive an immediate '`wall`' message.

    - If you disabled the '`wall`' alerts from the "Alerts management" menu (default), you can have a look at the alerts history from the "Alerts management" menu

    - If the mail has been correctly configured, you will receive an alert with subject: "[CHARON] License dongle disconnected" quite immediately. The immediate alert can be followed by an alert coming from the virtual machine log monitoring announcing the time remaining before stop

Appendixes

Contents

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

Table of contents

Description

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

Step-by-step guide

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

1. Setup your CHARON virtual machine as a service. To do so, refer to the corresponding documentation.
   Example: Running CHARON-AXP for Linux - Running as system service

2. Edit the service configuration file and add the following parameters:

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

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

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

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

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

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


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

3. Reload systemd manager configuration:

```
# systemctl daemon-reload
```

Notes

Autoboot

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

Example:

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

Restart limit reached

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

Example:

```
# systemctl start charon_pluto

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

# systemctl status charon_pluto

charon_pluto.service - DEMO as4100 pluto

   Loaded: loaded (/etc/systemd/system/charon_pluto.service; disabled)

   Active: failed (Result: start-limit) since Mon 2015-09-28 15:59:36 CEST; 3min 10s ago

  Process: 67122 ExecStop=/opt/charon/utils/charon_gstart stop /charon/pluto.cfg (code=exited,
status=0/SUCCESS)

  Process: 62391 ExecStart=/opt/charon/utils/charon_gstart start /charon/pluto.cfg (code=exited,
status=0/SUCCESS)

 Main PID: 62795 (code=killed, signal=KILL)


Sep 28 15:59:16 rhel71.localdomain systemd[1]: Unit charon_pluto.service entered failed state.

Sep 28 15:59:36 rhel71.localdomain systemd[1]: charon_pluto.service holdoff time over, scheduling restart.

Sep 28 15:59:36 rhel71.localdomain systemd[1]: Stopping DEMO as4100 pluto...

Sep 28 15:59:36 rhel71.localdomain systemd[1]: Starting DEMO as4100 pluto...

Sep 28 15:59:36 rhel71.localdomain systemd[1]: charon_pluto.service start request repeated too quickly,
refusing to start.

Sep 28 15:59:36 rhel71.localdomain systemd[1]: Failed to start DEMO as4100 pluto.

Sep 28 15:59:36 rhel71.localdomain systemd[1]: Unit charon_pluto.service entered failed state.

Sep 28 15:59:54 rhel71.localdomain systemd[1]: Starting DEMO as4100 pluto...

Sep 28 15:59:54 rhel71.localdomain systemd[1]: charon_pluto.service start request repeated too quickly,
refusing to start.

Sep 28 15:59:54 rhel71.localdomain systemd[1]: Failed to start DEMO as4100 pluto.

# systemctl reset-failed charon_pluto

# systemctl start charon_pluto

# systemctl is-active charon_pluto

active
```

CHARON Linux Toolkit integration

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

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

Example:

```
┌─STROMASYS - Virtualization Technologies────────────────V2.2b─┐
│ Service management (Start, Stop, Manage automatic boot & shutdown)
│
│ Server booted on: Wed 29-Jul-2015 13:43:00 - Current: Mon 28-Sep-2015 16:11:32
│ Number of CPUs: 3 - Memory(free/tot): 832,136kB / 3,868,776kB (21%)
│
│ Emulator/Config File          Cpu Mem  State            Stop script      B
│ ────────────────────────      ─── ───  ───────────      ───────────
│ - as4100/pluto                  1 256M ACTIVE           Customized       N
│   Auto-restart on-failure after 20s, max 2 times in 600 seconds
│   Description: DEMO as4100 pluto
│   Started: Mon 2015-09-28 16:03:39 CEST (PID=70658)
│
│ Available options
│ ─────────────────────────────────────────────────────────────
│ 1 - Update guests list          6 - Create/Edit guest stop script
│ 2 - Start/stop guests           7 - Connect to guest console
│ 3 - View latest guest log file  8 - Edit configuration files
│ 4 - View guest manager log file 9 - Manage monitored guests logs
│ 5 - Manage 'systemd' services   q - quit
│
│ Enter your choice (enter to refresh): █
```

Links

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

Related articles

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

Connection to guest console blocked by firewall

Problem

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

This can be caused by firewall settings.

Example1:

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

Example2:

```
# telnet charonserver 10003

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

Solution

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

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

# iptables -I INPUT -p udp --dport <port> -j ACCEPT

# service iptables save
```

Example:

```
# iptables -I INPUT -p tcp --dport 10003 --syn -j ACCEPT

# iptables -I INPUT -p udp --dport 10003 -j ACCEPT

# iptables -I INPUT -p tcp --dport 10004 --syn -j ACCEPT

# iptables -I INPUT -p udp --dport 10004 -j ACCEPT

# service iptables save
```

Related articles

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