Enabling system crash dumps on RHEL6

1 Introduction

In order to debug a system freeze (kernel/driver crash) it is necessary to capture the system state at the moment of the freeze. The linux kernel offers the possibility to automatically write such a system state as a crash dump when it detects a critical condition (that would otherwise result in a system freeze or reboot).

The crash dump is created as a physical file. This will occupy space on a disk. Because of this and also because it may take several minutes until the crash dump is completely written to disk this feature is usually not enabled by default.

The result of a successful crash dump is a single file named "vmcore" that may vary in size but could in theory be as big as the total amount of system RAM (but usually it will be smaller).

2 Setup

RHEL6 offers a graphical tool to configure the crash dump. It can be found in the `System/Administration` menu as "`Kernel crash dumps`"
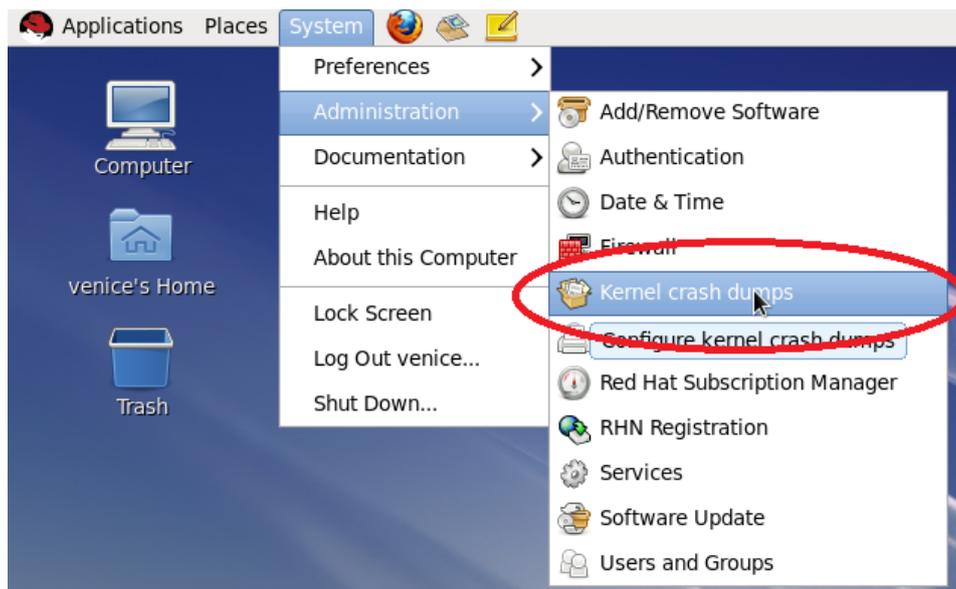
The tool's UI mostly consists of four vertical tabs which display the `Basic`, `Target`, `Filtering` and `Expert` settings.

If the Kernel Dump setup is still disabled there will be a green "Enable" button in the toolbar and no tabs can be edited. So in this case the first thing to do is to press "Enable".
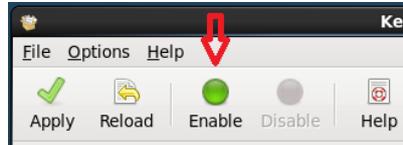
Then, in the `Basic Settings` tab:

- enable "`Manual kdump memory settings`"

- set "`New kdump Memory`" to **256 (MB)**. This needs to be set manually since experience shows that the default "automated" size of around 128 MB is not enough (in this case no file is written and the system just gets stuck).
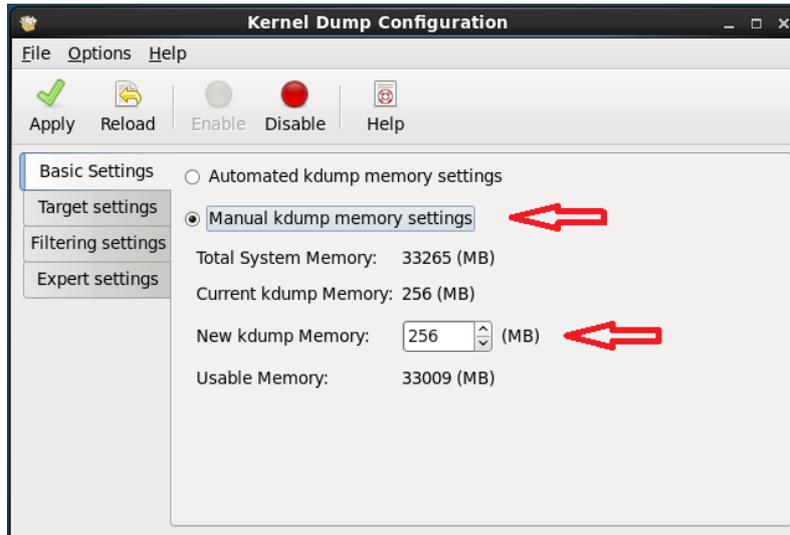
In the `Filter settings` tab:

