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## CentOS 7 (x86\_64) – with Updates HVM

This AML AMI includes Amazon’s pre-built CentOS 7 x86\_64 HVM image version 2002\_01. The image contains just enough packages to run within AWS, bring up an SSH Server and allow users to login. Please note that this is the default CentOS-7 image that Amazon recommends everyone uses. It contains packages that are updated at points in time to include critical security updates.

See Amazon's product overview and other details here:

[https://aws.amazon.com/marketplace/pp/B00O7WM7QW?ref=cns\\_srchrow](https://aws.amazon.com/marketplace/pp/B00O7WM7QW?ref=cns_srchrow)

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Xilinx Runtime (XRT) version 2019.2.0.3

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See the following URL for the source code: <https://github.com/Xilinx/XRT/blob/2019.2.0.3>

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~/xilinx-aml/example/cpp/test.cpp (example cpp code):

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xilinxaml.h (interface code to libxilinxaml.so):

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fuzzy\_xilinx\_aws-vu9p-f1\_shell-v04261818\_201920\_2.awsxclobin (bitstream meta data file – provided in binary form only):

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Package Name: boost-devel      Version: 1.53.0

URL: <http://www.boost.org>

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Package Name: boost-filessystem            Version: 1.53.0

URL: <http://www.boost.org>

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Package Name: boost-program-options Version: 1.53.0

URL: <http://www.boost.org>

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Package Name: boost-static      Version: 1.53.0

URL: <http://www.boost.org>

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Package Name: cmake Version: 2.8.12.2

URL: <http://www.cmake.org>

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CMake - Cross Platform Makefile Generator

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- \* US National Labs (Los Alamos, Livermore, Sandia) ASC Parallel Visualization Initiative.
- \* National Alliance for Medical Image Computing (NAMIC) is funded by the National Institutes of Health through the NIH Roadmap for Medical Research, Grant U54 EB005149.
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Package Name: cppcheck      Version: 1.90

URL: <http://cppcheck.wiki.sourceforge.net/>

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GUI graphics courtesy of Tango Desktop Project:

<http://tango.freedesktop.org>

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Package Name: curl      Version: 7.29.0

URL: <http://curl.haxx.se/>

License: MIT

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Package Name: dkms Version: 2.8.1

URL: <http://linux.dell.com/dkms>

License: GPLv2+ (printed at the end of this document)

Mario Limonciello <Mario\_Limonciello@dell.com>

- Debian/Ubuntu packaging, mkdeb/mkdsc.

Gary Lerhaupt <gary\_lerhaupt@dell.com>

- Main DKMS software development

- Build from source adaptation from QLogic RPM

Fred Treasure <fwtreas@us.ibm.com>



Dmidecode reports information about your system's hardware as described in your system BIOS according to the SMBIOS/DMI standard. This information typically includes system manufacturer, model name, serial number, BIOS

version, asset tag as well as a lot of other details of varying level of interest and reliability depending on the manufacturer. This will often include usage status for the CPU sockets, expansion slots (e.g. AGP, PCI, ISA) and memory module slots, and the list of I/O ports (e.g. serial, parallel, USB).

DMI data can be used to enable or disable specific portions of kernel code depending on the specific hardware. Thus, one use of dmidecode is for kernel developers to detect system "signatures" and add them to the kernel source code when needed.

Beware that DMI data have proven to be too unreliable to be blindly trusted. Dmidecode does not scan your hardware, it only reports what the BIOS told it to.

## **\*\* INSTALLATION \*\***

The home web page for dmidecode is hosted on Savannah:

<http://www.nongnu.org/dmidecode/>

You will find the latest version (including CVS) there, as well as fresh news and other interesting material, such as a list of related projects and articles.

This program was first written for Linux, and has since been reported to work on FreeBSD, NetBSD, OpenBSD, BeOS and Solaris as well.

There's no configure script, so simply run "make" to build dmidecode, and "make install" to install it. You also can use "make uninstall" to remove

all the files you installed. By default, files are installed in /usr/local but you can change this behavior by editing the Makefile file and setting prefix to wherever you want. You may change the C compiler and the compilation flags as well.

