Gentoo creator

A tool to build and install Gentoo

Purpose

This software is a set of simple scripts to automate the installation of the Gentoo GNU/Linux distribution. It follows the official AMD64 install handbook, with a limited number of configuration options. It creates a KDE Plasma platform compiled out of the latest available sources in the stable branch, with only a handful of packages belonging to the testing branch.

Output

The output is an ISO installation file that can be used to burn a DVD or create a bootable USB stick using dd under *nix platforms of Rufus on Windows.

Target

This software is targeted at users who love Gentoo but want to spare some time installing their favourite platform.

It is more specifically geared towars data science, with R installed along with a reasonably complete set of R libraries and the free version of the RStudio IDE.

Other software included are Libreoffice and Okular, a complete TeX Live distribution for PDF-report creation, and core libraries of the Qt5 platform.

Prerequisites

This software is designed to work on *nix platforms. It has only been tested under GNU/Linux (Ubuntu-20.04 and Gentoo itself).

For the time being, supported configurations should include the following features:

- 64-bit processor of the AMD64 (x86_64).
- Intel or Nvidia-compatible video card.
- Pre-installed software:
  - A prior VirtualBox install (preferably complete with extpack package and guest additions, other configurations have not been tested), version 6.1 (or later)
  - A complete install of CloneZilla with its own dependencies. Debian packages can be used.
  - Bash and squashfs
  - Tar available with xz-compression

  - mkisofs (from cdrtools)
  - wget
  - mountpoint
  - rsync.

- A working, preferably wired, direct internet connection (firewalls are not supported).

- At least 55 GB of spare disk space if the custom-made `vbox-img` tool patched from VirtualBox sources work on your platform. Otherwise, 100 GB of spare disk space.
- A removable USB storage device (USB stick or external USB drive) with at least 55 GB of reachable space if Gentoo is to be directly installed to an external device directly.

Installation guidelines and usage

- Clone or unpack

- Check possible options and option defaults by calling: `mkgentoo.sh help`

USAGE:
mkgentoo [[switch=argument]...] filename.iso [1]
mkgentoo [[switch=argument]...] [2]
mkgentoo help[=md] [3]

Usage [1] creates a bootable ISO output file with a current Gentoo distribution.
Usage [2] creates a VirtualBox VDI dynamic disk and a virtual machine with name Gentoo.
Usage [3] prints this help, in markdown form if argument 'md' is specified.
Warning: you should have at least 55 GB of free disk space in the current directory or in vmpath if specified.

In a nutshell

- To create a bootable ISO run with root privileges:
  `# ./mkgentoo full/path/to/ISO/file`
- To burn to DVD run:
  `# ./mkgentoo full/path/to/ISO/file burn` (if there is only one optical disc writer to your platform).
- To directly install on any block device (disk drive, USB stick..) mounted or not:
  `# ./mkgentoo [iso file] [burn] usb_device=/dev/sdX`

Other options

- The default user is **fab** with password **dev20** (same as root). You can specify other choices by adding `nonroot_user=name_of_user` and `passwd=password_of_user` to commandline.
- To create a direct install of Gentoo to e.g. block device `/dev/sdc` add `usb_device=/dev/sdc` to commandine.
- To create a USB stick CloneZilla installer (or recovery medium) on device `/dev/sdf` add `usb_installer=/dev/sdf` to commandline
- To process a VM disk already created at a prior stage into an ISO file and/or external device installation, add `from_vm=true vm=name-of-virtual-machine`, with sdX the device identifier, to the requested options (ISO creation and/or `usb_installer=...` and/or `burn`)
- To process an already created Gentoo install on a disk into an ISO file and/or a USB-stick CloneZilla installer add: `from_device=true usb_device=/dev/sdX` and the requested options (`usb_installer=...`, ISO file and/or `burn`)
- Likewise to process an already created ISO installer into a USB stick CloneZilla installer and/or burn the ISO to DVD add `from_iso=true`. Direct installation to device from iso is currently not supported: please use the ISO (e.g. burned to DVD) to create the installed OS.
- The project comes in with a default kernel configuration file (.config) adapted from the Ubuntu 20.04 platform. This configuration may be averall too overloaded with unnecessary built-in drivers but will come in handy to many users. Should you wish a lighter, possibly more reactive kernel, please add your configuration file with option: `kernel_config=/path/to/cutom/config/file`
- If your PC was made prior to 2015, its processor may not enable the AVX2 register, which is set as a global compiling option. In this case you should tweak the building process by adding:
  `cflags="-core2 -O2"` to commandline, if your processor is at least CORE2-compatible, otherwise just `cflags="-O2"`.
- For COREi7 and higher-end processors, you may tweak the `cflags` option at your own risk. A good option is `cflags="-native -O2"`.
- You can optionaly build a patched version of VirtualBox. This version will noticeably speed up direct install of the OS to external block devices (thanks to a patch against `vbox-img`). You will have to manually add the root directory to your PATH variable and either uninstall the vanilla version of VirtualBox or place the root directory in the PATH so that the patched version gains precedence.