- make sure "`zero page`", "`user data`" and "`free page`" are enabled.
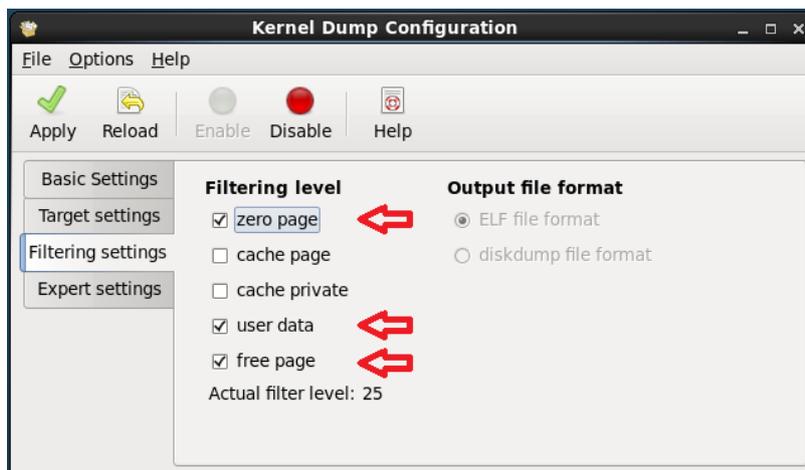
The two remaining tabs can usually be left at the default setting but will be briefly explained here for completeness.