Optionally, you can run "make strip" prior to "make install" if you want smaller binaries. However, be aware that this will prevent any further attempt to debug the programs.

Two parameters can be set in the Makefile file to make dmidecode work on non-i386 systems. They should be used if your system uses the big endian byte ordering (Motorola) or doesn't support unaligned memory accesses, respectively. For example, compiling for a SPARC processor would require both (but I am not aware of SPARC-based systems implementing SMBIOS). Compiling for an IA64 processor requires the memory alignment workaround, and it is enabled automatically.

## **\*\* DOCUMENTATION \*\***

Each tool has a manual page, found in the "man" subdirectory. Manual pages are installed by "make install". See these manual pages for command line interface details and tool specific information.

For an history of the changes made to dmidecode, see the NEWS file.

If you need help, your best chances are to visit the web page (see the INSTALLATION section above) or to get in touch with the developers directly. Have a look at the AUTHORS file and contact one of the maintainers.

If you want to help with the development of dmidecode, please consider joining the dmidecode-devel discussion list:

<http://lists.nongnu.org/mailman/listinfo/dmidecode-devel>

## **\*\* COMMON PROBLEMS \*\***

IA-64

Non-Linux systems are not yet supported.

MMAP

Note that mmap() is now used by default wherever possible, since this seems to solve a number of problems. This default behavior can be changed in config.h. Just to make sure this is clear, mmap() is not used for performance reasons but to increase the number of systems on which dmidecode can be successfully run.

CYGWIN

Dmidecode used to work under Cygwin. However the /dev/mem interface was removed at some point in time so it no longer works.

## **\*\* MISCELLANEOUS TOOLS \*\***

Three other tools come along with dmidecode: biosdecode, ownership and

vpddecode. These tools are only useful on systems with a BIOS, so they are not built on IA-64 by default.

## BIOSDECODE

This one prints all BIOS related information it can find in /dev/mem.

It used to be part of dmidecode itself, but as dmidecode was growing, we felt that the non-DMI part had to be moved to a separate tool.

## OWNERSHIP

This tool was written on a request by Luc Van de Velde for use with Novell tools in his company. It retrieves the "ownership tag" that can be set on most Compaq computers. Since it uses the same mechanisms dmidecode and biosdecode use, and could be of some use for other people as well, we decided to make it part of the project.

## VPDDECODE

This tool prints the contents of the "vital product data" structure as found in most IBM and Lenovo computers. It used to have a lookup table for the machine name, but it was unreliable and hard to maintain so it was ultimately dropped. It has a command line interface.

<<<<<<<<<Xilinx-separator>>>>>>>>

Package Name: epel-release      Version: 7

URL: <http://download.fedoraproject.org/pub/epel>

License: GPLv2 (printed at the end of this document)

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Package Name: gcc      Version: 4.8.5

URL: <http://gcc.gnu.org>

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Package Name: gcc-c++      Version: 4.8.5

URL: <http://gcc.gnu.org>

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Package Name: gdb      Version: 7.6.1

URL: <http://gnu.org/software/gdb/>

License: GPLv3+ and GPLv3+ with exceptions and GPLv2+ and GPLv2+ with exceptions (printed at the end of this document)

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Package Name: git      Version: 1.8.3.1

URL: <http://git-scm.com/>

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Linus Torvalds

-----

<<<<<<<<<Xilinx-separator>>>>>>>>>

Package Name: gnuplot Version: 4.6.2

URL: <http://www.gnuplot.info/>

License: gnuplot and MIT

/\*[

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]\*/

<<<<<<<<<Xilinx-separator>>>>>>>>>

Package Name: gtest-devel      Version: 1.6.0

URL: <http://code.google.com/p/googletest/>

License: BSD

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<<<<<<<<<Xilinx-separator>>>>>>>>>>>>

Package Name: libjpeg-turbo-devel      Version: 1.2.90

URL: <http://sourceforge.net/projects/libjpeg-turbo>

License: IJG

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The zlib License

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Package Name: libpng12-devel Version: 1.2.50

URL: <http://www.libpng.org/pub/png/>

License: zlib

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Package Name: libtiff-devel      Version: 4.0.3

URL: <http://www.remotesensing.org/libtiff/>

License: libtiff

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Package Name: libuuid-devel    Version: 2.23.2

URL: <http://en.wikipedia.org/wiki/Util-linux>

License: BSD

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<<<<<<<<<Xilinx-separator>>>>>>>>>>>>

Package Name: libxml2-devel    Version: 2.9.1

URL: <http://xmlsoft.org/>

License: MIT

XML toolkit from the GNOME project

Full documentation is available on-line at

<http://xmlsoft.org/>

This code is released under the MIT Licence see the Copyright file.