Commandline Options

Boolean values are either 'true' or 'false'. For example, to build a minimal distribution, specify on command line: `minimal=true`

switch	description	default value
debug_mode	Do not clean up mkgentoo custom logs at root of gentoo system files before VM shutdown. Boolean.	[false]
minimal	Remove *libreoffice* and *data science tools* from default list of installed software. Boolean.	[false]
elist	File containing a list of Gentoo ebuilds to add to the VM on top of stage3	[ebuilds.list]
vm	Virtual Machine name	[Gentoo]
vbpath	Path to VirtualBox directory	[/usr/bin]
vmpath	Path to VM base directory	[/home/fab/Dev/mkgentoo]
mem	VM RAM memory in MiB	[8000]
ncpus	Number of VM CPUs. By default the third of available threads.	[4]
processor	Processor type	[amd64]
size	Dynamic disc size	[55000]
livecd	Path to the live CD that will start the VM	[gentoo.iso]
mirror	Mirror site for downloading of stage3 tarball	[http://gentoo.mirrors.ovh.net/gentoo-distfiles/]
emirrors	Mirror sites for downloading ebuilds	[http://gentoo.mirrors.ovh.net/gentoo-distfiles/]
rstudio	RStudio version to be downloaded and built from github source	[1.3.1073]
r_version	R version	[4.0.2]
githubpath	RStudio Github path to zip: path right before version.zip	[https://github.com/rstudio/rstudio/archive/v]
cflags	GCC CFLAGS options for ebuilds	[-march=core-avx2 -O2]
nonroot_user	Non-root user	[fab]
passwd	User password	[dev20]
rootpasswd	Root password	[dev20]

switch	description	default value
download	Download install ISO image from Gentoo mirror. Boolean.	[true]
download_stage3	Download and install stage3 tarball to virtual disk. Booelan.	[true]
download_rstudio	Download and build RStudio. Boolean.	[true]
download_clonezilla	Refresh CloneZilla ISO download. Boolean	[true]
download_clonezilla_path	Use the following CloneZilla ISO	[https://sourceforge.net/projects/clonezilla/files/clone focal/clonezilla-live-20200703-focal-amd64.iso/download]
build_virtualbox	Download code source and automatically build virtualbox and tools	[false]
vbox_version	Virtualbox version	[6.1.14]
vbox_version_full	Virtualbox full version	[6.1.14a]
lineno_patch	Line patched against vbox-img.cpp in virtualbox source code	[797]
stage3	Path to stage3 archive	[stage3.tar.xz]
create_squashfs	(Re)create the squashfs filesystem. Boolean.	[true]
kernel_config	Use a custom kernel config file	[.config]
language	Set default login keyboard layout	[us]
burn	Burn to optical disc. Boolean.	[false]
cdrecord	cdrecord path. Automatically determined if left unspecified.	[/usr/local/bin/cdrecord]
scsi_address	In case of several optical disc burners, specify the SCSI address as x,y,z	[]

switch	description	default value
usb_device	Create Gentoo OS on external device. Argument is either a device label (e.g. sdb1, hdb1), or a mountpoint directory (if mounted), or a few consecutive letters of the model (e.g. 'Samsu', 'PNY' or 'Kingst'), if there is just one such.	[]
usb_installer	Create Gentoo clone installer on external device. Argument is either a device label (e.g. sdb2, hdb2), or a mountpoint directory (if mounted), or a few consecutive letters of the model, if there is just one such. If unspecified, **usb_device** value will be used. OS Gentoo will be replaced by Clonezilla installer.	[]
disable_md5_check	Disable MD5 checkums verification after downloads. Boolean.	[true]
cleanup	Clean up archives, temporary images and virtual machine after successful completion. Boolean.	[true]
help	This help	[]
from_vm	Do not generate Gentoo but use the VM . Boolean.	[false]
from_iso	Do not generate Gentoo but use the bootable ISO given on commandline. Boolean.	[false]
from_device	Do not Generate Gentoo but use the external device on which Gentoo was previously installed. Boolean.	[false]

Warnings

The install media will wipe out all data on the Desktop main disc (/dev/sda). It leaves no choice of the target disk and runs **non-interactively** from beginning to end.
Use it with care and only if you want to do a fresh install of your main PC disk. You have been warned.

Building the platforms comes in with the third of available threads as a default. If resources are strained, rerun with N cores by adding `ncpus=N` to commandline. The `ncpus` number of jobs is used to implement the portage `CFLAGS` parameter in **make.conf**, so that the building process is in line with ressources granted to the virtual machine. User should review this parameter later on according to the characteristics of the target platform.

Limitations

Currently video card support is limited to Intel and Nvidia. Internationalization is restricted to English and French. Gnome is not supported, nor other Gentoo profiles. Wifi is not completely configured.

`gentoo creator`: a virtual build tool for Gentoo GNU Linux

`gentoo-creator` arose from a simple practical need: to speed up my Gentoo recovery process when my platform ended up in tatters after too much tinkering with it. So here is a tool that meets this need, at least for core cases and without any claim to generality, completeness or achievement: making mistakes is better than faking perfection.

The overall conception of the tool strictly encapsulates the building process, using scripted VirtualBox machines to build the platform, clone it to block device and transform it to a CloneZilla bootable ISO.

I hope this tool will contribute to democratizing a very nice distribution by smoothing out some rough edges for newcomers.

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Montpellier, France Sept. 2020