How to replace Vela

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0.1 Diagnosing a disk crash on Vela

The first thing to do is to make sure that the problem really is a disk crash. Try to reboot VELA (see the section on how to reboot the HPs). If you can't login from the console, try to login from PUPPIS via `telnet`. If you get a login prompt but can't get in with `daprog` or any of the Pegasus accounts, try `observer` (guest password) or `root`. These two accounts only use the internal disk and should work even if the external disk has crashed. As a last resort, cycle the power to VELA — but don't do this until you have tried all other possibilities!

Watch the output on the console during the boot process! The computer should report that it has found a disk to boot from and then report the status of all attached disks (hopefully seeing messages saying something like "`filesystem clean`"). If the machine does not boot up to the login screen or you do get the login screen but can't login as `daprog` or on any of the colour accounts, then you are in trouble!!!

Let's start with the case where you can get a login prompt, either on the console or via `telnet` from PUPPIS.

If you can log in as `observer` (guest password) or as `root`, then the root-disk should be OK. Try the command `bdf`. The system should respond with one line of data for each of the six file systems installed on VELA: `/`, `/aux2`, `/archive`, `/cdscr`, `/logs` and `/alt`. "`/`" represents the root-disk which is a 2 GB internal disk, while the other five file systems reside on an external 8.7 GB disk.

If you can see all six of them, then things are not catastrophically bad. Make sure that none of the file systems has been filled up, i.e. "`%used`" must not be 100%! If this should be the case, you must clean up the full file system. If "`/`" is full, check out the directories `/tmp` and `/var/tmp`. However, be sure that you don't delete any important files (see the instructions on file cleaning in the section covering the bi-weekly tasks)! If `/aux2` is full, look through the different Pegasus accounts and try to find files that can be erased. If you don't want to erase files, you can try to move them to another file system, for example `/cdscr`.

If you can't see all of them, try "`mount -a`" (you need to be `root`) followed by `bdf`. If you still do not have the six file systems online (and you probably won't), the external disk is bad.

The computer makes a quick check of the disks when it boots, but you can force it to make a more extensive check with the command `check_disks`. All disks except the root-disk should be unmounted when you run `check_disks`. For more instructions on how to use this program, see the chapter on bi-weekly maintenance tasks. It is a good idea to run a thorough disk check as soon as there is any reason to suspect that there is a problem with a disk.

Don't try to play around with a broken disk! If you do, the chances that we can recover what is on it may decrease rapidly!

0.1.1 Replacing a crashed disk on Vela

There is a second external 4 GB disk connected to VELA. This disk is bootable and contains a fairly fresh (bi-weekly) back-up of the operating system as well as the Pegasus system and all the user accounts. This disk can thus be used as a fullworthy replacement for both the other disks on VELA. However, due to its limited size, the amount of disk space available is less, especially on the `/cdscr` file system which has been cut down to 24 MB (for more information of the configuration of the emergency disk, see the chapter on the physical set-up of VELA). To conserve disk space, `/cdscr` as well as `/archive` and `/logs` are empty.

The normal system on VELA consists of two disks: an internal disk with the root partition and an external disk with the rest of the partitions. There are thus three possible failure modes: the internal disk crashes, the external disk crashes or both disks crash. To completely switch over to the emergency disk is probably the safest thing to do, if you are uncertain about the status of the main disks. However, if the problem is clearly localised to the main root disk, you may want to use the emergency disk as root but still use the external main disk for Pegasus, since the observer then will be able to access his/her data and won't have to bother about setting up source lists and maps again.

Complete switch over to the emergency disk

- If possible logout anyone still logged in to VELA.

- Shut down VELA by logging in as `stop` (staff password) or login as `daprog` or `root` and type:
  > `cd /`
  > `shutdown -hy 0`
  Wait until you get the "`System is halted`"-message on the console and then switch off the power to the main computer followed by all external units. If it is impossible to login to VELA, just turn off the power.

- Disconnect the main external harddisk from the SCSI chain. Make sure that you reconnect the SCSI-chain properly.

- Switch on the external units (except the disconnected disk), wait 15 seconds and then switch on the power to VELA itself.

- Interrupt the boot process by continuously hitting `Escape` until you get the boot menu. Then type:
  > `boot alt`
  followed by "`n`". If you can't type anything at the boot menu, hit `Return` and try again. The boot process will be fully automatic once it has started.

- It should now be possible to login on any account and start up Pegasus again!

Use of the emergency disk only for root (normal Pegasus)

- If possible logout anyone still logged in to VELA.

- Reboot VELA by logging in as `daprog` or `root` and type:
  > `cd /`
  > `shutdown -ry 0`
  If it is impossible to login to VELA, just cycle the power.

- Interrupt the boot process by hitting `Escape`. When you get the boot menu type:
  > `boot alt`
  followed by "`n`". If you can't type anything at the boot menu, hit `Return` and try again. The boot process will be fully automatic once it has started.