To build on an Unixised setup:

`./configure ; make ; make install`

To build on Windows:

see instructions on win32/Readme.txt

To assert build quality:

on an Unixised setup:

`run make tests`

otherwise:

There is 3 standalone tools `runtest.c` `runsuite.c` `testapi.c`, which should compile as part of the build or as any application would.

Launch them from this directory to get results, `runtest` checks the proper functioning of libxml2 main APIs while `testapi` does

a full coverage check. Report failures to the list.

To report bugs, follow the instructions at:

<http://xmlsoft.org/bugs.html>

A mailing-list [xml@gnome.org](mailto:xml@gnome.org) is available, to subscribe:

<http://mail.gnome.org/mailman/listinfo/xml>

The list archive is at:

<http://mail.gnome.org/archives/xml/>

All technical answers asked privately will be automatically answered on the list and archived for public access unless privacy is explicitly required and justified.

Daniel Veillard

\$Id\$

<<<<<<<<<Xilinx-separator>>>>>>>>>>>>

Package Name: libyaml-devel    Version: 0.1.4

URL: <http://pyyaml.org/>

License: MIT

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The LibYAML library was written by Kirill Simonov. It is now maintained by the YAML community.

LibYAML is released under the MIT license.

This project was developed for Python Software Foundation as a part of Google Summer of Code under the mentorship of Clark Evans.

<<<<<<<<<Xilinx-separator>>>>>>>>>>>>

Package Name: lm\_sensors      Version: 3.4.0

URL: <http://github.com/groeck/lm-sensors/>

License: LGPLv2+ and GPLv3+ and GPLv2+ (printed at the end of this document) and Verbatim and Public Domain

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Package Name: make      Version: 3.82

URL: <http://www.gnu.org/software/make/>

License: GPLv2+ (printed at the end of this document)