The `Target Settings` tab allows to set where the crash dump will be stored. This should by default already be set to path "*/var/crash*". Each new crash dump will create a new subdirectory so two crash dumps do not overwrite each other. **Careful: this may fill up the system disk over time if old crash dumps aren't removed!**
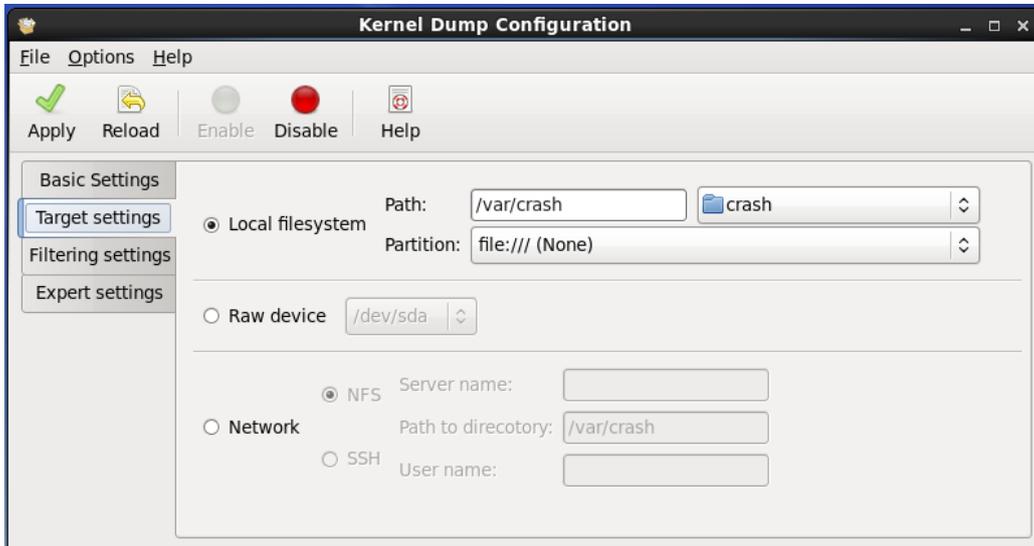
The `Expert settings` tab allows to fine tune certain settings. Their defaults should be ok.
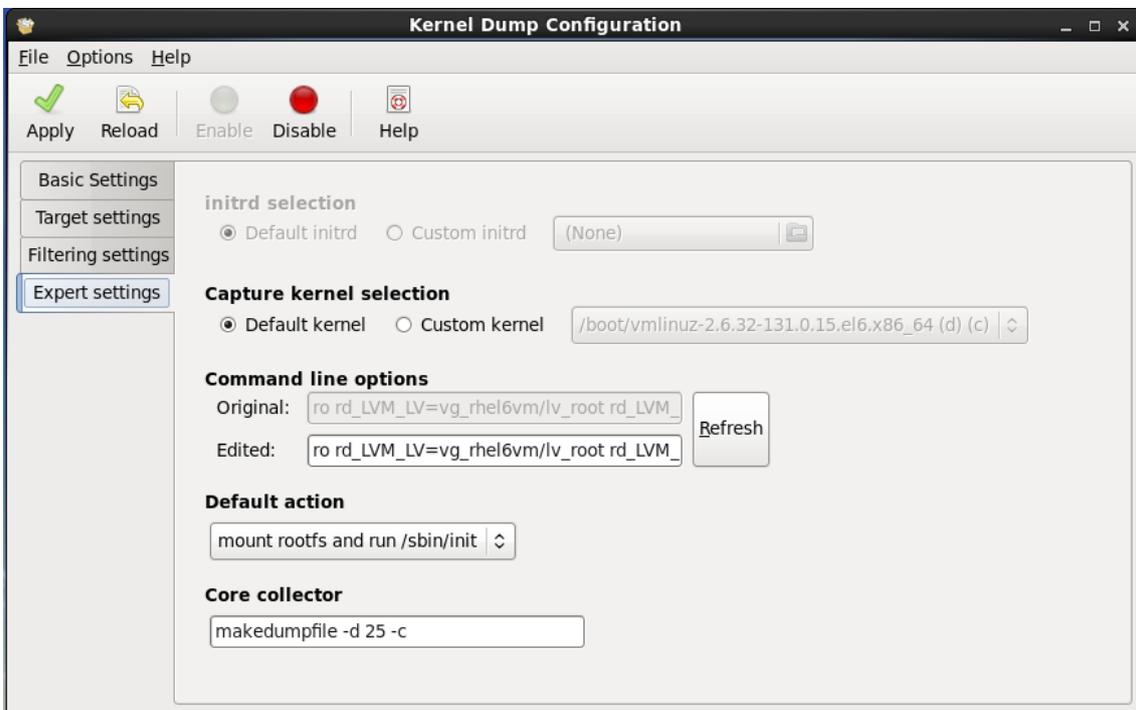
After everything is configured the final step is to press the "Apply" button. Depending on the system user that started the GUI tool it may be necessary to provide the root password several times.

Finally, the system needs to be restarted for these settings to become effective and the crash dump writer to become active.

To check if the crash kernel is indeed active one can look at the output of the dmesg command. In a console, type:

```
dmesg | grep Reserving
```

The result should look something like this:

```
Reserving 256MB of memory at 48MB for crashkernel (System RAM: 34816MB).
```

3 System crash

The next time a system crash occurs the kernel will write a crash dump file called "vmcore" which can be found in the target directory as set in the `Target settings` tab.

During this time the system may appear stuck since the graphics card is possibly not reconfigured. The screen output may also be garbled. But the hard disk should show activity.

If the crash dump was successful after several minutes (depending on how much data there is to write) the system will just reboot and restart.

After a restart the "vmcore" file will show up in a directory that is named after the time and date of the crash.

E.g.:

```
ls /var/crash
  2014-04-09-10:58:29
ls /var/crash/2014-04-09-10:58:29
  vmcore
```

The "vmcore" file is only readable by the root user so it may be necessary to change ownership before copying.