- When VELA has booted up, login as `daprog` and bring it down to maintenance mode:
  > `cd /`
  > `shutdown -y 0`
  Wait until VELA has gone down into maintenance mode. You will be logged in automatically at the end of the process.

- Change the disk configuration file:
  > `cd /etc`
  > `cp fstab_mirror_root fstab`

- Reboot VELA again:
  > `cd /`
  > `shutdown -ry 0`

- Interrupt the boot process by hitting `Escape`. When you get the boot menu type:
  > `boot alt`
  followed by "`n`" and wait until the machine has rebooted.

- It should now be possible to login on any account and start up Pegasus again!

Use of the emergency disk only for Pegasus (normal root)

- If possible logout anyone still logged in to VELA.

- Login to VELA as `daprog` or `root` and type:
  > `cd /`
  > `shutdown -y 0`
  Wait until VELA has gone down into maintenance mode. You will be logged in automatically at the end of the process.

- Change the disk configuration file:
  > `cd /etc`
  > `cp fstab_mirror_external fstab`

- Shut down VELA by typing:
  > `cd /`
  > `shutdown -hy 0`
  Wait until you get the "`System is halted`"-message on the console and then switch off the power to the main computer followed by all external units.

- Disconnect the main external harddisk from the SCSI chain. Make sure that you reconnect the SCSI-chain properly.

- Switch on the external units (except the disconnected disk), wait 15 seconds and then switch on the power to VELA itself. The boot process will be fully automatic.

- It should now be possible to login on any account and start up Pegasus again!

0.1.2 A crash of Vela itself

If the VELA computer itself appears to be dead, i.e. nothing happens when you try to reboot it, then you will have to replace VELA with VOLANS. The procedure is as follows:

- Login as `root` on VOLANS and prepare it to become the new VELA:
  > `cd /etc/rc.config.d`
  > `cp -p netconf.VELA netconf`

- Switch off both VELA and VOLANS together with all external hardware. First log out all users and then shut them down by logging in as `stop` with the staff password.

- Disconnect and remove VELA, its two external harddisks, its screen, its keyboard and its mouse. Leave the DAT-drive and the CD-drive.

- Move VOLANS, its screen, its keyboard, its mouse and (optionally) its external CD-drive to their new location in the control room. The screen from LEO can be used instead of VOLANS's screen.

- Build a new VELA by connecting all the pieces in the control room together including the DAT-drive and the CD-drive(s). Make sure that you terminate the SCSI-chain properly by connecting a terminator at the last open SCSI port. If you decide to include the external CD-drive from VOLANS, you will need the spare wide SCSI-cable, that is located in the first cabinet on the left in the software engineer's room. The same cabinet also holds a spare RGB-cable that will be needed if you decided to use the screen of LEO. The weather station should be connected to the first RS-232 port. The printer cable to LYNX should be connected to the parallel port.

- When everything is properly connected, turn on the power and wait while the computer boots up.

- Login as `root` and adapt the shutdown allowance file:
  > `cd /etc`
  > `cp shutdown.allow_VELA shutdown.allow`

- Start `cron` jobs that are needed:
  > `cd`
  > `crontab -r`
  > `crontab crontab.root_VELA`
  > `su daprog`
  > `cd /aux2/local/cfht/dev/argo/weather`
  > `crontab cronfile_vela`
  > `exit`
  > `su archive`
  > `cd /home/archive`
  > `crontab cronfile`
  > `exit`

> `logout`

- It should now be possible to login to any Pegasus account.
- Start testing the system. In case of communication problems you may have to reboot SCORPIUS, ICCABIN, ANTLIA or ICCNTRL.
- The pointing model and AOS drifts on VOLANS are updated in the bi-weekly back-up, and may thus not be fully up-to-date. If things have changed, you should follow the standard procedures to update them on the new VELA.
- When you have verified that the new system is working, resume observations. Since VOLANS receives a back-up from VELA once every two weeks, the observing accounts will probably contain data from old projects. If that is the case, you will have to clean them first. Do not archive anything from the account before cleaning, since it is old data that already has been archived. If the cleaning program refuses to clean the account, type:
  > `rm archive.id`
  before restarting the cleaning. The observer will also have to recreate source lists and possible customized map files.

Note that the performance using VOLANS may be a little bit worse, since VOLANS only is running at 75% of the clock speed of VELA. VOLANS is, on the other hand, equipped with more memory and more swap space than VELA.

Most things will work normally on VOLANS with a few exceptions: the disk usage monitor must be switched off and printing on LYNX will produce extra pages.

0.2 Replacing the monitor on vela

There is a 19" A4331D spare monitor sitting on top of one of the document cabinets that can be used on VELA if the 21" monitor fails. It is basically just to plug it in, but you will get a better configuration (and a larger viewable screen if you first reconfigure the graphics card on VELA. To do this you have to reboot VELA (for example by using the `restart` account with the staff password) and then abort the boot of VELA by hitting `Escape` until you get the boot menu and then follow these instructions.