<<<<<<<<<Xilinx-separator>>>>>>>>>>>>

Package Name: ncurses-devel      Version: 5.9

URL: <http://invisible-island.net/ncurses/ncurses.html>

License: MIT

```
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-----  
-- \$Id: README-first,v 1.9 2007/01/27 18:27:09 tom Exp \$  
-----

## C++ interface to ncurses routines

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This directory contains the source code for several C++ classes which ease the use of writing ncurses-based programs. The code was originally derived from the libg++ CursesWindow class, but rewritten for ncurses.

The classes simplify the use of window specific functions by encapsulating them in the window object. Function overloading is used in order to narrow the interface. For example, you do not have the distinction between ``printw'` and ``mvprintw'` anymore.

A second benefit is the removal of all `#defines` which are included in the `curses.h` file. This is a steady cause of trouble because many common identifiers are used. Instead now all `#defines` are inline functions, which also allows strict type checking of arguments.

The next enhancement is color support. It was originally provided by a derived class. This caused some trouble if you think about Panels or Menus and Forms with colors. We decided to put color support into the base class so that any derived class may use color support also.

The implementation chosen here is directed to unrestricted use of mixes of color and monochrome windows. The original `NCursesColorWindow` class is maintained for compatibility reasons.

The last point to mention is the support of other packages that are distributed with the ncurses package: the panels library, the menu library and the form library. This support is provided by the NCursesPanel class, which is also derived from the NCursesWindow class and the NCursesMenu and NCursesForm classes which are derived from NCursesPanel. This allows building interfaces with windows.

Please see the example program for a quick introduction.

Note that at this point, there is no documentation for these classes. Hopefully some will be written in the not too distant future. For now, to find out how to use the classes, read the code and the example program.

Suggestions for enhancements and contributions of code (and docs) are welcome. Please let us know which functionality you miss.

Original author:

Eric Newton      <newton@rocky.oswego.edu> for FSF's libg++

Authors of first ncurses based release (NCursesWindow, NCursesPanel):

Ulrich Drepper    <drepper@ira.uka.de>

and Anatoly Ivasyuk   <anatoly@nick.csh.rit.edu>

Authors of this release:

Juergen Pfeifer

Thomas E. Dickey

<<<<<<<<<Xilinx-separator>>>>>>>>>

Package Name: ocl-icd Version: 2.2.12

URL: <https://forge.imag.fr/projects/ocl-icd/>

License: BSD

This package aims at creating an Open Source alternative to vendor specific OpenCL ICD loaders.

The main difficulties to create such software is that the order of function pointers in a structure is not publicly available.

This software maintains a YAML database of all known and guessed entries.

If the configure script is called with `--enable-update-database`, then:

- a dummy OpenCL implementation using available headers on the system is created
- this dummy OpenCL implementation is installed system-wide (root access needed) with the file `dummy.icd` in `/etc/OpenCL/vendors/`
- a test program then calls every function defined in the headers and thus obtains the function mapping inside the demultiplexer

So, if an other OpenCL ICD loader is installed on the system, this allows us to discover the mapping of new entries in the structure, entries that are then recorded in the YAML database.

Of course, if the currently installed OpenCL ICD loader is this one, there won't be any problems but no new mapping will be discovered.

This package also delivers a skeleton of bindings to incorporate inside an OpenCL implementation to give it ICD functionalities.

Main Make targets:

all/check/install/...: builds the library and bindings from database

update-database: adds new functions to the database from the currently installed OpenCL ICD Loader. Needs root permission.

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Package Name: ocl-icd-devel    Version: 2.2.12

URL: <https://forge.imag.fr/projects/ocl-icd/>

License: BSD

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Package Name: opencv Version: 2.4.5

URL: <http://opencv.org>

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Package Name: openssl-devel Version: 1.0.2k

URL: <http://www.openssl.org/>

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 $\ast/$ 

```
<<<<<<<Xilinx-separator>>>>>>>
```

Package Name: pciutils Version: 3.5.1

URL: <http://atrey.karlin.mff.cuni.cz/~mj/pciutils.shtml>

License: GPLv2+ (printed at the end of this document)

```
<<<<<<<Xilinx-separator>>>>>>>
```

Package Name: perl      Version: 5.16.3

URL: <http://www.perl.org/>

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## ABOUT PERL

=====

Perl is a general-purpose programming language originally developed for text manipulation and now used for a wide range of tasks including system administration, web development, network programming, GUI development, and more.

The language is intended to be practical (easy to use, efficient, complete) rather than beautiful (tiny, elegant, minimal). Its major features are that it's easy to use, supports both procedural and object-oriented (OO) programming, has powerful built-in support for text processing, and has one of the world's most impressive collections of third-party modules.

For an introduction to the language's features, see `pod/perlintro.pod`.

For a discussion of the important changes in this release, see `pod/perldelta.pod`.

There are also many Perl books available, covering a wide variety of topics, from various publishers. See `pod/perlbook.pod` for more information.

## INSTALLATION

=====

If you're using a relatively modern operating system and want to install this version of Perl locally, run the following commands:

```
./Configure -des -Dprefix=$HOME/localperl  
make test  
make install
```

This will configure and compile perl for your platform, run the regression tests, and install perl in a subdirectory "localperl" of your home directory.

If you run into any trouble whatsoever or you need to install a customized version of Perl, you should read the detailed instructions in the "INSTALL" file that came with this distribution. Additionally, there are a number of "README" files with hints and tips about building and using Perl on a wide variety of platforms, some more common than others.

Once you have Perl installed, a wealth of documentation is available to you through the 'perldoc' tool. To get started, run this command:

```
perldoc perl
```

#### IF YOU RUN INTO TROUBLE

=====

Perl is a large and complex system that's used for everything from knitting to rocket science. If you run into trouble, it's quite likely that someone else has already solved the problem you're facing. Once you've exhausted the documentation, please report bugs to us using the 'perlbug' tool. For more information about perlbug, either type 'perldoc perlbug' or just 'perlbug' on a line by itself.

While it was current when we made it available, Perl is constantly evolving and there may be a more recent version that fixes bugs you've run into or adds new features that you might find useful.

You can always find the latest version of perl on a CPAN (Comprehensive Perl Archive Network) site near you at <http://www.cpan.org/src/>

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Package Name: pkgconfig      Version: 0.27.1

URL: <http://pkgconfig.freedesktop.org>

License: GPLv2+ (printed at the end of this document)

<<<<<<<<<Xilinx-separator>>>>>>>>>>>>

Package Name: protobuf-compiler      Version: 2.5.0

URL: <http://code.google.com/p/protobuf/>

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Package Name: python Version: 2.7.5

URL: <http://www.python.org/>

License: Python

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

All Python releases are Open Source (see <http://www.opensource.org> for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases.

Release	Derived from	Year	Owner	GPL-compatible? (1)
0.9.0 thru 1.2		1991-1995	CWI	yes
1.3 thru 1.5.2	1.2	1995-1999	CNRI	yes
1.6	1.5.2	2000	CNRI	no
2.0	1.6	2000	BeOpen.com	no
1.6.1	1.6	2001	CNRI	yes (2)
2.1	2.0+1.6.1	2001	PSF	no
2.0.1	2.0+1.6.1	2001	PSF	yes
2.1.1	2.1+2.0.1	2001	PSF	yes
2.2	2.1.1	2001	PSF	yes
2.1.2	2.1.1	2002	PSF	yes
2.1.3	2.1.2	2002	PSF	yes

2.2.1	2.2	2002	PSF	yes
2.2.2	2.2.1	2002	PSF	yes
2.2.3	2.2.2	2003	PSF	yes
2.3	2.2.2	2002-2003	PSF	yes
2.3.1	2.3	2002-2003	PSF	yes
2.3.2	2.3.1	2002-2003	PSF	yes
2.3.3	2.3.2	2002-2003	PSF	yes
2.3.4	2.3.3	2004	PSF	yes
2.3.5	2.3.4	2005	PSF	yes
2.4	2.3	2004	PSF	yes
2.4.1	2.4	2005	PSF	yes
2.4.2	2.4.1	2005	PSF	yes
2.4.3	2.4.2	2006	PSF	yes
2.4.4	2.4.3	2006	PSF	yes
2.5	2.4	2006	PSF	yes
2.5.1	2.5	2007	PSF	yes
2.5.2	2.5.1	2008	PSF	yes
2.5.3	2.5.2	2008	PSF	yes
2.6	2.5	2008	PSF	yes
2.6.1	2.6	2008	PSF	yes
2.6.2	2.6.1	2009	PSF	yes
2.6.3	2.6.2	2009	PSF	yes
2.6.4	2.6.3	2009	PSF	yes
2.6.5	2.6.4	2010	PSF	yes
2.7	2.6	2010	PSF	yes

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Package Name: unzip    Version: 6.0

URL: <http://www.info-zip.org/UnZip.html>

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Package Name: zlib-static      Version: 1.2.7

URL: <http://www.zlib.net/>

License: zlib and Boost

## ZLIB DATA COMPRESSION LIBRARY

zlib 1.2.7 is a general purpose data compression library. All the code is thread safe. The data format used by the zlib library is described by RFCs



(Request for Comments) 1950 to 1952 in the files

<http://tools.ietf.org/html/rfc1950> (zlib format), [rfc1951](http://tools.ietf.org/html/rfc1951) (deflate format) and [rfc1952](http://tools.ietf.org/html/rfc1952) (gzip format).

All functions of the compression library are documented in the file `zlib.h` (volunteer to write man pages welcome, contact [zlib@gzip.org](mailto:zlib@gzip.org)). A usage example of the library is given in the file `test/example.c` which also tests that the library is working correctly. Another example is given in the file `test/minigzip.c`. The compression library itself is composed of all source files in the root directory.

To compile all files and run the test program, follow the instructions given at the top of `Makefile.in`. In short `./configure; make test`, and if that goes well, `make install` should work for most flavors of Unix. For Windows, use one of the special makefiles in `win32/` or `contrib/vstudio/`. For VMS, use `make_vms.com`.

Questions about zlib should be sent to [<zlib@gzip.org>](mailto:zlib@gzip.org), or to Gilles Vollant [<info@winimage.com>](mailto:info@winimage.com) for the Windows DLL version. The zlib home page is <http://zlib.net/>. Before reporting a problem, please check this site to verify that you have the latest version of zlib; otherwise get the latest version and check whether the problem still exists or not.

PLEASE read the zlib FAQ [http://zlib.net/zlib\\_faq.html](http://zlib.net/zlib_faq.html) before asking for help.

Mark Nelson [<markn@ieee.org>](mailto:markn@ieee.org) wrote an article about zlib for the Jan. 1997 issue of Dr. Dobbs's Journal; a copy of the article is available at <http://marknelson.us/1997/01/01/zlib-engine/>.

The changes made in version 1.2.7 are documented in the file ChangeLog.

Unsupported third party contributions are provided in directory contrib/ .

zlib is available in Java using the java.util.zip package, documented at <http://java.sun.com/developer/technicalArticles/Programming/compression/> .

A Perl interface to zlib written by Paul Marquess <pmqs@cpan.org> is available at CPAN (Comprehensive Perl Archive Network) sites, including <http://search.cpan.org/~pmqs/IO-Compress-Zlib/> .

A Python interface to zlib written by A.M. Kuchling <amk@amk.ca> is available in Python 1.5 and later versions, see <http://docs.python.org/library/zlib.html> .

zlib is built into tcl: <http://wiki.tcl.tk/4610> .

An experimental package to read and write files in .zip format, written on top of zlib by Gilles Vollant <info@winimage.com>, is available in the contrib/minizip directory of zlib.

Notes for some targets:

- For Windows DLL versions, please see win32/DLL\_FAQ.txt
- For 64-bit Irix, deflate.c must be compiled without any optimization. With -O, one libpng test fails. The test works in 32 bit mode (with the -n32 compiler flag). The compiler bug has been reported to SGI.

- zlib doesn't work with gcc 2.6.3 on a DEC 3000/300LX under OSF/1 2.1 it works when compiled with cc.
- On Digital Unix 4.0D (formely OSF/1) on AlphaServer, the cc option -std1 is necessary to get gzprintf working correctly. This is done by configure.
- zlib doesn't work on HP-UX 9.05 with some versions of /bin/cc. It works with other compilers. Use "make test" to check your compiler.
- gzdopen is not supported on RISCOS or BEOS.
- For PalmOs, see <http://palmzlib.sourceforge.net/>

#### Acknowledgments:

The deflate format used by zlib was defined by Phil Katz. The deflate and zlib specifications were written by L. Peter Deutsch. Thanks to all the people who reported problems and suggested various improvements in zlib; they are too numerous to cite here.

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Package Name: openssl-static    Version: 1.0.2k

URL: <http://www.openssl.org/>

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Package Name: libstdc++-static Version: 4.8.5

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Package Name: glibc-static Version: 2.17

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Package Name: libdrm-devel      Version: 2.4.97

URL: <http://dri.sourceforge.net>

License: MIT

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Package Name: protobuf-static Version: 2.5.0

URL: <http://code.google.com/p/protobuf/>

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Package Name: redhat-lsb      Version: 4.1

URL: <http://www.linuxfoundation.org/collaborate/workgroups/lb>

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Package Name: gnutls-devel      Version: 3.3.29

URL: <http://www.gnutls.org/>

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Package Name: rpm-build      Version: 4.11.3

URL: <http://www.rpm.org/>

License: GPLv2+ (printed at the end of this document)

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Package Name: cmake3 Version: 3.17.3

URL: <http://www.cmake.org>

License: BSD and MIT and zlib

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Package Name: compat-libtiff3 Version: 3.9.4

URL: <http://www.remotesensing.org/libtiff/>

License: libtiff

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Package Name: kernel-headers Version: 3.10.0

URL: <http://www.kernel.org/>

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Package Name: kernel-devel Version: 3.10.0

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Package Name: opencl-headers Version: 2.2

URL: <https://www.khronos.org/registry/cl/>

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"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

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d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

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However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

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For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

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The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

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(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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